



### **Technical Visit to MMC-GAMUDA KVMRT Underground Station Site**

#### **Light at the end of the tunnel: Challenges and Illuminations**

by Mr. Lee Lai Sang, Grad. IEM

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The Tunnelling & Underground Space Technical Division (TUSTD) organised a technical visit to the KVMRT Cochrane Underground Station Site in Jalan Cochrane, Kuala Lumpur on 17<sup>th</sup> October 2014.

The group comprised of 34 participants arrived at Cochrane Underground Station Site Office Visitor Center at 9:30am cordially received by Cik Norayu, of MMC-Gamuda-JV. The group was briefed by the Chief Resident Engineer, Mr. David R Parks on the overview and history of the Klang Valley Mass Rapid Transit (KVMRT) project. The presentation focuses on the underground work scopes comprising of tunnelling and underground station construction progress. He explained the two geological features encountered generally was Kenny Hill from Semantan Portal to Bukit Bintang Station and Karstic Limestone from Bukit Bintang to Maluri Portal. He describe the challenges encountered during tunnelling works and tunnelling method using Tunnel Boring Machines (TBM).

The project utilises 3 number Earth Pressure Balance (EPB) TBMs and 5 number Variable Density (VD) Slurry TBMs recently developed. The difference between the two revolves around the mucking delivery system. The EPB uses conveyor system better suited in soft ground while the VD uses slurry, which is more suitable for harder material e.g. limestone. In EPB TBM, the excavation face is stabilized from collapsing via the pressure place on the face by controlling the muck rate of screw conveyor. In VD Slurry TBM, the tunnel face is supported by pressurized slurry in the excavation chamber. High density of slurry prevents the slurry from flooding the surface and higher viscosity prevent loss of slurry into cavities and minimize the risk of sinkholes in karstic limestone.

The interchangeability in the VD TBM was proven when the planned lower drive tunnel at Inai Shaft was re-sequenced due to delays in the excavation of Pudu Shaft. The situation warranted the decision to continue the VD TBM through both Karstic and Kenny Hill all the way from Cochrane to Pasar Seni Station.

We were given the tour at Cochrane underground station construction site by Chief Resident Engineer, Mr. David R Parks, at the designated viewing platform only due to safety reason when going underground in a large group and on-going Cochrane Station construction works. This was followed by a video presentation and Q & A session.

The visit ended at 11:30am with a presentation of memento of appreciation to Mr. David R Parks on behalf of the IEM.



*Group photo at Cochrane Underground Station Site*



*Presentation by Mr. David R Parks*