

**ITA-AITES World Tunnel Congress (WTC) 2020 and 46<sup>th</sup> General Assembly**  
Kuala Lumpur Convention Centre, Malaysia

# BULLETIN #1

November 2017





**KUALA LUMPUR  
CONVENTION CENTRE**

*Congress Venue: Kuala Lumpur Convention Centre*

ITA-AITES

**WTC 2020**

15 - 21 May 2020  
Kuala Lumpur, Malaysia



## ***Innovation and Sustainable Underground Serving Global Connectivity***

is more than a slogan for ITA-AITES and its members, it is a challenge to make a commitment to contribute to sustainable development. It is our great honour to share with the global tunnelling fraternity the Malaysian's little success story in innovative tunnelling and underground solutions. The encouragement of innovation and sustainable development in the organisation of WTC 2020, and technical presentations, is a key theme. We would be delighted if we could inspire a whole new generation's of engineers and professionals to be interested in both the works and achievements of ITA-AITES.



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Contact:



**IEM**

**The Institution of Engineers, Malaysia**

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# Welcoming Message



Dear Colleagues and Friends,

The Institution of Engineers, Malaysia (IEM) warmly welcomes you to the ITA-AITES World Tunnel Congress (WTC) 2020 and 46<sup>th</sup> General Assembly in Malaysia which will be held from 15<sup>th</sup> - 21<sup>st</sup> May 2020 at the prominent Kuala Lumpur Convention Centre (KLCC).

With the theme “Innovation and Sustainable Underground Serving Global Connectivity”, WTC 2020 will indeed be the world’s leading tunnelling event that will explore the latest innovations, trends and advances in all areas of tunnelling, i.e. from tunnel project development to both design and construction, as well as to tunnel service life cycle strategies, in a sustainable manner.

WTC 2020 will feature multiple technical paper presentations, along with tunnelling training courses, poster presentations, the ITA-AITES General Assembly, technical visits to ongoing tunnelling projects in Malaysia, and interesting exhibitions and shows by companies from all over the world presenting their latest tunnelling solutions, innovations and technologies. Along with plenteous opportunities for networking, delegates will have many occasions to learn and share new and exciting developments, and socialise with colleagues and leading experts from all over the world and at the same time conclude successful commercial deals.

We invite you to experience our warm Malaysian hospitality and enjoy the multitude of entertainment, cultural, culinary and leisure activities offered in one of the world’s most vibrant and value for money shopping destination. You can always find the most updated information on <http://wtc2020.seacetus2017.com/>.

We look forward to welcoming you to Kuala Lumpur.

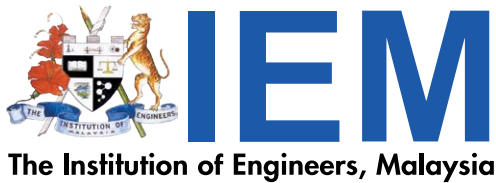
Best Wishes & Regards,

A handwritten signature in black ink, appearing to read 'Teik Aun Ooi', written in a cursive style.

**Ir. Dr Teik Aun Ooi**

Organising Chairman, WTC 2020

## Message by Ir. Dr Tan Yean Chin, IEM President ITA-AITES World Tunnel Congress 2020 (WTC 2020) and 46<sup>th</sup> General Assembly, Kuala Lumpur, Malaysia



My heartiest congratulations to The Institution of Engineers Malaysia for bringing to Malaysia the ITA-AITES World Tunnel Congress (WTC 2020) and 46<sup>th</sup> General Assembly which will be held from 15<sup>th</sup> -21<sup>st</sup> May 2020 at KLCC, Kuala Lumpur.

This prestigious congress will see the convergence of renowned speakers and delegates from around the world to our shores and will serve as a platform for knowledge exchange on the latest innovations, trends and advances in all areas of tunnelling, from tunnel project planning, design, construction and tunnel service life strategies, and how these can support sustainability and connectivity.

With the theme “Innovation and Sustainable Underground Serving Global Connectivity”, WTC 2020 will indeed be the world’s leading tunnelling event. By identifying the challenges in sustainable tunnelling, we will be able to fully understand where we are now and how we can use the right engineering technologies to create opportunities upon which to build the future. Thus, I truly believe that the respective invaluable experiences and insights by the speakers and delegates will add to the enrichment of the engineering fraternity.

Besides taking advantage of the networking and learning opportunities during the congress, I hope the speakers and delegates will take this opportunity to experience the many facets of our country. We are proud of our rich cultural heritage, our million-year-old rainforests, beautiful islands and modern cities. We have a great wealth of culture, cuisine, festivals and exciting events all year round, offering you an exciting time in Malaysia.

On behalf of the Institution of Engineers, Malaysia, I welcome you to Malaysia for a successful congress and may all of you have a pleasant stay in Malaysia.

Warmest Regards,

**Ir. Dr Yean Chin Tan**  
IEM President

# Welcome to Malaysia

## “Selamat Datang Ke Malaysia” means Welcome to Malaysia

For over 600 years, Malaysia has occupied a special place in the heart of the business world. Sitting at the nexus of major trade routes, it has been enticing travellers to gather from Europe, the Middle East, Africa and every nation across Asia. Today, Malaysia enjoys an important market position, situated between two of the world’s economic giants, i.e. India and China. It is a key player in the Association of Southeast Asian Nations (ASEAN), whose nations’ population totalled more than 600 million. Along with India and China, this region makes up 45% of the world’s population.

The country is now a role model for the developing world with a growing diversity of industry sectors, thanks to the government’s Economic Transformation Programme whose goal is for Malaysia to achieve developed nation status by year 2020. Substantial investments in infrastructure, research, education and urban development have created a vibrant and dynamic economy. Key industry sectors include automotive, chemical, commerce & finance, education, electronics & electrical, furniture, infrastructure construction, ‘halal’ food product development, oil & gas, Islamic finance, medical science, palm oil, renewable energy, rubber, science, textile, timber and many more.

Malaysia is well-served by international airlines, modern airports, road and rail transportation as well as a first-class internet and telecommunications infrastructure that facilitate the conduct of businesses from all over the globe.

As one of the most vibrant countries in Southeast Asia, Malaysia offers many advantages as a world class destination. First and foremost, Malaysia is an easy place to stage international conventions since English is widely spoken yet it is multilingual. Malaysia is a multiracial country with mixtures of Malay, Chinese, Indian, Middle Eastern and Western cultures, thus it can cater well for a diversity of food, language and cultural needs.



Malaysia has a total of six international airports with the main travel hub being centred at the Kuala Lumpur International Airport (KLIA). Over 60 International airlines fly direct to Malaysia connecting 113 major cities from 35 countries, including Australia, the UK and the USA, making Malaysia easily accessible from anywhere in the world.

