

# MMC-Gamuda invests RM400m

## Tunnelling machines to work on 9.3km underground portion of MRT line

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SCHWANAU (Germany): MMC-Gamuda KVMRT (T) Sdn Bhd, which bagged the RM8.2 billion underground works for the mass rapid transit (MRT) project in the Klang Valley, is spending over RM400 million on equipment for tunnelling.

MMC-Gamuda has procured 10 tunnel-boring machines (TBM) to tunnel the 9.3km underground portion of the 51km MRT line. It is buying eight TBMs from Germany-based Herrenknecht.

MMC-Gamuda project manager Gusztav Klados said due to the limestone formation in Kuala Lumpur, the company had to hire specialised and custom built TBMs to do the tunnelling works.

"Each TBM has a life of about 30km if you look after it. In this case, we are tunnelling an average of over one km for each machine, so the TBMs will have a lot of life left in them," Klados said at the official workshop on acceptance of the TBMs last Wednesday.

According to Klados, the machines could be deployed for other

tunnelling works upon completion of the underground works as there are 10 machines to cater for only 9.3km of tunnelling works.

MMC-Gamuda has to hire 10 machines for the short distance mainly due to the tight deadline of the MRT project, which needs to be completed in July 2017.

Herrenknecht manufactures TBMs for the widest variety of geological conditions, but had to specially design the variable density TBMs, the first of its kind for the limestones in Kuala Lumpur.

On a scale of one to five, Kuala Lumpur's limestones have a karsticity of five and more than two-fifths of the tunnelling works will be on karstic limestones, according to Klados.

The remaining three-fifths will be on relatively easy "Kenny Hill" clay, which can be bored with the more conventional earth pressure balance TBMs.

"The KL limestone formation is possibly one of the most challenging geological formations to tunnel in the world," he told the media in a recent visit to the Herrenknecht plant.

"We hope, of course, if there are the second and third alignments, we can win the underground works again and reuse the machines. It makes a lot of sense since we will be the only ones who already have these TBMs on hand,

as well as the only ones with experience in tunnelling on KL's karstic limestone," said Klados.

Karstic limestones refers to the unpredictable and varied formation of limestones, resulting in fissures and even chambers that cannot be accurately detected before tunnelling work commences.

Conventional TBMs used in the Smart (Stormwater Management and Road Tunnel) tunnelling works caused sinkholes almost 0.5km away from the tunnelling site as ground water collected in such underground chambers was disturbed by tunnelling, recalled Klados, who was involved in the Smart project.

The two additional MRT alignments are currently under a feasibility study by the Land Public Transport Authority and are expected to be proposed by the second half of next year.

The second alignment, which has been proposed as a circle line, is expected to have more extensive underground works.

(From left): MRT Corp strategic communication and PR director Amir Mahmood Razak, MMC-Gamuda project director Satpal S Bhogal and Klados officiating at the workshop acceptance at the TBM.

