REGISTRATION FORM
RANKINE LECTURE 2018 & STATE-OF-THE-ART GEOTECHNICAL LECTURES: DYNAMIC SOIL STRUCTURE INTERACTION; KNOWLEDGE TRANSFER; BIG DATA; SUSTAINABILITY
8 October 2018
Email: mgs@mygeosociety.org
Website: www.mygeosociety.org

Name(s)	Mobile No.	Membership No.	Fees (RM)
		Sub-total	
		Total Amount Payable:	

Company:_____

Address:_____

_____

Mobile:_____Tel(O):_____Fax:_____

E-mail:_____
(Please write clearly as the Confirmation & Update will be sent via email to participants)

Contact Person:_____ Designation:_____

Signature:_____ Date:_____

PAYMENT DETAILS

☐ Cash RM_____

☐ Cheque no. _____ for the amount of RM _____ **(non-refundable)** and made payable to "**MALAYSIAN GEOTECHNICAL SOCIETY**" and crossed '**A/C Payee Only"**

☐ Cash Deposit / Cheque Deposit / Internet Online Banking Transfer RM_____ to "**MALAYSIAN GEOTECHNICAL SOCIETY**"
HONG LEONG BANK BERHAD
Account No. **281-00-01231-6**

- **I/We* understand that the fee is not refundable if I/We withdraw after my/our* application is/are* accepted by the Organising Committee but substitution of participant will be allowed.**
- **If I/We* fail to attend the Seminar, I/We will still pay the registration.**

Terms & Conditions

- ✓ FULL PAYMENT must be settled before commencement of the Seminar, otherwise participants will not be allowed to enter the hall. If a place is reserved and the intended participants fail to attend the Seminar, the fee is to be settled in full.
- ✓ Fee paid is not refundable. Registration fee includes lecture notes and refreshment, if any.
- ✓ The Organizing Committee reserves the right to cancel, alter, or change the program due to unforeseen circumstances. Every effort will be made to inform the registered participants of any changes. In view of the limited places available, intending participants are advised to send their registrations as early as possible so as to avoid disappointment.

Malaysian Geotechnical Society

Organised by:
Malaysian Geotechnical Society (MGS)

RANKINE LECTURE 2018 & STATE-OF-THE-ART GEOTECHNICAL LECTURES: DYNAMIC SOIL STRUCTURE INTERACTION; KNOWLEDGE TRANSFER; BIG DATA; SUSTAINABILITY

Date/Day: 8th October 2018, Monday

Time: 8.45 am – 6.00 pm

Speaker: Dr. Nick O'Riordan

Venue: Prof. Chin Fung Kee Auditorium, 3rd Floor, Wisma IEM,
No. 21, Jalan Selangor,
46200 Petaling Jaya,
Selangor Darul Ehsan

REGISTRATION FEES:

Grade	Fee
MGS Member / IEM Member	RM 200.00
Non-MGS Member	RM 250.00

**** Notes: - 2 Coffee/Tea Breaks and 1 Buffet Lunch will be provided***
- Softcopy of notes will be provided and sent via email

Closing Date: 3rd October 2018

BEM Approved CPD/PDP Hours: Applying. Estimated 6 CPD Hours

Ref. No.: TBC

SYNOPSIS

1.) Dynamic Soil-Structure Interaction - Understanding the Holocene, Instrumenting the Anthropocene (Rankine Lecture)

Geotechnical engineering is at its most unpredictable and uncomfortable when variable or dynamic loads on foundation systems are significantly higher than in the static or 'at rest' condition. Resilient infrastructure requires that the duration of bounce-back, the time to restore functionality after extreme events, is minimised. Codes attempt to deal with this using combinations of load and resistance or material factors that are sometimes drawn from fatigue or repetitive loading experience. However, these can result in design solutions that either fail due to a lack of appreciation of the controlling parameters or that are uneconomic and overcautious. The lecture will examine soil-structure interaction under catastrophic collapse, wave loading, high speed trains and dense urban seismic loading using examples drawn from real-world installations. It will show how economy in design can be driven using unified soil-structure interaction modelling through advanced numerical analysis in which rate effects are explicitly considered. Recent improvements in the visualisation of foundation behaviour under extreme events enables us to articulate more effectively extreme event scenarios across disciplines and project stakeholders. The lecture will provide a springboard from which resilient, performance-based design methods can be developed and improved, with the promise of feedback from digital data analytics.

