

**East Midlands Gateway
Phase 2 (EMG2)**

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ENVIRONMENTAL STATEMENT

Volume 2 Technical Appendices

Appendix 14B

Fairhurst Ground Investigation Report (EMG2)

July 2025

14

The East Midlands Gateway Phase 2
and Highway Order 202X and The East Midlands Gateway
Rail Freight and Highway (Amendment) Order 202X

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SEGRO

Ground Investigation Report

East Midlands Gateway Phase 2,
Land South of East Midlands
Airport, Derby

August 2024



FAIRHURST

CONTROL SHEET

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EXECUTIVE SUMMARY

Introduction	<p>Fairhurst have been commissioned by SEGRO PLC (the Client) to provide a Ground Investigation Report (GIR) associated with the proposed development at East Midlands Gateway Phase 2, Land South of East Midlands Airport, Derby.</p> <p>The report has been prepared in support of the forthcoming Development Consent Order (DCO) application for the proposed Phase 2 development of East Midlands Gateway Logistics Park. This report covers the GI for the main site (to be known as EMG2) that lies to the south of East Midlands Airport. The remaining part of the application site that includes section of the land within EMG1, the north of East Midlands, where capacity upgrades to the existing rail freight terminal and utilities are proposed along with land required for potential highway improvements to accommodate the proposed development are to be submitted under separate cover.</p>
Scope & Objectives	<p>The report has been prepared in support of the forthcoming DCO application and also aims to provide geotechnical assessment and recommendations with respect to earthworks, foundations, external hard cover and floor slab proposals.</p> <p>The specific objectives include:</p> <ul style="list-style-type: none"> • Carry out and report on an intrusive ground investigation designed to determine the characteristic ground conditions and hydrogeology underlying the site and to identify any potentially significant environmental or geotechnical development constraints; • Review and assess the chemical and geotechnical test results to inform and update the conceptual site model; • Make recommendations for further actions, if applicable, relating to any remaining pollutant linkages identified by the ground investigation; and • Make recommendations relating to any geotechnical constraints to development identified by the ground investigation.
Ground & Groundwater Conditions	<p>The intrusive ground investigation encountered the following ground conditions:</p> <p>Topsoil was encountered from surface to a maximum depth of between 0.10m and 0.85m bgl (91.0m AOD and 58.8m AOD) where it was found to generally comprise firm to very stiff brown/reddish brown clay with silt, sand and gravel;</p> <p>Made Ground was encountered in isolated instances at a number of locations across the site, namely BH04, BH12, BH25, CP27, TP08, TP25, and TP37 where it extended to maximum depths of between 0.20m and 3.00m bgl (86.0m AOD and 53.0m AOD). The material was generally found to be cohesive dominant;</p> <p>The Oadby Member was encountered below the Topsoil/Made Ground in 21 of the 93 exploratory and was found to extend to depths of between 1.70m and 16.40m bgl (85.8m AOD and 63.9m AOD). The soils are generally described as stiff to very stiff greyish brown / dark grey clay with subordinate silt, sand and gravel;</p> <p>Glaciofluvial deposits was encountered below the Topsoil/Made Ground/Oadby Member where more extensive deposits were found in the central regions of the site. It was found to extend to maximum depths of between 0.40m and 17.30m bgl (89.7m AOD and 53.4m AOD). The deposits consisted variable interbedded cohesive and granular soils with limited lateral continuity of strata observed between exploratory positions;</p> <p>The Gunthorpe Member (subset of the Mercia Mudstone Group) was found across the entirety of the site and comprised predominantly mudstone interbedded with siltstone and sandstones. These deposits were found beneath the superficial soils where present, and from surface elsewhere, with a weathered profile invariably encountered at shallower depths. The weathered soils comprised predominantly stiff to very stiff reddish brown clays with silt, sand and gravel where the gravel fraction consisted of mudstone and siltstone lithorelicts. Pockets / lenses of grey silty sand / sandy silt and black staining on fracture surfaces were locally observed. Laminae of extremely weak mudstone and fine grained sandstone were recorded, generally increasing in frequency with depth suggesting a decrease in weathering grade;</p> <p>The bedrock was encountered below this weathered material where present, and below the Topsoil / Made Ground / superficial soils elsewhere; its upper surface varies between 1.40m and 18.50m bgl (86.8m AOD and 54.9m AOD) and extended the remaining extent of depths investigated where encountered. It comprised extremely weak to medium strong reddish brown;</p> <p>The Diseworth Sandstone, a subset of the Gunthorpe Member was also encountered where it was described as very weak to medium strong greenish grey fine to medium grained sandstone. The deposit was not found to be continuous between exploratory locations and appears as discrete sandstone strata interbedded with mudstone and siltstone;</p>

	<p>Groundwater strikes were observed during drilling at a range of depths within the Glaciofluvial and Gunthorpe Member (including weathered) Deposits. The strikes ranged from 2.80m to 26.50m bgl and from +49.60m AOD to +81.80m AOD; and,</p> <p>Monitoring suggests that a groundwater body is present between depths of 1.25m and 15.32m bgl (84.9m AOD and 52.7m AOD) within the Glaciofluvial, Weathered Gunthorpe Member and Gunthorpe Member.</p>
Geotechnical Assessment	<p>The following geotechnical considerations/recommendations have been identified:</p> <ul style="list-style-type: none"> • Utility searches and/or surveys are recommended prior to further design development to confirm the absence of services and verify the locations of any utilities that are identified on site; • It is recommended that foundations are inspected by a suitably qualified Geotechnical Engineer in order to confirm the absence of Made Ground or soft/loose soils within foundation excavations where foundations will require local deepening if encountered. Provision should be made for removal of the soils when encountered within the footprint of proposed structures. Excavations will need to be backfilled and re-compacted / compacted with material suitable for use as general fill; • Battering/shoring of excavations is recommended where collapsible, granular deposits are encountered. Battering of excavations to a suitable angle is recommended where excavations encounter cohesive strata; • Given shallow groundwater has been identified across the site, there is potential for groundwater induced instability and flooding of excavations. Therefore, provision of suitable shoring and appropriate dewatering measure are recommended; • All foundations and associated structures in contact with the underlying superficial soils and weathered bedrock should be designed to DS-2 AC-2. It may be possible to reduce this classification where buried structures are in contact with the solid bedrock however this will require careful consideration given the varied ground conditions and cut/fill configurations; • For the cohesive soils, prescriptive bearing capacities of c. 150kPa can be assumed where a minimum undrained shear strength of 75kPa is achieved. Where granular soils are encountered at foundation depth, a prescriptive bearing capacity of c. 150kPa can be assumed; • The competent Gunthorpe Member is likely to exhibit bearing capabilities in excess of 200kPa based on a minimum Unconfined Compressive Strength of 0.20MPa. However, the bearing capabilities of this stratum will need careful consideration given the variable weathering grade observed across the site. Where the bedrock is highly to moderately weathered (Grade Iva to Grade III) the bearing capacity is likely to be in the region of 150kPa; • Heavy plant and expensive breaking and ripping techniques may be required where excavations are within the competent bedrock. The possibility of cuttings encountering bedrock is subject to finalisation of the Cut and Fill Plan; • Design of foundations within areas of fill will be dictated by the depth and type of engineering fill utilised. Where fill is shallow and bedrock is present near surface, foundations should be extended through the fill into the competent natural strata. Where deeper fill is present or superficial soils are present at shallow depth, foundations will need to be formed in accordance with the standards or engineering fill placed or suitably designed based on the geotechnical criteria of the superficial material; • Initial settlement analysis suggests careful consideration is needed when assessing the potential for settlement across the site and the use of in-situ compaction on fill formation layers by use of rollers is likely required prior to the placement of fill to decrease the potential for settlement; • Collapsible deposits and strata susceptible to settlement have been identified on site therefore, the risk of failure of any proposed embankments as a result of the formation soils below will need to be carefully considered; • It is recommended that staged construction is undertaken and basal and interim granular layers are installed and linked to the wider drainage network to avoid build-up of pore-water pressure where embankments are formed from fine grained material. Drainage will also need to be carefully considered to cope with surface water and avoid softening of the slope faces and foundation soils, in particular at the toe of slopes; • Options for increasing the angle of embankment slopes thus reducing the footprint and volume of embankments may be explored; these may include reinforced soil embankments (geogrids) or even retaining walls if required;

	<ul style="list-style-type: none"> • Clean, natural soils are present within areas of cut and these materials should be suitable for re-use provided they are carefully selected and managed in accordance with a suitable earthworks specification. • Given the similarity in appearance of the cohesive superficial soils, it is likely these materials will become mixed during the earthworks. For this reason, supplementary testing will be required to reassess the material properties in terms of its earthworks suitability; • As elevated sulphates have been identified within the on-site soils, careful consideration should be given to the design specification of earthworks in relation to sulphate induced heave where lime stabilisation is used. Specialist advice should be sought to assess the suitability of utilising lime stabilisation as a moisture content control; • Initial pile capacity calculations have been undertaken to advise on construction of the lorry bridge over Hyam's Lane where it has been identified that piles will need to extend to a depth of c.18.00m to socket into the competent Gunthorpe Member ensuring sufficient bearing capacity is achieved; • CBR testing on prepared sub-formation should be undertaken to confirm adequate road construction details. Yard spaces may be surfaced in concrete slabs and therefore appropriate compaction to Series 600 of the specification for Highway works and a site specific Earthworks Specification will be required.
Geo-Environmental Assessment	<p>No exceedances of the site specific assessment criteria or commercial end use generic assessment criteria have been identified with respect to human health, and therefore the risk to site end users is considered low. Risks to controlled waters were also assessed as low.</p> <p>Based on the assessments presented in Section 7.0 of this report the conceptual site model was updated. The assessment confirms that the majority of source-pathway-receptor linkages are low or very low risk and require no further assessment or mitigation with limited exceptions. It is recommended that the following is implemented for the development of the site:</p> <ul style="list-style-type: none"> • Suitable drinking water supply pipes are to be installed. A WIR assessment may be required along the proposed drinking water pipe route to demonstrate material suitability. Alternatively the use of barrier pipe would negate the need for further testing. In both events, the local water company should be contacted to agree the chosen pipe material suitability. • In the event that unexpected contamination is encountered at the site, works in the area are to stop and the Local Authority and the appointed geo-environmental consultant should be contacted. The contamination should be sampled, tested and risk assessed and if required a remediation strategy should be agreed and implemented. • Based on the ground gas risk assessment, the site is classed as a Characteristic Situation CS1 (very low risk) site and no mitigation are required. • Risks to controlled waters were assessed as low and no further works are required. • Despite the low risk of encountering asbestos as part of the construction works, the Principal Contractor should develop appropriate RAMS to address the potential to encounter Asbestos during the construction works. • Shallow groundwater is likely to be encountered during excavation / construction works. Suitable allowance should be made for the disposal of groundwater and surface water. • Should offsite disposal of material be required, specific waste classification testing should be undertaken prior to disposal and liaison with the receiving facility should be sought. Given the site's agricultural history, there is low potential to encounter grossly contaminated soils or groundwater not encountered during the investigation. • An Earthworks Specification should be prepared to specify the geotechnical requirements for material re-use on site. • Prior to undertaking any cut and fill operations, consideration will have to be given to materials management onsite upon development; particularly for earthworks, in the form of a CL:AIRE DoWCoP Materials Management Plan (MMP) or Environmental Permit. Further testing under a site-specific earthworks specification is recommended to determine the suitability of site-won material for re-use.

1 INTRODUCTION

1.1 General

Fairhurst have been appointed by SEGRO PLC (the Client) to provide a Ground Investigation Report associated with the proposed development at East Midlands Gateway Phase 2, Land South of East Midlands Airport, Derby. The report has been prepared in support of anticipated Development Consent Order (DCO) application.

The site location plan and the existing site layout plan (proposed order limits) are provided with Appendix A. The majority of new build development is on 'the main site', as referred to in the DCO application. The main site will be referred to as EMG2 hereafter in this report. EMG2 lies to the south of East Midlands Airport. It falls within the 'East Midlands Airport and Gateway Industrial Cluster' (EMAGIC) designated as part of the East Midlands Freeport, which was created in 2022. The remaining part of the application site that includes section of the land within EMG1 where capacity upgrades to the existing rail freight terminal and utilities are proposed along with land required for potential highway improvements to accommodate the proposed development are to be submitted under separate cover. Any additional GI required for the remaining part of the site will be undertaken during detailed design stage post DCO submission.

1.2 Proposed Development

The proposed development will include construction of 16 No. warehouses with office space, ranging in footprint from 17,000 ft² to 898,000 ft², with associated services, access roads/pathways, parking and landscaping. The site is divided into northern and southern parts, which are to be connected via a road bridge spanning an unmade bridleway track (Hyam's Lane) that runs through the centre of the site. The road bridge is to allow car/lorry access between the northern and southern portions of the site. The structure is proposed due to a requirement to maintain Hyam's Lane to its current state.

The current Cut and Fill Plan (included in Appendix A) indicates the site is to be levelled to eight plateau zones ranging from +66.75m AOD to +89.00m AOD. Landscape bunds are proposed along the western and southern edge of the site to provide a visual obstruction between the development and the nearby town, Diseworth. Other landscape areas include old and new features which will deliver biodiversity enhancements.

1.3 Scope and Objectives

The report has been prepared in support of the forthcoming DCO application and also aims to provide geotechnical assessment and recommendations with respect to earthworks, foundations, external hard cover and floor slab proposals.

The specific objectives include:

- Carry out and report on an intrusive ground investigation designed to determine the characteristic ground conditions and hydrogeology underlying the site and to identify any potentially significant environmental or geotechnical development constraints;
- Review and assess the chemical and geotechnical test results to inform and update the conceptual site model;
- Make recommendations for further actions, if applicable, relating to any remaining pollutant linkages identified by the ground investigation; and
- Make recommendations relating to any geotechnical constraints to development identified by the ground investigation.

1.4 Sources of Information

The following available resources have been utilised and referenced within this report.

- BRE Special Digest 1:2005, Concrete in Aggressive Ground;
- BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice;
- BS 8002:2015 Code of practice for earth retaining structures;
- BS 8485:2015+A1:2019 - Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings;
- BS EN ISO 14688-2:2018, Geotechnical investigation and testing. Identification and classification of soil;
- BS EN ISO 14689:2018, Geotechnical investigation and testing. Identification and classification of rock;
- CIRIA C570 Engineering in Mercia Mudstone, October 2021;
- CIRIA C665 Assessing risks posed by hazardous ground gases to buildings, December 2007;
- CIRIA C733 Asbestos in soil and made ground: a guide to understanding and managing risks, March 2014;
- CIRIA R143 The standard penetration test (SPT): methods and use, 1995;
- Foundation Design and Construction, Seventh Edition M. J. Tomlinson 2001;
- Land Contamination Risk Assessment (LCRM), October 2020 updated April 2021
<https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>;
- NHBC Chapter 4.2 'Building Near Trees' (2024);
- Published Category 4 Screening Values (C4SLs) derived by CL:AIRE on behalf of DEFRA;
- The measurement of soil stiffness in the triaxial apparatus, Géotechnique 34(3):323-340, Jardine, R.J., Symes, M.J., Burland, J.B., (1984)
- The Standard Penetration Test and the Engineering Properties of Glacial Materials, M. A. Stroud & F. G. Butler (1975);
- Suitable 4 Use Screening Levels (S4USLs) derived by LQM/CIEH;
- UK Drinking Water Standards (UKDWS) and freshwater environmental quality standard (EQS); and,
- UK Water Industry Research (UKWIR) Guidance for the selection of water supply pipes to be used in brownfield sites, 2010.

The following site specific sources of information have been utilised in the preparation of this report:

- Fairhurst Phase 1 Geo-Environmental and Geotechnical Preliminary Risk Assessment (148749/R5, August 2024);
- Structural Soils Ltd; Factual Report on Ground Investigation, EMG Phase 2, ref. 765514-01 (02), May 2023 (Appendix B);

1.5 Limitations

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The nature of ground investigation is such that differing ground conditions, whether geotechnical or geo-environmental may be present between sampling positions and exploratory hole locations.

2 SITE SETTING

The following provides a summary of the Phase 1 Geo-Environmental and Geotechnical Preliminary Risk Assessment (ref. 148749/R5.0) which should be read and understood in conjunction with this report.

2.1 Site Description

The site is located immediately south of East Midlands Airport and to the east of the village of Diseworth in a triangle between Loughborough (approximately 15 km to the south-east), Derby (approximately 25 km to the north-west) and Nottingham (approximately 25 km to the north-east). It is located immediately north-west of Junction 23a of the M1 motorway and approximately 3 km south of Junction 24.

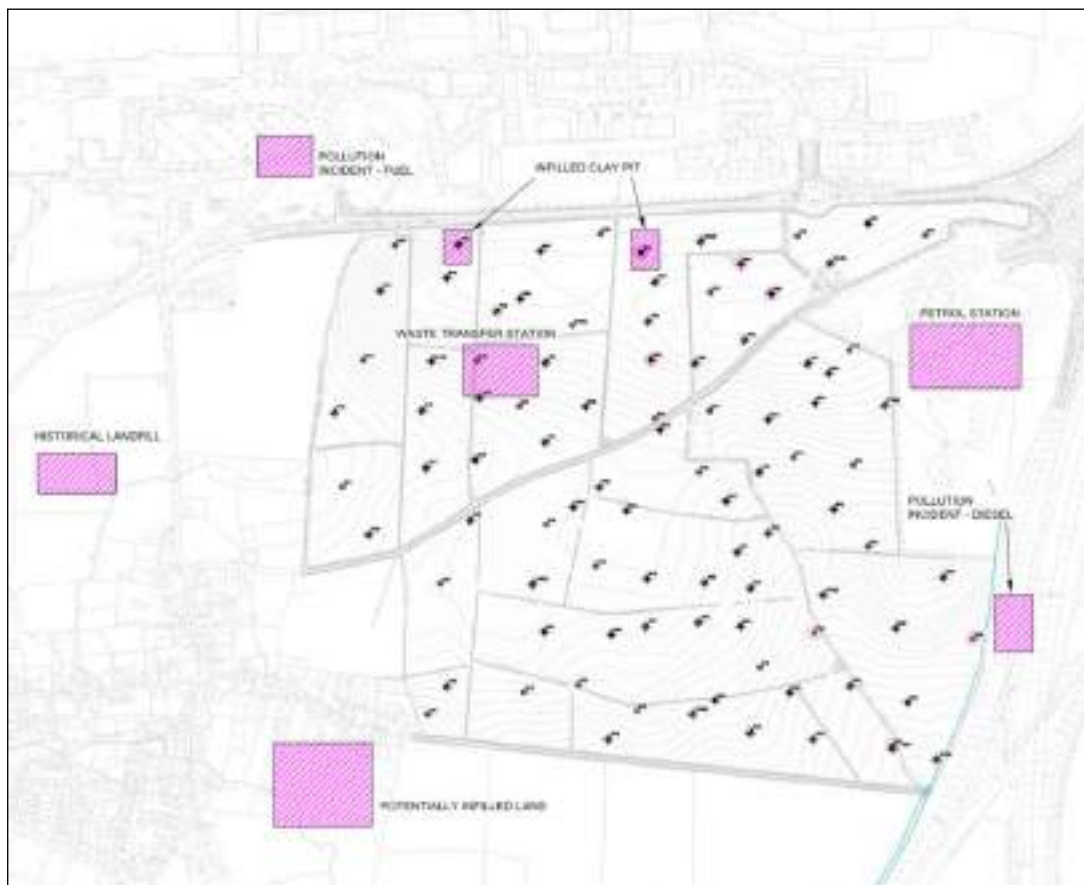
The site has an area of approximately 100ha and currently comprises undeveloped arable land with hedgerows and trees dividing the various fields. A public byway, known as Hyam's Lane, dissects the site from south-west to north-east. Overhead power cables are present extending across the western area of the site in a north to south direction.

The site is bound to the north by Ashby Road (A453) with East Midlands Airport beyond. Donington Park Services, including a petrol station, is located immediately adjacent to the north-east. To the east lies an undeveloped parcel of land, the A42 and the M1. Whilst the Long Holden public byway with fields beyond is immediately south and to the south-west is the village of Diseworth.

A site location plan is included in Appendix A.

2.2 History of the Site and its Surroundings

The figure below (excerpted from the Fairhurst PRA) indicates the potential sources of contamination identified by the Preliminary Risk Assessment.



On site

Historical mapping from the Envirocheck report indicates the site is occupied by agricultural fields with numerous ponds from the earliest mapping available (1883). In 1921, a pump was identified at the pond, north-east of the site. A drainage ditch was also noted extending southwards of a pond north of the site. In 1955, the pond in the south-east of the site was no longer labelled and this has been assumed to be infilled. Similarly, in 1972-1975, the pond in the north-eastern corner of the site is no longer labelled and assumed infilled.

Information provided by the Environment Agency identifies a waste transfer site (authorised November 1986) classified as 'very small' in the central part of the northern site.

Off-site

The Historical mapping from the Envirocheck report indicates the surrounding land as agricultural fields with ponds as of the 1883 map edition. A brick yard was also noted 100m south-west of the site. Though, in 1921, the brick yard was cleared with a stream shown extending along the western site boundary. In 1955, additional ponds were labelled from 50m south-west of the site along with an airfield, 400m north of the site. This airfield was extended to within 50m north-west of the site in 1962. In 1966, the M1 motorway and associated embankments was constructed from 100m east of the site. The airfield north of the site was also labelled as East Midlands Airport. Between 1972 and 1984, numerous ponds were no longer mapped and assumed to be infilled, with tanks being noted 260m north-west of the site. In 1989, commercial buildings and a hotel was noted 100m north of the site with a junction linking the M1 to the A453 (adjacent to the northern site boundary) shown as of the 1992-1994 map edition. Further commercial buildings were constructed in 2000 (north of the site) along with Donington Park Service Station. In 2006, a drain/stream was noted linking the 2 ponds 100m east of the site and in 2021, 2 sewage pumping stations were noted, one 240m west of the site and the other within Donington Park Service Station, 50m north-east of the site.

Information provided by the Environment Agency identifies the following pollution sources within influential distance of the site (within 250m of site):

- Pollution Incident to Controlled Waters (Diesel) is identified 26m east of site in 1997;
- Substantiated Pollution Incident 195m north-west, listed as significant incident comprising a Kerosene and Aviation Fuel spill in 2002; and,
- Historic landfill 250m west, listed as decommissioned in 1970.

2.3 Geology

The British Geological Survey (BGS) 1:50,000, Sheet No. 141, Loughborough, Solid and Drift (dated 2001) and historical BGS borehole records have been reviewed to provide information on the published and proven underlying geology and ground conditions at the site.

The site has undergone some minor development in isolated localities. A limited thickness of topsoil is likely present (identified in historical BGS boreholes) given the agricultural history of the site.

Due to the absence of widespread historical development on site, Made Ground is not anticipated consistently across the site. However, as identified on the historical mapping, 2 No. infilled clay pits are situated on the northern boundary which were reportedly infilled c.10 years prior to the Fairhurst visit although the nature of the infill material is unknown.

The BGS mapping indicates the presence of 3 types of superficial deposits on site;

- Head deposits comprising clay, silt sand and gravel are identified surrounding the inland river in the north-western corner of the northern field. According to BGS Lexicon of Named Rock

Units, the deposits are poorly sorted and poorly stratified, and deposited by solifluction processes;

- Glaciofluvial deposits comprising sand and gravel are identified across most of the central region in the northern site and in the north-eastern corner of the southern site. Glaciofluvial Deposits are a general a term for sand and gravels deposited in supraglacial, englacial, subglacial and ice-marginal drainage systems. Some silt and clay deposits are also expected within these strata; and,
- Oadby Member (Diamicton Till) is identified in the north-eastern corner of the southern site and southern centre portion of the northern site. Generally, this unit is a heterogeneous mixture of clay, sand, gravel and boulders deposited directly beneath a glacier.

The site is predominantly underlain by The Gunthorpe Member, comprising mudstone with subordinate dolomitic siltstone and fine-grained sandstones. It is considered that the upper zone of the Gunthorpe Member will be encountered as a weathered material consisting of clay with mudstone lithorelicts.

The Diseworth Sandstone, a subgroup of the Gunthorpe Member, is shown to outcrop in the western, central and eastern areas of the site and is expected to be encountered at depth elsewhere. Based on the BGS map, the stratum demonstrates a dip of 0.5 to the south.

Geological faults are identified across both northern and southern sites which predominantly show a north-west, south-east trend with the exception of an east-west fault running along the northern boundary of the northern site. Review of the available in-house 1:50,000 geological map of the area (sheet number 141) indicates that numerous faults down through to west, north-east, east and south-west potentially creating a complex horst-graben structure.

2.4 Hydrology

A drainage ditch was observed running along the north-western boundary where it enters site in the north-eastern corner and turns west halfway down the boundary length. It appears to originate offsite, flowing in a southerly direction.

2 No. drainage ditches that appear to converge in the south-eastern corner of the site are also present; one that runs from the central south-eastern area and one that runs along the south-eastern boundary, both flowing in a southerly direction. It is stipulated these ditches are in hydraulic connectivity with the groundwater although the ground investigation will need to confirm this.

2 No. inland rivers have been identified south of the site (Diseworth Brook 320m south and Long Whatton Brook 500m south-east of the site) which appear to be partially fed by the aforementioned drainage ditches. It is therefore considered that if the ground investigation finds the ditches to be in connectivity with the groundwater, they are valid pathways for groundwater contamination to enter these inland rivers.

3 No. ponds have been identified onsite, located in the centre, northeast and northern areas. A review of the Envirocheck report (Appendix B of the Preliminary Risk Assessment) indicates a number of off-site ponds situated 65m east, 85m east, 50m west, 70 north and 180m south-west of the site.

Information provided from the Environment Agency (EA) Flood Map for Planning indicates that the site is located in Flood Zone 1 (not considered to be at risk of flooding from rivers or seas up to the 1 in 1,000-year annual exceedance probability event (0.1% AEP)). The Flood Map identifies potential for surface water flooding during heavy rainfall in the western part of the northern site and south-eastern part of the southern site which may impact construction works and require mitigation as part of the site drainage strategy.

2.5 Hydrogeology

Information provided by the Environment Agency classifies the bedrock as a High Vulnerability Secondary B Aquifer (Gunthorpe Member) and the superficial deposits as a Secondary A Aquifer (Glaciofluvial deposits) and Secondary Undifferentiated Aquifer (Oadby Member and Head deposits).

The site is not located in a groundwater Source Protection Zone (SPZ) but it is located within a Nitrate Vulnerable Zone.

The Envirocheck Report indicates that there are no groundwater abstraction points within 1000m of the site boundary.

2.6 Ecology

An assessment of protected species is outside the scope of this report. This report considers ecology with respect to the Environmental Protection Act 1990 Part IIA (as amended) only and the Envirocheck report has identified the site is within a Nitrate Vulnerable Zone.

2.7 Geo-Environmental Considerations

The Fairhurst Geo-Environmental and Geotechnical Preliminary Risk Assessment (ref. 148749/R5 dated June 2023) concluded the proposed development does not result in an increased sensitivity with respect to land use (Commercial end use). Based on the initial CSM and Preliminary Risk Assessment (PRA), the majority of complete pollutant linkages is of **Moderate/Low** or **Low** risk. The PRA is conservative in its approach and therefore intrusive ground investigation is recommended in order to confirm the CSM and quantify the risks associated with the potential pollutant linkages.

The PRA has identified the following potential contaminative sources are present on/near to site:

- Waste Transfer Site (on site);
- Infilled Clay Pits (2 No. on site);
- Pollution Incident (Diesel) to Controlled Waters (26m E);
- Potentially infilled land (29m SW);
- Petrol filling station (67m NE);
- Pollution Incident (Kerosene and Aviation Fuel) (195m NW); and,
- Historic landfill (250m W).

The ground investigation should confirm the presence/nature of Made Ground soils in association with infilled ground on site and potential contamination from the identified sources listed above to ascertain the risk to human health via dermal contact / ingestion and / or inhalation of contaminated soils and via ground gas and / or soil vapour accumulation within voids or beneath structures; to building foundations from chemical attack due to direct contact with aggressive soil conditions; and, to drinking water supply pipes from direct contact with any hydrocarbon-impacted soils which may be identified during the investigation.

With this in mind, the investigation should also include a groundwater and ground gas monitoring regime and geo-environmental soil testing to assess the potential risks to human health and the environment including confirming the presence/absence of asbestos.

Following the ground investigation, an Interpretative Ground Investigative Report will be required to present the findings of the ground investigation and compile an updated CSM including a review of the geotechnical considerations and geo-environmental risks.

A Potential Sources of Contamination Plan is provided within Appendix A.

2.8 *Geotechnical Considerations*

The following potential geotechnical constraints to development may be present at the site inferred from desk based findings identified to date:

- The desk study has identified infilled ground around the site and its composition or compaction regime is not known. This gives rise to potential settlement (total and differential) risks;
- The BGS mapping indicates the presence of numerous geological faults intersecting across the site; these introduce numerous geotechnical issues including introduction of pathways for water flow (including contaminated waters), fractured/poor quality rockmass leading to instabilities and potential for sudden changes in rockhead depth (due to upthrow and downthrow of fault);
- Made Ground and Superficial deposits may contain obstructions typically in the form of brick, building rubble, cobbles and boulders;
- Pyrite (sulphate 'attack') may represent a risk to the proposed building structures and foundations associated with Made Ground, groundwater and natural soils.
- Potential for a groundwater body within the near-surface superficial/bedrock which may require pumping/dewatering during an intrusive works;
- The cohesive dominant superficial deposits may represent a potential risk to the proposed development with regards to shrink swell (heave);
- There is potential for surface water flooding during heavy rainfall in the western (northern site) and south-eastern part of the southern site which may impact on site works;
- Three different types of superficial deposit are shown on the BGS mapping, therefore there is the potential for variable strength superficial deposits underlying the site and due to lack of ground investigation data ground conditions cannot be conclusively assessed at this stage; and
- 3 No. ponds have been identified on site. There is the potential for silt rich soils to be present underlying these, which may require excavation and backfilling with geotechnically suitable material in accordance with a site-specific earthworks specification.

3 GROUND INVESTIGATION

3.1 Rationale

The following recommendations were made within the Geo-Environmental Assessment Report (ref. 148749/R5.0) with respect to the intrusive investigation and risk assessment:

- Confirm the nature and extent of infilled ground and potential contamination to assess the identified potential pollution sources listed in Section 2.7 above and provide a general coverage across the site;
- Groundwater monitoring to confirm the groundwater regime to inform design of a drainage strategy and undertake a groundwater and surface water sampling regime to identify any existing contamination and assess the contaminative effects of the project post construction;
- Ground gas monitoring to confirm the ground gas regime and potential risks to human health and the environment;
- Further understand and address the geotechnical constraints identified in relation to the proposed development.

The table below sets out the rationale behind the location of exploratory holes and the sampling strategy required to ensure the necessary information is acquired.

Table 1 Summary of the rationale behind selected exploratory locations

Location ID	Rationale	Sampling Strategy
All exploratory locations	Assess presence and nature of infilled ground and any potential obstructions/material unsuitable for re-use in earthworks	Geotechnical samples to assess settlement risk and suitability for re-use and geo-environmental samples to assess remediation requirements and suitability for re-use
All exploratory locations	Establish risk to buried concrete from pyrite (sulphate 'attack')	Geotechnical sampling at a range of depths for BRE SD1 testing
All exploratory locations	Investigate presence of groundwater and ascertain groundwater flow direction	Installation of groundwater monitoring installations to capture any groundwater encountered and monitor elevations
All exploratory locations	Investigate ground conditions to inform the geological ground model and geotechnical design	In-situ geotechnical testing and geotechnical sampling for laboratory testing
CP04, BH12	Establish deep ground conditions at bridge location for pile design	In-situ geotechnical testing and geotechnical sampling for laboratory testing
CP08, TP07, TP10	Assess presence of contamination from Waste Transfer Site	Geo-environmental soil samples, gas/groundwater monitoring pipe to screen any Made Ground/polluted soils
BH04 (s), TP08	Assess composition and nature of identified infilled clay pits. Assess potential contamination from off-site Distribution and Haulage site (159m N) and Freight Forwarders/Services (160m N).	In-situ geotechnical testing and sampling for laboratory testing. Geo-environmental soil samples and gas/groundwater monitoring installation to assess soil/groundwater contamination
CP28, BH27	Intercept migration pathway for groundwater contamination from pollution incident (26m E) listed as oil spill from ruptured diesel tank on lorry (1997)	Ground gas/groundwater installations for gas/groundwater monitoring. Geo-environmental soil and groundwater sampling for contaminant testing

Location ID	Rationale	Sampling Strategy
CP21, TP24	Intercept migration pathway for gas and groundwater contamination from potentially infilled ground (29m SW)	Ground gas/groundwater installations for monitoring. Geo-environmental soil and groundwater sampling for contaminant testing
CP01, CP12, BH13, BH01, BH02	Intercept migration pathway for gas and groundwater contamination from petrol filling station (67m NE). Assess potential contamination from printed circuit services (89m NE), vehicle cleaning services (67m NE) and service area (67m NE).	Ground gas/groundwater installations for gas and groundwater monitoring. Geo-environmental soil and groundwater sampling for contaminant testing
CP09, BH10	Intercept migration pathway for gas and groundwater contamination from pollution incident (195m NW). Assess potential contamination historic landfill (254m NW), recent/active landfill site (256m NW), and potential infilled land (169m NW)	Ground gas/groundwater installations for gas and groundwater monitoring. Geo-environmental soil and groundwater sampling for contaminant testing
CP11, TP15	Assess contamination from Historic landfill site (254m NW)	Ground gas/groundwater installations for gas and groundwater monitoring. Geo-environmental soil and groundwater sampling for contaminant testing

3.2 Scope of Investigation

Structural Soil Ltd undertook the role of Principal Contractor and subcontracted the environmental laboratory testing to Envirolab to fulfil the scope of works.

The 2023 intrusive investigation comprised:

- Buried utility services search to clear proposed exploratory hole locations of buried utilities and establish the location (x, y, z) of each location;
- 27 No. cable percussive boreholes with rotary core follow on to depths of between 20.00m and 31.00m bgl. CP drilling was carried out until competent bedrock was encountered. In-situ testing and undisturbed and disturbed sampling for laboratory analysis was also specified;
- 28 No. cable percussive boreholes to establish the depth to rockhead was carried out, taken to depths of between 4.50m bgl and 17.00m bgl. In-situ testing and undisturbed/disturbed sampling for laboratory analysis also specified;
- 38 No. machine excavated trial pits were completed (37 No. proposed, 1 No. additional to investigate extent of contaminated Made Ground), with hand shear vane testing and collection of samples for laboratory analysis;
- 8 No. soakaway infiltration tests in selected trial pits in accordance with BRE Digest 365, three repeat fillings of the pits were not undertaken due to slow infiltration rates;
- 2 No. variable head permeability tests carried out in BH11 and CP06 in accordance with BS EN ISO 22282-1:2012 and -2:2012;
- Installation of 25 No. groundwater and ground gas monitoring wells within selected borehole locations, 2 of which were dual installations. Following the monitoring period, all the installations were decommissioned aside from those at BH09, BH12, BH18, BH24, CP01 and CP27, this was to minimise disruption to the land owners;
- 3 No. further return visits to site to undertake groundwater and ground gas monitoring;

- 3 No. surface water sampling sets (downstream, midstream and upstream) from waterbodies situated in the south-eastern area of the site, along the western and south-eastern site boundaries and from a pond in the north-east of the site;
- Geotechnical laboratory testing of selected soil and groundwater samples (using UKAS accredited laboratory) allowing for targeted geotechnical testing based on the proposed development plans;
- Chemical laboratory testing of selected soil sample, groundwater and surface water (using a UKAS and MCERTS accredited laboratory) allowing for testing of a suite of contaminants based on historical land use;

Please refer to Potential Sources of Contamination Plan (Ref. 148749 – 9009, dated October 2023) provided in Appendix A for exploratory locations.

Photo-ionisation detector (PID) headspace readings has been undertaken on all geo-environmental samples during the GI. Ground gas monitoring included semi-quantitative monitoring of volatile organic compounds (VOCs) via PID.

The ground investigation was specified in accordance with the ICE UK Specification for Ground Investigation (2012) and was undertaken in general accordance with techniques outlined in Eurocodes 7 - BS EN 1997-2:2007, BS 5930:2015 Code of Practice for Site Investigations and BS 10175 Investigation of potentially contaminated sites. The works were carried out under the supervision of an experienced Geotechnical Engineer from/contracted by Structural Soils Ltd.

The Structural Soils Ltd Factual Report is included as Appendix B.

3.3 Ground Gas / Vapour and Groundwater Monitoring

Ground gas / vapour monitoring was undertaken at 15 No. locations across 3 no return monitoring visits 13/14th October, 26/27th October and 10-14th November 2022). Groundwater sampling was undertaken at all monitoring well locations on a single return monitoring visit.

The construction / targeted screening zones of the monitoring wells installed at the site are summarised in Table 2.

Table 2 – Locations of Groundwater, Ground Gas and Vapour Monitoring

Monitoring Well ID	Screened Section (m bgl) (Stratum Targeted)	Screened section (m AOD)
BH01	1.00 – 7.00 (WGM / GUN)	+ 88.22 – 82.22
BH02	4.00 – 20.00 (GFUD / WGM / GUN)	+ 86.55 – 70.55
BH04	1.00 – 2.50 (WGM)	+ 86.21 – 84.71
BH04(d)	6.00 – 30.30(WGM / GUN)	+ 81.21 – 56.91
BH05	5.00 – 7.00 (GFUD)	+ 82.17 – 80.17
BH06	18.00 – 30.80 (WGM / GUN)	+ 62.29 – 49.49
BH09	7.00 – 12.50 (WGM / GUN)	+ 67.23 – 61.73
BH09(d)	14.00 – 18.00 (GUN)	+ 60.23 – 56.23
BH10	3.00 – 20.00 (WGM / GUN)	+ 84.35 – 67.35
BH11	13.00 – 31.00 (GFUD / WGM)	+ 66.89 – 48.89
BH12	16.00 – 30.80 (WGM / GUN)	+ 64.23 – 49.43

Monitoring Well ID	Screened Section (m bgl) (Stratum Targeted)	Screened section (m AOD)
BH13	8.00 – 30.00 (WGM / GUN)	+ 80.03 – 58.03
BH14	1.00 – 11.50 (ODT / GFDU)	+ 83.68 – 73.18
BH16	2.00 – 20.00 (GFDU / WGM / GUN)	+ 71.98 – 53.98
BH17	1.00 – 4.50 (GFDU / WGM)	+ 73.45 – 69.95
BH18	4.50 – 16.00 (WGM / GUN)	+ 73.12 – 61.62
BH21	5.00 – 30.00 (GUN)	+ 70.56 – 45.56
BH23	1.00 – 8.00 (WGM / GUN)	+ 69.77 – 62.77
BH24	1.00 – 5.00 (WGM / GUN)	+ 66.02 – 62.02
BH25	4.00 – 20.00 (GUN)	+ 59.15 – 43.15
BH27	1.00 – 4.00 (WGM)	+ 58.09 – 55.09
CP01	1.00 – 7.50 (WGM)	+ 90.40 – 83.90
CP06	1.00 – 10.90 (ODT / GFDU / WGM)	+ 86.01 – 76.11
CP10	1.00 – 8.40 (ODT/GFDU)	+ 74.02 – 66.62
CP11	1.00 – 6.20 (WGM)	+ 67.97 – 62.77
CP16	5.60 – 9.00 (GFDU)	+ 71.64 – 68.24
CP17	14.00 – 17.00 (GFDU)	+ 68.31 – 65.31
CP21	1.00 – 5.00 (WGM)	+ 67.05 – 63.05
CP27	1.00 – 3.00 (MGR)	+ 54.98 – 52.98
CP28	1.00 – 4.60 (WGM)	+ 63.08 – 59.48

MGR – Made Ground, ODT – Oadby Member, GFDU – Glaciofluvial, WGM – Weathered Gunthorpe Member, GUN – Gunthorpe Member (Mudstone)

The groundwater and ground gas / vapour monitoring visits included use of a PID (Phocheck Tiger) to provide a semi-quantitative measure Volatile Organic Compounds (VOC) and a ground gas monitor. The gas monitor models used include the GFM430 and GA5000 for which calibration certificates (dated 06/06/2022 and 06/10/2022 respectively) are provided within the Structural Soils Factual Report. The gas monitoring recorded concentrations of carbon monoxide (CO), carbon dioxide (CO₂), hydrogen sulphide (H₂S), methane (CH₄) and oxygen (O₂). Atmospheric pressure readings and gas flow rates were also recorded.

3.4 Laboratory Testing

Geotechnical and geo-environmental laboratory testing was scheduled by Fairhurst and undertaken on soil and groundwater samples recovered from the ground investigation. Geotechnical analysis was carried out by Structural Soils Ltd within their UKAS accredited laboratories. Geo-Environmental testing was carried out by Envirolab UKAS and MCERT accredited laboratories. The laboratory analytical certificates are included in the Structural Soils Ltd Factual Report and assessment of the results is provided herein.

Table 3 below summarises the instances where geo-environmental testing is recorded as deviated as the maximum holding time was exceeded for the contaminants tested.

Table 3 – Summary of Deviated Samples

Location ID	Sample Depth (m)	Sample type	Testing type
BH07	4.50	S	Organic Matter
BH12	1.00	S	PAH-16MS Organic Matter EPHCWG VPHCWG
BH25	0.50	S	PAH-16MS VPHCWG
CP01	0.50	S	PAH-16MS VPHCWG
CP08	0.50	S	PAH-16MS TPH Banded 1 with ID
CP24	0.10	S	PAH-16MS Organic Matter EPHCWG VPHCWG
CP28	1.00	S	PAH-16MS VPHCWG Organic Matter VOC SVOC excluding PAH-16
TP27	1.60	S	PAH-16MS Organic Matter EPHCWG VPHCWG
TP29	1.40	S	PAH-16MS Organic Matter EPHCWG VPHCWG

The deviated results have been assessed to ascertain whether the results can be included in the overall assessment. In all cases, the deviated results are within the range of the overall results and so these results have tentatively been included in the overall assessment.

4 GROUND CONDITIONS

The following section provides a summary of the ground conditions encountered during the Fairhurst September / October 2022 ground investigation works and a comparison to the findings of previous works undertaken.

The Ground conditions encountered broadly corroborated the findings of British Geological Survey mapping review with the superficial soils more extensively encountered in the central portion of the site with little to no superficial cover in the northern and southern portions of the site. It must be noted that, although head deposits are indicated on site, the investigation did not identify any. This is likely because there was no discernible difference between the head deposits and the parent material.

Throughout the report the following abbreviations have been adopted using the BGS codes where available for ease of presentation:

Topsoil	TS
Made Ground	MGR
Oadby Member	ODT
Glaciofluvial Deposits	GFDU where (c) = cohesive and (g) = granular
Weathered Gunthorpe Member	WGM
Gunthorpe Member	GUN

Ground conditions encountered during the recent investigation are summarised in Table 4. Cross sections across the site are provided in Appen.

Table 4 – Summary of Ground Conditions

Lithology	Location	Base of Lithology (m bgl)	Base of Lithology (m AOD)
Topsoil	All exploratory hole locations (aside from where Made Ground is encountered)	0.10 – 0.85	91.0 – 58.5
Made Ground	(BH04, BH12, BH25, CP27, TP08, TP25, and TP37)	0.20 – 3.00	86.0 – 53.0
Oadby Member	21 No. positions, most extensively found E-W through the centre of the site (cross section line B-B)	1.70 – 16.40	85.8 – 64.0
Glaciofluvial	61 No. Positions, most extensively found E-W through the centre of the site (cross section line B-B)	0.40 – 17.30	89.7 – 53.4
Weathered Gunthorpe Member	73 No. positions, less extensively present where significant superficiais soils are found	1.40 – 18.50	88.2 – 51.0
Gunthorpe Member	33 No. positions	>33.35	<28.0

4.1 Topsoil

Topsoil was encountered at the majority of exploratory location (aside from where Made Ground was encountered) to maximum depths of between 0.10m and 0.85m bgl (91.0m AOD and 58.8m AOD). Although the material was described as Topsoil, observations made during the investigation indicate this material to generally comprise firm to very stiff brown/reddish brown clay with silt, sand, and gravel where the gravel comprised quartzite, mudstone, siltstone, sandstone, flint and quartz.

Cobbles were locally encountered, generally comprising subangular to well-rounded mudstone, sandstone and quartzite.

4.2 *Made Ground*

Made Ground was encountered from surface at 7 No. positions (BH04, BH12, BH25, CP27, TP08, TP25, and TP37) and extended to maximum depths of between 0.20m and 3.00m bgl (86.0m AOD and 53.0m AOD).

At BH04, BH12 and BH25, Made Ground was encountered to depths of 0.20m to 1.20m (86.0m AOD to 62.75m AOD) where it comprised clay/silt with subordinate sand and gravel. The gravel comprised mudstone, limestone, siltstone, quartzite and sandstone. Despite an absence of anthropogenic material found within these soils, these soils appeared disturbed due to human activity.

The material encountered at CP27 comprised clay with sand and gravel where the gravel was flint, sandstone, siltstone and quartzite. A moderate hydrocarbon odour was noted from 0.30m to 2.15m bgl with a strong hydrocarbon odour and iridescent sheen subsequently noted from 2.15m to 2.25m bgl. PID headspace testing recorded values of 4.0ppm and 13.5ppm at 3.00m and 4.00m bgl respectively. Subsequently, geo-environmental testing for a range of contaminants was scheduled on a sample of this material and a sample from the top of the natural soils to ascertain the nature and extent of this contamination.

At TP08 the Made Ground, found to a depth of 2.80m bgl (82.2m AOD), comprised silty sandy gravel of brick, tile, mudstone and quartzite with occasional brick and concrete blocks.

At TP25 and TP37 Made Ground was encountered to depths of 0.40m bgl (65.0m AOD) and 0.30m bgl (55.1m AOD) respectively. The soils comprised predominantly clay with subordinate sand and gravel; where the gravel consisted of brick, glass and ceramic tile.

No suspected Asbestos Containing Materials (ACMs) were recorded on the logs. Aside from the aforementioned instance at CP27, no visual or olfactory evidence of contamination was observed within the Made Ground soils.

4.3 *Oadby Member*

The Oadby Member was encountered below the Topsoil/Made Ground in 21 of the 93 exploratory holes and was found to extend to depths of between 1.70m and 16.40m bgl (85.8m AOD and 63.9m AOD). The most extensive deposits occur through the middle section of the site, roughly in the region of the B-B section line (Appendix A). It is considered this area is representative of a glacial cutting with subglacial deposition running through the site.

The soils are generally described as stiff to very stiff greyish brown / dark grey clay with subordinate silt, sand and gravel. The gravel consisted of fine to coarse mudstone, siltstone, sandstone, quartz, quartzite, flint and chalk with occasional cobbles also noted.

Some deposits of sand and gravel with subordinate clay and silt content were observed within the Oadby Member although these are only a minor component of the soils as a whole.

No visual evidences of desiccation were recorded within the deposit on any of the exploratory hole logs.

4.4 *Glaciofluvial Deposits*

Glaciofluvial deposits were found to underlay the Oadby Member where present and was encountered below the Topsoil/Made Ground elsewhere. It was found to extend to maximum depths of between 0.40m and 17.30m bgl (89.7m AOD and 53.4m AOD). The deposits consisted variable interbedded cohesive and granular soils with limited lateral continuity of strata observed between exploratory positions.

The majority of the deposit was found to be cohesive, where it generally comprised firm to very stiff reddish brown / orangish brown / yellowish brown clay with variable silt, sand and gravel content. The gravel was found to consist of predominantly mudstone with siltstone, sandstone, flint, quartz and quartzite. Light grey / grey mottling was encountered locally within this deposit.

The granular soils encountered were recorded as medium dense to very dense orangish brown / greyish brown gravel with variable clay, silt and sand content or medium dense to dense greyish brown / brown / reddish brown / orangish brown silty sand found to be locally clayey and gravelly. The gravel fraction of these deposits was found to comprise mudstone, siltstone, sandstone, flint, quartz and quartzite.

No visual evidences of desiccation were recorded within the cohesive soils on any of the exploratory hole logs.

4.5 Gunthorpe Member (Mercia Mudstone Group)

The Gunthorpe Member (subset of the Mercia Mudstone Group) was found across the entirety of the site and comprised predominantly mudstone interbedded with siltstone and sandstones. These deposits were found beneath the superficial soils where present, and from surface elsewhere, with a weathered profile invariably encountered at shallower depths. The weathered soils comprised predominantly stiff to very stiff reddish brown clays with silt, sand and gravel where the gravel fraction consisted of mudstone and siltstone lithorelicts. Pockets / lenses of grey silty sand / sandy silt and black staining on fracture surfaces were locally observed. Laminae of extremely weak mudstone and fine grained sandstone were recorded, generally increasing in frequency with depth suggesting a decrease in weathering grade.

Generally speaking, a much less extensive profile of weathered material is observed where extensive superficial soils are present overlying the Gunthorpe Member suggesting the weathered soils have been eroded away or the bedrock has not been exposed near surface allowing weathering processes to occur. The depth to the upper surface of the weathered Gunthorpe Member varied between depths of between 0.10m and 17.30m bgl (91.0m AOD and 53.0m AOD), reflective of the topography and variable degree of superficial cover encountered across the site.

The Weathered Gunthorpe Member has been separated from the bedrock material in the following geotechnical testing and assessment sections of this report for ease of presentation and analysis. In general, the material deemed to be weathered is logged as Grade IVb to Grade III whilst the bedrock is defined as Grade III to Grade I. The stratum is graded in accordance with CIRIA C570 and this distinction is based on observations made on the exploratory hole logs.

The bedrock was encountered below this weathered material where present, and below the Topsoil / Made Ground / superficial soils elsewhere; its upper surface varies between 1.40m and 18.50m bgl (86.8m AOD and 54.9m AOD) and extended the remaining extent of depths investigated where encountered. It comprised extremely weak to medium strong reddish brown mudstone with pockets / laminae of greenish grey sandy silt / siltstone locally recorded. Bedding fractures were recorded as closely to medium spaced, rough / smooth and planar / undulating with black staining and red clay infill along bedding fractures occasionally noted. Very closely spaced, randomly orientated, rough, undulating fractures with black staining are also noted.

Closely to very closely spaced laminae, generally 5mm to 20mm, of crystallised gypsum are occasionally present. Horizons of mudstone weathered to clay are encountered within the bedrock also, these are generally recorded stiff to very stiff laminated clay / silty clay with occasional mudstone lithorelicts.

Within the Gunthorpe, discrete stratum of extremely weak to strong, thinly laminated greenish grey siltstone with pockets of calcium carbonate were also encountered.

The Diseworth Sandstone, a subset of the Gunthorpe Member was also encountered where it was described as very weak to medium strong greenish grey fine to medium grained sandstone. The deposit

was not found to be continuous between exploratory locations and appears as discrete sandstone strata interbedded with mudstones and siltstone.

4.6 Groundwater

Groundwater strikes were observed during drilling at a range of depths within the Glaciofluvial and Gunthorpe Member (including weathered) Deposits. The strikes ranged from 2.80m to 26.50m bgl and from +49.60m AOD to +81.80m AOD; a summary of these strikes is provided below in Table 5.

Table 5 - Summary of Depths to Groundwater Strikes

Location ID	Strike depth (m bgl)	Strike Elevation (m AOD)	Stratum type
BH07	11.0	+ 76.2	GUN
BH08	8.0	+ 80.3	GUN
BH08	19.0	+ 69.3	GUN
BH09	4.0	+ 70.3	GFDU (g)
BH09	11.6	+ 62.6	GUN
BH09	16.7	+ 57.5	GUN
BH11	9.0	+ 70.9	GFDU (g)
BH11	21.0	+ 58.9	GUN
BH13	9.0	+ 79.0	WGM
BH13	26.5	+ 61.5	WGM
BH17	3.1	+ 71.4	GFDU (g)
BH18	15.5	+ 62.1	GUN
BH20	10.7	+ 66.2	GUN
BH21	26.0	+ 49.6	GUN
BH23	12.0	+ 58.8	GUN
BH24	10.5	+ 56.5	GUN
BH25	9.6	+ 53.5	GUN
CP02	6.0	+ 81.8	WGM
CP04	17.0	+ 64.7	GFDU (g)
CP06	9.0	+ 78.0	WGM
CP07	13.4	+ 64.7	GFDU (c)
CP08	8.2	+ 73.5	GFDU (g)
CP10	7.3	+ 67.7	GFDU (c)
CP16	5.75	+ 71.5	GFDU (c)
CP23	5.4	+ 65.9	WGM
TP13	3.3	+ 69.7	GFDU (g)
TP19	3.2	+ 72.5	GFDU (c)
TP22	3.3	+ 74.3	GFDU (g)
TP35	2.8	+ 56.7	WGM

Location ID	Strike depth (m bgl)	Strike Elevation (m AOD)	Stratum type
TP39	2.8	+ 52.9	WGM

Where not listed, exploratory holes did not encounter groundwater strikes whilst drilling. It should be noted that the speed of drilling, use of water flush and casing of holes can often mask minor seepages and water strikes.

3 No. gas and groundwater monitoring were completed between the dates of 13th October 2022 and 14th November 2022 and includes water monitoring of the well installations. A summary of the groundwater level monitoring results is presented as Table 6 below and is presented on the Groundwater Levels Plan included in Appendix A.

Table 6 – Summary Depths to Groundwater

Monitoring Well ID	Depth of Installation (m bgl)	Groundwater Levels (m AOD)		
		Round 1	Round 2	Round 3
BH01	1.00 – 7.00	83.49	83.43	83.39
BH02	4.00 – 20.00	82.83	82.75	82.63
BH04	1.00 – 2.50	-	84.89	84.72
BH04A	6.00 – 30.30	76.51	-	76.33
BH05	5.00 – 7.00	82.25	82.18	82.33
BH06	18.00 – 30.80	77.21	-	73.44
BH09	7.00 – 12.50	71.48	-	-
BH09A	14.00 – 18.00	70.55	70.71	71.12
BH10	3.00 – 20.00	72.13	72.20	68.22
BH11	13.00 – 31.00	71.18	77.73	71.21
BH12	16.00 – 30.80	73.48	73.26	73.26
BH13	8.00 – 30.00	76.83	76.93	58.81
BH14	1.00 – 11.50	76.07	75.93	75.89
BH16	2.00 – 20.00	69.43	69.50	69.56
BH17	1.00 – 4.50	72.74	72.80	68.02
BH18	4.50 – 20.50	71.8	71.77	72.62
BH21	5.00 – 30.00	66.22	66.11	46.15
BH23	1.00 – 8.00	64.57	64.52	62.84
BH24	1.00 – 5.00	63.83	63.67	63.44
BH25	4.00 – 20.00	59.22	59.26	58.95
BH27	1.00 – 4.00	56.05	56.19	56.52
CP01	1.00 – 7.50	84.29	84.20	83.92
CP06	1.00 – 11.00	80.14	80.09	75.99
CP10	1.00 – 8.50	70.70	70.75	66.39

Monitoring Well ID	Depth of Installation (m bgl)	Groundwater Levels (m AOD)		
		Round 1	Round 2	Round 3
CP11	1.00 – 6.20	66.70	-	66.94
CP16	5.75 – 9.00	73.39	-	73.36
CP17	14.00 – 17.00	75.11	75.93	74.45
CP21	1.00 – 5.00	Dry	Dry	63.15
CP27	1.00 – 3.00	54.58	54.73	52.73
CP28	1.00 – 4.60	Dry	Dry	60.27

Monitoring suggests that a groundwater body is present between depths of 1.25m and 15.32m bgl (84.9m AOD and 52.7m AOD) within the Glaciofluvial, Weathered Gunthorpe Member and Gunthorpe Member where the Glaciofluvial deposit is classified as a Secondary A Aquifer and the Gunthorpe Member is classified as a Secondary B Aquifer.

The groundwater elevation data suggests there is one groundwater body that is continuous across strata types and aquifers.

It should be noted that groundwater levels might fluctuate for a number of reasons, including in the short term due to the prevailing weather conditions and in the long term due to seasonal variations.

4.7 Visual and Olfactory Contamination

Visual and olfactory evidence was not recorded at the vast majority of exploratory positions advanced during the Structural Soils Ltd intrusive ground investigation. The only position where this was recorded was at CP27 where, as previously mentioned, an iridescent sheen and moderate to strong hydrocarbon odour was observed within the soils to a depth of 3.00m bgl. The source of this contamination is unknown but is stipulated to originate from the historic diesel power generator identified in the PRA. It is not considered likely that this contamination originated from the pollution incident to controlled waters identified nearby (26m E of site) as contamination was not identified at CP28 which is situated between the location of the pollution incident and CP27.

5 GEOTECHNICAL TESTING & ENGINEERING PROPERTIES

The geotechnical in-situ and laboratory data referred to is provided within the Structural Soils Ltd Factual Report included as Appendix B. Where necessary, characteristic parameters have been cautiously estimated using published correlations in conjunction with engineering judgement and consideration of the relevant limit state. The parameters are not considered to be absolute and should be referenced with the specific strata text in this section and reviewed when considering a specific area or development requirement of the site.

The below figures should be referenced accordingly in relation to the field and laboratory testing results.

Figure 1	Casagrande Plasticity Chart
Figure 2	Particle Size Distribution Chart – Topsoil
Figure 3	Particle Size Distribution Chart – Made Ground
Figure 4	Particle Size Distribution Chart – Oadby Member
Figure 5	Particle Size Distribution Chart – Glaciofluvial Deposits (cohesive)
Figure 6	Particle Size Distribution Chart – Glaciofluvial Deposits (granular)
Figure 7	Particle Size Distribution Chart – Weathered Gunthorpe Member
Figure 8	Particle Size Distribution Chart – Gunthorpe Member
Figure 9	SPT 'N' Value vs Depth (m bgl) – Made Ground
Figure 10	SPT 'N' Value vs Elevation (m AOD) – Made Ground
Figure 11	SPT 'N' Value vs Depth (m bgl) – Oadby Member
Figure 12	SPT 'N' Value vs Elevation (m AOD) – Oadby Member
Figure 13	SPT 'N' Value vs Depth (m bgl) – Glaciofluvial Deposits (cohesive)
Figure 14	SPT 'N' Value vs Elevation (m AOD) – Glaciofluvial Deposits (cohesive)
Figure 15	SPT 'N' Value vs Depth (m bgl) – Glaciofluvial Deposits (granular)
Figure 16	SPT 'N' Value vs Elevation (m AOD) – Glaciofluvial Deposits (granular)
Figure 17	SPT 'N' Value vs Depth (m bgl) – Weathered Gunthorpe Member
Figure 18	SPT 'N' Value vs Elevation (m AOD) – Weathered Gunthorpe Member
Figure 19	SPT 'N' Value vs Depth (m bgl) – Gunthorpe Member
Figure 20	SPT 'N' Value vs Elevation (m AOD) – Gunthorpe Member
Figure 21	Undrained Shear Strength vs Depth (m bgl) – Oadby Member
Figure 22	Undrained Shear Strength vs Elevation (m AOD) – Oadby Member
Figure 23	Undrained Shear Strength vs Depth (m bgl) – Glaciofluvial (cohesive)
Figure 24	Undrained Shear Strength vs Elevation (m AOD) – Glaciofluvial (cohesive)
Figure 25	Undrained Shear Strength vs Depth (m bgl) – Weathered Gunthorpe Member
Figure 26	Undrained Shear Strength vs Elevation (m AOD) – Weathered Gunthorpe Member
Figure 27	Unconfined Compressive Strength vs Depth (m bgl)
Figure 28	Unconfined Compressive Strength vs Elevation (m AOD)

A summary of the in-situ and laboratory soil and rock geotechnical testing undertaken is detailed in Table 7 below.

Table 7 – Summary of Soil Geotechnical Testing Undertaken

Geotechnical Test		Topsoil	Made Ground	Oadby Member	Glaciofluvial – cohesive	Glaciofluvial – granular	Weathered Gunthorpe Member	Gunthorpe Member
In-situ	Standard Penetration Tests (SPT)	0	2	49	50	27	171	16

Geotechnical Test		Topsoil	Made Ground	Oadby Member	Glaciofluvial – cohesive	Glaciofluvial – granular	Weathered Gunthorpe Member	Gunthorpe Member
	Hand Shear Vanes (HSV)	0	0	16	20	0	35	0
Laboratory – Soil	Moisture Content	0	3	38	36	2	64	4
	Atterberg Limit Determination	0	3	38	37	1	64	4
	Particle Size Distribution (sieve)	2	1	6	18	12	13	1
	Particles Size Distribution (sedimentation)	2	1	6	14	12	13	1
	Organic Matter	13	4	15	26	2	36	1
	Undrained Triaxial Compression Test	0	0	11	2	0	3	0
	OMC DD (2.5kg rammer)	1	3	9	7	1	21	0
	OMC DD (4.5kg rammer)	0	1	6	2	1	2	1
	One-dimensional Consolidation	0	0	3	1	0	4	0
	Moisture Condition Value	0	0	1	3	0	5	1
	BRE SD1 Suite D 2005	1	3	5	3	2	22	2
Laboratory – Rock	Point Load Index (axial, dimetral and irregular)	-	-	-	-	-	-	304
	Unconfined Compressive Strength	-	-	-	-	-	-	24
	Slake Durability	-	-	-	-	-	-	1

Upon receipt of the Structural Soils Ltd Factual Report, an assessment of the geotechnical properties of the strata has been undertaken and is detailed below.

Please note the SPT data has been converted to N60 values using the formula:

$$N_{60} = N_{\text{field}} \times E\% \text{ where } E\% = \text{hammer energy ratio}$$

5.1 Topsoil

Table 8 – Summary table of in-situ and laboratory testing for the Topsoil

Parameter	No. of tests	Range	Characteristic value
Classification			
Moisture Content (%)	1	-	11
Particle Size Distribution	2	-	Class 5A
Compaction			
Optimum Moisture Content and Maximum Dry Density	1	-	OMC 16%
		-	MDD 1.6Mg/m3

		-	Air voids >10%
Organic Content			
Soil Organic Matter (%)	13	0.2 – 6.1	3.1

Particle Size Distribution

Particle Size Distribution testing was undertaken on 2 No. samples of the Topsoil, collected from depths of 0.10m bgl (73.7m AOD) and 0.50m bgl (71.5m AOD). The testing identified the soils to consist of 0% to 15% gravel, 5% to 11% sand, 33% to 46% silt and 28% to 62% clay.

It should be noted that as 2 No. tests were undertaken, these results cannot be considered representative of the Topsoil across the entirety of the site. Further testing is recommended if comprehensive classification of the Topsoil is required.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

1 No. compaction test was undertaken on a Topsoil sample from BH10 at 0.30m bgl (87.0m AOD) utilising a 2.5kg rammer. The results recorded air voids exceeding 10% at the MDD, with an MDD of 1.60Mg/m³, and OMC of 16%.

Comparison of the OMC & MDD results with the moisture content of the Topsoil suggests the material is dry of the optimum.

Chemical Analysis and Sulphate Classification

1 No. samples of the Topsoil was scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

13 No. samples of the Topsoil from depths of 0.10m bgl to 0.50m bgl (89.3m AOD to 63.8m AOD) were submitted for organic matter analysis which identified concentrations ranging from 0.7% to 6.1%.

5.2 Made Ground

Table 9 – Summary table of in-situ and laboratory testing for the Made Ground

Parameter	No. of tests	Range	Characteristic value
Classification			
Moisture Content (%)	3	20 – 24	22
Atterberg Limits (%)	3	LL 46 – 67	LL 56
		PL 20 - 26	PL 23
		PI 26 – 43	PI 33
Modified Plasticity (%)		20 – 39	29
Plasticity term		-	Medium
Volume Change Potential		-	Medium
Particle Size Distribution	1	-	Class 2C
Particle Density Mg/m ³	2	2.49 – 2.67	2.58
Strength & Stiffness			
SPT 'N60' Value	2	9	9
Consistency term		-	Soft
Strength term		-	Low strength
Compaction			
Optimum Moisture Content and Maximum Dry Density	4	OMC 14 – 24%	OMC 19%
		MDD 1.57 – 1.88Mg/m3	MDD 1.7Mg/m3

Parameter	No. of tests	Range	Characteristic value
		Air voids <5%	Air voids <5%
Organic Content			
Soil Organic Matter (%)	4	0.5 – 6.7	2.9

Moisture Content and classification testing

3 No. Moisture Content tests and 3 No. Atterberg tests were undertaken on samples of the Made Ground taken at depths of between 0.90m and 2.40m bgl (86.3m AOD and 55.0m AOD). Moisture contents ranged between 20% and 24%. The testing reported liquid limits of 46% to 67%, plastic limits of 20% to 26%, and plasticity indexes of 26% to 43% with modified plasticity indexes of 20% to 39%. The results are consistent with an intermediate to high plasticity clay with medium to potentially high volume change potential in accordance with NHBC Chapter 4.2 'Building Near Trees' (2024).

Particle Size Distribution

Particle Size Distribution testing was undertaken on 1 No. sample of the Made Ground from TP08 at 0.50m bgl (84.5m AOD) where the results identified a 29% gravel, 19% sand, 32% silt and 20% clay content.

It should be noted that Made Ground is variable by nature thus these results cannot be considered representative of the Made Ground encountered elsewhere on site.

Particle Density

Particle density testing was undertaken on 2 No. samples of the Made ground; BH04 at 0.10m bgl (87.2m AOD) and TP08 at 1.50m bgl (85.0m AOD) and results of 2.67Mg/m³ and 2.49Mg/m³ were recorded respectively. Given the variability of Made Ground, these values cannot be considered as representative of the Made Ground as a whole.

In-Situ Testing, Strength & Stiffness

2 No. SPT tests were undertaken within the Made Ground at CP27, one at 1.20m bgl (54.8m AOD) and the other at 2.00m bgl (54.0m AOD), both of which were undertaken in cohesive deposits. In both instances an SPT N60 value of 9 was recorded.

Using the correlation proposed by Stroud & Butler (1974) and an f_1 factor of 4.4, the undrained shear strength of the cohesive material is derived to be 35kPa, corresponding to a low strength material in accordance with BS EN ISO 14688-2:2018.

No discernible correlation was derived from the data, reflective of the soils' variable nature. See Figures 9-26 for the SPT and Undrained Shear Strength data charts.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

4 No. compaction tests were undertaken on Made Ground samples from depths of 0.10m to 2.40m bgl (87.1m AOD to 55.0m AOD), 3 of which utilising a 2.5kg rammer and 1 utilising a 4.5kg rammer. The results invariably recorded air voids of less than 5% at MDD, with MDDs of between 1.57Mg/m³ and 1.88Mg/m³, and OMC of between 14% and 24%.

Comparison of the moisture content of the Made Ground with the MDD/OMC results indicates the material is dry of the optimum in 2 instances (BH04 at 0.10m bgl [87.1m AOD] and CP27 at 1.00m bgl [55.0m AOD]), wet of the optimum in 1 instance (TP08 at 1.50m bgl [83.5m AOD]) and at the optimum in 1 instance (TP08 at 2.40m bgl [82.6m AOD]).

Chemical Analysis and Sulphate Classification

4 No. samples of the Made Ground were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

4 No. samples of the Made Ground sampled from depths of 0.50m to 3.00m bgl (53.0m AOD to 84.5m AOD) were submitted for organic matter analysis which identified concentrations ranging from 0.5% to 6.7%.

5.3 Oadby member

Table 10 – Summary table of in-situ and laboratory testing for the Oadby Member

Parameter	No. of tests	Range	Characteristic value/trend
Classification			
Natural Moisture Content (%)	36	10 – 26	17
Atterberg Limits (%)	35	LL 27 – 51	LL 38
		PL 14 – 22	PL 18
		PI 8 – 33	PI 20
Modified Plasticity (%)		7 – 30	17
Plasticity term		Low – High	Low – High
Volume Change Potential		Low – Medium	Low – Medium
Particle Size Distribution	6	-	Class 2A/B & Class 2C
Particle Density (Mg/m³)	10	2.47 – 2.62	2.55
Strength & Stiffness			
SPT N ₆₀ value	49	11 – 111 (6 No. ref. at N _{field} = 50, 1 No. ref. at N _{field} = 100)	-
Undrained Shear Strength – Undrained Triaxial Compression test (kPa)	11	41 – 365	50 + 15(z-2) -
Undrained Shear Strength – Hand Shear Vane (kPa)	16	68 – 146	
Compaction, Compressibility & Consolidation			
Optimum Moisture Content and Maximum Dry Density	15	OMC 9 – 20%	OMC 16%
		MDD 1.67 – 2.01Mg/m³	MDD 1.80Mg/m³
		Air voids 0 - 10%	Air voids <5%
Coefficient of consolidation, c _v (m²/yr) at overburden	4	0.067 – 0.24	0.16
Coefficient of compressibility, m _v (m²/MN) at existing overburden		0.10 – 0.29	0.19
Compressibility term		Medium	Medium
Moisture Condition Value	1	-	11
Organic Content			
Soil Organic Matter (%)	15	0.4 – 2.1	<1

Moisture Content and classification testing

38 No. Moisture Content tests and 38 No. Atterberg tests were undertaken on samples of the Oadby Member taken at depths of between 0.50m and 14.70m bgl (87.0m AOD and 65.5m AOD). Moisture contents ranged between 10% and 26%. The testing reported liquid limits of 27% to 51%, plastic limits of 14% to 22%, and plasticity indexes of 8% to 33% with modified plasticity indexes of 7% to 30%. The

results are consistent with a low to moderate plasticity clay and a low to medium volume change potential in accordance with NHBC Chapter 4.2 'Building Near Trees' (2024).

Particle Size Distribution

Particle Size Distribution testing was undertaken on 6 No. samples of the Oadby Member from depths of between 1.20m and 4.50m bgl (78.3m AOD and 71.7m AOD) where the results invariably indicate the material to be cohesive dominant with 2% to 8% gravel, 18% to 25% sand, 37% to 43% silt and 27% to 43% clay content.

Particle Density

Particle density testing was undertaken on 10 No. samples of the Oadby Member from depths of 0.50m to 2.10m bgl (86.7m AOD to 75.4m AOD) where results of between 2.47Mg/m³ and 2.62Mg/m³ were recorded. A characteristic value of 2.55Mg/m³ was calculated from an average of the individual results.

In-Situ Testing, Strength & Stiffness

49 No. SPT tests were undertaken within the Oadby Member at depths of 1.20m to 15.00m bgl (86.0m AOD to 65.2m AOD); SPT N₆₀ values of 11 to 111 were recorded with 6 No. refusals recorded at N_{field} = 50 and 1 No. refusal at N_{field} = 100. The data is considered to indicate an increasing strength with depth correlation, increase from N₆₀ = 10 at 2.00m bgl to N₆₀ = 40 at 16.00m.

Using the correlation proposed by Stroud & Butler (1974) and an f₁ factor of 4.5, the undrained shear strength of the cohesive material is derived to be 41kPa to >300kPa, corresponding to a medium to extremely high strength clay in accordance with BS EN ISO 14688-2:2018.

The 11 No. Unconsolidated Undrained Triaxial Compression Tests undertaken on the Oadby Member at depths of between 2.00m and 12.00m bgl (79.7m AOD and 66.2m AOD) have confirmed the soils are largely of very high strength with undrained shear strengths between 158kPa and 365kPa for the majority of samples. However, 1 No. test recorded a result outside of this range where an undrained shear strength of 41kPa was recorded (BH09 at 4.00m [70.2m AOD]), indicating a medium strength material.

Hand shear vane testing undertaken in the boreholes and trial pits at depths of between 1.20m and 6.00m bgl (88.2m AOD and 71.8m AOD) recorded undrained shear strengths of between 68kPa and >140kPa indicating firm to very stiff conditions.

Based on these testing results, the following characteristic undrained shear strength (c_u) profile vs. depth (z) has been derived:

$$c_u = 50 + 15(z-2)$$

This means undrained shear strength linearly increases from 50kPa at 2.00m bgl to 200kPa at 12.00m bgl.

The undrained stiffness (E_u) at an axial strain of 0.1% (typical for foundations) has been derived using the recommendations in Jardine et al. (1984):

$$E_u = 400.c_u$$

Therefore, using the characteristic undrained shear strength profile presented above, the following equation can be used to derive the undrained stiffness of the Oadby Member at any depth:

$$E_u = 400(50 + 15[z-2])$$

The following correlation is considered appropriate to derive the drained stiffness (E'):

$$E' = 0.8E_u$$

3 No. one dimensional consolidation tests were undertaken on samples of Oadby Member from 2.00m to 5.00m bgl (75.2m AOD to 72.2m AOD). The reported coefficient of compressibility (m_v) results for the

corresponding pressures approximately equal to overburden pressure for each sample ranged between 0.10m²/MN and 0.29m²/MN. This suggests a medium compressibility clay, which is typical of a stiff fluvio-glacial clay (M.J. Tomlinson, 2001). The reported coefficient of consolidation (c_v) at overburden pressure ranged between 0.067m²/yr and 0.24m²/yr with an average result of 0.157m²/yr.

Moisture Condition Value

Moisture Condition Value testing was carried out on a number of samples of the Oadby Member with 2 No. Moisture Condition Calibration tests (MCC) (CP06 at 4.00m bgl [83.0m AOD] and CP10 at 4.00m bgl [71.0m AOD]) and 1 No. MCV test (TP07 at 1.00m bgl [82.7m AOD]) undertaken. The testing indicates MCVs of 8 and above at moisture contents at 22% and below.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

15 No. compaction tests were undertaken on Oadby Member samples taken from depths of 0.40m to 4.00m bgl (86.7m AOD to 75.4m AOD), 9 of which utilising a 2.5kg rammer and 6 utilising a 4.5kg rammer. The results generally recorded air voids of less than 5% at MDD with 1 result indicating air voids of 5-10%; MDDs of between 1.67Mg/m³ and 2.01Mg/m³ were recorded with OMC of between 9% and 20%.

Comparison of the moisture content with the MDD/OMC results indicates the material is dry of the optimum for the majority of results with 1 instance where the sample was wet of the optimum (BH06 at 4.00m bgl [76.3m AOD]) and at the optimum in 4 instances (BH05 at 0.50m bgl [86.7m AOD], BH06 at 0.70m bgl [79.6m AOD], BH14 at 0.70m bgl [84.0m AOD] and CP08 at 1.00m bgl [80.7m AOD]).

Chemical Analysis and Sulphate Classification

5 No. samples of the Oadby Member were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

15 No. samples of the Oadby Member sampled from depths of 0.40m to 13.50m bgl (88.5m AOD to 68.2m AOD) were submitted for organic matter analysis which identified concentrations ranging from 0.4% to 2.1%, although the majority of results were recorded as <1%.

5.4 Glaciofluvial Deposits

Cohesive Glaciofluvial Deposits

Table 11 – Summary table of in-situ and laboratory testing for the Cohesive Glaciofluvial Deposits

Parameter	No. of tests	Range	Characteristic value
Classification			
Natural Moisture Content (%)	35	5 – 28	17
Atterberg Limits (%)	35	LL 20 – 51	LL 37
		PL 11 – 34	PL 19
		PI 9 – 31	PI 19
		6 – 30	15
Modified Plasticity (%)	35	Low – Medium	Low – Medium
Plasticity term		Low – Medium	Low – Medium
Volume Change Potential	12	-	Class 2A/B & Class 2C
Particle Size Distribution	2	2.32 – 2.43	2.38
Particle Density (Mg/m ³)			

Parameter	No. of tests	Range	Characteristic value
Strength & Stiffness			
SPT N60 value	50	4 – 140 (2 No. ref. at N _{field} =50, 5 No. ref. at N _{field} =100)	-
Undrained Shear Strength – Undrained Triaxial Compression test (kPa)	2	105 – 258	50 + 15(z-2) -
Undrained Shear Strength – Hand Shear Vane (kPa)	20	36 – 140	
Compaction, Compressibility & Consolidation			
Optimum Moisture Content and Maximum Dry Density	9	OMC 13 – 20%	OMC 16%
		MDD 1.70 – 1.98Mg/m3	MDD 1.57 – 1.88Mg/m3
		Air voids 0% - 10%	Air voids <5%
Coefficient of consolidation <i>c_v</i> (m ² /yr) at overburden	2	0.057*	0.057*
Coefficient of compressibility <i>m_v</i> (m ² /MN) at existing overburden		0.41*	0.41*
Compressibility term		Medium	Medium
Moisture Condition Value	3	7.6 – 17.4	11.6
Organic Content			
Soil Organic Matter (%)	46	0.2 – 4.2	<1

*result is not considered representative of the stratum as only 1 No. test was successfully carried out.

Moisture Content and classification testing

38 No. Moisture Content tests and 38 No. Atterberg tests were undertaken on cohesive dominant samples of the Glaciofluvial Deposits taken at depths of between 0.30m and 11.20m bgl (89.9m AOD and 61.3m AOD). Moisture contents ranged between 5% and 26%. Liquid limits of 20% to 51%, plastic limits of 11% to 34%, and plasticity indexes of 9% to 31% with modified plasticity indexes of 6% to 30% recorded. The results are largely indicative of a low to moderate plasticity clay with a low to intermediate volume change potential where a number of results plot below the 'A-Line' suggesting predominantly silt soil in accordance with NHBC Chapter 4.2 'Building Near Trees' (2024).

Particle Size Distribution

Particle Size Distribution testing was undertaken on 12 No. samples of the cohesive dominant Glaciofluvial Deposits from depths of between 0.50m and 6.00m bgl (87.0m AOD and 68.9m AOD) where the results indicate the material to consist of 0% to 30% gravel, 7% to 61% sand, 21% to 71% silt and 12% to 45% clay where the fines content is >40% in all samples tested.

Particle Density

Particle density testing was undertaken on 2 No. samples of the cohesive Glaciofluvial Deposits; BH02 at 0.70m bgl (89.6m AOD) and BH13 at 4.00m bgl (84.0m AOD) and results of 2.32Mg/m³ and 2.43Mg/m³ were recorded respectively. A characteristic value for this deposit has therefore been calculated as 2.38Mg/m³ from an average of these two results.

In-Situ Testing, Strength & Stiffness

50 No. SPT tests were undertaken within the cohesive dominant Glaciofluvial Deposits at depths of 1.20m to 13.50m bgl (88.2m AOD to 62.7m AOD). SPT N₆₀ values of 4 to 140 were recorded with 2 No.

refusals recorded at $N_{field} = 50$ and 5 No. refusals at $N_{field} = 100$. The data is considered to exhibit an increasing strength with depth trend with SPT N_{60} values increasing from 10 at 2.00m bgl to 50 at 14.00m bgl.

Using the correlation proposed by Stroud & Butler (1974) and an f_1 factor of 4.5, the undrained shear strength is derived to be 36kPa to >300kPa, corresponding to a very low to extremely high strength clay in accordance with BS EN ISO 14688-2:2018.

The 2 No. Unconsolidated Undrained Triaxial Compression Tests undertaken on the cohesive Glaciofluvial Deposits (BH13 at 5.00m bgl [88.0m AOD] and CP17 at 7.50m bgl [82.3m AOD]) indicated the clay is generally of high to very high strength with undrained shear strengths of 105kPa and 258kPa recorded.

Hand shear vane testing undertaken in the boreholes and trial pits on samples of the cohesive dominant Glaciofluvial Deposits at depths of 0.40m to 4.00m (88.1m AOD to 54.0m AOD) recorded undrained shear strengths of between 32kPa and >140kPa indicating firm to very stiff conditions.

Based on these testing results, the following characteristic trend for undrained shear strength (c_u) vs. depth (z) has been derived:

$$c_u = 50 + 15(z-2)$$

This means undrained shear strength linearly increases from 50kPa at 2.00m bgl to 200kPa at 12.00m bgl.

The undrained stiffness (E_u) at an axial strain of 0.1% (typical for foundations) has been derived using the recommendations in Jardine et al. (1984):

$$E_u = 400.c_u$$

in which E_u/c_u is estimated to be 400. Therefore, using the characteristic trend presented above, the following equation can be used to derive the undrained stiffness of the cohesive Glaciofluvial Deposits at any depth:

$$E_u = 400(50 + 15[z-2])$$

The following correlation is considered appropriate to derive the drained stiffness (E'):

$$E' = 0.8E_u$$

1 No. One Dimensional Consolidation test was undertaken on a sample of the cohesive dominant Glaciofluvial Deposits from 2.00m bgl (61.9m AOD). The reported coefficient of compressibility (m_v) results for the corresponding pressure approximately equal to overburden pressure for the sample was 0.41; indicative of a high compressibility clay.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

9 No. compaction tests were undertaken on the cohesive dominant Glaciofluvial Deposit samples taken from depths of 0.50m to 5.00m bgl (90.0m AOD to 72.6m AOD), 7 of which utilising a 2.5kg rammer and 2 utilising a 4.5kg rammer. The results generally recorded air voids of less than 5% at MDD with 1 result indicating air voids of 5-10%; MDDs of between 1.70Mg/m³ and 1.98Mg/m³ were recorded with OMCs of between 13% and 20%.

Comparison of the moisture content with the MDD/OMC results indicates the material is dry of the optimum in 4 instances, wet of the optimum in 3 instances and at the optimum in 2 instances.

Moisture Condition Value

Moisture Condition Value testing was carried out on a number of samples of the Cohesive Glaciofluvial soils with 1 No. MCC test (BH14 at 4.00m bgl [80.7m AOD]) and 3 No. MCV tests (BH18 at 0.80m bgl [76.8m AOD], CP17 at 7.60m bgl [74.7m AOD] and TP14 at 0.40m bgl [81.7m AOD]) undertaken. The

testing indicates MCVs of 8 and above at moisture contents at c. 14% and below although 1 No. result recorded at MCV of 9.7 at a moisture content of 23%.

Chemical Analysis and Sulphate Classification

3 No. samples of the cohesive Glaciofluvial Deposit were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

26 No. samples of the cohesive dominant Glaciofluvial Deposits sampled from depths of 0.40m to 10.50m bgl (89.6m AOD to 54.3m AOD) were submitted for organic matter analysis which identified concentrations ranging from 0.2% to 2.3%, although the majority of results were recorded as <1%.

Granular Glaciofluvial Deposits

Table 12 – Summary table of in-situ and laboratory testing for the Granular Glaciofluvial Deposits

Parameter	No. of tests	Range	Characteristic value
Classification			
Natural Moisture Content (%)	2	13 – 16	15
Particle Size Distribution	12	-	Class 2A/B & Class 2C
Particle Density (Mg/m ³)	1	-	2.45
Strength & Density			
SPT N ₆₀ value	27	5 – 107 (9 No. ref. at N _{field} = 50, 2 No. ref. at N _{field} = 100)	10 at 3.0m bgl 50 at 16.0m bgl
Density term		Very loose – Very dense	Medium dense
Compaction			
Optimum Moisture Content and Maximum Dry Density	2	OMC 8 – 18%	OMC 13%
		MDD 1.78 – 2.08Mg/m ³	MDD 1.93Mg/m ³
		Air voids 0 – 5%	Air voids <5%
Organic Content			
Soil Organic Matter	2	0.7 – 1.4%	1.1%

Particle Size Distribution

PSD testing was also undertaken on 18 No. samples of the granular dominant Glaciofluvial Deposits from depths of between 0.70m and 16.50m bgl (86.8m AOD and 64.3m AOD) where results indicate the material to consist of 12% to 28% cobbles, 0% to 71% gravel, 10% to 77% sand, 15% to 68% silt and 5% to 21% clay with 6% to 12% fines recorded for the 4 No. samples where sedimentation testing was not undertaken.

Particle Density

1 No. particle density test was undertaken on the granular Glaciofluvial Deposits; BH15 at 5.00m (81.5m AOD) where a result of 2.45Mg/m³ was recorded.

In-Situ Testing, Strength & Stiffness

27 No. SPT tests were undertaken within the granular dominant Glaciofluvial Deposits at depths of 3.00m to 16.50m bgl (82.2m AOD to 65.2m AOD). SPT N₆₀ values of 5 to 107 were recorded with 9 No.

refusals recorded at $N_{field} = 50$ and 2 No. refusals recorded at $N_{field} = 100$ indicating loose to very dense conditions.

The results are considered to indicate an increasing strength with depth correlation with N_{60} values increasing from 10 at 3.0m bgl to 50 at 16.0m bgl.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

2 No. compaction tests were undertaken on the granular dominant Glaciofluvial Deposit samples taken from depths of 1.00m and 5.00m bgl (72.0m AOD and 74.5m AOD respectively); 1 utilising a 2.5kg rammer and the other a 4.5kg rammer. The results generally recorded air voids of equal to and less than 5% at MDD with MDDs of 1.78Mg/m³ and 2.08Mg/m³ and OMCs of 8% and 18%.

Comparison of the moisture content with the MDD/OMC results indicates the material is dry of the optimum for in 1 instance (BH15 at 5.00m [76.5m AOD]) and wet of the optimum in the other (TP13 at 1.00m [72.0m AOD]).

Chemical Analysis and Sulphate Classification

2 No. samples of the Glaciofluvial Deposit were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

2 No. samples of the granular Glaciofluvial Deposits from depths of 4.50m and 9.70m (69.7m AOD and 77.5m AOD) were also submitted for organic matter analysis in which concentrations of 0.7% and 1.4% were recorded respectively.

