

Encouraging the underground  
infrastructure renaissance

# ICE Engineering Underground Space 2015

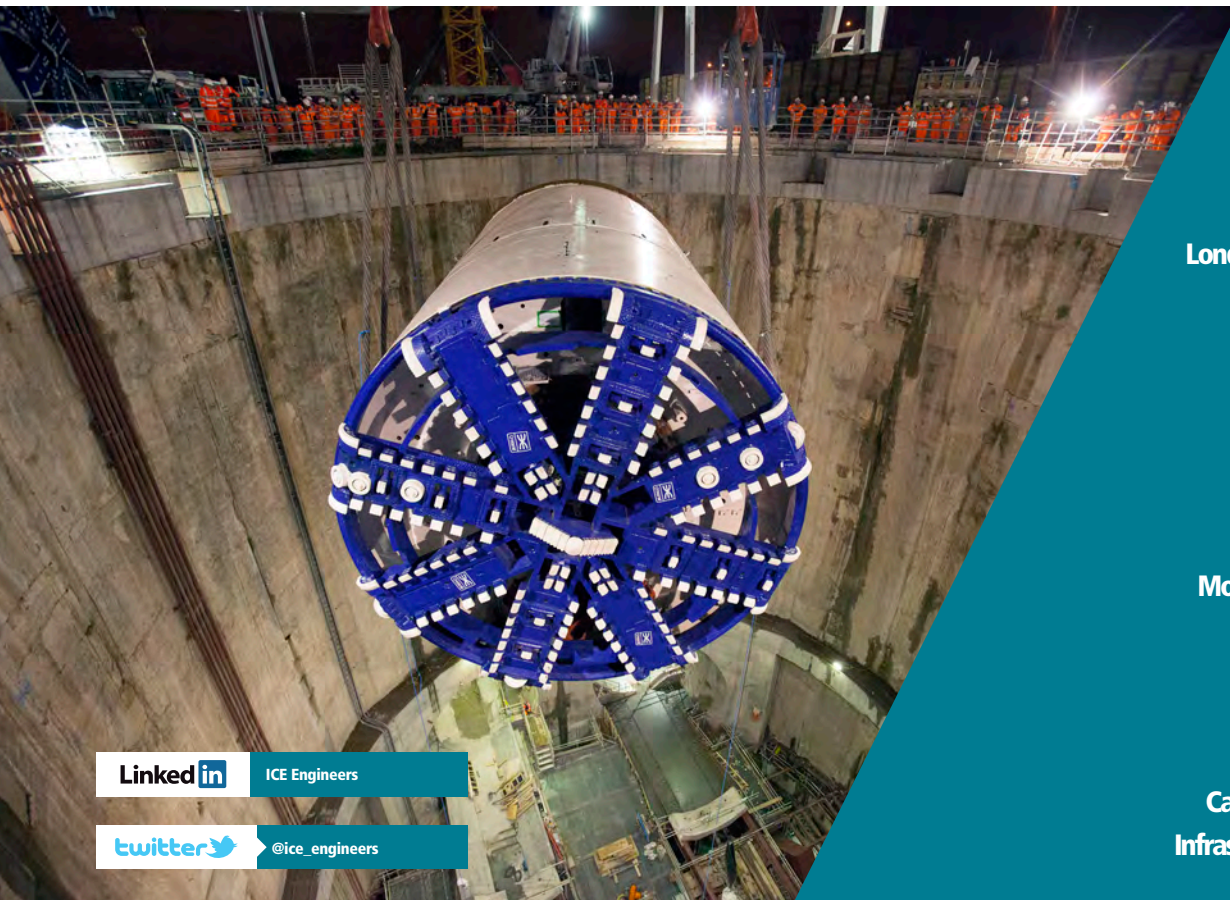
Innovating Infrastructure

18 February 2015

One Great George Street, Westminster

Topics include:

- Tunnelizing urban road networks - 'flyover' to 'flyunder'
- Thames Tideway Tunnel: underground space to safeguard the River Thames
- Tunnel asset management and data management - prioritisation and management of major client's assets
- Innovative use of fibre optic technologies for underground construction



Featuring expert speakers from:

- Crossrail
- Thames Tideway Tunnel
- London Underground & Taylor Woodrow BAM Nuttall JV
- Heathrow
- HS2
- ITA\_AITES
- Transport for London
- Morgan Sindall Underground Professional Services
- CH2M Hill
- Costain Skanska JV
- Cambridge Centre for Smart Infrastructure and Construction

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# About

18 February 2015, One Great George Street, Westminster

## ICE Engineering Underground

The ICE Engineering Underground Space conference will explore the solutions and opportunities that underground space presents for our critically over-flowing cities.