### Flying Times from Malaysia



**Kuala Lumpur International Airport (KLIA) won the World's Best Airport Immigration Service**  
*SkyTrax 2013*

## Flights to Malaysia

### List of Countries with Flights to Malaysia & Weekly Frequency

| ASIA REGION        |                    |     |  |
|--------------------|--------------------|-----|--|
| <b>Australia</b>   | Adelaide           | 11  |  |
|                    | Brisbane           | 7   |  |
|                    | Darwin             | 4   |  |
|                    | Gold Coast         | 7   |  |
|                    | Melbourne          | 42  |  |
|                    | Perth              | 24  |  |
|                    | Sydney             | 35  |  |
| <b>Bangladesh</b>  | Dhaka              | 56  |  |
|                    | Chittagong         | 2   |  |
| <b>Brunei</b>      | Bandar Sri Begawan | 32  |  |
| <b>Cambodia</b>    | Phnom Penh         | 28  |  |
|                    | Siem Reap          | 11  |  |
| <b>China</b>       | Beijing            | 21  |  |
|                    | Chengdu            | 7   |  |
|                    | Chongqin           | 4   |  |
|                    | Dalian             | 4   |  |
|                    | Fuzhou             | 3   |  |
|                    | Guangzhou          | 56  |  |
|                    | Guilin             | 4   |  |
|                    | Hangzhou           | 7   |  |
|                    | Hong Kong SAR      | 77  |  |
|                    | Kunming            | 11  |  |
|                    | Macau              | 17  |  |
|                    | Nanning            | 7   |  |
|                    | Shanghai           | 32  |  |
|                    | Shenzhen           | 14  |  |
|                    | Tianjin            | 3   |  |
|                    | Xi'an              | 4   |  |
|                    | Xiamen             | 8   |  |
|                    | Zhengzhou          | 4   |  |
| <b>India</b>       | Bangalore          | 16  |  |
|                    | Calcutta           | 7   |  |
|                    | Chennai            | 32  |  |
|                    | Hyderabad          | 7   |  |
|                    | Kochi              | 14  |  |
|                    | Mumbai             | 12  |  |
|                    | New Delhi          | 14  |  |
|                    | Tiruchirappalli    | 21  |  |
|                    | Vishakhapatnam     | 3   |  |
| <b>Indonesia</b>   | Bali               | 77  |  |
|                    | Balik Papan        | 3   |  |
|                    | Banda Aceh         | 7   |  |
|                    | Bandung            | 38  |  |
|                    | Batam/Batu Besar   | 4   |  |
|                    | Jakarta            | 156 |  |
|                    | Lombok             | 7   |  |
|                    | Makassar           | 4   |  |
|                    | Medan              | 77  |  |
|                    | Padang             | 14  |  |
|                    | Palembang          | 7   |  |
|                    | Pekan Baru         | 18  |  |
|                    | Semarang           | 4   |  |
|                    | Solo City          | 3   |  |
|                    | Surabaya           | 47  |  |
|                    | Yogyakarta         | 14  |  |
| <b>Japan</b>       | Osaka              | 14  |  |
|                    | Tokyo              | 25  |  |
| <b>Jordan</b>      | Amman              | 3   |  |
| <b>Laos</b>        | Vientiane          | 4   |  |
| <b>Maldives</b>    | Male               | 9   |  |
| <b>Mauritius</b>   |                    | 3   |  |
| <b>Myanmar</b>     | Yangon             | 28  |  |
| <b>Nepal</b>       | Kathmandu          | 28  |  |
| <b>New Zealand</b> | Auckland           | 6   |  |
| <b>Pakistan</b>    | Karachi            | 1   |  |
|                    | Lahore             | 2   |  |
|                    | Peshawar           | 2   |  |
| <b>Philippines</b> | Cebu               | 4   |  |
|                    | Kalibo             | 7   |  |
|                    | Mabalacat          | 4   |  |
|                    | Manila             | 60  |  |
| <b>Singapore</b>   |                    | 309 |  |
| <b>South Korea</b> | Seoul              | 21  |  |
|                    | Busan              | 4   |  |
| <b>Sri Lanka</b>   | Colombo            | 26  |  |
|                    | Hambantota         | 1   |  |
| <b>Taiwan</b>      | Taipei             | 41  |  |
| <b>Thailand</b>    | Bangkok            | 158 |  |
|                    | Chiangmai          | 14  |  |
|                    | Hat Yai            | 7   |  |
|                    | Hua Hin            | 3   |  |
|                    | Koh Samui          | 12  |  |
|                    | Krabi              | 18  |  |
|                    | Phuket             | 56  |  |
|                    | Surat Thani        | 3   |  |
| <b>Uzbekistan</b>  | Tashkent           | 3   |  |
| <b>Kazakhstan</b>  | Almaty             | 3   |  |
| <b>Vietnam</b>     | Hanoi              | 24  |  |
|                    | HCM City           | 67  |  |

| AFRICA          |             |   |
|-----------------|-------------|---|
| <b>Ethiopia</b> | Addis Ababa | 4 |

| EUROPE                |           |    |
|-----------------------|-----------|----|
| <b>France</b>         | Paris     | 10 |
| <b>Germany</b>        | Frankfurt | 9  |
| <b>Netherlands</b>    | Amsterdam | 14 |
| <b>Turkey</b>         | Istanbul  | 7  |
| <b>Turkmenistan</b>   | Ashgabat  | 1  |
| <b>United Kingdom</b> | London    | 14 |

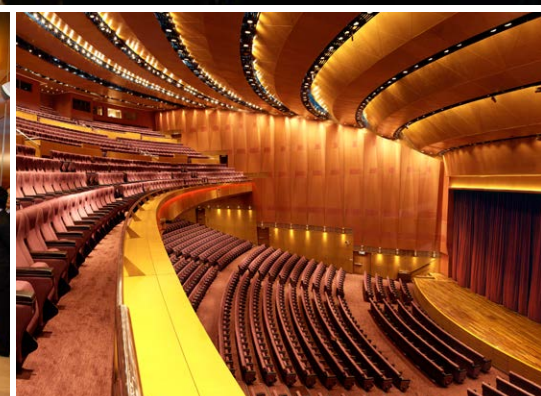
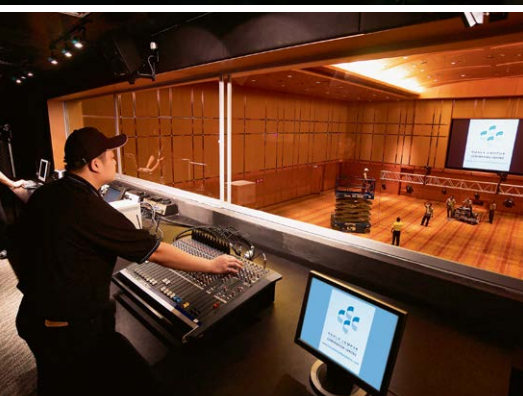
  

| MIDDLE-EAST         |           |    |
|---------------------|-----------|----|
| <b>Egypt</b>        | Cairo     | 3  |
| <b>Iran</b>         | Teheran   | 9  |
| <b>Iraq</b>         | Baghdad   | 2  |
| <b>Kuwait</b>       |           | 3  |
| <b>Oman</b>         | Muscat    | 7  |
| <b>Qatar</b>        | Doha      | 21 |
| <b>Saudi Arabia</b> | Jeddah    | 16 |
|                     | Madinah   | 5  |
|                     | Riyadh    | 3  |
| <b>UAE</b>          | Abu Dhabi | 14 |
|                     | Dubai     | 36 |
| <b>Yemen</b>        | Sanaa     | 1  |

