

The construction of the High Speed 2 railway: An opportunity to explore Mudstone heterogeneity?

by Kevin Briggs

Thursday 14 May 2020, 11.00-12.00, Online

Abstract:

This talk will give an overview of the ground investigation (GI) forming Phase 1 of the UK's HS2 High Speed Railway and present preliminary filtering of data from a 4km length of GI. The talk was planned to coincide with a (now deferred) visit to TU Delft to explore the 'Uncertainty and Heterogeneity' theme with researchers in the Geo-Engineering Section.

The construction of the HS2 High Speed Railway will increase connectivity across major UK cities and relieve the pressure on existing transport infrastructure. The railway will require large cuttings (up to 30m deep) across mudstone strata of increasing age with distance from London. The duration and magnitude of the ground heave (swelling) that follows excavation are uncertain because there is limited engineering data to characterise the behaviour of 'old' mudstone strata (older than London Clay).

The HS2 Ground Investigation (GI) will include c.8000 investigation locations and more than 1 million laboratory tests. There will be a fully instrumented cutting 'heave' trial in the early stages of construction (2019-2021).

The construction of HS2 Phase 1 from London to Birmingham (2019-2024) provides an opportunity to exploit Ground Investigation (GI) data to better understand the engineering properties of the Charmouth and Mercia Mudstones. Specifically, there may be an opportunity to explore the spatial heterogeneity of these engineering properties over many kilometres.

Bio:

Dr. Briggs is an Assistant Professor of Geotechnical Engineering and RAEng/HS2 Ltd Senior Research Fellow (2020-2025) at the University of Bath, UK. Kevin is Bath PI for the EPSRC-funded ACHILLES Programme (2018-2022) led by Newcastle University. ACHILLES will examine how to better monitor and maintain UK infrastructure earthworks, to save money and reduce transport disruptions. He has recently started (2020) a 5-year research programme to explore the engineering properties of mudstones underlying the UK's High Speed Railway (HS2). Because HS2 cuts across all the key mudstone strata in England, it presents an opportunity to better understand their engineering properties. The research will utilise the project ground investigation data and a full-scale cutting heave experiment.