



3RD ANNUAL  
**URBAN UNDERGROUND  
SPACE & TUNNELLING**

a **marcusevans** event



27th - 29th March 2017 | Singapore

**DESIGN MUST REFLECT THE PRACTICAL AND  
AESTHETIC IN BUSINESS BUT ABOVE ALL... GOOD  
DESIGN MUST PRIMARILY SERVE PEOPLE.**

**THOMAS J. WATSON**

**ATTENDING THIS PREMIER CONFERENCE  
WILL ENABLE YOU TO GAIN INSIGHTS  
INTO BEST PRACTICE STRATEGIES AND  
TECHNIQUES INCLUDING:**

- **Gaining** Insights on innovative technologies & proven solutions in underground excavation & tunnelling applied to projects globally
- **Exploring** latest techniques on overcoming geo-technical, geo physical, environmental & ground movement challenges
- **Tapping** into energy-saving and environmental protection approaches when dealing with underground structures and ground surface
- **Drawing** on retro commissioning to achieve sustainable facilities management and safety building management
- **Enabling** ecological expansion of the city with the new urbanism and retail commercialisation for underground space development
- **Gauging** the application and development of tunnel mechanical and electrical equipments in tunnelling
- **Addressing** geophysics issues and considerations during engineering and tunnel construction
- **Utilising** building simulation tools to create energy models to minimise energy consumption
- **Uncovering** the latest technological advances in design and engineering for tunneling and better construction planning
- **Constructing** transportation infrastructure and networked construction of urban underground space
- **Assessing** the commercial considerations in the design and operation of underground tunnels
- **Implementing** safety, quality and fire control systems for a viable and liveable underground city
- **Commercialising** underground spaces with amenities and proper infrastructure to support and economic development

**BENEFIT FROM THE PRACTICAL EXPERIENCE, CASE STUDIES AND EXPERT  
PRESENTATIONS FROM OUR DISTINGUISHED PLENARY SPEAKERS**

**Professor John Zacharias** Director of the Board  
ACUUS  
Chair Professor  
PEKING UNIVERSITY, CHINA

**Hans De Wit** Managing Director - Tunnelling  
ROYAL HASKONINGDHV, NETHERLANDS

**Nick Osborne** Geotechnical & Tunnels Director  
MOTT MACDONALD, SINGAPORE

**Ed Taylor** Engineering & Design Manager,  
Tunnels,  
JOHN HOLLAND  
President  
AUSTRALASIAN TUNNELLING SOCIETY

**John Endicott** Fellow/Geotechnical &  
Underground Engineering Expert  
AECOM, SINGAPORE

**SHOWCASING CASE STUDIES AND KEY INTERNATIONAL  
PRESENTATIONS FROM DISTINGUISHED SPEAKERS**

**Dr. Hong C. Rhim** Vice President  
KOREA INSTITUTE OF BUILDING  
CONSTRUCTION (KIC), SOUTH KOREA

**Byungsool Kwak** Executive Vice President  
KOREA MIDLAND POWER COMPANY, SOUTH  
KOREA

**Martin Jochman** Principal Director  
JADE + QA, CHINA

**Dr Chian Siau Chen** Vice President  
GEOTECHNICAL SOCIETY OF SINGAPORE (GEOSS)  
Assistant Professor  
NATIONAL UNIVERSITY OF SINGAPORE (NUS)

**Dr. Lawrence TH Lee** Senior Construction  
Engineer – Civil  
MTR CORPORATION, HONG KONG  
Senior Representative  
SMRT CORPORATION, SINGAPORE

**Henry Foo Yung Thye** Director, Thomson-East  
Coast Line  
LAND TRANSPORT AUTHORITY, SINGAPORE

**Harald Wagner** Advisor  
THAILAND UNDERGROUND & TUNNELLING  
GROUP (TUTG)  
Executive Council (EXCO) Member  
INTERNATIONAL TUNNELLING &  
UNDERGROUND SPACE ASSOCIATION (ITA)

**Colin Henson Principal**  
Henson Consulting, Australia, Former Governor  
THE WARREN CENTRE FOR ADVANCED  
ENGINEERING, AUSTRALIA

**Fabio Crocicolo** General Director – Rail  
Regulator Office  
MINISTRY OF INFRASTRUCTURE AND  
TRANSPORT, ITALY

Senior Representative  
SURBANA JURONG, SINGAPORE

**Marcus Levon Karakashian** Project Director,  
Sungai Buloh-Kajang (SBK) Line  
MASS RAPID TRANSIT CORPORATION,  
MALAYSIA

