



Christopher Jack BSc (Hons) MSc CGeol EurGeol FGS

Technical Director

Engineering geology and rock engineering

Education

Master of Science in Engineering Geology, Newcastle University, 2003 – 2004

Bachelor of Science with Honours in Geology, University of Edinburgh, 1997 – 2002

Memberships

Fellow of the Geological Society of London (FGS)

Chartered Geologist (CGeol)

European Geologist (EurGeol)

Mentor and Scrutineer for CGeol

Member of editorial board of the Quarterly Journal of Engineering Geology & Hydrogeology

Former Treasurer and Acting Chair of the Central Scotland Group of the Geological Society of London (GSL)

Former Honorary Secretary of the Hong Kong Regional Group of the GSL

Former Vice Chair and Treasurer of the Western Regional Group of the GSL

Member of the British Geotechnical Association (BGA)

Member of the International Association for Engineering Geology and the Environment (IAEG)

Member of the International Society of Rock Mechanics (ISRM)

Member of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

Member of the Edinburgh Geological Society

Member of the Glasgow Geological Society

Member of the Scottish Geology Trust

Year of employment

2016

Key qualifications

Chris has 20 years' experience as a specialist in engineering geology and rock engineering, with experience in tunnelling, cavern engineering, rock slopes, site investigation, foundations, earthworks, retaining walls, excavations, geotechnical asset management, landslides, engineering geomorphology, quarrying, mining and mining remediation. His main focus now is helping to enable the energy transition via hydro-electric, hydrogen and other PtX projects.

He is experienced in preparing desk studies, carrying out engineering geological mapping, designing, procuring and supervising site investigations, soil and rock description, in situ testing and monitoring, instrumentation and slope inspections, inspection of lined and unlined tunnels, rock mass characterisation and classification, assessment of long-term rock deterioration, assessment of soil and rock stability, ground investigation, design and feedback reports, geotechnical baseline reports, landslide assessments, development of engineering geological models, geotechnical and rock engineering design and temporary and permanent works design.

Chris is also experienced in leading technical teams, project management, staff training/coaching/mentoring (which he finds particularly rewarding), research, report writing, technical checking, reviews, risk management and assisting with claims and expert witness work. He is keenly interested in health and safety, the environment, sustainability and ethics.

He currently leads the Glasgow Engineering Geology team.

Language skills	Speaking	Reading	Writing
English	Native language	Native language	Native language
Other skills	Construction Skills Certification Scheme (CSCS) – Professionally Qualified Person Network Rail: Personal Track Safety (PTS) and Industry Common Induction (ICI) qualified Confined Space Entry – Medium Risk qualified		
Employment record			
2021 –	COWI UK Ltd Technical Director		
2019 – 2020	COWI UK Ltd Associate		
2017 – 2019	COWI UK Ltd Principal Engineering Geologist		
2016 – 2017	COWI (formerly Donaldson Associates) Senior Engineering Geologist		
2013 – 2016	Christopher Jack Rock Engineering (CJRE) Consultant Engineering Geologist		
2010 – 2013	GeoRisk Solutions, Hong Kong Senior Engineering Geologist		
2007 – 2010	Mott MacDonald Engineering Geologist		
2005 – 2007	Highland Geoservices Consultant Engineering Geologist		
2004 – 2005	Donaldson Associates Engineering Geologist		
2003 – 2004	Mason Evans Graduate Engineer		
2002 – 2003	Soil Mechanics Graduate Engineer		
Work experience	Jamaica, Panama, Malta, Kazakhstan, Hong Kong, Eritrea, Singapore, Sweden, Mongolia		
Selected projects			

