2nd Annual Underground Space Engineering
Driving Innovation: Redefining Tunnels & Underground of the Future
28 - 29 April 2015 | Singapore
“Government mulling large-scale underground developments - Prime Minister Lee Hsien Loong says that, the Government is considering more subterranean projects. This includes building an underground science city, an underground warehousing and logistics facility, and potential underground caverns”

-Singapore Business Insider

WHY YOU CANNOT MISS THIS EVENT
The tunnelling and underground industry is booming around the world. As the world’s cities continue to grow, so too does the demand for new infrastructure. With numerous opportunities emerging from tunnels and underground projects, now is the time to build new relationships that are essential to winning works.

Following the success of the 2014 event, TRUEVENTUS 2ND ANNUAL UNDERGROUND SPACE ENGINEERING continues its journey to the Asian underground city-Singapore! Mega tunnel and underground projects comes with all sorts of engineering challenges. This year’s conference will bring together decision-makers from across the industry to provide a unique insight into the complexity and challenges of tunneling in city areas, mitigating construction risk, tunneling through difficult ground conditions, managing groundwater inflows and microtunnelling as well as issues relevant to the design and construction of underground works.

Whether your focus is on TBM driven tunnels, drill & blast tunnels or microtunnelling, you should be at this event to hear and meet speakers from all over the World-providing a truly global view to allow you to stay ahead of competition!

KEY BENEFITS OF ATTENDING
Overcoming obstacles in tunnel construction across the globe
Exploring the advancement in sustainable tunneling and trenchless technology
Gauging technical and operational aspects that shape the tunneling and underground industry
Identifying specific challenges in the urban environment and how they can be overcome
Assessing the use of monitoring system to lower project risk
Uncovering the latest technological advances in design and engineering for tunneling and better construction planning

WHO SHOULD ATTEND?
CEOs, COOs, Heads, VP, SVPs, Directors, GMs and senior:
- Engineering and Construction
- Geotechnical Developers
- Pipeline Engineering
- Geotechnical Engineering
- Facilities Management Heads
- Ground Engineering
- Structural Engineering
- Architects
- Designers
- Utilities
- Piling
- Infrastructure

Local Government, Government Departments, Agencies & Authorities:
- Government – Federal, State & Local Councils
- Ministry and/or Department of Works and Transportation
- Rail Operators
- PPP Units / Economic Planning Units
- Financial Institutions, Institutional Investors
- Policy Makers
- Urban Planners

Engineers, Consultants, Project Managers and Contractors involved in:
- Engineering & Construction Firms
- Construction
- Building materials
- Structural
- Mechanical
- Electrical

Technical Specialists:
- Drill & Blast Supervisors
- Technical Superintendent/Managers
- Maintenance Managers
- Project Managers
- Technical Service Managers
- Rock Engineer/Specialists
- Geotechnical Specialists
- Operations
- Maintenance
- Reliability and Asset Management
Featuring Keynote Presentation and Case Studies Delivered by Distinguished Speakers:

**Martin Knights**  
Global Director, Tunneling  
Halcrow (CR2M), United Kingdom  

**Speaking on:** What can Asia Learn from Crossrail? Future projects could learn from Crossrail’s bored tunnels and ground movement mitigation  
Martin has over 40 years of broad experience in managing all aspect of civil engineering and infrastructure business and projects, with particular technical emphasis on urban tunnelling and underground projects. Martin was the President of the International Tunnelling Association in 2007-2010 and is also a Member of the British Tunnelling Society Committee.

**Angelo Indelicato**  
Engineering Geologist  
Dragages Hong Kong Ltd, Hong Kong  

**Speaking on:** Managing and Mitigating Water Infiltration within Underground Areas  
Angelo has 7 years of experience in Construction, 4 years working in Hong Kong, 2 years in Tunnel with Drill & Blast technique, last 2 years in deep marine foundation and ground investigation.

