



RESEARCH PROJECT CAPSULE [14-1C]

September 2013

TECHNOLOGY TRANSFER PROGRAM

Evaluation of Dowel Bar Alignment and Effect on Long-term Performance of Jointed Concrete Pavement

JUST THE FACTS:

Start Date:
June 15, 2013

Duration:
12 months

End Date:
June 14, 2014

Funding:
SPR: TT-Fed/TT-Reg

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Sponsored jointly by the Louisiana
Department of Transportation and
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University

POINTS OF INTEREST:

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

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PROBLEM

Recent concerns of misaligned dowel bars led to a technical assistance project to investigate the roadways in question using a MIT-SCAN-2 device borrowed from the Federal Highway Administration (FHWA). The device worked extremely well, and the Louisiana Department of Transportation and Development (DOTD) is considering its use in quality control and assurance. Dowel bar alignment has rarely been questioned in Louisiana due to the inability to check and because dowel related issues have not materialized, so new guidelines for dowel bar placement alignment and testing need to be developed. Such guidelines should consider the minimum alignment requirements to mitigate premature pavement failure due to load transfer or faulting because of the misaligned dowel bars.

OBJECTIVE

The objective of this research is to utilize the MIT-SCAN-2 as a non-destructive dowel bar alignment measuring device to determine the effect of dowel bar alignment and its effects on jointed concrete pavement performance. Five to seven jointed concrete pavements of each of these ages will be measured at 0-10 years, 10-20 years, and 20+ years of age to determine the effects of dowel bar misalignment on pavement performance indicators such as faulting and load transfer.

METHODOLOGY

A literature review will be conducted using available knowledge bases such as TRB's TRID and reports from states that have run trial sections with the MIT-SCAN-2. Five to seven projects constructed 0-10 years ago, 10-20 years ago, and 20+ years ago will have their joints tested with the MIT-SCAN-2. Statistical analysis will be used to compare the dowel bar alignment across the different ages of jointed concrete pavements. With positive results, a MIT-SCAN-2 operating procedure for quality control and assurance and an implementation plan will be developed. A final report will be prepared that will include the results and findings of the study. A recommendation for use and operating procedure for quality control and assurance will also be detailed. A recommendation and specification for appropriate dowel bar embedment for long term pavement performance will also be developed.

IMPLEMENTATION POTENTIAL

The MIT-SCAN allows for a non-destructive means of measuring dowel bar alignment, which until now, there were no means by which it could be completed. Implementation of the MIT-SCAN-2 will allow DOTD to accurately and effectively measure the dowel bar alignment.