It is no wonder roundabout (RAB) use across the country continues to grow. According to the Federal Highway Administration’s (FHWA) Modern Roundabouts: A Safer Choice YouTube video, modern roundabout intersections are not only safer than traditional signalized and stop-controlled intersections, but when properly designed, modern roundabouts operate more efficiently, often have lower life cycle costs, and result in increased fuel efficiency. These benefits, among others, are why there have been over 300 modern roundabouts constructed in North Carolina recently – over half of them in the North Carolina Department of Transportation (NCDOT) system.

Good design is critical to the success of a roundabout. When NCDOT’s Division Four started planning a roundabout near the newly announced CSX multimodal facility located in Edgecombe County, they wanted to take a slightly different design approach. Accounting for future large truck volumes once the new multimodal facility opens, it was time for a Portland cement concrete pavement (PCCP) roundabout, including travel lanes leading into and away from the circle. NCDOT’s Division Four Project Development Engineer Matt Clarke, PE, said, “Concrete pavement was identified as a benefit for long-term maintenance and durability in the roundabout and slip lane where loaded trucks will be making turning movements. Concrete pavement will provide a resilient roadway for the expected high truck volumes.”

Bid in July 2018, the RAB project contained 8,000 square yards of 9.5-inch PCCP as part of the larger grading, drainage and paving project. As directed within the contract documents, the low-bid contractor who was awarded the project, submitted (for approval) the detail for pavement joints. The details were required to follow the guidelines provided in the American Concrete Pavement Association (ACPA) EB237P, Concrete Pavement Field Reference: Pre-Paving. ACPA Southeast Chapter member Granite Contracting was selected by the prime contractor, Rose Brothers Paving, to complete the concrete portions of the roundabout paving.

Granite Contracting’s Project Manager Dallas Owens, stated the project presented some unique challenges. It was designed with varying lane widths, concrete shoulders, unbound edges, and keyed-in concrete medians (concrete base and aggregate base course used). The NCDOT Project Special Provisions required us to follow the means and methods of the NCDOT, but also required the pavement joints to be designed per ACPA’s Concrete Pavement Field Reference: Pre-Paving. Owens added that during the pre-construction stage they reached out to the ACPA National and ACPA Southeast Chapter, and found them to be very helpful by their participation at various meetings and invaluable input during the development of the jointing layout plan.

Although experienced with municipal type paving applications, this was Granite Contracting’s first opportunity to pave a concrete roundabout, therefore preparation was key – including a trip to Iowa to view successful concrete roundabout projects. During the Iowa trip, Owens spoke with another ACPA National contractor member with roundabout paving experience.

Well-designed roundabouts are all about improving traffic flow and improving safety. Even when trucks will be a large percentage of the traffic, roundabouts can be designed for long-lasting durability. Owens said, “We want to show concrete as a viable pavement option for unique applications, and our team was committed to making the needed investments to see that happen!”

By:
Greg Dean
Executive Director
Carolinas Concrete Paving Association