Richard Grant BEng PhD CEng FICE

Geotechnical Engineer

Grant& Brown
Consulting Geotechnical Engineers

- 25+ years' experience
- BEng (Hons) Civil Engineering
- PhD Civil Engineering
- FICE Fellow of the Institution of Civil Engineers
- CEng Chartered Engineer

Synopsis

Richard has been responsible for the geotechnical design and checking of below-ground structures, bridges, metros, highways, railways, water treatment plants and buildings, both in the UK and overseas. He has considerable experience in many areas of geotechnical engineering including foundations, piling, retaining structures, underground excavations, slopes, embankments and ground improvement.

Richard has a particular focus on integrating geotechnical, structural, civil and construction disciplines, to optimize and combine temporary and permanent works design with efficient construction sequence. He has strong commercial awareness, producing practical, pragmatic and buildable solutions within the constraints of project cost and programme. With extensive industry-wide experience, he provides comprehensive technical design, expertise and advice across the board, from optioneering | tender design | detailed design | technical review, to practical construction problems, and expert advice | opinion | claims issues.

Career History

Recent Positions:

2014-Present • Grant & Brown
Director | Geotechnical Engineer

2012-2014 • Independent
Consulting Geotechnical Engineer

2008-2012 • Scott Wilson|Benaim then URS [now Aecom]
Technical & Project Director (multi-disciplinary teams)

1999-2008 • Richard Davies Associates then Benaim
Associate (Geotechnics)

Richard started his career in the construction industry in 1984 working in a variety of civil engineering disciplines. After graduating in 1991 he began work for G. Maunsell & Partners, London, with a focus on ground engineering. This was followed by a period of PhD and post-Doctoral research, coupled with external consulting work, before returning full-time to industry in 1999. Richard has given talks and lectures on a wide variety of geotechnical subjects and has published numerous technical papers.

Key Skills

- Design of below-ground structures, deep basements, retaining walls & ground / slope / excavation stability
- Design of foundations for bridges & buildings
- Wide range of Design & Construct experience, construction techniques & analytical design skills
- Integration of geotechnical / structural / civil / construction disciplines
- Optimization / integration of temporary & permanent works with construction sequence & programme
- Practical, pragmatic & efficient solutions
- Team management & strong commercial awareness
- Flexible, collaborative & responsive approach
- Proactive, effective & communicative problem solver
- High quality, precise, comprehensive expertise
- Technical review
- Expert services

Selected Professional History

2019 • HS2
Technical advice for route-wide review.

2017-2019 • Congleton Link Road
Tender advice and temporary slope stability for large piling works on steep river escarpment with pre-existing slip.

2015-2017 • Major Basement, Belfast
Geotechnical consultant for follow-on contractor on a major urban basement D&C project, including assessment of secant pile basement walls, temporary works & bearing piles. Provision of Expert Opinion Report for adjudication.

2014-Present • Embedded retaining walls & bearing piles
Numerous tender & detailed designs for contractors for buildings, bridges & underground structures.

2012-2016 • Hinkley Point C – Technical Review
Technical Reviewer for design of extensive deep excavations (up to 35m deep) supported by ground nails.

2010-2014 • Claims / Legal Proceedings, UK / Europe
Extensive technical support on Expert Witness team for a major High Court hearing concerning an underground construction project in Europe.

Richard Grant BEng PhD CEng FICE
Geotechnical Engineer

Grant& Brown
Consulting Geotechnical Engineers

Selected Professional History

2014 • Dry Dock, Glasgow (Tender)
Tender advice for contractor on a deep dry dock D&C project in complex soft ground conditions.

2013 • Crossrail, London - Bond Street and Tottenham Court Road Stations
Category III Checks for changes to construction sequence of two deep, large underground station boxes.

2013 • Narrow Water Bridge, Ireland (Tender)
Geotechnical advice to contractor during tender.

2011-2013 • Claims / Legal Proceedings, Singapore - Arbitration
Extensive technical support on Expert Witness team for a major Arbitration concerning an underground construction project in Singapore.

2010-2013 • Osman Gazi Bridge (Izmit Bay), Turkey
URS Project Director and Lead Geotechnical Engineer for support to the concession company for a 2.7km long suspension bridge in a deep-water bay across the highly active North Anatolian Fault. Main span at 1,550m was the 4th longest in the world.

2010 • 3rd Bosphorus Bridge, Turkey (Tender)
URS Project Director of tender design for a long (and heavy) suspension bridge across the Bosphorus to carry both motorway and rail.

