Chapter I

INTRODUCTION

1. General Statement of the Problem

Increase of traffic volume on highways attributes the importance of base and sub-base courses in flexible pavement. Stable and durable base courses are neccessary to support load over pavement by distributing load through lower layers. These requirements can be accomplished easily when suitable materials are available. However, in some cases good quality materials such as stones or gravels are not found within the economic hauling distance. To keep cost down it is therefore desirable to use as much as locally available materials as posible. But these materials such as silty sand and lateritic soil offer poor strength properties. Hence, methods to improve the properties of silty sand and lateritic soil have been introduced. Asphalt stabilization have been used for this purpose with various degrees of sucess.

Stabilization of soil with asphalt is accomplished by two types of stabilization 1) cohesion and 2) waterproofing. In cohesion type of stabilization, the asphalt tends to cement the soil grains together, giving the soil mass greater strength. In the water prcofing-type stabilization, the asphalt binder, being water insoluble, retards moisture movement through the soil which results in a more stable material.

Recently (1961), a petroleum company in the United States developed a new emulsified asphalt called 'Penemulsion' specially for stabilization work. Penemulsion is a cationic, low penetration, "SS-Khh" grade, asphalt emulsion. The Penebase is produced by a special refining process, resulting in a very low (maximum 18) penetration asphalt. To determine the merit of this material for soil stabilization proposes, this study was introduced.

2. Purpose of the Study

The purpose of this study is to provide comparative strength data between silty sand and lateritic soil stabilized with Penemulsion and a conventional asphalt emulsion (SS-K) using as subbase and base courses for pavement.

3. Scope of Study

The comparative strength values were attained for asphalt contents from 2 % to 6 % by the Hveem Stabilometer and Cohesiometer tests. Both "Standard" method and Moisture Vapor Susceptibility test "(MVS" test) were used for the Hveem Stabilometer and Cohesiometer tests according to Chevron Asphalt Company Method (1967). The most economical percentage of Penemulsion and SS-K emulsion that made the soils suitable for base course was selected from the Hveem tests. The comparative unconfined compressive strength of the selected stabilized mixtures were determined after curing periods of 3 days, 7 days, 15 days and 28 days. Finally undrained triaxial test was conducted to study the comparative strength envelope of the selected stabilized mixtures.