# Congress Venue



KUALA LUMPUR  
CONVENTION CENTRE

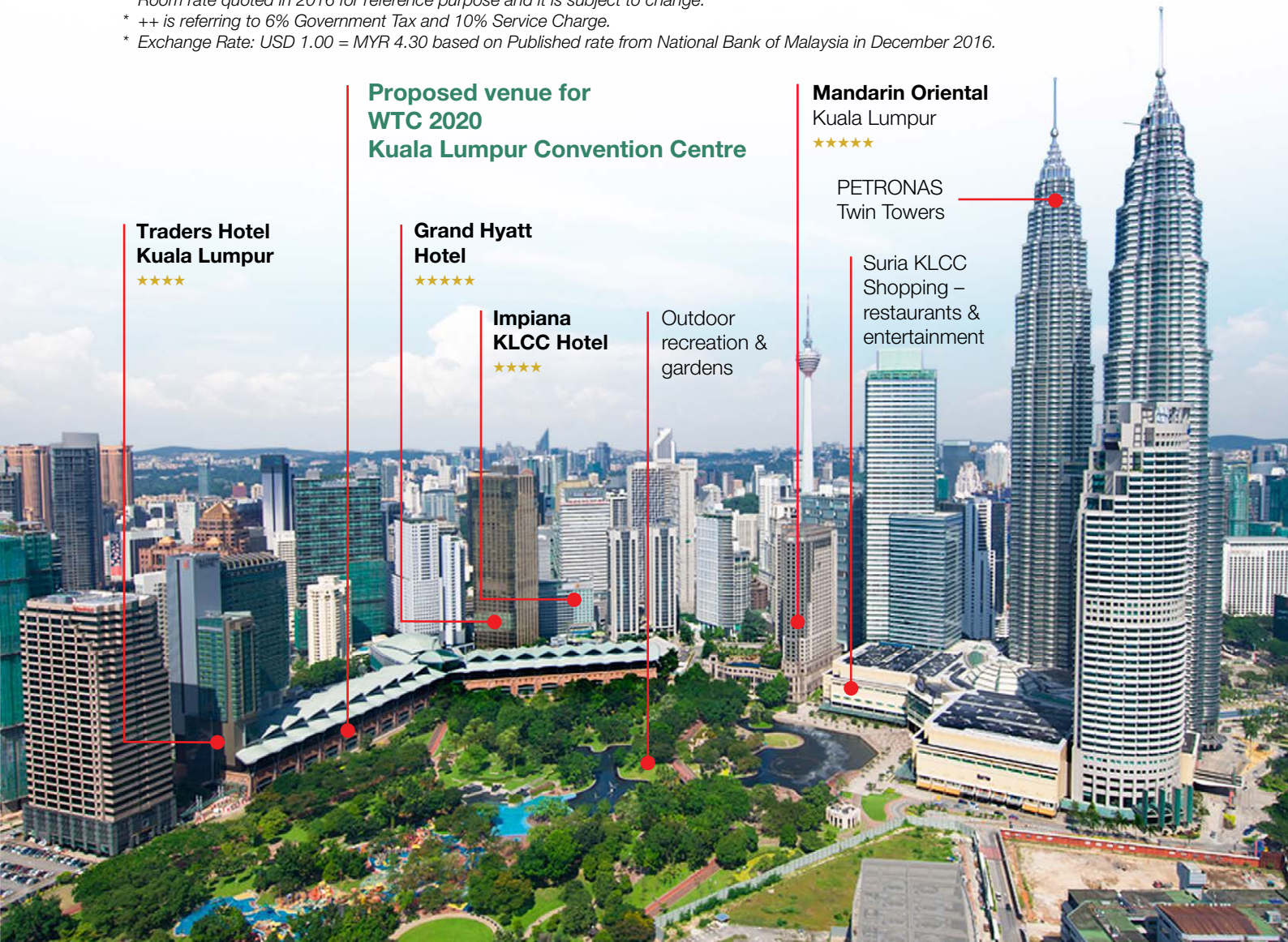




# Hotel Accommodations

| Hotel                          | Star Rating | Distance to KLCC                      | Room Rates (MYR) & (USD) Per Night                           |                              | Total Number of Rooms                       | Meeting Room        |                        |
|--------------------------------|-------------|---------------------------------------|--------------------------------------------------------------|------------------------------|---------------------------------------------|---------------------|------------------------|
|                                |             |                                       | Single-bed                                                   | Double-bed                   |                                             | 4 Rooms (30 people) | 4 Rooms (various size) |
| Traders Hotel Kuala Lumpur     | ★★★★        | Integrated with the Convention Centre | MYR 690.00++<br>USD 160.46++                                 | MYR 730.00++<br>USD 169.76++ | 520 rooms /<br>51 suites                    | × (1 room only)     | ✓                      |
| Impiana KLCC Hotel             | ★★★★        | Opposite the Convention Centre        | MYR 480.00++ to MYR 740.00++<br>USD 111.62++ to USD 172.09++ |                              | 519 rooms /<br>13 suites                    | ✓                   | ✓                      |
| Grand Hyatt Hotel              | ★★★★★       | Adjacent to the Convention Centre     | MYR 800.00++<br>USD 186.04++                                 | MYR 880.00++<br>USD 204.65++ | 412 rooms /<br>42 suites                    | ✓                   | ✓                      |
| Mandarin Oriental Kuala Lumpur | ★★★★★       | Adjacent to the Convention Centre     | MYR 710.00++<br>USD 165.11++                                 | MYR 750.00++<br>USD 174.41++ | 602 rooms /<br>41 suites /<br>51 apartments | ✓                   | ✓                      |

\* Room rate quoted in 2016 for reference purpose and it is subject to change.  
 \* ++ is referring to 6% Government Tax and 10% Service Charge.  
 \* Exchange Rate: USD 1.00 = MYR 4.30 based on Published rate from National Bank of Malaysia in December 2016.



# Programme Outline

The dates for WTC 2020 in Kuala Lumpur are Friday 15<sup>th</sup> – Thursday 21<sup>st</sup> May 2020. The proposed scheduled dates fall during the month of Ramadan which is the holiest month in the Islamic calendar. Participants will have the opportunity to experience the 'Buka Puasa' (Breaking of Fast) in Malaysia.

| Time<br>Date                | 08:00<br>to<br>09:00                                                                     | 09:00<br>to<br>10:00 | 10:00<br>to<br>11:00 | 11:00<br>to<br>12:00 | 12:00<br>to<br>13:00 | 13:00<br>to<br>14:00 | 14:00<br>to<br>15:00 | 15:00<br>to<br>16:00 | 16:00<br>to<br>17:00 | 17:00<br>to<br>18:00 | 18:00<br>to<br>19:00                           | 19:00<br>to<br>20:00 | 20:00<br>to<br>21:00 | 21:00<br>to<br>22:00 | 22:00<br>to<br>23:00 |                                    |  |  |  |  |
|-----------------------------|------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------------------------------------------------|----------------------|----------------------|----------------------|----------------------|------------------------------------|--|--|--|--|
| 15 May<br>2020<br>Friday    | ITACET Training Session<br>"Innovations in Tunnelling - Perspective for Young Engineers" |                      |                      |                      |                      |                      |                      |                      |                      |                      |                                                |                      |                      |                      |                      |                                    |  |  |  |  |
| 16 May<br>2020<br>Saturday  | ITACET Training Session                                                                  |                      |                      |                      |                      |                      |                      |                      |                      |                      | ITA Nation Member Reception<br>(by invitation) |                      |                      |                      |                      |                                    |  |  |  |  |
|                             | Registration                                                                             |                      |                      |                      |                      |                      |                      |                      |                      |                      |                                                |                      |                      |                      |                      |                                    |  |  |  |  |
| 17 May<br>2020<br>Sunday    | ITA Executive Meeting                                                                    |                      |                      |                      |                      |                      |                      |                      |                      |                      | Working Group Animatours Meeting               |                      |                      |                      |                      |                                    |  |  |  |  |
|                             | Registration                                                                             |                      |                      |                      |                      |                      |                      |                      |                      |                      | Congress Welcome Reception                     |                      |                      |                      |                      |                                    |  |  |  |  |
| 18 May<br>2020<br>Monday    | General Assembly                                                                         |                      |                      |                      |                      |                      |                      |                      |                      |                      | Lunch                                          |                      |                      |                      |                      | Working Group & Committee Meetings |  |  |  |  |
|                             | Registration                                                                             |                      |                      |                      |                      |                      |                      |                      |                      |                      | Opening Ceremony                               |                      |                      |                      |                      | Muir Wood & Keynote Lectures       |  |  |  |  |
| 19 May<br>2020<br>Tuesday   | Exhibition                                                                               |                      |                      |                      |                      |                      |                      |                      |                      |                      | Lunch                                          |                      |                      |                      |                      | Technical Sessions                 |  |  |  |  |
|                             | Named & Keynote Lectures                                                                 |                      |                      |                      |                      |                      |                      |                      |                      |                      | Working Group & Committee Meetings             |                      |                      |                      |                      |                                    |  |  |  |  |
|                             | Registration                                                                             |                      |                      |                      |                      |                      |                      |                      |                      |                      |                                                |                      |                      |                      |                      |                                    |  |  |  |  |
| 20 May<br>2020<br>Wednesday | Exhibition                                                                               |                      |                      |                      |                      |                      |                      |                      |                      |                      | Lunch                                          |                      |                      |                      |                      | Technical Sessions                 |  |  |  |  |
|                             | Named & Keynote Lectures                                                                 |                      |                      |                      |                      |                      |                      |                      |                      |                      | General Assembly                               |                      |                      |                      |                      | Gala Dinner                        |  |  |  |  |
|                             | Registration                                                                             |                      |                      |                      |                      |                      |                      |                      |                      |                      |                                                |                      |                      |                      |                      |                                    |  |  |  |  |
| 21 May<br>2020<br>Thursday  | Post Congress Technical Tours                                                            |                      |                      |                      |                      |                      |                      |                      |                      |                      |                                                |                      |                      |                      |                      |                                    |  |  |  |  |

# Leadership Team

## Executive Organising Committee

### Organising Chairman

- Ir. Dr Teik Aun Ooi

### Co-Organising Chairman

- Olivier Vion

### Deputy Organising Chairman

- Ir. Chee Min Khoo

### Committee Members

- Ir. Syed Rajah Hussain Shaib bin A.H. Mohd Haniff
- Ir. Sang Woh Ong
- Ir. Andrew Pow Kwei Yeow
- Ir. Chi Koong Chong
- Dr Rini Asnida Abdullah
- Ir. Frankie Peng Leong Cheah
- Ir. Boon Kheng Neo
- Ir Keith George Cowling
- Ir. Dr Hong Kok Wang
- Ir Dr Yean Guan Tan
- Ir. Thien Seng Yee
- Dr Bhavani Iyer
- Ir. Dr Swee Huat Chan
- Ir. Tuan Haji Mohd Ali Yusoff
- Ir. Boon Soon Ong
- Chee Kien Lee
- Ir. Sofiana Balkhis Talha
- Ir. Najiha Nadzru
- Ir. Dr Mohd Farid Ahmad
- Ir. Soon Hoe Yap
- Ir. Umi Kalthom Ahmad
- Ir. Elias Saldin
- Ir. Teong Sian Yam



