



RAPID SET CEMENT IS NCDOT'S MATERIAL OF CHOICE

Project Type:

Highway

Application:

Panel replacement

Location:

Interstate 40, Asheville, NC

Project Dates:

September 2019 – August 2020

Project Owner:

North Carolina DOT

Contractor:

Southern Road and Bridge

Project Size:

2,600 cubic yards

Product:

Rapid Set® Cement

Since 2014, the North Carolina Department of Transportation (NCDOT) has been using concrete mix designs containing Rapid Set® Cement to meet performance specifications for the state's roadway panel replacement projects. The hydraulic cement's rapid-hardening properties make it an ideal material for replacing jointed concrete pavement panels overnight and returning them to full service by morning. This fast return to service is needed to minimize traffic disruption.

One of the DOT's latest projects involved replacing broken roadway panels, typically around 10 inches thick, along a mile-long stretch of Interstate 40, at the Enka exit near Asheville. NCDOT Division 13 contracted Southern Road and Bridge, headquartered in Tarpon Springs, Fla., to perform the work, which included removing the existing concrete from the east- and westbound lanes and placing and finishing fresh concrete made with Rapid Set Cement and local aggregates.

The contractor was required to perform work overnight, and the repaired pavement had to reach a flexural strength of 400 psi in four hours. The strength requirement had to be met by 6:30 a.m. each morning so that normal traffic could resume. If the requirement was not met, the contractor faced a penalty of between \$1,000 and \$2,000 for every 15 minutes the opening was delayed.

Beginning at 8:00 p.m. each evening, the crew saw cut broken panels into manageable sections and removed them. They then checked the subgrade for correct compaction. Dowels and dowel baskets were positioned as required. The concrete was then produced from a volumetric mobile mixer to replace the broken panels. Heartland Concrete of Petersburg, Va., produced the Rapid Set Concrete as needed each night. The repaired sections were roller screeded, floated, hand-troweled and broom-finished before reopening to traffic in time for morning rush hour.

Repairs began in September 2019 and the project was completed August 2020. The crew worked in a range of temperatures—from 45 to 85 degrees Fahrenheit—employing hot- and cold-weather concreting techniques as needed. This included using burlap sheets for wet curing to prevent premature evaporation during summer heat and covering repaired surfaces with blankets to keep heat in and the wind out when temperatures dropped.

EXCEEDING EXPECTATIONS

By using Rapid Set Cement, Southern Road and Bridge met and exceeded the required strength each morning, often within two to three hours and with flexural strengths as high as 550 psi. Because Rapid Set Cement is engineered for low shrinkage and superior resistance to chemical attack, its use on this project will also maximize pavement service life and minimize maintenance needs, such as joint filling and crack sealing as well as more expensive repairs like potholes.

Approximately 2,600 cubic yards of concrete was placed during the project. Since the DOT began using Rapid Set Cement in 2014, more than 20,000 cubic yards of material have been placed to repair North Carolina's roadways. From the concrete producer to the contractor to the project owner, all parties involved are pleased with the performance of the material.

CTS Cement Manufacturing Corporation manufactures Rapid Set professional-grade cement products for concrete repairs and new construction projects. Contractors, owners, engineers and architects choose Rapid Set to eliminate problems they have with other concrete repair materials, to save time and money, when superior durability is required and results need to be aesthetically pleasing. For more information about CTS Cement and Rapid Set, please visit www.CTScement.com.

