RESEARCH
PROJECT CAPSULE [16-2C]
June 2016
TECHNOLOGY TRANSFER PROGRAM

Reliable Early Opening Strength for Concrete Pavements and Patch Work

JUST THE FACTS:

Start Date:
June 1, 2016

Duration:
12 months

End Date:
May 31, 2017

Funding:
SPR: TT Fed/TT-Reg

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Sponsored jointly by the Louisiana Department of Transportation and Development and Louisiana State University

POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used / Implementation Potential

PROBLEM

Early opening strengths for concrete vary greatly around the country for many different reasons. DOTD specifies early opening strengths and will benefit from understanding the latest thinking and practices adopted by similar agencies. Knowing the best approach can lead to dependable concrete, increased use of travel lanes, and a reduced cost in the concrete mixture used. The current opening specification for full-depth patching of jointed concrete pavement (JCP) and for patching of continuously reinforced concrete pavement is 3000 psi or 72 hours. For partial depth patching of JCP, the specification is 3200 psi. The current specifications are based solely on compressive strength and are not necessarily based on the mechanics of materials.

Pouring concrete patches
(Photo: ekays/Bigstock)

Delay in opening to traffic
(Photo: Susan Poag)

OBJECTIVE

The objective of this research project is to study the practices and requirements for early-opening-to-traffic concrete used by other state DOTs. This project will look to improve opening times, cost of concrete, and road conditions while keeping in mind the dependability and durability of the concrete. Current specifications are based on strength alone and may not be a true representation of the material used. Other factors or methods could be used in determining opening requirements such as traffic loads and conditions, concrete flexural strength, and the use of maturity for opening.

METHODOLOGY

Initially, a comprehensive literature review will be conducted, including review of specifications, rehabilitation policies, and publications from various states.

Determination of appropriate stress ratios for patched pavements and how the opening specifications can affect these ratios will be focused upon.

A survey of all states that are members of the National Concrete Consortium will be conducted, including questions on specifications and ongoing related work. Current specifications from around the country will be compared with those used by DOTD. An assessment of Louisiana's concrete rehabilitation experiences and actual field performance will be conducted.

The results and findings from this study will be compiled in a final report. Recommendations regarding Louisiana's specification for early opening strength of concrete will be provided.

IMPLEMENTATION POTENTIAL

This project may provide immediate benefit for concrete rehabilitation work in Louisiana. Concrete rehabilitation is critical in the service life of our roads and this research will give direction on the proper method for using early opening concrete. The result of this project may reduce construction time and cost, leading to shorter lane closures for the public.