香港岩土及岩土環境工程專業協會
ASSOCIATION OF GEOTECHNICAL &
GEOENVIRONMENTAL SPECIALISTS (HONG KONG)

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ANNOUNCEMENT

AGS (HK) Technical Seminar

Effectiveness of Cross-Walls in Reducing Wall Deflections in Deep Excavations

by

Lup Wong WONG

Date : 25 August 2022

Time : 18:30 – 19:30 (Hong Kong Time)

Venue : The webinar will be conducted through Zoom.

Successful applicants will be provided a link to the seminar. Participants should arrange for their own device with a stable network environment to join the webinar.

Enquiry : For general enquiries, please contact

Haydn Chan (email: haydn.chan@arup.com)

Seminar Fee : Free of charge

Registration : https://forms.gle/zVC4dFTyRaanSgYH6

Please register by 22nd August 2022. Successful applicants will receive webinar details on 23rd August 2022. CPD certificate will be sent to the attendees after the webinar.

Book Prize : The youth professionals under 35 years old are encouraged to submit their reports (max. 500 words) in quality on this event. Please refer to the AGS HK's website "The AGS Book Prize Reports–Assessment Framework" for details before the submission. The successful candidate will be awarded with the Book Prize that comprises of a book "Geology of Site Investigation Boreholes in Hong Kong" that written by Chris Fletcher, and a book coupon with value of HK$500 from Eslite Bookstore (誠品書店). The awarded report will further be uploaded to the website of AGSHK. Please send your report to Mr. Haydn Chan through the email: haydn.chan@arup.com.

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Synopsis:

Cross-wall is common construction method for protecting structures adjacent to deep excavations. It was initially developed for improving bottom heave stability and limiting displacements in deep excavations using diaphragm walls to act as cross-walls below the final excavation level in soft clay in Norway. Case histories for using cross-walls to reduce the displacements for excavations as deep as 32.5 m deep in soft clay in Taipei are reported. Although these case histories show that cross-walls are very effective in reducing lateral displacements of diaphragm wall, the design methodology has not been fully developed. The key parameters for design and analysis would be the stiffnesses for soils and for the cross-wall panels. Three cross-walls were installed to brace the diaphragm walls prior to excavation for a cross-over tunnel of the Taipei Metro in front of the South Gate of the old Taipei City and has now been a National Heritage. The cross-over tunnel had the maximum excavation depth of 20.1 m. The performance of the case history provides the opportunity for assessing the influence of the cross-wall panels. Three-dimensional finite element analyses have been performed to evaluate the effectiveness and the influence of the 3 cross-walls in reducing the wall deflections. The nonlinear Hardening-Soil model has been adopted in the analyses. The results of the analyses indicate that the maximum wall deflections are much reduced as a result and the effectiveness of cross-walls is thus proved. Understanding the influence of the cross-wall would enable rational design on the cross-walls such as determining the spacing, the thicknesses and the depths of the cross-wall panels.

About the Speaker:

Ir Lup Wong WONG, BSc, MEng, MHKIE, RPE (Geotechnical & Civil), has been the principal engineer of SMEC Asia Limited since 2013. He has extensive experience on infrastructure projects note-worthy the Central Reclamation, the Central-Wan Chai Bypass Tunnel, the West Kowloon Terminus Station of the Express Rail Link, the Hong Kong Boundary Crossing Facility Passenger Clearance Building of the Hong Kong-Zhuhai-Macao Bridge and the Kai Tak West of the Central Kowloon Route. He was the key technical person responsible for the geotechnical aspects of the Taipei Rapid Transit Systems, the Hsinchu-Miaoli-Tung Hsiao section of the Taiwan High Speed Rail and the 706 km long Pan Borneo Highway in Sabah. Ir Wong has published over 50 technical papers on 2D and 3D numerical modelling, deep excavations for basements and underground stations, deep foundations, slope stabilization, groundwater control and on ground treatment.