EVALUATION OF SLOPES FAILURE BASE ON SPT (N-VALUES) AND JKR PROBE TESTS IN TROPICAL RESIDUAL SOIL IN NORTHERN MALAYSIA

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ABSTRACT

Slope failures are generally caused by infiltration due heavy and intense rainfall, very steep slope angle, erosion of slope surface and slope toe, vibration due to blasting, rise of water table in slope and etc. Slopes will be more stable when they are having gentler slope angle, proper drainage on the slope such as providing interceptor drain and berm drain, proper vegetations are planted on slope surface such as hydroseeding,turfing and etc.

The objectives of this research is to determine the relationship between allowable bearing capacity obtained from results of JKR Probe and physical soil characteristic obtained from particles size distribution curves. A total of 10 un-failed slope locations were selected in Northern Malaysia. Five un-failed slope locations were selected along Jalan Gertak Sanggul, Pulau Pinang and another five locations were selected in Baling District, Kedah. The un-failed slopes along Jalan Gertak Sanggul were situated near a village called Kampung Gertak Sanggul while the un-failed slope in Baling is road along Baling town to Grik, Perak. Six numbers of JKR Probe tests were conducted and four soil samples were collected at each un-failed slope location. Soil samples were collected at about 100mm below the existing ground level.

It was found that the un-failed slope consists of silts, sandy, very silty sand and very silty gravel with silt has the widest range of numbers of blows / 300mm penetration compared to other soil types.

Chapter One - INTRODUCTION

1.1 AN OVERVIEW

Basically the majority of slope failures are caused by rainfall. Severe erosion and land sliding typically occur during or shortly after periods of heavy rainfall. Surface runoff on slope and groundwater can have a major impact on slope erosion and stability. In slope failures prone areas, the presence of surface runoff on slope is usually the primary factor leading to land sliding and erosion.

Slope failures can be broken down into two categories: (a) rapidly moving (generally known as debris flows), and (b) slow moving. Rapidly moving slope failures or debris flows present the greatest risk to human life, and people living in or travelling through areas prone to rapidly moving slope failures are at increased risk of serious injury. Slow moving slope failures can cause significant property damage, but are less likely to result in serious human injuries. This study is to find out why some slopes remain stable after many years of construction while other slope failed immediately after construction.

1.2 PROBLEM STATEMENT

So far there is no major effort to determine the relationship physical soil properties and allowable bearing capacity of soil slope especially for soil in the Northern of Malaysia. Hydrometer and sieve tests to determine the physical soil properties and the JKR probe will give the value of allowable bearing capacity