GeoSS-BCA Academy Geotechnical Seminar Series-3

FEM Analysis for Geotechnical Engineering: Applications and Limitations

Finite Element Method (FEM) analysis has become a popular and powerful tool in many engineering fields. In this seminar. speakers will share their knowledge on the use of commercially available FEM programs in various geotechnical applications. In addition, the use of FEM programs in common applications, such as modeling with proper soil parameters and the common mistakes of FEM analysis in deep excavation will be discussed. There will also be a discussion forum to enable participants to interact and exchange ideas with the speakers on the proper use of commercially available FEM programs for geotechnical analysis and design.

Seminar Contents

Lessons Learned from Numerical Analysis
By Prof. Wong Kai Sin
This presentation will highlight some of the lessons learned from many years of experience in the numerical analysis of geotechnical engineering problems. It will cover limitations of the Mohr-Coulomb model, evaluation of soil parameters, back-analysis and comparison with field measurements.

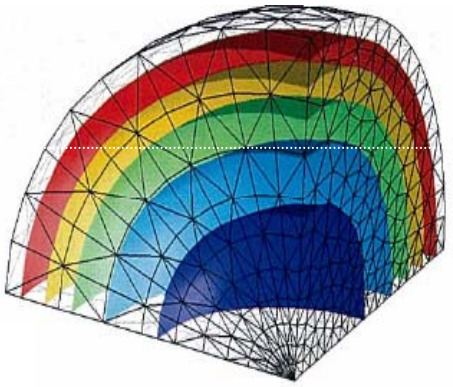
Some Pitfalls of Too-User-Friendly Geotechnical FEM
By Prof. Harry Tan Siew Ann
This presentation will focus on misunderstanding of drained, undrained and consolidation analysis with real-life case studies in which the outcomes lead to a bad analysis and design. It will also illustrate Singapore case studies on the pitfalls of an incorrect 2D FEM simulation in a land reclamation work on soft clays and in a deep excavation work on residual soils.

Looking Ahead in Geotechnical Finite Element Analysis - GeoFEA
By Prof. Lee Fook Hou
Using the software GeoFEA as an example, this presentation will examine some of the driving forces behind the developments in geotechnical finite element analysis and the directions in which future developments may take place. It will discuss three aspects of future developments, namely algorithms and codes, software-user interfaces and user competence.

Role of Constitutive Models in FEM Analyses
BY Prof. Andrew Whittle
This presentation will discuss the role of constitutive models in achieving realistic predictions using finite element analysis. It will also discuss the severe practical limits on the application of more complex soil models. The presentation will illustrate the role of semi-analytic, numerical limit analysis and elastic methods for excavation and tunneling applications.

Modeling Deep Excavation using SIGMA/W
By Prof. Chew Soon Hoe
This presentation aims to provide guidance on the use of SIGMA/W in deep excavation so that the user is aware of the advantages as well as the pitfalls of this FEM program. Various examples in Singapore context will be discussed.

Good Practices and Common Mistakes of Numerical Analysis Use in Deep Excavation Works
BY Dr Poh Teoh Yaw
Numerical method is a powerful tool for modeling complex deep excavation problems. This presentation will highlight some good practices and common mistakes of numerical analysis used in deep excavation projects.



Seminar Details

Date: 14 May 2009 (Thursday)
Time: 8.30 am - 5 pm
Venue: Function Hall
BCA Academy
200 Braddell Road
Singapore 579700
Fee: S$160.50 (Public)
S$128.40 (GeoSS member)
(Fee includes GST, course materials, lunch & refreshments. Free parking, based on a first-come, first-served basis)

Who should attend

- Practicing Structural Engineers
- Geotechnical Specialists
- Academics
- Students from Tertiary Institutions

Accredited by

PEB: pending

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Speakers' Profiles

Prof. Wong Kai Sin, Associate Professor, Nanyang Technological University.
Prof Wong graduated in 1972 with a BS degree from the University of Illinois. He received his MS and PhD degrees from the University of California at Berkeley in 1975 and 1978 respectively. He practiced geotechnical engineering in California before joining NTU in 1984. He is currently a member of the Geotechnical Division of Institute of Engineers, Singapore and a technical advisor to the Land Transport Authority of Singapore. His major areas of interest are deep excavations, deep foundations, slope stability, soil improvement, land reclamation and soil-structure interaction problems.