2010 • Hinkley Point C, Enabling Works, UK
Lead Geotechnical Engineer for D&C tender design of large deep excavations (up to 35m deep) for nuclear new build project, including diaphragm walls, bored pile walls and innovative alternative solutions.

2009-2010 • Crossrail, London – Technical Review
Lead Geotechnical Reviewer for Farringdon Station and Pudding Mill Lane Portal. Geotechnical advice for design of Paddington Station. CAT3 Checks for Royal Oak Portal (inc. ground movements), Tottenham Court Road, Bond Street and Woolwich Stations. All complex, deep, cut-and-cover underground structures, constructed in very congested urban areas by both top-down and bottom-up techniques, utilizing diaphragm/secant/contiguous bored pile walls and sheet-piles for support, with permanent and temporary propping.

2008-2010 • Royal Victoria Hospital, Phase 2B, Belfast
Contractors Lead Geotechnical Adviser for anchored contiguous/secant pile retention structures, to facilitate construction of a large two/three level basement, on a congested site bounded by existing buildings.

2008-2009 • Stratford City Access Bridges (Olympic Park), London
Lead Geotechnical Engineer for the D&C design of three bridges at the new Olympic Park, including a 90m span steel tied arch.

2005-2008 • Kincardine (Clackmannanshire) Bridge, Firth of Forth, Scotland
Lead Geotechnical Reviewer for the multi-award winning D&C design of a 1,200m long incrementally launched bridge with 45m spans, each sat on a single, rock-socketed 3m diameter pile, and which became the 2nd longest launched bridge in the world.

2005-2007 • Broadway Underpass and River Culverts, M1 / Westlink, Belfast
Project Manager for D&C successful tender design and subsequent detailed design of a large new underpass structure in very soft estuarine clay over mixed glacial deposits. The new underpass is 450m long, 30m wide and up to 8m deep, comprising large diameter secant bored pile walls and a 140m long by 30m single span roof/deck over the central portion.

2007 • Dunheved Bridge, A30, Devon / Cornwall, UK
Lead Geotechnical Engineer for alternative D&C design of a steel-composite bridge deck replacement, slid into place to minimise traffic disruption. Embankments, piles, caissons, banks-seats.

2006 • Grosvenor Road Temporary Bridge, M1 / Westlink, Belfast
Project Manager for substructure design for a 7-span temporary proprietary steel bridge (Mabey) and approach embankments, requiring ground improvement, embankment supporting piles and basal reinforcement / load transfer platforms due to soft ground.

2006 • Blackwater Viaduct, Fermoy Bypass, Ireland
Lead Geotechnical Engineer for D&C design of an 8-span launched pre-stressed concrete box girder viaduct, including driven pre-cast piles and spread foundations.

2006 • Victoria Square Re-development, Belfast
Contractors Lead Geotechnical Adviser for construction of a large, deep car-park basement structure (160m x 160m on plan) on a tight inner-city site.

2005 • Dubai LRTS, UAE (Tender)
Lead Geotechnical Engineer for D&C tender design for deep underground stations and above ground viaducts for extensive light rail scheme.

2004 • Channel Tunnel Rail Link, Contract C310
Project Manager to contractor for: assessment of effects of construction on existing structures and development of construction techniques to minimise the effects (inc. construction of 40m long, 2m dia bored piles within 1-2m of existing piles supporting an M25 viaduct); and design of road embankments on peat and soft alluvial soils.

Selected Professional History

2004 • White Hart Triangle Bridge, Thamesmead, London
Lead Geotechnical Engineer for D&C design of steel-composite bridge and approach, piled reinforced earth embankment.

2003 • A13 Freemasons Underpass, London
Lead Geotechnical Engineer for design of temporary works to minimise movements for a new underpass structure for on-line improvement works, including assessment of the effects of construction on existing buildings in close proximity.

2002 • Production Buildings, Addis Ababa, Ethiopia
Investigation, interpretation, design, testing and implementation for foundations in highly variable ground conditions (volcanic ash and river deposits).

2001-2002 • M6 Toll Road / Birmingham Northern Relief Road
Lead Geotechnical Engineer for detailed design of 11 motorway bridges.

2000 • Bangladesh UK Friendship Bridge / Bhairab Bridge (BCI Award winner)
Design of large diameter bored piles for a bridge crossing of the River Meghna, Bangladesh. The main crossing has 7no. x 110m spans which required piles up to 80m long to accommodate the massive loads and onerous scour conditions.

