



**Dr S W Lee**  
 BEng MSc MSc DIC PhD  
 MICE MHKIE MIED MIEM MIES  
 CEng NRA PEng RPE (CVL & GEL)  
**Associate Director**



### Key Experience

Dr S W Lee has 13 years geotechnical experience since graduation and his experience includes work with consulting engineers and in academic research. In his 10 years with GCG (Asia) Ltd he has carried out advanced analytical studies and designs for deep excavation, tunnelling, foundation, slope, reclamation, embankment, offshore geotechnics and hydrogeology. He has involved in site supervision and management. He is a committee member of AGS (HK) 2010-2012 and of ISSMGE TC103 Numerical Methods in Geomechanics 2010-2013, a reviewer for several ICE journals, an invited speaker for Plaxis and MPile courses in Asia, and an Advanced Registered Analyst with NAFEMS.

### Career Summary

#### 2001 – present: Graduate/Senior/Principal Geotechnical Engineer/Associate Director, GCG (Asia)

- Feasibility study/assessment of reclamation for Manjung Power Plant 4<sup>th</sup> Unit Extension, Malaysia
- Assess deep excavation for Western Cross Harbour Water Main, HK
- Assess subsea twin-tunnel interaction for Tuen Mun-Chek Lap Kok Link, HK
- Assess deep exc. effects on existing buildings in Whampoa, C1002 Kwun Tong Line Extension, HK
- Assess deep exc. effects on existing piles at Hung Hom Station, C1106 Shatin Central Link, HK
- Feasibility design and assessment of effect of new development excavation on the existing Joondalup Line tunnels for the Hub Project, Perth, Australia
- Assess tunnelling effects on existing piled foundation for C825, Express Rail Link, HK
- Design of deep excavation for tunnel launching shaft and assessment of ground stability due to existing tunnel lining removal for C703, West Island Line (WIL), HK
- Detailed engineering design for 50 ha fuel storage facilities reclamation, Tanjung Bin, Malaysia. Investigation into instability of a slope due to rapid reclamation construction.
- Assessment of tunnelling and deep excavation effects on piled foundation for existing buildings, WIL
- Establish design procedure of cement mixed soil and investigate softened residual soil from dredging for Pasir Panjang Terminal reclamation, Singapore
- Assessment of DWall excavation near viaduct piled foundation, Woodsville Interchange, Singapore
- Assessment of Grade Separated Road excavation on existing Piccadilly Line tunnels, Heathrow, UK
- Assessment of effect of tunnelling on existing buildings for Sydney Desalination Pipeline, Australia
- Assessment of trench stability for diaphragm walls at Contract C909 Chinatown Station, Singapore
- Investigation and design of drainage pipeline settlement in Yuen Long, Hong Kong
- Alternative design of bored pile wall and piled reinforced earth wall for Anderson Road, Hong Kong
- Tender design of launching shaft and tunnel-pile interaction for Lai Chi Kok Transfer Tunnel, HK
- Assessment of caisson and reclamation settlement for Busan New Port, Korea
- Foundation design for the Signature Towers, Dubai
- Investigation into excessive movements of piles installed in soft clay for Macau Studio City
- Geotechnical design for a deep foundation system at Business Financial Center, Singapore
- Investigation into cracking of an approach embankment for Port of Brisbane Motorway and geotechnical design in soft ground for Gateway Duplicate Bridge, Brisbane, Australia
- Geotechnical design for excavation in soft clay for casino City of Dreams, Macau
- Assessment of stability of an oval-shaped shaft at North Point sewage pumping station, Hong Kong
- Assessment of earthquake susceptibility for Songyu Container Terminal Port reclamation, China
- Investigation of excessive settlement and tilt of a 30-storey office building in Church St., Singapore
- Geotechnical assessment report for a mooring system at Dung Quat Refinery, Vietnam
- Investigation of excessive settlement caused by piling work at the Sheung Wan pumping station, HK. Design of earth lateral support system for the deep excavation of the station.
- Supervision & interpretation of piling obstruction for 600 nos. bored piles for Contract KDB400, KCRC Kowloon Southern Link (KSL), Hong Kong
- Review of 1 km long deep excavation design for Contract KDB300, KCRC KSL, Hong Kong
- Investigation of excessive settlement of a workshop building at D290, Taiwan High Speed Rail Link
- Assessment of the effect of deep excavation on adjacent 20-storey buildings for Contract KDB300, KCRC KSL, HK. Investigation into large ground settlement caused by sheet piling.
- Resident engineer for a residential development at 55 Conduit Road, Mid Levels, HK. Responsible for site safety, ground investigation, instrumentation monitoring and reporting of slope conditions, and involved in tendering for a bored pile wall construction and land survey.
- Review & finite element (FE) analysis of twin tunnelling effect for Perth New Metro Rail, Australia
- Review and FE analysis of a deep excavation for Saigon East-West Highway, Vietnam

