

HR-99, “Factors Influencing Stability of Granular Base Course Mixes”

Introduction and Problem Statement

To evaluate the various factors influencing the stability of granular base course mixes, three primary goals were included in the project:

- (1) determination of a suitable and realistic laboratory method of compaction;**
- (2) effect of gradation, density and mineralogy of the fines on shearing strength; and**
- (3) possible improvement of the shear strength with organic and inorganic chemical stabilization additives.**

PROBLEM 1 - LABORATORY COMPACTION The purpose of this study was to ascertain a laboratory compaction procedure which would give uniform, controllable density while minimizing degradation and segregation of the compacted stone samples. The procedures analyzed were:

- (1) standard AASHO-ASTM compaction;**
- (2) static compaction;**
- (3) vibratory compaction; and**
- (4) drop hammer compaction, i.e., molding the whole sample by drop hammering on both top and bottom.**

PROBLEM 2 -SHEAR STRENGTH OF UNTREATED GRANULAR MATERIALS The purpose of this study was to investigate the effect of gradation, density and mineralogical characteristics of the three crushed stone samples while subjected to shear stresses. Consolidated-undrained triaxial shear tests with total volume change and pore water pressure measurements were conducted on 4-in. dia by 8-in. high specimens, compacted by the vibratory procedure previously summarized. A rate of deformation of 0.01 in. per minute was used throughout the testing. This test was chosen for Problem Areas 2 and 3 as it more closely duplicates field conditions than other conventional tests, and also allows determination of the various shear strength parameters from one basic test method.

PROBLEM 3 - EFFECT OF STABILIZING AGENTS ON SHEARING STRENGTH

The purpose of this study was to investigate the effect of additions of various economically feasible stabilizing agents on the shear strength properties of the crushed stone materials. Knowledge gained in Problem Areas 1 and 2 assisted in this portion of the project, relative to methods of compaction, testing, and general stability analyses.