ASSESSMENT OF SLOPE FAILURES WITH REGARDS TO SOIL PHYSICAL PROPERTIES AND SOIL SHEAR STRENGTH

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Abstract

On the 11th December 1993, Highland Tower near Hulu Kelang, Selangor toppled due to slope failure causing 48 residents were 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 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 relationship between physical soil properties and soil shear strength under saturated condition. Hydrometer and sieve tests to determine the physical soil properties and saturated shear box tests were conducted to determine the shear strength for soil samples taken from slope failure locations. Slope failure locations selected were from slope failures tragedic sites in Balik Pulau in Penang, Baling in Kedah and Gerik in Perak. From this research it can be concluded that gravelly silt has the largest range of angle of shearing resistance while silt has the smallest range of angle of shearing resistance. Gravelly silt has the largest range of cohesion while very silty sand has the smallest range of cohesion.