### Geotechnical Consulting Group (Asia) Ltd



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- 2D & 3D FE analysis and reporting for investigation of Nicoll Highway Collapse, Singapore. Review and analysis of deep excavation design for the realignment work.
- 2D & 3D FE modelling and reporting for tender design of the cut-and-cover tunnels for KCRC KSL, HK. Analyses extended to temporary work design during construction.
- 2D & 3D FE analysis of groundwater table drawdown for Po Shan Drainage Tunnels, Mid-levels, HK
- Interpretation & reporting for reclamation settlement at Cyberport, HK
- Investigation for Lok Ma Chau embankment failures at Shatin Eastern Main Drainage Channel, HK
- Assessment of effect of residential development on a disused tunnel in Kowloon Tong, HK
- FE modelling & reporting for a sequenced slope formation and associated cracking of a road pavement at 55 Conduit Road, Mid-levels, HK. Established a hydrogeological model for the slope area. Supervised and interpreted pumping test results.
- FE analysis & reporting for pile lateral movement due to placement of reclamation fill at Container Terminal 9, Tsing Yi, Hong Kong. Results were used in an arbitration.
- FE & subgrade reaction analyses for cut-and-cover tunnels and retaining walls for Perth City Rail, Australia
- Detailed engineering design of 70 hectares reclamation works in Tanjung Bin Malaysia using FE modelling and interpretation of instrumentation monitoring data
- Slope stability analyses & reporting for the TCC 300 Lok Ma Chau Terminus and Pak Shek Kok reclamation in Hong Kong, and ash lagoons at the Manjung Power Station in Malaysia
- Interpretation of PLAXIS program manuals and deep excavation modelling results for Meinhardt, Singapore. Presentation of findings to Land Transport Authority, Singapore.
- FE analysis & reporting for stability of the twin Shatin Height rock tunnels, Hong Kong
- Finite difference (FD) analysis & reporting for sequentially excavated rock tunnels in completely decomposed granite for Route 7, Ma On Shan, HK. Rock mapping on the blasted tunnel face.
- FD soil-structure interaction analysis & reporting for underpinning an existing MRT Station in Singapore. Investigation of the effect of adjacent excavation and water pressure on the structure deformation.
- FD soil-structure interaction analysis & reporting for the effect of tunnelling on piled foundations for the Link Sewer Tunnels, Singapore
- FD flow analysis & reporting for runway heave at HK International Airport due to entrapped air pressure and tidal variation. Carried out custom-made laboratory air permeability tests on runway materials. Measurement & interpretation of air pressure data, and design and installation inspection of air pressure relief systems at the airport runway.
- FD modelling & reporting for load shedding in the shaft friction of bored piles for KCRC Ma On Shan Rail Extensions, HK. Prepared pile foundation design alternatives. Prepared claims for the contractor due to unforeseen ground conditions.
- FD modelling & interpretation of pile load tests for Taiwan High Speed Rail Link
- Supervision & interpretation of instrumentation monitoring data for the excavation of cut-and-cover tunnels at KCRC Tsuen Wan West Station, Hong Kong
- Assessment of reclamation settlement for a 2100KW power station in Manjung, Malaysia. FD modelling & reporting for an ash lagoon construction. Supervised field instrumentation installation.

#### **1998 – 2001: Research Engineer/Scholar at Cambridge University, UK**

Research thesis entitled "The effects of compensation grouting injections on tunnels" involving centrifuge and numerical (ABAQUS finite element) modelling in sand. As part of this work site data was made available from the London Docklands Light Railway Lewisham Extension where compensation grouting was used during tunnelling in layered ground conditions. This allowed the numerical modelling method developed in association with the centrifuge modelling to be tested against actual field data. The research resulted in an increased understanding of the compensation grouting process, particularly with respect to the interaction with tunnel design and achievable surface heave. Responsible to GCG (London) for conducting 7 centrifuge tests in layered ground conditions investigating the effects of tail voids on the stability of a segmented tunnel subjected to tidal water pressure variations. Responsible to Tokyo Gas Ltd for conducting numerical analyses (ABAQUS) in 2D and 3D investigating the pulling forces of pipes in axial, diagonal and lateral directions in both clays and sands. Supervisor for 3<sup>rd</sup> year Soil Mechanics course at the Cambridge University Engineering Department.

#### **November 1997 – March 1998: Civil Engineer with Perunding Timur Sdn. Bhd. (Malaysia)**

Civil design engineer for high-rise structures, roads, sewerage and sanitary systems.

#### **May 1996 – September 1996: Geotechnical Engineer with Dr Y G Tan & Engineers (Malaysia)**

Geotechnical design engineer for building foundations, highway bridges and piling seismic monitoring.

#### **Education**

MSc (Distinction) in Project Management, The Hong Kong Polytechnic University, 2008

PhD in Geotechnical Engineering (Tunnelling), Cambridge University, UK, 2001

MSc (Distinction) in Soil Mechanics & Environmental Geotechnics, Imperial College, London, 1997

BEng (1<sup>st</sup> Class Hons.) in Civil Engineering, University of Technology Malaysia, 1996

#### **Awards**

Co-winner of ICE Hong Kong Association Paper Competition 2001

Cambridge Commonwealth Trust & British Overseas Research Students Scheme Awards 1998 - 2001

The British High Commissioner's Chevening Awards 1996 -1997

#### **Professional Affiliations**

Registered Professional Engineer (Civil & Geotechnical), Registration No. RP0393970

Advanced Registered Analyst with NAFEMS (National Agency for Finite Element Methods & Standards, UK), No.102

Chartered Engineer, Engineering Council (UK), Membership No. 563613

Chartered Civil Engineer & Corporate member of the Institution of Civil Engineers (UK), Membership No.50980678

Corporate member of the Hong Kong Institution of Engineers, Membership No. MW0393970 (Geotechnical)

Corporate member of the Institution of Engineering Designers (UK), Membership No. 26763

Corporate member of the Institution of Engineers Malaysia, No. 20142; Professional Engineer, BEM, No. 13889

Member of the Institution of Engineers Singapore, Membership No. 20010043