

Singapore



Name: Tunnelling and Underground Construction Society (Singapore) (TUCSS)

Type of Structure: Non profit, open association

Number of Members: 1208 members, 117 corporate members

ASSOCIATION ACTIVITIES DURING 2018 AND TO DATE

In 2018, TUCSS continued to promote tunnelling and underground construction through organising monthly evening seminars, training courses, conference & site visits for dissemination of tunnelling & underground related information and best practices, as well as conducting social networking events to bring together the practitioners from the different sectors of the industry. TUCSS continued to support the accreditation of tunnelling resident site supervisory staff during the year.

18 January 2018 - Advanced Ground Support in D&B Tunnels - Richard Fuchs, DSI Underground

22 March 2018 - Mined tunneling in soil: Use of pre-support techniques to limit deformations and surface settlements - Massimo Marotta, Land Transport Authority

19 April 2018 - Structural & Fissure Grouting with Sovereign NOH2O - J D Park, SOVEREIGN-JEDA Pte Ltd

17 May 2018 - Diaphragm wall Construction and Seepage Repair - Mr. Totapally Krishna Mohan Sharma, Tiong Seng Dongah Joint venture

21 June 2018 - Crossrail C310 Thames Tunnel (London, UK) – Mixshield TBM Tunnelling in Alternating Ground Conditions with Low Overburden - Mr. Andreas Raedle, Arup Singapore

19 July 2018 - Supervision of Bored Tunnelling Works using Slurry TBMs Er. Sahabdeen Mohamed Mohideen, Mott MacDonald (S) Pte Ltd

16 August 2018 - Tunnelling and Underground Construction for Improved Productivity and Safety - Dr. Nimantha Baranasuriya, Ackcio Pte. Ltd

15 November 2018 - Artificial Intelligence and Physical Model Based Performance

Prediction of EPB TBM - Prof. Michael Mooney, Colorado School of Mines

Annual Lecture

- TUCSS Annual Lecture was held on Friday, 12 October 2018 at NTUC Auditorium. The topic was "Recent Bored Tunnels Beneath the Sea in Hong Kong" by Dr. Leonard John Endicott. The Annual Lecture was attended by 305 TUCSS members.

Hulme Prize Competition

- TUCSS Hulme Prize was held on 20th September 2018. The winners of the competition are:
 - 1st Prize: Ruben Duhme (Excavation Management of Slurry TBMs – Long Term Operational Accuracy Evaluation)
 - 2nd Prize: Russell Connors (Procedures to Minimise the Incidence of Decompression Sickness for Compressed Air Cutterhead

Interventions)

- 3rd Prize: Senthilnath GT (Effects of shallow over-crossing TBMs on existing tunnels and surface movements)

Training Courses

- TUCSS held the "TUCSS Tunnelling Seminar 2018" on 13th April 2018 at Raffles City Convention Centre. It was well attended by 130 participants.
- TUCSS held the Half Day Workshop on Bored Tunnel Excavation Management on 26 September 2018. It was attended by 100 participants.

UGS2018 Conference

- TUCSS held "Underground Singapore 2018" on Thursday & Friday, 27 & 28 September 2018, at Parkroyal on Beach Road. It was attended by a total of 350 participants with 37 papers presented at the conference.

Annual Dinner

- TUCSS Annual Dinner was held on 5 October 2018 at Mandarin Orchard Hotel. The event was attended by over 600 guests and members.

Golf Challenge

- TUCSS organised 2 golf tournaments in 2018:
 - 20 April 2018 at Singapore Island Country Club
 - 18 October 2018 at Sentosa Golf Club



Site Visits

- TUCSS held Technical Site Visit to T226 Marina Bay Station & Tunnels on 11 August 2018. It was attended by a total of 51 TUCSS members.

CURRENT TUNNELLING ACTIVITIES

Thomson-East Coast Line (TEL)

The TEL is a medium-capacity MRT line that is currently under construction, being the sixth line to be built. The 43km long TEL will add 32 new stations to the existing rail network, with 7 interchange stations, which will link to the other MRT lines. The integrated depot will stack three train depots together, with a bus depot built next to them. The entire depot will be housed within a single site of 36 hectares, thus saving 44 hectares of land. The integration of four depots is unprecedented. The TEL will be ready in stages from 2019 to 2024. In total, 27 Earth Pressure Balance (EPB) and 24 Slurry type Tunnel Boring Machines (TBMs) are being used for the tunnelling works.

Circle Line Stage (CCL) 6

The 4km CCL6 will close the loop for the CCL by connecting Harbour Front station to Marina Bay station. When the three

CCL6 stations of Keppel, Cantonment and Prince Edward Road are completed in 2025, the CCL will have a total of 33 stations, including 12 interchange stations with other MRT lines. In total 3 EPB TBMs will be used for the tunnelling works.

North East Line Extension (NELe)

The 2km long NELe will add one station, Punggol Coast, to bring the total number of stations on NEL to 17. It will serve Punggol North including the new Punggol downtown. It is expected to be completed by 2023. In total 2 EPB TBMs will be used for the tunnelling works.

North-South Corridor (NSC)

The North-South Expressway – originally conceived as a 21.5km expressway to connect towns in the north to city centre – is being redesigned as North-South Corridor to better enable cycling and walking. The NSC will be Singapore’s first integrated transport corridor featuring continuous bus lanes and cycling trunk routes. NSC is expected to be completed by 2026.

Deep Tunnel Sewerage System Phase 2 (DTSS Phase 2)

This is a massive 100km used water conveyance tunnel network for

transferring sewage largely under the Expressway, crossing undersea at the South West of Singapore and ending at deep inlet shafts within the future Tuas Water Reclamation Plant. In total 19 Tunnel Boring Machines will be used to dig at depths of between 35m to 55m below ground and under the sea to create 40km of deep tunnels and 10km of link sewers. The remaining 50km of link sewers will be constructed using pipe jacking.

FUTURE TUNNELLING ACTIVITIES

Changi East Development

In order to support airport infrastructure development Changi Airport Group is planning tunnels for underground roads, sewage transfer, common services, baggage handling and people mover systems. The construction is expected to commence during early 2020.

Cross Island Line (CRL)

Construction for the first stage of Cross Island Line (CRL) – Singapore’s longest fully underground MRT line – will commence 2020 and will be completed by 2029. The first stage is 29km long and would have 12 new stations spanning from Changi East to Bright Hill.



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