5.5 Gunthorpe Member

Weathered Gunthorpe Member

Table 13 – Summary table of in-situ and laboratory testing for the Weathered Gunthorpe Member

Parameter	No. of tests	Range	Characteristic value
Classification			
Natural Moisture Content (%)	35	10 – 29	18
Atterberg Limits (%)	35	LL 28 – 62	LL 38
		PL 15 – 26	PL 20
		PI 12 – 39	PI 18
		8 – 35	15
Modified Plasticity (%)		Low – High	Low – Medium
Plasticity term		Low – Medium	Low – Medium
Volume Change Potential			
Particle Size Distribution	6	-	Class 2A/B & Class 2C
Particle Density (Mg/m ³)	6	2.48 – 2.71	2.60
Strength & Stiffness			
SPT N_{60} value	49	10 – 113 (59 No. ref. at $N_{field} = 50$, 35 No. ref. at $N_{field} = 100$)	-
Undrained Shear Strength – Undrained Triaxial Compression test (kPa)	11	44 – 221	50 + 25(z-2)
Undrained Shear Strength – Hand Shear Vane (kPa)	16	24 – >140	-
Compaction, Compressibility & Consolidation			
	23	OMC 10 – 23%	OMC 17%

Optimum Moisture Content and Maximum Dry Density		MDD 1.56 – 2.11Mg/m ³	MDD 1.79Mg/m ³
		Air voids 0% - 5%	Air voids <5%
Coefficient of compressibility m_v (m ² /MN) <i>at existing overburden</i>	3	m_v (at overburden pressure) 0.14 – 0.22	m_v (at overburden pressure) 0.19
Compressibility term		Medium	Medium
Moisture Condition Value	1	3.5 – 18	10.3
Organic Content			
Soil Organic Matter	15	0.3 – 3.8%	1.5%

Moisture Content and classification testing

64 No. Moisture Content tests and 64 No. Atterberg tests were undertaken on samples of the Weathered Gunthorpe Member taken at depths of between 0.40m and 11.70m bgl (89.6m AOD and 52.0m AOD). Moisture contents ranged between 10% and 29%. Liquid limits of 28% to 62%, plastic limits of 15% to 26%, and plasticity indexes of 12% to 39% with modified plasticity indexes of 8% to 35% recorded. The results are indicative of a low to moderate plasticity clay with a low to medium volume change potential in accordance with NHBC Chapter 4.2 'Building Near Trees' (2024).

Particle Size Distribution

Particle Size Distribution testing was undertaken on 13 No. samples of the Weathered Gunthorpe Member from depths of between 0.50m and 6.40m bgl (87.2m AOD and 67.8m AOD) where the results indicate the material to consist of 0% to 14% cobble, 0% to 25% gravel, 1% to 66% sand, 16% to 84% silt and 0% to 34% clay.

Particle Density

Particle density testing was undertaken on 6 No. samples of the Weathered Gunthorpe Member between depths of 0.60m and 2.60m bgl (89.6m AOD and 70.4m AOD). A characteristic value of 2.60Mg/m³ has been calculated from an average of the results.

In-Situ Testing, Strength & Stiffness

173 No. SPT tests were undertaken within the Oadby Member at depths of 1.00m to 26.00m bgl (90.2m AOD to 50.6m AOD); SPT N_{60} values of 10 to 113 were recorded with 59 No. refusals recorded at $N_{field} = 50$ and 35 No. refusal at $N_{field} = 100$.

Using the correlation proposed by Stroud & Butler (1974) and an f_1 factor of 4.5, the undrained shear strength of the cohesive material is derived to be 43kPa to >300kPa, corresponding to a medium to extremely high strength clay in accordance with BS EN ISO 14688-2:2018.

Hand shear vane testing undertaken on 36 No. samples in the boreholes and trial pits at depths of between 0.40m and 4.00m bgl (89.6m AOD and 57.0m AOD) recorded undrained shear strengths of between 24kPa and >140kPa indicating soft to very stiff conditions.

3 No. Unconsolidated Undrained Triaxial Compression Tests were undertaken on the Weathered Gunthorpe Member at depths of between 1.20m and 2.00m bgl (74.9m AOD and 66.9m AOD) have confirmed the soils are largely of medium to very high strength with undrained shear strengths between 44kPa and 221kPa. These results corroborate the findings of the Hand shear vane testing.

Based on these testing results, the following characteristic trend for undrained shear strength (c_u) vs. depth (z) has been derived:

$$c_u = 50 + 25(z-2)$$

This means undrained shear strength linearly increases from 50kPa at 2.00m bgl to 125kPa at 5.00m bgl.

The undrained stiffness (E_u) at an axial strain of 0.1% (typical for foundations) has been derived using the recommendations in Jardine et al. (1984):

$$E_u = 400.c_u$$

in which E_u/c_u is estimated to be 400. Therefore, using the characteristic trend presented above, the following equation can be used to derive the undrained stiffness of the Weathered Gunthorpe Member:

$$E_u = 400(50 + 25[z-2])$$

The following correlation is considered appropriate to derive the drained stiffness (E'):

$$E' = 0.8E_u$$

4 No. one dimensional consolidation tests were undertaken on the Weathered Gunthorpe Member from 2.00m to 4.00m bgl (85.2m AOD to 66.1m AOD). The reported coefficient of compressibility (m_v) results for the corresponding pressures approximately equal to overburden pressure for each sample ranged between 0.14m²/yr and 0.22m²/yr. This suggests a medium compressibility clay (M.J. Tomlinson, 2001).

Moisture Condition Value

Moisture Condition Value testing was carried out on a number of samples of the Weathered Gunthorpe member with 1 No. MCC test (BH19 at 3.00m bgl [73.6m AOD]) and 5 No. MCV tests between depths of 0.40m and 7.50m bgl (88.6m AOD and 69.8m AOD) undertaken. The testing indicates MCVs of 8 and above at moisture contents at c. 22% and below.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

23 No. compaction tests were undertaken on Weathered Gunthorpe Member samples taken from depths of 0.50m to 7.50m bgl (88.2m AOD to 62.9m AOD), 21 of which utilising a 2.5kg rammer and 2 utilising a 4.5kg rammer. The results invariably recorded air voids of less than 5% at MDD with MDDs of between 1.56Mg/m³ and 2.11Mg/m³, and OMCs of 10% to 24%.

Comparison of the moisture content with the MDD/OMC results indicates the material was wet of the optimum for the majority of results with 6 instances where samples were dry of the optimum and 5 instances where samples were at the optimum.

Chemical Analysis and Sulphate Classification

22 No. samples of the Weathered Gunthorpe Member were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

36 No. samples of the Weathered Gunthorpe Member sampled from depths of 0.10m to 6.50m bgl (90.9m AOD to 52.0m AOD) were submitted for organic matter analysis which identified concentrations ranging from 0.3% to 3.8%.

Gunthorpe Member – bedrock

Table 14 – Summary table of in-situ and laboratory testing for the Gunthorpe Member

Parameter	No. of tests	Range	Characteristic value
Classification			
Natural Moisture Content (%)	17	11 – 17	15
Atterberg Limits (%)	4	LL 32 – 37	LL 35
		PL 18 – 21	PL 20
		PI 13 – 17	PI 16

Parameter	No. of tests	Range	Characteristic value
Modified Plasticity (%)		8 – 12	11
Plasticity term		Low – Medium	Low – Medium
Volume Change Potential		Low – Medium	Low – Medium
Particle Size Distribution	1	-	Class 2C
Strength & Stiffness			
SPT N ₆₀ value	49	53 – 107 (11 No. ref. at N _{field} = 50, 4 No. ref. at N _{field} = 100)	-
Undrained Shear Strength – Hand Shear Vane (kPa)	1	150	-
Compaction, Compressibility and Consolidation			
Optimum Moisture Content and Maximum Dry Density	1	-	OMC 15%
		-	MDD 1.82Mg/m ³
		-	Air voids <5%
Moisture Condition Value	1	-	11.4
Organic Matter			
Soil Organic Matter	1	-	1.1%
Rock Strength			
Unconfined Compressive Strength – Mudstone	15	0.2 – 24.4MPa	-
Unconfined Compressive Strength (converted from Axial Point Load tests) – Mudstone	129	0 – 38.6MPa	-
Unconfined Compressive Strength – Siltstone	8	3.4 – 30.1MPa	-
Unconfined Compressive Strength (converted from Axial Point Load tests) – Siltstone	6	0.5 – 28.3MPa	-
Unconfined Compressive Strength – Sandstone	1	57.8MPa	-
Unconfined Compressive Strength (converted from Axial Point Load tests) – Sandstone	3	5.1 – 12.7MPa	-

Moisture Content and classification testing

17 No. Moisture Content tests were undertaken on samples of the Gunthorpe Member taken at depths of between 2.10m and 14.30 bgl (84.2m AOD and 54.5m AOD) where moisture contents were found to range between 11% and 17%.

4 No. Atterberg tests were undertaken on samples from depths of between 2.75m and 4.70m bgl (72.2m AOD and 62.4m AOD) recorded Liquid limits of 32% to 37%, plastic limits of 18% to 21%, and plasticity indexes of 13% to 17% with modified plasticity indexes of 8% to 12% recorded. The results are indicative of a low to moderate plasticity clay with a low to intermediate volume change potential in accordance with NHBC Chapter 4.2 'Building Near Trees' (2024).

Particle Size Distribution

Particle Size Distribution testing was undertaken on 1 No. sample of the Gunthorpe Member from a depth of 2.70 bgl (69.1m AOD) where the results indicate the material to consist of 0% cobble, 34% gravel, 19% sand, 34% silt and 13% clay.

In-Situ Testing, Strength & Stiffness

16 No. SPT tests were undertaken within the Gunthorpe Member at depths of 3.50m to 18.50m bgl (82.5m AOD to 54.2m AOD); SPT N values of 50 to 100 were recorded with 11 No. refusals recorded at N = 50 and 4 No. refusal at N = 100.

Using the correlation proposed by Stroud & Butler (1974) and an f_1 factor of 4.5, the undrained shear strength of the cohesive material is derived to be 240kPa to >300kPa, corresponding to a very high strength/ hard rock in accordance with BS EN ISO 14688-2:2018.

No discernible trend is considered derivable from the data.

To further assess the strength of the Gunthorpe Member, a combination Unconfined Compressive Strength (UCS) Point Load testing was undertaken on selected sub samples of the rock cores achieved from the rotary cored borehole positions. Table 15 below displays the number of each test carried out on samples of the Mudstone, Siltstone and Sandstone encountered within the Gunthorpe Member.

Table 15 – Summary of Point Load and UCS testing

Rock Type	No. of UCS tests	No. of Axial Point Load tests	No. of Diametral Point Load tests	No. of Irregular Point Load tests
Mudstone	15	130	122	26
Siltstone	8	6	6	4
Sandstone	1	3	4	3

The axial Point Load tests undertaken within the Mudstone from depths of between 4.25m and 30.33m bgl (84.2m AOD and 31.6m AOD) returned Is_{50} values of between 0.00MPa and 1.68MPa. These values have been converted to UCS using a correction factor of 23, as commonly used for Mudstones, giving UCS ranging between 0.00MPa and 38.64MPa; indicative of extremely weak to medium strong rock in accordance with BS 14689. However, the majority of results were between 0.20MPa and c. 5.00MPa indicating extremely weak to weak rock.

The results of the 15 No. UCS tests undertaken on samples from 8.60m to 33.1m bgl (69.5m AOD to 37.2m AOD) recorded the Mudstone strength between 0.20MPa and 24.40MPa indicating extremely weak to moderately weak rock. This suggests the correction factor may be an over estimation. Additionally, consideration should be given to the volume of Point Load testing undertaken versus the volume of UCS testing as the variation in strength observed within the converted UCS results may be the result of a larger data set.

The wide range of strengths recorded within the Mudstone reflects the variability in weathering grade observed within the bedrock. It should be noted that, in accordance with BS EN 14689, materials with strength below 0.6MPa should be classed and described as soil. Following this guidance, 57 No. of 130 No. axial Plate Load tests and 10 No. of the 15 No. UCS tests indicate the material to fall below this threshold. However, in the interest of reporting simplicity, this guidance has not been applied when determining stratum designations.

The axial Point Load tests undertaken within the Siltstone from depths of between 9.77m and 24.64m bgl (73.0m AOD and 57.2m AOD) returned Is_{50} values of between 0.02MPa and 1.23MPa. When converted to UCS, using a factor of 23, the UCS generally ranges between 4.6MPa and 28.29MPa with one result of 0.46MPa recorded also. The results are indicative of very weak to medium strong rock in accordance with BS 14689.

The 8 No. UCS tests undertaken on Siltstone samples from depths of between 11.21m and 23.00m bgl (71.9m AOD and 51.5m AOD) recorded strengths of 3.40MPa to 30.10MPa indicating very weak to

medium strong rock in accordance with BS EN 14689. These results are clearly in corroboration with the converted axial Point Load tests, supporting the utilisation of a conversion factor of 23.

The axial Point Load tests undertaken within the Sandstone from depths of between 11.70m and 15.65m bgl (55.1m AOD and 53.2m AOD) returned I_{s50} values of between 0.22MPa and 0.55MPa. When converted to UCS, using a factor of 23, the UCS ranges between 5.06MPa and 12.65MPa indicating weak to moderately weak rock in accordance with BS EN 14689.

1 No. UCS tests was undertake on the Sandstone from BH10 at a depth of 16.27m bgl (71.1m AOD) where a strength of 57.80MPa was recorded indicative of a strong rock in accordance with BS 14689. It should be noted that this description is at odds with the geological logs as the stratum at this depth is described as Siltstone.

For avoidance of doubt, the results of the irregular and diametral Point Load tests have been omitted from the above assessment as they are widely considered to provide a less accurate result compared to axial testing when converting the results to UCS. However, the diametral and irregular results are presented within the Structural Soils Ltd Factual Report.

Optimum Moisture Content and Maximum Dry Density Analysis (OMC & MDD)

1 No. compaction tests was undertaken on a Gunthorpe Member sample taken from a depth of 2.00m bgl (86.7m AOD) utilising a 4.5kg rammer. The results indicated air voids of less than 5% at MDD with an MDD of 1.82Mg/m³ and an OMC of 15%.

Comparison of the moisture content with the MDD/OMC results indicates the material was dry of the optimum.

Moisture Condition Value

MCV testing was carried out on 1 No. sample (TP33 at 2.20m bgl [64.4m AOD]) of the Gunthorpe Member Bedrock. The testing recorded an MCV of 11.4 at a moisture content of 16%.

Chemical Analysis and Sulphate Classification

2 No. samples of the Gunthorpe Member were scheduled for Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005, Concrete in Aggressive Ground, the results of which are discussed within Section 6.0 of this report.

Organic Matter

1 No. sample of the Gunthorpe Member sampled from a depth of 10.00m bgl (78.0m AOD) was submitted for organic matter analysis which identified a concentration of 1.1%.

5.6 Soakaway Infiltration Testing

Soakaway infiltration testing was carried out in 8 No. machine excavated trial pits to ascertain infiltration rates of the shallow soils to assess the feasibility of utilising soakaways for storm water attenuation and dispersal. Out of the 8 tests undertaken, only 1 returned an infiltration rate; 3.64×10^{-6} m/s recorded at TP15 within cohesive Glaciofluvial deposits. It was not possible to calculate infiltration rates for the remaining tests (TP01, TP02, TP18, TP26, TP30, TP33 and TP37) as the soils did not have sufficient drainage. Full details of the soakaway tests are presented in the Structural Soils Factual Report in Appendix B.

5.7 Variable Head Permeability Testing

2 No. variable head permeability tests were undertaken in CP06 at 7.20m bgl and BH11 at 11.70m bgl. An in-situ permeability of 1.86×10^{-6} m/s was recorded at BH11 which was undertaken within the granular Glaciofluvial deposits whilst an in-situ permeability of 1.43×10^{-6} m/s was recorded at CP06, within the weathered Gunthorpe Member.

Full details of the soakaway tests are presented in the Structural Soils Factual Report in Appendix B.

5.8 Buried Concrete in Aggressive Ground

A total of 42 No. soil samples, 15 No. groundwater samples and 2 No. surface water samples were scheduled for BRE Suite D aggressive chemical environment for concrete (ACEC) classification testing in accordance with BRE Special Digest 1:2005.

The results indicate a Design Sulphate class of DS-1 and an ACEC class of AC-1 for the Made Ground, Topsoil, Oadby Member, cohesive Glaciofluvial Deposits, granular Glaciofluvial Deposits, Weathered Gunthorpe Member and Gunthorpe Member bedrock. The results also indicate a class of DS-1 AC-1 for the surface water however, a class of DS-2 AC-2 has been indicated for the groundwater on site.

It is therefore considered that all shallow foundations and associated buried structures in contact with the underlying soils should be designed to DS-1 AC-1. Where foundations and associated structures are at risk of contact with the groundwater, concrete should be designed to DS-2 AC-2. This will therefore apply to piled foundations proposed at the bridge spanning Hyam's Lane.

Table 16 – BRE Concrete Classification Assessment

Test Source	Number of tests	Parameter	Characteristic Value
Made Ground	3	Water soluble sulphate (mg/l)	72
		pH	7.9
		Total potential sulphate (%)	0.09
		Classification	DS-1 AC-1
Topsoil	1	Water soluble sulphate (mg/l)	<10
		pH	7.3
		Total potential sulphate (%)	0.06
		Classification	DS-1 AC-1
Oadby Member	5	Water soluble sulphate (mg/l)	40
		pH	8.3
		Total potential sulphate (%)	0.08
		Classification	DS-1 AC-1
Glaciofluvial – Cohesive	3	Water soluble sulphate (mg/l)	14
		pH	9.0
		Total potential sulphate (%)	0.075
		Classification	DS-1 AC-1
Glaciofluvial – Granular	2	Water soluble sulphate (mg/l)	11
		pH	8.3
		Total potential sulphate (%)	0.045
		Classification	DS-1 AC-1
Weathered Gunthorpe Member	24	Water soluble sulphate (mg/l)	109
		pH	7.9
		Total potential sulphate (%)	0.34
		Classification	DS-1 AC-1

Test Source	Number of tests	Parameter	Characteristic Value
Gunthorpe Member (bedrock)	4	Water soluble sulphate (mg/l)	493
		pH	8.1
		Total potential sulphate (%)	1.77
		Classification	DS-1 AC-1
Groundwater	15	Sulphate (mg/l)	598
		pH	7.2
		Classification	DS-2 AC-2
Surface water	2	Sulphate (mg/l)	76
		pH	7.8
		Classification	DS-1 AC-1

6 GEOTECHNICAL ASSESSMENT

6.1 Proposed Development

At the time of writing, it is understood the proposed development comprises a multi-unit logistics/industrial development along with supporting infrastructure. There are significant landscape bunds proposed to the west and south of the site.

The current cut and fill analysis indicates up to c. 15.0m fill and c. 10.0m cut is proposed in order to form the 8 plateau areas with formation levels ranging from +66.75mAOD to +89.00mAOD. Additionally, 3 No. landscape bunds with up to 12.0m fill are proposed along the western edge of the site to provide a visual obstruction between the development and the nearby town, Diseworth. It should be noted that final formation levels and cut/fill volumetrics may be subject to change during detailed design and the recommendations provided within this report are based on information available at the time of reporting.

The current Cut and Fill Plan is included in Appendix A along with the Proposed Development Plan.

6.2 Geotechnical Considerations

Presence of Existing Services

Although no services were encountered during the intrusive site investigation, it is recommended that searches and/or surveys are commissioned prior to further design development to identify and verify the locations of any utilities that may be present on site.

The presence of existing services may require capping and or diversion associated with the development, this should be managed through the appropriate utility suppliers during the construction phase. The Principal Contractor should ensure that appropriate mitigation measures are put in place during the construction phase (i.e. during foundation excavation).

Made Ground and Soft/Loose Soils

The presence of Made Ground on site has been proven through the intrusive ground investigation where it was encountered in isolated instances across the site. Given the variable nature of Made Ground, these soils cannot be considered a suitable bearing stratum, as such provision should be made for removal of the soils when encountered within the footprint of proposed structures. Excavations will need to be backfilled and re-compacted / compacted with material suitable for use as general fill.

Significant Made Ground was encountered to a maximum depth of 3.00m (53.0m AOD) at CP27 where it comprised clay with subordinate sand and gravel. The material is described as becoming very soft at a depth of 2.15m to 2.25m bgl. Given CP27 is located in the south-eastern corner of the Unit 1 plateau where approximately 10-12m of fill is to be placed in accordance with the most recent cut and fill plan, it is recommended that this material is excavated and recompacted to a suitable earthworks specification in order to mitigate the risk of significant settlement during placement of the fill.

The geotechnical testing undertaken on the Made Ground suggests it is largely suitable for re-use as general fill although elevated organic contents were observed at TP08. In this instance, the material may not be suitable as general fill but can be used as landscaping fill. Testing to date suggest the material could be within 1 or 2% of the optimum moisture content if not at the optimum in its natural state at the time of the investigation. Following appropriate processing the material should be classified prior to re-use to confirm suitability.

Generally speaking, soft/loose soils were not encountered across the site with the vast majority of the shallow soils classifying as firm to very stiff. Nevertheless, the presence of soft/loose soils elsewhere (i.e. between exploratory positions) cannot be ruled out.

Made Ground and soft/loose soils should not be considered a suitable founding stratum. It is recommended that foundations are inspected by a suitably qualified Geotechnical Engineer in order to confirm the absence of Made Ground or soft/loose soils within foundation excavations. Foundations will

require local deepening, if Made Ground or soft/loose soils are encountered within foundation excavations.

Groundwater and Excavations

The intrusive ground investigation has identified collapsible, granular deposits at a range of depths across the site. Where these deposits are encountered, excavations will require battering back or appropriate shoring to prevent collapse. Excavations within cohesive strata may retain stability in the short term however, battering to a suitable angle or shoring will be required should they require man entry or long-term stability.

For this reason, suitable shoring should be provided to allow both safe ingress and access routes as the potential for collapse cannot be discounted.

Groundwater strikes were encountered within both the superficial soils and the bedrock. Within the superfcials, groundwater strikes were recorded at depths of between 3.20m and 17.00m bgl, (74.3m AOD and 64.7m AOD), where they were exclusively encountered within the Glaciofluvial deposits. Within the Gunthorpe Member (weathered and bedrock), strikes were recorded from 2.80m bgl to 26.50m bgl (81.8m AOD to 52.9m AOD).

On completion of the intrusive ground investigation a programme of groundwater monitoring was undertaken (see Table 6) which found a groundwater body is present between depths of 1.25m and 15.32m bgl (84.9m AOD and 52.7m AOD) within the Glaciofluvial, Weathered Gunthorpe Member and Gunthorpe Member bedrock. Analysis of the elevations across the site suggests this groundwater body is continuous across strata types.

There is potential for groundwater to be encountered in foundation excavations in some plateau areas leading to instability of pits, particularly where water bearing, granular deposits are encountered. Therefore, provision of suitable shoring is recommended to allow maintenance of excavation stability. Groundwater seepages are expected where excavations expose the Gunthorpe Member (weathered and bedrock). Careful consideration will need to be given to the design and implementation of dewatering measures to avoid the loss of fines and inundation collapse in cut areas.

This assessment uses the groundwater data from the installations only, for this reason the potential for shallow groundwater outside of the areas identified above cannot be ruled out given the lack of data between exploratory locations.

Drainage and Soakaways

Please refer to the Fairhurst report 148749 R2.0 Drainage Strategy for full details of the proposed drainage strategy. Please note, this plan is at design stage at the time of writing and is therefore subject to revision prior to planning and should be used as guidance only. To summarise, the report finds that the use of soakaways is not considered viable given the presence of cohesive clay soils with low infiltration rates as well as shallow groundwater. The findings of the ground investigation support this statement as soakaway testing did not achieve sufficient infiltration rates and groundwater was found at shallow depths across significant areas of the site. As such, it is proposed that surface water will discharge to the minor watercourse in the south-eastern corner of the site.

Despite this, if the use of soakaways is required or further feasibility is to be explored, it is recommended that confirmatory BRE 365 soakage testing is undertaken at the specific intended soakaway locations mimicking the proposed volumes/depths, once the drainage design is finalised.

Chemical Attack on Buried Concrete

A number of soil and water samples were scheduled for BRE Suite D aggressive chemical environment for concrete (ACEC) classification in accordance with BRE Special Digest 1:2005. The results indicate that all shallow foundations and associated buried structures in contact with the underlying soils should be designed to DS-1 AC-1. Where foundations and associated structures are at risk of contact with the

groundwater, concrete should be designed to DS-2 AC-2. This will therefore apply to piled foundations proposed at the bridge spanning Hyam's Lane.

A summary of the associated testing is presented in Table 16 found in Section 5.8 above.

Volume Change of the Soil Including Presence of Desiccated Soils

A review of the moisture content and Atterberg testing indicated the following characteristic volume change potential for each stratum, Table 17 below summarises the Volume Change Potential of each stratum:

Table 17 – Summary of Volume Change Potential of each stratum

Stratum	Volume Change Potential
Made Ground	Medium
Oadby Member	Low – Medium
Glaciofluvial – cohesive	Low – Medium
Weathered Gunthorpe Member	Low – Medium
Gunthorpe Member	Low – Medium

Comparison between the ground model and the latest Cut and Fill Plan (provided in Appendix A) indicates in areas where foundations are to be formed within natural, in-situ strata (i.e. in areas of cut, no cut or fill, or where minimal fill is proposed) they will be formed within the cohesive Glaciofluvial deposits, Weathered Gunthorpe Member and Gunthorpe Member bedrock for the vast majority of the site. Foundations should be designed to appropriate minimum depths as specified in NHBC Chapter 4.2 'Building Near Trees' for medium volume change potential soils (i.e. 1.25m allowing for restricted new planting or 0.90m where outside the influence of new planting).

Although no visual signs of desiccation were recorded during the intrusive investigation, a review using 'Driscoll's Formula' (Driscoll R. [1983] "Influence of Vegetation on Clay Soils" Geotechnique. Vol 33), which states if $MC < 0.4 * \text{Liquid Limit}$ then the soils may be desiccated, has indicated 45 No. samples of the Oadby Member, cohesive Glaciofluvial deposits and Weathered Gunthorpe Member are desiccated. These samples which classify as desiccated were taken from across the site, at depths of between 0.30m and 11.20m bgl (89.6m AOD and 57.9m AOD) with no discernible patterns/trends observed. It is important to note, this is a crude relationship that cannot be solely relied upon and, given there were no soils reported as visually desiccated during the investigation and the somewhat random nature of the location/depth of soils classified as desiccated using Driscoll's, the risk of significant desiccation on site is considered low.

Additionally, foundations are envisaged to be outside the zone of influence of any trees across the site and minimal additional planting is proposed as part of the development. Therefore, the risk from seasonal shrink swell of these cohesive soils from tree action is considered low. With this in mind, consultation with the landscape architect is recommended to ensure all trees/extensive vegetation are positioned so they are not within influential distance of any foundations.

Furthermore, given the reduction in infiltration of surface water run off as part of the development, the potential for increased moisture contents of the soils following development is also considered low. However, in areas where shallow groundwater is present (previously identified under "Groundwater and Excavations" heading) there is an increased risk of moisture content fluctuations resulting from rise and fall of the water table. It is considered the risk of shrink and swell from cohesive soils is low as, although shallow groundwater has been identified, the soils are predominantly low to medium volume change potential.

On this basis, active treatment of the sub-formation is not considered necessary in order to support ground bearing slabs above a sufficient granular sub-base assuming the formation layer is prepared in accordance with an appropriate earthworks specification.

Given low to moderate plasticity clays have been identified on site, heave protection measures are not considered required as part of the development however, more in depth heave analysis specific to each plot/unit is required during geotechnical design stage to confirm this.

Proposed ground solutions

The Made Ground and any soft soils are considered unsuitable bearing stratum. Owing to the proposed earthworks and variable ground conditions, there is potential for the Oadby Member, Glaciofluvial (both cohesive and granular), Weathered Gunthorpe Member and the Gunthorpe Member bedrock to be present at formation and/or foundation level. As such, foundation solutions will have to be specific to the configuration of the ground conditions vs. elevation of each plateau. Detailed assessment of the required foundation configurations is beyond the scope of this report and will be undertaken at geotechnical design stage.

Cut areas

In the areas proposed for cut, it is likely that across each plateau elevation a combination of different strata types will be encountered at formation level. Therefore, there is potential for firm to stiff cohesive strata to be partially present under the proposed structures in combination with competent mudstone strata. As the cohesive soils are subject to a much greater degree of consolidation than lithified strata, careful consideration needs to be given to the potential for differential settlement across the footprint of proposed structures.

Bearing capacities have been calculated for the different strata however, please note the cohesive soils (Oadby, Glaciofluvial and Weathered Gunthorpe) have been grouped together as it is envisaged that distinction between them via visual inspection and as such, conservative bearing capacities have been calculated. For the cohesive soils, prescriptive bearing capacities of c. 150kPa can be assumed where a minimum undrained shear strength of 75kPa is achieved. Where granular soils are encountered at foundation depth, a prescriptive bearing capacity of c. 150kPa can be assumed.

The bearing capacity in the competent Gunthorpe Member is likely to be higher however, the bearing capabilities of this stratum will need careful consideration given the variance in weathering grade observed within the stratum.

Proposed cut slope design

As of the latest Cut and Fill drawings, significant cut slopes are required along the northern boundary of Unit 1, Unit 2 and Unit 3, and along the north-eastern boundary of Unit 4 and Unit 6; with minor cut slopes also widespread across the site.

Cuttings are anticipated to encounter bedrock (Gunthorpe Member) in the northwest of Unit 1, the north of Unit 2 and the north of Unit 3. Therefore, heavy plant and expensive breaking and ripping techniques may be required to excavate these slopes. The possibility of cuttings encountering bedrock is subject to finalisation of the Cut and Fill Plan, and cannot be ruled out between exploratory positions.

The Geotechnical Design Report (GDR) should consider the safe angle of repose in temporary and permanent condition due to the height and extent of some cuttings and, subject to engineering levels and development loadings, this may require slope stability analysis. Further investigation is required at design stage should slope angles require increasing to reduce cut volumes.

Table 18 sets out the characteristic peak friction angle (ϕ') for each stratum. For cohesive strata, in accordance with BS8004:2015, the equation below has been utilised:

$$\phi' = 42^\circ - 12.5 \log_{10}(I_P)$$

For granular strata, a conservative characteristic value has been selected following the guidance in BS8004:2015.

Table 18 – Summary table showing the peak friction angle for strata types

Stratum	Peak Friction Angle (ϕ')
Oadby	26°
Cohesive Glaciofluvial	26°
Granular Glaciofluvial	38°
Weathered Gunthorpe Member	26°*

*The peak friction angle given here has been calculated using the plasticity index results for the Weathered Gunthorpe Member, the characteristic peak friction angle of this stratum is also set out in CIRIA C570 which is presented in Table 19 below.

The friction angle for the Weathered Gunthorpe Member and Gunthorpe Member bedrock should be ascertained following the guidance set out in CIRIA C570 to take account of the weathering grade of the material. Table 19 below sets out the typical effective stress strength parameters for the Mercia Mudstone.

Table 19 – Summary table showing the typical stress strength parameters of the Mercia Mudstone weathering grades

Weathering Grade	Cohesion – c' (kPa)	Peak Friction Angle - ϕ' (°)
IV	<20	32-25
III	<20	42-32
I-II	>25	>40

Fill areas

Design of foundations within areas of fill will be dictated by the depth and type of engineering fill utilised. Where fill is shallow and bedrock is present near surface, foundations could be extended through the fill into the competent natural strata. Where deeper fill is present or superficial soils are present at shallow depth, foundations will need to be formed in accordance with the standards of engineering fill placed or suitably designed based on the geotechnical criteria of the superficial material. Detailed foundation design specific to each unit is beyond the scope of this report and will be captured as part of the geotechnical design stage.

Fairhurst have carried out an initial settlement analysis for a number of locations (Situation 1, Situation 2 and Situation 3) across the site where the risk of settlement is considered greatest; i.e. situations where a significant thickness of fill is to be placed on a significant thickness of superficial (compressible) strata. It is important to highlight the settlements provided below are likely to be overestimated as the calculations consider a uniform stress over the entire thickness of each stratum whereas, in reality the stresses will dissipate with depth. More in depth settlement analysis will be undertaken as part of the Geotechnical Design Report and these predictions are provided to highlight the areas where significant settlement is expected only.

Due to a lack of representative one-dimensional consolidation testing data, especially at greater depth, these analyses utilise characteristic compressibility (m_v) values derived from SPT N values using the following correlation presented in CIRIA R143:

$$m_v = f_2 \cdot N \text{ (m}^2\text{/MN)}$$

wherein f_2 is a factor based on the plasticity index. Using this equation the following m_v values (m²/MN) for each stratum have been utilised in the settlement calculations presented below:

Oadby Member	0.040m ² /MN throughout the stratum
Glaciofluvial Deposits (cohesive)	0.06m ² /MN at 2.00m bgl linearly decreasing to 0.02m ² /MN at 12.00m bgl
Weathered Gunthorpe Member	0.04m ² /MN at 2.00m bgl linearly decreasing to 0.01m ² /MN at 10.00m bgl

As this approach does not factor the likely decrease in compressibility due to increased confining pressure it is likely to over predict the settlements. Given these findings are not considered suitable for design stage and are presented only to highlight the potential for settlement on site due to the presence of significant thicknesses of compressible deposits and the substantial thicknesses of fill proposed.

Situation 1 looks at the southern area of where Plot 1 Campus Development is situated on the current Proposed Development Plan. The Cut and Fill Plan indicates a maximum fill thickness of c. 10.00m with plateau area and the ground conditions have been assessed to comprise 4.00m of Cohesive Glaciofluvial Deposits underlain by 3.00m of the Weathered Gunthorpe Member with bedrock below based on borehole data from BH16, BH17, CP13, CP14 and CP15.

A loading scenario consisting of Fill only (10.0m = 200kPa), Fill + Slab (200kPa + 50kPa = 250kPa) and Fill + Pad (200kPa + 150kPa = 350kPa). Where there is fill only placed, settlements of c. 45mm are predicted, where the Fill and Slab are placed settlements of c. 50mm are predicted whilst where Fill and the Pad are situated, settlements of c. 80mm were predicted.

Situation 2 looks at the southern area of Unit 5b is situated on the current Proposed Development Plan. The Cut and Fill Plan indicates a maximum fill thickness of 8.00m in this area and the ground conditions have been assessed to comprise 4.00m of Oadby Member underlain by 1.50m of cohesive Glaciofluvial Deposits and 5.50m of the Weathered Gunthorpe Member below this based on data from BH09.

The loading scenarios consisted of Fill only (8.00m = 160kPa), Fill + Slab (160kPa + 50kPa = 210kPa) and Fill + Pad (160kPa + 150kPa = 310kPa). Where there is fill only placed, settlements of c. 55mm are predicted, where the Fill and Slab are placed settlements of c. 75mm are predicted whilst where Fill and Pad foundations are situated, settlements of c. 110mm are predicted.

Situation 3 looks at the western area of Unit 6b is situated on the current Proposed Development Plan. The Cut and Fill Plan indicates a maximum fill thickness of 6.0m in this area and the ground conditions have been assessed to comprise 13.0m of Oadby Member with bedrock below based data from CP07.

The loading scenarios consisted of Fill only (6.0m = 120kPa), Fill + Slab (120kPa + 50kPa = 170kPa) and Fill + Pad (120kPa + 150kPa = 270kPa). Where there is fill only placed, settlements of c. 60mm are predicted, where the Fill and Slab are placed settlements of c. 90mm are predicted whilst where Fill and Pad foundations are situated, settlements of c. 140mm are predicted.

From this analysis it is clear careful consideration is needed when assessing the potential for settlement across the site, particularly (but not exclusively) in the areas highlighted above.

Embankment slope design

Large embankments, both structural and non-structural landscaping bunds, are proposed in the south of Unit 1, Unit 3, Unit 5/6 with minor embankments proposed elsewhere. It is therefore anticipated that significant cost will be incurred in the formation of these embankments due to the volumes of material required to be placed. It is assumed that clean, site won materials will be suitable for use within embankment constructions to avoid excessive cost of importing material. Options for increasing side slopes and reducing the footprint and volume of embankments may be explored; these may include reinforced embankments (geogrids) or soil stabilisation (lime and cement) or even retaining walls if required.

The investigation has identified both collapsible deposits and strata susceptible to settlement on site therefore, the risk of failure of any proposed embankments as a result of the formation soils below will need to be carefully considered.

It is recommended that staged construction is undertaken and basal and interim granular layers are installed and linked to the wider drainage network to avoid build-up of pore-water pressure where embankments are formed from fine grained material. Drainage will also need to be carefully considered to cope with surface water and avoid softening of the slope faces and foundation soils, in particular at the toe of slopes.

Earthworks

Significant cut and fill earthworks are required as part of the development to form plateau levels for construction of the proposed structures. In order to reduce the risk of excessive cost for offsite disposal or importation of material, it is assumed that site won materials will be utilised and a cut and fill volume balance will be achieved.

The ground investigation has determined that clean natural soils are present within the areas of cut and these materials should be suitable for re-use provided they are carefully selected and managed in accordance with a suitable earthworks specification. In particular, careful moisture content control is anticipated as the majority of site won material is likely to be cohesive superficial clays or mudstone weathered to cohesive material. Resultantly, consideration will need to be given to the prevailing weather conditions and, subject to testing, it may be possible that lime modification or stabilisation techniques could be used to allow marginal materials to be used within structural fill.

Given the similarity in appearance of the cohesive superficial soils, it is likely these materials will become mixed during the earthworks. For this reason, supplementary testing will be required to reassess the material properties in terms of its earthworks suitability.

An initial classification of the materials likely to be encountered is included below as Table 20, the material class has been assigned in accordance with the Specification for Road Works Series 600.

Table 20 – Summary of material classification for use during earthworks

Stratum	Material description	Material Class	Material use
TS	Firm CLAY with sand and gravel	Class 5A	Fill to Landscape
MGR	Firm to stiff CLAY with sand, gravel and rare brick	Class 2C	General Fill/Fill to Landscape
ODT	Stiff to very stiff CLAY with silt, sand and mudstone, siltstone, sandstone, quartz, quartzite, flint and chalk gravel with occasional cobbles also noted	Class 2A/B	General Fill
GFDU(c)	Firm to very stiff CLAY with silt, sand and mudstone, siltstone, sandstone, quartz, quartzite and flint gravel.	Class 2A/B Class 2C	General Fill
GFDU(g)	Medium dense to very dense GRAVEL with variable clay, silt and sand content or medium dense to dense silty SAND locally clayey and gravelly. The gravel comprised mudstone, siltstone, sandstone, flint, quartz and quartzite.	Class 1A Class 1B	General Fill
WGM	Stiff to very stiff CLAY with silt, sand and gravel where the gravel fraction consisted of mudstone and siltstone lithorelicts	Class 2A/B Class 2C	General Fill
GUN	Mudstone, Siltstone and Sandstone bedrock – likely to disintegrate to a gravelly clay during excavation	Class 2A/B Class 2C	General Fill

Although the PSD results did not identify any clasts >100mm, which would deem the material unsuitable for use as general fill, the logs suggest there are some cobbles/boulders present within all the superficial soils and weathered bedrock. Additionally, the competent mudstone is likely to breakdown under

excavation to form more cohesive soils therefore, for these reasons it is anticipated that some material sorting and crushing will be required as part of the earthworks.

As there is a risk the Weathered Gunthorpe Member will contain elevated sulphates, careful consideration should be given to the design specification of earthworks in relation to sulphate induced heave where lime stabilisation is used. Specialist advice should be sought to assess the suitability of utilising lime stabilisation as a moisture content control.

Bridge foundation recommendations

As previously mentioned, a bridge spanning the Hyam's Lane Bridleway is proposed to allow vehicular access between the northern and southern portions of the site. Given the deep superficial soils and limited spread of the load, it is considered construction of the bridge will require a piled foundation solution. Detailed pile design calculations will be provided in the forthcoming Geotechnical Design Report however, it is envisaged that piles will need to extend to a depth of c. 18.00m to socket into the competent Gunthorpe Member ensuring sufficient bearing capacity is achieved.

External yard space and road pavement

Subject to the cut and filling across the site, it is considered that re-engineered material and the natural deposits beneath the site could provide a minimum California Bearing Ratio (CBR) value of 5%. Made Ground in its present untreated condition, owing to its cohesive nature is likely to result in a lower CBR of c. 2%. CBR testing on prepared sub-formation should be undertaken to confirm adequate road construction details. Yard spaces may be surfaced in concrete slabs and therefore appropriate compaction to Series 600 of the specification for Highway works and a site specific Earthworks Specification will be required.

Unexploded Ordnance

An assessment of online Zetica UXO resources highlighted the site as Low risk with respect to unexploded ordnance. A Zetica site specific UXO Desk Study and Risk Assessment (ref. P11996-22-R1) was obtained on behalf of the Client. The report concludes the site is of Low risk and no special mitigation measures are required with regards to ground investigation or groundworks.

7 GENERIC QUANTITATIVE RISK ASSESSMENT

7.1 General

Geo-Environmental laboratory analysis was conducted on Made Ground and natural soil samples from across the site based on the contaminants of concern identified within the Geo-Environmental Preliminary Risk Assessment. The geo-environmental testing is provided in Appendix B, with a preliminary screening assessment provided as Appendix C.

7.2 Summary of Soil Analytical Laboratory Testing Undertaken

Table 21 provides a summary of the chemical analysis completed on soil samples collected during the October/November 2022 ground investigation works.

Table 21 – Summary of Geo-environmental Laboratory Soil Testing

Geo-Environmental Test	MGR	TS	ODT	GFDU	WGM	GUN
Metals (including Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium (total), Chromium III, Chromium VI, Copper, Lead, Mercury, Nickel, Selenium and Zinc)	2	15	8	16	23	1
Soil Organic Matter	2	15	8	16	23	1
Total Petroleum Hydrocarbon (TPH) (Aliphatic and Aromatic Split using the Criteria Working Group Methodology) and BTEX.	2	15	8	16	23	1
Polycyclic aromatic hydrocarbons (PAH) - Speciated (EPA 16)	2	15	8	16	23	1
Selected Volatile Organic Compound (VOC) and Semi-volatile Organic Compound (SVOC)	2	2	0	2	23	0
Methyl tert-butyl ether (MTBE)	2	13	8	16	23	1
Phenol	2	2	0	2	3	0
Asbestos screen (quantification if required)	2	0	0	0	0	0

7.3 Assessment Criteria and Approach – Risks to Human Health

For the assessment of the soil analytical results the human health generic assessment criteria (GAC) applied are the LQM/CIEH 'Suitable 4 Use Levels' (S4ULs) that have been developed in accordance with developments in UK human health risk assessment since 2009.

The S4ULs are based on Health Criteria that represent minimal or tolerable levels of risks to health as described in the Environment Agency's SR2 guidance, ensuring that the resulting assessment criteria are 'suitable for use' under planning.

For each substance, S4ULs have been derived for six generic land uses (including the two Public Open Space land uses defined in S4UL guidance) and a range of Soil Organic Matter contents (organic contaminants only). All toxicological and physical-chemical data inputs used in the derivation of the S4ULs are presented and discussed in the publication.

The assessment criteria outlined above have been used to provide a Generic Quantitative Risk Assessment (GQRA). No statistical analysis has been completed and recorded concentrations have been compared directly to the applied S4ULs.

The Soil Organic Matter test results ranged between 0.2% and 6.1%, with an average of 1.6%. However, the S4ULs have been applied on the basis of a 1% SOM as a conservative approach in the first instance given the variability.

There is no set screening criteria for the protection of human health with respect to asbestos / ACMs in soil. Industry best practice document 'Asbestos in soil and Made Ground: a guide to understanding and managing risks', CIRIA C733, 2014, identifies that soils containing an asbestos concentration of 0.001 % w/w may be able to liberate airborne fibre concentrations and potentially exceed the contemporary occupational exposure limit for nuisance dust, and as such appropriate mitigation measure should be implemented. However, as detailed in recent research, and publications such as the CAR-SOIL Industry Guidance (2016), in circumstances where very low concentrations of asbestos are identified in soil, the associated risks are considered low.

Given the proposed future end use of the site, human health receptors on site are considered to be commercial site end-users and therefore detected soil concentrations have been assessed against generic assessment criteria (GAC) derived for this receptor. Should any future development plans vary from this end use, the contaminated land risk assessment should be revised.

Individual laboratory results are presented within Appendix B and screening tables comparing the soil laboratory results to assessment criteria is provided as Appendix C.

7.4 Quantitative Assessment – Risks To Human Health

Utilising the assessment criteria discussed above, a summary of results from the soil assessment for human health are presented in **Table 22** and **Table 23**.

Table 22 – Summary Soil Screening Table – Risks to Human Health – Made Ground

Determinand				
	No. of Tests	Contaminant Range (mg/kg) above LoD	Assessment Criteria (mg/kg)	Number of Exceedances
Metals				
Arsenic	2	0.5 – 3.2	640	0
Cadmium	2	3	190	0
Chromium (total)	2	34 - 40	8,600	0
Chromium III	1	40	8600	0
Chromium VI	1	-	33	0
Copper	2	8 – 21	68,000	0
Mercury	2	0.34 – 0.46	320	0
Nickel	2	29 – 32	980	0
Lead	2	6 – 40	2,330	0
Selenium	2	-	12,000	0
Zinc	2	55 - 132	730,000	0
Total Petroleum Hydrocarbons				
Aliphatic >EC5 – EC6	2	-	3200	0
Aliphatic >EC6 – EC8	2	-	7800	0
Aliphatic >EC8 – EC10	2	-	2000	0
Aliphatic >EC10 – EC12	2	-	9700	0
Aliphatic >EC12 – EC16	2	-	59000	0

Determinand				
	No. of Tests	Contaminant Range (mg/kg) above LoD	Assessment Criteria (mg/kg)	Number of Exceedances
Aliphatic >EC16 - EC21	2	2	1600000	0
Aliphatic >EC21 - EC35	2	31	1600000	0
Aromatic >EC5 – EC7	2	-	26000	0
Aromatic >EC7 – EC8	2	-	56000	0
Aromatic >EC8 - EC10	2	-	3500	0
Aromatic >EC10 - EC12	2	-	16000	0
Aromatic >EC12 - EC16	2	2	36000	0
Aromatic >EC16 - EC21	2	25	28000	0
Aromatic >EC21 – EC35	2	189	28000	0
TPH (Ali & Aro >C5 – C35)	2	249	28000	0
BTEX - Benzene	2	-	27	0
BTEX - Toluene	2	-	56000	0
BTEX - Ethyl Benzene	2	-	5700	0
BTEX - m & p Xylene	2	-	5900	0
BTEX - o Xylene	2	-	6600	0
MTBEs				
MTBE	2	-	7900	0
Phenols				
Total Phenols	2	-	440	0
PAHs-16				
Naphthalene	2	-	190	0
Acenaphthylene	2	0.02	83,000	0
Acenaphthene	2	0.02 – 0.03	84,000	0
Fluorene	2	-	63,000	0
Phenanthrene	2	0.03 – 0.26	22,000	0
Anthracene	2	0.06	520,000	0
Fluoranthene	2	0.88	23,000	0
Pyrene	2	0.86	54,000	0
Benzo[a]anthracene	2	0.48	170	0
Chrysene	2	0.51	350	0
Benzo[b]fluoranthene	2	0.62	44	0
Benzo[k]fluoranthene	2	0.24	1,200	0
Benzo[a]pyrene	2	0.55	35	0
Indeno(1,2,3c,d)Pyrene	2	0.35	500	0
Dibenz(a,h)Anthracene	2	0.06	3.5	0
Benzo[g,h,i]perylene	2	0.31	3,900	0
VOCs & SVOCs				
A suite of VOCs was conducted on 2 No. samples in the Made Ground, all determinands were recorded as below the limit of detection for both samples				
Asbestos				
No asbestos was detected within the samples put forward for testing.				

Table 23 – Summary Soil Screening Table – Risks to Human Health – Natural Soils

Determinand				
	No. of Tests	Contaminant Range (mg/kg) above Limit of Detection (LoD)	Assessment Criteria (mg/kg)	Number of Exceedances
Metals				
Arsenic	56	1.0 - 27	640	0
Cadmium	56	0.5 – 1.3	190	0
Chromium (total)	56	21 – 70	8,600	0
Chromium III	30	21 – 64	8,600	0
Chromium VI	30	-	33	0
Copper	56	7 – 27	68,000	0
Mercury	56	0.2 – 1.97	320	0
Nickel	56	17 – 60	980	0
Lead	56	3 – 136	2,330	0
Selenium	56	1 – 2	12,000	0
Zinc	56	43 - 92	730,000	0
Total Petroleum Hydrocarbons				
Aliphatic >EC5 – EC6	56	-	3200	0
Aliphatic >EC6 – EC8	56	-	7800	0
Aliphatic >EC8 – EC10	56	-	2000	0
Aliphatic >EC10 - EC12	56	1	700	0
Aliphatic >EC12 - EC16	56	1 – 40	59000	0
Aliphatic >EC16 - EC21	56	1 – 37	1600000	0
Aliphatic >EC21 - EC35	56	1 – 18	1600000	0
Aromatic >EC5 – EC7	56	-	26000	0
Aromatic >EC7 – EC8	56	-	56000	0
Aromatic >EC8 - EC10	56	1 – 2	3500	0
Aromatic >EC10 - EC12	56	7	16000	0
Aromatic >EC12 - EC16	56	1 – 40	36000	0
Aromatic >EC16 - EC21	56	1 - 37	28000	0
Aromatic >EC21 – EC35	56	1 - 17	28000	0
TPH (Ali & Aro >C5 – C35)	56	1 – 111	8000	0
BTEX - Benzene	56	-	27	0
BTEX - Toluene	56	-	56000	0
BTEX - Ethyl Benzene	56	-	5700	0
BTEX - m & p Xylene	56	-	5900	0
BTEX - o Xylene	56	-	6600	0
MTBEs				
MTBE	56	-	7900	0
Phenols				
Total Phenols	6	-	440	0
PAH-16				

Determinand				
	No. of Tests	Contaminant Range (mg/kg) above Limit of Detection (LoD)	Assessment Criteria (mg/kg)	Number of Exceedances
Naphthalene	56	0.27	190	0
Acenaphthylene	56	0.05	83,000	0
Acenaphthene	56	1.48	84,000	0
Fluorene	56	0.44	63,000	0
Phenanthrene	56	0.05 – 0.94	22,000	0
Anthracene	56	0.31	520,000	0
Fluoranthene	56	0.88	23,000	0
Pyrene	56	0.56	54,000	0
Benzo[a]anthracene	56	0.1	170	0
Chrysene	56	0.11	350	0
Benzo[b]fluoranthene	56	0.06 – 0.07	44	0
Benzo[k]fluoranthene	56	-	1,200	0
Benzo[a]pyrene	56	0.06	35	0
Indeno(1,2,3c,d)Pyrene	56	0.03	500	0
Dibenz(a,h)Anthracene	56	-	3.5	0
Benzo[g,h,i]perylene	56	-	3,900	0
VOCs & SVOCs				
A suite of VOCs & SVOCs was conducted on 8 No. samples in the natural soils. The values above the LOD are detailed below.				
Dibenzofuran	6	529	-	0
2-Methylnaphthalene	6	132	-	0
n-Dibutylphthalate	6	286	-	0
1,3,5-Trimethylbenzene	6	6	-	0
1,2,4-Trimethylbenzene	6	1	42	0

7.5 Assessment of Soil Contamination – Risks to Human Health

All concentrations of contaminants analysed were below the commercial end use assessment criteria where, in the majority of instances, results were below the limit of detection. Of note, are the samples from CP27 which were identified as potentially contaminated during the intrusive investigation based on visual and olfactory evidence. The results from the sample of Made Ground from 3.00m bgl recorded 2 No. instances where contaminants were elevated above the limit of detection (Acenaphthene – 0.03mg/kg and Phenanthrene – 0.03mg/kg). The results from the top of the natural soils at 4.00m bgl indicated a number of occasions where PAHs, VOCs and SVOCs were above the limit of detection. However, in all instances these were only slightly elevated above detection limit and are not considered to pose a significant risk to end users.

Risks to future end users are therefore assessed as low.

Despite this, localised areas of contamination may be present at the site and the developer should keep a watching brief during construction works. Should any unexpected contamination be encountered, the contractor should contact the geo-environmental consultant and the Local Authority to discuss assessment of risks and mitigation measures, if required.

There are 5 No. instances (BH04, BH12, BH25, TP25 and TP37) where no geo-environmental testing was undertaken despite the identification of Made Ground at this locations. This was due to the soils not being logged as Made Ground until after the geo-environmental scheduling was undertaken. Despite this, the risk from gross contamination of these soils is considered low, as the soil in locations of BH04, BH12, BH25 does not contain any anthropogenic components and no visual or olfactory signs of contamination were recorded. This material has been described as Made Ground due to its reworked nature suggesting these are backfilled pits that have been infilled with natural material.

At TP25 and TP37 the risk of gross contamination is considered low as the soils descriptions indicate largely natural components with a few glass fragments, ceramics and plastic sheet with no visual or olfactory signs of contamination.

No occurrences of asbestos were identified during the ground investigation works. However, in order to inform future construction and maintenance workers, Risk Assessments and Method Statements (RAMS), this report should be issued to the Principal Contractor responsible for development of the site.

It is understood the development includes the creation of bunds at the site with a view of re-use of material. Based on the above the material appears to be suitable with regard to risks to human health. Further testing may be required in any forthcoming earthworks specification and materials management plan.

7.6 Controlled Waters Risk Assessment – Summary of Water Analytical Testing Undertaken

The initial CSM suggests a low/moderate risk to Controlled Waters. The intrusive works / groundwater monitoring confirms the presence of a defined groundwater body beneath the site between depths of 1.25m and 15.32m bgl (84.9m AOD and 52.7m AOD) within the Glaciofluvial, Weathered Gunthorpe Member and Gunthorpe Member. The groundwater elevation data suggests the groundwater body is flowing in a southerly direction and is in continuity across strata types.

The PRA has identified 2 No. watercourses within influential distance of the site, the closest being Diseworth Brook c. 248m south-west. Diseworth Brook flows south easterly and intercepts the Long Whatton Brook c. 545m south-east of the site. The Long Whatton Brook appears to be partially fed by drainage ditches which converge in the south-eastern corner of the site and continue off-site. As it has been identified that these ditches are in hydraulic connectivity with the groundwater, it is considered they are a pathway for groundwater contamination identified on-site to enter the 2 nearby watercourses.

With this in mind a suite of groundwater and surface water testing has been undertaken based on the range of contaminants identified in the Preliminary Risk Assessment.

15 No. groundwater samples from the following monitoring wells were taken and tested for a range of contaminants:

BH02, BH04 (d), BH05, BH06, BH09 (d), BH10, BH13, BH17, BH18, BH21, BH24, BH25, CP06, CP10 and CP27

Groundwater was at depths of between 2.51m and 19.00m bgl at these positions. Table 24 below sets out the list of contaminants tested for.

Table 24 – Summary of Geo-environmental Laboratory Groundwater Testing

Geo-Environmental Test	No. of tests
Metals (including Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium (total), Chromium VI, Copper, Lead, Mercury, Nickel, Selenium and Zinc)	15
TPH (Aliphatic and Aromatic Split using the Criteria Working Group Methodology), BTEX.	15

Geo-Environmental Test	No. of tests
PAH - Speciated (EPA 16)	15
SVOC and VOC	15
MTBE	15
Phenol	15
OCP and OPP Combined Pesticide Suite	14
PCBs (16MS)	14

2 No. surface water samples were taken from the drainage ditch that flows south from the central south-eastern area of the site to the south-eastern corner; one taken from the top of the ditch and one taken in the south-eastern corner. Table 25 below presents the range of contaminants that were tested for in these samples.

Table 25 – Summary of Geo-environmental Laboratory Surface Water Testing

Geo-Environmental Test	No. of tests
Metals (including Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium (total), Chromium VI, Copper, Lead, Mercury, Nickel, Selenium and Zinc)	2
TPH (Aliphatic and Aromatic Split using the Criteria Working Group Methodology), BTEX.	2
PAH - Speciated (EPA 16)	2
SVOC and VOC	2
MTBE	2
Phenol	2
OCP and OPP Combined Pesticide Suite	2
PCBs (16MS)	2

7.7 Quantitative Risk Assessment – Risks to Controlled Waters

All surface water results have been assessed to EQS freshwater criteria on the basis that the nearby surface waters are receiving drainage waters from the site via drainage ditches. Where criteria are not available, groundwater quality standards, such as UK or WHO drinking water standards have been utilised for initial screening purposes.

All groundwater samples were assessed against UKDWS or WHO drinking water standards.

It is noted that the onsite ditches will be infilled and replaced with appropriate surface water drainage systems, and these will discharge into the Public Surface Water Sewer in the south-eastern corner of the site. This will then discharge into Diseworth Brook. For full details of the drainage plan please refer to Fairhurst Drainage Strategy Report (Ref. 148749/R2)

The results of the groundwater and surface water testing are included in the Structural Soils factual report, Appendix B. The results of the testing indicated contaminant levels were below the level of detection for the majority of contaminant types. A small number samples were found to exceed the Generic Assessment Criteria for PAHs (0.1 ug/l), these instances are summarised below in Table 26 and Table 27.

Table 26 – Summary Screening Table – Controlled Waters Risk Assessment – Groundwater

Determinant	Contaminant Range (µg/l)	No. of Results Elevated	GAC for PAHs (ug/l)
-------------	--------------------------	-------------------------	---------------------

Acenaphthylene	0.13 – 0.15	2	0.1
Naphthalene	0.14 – 1.14	4	
Pyrene	0.13	1	

Table 27 – Summary exceedances – Controlled Waters Risk Assessment – Surface Water

Determinant	Contaminant Range (ug/l) above Limit of Detection (LoD)	No. of Results Elevated above LoD	GAC for PAHs (ug/l)
Naphthalene	0.18	1	0.1

Groundwater

Contaminant levels recorded within groundwater samples were generally below the Generic Assessment Criteria for the majority of samples, with the exception of a small number of PAHs exceedances as shown in Table 26 above.

PAHs are generally understood to derive from combustion of fuels such as coal, oil, gas and wood/crops and, although these activities may have occurred on site given the site's agricultural history, it is considered unlikely as PAH contamination was not identified within the soil testing on site. Exceedances were generally detected in samples taken from a greater depth (up to 19.0m bgl), and greater PAH exceedances in groundwater were detected in the northern reaches of the site (CP06 = 1.14 ug/l), with concentrations generally decreasing in samples obtained in the southern reaches of the site (CP27 = 0.13 ug/l).

Therefore, this PAH contamination is considered likely to have leached into the groundwater from an off-site source.

Considering the absence of abstraction points within 1,000m of the site and proposed betterment through the managed drainage system and reduced infiltration, risks to controlled water quality are assessed as low.

Surface Waters

As it can be seen, the 1 No. surface water sample detected a slight exceedance in Naphthalene. It has been identified that the drainage ditches are in hydraulic connectivity with the groundwater on site therefore, these elevated contaminants are thought to derive from the groundwater.

No other EQS exceedances have been identified. Where Drinking Water Standard exceedances are identified above, the risk to offsite controlled water receptors is considered low as these are not widespread. As such, the risk to Controlled Waters is considered to be low and no remedial activities are proposed in this regard.

7.8 Quantitative Risk Assessment – Risks to Drinking Water Supply Pipes

Routes of proposed drinking water supply pipes are unknown at the time of writing; however soil concentrations recorded across the site have been compared against UKWIR "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites (Ref 10/WM/03/21)" assessment guidance (Table 28).

Table 28 – Assessment of Maximum Soil Concentrations against UKWIR Assessment Criteria

UKWIR Assessment Criteria	Polyethylene (PE) Threshold (mg/kg)	Polyvinyl Chloride Pipe (PVC) Threshold (mg/kg)	Maximum Soil Concentration Detected (mg/kg)
Total VOCs	0.5	0.125	0.007 (CP27 4.00m)
Total BTEX & MTBE	0.1	0.03	<0.01

UKWIR Assessment Criteria	Polyethylene (PE) Threshold (mg/kg)	Polyvinyl Chloride Pipe (PVC) Threshold (mg/kg)	Maximum Soil Concentration Detected (mg/kg)
Total SVOCs excluding PAH	2	1.4	0.947 (CP27 4.00m)
C5-10 aliphatic / aromatic hydrocarbons	2	1.4	2 (BH20 0.10m, CP27 4.00m)
C10-16 aliphatic / aromatic hydrocarbons	10	n/a	47 (CP27 4.00m)
C16-40 aliphatic / aromatic hydrocarbons	500	n/a	214 (CP27 4.00m)
Phenols	2	0.4	<0.10

Thresholds are highlighted yellow where they have been exceeded in 1 or more samples

Based on the above assessment, 2 No. samples returned results over the threshold for polyethylene pipe, and 1 No. over the threshold for polyvinyl chloride pipe specification. Although these exceedances have been observed, the use of upgraded drinking water supply pipes is not considered necessary. This is because the elevated C5-10 aliphatic / aromatic hydrocarbons recorded at BH20 are within the Topsoil which would be stripped as part of the development.

Additionally, the elevated C5-10 and C16-40 aliphatic / aromatic hydrocarbons recorded at CP27 are representative of a hotspot of contamination. It is recommended the soils here are excavated and either processed to remove the contamination or suitably disposed of off-site therefore, mitigating the risk of hydrocarbons permeating any drinking water supply pipes.

As an additional preventative measure, suitable sampling and testing along the proposed pipe routes could be undertaken to determine if PE/PVC pipes are suitable, subject to consultation with the water supplier.

7.9 Ground Gas / Soil Vapour Risk Assessment (Human Health and Buildings)

3 No. gas monitoring visits have been completed where installations were selected for monitoring to assess the potential sources of ground gas identified within the PRA as well as to provide general coverage across the site.

Additionally, there were a number of positions (BH05, BH06, BH09, BH12 and CP16) where groundwater was sat within the non-perforated section of pipe. These were identified after the first round of monitoring and not scheduled for further gas monitoring.

The ground gas risk assessment has been undertaken in general accordance with the CIRIA Report C665 and BS8485:2015. The field records are included in Appendix B of the Structural Soils Ltd Factual report with the results under steady state conditions summarised in Appendix D of this report.

Across the monitoring visits, atmospheric pressures were recorded between 997-1019mb.

In accordance with BS8485:2015 A1:2019, the hazardous Gas Screening Value (GSV) is based on a 'worst-case' scenario whereby GSV equals the maximum hazardous gas concentration divided by 100 and multiplied by the maximum flow rate recorded in any of the monitored boreholes.

The worst case scenario is based on the maximum carbon dioxide concentration of 2.5%v/v and a maximum steady flow rate of 8.1l/hr which results in a worst case GSV of 0.2025l/hr recorded at BH04 (d). The worst case scenario for methane is based on a maximum concentration of 0.1% v/v meaning there is no risk posed from methane concentrations. CIRIA C665 recommends potentially increasing the site Characteristic Situation CS2, based on BS 8485:2015+A1:2019 (CS2 threshold is 0.07 to 0.7l/hr). A review of the data however shows elevated flow was only recorded on one occasion in one deep borehole and is not considered representative of the site conditions. This approach is supported

by site observations, where soil organic matter was generally reported at low concentrations and not conducive to ground gas generation. The Made Ground thicknesses encountered are generally < 1m with exception of CP27 where up to three metres of Made Ground were encountered. CP27 was included in the ground gas assessment and reported Characteristic Situation CS1 conditions.

For the reasons outlined above, Characteristic Situation CS1 is considered appropriate for this site based on BS 8485.

As outlined within the BS 8485 the proposed development is considered a Type D Building with the smaller office spaces classed as Type C buildings:

'Type D Building: industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorised as Type B or Type C.'

'Type C building: commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).'

Given a Characteristic situation of CS1 has been established for the site, Table 4 of BS 8485:2015+A1:2019 indicates there is no requirement (0 points) for gas protection measures for both Type C and Type D structures on site.

The long term occupational exposure limit (OEL) for carbon monoxide is 30ppm and hydrogen sulphide is 5ppm; both concentrations of which are based on eight hour working day ambient conditions. No concentrations of either gas (in ground) were recorded in excess of their long term OEL across the entire site. Carbon monoxide concentrations were typically <10 across the site and hydrogen sulphide concentrations were invariably elevated above 0. It is considered that carbon monoxide and hydrogen sulphide represent a low risk from to the proposed development and that no mitigation for these gasses is required.

VOCs were recorded at low concentrations during monitoring and were generally absent from soil sample head-space readings. It is considered the soil vapour represents a low risk to the proposed development and that no mitigation is required.

The risk with respect to bulk ground gas and volatile vapours is low and no ground gas or vapour protection measures are proposed.

7.10 Updated Conceptual Site Model

Based on the assessments presented in Section 7.0 of this report, the preliminary qualitative risk assessment has been updated based on the quantitative findings.

As it can be seen below, the majority of source-pathway-receptor linkages are low or very low risk and require no further assessment or mitigation. The exceptions are:

- Mitigation of potential risks to human health associated with permeation of drinking water supply pipes
- Mitigation of the potential risks to human health associated with accumulation and inhalation of ground gas

Potential Source	Potential Pathway (s)	Potential Receptor (s)	Assessment	Probability	Consequence	Risk Class
Identified On-Site Sources	Dermal contact, ingestion and / or inhalation of contaminated soils, dusts and waters;	Human health (on-site)	All soil determinants analysed were below the thresholds for commercial end use with no instances of Asbestos Containing Materials identified within soil samples. Therefore, risk to human health is considered low and no further action is required.	Unlikely	Medium	Low
	Migration and accumulation of ground gas / soil vapour, followed by inhalation.		The site has been characterised as Characteristic Situation 1 (CS1). Due to this, ground gas protection measures are not required.	Unlikely	Medium	Low
	Ingestion of contaminated mains water supply as a result of permeation of water supply pipe.		Contaminants with the potential to deteriorate water supply pipes and migrate into the on-site water supply have been encountered on site with recorded levels above the UKWIR guidance for Polyethylene piping in 2 No. instances. Therefore, it is recommended that barrier pipe and/or clean corridors are implemented to block this potential pathway.	Low Likelihood	Medium	Moderate/Low
	Inhalation of windblown dust / soils from the site.	Human health (off-site)	All soil determinants analysed were below the thresholds for commercial end use with no instances of Asbestos Containing Materials identified within soil samples. The risk to offsite human health receptors is low and off-site migration of contamination unlikely following development. There is a risk of contaminated	Unlikely	Medium	Low

Potential Source	Potential Pathway (s)	Potential Receptor (s)	Assessment	Probability	Consequence	Risk Class
			soils migrating off site during construction as a result of wind-blown material, this should be managed with appropriate dust suppression methods.			
	Off-site migration followed by accumulation and inhalation of ground gas and / or soil vapour.		The risk of off-site migration of ground gas is considered low given the cohesive nature of the majority of soils on site, the discontinuity of granular strata and as the site was categorised as CS1.	Unlikely	Medium	Low
	Off-site migration of contamination followed by permeation of pipe materials and subsequent contamination of water supply.		Although a groundwater body that is near-surface and quantities of PAHs have been identified above the limit of detection in a number of groundwater and surface water samples the risk to off-site human health is considered low as it is unlikely groundwater will be shallow enough to come into contact with water supply pipes.	Unlikely	Medium	Low
	Migration of contaminants and direct contact with the building fabric	Property (on-site)	Buried concrete is specified as DS-2 AC-2 for the superficial and Weathered Gunthorpe Member soils and DS-2 AC-2 for the groundwater. The use of sulphate resistant concrete will mitigate the risk of degradation therefore the risk to building fabric is low.	Likely	Minor	Low
	Migration and accumulation of ground gas / soil vapours, followed by ignition		The site has been characterised as Characteristic Situation 1 (CS1). Therefore use of gas protection measures is not required. Elevated VOC levels were not encountered, as such the risk to end users from potential vapours is low.	Unlikely	Medium	Low
	Off-site migration and accumulation of ground gas / soil vapours, followed by ignition	Property (off-site)	Although elevated levels of CO2 have been identified at certain localities on-site resulting in a CS2 categorisation for the site, the risk of off-site migration of ground gas is considered low given the cohesive nature of the majority of soils on site and the discontinuity of granular strata.	Unlikely	Medium	Low

Potential Source	Potential Pathway (s)	Potential Receptor (s)	Assessment	Probability	Consequence	Risk Class
	Off-site migration of contaminants followed by direct contact with building fabric		A continuous ground water body that is near surface in certain localities has been identified on site and slight exceedances of PAHs have been identified in groundwater and surface water samples. Despite this, the risk to off-site property is considered low given the low mobility of these contaminants in groundwater.	Unlikely	Medium	Low
	Vertical leaching and migration of contaminants from soil to groundwater and lateral leaching and migration into the adjacent source water systems	Controlled waters	No elevated levels of contaminants were identified within soil samples so risk of leaching considered low	Unlikely	Medium	Low
Identified Off-Site Sources	Migration onto site followed by accumulation and inhalation of ground gas and / or soil vapour	Human health (on-site)	Given the predominantly cohesive nature of the soils and the site characterisation as a CS1, off-site ground gas sources such as landfills are considered a low risk to site.	Unlikely	Medium	Low
	Migration onto site followed by ingestion of contaminated mains water supply		A body of continuous groundwater and surface water body has been identified on-site with slightly elevated levels of PAHs recorded. The origin of the PAH source has not been determined. However, the risk to on-site receptors is considered low given there are no abstraction points within 1,000m and the surface water bodies will be reconfigured to swales running off site as part of the drainage strategy.	Unlikely	Medium	Low
	Migration of contaminants onto site followed by direct contact with building fabric	Property (on-site)	No evidence of on-site contamination above human health GAC originating from offsite sources has been identified.	Unlikely	Medium	Low

Potential Source	Potential Pathway (s)	Potential Receptor (s)	Assessment	Probability	Consequence	Risk Class
	Migration onto site, followed by accumulation of ground gas / soil vapours and ignition		The site has been characterised as a Characteristic Situation CS1 (very low risk) indicating that offsite sources are not impacting on the site conditions.	Unlikely	Medium	Low

8 CONCLUSIONS

The on-site ground conditions and geotechnical considerations identified within this report have been summarised below.

8.1 *Geotechnical Conclusions*

The following geotechnical considerations/recommendations have been identified:

- Utility searches and/or surveys are recommended prior to further design development to confirm the absence of services and verify the locations of any utilities that are identified on site;
- It is recommended that foundations are inspected by a suitably qualified Geotechnical Engineer in order to confirm the absence of Made Ground or soft/loose soils within foundation excavations where foundations will require local deepening if encountered. Provision should be made for removal of the soils when encountered within the footprint of proposed structures. Excavations will need to be backfilled and re-compacted / compacted with material suitable for use as general fill;
- Battering/shoring of excavations is recommended where collapsible, granular deposits are encountered. Battering of excavations to a suitable angle is recommended where excavations encounter cohesive strata;
- Given shallow groundwater has been identified across the site, there is potential for groundwater induced instability and flooding of excavations. Therefore, provision of suitable shoring and appropriate dewatering measure are recommended;
- All foundations and associated structures in contact with the underlying superficial soils and weathered bedrock should be designed to DS-1 AC-1 except where foundations and buried structures have the potential to come into contact with groundwater. In this instance, a design class of DS-2 AC-2 should be adopted;
- For the cohesive soils, prescriptive bearing capacities of c. 150kPa can be assumed where a minimum undrained shear strength of 75kPa is achieved. Where granular soils are encountered at foundation depth, a prescriptive bearing capacity of c. 150kPa can be assumed;
- The bearing capacity in the competent Gunthorpe Member is likely to be higher however, the bearing capabilities of this stratum will need careful consideration given the variance in weathering grade observed within the stratum;
- Heavy plant and expensive breaking and ripping techniques may be required where excavations are within the competent bedrock. The possibility of cuttings encountering bedrock is subject to finalisation of the Cut and Fill Plan;
- Initial settlement analysis suggests careful consideration is needed when assessing the potential for settlement across the site and the use of in-situ compaction on fill formation layers by use of rollers is likely required prior to the placement of fill to decrease the potential for settlement;
- Collapsible deposits and strata susceptible to settlement have been identified on site therefore, the risk of failure of any proposed embankments as a result of the formation soils below will need to be carefully considered;
- It is recommended that staged construction is undertaken and basal and interim granular layers are installed and linked to the wider drainage network to avoid build-up of pore-water pressure where embankments are formed from fine grained material. Drainage will also need to be

carefully considered to cope with surface water and avoid softening of the slope faces and foundation soils, in particular at the toe of slopes;

- Options for increasing the angle of embankment slopes thus reducing the footprint and volume of embankments may be explored; these may include reinforced embankments (geogrids) or soil stabilisation (lime and cement) or even retaining walls if required;
- Clean, natural soils are present within areas of cut and these materials should be suitable for re-use provided they are carefully selected and managed in accordance with a suitable earthworks specification.
- Given the similarity in appearance of the cohesive superficial soils, it is likely these materials will become mixed during the earthworks. For this reason, supplementary testing will be required to reassess the material properties in terms of its earthworks suitability;
- As elevated sulphates have been identified within the on-site soils, careful consideration should be given to the design specification of earthworks in relation to sulphate induced heave where lime stabilisation is used. Specialist advice should be sought to assess the suitability of utilising lime stabilisation as a moisture content control;
- Initial pile capacity calculations have been undertaken to advise on construction of the lorry bridge over Hyam's Lane where it has been identified that piles will need to extend to a depth of c.18.00m to socket into the competent Gunthorpe Member ensuring sufficient bearing capacity is achieved;
- CBR testing on prepared sub-formation should be undertaken to confirm adequate road construction details. Yard spaces may be surfaced in concrete slabs and therefore appropriate compaction to Series 600 of the specification for Highway works and a site specific Earthworks Specification will be required.

8.2 Geo-environmental Conclusions and Recommendations

No exceedances of the site specific assessment criteria or commercial end use generic assessment criteria have been identified with respect to human health, and therefore the risk to site end users is considered low. Risks to controlled waters were also assessed as low.

The PRA identified a waste transfer station on the site, however the historical mapping and ground investigation found no evidence of Made Ground / filling. It is possible that the Waste Transfer Station was permitted but never active, or the location of the record is incorrect.

Based on the assessments presented in Section 7.0 of this report the conceptual site model was updated. The assessment confirms that the majority of source-pathway-receptor linkages are low or very low risk and require no further assessment or mitigation with limited exceptions. It is recommended that the following is implemented for the development of the site:

- Suitable drinking water supply pipes are to be installed. A WIR assessment may be required along the proposed drinking water pipe route to demonstrate material suitability. Alternatively the use of barrier pipe would negate the need for further testing. In both events, the local water company should be contacted to agree the chosen pipe material suitability.
- In the event that unexpected contamination is encountered at the site, works in the area are to stop and the Local Authority and the appointed geo-environmental consultant should be contacted. The contamination should be sampled, tested and risk assessed and if required a remediation strategy should be agreed and implemented.
- Based on the ground gas risk assessment, the site is classed as a Characteristic Situation CS1 (very low risk) site and no mitigation are required.
- Risks to controlled waters were assessed as low and no further works are required.

- Despite the low risk of encountering asbestos as part of the construction works, the Principal Contractor should develop appropriate RAMS to address the potential to encounter Asbestos during the construction works.
- Shallow groundwater is likely to be encountered during excavation / construction works. Suitable allowance should be made for the disposal of groundwater and surface water.
- Should offsite disposal of material be required, specific waste classification testing should be undertaken prior to disposal and liaison with the receiving facility should be sought. Given the site's agricultural history, there is low potential to encounter grossly contaminated soils or groundwater not encountered during the investigation.
- An Earthworks Specification should be prepared to specify the geotechnical requirements for material re-use on site.
- Prior to undertaking any cut and fill operations, consideration will have to be given to materials management onsite upon development; particularly for earthworks, in the form of a CL:AIRE DoWCoP Materials Management Plan (MMP) or Environmental Permit. Further testing under a site-specific earthworks specification is recommended to determine the suitability of site-won material for re-use. Further costs are likely to be incurred as a result of importation of material or offsite waste disposals, should they be deemed necessary.

APPENDIX A

DRAWINGS



Notes

1. Do not scale this drawing.

2. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.

Legend

— Proposed order limits

ISSUES & REVISIONS					
Rev	Date	Details of issue / revision	Drw	Rev	
P01	03.07.24	Issued for information	SRH	SRH	

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Client

SEGRO

Drawn:	S. Hilditch	Reviewed:	S. Hilditch
BWB Ref:	220500	Date:	03.07.24
Scale@A1:	1:10,000		

Project Title

**EAST MIDLANDS
GATEWAY 2 (EMG2)**

Drawing Status

FOR INFORMATION

Drawing Title

PROPOSED ORDER LIMITS

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
EMG2-BWB-GEN-XX-SK-CH-SK005	S2	P01



N

Key

Application Boundary

Strategic Landscape Proposals

Existing Vegetation Retained

Existing Tree Retained

Existing Telecoms Mast

Existing Public Right of Way / Footpath

Proposed footpath

Indicative Gradient

Indicative location of proposed SUD's within open land/landscaping

Existing Pond

Proposed Bus stop

Cycle Hire virtual Docking Station

Existing Foul water easement [5m easement either side]

Existing Overhead HV cables [3m easement either side]

Schedule of Accomodation				Plot Areas	
Unit 1 Total	800,000 ft ²	74,323 m ²	39.41 ac	15.95 ha	
Unit 2 Total	265,000 ft ²	24,619 m ²	11.86 ac	4.80 ha	
Unit 3 Total	460,000 ft ²	42,735 m ²	25.74 ac	10.42 ha	
Unit 4a Total	240,000 ft ²	22,297 m ²	10.85 ac	4.39 ha	
Unit 4b Total	145,000 ft ²	13,471 m ²	7.85 ac	3.18 ha	
Unit 5a Total	350,000 ft ²	32,516 m ²	16.00 ac	6.48 ha	
Unit 5b Total	230,000 ft ²	21,368 m ²	11.75 ac	4.75 ha	
Unit 6a Total	240,000 ft ²	22,297 m ²	12.71 ac	5.15 ha	
Unit 6b Total	100,000 ft ²	9,290 m ²	5.12 ac	2.07 ha	
Unit 7 Total	30,000 ft ²	2,787 m ²	1.98 ac	0.80 ha	
Grand Total	2,860,000 ft ²	265,703 m ²	143.28 ac	57.98 ha	
Pumping & Sub Station	TBC	TBC	0.61 ac	0.25 ha	

DRAFT

rev

amendments

by

ckd

date

East Midlands Gateway,
Phase 2
Illustrative Masterplan

SEGRO

umc

architects

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Drawing Status:

LM / MS

Date:

09/01/2024

Scale:

1:2500 A1

Drawing no:

19232 F0053

Feasibility

LM / MS

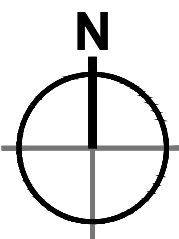
09/01/2024

A1

Revision:



- Dimensions are in millimeters, unless stated otherwise.
- Scaling of this drawing is not recommended.
- It is the recipient's responsibility to print this document to the correct scale.
- All relevant drawings and specifications should be read in conjunction with this drawing.



Key

- Application Boundary 299.89 ac 108.89 ha
- Development Areas
Including car parking, service yards, buildings, on plot landscaping, landscaping between plots, utilities and infrastructure
- Zone Boundaries within development area
- Estate Road
- Limits of deviation to Estate Road
- Corridor for new highway bridge over Hyam's Lane
- Open Land/Landscaping including landscape screen bunding, retained agricultural land & public open space
- Indicative location of proposed SUD's within open land/landscaping
- Strategic Landscape Proposals
- Existing Vegetation Retained
- Existing Tree Retained
- Existing Telecoms Mast
- Proposed Bus terminal
- Existing Pond

Development Schedule					
Zone	Number of Units	Maximum Development Floor Space per Zone(m ²)	Minimum Finished Floor Level (in meters above ordnance datum) [+0.500m above proposed plateau]	Maximum Building Height Measured to roof ridge / highest point (in meters above ordnance datum)	Maximum Ridge Height
Zone 1	1 to 2	85,000	66.750	90.750	24.000
Zone 2	1 to 4	25,000	70.100	88.100	18.000
Zone 3	1 to 4	55,000	78.900	102.900	24.000
Zone 4	1 to 2	35,000	75.550	93.550	18.000
Zone 5a	1 to 4	35,000	85.600	103.600	18.000
Zone 5b	1 to 4	25,000	81.800	99.800	18.000
Zone 6	1 to 4	35,000	87.500	105.500	18.000
Zone 7	1 to 4	5,000	90.090	105.090	15.000
Maximum Total Floor Space*		300,000			

*this total floor space is the maximum floor space that will be developed across zones 1-7 notwithstanding that the maximum floor space stated for each zone 1-7 combined would exceed this figure i.e. this is the overall floor space cap for zones 1-7.

