



Dr Michael Wan
BEng MSc PhD DIC CEng MICE MHKIE
Associate Director

Areas of expertise

Dr Michael Wan qualified as a chartered engineer in 2008 and has worked in the civil and geotechnical engineering industry mainly in the United Kingdom and Hong Kong for over 15 years, with extensive experience of infrastructure and building projects involving different ground conditions ranging from stiff over-consolidated clays, residual soils to very soft marine & alluvial deposits. His expertise areas include buildings & utilities damage assessments, foundations & deep excavations, field instrumentation & monitoring, infrastructure structural health monitoring, slopes & retaining walls, reclamation & ground improvement.

Experience with GCG

Michael is a UK and Hong Kong chartered engineer who joined the Geotechnical Consulting Group in April 2015. His roles within GCG include providing geotechnical specialist services, ranging from pre-planning advice, independent engineering checking, to full engineering design, for a number of public and private clients for foundation and deep excavation projects in central London. He was also involved in forensic investigation/expert witness work for a number of legal/dispute cases in the UK and overseas. While at GCG, Michael remains active in publishing award-winning technical research papers and giving presentations related to his research work with Imperial College and Crossrail concerning the effects of construction on adjacent ground and existing infrastructure (LUL's Central Line).

Working with a number of structural engineering consultants, Michael provided geotechnical specialist advice and input to pile foundation, excavation and basement design schemes during different RIBA stages for various tall building and deep basement projects in central London. He is experienced in helping structural engineers develop conceptual and detailed schemes of basement and foundations amid restrictions posed by ground conditions and underground obstructions. He also has extensive experience of advising and evaluating options of deep basement construction sequence and programme.

His work has involved assisting clients to satisfy 3rd party asset protection requirements by carrying out ground movement analyses and building & utilities damage assessments for deep basement and tunnelling works, with particular consideration on the potential impacts on existing cast iron and masonry lining tunnels and sewers. The major asset owners concerned include London Underground, London Overground, Network Rail, Royal Mail Group and Thames Water. He has worked to help clients to develop schemes in vicinity of major infrastructure (Crossrail 1, Crossrail 2 and High Speed Two) that fulfil safeguarding requirements, leading to approval of local authority planning applications and discharge of the conditions pursuant to planning application approvals.

Michael has been an integral part of the geotechnical peer review team for a logistic park client who has tens of large development sites of warehouses and data centres (usually tens of hectares) across Germany among other European countries. He has provided critical review of the works performed by the local consultants and contractors. Major geotechnical risks were identified and managed appropriately by working with the Client and the project team from the inception stage of acquiring the sites to the final stage of construction completion.

More recently, Michael led an investigation of the performance of the structural health monitoring system installed in two existing unbolted wedge-block precast concrete lined water tunnels under the River Thames, London in anticipation of the crossing of a TBM in close proximity for the construction of the Thames Tideway Tunnel. The installation records, initial calibration results and background measurement readings of the vibrating wire type and fibre optics type strain gauges and pressure transducers were interrogated in an attempt to determine the functionality, accuracy and fitness-for-purpose of the installed monitoring system. He made practical recommendations for the present and future projects including lessons learnt during installation and correction factors for data interpretation.



GEOTECHNICAL CONSULTING GROUP

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Previous experience

Prior to joining GCG, Michael worked in the Department of Geotechnics in Crossrail (UK) where he actively provided geotechnical advice and support to contract delivery teams at different Crossrail sites of bored tunnels and stations. He was also seconded to the bored tunnel Framework Design Consultant team carrying out the assessment of ground settlement induced by tunnel construction and box/shaft excavation in central London.

From 2009 to 2014, Michael undertook his PhD research at Imperial College London funded by Crossrail, investigating the ground response induced by construction of tunnels in London Clay by earth pressure balance tunnel boring machines (EPBMs). For the research investigation, he planned, designed and supervised the ground investigation and the state-of-the-art instrumentation works in Hyde Park, involving more than 40 borehole instruments and 60 surface monitoring points, obtaining research-quality field monitoring data of ground displacements and stress changes in response to EPBM tunnelling works. As part of the overall monitoring scheme, he also planned and organised the instrumentation and monitoring within the London Underground Central Line running tunnels near Lancaster Gate station. He disseminated the research results in form of a number of peer-reviewed journal papers and thesis publication.

Before moving to the UK in 2009, Michael was a chartered civil engineer (MICE and MHKIE) based in Hong Kong with Arup Geotechnics, with vast experience in geotechnical engineering practice in Asia including Hong Kong, Macao, Mainland China and Singapore. He acted as the Engineer's Representative for a full-scale field trial of ground improvement techniques for Disneyland Development in Shanghai, overlying very soft alluvial deposit where extensive ground improvement works were required. As a geotechnical consultant, he provided technical advice to the Chinese contractor, and interpreted the field monitoring results and assessed the performance of various improvement techniques such as the traditional surcharge preloading, vacuum preloading and dynamic preloading. He authored a number of field trial reports, on the basis of the monitoring result interpretation, recommending the client for the use of vacuum preloading method in light of significant saving in construction time and cost.

Michael's experience in Hong Kong is wide-ranging including geotechnical works in residual soil in tropical and sub-tropical climate. During his earlier career, he gained extensive experience in slope and retaining wall remedial work design and construction in decomposed granite and tuff with varying weathering degrees. Michael's other involvements in Asia region includes conducting an independent peer review on the geotechnical design of the basement construction of Marina Bay Financial Centre Phase 2 (Singapore), geotechnical engineering design of foundations and deep excavations for Venetian Cotai Resort Development (Macao), and the conceptual study of Hong Kong-Zhuhai-Macao Bridge Macao Landing Point involving large-scale reclamation.

Areas worked

UK, Germany, Slovakia, Ukraine, Croatia, Hong Kong, Singapore, Malaysia, Macao, China.

Education/Research

PhD, Imperial College London, 2014

MSc and DIC, Imperial College London, 2006

BEng, University of Hong Kong, 1999

Scholarships/Awards

Telford Gold Medal (for the best paper published in all ICE journals of the year), 2018

British Chevening Scholarship, 2005-2006

Professional Qualifications & Memberships

Member of British Geotechnical Association (BGA), 2014

Member of Hong Kong Institution of Engineers (MHKIE), 2008

Chartered Engineer (CEng), 2007

Member of Institution of Civil Engineers (MICE), 2007

Service on Technical/Professional Bodies

Organising committee of ISSMGE TC220 International Symposium on FMGM, London 2022

Reviewer for ICE Chartered Professional Review, 2020

Editorial panel for Géotechnique Symposium-in-Print, 2019

Committee of UK Chapter of Hong Kong Institution of Engineers, 2018 – present

Languages (Other than English)

Mandarin and Cantonese