**FEATURING INTERNATIONAL CASE STUDIES FROM**

- Italian High Speed Train Stations
  - Firenze Belfiore
  - Bologna HS
  - Torino Porta Susa
  - Milano Porta Garibaldi
- Fehmarnbelt Immersed tunnel - The 18 km immersed tunnel will connect Denmark and Germany
- Downtown lines 1, 2 & 3 - Singapore
- Jakarta MRT - Indonesia
- Jubilee line London - UK
- Melbourne metro - Australia
- Underground Yonsei University Campus – South Korea
- DangiLee Underground Power Station – South Korea
- Tokyo Station City - Japan
- Umeda , Osaka – Japan
- Shimao Underground Theme Park – China
- Thomson-East Cost Line – Singapore
- MTR Railway Project – Hong Kong
- Sungai Buloh-Kajang (SBK) Line – Malaysia
- Montreal Underground City Transport – Canada
- Melbourne City Link/Eastlink Tunnel – Australia
- Jurong Rock Caverns - Singapore

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## MORE ABOUT THE EVENT

### WHY YOU CANNOT MISS THIS EVENT

Overwhelming growth of cities in developing countries, shifting demographics and aging infrastructure in older cities engaged with the demand for improved liveability and environmental protection are creating a strong demand for new underground infrastructure. The underground as a spatial asset needs to be clearly understood by urban decision makers if it is to achieve its full potential in adapting cities to the many challenges that will be faced in the coming decades. In a congested city, the main concerns are designing of sustainable underground space and exploring the tunnelling aspects to address the problems of urban sprawl, traffic congestion and pollution that have threatened the prospects of biodiversity, liveability and general well-being of the inhabitants. The underground space in big cities is an important potential resource, where effective utilisation of urban underground space can perfect the urban comprehensive function.

**marcusevans** takes great pride in organising our flagship platform on "3rd Annual Urban Underground Space and Tunnelling" large scale conference whereby this conference is specially designed to meet all building industry practitioners' demands to secure and guarantee their investments. This conference will cover technology of underground space and tunnelling and the corresponding protection measures to put forward to provide guidelines for engineering practice for the infrastructure sector in cities.

#### Stream 1 Day One & Day Two Underground Space Design & Development

This stream will focus on urban underground space potential that could contribute significantly to the sustainable and resilient development of cities. Despite this, the importance of the ground beneath cities is still under-recognised and often overlooked, this stream will further focus on planning and design aspects of urban underground space which would mainly cover non-tunnelling aspects, sustainable growth of cities and the liveability of urban population in new underground spaces

#### Stream 2 Innovative Construction and Tunnelling Technologies

This stream will highlight engineering and construction technicalities, TBM issues and challenges, Operational, monitoring and maintenance aspects of underground structures, Incorporating innovative technologies and advancements for effective and efficient underground tunnelling developments

#### WORKSHOP on Day 3 Effective Project Management & Delivery – Boot Camp

This workshop will cover all project management stages and will revolve around Productivity Improvement of consultants, contractors and Project managers in underground construction sector. This will cover whole project life cycle from Design phase, construction & contract risk management up to completion phase.

**marcusevans** would like to thank all the world-leading visionaries, solution providers, associations, operators, end-users and delegates who have contributed to and supported the **marcusevans** 3rd Annual Urban Underground Space & Tunnelling Large Scale Event. We would particularly like to mention our speakers for their help in the research behind the event and also our sponsors for their continued support and commitment.

On behalf of **marcusevans** we hope you have a rewarding, enjoyable and productive time. We personally look forward to meeting you all and working with you at our future Large Scale Events planned in 2017. See you in March!

### BUSINESS DEVELOPMENT OPPORTUNITIES

Does your company have services, solutions or technologies that the conference delegates would benefit from knowing about?