<p>United Kingdom 2021 – 2024 Stantec UK Limited</p>	<p>Coire Glas Reference Design Technical Director - Leading the technical team developing the overall ground model for this large, 1.5 GW pumped storage scheme in Scotland, including planning of engineering geological mapping and extensive ground investigation in a remote area, developing the overall 3D ground model and developing the Geotechnical Baseline Report.</p> <p>Coire Glas is a proposed pumped hydro storage scheme with a potential capacity of up to 1500MW, located in the Great Glen, Scotland valued at £1.5bn. In 2021, COWI were direct awarded by SSE Renewables the scope for developing the ground investigation and exploratory adit for the project. COWI were also responsible for the Reference Design, Employers Requirements and Geotechnical Baseline Report for a network of underground tunnels, shafts and caverns of the main scheme. COWI's role also included providing support to Stantec and SSE throughout Tender Stage 1 and subsequent site supervision of the works which are presently ongoing. From 2023, COWI's role has evolved to partner with Stantec in a Joint Venture as SSE's Owners Engineer through Tender Stage 2 supporting SSE with assessment of contractors design proposals, technical and commercial assessment of the GBR schedules and providing support with project governance, sustainability, H&S and stakeholder management. This role is expected to continue through Construction and Commissioning, planned for 2031.</p>
<p>2020 – SSE</p>	<p>Coire Glas Reference Design Technical Director - Leading the engineering geological input</p> <p>Leading the technical team developing the overall ground model for this large, 1.3 GW pumped storage scheme in Scotland, including planning of engineering geological mapping and extensive ground investigation in a remote area.</p>
<p>Sweden 2020 – HOCHTIEF Infrastructure GmbH 2019 – AMCO</p>	<p>FSE101 Vårby Backe Förbifart LE00004 Technical Director - Leading the rock engineering input</p> <p>Providing the design of rock anchorages for various retaining walls.</p> <p>AIT Cavern Project Technical Director - Leading the engineering geological input</p> <p>Leading the technical team developing the engineering geological model and parameters for the design of a new c. 20 m x 20 m cylindrical underground cavern in halite salt at a depth of over 1 km for a neutrino-detection project.</p>
<p>United Kingdom 2019 – 2023 SCS JV</p>	<p>HS2 S1 and S2 Category III Checks Technical Director - Leading the engineering geological input</p> <p>Leading technical team preparing engineering geological models and parameters for Category 3 checking of HS2 Contracts S1 & S2.</p>
<p>Sweden 2019 – 2018 NCC AB</p>	<p>BMI Liseberg NCC E05-korsvägen Technical Director - Leading the rock engineering input</p> <p>Leading the technical team developing the rock engineering design of for rock cuttings at the base of large excavations on the E05 Korsvägen project in Gothenburg.</p>

<p>Malta 2018 – 2020 SINTEF</p>	<p>Malta-Gozo Subsea Tunnel Principal Engineering Geologist - Leading the engineering geological input</p> <p>Feasibility study and conceptual design of a proposed 14 km long, c. 14 m span subsea road tunnel between Malta and Gozo.</p>
<p>Saudi Arabia 2018 – 2019 Jabal Omar Development Company (JODC)</p>	<p>Jabal Omar Principal Engineering Geologist - Checking and review</p> <p>Review of rock slope calculations and designs for proposed large rock slopes at a property development in Mecca.</p>
<p>2018 – 2019 Strabag AG</p>	<p>North Yorkshire Polyhalite Project Principal Engineering Geologist - Involved with engineering geological and rock engineering aspects</p> <p>Category 3 checking for Wilton portal and first-awarded section of 5m diameter tunnel at depths up to 350m in weak, potentially squeezing mudstones and marls.</p>
<p>United Kingdom 2018 – 2019 SSE plc</p>	<p>SSE Grudie Bridge Principal Engineering Geologist - Undertaking the project management and the technical oversight.</p> <p>Preparation of technical note, associated calculations and rock mass mapping to check the capacity of a concrete high-pressure water tunnel in rock against increased transient water pressures due to proposed upgrade works at the Grudie Bridge Power station.</p>
<p>Singapore 2018 – 2018 Leighton Contractors Asia</p>	<p>HSR H205/H206 Tender Design Principal Engineering Geologist - Overall responsibility for all of the engineering geological aspects.</p> <p>Tender support to Leighton - involved in timely assessment of engineering geological and rock engineering aspects, including expected ground conditions, proposals for additional GI, inputs to shaft and lining design and proposals for ground improvement.</p>
<p>Hong Kong 2018 – 2018 Nishimatsu Construction Co Ltd HK Branch</p>	<p>Inter-Reservoir Transfer Scheme (IRTS) Principal Engineering Geologist - Leading the engineering geological input</p> <p>Tender design for a 3km long, 3m ID water transfer tunnel between two existing reservoirs in Hong Kong. The tender stage input involved geological / geotechnical interpretation of the ground conditions along the tunnel including comparison with the baseline and assessment of risks associated with the ground conditions.</p>
<p>Panama 2017 – AES</p>	<p>Changuinola Principal Engineering Geologist - Overall responsibility for all of the engineering geological aspects.</p> <p>Investigation of the source and mechanism of significant leakage from a hydroelectric headrace tunnel and proposals for mitigation works. Subsequent engineering geological work on site during remedial works and assistance to an expert witness.</p>
<p>Singapore 2017 – 2022 CPG Consultants Pte Ltd</p>	<p>DTSS Phase 2 T9 Detailed Design Principal Engineering Geologist - Responsible for all of the engineering geological aspects.</p> <p>DTSS2 is a new large, tunnelled sewer project in the Jurong district of Singapore. Contract T-09 comprises a 7.9Km long TBM-bored tunnel with seven shafts and associated mined tunnels for hydraulic structures and connections.</p>

