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# TBM and tunnelling challenges in mixed ground and limestone karsts in Malaysia

## Dr Ir Ooi Lean Hock and Gusztav Klados

Join Dr. Ir. Ooi Lean Hock and Gusztav (Gus) Klados for an informed discussion the innovative Kuala Lumpur SMART tunnel and MRT TBM tunnels.

*A much-needed solution to mitigate flooding in Malaysia's capital city has led to the innovation of the dual-purpose SMART tunnel, which diverts storm water and doubles as a tolled motorway tunnel. The mass rapid transit (MRT) lines were also developed to mitigate traffic congestion in the CBD. Sections of the metro lines cross the city underground in TBM excavated tunnels. Substantial sections of the infrastructure were undertaken in challenging Kuala Lumpur Limestone. This limestone has buried tropical karsts, complex three-dimensional network of solution features, highly variable rock head, steep sided troughs and cavities.*

*This presentation covers the geotechnical issues, advance works carried out as part of risk mitigation efforts and discusses innovations in TBM and slurry technologies that has significantly reduced tunneling risks in limestone karsts.*

### **Dr. Ir. Ooi, Lean Hock**

Ooi has over 30 years of experience in geotechnical engineering design and construction. Over the last 20 years, he has managed geotechnical design and construction of major infrastructure projects in South East Asia and Middle East. Underground experience include deep excavation works, cut and cover structures, TBM and drill & blast tunnels as well as pipe arch tunneling. Recent projects include Klang Valley MRT SSP and SBK Line, the Electrified Double Track Project (Padang Besar to Ipoh), SMART Project, NDIA Airport, Dukan Highway (Doha), Sitra Causeway (Bahrain), Nam Theun 1 HEP (Laos) and Pergau HEP.

### **Gusztav (Gus) Klados**

Gus has over 40 years' tunnelling experience in multicultural environments as a contractor, consultant and client. He has worked in Europe, India, South Africa and South-East Asia on water and rail projects in various management positions from Tunnel Manager to Project Director, on projects such as the Channel Tunnel, Klang Valley MRT SBK Line, Budapest Metro Lines 3 & 4, Athens Metro Lines 2 & 3 and Calcutta Metro sections 4/A and 2/B.

### **VENUE**

Hawken Auditorium, Engineering House,  
447 Upper Edward St, Spring Hill QLD  
4000

### **DATE & TIME**

**23 July 2019**

5:30pm - 6:00pm light refreshments

6:00pm - 7:00pm Presentation

7:00pm - 7:30pm Discussion and Drinks

### **TICKETS (incl. GST)**

ATS and EA Members FREE

Non-members \$30

Other Society Members \$30

### **REGISTRATIONS CLOSE**

23 July 2019

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