

Malaysian Tunneller makes clean Sweep of Global Tunnelling Awards in 2021

MMC Gamuda KVMRT (T) SDN BHD, Kuala Lumpur, Malaysia

The KVMRT Putrajaya Line project (**Fig. 1**) has recently been recognised by three prestigious industry awards namely the Major Project of the Year (with a budget of over 500 million Euro) at the ITA Tunnelling Awards 2021, hosted virtually by the International Tunnelling and Underground Space Association headquartered in Switzerland, the International Project of the Year at the Ground Engineering Awards 2021 hosted in London by the Ground Engineering Magazine which is the official publication of the British Geotechnical Association since 1968 and the Tunnelling Project of the Year (over 500 million USD) at the NCE Tunnelling Festival Awards 2021 hosted also in London by the New Civil Engineer which is the official magazine of the Institution of Civil Engineers (**Fig. 2**).

Awards Significance

The awards attracted industry leaders from around the world to celebrate the achievements of projects, people and businesses across tunnelling and geotechnical engineering. Other esteemed competing finalists included Singapore's highest building, the Guoco Tower, and Egypt's Ismailia Tunnels under the Suez Canal, all of

The major project KVMRT Putrajaya Line in Malaysia has been recognised by prestigious industry awards. MMC Gamuda could demonstrate its extensive experience in managing all phases from engineering, to procurement, construction, and commissioning.

Tunnelling • Award • Mega project • HSE • TBM • Innovation • Malaysia

which underwent a rigorous process of evaluation by a panel of international, independent judges in the industry. For the ITA Tunnelling Awards, the KVMRT Putrajaya Line came out on top amongst a total of 56 submissions for this category.

Key evaluation criteria included evidence of innovative, industry-advancing techniques to overcome significant technical challenges as well as value delivery for the client and the local community. Non-engineering initiatives, including initiatives to improve local workforce capabilities, inclusiveness and diversity as well as sustainability themes were also assessed.

MMC Gamuda ticked all the right boxes for its extensive experience in managing all phases of the Pu-



Fig. 1: Works progressing smoothly next to a busy highway at the Hospital Kuala Lumpur MRT Station worksite



Fig. 2: MMC Gamuda representatives with the Tunnelling Project of the Year award at the New Civil Engineer (NCE) Tunnelling Festival 2021

From left to right: Ng Hau Wei - Deputy Project Director of Gamuda Engineering, Datuk Isham Ishak - Secretary-General of Ministry of Transport Malaysia, Joyce Shamini - Technical Writer of MMG Gamuda, Satpal S. Bhogal - Project Director of Gamuda Engineering, Tan Ek Khai - General Manager of Gamuda Engineering, and Ubull Din Om - Executive Director of Gamuda Engineering Australia

trajaya Line's project delivery – from engineering, to procurement, construction, and commissioning. The awards also recognised MMC Gamuda's unique 'new normal' ecosystem for managing Covid-19 risks on the project that enabled the delivery of the tunnelling works on schedule.

A unique "new normal" Ecosystem as the Industry Gold Standard

Recognising Covid-19 as the top risk to project delivery, MMC Gamuda set up a one-of-a-kind "new normal

ecosystem" which comprised the only private (non-healthcare) owned RT PCR laboratory in the country with a dedicated crew of over 40 medical professionals to carry out fortnightly screening for the entire workforce of over 20,000 from senior management down to site operatives (Fig. 3). This frequent screening regime coupled with very stringent standard operating procedures was crucial, allowing the project team to nip in the bud any spread of Covid-19 before it developed into larger clusters.

Going a step further, MMC Gamuda established an in-house triage centre for staff to provide advance 24/7 medical care and management for Category 2 Covid-19 positive patients to minimise deterioration of personnel to symptomatic Category 3, reducing the burden on the public healthcare system.

With the rising national Covid-19 cases, MMC Gamuda pivoted quickly to constructing new centralized labour quarters (CLQs) in under 3 months to enable the redistribution of their workforce across these facilities for reduced density and improved social distancing.

