

Technical Session on Forensic Investigation of Long-Term Tunnel Settlement of Two Metro Lines in Shanghai

Organised by: GETD-TUSTD-WTC2020

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BEM Approved CPD/PDP Hours: 2 Ref No: IEM19/PP/xxx/T

Day/Date : **24th June 2019 (Monday)**

Time : **5.30 pm – 7.30 pm** (Refreshment will be served at Ground Floor)

Venue : **Malakoff Auditorium, Lower Ground Floor, Wisma IEM, PJ**

Presenter : **Prof. Charles W.W. Ng,**

The Hong Kong University of Science and Technology, HKSAR, China

SYNOPSIS

Non-uniform excessive tunnel settlements and relatively small tunnel heaves have been observed along Shanghai Metro lines 1 and 2 over the first 15 years of operation. The tunnels of the two Metro lines were constructed using an Earth Pressure Balance (EPB) machine. The causes of the observed large long-term tunnel settlements of up to 144 mm at some stations have been investigated and postulated by many engineers and researchers. However, the actual causes are still not fully understood. In this talk, four possible causes including the effects of tunnel construction, secondary compression of soft clay, cyclic loading due to running trains, and groundwater pumping are investigated and discussed. The likely mechanism for the observed long-term tunnel settlements is identified and explained.

ABOUT THE PRESENTER

Professor Charles W.W. Ng is currently the CLP Holdings Professor of Sustainability, Chair Professor in the Department of Civil and Environmental Engineering and Associate Vice-President for Research and Development at the Hong Kong University of Science and Technology (HKUST). He is a Chartered Civil Engineer (CEng) and Fellow of The Institution of Civil Engineers (FICE), United Kingdom (UK). He is the President of International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). Professor Ng obtained his MSc and PhD degrees from the University of Southampton and the University of Bristol in the UK in 1987 and 1993, respectively. After carrying out a period of post-doctoral research at the University of Cambridge between 1993 and 1995, he returned to Hong Kong and joined HKUST as Assistant Professor in 1995, and rose through the ranks to become Chair Professor in 2011. Professor Ng has become Chair Professor in 2011.

Professor Ng has supervised 48 PhD and 46 MPhil students to graduation and mentored dozens of postdoctoral fellows and visiting scholars. Professor Ng was elected an Overseas Fellow from Churchill College, Cambridge University, in 2005 and was elected Changjiang Scholar (Chair Professor in Geotechnical Engineering) by the Ministry of Education in China in 2010. Also he was elected as a Fellow of the Hong Kong Academy of Engineering Sciences in 2008.

Professor Ng has published over 300 SCI journal articles and 200 conference papers and delivered more than 50 keynotes and state-of-the-art reports in five continents. He is the main author of three reference books: (i) Soil-structure Engineering of Deep Foundations, Excavations and Tunnels by Thomas Telford, (ii) Advanced Unsaturated Soil Mechanics and Engineering and (iii) Plant-Soil slope Interaction by Taylor & Francis. He has received many awards including the 2017 Telford Premium Prize from the Institution of Civil Engineers, the Henry Adams Award from the Institution of Structural Engineers, the first Tan Swan Beng Award from the Southeast Asian Geotechnical Society, and the R. M. Quigley Award from the Canadian Geotechnical Society three times for his three best papers published in 2007, 2012 & 2016. He was conferred the Mao Yisheng Youth Award by the Chinese Institute of Soil Mechanics and Geotechnical Engineering for his significant contributions in Geotechnical Engineering over the years. He was one of the recipients of the 2nd Prize of 2015 Scientific Technological Advancement Award by the State of China.

Ir. Lee Peir Tien

Chairman,
Geotechnical Engineering Technical
Division (GETD)

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Tunnelling and Underground Space
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(Effective 1st October 2017)

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