



Short Course on Rock Mass Classification and Site Application in Tunnelling

by Dr Rini Asnida Abdullah

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Underground construction in Civil Engineering is associated with two types of geological materials, namely soils and rocks. Unlike the soil, the construction of any structures in or on rock mass (e.g. foundation, slope, tunnel and cavern) depends greatly on the rock mass properties and the interaction between the rock mass and the engineered structures. Therefore, it is important to understand the concept of rock mass particularly on how these geological materials react to both geological and underground construction. With that, Tunnelling and Underground Technical Division has organised Half-Day Short Course on Rock Mass Classification and Site Application in Tunnelling on 21st September 2016 at Wisma IEM, Petaling Jaya. The talk was attended by 40 participants from different background, i.e. students, engineers and also geologists. It aimed to provide a link between the knowledge of geology and its engineering applications in underground construction.

The talk began at 9:00 am with the first speaker by Dr. Rini Asnida Abdullah, from Universiti Teknologi Malaysia. Since the engineers were not so familiar with the weakness and the uncertainties in the rock mass. She started the course by giving a brief introduction to the element of weakness plane or so-called 'discontinuity' in the rock mass. It then followed with detail explanation on the commonly used rock mass classifications namely Rock Quality Designation (RQD), Rock Mass Rating (RMR) and also Q-System.

When dealing with the rock, one cannot avoid from understanding in the geologist point of view. With that, the second speaker is a geologist from MRTCA, Mr. Roziahisham Ab Wahid. He provided few case histories of lesson learnt from geological issues in tunnelling work. In which, each project may deal with different geological conditions thus reflected to the different mitigation methods.

For example, in KVMRT SBK project, where the sinkhole and blowout were the main geological incident due to the karstic weathered limestone. Whereas, in Pahang Selangor Raw Water Transfer Project (PSRWT), the spalling or rock bust were the main concern due to mining over the high overburden in hard and brittle rock. He emphasised that, it is important to understand the geological condition as it is one of the risk assessment tools.

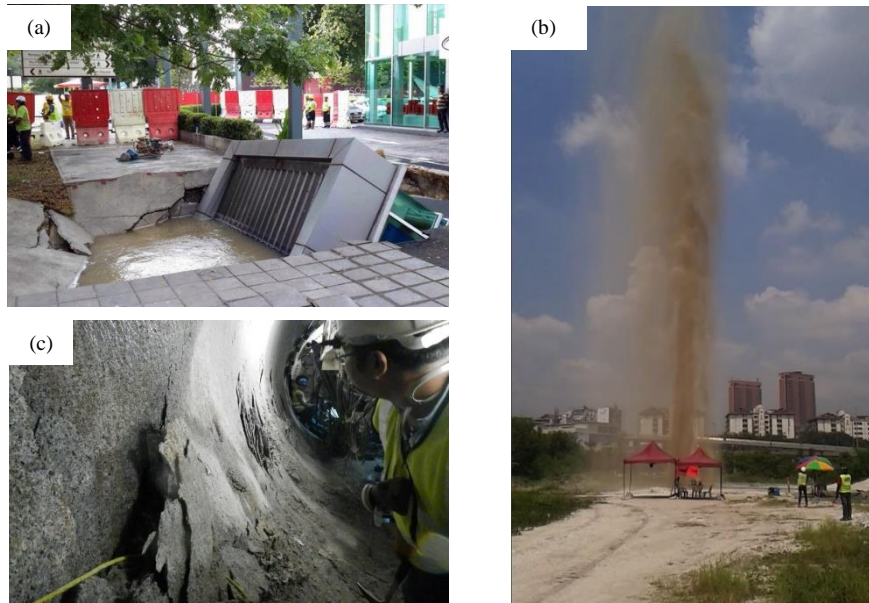


Figure 1: Incidents in tunnelling projects (a) sinkhole, (b) blowout and (c) rock spalling.

The last speaker was Ir. Andrew Yeow from MMC Gamuda KVMRT (PDP) Sdn Bhd. He shared his experience in the use of rock mass rating for the determination of tunnel primary support in the construction of two drill & blast tunnels near Taiping, namely Bukit Berapit Tunnel and Larut Tunnel. He explained on the general method used in the determination of tunnel primary support from tunnel face mapping, determination of rock quality based on Q-System or RMR System and correlation of rock quality to the tunnel support class. In the case of Bukit Berapit and Larut tunnels, the RMR System in conjunction with GSI was used to determine the tunnel support class. The range of support classes from umbrella arch with steel ribs for soil section to rock bolting and shotcrete for rock were also discussed.

In short, this course has systematically presented and discussed the fundamentals of engineering geology, also covers the engineering uses of rock material, the theory and practice in site investigations for underground construction and rock mass classification methods. This short course ended at 1:00 pm, with the presentation of a memento of appreciation by the TUSTD chairman, Ir. Syed Rajah Hussain Shaib.



Figure 2: Photo session with part of the participants