2017 – 2017 AECOM	<p>Hinkley Point C Principal Engineering Geologist - Responsible for the project management, engineering geological assessment and rock engineering aspects of the CATIII check of the intake and outfall water infrastructure for the power station. This consisted of all of the tunnels and shafts. Also included in the check were the diversification and liaison galleries.</p> <p>CATIII check of the ground model and geotechnical design for the power station water intake and outfall tunnels and shafts and three service tunnels.</p>
Saudi Arabia 2016 – 2018 Nesma	<p>King Abdul Aziz Road Development (KAAR) Senior Engineering Geologist - Preparation of GIRs for alluvial wadi deposits overlying sheared granitic and dioritic intrusions.</p> <p>Preparing ground investigation reports (GIR) for the foundations of two flyovers and some smaller structures.</p>
2016 – 2016 Morrison Construction	<p>Aberdeen Harbour Expansion Project Senior Engineering Geologist - Landslide-related aspects in various glacial deposits.</p> <p>Civil and geotechnical design for a proposed extension of Aberdeen Harbour into Nigg Bay including inspecting, assessing the stability and proposing design solutions for the slopes surrounding the site.</p>
2016 – 2016 AMCO	<p>Mullardoch Tunnel Senior Engineering Geologist - Engineering geological mapping of the tunnel rock mass (Glenfinnan Group).</p> <p>Detailed engineering geological mapping of rock mass surrounding a >50 year old unlined hydroelectric aqueduct tunnel in the Highlands of Scotland.</p>
2016 – 2016 AMCO	<p>River Peffery Scour Senior Engineering Geologist - Engineering geological and geotechnical assessment of alluvial deposits.</p> <p>Carrying out inspection and proposing remedial options for an area of bank scour under a railway overbridge embankment.</p>
2016 – 2016 Morrison Construction	<p>Tornagrain UTX (under-track crossing) Senior Engineering Geologist - Assessment of engineering geological properties of glaciomarine deposits.</p> <p>Review of the ground conditions underlying a UTX for a Scottish Water pipeline beneath the Inverness to Aberdeen railway line to determine micro-TBM requirements.</p>
2016 – 2016 Gilkes Energy	<p>Uisge Dubh Hydroelectric scheme Consultant Engineering Geologist - Geotechnical site walkover, advice on pipeline routing, landslides and aggregate sources (various glacial deposits).</p> <p>Proposed small-scale hydroelectric scheme, comprising several sites within Attadale Estate, Western Highlands.</p>
2015 – 2016 Cemex	<p>Southam Quarry Tunnel, CATIII Check Senior Engineering Geologist - Completed the reassessment of the engineering geological conditions (Lower Lias) and geotechnical check.</p> <p>Carrying out a CATIII check on the design of a small tunnel under a road in Warwickshire.</p>

