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**LABORATORY COMPARISONS AND NUMERICAL
ANALYSIS OF OPEN-GRADED ASPHALT TREATED
DRAINABLE BASE MIXTURES**

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ABSTRACT

Moisture is a very critical factor for both flexible and rigid pavement. Excess water in the pavement structure causes stripping in asphalt mixture, pumping in both asphalt and concrete pavement, and reduces the pavement serviceability.

Open-graded asphalt treated drainable base (ATDB) has been proven to be an effective subsurface drainage measure for both hot-mix asphalt (HMA) and Portland cement concrete (PCC) pavements. However, conventional open-graded ATDB used in Louisiana lacks sufficient structural support capability, and also causes construction difficulties.

This paper presents the results of a laboratory study, in which the conventional open-graded ATDB was compared with an open-graded large-stone asphalt mixture (LSAM). Fundamental engineering performance tests were conducted to characterize the mixtures. The laboratory tests included: SST frequency sweep at constant height (FSCH), indirect tensile strength (ITS), Asphalt Pavement Analyzer (APA), axial and creep, and the moisture susceptibility tests.

Finite element analyses were performed to compare the structural responses of flexible pavements designed with of both conventional ATDB and open-graded LSAM.

The results of this study indicated that the open-graded LSAM had the potential to improve the performance of the conventional ATDB, and field validation of the new mixture was recommended.

KEY WORDS: large stone, rutting, creep, APA, finite element.