





# Case Histories of Numerical Methods in Geotechnical Engineering



Numerical analysis using finite element and finite difference methods has transformed from a niche to a mainstream design tool within geotechnics in the last decade. This is due to the development of sophisticated yet accessible 2D and 3D programs that model the ground and adjacent structures, together with increased training in the use of this technology.

Many lessons are learned through hindsight. Looking at case histories is not only a great way to understand post design behaviour of the structures installed; there are also significant benefits in learning from what others have done, through both their positive and negative experiences. This seminar will highlight successes, near misses and failures in geotechnical engineering when involving the use of numerical analysis.

Two eminent geotechnical engineering professionals who have helped pioneer the development and application of these programs will give keynote lectures during morning and afternoon sessions. There will also be presentations by a number of leading geotechnical engineering companies on their experiences using numerical analysis.

## Who Should Attend?

- Geotechnical engineers and analysts, from newly qualified to experienced, who are already using or considering undertaking numerical analysis
- Stakeholders who commission geotechnical works
- Equipment manufacturers who develop geotechnical instrumentation
- Software developers who provide geotechnical software to the industry.

## Objectives

Attendance at the seminar will enable the delegates to:

- Appreciate the potential impact that numerical methods have on the geotechnical design
- Recognise and understand the various benefits from numerical methods through the presentations of case studies
- Understand how to improve the use of geotechnical numerical analysis by learning from practitioners within the industry
- Realise the future direction for geotechnical design using numerical methods.

The event will also provide an opportunity to network with other delegates and share knowledge and experiences in applying numerical analysis within geotechnics.

## agenda

### 09:15 Coffee & Registration

Welcome & Introduction

*Tim Morris, NAFEMS*  
*Asharaf El-Hamalawi, EMGG*  
*Peter Scott, NAFEMS GC*

Keynote Lecture 1

*Brian Simpson, Arup*

Presentations chaired by:

David Potts and Brian Simpson

High Rise Using Pile Assisted Raft, Including Pile Tests, Specialist SI and Back Analysis Based on Monitored Data

*Peter Scott & Jonathan Dewsbury, Buro Happold*

Calibrated Numerical Model for Assessment of Safe TBM Operating Pressures

*Yu Sheng Hsu, Mott MacDonald*

### 13:00 Lunch break

am

Keynote Lecture 2

*Tony O'Brien, Mott MacDonald*

Presentations Chaired by:

Andrew Chan and Tony O'Brien

A Practical Application of FEA to Derive Soil Displacements and Investigate the Effects on Piles from Jack-up Installation

*Nigel Kee and Lindsey Cubbon, Fugro*

Basal Instability Adopting Conventional and FE (Utilising Different Material Models)

*Alex Nikolic and Angelo Fasano, Buro Happold*

## Closing Remarks

*Peter Scott, Chairman of the NAFEMS Geotechnical Committee*

### 17:15 Close

pm



Engineers rely on computer modelling and simulation methods and tools as vital components of the product development process. As these methods develop at an ever-increasing pace, the need for an independent, international authority on the use of this technology has never been more apparent.

## NAFEMS is the only worldwide independent association dedicated to this technology.

Companies from numerous industries and every part of the globe have invested heavily in engineering technologies such as Finite Element Analysis and Computational Fluid Dynamics. But how do they ensure they get the best return from their investment? How do they develop and enhance their capabilities? How do they know they are using the technology in the most effective way?

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## exhibition

Please contact **Jo Davenport** at NAFEMS  
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if you would like more information.

## co-organiser

A sub-group of the ICE (Institution of Civil Engineers) East Midlands region. The main objectives of the committee are to provide a focal point for geotechnical interests in the East Midlands and to offer CPD opportunity to civil engineers.

The committee maintains links and organises joint meetings with other local organisations with similar or

complementary interests, such as the British Geological Society, the Permanent Way Institution, the International Geosynthetics Society and the Institution of Highways and Transportation.

Please note that members of ICE can attend this co-sponsored event for the discounted fee of £70, plus VAT.