DRAFT

rev amendments by ckd date
East Midlands Gateway,
Phase 2
Parameters Plan

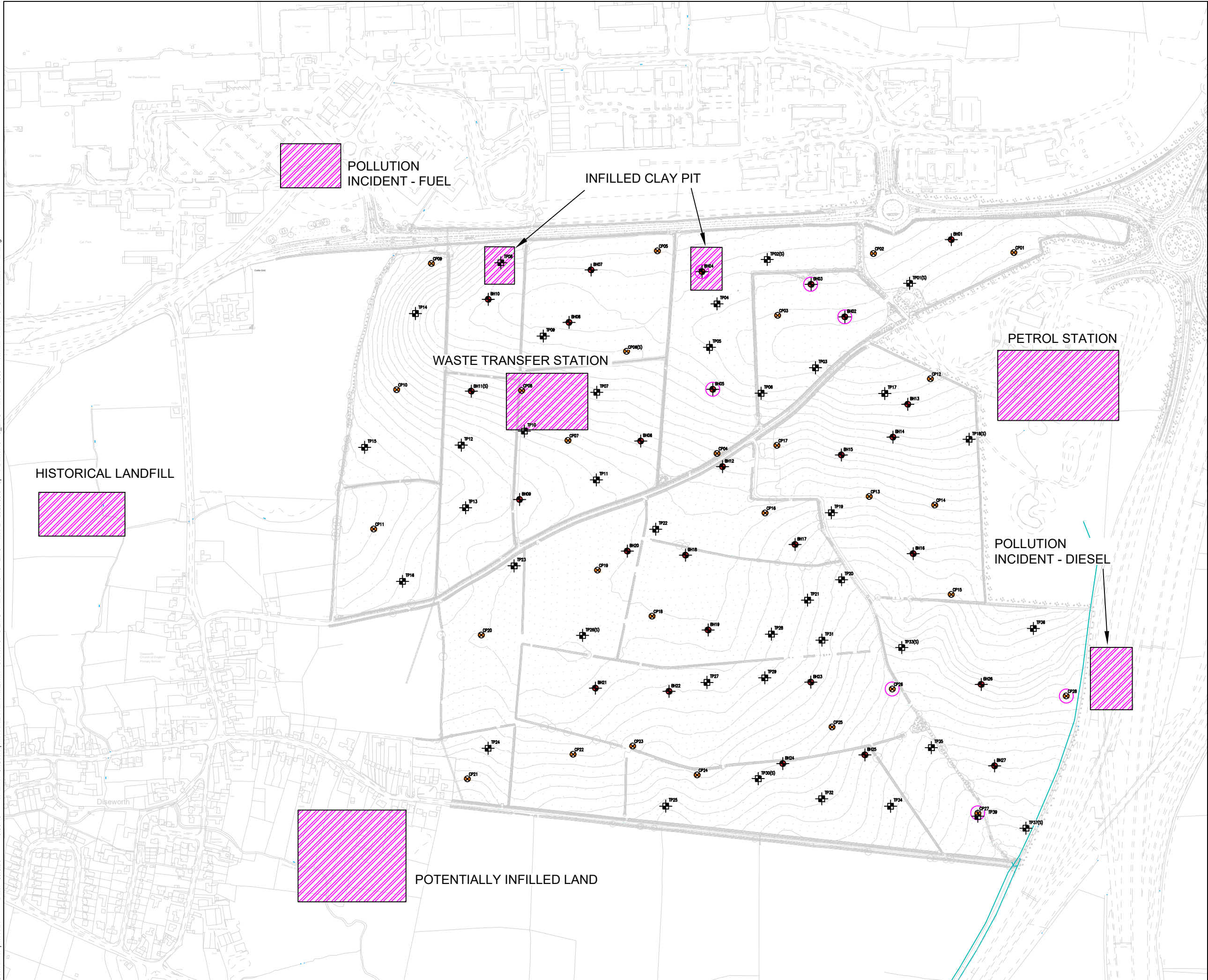
SEGRO

umc architects

Newark Beacon Innovation Centre, Cafferata Way, Newark, Nottinghamshire NG24 2TN
o: +44 (0)1636 653027 f: +44 (0)1636 653010 e: info@umcarchitects.com

Drawing Status:	Feasibility
Drawn / Checked:	DF / MS
Date:	02/08/2022
Scale:	1:2500 A1
Drawing no:	Revision:
19232 F0027	N

Username: pincourt Date: 09/06/23 13:30:43 Filename: C:\Users\pincourt\Documents\London Job\148749 EMG Phase 2 - 2023.05.31 Up To Date\148749 EMG Phase 2 - 9009 - Potential Sources Of Contamination Plan.dwg



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5. ALLOWANCE TO BE MADE FOR 10 NO. BRE365 SOAKAWAY TESTS WITHIN TRIAL PITS AND 6 NO. FALLING HEAD TESTS WITHIN ROTARY FOLLOW ON POSITIONS

BH0

ROTARY CORE BOREHOLE 30m

CP0

CABLE PERCUSSIVE BOREHOLE 15m

TP01

TRIAL PIT 3.5-4.0m

(S)

LOCATION OF SOAKAWAY

POTENTIAL SOURCE OF CONTAMINATION

Rev	Date	Description	Drawn	Chkd	Appd
Drawing Status					

FOR INFORMATION

FAIRHURST

3rd Floor, The News Building, 3 London Bridge Street, London, SE1 9SG

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SEGRO

Project Title

EMG PHASE 2

Drawing Title

POTENTIAL SOURCES OF CONTAMINATION PLAN

Drawn	Date	Designed	Date
P. MCCOURT	09/06/23		
Checked	Date	Approved	Date

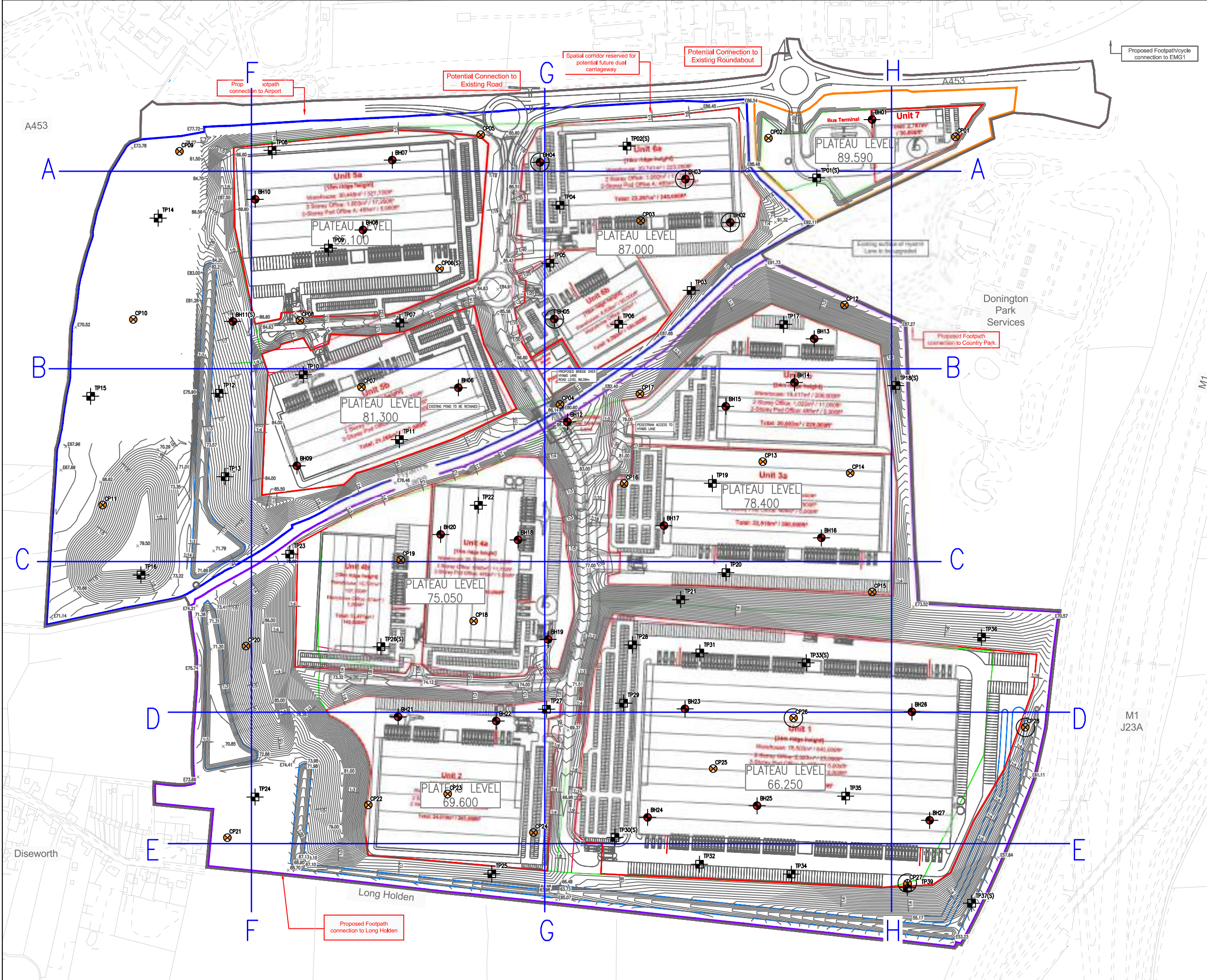
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Drawing Number

148749 - 9009

A

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MAINTENANCE



RESIDUAL DESIGN RISKS

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 5. ALLOWANCE TO BE MADE FOR 10 NO. BRE365 SOAKAWAY TESTS WITHIN TRIAL PITS AND 6 NO. FALLING HEAD TESTS WITHIN ROTARY FOLLOW ON POSITIONS

- ROTARY CORE BOREHOLE 30m
- CABLE PERCUSSIVE BOREHOLE 15m
- TRIAL PIT 3.5-4m
- (S) LOCATION OF SOAKAWAY

Rev	Date	Description	Drawn	Chkd	Appd
A	01/12/22	UPDATE COORDINATES	PM	CB	CB

FOR INFORMATION

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London, SE1 9SG
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SEGRO

Project Title
EMG PHASE 2

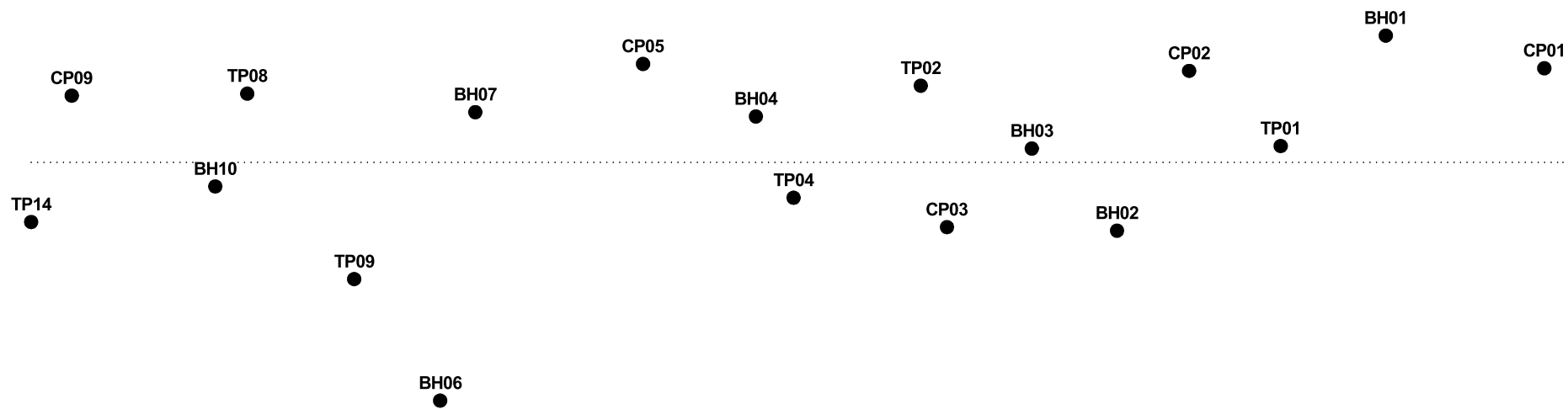
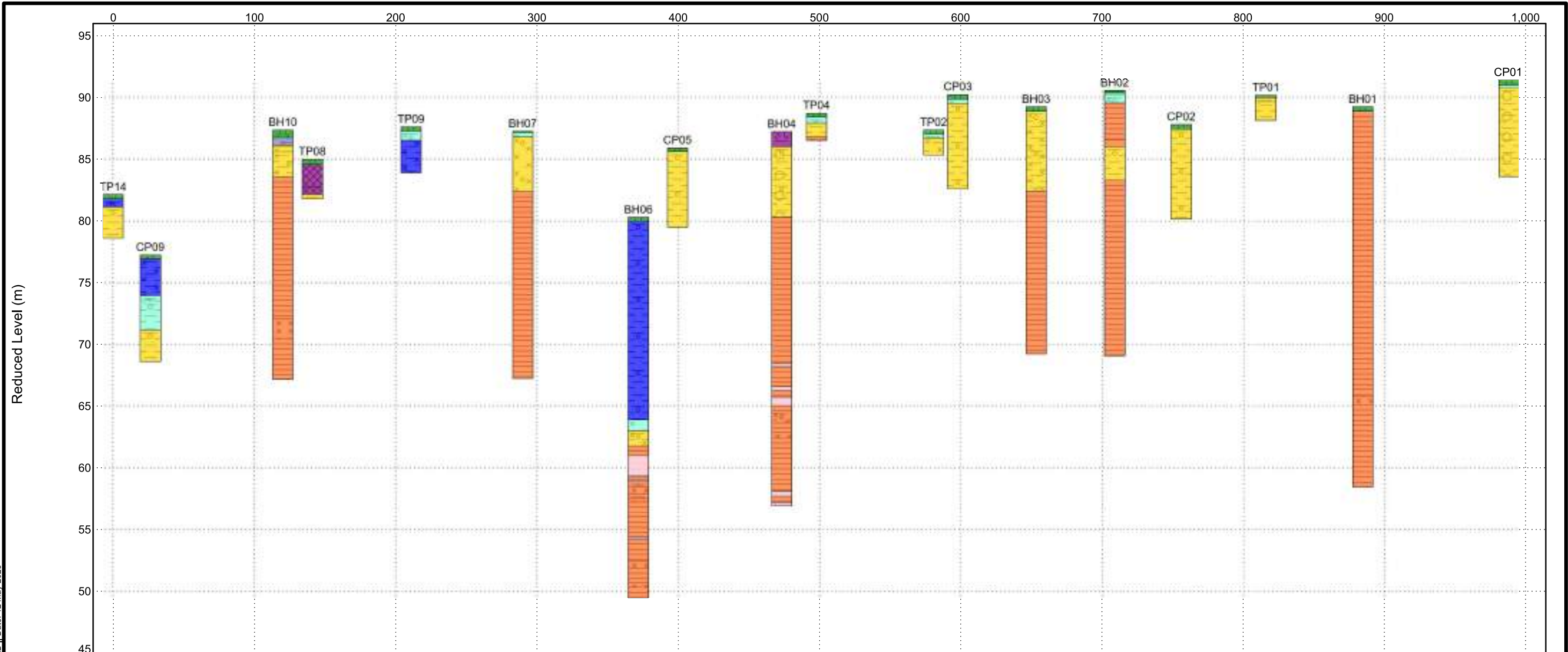
Drawing Title
CROSS-SECTION
PLAN

Drawn P. MCCOURT	Date 26/05/22	Designed	Date
Checked	Date	Approved	Date

A3	Scale NTS	Fairhurst Ref 148749	Revision A
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Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4_0.GLB || Date: 12 May 2023

PLAN VIEW



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Tel: 020 7828 8205
Email: paul.mccourt@fairhurst.co.uk

LITHOLOGY GRAPHICS

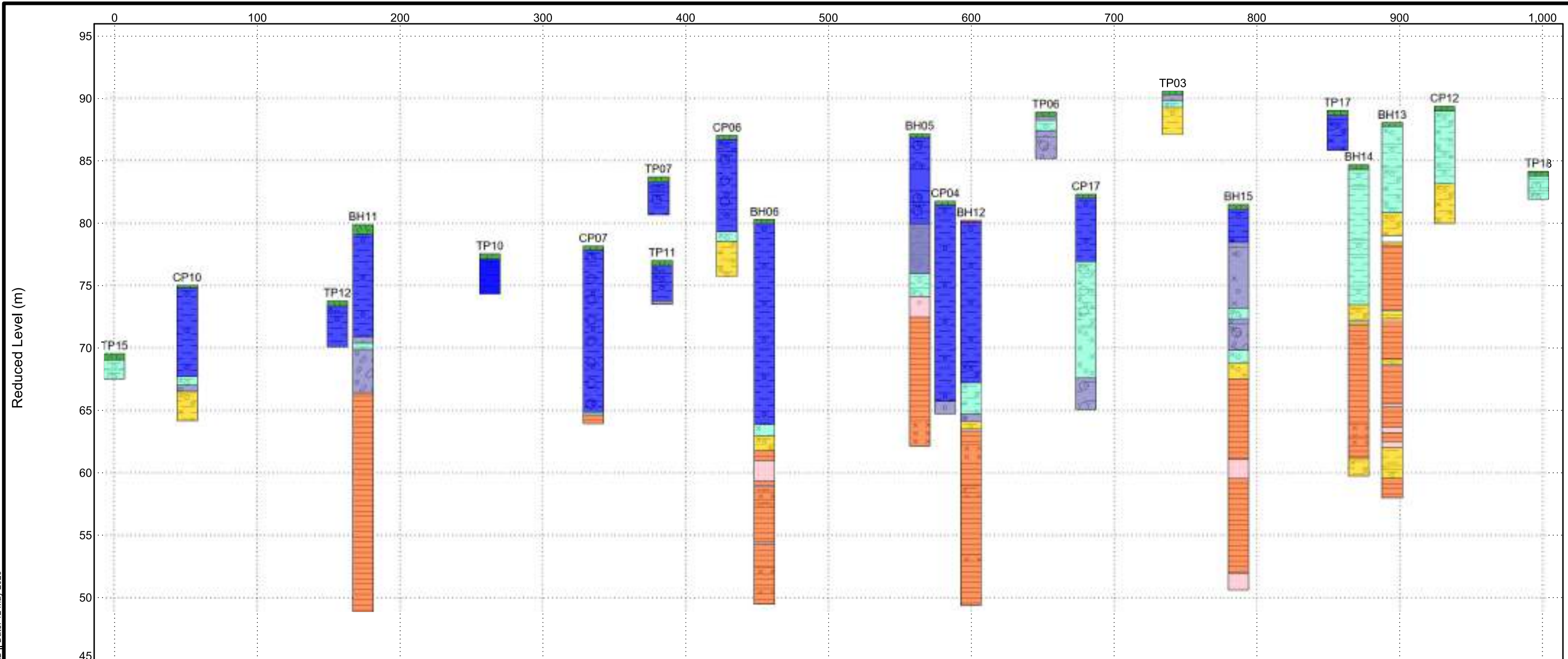
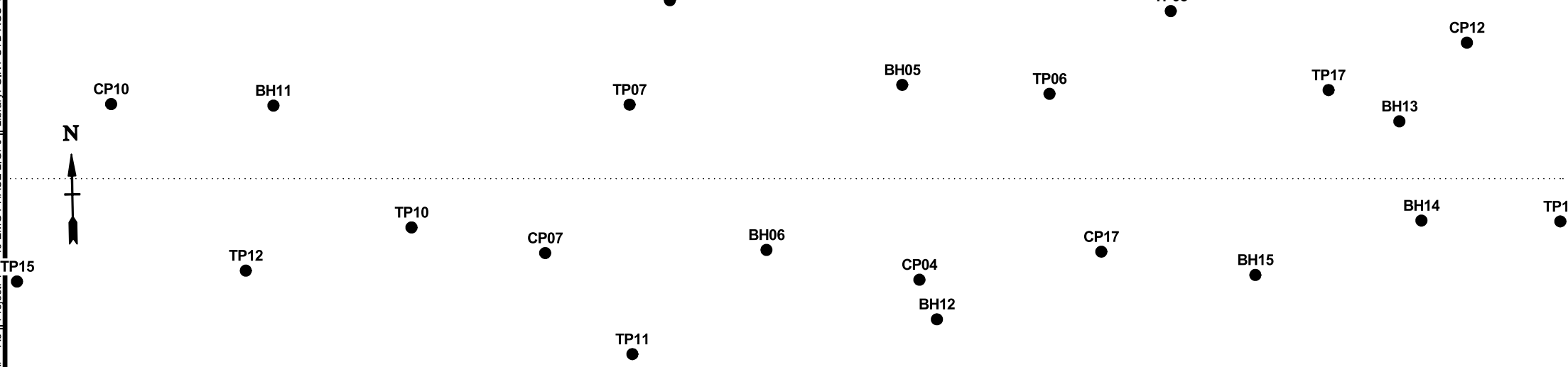


GEOLOGICAL CROSS-SECTION - FIGURE A-A

Client: SEGRO
Project: EMG Phase 2
Number: 148749

Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4_0.GLB || Date: 12 May 2023

PLAN VIEW





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London
SE1 0HR
Tel: 020 7828 8205
Email: paul.mccourt@fairhurst.co.uk

LITHOLOGY GRAPHICS

TOPSOIL	Sandy gravelly cobbly CLAY	VOID	Gravelly cobbly SAND	Clayey sandy GRAVEL
BOULDERS	Cobbly GRAVEL	Sandy gravelly CLAY	Gravelly SAND	MUDSTONE
SILTSTONE	Sandy SILT	Silty sandy gravelly CLAY	SANDSTONE	Sandy CLAY

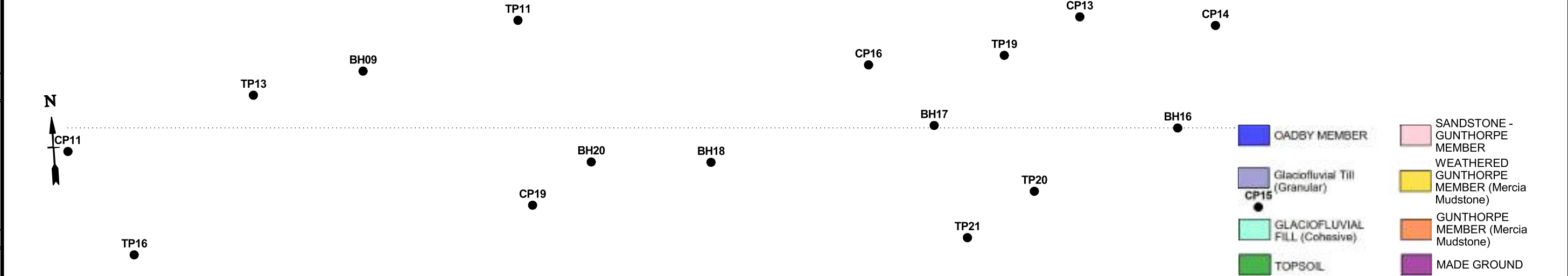
OADBY MEMBER	SANDSTONE - GUNTHORPE MEMBER
Glaciofluvial Till (Granular)	WEATHERED GUNTHORPE MEMBER (Mercia Mudstone)
GLACIOFLUVIAL FILL (Cohesive)	GUNTHORPE MEMBER (Mercia Mudstone)
TOPSOIL	MADE GROUND

GEOLOGICAL CROSS-SECTION - FIGURE B-B

Client: SEGRO
Project: EMG Phase 2
Number: 148749

Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4_0.GLB || Date: 12 May 2023

PLAN VIEW





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SE1 0HR
Tel: 020 7828 8205
Email: paul.mccourt@fairhurst.co.uk

LITHOLOGY GRAPHICS

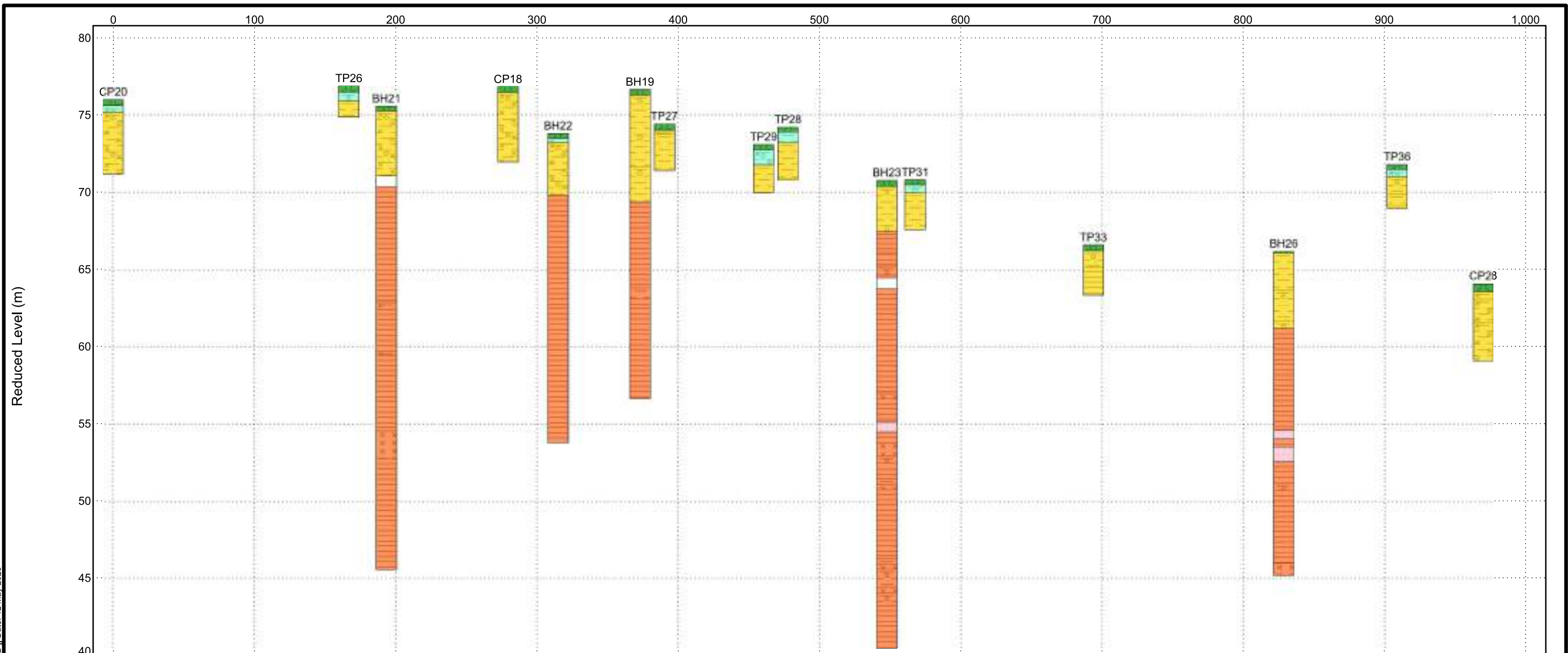
TOPSOIL	Sandy gravelly CLAY	Clayey gravelly SAND	SILTSTONE	MUDSTONE
SANDSTONE	Sandy gravelly SILT	Sandy SILT	Silty SAND	VOID
Silty sandy GRAVEL	Clayey GRAVEL	Sandy CLAY	sandy, clayey, cobbly, GRAVEL	

GEOLOGICAL CROSS-SECTION - FIGURE C-C

Client: SEGRO
Project: EMG Phase 2
Number: 148749

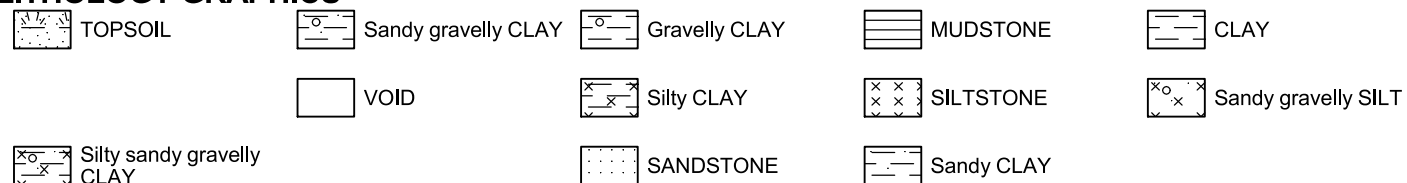
Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4_0.GLB || Date: 12 May 2023

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Tel: 020 7828 8205
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LITHOLOGY GRAPHICS

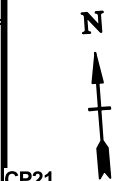
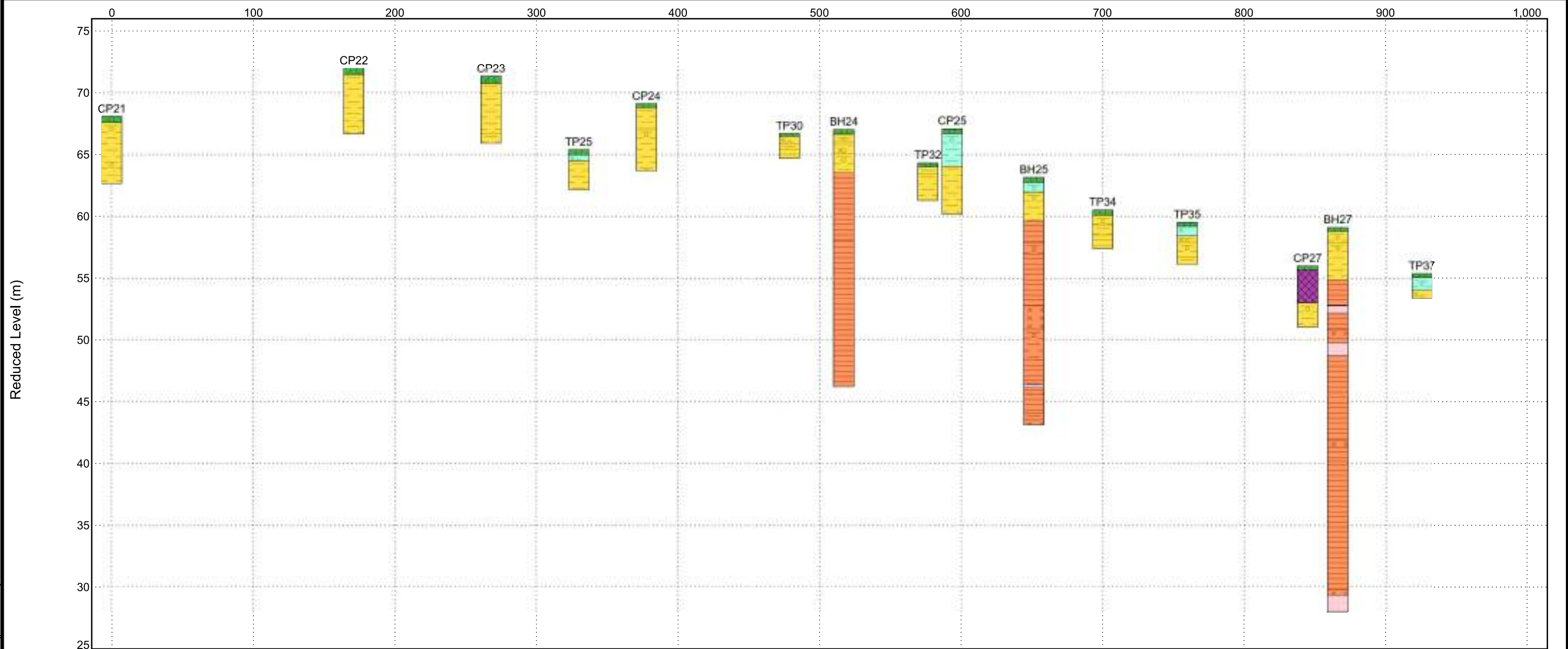


GEOLOGICAL CROSS-SECTION - FIGURE D -D

Client: SEGRO
Project: EMG Phase 2
Number: 148749

Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4_0.GLB || Date: 12 May 2023

PLAN VIEW



CP21

CP22

CP23

CP24

TP30

BH24

TP32

BH25

TP34

TP35

BH27

CP27

TP37

LITHOLOGY GRAPHICS

TOPSOIL

VOID

Sandy gravelly SILT

Gravelly CLAY

SILTSTONE

Sandy SILT

Sandy gravelly CLAY

Sandy CLAY

Silty sandy gravelly CLAY

Silty gravelly SAND

SANDSTONE

CLAY

MUDSTONE

MADE GROUND

GEOLOGICAL CROSS-SECTION - FIGURE E-E

Client: SEGRO

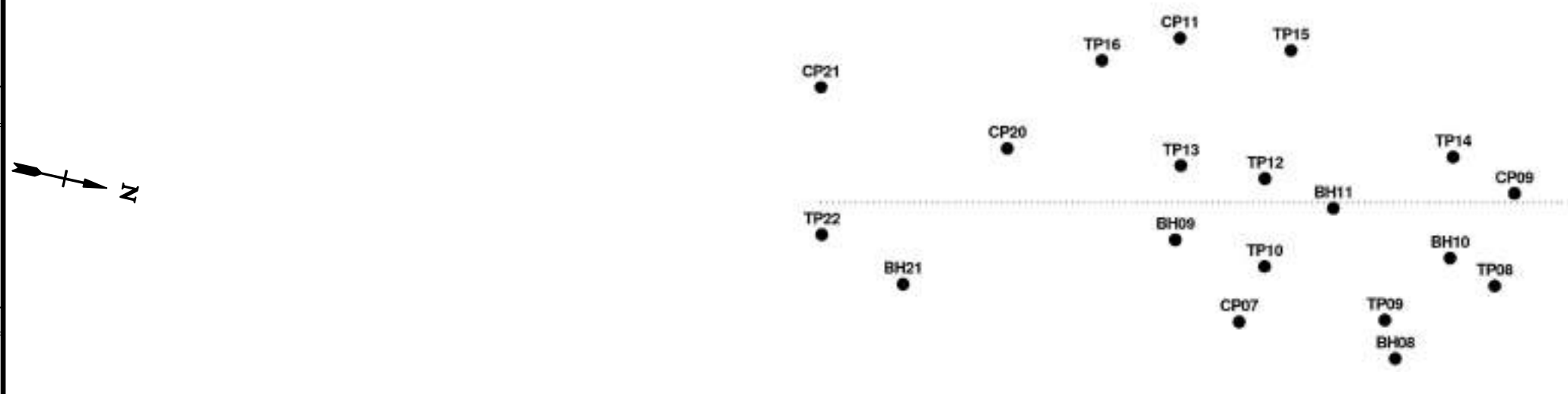
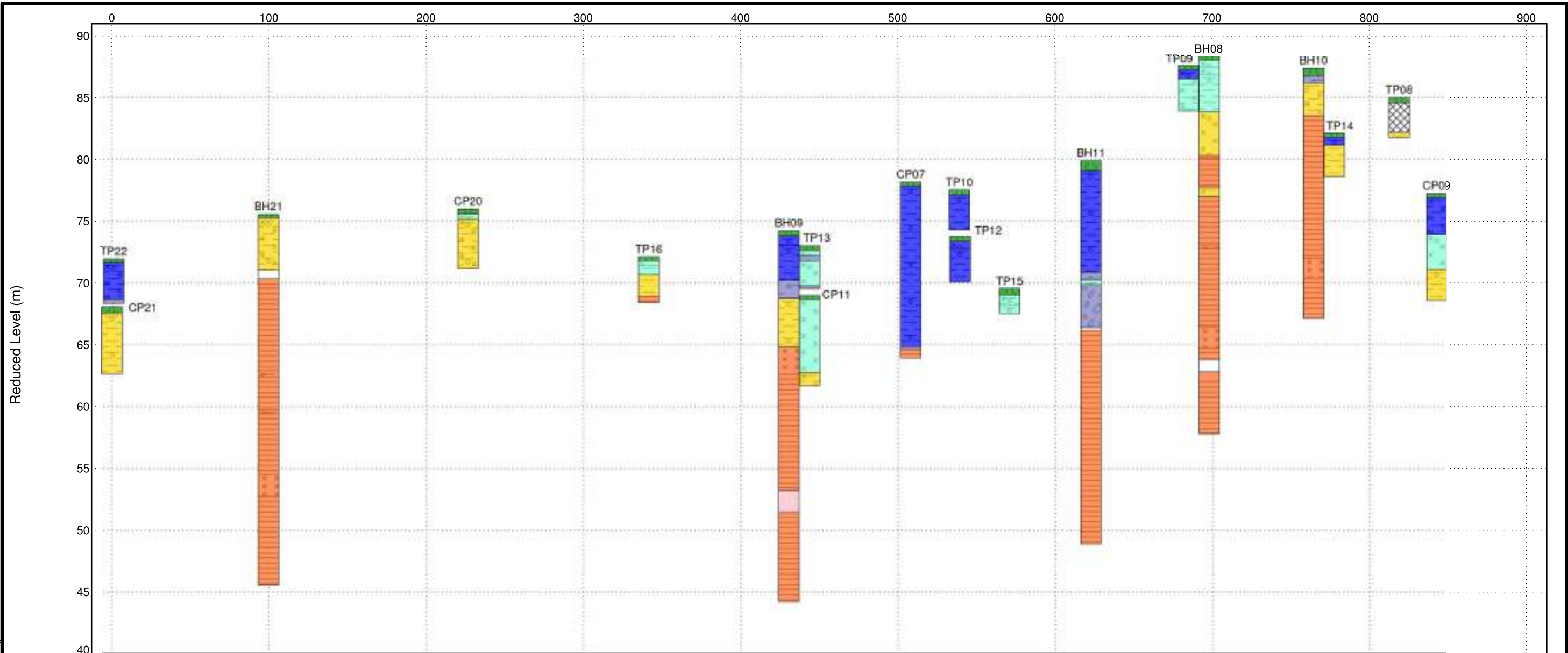
Project: EMG Phase 2

Number: 148749

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Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4 0.GLB || Date: 21 December 2022



- GLACIOFLUVIAL TILL (GRANULAR)
- OADBY MEMBER
- GLACIOFLUVIAL TILL (COHESIVE)
- TOPSOIL
- SANDSTONE - GUNTHORPE MEMBER
- GUNTHORPE MEMBER (Mercia Mudstone)
- WEATHERED GUNTHORPE MEMBER (Mercia Mudstone)

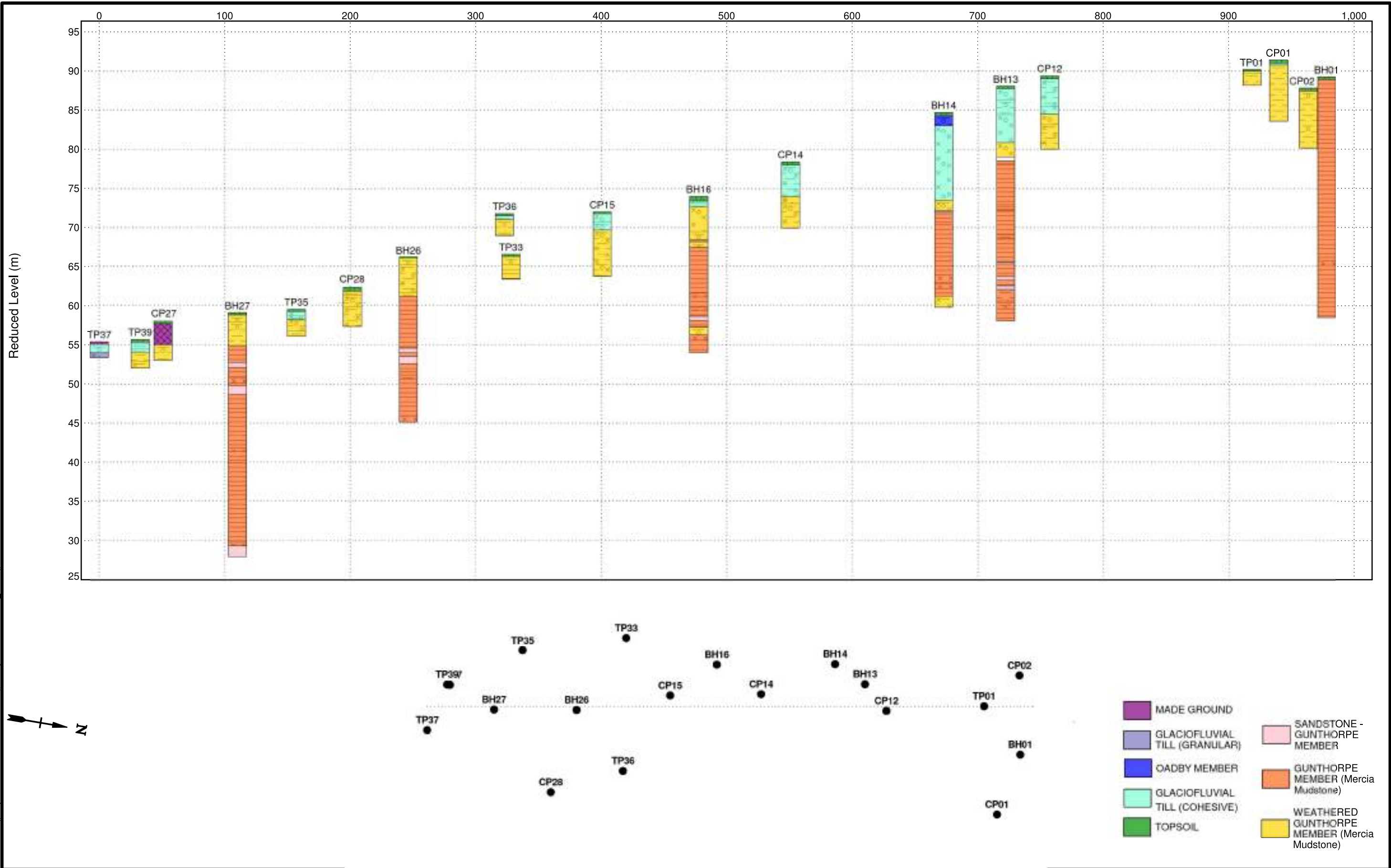
The Harlequin Building
65 Southwark Street
London
SE1 9SG
Tel: 020 7828 8205
Email: paul.mccourt@fairhurst.co.uk

LITHOLOGY GRAPHICS					
TOPSOIL	Sandy gravelly SILT	Sandy gravelly CLAY	SILTSTONE	Silty CLAY	
MUDSTONE	VOID		Clayey gravelly SAND	SANDSTONE	
Gravelly SAND	GRAVEL	Silty gravelly CLAY	Clay/Silt	Sandy SILT	

GEOLOGICAL CROSS-SECTION - FIGURE F-F

Client: SEGRO
Project: EMG Phase 2
Number: 148749

Report ID: AGS4 LITHOLOGY SITEMAP - A3 || Project: 148749 EMG PHASE 2.GPJ || Library: GINT STD AGS 4 0.GLB || Date: 21 December 2022



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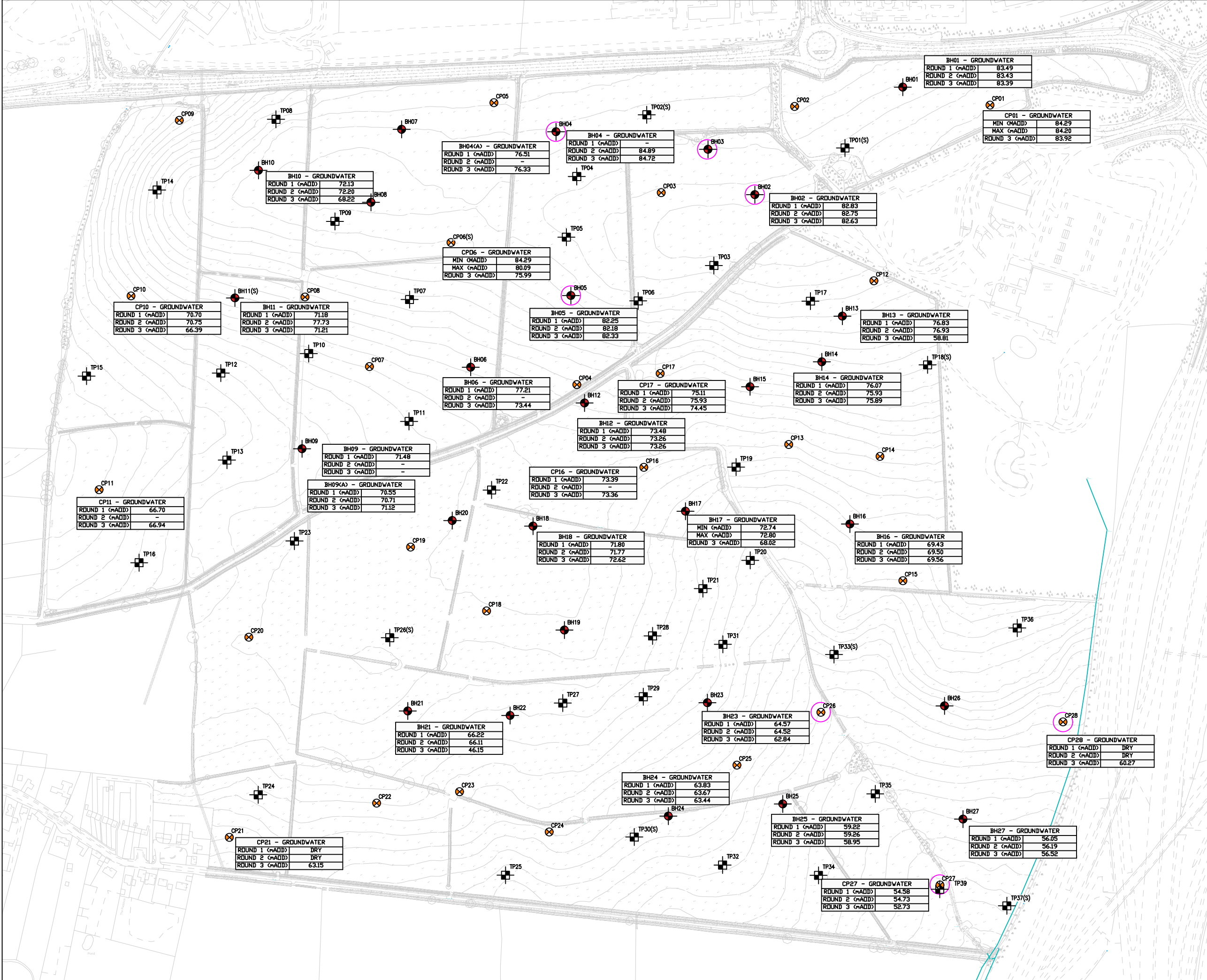
LITHOLOGY GRAPHICS

TOPSOIL	MUDSTONE	SILTSTONE	Sandy gravelly SILT	Sandy gravelly CLAY
VOID	Clayey GRAVEL	Sandy GRAVEL	Gravelly SILT	SANDSTONE
Sandy CLAY	Sandy SILT	Silty gravelly CLAY	Silty CLAY	CLAY

GEOLOGICAL CROSS-SECTION - FIGURE H-H

Client: SEGRO
Project: EMG Phase 2
Number: 148749

Filename: C:\Users\pmccourt\Documents\London Jobs\148749 EMG Phase 2 - 2023.05.11 Up To Date\148749 EMG Phase 2 - 9003 - Groundwater Levels Plan.dwg Date: 11/5/23 14:02:33 Username: pmccourt



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BH0

ROTARY CORE BOREHOLE 30m

CP0

CABLE PERCUSSIVE BOREHOLE 15m

TP01

TRIAL PIT 3.5-4m

(S)

LOCATION OF SOAKAWAY

Rev	Date	Description	Drawn	Chkd	Appd
Drawing Status					

FOR INFORMATION

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Tel: 0141 204 8800 Fax: 0141 204 8801

SEGRO

Project Title

EMG PHASE 2

Drawing Title

EXPLORATORY HOLE LOCATION PLAN WITH GROUNDWATER LEVELS

Drawn

P. MCCOURT

Date

19/12/22

Designed

Date

Checked

Date

Approved

Date

A3

Scale

NTS

Fairhurst Ref

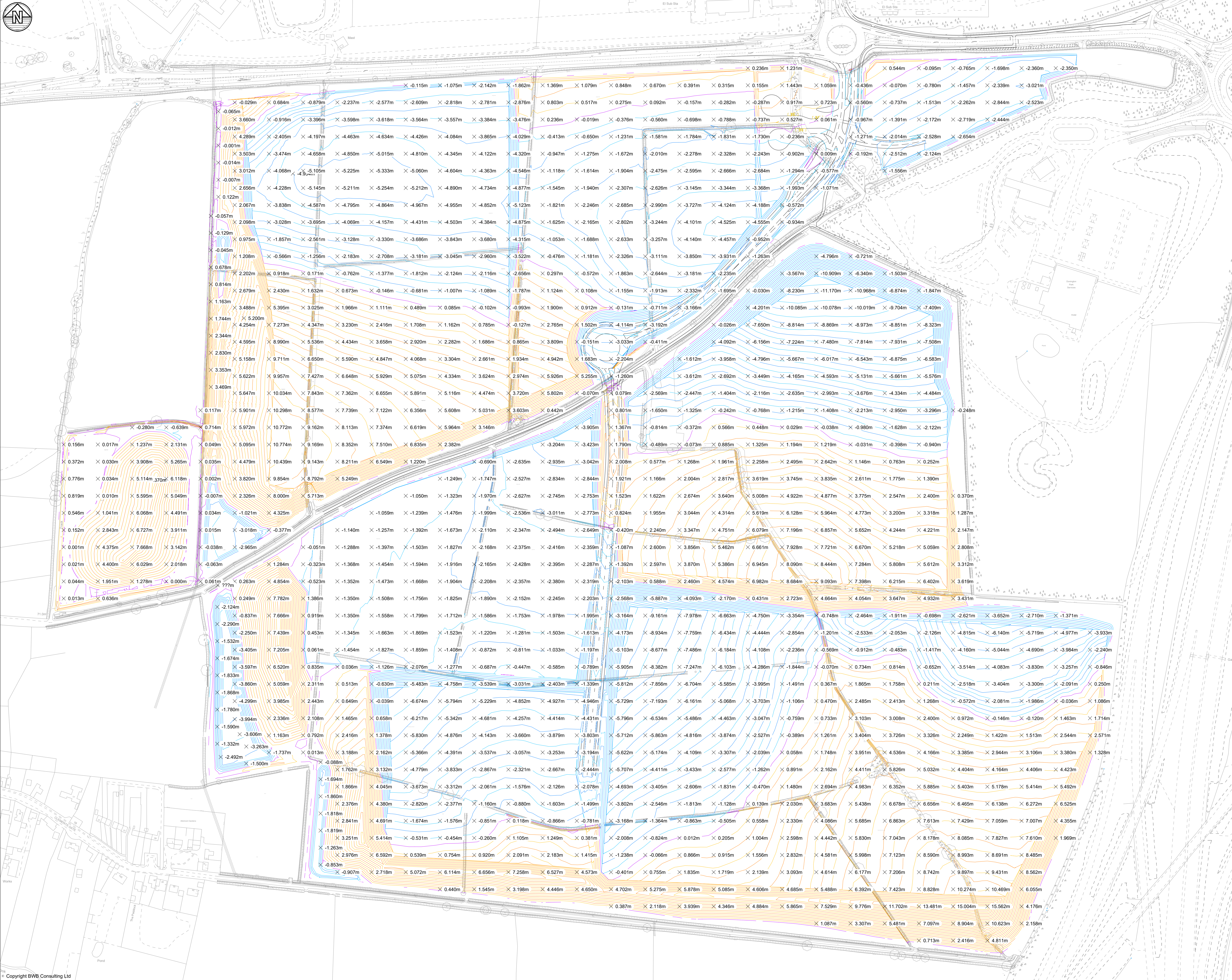
148749

Drawing Number

148749 - 9003

Revision

-



- Notes**
1. Do not scale this drawing. All dimensions must be checked / verified on site. If in doubt ask.
 2. This drawing is to be read in conjunction with all relevant engineers and specialists drawings and specifications.
 3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

- Legend**
- 0.1m Contour - Cut
 - 0.5m Contour - Cut
 - Balanced Contour
 - 0.1m Contour - Fill
 - 0.5m Contour - Fill

Isopachyte contours show cut/fill between existing ground level and proposed finished ground level. Topsoil strip, removal of existing pavements and proposed construction thickness to formation level are not accounted for on the drawing.

P01	26.07.24	For information	KB	SRH
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

Birmingham

0121 233 3322

Leeds

0113 233 8000

London

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Client
SEGRO

Project Title
EAST MIDLANDS GATEWAY 2

Drawing Title
ISOPACHYTES

Drawn:	K.Bassi	Reviewed:	S.Hilditch
BWB Ref:	220500	Date:	26.07.24
Drawing Status	Scale@A1:	1:2000	

FOR INFORMATION				Status	Rev
Project - Originator - Zone - Level - Type - Role - Number	EMG2-BWB-GEN-ZZ-DR-CH-0620			S2	P01

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- Do not scale this drawing. All dimensions must be checked / verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant engineers and specialists drawings and specifications.
 - All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.

Legend

0.100	0.1m Contour - Finished Ground Level
0.500	0.5m Contour - Finished Ground Level
X 0.034m	Ground Levels
X (Ex)0.534m	Existing Ground Levels
1:2.0 / 4.0%	Ground Slope

P01	26.07.24	For information	KB	SRH
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions



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Project Title

EAST MIDLANDS GATEWAY 2

Drawing Title

FINISHED LEVELS

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BWB Ref:	220500	Date:	26.07.24
Drawing Status		Scale@A1:	1:2000

FOR INFORMATION

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EMG2-BWB-GEN-ZZ-DR-CH-0600	S2	P01

APPENDIX B

STRUCTURAL SOILS LTD FACTUAL REPORT – MAY 2023



EMG PHASE 2

Factual Report on Ground Investigation

Report No: 765514-01 (02)

Client: SEGRO Properties Limited

MAY 2023

DOCUMENT ISSUE RECORD

Project No.:	765514
Report No.:	765514-1 (02)
Project Name:	EMG Phase 2
Document Title	Factual Report on Ground Investigation
Client:	SEGRO Properties Limited
Engineer:	Fairhurst
Status:	Final
Author	 pp. T Clifford BEng FGS
Approved by	 R Law BSc (Hons)
Report Issue Date	05/05/2023

ISSUE RECORD

Issue	Date	Description	Prepared by
00	24/02/23	Draft Factual Report	TC
01	23/03/23	Draft Factual Report	RL
02	03/05/23	Final Factual Report	AJ

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E: ask@soils.co.uk www.soils.co.uk			
Bristol <input type="checkbox"/>	The Old School, Stillhouse Lane, Bedminster, BRISTOL, BS3 4EB Tel: 0117 947 1000	Castleford <input checked="" type="checkbox"/>	The Potteries, Pottery Street, CASTLEFORD, West Yorkshire, WF10 1NJ Tel: 01977 552 255
Glasgow <input type="checkbox"/>	65 Sussex Street, GLASGOW, G41 1DX Tel: 0141 418 0471	Hemel Hempstead <input type="checkbox"/>	18 Frogmore Road, HEMEL HEMPSTEAD, Hertfordshire, HP3 9RT Tel: 01442 416 660
Tonbridge <input type="checkbox"/>	Anerley Court, Halfmoon Lane, Hildenborough, TONBRIDGE, TN11 9HU Tel: 01732 833 111	Wigan <input type="checkbox"/>	Unit 1 Forton Road, Wheatlea Industrial Estate, WIGAN, WN3 6YD Tel: 01942 825 052
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1 INTRODUCTION

This investigation was carried out by Structural Soils Ltd (SSL) on the instructions of Fairhurst (the Engineer) on behalf of SEGRO Properties Limited (the Client) at Diseworth, Leicestershire. The purpose of the work was to obtain geotechnical and geoenvironmental information for a proposed commercial warehousing development and associated infrastructure.

The scope of the investigation comprised cable percussion and rotary boreholes, trial pits, in situ testing, laboratory testing and the preparation of this report. The report contains a description of the site and the works carried out, the exploratory hole logs, in-situ and laboratory testing results.

The ground investigation has been carried out in accordance with the contract specification (48749/SPEC/01), and the general requirements of BS 5930:2015+A1:2020, BS 10175:2011+A2:2017, BS EN 1997-2:2007, BS EN ISO 22475-1:2021 and other relevant standards as identified below or elsewhere in this report.

This report presents the factual information obtained by the ground investigation, including records of all field and laboratory work carried out. All information given in this report is based on the ground conditions encountered during the site work, and on the results of the field and laboratory work performed during the investigation.

Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks. There may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes.

This report was prepared by SSL for the sole and exclusive use of SEGRO Properties Limited in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded. No liability will be accepted after a period of 6 years from the date of the report.

2 SITE DESCRIPTION

2.1 Location and Topography

The site is located on Hyam's Lane in Leicestershire, between the village of Diseworth, to the west, and Junction 23A of the M1 motorway, to the east, (see Site Location Map in Appendix A). The British National Grid Reference of the site is SK 459 249.

The site is undeveloped agricultural (arable) land, to the north and south of Hyam's Lane. There are a total of twenty fields; field boundaries of predominantly hedgerows and trees, with gated field entrances.

The site is an irregular shape, approximately 1100 m by 950 m, covering an area of about 100 hectares (see Exploratory Hole Location Plan in Appendix A).

The site is bounded to the east by the M1, East Midlands Airport to the north, agricultural land to the south and west, low rise residential development adjacent to the southwestern corner. Hyam's Lane traverses the approximate centre of the site in a southwest/north east direction.

The site slopes gradually downward from north to south, between approximately 91.5 m and 55.0 m above Ordnance Datum (AOD).

2.2 Geology

Information on the geology of the site was obtained from the following sources published by the British Geological Survey (BGS):

- BGS map (Loughborough, sheet 141, scale 1:50,000, published 2001).
- The BGS GeoIndex (onshore) digital geology map, which utilises the most up to date names for geological units. (<https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>)
- The BGS Lexicon of Named Rock Units, which provides typical descriptions for most geological units (<https://webapps.bgs.ac.uk/lexicon/>).

The site is shown to be underlain by the following descending sequence of strata:

TABLE 1 : SUMMARY OF EXPECTED SITE GEOLOGY	
Geological Unit Name	Description
SUPERFICIAL DEPOSITS	
Glaciofluvial Deposits	Sand and Gravel
Oadby Member	Diamicton, grey, weathering brown, characterised by Cretaceous and Jurassic rock fragments; subordinate lenses of sand and gravel, clay and silt. Clay, brown to grey, and silty clay, with chalk and flint fragments
Head Deposits	Clay, silt, sand and gravel. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period.

Superficial deposits are only shown across the northern portion of the site, predominantly north of Hyam's Lane, but also locally in the fields immediately south of Hyam's Lane.

The map indicates the head deposits to be situated near and along existing waterbodies to the west with a spur entering the approximate centre of the site and also to the south east of the site.

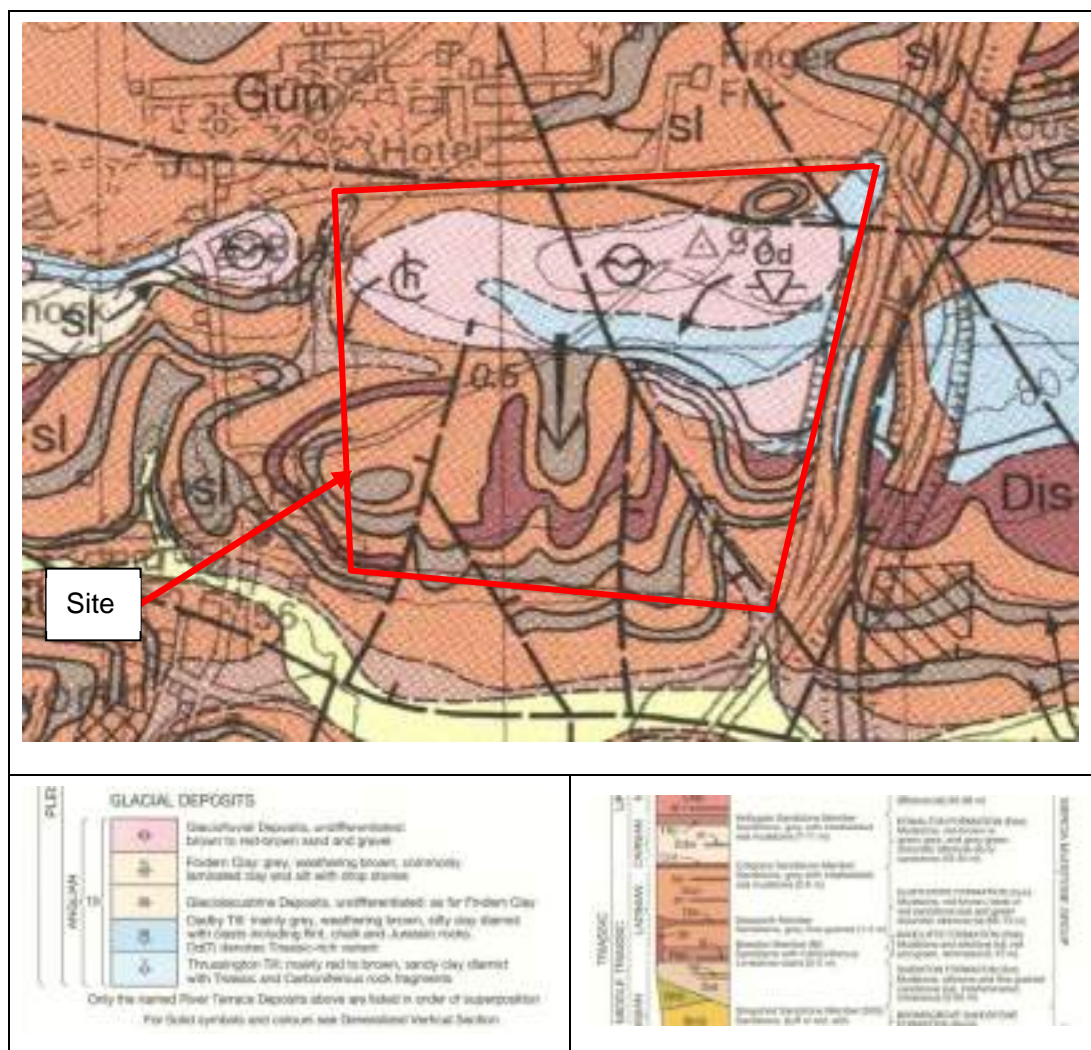
SOLID GEOLOGY

Mercia Mudstone Group including:

Gunthorpe Member (Sidmouth Mudstone Formation)	Mudstone, red-brown, with subordinate dolomitic siltstone and fine-grained sandstone, greenish grey, common gypsum veins and nodules.
Diseworth Sandstone (Gunthorpe Member)	Pale greenish grey siltstone and fine-grained sandstone.

Note: Information obtained from BGS digital records © NERC.

The BGS online maps portal provides access to scans of almost all maps produced by the BGS since 1932. An extract of the most recent available scanned map for the site is included below:



Note: Above images contain British Geological Survey materials © NERC [2023].

The geological maps show several faults crossing the site and details the dip of the solid geology to be 0.5 degrees to the south in the centre of the site.

3 FIELDWORK

3.1 General

The ground investigation was carried out by SSL between 5 September and 6 October 2022. The investigation was supervised by an engineer from SSL. The scope of works and positions were selected by Fairhurst, set out by SSL and adjusted where necessary to take account of buried or overhead services, or other restrictions. The exploratory hole and in-situ test locations are shown on the Exploratory Hole Location Plan presented in Appendix A.

Prior to the commencement of any exploratory hole a ground penetrating radar (GPR) survey was undertaken around each field boundary - the survey was carried out by RSK SafeGround. All locations were additionally checked for buried services using a cable avoidance tool (CAT) and signal generator ('genny').

Inspection pits were hand dug, to nominally 1.20 m, at all borehole locations.

On completion of the works, a survey of the exploratory hole locations was undertaken using specialist Global Positioning System (GPS) equipment. The coordinates of each exploratory hole were measured relative to British National Grid, and the level relative to Ordnance Datum. These are shown on the exploratory hole logs contained in Appendix B which have been printed with a reduced level column.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 2 :SCOPE OF INTRUSIVE WORKS			
Quantity	Exploratory Hole Type	Maximum depth (m)	Hole / Test Numbers
28	Cable Percussion Boreholes.	17.21	CP01 to CP28
25	Cable Percussion Boreholes extended by Rotary Drilling.	33.35	BH01 to BH09 & BH11 to BH26
2	Dynamic Sample Boreholes extended by Rotary Drilling.	31.10	BH10 & BH27
39	Machine Dug Trial Pits.	4.00	TP01 to TP37, TP33A & TP39

The exploratory hole logs are presented in Appendix B. These provide information including the equipment and methods used, samples taken, tests carried out, water observations and descriptions of the strata encountered. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, together with other explanatory information.

The holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015+A1:2020 (which incorporates the requirements of BS EN ISO 14688-1:2018, 14688-2:2018 and 14689:2018), and CIRIA Report C570 *Engineering in Mercia mudstone*. Detailed descriptions, together with relevant comments, are given on the logs.

Due to the nature of Mercia mudstone determining fracture indices accurately is difficult for some of the core recovered using rotary drilling methods. Where a fracture index could be logged this has been recorded and is presented in Appendix B.

Standard penetration tests (SPT) in the boreholes were carried out in accordance with BS EN ISO 22476-3:2005+A1:2011 and are presented on the logs in Appendix B as uncorrected 'N' values. The SPT hammer energy ratio certificates, a test result summary sheet, and 'N' value vs. depth plot are presented in Appendix C.

Hand shear vane tests were carried out in trial pits on suitable material, and suitably sized lumps recovered during excavation; results are presented on the relevant logs in Appendix B.

Photographs of the rotary drilled core and trial pits are presented in Appendix B, alongside the exploratory hole logs.

3.3 In-Situ Testing

The in-situ tests are listed in the following table. The test methods used are detailed on the test result sheets included in Appendix C, unless otherwise noted.

TABLE 3 : SCOPE OF IN-SITU TESTING		
Quantity	In-situ Test	Remarks
8	Soakaway Infiltration Tests in trial pits.	Single fill for all tests with minimal drainage after 3 hours.
2	Variable Head Permeability Tests.	Falling head tests carried out in BH11 and CP06.

The Soakaway tests were undertaken in trial pits in general accordance with recommended practice given in BRE Digest 365. Three fillings of the pits were not undertaken due to slow infiltration rates.

The Variable Head Permeability tests were undertaken in general accordance with BS EN ISO 22282-1:2012 and -2:2012.

3.4 Backfill and Instrumentation

On completion 50 mm diameter gas/groundwater monitoring wells were installed in selected exploratory holes, the design having been decided by Fairhurst. The installation details are shown on the exploratory hole logs and on a summarised in Appendix B.

Each installation was protected with a raised cover and marked with a wooden stake, nominally 1.20 m high.

The remaining boreholes were backfilled with bentonite pellets and arisings. The trial pits were backfilled with arisings, compacted in layers by the excavator bucket.

3.5 Monitoring and Post Fieldwork Environmental Sampling

Gas and groundwater monitoring was undertaken during three post fieldwork monitoring visits, between 13 October and 14 November 2022; the results are tabulated in Appendix F.

An infrared gas meter was used to measure concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, GGGG whilst hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. An integral flow meter was used to measure borehole flow rates (initial and steady state) in litres per hour (l/hr). In addition the atmospheric pressure before and during monitoring, together with the weather conditions were recorded.

Boreholes were also screened with a Photo-Ionisation Detector (PID) to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter. The results are recorded as ppm (isobutylene equivalent).

It should be noted that groundwater levels, gas concentrations and gas flows usually vary due to seasonal, atmospheric and/or other effects and may at times differ to those measured during the investigation.

During the second round of monitoring, groundwater samples were retrieved using low-flow purging and sampling equipment. Samples were also recovered from two surface water locations, referenced SW2 and SW3. Sampling scheduled at SW1 was not possible.

Groundwater levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) were monitored during low-flow purging, with parameter stabilisation indicating that purging is complete and sampling can begin. *In situ* water quality measurements undertaken during the purging process and are provided in Appendix F.

Groundwater samples were sent to Envirolab Limited, an MCERTS and UKAS accredited testing laboratory.

3.6 Well Decommissioning

The following monitoring wells were required to be retained after completion of the final monitoring round; CP01, CP27, BH09, BH12, BH18 and BH24.

All other monitoring wells were decommissioned, which comprised the removal of the protective steel cover, concrete surround, and the top 1 m of pipe. The locations were reinstated with topsoil.

4 LABORATORY TESTING

Samples for potential geotechnical testing were returned to one of the Company's UKAS accredited laboratories, and those for potential geoenvironmental testing were sent to a sister company Envirolab Limited, a MCERTS and UKAS accredited testing laboratory. Laboratory tests were scheduled by the Engineer. Tests carried out in accordance with MCERTS/UKAS standards where noted on the results sheets.

4.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing was generally carried out in accordance with the relevant parts of:

- BS EN ISO 17892:2014-2022 Parts 1-12, *Geotechnical investigation and testing – Laboratory testing of soil*,
- BS 1377:2016-2022 Parts 1-3, *Methods of test for soils for civil engineering purposes* (for test methods not covered in BS EN ISO 17892),
- BS 1377:1990 Parts 1-8, *Methods of test for soils for civil engineering purposes* (for tests carried out to older legacy methods),
- International Society for Rock Mechanics and Rock Engineering (ISRM) *Suggested Methods for Rock Characterization, Testing and Monitoring*, 1974-2006, 2007-2014 and 2015+
- BRE Special Digest 1:2005 (SD1) *Concrete in aggressive ground. Assessing the aggressive chemical environment*. Third edition.

The number of tests of each type completed are summarised below. The results are reported in tabular and/or graphical form and included as Appendix D of this report. The test methods used are detailed on the report sheets, and where non-standard procedures have been undertaken, this is recorded on the report sheet.

TABLE 4 :SUMMARY OF GEOTECHNICAL TESTING		
Test	Number of tests	Remarks
Classification Tests		
Water content.	151	
Liquid and plastic (Atterberg) limits.	151	
Particle size distribution by sieving.	53	
Particle size distribution by sedimentation.	48	
Particle Density	28	

TABLE 4 :SUMMARY OF GEOTECHNICAL TESTING		
Test	Number of tests	Remarks
Performance Tests		
Light Compaction (2.5kg)	42	
Heavy Compaction (4.5kg)	13	
MCV	14	
Compressibility, Permeability and Durability Tests		
One-dimensional consolidation test.	20	
Shear Strength - Total Stress		
Single stage unconsolidated undrained triaxial compression tests without the measurement of pore pressure.	16	
Hand vane tests using undisturbed soil samples.	23	
Rock Tests		
Rock moisture content	13	
Uniaxial compressive strength tests.	24	
Uniaxial compressive strength tests – with radial and axial deformation	1	
Point Load Index.	152	The natural ('as received') water content of the samples was determined. Note, each test contains a pair of specimens.
Slake Durability	1	
Chemical Tests: Soil*		
Water soluble sulphate, total (acid soluble) sulphate and total sulphur contents and pH value.	41	Test(s) carried out to method approved in BRE Special Digest 1.
Organic content.	27	

4.2 Geoenvironmental Laboratory Testing

The geoenvironmental testing carried out is summarised in the following table. The results are included as Appendix E of this report, and include details of the test method.

TABLE 5 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING		
Description	Notes	Numbers of tests
SOIL		
SSL HHB Human Assessment suite.	Comprises arsenic, cadmium, chromium (total), lead, mercury, selenium, copper, nickel, zinc, speciated polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPHCWG (speciated)), soluble organic matter, soluble sulphate and pH.	83
Volatile organic compounds (VOC).		12
Semi volatile organic compounds (SVOC)		12
Asbestos presence screen.	Identification was undertaken if/where asbestos fibres were detected.	2
WATER		
Suite F (Schedule 1.20.3) Groundwater Screening suite.	Comprises arsenic, boron, cadmium, chromium (total), copper, lead, mercury, selenium, nickel, zinc, speciated polyaromatic hydrocarbons (PAH – USEPA 16), total petroleum hydrocarbons, sulphate (SO ₄), phenol, cyanide and pH.	17
Chromium (Hexavalent)		17
Chromium (Trivalent)		17
Speciated PCB-WHO12		17
OCP+OPP Combined Pesticide Suite (incl. Atrazine + Simazine)		17

5 REFERENCES

- 5.1 BS 5930:2015+A1:2020 *Code of practice for ground investigations*
- 5.2 BS 10175:2011+A2:2017 *Investigation of potentially contaminated sites: Code of practice*
- 5.3 BS EN 1997-2:2007 *Eurocode 7 — Geotechnical design. Part 2: Ground investigation and testing*
- 5.4 BS EN ISO 22475-1:2021 *Geotechnical investigation and testing - Sampling methods and groundwater measurements. Part 1: Technical principles for the sampling of soil, rock and groundwater*
- 5.5 British Geological Survey sheet 141 scale 1:50,000, published 2001
- 5.6 British Geological Survey, Geoindex (onshore) digital map viewer. Available online: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>
- 5.7 British Geological Survey, Lexicon of Named Rock Units. Available online: <https://webapps.bgs.ac.uk/lexicon/>
- 5.8 British Geological Survey, BGS maps portal. Available online: <https://www.bgs.ac.uk/information-hub/bgs-maps-portal/>
- 5.9 BS EN ISO 14688-1:2018 *Geotechnical investigation and testing – Identification and classification of soil. Part 1: Identification and description*
- 5.10 BS EN ISO 14688-2:2018 *Geotechnical investigation and testing – Identification and classification of soil. Part 2: Principles for a classification*
- 5.11 BS EN ISO 14689:2018 *Geotechnical investigation and testing – Identification, description and classification of rock*
- 5.12 BS EN ISO 22476-3:2005+A1:2011 *Geotechnical investigation and testing – Field testing. Part 3: Standard penetration test*
- 5.13 BS 1377-9:1990 *Methods for test for soils for civil engineering purposes. Part 9: In-situ tests*, incorporating Amendments Nos. 1 and 2
- 5.14 BRE Digest 365 (2016) *Soakaway Design*

- 5.15** BS EN ISO 22282-1:2012 *Geotechnical investigation and testing — Geohydraulic testing. Part 1: General rules*
- 5.16** BS EN ISO 22282-2:2012 *Geotechnical investigation and testing — Geohydraulic testing. Part 2: Water permeability tests in a borehole using open systems*
- 5.17** BS EN ISO 17892:2014-2022 *Geotechnical investigation and testing – Laboratory testing of soil. Parts 1-12*
- 5.18** BS 1377:2016-2022 *Methods of test for soils for civil engineering purposes. Parts 1-3.* (for test methods not covered by BS EN ISO 17892 series of standards)
- 5.19** BS 1377:1990 *Methods of test for soils for civil engineering purposes. Parts 1-8.* (for tests carried out using legacy methods)
- 5.20** International Society for Rock Mechanics and Rock Engineering (ISRM, 1974-2006, 2007-2014, and 2015+), *The ISRM Suggested Methods for Rock Characterization, Testing and Monitoring*
- 5.21** BRE Special Digest 1:2005 (SD1), *Concrete in aggressive ground. Assessing the aggressive chemical environment. Third Edition*
- 5.22** BS EN IS/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*

APPENDIX A - PLANS AND DRAWINGS

- (i) Site Location Plan
- (ii) Exploratory Hole Location Plan



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CLIENT

SEGRO Properties Limited

PROJECT

EMG Phase 2

TITLE

SITE LOCATION MAP

00	12.01.2023	FIRST ISSUE	MW	TC	AJ
REV.	DATE	DESCRIPTION	BY	CHD.	APR.
DIMENSION		SCALE	DRAWING STATUS		
m		1:25,000	-		

JOB NO

765514

GRID REF

SK 460 244

SCALE BAR

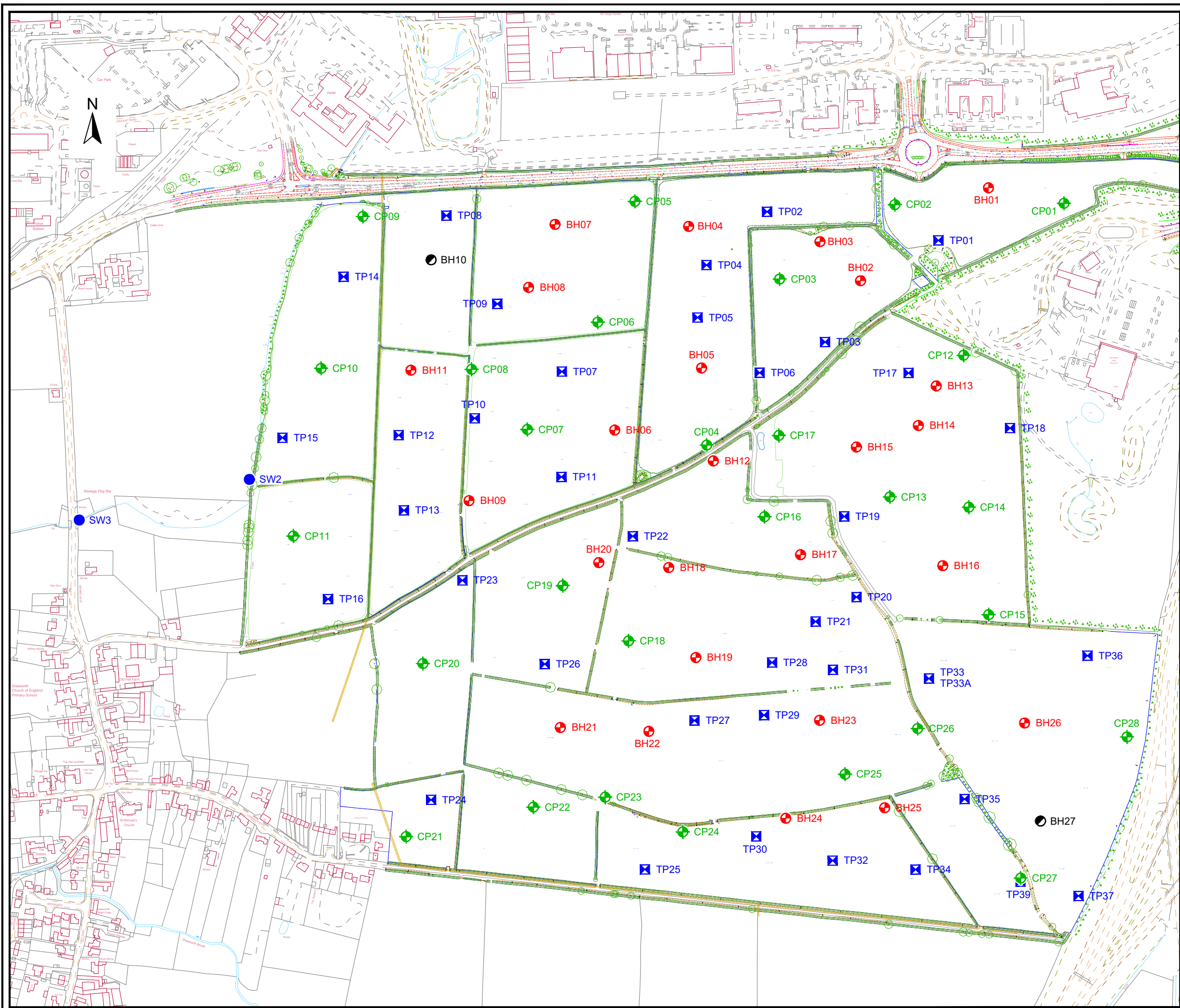


ORIGIN SIZE

A4

FIGURE


1



LEGEND

- TRIAL PIT LOCATION
- CABLE PERCUSSION BOREHOLE EXTENDED BY ROTARY DRILLING LOCATION
- CABLE PERCUSSION BOREHOLE LOCATION
- DYNAMIC SAMPLE BOREHOLE EXTENDED BY ROTARY DRILLING
- SURFACE WATER SAMPLING LOCATION


00	18.01.2023	-	MW	TC	AJ
REV	DATE	DESCRIPTION	BY	CHD	APR
DIMENSION		SCALE	ORIGIN SIZE		
m		1:5,000	A3		

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Castleford
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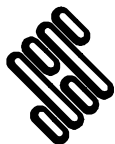
Tel: 01977 552255
ask@soils.co.uk
www.soils.co.uk

CLIENT	
SEGRO Properties Limited	
PROJECT	
EMG Phase 2	
TITLE	
EXPLORATORY HOLE LOCATION PLAN	
JOB NO	FIGURE
765514	2
DRAWING STATUS	REV
-	00

SCALE BAR


APPENDIX B - EXPLORATORY HOLE RECORDS

- (i) Key to Exploratory Hole Logs
- (ii) Borehole Logs
- (iii) Trial Pit Logs
- (iv) Standpipe Summary Table



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes:

B	=	Bulk disturbed sample.
C	=	Core sample.
D	=	Small disturbed sample.
DSPT	=	Small disturbed sample originating from SPT test.
ES	=	Soil sample for environmental testing.
EW	=	Water sample for environmental testing.
LB	=	Large bulk disturbed sample.
NR	=	
U	=	Undisturbed driven tube sample - Number of blows indicated. % recovery reported.
UT	=	Undisturbed thin wall sample.
UT-NR	=	Undisturbed thin wall sample - no recovery
W	=	Water sample.

Undisturbed sample detail codes:

U ₍₁₀₀₎	=	100mm diameter undisturbed sample.
U _(UT100)	=	Undisturbed sample UT100.

IN-SITU TESTING

SPT _(c)	=	Standard Penetration Test using a solid 60 degree cone.
SPT	=	Standard Penetration Test using split spoon sampler. _(NR) indicates 'No Sample Recovery'.
	=	* denotes extrapolated N value. NP denotes 'No Penetration'.
V	=	Field Vane Test. Peak value (c_u) & Residual value (c_r), given as shear strength in kPa.

ROTARY DRILLING INFORMATION

W	=	Water flush returns (%)
TCR	=	Total core recovery (%)
SCR	=	Solid core recovery (%)
RQD	=	Rock quality designations (%)
If	=	Fracture spacing (mm).

Where variable the minimum - mode - maximum spacing may be quoted.

In fracture column (i) denotes discontinuity is infilled (refer to Fracture Table for details).
'NI' denotes non-intact core. 'NA' denotes not applicable.

- All lengths used to determine rock core mechanical properties taken along the centre line of the core.
- Obvious induced fractures have been ignored.
- The assessment of solid core is based on lengths that show a full diameter and not necessarily a full circumference.

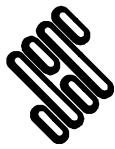
Where used Rotary flushing medium abbreviations:

A+M	=	Air+Mist
Air+Mist	=	

AZCL	=	Assessed zone of core loss.
------	---	-----------------------------

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1:2018, 14688-2:2018, 14689:2018, and BS5930:2015+A1:2020.
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. Fracture spacings (If) quoted in the Description of Strata for specific strata or specific fracture sets are also quoted in mm, e.g. (25/80/230) referring to (Min/Avg/Max).
4. The data on any sheet within the report showing the AGS icon is available in the AGS format.



KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

WATER COLUMN SYMBOLS

	First water strike, second water strike etc.
	Standing water level following first strike, standing water level following second strike etc.
	Seepage.
	Standing water level recorded at documented date.

