Arkansas State Highway and Transportation Department
Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 08/27/2010 **PROJECT AREA:** Materials

TITLE: Preventing Damage from Alkali Silica Reaction

PROBLEM STATEMENT:

Alkali-silica reaction is an expansive reaction between the alkalis in the cement and reactive silica in the aggregates. AHTD is currently witnessing the detrimental effects of ASR in the I-440 bridge substructure over the AR River in East Little Rock. The proposed research program will identify reactive aggregates in AR, investigate measures to prevent ASR, and review methods to mitigate ASR damage. With assistance from AHTD, the research team will identify local aggregates to include in the study. AASHTO T 303, which is a 16-day accelerated test, will be used as a screening mechanism to identify potentially reactive aggregates. These aggregates will then be subjected to ASTM C 1293, which is a 52-week test that many believe best represents field conditions. To develop preventative measures, locally available cements (low and high alkali content), and combinations of slag cements and/or fly ashes (Class C and F) will be batched with the reactive aggregates and tested. A thorough review of ASR mitigation measures will conclude the study.

OBJECTIVES:

There are several objectives in the project. The major aggregate sources (fine and coarse aggregate) in the state will be tested to identify potentially reactive aggregates. Measures to prevent ASR using locally available materials will also be determined. The effectiveness of AASHTO T 303 as a screening mechanism will be evaluated. Finally, methods to repair ASR damaged structures will be reviewed and recommended.

Form of Research Implementation:

The standard specifications will be changed to address ASR in Division 800. Additionally, the specifications in Division 500 may be changed to address preventative measures such as cement replacement with 35% Class F fly ash when reactive aggregates are used.

Total Estimated Cost and Project Duration: **$** 270,000 **and** 36 **months.**

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ADVISORY COUNCIL RANKING	TRC RANKING	Statement Combined with Statement Number(s)
14		