## Proposed Advisory Committee

### International

|                                 |   |                              |
|---------------------------------|---|------------------------------|
| • Dr Harald Wagner              | – | Chairman                     |
| • Prof. Tarcisio B. Celestino   | – | ITA President/ Chair WTC2014 |
| • Prof. Jenny (Jinxu) Yan       | – | ITA Vice President           |
| • Olivier Vion                  | – | ITA Executive Director       |
| • Claude Berenguier             | – | ITACET Executive Director    |
| • Zaw Zaw Aye                   | – | ITA Myanmar                  |
| • Leslie Pakianathan            | – | ITA Singapore                |
| • Ow Chun Nam                   | – | TUCSS Past President         |
| • Kulaindran Ariaratnam         | – | TUCSS President              |
| • Dr Aphichat Sramoon           | – | TUTG President               |
| • Randy Essex                   | – | ITA USA                      |
| • Abidemi Agwor                 | – | ITA Nigeria                  |
| • Dr Suchatvee Vince Suwansawat | – | Chair WTC 2012               |
| • Felix Amberg                  | – | Chair WTC 2013               |
| • Dr Davorin Kolic              | – | Chair WTC 2015               |
| • Michael Smithson              | – | Chair WTC 2016               |
| • Heidi Berg                    | – | Chair WTC 2017               |

### National

|                                              |   |                        |
|----------------------------------------------|---|------------------------|
| • Tan Sri Hj. Mhd. Amin Nordin bin Abd. Aziz | – | Mayor, DBKL            |
| • Dato' Sri Ir. Dr Roslan bin Md. Taha       | – | DG, JKR                |
| • Dato' Ir. Hj. Zulkefli bin Hassan          | – | DG, JPS                |
| • Dato' Ir. Dr. Zullkefle bin Nordin         | – | DG, JPP                |
| • Dato' Ir. Hj. Ismail bin Md. Salleh        | – | DG, LLM                |
| • Ir. Dr Tan Yean Chin                       | – | President, IEM         |
| • Dato' Ir. Ahmad 'Asri bin Abdul Hamid      | – | CEO, CIDB              |
| • Dato' Ir. Hj. Azman bin Mohd               | – | CEO, TNB               |
| • En. Mohd Azharuddin bin Mat Sah            | – | CEO, SPAD              |
| • Dato' Sri Azmi Abdul Aziz                  | – | President, Prasarana   |
| • Dato' Sri Shahril Mokhtar                  | – | CEO, MRT Corp          |
| • Dato' Mohd Nur Ismal bin Mohamed Kamal     | – | CEO, MyHSR Corp        |
| • Datuk Zulkefli Hj. Sharif                  | – | CEO, MyCEB             |
| • Dato' Ir. Paul Ha                          | – | Deputy GMD, MMC-Gamuda |



## Proposed Scientific Committee

|                                         |   |                                                                                       |                        |
|-----------------------------------------|---|---------------------------------------------------------------------------------------|------------------------|
| • Prof. Lord Robert Mair                | – |    | United Kingdom         |
| • Emeritus Prof. John Burland           | – |    | United Kingdom         |
| • Prof. In-Mo Lee                       | – |    | South Korea (Chairman) |
| • Dr Seung Ryul Kim                     | – |    | South Korea            |
| • Prof. Dr Yun Bai                      | – |    | China                  |
| • Prof. Jenny (Jinxu) Yan               | – |    | China                  |
| • Prof Charles Wang Wai Ng              | – |    | Hong Kong              |
| • Prof. Kwet Yew Yong                   | – |    | Singapore              |
| • Assoc. Prof. (Adj) Dr. Zhou Ying Xin  | – |    | Singapore              |
| • Prof. Dr Noppadol Phien-wej           | – |    | Thailand               |
| • Prof. Dr Quang Phich Nguyen           | – |    | Vietnam                |
| • Assoc. Prof. Ir. Dr Hisham b. Mohamad | – |    | Malaysia               |
| • Er. Poh Seng Tiok                     | – |   | Malaysia               |
| • Dato' Ir. Paul Ha                     | – |  | Malaysia               |
| • Ir. Dr Ooi Lean Hock                  | – |  | Malaysia               |
| • Prof. Dr Toshihisa Adachi             | – |  | Japan                  |
| • Yoshikazu Ota                         | – |  | Japan                  |
| • Prof. Dr Zhao Jian                    | – |  | Australia              |
| • Alexandre Gomes                       | – |  | Australia              |
| • Prof. Jamal Rostami                   | – |  | USA                    |
| • Randall J. Essex                      | – |  | USA                    |
| • Prof. Tarcisio Celestino              | – |  | Brazil                 |
| • Prof. Dr Markus Thewes                | – |  | Germany                |
| • Tim Babendererde                      | – |  | Germany                |
| • Prof. Pekka Särkkä                    | – |  | Finland                |
| • Dr Catherine Larive                   | – |  | France                 |
| • Prof. Wulf Schubert                   | – |  | Austria                |
| • Prof. Daniele Peila                   | – |  | Italy                  |
| • Prof. Massimo Coli                    | – |  | Italy                  |
| • Assoc. Prof. Dr Krishna Panthi        | – |  | Norway                 |
| • Prof. Charlie Li                      | – |  | Norway                 |
| • Felix Amberg                          | – |  | Switzerland            |
| • Gustaz Klados                         | – |  | Hungary                |
| • Dr Davorin Kolic                      | – |  | Croatia                |
| • Prof. Nuh Bilgin                      | – |  | Turkey                 |
| • Prof. Saffet Yagiz                    | – |  | Turkey                 |
| • Chhatra Basnet                        | – |  | Nepal                  |
| • Dr. Bassam AL Ghulman                 | – |  | United Arab Emirates   |
| • Prof. T. Ramamurthy                   | – |  | India                  |

# Sponsorships, Exhibitions and Advertisements

## Sponsorships

Anchored/Main Platinum Sponsor

|           |             |
|-----------|-------------|
| Package A | MYR 530,000 |
| Package B | MYR 318,000 |
| Package C | MYR 212,000 |

|                |             |
|----------------|-------------|
| Gold Sponsor   | MYR 106,000 |
| Silver Sponsor | MYR 42,400  |
| Bronze Sponsor | MYR 26,500  |

|                             |                                     |
|-----------------------------|-------------------------------------|
| Conference Bag              | MYR 530,000 (exclusive sponsorship) |
| Lanyard 3 sponsors @        | MYR 74,200 each                     |
| Name Tag sponsors @         | MYR 53,000 each                     |
| WTC 2020 Logo 16GB pendrive | MYR 318,000 (exclusive sponsorship) |



## Exhibition Space

|                                 |            |
|---------------------------------|------------|
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 Wisma IEM, Jalan Selangor, 46720 Petaling Jaya, Selangor Darul Ehsan, Malaysia.  
 P.O. Box 224 (Jalan Sultan) ☎ +603 7958 6851 📠 +603 7958 2851

# Abstracts and Papers

## Theme of Congress

The Institution of Engineers, Malaysia (IEM) is proud to host the ITA-AITES World Tunnel Congress (WTC) 2020 and 46<sup>th</sup> General Assembly in Kuala Lumpur, Malaysia from 15<sup>th</sup> to 21<sup>st</sup> May 2020.

The theme of the WTC 2020 is **Innovation and Sustainable Underground Serving Global Connectivity**. The theme has conscientiously been chosen to timely reflect the innovative achievements in the efforts of the ITA-AITES in promoting the use of tunnels and underground space for the benefits of public, environment and sustainable development for the past of almost half a century since its establishment in 1974.

## Session Topics

Growing numbers of underground innovations claimed to hold the key to unlock the door to a 'smarter urban connectivity'. More often than not, these innovations were being embedded into highly complex underground projects that aim to minimise environmental hazards, to save energy, to increase the functional diversity of the urban structure, to reduce the need of local transportation, to make services more easily accessible to residents, and to protect the urban landscape as well as culture for sustainable urban development.