MATERIAL GRAPHIC LEGENDS

	BOULDERS & COBBLES		BOULDERS		CLAY		Clayey GRAVEL		Clayey gravelly SAND
	Gravelly clayey SAND		Clayey SAND		Clayey sandy GRAVEL with COBBLES		Sandy clayey GRAVEL with COBBLES		GRAVEL with COBBLES
	Gravelly CLAY		Gravelly silty CLAY		Silty gravelly CLAY		Gravelly SAND		Gravelly SAND with COBBLES
	Gravelly SILT		MADE GROUND		Mudstone		Possible MADE GROUND		SAND & GRAVEL
	Sandstone		Sandy CLAY		Sandy silty CLAY		Sandy CLAY with COBBLES		Sandy GRAVEL
	Sandy GRAVEL with COBBLES		Sandy GRAVEL with COBBLES and BOULDERS		Gravelly sandy CLAY		Sandy gravelly CLAY		Sandy gravelly silty CLAY
	Sandy gravelly CLAY with BOULDERS		Sandy gravelly CLAY with COBBLES		Sandy gravelly CLAY with COBBLES and BOULDERS		Sandy gravelly clayey SILT		Sandy gravelly SILT
	Sandy gravelly SILT with COBBLES		Siltstone		Sandy clayey SILT		Sandy SILT		Topsoil
	Clayey SILT		Silty CLAY		Gravelly silty SAND		Silty SAND		Silty sandy GRAVEL



INSTRUMENTATION SYMBOLS

	Backfill		Bentonite cement grout		Bentonite cement pellets		Bentonite seal		Concrete
	Gravel filter		Upstanding cover						
	Plain pipe		Slotted pipe						



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8		Sheet: 1 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.10-0.10 0.10-0.30	1 2	D B									TOPSOIL		(0.35)	
0.50-0.50 0.50-0.50 0.50-1.00	101 3 4	ES D B	1xT+1xJ+1xV								Very stiff reddish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)	88.87	0.35	
1.00-1.00 1.10-1.10 1.20-1.50	102 5 6	ES D UT _(UT100)	1xT+1xJ+1xV 150 blows 83% recovery											
1.50-1.70 1.70-1.70	7 8	D D												
2.00-2.45 2.00-2.45 2.00-2.45	10 11	SPT DSPT B	N=36										(4.10)	
2.70	12	D												
3.00-3.45 3.00-3.45 3.00-3.45	15 16	SPT DSPT B	N=51											
3.70	17	D												
4.00-4.45 4.00-4.45	19	SPT DSPT	N=66								4.00-4.45m: becoming orangish in colour	84.77	4.45	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
05/09/22	16:31	2.50	2.50	200	Dry	3.80	4.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.45m using Geobor-S with air mist flush. 5. Unable to determine ground water strikes due to flush method.		
06/09/22	07:52	2.50	2.50	200	Dry						
06/09/22	12:00	4.45	3.00	200	-						
13/09/22	09:00	4.45	None	200							
13/09/22	17:00	11.25	4.45	146	10.90						
14/09/22	08:30	11.25	4.45	146	5.90						
14/09/22	17:00	30.75	4.45	146	28.15						
									All dimensions in metres	Scale: 1:25	
Method Used: Inspection pit + Cable Percussion + Rotary Cored			Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601			Drilled By: Jonny Hutt + Sam Carter		Logged By: JAlton + RStan		Checked By: 	





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8		Sheet: 2 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.45-5.25 (0:03)	20	C		88	78	44		Air+Mist (Brown)			Extremely weak to weak reddish brown MUDSTONE. Occasional pockets of grey siltstone. GRADE III. Bedding fractures: Closely spaced, 0-10°, undulating, rough, with abundant black staining. Rare reddish brown silty clay infill. (MERCIA MUDSTONE GROUP) ... 4.45-4.55m: AZCL.(stratum copied from 4.45m from previous sheet) ... 4.55-4.64m: Grey siltstone. ... 4.73-4.75m: 4°, undulating, rough, abundant black staining, clay infill >3mm. ... 4.85-4.87m: 9° undulating rough occasional black stained infill silty clay >3mm. ... 4.96-4.99m: 8°, undulating, rough, >3mm infill clay. Grey siltstone. ... 5.10-5.11m: 3°, undulating, rough, >3mm infill clay. ... 5.15-5.17m: Grey siltstone. ... 5.22-5.25m: Grey siltstone with 5°, undulating, rough fracture, >3mm clay infill.	83.97	5.25	
5.00-5.12				88	78	44								
5.25-6.75 (0:06)														
5.80-5.90	21	D		85	21	0		Air+Mist (Brown)			Extremely weak locally thinly laminated reddish brown MUDSTONE. Occasional to frequent pockets of grey siltstone. Bedding fractures: Closely spaced, 0-10°, undulating, rough and smooth, with occasional to abundant black staining. Fracture set 2: Widely spaced, 60-80°, undulating, rough, occasional black staining. (MERCIA MUDSTONE GROUP) ... 5.25-5.43m: AZCL. ... 5.43-5.47m: Fine to medium grained broken sandstone. ... 5.49-5.68m: Thinly laminated grey siltstone. ... 5.68-5.80m: Abundant black stained incipient fractures. ... 6.01-6.02m, 6.46-6.48m and 6.60-6.75m: Grey siltstone. 8.25-8.35m: Drilling disturbed. ... 8.62-8.70m: 8° undulating rough occasional black staining with clay infill >3mm. Description on next sheet	82.32	6.90	
6.75-8.25 (0:04)														
6.75-7.20														
7.40-7.60	22	C		90	83	83		Air+Mist (Brown)						
8.25-9.75 (0:04)														
8.83-8.94				100	93	93								

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
									6. Installed with 50mm standpipe on completion (response zone 1.00m to 7.00m). 7. SPT hammers AR3104-2022 (E_i = 64.00%) , AR3830-2021 (E_i = 67.00%) used.			
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601			All dimensions in metres			
Drilled By: Jonny Hutt + Sam Carter						Logged By: JAlton + RStan			Scale: 1:25			
									Checked By:  			



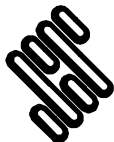
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8		Sheet: 3 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.75-11.25 (0:05)				100	93	93		Air+Mist (Brown)			... 8.77-8.79m: 5° undulating rough abundant black stained >3mm silty clay. Extremely weak to weak reddish brown MUDSTONE. GRADE III. Bedding fractures: Widely spaced, 0 to 10°, undulating, rough with occasional black staining. Rare clay infill. Occasional to abundant yellow staining. (MERCIA MUDSTONE GROUP) (stratum copied from 6.90m from previous sheet) ... 9.26-9.29m: Weak grey siltstone. ... 9.75-9.82m: Drilling disturbed.	78.74	10.48	
10.28-10.48	24	C		95	95	95		Air+Mist (Brown)			Extremely weak thinly to thickly laminated reddish brown MUDSTONE. Locally interbedded with weak grey siltstone. Bedding fractures: Closely to widely spaced, subhorizontal, planar, undulating, occasional to abundant black staining. (MERCIA MUDSTONE GROUP) ... 11.04-11.14m: Interbedded with grey siltstone. ... 11.25-11.36m: Gravelly silty clay.			
10.70-10.96	25	C									... 11.71-11.73m: Grey siltstone. ... 11.80-11.96m: Extremely weak thickly laminated mudstone, interbedded with weak siltstone. ... 11.91-11.96m: Clay			
11.25-12.75 (0:06) 11.38-11.70	26	C		100	65	54		Air+Mist (Brown)			... 12.28-12.46m: Siltstone and mudstone. ... 12.55-12.75m: NI.			
12.75-14.25 (0:07)				100	95	89		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8		Sheet: 4 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
14.25-15.75 (0:04)	27	C		100	95	89		Air+Mist (Brown)			Extremely weak thinly to thickly laminated reddish brown MUDSTONE. Locally interbedded with weak grey siltstone. Bedding fractures: Closely to widely spaced, subhorizontal, planar, undulating, occasional to abundant black staining. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 10.48m from previous sheet</i>) ... 13.50-13.53m: Grey siltstone. ... 13.53-13.55m: Sandstone. ... 13.55-13.57m: 4°, clay infill. ... 13.57m: Thinly interlaminated with siltstone (<10mm) ... 13.86-13.89m: 11°, incipient, planar, rough, abundant black staining. ... 13.86-13.90m: Siltstone. ... 13.89-14.07m: 88°, incipient, planar, rough, occasional black staining. ... 14.25-14.45m: AZCL. ... 14.71-14.72m: 5°, clay infill, undulating, rough. ... 14.87-14.89m: 9°, clay infill, undulating, rough. ... 15.38-15.46m: Clay. ... 15.38-15.59m: Locally interbedded with reddish clay. ... 15.59-15.64m and 15.70-15.75m: NI. ... 15.75-15.83m: Grey siltstone. ... 15.83-15.85m: Planar, rough, clay infill. ... 15.90-16.08m: 82°, undulating, rough, abundant black staining, incipient. ... 15.95-16.23: Clay and mudstone. ... 16.35-16.37: Clay and mudstone. ... 16.38-16.59m: 63°, undulating, rough, occasional black staining, incipient. ... 16.45-16.79: Clay and mudstone. ... 16.51-16.65m: 66° undulating rough occasional black staining incipient. ... 16.89-16.95m: Clay, siltstone and mudstone. ... 17.05-17.16m: 83° undulating rough abundant black staining incipient.	(6.77)		
14.26-14.50														
14.56-14.69	28	C		87	75	75		Air+Mist (Brown)						
15.38-15.47	29	D												
15.75-17.25 (0:04)														
16.23-16.34	30	C		100	86	71		Air+Mist (Brown)						
17.25-18.75 (0:05)				100	82	73		Air+Mist (Brown)				71.97	17.25	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601			All dimensions in metres	
Drilled By: Jonny Hutt + Sam Carter						Logged By: JAlton + RStan			Scale: 1:25	Checked By:





STRUCTURAL SOILS

BOREHOLE LOG

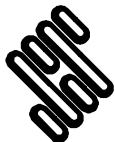
Contract: EMG Phase 2			Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8		Sheet: 5 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
17.93-18.18	31	C		100	82	73		Air+Mist (Brown)			Description on next sheet 17.51-17.57m: NI. Bare black staining on discontinuity surfaces. 17.70-17.73m: NI. Thinly laminated. 17.73-17.93m: 77° undulating rough abundant black staining and occasional yellow staining. Extremely weak to weak reddish brown MUDSTONE. Occasional beds of grey siltstone (<90mm). GRADE II. (MERCIA MUDSTONE GROUP) 17.25-17.31m: NI. (stratum copied from 17.25m from previous sheet) 18.18-18.22m: 15° planar rough occasional black staining. 18.20-18.30m: 60° undulating rough abundant black staining. 18.30-18.36m: Clay. 18.42-18.43m: 7° planar rough occasional black staining. 18.42-18.50m: 70° undulating rough abundant black staining. 18.50-18.56m: 35° planar rough abundant black staining. 18.67-18.73m: Grey siltstone. 18.78-19.05m: 87° planar rough rare black staining incipient. 19.50-19.52m: Grey siltstone. 19.62-19.67m: Grey siltstone. 19.96-20.03m: 52° undulating rough occasional black staining incipient. Extremely weak to very weak reddish brown mottled grey MUDSTONE. Occasional to frequent closely spaced beds of grey siltstone. (MERCIA MUDSTONE GROUP) 20.25-20.51m: Medium strong grey siltstone. 20.80-21.05m: Thinly and thickly cross laminate. 21.37-21.80m: Medium strong grey siltstone. 21.64-21.70m: 23°, undulating, rough, >3mm clay infill, occasional black staining. 21.80-21.92m: Medium strong grey siltstone.	(3.00)		
18.75-20.25 (0:04)														
19.50-19.82	32	C		100	100	100		Air+Mist (Brown)						
20.25-21.75 (0:06)											68.97	20.25	(3.23)	
21.14-21.37	33	C		100	100	100		Air+Mist (Brown)						
21.37-21.58	34	C												
21.75-23.25 (0:05)				100	100	100		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									All dimensions in metres		Scale: 1:25		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:	Dando 3000 Mark 2 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	JAlton + RStan	Checked By: 	







Contract: EMG Phase 2		Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 8 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 9 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 10 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 11 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 12 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 13 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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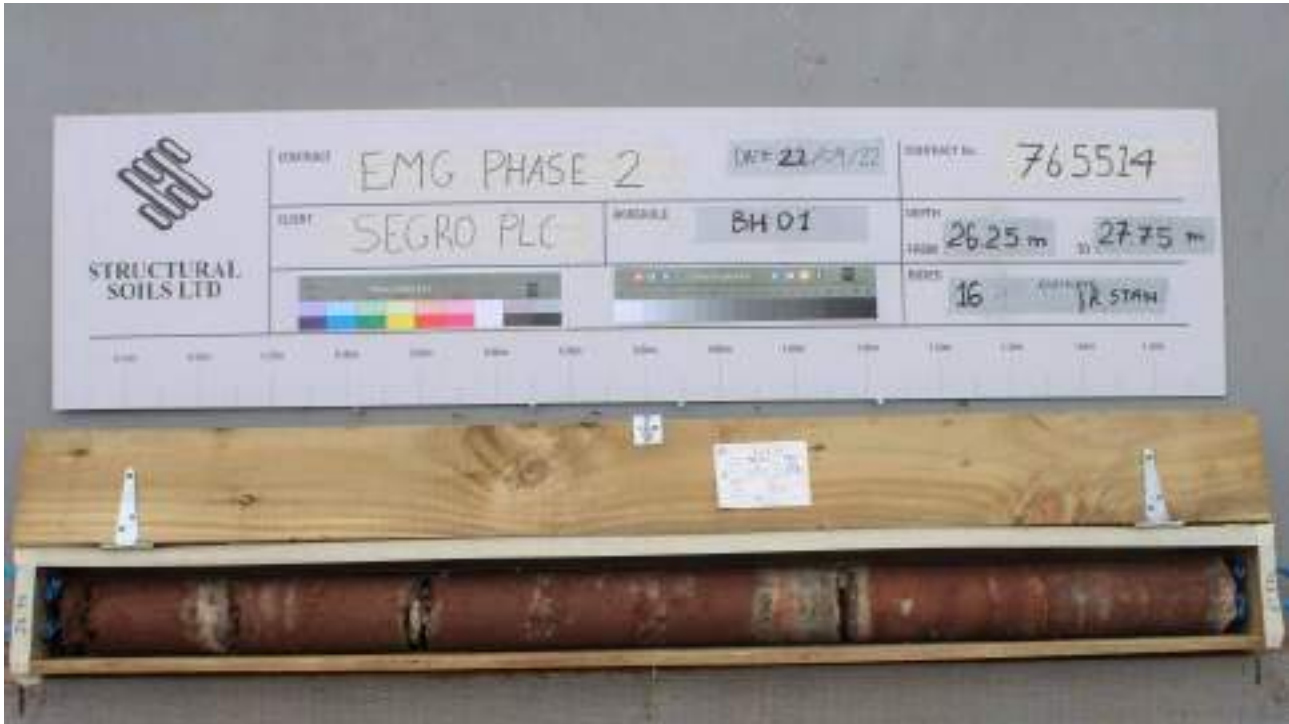
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 14 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 15 of 16



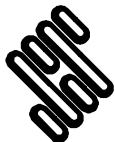
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH01
Contract Ref: 765514	Start: 05.09.22 End: 13.09.22	Ground Level (m AOD): 89.22	National Grid Co-ordinate: E:446551.3 N:325384.8	Sheet: 16 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4		Sheet: 1 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.30	1	D									TOPSOIL	90.35	0.20	
0.30-0.50	2	B									Firm to stiff brown slightly sandy gravelly CLAY. Low boulder content. Gravel is angular to rounded coarse of sandstone and mudstone.	90.15	0.40	
0.50	101	ES	1xT+1xJ+1xV								Very stiff dark brown slightly sandy slightly gravelly silty CLAY. Sand is fine and coarse. Gravel is subangular to subrounded of quartzite, sandstone, and siltstone.		(0.60)	
0.70	3	D										89.55	1.00	
0.70-1.00	4	B									Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular to subangular fine and medium of extremely weak mudstone lithorelicts. (MERCIA MUDSTONE GROUP) 1.00-4.15m: frequent thin laminae (<2mm) of siltstone.			
1.00	102	ES	1xT+1xJ+1xV											
1.20	5	D												
1.20-1.55	6	UT _(UT100)	150 blows 100% recovery											
1.55-1.65	7	D												
1.70	8	D												
2.00-2.45														
2.00-2.45	10	SPT	N=35											
2.00-2.45	11	DSPT B												
2.70	12	D												
3.00-3.36		SPT	6,8/16,19,15 for 60mm											
3.00-3.36	14	DSPT												
3.00-3.36	15	B												
3.70-3.70	16	D												
4.00-5.00 (0:07)												86.55	4.00	
4.00-4.42		SPT	3,8/12,14,14,10 for 40mm	45	0	0		Air-Mist (Brown)			AZCL. (MERCIA MUDSTONE GROUP)		(0.55)	AZCL
4.00-4.42	18	DSPT												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks																
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)																	
06/09/22	17:49	3.40	3.00	200	Dry	3.00	3.40	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.00m using Geobor-S with air mist flush. 5. Unable to determine ground water strikes due to flush method.																
07/09/22	08:06	3.40	3.00	200	Dry	3.40	4.00	00:45																	
07/09/22	11:00	4.00	2.00	200	-																				
16/09/22	08:50	8.00	4.00	146	6.40																				
16/09/22	15:25	21.50	4.00	146	20.60																				
15/09/22	14:00	4.00	None	200	3.50																				
15/09/22	17:00	8.00	4.00	146	7.65																				
16/09/23	07:30	8.00	4.00	146	6.40																				
Method Used:			Inspection pit + Cable Percussion + Rotary Cored			Plant Used:		Dando 3000 + Cornacchio GEO 601		Drilled By:		Jonny Hutt + Sam Carter		Logged By:		D'Neylon + JAlton		Checked By:							





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4		Sheet: 2 of 12

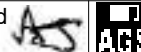
Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.90 5.00-6.50 (0:07)	19	D	N=41	45	0	0		Air+Mist (Brown)			Firm to stiff reddish brown slightly sandy gravelly CLAY with rare pockets (up to 20mm) of silt. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine and medium of mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP) ... 5.00-5.30m: AZCL.	86.00	4.55	
				80	0	0		Air+Mist (Brown)					(2.70)	
6.30 6.50-7.25 (0:03) 6.50-6.95	20	D						Air+Mist (Brown)			... 6.50-6.90m: AZCL.			
		SPT		47	0	0		Air+Mist (Brown)						
7.20 7.25-8.00 (0:03)	21	D						Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, tight, black staining on surfaces. (MERCIA MUDSTONE GROUP)	83.30	7.25	
7.55-7.70	22	C		109	109	85		Air+Mist (Brown)					(1.00)	
8.00-9.50 (0:00)								Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE thinly interbedded with very weak greenish grey siltstone and beds of thinly laminated reddish brown clay. GRADE II. (MERCIA MUDSTONE GROUP) ... 8.40-8.42m: Greenish grey siltstone.	82.30	8.25	
8.90	23	D		97	15	0		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
16/09/23	12:30	21.50	4.00	146	20.60					
									6. Installed with 50mm standpipe on completion (response zone 4.00m to 20.00m). 7. SPT hammers AR3104-2022 (E_r = 64.00%) , AR3830-2021 (E_r = 67.00%) used.	
									All dimensions in metres	Scale: 1:25
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 + Comacchio GEO 601		Drilled By: Jonny Hutt + Sam Carter		Logged By: D'Neylon + JAlton	Checked By: 	



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instru- mentation	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.03		EW						Air+Mist (Brown)			<p>... 8.75-9.15m: NI, recovered as angular to subrounded fine to medium gravel of mudstone.</p> <p>Extremely weak reddish brown MUDSTONE thinly interbedded with very weak greenish grey siltstone and beds of thinly laminated reddish brown clay. GRADE II.</p> <p>(MERCIA MUDSTONE GROUP)</p> <p><i>(stratum copied from 8.25m from previous sheet)</i></p> <p>... 9.50-10.10m: No siltstone laminae / beds.</p> <p>... 10.10-10.15m: NI.</p> <p>... 10.15m: Siltstone.</p>	80.25	10.30	
9.50-11.00 (0:00)														
10.60	24	D						Air+Mist (Brown)			<p>Extremely weak reddish brown MUDSTONE. GRADE II.</p> <p>Fractures: Very closely spaced, randomly orientated, smooth, planar, undulating, black staining on surfaces.</p> <p>(MERCIA MUDSTONE GROUP)</p> <p>... 10.30-10.80m: Frequent fine to coarse gravel size pockets of greenish grey siltstone.</p> <p>... 10.30-13.55m: Heavily fissured with sample breaking easily when handled.</p> <p>... 11.20-12.00m: Occasional fine to medium gravel size pockets of greenish grey siltstone.</p>			
11.00-12.50 (0:00)														
11.50-11.75	25	C						Air+Mist (Brown)			<p>... 12.25-12.30m: Reddish brown very sandy CLAY.</p>			
12.50-14.00 (0:00)														



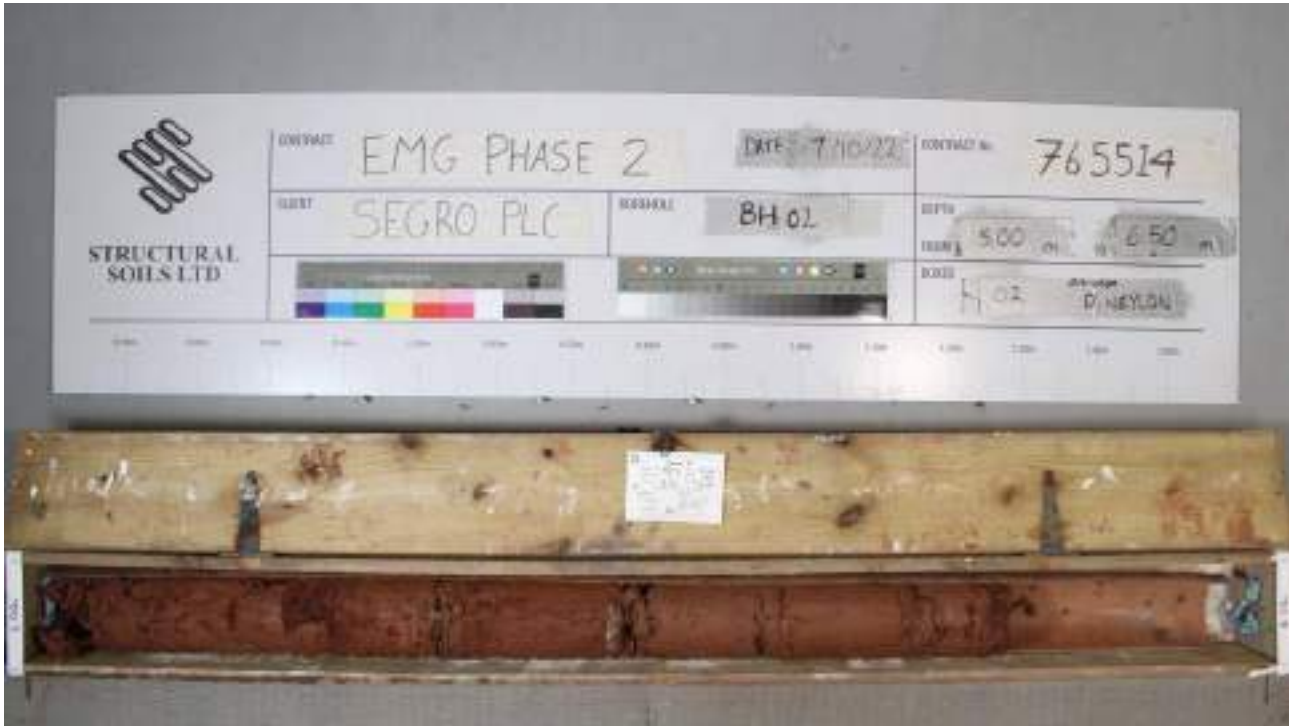
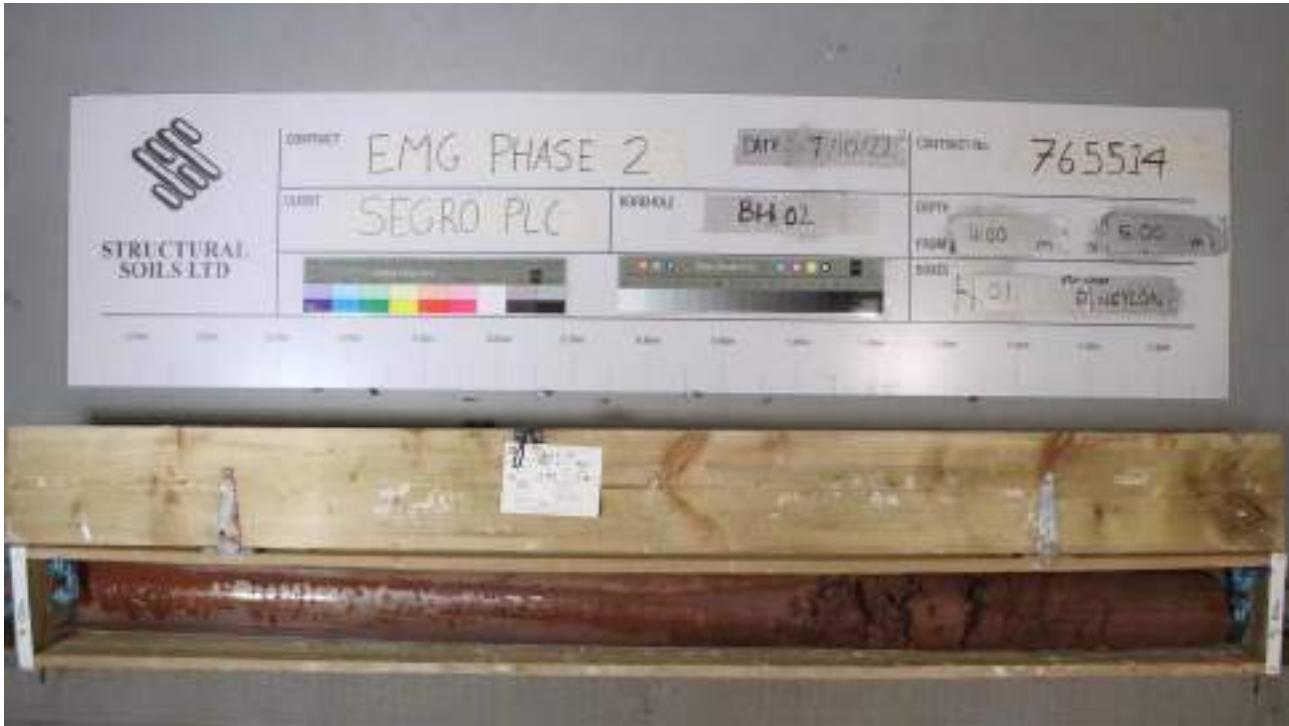
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks										
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)											
									All dimensions in metres										
Method Used:		Inspection pit + Cable Percussion + Rotary Corod.		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:		Jonny Hutt + Sam Carter		Logged By:		D'Neylon + JAlton		Checked By:			

ACS





Contract: EMG Phase 2			Client: SEGRO	Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 6 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 7 of 12



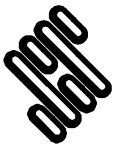
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 10 of 12



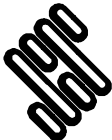
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH02
Contract Ref: 765514	Start: 06.09.22 End: 15.09.22	Ground Level (m AOD): 90.55	National Grid Co-ordinate: E:446375.9 N:325257.4		Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0		Sheet: 1 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.40-0.40	1	D	1xT+1xJ+1xV								TOPSOIL	88.86	(0.35)	
0.40-0.60	2	B									Stiff reddish brown mottled grey slightly sandy gravelly CLAY. Low cobble content. Gravel is subangular fine to coarse of mudstone and siltstone lithorelicts. Cobbles are angular tabular of siltstone. Frequent beds (up to 300mm) of silt / siltstone. (MERCIA MUDSTONE GROUP)		0.35	
0.50-0.50	101	ES												
0.60-1.00	4	B												
0.70-0.70	3	D												
1.00-1.00	5	D	N=25 1xT+1xJ+1xV								... Below 2.00m: Very stiff.			
1.00-1.45	102	SPT												
1.00-1.00	7	ES												
1.00-1.45	8	DSPT												
1.00-1.45		B												
1.70-1.70	9	D												
2.00-2.45		SPT	N=31											
2.00-2.45	11	DSPT												
2.00-2.45	12	B												
2.00-2.45														
2.70-2.70	13	D	6,8/8,15,15,12 for 60mm											
3.00-3.44		SPT												
3.00-3.44	15	DSPT												
3.00-3.45	16	B												
3.70-3.70	17	D												
4.00-5.00 (0:00)														
4.00-4.39		SPT	4,5/12,15,17,6 for 15mm											
4.00-4.39	19	DSPT												
				45	0	0		Air+Mist (Brown)				84.71	4.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
07/09/22	17:10	4.00	3.00	200	-	3.50	4.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.00m using Geobor-S with air mist flush. 5. Unable to determine ground water strikes due to flush method.	
20/09/22	13:15	4.00	None	200	3.80					
20/09/22	16:30	14.00	4.00	146	13.60					
21/09/22	08:00	14.00	4.00	146	-					
21/09/22	13:00	20.00	4.00	146	-					
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602			All dimensions in metres	
Drilled By: Jonny Hutt + Sam Carter						Logged By: JAlton + RStan			Scale: 1:25	
Checked By: AS						Checked By: AS			AGS	





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.80	20	D		45	0	0		Air+Mist (Brown)			Firm to stiff thinly to thickly laminated locally very thinly bedded reddish brown silty CLAY with occasional to frequent angular to subangular fine to medium gravel sized lithorelicts of mudstone. Occasional laminae (5 to 10mm) of extremely weak siltstone. GRADE III. (MERCIA MUDSTONE GROUP)			
5.00-6.50 (0:00)														
5.80	21	D		100	10	0		Air+Mist (Brown)						
6.50-8.00 (0:00)											. . . 5.72-5.76m: Very weak light grey siltstone. . . . 6.22-6.28m: Very weak light grey siltstone. . . . 6.39-6.46m: Very weak thinly to thickly laminated reddish brown mudstone. Bedding fractures are extremely closely spaced, 0°, undulating, smooth, <1mm soft clay on surfaces. . . . 6.59-6.71m: Extremely weak thickly to very thinly bedded light greenish grey siltstone. Bedding fractures are extremely closely spaced, undulating, smooth, with a little clay smear and occasional black specks on surfaces. Extremely weak locally very weak very thinly bedded reddish brown MUDSTONE. GRADE II. Discontinuities: Extremely closely to closely spaced, randomly orientated, undulating, smooth, black stained, locally clean. Rare thin clay smears on surfaces. (MERCIA MUDSTONE GROUP) . . . 7.01-7.04m: Siltstone recovered as gravelly clay. . . . 7.11-7.28m: 75° to 80° undulating rough discontinuity with 1m clay on surfaces. . . . 7.30-7.33m: Moderately weak light greenish grey siltstone. . . . 7.33-7.60m: 80° to 90° undulating rough clean discontinuity.			
7.10	22	D		93	6	0		Air+Mist (Brown)						
8.00-9.50 (0:00)							NI 30 90							
8.50	23	D		97	11	0		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks								
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)									
									6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR3104-2022 (E_r = 64.00%) used.								
									All dimensions in metres		Scale: 1:25						
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 Mark 2 + Comacchio Geo 602		Drilled By:		Jonny Hutt + Sam Carter				Logged By:		JAlton + RStan	



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO			Borehole: BH03		
Contract Ref: 765514		Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21		National Grid Co-ordinate: E:446320.3 N:325311.0			Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.43 9.50-11.00 (0:00)	24	C		97	11	0	NI 30 90	Air+Mist (Brown)			... 7.78-7.86m: Band of extremely weak light greenish grey siltstone. ... 8.05-8.30m: 80°-90° undulating smooth black stained discontinuity. ... 8.87-8.93m: 60°-70° undulating smooth black stained discontinuity. Extremely weak locally very weak very thinly bedded reddish brown MUDSTONE. GRADE II. Discontinuities: Extremely closely to closely spaced, randomly orientated, undulating, smooth, black stained, locally clean. Rare thin clay smears on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 6.80m from previous sheet) ... 9.40-9.50m: 40°-50° undulating smooth black stained discontinuity. Very weak very thinly to medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to medium spaced, 0° to 5°, undulating, smooth, locally black stained, occasionally clean. (MERCIA MUDSTONE GROUP) ... 10.10-10.27m: 75° undulating smooth, locally black stained, discontinuity, with a little clay smear on surfaces. ... 10.46-10.49m: Very weak light greenish grey siltstone. ... 10.47-10.56m: 65° undulating smooth black stained discontinuity. ... 10.56-10.73m: Randomly orientated extremely closely to very closely spaced undulating smooth clean discontinuities. ... 10.70-11.00m: Occasional 3-5mm diameter light grey reduction spots. ... 10.80-10.86m: 40° undulating smooth discontinuity with a little clay smear on surfaces. ... 10.90-10.95m: Randomly orientated extremely closely to very closely spaced undulating smooth clean locally black stained discontinuities. Extremely weak thinly laminated to thinly bedded reddish brown MUDSTONE. GRADE II.	79.11	10.10	
9.94	25	C		100	53	38	NI 70 300	Air+Mist (Brown)					(1.10)	
11.00-12.50 (0:00)												78.01	11.20	
11.45	26	C		97	68	51	NI 20 120	Air+Mist (Brown)					(2.18)	
12.50-14.00 (0:00)				97	37	8		Air+Mist (Brown)				75.83	13.38	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
									</		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO			Borehole: BH03			
Contract Ref: 765514		Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21		National Grid Co-ordinate: E:446320.3 N:325311.0			Sheet: 4 of 12	

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
13.83	27	C		97	37	8		Air+Mist (Brown)			Bedding fractures: Extremely closely to closely spaced, 0° to 5°, undulating, smooth, locally rough, clean, locally black stained (MERCIA MUDSTONE GROUP)			
14.00-15.50 (0:00)											... 11.40-11.43m: Very weak light greenish grey siltstone.			
											... 11.45-12.00m: Occasional fine to medium gravel size light greenish grey siltstone inclusions.			
											... 11.79-11.80m: 2 no laminae (<2mm) of extremely weak light greenish grey siltstone.			
											... 12.25-12.30m: Weak light greenish grey siltstone.			
											... 12.30-12.50m: Rare light greenish grey reduction spots.			
											... 12.30-13.20m: Extremely closely to very closely spaced randomly orientated undulating smooth, locally rough, clean, locally black stained discontinuities.		(3.49)	
15.17	28	C					NI 20 120	Air+Mist (Brown)			... 13.00m: Thin lamination (<5mm) of extremely weak siltstone.			
15.50-17.00 (0:00)											... 13.15-13.18m: Moderately weak greenish grey siltstone.			
											Extremely weak to very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II.			
											Bedding fractures: Very closely to closely spaced, 0° to 15°, undulating, smooth, black stained, with occasional black specks.			
16.00	29	C		97	40	27		Air+Mist (Brown)			(MERCIA MUDSTONE GROUP) (stratum copied from 13.38m from previous sheet)			
											... 13.50-13.58m: Extremely weak light greenish grey clayey siltstone.			
											... 13.58-13.61m: Very weak light greenish grey siltstone.			
											... 13.71-13.74m: Very weak light greenish grey siltstone.	72.34	16.87	
17.00-18.50 (0:00)							NI 50 230	Air+Mist (Brown)			... 14.48-14.68m: 85° to 90° undulating rough discontinuity with frequent black specks.			
											... 14.62-14.67m: 45° undulating rough discontinuity with frequent black specks.			
											... 14.80-14.81m: Extremely weak light greenish grey siltstone.			
											... 14.97-15.00m: Weak light greenish grey siltstone.			
											... 15.01-15.21m: Frequent thin laminae (<5mm) of extremely weak to very weak siltstone.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.28	30	C		100	63	37		Air+Mist (Brown)			. . . 15.34-15.50m: 80° to 90° undulating smooth black stained discontinuity. . . . 15.50-15.55m: 70° undulating smooth clean discontinuity locally black stained. . . . 15.66-15.72m: Drilling disturbed. . . . 15.73-15.82m: 50° undulating smooth discontinuity with 1mm clay infill. . . . 15.82-15.86m: Very weak light greenish grey siltstone. . . . 16.13-16.52m: Extremely to very closely spaced, randomly orientated black stained, locally clean, discontinuities. Occasional black specks on surfaces. . . . 16.32-16.48m: 80° to 90° undulating smooth black stained discontinuity. . . . 16.48-16.51m: (Soft to firm) light greenish grey gravelly silt. . . . 16.60-16.82m: Thinly and thickly laminated.	(3.13)		
18.50-20.00 (0:00)							NI 50 230							
19.30	31	C		100	49	28		Air+Mist (Brown)			. . . 17.04-17.06m: Weak light greenish grey siltstone. . . . 17.10-17.38m: 2 no parallel 80° very closely spaced undulating smooth black stained discontinuity. . . . 17.37-17.41m: Extremely closely spaced thick laminae (<10mm) of very weak light greenish grey siltstone. . . . 17.53-17.58m: Very weak light greenish grey siltstone. . . . 17.88-18.00m: 85° undulating smooth clean discontinuity. Very weak locally extremely weak thickly laminated to thinly bedded locally medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Extremely closely to medium spaced, 0° to 10°, planar and undulating, smooth, clean, locally with black specks on surfaces. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 16.87m from previous sheet)</i> . . . 18.21-18.25m: Weak light greenish grey siltstone. . . . 18350-18.95m: Extremely closely to very closely spaced, randomly orientated clean discontinuity with occasional black specks on surfaces.	69.21	20.00	

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07 | Log COMPOSITE LOG - A4P | 765514 EAST MIDLAND AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk | 08/05/23 - 20:44 | A4J |

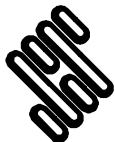


Contract: EMG Phase 2			Client: SEGRO			Borehole: BH03			
Contract Ref: 765514		Start: 07.09.22	End: 21.09.22	Ground Level (m AOD): 89.21		National Grid Co-ordinate: E:446320.3 N:325311.0		Sheet: 6 of 12	

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
											. . . 18.55-18.92m: 85° to 90° undulating smooth discontinuity with occasional black specks. . . . 18.98-19.20m: 85° to 90° undulating smooth discontinuity with occasional black specks. . . . 19.07-19.12m: 30° undulating smooth discontinuity with occasional black specks. . . . 19.20-19.27m: 60° undulating smooth discontinuity with occasional black specks. . . . 19.60-20.00m: 85° undulating rough discontinuity with frequent black specks. . . . 19.83-19.88m: Very weak light greenish grey siltstone. Borehole terminated at 20.00m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602			Drilled By: Jonny Hutt + Sam Carter	
						Logged By: JAlton + RStan			Checked By:	
									All dimensions in metres Scale: 1:25	





Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 7 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 10 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH03
Contract Ref: 765514	Start: 07.09.22 End: 21.09.22	Ground Level (m AOD): 89.21	National Grid Co-ordinate: E:446320.3 N:325311.0	Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 1 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.10 0.10 0.10-0.30	1 101 2	D ES B	1xT+1xJ+1xV								MADE GROUND: Firm to stiff dark brown sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone. Cobbles (up to 100mm) are subangular to well rounded. (TOPSOIL)		(1.20)	
0.80 0.80-1.10 0.90 0.90-1.20 1.00 1.00 1.20-1.65 1.20-1.65	3 4 5 6 102 103 7	D B D B ES ES SPT B	1xT+1xJ+1xV 1xT+1xJ+1xV N=17								Firm to stiff dark brown sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone. Cobbles are subangular to well rounded of mudstone (up to 100mm). ... 1.20-1.60m: With frequently thin laminae (<3mm) of extremely weak light bluish grey mudstone / siltstone.	86.01	1.20	
1.70 2.00 2.00-2.45	8 104 9	D ES UT (UT100)	1xT+1xJ+1xV 53 blows 100% recovery								Firm reddish brown slightly sandy slightly gravelly CLAY with occasional pockets (up to 20mm) of grey silty sand. Sand is fine of mudstone. Gravel is angular to subangular fine of extremely weak mudstone lithorelicts.	85.61	(0.40)	
2.70 3.00-3.45 3.00 3.00-3.45 3.00-3.45	10 105 12 13	D SPT ES DSPT B	N=36 1xT+1xJ+1xV								(MERCIA MUDSTONE GROUP) Very stiff reddish brown slightly gravelly slightly sandy CLAY with frequent pockets (up to 20mm) and lenses (up to 25mm) of grey silty sand. Sand is fine and coarse of mudstone. Gravel is angular to subangular fine to medium of extremely weak to very weak mudstone lithorelicts with relic laminae observed on some of the fragments. Destructured mudstone Grade IVa. (GUNTORPE MEMBER) (MERCIA MUDSTONE GROUP)	84.51	2.70	
3.70 4.00-4.38 4.00-4.38 4.00-4.45	14 16 17	D SPT DSPT B	4,8/10,18,22 for 75mm										(2.30)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
09/09/22	14:00	1.20	None	200	Dry	4.70	5.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 5.00m using Geobor-S with air mist flush. 5. Unable to determine ground water strikes due to flush method.							
12/09/22	08:00	1.20	None	200	-											
12/09/22	13:40	5.31	3.00	200	Dry											
22/09/22	08:30	5.00	5.00	200	4.90											
22/09/22	16:30	30.30	5.00	146	20.90											
23/09/22	08:15	30.30	5.00	146	10.90											
23/09/22	16:30	30.30	None	146	-											
Method Used:			Inspection pit + Cable Percussion + Rotary Cored			Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter	Logged By:	DNeylon + JAlton	Checked By:	AS	ACS





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 2 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	18	D	15,10/18,21,11 for 35mm									82.21	5.00	
5.00-6.30 (0:05)											Very stiff reddish brown slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular of extremely weak mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) ... 5.10-5.30m: trace thick laminae and very closely spaced thin laminae (<4mm) of extremely weak mudstone. ... 5.30-5.38m: weak greenish grey thickly laminated fine grained sandstone. ... 6.20-6.25m and 6.35-6.40m: extremely weak thickly laminated mudstone ... below 6.40m: frequent fine to coarse gravel size pockets of greenish grey sandy silt. ... 6.70-6.80m: Weak greenish thickly laminated grey sandstone. ... Extremely weak greenish grey SILTSTONE. Fractures: Very closely spaced, incipient, smooth, planar, with black specks on surfaces. Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, smooth, planar, tight, with black staining on surfaces. (MERCIA MUDSTONE GROUP) ... 8.70-9.10m: fine to medium gravel size pockets and lenses (<10mm) of greenish grey siltstone.	(1.90)		
5.00-5.31	20	DSPT		69	3	0		Air+Mist (Brown)						
6.00	29	D												
6.30-7.80 (0:03)												80.31	6.90	
7.05-7.23	30	C		93	60	56		Air+Mist (Brown)				(2.60)		
7.80-9.30 (0:05)														
8.80	31	D		100	48	27		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									6. Installed with dual 50mm standpipes on completion (response zone 1.00m to 2.50m and 6.00m to 30.00m). 7. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.				
									All dimensions in metres		Scale: 1:25		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter	Logged By:	DNeylon + JAlton		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 3 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.30-10.80 (0:06)				100	48	27					... 9.10-9.15m: gravelly clay.	77.71	9.50	
											Extremely weak reddish brown MUDSTONE, recovered as clayey sandy angular to subangular fine to coarse gravel. GRADE III. (MERCIA MUDSTONE GROUP)	77.26	9.95	
10.15-10.20	32	C		100	60	33		Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE with pockets (up to 6mm) and lenses (up to 20mm) of greenish grey siltstone with black specks. GRADE II. Bedding fractures: Closely spaced, smooth, undulating, with frequent black staining along surfaces. Fracture set 2: Very closely spaced, randomly orientated, smooth, undulating, with black staining on fracture surfaces. (MERCIA MUDSTONE GROUP) ... below 10.80m: no randomly orientated fractures. ... 11.15-11.20m: extremely weak greenish grey siltstone. ... 11.20-11.40m: very sandy clayey gravel. Gravel is angular to subangular mudstone.		(1.45)	
10.80-12.30 (0:06)														
11.40-11.70	33	C		97	62	51		Air+Mist (Brown)				75.81	11.40	
11.90		EW									Extremely weak reddish brown MUDSTONE with pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Medium to widely spaced, rough, undulating, infilled with greenish grey sandy gravel of angular to subangular fine to medium siltstone (likely to laminae of siltstone). Fracture set 2: Closely spaced, randomly orientated, undulating, smooth, with occasional black staining along surfaces. (MERCIA MUDSTONE GROUP)			
12.30-13.80 (0:04)														
12.90-13.00	34	C		97	78	45		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter	Logged By:	DNeylon + JAlton	Checked By:	AS	AGS





Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 4 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
13.80-15.30 (0:04)	35	C		97	78	45					Extremely weak reddish brown MUDSTONE with pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Medium to widely spaced, rough, undulating, infilled with greenish grey sandy gravel of angular to subangular fine to medium siltstone (likely to laminae of siltstone). Fracture set 2: Closely spaced, randomly orientated, undulating, smooth, with occasional black staining along surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 11.40m from previous sheet)		(5.80)	
14.05-14.32														
15.30-16.80 (0:05)	36	C		100	73	63		Air+Mist (Brown)			... 15.40-15.60m: extremely weak grey siltstone. ... below 16.30m: with closely spaced thin and thick laminae of siltstone.	70.01	17.20	
16.60-16.80														
16.80-18.30 (0:05)				93	53	29		Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Very closely spaced, randomly orientated, rough, undulating fractures with dark brown staining along surfaces. (MERCIA MUDSTONE GROUP) 17.50-17.60m and 17.80-17.85m, clayey gravel of angular to subangular fine to		(1.10)	
				100	21	0		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	DNeylon + JAlton		Checked By:	AS	AGS



Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
									All dimensions in metres			Scale: 1:25									
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:		Jonny Hutt + Sam Carter		Logged By:		D'Neylon + JAlton		Checked By:					

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 6 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
22.80-24.30 (0:05)				100	75	51					Extremely weak reddish brown MUDSTONE very closely interbedded with greenish grey SILTSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, rough, undulating, with frequent black staining along surfaces and frequent black specks on siltstone. (MERCIA MUDSTONE GROUP) (stratum copied from 22.20m from previous sheet)	64.61	22.60	
											Very stiff reddish brown sandy slightly gravelly CLAY. Sand is fine of mudstone. Gravel is angular to subangular fine and medium of mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) . . . 23.05-23.15m: band of thickly cross laminated greenish grey sandstone.	63.61	23.60	
24.00-24.10	41	C		100	40	23		Air+Mist (Brown)			. . . below 23.15m: randomly interspersed with stiff greenish grey sandy silt.	62.86	24.35	
24.30-25.80 (0:06)											Extremely weak reddish brown MUDSTONE. Bedding fractures: Closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP) . . . below 24.25m: becoming slightly interbedded/interspersed with greenish grey siltstone.	62.41	24.80	
25.25-25.60	42	C		100	100	97		Air+Mist (Brown)			Extremely weak greenish grey SILTSTONE. With incipient fractures observed on breaking up the core - yellow staining along surfaces. (MERCIA MUDSTONE GROUP)			
25.80-27.30 (0:06)											Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) . . . 24.80-25.30m: frequent fine gravel size pockets of extremely weak greenish grey siltstone.			
25.90-26.25	43	C									. . . below 25.90m: Bedding fractures: Widely to medium spaced, smooth, planar, with black staining along fracture surfaces.			
26.60-28.30	44	C		100	60	49		Air+Mist (Brown)			. . . 26.50-26.85m: fractures: very closely spaced, randomly orientated, rough, undulating, and closely interbedded with extremely weak greenish grey siltstone.			
													(4.30)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			





Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 8 of 16



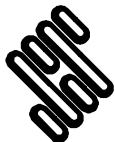
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 9 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 10 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 11 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 12 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 13 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9		Sheet: 14 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 15 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH04
Contract Ref: 765514	Start: 09.09.22 End: 26.09.22	Ground Level (m AOD): 87.21	National Grid Co-ordinate: E:446140.2 N:325331.9	Sheet: 16 of 16




Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 1 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10-0.10 0.10-0.10 0.10-0.30	1 101 2	D ES B	1xT+1xJ+1xV							TOPSOIL	86.87	(0.30) 0.30	
0.50-0.50 0.50-0.80 0.60-0.60	3 4 102	D B ES	1xT+1xJ+1xV							Soft to firm orangish brown sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone. Cobbles are subangular to well rounded of mudstone (up to 90mm).			
0.90-0.90 0.90-1.20 1.00-1.00	5 6 103	D B ES	1xT+1xJ+1xV										
1.20-1.65 1.20-1.65 1.20-1.65	8 8 9	SPT DSPT B	N=17									(2.50)	
1.70-1.70	10	D											
2.00-2.45	11	UT _(UT100)	80 blows 78% recovery										
2.45-2.55	12	D											
2.70-2.70	13	D									84.37	2.80	
3.00-3.30 3.00-3.30 3.00-3.30	15 15 16	SPT DSPT B	3,4/20,30 for 75mm							NO RECOVERY - driller notes, obstruction, possibly sandstone or mudstone boulder.			
4.00-4.26		SPT(c)	11,14/26,24 for 45mm									(1.70)	
											82.67	4.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
08/09/22	17:11	9.50	9.00	200	Dry	3.20	3.70	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 9.20m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water												
12/09/22	10:00	9.50	9.00	200	-	9.00	9.50	01:00													
12/09/22	17:00	13.00	13.00	150	-																
13/09/22	08:00	13.00	13.00	150	5.80																
13/09/22	15:00	25.00	15.00	150	-																
										All dimensions in metres		Scale: 1:25									
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Luke Bamford		Logged By:		JAlton + RSenior		Checked By:		AS			



STRUCTURAL SOILS

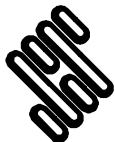
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.70-4.70	18	D								Dense multicolored (grey, orange, brown, white, and red) very clayey fine to coarse SAND AND subangular to well rounded fine to coarse GRAVEL of various lithologies. Medium cobble content of tabular subrounded to well rounded mudstone (up to 180mm).		(1.00)	
5.00-5.45	104	SPT(c)	N=39										
5.00-5.00	20	ES	1xT+1xJ+1xV										
5.00-5.45		B											
5.70-5.70	21	D								Stiff reddish brown sandy gravelly CLAY with low and medium cobble content. Sand is fine and medium. Gravel is angular to subrounded fine to coarse of mudstone. Cobbles are subangular to well rounded (up to 90mm).	81.67	5.50	
5.97		EW	N=23										
6.00-6.45	23	SPT											
6.00-6.45		DSPT											
6.00-6.45	24	B											
7.00	105	ES	1xT+1xJ+1xV								79.97	7.20	
7.20-7.20	105	ES	1xT+1xJ+1xV										
7.30-7.30	25	D											
7.50-7.92		SPT	10,10/9,15,15,11 for 45mm										
7.50-7.92	27	DSPT											
7.50-7.92	28	B											
8.70-8.70	29	D								Probable boulder.	78.47	8.70	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									strikes due to flush method. 6. Installed with 50mm standpipe on completion (response zone 5.00m to 7.00m). 7. SPT hammers AR3104-2022 ($E_i = 64.00\%$), AR3293-2022 ($E_i = 73.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Cornacchio GEO 205			All dimensions in metres	Scale: 1:25
Drilled By: Jonny Hutt + Luke Bamford						Logged By: JAlton + RSenior			Checked By: AS	AGS

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-9.30	106 31 32	SPT	13,12/21,29 for 70mm							Probable boulder. (stratum copied from 8.70m from previous sheet)		(1.00)	
9.00-9.00		ES	1xT+1xJ+1xV	↑	↑	↑							
9.00-9.30		DSPT											
9.00-9.50		B											
9.20-10.00													
9.50-9.73	33 34	SPT(c)	13,12/32,18 for 40mm	62	0	0					77.47	9.70	
9.50-9.73		C											
9.70		D											
10.00-11.50		SPT	5,7/12,18,20 for 40mm	↑	↑	↑				Drilling disturbed, very limited recovery. Recovered as probably very dense, grey, reddish brown and yellowish brown angular to subrounded medium and coarse GRAVEL of mudstone, limestone, and sandstone. High cobble content of subangular to subrounded mudstone, limestone, and sandstone.		(1.50)	
10.00-10.34													
				20	0	0							
11.20	35	D		↑	↑	↑				Drilling disturbed, very limited recovery. Recovered as stiff reddish brown mottled light grey slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to subrounded fine to coarse of mudstone and limestone.		(1.10)	
11.50-12.50													
				20	0	0							
12.30	36	D		↑	↑	↑				Drilling disturbed, very limited recovery. Recovered as grey yellowish brown and reddish brown subangular to subrounded coarse GRAVEL of mudstone, limestone, and sandstone. High cobble content. Cobbles are of mudstone and sandstone. ... 12.80-13.00m: 1 no. cobble of very strong dark grey limestone.		(0.70)	
12.50-13.00													
				40	0	0							
12.80-13.00	37	B		↓	↓	↓					74.17	13.00	
13.00-13.45	38	SPT	N=35							Open hole drilling. SAND AND GRAVEL (Driller's Description)			
13.00		D											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 4 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-13.79		SPT	7,12/18,32 for 60mm							Open hole drilling. SAND AND GRAVEL (Driller's Description) (stratum copied from 13.00m from previous sheet)		(1.70)	
14.00-14.09		SPT	25/50 for 40mm										
14.00	39	D									72.47	14.70	
										Open hole drilling. MUDSTONE (Driller's Description) (MERCIA MUDSTONE GROUP)	72.17	15.00	
15.00-16.00		SPT	25/50 for 50mm							Extremely weak thickly laminated to very thinly bedded reddish brown MUDSTONE. GRADE II		(0.70)	
15.00-15.12										Bedding fractures: Closely spaced, 0° to 5°, undulating, smooth, clean. (MERCIA MUDSTONE GROUP) ... 15.00-15.40m: AZCL.			
15.00	40	D											
15.50	41	D		60	16	10	NI				71.47	15.70	
15.78-15.90	42	C								Extremely weak thinly bedded reddish brown MUDSTONE. GRADE II.			
16.00-17.50										Bedding fractures: Closely spaced, 0° to 5°, undulating, smooth, clean. (MERCIA MUDSTONE GROUP) ... 16.10-16.45m: AZCL.			
										... 16.45-16.73m: NI, recovered as clayey gravel.			
16.73-16.87	43	C		63	63	13	NI			... 17.02-17.05m: Moderately weak light grey siltstone.			
17.24	44	D					600			... 17.10m: Thin lamination (<3mm) of weak grey siltstone.			
17.50-19.00										... 17.17-17.19m: Weak grey siltstone.		(3.40)	
17.70-17.84	45	C		93	93	24							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 6 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
23.00-23.23	52	C		100	100	65				20.91-20.93m: 10° planar rough discontinuity with 1mm thick calcite vein. 21.05-21.07m: 10° planar rough discontinuity with 1mm thick calcite vein. 21.15-21.17m: 10° planar rough discontinuity with 1mm thick calcite vein. 21.18-21.19m: Weak grey siltstone. 21.24-21.40m: Weak grey siltstone. 21.43-21.58m: 88° undulating rough clean discontinuity. 22.08-22.64m: 75° to 85° undulating rough locally stepped clean discontinuity. 22.27-22.39m: Weak grey siltstone. Very weak to weak thinly to medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely to medium spaced, 0° to 5°, undulating, rough, clean. (MERCIA MUDSTONE GROUP) (stratum copied from 20.20m from previous sheet)	64.19	22.98	
23.50-25.00											63.62	23.55	
23.90	53	D					NI 120 300						
24.00-24.18	54	C									63.14	24.03	
				93	93	37				Moderately weak thinly bedded light grey SILTSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, rough, clean. (MERCIA MUDSTONE GROUP) 23.40-23.45m: 40° undulating rough clean discontinuity. Very weak to weak thinly bedded light grey SILTSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, rough, clean. (MERCIA MUDSTONE GROUP) 23.72-23.84m: Moderately weak grey siltstone. Medium strong thinly bedded light grey SILTSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, rough, clean. (MERCIA MUDSTONE GROUP) 24.38-24.41m: Extremely weak reddish brown mudstone. 24.72-24.78m: 60° undulating rough clean discontinuity. 24.85-25.00m: Extremely weak reddish brown mudstone. Borehole terminated at 25.00m.			
											62.17	25.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 7 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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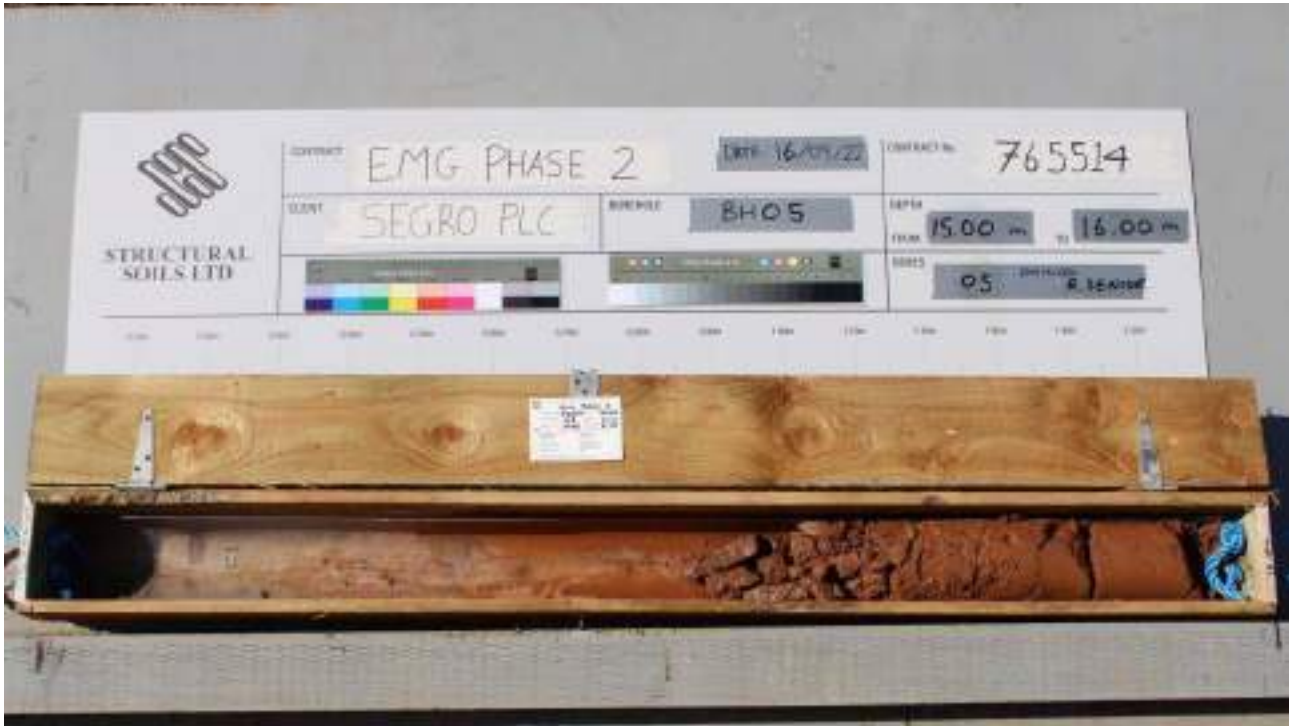
Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8	Sheet: 10 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH05
Contract Ref: 765514	Start: 09.09.22 End: 14.09.22	Ground Level (m AOD): 87.17	National Grid Co-ordinate: E:446157.9 N:325137.8		Sheet: 12 of 12




Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 1 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.10 0.10-0.20 0.20	1 2 101	D B ES									TOPSOIL	79.99	(0.30)	
0.70 0.70-1.00 0.80	3 4 102	D B ES									Stiff fissured grey mottled brown slightly sandy slightly gravelly CLAY with pockets of chalk. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, and quartz.			
1.20 1.20-1.50	5 6	D UT _(UT100)	150 blows 100% recovery											
1.50-1.60	7	D											(2.70)	
1.80	8	D												
2.00-2.45 2.00-2.45 2.00-2.45	10 11	SPT DSPT B	N=16											
2.70	12	D										77.29	3.00	
3.00-3.45 3.00-3.45	13 14	UT _(UT100) B	150 blows 0% recovery								Firm to stiff fissured dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and occasional chalk.			
3.70	15	D												
4.00-4.45 4.00-4.45 4.00-4.45	17 18	SPT DSPT B	N=15											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
28/09/22	18:05	8.00	7.50	200	Dry	18.00	18.50	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 18.50m using Geobor-S and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water							
29/09/22	07:44	8.00	7.50	200	Dry											
29/09/22	17:48	18.50	18.50	200	Dry											
04/10/22	08:30	18.50	17.00	200	15.50											
04/10/22	17:00	30.80	None	146	-											
									All dimensions in metres		Scale: 1:25					
Method Used:			Inspection pit + Cable Percussion + Rotary Cored			Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter	Logged By:	DNeylon + RStan	Checked By:	AS	

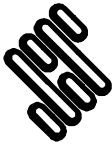


Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	19	D	110 blows 100% recovery N=18								Firm to stiff fissured dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and occasional chalk. (stratum copied from 3.00m from previous sheet)			
5.00-5.45	20	UT _(UT100)												
5.45	21	D												
5.70	22	D												
6.00-6.45		SPT	N=18											
6.00-6.45	24	DSPT												
6.00-6.45	25	B												
7.30	26	D	91 blows 100% recovery											
7.50-7.95	27	UT _(UT100)												
7.95-8.05	28	D												
8.70	29	D												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									strikes due to flush method. 6. Installed with 50mm standpipe on completion (response zone 18.00m to 30.80m). 7. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 601			Logged By: D.Neylon + R.Stan	Checked By: AS
Drilled By: Jonny Hutt + Sam Carter						All dimensions in metres			Scale: 1:25	AGS

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.00-9.45	31 32	SPT	N=30								Firm to stiff fissured dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and occasional chalk. (stratum copied from 3.00m from previous sheet)		(13.40)	
9.00-9.45		DSPT												
9.00-9.45		B												
10.30	33	D	150 blows 89% recovery											
10.50-10.95	34	UT _(UT100)												
10.95-11.05	35	D												
11.70	36	D	N=27											
12.00-12.45	38 39	SPT												
12.00-12.45		DSPT												
12.00-12.45		B												
13.30	40	D												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 4 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
13.50-13.80	41	UT _(UT100)	150 blows 83% recovery								Firm to stiff fissured dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and occasional chalk. (stratum copied from 3.00m from previous sheet) ... 13.90m: sandy.			
13.80-13.90	42	D												
14.70	43	D												
15.00-15.45		SPT	N=35											
15.00-15.45	45	DSPT												
15.00-15.45	46	B												
16.40	47	D										63.89	16.40	
16.50-16.80	48	UT _(UT100)	150 blows 67% recovery								Stiff to very stiff laminated grey slightly sandy SILT. Sand is fine.			
16.80-16.90	49	D											(0.90)	
17.20	50	D										62.99	17.30	
											Stiff to very stiff reddish brown gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. Occasional pockets of grey siltstone. (MERCIA MUDSTONE GROUP)			(1.20)

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 5 of 12
End: 10.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.00-18.26		SPT	10,15/24,26 for 60mm											
18.00-18.26	52	DSPT												
18.00-18.50	53	B										61.79	18.50	
18.50-18.80 (0:02)														
18.50-18.72		SPT	8,17/34,16 for 30mm	100	50	0		Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE, recovered as angular to subangular gravel with occasional fragments of greenish grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP)		(0.40)	
18.50-18.72	55	DSPT										61.39	18.90	
18.55-18.70	56	C												
18.80-20.30 (0:03)		EW									Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, smooth, undulating, with occasional black staining along some surfaces. (MERCIA MUDSTONE GROUP)		(0.40)	
19.00											Extremely weak greenish grey fine and medium grained SANDSTONE with frequent vugs (up to 2mm). (MERCIA MUDSTONE GROUP)			
19.30-19.50	57	C		93	40	10		Air+Mist (Brown)			... 19.70-19.75m: Extremely weak reddish brown MUDSTONE with rough planar fractures either side up to 5mm infilled with sandy clay. ... 19.75m: Verging towards a very weak to medium strong and no vugs. ... 20.10-20.30m: Becoming very weak reddish brown mudstone.		(1.65)	
20.30-21.80 (0:06)												59.34	20.95	
21.00-21.15	58	C		67	46	18		Air+Mist (Brown)			Very weak to weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, with yellow staining on surfaces. (MERCIA MUDSTONE GROUP)		(0.30)	
											... 20.95m: Reddish brown sandy clay.	59.04	21.25	
											Very weak greenish grey fine and medium grained SANDSTONE. Bedding fractures: Closely spaced, planar, with yellow staining on surfaces. (MERCIA MUDSTONE GROUP)	58.89	21.40	
21.80-23.30 (0:04)											Very stiff reddish brown slightly sandy slightly gravelly CLAY with occasional pockets (up to 20mm) of greenish grey silt. GRADE IVa. (MERCIA MUDSTONE GROUP)	58.49	21.80	
				93	27	15		Air+Mist (Brown)					(0.60)	
												57.89	22.40	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 6 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
22.90-23.05	59	C		93	27	15		Air+Mist (Brown)			Extremely weak greenish grey SILTSTONE interspersed with reddish brown mudstone verging towards a silt interspersed with clay. (MERCIA MUDSTONE GROUP) Very stiff reddish brown sandy CLAY. Sand is fine of mudstone and siltstone. GRADE IVa. (MERCIA MUDSTONE GROUP) (stratum copied from 22.40m from previous sheet)	57.49	22.80	
23.30-24.80 (0:05)											Extremely weak greenish grey SILTSTONE thinly interbedded with reddish brown MUDSTONE. (MERCIA MUDSTONE GROUP) Very weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Medium to closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP) ... 23.35m: Recovered as sandy fine gravel of siltstone and mudstone. ... 23.60-23.70m: Greenish grey siltstone.			
24.50-24.65	60	C		97	59	14		Air+Mist (Brown)						
24.80-26.30 (0:05)														
25.85-25.95	61	C		100	48	0		Air+Mist (Brown)			... 25.25-25.30m: Greenish grey siltstone. ... 25.35-25.40m: Greenish grey siltstone.	54.44	25.85	
26.30-27.80 (0:05)											Extremely weak to medium strong thinly cross laminated greenish grey SANDSTONE. (MERCIA MUDSTONE GROUP) Extremely weak to very weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 26.35-26.55m: Interspersed with laminae and lenses (<10mm) of greenish grey siltstone.	54.24	26.05	
				100	77	57		Air+Mist (Brown)					(1.80)	

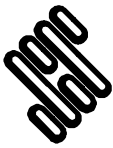
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Cornacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	DNeylon + RStan		Checked By:	AS	AGS
All dimensions in metres										Scale:		1:25				



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6		Sheet: 7 of 12
End: 10.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
27.10-27.30	62	C		100	77	57		Air+Mist (Brown)			... 26.95-27.15m: Very closely spaced, randomly orientated, smooth, undulating, fractures. Extremely weak to very weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) (stratum copied from 26.05m from previous sheet)	52.44	27.85	
27.80-29.30 (0:05)											Very weak greenish grey SILTSTONE. Bedding fractures: Very closely spaced, rough, planar, infilled with clayey sand. (MERCIA MUDSTONE GROUP) ... 27.98-28.02m: Clayey gravelly sand. ... 28.10-28.20m: Interspersed with lense (<2mm) of reddish brown clay. ... 28.25m: Verging towards a sandy silt. Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. ... 28.80-28.83m: Sandy clay. ... 28.83-28.83m: Sandy clay. ... 29.08-29.19m: Weak thickly laminated siltstone.		(0.55)	x x x x
28.40-28.70	63	C		100	87	60		Air+Mist (Brown)				51.89	28.40	x x x x
29.30-30.80 (0:05)													(1.15)	
												50.74	29.55	x x x x
													(0.40)	x x x x
												50.34	29.95	x x x x
30.10-30.40	64	C		97	90	83		Air+Mist (Brown)			Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 30.40-30.45m: Sandy clay.		(0.85)	
												49.49	30.80	
											Borehole terminated at 30.80m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6	Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: D.Neylon + R.Stan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6	Sheet: 10 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: D'Neylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH06
Contract Ref: 765514	Start: 28.09.22 End: 10.10.22	Ground Level (m AOD): 80.29	National Grid Co-ordinate: E:446038.9 N:325052.6	Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNeylon + RStan	Checked By: AS	AGS
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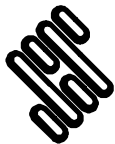
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7		Sheet: 1 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00	1	D								TOPSOIL	87.13	0.10	
0.00-0.10	3	B								Very stiff orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including quartzite, metamorphic rock, sandstone, and rare mudstone. Stiff to very stiff reddish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mudstone. Occasional pockets of grey fine grained siltstone. (MERCIA MUDSTONE GROUP)		(0.30)	
0.10	4	D											
0.10-0.40	6	B											
0.20	5	ES									86.83	0.40	
0.40	7	D											
0.40-1.00	9	B											
0.50	2	ES											
0.50	8	ES											
1.00	10	ES											
1.20	11	D	N=36										
1.20-1.65		SPT											
1.20-1.65	12	DSPT											
1.20-1.70	13	B											
2.00-2.45		SPT	N=49										
2.00-2.45	15	DSPT											
2.00-2.50	16	B											
2.50	17	D										(4.45)	
3.00-3.45		SPT	N=50										
3.00-3.45	18	DSPT											
3.00-3.50	19	B											
3.50	20	D											
4.00-4.31		SPT	11,14/19,24,7 for 28mm										
4.00-4.45	21	DSPT											
4.00-4.50	22	B											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
21/09/22	17:00	4.00	3.00	200	Dry	4.30	4.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water All dimensions in metres Scale: 1:25				
22/09/22	08:00	4.00	4.00	200	Dry								
22/09/22	17:00	15.50	4.00	150	-								
23/09/22	08:00	15.50	4.00	150	5.50								
23/09/22	16:00	20.00	4.00	150	-								
26/09/22	08:00	20.00	4.00	150	6.50								
26/09/22	10:00	20.00	4.00	150	6.50								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 + Comacchio GEO 205		Drilled By: Chris Jobson + Martin Speedie		Logged By: JAlton + RStan		Checked By: 			




STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7		Sheet: 2 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50-5.50	24	SPT	19,6/42,8 for 5mm	↑	↑	↑							
4.50-4.67													
4.50-4.95		DSPT									82.38	4.85	
	25	C		45	29	20	NI NI 200			Extremely weak locally thickly laminated reddish brown MUDSTONE. Occasional pockets and laminae of very weak to weak fine grained siltstone. GRADE IVb. Bedding fractures: Closely to widely spaced, planar, rough, locally with clay infill. (MERCIA MUDSTONE GROUP) ... 4.95-5.21m: NI, recovered as gravel. ... 5.14-5.50m: frequent grey siltstone. ... 5.29m: clay infill (<3mm). ... 5.50-5.65m: AZCL ... 5.65-6.17m: NI, recovered as gravel. ... 6.17-6.36m: thinly and thickly laminated. ... 6.42-6.54m: NI, recovered as gravel of mudstone and siltstone. ... 6.72-6.86m: thinly and thickly interlaminated with weak grey siltstone. ... 7.00-7.12m: grey siltstone			
5.30-5.50													
5.50-7.00												(2.45)	
	26	C		90	37	19	NI NI 580						
6.86-7.00													
7.00-8.50													
	27	C								Extremely weak to weak reddish brown MUDSTONE. Fractures: Very closely to closely spaced, randomly orientated, planar, rarely undulating, smooth and rough, with abundant black staining. (MERCIA MUDSTONE GROUP)			
7.30-7.46				100	43	36	NI NI 30				79.93	7.30	
										... 8.88-8.99m: grey siltstone.			
8.50-12.00				43	0	0	NI NI 20					(2.78)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									strikes due to flush method. 6. Borehole backfilled with bentonite on completion. 7. Borehole drilled using 150mm tools and casing. 8. Groundwater struck at 11.00m. Rose to 8.90m after 20 minutes. 9. Borehole backfilled with bentonite upon completion. 10. SPT hammer JB14-2022 (E_t = 63.00%) used.				
										All dimensions in metres	Scale: 1:25		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Chris Jobson + Martin Speedie	Logged By:	JAlton + RStan		Checked By:



Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-9.25	28	C					NI NI 20			Extremely weak to weak reddish brown MUDSTONE. Fractures: Very closely to closely spaced, randomly orientated, planar, rarely undulating, smooth and rough, with abundant black staining. (MERCIA MUDSTONE GROUP) (stratum copied from 7.30m from previous sheet)			
10.00-11.00				↑	↑	↑	↑			... 10.00-10.17m: NI.	77.15	10.08	
10.16-10.44	29	C		43 100	0 84	0 73	NI NI 250			Extremely weak thinly and thickly laminated reddish brown MUDSTONE. With widely spaced laminae and pockets of grey siltstone. Occasional grey reduction spots (up to 5mm). GRADE III. Bedding fractures: Widely and very widely spaced, 0-10°, planar, rough, clean. (MERCIA MUDSTONE GROUP) ... 10.44-10.45m: grey siltstone.			
11.00-12.50				↓	↓	↓	↓		↓	... 11.00-11.03m: grey siltstone. ... 11.00-11.10m: NI.			
11.10-11.40	30	C										(2.57)	
				100	27	21	NI NI 70			... 11.74-11.75m: grey siltstone.			
				↓	↓	↓	↓			... 11.94-11.99m, thinly interlaminated with grey siltstone.			
12.50-14.00				↑	↑	↑	↑				74.58	12.65	
12.50-12.65	31	C		87	10	10	NI 10 80			Extremely weak locally thinly laminated reddish brown MUDSTONE. Occasional pockets of grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP)			

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07 | Log COMPOSITE LOG - A4P | 765514 EAST MIDLAND AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk. | 08/05/23 - 20:47 | A4 |



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7		Sheet: 4 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
14.65-15.00	32	C		87	10	10	NI 10 80			Extremely weak locally thinly laminated reddish brown MUDSTONE. Occasional pockets of grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP) (stratum copied from 12.65m from previous sheet) ... 13.80-14.00m, AZCL.			
15.00-17.00							NI 45			... 15.32-15.50m, thickly interlaminated with grey siltstone.		(5.85)	
16.25-16.50	33	C		75	14	14	NI 40			... 16.03-16.20m, thickly interlaminated with grey siltstone.			
17.00-18.50							NI 150			... 16.77-16.89m, thickly interlaminated with grey siltstone.			
				100	3	0				... 17.78-17.99m, thickly laminated.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Chris Jobson + Martin Speedie		Logged By:	JAlton + RStan	Checked By:	AS	AGS



Contract: EMG Phase 2			Client: SEGRO			Borehole: BH07			
Contract Ref: 765514		Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23		National Grid Co-ordinate: E:445957.0 N:325334.7			Sheet: 5 of 11	

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.50-20.00				100	3	0	NI NI 150			Extremely weak locally thinly laminated reddish brown MUDSTONE. Occasional pockets of grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 12.65m from previous sheet</i>)	68.73	18.50	
										... 18.27-18.37m, thickly interlaminated with grey siltstone.			
										Extremely weak to weak locally thinly laminated reddish brown MUDSTONE. Occasional thin laminae of grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)		(1.05)	
				100	70	64	NI NI			... 19.18-19.30m: thinly laminated grey siltstone.	67.68	19.55	
										Extremely weak reddish brown MUDSTONE, recovered as sandy silty angular fine to coarse gravel. GRADE III. Fractures: Randomly orientated, planar, rough, non-intact. (MERCIA MUDSTONE GROUP)	67.23	20.00	
										Borehole terminated at 20.00m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7		Sheet: 6 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7	Sheet: 7 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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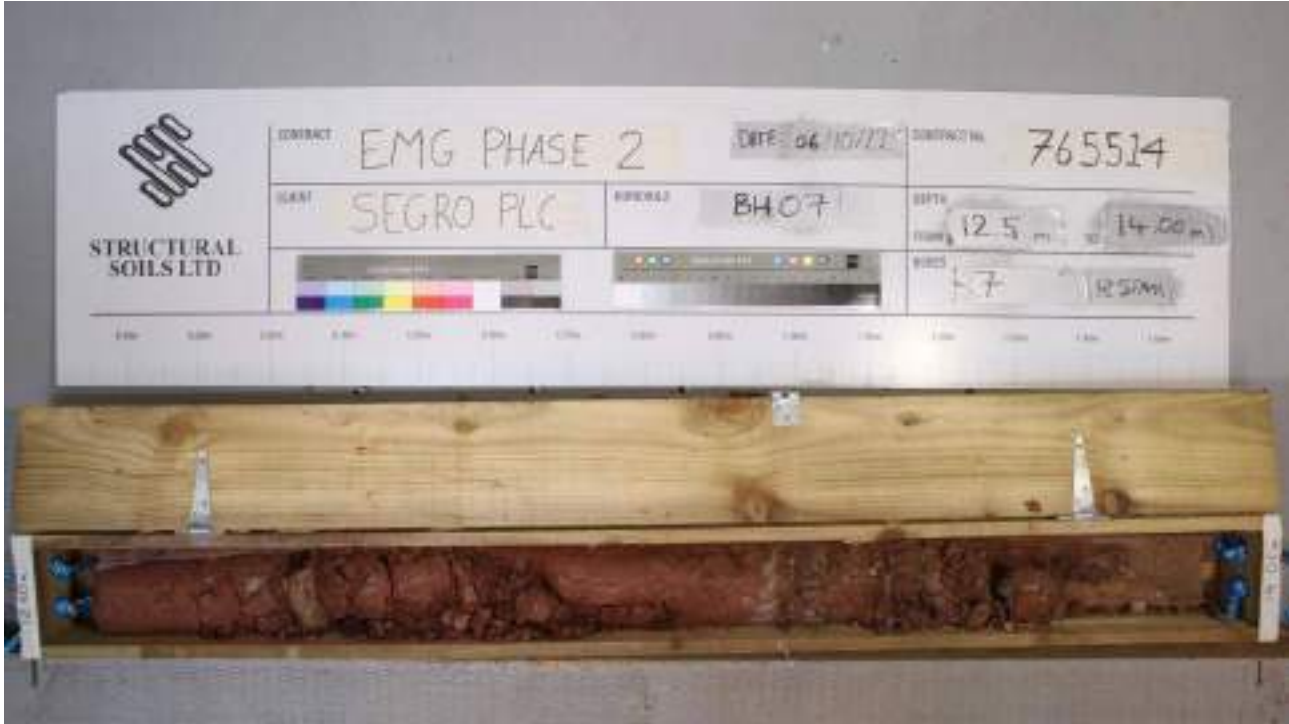
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7	Sheet: 8 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7	Sheet: 9 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7	Sheet: 10 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH07
Contract Ref: 765514	Start: 21.09.22 End: 26.09.22	Ground Level (m AOD): 87.23	National Grid Co-ordinate: E:445957.0 N:325334.7	Sheet: 11 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: JAlton + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3		Sheet: 1 of 16
End: 28.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00	1	D	1xT+1xJ+1xV							TOPSOIL	88.01	0.30	
0.00-0.10	3	B											
0.05	2	ES											
0.10	4	D											
0.10-0.30	6	B	1xT+1xJ+1xV							Stiff dark reddish brown slightly gravelly sandy SILT with low cobble content of subrounded quartzite. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone, and quartzite.	87.41	(0.60)	
0.20	5	ES											
0.30	7	D											
0.30-0.90	9	B											
0.50	8	ES	1xT+1xJ+1xV							Stiff reddish brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone and quartzite.	86.81	0.90	
0.90	10	D	1xT+1xJ+1xV										
0.90-1.20	12	B											
1.00	11	ES											
1.00	5	D	N=31							Stiff greenish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone, and quartzite.	83.81	1.50	
1.20-1.65	13	SPT											
1.20-1.65	13	DSPT											
1.20-1.70	14	B											
1.70	15	D	1xT+1xJ+1xV										
1.80	16	ES											
2.00-2.45	17	UT											
2.50	18	D											
2.50-3.00	19	B	N=35									(3.00)	
3.00-3.45	20	SPT											
3.00-3.45	21	DSPT											
3.00-3.50	21	B											
3.50	16	D											
4.00-4.45	19	B											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
22/09/22	17:00	7.00	3.00	200	-	7.80	8.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater struck at 8.00m depth, rising to 4.55m depth after 20 minutes.							
23/09/22	08:00	7.00	3.00	200	-											
23/09/22	10:30	8.00	3.00	200	4.25											
27/09/22	08:00	17.00	8.00	150	8.40											
27/09/22	17:00	30.50	17.00	150	-											
28/09/22	08:00	30.50	17.00	150	12.70											
28/09/22	10:00	30.50	17.00	150	12.70											
Method Used:				Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Chris Jobson + Martin Speedie	Logged By:	RSenior + RStan	Checked By:	AS	
										All dimensions in metres		Scale:		1:25		





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3		Sheet: 2 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50 4.50-5.00 4.60	24 26 25	D B ES	1xT+1xJ+1xV							Stiff to very stiff reddish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone. Occasional pockets (up to 300mm) of grey siltstone. GRADE IVb. (MERCIA MUDSTONE GROUP)			
5.00-5.45 5.00-5.45 5.00-5.50	27 28	SPT DSPT B	N=35										
5.50	22	D											
6.00-6.45 6.00-6.45 6.00-6.50	30 31	SPT DSPT B	N=50									(3.50)	
6.50	32	D											
7.00-7.34 7.00-7.45 7.00-7.50	33 34	SPT DSPT B	8,13/17,19,14 for 40mm										
7.50	35	D											
8.00-9.50 8.00-8.30 8.00-8.45	36	SPT DSPT	11,14/18,23,9 for 14mm								80.31 80.16 79.99	8.00 8.15 8.32	
8.60	37	D		97	7	7	NI 20 100						
										Strong light greyish green SILTSTONE. Drilling disturbed, recovered as subangular to subrounded fine to coarse gravel. GRADE II. (MERCIA MUDSTONE GROUP) Stiff thinly and thickly laminated reddish brown silty CLAY with occasional subangular fine to medium gravel sized mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) 8.45-8.95m: Discontinuities are extremely closely to very closely spaced			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Groundwater struck at 19.00m depth. Fast inflow. 7. Borehole backfilled with bentonite on completion.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Cornacchio GEO 205			All dimensions in metres Scale: 1:25	
Drilled By: Chris Jobson + Martin Speedie						Logged By: RSenior + RStan			Checked By:  	

GINT LIBRARY_V10_01.GLB LibVersion: v8_07 | Log COMPOSITE LOG - A4P | 765514, EAST, MIDLAND, AIRPORT.GPJ - V10_01.
Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 20:48 | AJ4 |



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514		Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 3 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.50-11.00				97	7	7				randomly orientated undulating smooth stained black. ... 8.97-9.07m: Very weak light greenish grey siltstone with 85° to 90° undulating rough discontinuity with occasional black specks. Extremely weak very thinly to thinly bedded reddish brown MUDSTONE. Bedding fractures: Closely spaced, 0° to 15°, undulating, smooth, black stained, locally with a little clay smear on surfaces. GRADE II. (MERCIA MUDSTONE GROUP) (stratum copied from 8.32m from previous sheet)		(2.24)	
10.70	38	D		70	10	0				... 9.07-9.35m: 75° to 90° undulating smooth black stained discontinuity. ... 9.40-10.30m: Discontinuities are very closely spaced randomly orientated undulating smooth, locally rough, black stained. ... 9.50-9.95m: AZCL. ... 10.29m: laminae (<2mm) of extremely weak light greenish grey siltstone.	77.75	10.56	
11.00-12.50										Stiff thickly laminated to very thinly bedded reddish brown silty CLAY with occasional subangular fine gravel sized mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)	77.01	11.30	
11.50	39	D		77	27	27				... 10.88-10.89m: Extremely weak light greenish grey siltstone with occasional black specks. ... 11.00-11.30m: Drilling disturbed. NI, recovered as slightly gravelly clay.			
12.50-14.00				60	0	0				Extremely weak to very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 5°, undulating, smooth and rough, clean, locally stained black. (MERCIA MUDSTONE GROUP) ... 11.34-11.38m: 40° undulating smooth discontinuity with <1mm clay on surfaces. ... 11.38-11.50m: 80° undulating rough clean discontinuity. ... 11.48-11.52m: Occasional fine to medium gravel size light greenish grey siltstone lithorelicts and occasional reduction spots. ... 11.64-11.66m: Very weak light grey sandy siltstone. ... 11.73-11.74m: Extremely weak light greenish grey siltstone. ... 12.02-12.12m: Thickly laminated. ... 12.27-12.38m: 50° to 60° undulating smooth discontinuity with 1mm soft clay		(3.90)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3		Sheet: 4 of 16
End: 28.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.60	40	D		60	0	0				infill on surfaces. ... 12.40-12.50m: Stiff thickly laminated to very thickly bedded silty clay. ... 12.50-13.10m: AZCL. ... 13.10-13.15m: Very weak to weak light greenish grey siltstone. ... 13.15-13.70m: Discontinuities are extremely closely to very closely spaced randomly orientated undulating smooth and rough predominantly stained black with frequent black specks. Extremely weak to very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 5°, undulating, smooth and rough, clean, locally stained black. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 11.30m from previous sheet</i>) ... 13.75-14.00m: Drilling disturbed, recovered as clayey angular to subangular fine to medium gravel of mudstone. ... 14.00-14.25m: Drilling disturbed, recovered as clayey angular to subangular fine to medium gravel of mudstone. ... 14.10-14.15m: Light greenish grey siltstone band recovered as clayey gravel. ... 14.40-14.80m: Discontinuities are very closely spaced randomly orientated undulating rough and smooth locally black stained and locally with a little clay smear on surfaces. Occasional reduction spots <20mm. ... 14.65-15.27m: 80° to 90° undulating smooth and rough lack stained discontinuity. ... 15.08-15.12m: 20° Undulating smooth black stained discontinuity. Very weak to weak very thinly to thinly bedded light greenish grey SILTSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 10°, undulating, smooth, with 1-5mm soft clay on surfaces. (MERCIA MUDSTONE GROUP) ... 15.20-15.23m: Extremely weak light greenish grey siltstone. <i>Description on next sheet</i> ... 16.02-16.17m: 85° to 90° undulating smooth clean discontinuity. ... 16.32-16.62m: 85° to 90° undulating smooth black stained discontinuity. ... 16.67-16.74m: 80° to 85° undulating smooth black stained discontinuity. ... 16.74-16.80m: Very weak to weak thickly laminated light greenish grey siltstone.	73.11	15.20	
14.00-15.00													
14.40	41	D		145	48	30							
15.33-15.41	42	C										(0.30)	x x x x
15.50-17.00												15.50	x x x x
16.00	43	D		97	9	0							
17.00-18.50													
				97	63	37							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514		Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 5 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
17.93-18.03	44	C		97	63	37				... 16.80-17.00m: Recovered as stiff thinly to thickly laminated reddish brown clay, possibly drilling disturbed.			
18.50-20.00										... 17.24-17.45m: 85° to 90° undulating smooth black stained discontinuity locally with a little clay smear on surfaces.		(6.40)	
										... 17.55-17.60m: Extremely weak light greenish grey siltstone.			
										Extremely weak to very weak thickly laminated to thinly bedded reddish brown MUDSTONE. GRADE II to III.			
										Bedding fractures: Very closely to closely spaced, locally extremely closely spaced, undulating, smooth and rough, clean, with occasional clay smear on surfaces.			
				97	45	27				(MERCIA MUDSTONE GROUP)			
										... 15.50-15.83m: Discontinuities are extremely closely to very closely spaced randomly orientated undulating smooth and rough clean with occasional black specks on surfaces. (stratum copied from 15.50m from previous sheet)			
20.00-21.50							NI 20 100			... 18.14-18.28m: 80° to 90° undulating smooth lack stained discontinuity.			
										... 18.50-18.80m: Drilling disturbed, recovered as slightly clayey angular to subangular fine to coarse mudstone gravel.			
										... 18.80-19.00m: 85° undulating smooth black stained discontinuity.			
										... 19.10-19.23m: 85° undulating clean discontinuity.			
				97	54	39				... 19.43-19.75m: 85° to 90° undulating, locally stepped, smooth black stained discontinuity.			
21.15-21.35	45	C								... 19.68-19.71m: Very stiff thinly laminated reddish brown clay.			
										... 19.80-19.84m: Very stiff thinly laminated reddish brown clay.			
21.50-23.00										... 20.20-20.48m: Very weak to weak very thinly to thickly bedded light greenish grey siltstone. Bedding fractures are very closely to closely spaced undulating rough locally smooth, with occasional black specks on surfaces.			
										... 20.22-20.43m: 85° to 90° undulating rough discontinuity with occasional black specks on surfaces.			
										... 20.70-20.76m: Extremely closely to very closely spaced randomly orientated clean locally lightly black stained discontinuities.	66.41	21.90	x x x x
				100	65	50				... 20.74-20.90m: 65° undulating rough black stained discontinuity.			x x x x
							30 120 340			... 20.90-21.16m: 2 no parallel closely spaced, locally black stained discontinuities.		(1.10)	x x x x

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
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STRUCTURAL SOILS

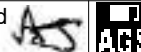
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3		Sheet: 6 of 16
End: 28.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.70-23.00	46	C		100	65	50				... 21.28-21.42m: Band of extremely weak light greenish grey siltstone. ... 21.50-21.90m: Drilling disturbed, recovered as clayey angular to subangular fine to coarse gravel of mudstone.	65.31	23.00	x x x x
23.00-24.50							30 120 340			Very weak to weak very thinly to thinly bedded light greenish grey SILTSTONE with occasional very thin to thin beds of reddish brown mudstone. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 5°, undulating, rough, with a little clay smear on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 21.90m from previous sheet)		(0.55)	x x x x
23.18-23.52	47	C									64.76	23.55	x x x x
				100	74	60				Very strong thickly to medium bedded light grey SILTSTONE. GRADE I. Bedding fractures: closely to medium spaced, 0°, undulating, rough, with occasional black specks and staining. (MERCIA MUDSTONE GROUP)		(0.95)	x x x x
							NI NI 130			Extremely weak to very weak thickly laminated to thinly bedded reddish brown MUDSTONE with occasional thick laminae and very thin beds of siltstone. GRADE II to III. Bedding fractures: Extremely closely to closely spaced, 0° to 5°, undulating, smooth and rough, clean, locally black stained. (MERCIA MUDSTONE GROUP)	63.81	24.50	
24.50-26.00										... 23.65-23.78m: 80° to 90° undulating rough clean discontinuity. AZCL. (MERCIA MUDSTONE GROUP)	62.81	25.50	AZCL
				33	0	0							
										Stiff thinly to thickly laminated reddish brown mottled light greenish grey CLAY. Occasional thick laminae and very thin beds of silt and extremely weak siltstone. Occasional fine to medium gravel sized mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)		(0.80)	
25.90	48	D					NI NI 20			... 26.13-26.23m: 40° undulating rough clean discontinuity.	62.01	26.30	
26.00-27.50		SPT	25/50 for 60mm							Extremely weak to very weak very thinly to thickly bedded reddish brown mottled grey silty MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 15°, undulating, smooth and rough, clean, locally with black specks. (MERCIA MUDSTONE GROUP) Description on next sheet			
26.00-26.13				100	20	0							
							NI 60 200						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
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Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks										
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)											
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Chris Jobson + Martin Speedie		Logged By:		RSenior + RStan		Checked By:			



Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
										Extremely weak to very weak very thinly to thickly bedded reddish brown mottled grey silty MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 15°, undulating, smooth and rough, clean, locally with black specks. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 26.30m from previous sheet)</i>			
											54.96	33.35	
										Borehole terminated at 30.50m depth.			



