MARA INSTITUTE OF TECHNOLOGY

SHAH ALAM

FINAL YEAR PROJECT REPORT

ADVANCED DIPLOMA IN CIVIL ENGINEERING

A STUDY ON AN ALLUVIAL CLAY CONSOLIDATION INDICES DUE TO PRELOADING - CASE STUDY

by

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SYNOPSIS

A series of consolidation tests is carried out to determine the consolidation characteristics of alluvial clay underlying an area in Pelabuhan Kelang , Selangor D.E. The area was originally a swamp and the existing conditions of the area could be categorised as follows:

i) preloaded area for 30 years,

ii) reclaimed area for 7 years,

iii) land fill area for 1 year and

iv) swamp.

Overburden pressure over the original swamp was estimated between 20 and 30 kPa and water level ranged from 0.70m to 0.90m with tidal effects. The alluvial clay can be classified as silty clay of high plasticity and is normally consolidated.

Consolidation test results showed that the preloaded areas were highly compressible with low permeability. Correlations between consolidation indices and preloading duration were acceptable indicating that preloading would reduce settlement.

From variation of compression parameters, it is anticipated that differential settlements would occur if existing conditions of the Site are not considered during the design and construction stages.

1.0 INTRODUCTION

1.1 General

The rapid progress of development in Malaysia in recent years has resulted to wider usage of its coastal areas. This can be seen with the growth of numerous new projects in the coastal areas either in the West or East Malaysia especially in the west coast of the peninsula.

Projects such as golf courses, holiday resorts and new industrial areas are being implemented and these projects would later resulted to provision of other infrastructures such as roads, schools, offices, etc. In the end, a new township would be developed in these areas to cater for the needs of these developments.

The coastal part of west coast of the peninsula are extensively underlain by very soft normally consolidated clay called alluvial clay as shown in Figure 1.1. Generally, alluvial clays are known for its high compressibility and low strength characteristics.

In order to develop these soft clay areas, various consideration should be given and one of them is the effect of consolidation of the underlying soft clay on structures built above it. Settlement of structures due to consolidation is not unusual. However, excessive occurrence of these phenomena has to be avoided and anticipated before the construction of structures.

Preloading is one of the various techniques which have been introduced to overcome or minimize the settlement of soft clay such as alluvium . This technique has