

UNIVERSITY OF  
BIRMINGHAM

# Midland Geotechnical Society

## Meeting Notice

[www.midlandgeotechnicalsociety.org.uk](http://www.midlandgeotechnicalsociety.org.uk)

Thank you to the Sponsors  
of the Society for their  
Support:

### Patron Sponsors

Aecom  
Applied Geology  
Arcadis  
Arup  
DTS Raeburn  
Geotechnics  
Huesker  
WSP

### Supporting Sponsors

Concept  
GIP Ltd  
M&J Drilling Services  
Penguin Recruitment  
Typsa

### Contact Us

Honorary Secretary:  
Scott O'Neill-Gwilliams  
[scott.oneill@aecom.com](mailto:scott.oneill@aecom.com)  
Tel: 0121 2148194

### Meeting Venue

Lectures start 7pm

Lecture Theatre G31, Dept of  
Mechanical and Civil  
Engineering, University of  
Birmingham B15 2TT

Refreshments are available  
prior to the meeting in the  
Shell lounge, Department of  
Mechanical and Civil  
Engineering, from 6:15  
onwards.

This lecture has been supported by sponsorship from:

# ARUP

## Monday 1<sup>st</sup> October 2018

Dr Nick O'Riordan

Rankine Lecture 2018

**Dynamic soil-structure interaction; understanding the Holocene,  
instrumenting the Anthropocene**

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.

### About the speaker:

Nick is an Arup Fellow and was the Global Geotechnics Skill leader for Arup from 2009-2018. 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 has worked on 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. Several of his projects have pioneered the use of embodied energy calculations and carbon footprinting of construction. He was the Ground Engineer Manager during the detailed design and construction of High Speed 1. Significant recent projects include the foundations for Salesforce Tower (at 326m, 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.

#### **Upcoming lectures..**

##### Monday 12th November 2018

Contracts and Contract Law - How to Avoid Being Sued  
Martin Fairlie, Waterman Group

##### Monday 3rd December 2018

Thames Tideway Tunnelling Talk  
TBC, Jacobs

##### Monday 14th January 2019

Dam and Reservoir Engineering - the Last 50 Years and the Next 50 Years  
Dr Peter Mason, Stantec

##### Monday 4th February 2019

Kinkley Point C  
Gemma Sherwood, Atkins

##### Monday 4th March 2019

Non-destructive Condition Assessment  
Dr Asaad Faramarzi, University of Birmingham

##### Monday 1st April 2019

John Mitchell Award Lecture 2019  
Title & Speaker TBC

##### Monday 13th May 2019

Annual General Meeting & Environmental Lecture  
TBC, Huesker - Possible IGS joint meeting