

CERAMAH TEKNIK TECHNICAL TALK

Quantification of the impact of weathering on geomechanical strengths: Granites and schists

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This talk was presented by Dr. Goh Thian Lai (UKM) on 5th September, 2018 at the Department of Geology, University of Malaya. An abstract of the talk is attached below.

As usual, there was a lively discussion session following the presentation.

We thank Dr. Goh for his contribution to the Society's activities.

Tan Boon Kong,

Chairman,

W/G on Engineering Geology & Environmental Geology

Abstract: Geomechanical strength of rock materials plays a significant role in influencing the stability of both cut rock slopes and underground openings. The characteristics of mechanical strength are subjected to both material strength and condition of weathering. This paper presents the results of a systematic research to quantify the mechanical characteristics of fresh as well as slightly weathered granites and schists of Peninsular Malaysia. A total of 459 geomechanical strength tests were conducted for both lithologies for fresh as well as slightly weathered rock material employing the uniaxial compressive strength test and Brazilian tensile strength test. Statistical analysis of the results at 95 percent confidence level exhibited that the means of compressive strength for fresh and slightly weathered granites were 113.6 ± 7.0 MPa and 68.9 ± 3.6 MPa and the respective values for fresh and slightly weathered schists were 137.3 ± 9.2 MPa and 84.8 ± 5.1 MPa. The respective mean values of tensile strength for fresh and slightly weathered granites were 8.8 ± 0.4 MPa and 5.3 ± 0.1 MPa and the values of mean of fresh and slightly weathered schists were 17.1 ± 0.9 MPa and 10.5 ± 0.4 MPa respectively. The results revealed that the geomechanical strengths of fresh rock material deteriorated by approximately 1/3 upon weathering of rock material reduce to slightly weathered rock materials. The results also exhibited that the Brazilian tensile strength for fresh and slightly weathered granites and schists are approximately 1/13 and 1/8 of uniaxial compressive strength.

Keywords: Uniaxial compressive strength test, Brazilian tensile strength test, granite, schist

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