**Rob McCrae**  
Technical Director  
Atkins, Hong Kong  

**Speaking on:** Evaluating the use of monitoring systems for mitigating risks when tunneling in the urban environment  
Rob is an experienced professional engineer with over 35 years of international experience working on a variety of major civil engineering projects. He has fulfilled senior management positions for the design and construction of major underground railway schemes both in Hong Kong and internationally. These have included tunnelling, station, permanent way and other varied construction work. Rob has just completed a role as Framework Director for all Atkins input to the Crossrail Project in London.

**Dr. Goh Kok Hun**  
Deputy Director, Geotechnical and Tunnels Division  
Land Transport Authority, Singapore  

**Speaking on:** The impact of urban tunnels on existing structures: how can potential damage be evaluated and the structures protected?  
Dr. Goh has 15 years of geotechnical engineering experience, and has been involved in the design aspects of various road and rail infrastructure projects in Singapore since 2001. He completed a doctoral study on the “Response of ground and buildings to deep excavations and tunneling” in the University of Cambridge.

**Panya Khammathit**  
Senior Tunnel Engineer  
Obayashi Corporation, Singapore  

**Speaking on:** Hard Rock Tunnelling: Cutting through obstacles using hybrid TBM  
Panya is in charge of all TBM and tunnel drives allocated by Tunnel Manager. Responsible for TBM progress and execute daily tunnel work programme and report to Tunnel Manager.

**John Endicott**  
Geotechnical Engineering & Tunneling Asia  
AECOM, Hong Kong  

**Speaking on:** Underwater ground reinforcement to prevent subsidence  
Prof. John Endicott is an AECOM Fellow. He has been the Project Director for deep drainage tunnels and the Geotechnical Specialist for deep sewer tunnels in Hong Kong and is currently involved with deep cable tunnels and deep sewer tunnels in Singapore.

**Nick Osborne**  
Senior Project Manager  
Mott McDonald, Singapore  

**Speaking on:** Controlling groundwater for tunnel and shafts: Pre-excitation grouting and groundwater control  
Nick Osborne has over 20 years international experience working on major underground Infrastructure projects. Projects he has worked for includes; Channel tunnel, Jubilee line extension.

**Gusztav Klados**  
Project Manager  
MMC-Gamuda KVMRT UG SBK Line, Malaysia  

**Speaking on:** Exploring the tunneling experience in the most difficult karstic limestone rock conditions  
Gus Klados is a Hungarian structural engineer specialised in mechanised tunnelling, having worked around the world on several tunnelling projects. In 42 years Klados worked in leading positions on many big projects namely; the SMART Tunnel in Malaysia, the Channel Tunnel.
Featuring Keynote Presentation and Case Studies Delivered by Distinguished Speakers:

Dr. Poh Teoh Yaw  
Deputy Director, Deep Excavation and Geotechnical Department  
Building and Construction Authority (BCA), Singapore  
Speaking on: Tunneling in mixed ground condition - a challenge to design and construction  
Dr Poh is a geotechnical specialist with over 18 years of practical experience. He has authored over 15 publications in geotechnical design and construction including those published in international peer-review journals and conferences.

Sugondo Gan 
Senior Tunnel Manager  
Shimizu Corporation, Singapore  
Speaking on: Reinforcing geotechnical investigation to avoid project delays and cost over-runs  
Has over 15 years working experiences in the major tunneling projects for urban rail and sewerage infrastructure under various geological conditions with major contractors, consultant/client organization. Specialties: Underground work, TBM Tunneling, Shaft Excavation, SCL Tunnel

Sivaram Thirumoorthy  
Geotechnical Design Team Leader  
ERL Project, Singapore  
Speaking on: Numerical investigation on urban tunneling: Influence of segmental joints and deformability of ground  
Sivaram has over 14 years of diversified international work experience in civil, geotechnical and tunnelling industry. He is specialized in underground metro projects, Involved with various metro projects around the world. He is expertise mainly in settlement analysis, damage assessment, Instrumentation and Monitoring

Eng. Guiseppe Maria Gaspari  
Senior Geotechnical Engineer  
Geodata Engineering S.p.A, Italy  
Speaking on: Innovative approach for construction of urban cuts and covers structures tunnels  
Giuseppe M. Gaspari published more than 15 scientific articles in international conferences and technical journal. He plays an active role in SIG (Italian Tunnelling Association, affiliated to ITA) and he is the Italian Young Geotechnical Engineers Annual Meeting Organizer and the representative of AGI (Italian Geotechnical Association) at the ISSMGE.

