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## MEDIA RELEASE

# TUNNELLING BENEATH JALAN BUKIT BINTANG COMPLETED

### **Newly designed Variable Density TBMs successfully tunnels through transition with minimal issues**

**Kuala Lumpur, 27 October 2014:** The construction of the twin MRT tunnels beneath Jalan Bukit Bintang has been completed with the breakthrough of two Tunnel Boring Machines (TBM) at the Pudu Shaft recently.

Inai 1 TBM broke through on 16 October 2014 while Inai 2 TBM broke through on 21 October 2014. Inai 1 TBM began tunnelling beneath Jalan Bukit Bintang near Bangunan LTAT on 7 April 2014 while Inai 2 entered on 16 April 2014.

The completion of tunnelling beneath Jalan Bukit Bintang is seen as a major achievement because of the challenging geology of the area. Furthermore, this is the most densely built-up and busy area in which construction of the MRT Sungai Buloh-Kajang Line had to take place, posing many challenges to the project team.

Mass Rapid Transit Corporation Sdn Bhd Director of Strategic Communications and Public Relations, Encik Amir Mahmood Razak says tunnelling works beneath Jalan Bukit Bintang has been a huge success.

“There was no impact to the adjacent buildings and structures. Except for two incidents of sinkhole formation – a risk that we were aware of and worked hard to mitigate – tunnel excavation in our most challenging section has been relatively smooth,” he tells reporters during a media conference at the Pudu Shaft today.

Jalan Bukit Bintang straddles two geological formations. The eastern end of Jalan Bukit Bintang sits above the Kuala Lumpur Limestone Formation while the western end is above the Kenny Hill Formation. The transition between these two formations is at the Pavilion area.

The extreme karstic characteristic of the Kuala Lumpur Limestone Formation was a cause of concern for MMC Gamuda KVMRT (T) Sdn Bhd, the Underground Works Package Contractor for the MRT Sungai Buloh-Kajang Line.



However, this was mitigated with the use of high precision engineering technology including the use of the Variable Density TBM, the first of its kind in the world which was jointly designed by MMC Gamuda and world-renowned TBM manufacturer Herrenknecht AG of Germany.

The Variable Density TBM has been shortlisted for the International Underground Space and Tunnel Awards 2014 under the Technical Innovation of the Year Category. The winner will be announced in December during the award ceremony in London.

Besides significantly reducing the incidence of sinkhole formation, the Variable Density TBM is able to be converted from the slurry shield mode (when tunnelling through limestone formation) to earth pressure balance mode (when tunnelling through Kenny Hill Formation) and vice-versa.

On the two sinkhole formation incidents, MMC-Gamuda head of tunnelling Ng Hau Wei says the use of the Variable Density TBM for the MRT Project had significantly reduce the risk of this occurring.

“During the excavation of the 9km SMART Tunnel through the same karstic limestone formation, there were more than 41 incidents of sinkhole formation. With only two incidents over 7.5km of tunnelling through karstic limestone formation for MRT Sungai Buloh-Kajang Line, it’s a 95% reduction in sinkhole formation,” he says.

Apart from challenges posed by the difficult geology, the Jalan Bukit Bintang stretch also has the highest concentration of utilities, some of which were charted and while others were not.

“Despite the relocation works, there were instances when the utilities got in the way and we have to deal with the situation as it arises,” Ng adds.

Another challenge were ground anchors left behind by previous construction projects which got entangled in the TBMs.

“The successful completion of the Bukit Bintang drive combined several factors. Topping the list was definitely the technology. Second was the various teams we formed to supervise and monitor the tunnel works,” Ng says.

Amir says the overall progress of the MRT Project Underground Works stood at 70%.

“We now have just two TBMs mining from Pudu Shaft towards Pasar Seni”, he says, adding that all tunnelling works are expected to be completed by the first quarter of 2015. Underground work will however continue until December 2016.

**END**



## **About the MRT Project**

*MRT is a new rail transport system for the Klang Valley. It is part of the government's Greater Kuala Lumpur/Klang Valley's National Key Economic Area (NKEA), under the Economic Transformation Programme. The Sungai Buloh – Kajang (SBK) Line runs for 51kms, from the north-west town of Sg Buloh to the south-east city town of Kajang. Upon completion, it will comprise 31 stations, and serve 1.2 million people along the route. It will also have strategic integration with KL's existing rail transport network, namely the LRT, Monorail and KTM Komuter, as well as intra and inter-city bus routes. The end result will be better connectivity for KL and its surrounding cities, while reducing the number of cars that enter the capital.*

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