

# Use of Glaciogenic Sediment Origin for Ground Water Management During Earthworks Construction on the HS2 Project

Gerard McArdle  
(Technical Expert - Engineering Geologist – SYSTRA Ltd)

14<sup>th</sup> May 2024 | Mott MacDonald, 10 Livery St, Birmingham B3 3NU / Zoom Video Conference | 6:00pm refreshments and networking | 6:30pm start.

## Abstract:

This will be a talk on how the principles of engineering geology were applied during the excavation of a cutting in Mid Pleistocene glacial fluvial deposits on the eastern margin of the Birmingham Plateau on the HS2 project. The general purpose of engineering geology and engineering geomorphology on infrastructure projects is to categorise geohazards. This is particularly important when the proposed infrastructure is being constructed in soils affected by periglacial processes. A less known site-based application is during the construction of earthworks.

As an earthworks design progresses through the outline to the detailed design stage of a project, the ground and ground water models are a simplified version of what can be a complex glaciogenic series of soils. This is by necessity and includes allowances for the geohazards identified earlier in the project. When the ground is opened during construction, soil structures lost during ground investigation sampling are revealed. When this happens there is an opportunity to refine the ground and ground water models to produce efficiencies in the construction sequence. A significant factor in making this field assessment successful is understanding the origin of the soils through revisiting desk study reference documents.



Figure 1: The photograph illustrates the lateral and vertical variation in the in situ strata (excluding the engineering fill in the foreground)

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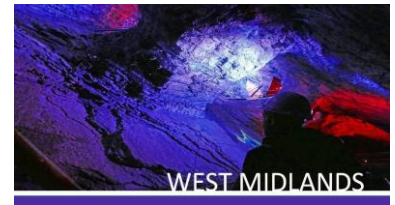
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**About the Speaker:**

Gerard has worked in the field of ground engineering for approximately eighteen years. The initial five years were in ground investigation and the last thirteen with SYSTRA Ltd (having formerly worked at TSP Projects, which SYSTRA acquired in 2019). SYSTRA is a multidisciplinary infrastructure design consultancy and part of the Mott Macdonald SYSTRA Design Joint Venture for lots N1 and N2 of HS2. Gerard is currently the engineering geology lead for Systra’s ground engineering discipline in the UK. As a Contractors Responsible Engineer, he has been responsible for the delivery of several large rail earthworks and ground improvement projects from the feasibility stage through to construction for design and build contractors. He has also acquired expertise in highways, land and marine based schemes within a design consultancy and site investigation contracting environments.



Gerard has particular interest in engineering geomorphology, periglacial processes and digital ground modelling. His work in this field led him to being a named contributor in a book on the subject ‘*Applied Multidimensional Geological Modelling*’ published by Wiley Blackwell. He is a Fellow of the Geological Society and a Chartered Geologist.

**Forthcoming Talks:**

Date	Title	Speaker	Venue
Tuesday 11 <sup>th</sup> June 06:30pm start	Provisional: Contaminated Land / Hydrogeology (TBC)	Dan Welch, Atkins Réalis	Mott MacDonald’s Birmingham office / Zoom Video Conference

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