If so, you can find out more about the exhibiting, networking and branding opportunities available by contacting:

**Mark Christopher** on +91 22 6167 9600 or  
email [MarkC@marcusevansin.com](mailto:MarkC@marcusevansin.com)

### WHO SHOULD ATTEND

**Top level decision makers such as CEOs, COOs, CFOs, Heads, President, VP, SVPs, Directors, GMs and Senior personnel such as:**

- Architects
- Designers
- Engineering and Construction
- Geotechnical
- Developers
- Facilities Management Heads
- Financial Advisors / Bankers
- Insurers

**Local Government, Government Departments, Agencies & Authorities:**

Government – Federal, State & Local Councils

- Ministry and/or Department of Finance
- Ministry and/or Department of Transportation
- Ministry and/or Department of Public Works
- Rail Operators
- PPP Units / Economic Planning Units
- Bankers, Financial Institutions, Institutional Investors
- Policy Makers
- Construction and Engineering Firms
- Urban Planners, Designers, Developers
- Retail (Station) Operators
- Consultants (Engineering & Environmental)
- Legal Firms
- Turnkey / Technology Solution Providers
- Cement, Steel and Concrete Suppliers

**Engineers, Consultants, Project Managers and Contractors involved in:**

- Electrical
- Structural
- Mechanical
- Fire and security
- Health and safety
- Air Conditioning
- Lighting
- Environment
- Construction
- Building materials

**Technical Market:**

- Operations
- Maintenance
- Engineering
- Mobile Equipment
- Reliability and Asset Management
- Production
- Technical Services
- Contractor Management
- Process Improvements
- Procurement and Purchasing
- Drill & Blast Supervisors/Foreman/ Superintendents
- Technical Superintendent/Managers
- Maintenance Managers
- Project Managers
- Technical Service Managers
- Rock Engineer/Specialists
- Explosive Engineers
- Geotechnical Engineers/Specialists
- HSE Managers/Supervisors

### PREVIOUS ATTENDEES TESTIMONIALS

Well coordination and invited speakers from worldwide

Managing Director

**Green De Corp LTD, Hong Kong**

Overall well done

Branch Manager

**Rutherford, Hong Kong**

A great experience of mutual assistance in furthering the cause of sustainable

General Manager

**RITES, India**

It was a good experience. It allowed me to know people I would never meet

Partner

**Artist**

Organizing the conference. Marcus Evans staff is very professional

Industrial Planning Specialist

**Royal Commission Yanbu & Jubail, Saudi Arabia**

Food, venue excellent and the quality of the speaker and contributing theme was high

Managing Director

**RUC Cementation, Australia**



# THE PROGRAMME - DAY ONE

**monday 27<sup>th</sup> March 2017**

- 0830 Registration and Morning Refreshments
- 0900 Chairperson Opening Remarks
- 0910 **PASSENGERS TO FOOT-TRAFFIC**  
**Plenary One: Designing Aesthetic Underground Commercial Spaces to achieve ROI- Takeaways From Tokyo Station & Umeda, Osaka**  
Professor John Zacharias, Director of the Board, ACUUS, Chair Professor, Peking University, China
- 0950 **COUNTRY SPOTLIGHT - NETHERLANDS**  
**Plenary Two: Leveraging on Immersed tunnels, A Competitive Technology to Cross Water Ways- Learning from Fehmarnbelt Immersed Tunnel**  
Hans De Wit, Managing Director, Royal HaskoningDHV, Netherlands
- 1030 Morning Refreshments
- 1100 **Plenary Three: Formulating a Public Private Partnership (PPP) Framework to Catalyse Investments and Harness Future Economic Growth**
- 1140 **Plenary Four: Predicting and Monitoring Excavation Impacts of Tunnelling to Protect Neighbouring Sensitive Structures in Urban Environment – Learning Lessons from Regional Rail Projects**  
Nick Osborne, Geotechnical & Tunnels Director, Mott MacDonald, Singapore
- 1220 Networking Lunch