Prof. Harry Tan Siew Ann, Associate Professor of Geotechnical Faculty, National University of Singapore.
Prof Harry Tan is a registered Professional Civil Engineer in Singapore since 1994; He is also a Professional Engineer and Accredited Checker (Geotechnical). He has been involved in several large geotechnical consulting jobs for deep excavations, deep foundations, reclamation works, and geosynthetics in Singapore and in the region. Prof Harry Tan has served as the State Expert Witness for two recent major geotechnical failures, the collapse of Nicoll Highway Tunnel, and the pile foundation settlement failure of the 31-storey tower building at No. 3 Church Street. He has been an active user of Plaxis Geotechnical FEM software since 1992. He is also part of the Plaxis International Advisory Scientific Committee which is involved in the continued development of Plaxis softwares.

Prof. Lee Fook Hou, Associate Professor & Acting Head of Civil Engineering Department, National University of Singapore.
Dr Lee has a strong interest in soil improvement, especially in the modelling of soil improvement processes and the characterization of improved soil behaviour, as well as underground construction in urban areas. Dr Lee developed & commissioned the NUS Geotechnical Centrifuge, which is the only geotechnical centrifuge in Southeast Asia. He also has a strong interest in geotechnical finite element analysis & is currently the Technical Director of Geosoft Pte Ltd, which is marketing a fast, full-featured three-dimensional finite element software for geotechnical analysis. He is a registered Professional Engineer (Civil) as well as Professional Engineer (Geotechnical Specialist) and regularly acts as a consultant. Dr Lee is the Managing Director of the Journal of Earthquake and Tsunami.

Prof. Andrew Whittle, Professor, Department of Civil and Environmental Engineering , Massachusetts Institute of Technology, USA
Prof Whittle's main research interests relate to the development of constitutive models and their application in predicting the performance of foundations and underground construction projects. His research has been widely used in the design of foundation systems for deepwater oil production facilities in the Gulf of Mexico. He has worked extensively on problems of soil-structure interaction for urban excavation and tunneling projects. He is currently based in Singapore as the lead Principle Investigator for a major MIT research initiative on 'Environmental sensing and modeling' (http://censam.mit.edu). Dr Whittle has published more than 100 papers in refereed journals and conferences, and received several awards for his work from the American Society of Civil Engineers. He is a licensed professional engineer in New York State.

Prof. Chew Soon Hoe, Assistant Professor, Department of Civil Engineering, National University of Singapore
Prof Chew is the Deputy Director of the Centre for Protective technology (CPT), jointly established by the Ministry of Defence and NUS. He is actively involved in research and consultancy, relating to various applications of geosynthetics, erosion control, ground improvement and deep excavation projects in Singapore and this region. He has published widely on various aspects of geotechnical engineering, including deep excavation and numerical modelling. He has conducted many training courses on Slope/W, Seep/W and Sigma/W for practicing engineers in Singapore and Malaysia. He is the President of Southeast Asia Chapter of International Geosynthetics Society. He is also a registered Professional Engineer in Singapore.

Dr Poh Teoh Yaw, Senior Executive Geotechnical Specialist, Building and Construction Authority
Dr Poh oversees and administers the regulatory framework on building structure safety in Singapore. He is a geotechnical specialist with over 13 years of practical experience. He has authored over 15 publications in geotechnical design and construction, including those published in international peer-review journals and conferences.

	Participant Name	NRIC/Passport No	Designation	HP no.	Email	PEB
☐						☐

(Please √ accordingly)

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Mailing Address: _____ GeoSS membership no. _____

CONTACT PERSON PARTICULARS

Name: DR/Mr/Mrs/Ms: _____ Email: _____

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For enquiries, please call 6248-9999 / 6248-9843
or email bca_academy@bca.gov.sg

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REGISTRATION:

Seats are limited, registration is on a first-come-first-served basis. Seat will be confirmed upon the payment of the seminar fees before the commencement date.

Please fax application form to facsimile: **6258-0558**

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