

## **Application of the GSI system for slope stability studies on selected slopes of the Crocker Formation in Kota Kinabalu area, Sabah**

### **ABSTRACT**

This study was conducted on two selected slopes in Kota Kinabalu area of Sabah. The area is underlain by Crocker Formation which consisting of interbedded sandstone and shale layers. The objectives of this study are to determine the Geological Strength Index (GSI) rating, rock mass properties and slope stability for the selected slopes. Engineering geological mapping and discontinuity survey were conducted to obtain quantitative description of discontinuities as well as rock sampling based on grain sizes. GSI rating and disturbance factor was obtained from discontinuity survey and field observation on the slope face, respectively. Residual GSI rating was determined using empirical method. Laboratory study was done to determine the Uniaxial Compressive Strength via point load test and unit weight by dry density test along with the intact rock constant. Rock mass properties such as cohesion, friction angle, tensile strength, Young's modulus and residual strength were determined by applying GSI system into the Hoek-Brown criterion. Kinematic analysis and finite element analysis were conducted to identify localised mode of failure and the safety factor of the selected slopes. Prescriptive measures were used to determine the rock cut slope designs. GSI rating for both slopes were obtained with both slopes can be considered as stable according to kinematic analysis and finite element analysis. Prescriptive measures for slope protection are needed to prevent water pressure build up and future failure.