## STREAM ONE

### UNDERGROUND SPACE DESIGN & DEVELOPMENT

- 1320 Chairperson's Opening Remarks
- 1330 **Re-Inventing & Optimising Underground Space Functions –A Case Study of the Yonsei University Campus**
- Exploring new underground large scale occupied space functions in South Korea
  - Leveraging on top-down/skip floor construction method
  - Capitalising on innovative methodologies for 530 meters deep geothermal installation
- Dr. Hong C. Rhim, Vice President, Korea Institute of Building Construction (KIC), South Korea
- 1410 **Moving your City Assets Underground to Transform Land in Public Spaces – Learning from DangIn Lee Underground Power Station**
- Exploring new underground space functions for secured and protected public assets
  - Capitalising on new the urban dimension without destroying the heritages or negatively impacting the surface environment
  - Designing and maintaining fully integrated systems to keep the working environment sustainable and safe
- Byungsool Kwak, Executive Vice President, Korea Midland Power Company, South Korea
- 1450 Afternoon Refreshments
- 1520 **SKYHIGH UNDERGROUND**  
**Shimao Underground Theme Resort: Technical Challenges and Advantages of the Design and Construction of a Sustainable Hotel in a Quarry**
- Transforming a natural abandoned quarry into a world class tourism destination
  - Unveiling the unconventional design approach to create a sustainable masterpiece
  - Challenging the concept of the unique design problem solving by by applying best possible knowledge and technology applications
- Martin Jochman, Principal Director, JADE + QA, China
- 1600 **Exploring Future Role of Underground Stations to Augment Economic Growth – An Italian Perspective**
- Creating integrated public realm for shopping and enhanced as well as diverse traveller experience
  - Optimising existing space to design future business model and to unlock revenue streams
  - Assessing the desires and directions of people to create public-oriented spaces
- Fabio Crococo, General Director – Rail Regulator Office, Ministry of Infrastructure and Transport, Italy
- 1640 Chairperson's Closing Remarks
- 1650 End of Day One

## STREAM TWO

### INNOVATIVE CONSTRUCTION & TUNNELLING TECHNOLOGIES

- 1320 Chairperson's Opening Remarks
- 1330 **Leveraging on Fibre-Reinforced Concrete (FRC) Segments to Enhance Structural Integrity & Save Costs**
- Capitalising on FRC to bridge the crack and increase the ductility of concrete elements
  - Lowering the permeability of concrete matrix and reducing water leakage
  - Promoting optimum utilisation for strong, durable and cost-saving structures
- 1410 **Optimising Cement Stabilisation in Different Soil and Climate Conditions for Ground Improvements**
- Tailoring the engineering properties of site soils to the desirable strength
  - Reducing wastage and impact to environment
  - Customising ground improvement techniques for different soil and climate conditions
- Dr Chian Siau Chen, Darren, Vice President, Geotechnical Society of Singapore (GeoSS), Assistant Professor, National University of Singapore (NUS)
- 1450 Afternoon Refreshments
- 1520 **SKYHIGH UNDERGROUND**  
**Rectangular TBM Vs Circular TBM: Trenchless Construction Using Rectangular Tunnel Boring Machine for a MRT Underpass at Thomson-East Coast Line Havelock Station**
- Capitalising on modern Rectangular Tunnel Boring Machine (RTBM) to enhance the operational efficiency, save time and reduce disruption
  - Customising tunnel shapes and sizes to pave future rail and road projects in Singapore
  - Analysing RTBM's technical advantages and disadvantages for underground environments in Singapore
- Henry Foo Yung Thye, Director, Thomson-East Coast Line, Land Transport Authority, Singapore
- 1600 **Leveraging on Contemporary Drilling and Blasting Methods – As Case Study of the MTR Railway Project in Hong Kong**
- Optimizing blasting parameters to improve the blast performance for tunnel blasting when excavating a tunnel with limited blast vibration constraints
  - Gauging geological and rock mechanical conditions for effective drilling pattern and produce accurate and smooth tunnel wall, roof and floor
  - Assessing and mitigating risks during tunnel blasting in urban areas to avoid safety hazards
- Dr. Lawrence TH Lee, Senior Construction Engineer – Civil, MTR Corporation, Hong Kong
- 1640 Chairperson's Closing Remarks
- 1650 End of Day One



# THE PROGRAMME - DAY TWO

**tuesday 28<sup>th</sup> March 2017**

- 0830 Registration and Morning Refreshments
- 0910 Opening and Welcome Remarks from the Chairperson
- 0920 **COUNTRY SPOTLIGHT – CANADA**  
**Plenary One: Delving into Montreal Underground City Model to Tackle Urban Sprawl in Densely Populated Cities**
- 1000 **VISION TO ACTION**  
**Plenary Two: Narrowing the Expectation Gap and Promoting Strong Stakeholder Collaboration to Achieve Greater Success: A Melbourne City Link/Eastlink Tunnel Perspective**  
Ed Taylor, Engineering & Design Manager, Tunnels, **John Holland**, President, **Australasian Tunnelling Society**
- 1040 Morning Refreshments
- 1110 **Plenary Three: Integrating the Seismic Design & Analysis Approach for Underground Structures to Withstand Unexpected Deformations and Displacements**
- 1150 **Plenary Four: Mitigating Risks in Underground Construction through Numerical Analysis to Predict Ground Conditions and Construction Behaviour**  
**John Endicott**, Fellow/Geotechnical & Underground Engineering Expert, **Aecom**, Singapore
- 1230 Networking Lunch

