K.G. Higgins
BSc MSc DIC FREng FICE FCIHT
Senior Partner
Visiting Professor, Imperial College London

Areas of expertise
Assessment of the impact of construction on infrastructure. The design of embankments, earth retaining structures, shafts, tunnels, foundations, monitoring systems and interpretation of results.

Experience with GCG
In 2019 Kelvin became a Fellow of the Royal Academy of Engineering. Since 2012 he has been a Visiting Professor at Imperial College, London. Until recently he was Chair of the British Geotechnical Association and Chair of CIRIA's Geotechnical Advisory Panel. Since joining GCG in 1986 Kelvin has worked on the application of numerical methods to engineering problems, including the design of tunnels, retaining structures, highways, dams, embankments, cuttings, and foundations (offshore and onshore).

He has extensive experience of the assessment of the effects of underground construction, which includes excavations, shafts and tunnels (SCL, segmental, brick lined and cut & cover tunnels), on adjacent structures. This includes developing alternative designs, construction techniques and sequencing of works to mitigate the effects of construction on adjacent structures and services by predicting the effects of construction on adjacent structures, services, operational tunnels and installations within these structures (e.g. escalators, permanent way, etc.). These activities have been predominately within a railway environment and in a number of cases he has been able to demonstrate economic benefits to alternative sequences and designs. He regularly advises Clients on these issues and the infrastructure companies.

Responsible for GCG's input to the Port of Dublin Tunnel and recently he has worked on the design of the Bank Station Upgrade that included assessing the effects of construction on buildings (masonry & framed), tunnel and shaft construction, the Bloomberg development in the City of London adjacent to Bank Station, the Nova development in Victoria built while the Victoria Station upgrade was underway, developments at Heathrow over existing tunnels and numerous other developments in the urban environment. In most of these cases piled foundations and retaining structures of different form have been used. His work has extended to the design of monitoring systems and the interpretation of results throughout construction and beyond. He worked for Tideway reviewing reports related to the impact on bridges, tunnels, river walls etc. and was an expert witness for the DCO. He has investigated the causes of the failures of foundations and slopes, designed remedial schemes and monitored construction. He has also provided expert advice related to legal proceedings.

His research and publications cover earth retaining structures, slopes, sheet piling, new monitoring technologies , soil behaviour, the performance and analysis of foundations, earth retaining structures, tunnels, embankment dams, slope stability, thermal plies, monitoring, soil behaviour and the use of advanced numerical methods. He co-authored the report "*The management of advanced numerical modelling in geotechnical engineering"* (CIRIA C791) and chaired the steering group for *"Assessing the effects of construction induced ground movement on framed buildings"* (CIRIA C796).

Areas worked
UK, Argentina, Belgium, Falkland Islands, Fiji, Iran, Ireland, Mexico, Papua New Guinea, Russia, Serbia, Sultanate of Oman, Saudi Arabia, Singapore, West Africa and the USA

GEOTECHNICAL CONSULTING GROUP

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Previous experience

Sir Alexander Gibb & Partners: 1977 - 1985

- 1977 – 1979: Design of foundations and embankment dams (Iran, Argentina, Fiji).
- 1979 – 1981: Assistant Resident Engineer, road schemes in the Middle East,
- 1981 Geotechnical Engineer, design of embankment dams and monitoring.
- 1982 – 1983: Post-graduate Imperial College. Research into ground movements associated with diaphragm wall construction.
- 1983 – 1985: Project Geotechnical Engineer for the foundation design of Sizewell "B" new nuclear power station. Responsible for the geotechnical design work relating to the Mount Pleasant Airport in the Falkland Islands
- 1985 -1986: Mount Pleasant Airport Falklands Islands. Resident Engineer for all roads and services and for the construction of earth retaining structures and Design Liaison Engineer for other aspects of the development.

Education/Research

MSc & DIC, Imperial College, London, 1983
BSc, Birmingham University, 1977

Scholarships/Awards

Visiting Professor, Imperial College, London, 2012 – present
Institution of Civil Engineers R&D Enabling Fund: Pile-Tunnel Interaction Problems, 1999

Professional Qualifications & Memberships

Fellow of the Royal Academy of Engineering 2019 to date
Fellow Institution of Civil Engineers, 2000 to date (Member 1981-2000)
Fellow Chartered Inst. of Highways & Transportation, 2000 to date (Member 1982-2000)
Member: British Geotechnical Association, British Tunnelling Society and the Railway Civil Engineers Association
UK Registered Ground Engineering Adviser

Service on Technical/Professional Bodies

Construction Industry Research and Information Association (CIRIA)

- *Geotechnical Engineering Advisory Panel*: *Member 2010 – 2017, Chairman 2018 – 2019*
- *Construction impact on framed buildings report (C796):: Chairman of Steering Group*

Institution of Civil Engineers:

- *Awards for Papers Panel: Member 2003 - present*
- *Exemptions & Recognition Panel: Member 2009 – 2015, Vice. Chair 2015 - 2017, Chair 2017 - 2019*
- *Qualifications Panel: Member 2017 – 2019*
- *Professionalism Panel 2021 to date*

Geotechnique Advisory Panel: *Member 2001 - 2004*

British Geotechnical Association:

- *Exec. Committee Member 2000 – 2003, 2015 – 2017, Vice Chair 2017 – 2019, Chair 2019 –2021, Immediate Past Chair 2021 to date*
- *Piling 2020 Conference: Chairman of organising committee*

International Society for Soil Mechanics and Geotechnical Engineering: *Member Committee TC207, Soil-Structure Interaction and Retaining Walls. 2015 – to date*

Other Professional Activities

Imperial College, London**.**

- *CPD courses Lecturer for "Numerical Analysis in Geotechnical Engineering" and "Earth Retaining Structures: Recent developments in design and analysis".*
- *Supervision of MEng. & MSc Soil Mechanics research projects*
- *Peter Vaughan Memorial Symposium. 2009: Member organising committee*.

International Society for Soil Mechanics and Geotechnical Engineering:

- 1st Int. Conf. on Transportation Geotechnics, 2008: *Member of International Advisory Committee and Session Chairman (7).*
- 2nd Int. Symp. Pre-failure Deformation Characteristics of Geomaterials, IS Torino '99: *Discussion Leader*

EMAP Basements & Underground Construction. 2010, London: *Conference Chairman.*
CIRIA Int. Conference "Response of Buildings to Excavation: Induced Ground Movements". Imperial College, London, 2001: *Discussion Leader*.
Institution of Civil Engineers':

- *Skempton Conference. 2004: Member of organising committee.*
- *"Retaining Structures", conference 1992: Panel Member*

Imperial College, Nottingham University, Midlands Geotechnical Soc. & East Midlands Geotechnical Group: *Invited Lectures*