This Congress aims at providing a forum for practising professionals – engineers, consultants, contractors, technologists, researchers, academicians, manufacturers and suppliers to share their experiences, research, studies and views so as to contribute to the advancement of Innovation and Sustainable Underground Serving Global Connectivity. A wide range of high quality scientific and technical papers of international or regional significance on tunnelling and underground space development is expected on, but not limited to, the following topics.

1. Innovation in tunnels and tunnelling technology
2. Innovation in rock support and water proofing technology
3. Sustainable and strategic use of underground space
4. Environment sustainability in underground construction
5. Urban dewatering and flood control with underground tunnels
6. Planning, design and construction of tunnels and underground structures
7. Risk, health and safety, contractual practices and project management of underground construction
8. Instrumentation and monitoring in underground construction
9. Conventional tunnelling, sprayed concrete use, drill and blast excavation
10. Mechanised tunnelling and excavation (hard rock, soft rock and soil)
11. Site investigation and ground characterisation
12. Geological and geotechnical aspects in underground construction
13. Stability assessment and ground stabilisation in underground construction
14. Operation, repair and maintenance of tunnels and underground structures
15. Design and installation of mechanical and electrical systems for underground structures
16. Information modelling in tunnelling and underground space development
17. Projects and case histories
18. Others (e.g. economics of tunnels and use of underground space, life cycle asset management, etc.)

## Important Dates

The Organising Committee of the WTC 2020 cordially invites you to submit abstract(s) of not more than 200 words for the Congress to [wtc2020@iem.org.my](mailto:wtc2020@iem.org.my).

- |                           |                    |                            |                   |
|---------------------------|--------------------|----------------------------|-------------------|
| • Call for papers         | : 01 January 2018  | • Submission of papers     | : 31 October 2019 |
| • Submission of abstracts | : 31 December 2018 | • Acceptance of papers     | : 31 January 2020 |
| • Acceptance of abstracts | : 31 March 2019    | • Notification to speakers | : 15 March 2020   |

The Congress language shall be English.

Authors of selected papers will be invited to submit upgraded versions of their papers for publication as full journal papers in Geotechnical Engineering Journal of the SEAGS & AGSSEA (which is an EI, ESCI and Scopus indexed journal).

# Accompanying Persons' Programme

## Discover Kuala Lumpur with Hop-On Hop-Off

Duration: 2-3 hours

KL Hop-On Hop-Off is a free and easy city tour that has 22 stops which covers more than 40 attractions. All buses provide commentary from a choice of nine different languages and a friendly tourist service officer would assist tourists while on the bus.

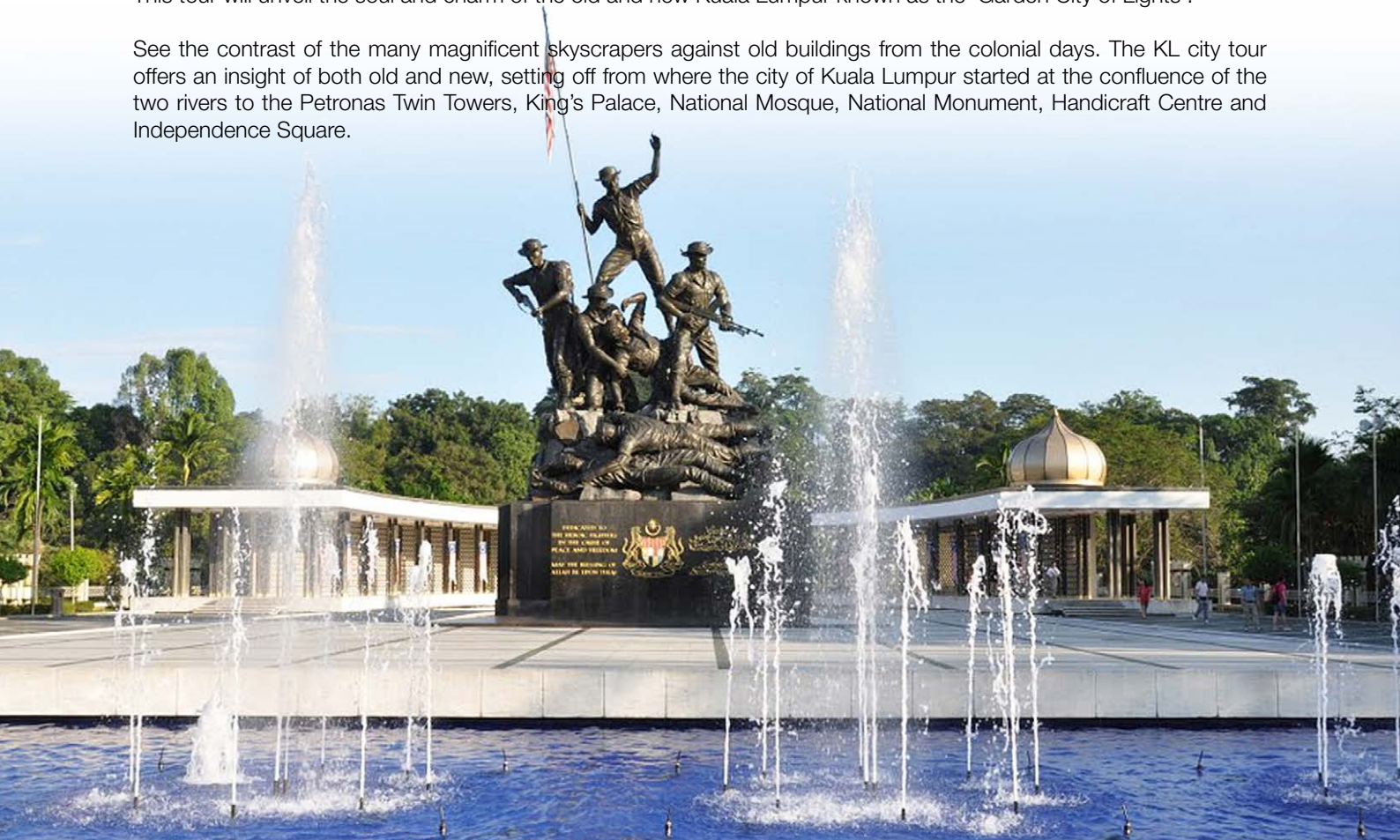


## Kuala Lumpur City Tour

Duration: 4 hours

This tour will unveil the soul and charm of the old and new Kuala Lumpur known as the 'Garden City of Lights'.

See the contrast of the many magnificent skyscrapers against old buildings from the colonial days. The KL city tour offers an insight of both old and new, setting off from where the city of Kuala Lumpur started at the confluence of the two rivers to the Petronas Twin Towers, King's Palace, National Mosque, National Monument, Handicraft Centre and Independence Square.





## Accompanying Persons' Programme (Continued)

### Kuala Lumpur Shopping Paradise - BBKLCC

Duration: 2-3 hours

Featured as the world's fourth best shopping city in CNNGo, Kuala Lumpur is indeed a shopper's paradise.

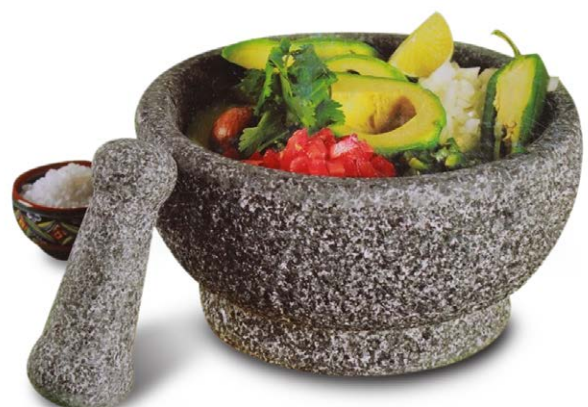
Three out of the world's 10 largest malls are located in KL, while year-round sales offer value for money. The BBKLCC stretches from Bukit Bintang to the Kuala Lumpur City Centre, in particular, will leave you spoilt for choice with its abundance of fashion, food and entertainment options. Lose yourself in the huge selection of local and international brands available across nine signature malls within the area. The shopping district is also well-connected via a covered pedestrian walkway and an efficient network of public transport.



### Malaysian Home Cooking with Markets' Visits

Duration: 6 hours

Gets hands-on experience in a Malaysian home cooking class with traditional stone and wooden utensils in a modern kitchen. Participants are taken to a local market to source for fresh ingredients. No experience is needed except a generous dose of enthusiasm, a genuine love for food and a pair of comfortable shoes. All ingredients, equipment and recipes are provided, including aprons. The chef will be on hand to help out, demonstrate special techniques or to pass on some cooking tips. The class ends with a sit-down meal to taste the dishes prepared.



