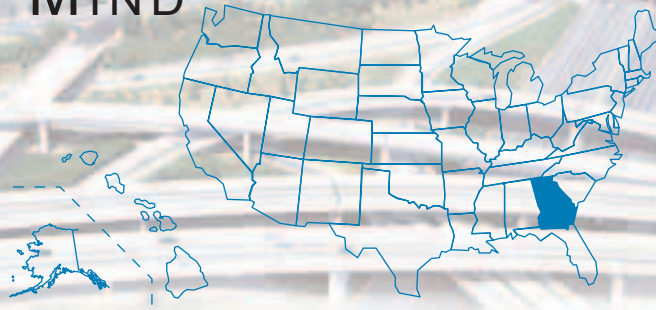


# CRCP in Georgia

## DURABLE PAVEMENT ON THEIR MIND



Until the late 1960's, State Route 42 was a two-lane country highway winding through the heart of rural Georgia. When Interstate 75 was built in 1967, 13 miles of SR-42 between Forsyth and Macon became the southbound lanes of I-75. Two new northbound lanes were constructed.

SR-42 was paved in 1954 with 8-inch-thick jointed plain concrete pavement (JPCP), and it was in good condition until it became I-75. With the increased interstate truck traffic, however, it did not take long for the pavement to deteriorate.

By the early 1970s, the jointed concrete was showing signs of distress, specifically at the joints. Many states faced the same issue at that time: jointed concrete pavements were suffering structural deterioration and required major repairs, overlays, or replacement.

### Bold New Overlay

In 1971, Georgia's forward-looking pavement engineers designed and built a continuously reinforced concrete pavement (CRCP) overlay on top of the existing SR-42 jointed concrete pavement. Although the first CRCP overlay in the U.S. was built in Texas in 1959, by 1971 only a handful of additional CRCP overlays had been built.

Georgia's first CRCP overlay project paid off. The 13-mile stretch of pavement between Forsyth and Macon has provid-

ed exceptional performance for over 30 years. "The overlay has served us very well," says Thomas Howell, P.E., District Engineer for Georgia Department of Transportation (GDOT) District 3.

CRCP is, simply, concrete pavement that is reinforced with steel bars. No transverse joints are needed. The reinforcing bars control the width of the transverse cracks that form and hold them closed. The transverse cracks do not impair the structural integrity of the pavement.

Because of its greater durability, longer life expectancy, and minimal maintenance requirements, CRCP can provide the best long-term value of any pavement type. "I personally love it," says Howell. "CRCP is a good product that cuts down on maintenance."



### CRCP Overlay Makes the Grade

The CRCP overlay on SR-42 was 8-inches thick over approximately 10 miles of the project and 7-inches thick over the remainder. The overlay was constructed with #5 reinforcing bars spaced 6 inches on-center, providing about 0.6 percent steel on the 8-inch-thick section and about 0.7 percent steel on the 7-inch-thick section. No interlayer or transverse steel was used.

A 1975 condition survey concluded, "The excellent condition of this project is indicated by the absence of spalled cracks, longitudinal cracking, and localized punchouts. The project rides very well."

Typical transverse cracking on I-75



## Repair or Replace?

Jointed plain concrete pavement (JPCP) typically requires considerably more long-term maintenance than continuously reinforced concrete pavement (CRCP), which has no transverse joints to maintain. The entrance of water through joints, the presence of erodible or compressible subgrade, and heavy load applications all combine to damage jointed concrete pavement. CRCP withstands these conditions best.

When repairing existing JPCP, GDOT typically adds steel reinforcing bars. The concrete that is damaged is removed, then transverse and longitudinal reinforcing bars are placed and either doweled into the adjacent concrete or welded to the surrounding reinforcing bars, and new concrete is poured, creating a sort of “hybrid” CRCP patch.

“The reinforcing bars provide better pavement performance with minimal additional cost,” says Buddy Gratton, P.E., Georgia State Maintenance Engineer.

In general, for Georgia’s Interstate highways, if a section of concrete pavement has already been repaired or rehabilitated once or twice over an 8-year period, and more than approximately 30 percent of the



## Increasingly Heavier Loading

Increased traffic along this stretch of roadway over subsequent decades has been paralleled on virtually all Interstate highways. To meet demands of the heavy traffic load, in 1989, GDOT widened I-75 to four lanes in each direction, building two new northbound and southbound lanes within the right-of-way of the median.

The new southbound lanes (lane numbers 1 and 2) were constructed with full-depth CRCP, 8 inches thick with #6 longitudinal and #4 transverse reinforcing bars spaced at 6 inches on-center. The CRCP-overlaid section of the original SR-42 continued to serve as the two outside lanes (lane numbers 3 and 4), which carried most of the truck traffic.

From 1990 to 2002, traffic through Forsyth increased by 64 percent. Truck traffic accounted for approximately 24 percent of the vehicular load. “There’s been a huge increase in truck traffic over the past decade,” says Howell. “The truck traffic is outrageous on I-75.”

## For This Generation and the Next

By 2001, the 10-mile stretch between Forsyth and Macon was showing its age. GDOT decided to rehabilitate the three interior lanes of I-75 and replace the outside lane. “We’ve had to do very little maintenance on that segment of pavement,” says Howell, “but after 30 years and a lot of trucks, parts of it were pretty worn out.”

The CRCP on the two inside lanes (lanes 1 and 2) showed little adverse transverse cracking and no longitudinal cracking. Nominal patching—approximately 20 patches per lane over a 10-mile stretch—was performed.

Lane 3 (the 1971 CRCP over the 1954 JPCP) was also patched. Lane 4, which gets the most truck traffic, is currently being replaced with 8-inch-thick CRCP. “We hope to get another good 30 years of low-maintenance service from that stretch,” says Howell.



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