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 9 of 16



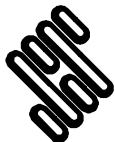
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 10 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 11 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 12 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 13 of 16



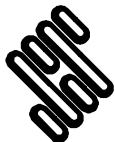
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 14 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 15 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH08
Contract Ref: 765514	Start: 22.09.22 End: 28.09.22	Ground Level (m AOD): 88.31	National Grid Co-ordinate: E:445920.7 N:325248.3	Sheet: 16 of 16




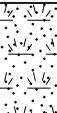
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: RSenior + RStan	Checked By: AS	AGS
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



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9		Sheet: 1 of 14

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00-0.00	1	D	1xT+1xJ+1xV							TOPSOIL	73.83	(0.40)	
0.00-0.20	3	B											
0.10-0.10	2	ES											
0.20-0.20	4	D											
0.20-0.40	6	B	1xT+1xJ+1xV										
0.30-0.30	5	ES											
0.40-0.40	7	D											
0.40-0.80	9	B											
0.50-0.50	8	ES	1xT+1xJ+1xV										
0.80-0.80	10	D											
0.80-1.20	12	B											
1.00-1.00	11	ES											
1.20-1.65	13	SPT	N=10										
1.20-1.65		DSPT											
1.20-1.70		B											
1.40		ES											
1.70	16	D	42 blows 100% recovery										
1.80	17	ES											
2.00-2.45	18	UT											
2.50	19	D											
2.50-3.00		20	B										
3.00	21	ES	N=15										
3.00-3.45		SPT											
3.00-3.45		DSPT											
3.00-3.50		B											
3.50	24	D	36 blows 100% recovery										
3.80	25	ES											
4.00-4.45	26	UT											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
16/09/22	13:00	1.20	1.20	200	-	8.80	9.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 9.00m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater encountered at 11.60m depth rising to 7.10m after 30 minutes. All dimensions in metres Scale: 1:25												
20/09/22	08:00	1.20	1.20	200	-																
20/09/22	16:00	9.00	7.50	200	8.65																
22/09/22	08:30	9.00	None	200	7.80																
22/09/22	16:00	25.50	9.00	150	-																
23/09/22	08:00	25.50	9.00	150	2.70																
23/09/22	16:00	30.00	9.00	150	23.40																
26/09/22	08:00	30.00	9.00	150	2.85																
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 2000 Mark 2 + Cornacchio GEO 205		Drilled By:		Chris Jobson + Marc Pearson		Logged By:		JAlton + RStan		Checked By:					





Contract: EMG Phase 2			Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9		Sheet: 2 of 14
End: 26.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50	27	D	N=7							Brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine and medium of mudstone and sandstone. Driller notes, with bands of clay. (stratum copied from 4.00m from previous sheet)		(1.50)	
4.50-5.00	28	B											
5.00-5.45	29	SPT											
5.00	30	DSPT	N=33							Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular to subangular of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)	68.73	5.50	
5.00-5.50	31	B											
5.50	32	D											
6.00-6.45	33	SPT	N=40							Occasional thin bands of fine and medium gravel size pockets of sandy silt.		(3.90)	
6.00-6.45	34	DSPT											
6.00-6.50	35	B											
6.50	36	ES	8,17/17.23,10 for 39mm										
6.50	37	D											
7.00-7.45	38	SPT											
7.00-7.45	39	DSPT											
7.00-7.50	40	B											
7.50	41	D											
8.00-8.33		SPT											
8.00		DSPT											
8.00-8.50		B											
8.50		D											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
26/09/22	10:30	30.00	9.00	150	2.85				
									6. Borehole installed with dual standpipes on completion (response zones 7.00m to 12.50m (19mm) and 14.00m to 18.00m (50mm)). 7. SPT hammer JB14-2022 ($E_r = 63.00\%$) used.
									All dimensions in metres
									Scale: 1:25
Method Used: Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 2000 Mark 2 + Cornacchio GEO 205		Drilled By: Chris Jobson + Marc Pearson		Logged By: JAlton + RStan		Checked By:	

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Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks														
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)															
Method Used:			Inspection pit + Cable Percussion + Rotary Coring			Plant Used:		Dando 2000 Mark 2 + Comacchio GEO 205		Drilled By:		Chris Jobson + Marc Pearson		Logged By:		JAlton + RStan		Checked By:					

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Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-15.00				↑	↑	↑				. . . 13.42-13.50m: NI. Extremely weak locally weak reddish brown MUDSTONE. Frequent laminae of grey siltstone and occasional reddish brown fine grained sandstone. Bedding fractures: widely spaced, 0-10°, planar, rough, rarely undulating, with some black, locally yellow, staining. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 11.60m from previous sheet)</i> . . . 13.50-13.58m: NI. . . . 13.64-13.69m: NI. 13.65-13.69m: Frequent yellow stained on discontinuities surface. Randomly orientated. . . . 13.69-13.74m: Band of siltstone. . . . 13.85-14.00m: Frequent pockets of grey siltstone. . . . 13.98-14.03m: Band of siltstone. . . . 14.18-14.29m: ??? siltstone and mudstone. . . . 14.38-14.39m: 6° planar rough fine reddish brown sandy infill <3mm. . . . 14.54-14.61m: 15° planar rough fine reddish brown infill <3mm. . . . 14.74-14.93m: 75° planar rough occasionally yellow brown stained. 15.22-15.75m: Reddish brown inbedded carbonate fine to medium grained sandstone. . . . 15.50-15.53m: NI. 15.373-16.07m: Interbedded sandstone with reddish brown mudstone and grey siltstone. 16.93-17.02m: Thin laminite mudstone. . . . 16.38-16.50m: AZCL. . . . 16.50-16.66m: Grey siltstone band.			
14.08-14.18	46	C		100	91	91							
15.00-16.00				↓	↓	↓							
15.00		EW		↑	↑	↑							
15.48-15.74	48	C		138	135	119							
16.03-16.25	47	C		↓	↓	↓							
16.50-18.00				↑	↑	↑			3				
17.00-17.20	49	C		93	77	43							
				↓	↓	↓							
									 17.31-17.66m: Reddish brown mudstone with infill and pockets of reddish brown sand, locally sandy MUDSTONE. . . . 17.44-17.52m: NI. . . . 17.59-17.66m: NI. . . . 17.66-17.90m: Recover as angular MUDSTONE with occasional pockets of siltstone.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



STRUCTURAL SOILS



BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9		Sheet: 5 of 14

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50 18.06-18.33	50	C		↑ 100	↑ 74	↑ 71				... 17.90-18.00m: AZCL. Extremely weak locally weak reddish brown MUDSTONE. Frequent laminae of grey siltstone and occasional reddish brown fine grained sandstone. Bedding fractures: widely spaced, 0-10°, planar, rough, rarely undulating, with some black, locally yellow, staining. (MERCIA MUDSTONE GROUP) (stratum copied from 11.60m from previous sheet) ... 18.00-18.06m: NI. ... 18.00-18.37m: Occasional pockets of reddish brown fine sand. ... 18.32-19.81m: 13° >3mm open with sandy silt infill. (reddish brown) ... 18.33-18.34m: 4° planar rough <3mm open fine reddish brown sand infill. ... 18.57-18.86m: NI due to difference rocks and ?? level: weak sandy MUDSTONE and weak to medium strong siltstone interbedded. Recovery as silty sandy gravel of mudstone and siltstone. ... 18.57-19.06m: Interbeds siltstone.mudstone. ... 19.40-19.50m: NI. ... 19.50-19.60m: AZCL. ... 19.60-19.71m: Pockets reddish brown fine sand and partings. ... 19.82-19.96m: Band of grey siltstone. ... 20.38-20.40m: NI due to weakness. Lithorelicts of grey siltstone, 4° planar rough due to weakness. ... 20.40-20.65m: Bands of grey siltstone. ... 20.55-20.56m: 5° undulating rough reddish brown silty CLAY infill (up to 4mm) >3mm ?? ... 20.65-20.85m: Interbedding grey siltstone and mudstone. Extremely weak to weak reddish brown fine grained SANDSTONE. Rare pockets of weak grey siltstone. Local laminae of reddish brown mudstone. (MERCIA MUDSTONE GROUP) ... 21.26-21.37m: NI due to weakness. ... 21.40-21.62m: Mudstone. ... 21.53-21.68m: 79° undulating rough clean possible induce.			
19.50-21.00				↑	↑	↑							
19.96-20.38	51	C		↑ 82	↑ 79	↑ 61							
21.00-22.50				↑	↑	↑					53.23	21.00	
21.97-22.19	52	C		↑ 100	↑ 93	↑ 93						(1.78)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
									All dimensions in metres Scale: 1:25		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 2000 Mark 2 + Comacchio GEO 205		Drilled By:			
Logged By:		JAlton + RStan		Checked By:							



STRUCTURAL SOILS

BOREHOLE LOG

Contract: <div>EMG Phase 2</div>			Client: <div>SEGRO</div>			Borehole: <div>BH09</div>			
Contract Ref: <div>765514</div>		Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): <div>74.23</div>		National Grid Co-ordinate: <div>E:445839.0 N:324955.9</div>			Sheet: <div>7 of 14</div>	

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
27.00-28.50	56	C		↑	↑	↑				Extremely weak reddish brown locally mottled grey MUDSTONE. GRADE III. Bedding fractures: 0-10°, closely spaced, planar, rough, clean. (MERCIA MUDSTONE GROUP) ... 27.00m: Extremely weak reddish brown local mottled grey unbedded slightly carbonate fine MUDSTONE. Fracture bedding 0-10° planar rough clean. Fracture 60-70 undulating rough clean, CIRIA GRADE III) ... 27.00-27.08m: NI. ... 27.07-27.09m dept: 3° planar rough clean. ... 27.18-27.19m: 8° planar rough clean. ... 27.28-27.29m: 6° undulating rough clean. ... 27.32-27.34m: Undulating rough silty lithorelicts. ... 27.55-27.57m: 8° undulating rough clean. ... 27.65-27.73m: NI. ... 27.73-27.74m: 4° planar rough clean. ... 27.83-27.84m: 5° planar rough clean. ... 27.83-27.87m: NI. ... 27.92-28.06m: 69° undulating rough clean. ... 28.07-28.30m: 64° undulating rough clean. ... 28.36-28.50m: NI. ... 28.61-28.63m: 14° undulating rough clean. ... 28.84-28.87m: 7° undulating rough clean. ... 28.94-30.00m: Grey siltstone interbedding with mudstone., ... 29.00-29.07m: 28° undulating rough clean. ... 29.16-29.28m: NI, recover as silty gravel of mudstone and siltstone angular. ... 29.36-29.37m: 4° undulating rough clean. ... 29.43-29.44m: 6° undulating rough clean. ... 29.64-29.65m: 6° planar rough clean. ... 29.80-29.81m: 3° planar rough clean. ... 29.95-29.96m: Planar rough clean. Borehole terminated at 30.00m depth.			
27.35-27.56				100	88	67							
28.50-30.00				↓	↓	↓							
29.44-29.65	57	C		↑	↑	↑				44.23	30.00		
				100	95	77	↓						↓

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									</	



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 8 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 9 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 10 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Cornacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9		Sheet: 11 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 12 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Cornacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 13 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH09
Contract Ref: 765514	Start: 16.09.22 End: 26.09.22	Ground Level (m AOD): 74.23	National Grid Co-ordinate: E:445839.0 N:324955.9	Sheet: 14 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark 2 + Cornacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: JAlton + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 1 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10-0.10	1	ES	1xT+1xJ+1xV							TOPSOIL			
0.30-0.30	2	D										(0.60)	
0.30-0.50	3	B									86.75	0.60	
0.70-0.70	4	ES	1xT+1xJ+1xV							Reddish brown slightly gravelly to gravelly clayey coarse SAND. Gravel is subrounded to rounded fine and medium of mudstone, siltstone, and sandstone.			
0.70-0.90	5	B										(0.60)	
0.90-0.90	6	D									86.15	1.20	
1.20-2.20										Stiff reddish brown mottled light grey slightly sandy silty CLAY with frequent angular to subangular fine and medium gravel sized mudstone lithorelicts. Occasional rootlets. (MMG, GRADE IVA) (MERCIA MUDSTONE GROUP)	86.00	1.35	
1.20-1.65	7	SPT	N=19									(0.40)	
1.20-1.20	8	DSPT		100	0	0				Stiff thinly laminated to very thinly bedded light greenish grey clayey SILT with frequent angular to subangular fine and medium gravel sized siltstone lithorelicts and frequent thick laminae and very thin beds of extremely weak siltstone. (MMG, GRADE III) (MERCIA MUDSTONE GROUP)	85.60	1.75	
1.30		D								Stiff thinly and thickly laminated reddish brown silty CLAY with frequent fine gravel sized mudstone lithorelicts. (MMG, GRADE III) (MERCIA MUDSTONE GROUP)			
2.20-3.70		SPT	8,10/10,11,16,13 for 40mm							... 1.98-2.02m: Thinly to thickly laminated light greenish grey siltstone.			
2.20-2.62										... 2.54-2.70m: Lithorelicts are angular to subangular fine to coarse gravel size.			
2.70	9	D		100	0	0						(2.05)	
3.70-5.20											83.55	3.80	
4.00	10	D		100	10	0				Description on next sheet			
										... 3.90-4.15m: 75° undulating smooth discontinuity with <1mm clay smear on surfaces.			
										... 4.02-4.08m: Drilling disturbed, recovered as soft gravelly clay.			
										... 4.10-4.70m: With extremely closely to closely spaced undulating smooth black			

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				
27/09/22	16:00	17.20	2.20	150	-	1. Position cleared using CAT and Genny 2. Hand dug inspection pit to 1.20m. 3. Borehole dynamic sampled to 2.20m. 4. Rotary cored from 2.20m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water strikes due to flush method. 6. Borehole installed with 50mm standpipe on completion (response zone 3.00m to			
28/09/22	08:00	17.20	2.20	150	15.50				
28/09/22	10:30	20.20	2.20	150	-				
Method Used: Dynamic sampling + Rotary Cored						All dimensions in metres			
Plant Used: Comacchio GEO 205						Scale: 1:25			
Drilled By: Marc Pearson						Logged By: RSenior			
Checked By: AS						Checked By: AS			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
5.20-6.70	11	D		100	10	0				stained discontinuities. Extremely weak very thinly to thickly bedded reddish brown MUDSTONE. Bedding fractures are very closely to closely spaced 0° to 5° planar and undulating smooth clean and locally with black spots and with <1mm clay smear on surfaces. (MMG, GRADE II) (MERCIA MUDSTONE GROUP) (stratum copied from 3.80m from previous sheet)			
5.40										4.68-4.74m: Drilling disturbed recovered as clayey angular to subangular fine mudstone gravel.			
	12	D		100	0	0				4.75-4.92m: 80° to 90° undulating rough slightly black stained discontinuity.			
6.20										4.92-4.95m: Very weak light greenish grey siltstone.			
	13	D								4.96-5.02m: 45° undulating smooth clean discontinuity.			
6.70-8.20										5.20-5.25m: Weak reddish brown mudstone.			
	13	D								5.41-5.42m: Extremely weak light greenish grey siltstone.			
7.30										5.52-5.60m: (Soft) reddish brown silty clay with frequent angular fine to medium gravel size lithorelics.			
	13	D								5.66-5.82m: (Soft) reddish brown silty clay with frequent angular fine to medium gravel size lithorelics.			
8.20-9.70										6.00-6.20m: (Soft to firm) reddish brown silty clay with frequent angular fine to medium gravel size lithorelics.			
	13	D								6.47-6.52m: Extremely weak light greenish grey siltstone.			
										6.60-6.70m: Drilling disturbed, recovered as soft gravelly clay.			
	13	D								6.70-6.85m: (Firm) reddish brown silty clay with occasional angular to subangular fine to medium gravel size lithorelics.			
										7.02-7.15m: (Soft to firm) reddish brown silty clay with occasional angular to subangular fine to medium gravel size lithorelics.			
	13	D								7.15-7.25m: Moderately weak light greenish grey siltstone.			
										7.15-7.32m: 75° undulating smooth discontinuity with occasional black specks.			
	13	D								7.40-7.85m: 75° to 90° undulating rough clean locally lightly black stained discontinuity.			
										8.50-8.51m: Weak light greenish grey siltstone.			
	13	D								8.55-8.95m: With extremely closely to very closely spaced randomly orientated undulating smooth and rough clean locally black stained discontinuities.			

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						20.20m).	
						7. SPT hammer LS01-2022 ($E_r = 64.00\%$) used.	
All dimensions in metres						Scale:	1:25
Method Used:	Dynamic sampling + Rotary Cored		Plant Used:	Comacchio GEO 205		Drilled By:	Marc Pearson
						Logged By:	RSenior
						Checked By:	AS
							AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.15-9.35	14	C		90	47	7				... 8.69-8.71m: Very weak to weak light greenish grey siltstone. ... 8.96-9.06m: Stiff reddish brown silty clay. Very weak thickly laminated to thickly locally medium bedded reddish brown MUDSTONE. Bedding fractures are very closely to closely locally medium spaced 0° to 5° planar and undulating smooth with >1mm clay smear of surfaces locally with rare to occasional black staining. (MMG, GRADE II) (MERCIA MUDSTONE GROUP) (stratum copied from 8.20m from previous sheet) ... 9.50-9.65m: AZCL. ... 9.70-9.85m: 90° undulating smooth discontinuity with 1-2mm soft clay on surfaces.	76.90	(2.25) 10.45	
9.70-11.20										Extremely weak thickly laminated to thickly bedded reddish brown mottled grey slightly sandy locally sandy MUDSTONE. Bedding fractures are extremely closely to closely spaced 0° planar and undulating clean locally with <1mm clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 10.82-11.00m: Firm to stiff thinly laminated reddish brown silty clay with occasional subangular fine gravel size mudstone lithorelics. ... 11.20-11.45m: AZCL. ... 11.45-11.80m: With very closely spaced randomly orientated undulating smooth and rough black stained locally clean discontinuity. ... 11.80-12.22m: 85° to 90° undulating smooth and rough black stained discontinuity.		(2.15)	
9.88-10.22	15	C		100	53	33				... 12.24-12.28m: Weak light greenish grey siltstone. ... 12.45-12.60m: Drilling disturbed, recovered as gravelly clay.	74.75	12.60	
11.20-12.70										Extremely to very weak very thickly to thinly bedded reddish brown MUDSTONE. Bedding fractures are very closely to closely spaced 0° to 5° undulating smooth and rough locally black stained and locally with <1mm clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 12.70-12.92m: 85° to 90° undulating rough blacks stained discontinuity. ... 13.25-13.32m: 45° undulating rough clean discontinuity .			
11.50	16	C		83	53	33							
12.70-14.20													
12.99-13.12	17	C		93	42	21							

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				
Method Used: Dynamic sampling + Rotary Cored						All dimensions in metres			
Plant Used: Comacchio GEO 205						Scale: 1:25			
						Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	AGS



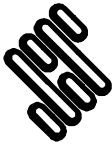
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 4 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
14.20-15.70				93	42	21				Extremely to very weak very thickly to thinly bedded reddish brown MUDSTONE. Bedding fractures are very closely to closely spaced 0° to 5° undulating smooth and rough locally black stained and locally with <1mm clay smear on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 12.60m from previous sheet) ... 13.50-13.56m: Extremely weak light greenish grey siltstone. ... 13.56-13.70m: Extremely weak mudstone with extremely closely spaced randomly orientated rough clean discontinuity. ... 13.77-13.86m: Moderately weak light greenish grey siltstone. ... 13.86-13.96m: Strong light greenish grey siltstone. ... 13.91-13.97m: 50° undulating smooth black stained discontinuity. ... 13.97-14.10m: Drilling disturbed, recovered NI as subangular fine to coarse gravel.	72.04	15.31	
15.40-15.60	18	C								... 14.10-14.20m: AZCL. ... 14.70-14.77m: Weak siltstone, NI, recovered as subangular fine to coarse gravel. ... 14.84-14.98m: 2No. parallel very closely spaced 50° undulating smooth black stained discontinuities. ... 15.12-15.24m: 2No. parallel very closely spaced 85° to 90° undulating smooth black stained discontinuities.			x x x x
15.70-17.20										Weak to strong thickly to medium bedded light greenish grey SILTSTONE. Bedding fractures are closely to medium spaced 0° to 10° undulating rough clean locally with occasional black specks on surfaces. (MMG, GRADE I) (MERCIA MUDSTONE GROUP) ... 15.31-15.36m: 30° undulating rough light black stained discontinuity, with occasional black specks. ... 15.70-15.90m: Extremely weak reddish brown mudstone. ... 15.99-16.01m: Extremely weak reddish brown mudstone. ... 16.20-16.23m: Stiff reddish brown clay with frequent angular fine gravel size lithorelics.	70.45	16.90	x x x x
16.27-16.57	19	C								... 17.37-17.42m: Bedding fractures are with black staining. ... 17.44-17.58m: 70° to 80° undulating rough clean locally black stained discontinuity.			
16.42		EW		100	73	41							
17.20-18.70													
17.20-17.38	20	C											
				95	13	7							
17.84-18.28	21	C											

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				



Contract: EMG Phase 2			Client: SEGRO			Borehole: BH10			
Contract Ref: 765514		Start: 27.09.22	End: 28.09.22	Ground Level (m AOD): 87.35		National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 5 of 12	

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.70-20.20				95	13	7				17.62-17.83m: Very weak light greenish grey siltstone.			
										17.90-18.70m: Drilling disturbed, recovered as (very soft to soft) gravelly clay.			
										Extremely weak to very weak very thinly to thickly locally medium bedded reddish brown MUDSTONE. Bedding fractures are very closely to medium spaced undulating smooth and rough clean locally with <1mm clay of surfaces. (MMG, GRADE II) (MERCIA MUDSTONE GROUP) (stratum copied from 16.90m from previous sheet)		(3.30)	
				100	47	36				19.76-19.83m: 80° undulating rough locally black stained discontinuity.			
										19.95-20.11m: 75° undulating rough black stained discontinuity.			
										Borehole terminated at 20.20m depth.	67.15	20.20	

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2		Sheet: 6 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 7 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 8 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 9 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 10 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 11 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH10
Contract Ref: 765514	Start: 27.09.22 End: 28.09.22	Ground Level (m AOD): 87.35	National Grid Co-ordinate: E:445787.3 N:325286.2	Sheet: 12 of 12



Method Used: Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Marc Pearson	Logged By: RSenior	Checked By: AS	
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514		Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 1 of 13


Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10-0.10	1	ES	1xT+1xJ+1xV							TOPSOIL			
0.50-0.50	2	B										(0.80)	
0.50-0.50	3	D									79.09	0.80	
0.80-0.80	4	ES	1xT+1xJ+1xV							Firm to stiff dark orangish brown slightly sandy gravelly CLAY. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of mudstone, siltstone, and sandstone.		(0.40)	
1.00-1.00	5	B											
1.10-1.10	6	D									78.69	1.20	
1.20-1.65	7	UT	90 blows							Very stiff greyish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to subrounded fine to coarse of sandstone, chalk, quartzite, and mudstone.			
1.70	8	D										(1.30)	
2.00-2.45		SPT	N=20										
2.00	10	D											
2.00-2.50	11	B									77.39	2.50	
3.00-3.45	12	UT	70 blows							Firm greyish brown locally reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to subrounded predominantly fine occasionally medium to coarse of chalk, sandstone, and mudstone.			
3.00	13	D											
3.00	14	ES											
3.50-4.00	15	B											
4.00-4.45		SPT	N=24									(3.20)	
4.00	17	D											
4.00-4.50	18	B											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks									
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)										
27/09/22	17:00	7.50	7.50	200	-	10.00	10.50	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussison borehole drilled using 200mm tools and casing. 4. Rotary cored from 12.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater struck at 9.00m depth, rising to 8.40m depth after 20 minutes.									
28/09/22	08:00	7.50	7.50	200	-	10.50	11.00	01:00										
28/09/22	17:00	12.50	12.50	200	11.45	11.00	11.50	01:00										
29/09/22	08:00	12.50	12.50	200	-	11.50	12.00	01:00										
29/09/22	16:00	13.10	12.50	200	-	12.00	12.50	01:00										
30/09/22	07:00	13.10	12.50	200	-													
30/09/22	14:00	31.00	13.50	150	-													
Method Used:			Inspection pit + Cable Percussion + Rotary Cored			Plant Used:		Dando 2000 + Comacchio GEO 205		Drilled By:	Mathew Heath + Lee Smith		Logged By:	DNeylon + JAlton		Checked By:	AS	AGS



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8		Sheet: 2 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
5.00-5.45 5.00	19 20	UT D	80 blows							Firm greyish brown locally reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to subrounded predominantly fine occasionally medium to coarse of chalk, sandstone, and mudstone. (stratum copied from 2.50m from previous sheet)			
5.50 5.50-6.00 5.70	21 23 22	ES B D									74.19	5.70	
6.00-6.45 6.00 6.00-6.50		SPT D B	N=27							Firm greyish brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine of chalk and occasionally mudstone.			
7.00	27	D										(3.30)	
7.50-7.95	28	UT	90 blows 100% recovery										
8.00	29	D											
											70.89	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Groundwater struck at 21.00m depth. Rose to 18.70m after 20 minutes. 7. Borehole installed with 50mm standpipe upon completion (response zone 13.00m to 31.00m). 8. SPT hammer JB05-2022 ($E_i = 68.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 2000 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Mathew Heath + Lee Smith						Logged By: D'Neylon + JAlton			Scale: 1:25	
									Checked By: 	



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8		Sheet: 3 of 13
End: 30.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instru- mentation	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-9.45 9.00-9.45 9.00-9.50 9.00	30 31 32	SPT DSPT B D	N=50							Dense reddish brown gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of mudstone, quartzite, flint, and sandstone.	70.44	9.45	
9.60-10.02		SPT	10,13/15,15,12,8 for 45mm							Brown very sandy subangular to subrounded fine to coarse GRAVEL of quartzite, flint, and sandstone. Stiff greyish brown mottled blue and reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of chalk, quartzite, sandstone, and mudstone. Dense brown very sandy subangular to subrounded fine to coarse GRAVEL of quartzite, sandstone, mudstone, and flint.	70.29	9.60	
10.00 10.00-10.50	34 35	D B	10,15/40,10 for 25mm								69.89	10.00	
11.00 11.00-11.22	36	D SPT											
11.00 11.00-11.50	37 38	DSPT B											
12.00-12.50	39	B											
12.50-12.82 12.50	40	SPT DSPT	12,13/24,19,7 for 15mm										
13.00-13.50													
											66.39	13.50	





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8		Sheet: 5 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50 18.10-18.45	44	C		100			NI NI NI			Extremely weak to weak reddish brown MUDSTONE. Rare to occasional pockets of grey siltstone. GRADE II. Fractures: Widely and extremely widely spaced, 0-10°, planar, rough clean. (MERCIA MUDSTONE GROUP) (stratum copied from 17.27m from previous sheet)			
19.50-21.00 19.60-19.97	45	C		100	97	97	NI NI NI			... 19.02-19.06m: Pockets of grey siltstone. ... 19.50-19.57m: Pockets of grey siltstone. ... 19.65-19.68m: Sandy silty mudstone. ... 19.88-20.50m: interbedded with grey siltstone. ... 20.02-20.06m: 14° planar rough clean. ... 20.76-20.83m: Pockets of silty fine sand. ... 20.86-21.23m: Very weak to weak grey siltstone. ... 21.08-21.09m: 5° planar rough <3mm silty clay infill.			
21.00-22.50												(7.73)	
21.60-21.82	46	C		100	100	95	30 460			... 21.55-21.59m: Medium strong reddish brown fine grained sandstone. ... 21.55-21.79m: Pockets of siltstone. ... 21.59-21.60m: 4° undulating rough fine sand infill <3mm. ... 21.78-22.00m: 85° undulating rough clean. ... 22.00-22.25m: 69° undulating rough clean.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 2000 + Comacchio GEO 205		Drilled By:	Mathew Heath + Lee Smith	Logged By:	DNeylon + JAlton	Checked By:	AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8		Sheet: 6 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.50-23.50	47	C		100	78	78	NI			Extremely weak to weak reddish brown MUDSTONE. Rare to occasional pockets of grey siltstone. GRADE II. Fractures: Widely and extremely widely spaced, 0-10°, planar, rough clean. (MERCIA MUDSTONE GROUP) (stratum copied from 17.27m from previous sheet) ... 23.30-23.41m: Grey siltstone. ... 23.38-23.50m: NI.			
22.50-22.73							NI						
23.50-25.00	48	C		100	97	91	NI			... 23.77-23.78m: 5° planar rough clean. ... 23.90-23.92m: 8° undulating rough clean. ... 24.23-24.38m: 74° undulating rough. Rare laminae of siltstone. ... 24.35-24.41m: 52° planar rough clean. ... 24.35-24.44m: 52° and 57° intersecting planar rough clean discontinuities. ... 24.43-24.53m: 48° planar rough clean. ... 24.67-24.68m: 4° planar rough clean. ... 24.76-24.84m: NI.	54.89	25.00	
24.02-24.20							NI						
25.00-26.50	49	C		100	83	83	NI			Very weak reddish brown MUDSTONE. Locally grey siltstone. Occasional laminae and pockets of grey siltstone. GRADE II. Fractures: randomly orientated, closely to widely spaced, undulating, rough, clean. (MERCIA MUDSTONE GROUP) ... 25.14-25.18m: 8° undulating rough clean. ... 25.50-25.65m: 7° occasional laminae of siltstone. ... 25.50-25.70m: Occasional laminae of siltstone. ... 25.50-25.74m: 69° undulating rough clean. ... 25.72-25.81m: 85° undulating rough clean. ... 25.75-25.85m: 44° undulating rough clean. ... 25.83-25.92m: 52° undulating rough clean. ... 25.86-25.98m: 5° planar rough clean. ... 26.20-26.22m: 14° planar rough clean.			
25.16-25.47							NI						
26.50-28.00	50	C		100	67	57	NI						
26.59-26.80							NI						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 2000 + Comacchio GEO 205		Drilled By:	Mathew Heath + Lee Smith	Logged By:	DNeylon + JAlton	Checked By:	AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8		Sheet: 7 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
28.00-29.50				100	67	57	NI 80 480			... 26.37-26.61m: Grey siltstone. ... 26.78-26.86m: 39° planar rough clean. Very weak reddish brown MUDSTONE. Locally grey siltstone. Occasional laminae and pockets of grey siltstone. GRADE II. Fractures: randomly orientated, closely to widely spaced, undulating, rough, clean. (MERCIA MUDSTONE GROUP) (stratum copied from 25.00m from previous sheet) ... 27.07-27.41m: NI, fractures closely spaced randomly orientated planar rough clean. ... 27.62-27.66m: NI. ... 27.77-27.84m: NI fracture randomly orientated 60-80° ... 27.87-27.93m: Grey siltstone. ... 28.00-28.10m: NI. ... 28.26-28.43m: NI, randomly orientated, undulating, rough, incipient fractures with yellow staining on surfaces. ... 28.64-28.83m: Grey siltstone. ... 28.67-28.69m: Extremely weak mudstone.		(6.00)	
29.07-29.30	51	C		100	82	82	NI NI 830			... 29.11-29.42m: Grey siltstone.			
29.50-31.00										... 29.35-29.36m: 6° planar rough clean. ... 29.50-30.34m: With laminae of very weak to weak grey siltstone.			
29.59-29.83	52	C		100	84	75	NI NI 530			... 30.34-30.47m: NI. ... 30.55-31.00m: Very weak to medium strong fine to medium grained SANDSTONE. ... 30.57-30.66m: NI. ... 30.89-31.00m: NI.	48.89	31.00	
Borehole terminated at 31.00m depth.													

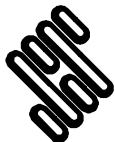
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 8 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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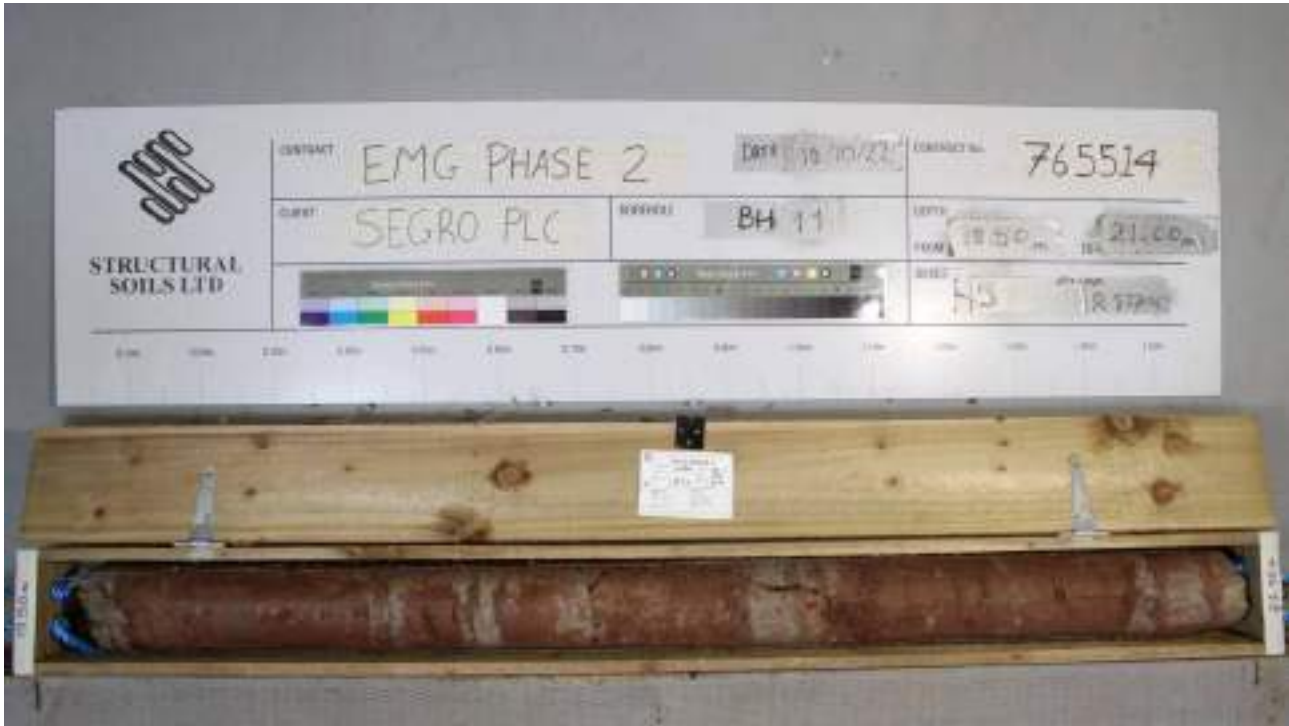
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 9 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 10 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 11 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 12 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH11
Contract Ref: 765514	Start: 27.09.22 End: 30.09.22	Ground Level (m AOD): 79.89	National Grid Co-ordinate: E:445759.5 N:325134.8	Sheet: 13 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 + Comacchio GEO 205	Drilled By: Mathew Heath + Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3		Sheet: 1 of 12



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.00-0.20	1	B	1xT+1xJ+1xV								MADE GROUND: Firm dark brown gravelly sandy SILT with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone, siltstone, and quartzite. (TOPSOIL) Firm fissured dark greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone, and quartzite.	80.03	0.20	
0.10	101	ES												
0.10	2	D												
0.40	3	D	100 blows 100% recovery											
0.40-0.60	4	B												
1.00	5	D	N=14											
1.00-1.20	6	B												
1.20-1.40	7	UT _(UT100)												
1.40-1.50	8	D	150 blows 78% recovery											
1.70	9	D												
2.00-2.45	11	SPT	N=15											
2.00-2.45	12	DSPT												
2.00-2.45	12	B												
2.70	13	D												
3.00-3.45	14	UT _(UT100)												
3.45-3.55	15	D												
3.70	16	D												
4.00-4.45	18	SPT												
4.00-4.45	19	DSPT												
4.00-4.45	19	B									Description on next sheet	76.33	3.90	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
26/09/22	17:15	3.90	3.00	200	Dry	16.50	16.70	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 16.80m using Geobor-S and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water	
27/09/22	08:26	4.00	3.00	200	Dry					
27/09/22	17:33	16.50	16.50	200	14.00					
28/09/22	08:14	16.50	16.50	200	14.10					
28/09/22	10:54	16.80	16.50	200	-					
29/09/22	15:30	16.80	16.50	200	15.50				All dimensions in metres Scale: 1:25	
29/09/22	17:00	23.30	16.50	146	20.70					
30/09/22	08:30	23.30	16.50	146	6.80					
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio Geo 602		Drilled By: Jonny Hutt + Sam Carter		Logged By: RSenior + RSian
										Checked By:



Contract: EMG Phase 2			Client: SEGRO			Borehole: BH12		
Contract Ref: 765514		Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23		National Grid Co-ordinate: E:446174.0 N:325010.3		Sheet: 2 of 12	

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	20	D	80 blows 89% recovery								Firm fissured greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, quartzite, and siltstone. (stratum copied from 3.90m from previous sheet)			
5.00-5.45	21	UT _(UT100)												
5.45-5.55	22	D												
5.70	23	D	N=24								... Below 6.00m, becoming stiff to very stiff.			
6.00-6.45		SPT												
6.00-6.45	25	DSPT												
6.00-6.45	26	B												
7.30	27	D	150 blows 100% recovery											
7.50-7.95	28	UT _(UT100)												
8.70	29	D												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
30/09/22	13:30	30.80	16.50	146	-				strikes due to flush method. 6. Borehole installed with 50mm standpipe on completion (response zone 16.00m to 30.80m). 7. SPT hammer AR3104-2022 (E_r = 64.00%) used.							
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio Geo 602		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	RSenior + RStan		Checked By:		

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3		Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.00-9.45	31 32	SPT	N=25								Firm fissured greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, quartzite, and siltstone. <i>(stratum copied from 3.90m from previous sheet)</i>	70.03	10.20	
9.00-9.45		DSPT												
9.00-9.45		B												
10.30	33	D	150 blows 89% recovery								Very stiff fissured dark brown slightly sandy gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine of mixed lithologies including sandstone, mudstone, and siltstone.	68.83	(1.20)	
10.50-10.95	34	UT _(UT100)												
11.70	35	D												
12.00-12.37	37 38	SPT	5,7/7,20,23 for 70mm								Very stiff reddish brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular fine of mixed lithologies including sandstone and mudstone.	67.23	(1.60)	
12.00-12.30		DSPT												
12.00-12.30		B												
13.00-13.50	39	B									Firm fissured sandy silty CLAY.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3		Sheet: 6 of 12
End: 30.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
23.05-23.30	58	C		97	90	52		Air+Mist (Brown)			Extremely weak to very weak thinly bedded light grey SILTSTONE. GRADE II. Bedding fractures: Closely spaced, undulating and stepped, rough, clean, locally stained orangish brown. (MERCIA MUDSTONE GROUP)			
23.30-24.80 (0:04)											... 22.33-22.45m: 70° undulating rough clean discontinuity. ... 22.43-22.46m: 20° undulating rough clean discontinuity. Extremely weak to very weak thinly to medium bedded reddish brown silty MUDSTONE. Bedding fracture: Closely to medium spaced, 0° to 10°, undulating, smooth and rough, clean, locally with <1mm clay smear on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 22.16m from previous sheet)			
23.90-24.15	59	C		100	81	55		Air+Mist (Brown)			... 22.74-22.77m: 20° undulating rough clean discontinuity. ... 24.22-24.24m: 20° undulating rough clean discontinuity. ... 24.27-24.32m: very weak light greenish grey siltstone. ... 24.38-24.40m: weak light greenish grey siltstone. ... 24.72-24.90m: Very thickly to thinly bedded light greenish grey siltstone. ... 24.85-24.92m: 70mm diameter siltstone inclusion. ... 24.94-24.96m: 20° undulating rough clean discontinuity. ... 25.24-25.30m: 40° undulating rough clean discontinuity. ... 25.41-25.43m: light greenish grey siltstone.			
24.80-26.30 (0:04)											... 25.90-26.00m: 90° undulating rough clean discontinuity.			
24.95-25.12	60	C		100	78	70		Air+Mist (Brown)						
26.30-27.80 (0:06)														
26.55-26.78	61	C		99	73	61		Air+Mist (Brown)						
Description on next sheet												53.43	26.80	x x x x x x x x x x x x x x x x

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3		Sheet: 7 of 12
End: 30.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
27.80-29.30 (0:04)				99	73	61		Air+Mist (Brown)			Very weak to weak very thinly to thickly bedded light greenish grey SILTSTONE. GRADE II. Bedding fracture: Very closely to closely spaced, 0° to 5°, undulating, rough, with <1mm clay on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 26.80m from previous sheet) ... 27.03-27.04m: firm reddish brown silty clay.	52.93	(0.50)	× × × × × × × × × × × × × × × × × × × ×
28.78-29.00	62	C						Air+Mist (Brown)			Very weak thinly to medium bedded reddish brown silty MUDSTONE. GRADE II. Bedding fractures: Closely to medium spaced, 0° to 10°, undulating, rough, clean, locally with <1mm clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 27.73-28.00m: light greenish grey siltstone. ... 27.97-28.05m: weak light greenish grey siltstone. ... 28.18-28.29m: 70° undulating rough discontinuity with <1mm clay smear of surfaces. ... 28.68-28.86m: Very weak thinly bedded light greenish grey siltstone.		(2.00)	
29.30-30.80 (0:04)				100	77	71		Air+Mist (Brown)			... 29.16-29.18m: moderately weak light greenish grey siltstone. Extremely weak to very weak thinly to medium bedded reddish brown silty MUDSTONE. GRADE II. Bedding fractures: Closely to medium spaced, 0° to 15°, undulating, rough, clean, locally with <1mm clay on surfaces. (MERCIA MUDSTONE GROUP) ... 29.30-29.35m: Drilling disturbed. NI / soft gravelly clay. ... 29.37-29.42m: 30° undulating rough clean locally black stained discontinuity. ... 29.45-29.50m: 25° undulating rough clean locally light stained orangish brown discontinuity. ... 29.45-29.80m: Occasional fine to medium gravel size siltstone inclusions. ... 30.20m-30.23m: 20° undulating smooth lightly orange stained discontinuity locally with <1mm clay on surfaces.	50.93	29.30	
30.33-30.50	63	C		97	67	60		Air+Mist (Brown)			Borehole terminated at 30.80m depth.	49.43	30.80	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio Geo 602		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	RSenior + RStan		Checked By:	AS	AGS
All dimensions in metres										Scale:		1:25				



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3	Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3	Sheet: 10 of 12



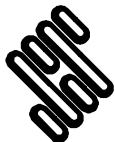
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: RSenior + RStan	Checked By: AS	AGS
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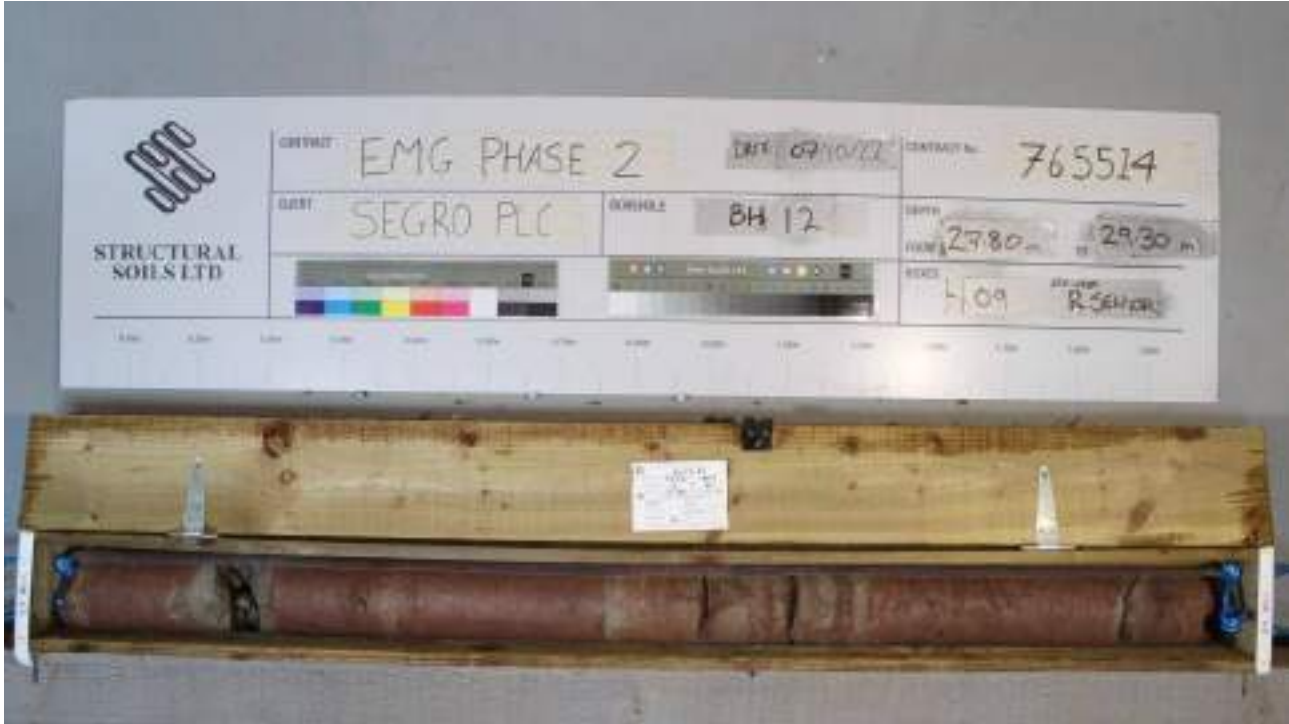
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: RSenior + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH12
Contract Ref: 765514	Start: 26.09.22 End: 30.09.22	Ground Level (m AOD): 80.23	National Grid Co-ordinate: E:446174.0 N:325010.3	Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio Geo 602	Drilled By: Jonny Hutt + Sam Carter	Logged By: RSenior + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 1 of 14
End: 23.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10 0.10-0.20 0.20	1 2 101	D B ES	1xT+1xJ+1xV							TOPSOIL	87.73	(0.30)	
0.50 0.50 0.50-0.70	102 3 4	ES D B	1xT+1xJ+1xV							Firm orangish brown gravelly sandy SILT. Sand is fine to coarse, predominantly coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies. Occasional roots and pockets of organic matter (up to 5mm).	86.83	(0.90)	
1.20 1.20-1.65 1.20-1.65 1.20-1.65	5 7 8	D SPT DSPT B	N=20							Firm to stiff reddish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies.	86.33	(0.50)	
1.80 2.00-2.45 2.00-2.45 2.00-2.45	9 11 12	D SPT DSPT B	N=7							Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies.		(1.90)	
2.70 3.00-3.45	13 14	D UT _(UT100)	62 blows 94% recovery								84.43	3.60	
3.45-3.55 3.70 4.00-4.45 4.00-4.45 4.00-4.45	15 16 18 19	D D SPT DSPT B	N=20							Stiff reddish brown mottled grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
20/09/22	16:10	9.00	7.50	200	8.00	8.70	9.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Groundwater struck at 9.00m depth, rising to 8.00m depth after 20 minutes. 4. Cable percussion drilled using 200mm diameter tools and casing. 5. Rotary cored from 9.38m using SWF core barrel and 150mm diameter casing and air mist flush.	
21/09/22	12:30	9.00	None	200	6.70					
21/09/22	17:00	15.00	9.00	150	-					
22/09/22	08:00	15.00	9.00	150	9.30					
22/09/22	17:00	28.50	9.00	150	24.00					
23/09/22	08:00	28.50	9.00	150	-				All dimensions in metres	
23/09/22	10:00	30.00	9.00	150	-				Scale: 1:25	
Method Used: Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205		Drilled By: Jonny Hutt + Luke Bamford		Logged By: DNeylon + RStan		Checked By:		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 2 of 14

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.90 5.00-5.45	20 21	D UT _(UT100)	150 blows 78% recovery							Stiff reddish brown mottled grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies. (stratum copied from 3.60m from previous sheet)			
5.45-5.55	22	D										(3.60)	
5.70	23	D											
6.00-6.45 6.00-6.45 6.00-6.45	25 26	SPT DSPT B	N=29										
7.30 7.50-7.95 7.50-7.95 7.50-7.95	27 29 30	D SPT DSPT B	6,6/9,12,15,14 for 70mm							Stiff to very stiff reddish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse of mudstone. Gravel is subangular fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)	80.83	7.20	
8.70	31	D										(1.80)	
											79.03	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Unable to determine ground water strikes due to flush method. 7. Borehole installed with 50mm standpipe on completion (response zone 8.00m to 30.00m) 8. SPT hammer AR3104-2022 (E _r = 64.00%) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205			All dimensions in metres	Scale: 1:25
Drilled By: Jonny Hutt + Luke Bamford						Logged By: DNeylon + RStan			Checked By:	

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 4 of 14
End: 23.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-15.00	39	C		↑	↑	↑				13.45-13.48m: extremely weak greenish grey siltstone.	74.48	13.55	
13.85-13.97										Extremely weak thinly laminated reddish brown MUDSTONE with pockets (up to 20mm) of greenish grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP)	73.98	14.05	(0.50)
				90	50	0				Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Very closely spaced, randomly orientated, smooth, planar. (MERCIA MUDSTONE GROUP)	73.48	14.55	(0.50)
15.00-16.50	40	D		↑	↑	↑				14.50-14.55m: greenish grey siltstone with bedding fractures infilled with reddish brown very gravelly clay.			
										Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. Fractures: Closely spaced, randomly orientated. (MERCIA MUDSTONE GROUP)	72.93	15.10	(0.55)
15.30										Reddish brown very clayey sandy angular to subangular fine to coarse GRAVEL of extremely weak mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)	72.63	15.40	(0.30)
				90	50	0				Very stiff slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)	72.33	15.70	(0.30)
										Stiff thinly laminated greenish grey slightly gravelly SILT. (MERCIA MUDSTONE GROUP)	72.18	15.85	(0.55)
16.50-18.00	41	C		↑	↑	↑				Extremely weak greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP)	71.53	16.50	
										Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, with black specks on surfaces. (MERCIA MUDSTONE GROUP)	71.08	16.95	(0.45)
										Extremely weak reddish brown MUDSTONE, recovered as NI. GRADE II. Fractures: Very closely spaced, randomly orientated, with dark brown staining. (MERCIA MUDSTONE GROUP)	70.73	17.30	(0.35)
				93	25	0				Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP)	70.48	17.55	
										Extremely weak reddish brown MUDSTONE thickly interlaminated with greenish grey fine grained SANDSTONE			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 5 of 14

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50	42	C		↑	↑	↑				and SILTSTONE. (MERCIA MUDSTONE GROUP) Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated. (MERCIA MUDSTONE GROUP) (stratum copied from 17.55m from previous sheet) ... 8.15-18.30m: Thinly interlaminated with greenish grey siltstone.	69.08	18.95	
18.45-18.70				97	50	43							
19.50-21.00	43	C		↑	↑	↑				Stiff reddish brown slightly sandy gravelly CLAY with frequent thick laminae (up to 10mm) of greenish grey silt. Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) Black thinly cross laminated greenish grey SANDSTONE. (MERCIA MUDSTONE GROUP) Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) ... 19.65-19.70m: Weak greenish grey siltstone. ... 19.95-20.20m: Bedding fractures: very closely spaced, rough, undulating, infilled with subangular gravel. ... 20.30m: Becoming very weak with closely spaced randomly orientated rough undulating fractures, with occasional black staining on fracture surfaces.	68.68	19.35	
20.20-20.35				90	57	48							
21.00-22.50	44	C		↑	↑	↑				... 21.00m: Closely spaced randomly orientated smooth undulating fractures with occasional black staining along surfaces. ... 21.95-22.20m: Rough undulating bedding fractures, infilled (<50mm) with sandy gravel.	68.53	19.50	
22.35-22.50				107	27	15							
				↓	↓	↓					65.53	22.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 Mark 2 + Comacchio GEO 205		Drilled By: Jonny Hutt + Luke Bamford		Logged By: DNeylon + RStan		Checked By: 			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 6 of 14
End: 23.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.50-24.00	45	C		↑	↑	↑				Weak greenish grey fine to medium grained SANDSTONE with occasional vugs (up to 0.6mm). (MERCIA MUDSTONE GROUP)	65.28	22.75	
22.63-22.85										Extremely weak reddish brown MUDSTONE. Fractures: Very closely to closely spaced, randomly orientated, undulating, with dark brown staining on surfaces. (MERCIA MUDSTONE GROUP)			
				97	21	13				23.05-23.15m: Greenish grey siltstone.			
										23.15-23.70m: Rough undulating fracture, approximately 80°, with dark brown staining along the fracture surface.		(1.60)	
										23.70-23.80m: Extremely weak greenish grey thinly laminated siltstone.			
24.00-25.50	46	C		↑	↑	↑					63.68	24.35	
										Weak greenish grey fine to medium grained SANDSTONE with occasional vugs (up to 0.6mm). (MERCIA MUDSTONE GROUP)		(0.45)	
				90	47	29					63.23	24.80	
24.82-25.12	46	C								Extremely weak to weak reddish brown MUDSTONE thinly interbedded with greenish grey SILTSTONE. Bedding fractures: Closely spaced, rough, infilled with reddish brown gravelly clay and green silt. (MERCIA MUDSTONE GROUP)		(0.70)	
										24.95-25.00m: Bedding fracture infilled (<100mm) with reddish brown clay.	62.53	25.50	
										25.45m: Thinly interbedded.			
25.50-27.00	47	C		↑	↑	↑				Weak to medium strong greenish grey fine to medium grained SANDSTONE. (MERCIA MUDSTONE GROUP)		(0.50)	
										25.65-25.80m: Interspersed with reddish brown siltstone.	62.03	26.00	
										25.90m: Abundant fine to medium sand size vugs,			
				93	29	23				Very stiff reddish brown slightly sandy CLAY. Sand is fine of mudstone. GRADE IVb. (MERCIA MUDSTONE GROUP)			
26.50-26.72	47	C								26.38-26.45m: Weak greenish grey fine to medium grained sandstone with fine to medium sand size vugs.		(1.45)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



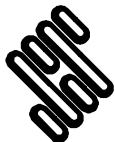
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2		Sheet: 7 of 14

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
27.00-28.50	48	C		↑	↑	↑				Very stiff reddish brown slightly sandy CLAY. Sand is fine of mudstone. GRADE IVb. (MERCIA MUDSTONE GROUP) (stratum copied from 26.00m from previous sheet)	60.58	27.45	
27.50-27.75				100	53	0				... 27.00m: Fine to coarse gravel size pockets of greenish grey silt. Stiff greenish grey sandy SILT. (MERCIA MUDSTONE GROUP)	60.33	27.70	
28.50-30.00				↓	↓	↓				Stiff reddish brown slightly sandy slightly gravelly CLAY. Interspersed with greenish grey sandy silt. Sand is fine and medium of mudstone and siltstone. Gravel is angular to subangular fine and medium of mudstone and siltstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP)	59.58	28.45	
29.20-29.50	49	C		100	6	4				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 28.45-28.55m: Thinly interbedded with greenish grey siltstone. ... 28.55-28.75m: Very closely spaced randomly orientated fractures. ... 29.00m: Rare pockets of siltstone.		(1.55)	
				↓	↓	↓				Borehole terminated at 30.00m depth.	58.03	30.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 Mark 2 + Cornacchio GEO 205		Drilled By: Jonny Hutt + Luke Bamford		Logged By: DNeylon + RStan
										Checked By:
										Scale: 1:25



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 8 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNeylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 9 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNeylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 10 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: D.Neylon + R.Stan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 11 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNeylon + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 12 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: D.Neylon + R.Stan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 13 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: D.Neylon + R.Stan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH13
Contract Ref: 765514	Start: 20.09.22 End: 23.09.22	Ground Level (m AOD): 88.03	National Grid Co-ordinate: E:446479.7 N:325113.2	Sheet: 14 of 14



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 Mark 2 + Cornacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNeylon + RStan	Checked By: AS	AGS
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



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 1 of 12



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.10 0.10-0.30 0.20	1 2 101	D B ES	1xT+1xJ+1xV								TOPSOIL	84.28	0.40	
0.50	102	ES	1xT+1xJ+1xV								Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including quartzite, metamorphic rock, and sandstone.			
0.70 0.70-0.90	3 4	D B												
1.00	103	ES	1xT+1xJ+1xV										(1.30)	
1.20 1.20-1.50	5 6	D UT _(UT100)	150 blows 83% recovery									82.98	1.70	
1.50-1.63	7	D									Firm reddish brown sandy CLAY. Sand is fine to coarse, predominantly coarse.			
1.80	8	D												
2.00-2.45 2.00-2.45 2.00-2.45	10 11	SPT DSPT B	N=12										(1.10)	
2.90 3.00-3.45	12 13	D UT _(UT100)	150 blows 89% recovery								Stiff thinly to thickly laminated reddish brown sandy CLAY. Sand is fine to coarse.	81.88	2.80	
3.00-3.50	15	B												
3.45-3.55	14	D											(1.50)	
3.70	16	D												
4.00-4.45 4.00-4.45 4.00-4.45	18 19	SPT DSPT B	N=31									80.38	4.30	
Description on next sheet														

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
21/09/22	17:34	12.50	12.00	200	10.80	12.30	12.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion borehole drilled using 200mm tools and casing. 4. 200 litres of water added added between 9.00m and 12.00m to aid drilling. 5. Rotary cored from 12.50m using Geobor-S and air mist flush.					
26/09/22	10:00	12.50	12.50	200	9.20									
26/09/22	16:30	21.90	12.50	146	-									
27/09/22	09:00	21.90	12.50	146	9.20									
27/09/22	16:30	24.90	12.50	146	-									
All dimensions in metres									Scale: 1:25					
Method Used:	Inspection pit + Cable Percussion + Rotary Cored			Plant Used:	Dando 3000 + Cornacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	JAlton + RSenior	Checked By:		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	20	D	N=15								Stiff fissured reddish brown mottled grey sandy CLAY. Sand is fine to coarse. (stratum copied from 4.30m from previous sheet)	78.68	(1.70)	
5.00-5.45	22	SPT												
5.00-5.45	23	DSPT B												
5.70	24	D	N=37								Stiff fissured dark brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including quartzite, metamorphic rock, and sandstone.	77.48	(1.20)	
6.00-6.45	26	SPT												
6.00-6.45		B												
7.30	27	D	N=32								Stiff dark brown sandy CLAY. Sand is fine to coarse.		(2.50)	
7.50-7.95	29	SPT												
7.50-7.95	30	DSPT B												
8.70	31	D												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
									6. No groundwater strikes in the cable percussion section. Unable to determine ground water strikes due to flush method. 7. Borehole installed with 50mm standpipe upon completion (response zone 1.00m to 11.50m). 8. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.				
										All dimensions in metres		Scale: 1:25	
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 + Comacchio GEO 601		Drilled By: Jonny Hutt + Sam Carter		Logged By: JAlton + RSenior		Checked By: 			



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 3 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend		
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)									
9.00-9.45 9.00-9.45 9.00-9.45	33 34	SPT DSPT B	N=31								Stiff dark brown sandy CLAY. Sand is fine to coarse. (stratum copied from 7.20m from previous sheet)	74.98	9.70			
10.30	35	D	N=29								Stiff dark reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subrounded to subangular fine to coarse of mixed lithologies including quartzite, metamorphic rock, sandstone, and mudstone.		(1.50)			
10.50-10.95 10.50-10.95 10.50-10.95	37 38	SPT DSPT B														
11.70	39	D	3,6/10,11,15,14 for 55mm								Stiff to very stiff reddish brown mottled light greenish grey gravelly silty CLAY. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. With occasional pockets of grey siltstone. GRADE IVb. (MERCIA MUDSTONE GROUP)		(1.30)			
12.00-12.43 12.00-12.43 12.00-12.45	41 42	SPT DSPT B														
12.50-12.90 (0:01) 12.50-12.77	44 45	SPT	13,12/24,26 for 65mm	↑	↑	↑		↑			AZCL (MERCIA MUDSTONE GROUP)	71.98	12.70	AZCL		
12.50-12.77 12.80 12.90-14.40 (0:05)		DSPT D		↓	↓	↓		↑	↑			Stiff to very stiff thickly laminated to very thinly bedded reddish brown mottled light greenish grey silty CLAY with frequent angular to subangular fine and medium gravel sized lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)	71.78	12.90		
					93	43	0	NI 30 80	↑	↑						
											Description on next sheet 13.32-13.55m: 85°-90° undulating rough black stained		(1.10)			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 4 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
13.90	46	D		93	43	0	NI 30 80	Air+Mist (Brown)			locally orangish brown stained discontinuity. Extremely weak to very weak thickly laminated to thinly bedded reddish brown MUDSTONE. GRADE II.	70.68	14.00	
14.40-15.90 (0:05)											Bedding fractures: Very close to closely spaced, 0° to 5°, undulating, smooth, locally stained black and orangish brown.		(0.35)	
14.62-14.78	47	C									Fracture set 2: Extremely closely to very closely spaced, randomly orientated, smooth and rough, locally black and orangish brown stained. (MERCIA MUDSTONE GROUP) (stratum copied from 12.90m from previous sheet) ... 13.59-13.61m: Very weak light greenish grey siltstone. ... 13.60-13.80m: 60° undulating smooth clean locally orangish brown stained discontinuity. ... 13.98-14.00m: Very weak light greenish grey siltstone with occasional black specks on discontinuity surfaces.	70.33	14.35	
15.90-17.40 (0:06)							NI 50 130				Very stiff thickly laminated to very thinly bedded reddish brown CLAY with frequent angular to subangular fine and medium gravel sized lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP) ... 14.10-14.12m: Stiff light greenish grey silt.			
16.63-16.75	48	C		97	73	20		Air+Mist (Brown)			Extremely weak to weak thickly laminated to thinly bedded reddish brown mottled light greenish grey MUDSTONE. Bedding fracture: Very closely to closely spaced, locally extremely closely spaced, undulating, smooth, clean, locally rough, with occasional black staining on surfaces. (MERCIA MUDSTONE GROUP) ... 14.78-14.85m: Weak silty mudstone. ... 15.08-15.42m: 85° to 90° undulating smooth orangish brown stained and black speckled discontinuity. ... 15.29-15.36m: 50° undulating smooth locally orangish brown stained discontinuity with rare black specks.		(4.75)	
17.40-18.90 (0:05)														
				100	47	27		Air+Mist (Brown)						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	JAlton + RSenior	Checked By:	AS	AGS
All dimensions in metres										Scale:		1:25			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 5 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.44-18.63	50	C		100	47	27	NI 50 130	Air+Mist (Brown)			... 15.60-15.62m: Extremely weak light greenish grey siltstone. ... 15.69-15.70m: Extremely weak light greenish grey siltstone. ... 15.75-15.90m: Extremely weak and thinly laminated mudstone. ... 15.95-15.97m: Strong light grey siltstone. ... 16.14-16.16m: Strong light grey siltstone. ... 16.27-16.30m: Strong light grey siltstone. ... 16.30-16.39m: Drilling disturbed, recovered as (soft) gravelly clay. ... 16.48-16.58m: 90° undulating smooth clean, locally lightly stained orange. ... 16.59-16.60m: Light greenish grey siltstone. ... 16.84-17.06m: 75° undulating smooth black stained discontinuity. ... 17.05-17.15m: 80°-90° undulating smooth black stained locally orangish brown stained discontinuity. ... 17.27-17.29m: Extremely weak light greenish grey siltstone. ... 17.40-17.50m: Drilling disturbed, recovered as angular fine to coarse gravel size fragments. ... 17.50-17.65m: 85° to 90° undulating rough discontinuity with frequent black specks on surface. ... 17.65-17.80m: 90° undulating rough black stained discontinuity. ... 17.80-19.10m: extremely closely to very closely spaced, randomly orientated, undulating, smooth and rough, clean and black stained discontinuities. Extremely weak to weak thickly laminated to thinly bedded reddish brown mottled light greenish grey MUDSTONE. Bedding fracture: Very closely to closely spaced, locally extremely closely spaced, undulating, smooth, clean, locally rough, with occasional black staining on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 14.35m from previous sheet) ... 18.90-19.10m: strong thinly bedded light grey siltstone.	65.58	19.10	
18.90-20.40 (0:05)														
19.50-19.80	51	C		100	72	45	NI 80 300	Air+Mist (Brown)					(1.65)	
20.40-21.90 (0:05)														
20.40-20.53	52	C										63.93	20.75	
20.80-21.05	53	C		100	97	81	NI 120 260	Air+Mist (Brown)					(1.00)	
												62.93	21.75	
21.90-23.40 (0:05)				100	53	17	NI 60 260	Air+Mist (Brown)				62.78	21.90	
													(0.62)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	JAlton + RSenior	Checked By:	AS	AGS
All dimensions in metres										Scale:		1:25			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 6 of 12

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
23.19-23.33	54	C		100	53	17	NI 60 260	Air+Mist (Brown)			Extremely weak to very weak very thickly to thinly locally medium bedded reddish brown mottled light greenish grey MUDSTONE. Bedding fractures: Very closely to medium spaced, 0° to 5°, undulating, smooth, clean and lightly black stained. (MERCIA MUDSTONE GROUP) ... 20.09-20.15m: Extremely weak to very weak thinly and thickly laminated light greenish grey siltstone.	62.16	22.52	
23.40-24.90 (0:06)													(0.98)	
24.00	55	D		100	22	13	NI NI 280	Air+Mist (Brown)			Very weak to weak thinly to medium bedded light greenish grey SILTSTONE with frequent vugs (up to 5mm). GRADE III. Bedding fractures: Closely to medium spaced, 0° to 5°, undulating, rough, with frequent black specks locally clean. (MERCIA MUDSTONE GROUP) ... 21.25-21.57m: Siltstone is very thinly to thinly bedded with interbeds of very weak reddish brown mudstone.	61.18	23.50	
24.64-24.90	56	C									Extremely weak thickly laminated to very thinly bedded reddish brown mottled light greenish grey MUDSTONE. GRADE II. Bedding fractures: Very closely spaced, undulating, rough, clean, locally black stained. (MERCIA MUDSTONE GROUP) ... 22.40-22.50m: 50° undulating rough discontinuity with occasional black specks. Medium strong thinly to medium bedded light greenish grey SILTSTONE. GRADE I. Bedding fractures: Closely to medium spaced, 0° to 10°, undulating, rough, clean, locally with occasional black specks on surface. (MERCIA MUDSTONE GROUP) (stratum copied from 21.90m from previous sheet) Extremely weak to very weak thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, rough, clean, locally with <1mm clay surfaces. (MERCIA MUDSTONE GROUP) Description on next sheet	59.78	24.90	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 601			All dimensions in metres	
Drilled By: Jonny Hutt + Sam Carter						Logged By: JAlton + RSenior			Scale: 1:25	Checked By:



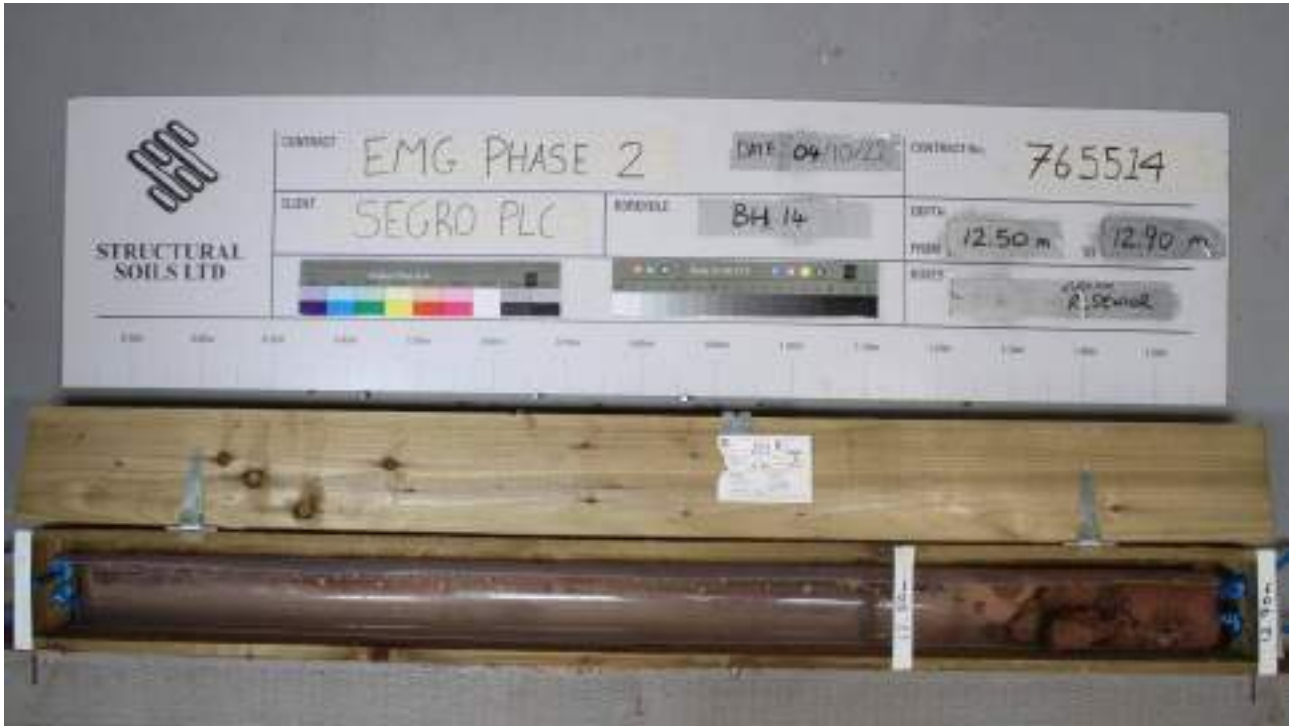
Contract: EMG Phase 2			Client: SEGRO			Borehole: BH14
Contract Ref: 765514		Start: 15.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 7 of 12
		End: 27.09.22				

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
											<p>... 22.55-22.65m: 50° undulating rough clean discontinuity.</p> <p>... 22.74-22.77m: Extremely weak light greenish grey siltstone.</p> <p>... 23.21-23.40m: Very weak very thinly bedded light greenish grey siltstone.</p> <p>... 23.40-23.49m: 88° to 90° undulating rough clean discontinuity.</p> <p>Stiff to very stiff thickly laminated to very thinly bedded reddish brown silty CLAY with frequent angular to subangular fine and medium gravel sized lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)</p> <p>... 23.93-24.09m: Extremely weak light greenish grey siltstone.</p> <p>... 24.32-24.40m: Extremely weak light greenish grey siltstone.</p> <p>... 24.46-24.50m: Weak light greenish grey siltstone.</p> <p>... 24.64-24.73m: Very weak to weak light greenish grey siltstone.</p> <p>Borehole terminated at 24.90m depth.</p>			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0	Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0	Sheet: 10 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH14
Contract Ref: 765514	Start: 15.09.22 End: 27.09.22	Ground Level (m AOD): 84.68	National Grid Co-ordinate: E:446455.2 N:325059.0		Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: JAlton + RSenior	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4		Sheet: 1 of 13

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
0.10 0.10 0.10-0.30	1 101 2	D ES B	1xT+1xJ+1xV								TOPSOIL	81.09	(0.40)	
0.60 0.70 0.70-0.90	102 3 4	ES D B	1xT+1xJ+1xV								Stiff reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, and mudstone.			
1.20 1.20-1.50	5 6	D UT _(UT100)	150 blows 83% recovery										(2.20)	
1.50-1.60	7	D												
1.70	8	D												
2.00-2.45 2.00-2.45 2.00-2.45	10 11	SPT DSPT B	N=30									78.89	2.60	
2.60-3.00	12	B									Greyish brown sandy silty very angular to subangular coarse GRAVEL of mixed lithologies including sandstone and quartzite. Sand is fine to coarse.	78.49	(0.40)	
3.00-3.45 3.00-3.45 3.00-3.45	14 15	SPT DSPT B	N=30								Medium dense to dense greyish brown silty SAND.	78.04	(0.45)	
3.70	16	D									Dense greyish brown very gravelly silty fine to coarse SAND. Gravel is fine to coarse of mixed lithologies including sandstone and siltstone.			
4.00-4.45 4.00-4.45	18	SPT(c) B	N=32											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
22/09/22	17:00	3.00	3.00	200	Dry	9.20	9.60	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. 200 litres of water added from 3.00m to 12.00m to aid drilling. 5. Rotary cored from 14.00m using Geobor-S and air mist flush. All dimensions in metres Scale: 1:25							
23/09/22	07:42	3.00	3.00	200	Dry	11.20	11.70	01:00								
23/09/22	15:00	12.00	12.00	200	9.10	13.30	13.80	01:00								
26/09/22	09:20	12.00	12.00	200	6.60											
26/09/22	13:24	14.00	13.50	200	-											
28/09/22	11:00	14.00	13.50	200	12.50											
28/09/22	17:00	26.35	13.50	146	24.50											
29/09/22	08:30	26.35	13.50	146	6.40											
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Cornacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	DNartey + RStan		Checked By:	AS	AGS





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4		Sheet: 2 of 13

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	19	D	N=33								Dense greyish brown very gravelly silty fine to coarse SAND. Gravel is fine to coarse of mixed lithologies including sandstone and siltstone. (stratum copied from 3.45m from previous sheet) ... Below 5.00m: Gravelly.		(2.55)	
5.00-5.45 5.00-5.45	21	SPT(c) B												
5.70	22	D	N=33								Medium dense to dense orangish brown very gravelly silty fine to coarse SAND. Gravel is fine of mixed lithologies including sandstone, siltstone, and limestone.	75.49	6.00	
6.00-6.45 6.00-6.45	24	SPT(c) B												
7.30	25	D	N=26								Description on next sheet		(2.30)	
7.50-7.95 7.50-7.95 7.50-7.95	27 28	SPT DSPT B												
8.70	29	D										73.19	8.30	
													(0.90)	



Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
29/09/22	17:00	30.85	13.50	146	-							
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 601			Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: 	



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend		
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)									
9.00-9.32		SPT	4,5/7,26,17 for 20mm								Stiff laminated reddish brown mottled grey slightly sandy gravelly SILT. Sand is fine to coarse, predominantly coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and coal. Low cobble content of flint. <i>(stratum copied from 8.30m from previous sheet)</i> Cobbles and boulders of flint. Medium dense orangish brown silty sandy angular to subangular fine to coarse GRAVEL of mixed lithologies including sandstone, siltstone, and flint. With low cobble content.	72.29	9.20			
9.00-9.32	31	DSPT											(0.40)			
9.00-9.32	32	B										71.89	9.60			
10.30	33	D														
10.50-10.95		SPT	N=23											(2.10)		
10.50-10.95	35	DSPT														
10.50-10.95	36	B														
11.20-11.70	37	B														
11.80	38	D														
12.00-12.45		SPT	N=36								Stiff reddish brown mottled grey gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including mudstone and flint.			(1.00)		
12.00-12.45	40	DSPT														
12.00-12.45	41	B														
12.50	42	W														

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Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:		Jonny Hutt + Sam Carter		Logged By:		DNarley + RStan		Checked By:					

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4		Sheet: 5 of 13

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.85-20.35 (0:06)				100	92	66	15 350 830	Air+Mist (Brown)			... 16.27-16.28m: 4° undulating grough clean. ... 16.30-16.31m: 5° planar rough abundant black staining. ... 16.35-16.40m: NI, recovered as silty angular fine to medium gravel. ... 16.40-16.46m: 84° planar rough abundant black staining. ... 16.46-16.50m: NI, recovered as clayey silty angular fine to medium gravel. ... 16.50-16.59m: 82° undulating rough abundant black staining. ... 16.59-16.60m: 5° planar rough abundant black staining. ... 17.12-17.14m: Grey siltstone. ... 17.16-17.18m: NI, recovered as silty sandy gravel. ... 17.18-17.24m: Grey siltstone. ... 17.35-17.43m: 43° undulating rough occasional black staining. ... 17.79-18.20m: Weak grey siltstone.			
19.61-19.89	54	C		100	100	96	70 120 490	Air+Mist (Brown)			... 17.95-17.99m: 12° undulating rough occasional brown staining. ... 17.98-17.99m: 4° undulating rough occasional brown staining. Extremely weak to weak reddish brown silty MUDSTONE. Fractures: Closely spaced, 0-10°, planar, rough, frequently black stained. (MERCIA MUDSTONE GROUP) ... 15.08-15.09m: 6° planar rough with silty clay infill (<3mm). (stratum copied from 15.08m from previous sheet) ... 18.02-18.05m: 15° planar rough abundant brown staining. ... 18.07-18.08m: 6° undulating grough abundant brown staining. ... 18.16-18.17m: 5° undulating rough abundant brown and yellow staining. ... 18.20-18.23m: NI. ... 18.20-18.66m: Grey mottled reddish brown siltstone interbedded with mudstone. ... 18.32-18.38m: 29° planar rough occasional black staining. ... 18.98-19.00m: NI. ... 19.01-19.26m: Medium strong grey siltstone. ... 19.11-19.13m: 9° planar rough occasional brown staining.	61.51	19.98	
20.35-21.85 (0:06)													(0.44)	
20.51-20.69	55	C										61.07	20.42	
21.85-23.35 (0:05)				100	77	77	NI NI NI	Air+Mist (Brown)					(1.48)	
22.03-22.26	56	C		100	97	97	NI NI NI	Air+Mist (Brown)				59.59	21.90	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	DNartey + RStan		Checked By:	AS	AGS

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4		Sheet: 6 of 13

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
23.35-24.85 (0:06)				100	97	97	NI	Air+Mist (Brown)			... 19.26-19.97m: Grey mottled reddish brown siltstone and mudstone. ... 19.34-19.41m: 40° planar rough abundant black staining. ... 19.59-19.64m: 27° planar rough clean. Very weak to weak reddish brown silty sandy MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) Very weak to weak reddish brown mottled grey fine and medium grained SANDSTONE interbedded with grey siltstone. (MERCIA MUDSTONE GROUP) ... 21.50-21.90m: NI. ... 22.26-22.28m: Reddish brown fine to medium grained sandstone. Very weak to weak reddish brown MUDSTONE. Occasional pockets and laminae of grey siltstone. Rare laminae of reddish brown fine to medium grained sandstone. GRADE II. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 21.90m from previous sheet</i>) ... 23.35-23.40m: 43° undulating rough clean. ... 23.41-23.43m: 9° planar rough brown stained. ... 23.48-23.52m: 33° planar rough brown stained. ... 23.53-23.56m: 16° planar rough brown stained. ... 24.66-24.78m: With laminae of grey siltstone. ... 25.20-25.43m: Grey mottled reddish brown siltstone and mudstone. ... 25.60-25.71m: Pockets grey siltstone. ... 25.98-26.65m: Weak fine grained sandstone.			
24.20-24.51	57	C		95	92	67	60 80 NI	Air+Mist (Brown)						
24.85-26.35 (0:06)														
25.55-25.91	58	C		100	100	100	NI	Air+Mist (Brown)						
26.35-27.85 (0:06)														
26.60-26.90	59	C		100	98	98	NI	Air+Mist (Brown)			... 26.65-27.05m: Grey siltstone. ... 26.90-26.93m: NI.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 601		Drilled By:	Jonny Hutt + Sam Carter		Logged By:	DNartey + RStan		Checked By:	AS	AGS



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4		Sheet: 7 of 13

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
27.85-29.35 (0:06)	60	C		100	98	98	NI NI NI	Air+Mist (Brown)			Very weak to weak reddish brown MUDSTONE. Occasional pockets and laminae of grey siltstone. Rare laminae of reddish brown fine to medium grained sandstone. GRADE II. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 21.90m from previous sheet</i>) ... 27.34-27.38m: Grey siltstone. ... 27.47-27.75m: Weak grey siltstone ... 27.75-27.85m: Sandy mudstone. ... 28.08-28.14m: Medium strong grey siltstone. ... 28.14-28.60m: Grey mottled reddish brown siltstone. ... 28.36-28.43m: 35° planar rough brown stained. ... 28.95-28.97m: Reddish brown fine grained sandstone.			
28.43-28.68				100	100	100	NI NI NI	Air+Mist (Brown)						
29.35-30.85 (0:04)				100	100	100		Air+Mist (Brown)				51.97	29.52	
29.35-30.85	61	C		100	100	100		Air+Mist (Brown)			Weak reddish brown fine and medium grained SANDSTONE. Occasional pockets and laminae of grey siltstone and very weak reddish brown mudstone. (MERCIA MUDSTONE GROUP) ... 30.03-30.18m: Reddish brown mudstone. ... 30.82-30.85m: Grey siltstone. Borehole terminated at 30.85m depth.		(1.33)	
												50.64	30.85	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			

GINT LIBRARY_V10_01.GLB LibVersion: v8.07 | Log COMPOSITE LOG - A4P | 765514, EAST MIDLAND AIRPORT.GPJ - v10_01. Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 20:54 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 8 of 13



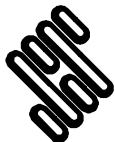
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 9 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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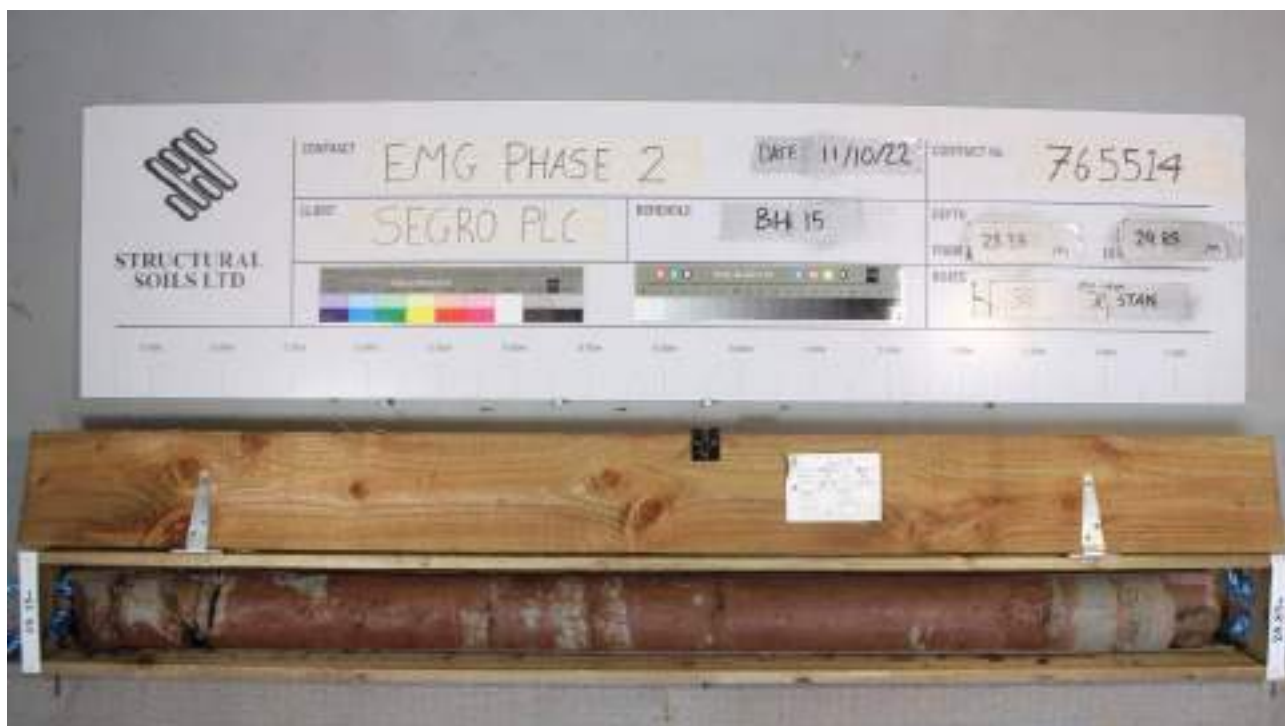
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 10 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 11 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 12 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH15
Contract Ref: 765514	Start: 22.09.22 End: 29.09.22	Ground Level (m AOD): 81.49	National Grid Co-ordinate: E:446370.2 N:325029.4	Sheet: 13 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 601	Drilled By: Jonny Hutt + Sam Carter	Logged By: DNartey + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7		Sheet: 1 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00-4.50										TOPSOIL			
0.20	1	D										(0.60)	
0.20-0.40	2	B									73.38	0.60	
0.70	3	D								Firm reddish brown gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite and sandstone.	73.08	(0.30)	
0.70-0.80	4	B										0.90	
1.00-1.20	5	B								Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse, predominant coarse. Gravel is subangular to subrounded fine to coarse of metamorphic rocks, sandstone, and occasional quartzite.		(0.40)	
1.20-1.40	6	UT _(UT100)	150 blows 100% recovery								72.68	1.30	
1.40-1.50	7	D								Stiff to very stiff reddish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is angular to subangular of mudstone lithorelicts. GRADE IVb. (MERCIA MUDSTONE GROUP)			
1.70	8	D											
2.00-2.45			N=32										
2.00-2.45	10	SPT											
2.00-2.45	11	DSPT B											
2.70	12	D											
3.00-3.43		SPT	9,9/9,13,16,12 for 55mm									(3.20)	
3.00-3.43	14	DSPT											
3.00-3.45	15	B											
3.70	16	D											
4.00-4.36		SPT	9,12/16,18,16 for 60mm										
4.00-4.36	18	DSPT									69.48	4.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
16/09/22	16:00	4.00	3.00	200	Dry	3.60	4.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water	
20/09/22	11:00	4.00	None	200	3.20					
20/09/22	17:00	14.00	4.50	150	-					
21/09/22	08:00	14.00	4.50	150	5.30					
21/08/32	11:00	20.00	4.50	150	13.00					
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres Scale: 1:25	
Drilled By: Jonny Hutt + Luke Bamford						Logged By: DNartey + DNeylon			Checked By:	



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7		Sheet: 2 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50-5.00	20	D		60	0	0				Stiff reddish brown slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of mudstone lithorelicts with some exhibiting thin laminae. GRADE III. (MERCIA MUDSTONE GROUP)			
4.90												(1.05)	
5.00-6.50											68.43	5.55	
5.55-5.75	21	C		73	13	13				Extremely weak reddish brown thinly laminated MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP)	68.18	5.80	
6.30	22	D								Firm reddish brown slightly sandy gravelly CLAY with fine to coarse gravel sized pockets of sandy silt. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)		(0.65)	
6.50-8.00											67.53	6.45	
7.50-8.00	23	C		77	17	17				Extremely weak reddish brown MUDSTONE with frequent randomly orientated smooth planar clean fractures. GRADE II. (MERCIA MUDSTONE GROUP) ... 7.10-7.25m: Very closely spaced laminae (<10mm) and medium to coarse gravel size pockets of thinly cross laminated siltstone. ... 7.35-7.45m: Very closely spaced laminae (<10mm) of extremely weak greenish grey thinly cross laminated siltstone, with occasional clay. ... 8.25-8.30m: Thinly laminated cream siltstone and mudstone. ... 8.40-8.45m: Thinly laminated coloured siltstone and mudstone.		(3.00)	
8.00-9.50													
				77	15	8							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									strikes due to flush method. 6. Borehole installed with 50mm diameter standpipe on completion (response zone 2.00m to 20.00m). 7. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Luke Bamford						Logged By: DNartey + DNeylon			Scale: 1:25	Checked By:



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH16	
Contract Ref: 765514		Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7		Sheet: 3 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.50-11.00	24	D		77	15	8				Extremely weak reddish brown MUDSTONE with frequent randomly orientated smooth planar clean fractures. GRADE II. (MERCIA MUDSTONE GROUP) (stratum copied from 6.45m from previous sheet)	64.53	9.45	
10.20				100	3	0				Extremely weak reddish brown MUDSTONE. (MERCIA MUDSTONE GROUP)			
11.00-12.50										10.25-10.85m: Smooth planar incipient fracture at approx angle of 85° running through the centre of the core.			
11.25	25	D								10.85-10.95m: Fine to coarse gravel size pockets of greenish grey siltstone.		(2.95)	
11.90-12.10				93	49	45				10.90-11.50m: Very closely spaced randomly orientated closed fractures.			
12.50-14.00	26	C								Extremely weak to very weak thinly laminated greenish grey SILTSTONE with vugs (up to 20mm). (MERCIA MUDSTONE GROUP)	61.58	12.40	x x x x
13.30-13.40				93	29	0				Description on next sheet	61.08	12.90	x x x x
	27	C											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Jonny Hutt + Luke Bamford	Logged By:	DNartey + DNeylon	Checked By:	AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7		Sheet: 4 of 11
End: 15.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
14.00-15.50				93	29	0				Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Closely spaced, randomly orientated, undulating, smooth, with occasional yellow staining and black specks on surfaces. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 12.90m from previous sheet</i>)	59.78	14.20	
14.25-14.55	28	C								Extremely weak to very weak thinly laminated greenish grey SILTSTONE with vugs (up to 20mm). (MERCIA MUDSTONE GROUP)	59.38	14.60	x x x x
15.10-15.35	29	C		100	63	45				Extremely weak reddish brown MUDSTONE closely interbedded with extremely weak greenish grey SILTSTONE. Boundaries of interbeds are transitional and not distinct. Bedding fractures: Closely spaced, rough, planar, with sandy clay infill. (MERCIA MUDSTONE GROUP)	58.63	15.35	x x x x
15.50-17.00										Very weak to weak thickly cross laminated greenish grey SANDSTONE. (MERCIA MUDSTONE GROUP) . . . 15.35-15.70m: Rough undulating fracture at approx 85° through the core with black specks and yellow stain along surfaces. . . . 15.70-15.75m: Subhorizontal rough undulating wide bedding fracture infilled with sandy gravel of sandstone and red clay. . . . 15.75m: Verging towards an extremely weak siltstone with frequent fine to medium gravel size vugs.	58.08	15.90	
16.40-16.70	30	C		93	53	42				Extremely weak reddish brown MUDSTONE with occasional pockets (2 to 6mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)	57.23	16.75	
17.00-18.50										Firm reddish brown slightly gravelly sandy CLAY with frequent pockets (2 to 20mm) of greenish grey sandy silt. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)		(0.95)	
17.30	31	D		80	32	28					56.28	17.70	
										<i>Description on next sheet</i> . . . 17.75-17.80m: Weak greenish grey fine grained sandstone.			x x x x

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



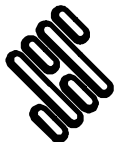
STRUCTURAL SOILS

BOREHOLE LOG

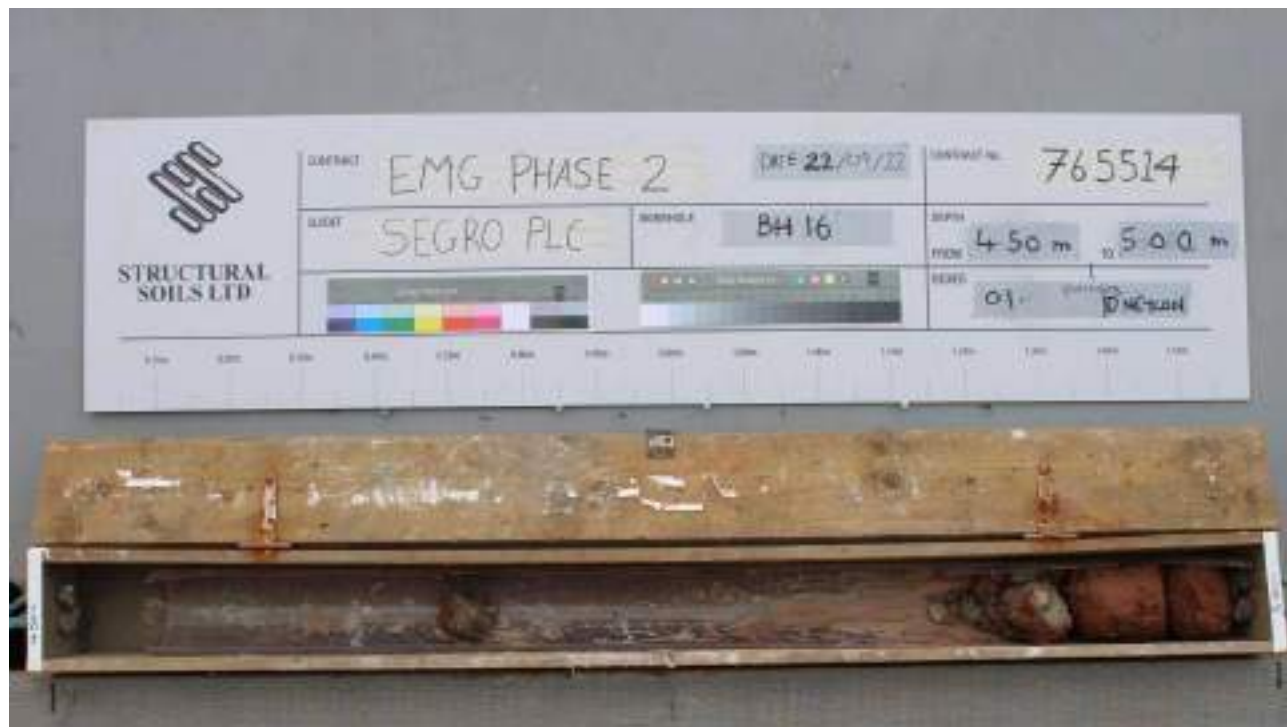
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 5 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.50-20.00	32	C		80	32	28				Extremely weak to very weak greenish grey SILTSTONE closely interbedded with extremely weak reddish brown MUDSTONE. (MERCIA MUDSTONE GROUP) (stratum copied from 17.70m from previous sheet)	55.58	(0.70)		
18.70-18.90											Extremely weak reddish brown MUDSTONE with occasional pockets (up to 60mm) of greenish grey siltstone. Bedding fractures: Medium spaced, rough, undulating, infilled with sandy clay. Fracture set 2: rough, planar, infilled with clayey sand. (MERCIA MUDSTONE GROUP) 18.70-18.80m: Extremely weak greenish grey thickly cross laminated SILTSTONE with thin laminae (<2mm) of SANDSTONE.		(1.60)	
						93	17		17				53.98	20.00
										Borehole terminated at 20.00m depth.				

