

A SURVEY OF SLOPE FAILURES ALONG THE SENAWANG-AIR KEROH HIGHWAY, NEGERI SEMBILAN/MELAKA

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The Senawang-Air Keroh Highway is about 60 km in length and traverses four different lithological units, namely: quartz-mica schist, quartzite/phyllite, graphitic schist and granite. Some 112 cut slopes and 106 embankment slopes along this highway have been surveyed and categorised in terms of slope stability using the following common scheme: category 'A' for major failures, category 'B' for minor failures/erosion/gullying problems, and category 'C' for stable slopes.

The results of the surveys indicate that for the cut slopes, the graphitic schist is the most problematical material followed by the quartz-mica schist, quartzite/phyllite, and then granite. The breakdown for category 'A' cut slopes being: graphitic schist (8), quartz-mica schist (3), and phyllite (1), making a total of 12 category 'A' cut slopes. The breakdown for category 'B' cut slopes is as follows: graphitic schist (11), quartz-mica schist (8), and quartzite/phyllite (6), i.e. totalling 25 for category 'B' cut slopes. In addition to lithologies, other geological factors affecting the stability of the cut slopes include the grade of weathering and the nature and orientation of the fracture planes (foliations, etc.). The stability of the graphitic schist cut slopes is further exacerbated by its highly fractured nature, with fractures infilled by soft clay, the formation of secondary minerals from the oxidation of pyrite in the graphitic schist, and the resulting low pH conditions.

The embankment slopes also showed several major and minor failures. The breakdown for category 'A' embankment slopes being: graphitic schist (1), quartz-mica schist (7), and quartzite/phyllite (2), making a total of 10 category 'A' embankment slopes some of which are currently under repair. The category 'B' embankment slopes consist of graphitic schist (1), quartz-mica schist (1), quartzite/phyllite (7), and unknown materials (3), i.e. totalling 12. The correlation between embankment slope failures with lithologies or material types is, however, not well established.