The one day event will offer case studies and strategies that demonstrate innovation, skills and best practice, and help delegates understand the technologies and techniques guiding industry.

The programme features sessions from Crossrail, HS2, London Underground and Thames Tideway Tunnel, as well as international examples of planning for a special asset in urban areas. It will be expertly Chaired by Robert Mair, ICE Vice President, Professor of Geotechnical Engineering at Cambridge University.

The profile of subterranean engineering has never been higher, and there is a lot of optimism for the future pipeline. Speakers at ICE's conference will explain the critical paths to deliver that pipeline. The event will provide a platform for engineers and planners to meet and share experiences from large UK projects and international lessons. Delegates will discuss and learn about the planning and development of crucial new subsurface space.

## Why Attend

Delegates will:

- Identify new strategies and skills
- Learn about progression, planning and modernisation of engineering underground space
- Witness innovative programmes and examples of intelligent solutions
- Gain understanding of new practices shaping our underground infrastructure
- Support and develop their ability to respond to industry needs
- Experience a diverse networking opportunity

The conference will focus on:

- The creation of space for underground infrastructure
- Strategic use and the opportunities for financial value
- Sustainable future cities and commercial viability
- Utilising the assets beneath our feet / asset and data management
- Innovative technologies and solutions
- Challenges faced in planning and design
- Pioneering procurement methods
- Managing critical safety risks
- Attracting new and diverse talent

# Speakers

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Han Admiraal,  
Chair of the  
Underground Space  
Committee, Vice  
Chair of ITACUS,  
**ITA\_AITES**



The Paddington  
Project Team,  
**Crossrail**



Mike Crabtree,  
Lead Sponsor, Station  
Development, Major  
Programme Sponsorship,  
**Transport for London  
Rail & Underground**

**Heathrow**

Andy Rhoades,  
Head of Service  
Protection, **LHR  
Airports, Heathrow**



Colin Eddie,  
Managing Director,  
**Morgan Sindall  
Underground  
Professional  
Services**



Mohammed Elshafie,  
Lecturer, **Laing  
O'Rourke Centre  
for Construction  
Engineering  
and Technology,  
Cambridge University**



Simon Fricker,  
Engineering Delivery  
Manager, **Thames  
Tideway Tunnel**



Roger Hewitt,  
Project Director, **URS**



Martin Knights,  
Senior Vice President:  
Tunnelling and Earth  
Engineering and  
Sciences, **CH2M Hill**



Robert Mair,  
Chair, **ICE Engineering  
Underground Space,  
ICE Vice President**



Angus Maxwell,  
Director, **Maxwell  
Geosystems Ltd**



Andy Mooney,  
Construction  
Manager, **Costain  
Skanska Joint  
Venture**



Keith Ramsay,  
Civils Section Manaer,  
**Taylor Woodrow BAM  
Nuttall JV**



Karl Simons,  
Head of Health, Safety  
and Wellbeing, **Thames  
Water**



Tim Smart,  
Head of Engineering and  
Operations, **HS2**



Franck Gayraud, CEO,  
**ARCURE**

# Programme

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## 08:15 REGISTRATION

## 09:00 WELCOME AND INTRODUCTION FROM CHAIR

Professor Robert Mair, ICE Vice President and Head of Civil and Environmental Engineering, **Cambridge University**



## THE GROWING ASSETS BENEATH YOUR FEET

The use of underground space is increasingly recognised as part of the solution to sustainable urban development. Its creation poses many special challenges, both from a design perspective, and in terms of technical construction and cost.

How have some of the UK's most significant projects used underground space strategically and overcome these challenges?

