

**Sector:** Rail

## Services Supplied on this Project:

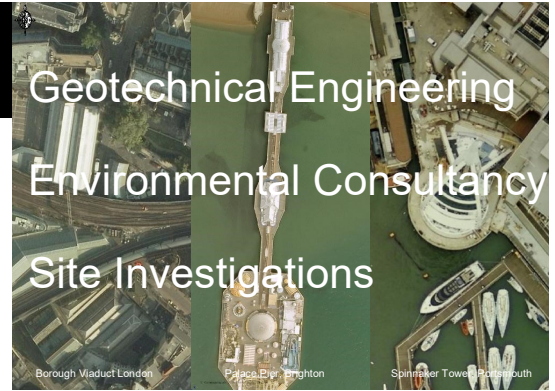
- Full time attendance of a Geo-Environmental Engineer to set out and supervise the intrusive investigation,
- Undertake sampling, in-situ testing and logging of recovered soils.
- Construction of 4No. boreholes to a provisional depth of up to 15.0m bgl .
- Construction of up to 10No. dynamic sampler boreholes to depths of up to 4.0m bgl,.
- Installation of 4No. combined ground gas and groundwater monitoring wells to facilitate return monitoring.
- The hand excavation of 21No. trial pits to depths of up to 1.30m.
- Geotechnical Laboratory Testing and Geochemical laboratory testing .
- Phase 1 Desk Study and Ground Investigation Report.
- Geotechnical Design Report.

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### We Value:

Quality  
Health and Safety  
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Geotechnical Engineering  
Environmental Consultancy  
Site Investigations



## The Project

Geo-Environmental Services Limited was instructed by Waldeck Consulting Limited prepare a desk study and ground investigation report for the proposed development works within the boundaries of the Norwich Crown Point Rail Depot at Norwich.



## Health and Safety Considerations

The site was an operational train depot, there was overhead high voltage cables and trains passing through the depot (see above). In addition there was a risk of unexploded ordnance and poor ground conditions. Safe systems of work were created to mitigate these risks.

## Gas Monitoring

There were many findings from the report, however, one of the areas assessed was ground gas levels. The desk study undertaken identified the presence of fuel tanks and fuel filling points on the subject site along with the potential for Made Ground to be present, coupled with permeable strata within the underlying geology. Spot monitoring was undertaken within wells installed within locations that were selected to provide general coverage of the site. The monitoring identified elevated levels of gas and it was recommended that an additional five ground gas and vapour monitoring visits are undertaken in order to make a more robust risk assessment.

## Track Bed Design

The Company also provided advice on the track bed design. The required trackbed layers thickness at the top of the River Terrace Deposits was 350mm and determined based on an undrained subgrade modulus of 24MN/m<sup>2</sup>. However, in the event of localised deep Made Ground, a trackbed layers thickness of 300mm was recommended based on a drained subgrade modulus of 30MN/m<sup>2</sup>.