

UNIVERSITI TEKNOLOGI MARA

**CHARACTERISTICS OF
GEOMECHANICAL PROPERTIES
OF SUNGAI BULOH WEATHERED
GRANITE**

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

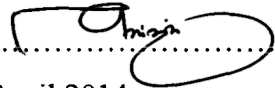
Faculty of Civil Engineering

April 2014

AUTHOR'S DECLARATION

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ABSTRACT

Stability of engineering structures that are constructed on or in rock masses is greatly influenced by the engineering behavior of rock mass and its properties. Furthermore, the engineering characteristic of rock and particularly, the shear strength in rock masses play a key role in civil engineering and specifically in the design and safety evaluation of dams. At present, many researchers have carried out with investigations regards to understanding of the rock mass but not many contributions have been made for use in engineering design. In addition, insufficient understanding of engineering data especially related to rock mass in the tropical region has contributed to unexpected occurrence of failure. In verifying the characteristic of weathered granite subjected to triaxial loading, laboratory tests are needed to be carried out to gather the data and record the results. This research focus on examination of field samples, determination of hardness in order to classify the weathering grade and relevant laboratory works to establish the characteristic of the rock samples. Samples of weathered granite ranging from Grade II to Grade IV were used in this research. Physical properties which are hardness, moisture content, density, porosity, specific gravity and void ratio were determined. Petrographic and X-Ray Diffraction (XRD) analysis were also conducted to determine the mineralogical characteristic of the different state of weathering. Free-Free Resonant Column (FFRC) method was used to determine the velocity result of weathered granite, meanwhile Rock's Triaxial (RTX 3000) was used to determine the shear strength properties of the samples. The RTX 3000 equipment was used for confined Triaxial test with confining pressure of 5 MPa, 10 MPa, 15 MPa and 20 MPa. The data obtained from laboratory assessment were analysed to determine the effect of weathering on the rock properties and shear strength parameters. The results show that the density, hardness, specific gravity and velocity of granite decreases with increasing of weathering grade of granite. Meanwhile, moisture content, porosity and void ratio increases with increasing weathering grade of granite. It is also indicated that internal friction and cohesion parameters decrease with increasing with state of weathering. In addition, correlation between all properties and shear strength parameter is also established.

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