Neil Smith  
Director  
SP Powergrid Ltd., Singapore  
Speaking on: The Cable Tunnel Story: Overcoming the existing congestion of underground space and utility services in Singapore  
Has over 24 years of experience working on major underground infrastructure projects in the UK, Hong Kong and Singapore, employed by Clients and Consultants. He is currently employed as Project Director for Singapore Power, leading a team to deliver a number of cable tunnel projects to provide a long term electricity distribution network for Singapore. A total of 7 contracts have been let to deliver approximately 42km of underground cable tunnels housing a combination of 230 & 400KV circuits.

Justin Taylor  
Risk Manager  
Leighton Asia Limited, Hong Kong  
Speaking on: Horizontal directional ground investigation - Reducing tunneling risks by minimizing geological uncertainty  
Justin has previously worked on underground tunnelling infrastructure projects for railways and waste disposal utilising drill & blast, raise-boring, shaft sinking and hard rock TBM’s providing both engineering and commercial support. Justin is the immediate past Chairman of the Hong Kong Institute of Engineers (Geotechnical Division) Working Group on Cavern and Tunnel Engineering.

David Hake  
Construction Manager  
Jon Holland, Australia  
Speaking on: Managing geotechnical and construction risk of underground excavations in Hong Kong & Singapore  
David Hake is a civil engineer with over 24 years of experience in underground construction in Australia, the United Kingdom, Hong Kong and Singapore. This experience includes current support for SIL(E)904 in Hong Kong, DTL3 C935 and Thomson Line T208 in Singapore, completion of Airport Link Project in Brisbane, Kowloon Southern Link and Kai Tak Transfer Scheme in Hong Kong, the Northside Storage Tunnel Alliance for Sydney Water and the North Western Sewer Project in Melbourne.
Day 1, Wednesday 28th April 2015