## CROSSRAIL CASE STUDY: ENGINEERING PADDINGTON BOX

- A project overview and enabling works
- The design and interchange
- What were the challenges during construction

The Paddington Project Team, **Crossrail**

Roger Hewitt, Project Director, **URS**

Andy Mooney, Construction Manager, **Costain Skanska Joint Venture**



**SKANSKA**

## ENGINEERING UNDERGROUND SPACE IN A SECURE AND CHANGING ENVIRONMENT

Andy Rhoades, Head of Service Protection, **LHR Airports, Heathrow**

## MANAGING THE CHALLENGES AND COMPLEXITIES OF VICTORIA STATION UPGRADE

- Prop-less solution to station breakthroughs
- Reverse contour noise mapping
- Jet grouting for SCL tunnels
- D&C underpass
- Sharing railway and track possessions
- Waste management and recycling performance



Mike Crabtree, **London Underground**

Keith Ramsay, **Taylor Woodrow BAM Nuttall**

## HS2 CASE STUDY: GOING UNDERGROUND, THE USE OF SPACE AT EUSTON STATION

Tim Smart, Head of Engineering and Operations, **HS2**



## QUESTION AND ANSWER SESSION

## REFRESHMENTS AND NETWORKING

## THINK DEEP: UNDERGROUND URBANISATION AND SUSTAINABLE SUBTERRANEAN CITIES

Many places around the world are maximising the potential of subterranean cities, and developing intelligent, sustainable urban infrastructure. This session will examine the impact of underground engineering works in the wider world. It will look at how underground space can be used in a multi-functional manner and the impact on the environment, as well as considering risk and value to urban liveability and the economy.

## PLANNING FOR A SPACIAL ASSET IN URBAN AREAS AND AN INTERNATIONAL EXAMPLES OF PLANNING FOR UNDERGROUND SPACE – HELSINKI AND ARNHEM

- Planning, maintenance and reserving space for future uses
- Key considerations for the use of underground space, the importance of planning
- Designing down for a sustainable future
- Three-dimensional interactions between the built environment and its supporting infrastructure
- Ownership / user rights of land, planning as a legally binding document and preventing spatial conflicts
- Maintaining premises below a city's terrain



Han Admiraal, Chair of the Underground Space Committee and Antonia Cornaro, Vice Chair of ITACUS, **ITA-AITES**

## TUNNELIZING URBAN ROAD NETWORKS - 'Flyover' to 'Flyunder'

- The potential for flyunders, mini-tunnels and decking on strategic road network to reduce congestion and severance
- Unlocking development potential and enabling improvements for sustainable modes and public realm at the surface
- Environmental, commercial and other value adding benefits



Martin Knights, Senior Vice President, Tunnelling and Earth Engineering and Sciences; Senior Fellow of Technology; **CH2MHill**

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## GEOTECHNICAL RISK MANAGEMENT FOR TUNNELING IN ASIA – THE LAST TWENTY YEARS

- How systems can help to identify, communicate and mitigate risks to design
- How such systems are procured and the resultant beneficial effects on projects costs

Dr Angus Maxwell, Director, **GeoMax Partnership**



## QUESTION AND ANSWER SESSION

## LUNCH AND NETWORKING

## STRATEGICALLY STEERING THE FUTURE

There are great challenges to managing critical infrastructure underground. Innovative techniques and technologies, specifically designed to manage subterranean developments and the safety risks that these projects pose are in great demand.

## SECURING YOUR SURROUNDINGS AND SAFETY UNDERGROUND

- How has this technology developed?
- The application to real projects
- What are the main benefits?

Arcure, Speaker to be announced



## LEE TUNNEL – LONDON'S DEEPEST EVER TUNNEL – CHALLENGES OF MANAGING THE ASSET AND THE CRITICAL SAFETY RISKS

- Managing the asset in the future
- Innovative benefits of the project
- Construction challenges foreseen and tackled
- Managing critical safety risks deep underground

Karl Simons, Head of Safety, Health and Wellbeing, **Thames Water**



## THAMES TIDEWAY TUNNEL: UNDERGROUND SPACE TO SAFEGUARD THE RIVER THAMES

- The background behind the project from initial studies to the current design solution
- A description of the methods used to validate the design, the required size of tunnels and structures and the proposed method of operation
- What challenges do we foresee during the detailed design and construction of this nationally significant infrastructure project?

