

## **Durability of "Early-Opening-to-Traffic" Portland Cement Concrete for Pavement Rehabilitation**

This research in response to a National Cooperative Highway Research Program (NCHRP) request for the study entitled, "Durability of 'Early-Opening-to-Traffic' Portland Cement Concrete for Pavement Rehabilitation." As stated in the RFP, there is an increasing need for "early-opening-to-traffic (EOT)" rehabilitation strategies that minimize disruption to traffic in crowded urban areas. For the repair of portland cement concrete (PCC) pavements, these strategies must include the use of full-depth repair and slab replacement featuring the application of EOT PCC, which rapidly gains strength to support traffic within a relatively short time period. Past research efforts have focused extensively on the requirement for early strength development, "often with limited consideration given to materials and construction aspects that influence long-term performance and durability." In many instances, this has resulted in the construction of full-depth repairs and slab replacements with PCC that possessed adequate initial strength, but with poor, long-term durability characteristics.

The assembled project team, that includes Michigan Technological University (MTU), Michigan State University (MSU), and the Michigan Department of Transportation (MDOT), has the technical background, facilities, and practical experience needed to meet the NCHRP's needs for both technical rigor and the development of an implementable product. Dr. Thomas J. Van Dam, P.E., will direct the project, and will be assisted at MTU by Dr. Larry L. Sutter and Karl R. Peterson. The co-Principal Investigator at MSU will be Dr. Neeraj Buch who will be assisted by Sia Ravan. John F. Staton, P.E. and Thomas B. Woodhouse will supervise the work to be conducted at MDOT.

The study objective "is to develop guidelines for materials, mixtures, and construction techniques to obtain long-term durability of early-opening-to-traffic portland cement concrete for pavement rehabilitation." The study is to focus on two types of EOT PCC mixtures: those that are suited for opening to traffic within 6 to 8 hours after placement and those that can be opened to traffic within 20 to 24 hours of placement. Further, the study is limited to full-depth rehabilitation that includes full-depth repair and slab replacement. A final requirement is that the research must make use of the information developed under NCHRP Project 18-04A, "Assessment of Durability Performance of "Early-Opening-to-Traffic" Portland Cement Concrete."