Bright Future for Tunnelling & Underground Space Development

TUNNELLING AND UNDERGROUND SPACE TECHNICAL DIVISION

reported by

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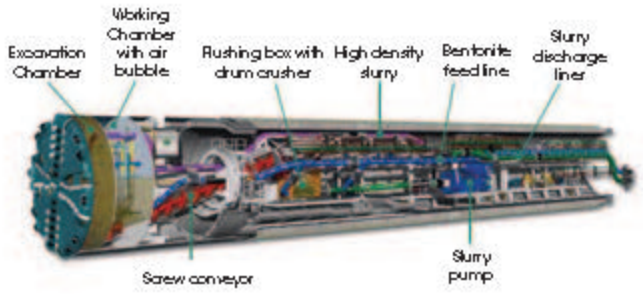
The SMART Project

Tunnelling & Underground Space Development in the country has been flourishing for the last two decades. Starting with the elaborate design of the SMART project in Kuala Lumpur 15 years ago, the innovative Variable Density Tunnel Boring Machine (VD TBM) for the Klang Valley MRT project won International awards and respect from the Tunnelling fraternity all over the world.

Building on experience gained and technological advances in the industry, the SMART Tunnel broke new ground, not only in Malaysia but also worldwide, by combining the functions of stormwater drainage and motorway tunnel. Stretching 9.7km, SMART Tunnel is the longest tunnel in South East Asia and the second longest in Asia. With a diameter of 13.2m and constructed using a slurry shield TBM, this is also among the largest diameter tunnels in the world. The SMART Tunnel has earned international recognition such as the British Construction Industry International Award (2008) and the UN Habitat Scroll of Honour Award (2011) for its innovative and unique management of stormwater and peak hour traffic.

In April 2015, it was again described by the United Nations as one of the most innovative projects in the world for an urban issue. CNN has also listed SMART Project as one of the world's top 10 greatest tunnels which is expected to prevent billions of dollars in potential flood damage and costs from traffic congestion in Kuala Lumpur's city centre.

When the VD TBM tunnelling was "reinvented" in Malaysia, all conservative rules were broken and we



The Variable Density TBM

Tunnelling Training Academy

achieved what was considered "impossible". Local tunnelling experts have come of age and today, they are highly regarded for having honed the right skills and gaining the expertise to take tunnelling to the next level in innovation technology.

VD TBM applies innovative technology by combining the advantages of both methods in one machine. Without mechanical modifications the machine can switch between four different tunnelling modes directly inside the tunnel. This means geological and hydro-geological changes along the alignment can be managed with flexibility. The multi-mode VD TBM with EPB and slurry-supported mode is the most complex form of a convertible machine currently in existence. VD TBM has also won the Technical Innovation of The Year Award in 2014 at the ITA/NCE Awards in London.

Homegrown construction outfit MMC-Gamuda credits itself as being the country's foremost tunneller. It continues to build on its strength by expanding on human capital needs in the niche tunnel engineering. It set up the world's first tunnelling school, Tunnelling Training Academy (TTA), in

record time in December 2011. This was in response to the urgent call to create high-income jobs in line with Malaysia shifting into high gear to enter a new era of economic transformation and to achieve the coveted developed nation status by the year 2020.

This was also in recognition of the fact that Malaysia needed to create a sustainable pool of certified tunnelling workforce for the massive KVMRT project as well as to nurture expertise and boost productivity in tunnel engineering. This will enable local players to take on more complex tunnel construction projects in the future.

The recent initiative to set up the local TBM refurbishment plant is, in a way, another initiative towards sustainable development. The boom in infrastructure development and concerns about its impact on the environment, have given rise to the need for tunnels and underground space. With the KVMRT, tunnelling and underground space construction will increase tremendously and with it, the challenges of tunnelling through the congested city centre with the cavernous karstic limestone landscape of Kuala Lumpur. Growing advancements in tunnelling claim to hold the key to unlocking the door to "innovation and sustainable urban connectivity".

With these many "firsts" or "first of its kind" achievements, Malaysia has come of age in technical innovation for tunnelling solutions. The golden era of tunnelling has firmly put us on the tunnelling fraternity world map and we're an active member nation of International Tunnelling & Underground Space Association (ITA).

It is no surprise that the Tunnelling & Underground Space Technical Division of The Institution of Engineers Malaysia (IEM) has submitted a bid to host the ITA-AITES World Tunnel Congress 2020 (WTC2020) in Kuala Lumpur. Bidding for this prestigious event is held three years in advance and is well-placed amongst thought leaders in Tunnelling & Underground engineering.

Malaysia's advantage in gaining a significant share of this engineering feat lies in its existing strengths in underground infrastructure, innovative environment and strong history and political will to tackle sustainability challenges. This is the Malaysian dream.

To support Malaysia's bid for WTC2020, IEM will host, for the first time, the **Southeast Asian Conference and Exhibition in Tunnelling & Underground Space (SEACETUS2017) in Subang Jaya, Selangor, on 18-19 April, 2017**. There will be 14 invited Keynotes and Special Lectures as well as 40 contributed technical papers. The event is expected to attract more than 500 participants from all over the world.

In the past, IEM had successfully organised international tunnelling conferences such as ICETUS2006, ICETUS2011 and ICETUS2015. ■