# Pre & Post Congress Tour

Malaysia's diverse and easily accessible attractions have made it a popular choice for delegates and their accompanying persons. From idyllic tropical islands, to ancient rainforest teeming with flora and fauna, to world heritage sites, there is no shortage of venues to choose from. Visiting delegates have an array of pre and post congress options, such as late night shopping, excursions or unique cultural experiences. Being a relatively small country with a strong transportation network, no destination is too far away.

## Penang – The Pearl of the Orient

Witness the delightful fusion of the East and West as well as the old and new in Penang, the Pearl of the Orient and a UNESCO World Cultural Heritage Site.



Pre & Post Congress Tour (Continued)

## Langkawi – The Jewel of Kedah

The jewel in the crown of Kedah, part of the 99-island Langkawi Archipelago, this charming tropical isle boasts some of the region's best natural attractions.



## Malacca – The Historic State

One of the most pronounced influence is the Portuguese architectural that one can see around Malacca. Malacca was also granted the prestigious title of a UNESCO World Heritage Site.



## Pre & Post Congress Tour (Continued)

### Sabah – The Land Beneath the Wind

Stunning tropical islands and luxuriant nature makes Sabah the ideal destination for eco-adventures.



### Sarawak – The Land of the Hornbills

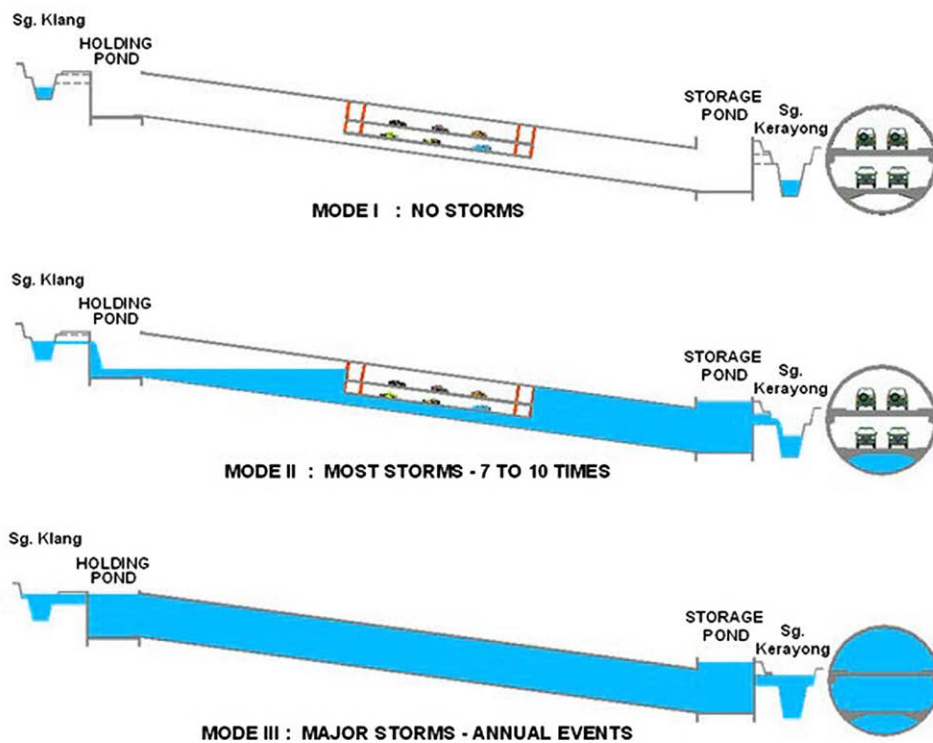
Utterly fascinating and mystical destination. This is the largest state in Malaysia, occupying the south-western ridge of Borneo.



# Technical Tour / Visit

## SMART Tunnel

The tour to the Smart Tunnel will be an excellent opportunity for the congress participants to understand the concept and philosophy behind flood mitigation via SMART tunnel. A video presentation will be included in the tour programme to showcase the project planning, construction, engineering innovation and latest technologies in tunnel construction, follow by soft part of the operation (i.e. challenges and limitations) as well as public and government related issues.



# Tunnelling in Malaysia

The achievements in tunnelling and underground space development in Malaysia, in the past one and half decades are impressive. From the very beginning of the older tunnels constructed associated with the construction of dams (e.g. Kelinci Dam water transfer tunnel, diversion tunnel of the Sg. Selangor Dam, pressure tunnels and powerhouse for the Pergau Dam, etc.) and highways (e.g. Karak Highway twin tunnels and Penchala Link twin tunnels) and on to the subway Light Rail Transit (LRT) system, tunnelling activities have been gaining momentum in the 21st century with the construction of the Storm Water Management and Road Transport System (SMART) dual-purpose tunnel, Pahang-Selangor interstate water transfer tunnel, double tracking electrified railway tunnel and the most recently completed is the Klang Valley Mass Rapid Transit (KVMRT) from Sungai Buluh to Kajang as well as the planned High Speed Rail (HSR) and the East Coast Rail Link (ECRL) projects.

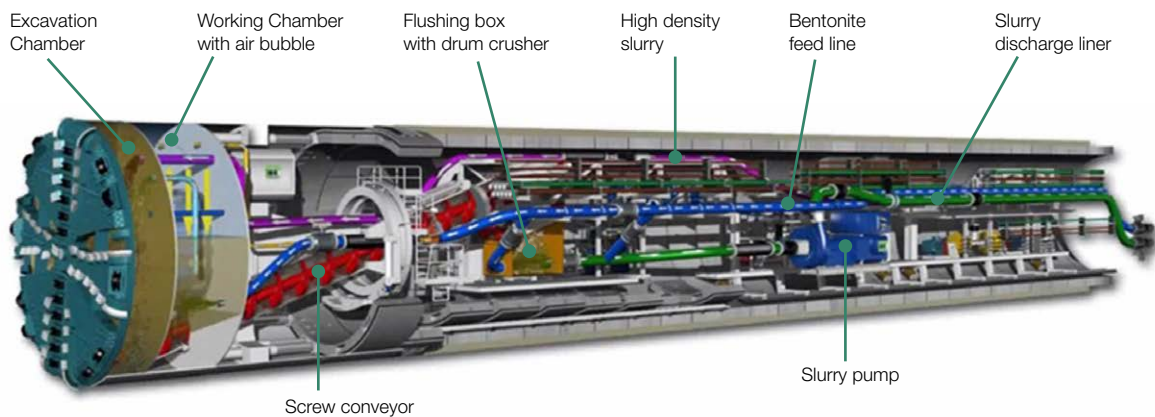


Karak Highway Twin Tunnel



Sungai Selangor Water Transfer Tunnel

Recent development in Variable Density TBM, conceptualised by Malaysian owned companies MMC-Gamuda JV through exhaustive research and collaboration with TBM supplier Herrenknecht AG and Ruhr-University, is the first-of-its kind in the world of the tunnelling industry. VD TBM has proven to be an effective tool to excavate in different types and yet challenging geology and performed beyond expectations when in successfully endured the tunnel drives of the Klang Valley MRT Project through underground karstic formation without any incident of the dreaded sinkholes or blowouts.



Variable Density Tunnel Boring Machine

It is worth also noting the success in of setting up the world's first tunnelling school, also known as the Tunnelling Training Academy (TTA) in record time in December 2011 to response to the urgent call to create high-income employments as Malaysia is shifting into high-gear as the nation enters a new era of economic transformation to achieve the coveted developed nation status by the year 2020 as well as to realise our need to create a sustainable pool of certified tunnelling workforce to cater for new phases of for the massive Klang Valley Mass Rapid Transit (KVMRT) project. TTA is the answer to the needs of the mega KVMRT project, as well as to create a sustainable industrial technology base to nurture expertise and boost productivity in tunnel engineering, enabling local players to take on more complex tunnel construction projects in the future.

## Tunnelling in Malaysia (Continued)



Tunnelling Training Academy (TTA) Opening Ceremony in 2011

The following is a list of tunnelling projects recently completed in Malaysia and the projects in the pipeline together with their contribution to the advancement of the underground construction industry as a whole.

