

Capability Statement

I am a civil engineer with 9 years of experience in engineering design and engineering management for major infrastructure and tunnelling projects. I have a keen professional interest in applying innovative solutions to realise improvements in safety, sustainability and cost and I am currently undertaking doctoral research in the field of tunnelling methodology. My experience in the detailed design of underground space coupled with experience in risk management in the nuclear industry enables me to deliver value to clients.

Key Projects and Achievements

UK Geological Disposal Facility

- Responsible for the 'Constructability' and 'Construction Safety' siting factors as part of the GDF site evaluation process considering the influence of geology and geography on the feasibility of siting a GDF.

Thames Tideway West, Thames Water, £416m

- Responsible for the permanent works design of the 6.5m internal diameter, 6.9km main tunnel, in particular the innovative steel fibre reinforced, boltless, segmental primary lining.
Design lead for SCL shaft linings, tunnel portals and base slabs for the seven Combined Sewer Overflow drop shafts.

Lee Tunnel, Thames Water, £635m

- Permanent Works Design and Implementation: Lead design engineer for key structural elements associated with the 38m diameter, 80m deep Tideway Pumping Shaft including the Suction Tunnel, Suction Culvert, Central Wall, Props and Roof Slab. Managed the design and CAD teams to ensure successful delivery of the design. Based on site for 6 months to manage design issues and liaised with the site team, client's team and subcontractors.
- Third Party Consents: Undertook design analysis and assessments for two third-party assets within the zone of influence of the Lee Tunnel works
- Research and Development: coordination of large-scale beam bending tests to demonstrate the viability of an innovative steel fibre reinforced solution for the 7.2m internal diameter secondary lining under the critical serviceability load case.

Crossrail C510 – Whitechapel and Liverpool Street Stations, £235m

- Settlement Analysis: Developed detailed, staged 3D models of both Whitechapel and Liverpool Street Station SCL tunnelling works for settlement prediction. Analysed various intermediate results to inform the settlement mitigation strategy. Back analysis of the monitoring data to provide useful feedback and inform future projects regarding settlement.
- Primary Lining Design Category 2 Checking: Independent checking of primary SCL lining designs including the 17m wide Whitechapel crossover cavern. Responsible for assessment of all temporary and permanent stages of construction as well as generation of lining movement predictions.

York Potash Mine (Tender)

- Geological modelling for a deep potash mine in North Yorkshire using Bentley gINT and PowerCivil software. Liaised with potential supply chain partners regarding high strength concrete for 1500m deep shaft lining materials

Education and Professional Status:

- MA MEng (Hons) in Civil, Structural and Environmental Engineering (2.i achieved in Years 1 & 2. 1st achieved in Year 3. Merit awarded for Year 4), University of Cambridge (2007-2011)

- Chartered Engineer – Institution of Civil Engineers (2015)

Employment Record

September 2020 – present

Principal Engineer and PhD Research Student – CECL Global / University of Warwick

In my current role, I work with a wide range of Clients to deliver value engineering to tunnelling and underground related projects, including:

- Research and development
- Design and Construction support
- Value Engineering
- Expert Witness support

I am also carrying out research as part of my PhD in a tunnelling-related field.

2017-2020

Radioactive Waste Management Ltd – Engineering Manager

- Responsible for the ‘Constructability’ and ‘Construction Safety’ siting factors as part of the GDF site evaluation process considering the influence of geology and geography on the feasibility of siting a GDF. Lead for the underground construction aspects of the generic feasibility work for a GDF, notably considering how these aspects interface with the nuclear and environmental safety cases. Led the company’s involvement with a full-scale, in-situ experiment investigating the performance of different tunnel support systems at the Mont Terri underground research laboratory. Led back-analysis work of monitoring results and interpretation of how the experimental findings are applicable to a GDF in a UK context.

2015-2017

Underground Professional Services Ltd - Senior Tunnel Design Engineer

- Thames Tideway – West Section.
Responsible for the permanent works design of the 6.5m internal diameter, 6.9km main tunnel, in particular the innovative steel fibre reinforced, boltless, segmental primary lining. Design lead for SCL shaft linings, tunnel portals and base slabs for the seven Combined Sewer Overflow drop shafts. Managed a team of design engineers and CAD technicians to deliver detailed design documentation. Liaised with the main works contractor, subcontractors, suppliers, the client, and other design disciplines in order to ensure buildability, meet the required performance criteria and manage interfaces.

2011-2015

Underground Professional Services Ltd – Tunnel Design Engineer

- Permanent Works Design and Implementation on major tunnelling projects (Crossrail C510, Lee Tunnel)
- Third Party Consents
- Research and Development (design assisted by testing)
- Tunnelling-induced settlement analysis around complex geometries excavated underground
- Design and independent checking
- Geological modelling
- Tender Support (York Potash Mine, Bank Station Capacity Upgrade, Hinkley Point C Nuclear Power Station Marine Works)

2010 (Placement)

Buro Happold (Consulting Civil Engineers) – Trainee Engineering Geologist

- Interpreted and evaluated historic site information and ground investigation data for building construction projects. Assessment of piling logs for projects on site to ensure that the specifications were met. Analysis and processing of monitoring data for earthworks.