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# APPLICATION OF HOEK AND BROWN FAILURE CRITERION FOR ROCK MASS CHARACTERIZATION: CASE STUDY OF QUARTZITE FROM BANDAR SUBANG IMPIAN, SHAH ALAM, SELANGOR DARUL EHSAN, MALAYSIA.

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## ABSTRACT

There are numerous schemes of rock mass classification especially for engineering purposes. Rock Mass Rating ($RMR_{89}$) by Bieniawski (1989), and Hoek and Brown's (2000) Geological Strength Index (GSI), are among the established classifications. A critical rock slope was selected for assessment located at approximately 346500 N and 389833 E, Section U10, Bukit Cherakah, Shah Alam, where a moderately jointed, steep rock slope had been cut. Based on site observations and mapping, estimating the GSI value for rock mass was determined directly using the GSI table as recommended by Hoek and Brown (2000). The effective principal stresses ($\sigma'_1$ and $\sigma'_3$) were subsequently derived and using the Hoek and Brown failure criterion, the effective cohesion (c') and friction angle (Ø') of the rock mass was estimated using Mohr-Coulomb failure envelope. Using average values obtained from samples that exhibit only materials failure by Uniaxial Compressive Strength (UCS) and Brazil tests, it was estimated that an intact fresh quartzite sample of Kenny Hill Formation is having c' value of 12.5 MPa and Ø' is $52^0$. The rock mass that comprises predominantly moderately fractured quartzite was estimated to have c' = 300 to 400 kPa and Ø' = $32^0$ which falls under class III of Bieniawski's $RMR_{89}$ classification.