1996-1998 • Geotechnical Consulting Group (GCG), London - part-time
- Chelsea/Hackney Line Tunnels, London - Assessment of the impact on buildings.
- London Underground Thames Tunnel, Rotherhithe - Site supervision of the refurbishment of Brunel's historic Thames Tunnel (East London Line). Permeation grouting of the gravels to protect the original tunnel on the south side and extensive monitoring of ground movements.

1994-1999 • City University, London
Geotechnical Engineering Research Fellow. Geotechnical Research inc. PhD on ground movements arising from tunnelling in stiff clay with overlying granular deposits, triggered by the London Underground Jubilee Line Extension. Other research into geotechnical problems using centrifuge model testing and finite element analysis, including movements around tunnels.

1991-1994 • G. Maunsell and Partners, London
Design Engineer for London Underground Jubilee Line Extension.

Selected Other Projects Include:

- Large LNG storage tanks, overseas – tender and detailed foundation design
- HS2 Rail Bridge Replacement – CAT3 Check of large caisson foundations for 90m span bridge
- Park Grounds Energy from Waste, UK – geotechnical design for new facility
- Elephant & Castle Redevelopment, London – CAT3 Check of LUL and Network Rail assets
- Google Offices, Kings Cross, London – geotechnical input to temporary works design
- Belfast Transport Hub - geotechnical input at tender in very soft ground conditions
- C21 Building, Barrow – substructure design review
- Bristol Arena – tender designs for piled foundation schemes
- Thames Tideway | Kirtling Street Jetty, London – independent check
- Battersea Power Station Development, London – piled foundations
- Bridge, Brunei – Advice on pile design at Tender
- Bank Underground Station Capacity Upgrade, London – Tender
- Emirates Airline Cable Car, London – Foundation Design
- Royal Commonwealth Pool, Edinburgh – Extensive Underpinning
- Water Treatment Works, Abu Dhabi, UAE - D&C earthworks & foundations
- East London Line – Launched bridge & Dalston Station independent check
- Milton Keynes to Bletchley Railway Widening, UK – Retaining wall designs
- Ashford Rail Depot Bridge, Kent, UK – Foundations and RE wall design
- Sohar Seawater Outfall, Oman – Ground improvement and foundations
- Dublin Port Tunnel – Independent Design Review of temporary works
- 3rd Karnaphuli Bridge, Bangladesh - Independent Check of foundations
- A63 Selby Bypass – Design of embankments on laminated clay and peat
- Thornbank Gardens, Bath – Remedial works design for slope instability
- Canary Wharf, London – Cat 3 Check of large diameter bored piles
- London Underground Embankment Stabilisation – Remedial works design
- Darwin East Arm Port, Australia – Back-analysis of sheet-pile wall movements

Richard Grant BEng PhD CEng FICE
Geotechnical Engineer

Grant& Brown
Consulting Geotechnical Engineers

Published Papers & Professional Activities

Reviewer for *Geotechnical Engineering Journal, Proceedings of the Institution of Civil Engineers.* 2009.

'N8 Blackwater Viaduct', evening lecture to the Geotechnical Society of Ireland, Dublin. 2008.

Member of the Steering Committee for EPSRC project 'Use of Enhanced Formation Stiffness Measures for Controlling Ground Movements Around Excavations'. 2005-2007.

Geotechnical Engineering Courses, University of Bath (2002 to 2007). Lecture courses to undergraduates on Pile Design / Construction and Underground Construction.

Piles & Piling – from light-weight housing to long-span bridges. Lecture to IStructE, Bath (April 2004).

Invited presentation on 'Groundwater control – for stability and ground movement control'. *Symp. on Construction Processes in Geotechnical Engineering, London, April 2003.*

Invited presentation in session on 'Deep Foundations'. *Symp. on Construction Processes in Geotechnical Engineering, London, April 2003.*

Grant, R.J. & Taylor, R.N. (2000). Tunnelling-induced ground movements in clay. *Proc. Institution of Civil Engineers, London, Geotechnical Engineering,* 143.

Grant, R.J. & Taylor, R.N. (2000). Stability of tunnels in clay with overlying layers of coarse grained soil. *Proc. Int. Conf. (ISSMGE) GeoEng2000, Melbourne, Australia.*

Hagiwara, T., **Grant**, R.J., Calvello, M. & Taylor, R.N. (1999). The effect of overlying strata on the distribution of ground movements induced by tunnelling in clay. *Soils and Foundations Vol.39, No.3*, Japanese Geotechnical Society, Tokyo.