<p>Hong Kong 2013 – 2013 Leighton – John Holland Joint Venture</p>	<p>MTR Contract 904 (Ap Lei Chau/South Horizons) Senior Engineering Geologist - Engineering geological mapping and assisting with other aspects such as temporary support and permanent lining optimisation in tuff. Metro line being constructed at Ap Lei Chau as part of the South Island Line (including station cavern, running tunnels, access adits, surface excavations and foundations).</p>
<p>2010 – 2010 Highways Agency</p>	<p>Highways Agency Area 2 (Western England), Geotechnical Projects Geotechnical Team Leader - Project management, engineering geology, geotechnical engineering Inspections, assessments, design and construction supervision of projects including cut and fill earthworks, sourcing of aggregates, gantry and bridge foundations</p>
<p>2007 – 2010 Highways Agency</p>	<p>Highways Agency – Area 2 (Western England), Rock Slopes Engineering Geologist - Engineering geology, rock engineering, research and project management. Prepared and undertook the necessary research for a proposal to improve the Highway Agency's methodology and guidance for the inspection and assessment of rock slopes. Inspection and assessment of a number of rock slopes in Area 2.</p>
<p>2005 – 2007 Mott MacDonald</p>	<p>Network Rail – Earthwork Examinations Consultant Engineering Geologist - Earthworks examination Examination and reporting on 110 yard long railway earthworks sites in the Network Rail Great Western Region to assign condition value scores to assist in asset management. Assessments undertaken using the Network Rail GISmo system.</p>
<p>2004 – 2005 Network Rail</p>	<p>Tunnel Management Strategy (TMS) Project Engineering Geologist - Engineering geology, project management, site walkovers Involved researching and examining all of the tunnels in the Network Rail North Western Territory and producing detailed desk study reports on them. This work was required as Network Rail did not have complete records for many of their tunnels and did not have sufficient information on the geological setting and historical context. Each report contained information concerning the history, nature of construction, geology and current condition amongst other things. On the basis of this report defects, hazards and risks were identified and recommendations were then made to Network Rail on how best to manage each tunnel in the future. Site visits to each tunnel were undertaken to confirm findings, locate hidden shafts or areas of subsidence, identify defects and carry out inspections where possible.</p>
<p>2003 – 2004 Dunedin Housing Association</p>	<p>Hyvots Bank Mining Remediation Graduate Engineer - Mining remediation site supervision Design and supervision of grouting works to infill workings in the Gilmerton Limestone of south Edinburgh. Portions of these workings had recently collapsed and the works were required to ensure the area could be safely redeveloped. Site works took over two months to complete with very large quantities of grout required to infill the large open limestone workings which were situated at the base of an infilled quarry. The quarry area was subsequently vibro-compacted.</p>
<p>2002 – 2003 English Partnerships</p>	<p>Stockton-on-Tees Graduate Engineer - Ground investigation site agent Medium-scale ground investigation adjacent to the Tees Barrage. Work utilised three cable tool rigs, one rotary rig, a window sampling crew and a trial pitting crew. The investigation took six weeks to complete.</p>

Publications

2019, The application of geology to the design, construction and ongoing maintenance of the Mullardoch Tunnel.

2015, Discussion on rock slope management in Scotland. XVI European Conference on Soil Mechanics and Geotechnical Engineering 2015, Edinburgh.

2014, Communicating geological uncertainty – the use of the conceptual engineering geological model. IAEG XII Congress - Torino 2014, Engineering Geology for Society and Territory.

2012, Structural Geological Input for a Potential Cavern Project in Hong Kong. Engineering Geology and Rock Engineering. The Hong Kong Institution of Engineers Geotechnical Division 32nd Annual Seminar, 2012.

2011, Science, Engineering Geology and the Landslip Preventative Measures Programme. The Hong Kong Institution of Engineers Geotechnical Division 31st Annual Seminar, 2011.

2011, Engineering Geology and Rock Engineering. Proceedings of the Joint Hong Kong Institution of Engineers – Hong Kong Institution of Planners Conference on Planning and Development of Underground Space.

2010, Initial assessment of rock slopes for the Highways Agency. In: Proceedings of the 11th British Geotechnical Association Young Geotechnical Engineer's Symposium. Bristol.

Professional references

Lynn Masterson, Regional Director, COWI UK Limited, msly@cowi.com