



Malaysian Geotechnical Society

Webinar – Talk On “Lessons Learned from Deep Excavation in Various Grounds and Case Histories of Deep Excavation in Taipei and Malaysia”

9th March 2022 (Wednesday) 5.00 p.m to 7.00 p.m
BEM Approved CPD Hours: 2 Ref. No. Ruj Kami: BEM/REG/12 Jld. 9 (109) PEB PDU: 2

Speaker 1: Professor Benson Hsiung

Title: Lessons Learned From Deep Excavation in Various Grounds

Synopsis: Due to a fast development of urban area, it has a need to increase underground space for the use of both public and private sectors. Deep excavation thus becomes an important tool to fulfill the need stated above. Therefore, details of excavations in various ground conditions, such as clay, sand, gravel and even mixed ground with different retaining structures and excavation methods are collected. Field monitoring data and construction details are first collected to explore engineering characteristics of deep excavations under different conditions and reasons lead to these characteristics are examined too. After confirming the reliability of field monitoring data, details of lab and in-situ tests data are studied and advanced numerical simulations are undertaken to validate soil parameters and also excavation-induced behaviours. Considering results from these studies, simplified methods are developed to be adopted for the application of engineering practice. At the end, introductions of some new technologies for deep excavations, such as centrifuge test and LIDAR are included in the presentation too.



Profile: Professor Benson Hsiung completed his first degree in Taiwan in 1993 and then continued to work on his Master degree in University of Illinois, Urbana- Champaign, United States starting from 1994. After Professor Hsiung graduated from University of Illinois, he came back to Taiwan to work as a geotechnical engineer for approximately 1 year before he went to University of Bristol, United Kingdom to work for his PhD. Professor Hsiung got his PhD at the end of 2001 and then moved to London to work for Maunsell (now AECOM) for several large- scale infrastructure projects in both UK and Taiwan. He went back to Taiwan and joined Department of Civil Engineering, National Kaohsiung University of Applied Sciences (now rename to National Kaohsiung University of Science and Technology, NKUST) in August 2003. Main research activities which Professor Hsiung has are deep excavations, soft ground tunneling and soil improvement etc. Professor Hsiung is a well- qualified British chartered civil engineer and also acts as international secretary and executive committee member of Chinese Taipei (Taiwan) Geotechnical Society currently. He is the secretary of ATC6 as well as member of TC305 of ISSMGE.

Speaker 2: Ms Tseng Ting-Ling

Title: Top-Down Deep Excavation Case in Taipei

Synopsis: In order to shorten the time of underground structure construction, the Top-down method may be selected for deep excavation. During the construction, the unsupported excavation depth of the last stage excavation is large and then possibly leads to a comparatively larger wall displacement and the rebar in the rebar cage is not easy to arrange in the aspect of constructability. Therefore, additional levels of the strut at the last excavation stage are often to be used to decrease the induced displacement, shear, and moment of the diaphragm wall. Some alternatives are also considered to solve this issue in which it has a difficulty to install steel struts. In this case study, the triangle temporary reinforced concrete supports which connects to the steel column and slab is applied to replace the strut and design and construction details are briefed. At the end, numerical results using PLAXIS2D are compared with the monitoring data and some discussions are explored.



Profile: Ms. Ting-Ling Tseng completed her Bachelor degree in 2018 at the National Kaohsiung University of Applied and Sciences (now rename to National Kaohsiung University of Science and Technology, NKUST) and then continued to work on her Master degree in geotechnical engineering at National Taiwan University. After graduated from National Taiwan University in 2020, she works for Trinity Foundation Engineering Consultants Co., Ltd as geotechnical engineer. She is responsible for on-site geotechnical investigation, preparation of geotechnical interpretation report, geotechnical design of underground structure and impacts on adjacent MRT structures from deep excavations nearby etc.

Speaker 3: Mr Ang Jen Shen

Title: Deep Excavation Using Diaphragm Wall with Buttress Wall in Taipei and Malaysia

Synopsis: Buttress walls have been widely adopted, with many successful cases for excavation work. The field instrumented displacement data indicated that buttress walls could effectively reduce the lateral displacement of diaphragm wall and thus enhance the stability of the excavation work. The interaction between the soil/buttress- and diaphragm walls is a three-dimensional problem. In such, three-dimensional finite element analyses of two deep excavations using diaphragm wall with buttress walls in Taiwan and Malaysia will be presented.



Profile: Mr. Ang Jen Shen completed his Bachelor degree and Master Degree in Taiwan (Kaohsiung) in 2018 from Department of Civil Engineering, National Kaohsiung University of Science and Technology.

Mr. Ang has 3 years' experience in the design, construction and project management of Geotechnical works for major civil and building projects. He is currently working for G&P Professionals group in Malaysia as geotechnical engineer.

Mr. Ang Jen Shen has been actively involved in numerous projects related to rail transit systems, tunnels, highways and underground works for deep basements. He has a wide knowledge and experience dealing with challenging ground conditions such as Kuala Lumpur Limestone, Kenny Hill formation, Granite Formation and soft ground. He is also familiar with advanced finite element modelling using PLAXIS3D and PLAXIS2D specifically on modelling of soil-structure interaction (such as deep excavation, deep and shallow foundation) and soft ground settlement with different methods.

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Ir. Dr. Dominic Ong Ek Leong
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