Grant, R.J. & Taylor, R.N. (1999). Evaluating plasticity solutions for the response of clay around tunnels. *Proc. Int. Symp. Geotechnical Aspects of Underground Construction in Soft Ground, IS-Tokyo'99.*

Grant, R.J., Stallebrass, S.E. & Taylor, R.N. (1999). Modelling soil deformation at a tunnel heading using physical and numerical techniques. *Proc. 12th Eur. Conf. Soil Mechanics and Geotechnical Engineering, Amsterdam.* Balkema, Rotterdam.

Chow, F.C., Bracegirdle, A., Mack, D., Kettle, C. & **Grant**, R.J. (1998). The application of permeation grouting to protect the Thames Tunnel. *Proc. 2nd Int. Conf. Ground Improvement Techniques, Singapore*.

Kuwano, J., Taylor, R.N. & **Grant**, R.J. (1998). Modelling of deformations around tunnels in clay reinforced by soil nails. *Proc. Int. Conf. Centrifuge 98, Tokyo.*

Taylor, R.N. & **Grant**, R.J. (1998). Centrifuge modelling of the influence of surface structures on tunnelling induced ground movements. *Proc. World Tunnelling Congress 98 on Tunnels and Metropolises, Sao Paulo, Brazil.*

Taylor, R.N., Robson, S., **Grant**, R.J. & Kuwano, J. (1998). An image analysis system for determining plane strain and 3-D displacements in centrifuge models. *Proc. Int. Conf. Centrifuge 98, Tokyo.* Balkema, Rotterdam.

Grant, R.J. (1998). Prediction of pre-failure ground movements due to tunnelling: physical and numerical modelling. Invited contribution to the '3x3' workshop on *Prediction and Performance in Geotechnical Engineering,* Universita Degli Studi di Napoli Frederico II, Dipartmento di Ingegneria Geotecnica, Italy.

Grant, R.J. (1998). *Movements around a tunnel in two-layer ground.* PhD Thesis, City University, London.

Kuwano, J., Taylor, R.N. & **Grant**, R.J. (1998). Centrifuge study on deformations around tunnels in clay reinforced by soil nails. *Proc. 2nd Regional Symp. Infrastructure Development in Civil Engineering, Manila, Philippines,* Vol.1.

Grant, R.J., Stallebrass, S.E. & Taylor, R.N. (1997). Prediction of pre-failure ground movements: physical and numerical techniques. *Proc. 14th Int. Conf. Soil Mechs. and Foundation Engineering, Hamburg.*

Kuwano, J., Taylor, R.N. & **Grant**, R.J. (1997). Centrifuge study on stability around tunnels in clay reinforced by soil nails. *Proc. 30th Anniversary Symp. Southeast Asian Geotechnical Society, Deep Foundations, Excavations, Ground Improvements and Tunnelling, Bangkok.*

Kuwano, J., Taylor, R.N. & **Grant**, R.J. (1997). Soil nailing and its effect on tunnelling induced ground movements. *Japan National Conf. on Soil Mechanics and Foundation Engineering.*

Hagiwara, T., **Grant**, R.J., & Taylor, R.N. (1997). Centrifuge modelling of ground movements due to tunnelling in layered ground. *Japan National Conf. on Soil Mechanics and Foundation Engineering (in Japanese).*

Hagiwara, T., **Grant**, R.J., & Taylor, R.N. (1997). Centrifuge modelling of the effect of overlying strata on the ground movements induced by tunnelling in clay. *Proc. Int. Symp. Deformation and Progressive Failure in Geomechanics. IS-Nagoya, Japan.*

Richard J. **Grant** & R. Neil Taylor (1996). Modelling of ground movements due to tunnelling in layered ground. Article in Research Developments, *Ground Engineering,* Jan/Feb 1996.

Stallebrass, S.E., **Grant**, R.J. & Taylor, R.N. (1996). A finite element study of ground movements measured in centrifuge model tests of tunnels. *Proc. Int. Symp. Geotechnical Aspects of Underground Construction in Soft Ground, London.* Balkema, Rotterdam.

Grant, R.J. & Taylor, R.N. (1996). Centrifuge modelling of ground movements due to tunnelling in layered ground. *Proc. Int. Symp. Geotechnical Aspects of Underground Construction in Soft Ground, London.* Balkema, Rotterdam.