2.) Knowledge Development and Transfer in Geotechnical Engineering

Civil, and its slightly younger offspring Geotechnical, Engineering is, at its best and most enjoyable, a team sport. Unlike most sports each project is unique (the ball changes shape and size, sometimes there is no ball, the pitch changes during the match and so on), it generally has a long timeline from concept through delivery to use, and team membership changes all the time. So how do we provide the confidence and desire to innovate to a project team so that clients and stakeholders are delighted rather than dismayed? The lecture will provide examples of geotechnical knowledge development and transfer at various levels of scale: global/regional, country, company, project, individual. It will set out some of the challenges and differences in priority that exist in industry and academia in knowledge development, transfer and application. It will include ways in which inverse analysis, data analytics and curation, and artificial intelligence can improve outcomes and reduce loss of knowledge and confidence.

3.) New International Airport for Mexico: Some Challenges

The site of NAICM covers a hitherto undeveloped 10 km square area immediately to the east of Mexico City, a conurbation with a population in excess of 20M. The airport is located on the former Lake Texcoco, to the east of the Aztec dam that separated the 'freshwater' lake, upon which Tenochtitlan was founded and where much of the city later developed, from the 'salt water' lake deposits. Lake Texcoco deposits comprise up to 500m of soft clays that become progressively stiffer below about 30m depth, and are interbedded with silts and sands of variable mineralogy, diatom content, density, stiffness and permeability. Groundwater is extracted for the public water supply from wells below 120m depth. Since 1930 there has been regional surface subsidence of about 8 to 10m, with current settlement rates being about 20 cm/year in the vicinity of the site. The softest soils have a void ratio of about 6, a water content around 250%, a plasticity index of about 200% and an effective stress friction angle of over 40° in compression. Engineering properties of the soil in this area of continuing consolidation and subsidence present something of a moving target. The lecture describes the complex depositional and drainage history of the site, ground investigations, the use of compensated foundation design principles for the 1.6km x 0.5km passenger terminal building, and the shallow piled mat foundation for the 89m high air traffic control tower. Newly developed soil properties together with back-analyses of some case histories of instrumented excavations bridges and structures enable predictions of foundation behaviour during large magnitude earthquakes to be made. The choice of operational strengths for excavation and pile design in these materials is somewhat challenging and some results from a full scale testing program will be presented.

4.) Subsurface Investigation: A Future for Data, Interpretation, Construction Feedback and Adaptation

The ease of data acquisition, manipulation, analysis and display enables us to contribute to sustainable development in new and exciting ways. While digitisation of factual information has been with us for decades, the integration of ground information into a project's digital environment remains a challenge. The acquisition of digital site investigation information through AGS is now commonplace and the visualisation of that data on cross-sections, 3D models and fly-throughs is straightforward. These form the basic building blocks for site evaluation and option selection for a project. Moving into project design and implementation, the picture becomes less clear. Considerable efforts have been made to integrate the activities of the various disciplines in the visualisation of design through international government initiatives such as Building Information Modelling. However, the challenge remains to integrate an evolving ground model with other disciplines. The pace of design of a project has a different, often more rapid trajectory than the evolution of a robust ground model. Indeed, the ground model will only be 'complete' once construction monitoring has provided the feedback to inform and update the model. The ground model itself has many components: stratigraphy, structure, chemical composition, groundwater pressure and flow, and associated numerical models to enable future performance to be predicted. Each one of these components will evolve, and change during the project lifetime. These changes may well affect the ability of the installation to be modified and adapted to new demands in the future. It follows that we, as ground professionals, have a duty in the context of sustainable development to leave behind accessible, digital clues or 'footprints' that enable our successors to understand what we have done so that adaptations can be made efficiently from a state of knowledge. A promising area what we might call 'digital ground engineering' lies in the increasing use of learning algorithms in inverse analysis of construction in urban areas. We can predict that in future there will be fewer, and more reliable, numerical models, for example, Mercia Mudstone or London Clay and part of the skill of the ground professional will be to identify the numerical model(s) best suited to the task in hand. One of the advantages of digital data production from the ground before, during and after construction is that the data can be accessed through wireless connectivity. The techniques surrounding Big Data, can be fruitfully employed here. Cumulative data on performance can be released to multiple stakeholders, and multiple interpretations can enrich our technical environment. The open access to all earthquake records, recording station by recording station provides a ready example that could be a model for the dissemination of data arising from human activities at a given site. Such emancipation of digital data can be controversial, as the potential enrichment could just as easily lead to polarisation of opinion. However, the trend toward greater openness and public accountability for the exploitation of the subsurface does seem unstoppable. Particular issues surrounding progressive investigation, revision of interpretations, feedback from construction, regulatory monitoring, as-built information and future adaptation will be addressed. Examples from recent projects in UK and California will be presented.

