Arkansas State Highway and Transportation Department
Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 08/27/2010

PROJECT AREA: Materials

TITLE: Internal Curing

PROBLEM STATEMENT:

Concrete cracking due to shrinkage is a problem that has plagued concrete pavements and bridge decks for many years. This cracking is due to plastic shrinkage and drying shrinkage. Plastic shrinkage cracks can be prevented or minimized by proper curing. Drying shrinkage is caused by the consumption of water that occurs during cement hydration. However, if a source of water is available, cracking associated with drying shrinkage can also be minimized. One source of water is presoaked, lightweight aggregate that can be added to the concrete mixture. Once the concrete is cast, the lightweight aggregate provides water needed for hydration and prevents or reduces drying shrinkage. This process is known as internal curing. A limited amount of internal curing research has been conducted.

OBJECTIVES:

This research project will determine the appropriate content of lightweight aggregate per cubic yard of concrete required to reduce drying shrinkage without sacrificing the hardened concrete properties. In addition to concrete drying shrinkage, concrete compressive strength, modulus of elasticity, and durability will be measured. This project will examine both locally available expanded slate and expanded clay lightweight aggregate.

Form of Research Implementation:

The proposed research will provide AHTD with preliminary data on the effectiveness of internal curing in reducing drying shrinkage. The results will recommend appropriate lightweight aggregate contents required to reduce shrinkage without affecting the other hardened concrete properties.

Total Estimated Cost and Project Duration: **$** 160,000 **and** 24 **months.**

PREPARED BY: Micah Hale **and**

AGENCY: University of Arkansas

PHONE: (479) 575-6348 **REVIEWER:** Sarah Tamayo

ADVISORY COUNCIL RANKING	TRC RANKING	Statement Combined with Statement Number(s)
3		