Simon Fricker, Engineering Delivery Manager, **Thames Tideway Tunnel**



## INNOVATIVE USE OF DISTRIBUTED OPTICAL FIBRE STRAIN SENSING TECHNOLOGIES FOR UNDERGROUND CONSTRUCTION

Emerging technologies and examples of application of optical fibre strain sensing in tunnels

- Relying on experience to estimate the magnitude and distribution of loads applied to a tunnel lining and the uncertainty in estimating the loading on a tunnel lining
- Optical fibre strain sensing technology, used for Crossrail's tunnel in North Woolwich, the investigation and what the results indicate
- A distributed fibre optic monitoring system embedded within SCL and the potential impact of Sprayed Concrete Linings (SCL) to the industry
- A step change in understanding tunnel linings in the future

Dr Mohammed Elshafie, Laing O'Rourke Lecturer in Construction Engineering and Technology, Co-Investigator at the Cambridge Centre for Smart Infrastructure and Construction, **University of Cambridge**



## QUESTION AND ANSWERS SESSION

## REFRESHMENTS AND NETWORKING

## BIM FOR TUNNEL ASSET AND DATA MANAGEMENT

Prioritisation and management of major client's assets

Speaker to be announced

## WHAT IS THE FUTURE FOR CONSTRUCTING UNDERGROUND SPACE? ATTRACTING AND UTILISING TALENT

Colin Eddie, Managing Director, **Morgan Sindall Underground Professional Services**



## QUESTION AND ANSWER SESSION

## 17:00 SUMMARY FROM THE CHAIR

## 17:15 CONFERENCE CLOSE AND DRINKS RECEPTION

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## GEOMAX PARTNERSHIP

GeoMax Partnership is a joint venture between instrumentation specialist Geotechnical Observations and infrastructure data management specialist Maxwell Geosystems. The Geomax Partnership focuses on the design, implementation and management of effective holistic construction monitoring schemes providing real time feedback on design, production performance and safety.

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## ARCURE

The number of accidents in construction involving mobile machines and people remains worrying. Despite technical, operational and material improvements, figures show accidents remain at a high level. Each year accidents occur, many of them where pedestrian to vehicle interaction is unavoidable.

Arcure was founded in 2009 to address this issue.

[www.arcure.net](http://www.arcure.net)

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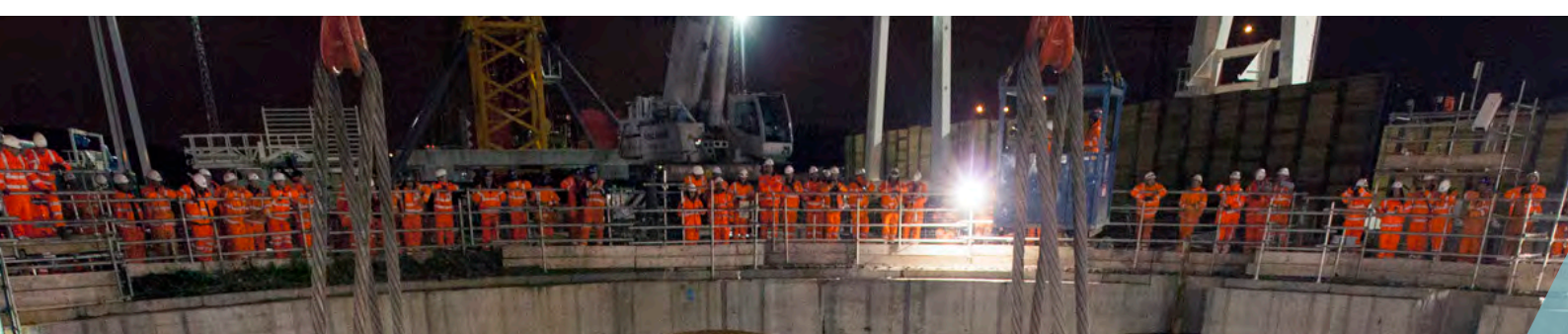
## GROUNDFORCE SHORCO

Groundforce Shorco (Major Projects) is the market leader in high end hydraulic propping solutions. This division has a large fleet of equipment combined with a first class technology and technical service to support both designers and site personnel.

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## BORDER ACHAEOLOGY

Working from our seven offices throughout England & Wales, we have nearly 20 years of experience in managing the archaeological components of infrastructure & construction projects and demonstrably appreciate the need to integrate archaeology & engineering at an early stage for the avoidance of undue delays and costs.

