

Petrography Study and its Implication to the Uniaxial Strength of Weathered Volcanic Rocks from Tawau, Sabah

Abstract

This paper discussed the petrographic study and its effect to the uniaxial strength of weathered volcanic rocks from Tawau, Sabah, Malaysia. The volcanic rock consists of associated dacite, andesite and basalt rocks with the age of Pliocene to Quaternary. In this study the Murphy (1985) classification were used to determine the weathering grade of volcanic rocks. The uniaxial strength value were obtained from the Point Load Test and also estimated calculation from Uniaxial Compressive Strength test. The microstructures and identification of altered minerals were analysed using scanning electron microscope (SEM) and polarized microscope, respectively. The result of analysis indicated that the uniaxial strength of volcanic rocks decreased with the degree of weathering grades where the uniaxial strength decreased from 122.2 to 15.8 MPa for dacite, 143.4 to 10.1 MPa for basalt and 181.2 to 26.8 MPa for andesite. This result is due to the different percentages of quartz and feldspar minerals in the rock samples as well as formation of secondary minerals in weathered rocks. Microstructures study showed the appearance of micro fractures with narrow apertures in the minerals also influenced the uniaxial strength of the rocks.