

Seminar by staff of Geology Department, University of Malaya — Abstracts of Papers

Stability of slope cuts in the Rawang-Tanjung Malim area

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The study area is underlain by metasedimentary rock formations and igneous rocks. To the south of Tanjung Malim, the metasedimentary rocks consists of the older quartz-mica schist, graphitic schist and graphitic phyllite of the Terolak Formation (M. Ord.–Sil.?) along with younger metasandstone, metaquartzite, chert, shale and phyllite of the Belata Formation (Carb.?–Perm.). Both the Terolak and Belata Formations show general strike trends of NW-SE, moderately to steeply dipping towards west. The Belata Formation is postulated to be stratigraphically equivalent to the Kenny Hill Formation (Gan, 1992).

In the Rawang area, the metasedimentary rocks are composed of the Older Sequence and the Younger Sequence (Wong, 1970). The Older Sequence consists of fine grained quartz-chlorite-mica schist (Choh schist) and graphite-quartz-mica schist (Rawang schist). The Younger Sequence consists mainly of phyllite. In Taman Sentosa (Bukit Beruntung), localised dolerite dyke intrusion into the surrounding graphitic schist and phyllite were detected. The Older sequence is postulated to be stratigraphically equivalent to the Dinding Schist (Gobbett, 1964; Wong, 1970) while The Younger Sequence is postulated to be stratigraphically equivalent to the Kenny Hill Formation (Wong, 1970).

Slope cuts involving metasedimentary rocks along the Rawang-Tanjung Malim PLUS highway interchanges were mapped and classified into five different groups. The number of slope cuts, benches and failures were also recorded. Generally, all the slope cuts along the highway possesses the slope angle within the range of 38° to 48°.

Consolidated undrained shear tests were conducted involving slightly to highly weathered phyllite and graphitic schist samples. The former shows peak and residual angle of internal friction between 26.5° to 32° and 25° to 32° respectively. The graphitic schist shows the peak and residual angle of internal friction between 30.5° to 31.5° and 24.7° to 26.3° respectively. The natural moisture content for slightly weathered to highly weathered phyllites and graphitic schist samples taken from stable slope cuts ranges from 7% to 20% and 12% to 24% respectively.

Slope failures present in the study area could be generally divided into circular failure, slip and slide (due to day-lighting) and failures due to discontinuity planes. Majority of slope cuts between Tanjung Malim highway interchange heading to Rawang highway interchange were subjected to slip and slide failures. These are due to the general dipping trend of metasediments from the Terolak Formation, Belata Formation, Choh Schist and Rawang schist which are dipping westwards, in the same direction as the existing slope cuts which resulted in day-lighting. Slope failures between Rawang highway interchange heading to Tanjung Malim highway interchange are less abundant and mostly circular. The main reason is that the metasediments are dipping into the slope and are not day-lighting. Most of the slopes that failed show signs of seepage implying high moisture content and pore water pressure. The moisture content collected from failed slopes ranges from 26% to 38% and is generally higher than those samples obtained from stable slopes. The factors controlling slope instabilities are mainly the general dip and strike trends of the metasediments, groundwater table, pressure release, discontinuity planes, high slope angle, low vegetation on slope surface and erosion.