5.) Sustainable and Resilient Geotechnical Engineering

The pressures of urbanization place demands on city infrastructure and connections between cities. The rapid urbanization in the latter half of the 20th century was carried out against a backdrop of depletion of limited natural resources, generation of wastes, including greenhouse gases, and inefficient use of energy. The Bruntland Commission and subsequent report of 1987 recognized this behavior as globally unsustainable. Over the past 25 years, much effort has been expended to establish carbon emissions on a country by country basis in order to enable reductions against a baseline to be demonstrated. There has been a transformation in energy consumption in commercial and residential buildings as a result of concerted efforts in energy conservation. However, the construction of buildings and infrastructure, and the operations and maintenance of infrastructure has received comparatively little attention, despite being responsible for around 25% of global greenhouse gas emissions. The lecture concentrates on the use of carbon accounting and embodied energy methods for a wide range of ground engineering construction activities. The concepts of Capital and Operational Carbon and associated payback period are examined and examples show how this holistic approach can result in design changes and considered choices in construction and maintenance means and methods. Recent natural and man-made disasters have underlined the importance of a 'Repairable Limit State' that is important when design resilient infrastructure. Again examples of approaches to coastal protection works, embankments, railway trackbed and buried pipelines are provided in which carbon accounting principles are applied.

BIODATA OF SPEAKER

Dr. Nick O'Riordan is an Arup Fellow and has been the Global Geotechnics Skill leader for Arup from 2009 to 2017, having been appointed a director of the firm since 1998. He has over thirty years' experience of ground-related risk management associated with contaminated and derelict land, earthquake and storm hazards and collapses of underground excavations. He is experienced in the aggregation of technical, financial and program risks associated with all aspects of ground engineering. He has acted as an expert witness on matters relating to geotechnical analysis and ground contamination and has been cross-examined in both English and US jurisdictions. Nick is the author or co-author of over 100 publications covering many aspects of soil/structure interaction ranging from offshore and high-speed railway structures to the construction of embankments on very soft clays and the performance of piles in very stiff clays. He has sat on many UK and international committees and has been a Visiting Professor at Southampton University. Several of his projects have pioneered the use of embodied energy calculations and carbon foot printing of construction. He was the Ground Engineer Manager during the detailed design and construction of High Speed 1 in the UK. Significant recent projects include the new International Airport for Mexico (NAIM) on very soft Lake Texcoco clays, the foundations for Salesforce Tower (at 326 m, the tallest building in San Francisco), the nearby Transbay Transit Center substructure and the base-grouted piling for the new Gerald Desmond Bridge, Port of Long Beach, CA. He presented the 58th Rankine Lecture, 'Dynamic soil-structure interaction: understanding the Holocene, instrumenting the Anthropocene', in March 2018.

PROGRAMME

8.45am	-	9.00am	Welcoming Remarks & Introduction
9.00am	-	10.30am	Rankine Lecture 2018 - "Dynamic Soil-Structure Interaction - Understanding the Holocene, Instrumenting the Anthropocene"
10.30am	-	10.45am	Questions & Discussions
10.45am	-	11.15am	Coffee/Tea Break
11.15am	-	12.15pm	Lecture 1 - "Knowledge Development and Transfer in Geotechnical Engineering"
12.15pm	-	12.30pm	Questions & Discussions
12.30pm	-	1.45pm	Lunch
1.45pm	-	2.45pm	Lecture 2 - "New International Airport for Mexico: Some Challenges"
2.45pm	-	3.00pm	Questions & Discussions
3.00pm	-	3.30pm	Coffee/Tea Break
3.30pm	-	4.30pm	Lecture 3 - "Subsurface Investigation: A Future for Data, Interpretation, Construction Feedback and Adaptation"
4.30pm	-	5.30pm	Lecture 4 - "Sustainable and Resilient Geotechnical Engineering"
5.30pm	-	6.00pm	Questions & Discussions
6.00pm			End

CANCELLATION POLICY

MGS reserves the right to postpone, reschedule, allocate or cancel the Seminar. No cancellation of registration will be accepted 1 day prior to the date of the event or during the event day. Replacement or substitute name and additional fees however, can be made at least 3 days prior to the event date.