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## HERRENKNECHT

Herrenknecht is a technology and market leader in the area of mechanized tunnelling systems. As the only company worldwide, Herrenknecht delivers cutting-edge tunnel boring machines for all ground conditions and in all diameters – ranging from 0.10 to 19 meters.

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## PONTOONWORKS

Pontoonworks is an innovative support service specialising in work on water; solving issues and creating opportunities for a growing number of industries. We make access over water simple and safe and are a trusted partner to many organisations and several of the UK's largest construction companies.

[www.pontoonworks.co.uk](http://www.pontoonworks.co.uk)

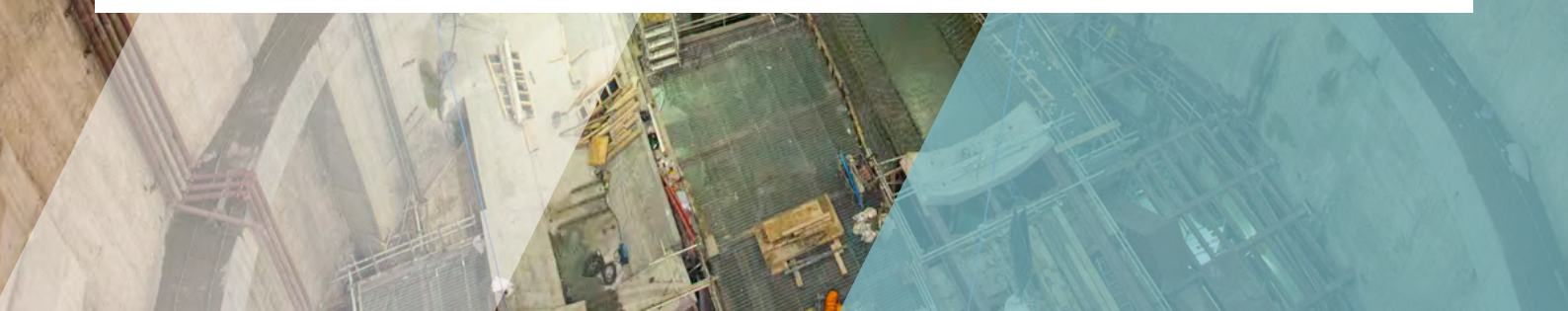
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# Registration

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## ICE Engineering Underground Space 2015

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### Registration form

#### Booking type: (tick appropriate box)

<input type="checkbox"/>	ICE member	membership number
<input type="checkbox"/>	Member of supporting organisation	Organisation membership number
<input type="checkbox"/>	Non-member	

Where did you hear about this event?

#### Contact details:

Prefix	Date of birth
First name	
Last name	
Phone number	
Email address	
Job title	
Organisation	
Mailing address line 1	
Mailing address line 2	
City	Postcode
Country	
Dietary requirements:	
Specific needs	

#### Payment details: (tick appropriate box)

Payment type  Invoice  Cheque

To protect your data ICE does not accept or store credit card details. To pay with a card please call the Events Team on +44 (0)20 7665 2226 or complete your booking via the website.

**Terms and Conditions:** By ticking this box you confirm that you have read and agree with our Terms and Conditions. Please note your booking can not be processed unless this box has been ticked. Terms and Conditions available at [ice-underground.com](http://ice-underground.com)

Please send this form by fax to +44 (0)20 7665 2189 or by email to [events@ice.org.uk](mailto:events@ice.org.uk) or by post to ICE Events Team, Institution of Civil Engineers, One Great George Street, London SW1P 3AA UK

### Registration form

1. Register online at [ice-underground.com](http://ice-underground.com)
2. Complete and fax the registration form to +44 (0)20 7665 2189
3. Call +44 (0)20 7665 2226

### Prices <sup>1</sup>

	Fee
Member	£327
Non-member	£377
Local Authority <sup>2</sup>	£257
Supporting association	£337
Student / Retired member	£197

<sup>1</sup> All prices are excluding VAT. Terms and conditions apply see online at [ice-underground.com](http://ice-underground.com)

<sup>2</sup> Must have a valid .gov email address

### Venue

Institution of Civil Engineers,  
One Great George Street,  
London SW1P 3AA