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



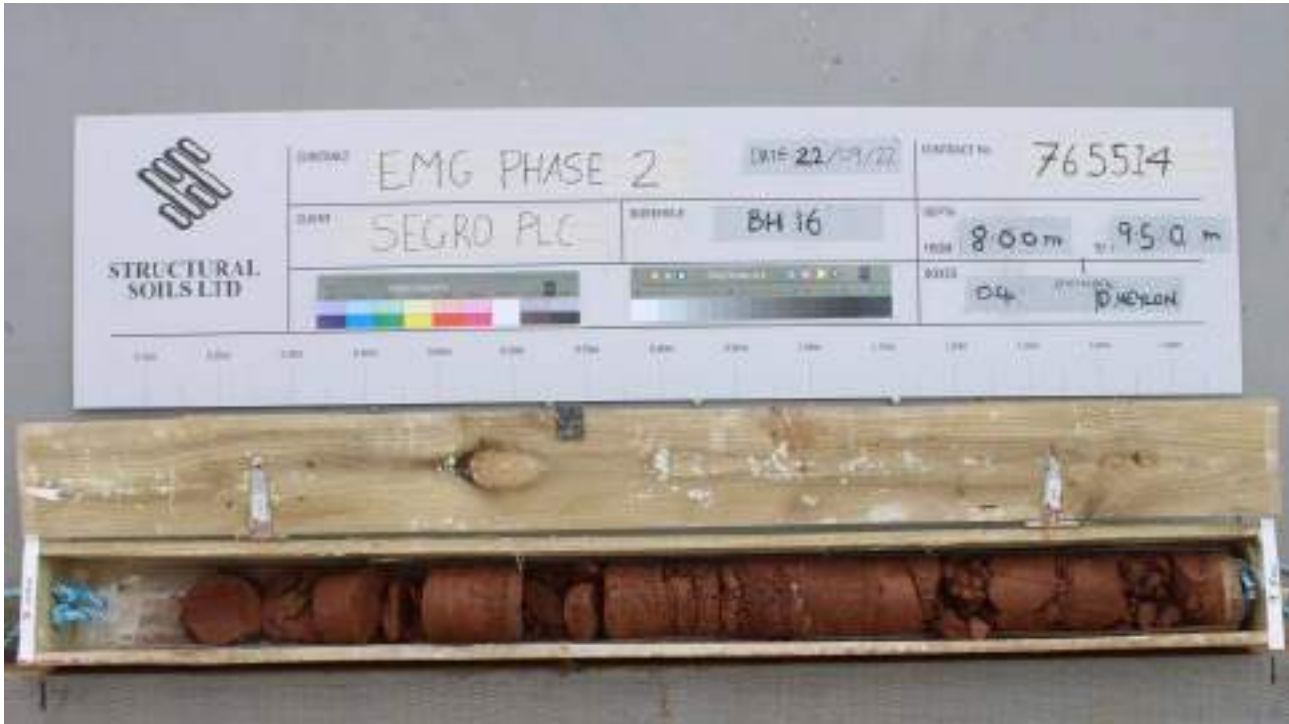
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 6 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 7 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7		Sheet: 8 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 9 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 10 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH16
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 73.98	National Grid Co-ordinate: E:446488.6 N:324866.7	Sheet: 11 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8		Sheet: 1 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.20 0.20 0.20-0.50	1 101 2	D ES B	1xT+1xJ+1xV							TOPSOIL	74.25	0.20	
0.50	102	ES	1xT+1xJ+1xV							Firm dark yellowish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including quartzite and siltstone.			
0.90 0.90-1.20 1.00	3 4 103	D B ES	1xT+1xJ+1xV							... Below 1.80m: Stiff.		(1.30)	
1.20-1.65	5	UT _(UT100)	32 blows 100% recovery								72.95	1.50	
1.70	6	D								Soft to firm reddish brown very sandy CLAY. Sand is fine to coarse.			
2.00-2.45 2.00-2.45 2.00-2.45	8 9	SPT DSPT B	N=13									(1.10)	
2.70	10	D									71.85	2.60	
2.86 3.00-3.45 3.00-3.45 3.00-3.45	12 13	EW SPT DSPT B	N=16							Medium dense dark brown mottled grey silty fine to coarse SAND.		(1.30)	
3.90 3.90 4.00-4.44	14 27	D W SPT	6,10/12,13,13,12 for 60mm								70.55	3.90	
4.00-4.44 4.00-4.44	16 17	DSPT B								Stiff to very stiff reddish brown mottled grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mudstone. Occasional pockets of grey silt (up to 20mm). (MERCIA MUDSTONE GROUP)			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
15/09/22	15:15	5.00	4.50	200	Dry	5.50	6.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Groundwater strike at 3.10m rising to 3.80m after 20 minutes. 5. Rotary cored from 6.00m using SWF core barrel and 150mm diameter casing and air mist flush.	
16/09/22	08:25	5.00	4.50	200	3.90					
16/09/22	09:55	6.00	4.50	200	-					
21/09/22	08:00	6.00	None	200	1.60					
21/09/22	17:00	21.00	6.00	150	-					
22/09/22	08:00	21.00	6.00	150	1.80				All dimensions in metres	
22/09/22	11:00	21.00	6.00	150	1.80				Scale: 1:25	
Method Used: Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 + Comacchio GEO 205		Drilled By: Jonny Hutt + Martin Speedie		Logged By: DNartey + RStan		Checked By: 		



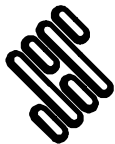
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8		Sheet: 2 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	18	D	N=39							Stiff to very stiff reddish brown mottled grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of mudstone. Occasional pockets of grey silt (up to 20mm). (MERCIA MUDSTONE GROUP) <i>(stratum copied from 3.90m from previous sheet)</i>		(2.10)		
5.00-5.45	20	SPT												
5.00-5.45	21	DSPT B												
5.50-5.84		SPT	8,12/15,21,14 for 40mm											
5.50-5.84	23	DSPT												
5.50-6.00	24	B												
6.00-7.50		SPT	12,13/19,24,7 for 15mm	↑	↑	↑				AZCL. (MERCIA MUDSTONE GROUP)		(0.30)	AZCL	
6.00-6.30	26	DSPT												
6.00-6.30														
6.70-6.77	27	D		80	35	21				Extremely weak MUDSTONE, recovered as slightly sandy silty gravel. GRADE IV. (MERCIA MUDSTONE GROUP) ... 6.30-6.81m: NI.		(0.62)		
				↓	↓	↓		... 6.86-6.92m: NI.		67.53	6.92			
								Extremely weak thinly laminated MUDSTONE. Occasional pockets and laminae of grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP) ... 6.92-6.97m: Thin laminae of grey siltstone. ... 6.97-7.00m: NI. ... 7.00-7.30m: Thinly interlaminated mudstone and siltstone.		(0.38)				
7.33-7.41	26	C		↓	↓	↓				67.15	7.30			
7.50-9.00				↑	↑	↑								
				↓	↓	↓								
8.30-8.47	28	C		87	70	62			Extremely weak to weak MUDSTONE. Occasional pockets and laminae of grey siltstone. GRADE III. Fractures: Very closely spaced, randomly orientated, incipient, undulating, smooth and rough, with occasional black staining on surface. (MERCIA MUDSTONE GROUP) ... 7.50-7.70m: AZCL. ... 7.70-7.93m: NI. ... 8.05-8.10m: Pockets of grey siltstone. ... 8.14-8.21m: Thinly laminated. ... 8.30-8.38m: Grey siltstone.					
				↓	↓	↓								

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Borehole installed with 50mm standpipe on completion (response zone 1.00m to 4.50m). 7. SPT hammers AR3104-2022 ($E_s = 64.00\%$), AR3784-2022 ($E_s = 71.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Cornacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Martin Speedie						Logged By: DNartey + RStan			Scale: 1:25	Checked By:



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8		Sheet: 3 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-10.50				↑	↑	↑				... 8.95-9.00m: Pocket of silty clay. Extremely weak to weak MUDSTONE. Occasional pockets and laminae of grey siltstone. GRADE III. Fractures: Very closely spaced, randomly orientated, incipient, undulating, smooth and rough, with occasional black staining on surface. (MERCIA MUDSTONE GROUP) (stratum copied from 7.30m from previous sheet)			
10.21-10.41	29	C		100	77	69				... 9.11-10.03m: Thin laminated, locally mottled grey, interlaminated with grey siltstone. ... 9.13-9.16m: Clay mudstone. ... 9.32-9.37m: Dark laminae of mudstone and siltstone. ... 9.46-9.54m: Grey siltstone. ... 9.93-10.03m: Recovery as sandy gravel. ... 10.45-10.50m: NI. ... 10.50-10.64m: NI with band of weak grey siltstone. ... 10.80-10.96m: 71° planar rough clean.		(5.51)	
10.50-12.00				↑	↑	↑							
10.90-11.20	30	C		100	84	84							
12.00-13.50				↑	↑	↑				... 11.95-12.00m: NI. ... 12.00-12.27m: NI.			
12.41-12.61	31	C		100	64	55				... 12.19-12.27m: Thinly laminated. ... 12.27-12.29m: Bedding fracture, 5° undulating rough silty clay infill. ... 12.27-12.39m: 85° planar rough yellow and grey stained. ... 12.34-12.49m: Thinly laminated greenish grey siltstone, with occasional yellow staining. ... 12.49-12.81m: Weak. ... 12.75-12.95m: 63° planar rough with calcite infill (<3mm). Description on next sheet	61.64	12.81	
				↓	↓	↓				... 13.24-13.41m: Thinly laminated mudstone and grey siltstone. Rare calcite.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres		
Drilled By: Jonny Hutt + Martin Speedie						Logged By: DNartey + RStan			Scale: 1:25		
									Checked By: AS		



Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instru- mentation	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-15.00	32	C		↑	↑	↑				Extremely weak reddish brown slightly sandy MUDSTONE interbedded with weak to medium strong grey SILTSTONE. Occasional calcite bands (up to 3mm). GRADE III. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 12.81m from previous sheet)</i> ... 13.50-13.56m: NI. ... 13.98-14.01m: Grey siltstone. ... 14.01-14.52m: Weak to medium strong grey siltstone. ... 14.52-14.63m: with thin laminae of grey siltstone. ... 14.68-14.71m: Medium strong siltstone. ... 14.74-14.81m: Thinly laminated mudstone. ... 14.81-15.10m: Frequent calcite pockets (<30mm). ... 15.00-15.13m: NI.		(2.32)	
14.01-14.26				100	83	71							
15.00-16.50				↓	↓	↓							
15.60-15.81				100	91	84							
16.50-18.00	33	C	25/50 for 50mm	↓	↓	↓				Medium strong grey SILTSTONE. (MERCIA MUDSTONE GROUP) ... 15.13-15.22m: 36° undulating rough, rare brown staining. ... 15.35-15.36m: 8° planar rough, clay infill with occasional brown staining. ... 15.43-15.58m: 70° undulating rough occasionally yellow and brown staining. ... 15.58-15.62m: 15° undulating rough. Rare yellow staining.		(0.70)	
16.50-16.61				52	47	43							
17.72-17.89	34	C		↓	↓	↓				Weak reddish brown MUDSTONE interbedded with reddish brown fine to medium grained SANDSTONE. Occasional pockets and laminae of grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP) ... 15.83-15.96m: 50° planar rough. ... 16.07-16.20m: Grey siltstone. ... 16.28-16.40m: 53° planar rough. ... 16.63-17.30m: AZCL.		(1.47)	
										Extremely weak to weak reddish brown slightly sandy MUDSTONE interbedded with weak fine grained SANDSTONE. Occasional laminae of weak grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP)			

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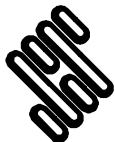
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO			Borehole: BH17			
Contract Ref: 765514		Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45		National Grid Co-ordinate: E:446293.6 N:324881.8			Sheet: 5 of 10	

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50				↑	↑	↑				Extremely weak to weak reddish brown slightly sandy MUDSTONE interbedded with weak fine grained SANDSTONE. Occasional laminae of weak grey siltstone. GRADE III. (MERCIA MUDSTONE GROUP) (stratum copied from 17.30m from previous sheet)			
18.91-19.14	35	C		100	93	87				... 18.00-18.46m: Interlaminated sandstone and grey siltstone. ... 18.46-18.62m: with sandy silt matrix, GRADE IVb. ... 18.62-18.75m: Siltstone with local yellow staining. ... 19.11-19.30m: Very weak mudstone interlaminated with grey siltstone. ... 19.30m: NI.		(3.31)	
19.50-21.00				↑	↑	↑				... 19.60-20.24m: Pockets of calcite. ... 19.65-19.75m: 75° planar rough calcite infill (<3mm).			
20.04-20.43	36	C		100	95	95				Extremely weak to weak reddish brown mottled grey occasional pockets and laminae grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 20.61-20.68m: NI.	53.84	20.61	x x x x
				↓	↓	↓				Borehole terminated at 21.00m depth.	53.45	21.00	x x x x

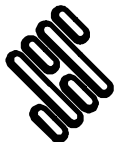
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8	Sheet: 6 of 10



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8	Sheet: 7 of 10



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8	Sheet: 8 of 10



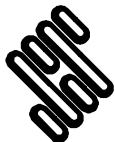
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8	Sheet: 9 of 10



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH17
Contract Ref: 765514	Start: 15.09.22 End: 16.09.22	Ground Level (m AOD): 74.45	National Grid Co-ordinate: E:446293.6 N:324881.8	Sheet: 10 of 10



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 1 of 12
End: 06.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00	1	D	N=18							TOPSOIL	77.42	0.20	
0.00-0.20	3	B								Stiff to very stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithology included siltstone and occasional quartzite.			
0.10	2	ES											
0.20	4	D											
0.20-0.40	6	B											
0.30	5	ES											
0.40	7	D											
0.50	10	D											
0.50	8	ES											
0.50-0.80	9	B											
0.80-1.20	12	B											
1.00	11	ES											
1.20-1.65		SPT	95 blows 100% recovery							(3.90)			
1.20-1.65	13	DSPT											
1.20-1.70	14	B											
1.70	15	D											
2.00	16	ES											
2.00-2.45	17	UT _(UT100)											
2.50	18	D											
2.50-3.00	20	B											
2.60	19	ES											
3.00	21	ES											
3.00-3.45	22	SPT											
3.00-3.45	23	DSPT											
3.00-3.50		B											
3.50	24	D	N=23							Description on next sheet	73.52	4.10	
4.00	25	ES											
4.00-4.45	26	UT _(UT100)											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
14/09/22	17:00	1.20	None	N/R	Dry	7.30	7.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater strike at 15.50m, fast flow noted. 6. Borehole installed with 50mm diameter standpipe	
15/09/22	08:00	1.20	None	N/R	Dry	8.50	9.00	01:00		
15/09/22	17:00	7.50	6.00	200	-					
16/09/22	08:30	7.50	6.00	200	5.80					
16/09/22	11:00	9.00	6.00	200	-					
20/09/22	09:00	9.00	None	200	6.30					
20/09/22	17:00	25.50	9.00	150	-					
21/09/22	08:30	25.50	9.00	150	6.20					
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			Logged By: DNeylon + JAlton	Checked By: AS
Drilled By: Chris Jobson + Martin Speedie						Scale: 1:25			AGS	

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 2 of 12

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50	27	D								Firm fissured light brown mottled reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse, predominant coarse. Gravel is angular and subangular fine to coarse of mixed lithology. (stratum copied from 4.10m from previous sheet)	72.62	(0.90)	
4.50	28	ES											
4.50-5.00	29	B											
5.00	30	ES	N=31							Stiff to very stiff reddish brown slightly gravelly sandy CLAY. Sand is fine and medium. Gravel is angular and subangular of mudstone. Occasional pockets (up to 30mm) of grey siltstone. GRADE IVb. (MERCIA MUDSTONE GROUP)			
5.00-5.45	31	SPT											
5.00-5.45	32	DSPT											
5.00-5.50	32	B											
5.50	33	D											
6.00	34	ES	N=43										
6.00-6.45	35	SPT											
6.00-6.45	36	DSPT											
6.00-6.50	36	B											
6.50	37	D											
7.00-7.36		SPT	8,12/14,19,17 for 61mm									(4.00)	
7.00-7.45	38	DSPT											
7.00-7.50	39	B											
7.18		EW											
7.50	40	D	10,13/18,26,6 for 25mm										
7.50-7.83		SPT											
7.50-7.95	41	DSPT											
7.50-8.00	42	B											
8.00-8.38		SPT	8,10/11,15,24 for 75mm										
8.00-8.45	43	DSPT											
8.00-8.50	44	B											
8.50	45	D											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
21/09/22	10:00	25.50	9.00	150	6.20						
									on completion (response zone 4.50m to 16.00m). 7. SPT hammer JB14-2022 (E_t = 63.00%) used.		
									</		

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 3 of 12
End: 06.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-10.50	46	SPT	18,7/31,19 for 42mm	↑	↑	↑				AZCL. (MERCIA MUDSTONE GROUP)		(0.40)	AZCL
9.00-9.21		DSPT									68.22	9.40	
9.00-9.45													
	47	D		80	15	0				Reddish brown clayey angular to subangular fine to coarse GRAVEL of mudstone. Sand is fine to coarse of mudstone. Gravels and matrix showing traces of thin laminations. GRADE III. (MERCIA MUDSTONE GROUP)		(0.75)	
9.90											67.47	10.15	
										Very weak greenish grey SILTSTONE. Bedding fractures: Very closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP)		(0.35)	
	48	C		↑	↑	↑				10.40-10.45m: Extremely weak reddish brown mudstone.			
10.50-12.00										Very weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)		(1.05)	
				87	63	41					66.07	11.55	
	49	D		↑	↑	↑				Extremely weak reddish brown MUDSTONE very thinly to thickly interlaminated with very weak greenish grey SILTSTONE. Bedding fractures: Very closely spaced, rough, undulating, infilled with reddish brown clay. (MERCIA MUDSTONE GROUP)		(0.45)	
12.00-13.50										11.65-11.70m: Moderately weak light reddish brown sandstone.			
				100	39	0				Very weak reddish brown MUDSTONE with occasional pockets (up to 60mm) of greenish grey siltstone. GRADE II. Fractures: Closely spaced, randomly orientated. (MERCIA MUDSTONE GROUP)		(1.25)	
12.60										12.15-12.25m: Recovered as sandy angular fine to coarse gravel, verging towards GRADE III.			
										Description on next sheet			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 4 of 12
End: 06.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-15.00	50	D		↑	↑	↑				Weak greenish grey SILTSTONE very thinly interbedded with extremely weak reddish brown mudstone and clay bands. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 13.25m from previous sheet)</i>	63.82	(0.55)	× × × ×
				100	17	0				Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Very closely spaced, randomly orientated, rough, undulating, with occasional black staining along surfaces. (MERCIA MUDSTONE GROUP) . . . 14.00-14.03m: Trace thin laminae and recovered partly as clayey gravel. . . . 14.40-14.75m: Some fractures are stained yellow. . . . 14.75-14.80m: Very weak greenish grey siltstone.		(1.20)	× × × ×
14.50													× × × ×
15.00-16.50	51	D		↑	↑	↑				AZCL. (MERCIA MUDSTONE GROUP)	62.42	15.20	AZCL
				87	0	0				Extremely weak reddish brown MUDSTONE, recovered as sandy angular to subangular fine to coarse gravel. GRADE III. (MERCIA MUDSTONE GROUP)	61.92	15.70	
15.90										Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Very closely spaced, randomly orientated, with occasional black staining on surfaces. (MERCIA MUDSTONE GROUP)		(0.86)	
16.50-18.00	52	C		↑	↑	↑				Very weak greenish grey fine grained SANDSTONE. Bedding fractures: Closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP)	60.87	16.75	
				77	50	35				Extremely weak thinly laminated reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) . . . 16.90-17.00m: Randomly orientated fractures. AZCL	60.52	17.10	
17.55-17.80										Very weak to weak reddish brown MUDSTONE with occasional gravel size pockets of siltstone. GRADE II. (MERCIA MUDSTONE GROUP)	60.07	17.55	AZCL

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 5 of 12
End: 06.10.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50	53	C		↑	↑	↑				Very weak to weak reddish brown MUDSTONE with occasional gravel size pockets of siltstone. GRADE II. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 17.55m from previous sheet</i>)	59.07	(1.00)	
				97	69	37				Very weak greenish grey fine grained SANDSTONE with occasional vugs (up to 0.6mm). Bedding fractures: Very closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP)		(0.70)	
19.10-19.20											58.37	19.25	
19.50-21.00	54	C		↑	↑	↑				Extremely weak reddish brown MUDSTONE interspersed with greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)	58.27	19.35	
				97	77	61				Moderately weak to medium strong greenish grey fine grained SANDSTONE. (MERCIA MUDSTONE GROUP) . . . 19.50-19.60m: Reddish brown very clayey angular medium to coarse gravel. . . . 19.80m: Rough planar bedding fracture, infilled with reddish brown clay. . . . 19.83-19.87m and 19.90-19.95m: Extremely weak reddish brown mudstone. . . . 20.10m: Rough planar bedding fracture, infilled with reddish brown clay. . . . 20.10-20.15m: Thinly laminated with some thin beds of reddish brown clay. . . . 20.23-20.30m: Thinly laminated and partly recovered as fine to medium size gravel.	57.32	20.30	
20.75-20.85												(1.00)	
21.00-22.50	55	C		↑	↑	↑				Extremely weak reddish brown MUDSTONE with frequent pockets (2 to 60mm) of greenish grey silt. GRADE II. (MERCIA MUDSTONE GROUP) . . . 20.30-20.70m: 75° undulating rough fracture.	56.32	21.30	
				93	40	40				Extremely weak to very weak greenish grey SILTSTONE interspersed with extremely weak reddish brown mudstone. Generally recovered as a sandy gravel to cobbles, with laminae in some gravel fragments. Randomly orientated fractures in larger gravel / cobbles. (MERCIA MUDSTONE GROUP)	55.57	22.05	
21.80-22.05												(0.75)	
										Stiff reddish brown sandy CLAY with occasional pockets (up to 20mm) of greenish grey silt. GRADE IVa. (MERCIA MUDSTONE GROUP)	55.27	22.35	
										Description on next sheet	55.12	22.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2	Sheet: 7 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2		Sheet: 8 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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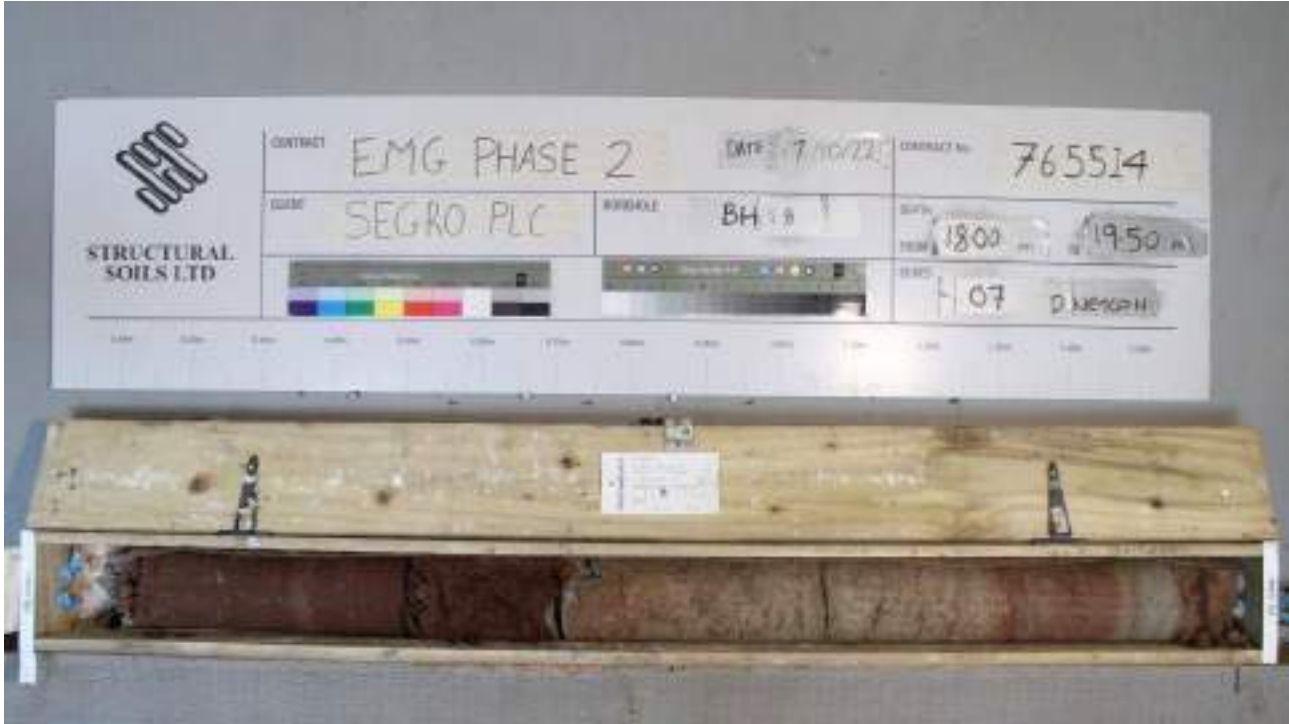
Contract: EMG Phase 2			Client: SEGRO	Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2	Sheet: 9 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2	Sheet: 10 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2	Sheet: 11 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: D.Neylon + J.Aiton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH18
Contract Ref: 765514	Start: 15.09.22 End: 06.10.22	Ground Level (m AOD): 77.62	National Grid Co-ordinate: E:446112.9 N:324864.2	Sheet: 12 of 12



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Martin Speedie	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 1 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10 0.10-0.30 0.20	1 2 101	D B ES	1xT+1xJ+1xV							TOPSOIL	76.28	(0.35)	
0.90 0.90-1.20 1.00	3 4 102	D B ES	1xT+1xJ+1xV							Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP)			
1.20-1.65	5	UT _(UT100)	150 blows 78% recovery										
1.65-1.75	6	D											
1.90 2.00-2.45 2.00-2.45 2.00-2.45	7 10 9	D SPT B DSPT	N=27										
2.70	11	D										(4.65)	
3.00-3.44 3.00-3.44 3.00-3.45	13 14	SPT DSPT B	6,7/10,13,13,14 for 65mm										
3.70	15	D											
4.00-4.44 4.00-4.44 4.00-4.45	17 18	SPT DSPT B	10,13/13,13,13,11 for 60mm							4.35-4.45m: medium strong grey siltstone			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
14/09/22	16:20	5.00	3.00	200	Dry				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 5.00m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water	
16/09/22	08:00	5.00	5.00	150	Dry					
16/09/22	17:00	20.00	5.00	150	Dry					
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By: Jonny Hutt + Martin Speedie		Logged By: JAlton + RSenior
										Checked By: AS
										Scale: 1:25

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Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552259, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 20:56 | AJ4 |



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 2 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.70	19	D								Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) (stratum copied from 0.35m from previous sheet)	71.63	5.00	
5.00-6.50 5.00-5.39		SPT	8,12/13,16,16,5 for 15mm										
5.00-5.39	21	DSPT								Stiff thickly laminated to thinly bedded reddish brown mottled light grey CLAY with occasional subangular fine to medium gravel sized mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP) ... 5.00-5.74m: AZCL (SPT). ... 5.83-5.84m: extremely weak siltstone.			
6.20	21	D		51	0	0						(2.25)	
6.50-8.00 6.50-6.90		SPT	5,7/10,14,16,10 for 25mm							... 6.36-6.50m: 3 no very closely spaced thin beds of extremely weak to very weak siltstone. ... 6.50-7.25m: AZCL (SPT).			
7.50	22	D		50	0	0				... 7.18-7.26m: 80° undulating smooth discontinuity with occasional black spots on surface.	69.38	7.25	
8.00-9.50 8.00-8.30		SPT	2,10/19,31 for 70mm							Extremely weak very thinly bedded locally thickly laminated reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, undulating, rough, with a little clay smear on surfaces and locally stained black. (MERCIA MUDSTONE GROUP) ... 7.32m: 5° undulating smooth discontinuity with frequent black spots and a little yellowish brown staining. ... 7.40-7.53m: 80° to 90° undulating rough black stained discontinuity. ... 7.45-7.50m: 50° undulating smooth black stained discontinuity. ... 7.54-7.57m: 50° undulating smooth black stained discontinuity. ... 7.58-7.62m: 45° undulating smooth black stained discontinuity.		(2.00)	
8.80	23	D		97	23	7							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									strikes due to flush method. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR3104-2022 (E _r = 64.00%) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Cornacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Martin Speedie						Logged By: JAlton + RSenior			Scale: 1:25	Checked By:



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 3 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.50-11.00				97	23	7	NI NI 30			... 7.62-7.74m: very stiff clay with occasional subangular fine to coarse gravel size lithorelics of extremely weak mudstone. ... 8.00-8.20m: Drilling disturbed, recovered NI as gravel. ... 8.33-8.50m: 80° to 90° undulating smooth black stained discontinuity occasionally with a little clay smear on surfaces. ... 8.50-8.56m: NI with extremely closely spaced randomly oriented undulating smooth clay smeared discontinuities, locally black stained. ... 8.87-8.89m: extremely weak siltstone. ... 8.90-8.93: very weak mudstone. Very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fracture: Very closely to closely spaced, 0° to 5°, planar and undulating, smooth, clean, locally with a little clay smear and black staining on surfaces. (MERCIA MUDSTONE GROUP) ... 9.26-9.32m: 85° undulating rough discontinuity with frequent black specks. ... 9.32-9.43m: 90° undulating smooth black stained discontinuity. ... 9.35-9.45m: 50° undulating rough discontinuity with a little clay smear on surfaces. ... 9.50-9.75m: extremely weak very thinly to thinly bedded mudstone. ... 9.64-9.75m: Recovered NI as gravel. Extremely weak thickly laminated to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Extremely closely to closely spaced, undulating, smooth, with a little clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 9.95-10.15m: Discontinuity are extremely closely to very closely spaced randomly orientated undulating smooth with black staining on surfaces. ... 10.15-10.21m: extremely weak light greenish grey siltstone. ... 10.26-10.40m: 70° undulating smooth black stained discontinuity. ... 10.29-10.31m: 20° undulating smooth black stained discontinuities. ... 10.42-10.55m: firm to stiff thinly to thickly laminated reddish brown clay with frequent gravel size lithorelics. ... 10.75-10.85m: 75° undulating smooth discontinuity with occasional black staining on surfaces.	67.38	9.25	
10.53-10.63	24	C		87	37	0					66.68	9.95	
11.00-12.50							NI 10 70					(0.70)	
12.00	25	D		100	11	0						9.95	
12.50-14.00												(2.85)	
12.93-13.16	26	C		95	27	0	NI NI 100				63.83	12.80	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Martin Speedie		Logged By:		JAlton + RSenior		Checked By:		AS		AGS	
All dimensions in metres												Scale:		1:25							



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 4 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
14.00-15.50				95	27	0				... 10.85-11.00m: AZCL. ... 11.00-11.15m: drilling disturbed, recovered NI as clayey gravel. ... 11.18-11.23m: very weak to weak very thinly bedded greenish grey siltstone. ... 11.25-11.36m: 85° undulating rough discontinuity with frequent black specks on surfaces. ... 11.36-11.45m: Discontinuities are extremely closely to closely spaced randomly orientated with <1mm clay on surfaces. Locally surfaces are clean. ... 12.43-12.50m: extremely weak light grey siltstone. ... 12.55-12.80m: 85° undulating rough discontinuities with frequent black spots on surfaces. Stiff thickly laminated to very thinly bedded reddish brown mottled light grey CLAY with occasional angular and subangular fine to medium gravel size mudstone lithorelicts. GRADE III. Bedding fractures: Extremely closely to very closely spaced, 0° to 5°, undulating, smooth and rough, clean, locally with a little clay smear on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 12.80m from previous sheet) Extremely weak very thinly to thickly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Extremely closely to very closely spaced, 0° to 5°, planar, smooth and undulating, rough, locally stained black and with occasional black spots. (MERCIA MUDSTONE GROUP) ... 13.56-13.63m: 85° to 90° undulating smooth black stained discontinuity. ... 13.68-13.71m: very weak light greenish grey siltstone. ... 13.76-13.80m: very weak light greenish grey siltstone. ... 13.82-13.85m: very weak light greenish grey siltstone. ... 13.85-13.90m: stiff reddish brown clay. ... 13.90-13.95m: very weak greenish grey siltstone. ... 14.06m: 1 no 15mm diameter reduction spot. ... 14.16-14.22m: 88° undulating smooth black stained discontinuity. Very weak very thinly to thickly bedded reddish brown MUDSTONE. GRADE II.	63.10	13.53	
14.45-14.59	27	C									62.38	14.25	
15.50-17.00				97	40	17					61.78	14.85	
16.58-16.65	28	C									61.13	15.50	
17.00-18.50				100	49	7					60.48	16.15	
17.70	29	D		100	24	13					58.83	17.80	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Cornacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Martin Speedie						Logged By: JAlton + RSenior			Scale: 1:25	
									Checked By:	



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 5 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.50-20.00				100	24	13	NI 20 200			Bedding fractures: Very closely to closely spaced, subhorizontal, undulating, smooth, stained black locally clean. (MERCIA MUDSTONE GROUP) ... 14.30-14.33m: 85° undulating smooth black stained discontinuity. ... 14.33-14.42m: 80° to 90° undulating rough clean locally black stained discontinuity. ... 14.35-14.45m: extremely weak clayey siltstone. ... 14.60-14.72m: 85° undulating rough discontinuity with occasional black specks on surfaces. ... 14.72m: thin lamination (3mm) of greenish grey siltstone band. Extremely weak very thinly to thickly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, subhorizontal, undulating, smooth, black stained and occasionally clean. (MERCIA MUDSTONE GROUP) ... 14.86-14.89m: siltstone inclusions (<50mm). ... 15.00-15.40m: randomly orientated extremely closely to very closely spaced undulating smooth black stained discontinuities. ... 15.40-15.50m: 75° undulating rough black stained discontinuity. Extremely weak thinly and thickly laminated reddish brown MUDSTONE with occasional thin laminae of siltstone. GRADE II. Bedding fractures: Extremely closely to very closely spaced, subhorizontal, undulating, smooth, clean. Occasionally with a little silt on surfaces. (MERCIA MUDSTONE GROUP) ... 15.90-15.98m: weak grey siltstone. ... 16.07-16.14m: very weak light grey siltstone. Extremely weak to very weak thickly laminated to very thinly bedded reddish brown mottled light grey MUDSTONE. GRADE II. Bedding fractures: Extremely closely to closely spaced, 0° to 5°, undulating, smooth, with a little clay smear on surfaces and locally with occasional black spots. (MERCIA MUDSTONE GROUP) ... 16.15-16.50m: randomly orientated extremely closely to very closely spaced undulating smooth black stained	58.13	18.50	
18.80-18.96	30	C											
19.50-19.70	31	C		100	67	50	NI 20 60				56.63	20.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Martin Speedie						Logged By: JAlton + RSenior			Scale: 1:25	Checked By:



Contract: EMG Phase 2			Client: SEGRO			Borehole: BH19		
Contract Ref: 765514		Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63		National Grid Co-ordinate: E:446150.1 N:324740.8		Sheet: 6 of 11	

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
										discontinuities, occasionally clean. ... 16.58-16.61m: siltstone inclusions (<40mm). ... 16.70-16.80m: 85° to 90° undulating smooth black stained discontinuity. ... 17.10-17.21m: 80° to 85° undulating smooth black stained discontinuity with <1mm clay on surfaces. ... 17.40-17.80m: Randomly orientated extremely closely to closely spaced undulating smooth predominantly black stained discontinuities. ... 17.60-17.80m: Recovered NI as gravel. Very weak to weak thinly bedded reddish brown MUDSTONE. GRADE I. Bedding fractures: Very closely to closely spaced, 0° to 5°, undulating and planar, smooth, black stained. (MERCIA MUDSTONE GROUP) ... 17.80-8.20m: 80° to 90° undulating smooth black stained discontinuity. (stratum copied from 17.80m from previous sheet) Very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Extremely closely to closely spaced, 0° to 5°, undulating, smooth, clean, locally black stained with occasional clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 18.50-18.56m: drilling disturbed, recovered as gravel. ... 18.88-19.04m: moderately weak light greenish grey siltstone. ... 19.10-19.14m: 30° undulating smooth black stained discontinuity. ... 19.20-19.21m: 20° undulating smooth black stained discontinuity. ... 19.42-19.45m: 30° undulating smooth discontinuity with occasional black specks. ... 19.74-19.80m: 60° undulating smooth black stained discontinuity. Borehole terminated at 20.00m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									All dimensions in metres	Scale: 1:25
Method Used: Inspection pit + Cable Percussion + Rotary Cored		Plant Used: Dando 3000 + Comacchio GEO 205		Drilled By: Jonny Hutt + Martin Speedie		Logged By: JAlton + RSenior		Checked By:		



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8	Sheet: 7 of 11



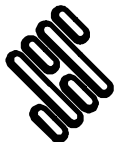
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8	Sheet: 8 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8	Sheet: 9 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: JAlton + RSenior	Checked By: AS	AGS
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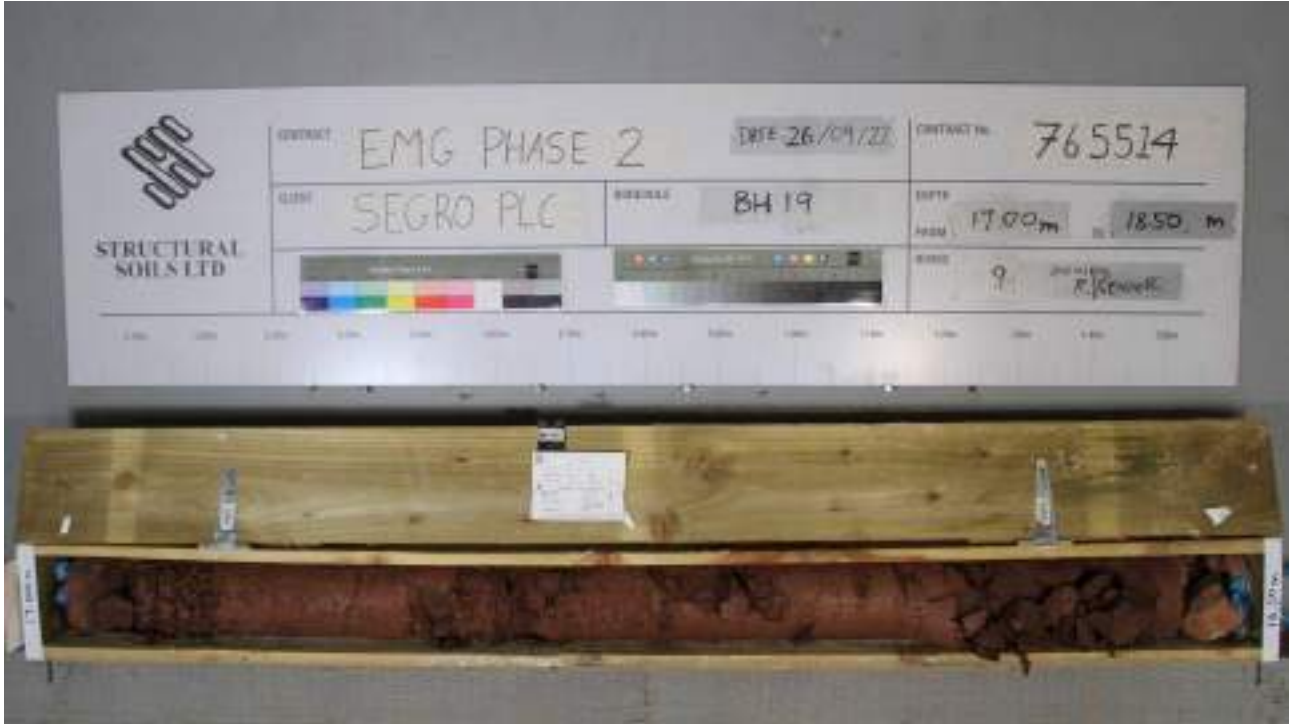
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8	Sheet: 10 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH19
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 76.63	National Grid Co-ordinate: E:446150.1 N:324740.8	Sheet: 11 of 11




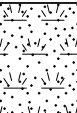
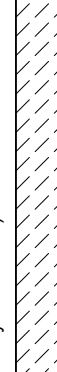
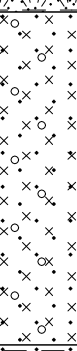
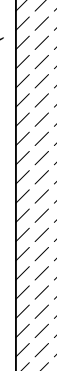

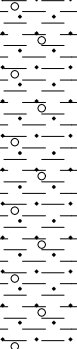

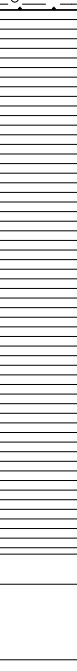
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: JAlton + RSenior	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9		Sheet: 1 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend																										
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)																																	
0.00-0.20	1	B	1xT+1xJ+1xV					Air+Mist (Red/Grey Mudstone.)			TOPSOIL	76.51	0.40																											
0.10	101	ES																																						
0.10	2	D																																						
0.25	3	D																																						
0.25-0.40	4	B	1xT+1xJ+1xV												Air+Mist (Red/Grey Mudstone.)			Firm reddish brown slightly gravelly sandy SILT. Sand is fine to coarse, predominantly coarse. Gravel is subangular to subrounded fine to coarse of quartzite.	(1.10)																					
0.30	102	ES																																						
0.60	103	ES																			1xT+1xJ+1xV																			
0.60	5	D																																						
0.60-0.90	6	B																																						
1.00	104	ES																																						
1.00	7	D	1xT+1xJ+1xV																					Air+Mist (Red/Grey Mudstone.)																
1.00-1.20	8	B																																						
1.20-1.65		SPT		N=15																																				
1.20-1.65	10	DSPT																																						
1.20-1.65	11	B																																						
1.60-1.80	12	B																																						
1.80	13	D	120 blows 89% recovery								Air+Mist (Red/Grey Mudstone.)			Very stiff reddish brown mottled grey slightly gravelly sandy CLAY. Sand is fine to coarse, predominantly coarse. Gravel is angular to subangular fine of mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP)					(1.20)																					
2.00-2.45	14	UT _(UT100)																																						
2.45-2.55	15	D																																						
2.80	16	D																																						
3.00-3.45		SPT	N=30																													Air+Mist (Red/Grey Mudstone.)			Extremely weak reddish brown MUDSTONE with rare greenish grey laminae and pockets of siltstone. GRADE IVb. (MERCIA MUDSTONE GROUP)	(2.50)				
3.00-3.45	18	DSPT																																						
3.00-3.45	19	B																																						
3.70	20	D																																						
4.00-4.41		SPT	7,9/10,13,18,9 for 30mm																									Air+Mist (Red/Grey Mudstone.)												
4.00-4.41	22	DSPT																																						
4.00-4.45	23	B																																						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
15/09/22	12:00	5.00	4.50	200	-				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 5.20m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groudwater strike at 10.70m rising to 9.80m after 20 minutes.	
20/09/22	10:00	5.00	None	200	-					
20/09/22	17:00	21.00	5.20	150	-					
21/09/22	08:30	21.00	5.20	150	8.30					
21/09/22	12:30	30.00	5.20	150	25.90					
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Drilled By: Jonny Hutt + Marc Pearson			Logged By: DNartey + DNeylon	Scale: 1:25
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Drilled By: Jonny Hutt + Marc Pearson			Checked By: AS	AGS



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9		Sheet: 2 of 16
End: 15.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
4.70	24	D	12,13/16,21,17 for 55mm								Extremely weak reddish brown MUDSTONE with rare greenish grey laminae and pockets of siltstone. GRADE IVb. (MERCIA MUDSTONE GROUP) (stratum copied from 2.70m from previous sheet)			
5.00-5.36		SPT												
5.00-5.36	26	DSPT										71.71	5.20	
5.20-6.00														
5.48-5.65	28	C		69	25	25		Air+Mist (Red/Grey Mudstone)			Extremely weak to very weak reddish brown MUDSTONE with frequent beds of greenish grey siltstone. GRADE II. Fractures: Extremely closely spaced, randomly orientated, planar, smooth, with frequent black and yellow staining. (MERCIA MUDSTONE GROUP) ... 5.20-5.45m: AZCL. ... 5.45-5.75m: NI.			
6.00-7.50														
							NI 20 150						(2.30)	
				100	9	9		Air+Mist (Red/Grey Mudstone)			... 6.55-6.72m: 60° planar smooth clean. ... 6.70-7.10m: 9° undulating rough with black and yellow staining. GRADE II. ... 6.90-7.00m: 60° planar smooth clean.			
7.25-7.40	29	C												
7.50-9.00												69.41	7.50	
8.24	30	D		100	67	60	NI 30 70	Air+Mist (Red/Grey Mudstone)			Extremely weak to very weak thinly laminated to very thinly bedded reddish brown MUDSTONE with thin laminations of greenish grey siltstone. Fracture Set 1: Randomly orientated, very closely spaced, planar and undulating, smooth and rough, with black and yellow staining. Fracture Set 2: 45°, closely spaced, planar, smooth, with black and yellow staining. (MERCIA MUDSTONE GROUP)			
											Description on next sheet			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
									6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR3104-2022 (E_r = 64.00%) used.												
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Marc Pearson		Logged By:		DNartey + DNeylon		Checked By:		AS		AGS	
All dimensions in metres										Scale:		1:25									

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Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 20:57 | AJ4 |



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9		Sheet: 3 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
9.00-10.50 9.08-9.36	31	C		100	47	47	NI 30 70	Air+Mist (Red/Grey Mudstone)			8.90-8.95m: Greenish grey siltstone. Extremely weak to very weak thinly laminated to very thinly bedded reddish brown MUDSTONE with thin laminations of greenish grey siltstone. Fracture Set 1: Randomly orientated, very closely spaced, planar and undulating, smooth and rough, with black and yellow staining. Fracture Set 2: 45°, closely spaced, planar, smooth, with black and yellow staining. (MERCIA MUDSTONE GROUP) (stratum copied from 7.50m from previous sheet) 9.36-9.42m: Medium strong. 9.75-9.82m: (Firm) reddish brown clay with lithorelics of mudstone. 9.82-9.92m: Greenish grey siltstone. 10.45-10.60m: (Soft) reddish brown silty clay with lithorelics of mudstone.		(3.90)	
10.50-12.00														
11.00-11.20	32	C		77	77	77		Air+Mist (Red/Grey Mudstone)				65.51	11.40	
12.00-13.50											Extremely weak to weak reddish brown and greenish grey MUDSTONE with closely spaced very thin to thin beds of greenish grey SILTSTONE. GRADE II. Fractures: Randomly orientated, very closely spaced, planar and undulating, smooth, clean. (MERCIA MUDSTONE GROUP)			x x x x
12.30	33	D		97	60	47	NI 50 170	Air+Mist (Red/Grey Mudstone)					(2.85)	x x x x

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Jonny Hutt + Marc Pearson		Logged By:	DNartey + DNeylon		Checked By:	AS	AGS



STRUCTURAL SOILS


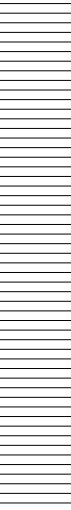

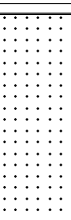







BOREHOLE LOG



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9		Sheet: 4 of 16

Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
13.50-15.00	34	C		97	40	30	NI 50 170	Air+Mist (Red/Grey Mudstone)			Extremely weak to weak reddish brown and greenish grey MUDSTONE with closely spaced very thin to thin beds of greenish grey SILTSTONE. GRADE II. Fractures: Randomly orientated, very closely spaced, planar and undulating, smooth, clean. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 11.40m from previous sheet</i>)	62.66	14.25	x x x x
13.50-13.65														
							NI 5 60				Extremely weak reddish brown clayey MUDSTONE with abundant very closely spaced thin beds of greenish grey siltstone. Fractures: Randomly orientated, extremely closely spaced, planar, smooth, clean. (MERCIA MUDSTONE GROUP) . . . 14.50-14.65m: Clay with frequent lithoerlicts.	62.21	(0.45)	x x x x
15.00-16.50							NI 10 10				Very weak reddish brown MUDSTONE with medium spaced thin beds of greenish grey SILTSTONE. Fracture Set 1: 0-15°, closely spaced, undulating, smooth, clean. GRADE I. Fracture set 2: Randomly orientated, extremely closely spaced, planar, smooth, clean. . . . 14.80-15.25m: NI - drilling disturbed.		(1.80)	x x x x
15.89-16.05	35	C		87	53	43		Air+Mist (Red/Grey Mudstone)			. . . 16.30-16.50m: NI - drilling disturbed.	60.41	16.50	x x x x
16.50-18.00														
17.30-17.50	36	C		97	31	0		Air+Mist (Red/Grey Mudstone)			Extremely weak to very weak reddish brown MUDSTONE. Frequent gravel size pockets and lenses (<15mm) of greenish grey siltstone. GRADE II. Bedding fractures: Closely spaced, rough, planar. Fractures Set 2: Very closely spaced, randomly orientated, smooth, planar. (MERCIA MUDSTONE GROUP) . . . 17.00-18.00m: Becoming extremely weak to very weak .			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)								
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Jonny Hutt + Marc Pearson		Logged By:	DNartey + DNeylon		Checked By:	AS	AGS



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)							
18.00-19.50	37	C		↑	↑	↑		Air+Mist (Red/Grey Mudstone)			Extremely weak to very weak reddish brown MUDSTONE. Frequent gravel size pockets and lenses (<15mm) of greenish grey siltstone. GRADE II. Bedding fractures: Closely spaced, rough, planar. Fractures Set 2: Very closely spaced, randomly orientated, smooth, planar. (MERCIA MUDSTONE GROUP) (stratum copied from 16.50m from previous sheet) ... 18.00-18.15m: Weak to medium strong greenish grey SANDSTONE with fine to medium sand size vugs.		(3.25)	
18.90-19.10				97	43	20								
19.50-21.00				↓	↓	↓								
	38	C		↑	↑	↑		Air+Mist (Red/Grey Mudstone)			Weak greenish grey fine to medium grained SANDSTONE with frequent vugs (up to 0.60mm). Interspaced with thin laminae of siltstone. Bedding fractures: Closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP) ... 19.80m to 19.85m: Siltstone. ... 20.20-20.40m: Sandstone is interspersed with reddish brown clay with mudstone lithorelics.	57.16	19.75	
				97	65	27								
20.45-20.70				↓	↓	↓								
	39	C		↑	↑	↑		Air+Mist (Red Mudstone)			Weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) ... 20.70-20.80m: Very closely spaced randomly orientated fractures and recovered as gravel of mudstone. Weak to medium strong greenish grey fine to medium grained SANDSTONE. (MERCIA MUDSTONE GROUP) ... 21.00-21.45m: AZCL.	56.46	20.45	
21.00-22.50				70	53	33								
21.60-21.95				↓	↓	↓								
											Very weak greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP)	56.11	20.80	
											Description on next sheet			
											... 22.35-22.50m: Siltstone.			
												55.21	21.70	
												54.91	22.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks														
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)															
Method Used:			Inspection pit + Cable Percussion + Rotary Cored			Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Marc Pearson		Logged By:		DNartey + DNeylon		Checked By:					

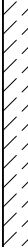




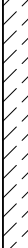








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The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk | 08/05/23 - 20:57 | A4 |



Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
									All dimensions in metres Scale: 1:25		
Method Used: Inspection pit + Cable Percussion + Rotary Cored			Plant Used: Dando 3000 + Comacchio GEO 205			Drilled By: Jonny Hutt + Marc Pearson		Logged By: DNartey + DNeylon			

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PriVersion: v8_07 | Log COMPOSITE LOG - A4P | 765514 EAST_MIDLAND AIRPORT.GPJ - v10_01.



Depth (m)	Samples & Testing			Mechanical Log				Flush Returns & Details	Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend	
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)								
27.00-28.50	43	C		↑	↑	↑		Air+Mist (Red Mudstone)			Medium strong greenish grey thinly to thickly laminated SANDSTONE. (MERCIA MUDSTONE GROUP) (stratum copied from 26.90m from previous sheet)	49.81	27.10		
				100	87	30						Extremely weak reddish brown MUDSTONE with abundant fine to medium gravel size pockets of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)		(0.75)	
27.85-28.15												27.10-27.40m: 70°, smooth, planar fracture.	49.06	27.85	
															
28.50-30.00	44	C		↓	↓	↓		Air+Mist (Red Mudstone)			Weak reddish brown fine grained SANDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. (MERCIA MUDSTONE GROUP)				
															
												28.80m: Bedding fracture is infilled with subangular gravel of reddish mudstone.		(1.45)	
															
29.40-29.60				87	50	28					29.20-29.50m: Thinly cross laminated.	47.61	29.30		
				↓	↓	↓					Extremely weak reddish brown fine grained SANDSTONE. (MERCIA MUDSTONE GROUP)		(0.70)		
											29.95m: Greenish grey siltstone.	46.91	30.00		
											Borehole terminated at 30.00m depth.				

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
				</							

GINIT_LIBRARY_V10_01.GLB LibVersion: v8.07_001 PriVersion: v8.07 | Log COMPOSITE LOG - A4P | 765514 EAST_MIDLAND_AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255 Fax: 01977-552299. Web: www.solis.co.uk | Email: ask@solis.co.uk | 08/05/23 - 20:57 | A/J4 |



Contract: EMG Phase 2			Client: SEGRO	Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 8 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 9 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 10 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 11 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 12 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 13 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 14 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2		Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 15 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH20
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 76.91	National Grid Co-ordinate: E:446017.0 N:324870.9	Sheet: 16 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Marc Pearson	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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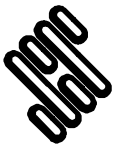
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 1 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10 0.10-0.30 0.20	1 2 101	D B ES	1xT+1xJ+1xV							TOPSOIL	75.26	(0.30)	
0.40 0.40 0.40-0.60	102 3 4	ES D B	1xT+1xJ+1xV							Stiff orangish brown mottled grey slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of extremely weak mudstone and siltstone lithorelicts and occasional sandstone. GRADE IVa. (MERCIA MUDSTONE GROUP)	74.76	(0.50)	
0.80 0.80-1.20 1.00	5 6 103	D B ES	1xT+1xJ+1xV							Stiff to very stiff reddish brown slightly sandy slightly gravelly silty CLAY. Sand is predominantly coarse. Gravel is subangular fine to coarse of extremely weak mudstone and siltstone lithorelicts and occasional sandstone. GRADE IVa. (MERCIA MUDSTONE GROUP)		0.80	
1.20-1.65 1.20-1.65 1.20-1.65	8 9	SPT DSPT B	N=14										
1.70	10	D											
2.00-2.40	11	UT _(UT100)	150 blows 88% recovery										
2.40-2.50	12	D											
2.70	13	D											
3.00-3.40 3.00-3.40 3.00-3.45	15 16	SPT DSPT B	5,10/10,13,18,9 for 20mm							... below 3.00m: becoming very stiff.			
3.70	17	D											
4.00-4.37 4.00-4.37	19	SPT DSPT	6,8/13,20,17 for 65mm										
											71.06	4.50	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
13/09/22	16:45	1.90	1.90	200	Dry				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.37m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater strike at 26.00m rising 25.50m after 20 minutes.	
14/09/22	07:45	1.90	1.90	200	Dry					
14/09/22	11:00	4.00	3.00	200	Dry					
16/09/22	08:20	4.00	None	200	Dry					
16/09/22	17:00	30.00	4.50	150	26.00					
17/09/22	08:30	30.00	4.50	150	10.30					
17/09/22	10:00	30.00	4.50	150	10.30					
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Luke Bamford						Logged By: JAlton + RSenior			Scale: 1:25	
Checked By: AS						Checked By: AS			AGS	



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 2 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50-6.00										AZCL. (MERCIA MUDSTONE GROUP)		(0.70)	AZCL
5.60	23	D		53	9	9				Extremely weak to very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 10°, undulating, smooth and rough, clean, with rare black specks. (MERCIA MUDSTONE GROUP)	70.36	5.20	
6.00-7.50										... 6.00-6.15m: AZCL.			
7.00	24	D		83	22	0				... 6.30-6.50m: Stiff reddish brown silty clay with occasional subangular fine to coarse gravel size mudstone lithorelicts.			
7.50-9.00										... 7.02m: thin laminae (5mm) of weak light greenish grey siltstone. ... 7.12-7.38m: With frequent thick laminae and very thin beds of very weak light greenish grey siltstone. ... 7.34-7.36m: 45° undulating rough discontinuity with frequent black specks. ... 7.34-7.62m: 85° undulating rough locally orangish brown stained discontinuity with frequent black specks.			
8.00	25	D		99	33	7				... 7.94-8.00m: 40° undulating rough black stained discontinuity. ... 8.12-8.46m: 85° to 90° undulating smooth discontinuity with frequent black specks. ... 8.39-8.86m: 3 no parallel 50° closely spaced undulating smooth black stained discontinuities. ... 8.60-9.00m: 80° to 90° undulating smooth rough black stained discontinuity.		(5.97)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Borehole installed with 50mm standpipe on completion (response zone 5.00m to 30.00m). 7. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Jonny Hutt + Luke Bamford						Logged By: JAlton + RSenior			Scale: 1:25	Checked By:



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 3 of 17
End: 16.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-10.50 9.00-9.27	26	C		97	61	43				Extremely weak to very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to closely spaced, 0° to 10°, undulating, smooth and rough, clean, with rare black specks. (MERCIA MUDSTONE GROUP) (stratum copied from 5.20m from previous sheet) ... 9.27m: Thick laminae (15mm) of very weak light greenish grey siltstone. ... 9.69-9.78m: 50° undulating rough black stained discontinuity. ... 10.00-10.20m: 85° to 90° undulating rough black stained discontinuity. ... 10.13-10.320m: 50° undulating rough discontinuity with frequent black specks. ... 10.35-10.50m: With very closely spaced randomly orientated undulating smooth and rough discontinuities with occasional black specks. ... 10.50-10.55m: Moderately weak light grey siltstone. ... 10.72-10.80m: 50° undulating smooth discontinuity with <1mm clay on surfaces. ... 10.72-10.89m: Discontinuities are closely to very closely spaced randomly orientated undulating smooth and rough clean locally stained black. ... 10.89-11.00m: Thinly and thickly laminated.			
10.44 10.50-12.00		EW					NI 60 170						
11.02-11.17	27	C		95	80	69				Very weak thinly to medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely to medium spaced, 0°, undulating, smooth, clean, locally with a little clay smear on surfaces. (MERCIA MUDSTONE GROUP) ... 11.29-11.35m: Coarse gravel size siltstone inclusion. ... 11.38-11.42m: Extremely weak light greenish grey siltstone. ... 12.00-12.20m: AZCL. ... 12.20-12.30m: Thickly laminated. ... 12.30-12.50m: Drilling disturbed, recovered as clayey gravel. ... 12.50-12.65m: Thickly laminated.	64.39	11.17	
11.56-11.76	28	C					NI 60 200					(1.48)	
12.00-13.50													
				87	47	17	NI NI 90			Stiff thinly to thickly laminated silty CLAY with frequent angular to subangular fine to medium gravel size lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP) ... 12.70-12.72m: Thick laminae of stiff light greenish grey silt. ... 12.86-13.07m: Thinly laminated to very thickly bedded stiff to very stiff light greenish grey clay. Description on next sheet	62.91	12.65	
13.28-13.42	29	C					NI 60 170					(0.50)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		







STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 6 of 17
End: 16.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.50-24.00							NI 120 300			<1mm silt on surfaces. (MERCIA MUDSTONE GROUP) . . . 19.07-19.20m: 75°-90° curved undulating rough black stained discontinuity. . . 19.25-19.42m: Moderately weak light greenish grey siltstone. . . 19.50-19.77m: Occasional fine to medium gravel size inclusions of siltstone. . . 19.82-19.97m: 85°-90° undulating smooth and rough clean and locally with frequent black specks. . . 20.19-20.23m: Thinly interlaminated stiff reddish brown clay and very weak light greenish grey siltstone. . . 20.23-20.27m: Moderately weak light greenish grey siltstone. . . 20.27-20.45m: 50°-70° undulating smooth and rough clean locally black stained discontinuity. . . 20.38-20.40m: 50° undulating smooth black stained discontinuity. . . 20.70-20.82m: Extremely closely to very closely spaced randomly orientated undulating rough and smooth clean locally lightly black stained discontinuities. . . 21.62-21.63m: Stiff reddish brown clay. . . 21.77-22.00m: Stiff thinly bedded reddish brown mudstone locally trending to extremely weak mudstone. Weak to strong thinly to medium bedded light greenish grey SILTSTONE with occasional vugs (up to 2mm). GRADE II. Bedding fractures: 0° to 10°, undulating, rough, clean, locally orange stained. (MERCIA MUDSTONE GROUP) (stratum copied from 21.00m from previous sheet)	52.76	22.80	x x x x x
23.52-23.74	36	C		97	32	19							
24.00-25.50							NI NI 220					(2.42)	
25.12-25.50	37	C		97	36	25					50.34	25.22	
25.50-27.00													
25.55-25.79	38	C					NI 150 380						
				97	77	69							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 7 of 17
End: 16.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
27.00-28.50	39	C		↑	↑	↑				... 23.80-23.84m: 40° undulating rough clean discontinuity.			
27.28-29.46										... 24.09-24.15m: Firm reddish brown silty clay.			
										... 24.25-24.30m: Firm reddish brown silty clay.			
										... 24.30-24.58m: Thinly interbedded extremely weak light greenish grey siltstone with stiff reddish brown silty clay.		(4.78)	
										... 24.88-25.22m: Extremely weak thickly laminated to very thinly bedded light greenish grey siltstone.			
										... 25.50-25.55m: Thickly interlaminated to very thinly interbedded very weak greenish grey siltstone and extremely weak reddish brown mudstone.			
										... 25.93-25.97m: 25° undulating smooth lightly black stained discontinuity.			
28.50-30.00				↑	↑	↑	NI 150 380			... 26.02-26.15m: 80°-90° undulating rough clean discontinuity.			
										... 26.40-26.50m: Weak light greenish grey siltstone with 85° undulating rough clean locally orangish brown stained discontinuity.			
29.00-29.32	40	C		↑	↑	↑				... 26.65-26.68m: 15° undulating rough black stained discontinuity.			
										Extremely weak to very weak thinly to medium bedded reddish brown mottled light greenish grey silty MUDSTONE. GRADE II.			
										Bedding fractures: Closely to medium spaced, 0° to 10°, undulating, rough, stained, orangish brown, locally with up to 1mm silt on surfaces.			
										(MERCIA MUDSTONE GROUP) (stratum copied from 25.22m from previous sheet)			
				↓	↓	↓	↓			... 27.10-27.12m: Weak light grey siltstone.	45.56	30.00	
										... 27.18-27.21m: Weak light grey siltstone.			
										... 27.30-27.34m: 2 no very thin bands of weak light grey siltstone.			
										... 27.48-27.60m: 85°-90° undulating rough discontinuity with light orangish brown staining over lower 30mm.			
										... 28.13-28.33m: 60°-90° curved undulating rough clean discontinuity.			
										... 28.69-28.79m: Very weak light greenish grey siltstone.			
										... 28.97-29.00m: 0°-25° undulating smooth clean discontinuity locally with <1mm silt on surfaces.			
										... 29.35-29.43m: Extremely weak to very weak light greenish grey siltstone.			
										... 29.37-29.45m: 40° undulating rough discontinuity with 1-2mm of firm clay on			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
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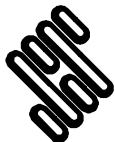


Contract: EMG Phase 2			Client: SEGRO			Borehole: BH21			
Contract Ref: 765514		Start: 14.09.22	End: 16.09.22	Ground Level (m AOD): 75.56		National Grid Co-ordinate: E:445964.3 N:324644.9		Sheet: 8 of 17	

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
										surfaces. ... 29.60-29.77m: Very stiff reddish brown silty clay. ... 29.80-30.00m: 70° undulating rough clean discontinuity. Borehole terminated at 30.00m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			Drilled By: Jonny Hutt + Luke Bamford	
						Logged By: JAlton + RSenior			Checked By:	
									All dimensions in metres Scale: 1:25	





Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 9 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 10 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 11 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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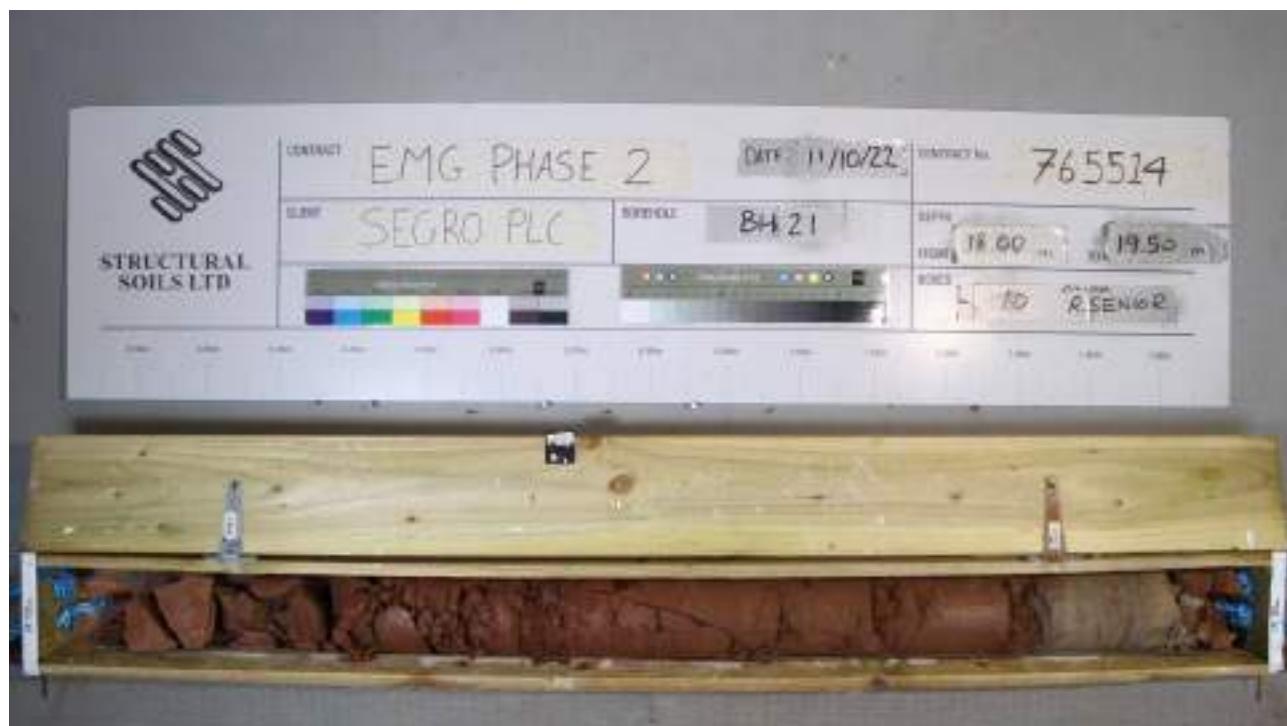
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 12 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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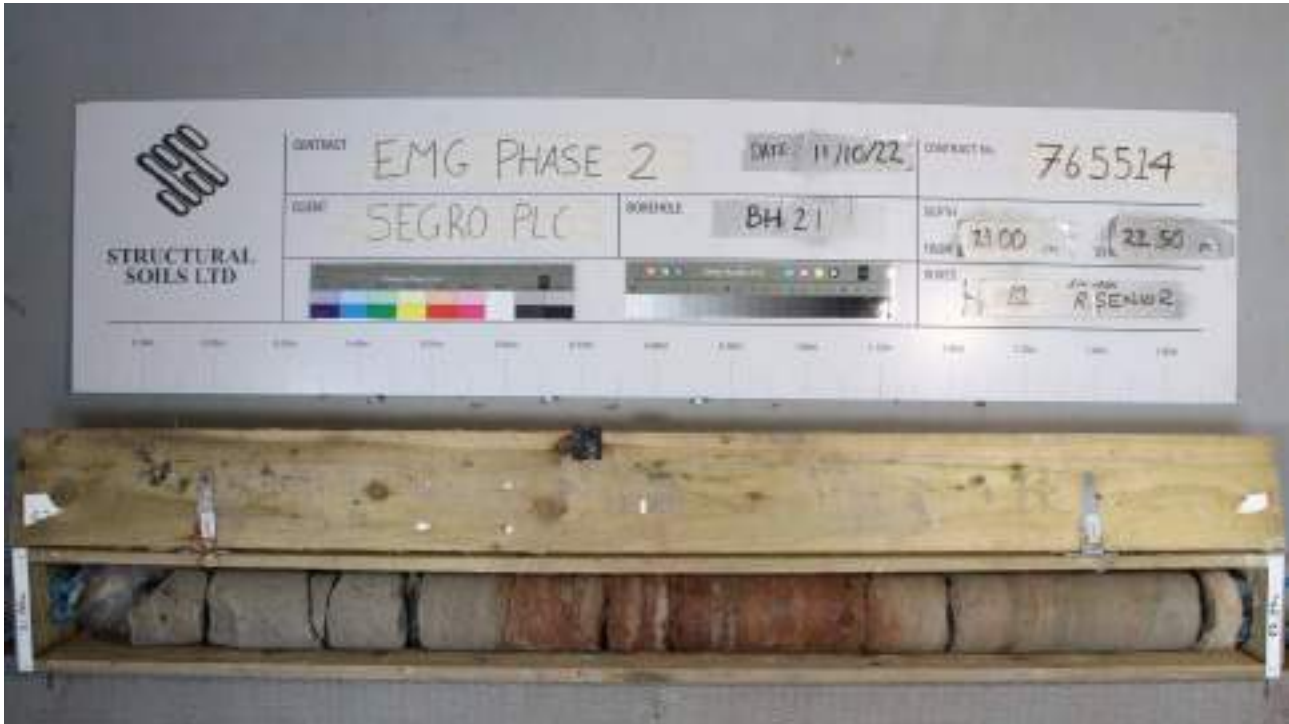
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 13 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 14 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 15 of 17



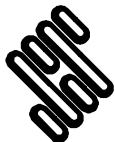
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 16 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH21
Contract Ref: 765514	Start: 14.09.22 End: 16.09.22	Ground Level (m AOD): 75.56	National Grid Co-ordinate: E:445964.3 N:324644.9	Sheet: 17 of 17



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: JAlton + RSenior	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6		Sheet: 1 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.20 0.20-0.50	1 2	D B								TOPSOIL	73.50	(0.30)	
0.50 0.60	101 102	ES ES	1xT+1xJ+1xV 1xT+1xJ+1xV							Firm dark brown slightly gravelly sandy SILT. Sand is fine to coarse, predominantly coarse. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone, and occasional quartzite.	73.25	0.55	
0.80 0.80-1.20	3 4	D B								Stiff orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse, predominantly coarse. Gravel is subangular to subrounded fine to coarse of extremely weak mudstone and siltstone lithorelicts and occasionally sandstone. GRADE IVa. (MERCIA MUDSTONE GROUP) ... Below 1.00m: Reddish brown			
1.20-1.65	5	UT _(UT100)	150 blows 67% recovery										
1.65-1.75 1.70	6 7	D D											
2.00-2.45 2.00-2.45 2.00-2.45	10 9	SPT B DSPT	N=22									(3.45)	
2.70	11	D											
3.00-3.39 3.00-3.39 3.00-3.45	13 14	SPT DSPT B	8,8/10,18,18,4 for 10mm										
3.70	15	D											
4.00-5.00 4.00-4.37		SPT									69.80	4.00	
4.00-4.37 4.30-4.40	17 18	DSPT C	5,11/14,26,10 for 65mm	100	90	16	NI NI 110			Description on next sheet			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
13/09/22	14:00	4.00	3.00	200	Dry				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 4.00m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater strikes in the cable percussion section. Unable to determine ground water	
15/09/22	08:00	4.00	None	200	2.30					
15/09/22	15:15	20.00	4.00	150	16.00					
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Cornacchio GEO 205		Drilled By: Jonny Hutt + Luke Bamford		Logged By: DNartey + RSenior
										Checked By: AS
										Scale: 1:25



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6		Sheet: 2 of 13

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.90 5.00-6.50	19	D		100	90	16				... 4.42-4.80m: NI with extremely closely spaced randomly orientated planar and undulating smooth clean locally black stained discontinuities. ... 4.46-4.55m: Extremely weak light greenish grey siltstone. Very weak very thinly to thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely spaced, 0° to 10°, undulating, smooth, clean, locally with a little clay smear on surfaces and locally with black non-penetrative staining. (MERCIA MUDSTONE GROUP) ... 4.00-4.15m: NI with extremely closely spaced randomly orientated planar and undulating smooth clean locally black stained discontinuities. (stratum copied from 4.00m from previous sheet) ... 4.65-4.73m: Extremely closely spaced bands of very weak greenish grey siltstone. ... 4.78-4.82m: Strong grey siltstone. ... 5.00-5.20m: AZCL.		(2.29)	
5.50	20	D		100	87	37	NI 110			... 5.35-5.40m: NI recovered as clayey angular fine to medium gravel. ... 5.45-5.50m: NI recovered as clayey angular fine to medium gravel. ... 5.59-5.95m: NI recovered as clayey angular fine to medium gravel. ... 5.89-6.29m: Extremely closely to very closely spaced thin and thick laminae (3 to 20mm) of light grey siltstone.	67.51	6.29	
6.30-6.50 6.50-8.00	21	C								Very weak to weak thinly to medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, smooth with frequent black non-penetrative staining. (MERCIA MUDSTONE GROUP) ... 6.50-6.58m: 40° undulating smooth discontinuity with 1mm clay infill on surfaces. ... 6.69-6.85m: 65° undulating smooth discontinuity with black non-penetrative staining on surfaces. ... 6.71-6.88m: 40° to 75° undulating smooth discontinuity with black non-penetrative staining on surfaces. ... 6.84-6.91m: Undulating smooth discontinuity with black non-penetrative staining on surfaces. ... 6.93-6.97m: 10° to 20° undulating smooth black stained discontinuity. ... 7.02-7.18m: 30° to 50° undulating smooth black stained discontinuity. ... 7.17-7.23m: 40° undulating smooth discontinuity with 1mm clay infill on			
6.80	22	D		100	97	43	NI 80 230						
7.35	23	D											
8.00-9.50 8.33-8.44	24	C		100	97	12						(5.11)	

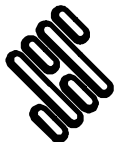
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
									strikes due to flush method. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR3104-2022 (E _r = 64.00%) used.		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres		
Drilled By: Jonny Hutt + Luke Bamford						Logged By: D'Nartey + RSenior			Scale: 1:25		
									Checked By:		



Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00	25	D		100	97	12				surfaces. ... 7.20-7.36m: 50° undulating rough clean discontinuity. ... 7.35-7.45m: NI with extremely closely to very closely spaced randomly orientated undulating smooth clean locally black stained discontinuities. ... 7.40-7.53m: 70° undulating smooth black stained discontinuity. ... 7.45m: 3mm diameter light grey reduction spot. ... 7.56-7.58m: 10° undulating smooth black stained discontinuity. ... 7.68-7.70m: Thick laminae (20mm) with fine to medium gravel size siltstone inclusions. ... 7.80-7.93m: 2 no. very closely spaced 30° undulating smooth discontinuities with a little clay smear on surfaces. ... 8.00-8.12m: NI with extremely closely spaced randomly orientated undulating smooth discontinuities with a little clay smear on surfaces.			
9.50-11.00										... 8.24-8.26m: Greenish grey siltstone. ... 8.26-8.36m: Extremely weak reddish brown mudstone with extremely closely spaced randomly orientated discontinuities, 1mm clay infill. ... 8.46-8.56m: 30° to 70° curved undulating smooth black stained discontinuity.			
10.00	26	D		100	90	65	NI 80 230			... 8.54-8.62m: 60° undulating smooth black stained discontinuity. ... 8.61-8.73m: 85° to 90° undulating smooth black stained discontinuity. ... 8.65-8.71m: 2 no. parallel very closely spaced undulating smooth black stained discontinuity.	62.40	11.40	
10.75-10.94	27	C								... 8.82-8.95m: 60° undulating rough black stained discontinuity. ... 8.95-9.30m: 3 no. parallel 70° to 85° extremely closely spaced undulating smooth clean locally black stained discontinuities.	61.65	12.15	
11.00-12.50										Very weak to weak thinly to medium bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, undulating, smooth with frequent black non-penetrative staining. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 6.29m from previous sheet)</i>			
11.50	28	D		100	85	50	NI NI 40			... 9.50-9.65m: Drilling disturbed, NI, recovered as gravel. ... 9.92-10.10m: Stiff clay with 50% lithorelicts.		(0.75)	
12.15-12.32	29	C					NI 100 160				61.20	12.60	
12.50-14.00													
13.00	30	D		100	96	47	NI 60 180						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
										All dimensions in metres		Scale: 1:25									
Method Used:		Inspection pit + Cable Percussion + Rotary Corod.		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Luke Bamford		Logged By:		DNartey + RSenior		Checked By:		AS		ACS	





STRUCTURAL SOILS

BOREHOLE LOG

Contract: <div>EMG Phase 2</div>			Client: <div>SEGRO</div>			Borehole: <div>BH22</div>		
Contract Ref: <div>765514</div>		Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): <div>73.80</div>		National Grid Co-ordinate: <div>E:446085.7 N:324639.6</div>			Sheet: <div>5 of 13</div>

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.20	37	D		100	93	39				smooth and rough, clean with occasional clay smear on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 12.60m from previous sheet) ... 13.62-13.64m: Occasional 5 to 10mm diameter grey reduction spots. ... 13.63-13.69m: 50° planar smooth clean discontinuity. ... 13.65-13.75m: 40° planar smooth clean discontinuity with 1mm soft clay on surfaces. ... 13.78-13.83m: 85° undulating smooth black stained discontinuity. ... 13.80-14.00m: 85° to 90° undulating smooth black stained discontinuity. ... 14.00-14.15m: Drilling disturbed, NI, recovered as gravel. ... 14.15-14.32m: 85° to 90° undulating rough black stained discontinuity. ... 14.30-14.45m: Occasional fine to medium gravel size light grey siltstone inclusions. ... 14.57-14.66m: 85° to 90° undulating smooth black stained discontinuity. ... 14.60-14.90m: Extremely closely to very closely spaced randomly orientated undulating smooth black stained discontinuities. ... 14.93-14.98m: Extremely weak light grey siltstone. ... 14.98-15.13m: Thinly to thickly laminated stiff reddish brown clay interbedded with extremely weak mudstone. ... 15.14-15.15m: Extremely weak siltstone. ... 15.45-15.50m: Extremely weak siltstone. ... 15.55-15.65m: Moderately weak thickly laminated greenish grey siltstone. ... 15.65-16.00m: Extremely weak thickly laminated reddish brown mudstone. ... 16.01-16.05m: Weak light grey siltstone. ... 16.05-16.24m: 80° to 85° undulating rough yellow brown stained discontinuity. ... 16.43-16.48m: 40° undulating rough yellow brown stained discontinuity. ... 16.48-16.51m: 30° undulating rough clean discontinuity. ... 16.53-16.56m: 15° undulating smooth yellow brown stained discontinuity. ... 16.54-16.60m: 80° undulating smooth clean discontinuity. ... 16.60-16.64m: Drilling disturbed, NI, recovered as gravel.			
18.50-20.00													
18.80-18.90	38	C					NI 80 200						
19.50	39	D		100	98	43							
											53.80	20.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
										<p>... 16.65-16.90m: 75° to 85° undulating rough yellow brown stained discontinuity. ... 16.77-16.84m: 40° undulating smooth clean discontinuity. ... 16.90-17.00m: AZCL. ... 17.15-17.32m: 60° to 85° curved undulating rough clean discontinuity. ... 17.28-17.31m: 70° undulating smooth yellow brown stained discontinuity. ... 17.31-17.40m: Randomly orientated extremely closely spaced undulating rough yellow brown stained discontinuities. ... 17.58-17.62m: 15° undulating smooth yellow brown stained discontinuity. ... 17.72-17.80m: Occasional 2-5mm diameter grey reduction spots. ... 17.75-17.80m depth: 30° undulating smooth yellow brown stained discontinuity. ... 17.82-17.89m: 75° to 85° undulating smooth yellow brown stained discontinuity. ... 17.94-18.02: 60° undulating smooth yellow brown stained discontinuity. Very weak thinly bedded reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, 0° to 5°, planar and undulating, smooth, occasional yellowish brown staining on surfaces. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 16.00m from previous sheet</i>) ... 18.00-18.10m: Randomly orientated extremely closely spaced undulating smooth clean discontinuities. ... 18.10-18.26m: 75° undulating smooth yellow brown stained discontinuity. ... 18.12-18.15m: 30° undulating smooth yellow brown stained discontinuity. ... 18.25-18.40m: Weak grey siltstone. ... 18.25-18.40m: 60° undulating smooth clean discontinuity locally lightly stained yellow brown. ... 18.68-18.76m: 80° to 90° undulating rough clean discontinuity. ... 18.78-18.80m: Moderately weak light grey siltstone. ... 19.11-19.30m: 50° undulating rough clean discontinuity. ... 19.30-19.33m: Extremely weak light grey siltstone. ... 19.40-19.48m: 5 no. parallel extremely closely spaced 80° to 85° undulating rough clean discontinuities. ... 19.55-19.57m: Very weak light grey siltstone. ... 19.57-19.60m: 20° undulating smooth clean discontinuity.</p>			

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07 | Log Composite Log - A4P 765514 EAST MIDLAND AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk, 08/05/23 - 20:59 | A4J |



Contract: EMG Phase 2			Client: SEGRO			Borehole: BH22		
Contract Ref: 765514		Start: 13.09.22	End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6		Sheet: 7 of 13	

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
										<div>... 19.60-19.79m: 70° undulating smooth yellow brown stained discontinuity.</div> <div>... 19.68-19.72m: 25° undulating smooth yellow brown stained discontinuity.</div> <div>... 19.81-19.85m: 50° undulating smooth discontinuity with a little clay smear on surfaces.</div> <div>... 19.83-19.87m: 20° planar smooth clean discontinuity.</div> <div>Borehole terminated at 20.00m depth.</div>			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Luke Bamford
Logged By:		DNarthey + RSenior		Checked By:		AS		AGS		

GINT LIBRARY_V10.01.GLB LibVersion: v8.07.001 PjVersion: v8.07 | Log COMPOSITE LOG - A4P | 765514, EAST MIDLAND AIRPORT.GPJ - V10.01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 20:59 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6	Sheet: 8 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6	Sheet: 9 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNarley + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6		Sheet: 10 of 13



