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Shear Strength Variability of Graphitic Schist Derived from Weathered Hawthornden Schist

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In the Kuala Lumpur area, Gobbett (1964) identified two schist units, namely, the Hawthornden Schist which is a fine-grained black (graphite) schist, and lower down the sequence, the Dinding Schist which is a quartz mica schist and quartz-schist. Later Yin (1980) combined the two schist units into the Hawthornden Schist and he introduced another schist unit, namely Kajang Formation, for schist which have intercalation limestone. The Hawthornden Formation is originated from sediments which were deposited in western basin of Peninsular in the Middle to Upper Silurian time. The sediments has been both regional and thermally metamorphosed. The grade of metamorphism is generally low. It consists of mainly schist , phyllite and minor hornfels. It is found in the northern half of the Klang Valley. The foliation trend of the schistose rocks generally north-northwest and south-southeaster (Yin, 1980). This foliation direction changes locally, especially near the contacts with the granite where there is a tendency for the trend to be parallel to the contact. Shu (1989) mapped similar schist units in Jelebu areas (Negeri Sembilan) and estimated the schist units is almost 4000m in thickness. Similar schist units are exposed along the Senawang-Air Keroh (Melaka-Negeri Sembilan) section of the North-South Highway (Tan, 1992). Slope failures on cut slope which consist of weathered graphitic schist ourcrop along highway is reported (Tan, 1992).

The shear strength of soil and rock which can be developed along a surface through the material, is dependent on four main factors: (i) magnitude of the effective stress, s¢, acting normal to the surface, (ii) frictional properties of the material; (iii) dilatency, which is a measure of the volume increase or decrease experienced by the material when shear movement occurs, and other components of strength, such as cohesion, manifested by the bonding of particles(Fookes,1997). The shear strength of tropically weathered in-situ materials(TWIMs) derived from graphic schist was tested at four different angles orientation of undisturbed samples. The samples were tested using circular shear box under soaked condition therefore the influence of moisture condition is eliminated in this analysis. Index properties, mineralogy and micro-meso fabric form of tested samples is investigated. This paper give a description of the characterisation procedures used in the study of weathered in-situ geomaterial derived from graphitic schist outcrop on man made slope in Klang Valley. The evolution of microfabric due to weathering of parent materials together with mineralogy and index properties are shown to illustrate the application of the procedure. The result of strength variability of the TWIMs tested at horizontal(0^o), inclined 30^o and 60^o and vertical (90^o) to horizontal surface are shown. The directional shear strength test was carried out under fully drained condition using circular shear box. Sampling techniques used to collect orientated 'undisturbed' tube sample for shear strength and fabric orientation study are illustrated.

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