RCC is the Right Choice for Busy Interstate Exchange

Structural Strength of RCC Stands Up to Heavy Truck Traffic

By Sheryl S. Jackson

EXIT 104 ON INTERSTATE 59/20 IN JEFFERSON COUNTY near Birmingham, Ala., is a busy interchange. Not only is there an active truck stop at the exit, but the road also carries traffic from a large rail to truck intermodal facility and a large distribution warehouse.

"This is a typical diamond interchange, but the high truck counts have contributed to the deterioration of the asphalt pavement on both sides of the concrete bridge," says Ken Couch, P.E., county transportation engineer for the Birmingham area for ALDOT. "The City of Bessemer, Jefferson County, ALDOT and the Federal Highway Administration worked together to fund the project," he explains. "The goal was to restore the pavement to the point that it could weather the heavy truck traffic."

The initial design called for building up the asphalt road to provide the pavement strength needed, but that meant raising the bridge crossing the interstate. Rather than raising the bridge, the decision was made to remove the existing pavement and dig deeper to place the extra material. To minimize the amount of digging and remain on grade with the bridge, ALDOT explored Roller Compacted Concrete (RCC) as a solution. Although RCC is commonly used in industrial areas, this was the first road pavement project for the Birmingham area.

ALDOT was looking for a location to test RCC in a real-world situation, explains Terry W. Robinson, acting bureau chief of the Innovative Programs Bureau of ALDOT. "Although the concrete is not as deep as traditional asphalt pavement, it provides the structural strength needed in areas of heavy truck traffic."

Because RCC does not rut or shove as large trucks stop, start and turn, the length of life for

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the pavement as well as less maintenance costs added to the benefits of RCC for the interstate intersection.

Speed of construction was also a concern. "We had to keep traffic flowing and RCC could be placed quicker than conventional concrete at the depth that was being used," explains Couch. "The initial cost was a little higher but the RCC should give us 20 years of service versus 10 to 15 for asphalt."

The project included 3,640 linear ft of pavement with 1,580 linear ft of RCC used to pave from the end of the bridge to the on and off ramps on both sides. RCC pavement also extends to the truck stop driveway. Other work included repair and buildup of part of the asphalt road that leads up to the interchange and cast-in-place concrete work at the top of each ramp.

Borings taken prior to design indicated a crushed stone base layer, says Couch. "We discovered that the degradation of the pavement led to water in the subgrade and no stone in some areas," he says.

In the areas that did not provide enough support for the RCC pavement, the contractor, A.G. Peltz, an ACPA member, had to undercut and

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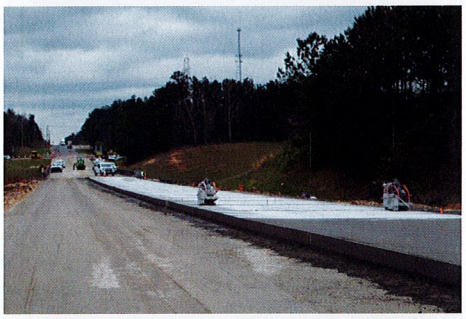

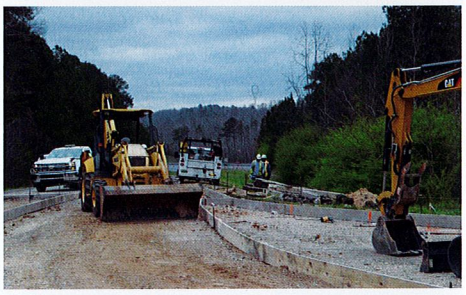

replace material. "This project was different for us because we are usually a subcontractor, but we were the prime contractor on this project," says Rodney Woodham, project manager for A.G. Peltz. Woodham's crew handled the grading and placement of 10 in. of RCC but subcontracted the asphalt milling to another company.

To allow time to cure, lanes across the bridge and entrance/exit ramps were constructed in phases. Traffic was re-routed to the next interstate exit to minimize traffic at the work site.

This is not the first RCC road pavement placed by A.G. Peltz, and although the process is similar to industrial or commercial applications, there are two differences, says Chris Carwie, business development manager for the contractor. "This pavement must meet rideability specifications set by ALDOT, so it was necessary to grind," he says. "Also, the pavement design was thinner than typically required for container stacking operations at an intermodal facility so a single lift RCC was possible—10 in. was placed in one pass."

One lesson learned in this—the first RCC road pavement in the area—was related to contract language, says Couch. "Detail work, such as the top of the entrance and exit ramps, required cast-in-place concrete to provide the transition from the RCC pavement to the ramp," he says. "We did not anticipate that and will provide a separate line item for that work in the future."

"It was an efficient process with the same paver used to spread and compact the base that was used to place the RCC," says Couch. He does see RCC as a potential solution for road projects that have long, uninterrupted stretches of pavement, for which temporary lane closures to allow cure time are possible. "I will recommend use of RCC to my supervisors again for the right application."

ALABAMA I-59/20

PROJECT SNAPSHOT

- **Project:** RCC pavement of interstate diamond exchange
- **Length:** 1,580 linear ft. of RCC in total project of 3,640 linear ft.
- **Description of pavement:** 10-in. RCC over 6-in. crushed aggregate base
- **Quantity of RCC:** 9,727 sq. yds.
- **Contractor:** A.G. Peltz Group LLC