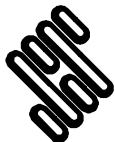
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6		Sheet: 11 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6	Sheet: 12 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + RSenior	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH22
Contract Ref: 765514	Start: 13.09.22 End: 15.09.22	Ground Level (m AOD): 73.80	National Grid Co-ordinate: E:446085.7 N:324639.6	Sheet: 13 of 13



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Luke Bamford	Logged By: DNartey + RSenior	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 1 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.10 0.10 0.10-0.30	1 101 2	D ES B	1xT+1xJ+1xV							TOPSOIL	70.37	(0.40)	
0.60 0.70 0.70-1.00	102 3 4	ES D B	1xT+1xJ+1xV							Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular to subangular fine of extremely weak to very weak mudstone lithorelicts. Occasional pockets (up to 20mm) of grey silty sand. GRADE IVa. (MERCIA MUDSTONE GROUP)	69.77	1.00	
1.00 1.20 1.20-1.50	103 5 6	ES D UT _(UT100)	1xT+1xJ+1xV 150 blows 100% recovery							Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent laminae (up to 10mm) of very weak to weak brown sandstone. Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of extremely weak to very weak mudstone lithorelicts and weak fine grained sandstone. GRADE III verging towards GRADE IVb. (MERCIA MUDSTONE GROUP)	68.77	2.00	
1.50-1.60 1.70	7 8	D D											
2.00-2.45 2.00-2.45 2.00-2.45	10 11	SPT DSPT B	N=40							Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent pockets (up to 20mm) of grey silty sand. Sand is fine of mudstone. Gravel is angular and subangular fine to coarse of extremely weak to very weak mudstone lithorelicts and weak fine grained sandstone. GRADE IVb. (MERCIA MUDSTONE GROUP)		(1.30)	
2.50-2.88 2.50-2.88 2.50-3.00	13 14	SPT DSPT B	8,12/13,14,23 for 75mm										
3.00-3.37 3.00-3.37 3.30-4.80	16	SPT DSPT	9,14/15,17,18 for 70mm										
				↑	↑	↑				AZCL. (MERCIA MUDSTONE GROUP)	67.27	3.50	AZCL
										Very stiff reddish brown slightly sandy gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone. GRADE III. (MERCIA MUDSTONE GROUP)	67.02	3.75	
3.90	25	D		80	33	0				Description on next sheet		(0.90)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks												
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)													
12/09/22	16:30	2.50	1.50	200	Dry	2.50	3.00	00:45	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 3.30m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater encountered at 12.00m. 6. Borehole Installed with 50mm standpipe on												
13/09/22	08:00	2.50	1.50	200	Dry																
13/09/22	11:00	3.30	3.00	200	Dry																
14/09/22	09:00	3.30	None	150	-																
14/09/22	17:00	15.30	4.00	150	-																
15/09/22	08:00	15.30	4.00	150	6.10																
15/09/22	16:30	30.30	4.00	150	7.80																
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Martin Speedie		Logged By:		DNartey + DNeylon		Checked By:		AS		AGS	
										All dimensions in metres		Scale:		1:25							



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 2 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.80-6.30	26	D		80	33	0				Extremely weak reddish brown MUDSTONE. GRADE II Fractures: Very closely spaced, randomly orientated, rough, undulating, dark brown staining on surfaces.. (MERCIA MUDSTONE GROUP) (stratum copied from 3.75m from previous sheet)	66.12	4.65	
											65.97	4.80	x x x x x x x x
5.20										Extremely weak greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP)		(0.65)	
										Extremely weak thickly laminated reddish brown MUDSTONE with very closely spaced laminae and very thin beds (up to 25mm) of gravelly clay. GRADE II verging towards GRADE III. (MERCIA MUDSTONE GROUP)	65.32	5.45	
				97	21	0					65.22	5.55	x x x x x x x x
										Extremely weak thinly laminated greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP)		(0.55)	
6.30-7.80										Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is fine and medium of mudstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP)	64.67	6.10	
										Extremely weak thinly laminated reddish brown MUDSTONE. GRADE II verging towards GRADE III. (MERCIA MUDSTONE GROUP)	64.47	6.30	
										AZCL. (MERCIA MUDSTONE GROUP)		(0.70)	AZCL
6.80-7.17	27	D	2,9/11,14,25 for 70mm	53	18	0				Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP) ... 7.00-7.40m: Thinly laminated. ... 7.40-7.45m: Thinly laminated greenish grey silt. ... 7.45-7.55m: Extremely weak greenish grey thinly laminated siltstone. ... 7.55-7.85m: Thickly laminated. ... 7.85-8.20m: Very closely spaced randomly orientated rough undulating fractures with black staining on surfaces.	63.77	7.00	
7.20													
7.80-9.30													
8.40	28	D		100	9	0				... 8.35-8.65m: Extremely closely spaced rough planar bedding fractures and very closely spaced randomly orientated rough undulating fractures with dark brown staining on surfaces. ... 8.65-8.70m: Thinly laminated greenish grey silt. ... 8.70-8.95m: Recovered as gravel.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									completion (1.00m to 8.00m). 7. SPT hammer AR3104-2022 ($E_s = 64.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 3000 + Comacchio GEO 205			All dimensions in metres	Scale: 1:25
Drilled By: Jonny Hutt + Martin Speedie						Logged By: DNartey + DNeylon			Checked By: AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 3 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.30-10.80	29	D		100	9	0				... 8.95-9.40m: Very closely spaced randomly orientated rough undulating fractures with black staining on surfaces. Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP)	(5.70)		
										... 7.00-7.40m: Thinly laminated. (stratum copied from 7.00m from previous sheet)			
										... 9.40-9.45m: Extremely weak laminated greenish grey siltstone.			
	30	D		97	35	11				... 9.45-9.70m: Very closely to extremely closely spaced randomly orientated rough planar and undulating fractures with black staining on surfaces.			
										... 9.90-9.95m: Thinly laminated greenish grey sandstone, recovered as subangular fine to medium gravel.			
										... 10.35-10.40m: Thinly laminated greenish grey sandstone, recovered as subangular fine to medium gravel.			
10.55	31	D								... 10.40-10.65m: Stiff thinly laminated reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse mudstone derived. Gravel is fine to medium angular to subangular mudstone lithorelicts. GRADE III.			
10.80-12.30										... 11.15-11.45m: Recovered as gravel.			
										... 11.45-12.70m: Very closely spaced randomly orientated rough undulating fractures with black staining on surfaces and closely to very closely spaced bedding fractures with black and yellow staining on surfaces.			
11.70	SPT		25/50 for 60mm	77	33	28					58.07	12.70	
12.30-13.80										Extremely weak reddish brown MUDSTONE, recovered as sandy angular to subangular fine to medium gravel. GRADE III. (MERCIA MUDSTONE GROUP)		(0.50)	
12.30-12.43				77	33	28					57.57	13.20	
13.20										Description on next sheet		(0.60)	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 5 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.30-19.80	35	D								Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular fine to coarse of mudstone lithorelicts. GRADE IVa. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 17.80m from previous sheet</i>)	52.47	(0.50)	
										AZCL. (MERCIA MUDSTONE GROUP)	52.07	(0.40)	AZCL
										Extremely weak thinly laminated reddish brown MUDSTONE. GRADE II. Bedding fractures: Extremely closely spaced, rough, planar. (MERCIA MUDSTONE GROUP)	51.47	(0.60)	
				73	29	0							
19.40	35	D								Stiff reddish brown sandy CLAY. Sand is fine and medium of mudstone. GRADE IVb. (MERCIA MUDSTONE GROUP)	51.07	(0.40)	
19.80-21.30	36	C								Extremely weak greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP) . . . 19.80-19.85m: Stiff reddish brown sandy clay. . . . 19.85-20.00m: Very closely spaced randomly orientated fractures with yellow staining on surfaces. Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Closely spaced, rough, planar. (MERCIA MUDSTONE GROUP)	50.77	(0.30)	
				100	0	0							
21.20-21.30	36	C								Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP)		(0.65)	
21.30-22.80										. . . 21.50m: Firm reddish brown clay.	49.12	21.65	
	37	C								Extremely weak reddish brown MUDSTONE with frequent pockets (up to 60mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) . . . 22.00-22.50m: Closely interbedded with weak greenish grey siltstone. Bedding fractures: Closely spaced, rough, planar, infilled with reddish brown clay.			
22.05-22.25													
				100	41	35							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 6 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.80-24.30				100	41	35				Extremely weak reddish brown MUDSTONE with frequent pockets (up to 60mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 21.65m from previous sheet</i>) ... 22.50-22.55m: Recovered as clayey gravel. ... 22.90-23.15m: Recovered as sandy clayey gravel.	47.27	23.50	
23.65-24.00	38	C		97	67	43				Extremely weak reddish brown MUDSTONE, grading towards very stiff clay. GRADE II. (MERCIA MUDSTONE GROUP)		(1.00)	
24.30-25.80										Very stiff reddish brown slightly sandy CLAY. GRADE IVb. (MERCIA MUDSTONE GROUP)	46.27	24.50	
25.40-25.65	39	C		100	20	0				Extremely weak thinly interbedded greenish grey SILTSTONE with fine grained SANDSTONE. Bedding fractures: Closely spaced, rough, undulating, infilled with sandy fine to medium gravel of siltstone. (MERCIA MUDSTONE GROUP)	45.92	24.85	
25.80-27.30										Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular fine to coarse of mudstone lithorelicts. GRADE III verging towards GRADE II. (MERCIA MUDSTONE GROUP)	45.57	25.20	
26.85-27.15	40	C		100	20	0				Extremely weak thickly interlaminated greenish grey SILTSTONE with fine grained SANDSTONE. Bedding fractures: Closely spaced, rough, undulating, infilled with sandy fine to medium gravel. (MERCIA MUDSTONE GROUP)	44.42	26.35	
										<i>Description on next sheet</i>	44.07	26.70	

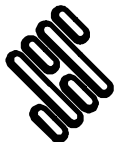
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7		Sheet: 7 of 16

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
27.30-28.80	41	C		100	20	0				Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular fine to coarse of mudstone lithorelicts. GRADE III verging towards GRADE II. (MERCIA MUDSTONE GROUP) (stratum copied from 26.70m from previous sheet)	43.22	(0.85)	
27.60-27.80				93	71	50				Very weak reddish brown MUDSTONE with closely spaced, planar, gypsum veins, typically between 5 to 20mm thickness. (MERCIA MUDSTONE GROUP)			
28.80-30.30	42	C								... 28.55-29.25m: Becoming weak and light reddish brown.			
28.80-29.05										... 29.25-29.40m: Greenish grey siltstone. ... 29.40m: Becoming very weak to extremely weak.			
				100	85	75					40.45	30.32	
										Borehole terminated at 30.32m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Jonny Hutt + Martin Speedie	
Logged By:		DNartey + DNeylon		Checked By:		AS		AGS			
All dimensions in metres						Scale: 1:25					



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 8 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 9 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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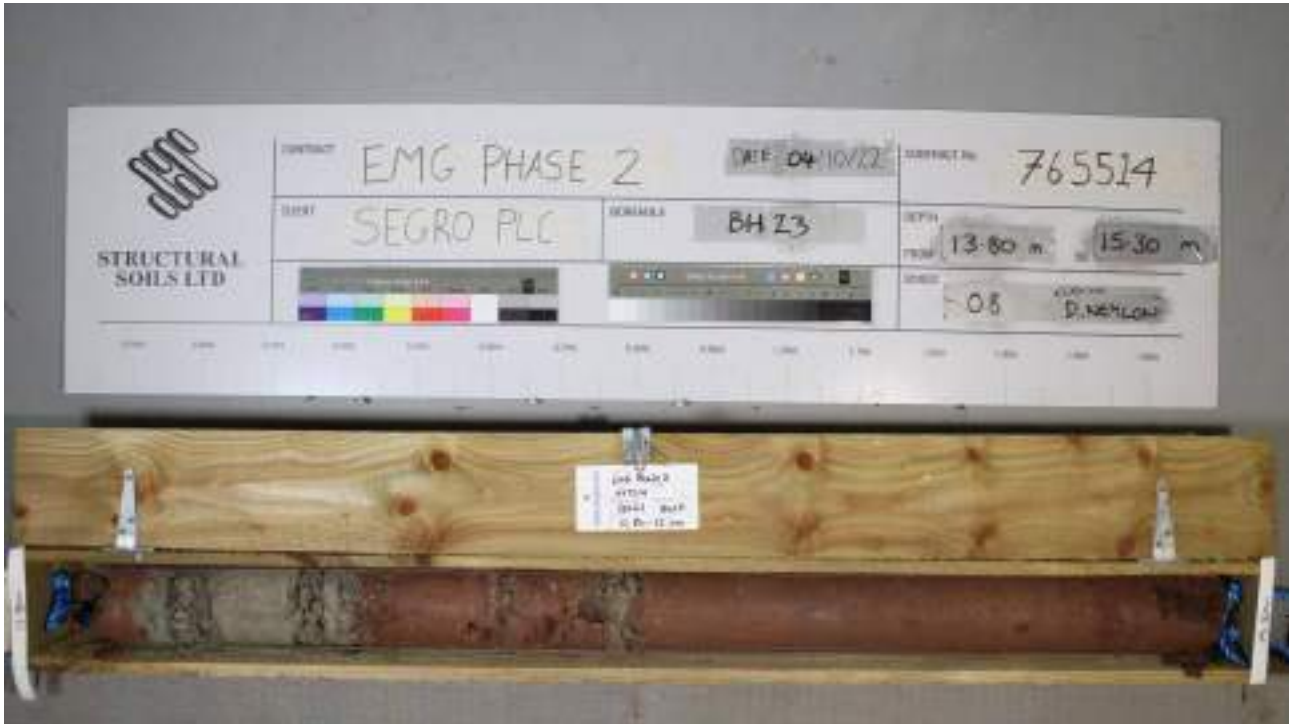
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 10 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 11 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylou	Checked By: AS	AGS
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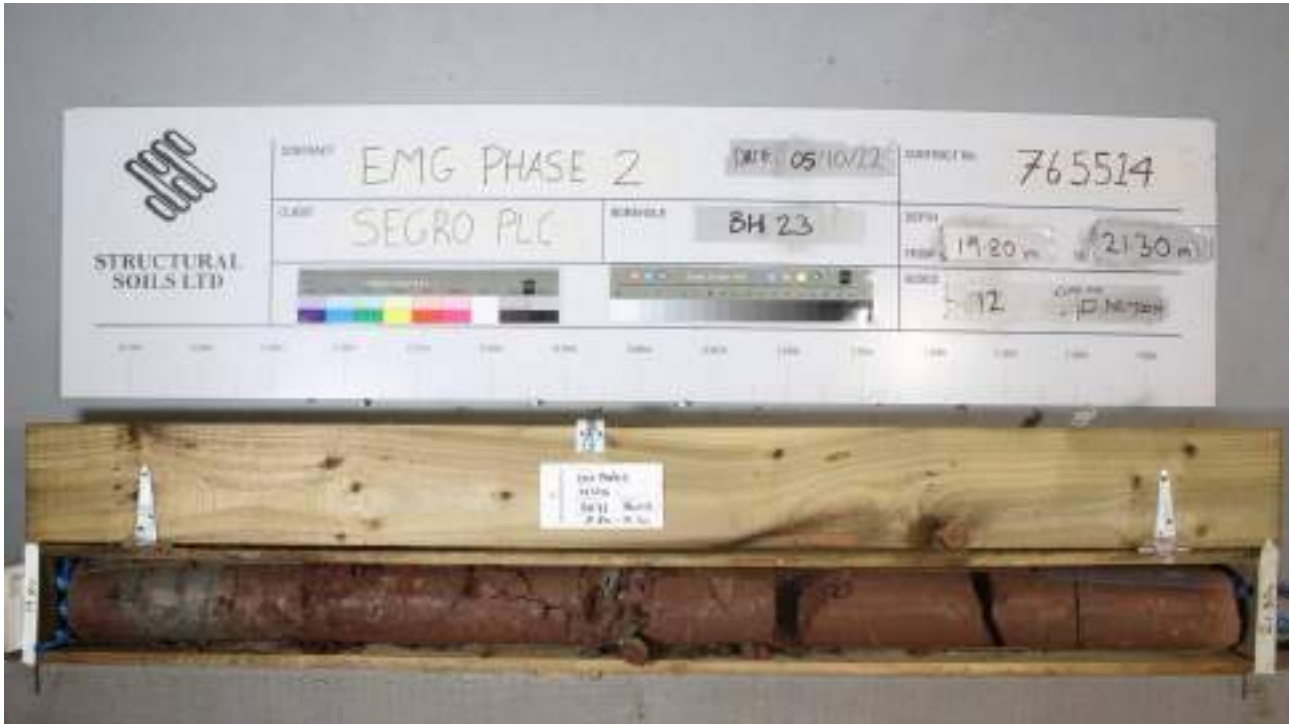
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 12 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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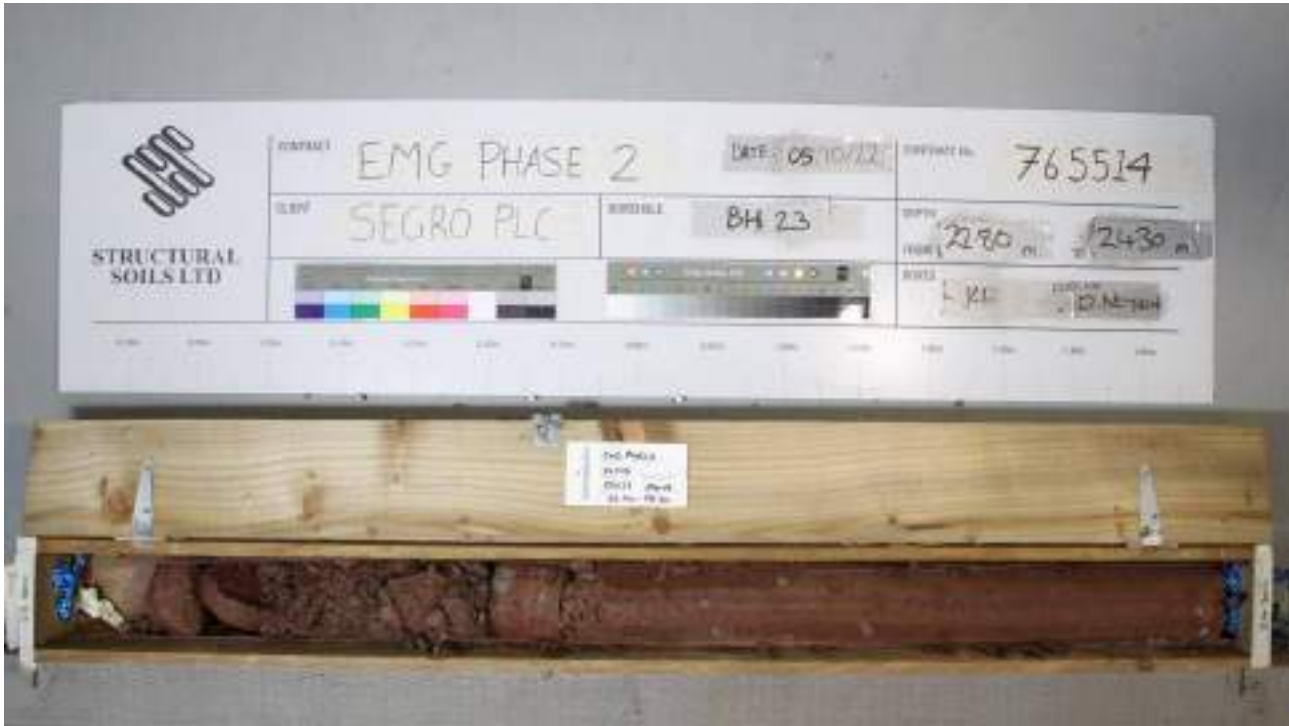
Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 13 of 16



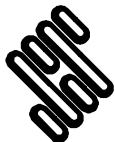
Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 14 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 15 of 16



Method Used:	Inspection pit + Cable Percussion + Rotary Cored	Plant Used:	Dando 3000 + Comacchio GEO 205	Drilled By:	Jonny Hutt + Martin Speedie	Logged By:	DNartey + DNeylon	Checked By:	AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH23
Contract Ref: 765514	Start: 13.09.22 End: 14.09.22	Ground Level (m AOD): 70.77	National Grid Co-ordinate: E:446319.7 N:324654.7	Sheet: 16 of 16



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Jonny Hutt + Martin Speedie	Logged By: DNartey + DNeylon	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3		Sheet: 1 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00-0.00	1	D								TOPSOIL			
0.00-0.10	3	B										(0.40)	
0.05-0.05	2	ES	1xT+1xJ+1xV								66.62	0.40	
0.10-0.10	4	D											
0.10-0.40	6	B											
0.20-0.20	5	ES	1xT+1xJ+1xV										
0.40-0.40	7	D											
0.40-1.00	9	B											
0.50-0.50	8	ES	1xT+1xJ+1xV								66.02	1.00	
1.00-1.00	10	ES	1xT+1xJ+1xV										
1.20-1.65		SPT	N=49								65.82	1.20	
1.20-1.65	12	DSPT											
1.20-1.70	13	B											
1.70	14	D											
2.00	15	ES	N=45								65.02	2.00	
2.00-2.45		SPT											
2.00-2.45	16	DSPT											
2.00-2.50	17	B											
2.50	18	D											
3.00	19	ES	3,9/14,23,13 for 43mm										
3.00-3.34		SPT											
3.00-3.45	20	DSPT											
3.00-3.50	21	B									63.52	3.50	
3.50-5.00													
3.50	22	D	7,15/26,24 for 50mm										
3.50-3.78		SPT											
3.50-3.95	23	DSPT											
				100	0	0	3 15						

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
13/09/22	16:00	3.50	1.50	200	Dry	3.30	3.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 3.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater strike at 10.50m rising to 9.50m after 20 minutes.					
14/09/22	09:00	3.50	None	200	Dry									
14/09/22	17:00	9.00	3.50	150	Dry									
15/09/22	08:30	9.00	3.50	150	3.40									
15/09/22	12:30	20.80	3.50	150	-									
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:	Dando 2000 Mark2 + Comacchio GEO 205		Drilled By:	Chris Jobson + Lee Smith		Logged By:	JAlton + RStan	Checked By:	AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3		Sheet: 2 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.56 4.60-4.70	27	EW D		100	0	0				Extremely weak to very weak reddish brown MUDSTONE, recovered as slightly clayey sandy angular fine to coarse gravel. Occasional thin and thick laminae of grey siltstone. Fractures: Randomly orientated, very closely spaced, undulating rough to undulating smooth, abundant black staining. (MERCIA MUDSTONE GROUP) ... 3.50-3.75m: NI, clayey sandy gravel. (stratum copied from 3.50m from previous sheet) ... 4.60-4.74m: NI, clayey sandy gravel. ... 5.00-6.00m: Fracture 0-10°, 60-80° predominantly very closely spaced undulating rough occasional and abundant black staining. ... 5.13-5.30m: NI, sandy gravel. ... 5.40-5.43m: grey siltstone. ... 5.43-5.51m: NI, sandy gravel. ... 5.62-5.73m: thinly inter laminated with grey siltstone. ... 5.84-5.87m: medium strong grey siltstone. ... 5.94-6.00m: weak grey siltstone.	61.02	6.00	
5.00-6.00							3 15						
5.41-5.54	25	C		100	0	0							
5.74-5.83	26	D											
6.00-7.50													
6.39-6.63	27	C		100	62	40							
7.50-9.00 7.55-7.71	28	C		100	67	40	NI 270			Extremely weak locally thinly laminated dark reddish brown MUDSTONE. Occasional pockets and laminae of weak to medium strong grey siltstone. GRADE III. Fractures: Incipient, randomly orientated, undulating, rough, occasional black staining and discolouration on surface. (MERCIA MUDSTONE GROUP) ... 6.00-6.42m: multifractured randomly orientated incipient undulating rough with occasional black staining. Recovered as angular gravel. Rare reduction spots (<5mm). ... 6.30-6.42m: 50° undulating rough. ... 6.62m: 18° undulating rough, silty clay infill up to 3mm. ... 6.64-7.08m: thinly and thickly inter laminated with grey siltstone. ... 6.96-7.05m: 51° undulating rough yellow stained. ... 7.00-7.06m: 50° undulating rough yellow stained. ... 7.04-7.06m: 4° undulating rough, silty clay infill up to 3mm. ... 7.16-7.17m: 5° planar rough occasional black staining ... 7.50-7.55m: NI. ... 7.72-7.73m: 4° planar rough rare black staining	58.02	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Borehole backfilled with bentonite on completion. 7. SPT hammer JB14-2022 ($E_t = 63.00\%$) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 2000 Mark2 + Comacchio GEO 205			All dimensions in metres	Scale: 1:25
Drilled By: Chris Jobson + Lee Smith						Logged By: JAlton + RStan			Checked By:	



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3		Sheet: 3 of 11
End: 14.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-10.50										7.85-7.86m: 9° planar rough rare black specks. 7.88-7.96m: 77° undulating rough clean. 8.01-8.12m: 37° planar rough clean. 8.05-8.21m: 31° undulating rough occasional black staining. 8.18-8.33m: NI. 8.31-8.46m: 81° undulating rough occasionally black staining. 8.56-8.71m: NI, thinly interlaminated with grey siltstone. 8.73-8.87m: 76° planar rough occasional black specks. AZCL (MERCIA MUDSTONE GROUP)		(0.55)	AZCL
9.42-9.55	29	C		87	19	8					57.47	9.55	
10.50-11.80										Extremely weak thinly laminated locally dessicated reddish brown MUDSTONE. Occasional interlaminae of grey fine siltstone. GRADE III. Fractures: Randomly orientated, predominantly planar, rough, with occasional clayey silt infill. (MERCIA MUDSTONE GROUP) 9.55-9.81m: NI, recovered as clayey gravel. 9.81-10.01m: extremely weak mudstone. 10.01-10.45m: thinly laminated mudstone with occasional interlaminae of grey siltstone. 10.45-10.50m: NI recovered as gravel. 10.50-10.86m: AZCL. 10.86-11.00m: Weak interlaminated mudstone and grey siltstone. 11.00-11.27m: NI, recovered as sandy angular gravel. Extremely weak to very weak reddish brown MUDSTONE. Occasionally interbedded with weak to medium strong siltstone. GRADE III. Bedding fracture: 0-10°, closely to widely spaced, predominantly planar, rough, with occasional black staining on surface, rare infill of silt. (MERCIA MUDSTONE GROUP) 11.27-11.28m: 4° planar rough occasional black staining. 11.32-11.39m: 7° planar rough occasional black staining, silt infill up to 3mm. 11.39-11.40m: 6° planar rough occasional black staining, silt infill. 12.32-12.33m: 4° planar rough occasional black staining.		(1.72)	
11.48-11.68	30	C		72	40	18					55.75	11.27	
11.80-13.30													
11.80-11.89		SPT	26/50 for 20mm										
11.88-12.18	31	C		100	91	71	170 1080						
13.30-14.80				100	88	84					53.72	13.30	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3		Sheet: 4 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.74-13.95	32	D		100	88	84				... 12.32-12.39m: 71° planar rough abundant black staining ... 12.50-12.52m: 7° planar rough occasional black staining. ... 12.61-12.71m: 69° undulating rough abundant black staining. ... 12.70-12.71m: 5° planar rough clean. ... 12.87-12.88m: 11° undulating rough rare black staining. ... 12.88-12.92m: 7° planar rough occasional black staining. ... 13.11-13.20m: NI. ... 13.31-13.45m: 54° planar rough occasional black staining. ... 13.36-13.37m: 4° planar rough occasional black staining. Extremely weak to very weak reddish brown MUDSTONE. Occasionally interbedded with weak to medium strong siltstone. GRADE II. Fractures: 80-90° and 0-10°, planar, rough, occasional black staining. (MERCIA MUDSTONE GROUP) ... 13.30-13.74m: medium strong fragmented siltstone.(stratum copied from 13.30m from previous sheet) ... 13.63-13.65m: 9° planar rough occasional black staining. ... 13.91-14.59m: 82° planar rough occasional black staining. ... 14.51-14.55m: weak siltstone. ... 14.70-14.80m: NI, recovered as angular gravel. ... 14.80-14.99m: NI, fractures randomly orientated and 40-50° closely spaced planar rough clean. ... 15.15-15.80m: Grey weak and medium strong siltstone. ... 15.67-15.92m: reddish brown mottled grey mudstone and siltstone. ... 16.04-16.22m: 86° undulating rough rare black staining. ... 16.34-16.50m: grey siltstone. ... 16.78-16.86m: grey siltstone. ... 17.03-17.05m: grey siltstone. ... 17.12-17.15m: grey siltstone. ... 17.22-17.23m: 8° planar rough clean. ... 17.23-17.31m: grey siltstone. ... 17.80-17.86m: NI. ... 17.80-18.30m: grey siltstone.			
14.80-16.30													
15.21-15.45	33	C		100	87	82							
16.30-17.80													
16.81-17.08	34	C		100	100	100						(7.50)	
17.80-19.30				100	91	81							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 2000 Mark2 + Comacchio GEO 205			All dimensions in metres	
Drilled By: Chris Jobson + Lee Smith						Logged By: JAlton + RStan			Scale: 1:25	Checked By:



Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
19.13-19.30	35	C		100	91	81			 17.93-17.97m: thinly laminated siltstone. 17.97-18.00m: 8° undulating rough occasional black staining. Extremely weak to very weak reddish brown MUDSTONE. Occasionally interbedded with weak to medium strong siltstone. GRADE II. Fractures: 80-90° and 0-10°, planar, rough, occasional black staining. (MERCIA MUDSTONE GROUP) 13.30-13.74m: medium strong fragmented siltstone.(<i>stratum copied from 13.30m from previous sheet</i>) 18-07-18.08m: 4° planar rough occasional black staining. 18.15-18.26m: 44° planar rough clean. . . . 18.60-18.62m: NI. 18.70-18.72m: 9° planar rough occasional black staining. 18.87-18.90m: 10° planar rough occasional black specks. 19.00-19.05m: 21° undulating smooth, polished, occasional yellow staining. . . . 19.13-19.14m: 4° planar rough clean. . . . 19.30-19.67m: interbedded weak fine siltstone. . . . 19.77-19.81m: 69° undulating rough calcite infill <3mm. . . . 19.82-20.29m: 79° planar rough clean. . . . 20.31-20.42m: 56° undulating rough clean. . . . 20.45-20.42m: 56° undulating rough clean. 20.56-20.57m: 7° planar rough occasional black staining. . . . 20.68-20.69m: 9° planar rough clean. Borehole terminated at 20.80m depth.			
19.30-20.80	36	C									46.22	20.80	



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 6 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 7 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 8 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 9 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 10 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH24
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 67.02	National Grid Co-ordinate: E:446273.4 N:324520.3	Sheet: 11 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Lee Smith	Logged By: JAlton + RStan	Checked By: AS	AGS
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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7		Sheet: 1 of 11
End: 15.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
0.00-0.00	1	D	1xT+1xJ+1xV							MADE GROUND: Firm to stiff orangish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine of mudstone. (TOPSOIL)	62.75	(0.40)	
0.00-0.10	3	B											
0.05-0.05	2	ES											
0.10-0.10	4	D	1xT+1xJ+1xV							Firm light orangish brown sandy gravelly CLAY. Sand is fine and medium. Gravel is angular to subrounded fine and medium of mudstone.	62.15	(0.60)	
0.10-0.40	6	B											
0.20-0.20	5	ES											
0.40-0.40	7	D	1xT+1xJ+1xV							Reddish brown slightly clayey gravelly medium and coarse SAND. Gravel is angular to subrounded fine to coarse of mudstone and sandstone.	61.95	1.20	
0.40-1.00	9	B											
0.50-0.50	8	ES											
1.00-1.00	10	ES	1xT+1xJ+1xV							Stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine and medium of extremely weak mudstone and siltstone lithorelicts. Frequent pockets and lens (up to 10mm) of grey silty sand. GRADE IVa. (MERCIA MUDSTONE GROUP)	60.15	3.00	
1.20-1.20	11	D	N=15										
1.20-1.65	12	SPT											
1.20-1.65	13	DSPT											
1.20-1.70	14	B	N=19							Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is angular to subangular fine to coarse of mudstone and siltstone lithorelicts. GRADE IVa and verging towards GRADE III. (MERCIA MUDSTONE GROUP)	59.65	3.50	
1.70	14	D											
2.00	15	ES											
2.00-2.45	16	SPT	5,18/18,18,14 for 57mm							Extremely weak thickly laminated reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely spaced, rough, undulating, with dark brown staining on surfaces. (MERCIA MUDSTONE GROUP)	59.20	(0.45)	
2.00-2.45	17	DSPT											
2.00-2.50	18	B											
2.50	18	D	7,18/21,29 for 72mm							Description on next sheet			
3.00	19	ES											
3.00-3.36	20	SPT											
3.00-3.45	21	DSPT	87										
3.00-3.50	22	B											
3.50-5.00	23	D											
3.50	22	SPT	21										
3.50-3.79	23	DSPT											
3.50-3.96	25	C											
4.25	25	C	0										

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
13/09/22	17:00	1.20	None	N/R	Dry	3.30	3.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Cable percussion drilled using 200mm diameter tools and casing. 4. Rotary cored from 3.50m using SWF core barrel and 150mm diameter casing and air mist flush. 5. Groundwater strike at 9.60m rising to 7.80m after 20 minutes.	
14/09/22	08:00	1.20	None	N/R	Dry					
14/09/22	10:00	3.50	1.50	200	Dry					
15/09/22	15:30	3.50	None	200	Dry					
15/09/22	16:30	3.50	3.50	200	Dry					
16/09/22	08:00	3.50	3.50	200	Dry				All dimensions in metres	
16/09/22	15:45	20.00	3.50	150	-				Scale: 1:25	
Method Used:		Inspection pit + Cable Percussion + Rotary Cored		Plant Used:	Dando 2000 Mark2 + Comacchio GEO 205	Drilled By:	Chris Jobson + Marc Pearson	Logged By:	DNeylon + JAlton	Checked By:



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7		Sheet: 2 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
5.00-6.50 5.05		EW		87	21	0				Extremely weak reddish brown MUDSTONE. GRADE II. Fractures: Very closely spaced, randomly orientated, rough, undulating, dark brown staining on surfaces. (MERCIA MUDSTONE GROUP) (stratum copied from 3.95m from previous sheet)	57.85	5.30	
6.35-6.45 6.50-8.00	26	C		97	8	0				Stiff reddish brown slightly sandy gravelly CLAY with occasional pockets (up to 20mm) and lenses (up to 15mm) of greenish grey silt. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine and medium of mudstone and siltstone lithorelicts. GRADE III. (MERCIA MUDSTONE GROUP) 5.75-5.90m: Extremely weak mudstone.	57.00	6.15	
7.84-8.00 8.00-9.50	27	C		87	64	58				Extremely weak reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, rough, undulating. Fracture set 2: Very closely spaced, randomly orientated, rough, undulating, dark brown staining on surfaces. (MERCIA MUDSTONE GROUP) 6.90-7.00m: Thinly cross laminated greenish grey siltstone.		(3.00)	
8.60-8.70	28	C		100	59	53				8.70-8.85m: Thinly laminated greenish grey siltstone.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		
									6. Borehole installed with 50mm standpipe on completion (response zone 4.00m to 20.00m). 7. SPT hammer JB14-2022 (E _r = 63.00%) used.	
Method Used: Inspection pit + Cable Percussion + Rotary Cored						Plant Used: Dando 2000 Mark2 + Comacchio GEO 205			All dimensions in metres	Scale: 1:25
Drilled By: Chris Jobson + Marc Pearson						Logged By: DNeylon + JAlton			Checked By:	

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Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.sols.co.uk, Email: ask@sols.co.uk | 08/05/23 - 21:01 | AJ4 |



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7		Sheet: 3 of 11
End: 15.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.50-11.00	29	C		100	59	53				9.00-9.15m: Thickly laminated greenish grey siltstone. Extremely weak reddish brown MUDSTONE. GRADE II. Bedding fractures: Closely spaced, rough, undulating, black staining on surfaces. (MERCIA MUDSTONE GROUP)	54.00	9.15	
9.65-9.80												(1.25)	
10.45-10.60	30	C		100	56	33				1.25m: Very closely spaced randomly orientated rough planar fractures with dark brown staining on surfaces. Very weak locally medium strong greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP)	52.75	10.40	
11.00-12.50												(1.90)	
11.60-11.85	31	C		83	70	56				11.05-11.10m: Reddish brown sandy very clayey fine to medium gravel of mudstone, suspected to be infilled bedding fractures. 11.10-11.18m depth: Extremely weak reddish brown mudstone. 11.33-11.368m: Extremely weak reddish brown sandstone.			
12.50-14.00										12.10m: Verging towards medium strong fine grained sandstone.	50.85	12.30	
12.50-12.58	SPT		25/50 for 45mm	93	0	0				Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent pockets (up to 20mm) and lenses (up to 15mm) of greenish grey sandy silt. GRADE IVa. (MERCIA MUDSTONE GROUP) 12.55-12.65m: Extremely weak greenish grey sandstone with fine to medium sand size vugs.			
13.15-13.35													
13.15-13.35	32	C											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7		Sheet: 4 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
14.00-15.50	33	C		93	0	0				Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent pockets (up to 20mm) and lenses (up to 15mm) of greenish grey sandy silt. GRADE IVa. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 12.30m from previous sheet)</i>	48.35	(2.50)	
14.25-14.45													
15.50-17.00	34	C		103	5	0				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 60mm) of greenish grey siltstone. GRADE II. Fractures: Closely spaced, randomly orientated, rough, undulating, brown staining on surfaces. (MERCIA MUDSTONE GROUP)	46.70	(1.65)	
15.85-16.10													
17.00-18.50	35	C		103	70	42				Stiff reddish brown slightly sandy CLAY. Sand is fine of mudstone. GRADE IVb. (MERCIA MUDSTONE GROUP)	46.40	(0.30)	
17.28-17.45													
										Very weak greenish grey fine and medium grained SANDSTONE very thinly interbedded with extremely weak reddish brown MUDSTONE. (MERCIA MUDSTONE GROUP)	46.15	17.00	
										Extremely weak reddish brown MUDSTONE. GRADE II. (MERCIA MUDSTONE GROUP)	45.90	17.25	
										Extremely weak greenish grey SILTSTONE thickly interlaminated with very weak fine and medium grained SANDSTONE. (MERCIA MUDSTONE GROUP) ... 17.45m: Lenses (<4mm) of reddish brown clay.	45.60	17.55	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7		Sheet: 5 of 11

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.50-20.00	36	C		93	68	47				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 60mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) (<i>stratum copied from 17.55m from previous sheet</i>) ... 18.10-18.25m: Recovered as sandy gravel with trace thick interlaminae with greenish grey extremely weak siltstone. Suspected interlaminated zone, verging towards GRADE III.	44.09	19.06	
18.70-18.85				100	30	0				Stiff reddish brown slightly sandy CLAY with occasional pockets (up to 20mm) of greenish grey silt. GRADE IVb. (MERCIA MUDSTONE GROUP)	43.55	19.60	
										Very weak greenish grey SILTSTONE. (MERCIA MUDSTONE GROUP) ... 19.60-19.75m: 85°, rough undulating fractures. ... 19.85-19.90m: Band of greenish grey sandy silt. Borehole terminated at 20.00m depth.	43.15	20.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 6 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 7 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 8 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 9 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 10 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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
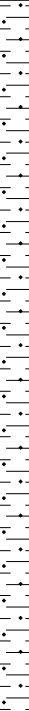

Contract: EMG Phase 2		Client: SEGRO		Borehole: BH25
Contract Ref: 765514	Start: 12.09.22 End: 15.09.22	Ground Level (m AOD): 63.15	National Grid Co-ordinate: E:446409.0 N:324534.7	Sheet: 11 of 11



Method Used: Inspection pit + Cable Percussion + Rotary Cored	Plant Used: Dando 2000 Mark2 + Comacchio GEO 205	Drilled By: Chris Jobson + Marc Pearson	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0		Sheet: 1 of 10
End: 20.09.22					

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend											
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)																	
0.00	1	D	N=25							TOPSOIL	66.07	0.10												
0.10	2	D								Stiff reddish brown slightly sandy CLAY with occasional pockets (up to 2mm) of greenish grey silt. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)		(2.40)												
0.10-0.40	3	B																						
0.20	101	ES																						
0.40	4	D																						
0.40-1.00	5	B																						
0.50	102	ES																						
1.00	103	ES																						
1.00	6	D																						
1.00-1.20	7	B																						
1.20-1.65		SPT																						
1.20-1.65	8	DSPT																						
1.20-1.70	9	B																						
1.70	10	D																						
2.00	104	ES	150 blows 78% recovery																					
2.00-2.45	11	UT																						
2.50	12	D																						
2.50-3.00	13	B																						
3.00-3.45	14	SPT																						
3.00-3.45		DSPT																						
3.00-3.50		B																						
3.50	16	D								(2.00)														
4.00-4.45	17	UT																						
4.00-4.50	18	B																						
										... 3.50-4.50m: Dark reddish brown.														
														61.67	4.50									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks													
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)														
09/09/22	15:00	1.20	None	N/R	Dry	4.80	5.00	00:30	<div>1. Position cleared using CAT and Genny.</div> <div>2. Hand dug inspection pit to 1.20m.</div> <div>3. Cable percussion drilled using 200mm diameter tools and casing.</div> <div>4. Rotary cored from 5.00m using SWF core barrel and 150mm diameter casing and air mist flush.</div> <div>5. No groundwater strikes in the cable percussion section. Unable to determine ground water</div>													
12/09/22	08:30	1.20	None	N/R	Dry																	
12/09/22	14:00	5.00	1.50	200	-																	
14/09/22	08:00	5.00	None	200	4.10																	
14/09/22	15:30	21.00	5.00	150	18.00																	
									All dimensions in metres		Scale: 1:25											
Method Used:			Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:		Chris Jobson + Luke Bamford		Logged By:		DNartey + RStan		Checked By:		AS		P AGS	

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Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.sols.co.uk, Email: ask@sols.co.uk | 08/05/23 - 21:02 | AJ4 |



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514		Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0	Sheet: 2 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
4.50	19	D	8,14/28,22 for 51mm							Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. Gravel is angular to subangular fine and medium of extremely weak mudstone lithorelicts. Occasional pockets (up to 20mm) of grey silty sand and trace evidence of bedding. GRADE IVa. (MERCIA MUDSTONE GROUP)	61.17	(0.50)	
4.50-4.78		SPT											
4.50-4.95	20	DSPT											
4.50-5.00	21	B	19,6/39,11 for 8mm							Extremely weak reddish brown MUDSTONE with frequent pockets (up to 6mm) and laminae (up to 15mm) of greenish grey siltstone, recovered as clayey sand angular fine to coarse gravel. (MERCIA MUDSTONE GROUP)	60.67	5.50	
5.00-6.00		SPT											
5.00-5.17													
5.50	23	D		85	8	0				Extremely weak reddish brown MUDSTONE. GRADE II. Bedding fractures: Very closely spaced, smooth, undulating, black staining. Fracture set 2: Randomly orientated, very closely spaced, smooth, planar, black staining on surfaces. (MERCIA MUDSTONE GROUP)	59.67	(1.00)	
6.00-7.50													
6.35	24	D											
7.50-9.00				87	38	0				Extremely weak reddish brown MUDSTONE recovered as clayey sandy angular fine to coarse gravel. With gravel size fragments of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 6.90-7.10m: Extremely weak siltstone.	59.07	(0.60)	
7.90	25	D											
				93	41	29				Extremely weak reddish brown MUDSTONE with pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Closely spaced, smooth, planar, black staining on surfaces. Fracture set 2: Randomly orientated, smooth, planar. (MERCIA MUDSTONE GROUP) ... 7.55-7.60m: Greenish grey siltstone.		(2.85)	
										... 8.50-8.60m: Recovered as angular gravel, suspected bedding fracture.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Chris Jobson + Luke Bamford		Logged By:	DNartey + RStan	Checked By:	AS	AGS



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514		Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0	Sheet: 3 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.00-10.50	26	D		↑	↑	↑				Extremely weak reddish brown MUDSTONE with pockets (up to 20mm) of greenish grey siltstone. GRADE II. Bedding fractures: Closely spaced, smooth, planar, black staining on surfaces. Fracture set 2: Randomly orientated, smooth, planar. (MERCIA MUDSTONE GROUP) (stratum copied from 7.10m from previous sheet)			
9.25				93	41	29				... 9.60-9.65m: Recovered as angular gravel, suspected bedding fracture.	56.22	9.95	
										... 9.85-9.90m: Recovered as angular gravel, suspected bedding fracture.		(0.55)	
	27	D		↑	↑	↑				Extremely weak reddish brown MUDSTONE thinly interbedded with greenish grey SILTSTONE. GRADE II. Fractures: Randomly orientated, smooth, planar, frequent black staining on surfaces. (MERCIA MUDSTONE GROUP)	55.67	10.50	
10.50-12.00				↑	↑	↑				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. Bedding fractures: Medium spaced, smooth, planar, with black staining on surfaces. Fracture set 2: Randomly orientated, smooth, planar, with black staining on surfaces. (MERCIA MUDSTONE GROUP)		(1.10)	
11.20				100	67	40					54.57	11.60	
	28	C		↑	↑	↑				Extremely weak thinly to thickly laminated greenish grey SANDSTONE with pockets (up to 6mm) and occasional laminae of brown coloured carbonate minerals and siltstone. GRADE II. (MERCIA MUDSTONE GROUP)		(0.55)	
12.00-13.50				↑	↑	↑					54.02	12.15	
12.20				90	63	47				Extremely weak reddish brown MUDSTONE thinly interbedded with greenish grey SILTSTONE. GRADE I. Bedding fractures: Very closely spaced, rough, undulating. (MERCIA MUDSTONE GROUP)	53.52	12.65	
	30	C		↑	↑	↑				Weak thinly cross laminated greenish grey SANDSTONE. (MERCIA MUDSTONE GROUP)		(0.95)	
13.00-13.15				↓	↓	↓				... 13.00m: 60° fracture.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514		Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0	Sheet: 4 of 10



Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
13.50-15.00	31	C		↑	↑	↑				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP)	52.57	13.60	
13.75-14.10				100	80	73						(1.00)	
14.75	32	D		↓	↓	↓				Very stiff greenish grey sandy SILT. Sand is fine of siltstone. GRADE IVa. (MERCIA MUDSTONE GROUP)	51.57	14.60	
15.00-16.50	33	D		↑	↑	↑					51.17	15.00	
15.30				↓	↓	↓				Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium of mudstone. GRADE IVa. (MERCIA MUDSTONE GROUP)	50.67	15.50	
16.30-16.50	34	C		↑	↑	↑						(2.10)	
16.50-18.00	35	C		↑	↑	↑				Extremely weak reddish brown MUDSTONE with occasional pockets (up to 20mm) of greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) ... 15.85m: 35°, smooth planar fracture, infilled with sandy clay. ... 16.00-16.05m: Thinly cross laminated siltstone.			
17.05-17.20				93	63	60							
				↓	↓	↓				Description on next sheet	48.57	17.60	

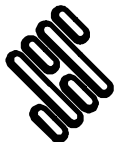
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0		Sheet: 5 of 10

Depth (m)	Samples & Testing			Mechanical Log				Backfill	Water	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.00-19.50	36	D		↑	↑	↑				Extremely weak thinly to thickly laminated reddish brown MUDSTONE thinly interbedded with extremely weak thinly to thickly cross laminated greenish grey SILTSTONE. GRADE II. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 17.60m from previous sheet)</i> . . . 18.00-18.90m: Randomly orientated rough planar fractures.	47.27	(1.30)	
18.50				90	7	0							
19.50-21.00				↓	↓	↓							
19.50-19.90	37	C		↑	↑	↑				Extremely weak reddish brown MUDSTONE with frequent pockets (up to 20mm) of greenish grey siltstone. (MERCIA MUDSTONE GROUP) . . . 18.90-19.30m: Randomly orientated planar fractures.	45.97	20.20	
				80	73	60							
				↓	↓	↓							
				↑	↑	↑				Extremely weak thinly to thickly cross laminated greenish grey SILTSTONE with closely spaced laminae (up to 15mm) of sandstone. (MERCIA MUDSTONE GROUP)	45.17	(0.80)	
	Borehole terminated at 21.00m depth.												

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks						
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)							
Method Used:		Cable Percussion + Rotary Cored		Plant Used:		Dando 3000 + Comacchio GEO 205		Drilled By:	Chris Jobson + Luke Bamford		Logged By:	DNartey + RStan	Checked By:		
											All dimensions in metres		Scale: 1:25		



Contract: EMG Phase 2		Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0	Sheet: 6 of 10



Method Used: Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Luke Bamford	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0	Sheet: 7 of 10



Method Used: Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Luke Bamford	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0		Sheet: 8 of 10



Method Used: Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Luke Bamford	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0		Sheet: 9 of 10



Method Used: Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Luke Bamford	Logged By: DNartey + RStan	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH26
Contract Ref: 765514	Start: 09.09.22 End: 20.09.22	Ground Level (m AOD): 66.17	National Grid Co-ordinate: E:446600.8 N:324651.0		Sheet: 10 of 10












Method Used: Cable Percussion + Rotary Cored	Plant Used: Dando 3000 + Comacchio GEO 205	Drilled By: Chris Jobson + Luke Bamford	Logged By: DNartey + RStan	Checked By: AS	AGS
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



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 1 of 17



Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)									
0.10-0.10	101	ES	1xT+1xJ+1xV							TOPSOIL	58.79	(0.30)				
0.40-0.40	102	ES	1xT+1xJ+1xV							Firm to stiff reddish brown slightly sandy gravelly CLAY. Sand is fine and medium. Gravel is angular to subrounded fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)	57.89	(0.90)				
1.20-2.20	1	SPT DSPT	N=9	↑	↑	↑				Very stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of mudstone and siltstone lithorelicts. Frequent randomly orientated fractures with black staining on surfaces. GRADE IVa. (MERCIA MUDSTONE GROUP)	56.34	(1.55)				
1.20-1.65																
1.20-1.20																
1.90-2.00	103	ES	6,8/12,21,17 for 30mm	↓	↓	↓				Very stiff reddish brown slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone lithorelicts and occasional very weak siltstone lithorelicts. GRADE III. Bedding: Extremely closely to very closely spaced, rough, undulating, black staining. Discontinuities: Tight to very tight, randomly orientated. (MERCIA MUDSTONE GROUP)	54.89	(1.45)				
2.00-2.10	4	D														
2.10-2.20	5	C														
2.20-3.00		SPT														
2.20-2.53																
2.80-2.90	106	ES								Description on next sheet						
2.90-3.00	7	D														
3.00-3.40	8	D														
3.10-3.20																
3.40-4.90																
4.30-4.40	9	D														

Boring Progress and Water Observations						General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth						
12/09/22	16:30	4.90	2.00	150	Dry	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using dynamic sampling to 2.20m. 4. Rotary cored from 2.20m using SWF core barrel and 150mm diameter casing and air mist flush. 5. No groundwater encountered. 6. Borehole installed with 50mm diameter standpipe on completion (response zone 1.00m to 4.00m).					
13/09/22	08:30	4.90	2.00	150	3.90						
13/09/22	17:00	22.80	2.00	150	-						
14/09/22	08:30	22.80	2.00	150	2.90						
14/09/22	13:00	30.30	2.00	150	-						
						All dimensions in metres		Scale:	1:25		
Method Used:		Inspection pit + Dynamic sampling + Rotary Cored		Plant Used: Comacchio GEO 205		Drilled By: Lee Smith		Logged By: D'Neylon + J'Alton		Checked By: 	



Contract:		Client:		Borehole:
EMG Phase 2		SEGRO		BH27
Contract Ref:	Start: 12.09.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
765514	End: 14.09.22	59.09	E:446622.8 N:324516.7	2 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend		
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)								
4.65-4.80	10	C	17,8/50 for 50mm	77	35	15				Very weak reddish brown MUDSTONE with medium spaced laminae and very thin beds (up to 40mm) of weak greenish grey siltstone. (MERCIA MUDSTONE GROUP) . . . 4.20-5.10m: Very closely spaced smooth planar bedding fractures with frequent black staining and extremely closely spaced smooth planar fractures, 60° and frequently stained dark brown and black on fracture surfaces.(<i>stratum copied</i> from 4.20m from previous sheet) . . . 5.10-5.30m: Slightly sandy slightly gravelly clay. . . . Below 5.30m: Bedding: Very closely spaced, smooth, planar. Fractures: 60°, closely spaced, planar. GRADE II.		(2.15)			
4.90-6.30	SPT	↓		↓	↓										
4.90-5.04		↑		↑	↑										
		↓		↓	↓										
		89		46	0										
5.90-6.00	11	C													
6.15	12	D		↓	↓	↓									
6.30-7.80			↑	↑	↑						6.30-6.45m: Frequent thin laminae (<5mm) of cream sandstone.	52.74	6.35		
6.35	13	D									Weak greenish grey fine grained SANDSTONE with pockets (up to 20mm) of very weak siltstone. GRADE II. Bedding fractures: Closely spaced, smooth, undulating. (MERCIA MUDSTONE GROUP) . . . 6.45-6.60m: Rough undulating fracture. . . . 6.65m: Extremely weak siltstone. . . . Below 6.70m: reddish brown (transition zone) and very weak with lenses of very weak mudstone.	52.14	6.95		
6.40-6.55	14	C													
				90	79	13					Very weak reddish brown MUDSTONE with frequent pockets (up to 6mm) of greenish grey siltstone with black specs. GRADE II. Bedding fractures: Closely spaced, smooth, planar, brown staining. Fracture set 2: 80°, rough, undulating. (MERCIA MUDSTONE GROUP)		(1.30)		
			↓	↓	↓										
7.80-9.30			↑	↑	↑										
												50.84	8.25		
				100	100	73					Extremely weak greenish grey SILTSTONE. Fractures: Closely spaced, 20°, undulating, smooth. (MERCIA MUDSTONE GROUP)		(0.75)		
8.60-8.80	15	C													
8.90	16	D													
										50.09	9.00				

Boring Progress and Water Observations						General Remarks							
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth								
						7. SPT hammer LS01-2022 (E_r = 64.00%) used.							
						All dimensions in metres		Scale: 1:25					
Method Used:		Inspection pit + Dynamic sampling + Rotary Coring		Plant Used: Comacchio GEO 205		Drilled By: Lee Smith		Logged By: D'Neylon + J'Alton		Checked By: 			

GINT_LIBRARY_V10_01.GLB LibVersion: v8_07 | Log Composite Log - A4P 765514 EAST MIDLAND AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk, 08/05/23 - 21:02 | A4J |



STRUCTURAL SOILS



BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 3 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
9.30-10.80	17	C		100	100	73				Extremely weak reddish brown MUDSTONE with occasional lenses (up to 15mm) of greenish grey siltstone and closely to very closely spaced smooth planar tight bedding fractures with slight darker staining. (MERCIA MUDSTONE GROUP) ... 9.15m: 80° fracture, with slight dark brown staining along surface. GRADE II.	49.74	9.35	
9.50-9.75										Weak greenish grey SANDSTONE. Bedding fractures: Closely to medium spaced, rough, undulating, infilled with silt. (MERCIA MUDSTONE GROUP) ... 10.00-10.15m: Extremely weak reddish brown mudstone. ... Below 10.15m: Interbedded with siltstone and thin laminae (<2mm) of slightly harder carbonate material.		(1.05)	
10.50	18	D		100	71	63					48.69	10.40	
10.80-12.30										Extremely weak locally very weak reddish brown MUDSTONE with frequent pockets (up to 20mm) of greenish grey sandy silt. GRADE II. Bedding fractures: Closely spaced, rough, planar. (MERCIA MUDSTONE GROUP) ... 10.80-11.00m: Weak brown sandstone with very closely spaced bedding fractures with red clay infill.			
11.65-11.85	19	C		80	67	20							
11.85	20	D										(3.30)	
12.30-13.80										... 12.15-12.55m: Very weak light greenish grey siltstone becoming extremely weak and darker in colour from 12.35m depth. ... 12.30m: 70° smooth planar fracture.			
12.90-13.00	21	C		100	35	29				... 12.85-13.00m: Extremely weak greenish grey siltstone with yellow staining along bedding.			
13.40	22	D											

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				
						</			



Boring Progress and Water Observations						General Remarks								
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth									
						All dimensions in metres		Scale:	1:25					
Method Used:		Inspection pit + Dynamic sampling + Rotary Cored		Plant Used:		Comacchio GEO 205		Drilled By:	Lee Smith	Logged By:	DNeylon + JAlton	Checked By:		

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 5 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
18.30-19.80				87	83	70				Extremely weak reddish brown MUDSTONE with frequent pockets and lenses (up to 15mm) of extremely weak greenish grey siltstone. GRADE II. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 17.75m from previous sheet)</i> ... 18.30-18.60m: thinly interbedded (<60mm) with greenish grey siltstone.	40.19	18.90	
				77	33	19				AZCL (MERCIA MUDSTONE GROUP)	39.89	19.20	AZCL
19.50	29	D								Extremely weak reddish brown MUDSTONE with frequent pockets (up to 6mm) of greenish grey sandy silt. GRADE II. (MERCIA MUDSTONE GROUP)			
19.80-21.30												(1.90)	
20.40-20.60	30	C		97	41	41					37.99	21.10	
21.30-22.80										Very weak reddish brown MUDSTONE with closely to very closely spaced (up to 40mm, generally 5mm to 20mm) of crystalised gypsum, generally parallel with bedding. GRADE I. (MERCIA MUDSTONE GROUP)			
21.85-22.20	31	C		83	83	63							

Boring Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth		
						All dimensions in metres	Scale: 1:25
Method Used: Inspection pit + Dynamic sampling + Rotary Cored		Plant Used: Comacchio GEO 205		Drilled By: Lee Smith	Logged By: D.Neylon + J.Aiton	Checked By: <i>AS</i>	

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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514		Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 6 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
22.80-24.30				83	83	63				Very weak reddish brown MUDSTONE with closely to very closely spaced (up to 40mm, generally 5mm to 20mm) of crystallised gypsum, generally parallel with bedding. GRADE I. (MERCIA MUDSTONE GROUP) (stratum copied from 21.10m from previous sheet)			
23.50-23.80	32	C		100	70	61							
24.30-25.80													
24.60	33	C		97	97	97						(8.20)	
25.80-27.30				100	100	100							
										26.30-26.50m: Extremely weak greenish grey siltstone.			

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				
Method Used: Inspection pit + Dynamic sampling + Rotary Cored			Plant Used: Comacchio GEO 205			All dimensions in metres		Scale: 1:25	Checked By:
						Drilled By: Lee Smith	Logged By: DNeylon + JAlton		

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 7 of 17

Depth (m)	Samples & Testing			Mechanical Log				Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
	No	Type	Results	TCR (%)	SCR (%)	RQD (%)	If (mm)						
27.00-27.30	34	C		↓	↓	↓			Very weak reddish brown MUDSTONE with closely to very closely spaced (up to 40mm, generally 5mm to 20mm) of crystallised gypsum, generally parallel with bedding. GRADE I. (MERCIA MUDSTONE GROUP) (stratum copied from 21.10m from previous sheet) ... 27.30-27.90m: Thinly laminated with occasional siltstone laminae (<5mm). ... 28.30-28.55m: Random orientated fractures breaking up the core, generally closely spaced.				
27.30-28.80				100	100	100							
27.50				100	77	58							
28.80-30.30				↓	↓	↓							
29.75-31.10	36	C		↓	↓	↓			Weak thinly to thickly laminated greenish grey SILTSTONE with pockets (up to 20mm) of calcium carbonate, material slightly harder than the surrounding matrix. Unweathered. (MERCIA MUDSTONE GROUP) ... 29.45-29.55m: Extremely weak thinly laminated reddish brown mudstone.	29.79	29.30	x x x x	
				100	100	87			(0.45)	x x x x			
				↓	↓	↓			29.34	29.75	x x x x		
										(1.35)	x x x x		
									Weak to medium strong thinly to thickly cross laminated reddish brown SANDSTONE with intermittent lenses of greenish grey weak siltstone. Unweathered. (MERCIA MUDSTONE GROUP)	27.99	31.10	x x x x	
									Borehole terminated at 31.10m depth.				

Boring Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth				



Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 8 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 9 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 10 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: DNeylon + JAlton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 11 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 12 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylan + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 13 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 14 of 17
End: 14.09.22					



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7		Sheet: 15 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2			Client: SEGRO	Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 16 of 17



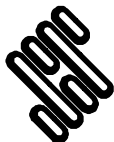
Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neylon + J.Allton	Checked By: AS	AGS
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Contract: EMG Phase 2		Client: SEGRO		Borehole: BH27
Contract Ref: 765514	Start: 12.09.22 End: 14.09.22	Ground Level (m AOD): 59.09	National Grid Co-ordinate: E:446622.8 N:324516.7	Sheet: 17 of 17



Method Used: Inspection pit + Dynamic sampling + Rotary Cored	Plant Used: Comacchio GEO 205	Drilled By: Lee Smith	Logged By: D.Neyton + J.Allton	Checked By: AS	AGS
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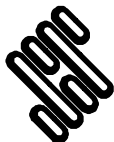
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP01
Contract Ref: 765514	Start: 05.09.22 End: 06.09.22	Ground Level (m AOD): 91.40	National Grid Co-ordinate: E:446654.8 N:325363.5		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES	1xT+1xJ+1xV			TOPSOIL ... 0.20-0.40m: becomes stiff	91.00	0.40	
0.50	2	ES	1xT+1xJ+1xV			... 0.30-0.40m: With low cobble content. Cobbles are subangular of sandstone (<250x150x100mm).	90.75	0.65	
1.00	3	ES	1xT+1xJ+1xV			Stiff dark reddish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite and sandstone.			
1.20-1.65	4	SPT	N=18			Stiff dark reddish brown slightly sandy CLAY with low cobble content. Cobbles are subangular of dark grey siltstone (up to 150x90x80mm). Occasional light greenish grey reduction spots. (MERCIA MUDSTONE GROUP)			
1.20-1.65	5	DSPT B				... 0.65m: Cobbles are subangular of dark grey siltstone (<230x150x100mm).			
1.80	6	D							
2.00-2.45	7	SPT	N=30						
2.00-2.45	8	DSPT B							
2.80	9	D							
3.00-3.31		SPT	13,12/18,22,10 for 5mm						
3.00-3.30	10	DSPT							
3.00-3.50	11	B							
3.80	12	D							
4.00-4.45		SPT	N=50						
4.00-4.45	13	DSPT							
4.00-4.50	14	B							
4.80	15	D							
5.00-5.38		SPT	6,10/10,10,20,10 for 5mm			... 5.00-7.95m: very stiff			
5.00-5.30	16	DSPT							
5.00-5.50	17	B							
5.80	18	D							
6.00-6.45		SPT	N=49						
6.00-6.45	19	DSPT							
6.00-6.50	20	B							
6.80	21	D							
7.50-7.81		SPT	6,8/17,23,10 for 5mm						
7.50-7.81	22	DSPT					83.59	7.81	
Cable percussion borehole terminated at 7.81m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
05/09/22	17:00	1.20	-		Dry	3.30	3.50	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. No groundwater encountered during drilling. 5. Borehole installed with 50mm standpipe on completion (response zone 1.00m to 7.81m). 6. SPT hammer JB05-2022 ($E_s = 68.00\%$) used.
06/09/22	08:00	1.20	-		Dry	5.60	6.00	00:30	
06/09/22	14:00	7.81	3.00	150	Dry				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Will Nevins		Logged By: GKalahar		Checked By: AS			



STRUCTURAL SOILS

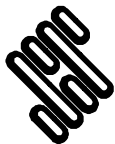
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP02
Contract Ref: 765514	Start: 07.09.22 End: 07.09.22	Ground Level (m AOD): 87.79	National Grid Co-ordinate: E:446423.0 N:325361.8		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.50	1	ES	1xT+1xJ+1xV			TOPSOIL ... 0.20-0.35m: stiff	87.44	0.35	
0.50	2	D				Stiff dark reddish brown slightly sandy gravelly CLAY with occasional pockets (up to 60mm) and lenses (up to 10mm) of greenish grey sandy silt with trace laminae and brown bands (up to 3mm). Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone. (MERCIA MUDSTONE GROUP)		(1.25)	
1.00	3	ES	1xT+1xJ+1xV						
1.00	4	D							
1.20-1.65	5	SPT	N=21						
1.20-1.65	6	DSPT					86.19	1.60	
1.20-1.70	6	B							
1.80	7	D				Very stiff dark reddish brown slightly sandy gravelly CLAY with occasional pockets (up to 60mm) of greenish grey sandy silt. Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)			
2.00-2.45	8	UT _(UT100)	60 blows 100% recovery						
2.60	9	D							
2.60-3.00	10	B							
3.00-3.41		SPT	5,5/13,13,15,9 for 35mm			... 3.00-3.30m: verging towards Grade III with extremely weak to very weak mudstone and occasional fine gravel size fragments of dark brown fossilised organic matter.			
3.00-3.40	11	DSPT							
3.00-3.50	12	B						(4.40)	
3.80	13	D							
4.00-4.45	14	UT _(UT100)	90 blows 100% recovery						
4.60	15	D							
4.60-5.00	16	B							
5.00-5.31		SPT	5,7/12,28,10 for 5mm			... 5.00-5.30m: occasional fine gravel size fragments of dark brown fossilised organic matter.			
5.00-5.30	17	DSPT							
5.00-5.50	18	B							
5.80	19	D					81.79	6.00	
6.00-6.37		SPT	8,14/25,25,25 for 70mm			Very stiff dark reddish brown slightly sandy gravelly CLAY with infrequent beds (up to 30mm) of light greenish grey siltstone. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone and siltstone. (MERCIA MUDSTONE GROUP)			
6.00-6.40	20	DSPT						(1.63)	
6.00-6.50	21	B				... 7.00-7.63m: gravel size fraction extremely weak to very weak			
6.80	22	D							
7.50-7.63		SPT	25/75 for 55mm				80.16	7.63	
7.50-7.63	23	DSPT				Cable percussion borehole terminated at 7.63m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
07/09/22	16:00	7.63	1.50	150	-	3.40 6.80	3.60 7.00	00:30 00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. Groundwater strike at 6.00m. Rise to 5.70m after 20 minutes. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer JB05-2022 (E _s = 68.00%) used.
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Will Nevins		Logged By: RStan		Checked By: RL			

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Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NL. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 05/05/23 - 17:20 | AJ4 |



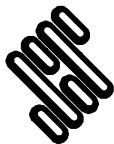
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP03
Contract Ref: 765514	Start: 08.09.22 End: 08.09.22	Ground Level (m AOD): 90.21	National Grid Co-ordinate: E:446264.9 N:325259.7		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES	1xT+1xJ+1xV			TOPSOIL			
0.20	2	D				... 0.20-0.35m: becoming stiff.	89.86	0.35	
0.50	3	ES	1xT+1xJ+1xV			Stiff dark orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite, sandstone, and flint.	89.51	0.70	
0.50	4	D						(0.50)	
1.00	5	B				Stiff to very stiff dark reddish brown slightly sandy slightly gravelly CLAY with frequent rootlets (up to 1mm) and occasional pockets (up to 6mm) of greenish grey silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, flint, and sandstone. Occasional pockets (up to 6mm) of dark brown decayed organic matter.	89.01	1.20	
1.00	6	ES	1xT+1xJ+1xV			... 0.80-1.20m: occasional lenses (<10mm) of dark reddish brown fine to coarse sand			
1.00	7	D				Very stiff dark reddish brown slightly sandy slightly gravelly CLAY with occasional beds and lenses (up to 25mm) of greenish grey sandy silt with trace laminae and brown silt bands (up to 3mm). Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of extremely weak mudstone.			
1.20	8	B				(MERCIA MUDSTONE GROUP)			
1.20-1.65	9	SPT	N=16			... 2.60-3.00m: friable			
1.20-1.70	10	B				... 3.00-6.50m: frequent gravel size pockets of greenish grey sandy silt			
1.20-1.65	9	DSPT							
1.80	11	D							
2.00-2.45	12	UT _(UT100)	120 blows 100% recovery						
2.60	13	D							
2.60-3.00	14	B							
3.00-3.45		SPT	N=53						
3.00-3.45	15	DSPT							
3.00-3.50	16	B							
3.80	17	D							
4.00-4.40	18	UT _(UT100)	150 blows 100% recovery						
4.00	19	D							
4.40-5.00	20	B							
5.00-5.45		SPT	N=45						
5.00-5.45	21	DSPT							
5.00-5.50	22	B							
5.80	23	D							
6.00-6.45		SPT	N=60						
6.00-6.45	24	DSPT							
6.00-6.50	25	B					83.71	6.50	
6.80	26	D				Very stiff dark reddish brown slightly sandy gravelly CLAY with occasional beds (up to 20mm) of light greenish grey siltstone. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of extremely weak mudstone and siltstone.			
7.00-7.25		SPT	8,15/40,60 for 20mm			(MERCIA MUDSTONE GROUP)			
7.00-7.25	27	DSPT							
7.00-7.30	28	B							
7.30-7.61		SPT	13,12/20,40,15 for 10mm				82.60	7.61	
7.30-7.61	29	DSPT				Cable percussion borehole terminated at 7.61m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
08/09/22	18:00	7.00	1.50	150	Dry	2.60	3.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer JB05-2022 ($E_r = 68.00\%$) used.
08/09/22	08:00	7.00	1.50	150	Dry	7.00	7.30	00:30	
09/09/22	09:00	7.61	1.50	150	Dry				
Method Used: Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000			Drilled By: Will Nevins			Logged By: RStan		Checked By: RL	



STRUCTURAL SOILS

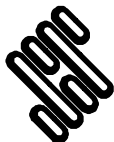
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP04
Contract Ref: 765514	Start: 12.09.22 End: 13.09.22	Ground Level (m AOD): 81.74	National Grid Co-ordinate: E:446165.0 N:325032.0		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	3	B				TOPSOIL	81.44	0.30	
0.50	1	ES				Stiff brown slightly gravelly sandy CLAY with occasional rootlets (up to 1mm). Sand is fine and medium. Gravel is angular to subrounded fine and medium of mudstone and sandstone. ... 0.85-1.00m: low cobble content. Cobbles (<100mm x 70mm x 40mm) are subrounded quartzite.			
0.50	2	D							
0.50-1.00	6	B							
1.00	4	ES							
1.00	5	D							
1.20-1.65	7	SPT	N=11						
1.20-1.65	8	DSPT							
1.20-1.70	8	B							
1.80	9	D							
2.00-2.45	10	UT _(UT100)	80 blows 100% recovery				79.54	2.20	
2.60	11	D				Stiff brownish grey occasionally mottled brown and reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone, siltstone, chalk, and unknown metamorphic rock. ... below 4.00m: becoming very stiff			
2.60-3.00	12	B							
3.00-3.45		SPT	N=19						
3.00-3.45	13	DSPT							
3.00-3.50	14	B							
3.80	15	D							
4.00-4.45	16	UT _(UT100)	90 blows 100% recovery						
4.60	17	D							
4.60-5.00	18	B							
5.00-5.45		SPT	N=35						
5.00-5.45	19	DSPT							
5.00-5.50	20	B							
5.80	21	D							
6.00-6.45	22	UT _(UT100)	110 blows 100% recovery						
6.60	23	D							
6.60-7.00	24	B							
7.00-7.45		SPT	N=37						
7.00-7.45	25	DSPT							
7.00-7.50	26	B							
7.80	27	D							
8.00-8.45		SPT	N=35						
8.00-8.45	28	DSPT							
8.00-8.50	29	B							
8.80	30	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
12/09/22	18:00	11.00	3.00	150	-				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. Groundwater strike at 17m. Rose to 10.20m after 20 minutes. 5. Borehole was backfilled with bentonite seal upon completion. 6. SPT hammer JB05-2022 ($E_r = 68.00\%$) used. All dimensions in metres Scale: 1:50
13/09/22	08:00	11.00	3.00	150	-				
13/09/22	18:00	17.00	13.50	150	12.10				
14/09/22	08:00	13.50	13.50	150	11.00				
14/09/22	11:00	15.00	15.00	150	-				
Method Used: Inspection pit + Cable percussion	Plant Used: Dando 2000		Drilled By: Will Nevins		Logged By: GKalahar		Checked By: RL		





STRUCTURAL SOILS

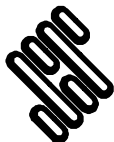
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP05
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 85.91	National Grid Co-ordinate: E:446066.5 N:325366.2		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				TOPSOIL	85.61	0.30	
0.00-0.30	101	ES							
0.30-0.30	2	D							
0.50-1.00	3	B							
0.50-0.50	102	ES							
0.70-0.70	4	D							
1.00-1.00	103	ES							
1.20-1.65	5	UT	18 blows 100% recovery						
1.65-1.75	6	D							
2.00-2.45		SPT	4,9/9,13,13,15 for 70mm						
2.00-2.45	7.1	DSPT							
2.00-2.45	8	B							
2.75-2.75	9	D							
3.00-3.44		SPT	6,11/13,12,12,13 for 65mm						
3.00-3.45	10.1	DSPT							
3.00-3.45	11	B							
3.75-3.75	12	D							
4.00-4.39		SPT	4,6/14,15,17,6 for 10mm						
4.00-4.45	13.1	DSPT							
4.00-4.45	14	B							
4.75-4.75	15	D							
5.00-5.30		SPT	8,10/15,31,4 for 0mm						
5.00-5.45	16.1	DSPT							
5.00-5.45	17	B							
5.75	18	D							
6.00-6.25		SPT	10,15/36,14 for 25mm						
6.00-6.45	19.1	DSPT							
6.20-6.41		SPT	25/38,62 for 60mm						
6.20	104	ES							
6.20-6.65	20.1	DSPT							
						Cable percussion borehole terminated at 6.41m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
27/09/22	14:00	6.41	6.20	150	Dry	6.00	6.20	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite. 6. SPT hammer DS5-1-22 ($E_r = 61.00\%$) used.
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000			Drilled By: Nathan Topping			Logged By: RStan		Checked By: AS	

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STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP06
Contract Ref: 765514	Start: 28.09.22 End: 29.09.22	Ground Level (m AOD): 87.01	National Grid Co-ordinate: E:446015.6 N:325200.5		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				TOPSOIL	86.71	0.30	
0.00-0.10	101	ES							
0.20	2	D							
0.50-1.00	3	B							
0.50	102	ES						(1.00)	
0.70	4	D							
1.00	103	ES					85.71	1.30	
1.20-1.65	5	UT	80 blows 40% recovery						
1.30	104	ES							
1.65	6	D							
2.00-2.45		SPT	N=23						
2.00-2.45	7	DSPT							
2.00-2.45	8	D							
2.75	9	D							
3.00-3.45	10	UT	28 blows 50% recovery						
3.65	11	D						(4.65)	
4.00-4.45		SPT	N=30						
4.00-4.45	12	DSPT							
4.00-4.45	13	B							
4.75	14	D							
5.00-5.45	15	UT	26 blows 50% recovery						
5.65	16	D					81.06	5.95	
6.00-6.45		SPT	N=37						
6.00	105	ES							
6.00	17	DSPT						(1.75)	
6.00	18	B							
7.00	19	D							
7.50-7.95	20	UT	50 blows 20% recovery				79.31	7.70	
7.70	106	ES							
8.07		EW							
8.50	21	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
28/09/22	18:00	11.26	11.00	150	Dry	10.60	11.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. Groundwater struck at 9.00m depth, rising to 7.20m depth after 20 minutes. 5. Borehole installed with 50mm standpipe (response zone 1.00m to 11.26m). 6. SPT hammer DS5-1-22 ($E_r = 61.00\%$) used.
29/09/22	08:00	11.26	11.00	150	-				
29/09/22	11:00	11.26	11.00	150	-				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Nathan Topping		Logged By: RStan		Checked By: AS			



Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45 9.00-9.45 9.00	22 23	SPT DSPT B	N=66			Stiff to very stiff reddish brown sandy gravelly silty CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of mudstone. Occasional bands of grey siltstone. (MERCIA MUDSTONE GROUP) <i>(stratum copied from 7.70m from previous sheet)</i>	75.75	(3.56)	
10.00	24	D							
10.50-10.83		SPT	12,12/24,51,20 for 30mm						
10.50-10.83	25	DSPT							
11.00-11.26		SPT	12,14/29,71 for 50mm						
11.00 11.00-11.26	107 26	ES DSPT				Cable percussion borehole terminated at 11.26m depth.			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP07
Contract Ref: 765514	Start: 30.09.22 End: 03.10.22	Ground Level (m AOD): 78.15	National Grid Co-ordinate: E:445919.0 N:325053.4		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.00	1	D				TOPSOIL	77.85	0.30	
0.10-0.20	2	B							
0.20-0.20	101	ES	1xT+1xJ+1xV			Stiff, becoming very stiff, brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of quartzite, chalk, mudstone, sandstone, and coal. Occasional cobbles (up to 100mm) of quartzite and sandstone.			
0.40-0.40	102	ES	1xT+1xJ+1xV						
0.60-0.60	3	D							
0.60-0.80	4	B							
1.30	5	D				... below 1.50m, very stiff.			
1.50-1.95	6	UT _(UT100)	150 blows 89% recovery						
2.30	7	D							
2.50-2.95		SPT	N=20						
2.50-2.95	10	B							
2.50-2.95	9	DSPT							
3.20	11	D							
3.50-3.95	12	UT _(UT100)	100 blows 89% recovery						
3.50-3.95	13	D							
4.30	14	D							
4.50-4.95		SPT	N=21						
4.50-4.95	16	DSPT							
4.50-4.95	17	B							
5.70	18	D							
6.00-6.45	19	UT _(UT100)	100 blows 93% recovery						
6.45-6.55	20	D						(13.00)	
7.30	21	D							
7.50-7.95		SPT	N=20						
7.50-7.95	23	DSPT							
7.50-7.95	24	B							
8.70	25	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
30/09/22	18:00	8.00	7.50	200	Dry	13.50	14.00	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Drilled using 150mm diameter tools and casing. 4. Groundwater struck at 13.40m depth, rising to 8.40m depth after 20 minutes. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.
03/10/22	08:00	8.00	7.50	200	Dry				
03/10/22	15:00	14.21	9.00	200	-				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 3000			Drilled By: Jonny Hutt			Logged By: RStan		Checked By: AS	













Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45		SPT	N=37			Dense brown mottled reddish brown slightly gravelly silty fine to coarse SAND with occasional bands (up to 50mm) of strong grey siltstone. Gravel is subangular to subrounded fine to coarse of quartzite and siltstone. <i>(stratum copied from 8.50m from previous sheet)</i> Stiff grey mottled reddish brown slightly sandy slightly gravelly CLAY interbedded with reddish brown gravelly clayey fine to coarse SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite and rare siltstone. Very stiff brown mottled reddish brown sandy gravelly CLAY with occasional to frequent pockets (up to 20mm) of grey silty clay. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium of mixed lithologies including quartzite and coal.	72.18	9.50	
9.00-9.45	34	DSPT							
9.00-9.50	35	B							
9.50	36	D							
9.90-10.22		SPT	4,10/13,28,9 for 20mm						
9.90-10.22	38	DSPT							
9.90-10.20	39	B							
10.20	40	D							
10.50	41	D							
11.00-11.45		SPT	N=69						
11.00-11.45	43	DSPT							
11.00-11.50	44	B							
11.50-11.91		SPT	10,13/19,24,32,25 for 30mm						
11.50-11.91	46	DSPT							
11.50-12.00	47	B							
12.00	48	D							
12.10-12.50		SPT	10,14/21,26,26,27 for 25mm						
12.10-12.50	50	DSPT							
12.30	51	D							
12.30-12.63		SPT	12,12/25,40,35 for 30mm						
12.30-12.63	53	DSPT							
						Cable percussion borehole terminated at 12.63m depth.			



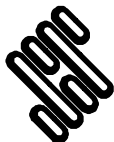
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP09
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 77.24	National Grid Co-ordinate: E:445693.6 N:325345.4		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
Depth	No	Type	Results									
0.00-0.50	1	B	N=11			TOPSOIL	76.94	0.30				
0.01	101	ES				Stiff reddish brown mottled grey sandy silty CLAY with pockets of siltstone. Sand is fine to coarse. Gravel is angular to subangular fine of mudstone.	(3.00)					
0.20	2	D										
0.50-1.00	3	D										
0.50	102	ES										
0.70	4	D										
1.00	103	ES										
1.20-1.65		SPT										
1.20-1.65	5	DSPT										
1.20-1.65	6	B										
1.75	7	D										
2.00-2.45	8	UT	28 blows 80% recovery									
2.45	9	D	7,8/10,90 for 60mm			73.94	3.30					
3.00-3.29		SPT										
3.00-3.45	10	DSPT										
3.00-3.45	11	B										
3.30	104	ES							Stiff grey mottled reddish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone, siltstone, and mudstone. With low cobble content of siltstone.	73.49	3.75	
3.75	12	D										
3.75	105	ES										
4.00-4.45		SPT										
4.00-4.45	13	DSPT										
4.00-4.45	14	B										
4.75	15	D										
5.00-5.45		SPT										
5.00-5.45	16	DSPT										
5.00-5.45	17	B										
5.75	18	D	N=31			71.14	6.10					
6.00-6.45		SPT										
6.00-6.45	19	DSPT										
6.00-6.45	20	B										
7.00	21	D										
7.50-7.95		SPT										
7.50-7.95	22	DSPT										
7.50-7.95	23	B										
8.00-8.36		SPT										
8.00	106	ES										
8.00-8.36	24	DSPT										
8.40-8.65		SPT	25/26,32,34,8 for 0mm			68.59	8.65					
8.40-8.65	25	DSPT										
						Cable percussion borehole terminated at 8.65m depth.						


















Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
29/09/22	17:00	8.65	8.40	150	Dry	7.60 8.00	8.00 8.40	00:30 00:30						
Method Used:		Inspection pit + Cable percussion		Plant Used:		Dando 2000		Drilled By:	Nathan Topping	Logged By:	GKalahar	Checked By:	AS	AGS





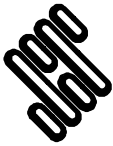
STRUCTURAL SOILS

BOREHOLE LOG

Contract:			Client:			Borehole:		
EMG Phase 2			SEGRO			CP10		
Contract Ref:		Start: 29.09.22	Ground Level (m AOD):		National Grid Co-ordinate:		Sheet:	
765514		End: 30.09.22	75.02		E:445636.3 N:325137.2		1 of 2	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend														
Depth	No	Type	Results																				
0.10-0.20	1	B	1xT+1xJ+1xV			TOPSOIL	74.82	0.20															
0.10	2	D				Stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, mudstone, and quartzite.		(0.60)															
0.10	101	ES																					
0.30-0.60	3	B	1xT+1xJ+1xV				74.22	0.80															
0.30	102	ES																					
0.50	4	D				Stiff light brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, siltstone, mudstone, and chalk.																	
0.90-1.20	5	B	1xT+1xJ+1xV																				
0.90	103	ES																					
1.00	6	D																					
1.50-1.95		SPT	N=25																				
1.50-1.95	8	DSPT									(2.00)												
1.50-1.95	9	B																					
2.50-2.95	10	UT _(UT100)	125 blows 100% recovery				72.22	2.80															
2.95-3.05	11	D	1xT+1xJ+1xV																				
3.00-3.30	12	B											(1.20)										
3.00	104	ES																					
3.50-3.95		SPT	N=37																				
3.50-3.95	14	DSPT									4.00												
3.50-3.95	15	B																					
4.00	16	D	1xT+1xJ+1xV																				
4.00-4.40	17	B									Stiff brown mottled grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine of mixed lithologies including sandstone, siltstone, and flint.												
4.00	105	ES																					
4.50-4.95	18	UT _(UT100)	150 blows 100% recovery																				
4.95-5.10	19	D	(3.30)																				
5.45	20	EW																					
5.50		D																					
6.00-6.12		SPT	25/100 for 75mm																				
6.00-6.12	22	DSPT																					
6.00-6.50	23	B																					
7.00	24	D	1xT+1xJ+1xV				67.72	7.30															
7.30	106	ES					Stiff reddish brown mottled grey gravelly sandy silty CLAY. Sand is fine. Gravel is fine of mudstone and siltstone.					(0.70)											
7.50-7.83		SPT																					
7.50-7.83	26	DSPT	6,10/25,25,50 for 30mm				67.02	8.00															
7.50-8.00	27	B									(0.50)												
8.00-8.50	28	B																					
8.50-9.00	29	B	1xT+1xJ+1xV				66.52	8.50															
8.50	30	D					Reddish brown sandy subangular to subrounded predominantly coarse GRAVEL of mixed lithologies including sandstone, mudstone, siltstone, and flint. Sand is fine to coarse. With low cobble content of flint.																
8.50	107	ES																					
						Description on next sheet																	

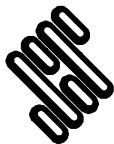
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)			
29/09/22	17:00	7.83	7.50	150	7.30	6.00	6.20	00:30			
30/09/22	08:00	7.83	7.50	150	5.10	8.00	8.50	01:00			
30/09/22	13:00	10.84	9.00	150	4.40						
Method Used: Inspection pit + Cable percussion						Drilled By: Robert Foster		Logged By: RStan		Checked By: 	
								All dimensions in metres		Scale: 1:50	
Plant Used: Dando 2500											



Contract: EMG Phase 2			Client: SEGRO		Borehole: CP10
Contract Ref: 765514	Start: 29.09.22 End: 30.09.22	Ground Level (m AOD): 75.02	National Grid Co-ordinate: E:445636.3 N:325137.2		Sheet: 2 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.29	32 33	SPT	8,16/40,60 for 65mm			Stiff to very stiff reddish brown gravelly sandy silty CLAY. Sand is fine. Gravel is fine angular to subangular of mudstone. Occasional bands of grey siltstone. (MERCIA MUDSTONE GROUP) (stratum copied from 8.50m from previous sheet)		(2.34)	
9.00-9.29		DSPT							
9.00-9.50		B							
10.00	34	D	13,12/20,30,50 for 70mm				64.18	10.84	
10.50-10.84	36	SPT							
10.50-10.84		DSPT							
						Cable percussion borehole terminated at 10.84m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									completion (response zone 1.00 to 8.60m). 7. SPT hammer AR1862-2022 ($E_r = 65.00\%$) used.
									All dimensions in metres
									Scale: 1:50
Method Used: Inspection pit + Cable percussion			Plant Used: Dando 2500			Drilled By: Robert Foster	Logged By: RStan	Checked By:	



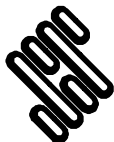
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP11
Contract Ref: 765514	Start: 30.09.22 End: 03.10.22	Ground Level (m AOD): 68.97	National Grid Co-ordinate: E:445598.3 N:324907.3		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				TOPSOIL	68.67	0.30	
0.00	2	D							
0.01	101	ES							
0.30	102	ES							
0.50-1.00	3	B							
0.70	4	D							
1.00-1.65	103	ES							
1.20-1.65		SPT	N=29						
1.20-1.65	5	DSPT							
1.20-1.65	6	B							
1.75	7	D							
2.00-2.45	8	UT	29 blows 40% recovery						
2.65	9	D							
3.00-3.45		SPT	N=67						
3.00-3.45	10	DSPT						(5.90)	
3.00-3.45	11	B							
3.75	12	D							
4.00-4.45		SPT	N=94						
4.00-4.45	13	DSPT							
4.00-4.45	14	B							
4.75	15	D							
5.00-5.45		SPT	N=90						
5.00-5.45	16	DSPT							
5.00-5.45	17	B							
5.75	18	D							
6.00-6.45		SPT	9,7/13,15,27,45 for 70mm				62.77	6.20	
6.00-6.45	19	DSPT							
6.00-6.45	20	B				Stiff to very stiff reddish brown gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular of mudstone. Occasional pockets of grey siltstone. (MERCIA MUDSTONE GROUP)		(1.09)	
6.75	21	D							
7.00-7.29		SPT	16,9/41,44,15 for 10mm				61.68	7.29	
7.00-7.29	22	DSPT				Cable percussion borehole terminated at 7.29m depth.			

