

# **Workshop and Lectures on Geotechnical Engineering Practice: Deep Excavations for Basements of Buildings, Cut and Cover Tunnels and MRT Stations**



**Organised by: Centre for Infrastructure Engineering and Management and Griffith School of Engineering, Griffith University Gold Coast Campus**

**Date: 24-25 November 2008**

**Venue: Room G23 2.07A, Griffith University Gold Coast Campus**

**PLEASE NOTE THAT ONLINE REGISTRATION IS NOW AVAILABLE!  
FOLLOW THE LINK BELOW:**

**<https://www.conferenceonline.com/index.cfm?page=booking&object=conference&id=12855&categorykey=6F611798%2D1BF9%2D4BC6%2D8D94%2D77F9E70A43A5&clear=1>**

***See Online Registration Details Inside this Bulletin***

**For additional information please contact (preferably by e-mail)**

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## **INTRODUCTION**

Practice oriented Workshops and Courses are organised by Griffith University now for nearly five years. These activities are planned round the year only during the time when there is no formal teaching. Such a restraint is there as it is during the non-teaching period only, the lecture rooms are available for this purpose. A number of students are helping these and other activities and as such, they need to be planned carefully in order that it can be self supporting by itself. The next activity in this series is by Prof. Ou from Taiwan who has done some excellent works on deep excavations and has written many papers and recently published an excellent book.

Excavation is an important segment of foundation engineering. For example, in the construction of the foundations or basements of high rise buildings, underground oil tanks, subways or mass rapid transit systems, etc. Though books on general foundation engineering introduce the basic analysis and design of excavations, they are usually too simple to cope with analysis and design in practice. With economic development and urbanization, excavation goes deeper and is larger in scale, sometimes it is carried out in difficult soils. These conditions require advanced analysis and design methods and construction technologies.

Prof. Ou has focused on studies of soil behavior and excavation problems since beginning to teach in a university and has published many journal and conference papers concerning the subjects. At the same time, working with industrial builders, Prof. Ou has also taken part in many large-scale excavation projects and accumulated experience in analysis and design. Supported by extensive studies and combined with analytical experience, he has developed an excellent course on deep excavation at his university. VEX computer software developed by Prof. Ou for excavation analysis will also be discussed. Not only does the program help readers to understand excavation behavior, it also can be used as a design tool for excavations.

All practitioners and academics will benefit immensely by attending the lectures given by Prof. Ou.

## **DAILY PROGRAMME**

### **Day 1: Monday, 24 November 2008**

#### **Stability and Deformation Analysis**

**08:30 – 09:00am    Registration**

**09:00 – 10:40am    Stability analysis-1: Overall shear failure: push-in, basal heave and  
Ground upheaval**

**10:40 – 11:00am    Coffee**

**11:00 – 12:30pm    Stability analysis-2: Sand boiling and case studies with sand boiling**

**12:30 – 01:00pm    Lunch**

- 01:00 – 02:30pm    Deformation analysis -1: Simplified methods- effects of wall installation and lateral movements, 3D effects;**
- 02:30 – 03:00pm    Coffee**
- 03:00 – 05:00pm    Deformation analysis-2: (i) Ground settlements: characteristics, influence zones, shapes of settlement patterns, 3D effects;  
(ii) Empirical methods: Peck, Clough and O'Rourke, Ou and Hsieh;  
(iii) Case studies**

## **Days 2: Tuesday November 25, 2008**

- 08:00      –    09:00am    Registration**
- 09:00      –    011:00am    Deformation and stress analysis: (i) Simplified methods,  
numerical analysis, beam on elastic foundations and FEM of  
analysis**
- 11:00      –    11:15am    Coffee**
- 11:15      –    12:15pm    FEM analysis continued and case studies**
- 12:15      –    01:00pm    Lunch**
- 01:00      –    03:00pm    Excavation and protection of adjacent structures-1:  
  
(i) Procedure of evaluating the potential damage of adjacent  
structures  
(ii) Ground improvement**
- 03:00      –    03:30pm    Coffee**
- 03:30      –    05:00pm    Excavation and protection of adjacent structures-2:  
  
(iii) Cross wall  
(iv) Buttress wall  
(v) Micro piles  
(vi) Strengthening the retaining-strutting system**

**Geotechnical Engineering Practice:  
Deep Excavations for Basements of Buildings, Cut and Cover Tunnels and MRT  
Stations****ON LINE REGISTRATION AND PAYMENT:**

