

DEPARTMENT OF CIVIL ENGINEERING

SEMINAR

Effect of tunnelling on adjacent ground and existing tunnels: a Crossrail's case history

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Date: 6 March 2024 (Wednesday)
Time: 10:30 a.m. – 11:30 a.m.
Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

ABSTRACT

The new London Underground Elizebath Line (formerly called Crossrail) had its civils and tunnelling works through London completed from 2011 to 2015. The Crossrail construction project offered excellent opportunities for researchers and partitioners alike to establish valuable case histories of field monitoring of the response of the ground and existing structures to the adjacent tunnel and underground station construction.

The twin-bore Crossrail tunnels under western and central London were mostly constructed in London Clay using earth-pressure-balance machines (EPBMs). The tunnelling-induced ground response, in terms of surface and subsurface displacements, as well as changes in pore water pressure and total horizontal stress, was measured at a 'greenfield' research monitoring site in Hyde Park. The key findings from the field research have been published in Géotechnique, which contribute to a comprehensive and unique field monitoring case history of the short-term ground response to EPBM tunnelling in London Clay, making them invaluable for assessing ground response to tunnelling and validating future numerical analyses. The field monitoring of ground and existing tunnel response was one of five strands of a coordinated Crossrail research programme performed by Imperial College London.

In this Techtalk, Dr Wan will present key aspects of the measured ground and existing tunnel response caused by the different stages of the tunnel construction, with an emphasis on the interpretation of the monitoring data in relation to various EPBM operations. The other research strands will also be introduced to highlight the importance of a coordinated research programme to capitalising the unique case history to advance the understanding of the effect of tunnel construction on the adjacent ground and existing structures.

ABOUT THE SPEAKER

Michael is a UK and Hong Kong chartered engineer, having over 20 years of experience in geotechnical engineering services in Europe and Asia, after graduating from HKU with a BEng in 1999 and a MSc in 2003. Having obtained his PhD at Imperial College London in 2014, Michael currently works at Geotechnical Consulting Group LLP based in London where he performs specialist geotechnical consultancy work and continues practical engineering research. His areas of expertise include geotechnical instrumentation & monitoring, ground movement assessment, and buildings & utilities impact assessments.

For his highly rated and cited publications of the Crossrail field monitoring case history in Géotechnique, Michael won ICE Telford Gold Medals twice and a British Geotechnical Association (BGA) Medal. Michael is a Fellow of the Institution of Civil Engineers and currently Chairman of the UK Chapter of the Hong Kong Institution of Engineers.

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