0800 Registration and Coffee
0845 Opening Address by Chairperson
0900 Session One
What can Asia Learn from Crossrail? - Future projects could learn from Crossrail’s bored tunnels and ground movement mitigation
Crossrail is amongst the most significant infrastructure projects ever undertaken in the UK. Digging tunnels, shafts and basements always causes small movements. This session will highlight discussion to mitigate the effects of ground settlement arising from Crossrail construction developing tunnel boring machine.
Martin Knights Global Director, Tunneling Halcomb (CH2M), United Kingdom
0945 Session Two
The Cable Tunnel Story: Overcoming the existing congestion of underground space and utility services in Singapore
In a land scarce Singapore, were the road reserves are becoming increasingly congested with utilities and services, there is a need to develop a number of cable tunnels to secure a reliable electricity distribution network.
• The design life of a cable within a tunnel is increased considerably when compared to the conventional direct burial method and the maintenance & replacement of cables does not cause any inconvenience to the public in the streets above.
• Outlining the 42km network cable tunnels currently under construction and describe some of the construction challenges that the Project team are facing
• Sharing new safety initiatives that have been developed by Singapore Power in order to improve the standard of safety across all project sites
Neil Smith Director SP Powergrid Ltd., Singapore
1030 Morning Refreshment
1100 Session Three
The impact of urban tunnels on existing structures: How can potential damage be evaluated and the structures protected?
One of the biggest issues for underground construction in a densely built-up urban environment is the potentially adverse impact on buildings due to tunnelling and excavation activities. This session seeks to highlight the following key elements:
• Evaluating the influence of urban tunnels on existing structures and determining whether damage is acceptable or whether additional mitigation and protective measures need to be implemented: How is the risk of damage evaluated using a three-stage impact assessment approach
• The influence of building stiffness illustrated using case studies, and how this may be incorporated into the impact assessment approach
Dr. Goh Kok Hun Deputy Director, Geotechnical and Tunnels Division Land Transport Authority, Singapore
1145 Session Four
Exploring the tunnelling experience in the most difficult karstic limestone rock conditions
The underground section of the KVMRT SBK Line is excavated in the urban areas of Kuala Lumpur, half of the 9.5km in very adverse geological conditions. This session is to highlight the key elements of how the foreseeable tunnelling problems were successfully mitigated by the innovative use new tunnelling technology the Variable Density TBM (VD TBM);
• Zooming into the experience lead to the development of the VD TBM
• Examining the new features of the VD TBM
• Exploring the experiences of successfully using the VD TBM
• Analysing potential further developments in VD TBM technology
Gustav Klados Project Manager MMC-Gamuda KVMRT UG SBK Line, Malaysia
1230 Networking Luncheon
1400 Session Five
Numerical investigation on urban tunnelling: Influence of segmental joints and deformability of ground
Prior to excavation, the magnitude and distribution of the ground surface movements should be evaluated in order to assess their impacts on adjacent structures. This session will discuss the use of HSS numerical modeling.
Sivaram Thirumoorthy Geotechnical Design Team Leader The ERL Project, Singapore
1445 Session Six
Reinforcing geotechnical investigation to avoid project delays and cost over-runs
• Assessing the extent of geotechnical investigation
• Establishing a preliminary design investigation plan
• Examining the methods and instrumentation, that should be used to maximise data generation in the process
• Exploring the best option in improving site exploration methods and the costs involved
• How existing geological, seismic and geophysical data can be best used to enhance your investigation
Sugondo Gan Senior Tunnel Manager Shimizu Corporation, Singapore
1530 Afternoon Refreshments
1600 Session Seven
Evaluating the use of monitoring systems for mitigating risks when tunneling in the urban environment
Increasingly complex instrumentation and monitoring schemes, involving collection of vast amounts of data, are being used on tunnel schemes in the urban environment. The interpretation of this data can greatly aid the planning and implementation of any necessary mitigation measures. This session will consider among other factors:
• The planning of instrumentation systems to provide the necessary data to determine if mitigation measures are required
• How the data arising can be best evaluated against pre-determined models or predictions to trigger mitigation actions
• The effectiveness of monitoring systems (in terms of time, cost and stakeholder confidence) in providing useful input to mitigate risks arising from urban tunnelling
Rob McCrae Technical Director Atkins, Hong Kong
1645 Session Eight
Examining the reduction of flow water into tunnels to prevent subsidence
Tunneling can result in subsidence of the ground above the tunnels. In urban areas utilities and structures can be adversely affected. For deep tunnels the effects are mostly due to leakage of ground water into the tunnels. Therefore the flow of ground water into tunnels during construction must be carefully controlled.
• Methods of assessing to what extent the flow of water into deep tunnels should be limited
• How the amount of inflow can be addressed at the design stage
• What practical considerations should be given regarding the methods of construction and the means of reducing the rates of inflow to meet specified limits
John Endicott Geotechnical Engineering & Tunneling Asia AECOM, Hong Kong
1730 End of Day One
Day 2, Thursday 29th April 2015

0800  Registration and Coffee

0845  Welcome address

0900  Session One
Thinking deep: Construction of tunnel under the sea - Marina Coastal Expressway (MCE) - Case Study

The MCE will be a major engineering challenge, especially the section that has to be constructed below the sea. Difficult soil conditions, coupled with the scope of excavation, will require robust temporary works for the earth retaining systems, as well as extensive ground improvement works to ensure safety. Hear the speaker as he takes you on a technical journey of the MEC.

