

# Evaluation of Superpave Mixtures Containing Hydrated Lime

Starting Date: 4/1/2006

Duration: 12 months

Completion Date: 3/31/2007

Funding: State

Principal Investigator:

Louay Mohammad, Ph.D.

Professor of CEE

EMCRF Manager, LTRC

Co-Principal Investigator:

Sam Cooper, Jr., P.E.

Sr. Asphalt Research Engineer,

LTRC

## LTRC Contacts

Administrative:

Mark Morvant, P.E.

Associate Director, Research

(225) 767-9124

Technical:

Chris Abadie, P.E.

Materials Research Administrator

(225) 767-9109

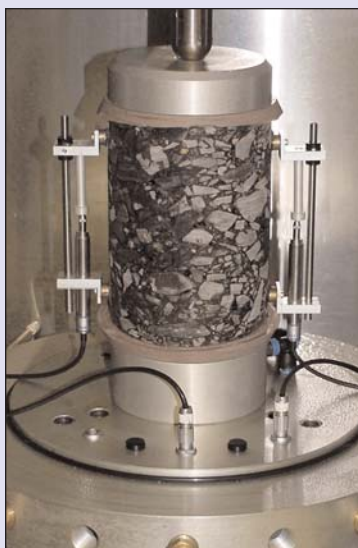
## Problem

In 2003, Louisiana implemented the Superpave mixture design method. A volumetric requirement for voids in the mineral aggregate (VMA) is included. In order to satisfy the Superpave VMA criteria, material fines were removed from the aggregate structure.

However, the minimal use of fine aggregates in HMA mixtures has caused problems, such as excessive permeability and difficulty with field compaction. A possible solution to

these concerns about HMA mixture behavior is the addition of quality fine materials such as hydrated lime or aggregate screenings to the HMA mixture.

The investigators realize that the addition of hydrated lime to current HMA design mixtures will increase costs. Recognizing this concern, the study will compare the laboratory performance of conventional HMA mixtures containing PG 76-22M to HMA mixtures containing PG 70-22M with hydrated lime.



Dynamic modulus test setup (left) and loaded wheel tracking tester (right)



LTRC



Louisiana Transportation  
Research Center

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

4101 Gourrier Avenue  
Baton Rouge, LA 70808-4443

## Objectives

The primary objective of this study is to improve HMA mixture performance by using hydrated lime or aggregate screenings. The fundamental engineering properties of HMA mixtures containing hydrated lime or aggregate screenings will be compared to a conventional mixture designed to meet current Louisiana Superpave specifications. A secondary objective is to evaluate how the method of adding hydrated lime influences the mechanical properties of the resulting HMA mixtures.

## Description

Four HMA mixtures will be designed and examined. Siliceous limestone aggregates commonly used in Louisiana will be included. The first mixture will be a conventional one that contains no hydrated lime or aggregate screenings. It will include an SB polymer modified asphalt cement meeting Louisiana specifications for PG 76-22M. The second and third mixtures will contain hydrated lime with PG 70-22M asphalt cements.

The hydrated lime will be incorporated into the mixture in two ways: “paste” (slurry) and “no paste” (dry). The “paste” simulates hydrated lime added to wet aggregate in a pug mill, whereas “no paste” simulates hydrated lime injected into a drum mixer.

The fourth mixture contains an aggregate screening type, namely granite fines, with PG 70-22M asphalt cement.

A suite of fundamental and simulative materials characterization tests will be conducted to define the permanent deformation and endurance life of HMA mixtures with and without hydrated lime or aggregate screenings. These tests include dynamic modulus, flow number, loaded wheel tracking (LWT), indirect tensile strength, and semi-circular bending.

## Implementation Potential

The investigators anticipate that this research will provide the necessary HMA mixture specification modifications for longer flexible pavement performance life and may also decrease the initial cost.