The existing CLQs on the project were also reconfigured and retrofitted with segregated common facilities to minimise the potential for any spread of Covid-19 as well as isolated quarantine blocks for positive cases. These facilities were touted as a gold standard for Covid resilient worker accommodation by local authorities as well as covered extensively in local media as a model to follow.

These efforts have resulted in a clear divergence between rising national infection trends versus the organisation's relatively low infectivity rates, thus securing the confidence of authorities for work approvals throughout the nationwide lockdowns.

Project's stellar Health and Safety Track Record paved the Way to effectively handle the Covid Crisis

MMC Gamuda's commitment to exemplary safety & health outcomes and international best practices culminated in four consecutive 5-star Occupational Health and Safety Audits by the British Safety Council (BSC) since 2018. To top it off, they also were accorded two consecutive Swords of Honour for our safety & health performance from BSC with a third currently pre-qualified.

In-house Innovation recognised with international Awards

Building on the success of the Variable Density tunnel boring machine introduced on the Kajang Line, Putrajaya Line broke new ground with more award-winning innovations. Tackling the labour-intensive, risky aspects of tunnelling works, a group of in-house engineers developed the world's first autonomous tunnel boring machine, a plug and play, AI-driven system that can



Fig. 3: MMC Gamuda regularly tests the entire MRT Putrajaya Line project workforce using their in-house PCR testing laboratory

autonomously operate any TBM with minimal human input. Having successfully navigated over 10 km of tunnelling in challenging mixed ground conditions, the system was recognised by ITA as the Technical Product/Equipment Innovation of the Year in 2019.

MMC Gamuda's cutting edge and industry-leading innovation have also been a key differentiator on the project. First in the region to be certified BIM (Building Information Modeling) Level 2 by the British Research Establishment, the project's comprehensive BIM digital infrastructure offered endless opportunities for impactful applications. One example is their BIMAR (Augmented Reality for BIM) mobile application which uses the camera on a tablet to overlay 3D BIM models on the actual built environment allowing for clashes and errors to be spotted instantly on-site, minimizing costly rework. Another award-winning innovation deployed on the project is their cloud-based Geospatial Information System (GIS) portal to enable seamless collaboration between stakeholders which integrates drone surveys with BIM models for monthly up-to-date 3D progress reports of all the construction sites.

Wide-scale Capacity Building as the Backbone of the Project

None of these, from the project's impeccable health and safety performance to all-around innovative DNA, would have been possible without a strong pipeline of local talent and expertise. Large scale upskilling initiatives ranged from establishing Asia's first purpose-built Tunnel Training Academy (TTA), a BIM academy where over 2,500 has been trained to the KVMRT Safety Training Centre where over 50,000 staff had been upskilled.

At the TTA, over 1,000 personnel – many school leavers hailing from underprivileged backgrounds – had graduated and launched their tunnelling careers on the project and subsequently the TBM refurbishment initiative. The TBM refurbishment initiative is a tour de force of collaboration, roping in a German technology partner, Herrenknecht AG with local SME partners and suppliers for technology transfer. Eight TBM's from the Kajang line were refurbished and recommissioned for the Putrajaya Line resulting in over USD100 million in client savings as well as the sustainability savings in terms of avoided carbon emissions from this local refurbishment initiative.

An all-star Performer on the global Stage

Both events gathered thought-leaders, decision-makers and young engineers from the entire international tunnelling and construction community to network, share best practices and discuss what is at the cutting-edge of the industry. MMC Gamuda has once again done Malaysia proud by edging out stiff competition for both Project of the Year awards ahead of leading global industry players, cementing their place as an international leader in the delivery of mega infrastructure projects with innovative solutions.

MMC GAMUDA KVMRT (T) SDN BHD

Gamuda Engineering is a wholly-owned subsidiary of Gamuda Berhad, which is part of the joint venture entity, MMC Gamuda KVMRT (T) Sdn. Bhd or "MGKT". MGKT is the appointed Underground Works Package contractor for the Klang Valley Mass Rapid Transit Sungai-Buloh-Serdang-Putrajaya Project, Kuala Lumpur, Malaysia.

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