Statement No. 33

Arkansas Department of Transportation

Transportation Research Committee

RESEARCH PROBLEM STATEMENT

DATE: 09/13/2017 | **PROJECT AREA:** Pavements

TITLE: Improved Characterization of Cement Treated Bases for Roadway Applications

PROBLEM STATEMENT:

ARDOT Standard Specification Section 307 provides specifications related to "Cement Treated Base Courses". Material characterization and mixture design are based solely on the unconfined compressive strength (UCS) of the soil/aggregate-cement mixture. Two significant issues arise from this approach: (1) the current material characterization is somewhat insufficient for fully considering these materials in the new Pavement Design Guide (MEPDG); (2) field acceptance of the material is based solely on density, as measured with a nuclear density gauge - with no indication of whether a given soil-aggregate-cement mixture has (or can) achieve minimum strengths. In addition, it is unclear whether all locally-available materials - including 'waste' materials - represent viable alternatives to imported materials. Research is needed to more fully characterize cement-treated base materials, particularly geared towards providing data to support use in the MEPDG; expanding the list of acceptable 'raw' materials to be used; and specialty applications, i.e. truck parking ramps, problematic soil areas, local agency use, etc.

OBJECTIVES:

1. Investigate current materials characterization and design procedures for cement-treated bases.
2. Develop and/or adapt simplified laboratory procedures to characterize cement-treated bases for a variety of applications, using a variety of locally-available natural and waste materials.
3. Develop an Applications Guide for the design, characterization, and use of cement-treated bases, to include a variety of applications.

FORM OF RESEARCH IMPLEMENTATION:

1. Laboratory mix design and material characterization specifications for cement-treated base materials.
2. Applications Guide, suitable for ARDOT and local agencies, for the design and use of cement-treated bases.
3. Training materials related to mixture design procedures, material characterization procedures, and design applications for the use of cement-treated bases.

Estimated Project Duration: 24 **months**

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
1 / 2	28 / 44	