BEHAVIOUR OF SAND

AT LOW

STRESS LEVELS

by

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ABSTRACT

A programme of triaxial compression tests was conducted in the laboratory on samples of dry sand at various density and subjecting them to low values of cell pressures of σ_3. Mining sand from a site in Puchong was used in this study. Laboratory tests such as Sieving analysis, Specific Gravity, and Triaxial Compression Test were conducted on the samples. Hydraulic triaxial compression test apparatus was used for the determination of the shear strength properties.

In the triaxial tests, the samples were subjected to a variety of cell pressure ranging from 50 to 75 kPa. The objective was the samples were initially subjected to low values of cell pressure and keeping the volume constant. Unconsolidated Undrained triaxial tests were carried out until failure occurred.

From the tests it was found that the stress-strain relationship, different densities and cell pressure effected the behaviour of sand and the shear strength parameters with increasing densities also increased the angle of friction, ϕ. The soil stiffness such as Young's Modulus were dependent with a deviator stress and cell pressures.

CHAPTER 1

INTRODUCTION

1.1 GENERAL

Soil may be defined as an accumulation of solid particles produced by mechanical and chemical disintegration of rocks. It may contain organic constituents and water. This broad definition applies to a construction material that varies widely in its physical composition and behaviour from location to location, and even on a particular site. It will describe the nature of various soil constituents and how they are developed from parent rock. Knowledge of the physical character of soil constituents in essential to an understanding of soil behaviour during construction.

Soils in general are not elastic and their behaviour in-situ depends on many factors. These include the magnitude of the imposed stress changes; the way which they change; the previous history of loading, whether due to natural causes (geomorphological) or to changes imposed by man (e.g. previous loading, excavation, alteration of ground water level).

Knowledge of the strength and deformational behaviour of a soil under stress is necessary in the analysis of most field problems in soil mechanics. Because of the complex nature