EVALUATION OF SHEAR STRENGTH PARAMETERS USING SHEAR BOX TESTS FOR SLOPE FAILURES IN PENANG

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APRIL 2011

PENGHARGAAN

Setinggi-tinggi penghargaan dan ribuan terima kasih diucapkan kepada semua pihak yang terlibat secara langsung dan tidak langsung bagi membolehkan penyelidikan ini disiapkan dengan sempurna.

Diantaranya :

Pn Janidah bt Eman
(Head of Civil Engineering Faculty, UiTM Penang Campus)

Cik Farah Hariyani bt Haris
(LabTechnician in UiTM Penang Laboratory)

Cik Wan Nuursufila bt Salleh
Nur Dhamirah bt Abdul Rahman
Azarudin b Abdullah
(Final year degree students UiTM Penang Campus)

dan

All the staffs in JKR Balik Pulau, Penang, and
International Research Centre on Disaster Prevention (IRCDIP), Shah Alam
yang telah memberikan kerjasama dan sokongan
di dalam menjayakan penyelidikan ini

Abstract

On the 11th December 1993, Highland Tower near Hulu Kelang, Selangor toppled due to slope failure causing 48 residents was killed. It became the worst nightmare to the all Malaysian especially to those who are the residents of the un-failed nearby tower as well as in the engineering lines. Since then, many more slope failures occurred in Malaysia yearly during the rainy seasons. Hence, slope failures ranked among the worst natural disaster occurring in Malaysia, studies on the slope failures are becoming important. Therefore, it is very important for us to know the main causes that are causing the occurrences of landslides or failure in slopes in Malaysia. Slope failure, also referred to as mass wasting, is the down slope movement of rock debris and soil in response to gravitational stresses. There are many factors affecting slope failures such as weaknesses in the composition or structure of the rock or soil; variation in conditions such as change in rainfall, unorganized drainage or surface stability (removal of vegetation). Among these factors, rainfall, earthquake and human activities are important starter factors that are causing slope failures to occur. This study is to determine the soil shear strength under saturated condition along 2 roads in Penang Island namely along Teluk Bahang – Balik Pulau road and along Teluk Kumbar – Gertak Sanggul road. Saturated shear box tests were conducted to determine the shear strength for soil samples taken from slope failure locations. Histograms of the cohesion and friction angle were plotted along the 2 roads and their average values were determined. It was found that the ranges average value of cohesion and friction angle along Teluk Bahang – Balik Pulau road are higher than that along Teluk Kumbar – Gertak Sanggul road.

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