Research Project

93-1ALF

Capsule

Technology Transfer Program

LTRC

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Construction and Comparison of Louisiana's Conventional and Alternative Base Courses Under Accelerated Loading

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LTRC

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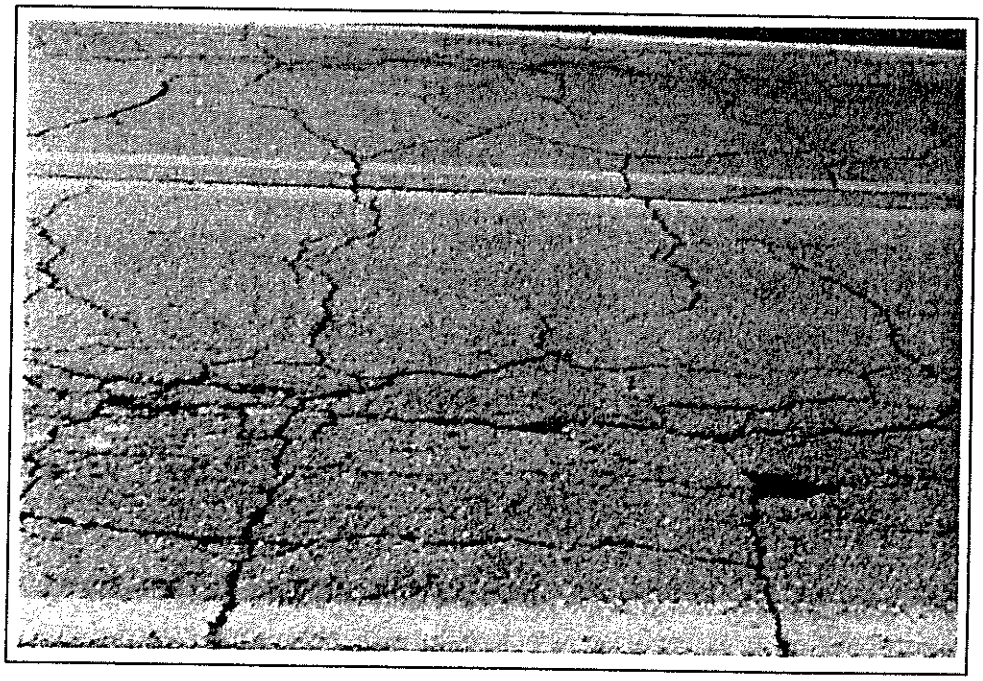
Problem

In-place cement stabilized select soils are used extensively in Louisiana. A hindrance to the long-term performance of this product is the development of shrinkage cracks in the base which allow water to enter the pavement system and reduce load-carrying capacity.

Objectives

The objective of this study is to evaluate a number of alternative base materials and construction techniques which could provide a reduction in the amount of shrinkage and reflected block cracking in cement stabilized soils. Alternative designs must accomplish this reduction in



Shown here is typical cement stabilized base reflective cracking which appears in many of Louisiana's roads, a problem which will be addressed by the pavement testing facility.

shrinkage and cracking without a significant reduction in structural capacity or an increase in life cycle costs.

This study will evaluate the performance characteristics of the historically prevalent in-place soil cement stabilized base construction and several promising alternative materials, design and construction processes for pavements subjected to repeated heavy loads. The accelerated loads will be applied using the Department of Transportation and Development's Accelerated Loading Device (ALF).

Description

A comparison of performance will be obtained from nine test sections constructed at the Louisiana Pavement Research Facility. The test sections represent eight alternative base materials and/or design methodologies. Performance evaluation and testing of the control and test sections will be accomplished through loading records, pavement instrumentation, monitoring destructive and non-destructive testing and visual observation.

The construction, testing, and evaluation of the nine test sections will be conducted in three unique but related phases. Each phase consists of construction, loading, testing, and evaluation of a control section and two test sections.

Phase 1 testing will incorporate crushed stone alternatives to soil cement bases. Phase 2 is designed to compare the performance of the current in-place stabilized soil cement design and construction with that of soil cement constructed under the proposed (plant mixed) specification.

Phase 3 will include a comparison of existing in-place soil cement design and construction procedures with that of a plant mixed soil cement process using a reduced cement content (10 percent to 4 percent). Another test section will facilitate the comparison of trade-offs between increased base thickness and reduction in cement content.

Also evaluated during Phase 3 will be a crack reducing interlayer of stone placed between an in-place stabilized soil cement base and the HMAC surfacing.

In each of the three phases, all control and test sections will be surfaced with 3.5 inches of asphaltic concrete and will be constructed on 5.0 feet of a uniform embankment soil with a PI of between 20 and 30 placed over natural soils. All select soils, aggregate materials, and other materials common between sections will be of the same type, from the same source and of the same quality. All will be loaded in a uniform manner at the same load intensity.

Implementation Potential

Base course design and construction techniques which result in reduced reflective cracking will be recommended for implementation. Specifications will be developed and incorporated into the DOTD *Standard Specifications* for future construction projects based on the positive findings of this project.