

Ceramah Teknik (Technical Talk)

**MALAM GEO-KEJURUTERAAN G&P
(Engineering Geology G&P Nite)
28 July 2004
Geology Department
Universiti Malaya**

Report

Malam “Geologi Kejuruteraan G&P” featured three speakers from Gue & Partners who presented various topics of interest to engineering geologists. Much construction and test details were presented by the speakers for the benefit of the audience.

The program for the event is as below:

5:30 – 6:00 p.m :	Rock Slope Stabilisation Yew Chee Kean (Gue & Partners)
6:00 – 6:30 p.m :	Inflatable Packer Test Nur Huda Bt Mohd Jamin (Gue & Partners)
6:30 – 7:00 p.m :	Soil Improvement by Stone Columns Tiong Chiong Ngu (Gue & Partners)

Tan Boon Kong
Chairman

Working Group on Engineering Geology & Hydrogeology

Abstracts of Papers

Rock slope stabilisation

YEW CHEE KEAN
Gue & Partners Sdn Bhd

Rock slope stabilization is very important in the aspect of geotechnical engineering. Unfavorable discontinuities like joints shear zone and fault with opened aperture and over hanging block mat cause instability in rock slope. There are four main types of slope failure, namely planar failure, wedge failure, toppling failure and circular failure. Rock slope could be stabilized by carrying out strengthening works like installing rock bolt, rock dowel, rock horizontal drain and shotcrete. Although proper design is important to form a safe rock slope, installation of rock bolt, rock dowel and horizontal drain during construction are also important aspect to ensure the design requirements are met. Galvanized steel bar and corrugated pipe are needed to prevent corrosion. During pregrouting, vertical grouting is to ensure the corrugated pipe and bar is fully filled with non-shrink grout. Suitable centralizer should be used for rock bolt and rock dowel when grouting in a drilled hole. The importance of rock horizontal drain is to discharge ground water to prevent building up of water pressure in rock slope. Shotcrete is used for surface protection and to prevent falling of small fractured rocks. Weep holes should be installed at the rock joints and at the areas with water seepage. Proper supervision during construction is much critical to ensure quality of work and performance of rock slope strengthening as per the design.

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Inflatable packer test

NUR HUDA BT MOHD JAMIN
Gue & Partners Sdn Bhd

Inflatable packers have been used extensively in oil drilling and production industries for more than 50 years. With the increasing availability of inflatable packers that is designed specifically for economical use in industries other than the oil business, areas of inflatable packer application are constantly broadening. The inflatable packer test is a reliable test in determining the permeability of rock at the particular test section.

This presentation covers the general operating procedures, testing method and interpretation of packer testing using wire line. The result can give indication of type of material and can be correlated with core rock sample.

Soil improvement by stone columns

TIONG CHIONG NGU
Gue & Partners Sdn Bhd

Ground with soft cohesive soils always have problem to geotechnical engineers when design and construction of embankments and structures. This is because soft cohesive soils have high compressibility and low strength characteristics. Therefore, stone column serves as a ground improvement technique to improve soft clays and silts and loose silty sand. However, special care must be taken when using stone columns in sensitive soils and in soils containing organics and peat lenses or layers. Stone columns construction is generally a partial replacement of unsuitable subsoil with a compacted vertical column of stone or aggregate that usually completely penetrates the weak strata. The stone column concept was first applied in France in 1830 to improve a native soil. Stone column was brought into Malaysia in 1992. It can be constructed using either wet method (vibro-replacement) or dry method (vibro-displacement). The main difference between the two methods is that one is using jetting water during initial formation of the hole (wet process) and the other is using compressed air method (dry process). Wet method is more suited for sites underlain by very soft to firm soils and with high ground water table, whereas dry method is best suited for sites underlain by firmer soils and with low ground water table. The stone column and the in-situ soil form an integrated composite system with lower compressibility and higher shear strength. Thus, it can improve bearing capacity, reduce settlement and increase the time-rate of consolidation. Construction of stone columns required a specialist and experience contractors. Supervision on the stone construction is also very important to ensure the stone column is properly installed in accordance to the design and specifications. Stone columns can be applied to support embankment (highway or railway), abutments, and bridges and also can be used for stabilization of slopes.