## Tunnelling Activities in the Recent Past

### Storm Water Management and Road Transport System (SMART)

An example of successful urban underground development to help solve urban problems, the innovative SMART project is a dual-purpose tunnel. The project provides a storm water diversion scheme including flood-water storage reservoir and a 9.7 km, 11.8 m diameter bypass tunnel, sufficient to save the Kuala Lumpur city from flooding at the time of inclement weather in the foreseeable future. With no major flood events over most of the years, the dual-purposes tunnel was engineered, with a waterway beneath the double-decks motorway built into the central 3 km section, relieving traffic congestion by providing 2 x 2 traffic lanes for cars connecting the city centre to the southern gateway, i.e. the KL-Seremban Highway.

SMART project won the British Construction Industry International Award in 2008 and received the UN Habitat Scroll of Honour Award in 2011 for its innovative and unique management of storm water and peak hour traffic.



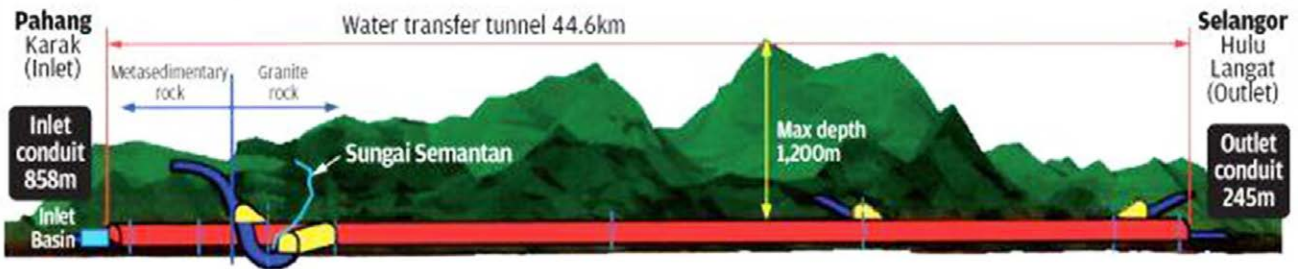
SMART Tunnel

## Tunnelling in Malaysia (Continued)

### Pahang – Selangor Raw Water Transfer Tunnel

In June 2009, Malaysia began a project to build the Pahang-Selangor raw water transfer tunnel. It was to be one of the longest and biggest tunnels in Southeast Asia and the sixth biggest in the world - a 44.6 km long, 5.2 m in diameter tunnel with a water delivery capacity of 1.89 billion litres per day, laid underneath a mountain range between Pahang and Selangor states.

### Pahang-Selangor Raw Water Transfer Project

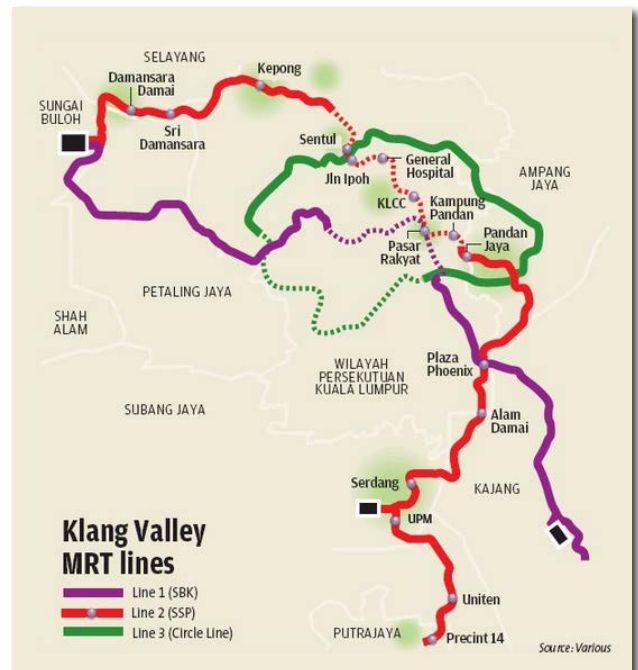


Pahang-Selangor Interstate Raw Water Transfer Tunnel

This huge excavation project was successfully completed in February 2014 and able to overcome the various challenges (e.g. over 50 m high empty cavern inside a mountain, pressurised spring water that shot out as much as 24.6 tonnes of water per minute, rock burst, etc.) thanks to the strong solidarity of its multinational team consisting over 1,000 workforce from 15 countries.

### Mass Rapid Transit (Line 1 & 2), SBK Line & SSP Line

The Klang Valley Mass Rapid Transit (KVMRT) Project involves the construction of a rail-based public transport network, Mass Rapid Transit (MRT) system, together with the existing urban rail network, will form the backbone of the public transport system in the Greater Kuala Lumpur/ Klang Valley region. The first MRT line implemented is the 51 km Sungai Buloh-Kajang Line (SBK Line). Construction of the line began on 8 July 2011 and fully operational in July 2017. The MRT SSP Line is the second MRT line under construction. The line will serve a corridor with a population density of around 2 million people stretching from Sungai Buloh to Putrajaya. The SSP alignment is 52.2 km of which 13.5 km is underground. A total of 37 stations, with 11 of them underground.



Klang Valley MRT Lines



## Tunnelling in Malaysia (Continued)

### Mass Rapid Transit (Line 1 & 2), SBK Line & SSP Line (continued)

The successful completion of KVMRT SBK Line tunnels in Malaysia marks an important step in the use of Steel Fibre Reinforced Concrete (SFRC) tunnel segmental lining in South East Asia. The successful experience encourages other rail developers and contractors in the region to embark on the usage of SFRC tunnel lining for other suitable projects. Circle lines are now being planned.



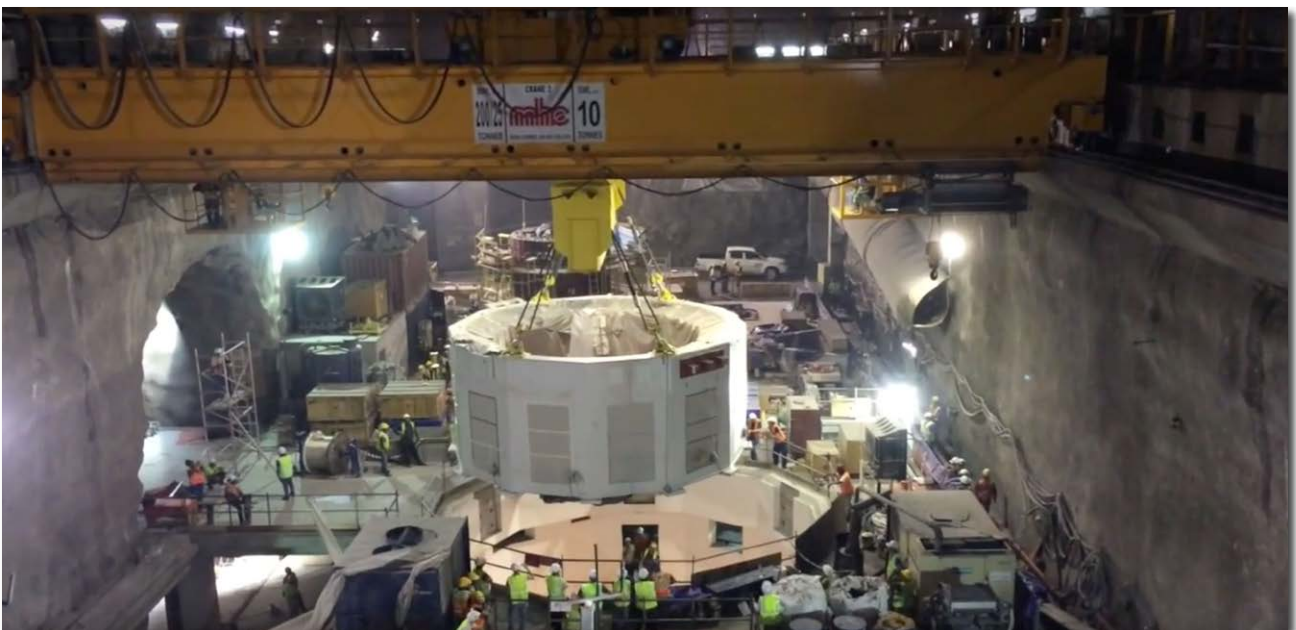
TRX Station and TBM Machines

### Ulu Jerai Hydroelectric Project – Underground Powerhouse

The Ulu Jerai Hydroelectric Power (HEP) Scheme was initiated by the Tenaga Nasional Board (TNB), Malaysia to provide additional 326 Gigawatt hours (GWhr) power generation for the increase in electricity demand and to improve the reliability of the electricity supply. The HEP Scheme is located in the Cameron Highlands, Pahang State, West Malaysia and comprises water transfer tunnels from the Lemoi and Telom rivers into a 0.74 million (M) m<sup>3</sup> capacity reservoir retained by the Susu Dam spanning the Bertam River Valley. The Ulu Jerai HEP Scheme commenced construction early 2011 for a Contract sum of MYR 820 million (US\$ 185 million) and is due for completion early 2017.