[HTTPS://WWW.CONFERENCEONLINE.COM/INDEX.CFM?PAGE=BOOKING&OBJECT=CONFERENCE&ID=12855&CATEGORYKEY=6F611798%2D1BF9%2D4BC6%2D8D94%2D77F9E70A43A5&CLEAR=1](https://www.conferenceonline.com/index.cfm?PAGE=BOOKING&OBJECT=CONFERENCE&ID=12855&CATEGORYKEY=6F611798%2D1BF9%2D4BC6%2D8D94%2D77F9E70A43A5&CLEAR=1)

**(A) SIMPLY FOLLOW THE LINK; YOU WILL BE REQUIRED TO FILL IN YOUR DETAILS  
AS BELOW:****First Name:****Last Name:****Preferred First Name:****Organisation:****Contact phone:****Fax:****Contact email:****Address:****City/Suburb:****State/Country:****Postcode/Zipcode:****Country:**

**\*Please note that password is also required. You will use this password to log into the User Admin area and modify your registration if necessary.**

**(B) BY CLICKING “NEXT STEP”, YOU WILL BE ABLE TO SELECT THE MODULE YOU  
INTEND TO ATTEND.**

- ☐ AUD \$ 390 - Monday, 24<sup>th</sup> November
- ☐ AUD \$ 390 - Tuesday, 25<sup>th</sup> November

**By ticking the box, you are now registered for the day you selected.**

**(C) PLEASE CLICK “NEXT STEP” AGAIN, YOU WILL NOW ABLE TO SELECT THE  
PAYMENT METHOD YOU WANT TO USE. THESE INCLUDE:**

- ☐ CREDIT CARD (VISA/ MASTERCARD/ AMEX)
- ☐ CHEQUE
- ☐ DIRECT DEPOSIT (EFT)

**(D) AFTER YOU FILLED IN ALL THESE DETAILS, YOU ARE NOW REGISTERED  
IN THE WORKSHOP BY CLICKING THE “SUBMIT” BUTTON. AN INVOICE  
WILL BE SENT TO YOUR EMAIL DIRECTLY.**

**\*For additional information please contact (preferably by e-mail)**

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# Bio-data

Prof. Chang-Yu Ou received his Bachelor's Degree in Engineering in 1977 from National Cheng-Kung University in Taiwan and his Masters and Doctoral Degrees from Stanford University in 1984 and 1987 respectively. He is currently the Dean of engineering at the National Taiwan University of Science and Technology, Taipei, Taiwan. He is also the **Director** of Ecological and Hazard Mitigation Engineering Research Center of the National Taiwan University of Science and Technology, Taipei, Taiwan. He was also a Visiting Professor at University of California, Berkeley.

His areas of interest are deep excavations, soil behaviour, soft ground tunnelling and ground improvement.

## Details of the Book by Prof. Ou

The book is divided into twelve chapters, whose contents are summarized as follows:

The first chapter introduces the flow of analysis and design of excavations. The second chapter introduces the basic properties of soils and the representative values for various urban soils around the world. Besides, the chapter also explains the principles of drained and undrained strengths of soils and the test methods to obtain them. The third chapter introduces commonly used excavation methods and retaining-strut systems. The excavation of the Taipei National Enterprise Centre (TNEC), referred to many times as an example in the book, is also introduced in this chapter. The fourth chapter introduces the concept of lateral earth pressure and its application to excavation.

The fifth chapter introduces the ultimate analysis, the uplift analysis, and sand boiling analysis for excavations. Also, reasonable factors of safety for these analyses are discussed in this chapter. The sixth chapter introduces the hand calculation for the estimation of excavation-induced deformation, ground settlement, and the stress of the strutting-retaining wall. The method, which is based on hand calculation, is called the simplified method in the book. The seventh chapter introduces deformation and ground settlement analysis by using the beam on elastic foundation method. The eighth chapter introduces deformation and ground settlement analysis by using the finite element method.

The ninth chapter introduces methods of dewatering, well theories and the design of excavation dewatering. The tenth chapter introduces the design of structural components in braced excavations and anchored excavations. These components include the retaining wall, the strut, the wale, the centre post, and the anchor. The eleventh chapter introduces building protection during excavation, including the determination of allowable settlement, commonly used building protection methods, and auxiliary methods. The twelfth chapter introduces the principles of monitoring instruments, items of instruments, determination of alert and action values, and the application of feedback analysis.