



Geo-Environmental

Supporting Highway Infrastructure

- Site Risk Assessment
- Environmental Consultancy
- Geotechnical Consultancy
- Remediation and Validation

Geo-Environmental Services is an International Geotechnical and Environmental Engineering Consultancy, part of the Geo-Environmental group of companies. Our consulting engineering team consists of Degree and Masters qualified consulting engineers, and include; Chartered Geologists, Chartered Environmentalists, Chartered Scientists. This experience is backed up by our use of the latest technology to support our investigations, a fully integrated management system, a range of health and safety accreditations and our membership of a range of industry bodies.

Geotechnical and environmental engineering is essential to the development and operation of a railway system. Most highways run for much of their length within or on geotechnical structures such as cuttings and embankments. The principles of soil mechanics, which underlie the practice of geotechnical engineering, may equally be applied to a ballasted road surface. Furthermore, the industrial heritage and high usage of our road network means that land and water contamination may be present or occur for a wide range of reasons

- Assessing the geotechnical ground conditions to evaluate ground conditions and provide design parameters or design solutions for stable embankments and cuttings, pads and footings for heavy plant used during construction, pile designs for bridges and viaducts, as well as roadbeds.
- Assessing the environmental ground conditions to evaluate the need for any remediation methods to avoid mobilisation of contaminants (for example: there may also be historical chemical or fuel spillage, leaking fuel tanks, engineering landfills and other buried waste).



Services Supplied on this Project:

- Geotechnical Assessment
 - Foundations (Residential Development)
 - Foundations (On Site Bridges and Associated Structures)
- Earthworks Suitability and Classification
- On Site Highways
- Soft Ground Engineering Options
- Slope Stability
- Off-site Earthworks
- Off-site Bridge Structure Foundations;

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The Project

Geo-Environmental undertook an investigation for Berkeley Homes on a new residential development in Horsham, that required on site highways and bridges, off-site highway improvements to existing infrastructure, a new grade separated junction on a dual carriageway and a new footbridge crossing an existing dual carriageway.

During the detailed ground investigation, it was found that the proposed approach road to the central access bridge crossed over an infilled alluvial channel and thereby some form of soft ground engineering was required to mitigate total and differential settlement.

It was anticipated that if the embankment had been constructed directly onto soft ground, then total settlement in the range 200-400mm could occur.

Expertise

In defining an engineering solution to the problem our engineers used best practice in the Transport Research Laboratory (TRL) Contractor's Report 341, which sets out three basic construction methods which are typically considered for embankments constructed under these conditions. These methods are; modify the load on the ground; provide additional structural support to the embankment; and ground improvement.

Benefits

Given that only a relatively short section of the approach embankment crossed the infilled alluvial channel (approximately 25m length of embankment) on either bank and the connection to the piled bridge structure, it was considered that differential settlement could be managed through the construction of additional piles and a load transfer platform to support the embankment leading up to the bridge abutment, mitigating the need for a more costly engineering solutions.