Speaker to be advised

0945  Session Two
Tunnelling in mixed ground condition - a challenge to design and construction

Requirements and good practices of bored tunnelling works
- Highlighting some of the challenges in bored tunnelling works in Singapore
- Good practices for bored tunnelling works, especially when tunnelling in close proximity to existing buildings
- Sharing of key requirements of bored tunnelling works

Dr. Poh Teoh Yaw
Deputy Director, Deep Excavation and Geotechnical Department Building and Construction Authority (BCA), Singapore

1100  Session Three:
Managing and mitigating groundwater infiltration within underground excavations in rock

Underground excavation often involves dealing with groundwater infiltration. The management and mitigation of water inflow is important during the tunneling work as it affects both the construction area and the surroundings. This session will focus on the following key elements:
- Examining the groundwater source
- Understanding how to measure the water infiltration
- Examining the mitigation measures
- Sharing of past cases

Angelo Indelicato Engineering Geologist Dragages Hong Kong Ltd, Hong Kong

1145  Session Four: Joint Presentation
Managing geotechnical and construction risk of underground excavations in Hong Kong & Singapore

- Examining the key geotechnical and construction risks faced on recent Hong Kong and Singapore projects using Drill and Blast and TBM Tunnelling techniques
- Reviewing the Hong Kong and Singapore requirements of risk management during design and construction of underground works and their impacts to the process
- Practical implementation and development of risk management during the course of the design and construction from a current project perspective, with a view of the lessons learned

Justin Taylor Risk Manager Leighton Asia Limited, Hong Kong

David Hake Construction Manager John Holland, Australia

1400  Session Five
Controlling groundwater for tunnel and shafts: Pre-excavation grouting and groundwater control

A significant number of problems encountered during excavations are driven by groundwater flow into the excavation causing instability and large settlements and damage to surrounding structures. This session will discuss the following topics:
- Developing and understanding the hydrogeological model
- Challenges posed by high ground water flows and the consequence to major urban infrastructure projects
- Measures to control ground water flow
- Case studies highlighting and discussing the issue

Nick Osborne Senior Project Manager Mott McDonald, Singapore

1445  Session Six
Innovative approach for construction of urban cut and covers structures and tunnels

The cut and cover method is frequently used for construction of underground structures in urban areas. This session will underline the innovative techniques and methods with collaboration of all the stakeholders, to achieve successful cut and cover projects in challenging urban environment.

Eng. Giuseppe Maria Gaspari Senior Geotechnical Engineer Geodata Engineering S.p.A, Italy

1600  Session Seven
Hard Rock Tunnelling: Cutting through obstacles using hybrid TBM

The challenging for the operating TBM through the obstacles base on past experienced to be discussed:
- Unexpected Ground condition, Mixed Face, Face collapse, Shear/Fault zone
- Existing structures, Abandoned foundation, Shallow tunnel, Micro tunnelling, MRT and Deep tunnel DTSS, Cable Tunnel
- Granite, Boulders, Abrasive rock, Rock fragmentation
- Tunnelling beneath open water

Panya Khammathit Senior Tunnel Engineer Obayashi Corporation, Singapore

1645  Session Eight
Optimising existing underground infrastructure using trenchless technology – Case Study Indah Water

Trenchless tunnelling technology will continue to develop alongside the growth of pipeline infrastructure. This session seeks to explore the key advantages of trenchless technology over traditional open-cut construction as well as over other underground construction method form a underground waste water facilities.

Speaker to be advised

1730  End of Conference
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### ATTENDEE DETAILS

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### APPROVAL

NB: Signatory must be authorised on behalf of contracting organisation.

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### COURSE FEES

- **USD 2195 per delegate**
- Documentation Package USD 495
- All options inclusive of delegate pack, luncheon and refreshments.

### PAYMENT DETAILS

Payment is due in 5 working days. By signing and returning this form, you are accepting our terms and conditions.

- **Please debit my:**
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