## STREAM ONE

### UNDERGROUND SPACE DESIGN & DEVELOPMENT

- 1330 Chairperson's Opening Remarks
- 1340 **Redefining Subterranean Living : Designing Underground Space for more Liveable, Sustainable and People-Centric Spaces**
- Adopting an integrated planning approach for reaping social and economical benefits whilst maintaining a liveable environment
  - Employing effective spatial planning to optimise subsurface available space
  - Meeting the required levels of service in the most cost effective way for the present and future generations
- Colin Henson Principal**, Henson Consulting, Australia Former Governor, **The Warren Centre for Advanced Engineering, Australia**
- 1420 **Enhancing the Safety and Operational Efficiency of Subway Lines with Two-lane Tunnels to Maintain Smooth Traffic Flow**
- Carrying out emergency drills on a regular basis to enable teams to deal with unexpected events calmly, quickly and appropriately
  - Equipping disaster prevention monitoring systems to enable and monitor all areas within tunnels in an integrated manner
  - Establishing integrated control and sharing of real-time information system to improve operational efficiency and safety
- 1500 Networking Refreshments
- 1530 **Drawing on Rock Caverns to Provide Safe and Secure Underground Storage Space For Strategic Resources and Beyond**
- Utilising natural caverns to your advantage to safeguard country assets
  - Linking underground facilities with other city infrastructure for smooth commuting
  - Designing a hydrocarbon cavern to provide infrastructural support and increase operations efficiency
- Senior Representative, **Surbana Jurong, Singapore**
- 1610 **Leveraging on Crowd Evacuation Modelling Approach to Address and Prevent Critical Events that Endanger Human life, Environment and Equipment**
- Adopting new radical risk-based approach for crowd evacuation under catastrophic situation
  - Analysing and outlining disastrous scenario evaluation for better protection and control
  - Determining threats, risks, and security requirements of critical underground infrastructure
- 1650 Chairperson's Closing Remarks
- 1700 End of Conference

## STREAM TWO

### INNOVATIVE CONSTRUCTION & TUNNELLING TECHNOLOGIES

- 1330 Chairperson's Opening Remarks
- 1340 **TOPOGRAPHIC SCENARIO ANALYSIS**  
**Unveiling Effective Ground Consolidation & Tunnelling Techniques to Tackle Wearing and Karst Topography Soil: Sungai Buloh-Kajang(SBK) Line Case Study**
- Dealing with unknown contaminated ground conditions and the approach to mitigating delays
  - Zooming in an innovative use new tunnelling technology for karstic limestone conditions
  - Adopting best practices like grouting, jet grouting, vibro-compaction, stone columns, soil mixing for sound ground consolidation
- Marcus Levon Karakashian**, Project Director, Sungai Buloh-Kajang (SBK) Line, **Mass Rapid Transit Corporation, Malaysia**
- 1420 **Integrating Building Information Modelling (BIM) and Data Technology for Monitoring Tunnelling, Geotechnical and Structural Behaviours**
- Assessing post design geotechnical and structural behaviours for tunnel stability and strength
  - Drawing on BIM for greater viability and to extend the life of underground assets
  - Delivering future tunnelling schemes through effective data monitoring and analysis
- Senior Representative, **SMRT Corporation, Singapore**
- 1500 Networking Refreshments
- 1530 **Managing and Mitigating Geotechnical and Construction Risks of Underground Excavations to Enhance the Tunnel's Lifecycle**
- Examining the key geotechnical and construction risks on existing tunnelling excavation techniques
  - Implementing effective monitoring and maintenance system to mitigate risks arising from tunnel excavation
  - Examining water flow into tunnels to prevent subsidence
- Harald Wagner**, Advisor, **Thailand Underground & Tunnelling Group (TUTG)** Executive Council (EXCO), **International Tunnelling & Underground Space Association (ITA)**
- 1610 **EASIER TO BUILD**  
**Capitalising on Cutting Edge Prefabricated, Pre-finished and "Lego-Style" Methods to Reduce Tunnel Construction Time and Space**
- Integrating prefabricated tunnel segments in construction to improve project construction time
  - Promoting prefabrication to avoid the imperfections frequently found in concrete poured onsite
  - Promoting seismic prefabricated structures to be adaptable against deformation and additional loads under the action of earthquakes
- 1650 Chairperson's Closing Remarks
- 1700 End of Conference