The project involves the construction of an underground plant, which will house two Francis turbines with a power output of 191 MW each and the construction of approximately 26 km of hydraulic tunnels, of which approximately 15 km excavated with Tunnel Boring Machines (TBM) and the remaining with the traditional method.

Other underground structures include headrace and tailrace tunnels, surge shaft, two pen stocks, transformer and surge chamber caverns. Construction of the water transfer tunnels were performed using a 3m diameter tunnel boring machine. The drill and blast technique was employed for the excavation of the underground power house, transformer and surge chamber caverns, headrace and tailrace tunnels and penstocks. The surge shaft was excavated using the raised boring technique.



Ulu Jerai HEP Underground Powerhouse

## Tunnelling in Malaysia (Continued)

### Bukit Berapit Rail Tunnel

Bukit Berapit Rail Tunnel, a 3300m twin tunnel is the longest rail tunnel in Malaysia. It is located in Bukit Berapit near Bukit Gantang, Perak, Malaysia. It was included as a part of Ipoh-Padang Besar Electrified Double Tracking Project. The tunnel was constructed as an alternative to the old winding tracks with many tunnels. The completion of this tunnel saw the closure of the Bukit Berapit Halt.

Construction of the tunnel started in 2008 and was completed in 2013. And now, it has been commissioned and is in operation.



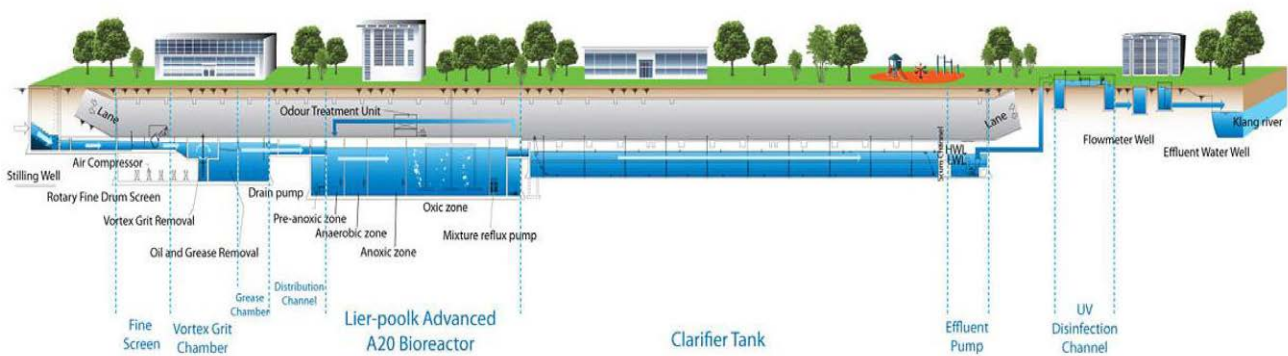
Bukit Berapit Rail Tunnel

### Pantai 2 STP Green Transformation

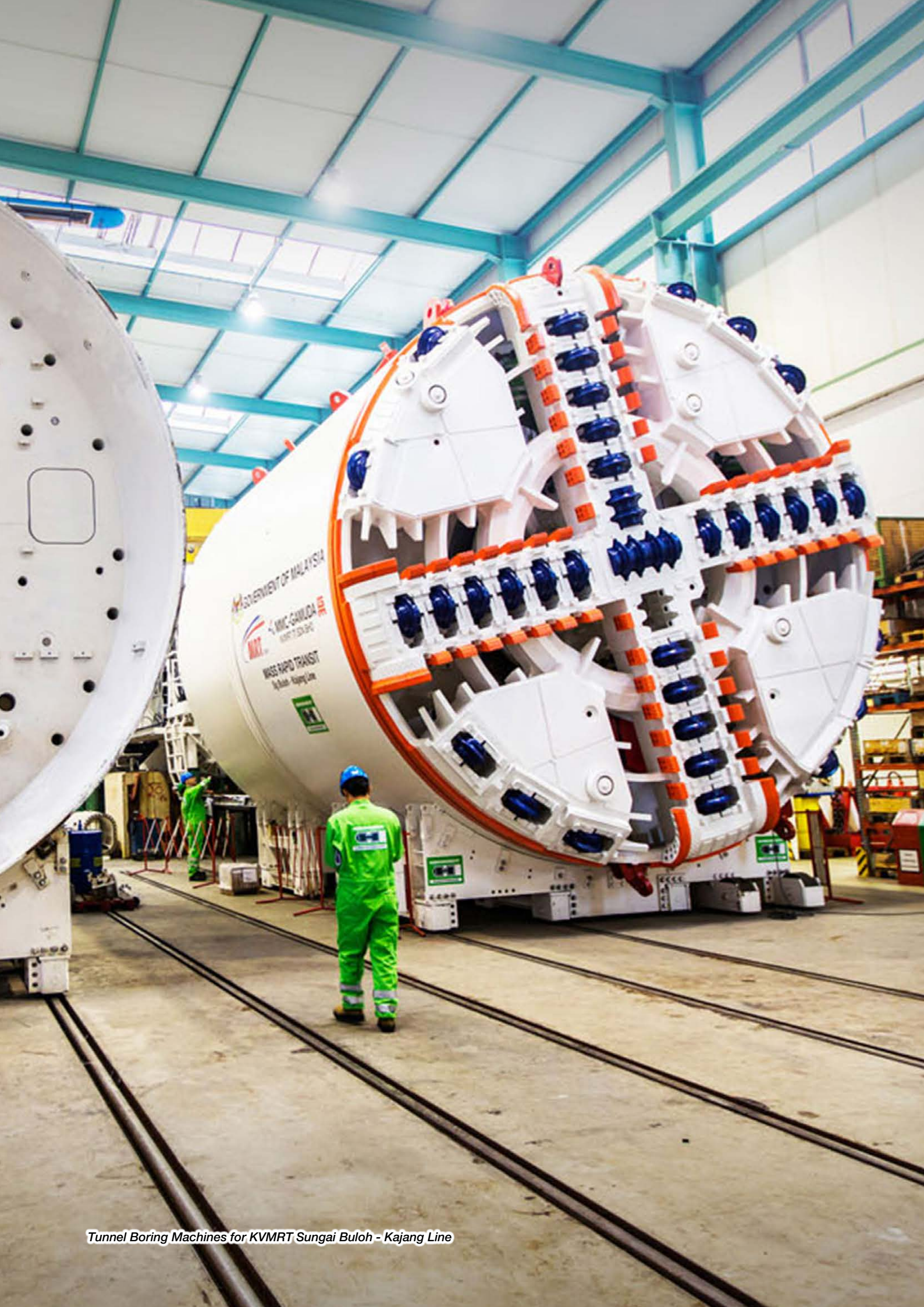
The country's first and biggest sewage treatment plant (STP) as well as the largest in Asia Pacific, Pantai 2 Sewage Treatment Plant (P2STP), is constructed underground and equipped with state-of-the-art green technologies. The plant could cater to the growing population until year 2035. Once completed, the plant will be able to receive the sewage flow from a 6,700 ha Pantai catchment covering central and south-western parts of Kuala Lumpur.

A 1.423 million PE sludge management facility will be constructed to treat and manage the waste biological sludge, with the provision of bio gas power generation facility. The P2STP features various green technologies including utilising the skylight concept for the underground plant, effluent reuse, rainwater harvesting and the use of biogas and solar panels to generate electricity. The plant also uses energy-efficient equipment to reduce the amount of electricity consumed.

One of the main highlights of the project is the Pantai 2 STP which will be developed as an underground facility with ground/ area above the STP developed as a leisure park with sports, recreational, administration building and community facilities for the local residents.



Underground Sewage Treatment Plant (Pantai 2 STP)



Tunnel Boring Machines for KVMRT Sungai Buloh - Kajang Line

See you at WTC 2020

ITA-AITES  
**WTC 2020**  
15 - 21 May 2020  
Kuala Lumpur, Malaysia



*Innovation and Sustainable Underground  
Serving Global Connectivity*