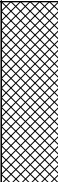

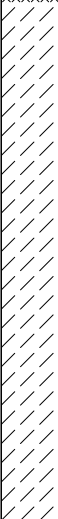
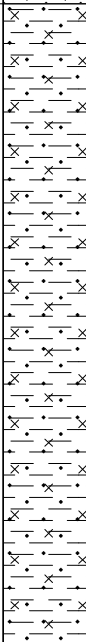

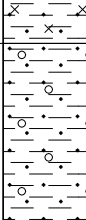

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
30/09/22	17:00	6.00	6.00	150	Dry	3.50	3.90	00:40	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole installed with 50mm standpipe upon completion (response zone 1.00m to 6.20m). 6. SPT hammer DS5-1-22 ($E_s = 61.00\%$) used.
03/10/22	08:00	6.00	6.00	150	-	6.50	7.00	00:30	
03/10/22	11:00	7.29	7.00	150	-				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Nathan Topping		Logged By: RStan		Checked By: AS			





STRUCTURAL SOILS

BOREHOLE LOG



Contract: EMG Phase 2			Client: SEGRO		Borehole: CP12
Contract Ref: 765514	Start: 30.09.22 End: 30.09.22	Ground Level (m AOD): 89.36	National Grid Co-ordinate: E:446517.1 N:325155.1		Sheet: 1 of 2

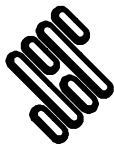
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thick- ness)	Material Graphic Legend				
Depth	No	Type	Results										
0.00-0.50	1	B	N=13			TOPSOIL	88.96	0.40					
0.10-0.10	101	ES				Firm dark reddish brown mottled grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, limestone, and quartzite.							
0.30-0.30	2	B											
0.50-1.00	3	B											
0.50-0.50	102	ES											
0.70	4	D											
1.00-1.00	103	ES											
1.20-1.65		SPT											
1.20-1.65	5	DSPT											
1.20-1.65	6	B											
1.75-1.75	7	D											
2.00-2.45	8	UT											
2.75-2.75	9	D											
3.00-3.45		SPT	N=8			Soft orangish brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone and siltstone.	84.46	4.90					
3.00-3.45	10	DSPT											
3.00-3.45	11	B											
3.75-3.75	12	D											
4.00-4.45	13	UT											
4.65-4.65	14	UT											
5.00-5.45		SPT	N=4							Stiff to very stiff reddish brown gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of mudstone and occasionally siltstone. (MERCIA MUDSTONE GROUP)	83.16	6.20	
5.00-5.45	15	NR											
5.00-5.45	16	B											
5.75	17	D											
6.00-6.45		SPT	N=36										
6.00-6.45	18	DSPT											
6.00-6.50	19	B											
7.00	20	D	4,10/16,24,29,31 for 60mm										
7.50-7.94		SPT											
7.50-7.94	21	DSPT											
7.50-8.00	22	B											
8.50	23	D											

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
05/10/22	17:00	9.36	9.00	150	-	8.80	9.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer DS5-1-22 ($E_r = 61.00\%$) used.			
									All dimensions in metres		Scale: 1:50	
Method Used: Cable percussion				Plant Used: Dando 2000			Drilled By: Nathan Topping		Logged By: RStan		Checked By: 	

GINT LIBRARY V10.01.GLB LibVersion: v8.07 | Log Cable Percussion Log - A4P | 765514 EAST MIDLAND AIRPORT GPJ - V10.01. Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NL. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 05/05/23 - 17:21 | A4J |



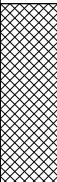

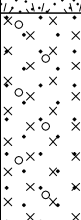




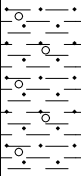

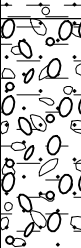

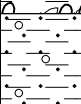





Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.36	104 24	SPT	10,11/26,37,37 for 60mm				80.00	9.36	
9.00 9.00-9.36		ES DSPT				Cable percussion borehole terminated at 9.36m depth.			



STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP13
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 77.14	National Grid Co-ordinate: E:446416.1 N:324961.0		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend								
Depth	No	Type	Results														
0.10	1	D	1xT+1xJ+1xV 1xT+1xJ+1xV			TOPSOIL	76.84	0.30									
0.10-0.20	2	B				Soft light orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of sandstone and mudstone.		(1.40)									
0.20	101	ES															
0.40	102	ES															
0.60	3	D															
0.60-0.80	4	B															
1.20	5	D	N=10			Soft reddish brown slightly sandy gravelly CLAY. Sand is fine and medium of mudstone. Gravel is subangular to rounded fine to coarse of sandstone, mudstone, and siltstone.	75.44	1.70									
1.50-1.95	7	SPT						(0.60)									
1.50-1.95	8	B															
1.80-2.00	103	ES															
1.80	103	ES															
2.40	9	D				1xT+1xJ+1xV N=9			Firm light orangish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of sandstone and mudstone.		(1.70)						
2.40	104	ES															
2.50-2.95	11	SPT															
2.50-2.95	12	DSPT															
2.50-2.95	13	B															
3.00	23	W	N=12						Loose multicolored (greenish blue, red, white, grey) very sandy clayey subangular to rounded fine to coarse GRAVEL of siltstone, mudstone, sandstone, quartzite, and chalk with low cobble content. Sand is fine to coarse. Cobbles (up to 100mm) are subrounded.	73.14	4.00						
3.30	13	D															
3.50-3.95	15	SPT															
3.50-3.95	16	DSPT															
3.50-3.95	16	B															
4.00-4.50	17	B															
4.50-4.95	19	SPT(c)	N=5			Stiff becoming very stiff reddish brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is subrounded to rounded of siltstone, sandstone, and mudstone. Occasional bluish grey silt beds (up to 50mm).		(1.60)									
4.50-4.95		B															
							71.54	5.60									
5.70	20	D	N=31			Medium dense multicolored (greenish blue, red, white, grey) slightly sandy clayey rounded to subangular fine to coarse GRAVEL of siltstone, mudstone, sandstone, quartzite, and chalk with low cobble content. Sand is fine to coarse. Cobbles (up to 100mm) are subrounded of siltstone, quartzite, and sandstone.	70.94	6.20	(1.40)								
6.00-6.45	22	SPT															
6.00-6.45	24	DSPT															
6.00-6.20	24	B															
6.20-6.45	25	B															
7.30	26	D	6,9/11,20,19 for 60mm			Extremely weak light reddish brown mottled grey MUDSTONE. (MERCIA MUDSTONE GROUP)	69.54	7.60	(1.64)								
7.50-7.86	SPT(c)																
7.50-7.95	28	B															
8.30	29	D															
8.50-8.72	SPT	25/42,58 for 70mm															
8.50-8.72	31	DSPT															

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
05/10/22	18:36	6.00	6.00	200	4.10	5.80	6.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 200mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer AR3104-2022 (E _r = 64.00%) used.
06/10/22	07:35	6.00	6.00	200	3.10	8.50	9.00	01:00	
06/10/22	16:00	9.24	8.50	200	-				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 3000			Drilled By: Jonny Hutt			Logged By: RStan		Checked By: AS	



Contract:		Client:		Borehole:
EMG Phase 2		SEGRO		CP13
Contract Ref:	Start: 05.10.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
765514	End: 05.10.22	77.14	E:446416.1 N:324961.0	2 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
8.50-9.00	32	B	20,5/34,56,10 for 10mm				67.90	9.24	
9.00-9.24		SPT							
9.00-9.24	34	DSPT				Cable percussion borehole terminated at 9.24m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)		



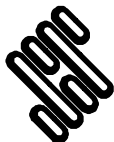
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP14
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 78.39	National Grid Co-ordinate: E:446524.3 N:324946.9		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				TOPSOIL			
0.10	101	ES					77.99	0.40	
0.30-0.50	2	D							
0.50-1.00	4	B				Stiff dark reddish brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone, siltstone, mudstone, and quartz.		(0.50)	
0.50	102	ES					77.49	0.90	
0.70	3	D							
1.00	103	ES				Stiff reddish brown mottled grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine of mixed lithologies including siltstone and mudstone.			
1.20-1.65	5	UT							
1.65	6	UT							
2.00-2.45		SPT	N=16						
2.00-2.45	7	DSPT						(2.90)	
2.00-2.45	8	B							
2.75	9	D							
3.00-3.45		SPT	N=17						
3.00-3.45	10	DSPT							
3.00-3.45	11	B					74.59	3.80	
3.75	12	D				Firm orangish brown occasionally gravelly sandy silty CLAY. Sand is fine. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone and siltstone.		(0.60)	
3.80	104	ES							
3.80	105	ES					73.99	4.40	
4.00-4.45		SPT	N=26						
4.00-4.45	14	B				Medium dense orangish brown very sandy silty angular to subangular fine to coarse GRAVEL of predominantly flint with low cobble content. Sand is fine.		(0.90)	
5.00-5.45		SPT(c)	N=42						
5.00-5.45	16	B					73.09	5.30	
6.00-6.45		SPT	N=55			Very stiff reddish brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)		(1.60)	
6.00-6.45	17	B							
6.40-6.45	18	B					71.49	6.90	
7.00	19	D				Very stiff reddish brown gravelly sandy silty CLAY with occasional pockets of siltstone. Gravel is angular to subangular fine of mudstone. (MERCIA MUDSTONE GROUP)		(1.50)	
7.50-7.95		SPT	6,11/13,20,32,35 for 70mm						
7.50-7.95	20	DSPT							
7.50-7.95	21	B							
8.00-8.40		SPT	10,14/18,28,41,13 for 20mm				69.99	8.40	
8.00-8.40	22	DSPT				Cable percussion borehole terminated at 8.40m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
04/10/22	16:00	8.40	8.00	150	-	4.50 7.50	5.00 8.00	00:50 00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 200mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.
Method Used: Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000			Drilled By: Jonny Hutt			Logged By: RStan		Checked By: AS	





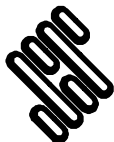
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP15
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 71.98	National Grid Co-ordinate: E:446551.5 N:324799.4		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	1	B				TOPSOIL	71.78	0.20	
0.10	101	ES				Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, and quartz.			
0.30	2	D							
0.50-1.00	3	B							
0.50	102	ES						(1.10)	
0.70	4	D							
1.00	103	ES					70.68	1.30	
1.20-1.65	5	UT				Stiff reddish brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of mixed lithologies including siltstone and mudstone.			
1.30	104	ES						(1.00)	
1.65	6	D							
2.00-2.45		SPT	N=9			Stiff to very stiff reddish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to coarse of mudstone. Occasional pockets of grey mudstone and siltstone. (MERCIA MUDSTONE GROUP)	69.68	2.30	
2.00-2.45	7	DSPT							
2.00-2.45	8	B							
2.30	105	ES							
2.75	9	D							
3.00-3.45		SPT	N=12						
3.00-3.45	10	DSPT							
3.00-3.45	11	B							
3.75	12	D							
4.00-4.45		SPT	N=75						
4.00-4.45	13	DSPT							
4.00-4.45	14	B							
4.75	15	D							
5.00-5.45		SPT	N=48						
5.00-5.45	16	DSPT							
5.00-5.45	17	B						(5.96)	
5.75	18	D							
6.00-6.45		SPT	N=38						
6.00-6.45	19	DSPT							
6.00-6.45	20	B							
7.00	21	D							
7.50-7.86		SPT	10,15/21,32,47 for 60mm						
7.50-7.95	22	DSPT							
7.50-8.00	23	B							
8.00-8.26		SPT	14,11/30,48,22 for 20mm				63.72	8.26	
8.00	106	ES				Cable percussion borehole terminated at 8.26m depth.			
8.00-8.26	24	DSPT							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
03/10/22	16:00	8.26	8.00	150	Dry	7.50	8.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer DS5-1-22 ($E_t = 61.00\%$) used.					
									All dimensions in metres		Scale: 1:50			
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2000		Drilled By:	Nathan Topping		Logged By:	RStan	Checked By:		



STRUCTURAL SOILS

BOREHOLE LOG

Contract:	EMG Phase 2		Client:	SEGRO		Borehole:	CP16	
Contract Ref:	765514		Start: 04.10.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 2	
			End: 04.10.22	77.24	E:446244.3 N:324933.8			

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.30	1	B				TOPSOIL			
0.10	101	ES	1xT+1xJ+1xV				76.89	0.35	
0.40-0.70	2	B				Stiff orangish brown gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, quartz, chalk, and siltstone.			
0.50	3	D							
0.50	102	ES	1xT+1xJ+1xV						
0.90-1.20	4	B							
1.00	5	D							
1.00	103	ES	1xT+1xJ+1xV						
1.50-1.94		SPT	N=49						
1.50-1.94		DSPT							
1.50-1.94	8	B						(3.05)	
2.50-2.95	9	UT _(UT100)	100 blows 100% recovery						
2.95-3.10	10	D							
							73.84	3.40	
3.40	11	D				Very stiff dark reddish brown mottled grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, and mudstone.			
3.40	104	ES	N=19						
3.50-3.95		SPT							
3.50-3.95	13	DSPT							
3.50-3.95	14	B							
4.50-4.95	15	UT _(UT100)	100 blows 100% recovery					(2.35)	
5.00	16	D							
5.50	17	D							
5.80	105	ES	1xT+1xJ+1xV				71.49	5.75	
6.00-6.45		SPT	N=65			Stiff to very stiff grey sandy silty CLAY. Sand is fine to coarse.			
6.00-6.45	19	DSPT							
6.00-6.45	20	B							
7.00	21	D						(3.25)	
7.50-7.95	22	UT _(UT100)	125 blows 100% recovery						
8.00	23	D							
8.50	24	D							
							68.24	9.00	

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
04/10/22	17:00	3.10	2.50	150	Dry	10.50	11.00	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. 15 litres of water added between 1.20m and 2.50m to aid drilling. 5. Groundwater strike at 5.75m rising to 5.00m after 20 minutes. 6. Borehole installed with 50mm standpipe on
05/10/22	08:00	3.10	2.50	150	Dry				
05/10/22	17:15	11.15	10.50	150	-				
06/10/22	08:00	11.15	10.50	150	9.25				
06/10/22	11:15	11.15	10.50	150	-				
Method Used: Inspection pit + Cable percussion						Drilled By: Robert Foster			Logged By: RStan
Plant Used: Dando 2500						Checked By: AS			Scale: 1:50



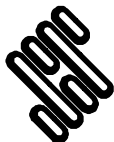
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP16
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.24	National Grid Co-ordinate: E:446244.3 N:324933.8		Sheet: 2 of 2

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick-ness)	Material Graphic Legend
Depth	No	Type	Results						
9.00-9.45 9.00 9.00-9.45 9.00-9.45	106 26 27	SPT ES DSPT B	N=48 1xT+1xJ+1xV			Stiff reddish brown mottled grey gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mixed lithologies including sandstone, siltstone, and mudstone. (MERCIA MUDSTONE GROUP)	67.24	10.00	
10.00-10.50 10.00	28 107	B ES	1xT+1xJ+1xV			Stiff to very stiff reddish brown gravelly sandy silty CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of mudstone. Occasional bands of grey siltstone. (MERCIA MUDSTONE GROUP)		(1.15)	
10.50-10.70 10.50-10.70 10.50-11.00 11.00-11.15		SPT DSPT B SPT	25/50,50 for 55mm 25/60,40 for 40mm				66.09	11.15	
11.00-11.15	33	DSPT				Cable percussion borehole terminated at 11.15m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									completion (response zone 5.75m to 9.10m). 7. SPT hammer AR1862-2022 ($E_r = 65.00\%$) used.
									All dimensions in metres
									Scale: 1:50
Method Used: Inspection pit + Cable percussion			Plant Used: Dando 2500			Drilled By: Robert Foster	Logged By: RStan	Checked By:	



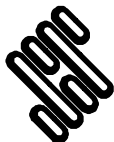
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP17
Contract Ref: 765514	Start: 15.09.22 End: 05.10.22	Ground Level (m AOD): 82.31	National Grid Co-ordinate: E:446263.8 N:325045.2		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00	1	D				TOPSOIL	82.01	0.30	
0.00-0.00	2	B							
0.10	1	D							
0.10-0.20	2	B							
0.10	101	ES	1xT+1xJ+1xV						
0.20	101	ES	1xT+1xJ+1xV						
0.40	102	ES							
0.60	3	D							
0.60-0.80	4	B							
1.20	5	D							
1.50-1.70	6	UT _(UT100)	100 blows 100% recovery						
1.70-1.80	7	D							
2.30	8	D							
2.50-2.95		SPT	N=25			. . . Below 2.50m: becoming stiff.		(5.10)	
2.50-2.95	10	DSPT							
2.50-2.95	11	B							
3.30	12	D							
3.50-3.95	13	UT _(UT100)	100 blows 89% recovery			. . . Below 3.50m: becoming very stiff.			
3.50-3.95	14	D							
3.95-4.05	14	D							
4.30	15	D							
4.50-4.95		SPT	N=35						
4.50-4.95	17	DSPT							
4.50-4.95	18	B							
5.50	103	ES	1xT+1xJ+1xV				76.91	5.40	
5.70	19	D				Stiff light reddish brown mottled grey slightly gravelly sandy silty CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone and sandstone. Cobbles (up to 80mm) are of mudstone and sandstone. Frequent bluish grey siltstone beds (up to 50mm).			
6.00-6.45		SPT	N=25						
6.00-6.45	21	DSPT							
6.00-6.45	22	B							
7.30	23	D				. . . Below 7.30m: very stiff, slightly sandy slightly gravelly. Gravels decreasing in size.		(5.30)	
7.50-7.95	24	UT _(UT100)	80 blows 89% recovery						
7.95-8.05	25	D							
8.70	26	D							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
04/10/22	17:45	16.00	16.00	200	12.10	16.60	17.00	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. Water added between 15.00m and 16.00m to aid drilling. 5. No groundwater encountered during drilling. 6. Borehole installed with 50mm standpipe upon completion (response zone 14.00m to 17.21m).
05/10/22	08:15	16.00	16.00	200	10.40				
05/10/22	12:00	17.21	16.50	200	-				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 3000		Drilled By: Jonny Hutt		Logged By: RStan		Checked By: AS			



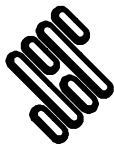
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP17
Contract Ref: 765514	Start: 15.09.22 End: 05.10.22	Ground Level (m AOD): 82.31	National Grid Co-ordinate: E:446263.8 N:325045.2		Sheet: 2 of 2

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend								
Depth	No	Type	Results														
9.00-9.45 9.00-9.45 9.00-9.45	28	SPT DSPT B	N=44			Stiff light reddish brown mottled grey slightly gravelly sandy silty CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone and sandstone. Cobbles (up to 80mm) are of mudstone and sandstone. Frequent bluish grey siltstone beds (up to 50mm). <i>(stratum copied from 5.40m from previous sheet)</i>	71.61	10.70									
10.30		30	D							N=60 1xT+1xJ+1xV	Firm to stiff greyish brown slightly sandy slightly gravelly SILT with low cobble content. Sand is fine and medium. Gravel is angular to subrounded fine and medium of siltstone. Frequent bluish grey siltstone beds (up to 80mm).	67.61	14.70				
10.50-10.95		32	SPT														
10.50-10.95	33	DSPT															
10.50-10.95	33	B															
10.80	104	ES															
11.70	34	D	N=58					(4.00)									
12.00-12.45	36	SPT															
12.00-12.45	36	DSPT															
12.00-12.45	37	B															
13.30	38	D	N=56														
13.50-13.95	40	SPT															
13.50-13.95	40	DSPT															
13.50-13.95	41	B															
14.70	42	D	N=48					Dense multicolored (greenish blue, red, white, grey) sandy clayey subangular to rounded fine to coarse GRAVEL of siltstone, mudstone, sandstone, quartzite, and chalk with low cobble content. Sand is fine to coarse. Cobbles (up to 100mm) are subrounded of siltstone, quartzite, and sandstone.	67.61	14.70							
15.00-15.45	44	SPT(c)										8,17/26,32,42 for 75mm				(2.51)	
15.00-15.45		B															
16.30	45	D										25/46,54 for 65mm					
16.50-16.88	47	SPT															
16.50-16.88		DSPT															
16.50-16.90	48	B	25/46,54 for 65mm														
17.00-17.21	50	SPT															
17.00-17.21		DSPT															
17.00-17.21	50	DSPT						Cable percussion borehole terminated at 17.21m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
									7. SPT hammer AR3104-2022 ($E_r = 64.00\%$) used.





STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP18
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 76.81	National Grid Co-ordinate: E:446057.8 N:324763.5		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.30	1	B				TOPSOIL			
0.10	101	ES	1xT+1xJ+1xV				76.46	0.35	
0.40-0.70	2	B				Stiff to very stiff reddish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of mudstone. Occasional pockets of grey siltstone. (MERCIA MUDSTONE GROUP)			
0.50	3	D							
0.50	102	ES	1xT+1xJ+1xV						
0.90-1.20	4	B							
1.00	5	D							
1.00	103	ES	1xT+1xJ+1xV						
1.50-1.95		SPT	N=24						
1.50-1.95		DSPT							
1.50-1.95	8	B							
2.50-2.95	9	UT _(UT100)	125 blows 100% recovery					(4.50)	
3.00	10	D							
3.50-3.91		SPT	6,10/16,25,36,23 for 35mm						
3.50-3.91	12	DSPT							
3.50-3.91	13	B							
4.50-4.85		SPT	15,10/17,27,56 for 70mm						
4.50	104	ES	1xT+1xJ+1xV				71.96	4.85	
4.50-4.85	15	DSPT				Cable percussion borehole terminated at 4.85m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
04/10/22	13:15	4.85	3.00	150	Dry	3.50	4.50	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. 15 litres of water added between 1.20m and 4.50m to aid drilling. 5. No groundwater encountered during drilling. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer AR1862-2022 (E ₁ = 65.00%) used.			
									All dimensions in metres		Scale: 1:50	
Method Used:	Inspection pit + Cable percussion			Plant Used:	Dando 2500		Drilled By:	Robert Foster	Logged By:	RStan	Checked By: 	

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STRUCTURAL SOILS

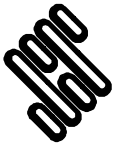
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP19
Contract Ref: 765514	Start: 30.09.22 End: 30.09.22	Ground Level (m AOD): 76.75	National Grid Co-ordinate: E:445967.7 N:324839.4		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.30	1	B				TOPSOIL	76.45	0.30	
0.10	101	ES	1xT+1xJ+1xV			Stiff dark orangish brown slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of mixed lithologies including sandstone and siltstone.		(0.60)	
0.40-0.70	2	B							
0.50	3	D							
0.50	102	ES	1xT+1xJ+1xV				75.85	0.90	
0.90-1.20	4	B				Stiff to very stiff reddish brown gravelly sandy silty CLAY with occasional bands of grey siltstone. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)			
1.00	5	D							
1.00	103	ES	1xT+1xJ+1xV						
1.50-1.95		SPT	N=25						
1.50-1.95		DSPT							
1.50-1.98	8	B							
2.50-2.95	9	UT _(UT100)	100 blows 100% recovery					(3.97)	
3.00	10	D							
3.50-3.93		SPT	7,12/17,23,28,32 for 55mm						
3.50-3.93	12	DSPT							
3.50-3.93	13	B							
4.50-4.87		SPT	8,10/20,30,50 for 70mm			Cable percussion borehole terminated at 4.87m depth.	71.88	4.87	
4.50	104	ES	1xT+1xJ+1xV						
4.50-4.87	15	DSPT							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks									
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)										
03/10/22	16:30	4.87	3.00	150	Dry	3.50	4.50	01:00	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. 20 litres of water between 1.20m to 4.50 meters to aid drilling. 5. No groundwater encountered during drilling. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer AR1862-2022 (E_t = 65.00%) used.									
									All dimensions in metres									
Method Used:		Inspection pit + Cable percussion		Plant Used:		Dando 2500		Drilled By:		Robert Foster	Logged By:		RStan	Checked By:		AS		

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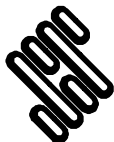
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP20
Contract Ref: 765514	Start: 30.09.22 End: 03.10.22	Ground Level (m AOD): 75.98	National Grid Co-ordinate: E:445775.9 N:324732.4		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.30	1	B				TOPSOIL			
0.10	101	ES	1xT+1xJ+1xV				75.58	0.40	
0.40-0.70	2	B							
0.50	3	D							
0.50	102	ES	1xT+1xJ+1xV			Stiff dark orangish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is angular to subangular fine of mixed lithologies including sandstone and siltstone.	75.18	0.80	
0.90-1.20	4	B							
1.00	5	D							
1.00	103	ES	1xT+1xJ+1xV			Stiff to very stiff reddish brown gravelly sandy silty CLAY with occasional bands of grey siltstone. Sand is fine. Gravel is angular to subangular fine to coarse of mudstone. (MERCIA MUDSTONE GROUP)			
1.50-1.95		SPT	N=26						
1.50-1.95		DSPT							
1.50-1.95	8	B							
2.50-2.95	9	UT _(UT100)	100 blows 67% recovery					(3.99)	
3.00	10	D							
3.50-3.91		SPT	5,12/20,25,35,20 for 35mm						
3.50-3.91	12	DSPT							
3.50-3.91	13	B							
4.50-4.79		SPT	10,15/40,60 for 75mm						
4.50-4.79	15	DSPT					71.19	4.79	
Cable percussion borehole terminated at 4.79m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
03/10/22	13:00	4.79	3.00	150	Dry	3.50	4.50	01:00	<div>1. Position cleared using CAT and Genny.</div> <div>2. Hand dug inspection pit to 1.20m.</div> <div>3. Borehole drilled using 150mm tools and casing.</div> <div>4. 20 litres of water added between 1.20m and 4.50m to aid drilling.</div> <div>5. No groundwater encountered during drilling.</div> <div>6. Borehole backfilled with bentonite on completion.</div> <div>7. SPT hammer AR1862-2022 (E_i = 65.00%) used.</div>					
Method Used:		Inspection pit + Cable percussion		Plant Used:		Dando 2500		Drilled By:	Robert Foster	Logged By:	RStan	Checked By:	AS	AGS

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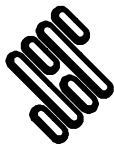
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BOREHOLE LOG

Contract:			Client:			Borehole:		
EMG Phase 2			SEGRO			CP21		
Contract Ref:		Start: 04.10.22	Ground Level (m AOD):		National Grid Co-ordinate:		Sheet:	
765514		End: 04.10.22	68.05		E:445752.9 N:324495.1		1 of 1	

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES				TOPSOIL		(0.50)	
0.50	2	ES					67.55	0.50	
0.50	3	B				Firm light reddish brown slightly sandy gravelly CLAY. Sand is fine and medium of mudstone. Gravel is subangular to rounded fine to coarse of siltstone and mudstone. Occasional gravel size bluish grey silt pockets (up to 50mm). (MERCIA MUDSTONE GROUP)			
0.50	4	D							
1.00	5	B							
1.00	6	D							
1.00	7	B							
1.20-1.65	8	U	35 blows						
1.70	9	D							
2.00-2.45		SPT	N=23						
2.00-2.45	10	DSPT							
2.00-2.50	11	B							
2.80	12	D						(4.88)	
3.00-3.45	13	U	120 blows						
3.70	14	D				. . . 3.60-4.80m: clay becoming stiff.			
4.00-4.45		SPT	N=100						
4.00-4.40	15	DSPT							
4.00-4.50	16	B							
4.80	17	D				. . . 4.80-5.30m: clay becoming very stiff.			
5.00-5.38		SPT	13,12/27,30,43 for 75mm						
5.00-5.38	18	DSPT					62.67	5.38	
						Cable percussion borehole terminated at 5.38m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
03/10/22	18:00	5.38	5.00	150	Dry	4.70	5.00	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole installed with 50mm standpipe upon completion response zone 1.00m to 5.38m). 6. SPT hammer JB05-2022 ($E_s = 68.00\%$) used.
04/10/22	08:00	5.38	5.00	150	Dry				
04/10/22	11:00	5.38	5.00	150	Dry				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used:		Dando 2500		Drilled By: Matthew Heath		Logged By: RStan		Checked By: AS	





STRUCTURAL SOILS

BOREHOLE LOG

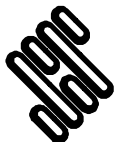
Contract: EMG Phase 2			Client: SEGRO		Borehole: CP22
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	101	ES				TOPSOIL.	71.46	(0.50)	
0.50	3	D				Very stiff reddish brown slightly sandy CLAY with frequent lithorelicts of mudstone and light grey siltstone. Locally grading to extremely weak mudstone. (MERCIA MUDSTONE GROUP)		0.50	
0.50	4	B							
0.50	102	ES							
1.00	5	D							
1.00	6	B							
1.20-1.65	7	U	50 blows						
1.70	8	D							
2.00-2.45		SPT	N=50						
2.00-2.50	10	B							
2.00-2.45	9	DSPT							
2.50	11	D						(4.80)	
3.00-3.45	12	U	150 blows						
4.00-4.42		SPT	5,7/10,20,33,37 for 40mm						
4.00-4.45	14	DSPT							
4.00-4.50	15	B							
4.50	16	D							
5.00-5.30		SPT	10,15/42,58 for 75mm				66.66	5.30	
5.00-5.30	17	DSPT				Cable percussion borehole terminated at 5.30m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks			
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)				
04/10/22	18:00	5.30	3.00	150	Dry	4.50	5.00	00:30				
									1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer JB05-2022 (E_r = 68.00%) used.			
									All dimensions in metres		Scale: 1:50	
Method Used: Cable percussion				Plant Used: Dando 2000			Drilled By: Mathew Heath		Logged By: RStan		Checked By: 	

1. Position cleared using CAT and Genny.
2. Hand dug inspection pit to 1.20m.
3. Borehole drilled using 150mm tools and casing.
4. No groundwater encountered during drilling.
5. Borehole backfilled with bentonite on completion.
6. SPT hammer JB05-2022 ($E_r = 68.00\%$) used.





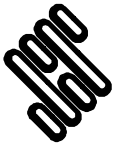
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP23
Contract Ref: 765514	Start: 22.09.22 End: 23.09.22	Ground Level (m AOD): 71.31	National Grid Co-ordinate: E:446025.7 N:324549.2		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES				TOPSOIL.		(0.60)	
0.50	2	B				Very stiff reddish brown slightly sandy CLAY with occasional lithorelicts of mudstone. (MERCIA MUDSTONE GROUP)	70.71	0.60	
0.50	3	D							
0.60	4	ES							
1.00	5	B							
1.00	6	D							
1.20-1.65	7	UT							
1.70	8	D							
2.00-2.45		SPT	N=22			... 2.00m: With occasional gravel size pocket/lense (<15mm) of greenish grey sandy silt.			
2.00-2.50	10	B							
2.00-2.45	9	DSPT						(4.00)	
2.80	11	D							
3.00-3.45	12	UT	140 blows			Very stiff reddish brown slightly sandy CLAY with frequent lithorelicts of mudstone and light grey siltstone. Locally grading to extremely weak mudstone. (MERCIA MUDSTONE GROUP)			
3.50	13	D							
4.00-4.43		SPT	10,15/16,17,29,38 for 50mm						
4.00-4.43	14	DSPT					66.71	4.60	
4.00-4.50	15	B							
4.80-5.00	16	B						(0.81)	
4.80	17	D							
5.00-5.41		SPT	15,10/22,21,25,32 for 45mm			Cable percussion borehole terminated at 5.41m depth.	65.90	5.41	
5.00-5.41	18	DSPT							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
22/09/22	18:00	2.00	1.50	150	Dry				
23/09/22	08:00	2.00	1.50	150	Dry				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm diameter tools and casing. 4. Groundwater strike at 5.40m. Did not rise after 20 minutes. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer JB05-2022 (E _s = 68.00%) used.
23/09/22	15:00	5.41	1.50	150	5.37				
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Matthew Heath		Logged By: RStan		Checked By: AS			



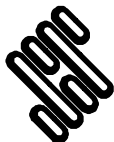
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP24
Contract Ref: 765514	Start: 26.09.22 End: 26.09.22	Ground Level (m AOD): 69.09	National Grid Co-ordinate: E:446132.1 N:324501.5		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES				TOPSOIL (TOPSOIL)	68.79	0.30	
0.50	2	B				Very stiff dark brown slightly sandy CLAY. Sand is fine and medium of mudstone. (MERCIA MUDSTONE GROUP)	68.39	0.70	
0.50	3	D							
0.60	4	ES							
1.00	5	B				Stiff reddish brown slightly gravelly slightly sandy CLAY with frequent pockets (up to 60mm) and lenses (up to 10mm) of greenish grey sandy silt. Gravel is fine to medium of mudstone. (MERCIA MUDSTONE GROUP)		(1.30)	
1.00	6	D							
1.20-1.65	7	UT	60 blows						
1.70	8	D					67.09	2.00	
2.00-2.45		SPT	N=42			Firm reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is angular to subangular fine and medium of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)		(1.10)	
2.00	10	D							
2.00-2.50	11	B							
2.00-2.45	9	DSPT					65.99	3.10	
2.80	12	D				Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent pockets (up to 20mm) and lenses (up to 15mm) of greenish grey sandy silt. Sand is fine and medium of mudstone. Gravel is angular fine and medium of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)		(2.30)	
3.00-3.45	13	UT	150 blows						
3.50	14	D							
3.50-4.00	15	B							
4.00-4.41		SPT	5,10/17,25,34,24 for 30mm						
4.00-4.41	16	DSPT							
4.00-4.50	17	B							
4.80	18	D							
5.00-5.40		SPT	7,8/16,33,34,17 for 20mm						
5.00-5.40	19	DSPT					63.69	5.40	
						Cable percussion borehole terminated at 5.40m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
26/09/22	16:00	5.40	4.50	150	Dry				
									1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer JB05-2022 ($E_r = 68.00\%$) used.
									All dimensions in metres Scale: 1:50
Method Used: Inspection pit + Cable percussion			Plant Used: Dando 2000			Drilled By: Matthew Heath	Logged By: RStan	Checked By: AS	



STRUCTURAL SOILS


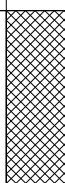


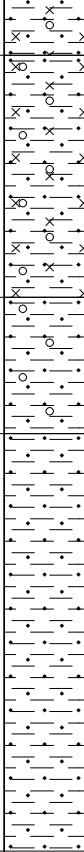

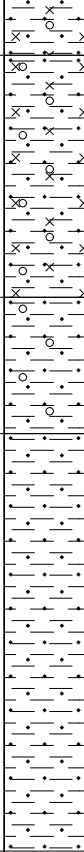

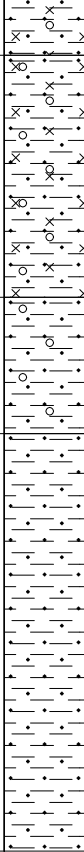

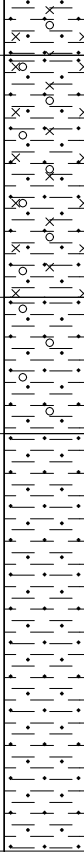

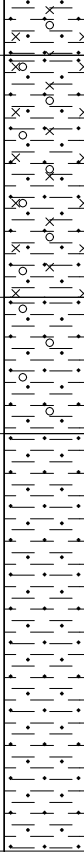
BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP25
Contract Ref: 765514	Start: 21.09.22 End: 22.09.22	Ground Level (m AOD): 67.07	National Grid Co-ordinate: E:446354.7 N:324580.7		Sheet: 1 of 1

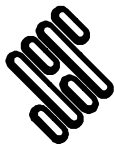
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.10	1	ES				TOPSOIL			
0.10	2	D					66.67	0.40	
0.10-0.40	3	B							
0.30	4	D							
0.50	5	D							
0.50	6	ES				Stiff to very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is subangular fine to coarse mudstone. (MERCIA MUDSTONE GROUP)			
0.50	7	D							
0.90-1.00	8	B							
1.00	9	ES							
1.00	10	D							
1.00-1.20	11	B						(2.40)	
1.20-1.65		SPT	N=50						
1.20-1.65	12	DSPT							
1.20-1.70	13	B							
1.90	14	D							
2.00-2.45	15	UT	150 blows						
2.50	16	D					64.27	2.80	
2.80-3.00	17	B				Very stiff reddish brown locally light grey slightly sandy gravelly CLAY. Sand is fine to coarse of mudstone. Gravel is subangular fine to coarse of mudstone and light grey siltstone. (MERCIA MUDSTONE GROUP)	64.07	3.00	
2.90	18	D							
3.00-3.45		SPT	N=56						
3.00-3.45	19	DSPT							
3.00-3.50	20	B				Very stiff dark orangish brown slightly sandy CLAY. Occasional very thin beds and lenses of light grey siltstone. (MERCIA MUDSTONE GROUP)			
3.80	21	D							
4.00-4.45	22	UT							
4.50	23	D						(3.88)	
5.00-5.39		SPT	8,17/20,26,37,17 for 15mm						
5.00-5.40	24	DSPT							
5.00-5.40	25	B							
6.00	26	D							
6.50-6.88		SPT	10,15/23,31,40,6 for 5mm						
6.50-6.88	27	DSPT					60.19	6.88	
						Cable percussion borehole terminated at 6.88m depth.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)						
21/09/22	18:00	3.00	3.00	150	Dry				1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm diameter tools and casing. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer JB05-2022 (E_r = 68.00%) used.					
22/09/22	08:00	3.00	3.00	150	Dry									
22/09/22	13:00	6.88	6.00	150	Dry									
Method Used:		Inspection pit + Cable percussion		Plant Used:		Dando 2000		Drilled By:	Matthew Heath	Logged By:	RStan	Checked By:	AS	AGS



Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES	N=10			TOPSOIL	63.76	0.10	
0.10	2	D				Stiff dark brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse predominantly fine and medium of quartzite and mudstone.	62.36	1.50	
0.10-0.40	3	B							
0.30	4	ES							
0.30	5	D							
0.50	6	ES							
0.50	7	D							
0.50	8	B							
1.00	9	ES							
1.00	10	D							
1.00	11	B							
1.20-1.65	12	SPT	30 blows 100% recovery		Stiff dark orangish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, quartzite sandstone, and siltstone. Occasional patches (up to 4x4mm) and fragments (up to 3x3mm) of black organic decayed plant matter.	60.76	3.10		
1.20-1.65	13	DSPT							
1.20-1.70	14	B							
1.80	15	D							
2.00-2.45	16	UT _(UT100)							
2.60	17	D	N=10		Stiff dark reddish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of light grey siltstone. (MERCIA MUDSTONE GROUP)	59.86	4.00		
2.60-3.00	18	B							
3.00-3.45	19	SPT							
3.00-3.45	20	DSPT							
3.00-3.50	21	B							
3.80	22	D	5,8/10,15,50 for 75mm		Very stiff dark orangish brown mottled reddish brown slightly sandy CLAY. Occasional very thin lenses of light grey siltstone. (MERCIA MUDSTONE GROUP)	57.10	6.76		
4.00-4.38	23	SPT							
4.00-4.40	24	DSPT							
4.00-4.50	25	B							
4.00	26	D							
5.00-5.35	27	SPT	5,10/20,30,35 for 45mm		Cable percussion borehole terminated at 6.76m depth.				
5.00-5.40	28	DSPT							
5.00-5.50	29	B							
6.00	30	D							
6.50-6.76	31	SPT	8,17/33,47,20 for 10mm						
6.50-6.76	32	DSPT							

GINT_LIBRARY_V10_01:GLB LibVersion: v8_07 | Log Cable Percussion Log - A4P 765514 EAST MIDLAND AIRPORT.GPJ - v10_01.
The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.solls.co.uk, Email: ask@solls.co.uk. 05/05/23 - 17:23 AJ4



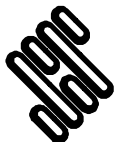
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP27
Contract Ref: 765514	Start: 15.09.22 End: 15.09.22	Ground Level (m AOD): 55.98	National Grid Co-ordinate: E:446595.5 N:324438.4		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES				MADE GROUND: Very stiff slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular fine and medium of quartzite. (TOPSOIL)	55.68	0.30	
0.10	2	D							
0.50	3	ES				Firm dark brown mottled grey locally dark blue and grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint, sandstone, siltstone, and quartzite. Moderate hydrocarbon odour observed. (MADE GROUND - REWORKED) ... 2.15-2.25m: becoming very soft with strong hydrocarbon odour and iridescent sheen to extracted materials. ... 2.50-3.00m: occasional grey organic roots and rootlet remnants.			
0.50	4	D							
0.50	5	B							
1.00	6	ES							
1.00	7	D							
1.00-1.65	8	B							
1.20-1.65		SPT	N=8						
1.20-1.70	10	B						(2.70)	
1.20-1.65	9	DSPT							
1.80	11	D							
2.00	12	ES				Very stiff reddish brown slightly sandy slightly gravelly CLAY with frequent pockets (up to 20mm) of greenish grey sandy silt. Sand is fine and medium of mudstone. Gravel is angular to subangular fine to coarse of mudstone lithorelicts. (MERCIA MUDSTONE GROUP)			
2.00	13	D							
2.00-2.45		SPT	N=8						
2.00-2.45	14	DSPT							
2.00-2.50	15	B							
2.51		EW							
2.80	16	D					52.98	3.00	
3.00-3.45		SPT	N=58						
3.00-3.45	17	DSPT							
3.00	18	ES							
3.00	19	D				Cable percussion borehole terminated at 4.95m depth.			
3.00-3.50	20	B							
3.80	21	D						(1.95)	
4.00-4.35		SPT	10,15/15,20,40 for 45mm						
4.00-4.40	22	DSPT							
4.00	23	ES							
4.00	24	D							
4.60-4.95		SPT	15,10/20,30,25 for 45mm				51.03	4.95	
4.60-4.95	25	DSPT							

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
15/09/22	18:00	4.95	3.00	150	Dry	4.40	4.60	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole installed with 50mm standpipe on completion (response zone 1.00m to 3.00m). 6. SPT hammer JB05-2022 ($E_s = 68.00\%$) used.
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:50
Plant Used: Dando 2000		Drilled By: Will Nevins		Logged By: RStan		Checked By: AS			



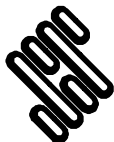
STRUCTURAL SOILS

BOREHOLE LOG

Contract: EMG Phase 2			Client: SEGRO		Borehole: CP28
Contract Ref: 765514	Start: 14.09.22 End: 15.09.22	Ground Level (m AOD): 64.08	National Grid Co-ordinate: E:446741.3 N:324631.8		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.50	3	B				TOPSOIL		(0.50)	
0.50	1	ES				Stiff reddish brown slightly sandy silty CLAY. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)	63.58	0.50	
0.50	2	D						(0.50)	
0.50-1.00	6	B					63.08	1.00	
1.00	4	ES				Stiff reddish brown slightly gravelly slightly sandy silty CLAY with occasional pockets (up to 10mm) of greenish grey siltstone. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint and mudstone. (MERCIA MUDSTONE GROUP)			
1.00	5	D							
1.20-1.65	7	SPT	N=11					(1.50)	
1.20-1.65	8	DSPT							
1.20-1.70	8	B							
1.80	9	D							
2.00-2.45	10	UT-NR _(UT100)	55 blows 0% recovery				61.58	2.50	
2.50-2.95		SPT	N=13			Stiff to very stiff reddish brown slightly sandy silty CLAY with occasional pockets of greenish grey siltstone. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)			
2.50-2.95	11	DSPT							
2.50-2.90	12	B							
2.90	13	D							
3.10-3.45	14	UT _(UT100)	150 blows 129% recovery						
3.60	15	D						(2.50)	
3.60-4.00	16	B							
4.00-4.42		SPT	6,12/13,17,33,35 for 40mm						
4.00-4.42	17	DSPT							
4.60-5.00		SPT	13,12/20,20,30,30 for 20mm						
4.60-5.00	18	DSPT					59.08	5.00	
						Cable percussion borehole terminated at 5.00m depth.			

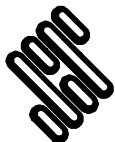
Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks				
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)					
14/09/22	18:00	3.60	3.00	150	Dry	4.40	4.60	00:30	1. Position cleared using CAT and Genny. 2. Hand dug inspection pit to 1.20m. 3. Borehole drilled using 150mm tools and casing. 4. No groundwater encountered during drilling. 5. Borehole installed with 50mm standpipe upon completion (response zone 1.00m to 5.00m). 6. SPT hammer JB05-2022 ($E_r = 68.00\%$) used.				
15/09/22	08:00	3.60	3.00	150	Dry								
15/09/22	11:00	5.00	3.00	150	Dry								
									All dimensions in metres				
Method Used:	Inspection pit + Cable percussion		Plant Used:	Dando 2000		Drilled By:	Will Nevins		Logged By:	RStan	Checked By:	AS	ACS



Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP01
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 90.15	National Grid Co-ordinate: E:446482.7 N:325312.7		Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.10	1	ES	c _u => 140			TOPSOIL	89.95	0.20	
0.10	2	D				Very stiff dark orangish brown to reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite.	89.65	(0.30)	
0.30	3	ES						0.50	
0.30	4	D							
0.30-0.40	5	LB				Very stiff dark reddish brown slightly sandy CLAY with frequent beds (up to 40mm) of extremely weak to very weak light greenish grey siltstone. (MERCIA MUDSTONE GROUP)		(1.50)	
0.60	6	ES							
0.60	7	D							
0.60-0.70	8	LB							
0.60		V				... 1.90-2.00m: Thin bed (<100mm) of very weak light grey siltstone. Trial pit terminated at 2.00m depth.	88.15	2.00	

Plan (Not to Scale)		General Remarks			
		<p>1. All faces similar and stable. 2. No groundwater encountered during excavation. 3. Soakaway carried out at 2.00m.</p>			
Method Used: Machine dug		Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

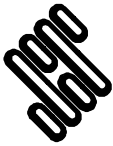


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP01
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 90.15	National Grid Co-ordinate: E:446482.7 N:325312.7	Sheet: 2 of 3

Face 1



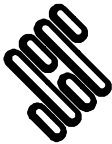
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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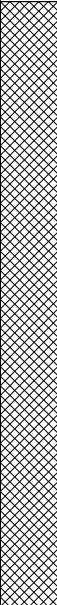


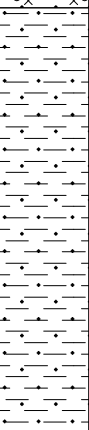
Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP01
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 90.15	National Grid Co-ordinate: E:446482.7 N:325312.7	Sheet: 3 of 3

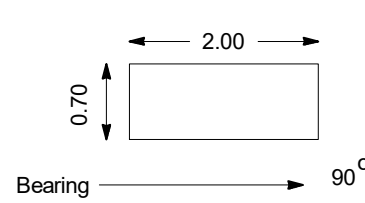


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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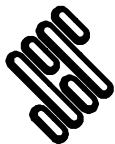


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP02
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 87.34	National Grid Co-ordinate: E:446247.8 N:325352.0		Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	c _u => 140			TOPSOIL	87.04	(0.30)	
0.40 0.40 0.40-0.50	3 4 5	ES D LB				Very stiff dark orangish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.	86.74	(0.30)	
0.70 0.70 0.70-0.80 0.70	6 7 8	ES D LB V				Very stiff dark reddish brown slightly gravelly slightly sandy silty CLAY / clayey SILT with frequent (up to 20mm) mudstone lithorelicts and occasional very thin beds (up to 30mm) of very weak light greenish grey siltstone. (MERCIA MUDSTONE GROUP)	85.34	(1.40)	
						Trial pit terminated at 2.00m depth.			

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation. 3. Soakaway carried out at 2.00m.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

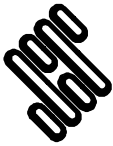
GINT LIBRARY V10.01.GLB LibVersion: v8.07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10.01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:04 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP02
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 87.34	National Grid Co-ordinate: E:446247.8 N:325352.0	Sheet: 2 of 3



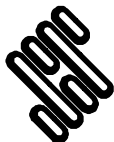
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP02
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 87.34	National Grid Co-ordinate: E:446247.8 N:325352.0	Sheet: 3 of 3



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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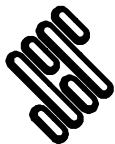
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP03
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 90.59	National Grid Co-ordinate: E:446327.3 N:325173.4	Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	$c_u = 52/54$			TOPSOIL.	90.29	(0.30)	
0.40 0.40 0.40-0.50	3 4 5	ES D B				Light orangish brown very gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse of flint and quartzite.	89.79	(0.50)	
1.00 1.00 1.00-1.10	6 7 8	ES D B				Stiff dark orangish brown to reddish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint and quartzite. (MERCIA MUDSTONE GROUP)	89.29	(0.50)	
1.50 1.50-1.60 1.50 1.60	10 11 9	D B ES V				Stiff dark reddish brown slightly sandy slightly gravelly CLAY with frequent lenses of reddish brown gravelly fine to coarse sand and occasional to frequent pockets (up to 50mm) of green silt. (MERCIA MUDSTONE GROUP)		1.30	
						2.00m: Sand lenses absent. Occasional pockets (<100x50mm) of reddish brown sand.		(2.20)	
3.00 3.20 3.40-3.50	12 13	D B				3.00m: Firm, low cobble content and occasional boulders. Cobbles (<200x150x100mm) subangular siltstone. Boulders (<450x350x100mm) subangular siltstone.	87.09	3.50	
						Trial pit terminated at 3.50m depth.			

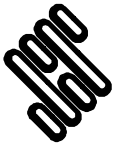
Plan (Not to Scale)		General Remarks		
		1. All faces similar and stable. 2. No groundwater encountered during excavation.		
Method Used: Machine dug		Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL
All dimensions in metres		Scale: 1:25		



Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP03
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 90.59	National Grid Co-ordinate: E:446327.3 N:325173.4		Sheet: 2 of 5



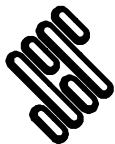
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP03
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 90.59	National Grid Co-ordinate: E:446327.3 N:325173.4	Sheet: 3 of 5



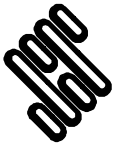
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP03
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 90.59	National Grid Co-ordinate: E:446327.3 N:325173.4	Sheet: 4 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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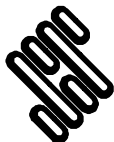


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP03
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 90.59	National Grid Co-ordinate: E:446327.3 N:325173.4	Sheet: 5 of 5



GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PnVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Castleford: The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:05 | AJ4 |

Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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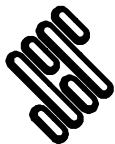


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP04
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.71	National Grid Co-ordinate: E:446164.8 N:325278.9		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	c _u =120			TOPSOIL.	88.41	(0.30)	
0.40 0.40 0.40-0.50	3 4 5	ES D B				Stiff to very stiff dark reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of quartz and mudstone.		(0.50)	
1.00 1.00 1.00-1.10 1.00	6 7 8	ES D B V				Stiff dark reddish brown and light grey slightly sandy CLAY with occasional thin beds (up to 100mm) of extremely weak to very weak light greenish grey siltstone. (MERCIA MUDSTONE GROUP) ... 1.00m: Friable. ... 1.20-1.30m: Siltstone bed. ... 1.65-1.75m: Siltstone bed.	87.91	0.80	
2.00 2.00-2.20	10 9	D B				Very weak light grey SILTSTONE with occasional very thin beds (up to 30mm) of extremely weak dark reddish brown mudstone. (MERCIA MUDSTONE GROUP)	86.81	1.90	
						Trial pit terminated at 2.20m depth.	86.51	2.20	

Plan (Not to Scale)		General Remarks			
		1. All faces similar and stable. 2. No groundwater encountered during excavation.			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL		

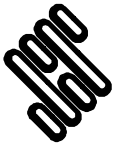
GINT LIBRARY_V10_01.GLB LibVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:05 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP04
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.71	National Grid Co-ordinate: E:446164.8 N:325278.9	Sheet: 2 of 4



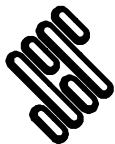
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP04
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.71	National Grid Co-ordinate: E:446164.8 N:325278.9	Sheet: 3 of 4



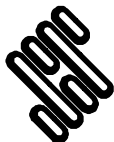
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP04
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.71	National Grid Co-ordinate: E:446164.8 N:325278.9	Sheet: 4 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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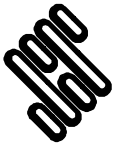


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP05
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 89.03	National Grid Co-ordinate: E:446152.5 N:325207.0		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	D ES				TOPSOIL.		(0.40)	
0.50 0.50 0.50-0.60	3 4 5	D ES B				Very stiff dark yellowish brown slightly sandy slightly gravelly clayey SILT with occasional lenses (up to 100x30mm) and pockets (up to 30x30mm) of reddish brown fine to coarse sand. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.	88.63	0.40	
0.80		V	$c_u > 140$					(0.90)	
1.50 1.50 1.50-1.60	6 7 8	ES D B				Very stiff dark brown mottled light grey slightly sandy slightly gravelly CLAY with occasional pockets (up to 30x30mm) of orange to yellow silt and sand. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartz, siltstone, mudstone, sandstone, and chalk.	87.73	1.30	
2.00		V	$c_u = 120$					(1.90)	
2.80		V	$c_u = 110$						
3.00-3.10 3.00	10 9	B D					85.83	3.20	
Trial pit terminated at 3.20m depth.									

Plan (Not to Scale) Bearing 75°		General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.	
All dimensions in metres		Scale: 1:23	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL

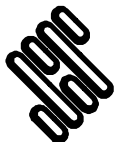
GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 ProjVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514, EAST_MIDLAND_AIRPORT.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters Street, Castleford, West Yorkshire, WF10 1NU. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:05 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP05
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 89.03	National Grid Co-ordinate: E:446152.5 N:325207.0	Sheet: 2 of 4



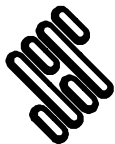
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalahar	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP05
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 89.03	National Grid Co-ordinate: E:446152.5 N:325207.0	Sheet: 3 of 4



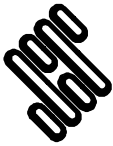
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP05
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 89.03	National Grid Co-ordinate: E:446152.5 N:325207.0	Sheet: 4 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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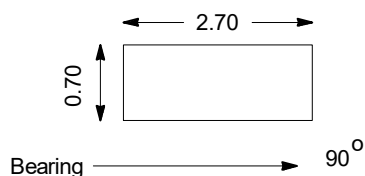
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP06
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.88	National Grid Co-ordinate: E:446237.5 N:325131.3		Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	c _u =100			TOPSOIL		(0.35)	
0.40 0.40 0.40-0.50	3 4 5	ES D B				Dark orangish brown gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse of quartz, flint, and mudstone.	88.53	0.35	
0.80 0.80 0.80-0.90 0.80	6 7 8	ES D B V				Stiff dark orangish brown to reddish brown slightly sandy slightly gravelly CLAY with occasional locally frequent pockets (up to 40mm) of silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartz, sandstone, siltstone, flint, and mudstone.		(0.85)	
1.60 1.60-1.70 1.60	10 11 9	D B ES				Dark orangish brown gravelly fine to coarse SAND with medium cobble content and occasional thin beds (up to 20mm) of stiff orangish brown slightly sandy silty clay. Gravel is angular to rounded fine to coarse of siltstone, quartzite, and flint.	87.38	1.50	
2.10 2.10 2.10-2.20	12 13 14	ES D B				Dark yellowish brown sandy clayey angular to rounded fine to coarse GRAVEL siltstone, quartz, mudstone, sandstone, and flint with medium cobble and low boulder content. Sand is fine to coarse. Cobbles and boulders (up to 450mm) are subangular to subrounded of siltstone. (GROVESEND BEDS - UPPER PENNANT MEASURES)	86.88	2.00	
3.50	15	D				... Below 3.40m: Medium boulder content (<600x400x200m)		(1.70)	
							85.18	3.70	
						Trial pit terminated at 3.70m depth.			

Plan (Not to Scale)



General Remarks

1. All faces similar and stable.
2. No groundwater encountered during excavation.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

Plant Used:

Tracked excavator

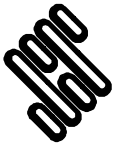
Logged By:

GKalaher

Checked By:

RL

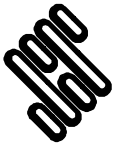




Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP06
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.88	National Grid Co-ordinate: E:446237.5 N:325131.3	Sheet: 2 of 5



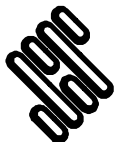
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP06
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.88	National Grid Co-ordinate: E:446237.5 N:325131.3	Sheet: 3 of 5



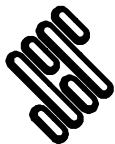
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP06
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.88	National Grid Co-ordinate: E:446237.5 N:325131.3	Sheet: 4 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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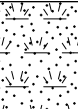
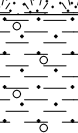

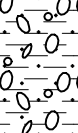
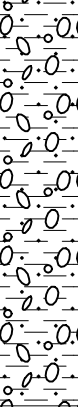
Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP06
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 88.88	National Grid Co-ordinate: E:446237.5 N:325131.3	Sheet: 5 of 5



GINT LIBRARY_V10_01.GLB LibVersion: v8_07_001 PnVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01.
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Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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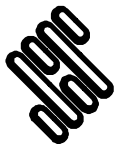


Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						TOPSOIL		(0.40)	
0.20 0.20	1 2	ES D					83.30	0.40	
0.50 0.50 0.50-0.60	3 4 5	ES D B				Dark yellowish brown to orangish brown slightly gravelly sandy CLAY.	82.90	0.80	
1.00 1.00 1.00-1.10	6 7 8	ES D B				Stiff to very stiff dark reddish brown slightly sandy slightly gravelly CLAY.	82.50	1.20	
1.30 1.30-1.40 1.30 1.30	10 11 9	D B ES V	$c_u=120/>140$			Stiff to very stiff dark yellowish brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content, occasional pockets (up to 30x30mm) of orange and yellow silt, and lenses (up to 100x20mm) of reddish brown fine to coarse sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of siltstone, quartzite, and chalk. Cobbles (up to 150mm) are subangular of siltstone.		(1.80)	
						Trial pit terminated at 3.00m depth.	80.70	3.00	



- Scale: **1:25**

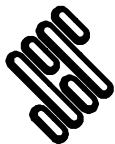
AGS



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP07
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 83.70	National Grid Co-ordinate: E:445966.4 N:325132.9	Sheet: 2 of 3



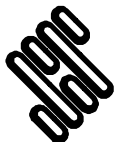
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP07
Contract Ref: 765514	Start: 03.10.22 End: 03.10.22	Ground Level (m AOD): 83.70	National Grid Co-ordinate: E:445966.4 N:325132.9	Sheet: 3 of 3



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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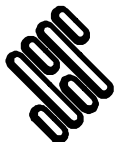


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP08
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 84.97	National Grid Co-ordinate: E:445808.1 N:325346.7	Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D				MADE GROUND: Firm dark brown slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of quartzite, flint, brick, glass, and ceramic tile. Cobbles (up to 215x100x65mm) are angular of full and half brick. (TOPSOIL)	84.57	(0.40) 0.40	
0.50 0.50 0.50-0.60	3 4 5	ES D LB				MADE GROUND: Reddish brown sandy very silty angular to rounded fine to coarse GRAVEL of brick, tile, quartzite, and mudstone. With low cobble content, cobbles (up to 215x100x65mm) are angular of full and half brick, with occasional concrete blocks (up to 400x150x120mm).		(1.80)	
1.50 1.50 1.50-1.60	6 7 8	ES D LB				... below 2.00m: frequent cobbles of full and half brick, and occasional fragments of rope.	82.77	2.20	
2.40 2.40 2.40-2.50	10 11 12	ES D LB				POSSIBLE MADE GROUND: Firm to stiff dark reddish brown locally dark grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite and flint.	82.17	(0.60) 2.80	
2.90-3.00 2.90	13 14	LB D				Stiff dark reddish brown mottled light grey slightly sandy CLAY. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)		(0.40)	
						Trial pit terminated at 3.20m depth.	81.77	3.20	

Plan (Not to Scale) Bearing → 0°		General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.	
Method Used: Hand dug		Plant Used: Hand tools	
All dimensions in metres		Scale: 1:25	
Logged By: GKalaher		Checked By: RL	

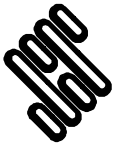
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP08
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 84.97	National Grid Co-ordinate: E:445808.1 N:325346.7	Sheet: 2 of 4



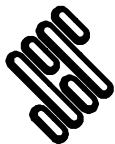
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP08
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 84.97	National Grid Co-ordinate: E:445808.1 N:325346.7	Sheet: 3 of 4



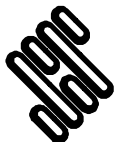
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP08
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 84.97	National Grid Co-ordinate: E:445808.1 N:325346.7	Sheet: 4 of 4



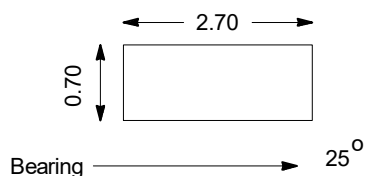
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP09
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 87.60	National Grid Co-ordinate: E:445878.0 N:325225.7	Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D	$c_u=110$			TOPSOIL	87.25	(0.35) 0.35	
0.60 0.60 0.60-0.70 0.60	3 4 5	ES D LB V				Stiff to very stiff dark greyish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of flint and quartzite.		(0.75)	
1.30 1.30 1.30-1.40	6 7 8	ES D LB				Firm to stiff dark reddish brown mottled greenish grey slightly sandy gravelly silty CLAY with abundant pockets (up to 100x30mm) of yellowish orange and red silt and occasional lenses (up to 50mm) of reddish brown fine to coarse sand. ... below 1.80m: firm, locally soft and firm.	86.50	1.10	
3.30 3.30-3.40	10 9	D LB				... below 2.70m: with medium cobble and boulder content. Cobbles (<200x150x100mm) are subangular and subrounded of siltstone. Boulders (<350x250x150mm) are subangular of siltstone.		(2.60)	
						Trial pit terminated at 3.70m depth.	83.90	3.70	

Plan (Not to Scale)



General Remarks

1. All faces similar and stable.
2. No groundwater encountered during excavation.

All dimensions in metres

Scale: **1:25**

Method Used:

Hand dug

Plant Used:

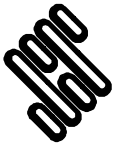
Hand tools

Logged By:

GKalaher

Checked By:

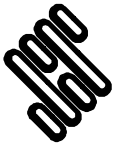
RL



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP09
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 87.60	National Grid Co-ordinate: E:445878.0 N:325225.7	Sheet: 2 of 4



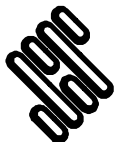
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP09
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 87.60	National Grid Co-ordinate: E:445878.0 N:325225.7	Sheet: 3 of 4



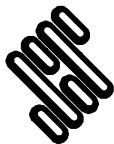
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP09
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 87.60	National Grid Co-ordinate: E:445878.0 N:325225.7	Sheet: 4 of 4



Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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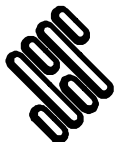
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP10
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.53	National Grid Co-ordinate: E:445846.9 N:325068.8		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D				TOPSOIL	77.13	(0.40) 0.40	
0.50 0.50 0.50-0.60	3 4 5	ES D LB				Stiff dark yellowish brown to orangish brown slightly sandy gravelly CLAY with frequent pockets (up to 40x40mm) of reddish brown fine to coarse sand. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, mudstone, and flint.	76.83	(0.30) 0.70	
0.80 0.80 0.80-0.90	6 7 8	ES D LB				Very stiff dark orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, flint, and chalk.	76.28	(0.55) 1.25	
1.40 1.40-1.50 1.40	10 11 9	D LB ES				Very stiff friable light yellowish brown mottled grey slightly sandy slightly gravelly CLAY with occasional pockets (up to 20x10mm) of yellow and orange silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of chalk and siltstone.	75.53	(0.75) 2.00	
2.10 2.10 2.10-2.20	12 13 14	ES D LB				Stiff dark brown mottled grey slightly sandy slightly gravelly CLAY with occasional pockets (up to 20x20mm) of orange and yellow silt. Sand is fine to coarse. Gravel is subangular fine to coarse of siltstone, flint, chalk, and mudstone.		(1.20)	
3.10	15	D				. . . below 2.50m: stiff to very stiff.	74.33	3.20	
						Trial pit terminated at 3.20m depth.			

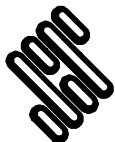
Plan (Not to Scale)		General Remarks			
		<ol style="list-style-type: none">1. All faces similar and stable.2. No groundwater encountered during excavation.3. Ceramic land drain 1.00-1.10m depth.			
Method Used: Hand dug		Plant Used: Hand tools		Logged By: GKalaher	Checked By: RL
		All dimensions in metres		Scale: 1:25	



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP10
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.53	National Grid Co-ordinate: E:445846.9 N:325068.8	Sheet: 2 of 4



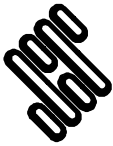
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP10
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.53	National Grid Co-ordinate: E:445846.9 N:325068.8	Sheet: 3 of 4



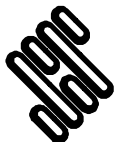
Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP10
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.53	National Grid Co-ordinate: E:445846.9 N:325068.8	Sheet: 4 of 4



Method Used: Hand dug	Plant Used: Hand tools	Logged By: GKalaher	Checked By: RL	
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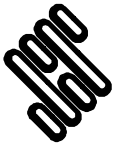


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP11
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.02	National Grid Co-ordinate: E:445965.8 N:324988.4		Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D				TOPSOIL		(0.40)	
0.60 0.60 0.60-0.70	3 4 5	ES D B				Dark orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite.	76.62	0.40	
1.20 1.20 1.20-1.30	6 7 8	ES D B				Stiff dark orangish brown and greyish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint, quartzite, and chalk.	76.02	1.00	
1.80 1.80-1.90 1.80	10 11 9	D B ES				Stiff dark orangish brown mottled grey slightly sandy slightly gravelly CLAY with frequent lenses (up to 50mm) of reddish brown fine to coarse sand with frequent pockets (up to 50x30mm) of yellow and orange silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, siltstone, mudstone, chalk, and flint.		(1.50)	
						. . . Below 2.90m: with frequent lenses of reddish brown and yellowish orange firm silt (<100mm).	73.82	3.20	
3.30 3.30 3.30	12 13 14	ES D B				Dark orangish brown gravelly clayey SAND with occasional very thin beds (up to 30mm) of firm slightly sandy silty clay.	73.52	(0.30) 3.50	
						Trial pit terminated at 3.50m depth.			

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

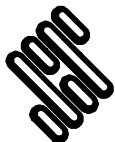
GINT LIBRARY V10.01.GLB LibVersion: v8.07.001 PnVersion: v8.07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10.01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:06 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP11
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.02	National Grid Co-ordinate: E:445965.8 N:324988.4	Sheet: 2 of 5



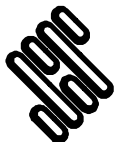
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP11
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.02	National Grid Co-ordinate: E:445965.8 N:324988.4	Sheet: 3 of 5



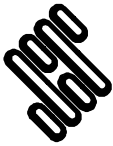
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP11
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.02	National Grid Co-ordinate: E:445965.8 N:324988.4	Sheet: 4 of 5



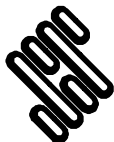
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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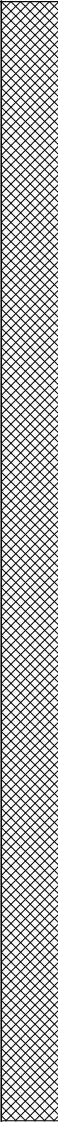

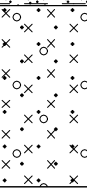
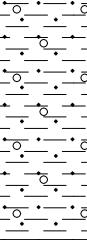

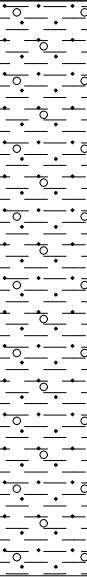
Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP11
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 77.02	National Grid Co-ordinate: E:445965.8 N:324988.4	Sheet: 5 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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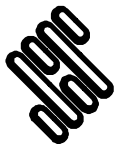


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP12
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 73.79	National Grid Co-ordinate: E:445742.7 N:325045.7		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
Depth	No	Type	Results									
0.20 0.20	1 2	ES D	c _u =>140			TOPSOIL	73.39	(0.40)				
0.50 0.50 0.50-0.60	3 4 5	ES D B				Stiff dark yellowish brown sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartz and flint. ... Below 0.60m: very stiff clayey SILT	72.79	(0.60)				
1.10 1.10 1.20-1.30 1.20	6 7 8	ES D B V				Very stiff dark yellowish brown to reddish brown mottled light grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, chalk, and quartzite. ... 1.45m: thin bands (<50mm) of reddish brown gravelly fine to coarse sand.	71.99	(0.80)				
2.00 2.00 2.00 2.00	10 11 9	D B ES V				c _u =120			Stiff dark greyish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint, chalk, and quartzite.		(1.90)	
3.50	12	D										
						Trial pit terminated at 3.70m depth.						

Plan (Not to Scale) Bearing 340°		General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.	
All dimensions in metres		Scale: 1:25	
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL

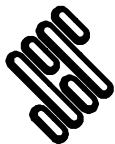
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP12
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 73.79	National Grid Co-ordinate: E:445742.7 N:325045.7	Sheet: 2 of 4



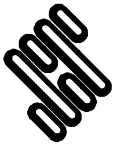
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP12
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 73.79	National Grid Co-ordinate: E:445742.7 N:325045.7	Sheet: 3 of 4



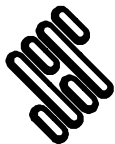
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP12
Contract Ref: 765514	Start: 04.10.22 End: 04.10.22	Ground Level (m AOD): 73.79	National Grid Co-ordinate: E:445742.7 N:325045.7	Sheet: 4 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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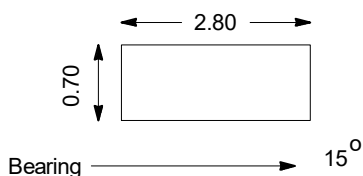
STRUCTURAL SOILS

TRIAL PIT LOG

Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP13
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 73.00	National Grid Co-ordinate: E:445749.9 N:324942.5		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.50 0.50 0.50	1 2 3	ES D B				TOPSOIL	72.65	(0.35)	
						Light orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite and flint.	72.20	(0.45)	
								0.80	
1.00 1.00 1.00-1.10	4 5 6	ES D B				Light yellowish orangish brown very gravelly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse of quartzite and flint.	71.80	(0.40)	
								1.20	
1.50 1.50 1.50-1.60	7 8 9	ES D B				Stiff dark orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.			
						. . . Below 1.70m: dark reddish brown		(1.20)	
							70.60	2.40	
2.50 2.50 2.50-2.60	10 11 12	ES D B				Soft dark orangish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of flint.		(0.80)	
							69.80	3.20	
3.30 3.30 3.30-3.40	13 14 15	ES D B				Brown slightly gravelly fine to coarse SAND with occasional pockets (up to 150x150x100mm) of firm dark orangish brown clay.	69.50	(0.30)	
						Trial pit terminated at 3.50m depth.			

Plan (Not to Scale)



General Remarks

1. All faces similar and stable.
2. Water strike at 3.30m depth, rose to 3.05m after 20 mins.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

Plant Used:

Tracked excavator

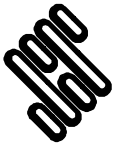
Logged By:

GKalaher

Checked By:

RL

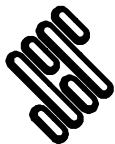




Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP13
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 73.00	National Grid Co-ordinate: E:445749.9 N:324942.5	Sheet: 2 of 4



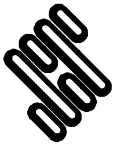
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP13
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 73.00	National Grid Co-ordinate: E:445749.9 N:324942.5	Sheet: 3 of 4



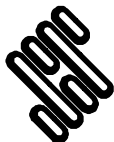
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP13
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 73.00	National Grid Co-ordinate: E:445749.9 N:324942.5	Sheet: 4 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalahar	Checked By: RL	
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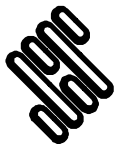


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP14
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 82.12	National Grid Co-ordinate: E:445667.1 N:325262.9		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20	1	ES				TOPSOIL		(0.35)	
0.40	2	D				Stiff reddish brown to grey slightly sandy slightly gravelly CLAY with low cobble and boulder content. Gravel is angular to rounded fine to coarse of siltstone, quartzite, and chert.	81.77	0.35	
0.40-0.60	3	B							
0.40	4	ES						(0.65)	
0.80	5	D				Very stiff reddish brown mottled light grey CLAY with some gravel sized lithorelicts of mudstone and siltstone. (MERCIA MUDSTONE GROUP) ... 1.40-1.60m: Lense of light grey silt. (2mx0.20m) ... Below 1.50m: Locally silty.	81.12	1.00	
0.80-1.00	6	B							
0.80	7	ES							
1.50	8	D							
1.80	9	D							
2.50-2.70	10	B						(2.50)	
3.00	11	D				... Below 2.90m: With tabular gravel to cobbles of light grey siltstone and mudstone.			
3.50	2	D				Trial pit terminated at 3.50m depth.	78.62	3.50	

Plan (Not to Scale)		General Remarks			
		<ul style="list-style-type: none">1. Unsuitable for hand vanes.2. All faces similar and stable.3. No groundwater encountered during excavation.4. Terminated due to difficulty of excavation.			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: TC Clifford	Checked By: RL		

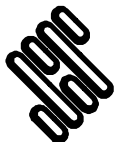
GINT LIBRARY V10_01.GLB LibVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514 EAST_MIDLAND_AIRPORT.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:07 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP14
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 82.12	National Grid Co-ordinate: E:445667.1 N:325262.9	Sheet: 2 of 4



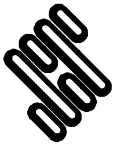
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: TC Clifford	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP14
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 82.12	National Grid Co-ordinate: E:445667.1 N:325262.9	Sheet: 3 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: TC Clifford	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP14
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 82.12	National Grid Co-ordinate: E:445667.1 N:325262.9	Sheet: 4 of 4



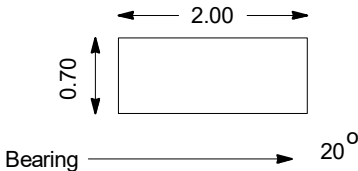
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: TC Clifford	Checked By: RL	
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Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP15
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 69.53	National Grid Co-ordinate: E:445583.3 N:325042.1		Sheet: 1 of 2

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.30 0.30	1 2	ES D				TOPSOIL		(0.50)	
0.60 0.60 0.60-0.70	3 4 5	ES D B				Firm dark yellowish brown to orangish brown slightly sandy slightly gravelly CLAY with occasional lenses (up to 50mm) of reddish brown fine to coarse sand. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint and quartzite.	69.03	0.50	
1.50 1.50 1.50-1.60	6 7 8	ES D B				Firm to stiff dark brown mottled light grey slightly sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of quartzite, flint, and siltstone. Cobbles (up to 200x150x110mm) are subangular of siltstone.	68.23	1.30	
						Trial pit terminated at 2.00m depth.	67.53	2.00	

Plan (Not to Scale)



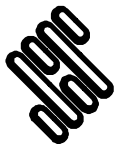
General Remarks

1. All faces similar and stable.
2. No groundwater encountered during excavation.
3. Soakaway carried out at 2.00m.

All dimensions in metres

Scale: **1:25**

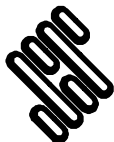
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP15
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 69.53	National Grid Co-ordinate: E:445583.3 N:325042.1	Sheet: 2 of 2



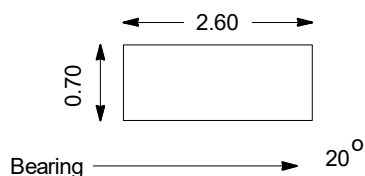
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP16
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 72.11	National Grid Co-ordinate: E:445645.8 N:324820.9	Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
Depth	No	Type	Results									
			c _u >=140			TOPSOIL		(0.30)				
0.20	1	ES					71.81	0.30				
0.20	2	D				Dark orangish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite.		(0.35)				
0.40	3	ES										
0.40	4	D										
0.40-0.50	5	LB					71.46	0.65				
0.70	6	ES				Very stiff dark reddish brown slightly sandy silty CLAY. Sand is fine to coarse.						
0.70	7	D					71.26	0.85				
0.70-0.80	8	LB	Stiff to very stiff locally friable dark reddish brown and light grey slightly sandy CLAY with frequent very thin beds (up to 40mm) of very weak light grey siltstone.				(0.45)					
1.00	10	D				c _u =110						
1.00-1.10	11	LB										
1.00	9	ES								70.81	1.30	
1.00		V										
1.40	12	ES	Stiff friable dark reddish brown locally mottled light grey slightly sandy CLAY with occasional mudstone lithorelicts (up to 10x10mm).									
1.40	13	D										
1.40-1.50	14	LB										
1.40		V										
2.10	15	D				... below 2.00m: with frequent very thin beds (<40mm) of extremely weak and very weak reddish brown mudstone and siltstone.		(1.90)				
2.80	16	D	... 2.70-2.90m: thin bed (<200mm) of extremely weak and very weak light greenish grey siltstone.	68.91	3.20							
3.30-3.40	17	LB		Extremely weak locally friable dark reddish brown MUDSTONE.		(0.50)						
3.30	18	D										
				68.41	3.70							

Plan (Not to Scale)



General Remarks

1. All faces similar and stable.
2. No groundwater encountered during excavation.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

Plant Used:

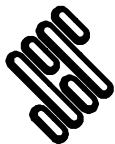
Tracked excavator

Logged By:

GKalaher

Checked By:

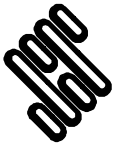
RL



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP16
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 72.11	National Grid Co-ordinate: E:445645.8 N:324820.9	Sheet: 2 of 5



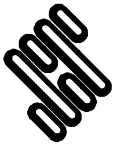
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP16
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 72.11	National Grid Co-ordinate: E:445645.8 N:324820.9	Sheet: 3 of 5



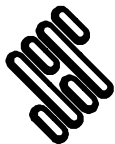
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP16
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 72.11	National Grid Co-ordinate: E:445645.8 N:324820.9	Sheet: 4 of 5



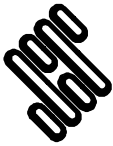
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP16
Contract Ref: 765514	Start: 29.09.22 End: 29.09.22	Ground Level (m AOD): 72.11	National Grid Co-ordinate: E:445645.8 N:324820.9	Sheet: 5 of 5

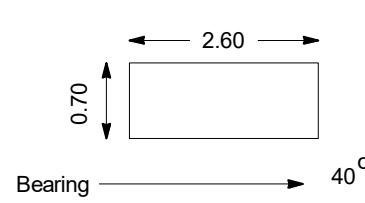


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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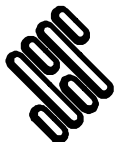


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP17
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 89.01	National Grid Co-ordinate: E:446441.7 N:325131.0		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D				TOPSOIL		(0.40)	
0.50 0.50 0.50-0.60	3 4 6	ES D LB				Orangish brown very gravelly silty SAND. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, mudstone, and flint.	88.61	0.40	
0.80 0.80 0.80-0.90	7 8 9	ES D LB				Very stiff dark greyish brown slightly sandy slightly gravelly silty CLAY with occasional very thin lenses (up to 100mm) of reddish brown gravelly fine to coarse sand and frequent pockets (up to 30x30mm) of orange and yellow silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, flint, chalk, siltstone, and sandstone.	88.26	0.75	
2.00		V	$c_u=120$					(2.45)	
2.80-2.90 2.80 2.80	10 11	LB D V	$c_u=107$... 2.50m: Cobble (<260x150x110mm) of subangular flint.			
							85.81	3.20	
						Trial pit terminated at 3.20m depth.			

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

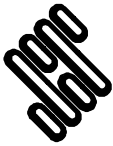
GINT LIBRARY V10.01.GLB LibVersion: v8.07.001 PjVersion: v8.07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10.01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:07 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP17
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 89.01	National Grid Co-ordinate: E:446441.7 N:325131.0	Sheet: 2 of 4



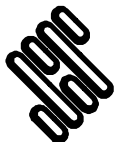
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP17
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 89.01	National Grid Co-ordinate: E:446441.7 N:325131.0	Sheet: 3 of 4



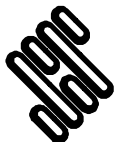
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalahar	Checked By: RL	
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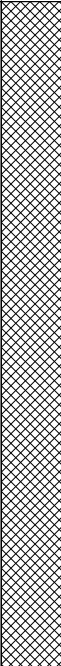
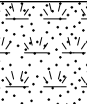
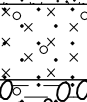
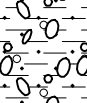
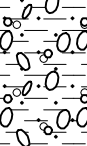

Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP17
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 89.01	National Grid Co-ordinate: E:446441.7 N:325131.0	Sheet: 4 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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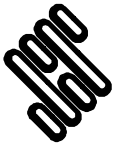


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP18
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 84.13	National Grid Co-ordinate: E:446580.8 N:325055.4		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20	1	ES	c _u =50/80			TOPSOIL (TOPSOIL)		(0.35)	
0.20	2	D					83.78	0.35	
0.40	3	ES				Firm dark orangish brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.	83.53	0.60	
0.40	4	D							
0.40-0.50	5	LB				Very stiff dark reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, mudstone, and flint. Cobbles (up to 130x80x70mm) and subrounded of quartzite.	82.63	(0.90)	
0.70	6	ES							
0.70	7	D							
0.70-0.80	8	LB							
						Stiff dark reddish brown slightly sandy slightly gravelly silty CLAY with medium cobble and boulder content, frequent pockets (up to 30x30mm) and thin lenses (up to 15x100mm) of orange silt and yellow sand, and occasional subrounded nodules (up to 90x60x40mm) of mudstone. Cobbles (up to 200x120x100mm) are subangular to subrounded of siltstone. Boulders (up to 400x300x150mm) are subangular to subrounded of siltstone. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, siltstone, and sandstone.	81.93	(0.70)	
1.70	10	D							
1.70-1.80	11	LB							
1.70	9	ES							
1.70		V						2.20	
Trial pit terminated at 2.20m depth.									

<div>Plan (Not to Scale)</div> <div><p>1.70</p><p>0.70</p><p>Bearing 350°</p></div>		<div>General Remarks</div> <div><p>1. All faces similar and stable.</p><p>2. No groundwater encountered during excavation.</p><p>3. Soakaway carried out at 2.20m.</p></div>			
		All dimensions in metres		Scale: 1:25	
		Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL

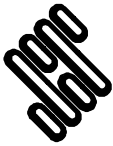
GINT LIBRARY_V10_01.GLB LibVersion: v8_07_001 PnVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:08 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP18
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 84.13	National Grid Co-ordinate: E:446580.8 N:325055.4	Sheet: 2 of 4



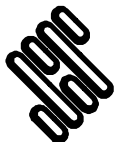
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP18
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 84.13	National Grid Co-ordinate: E:446580.8 N:325055.4	Sheet: 3 of 4



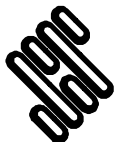
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP18
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 84.13	National Grid Co-ordinate: E:446580.8 N:325055.4	Sheet: 4 of 4

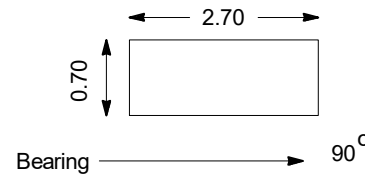


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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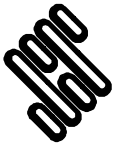


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP19
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 75.72	National Grid Co-ordinate: E:446353.6 N:324934.2		Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	c _u => 140			TOPSOIL	75.42	(0.30)	
0.40 0.40 0.40	3 4 5	ES D LB				Stiff dark orangish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.	74.92	(0.50)	
0.90 0.90 0.90 0.90	6 7 8 8	ES D LB V				Stiff to very stiff dark brown mottled grey, yellow, and orange slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite, siltstone, sandstone, and flint.	74.12	(0.80)	
1.70 1.70 1.70	10 11 9	D LB ES				Stiff dark reddish brown mottled grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite. ... 1.80m: Boulder (<200x200x150mm) of subangular siltstone.	73.82	(0.30)	
2.00 2.00 2.00	12 13 14	ES D LB				Stiff yellowish brown to orangish brown mottled grey slightly sandy locally sandy SILT. Sand is fine to coarse. ... 2.50m: Firm and stiff with occasional thin lenses (<100mm) of firm dark orangish brown mottled grey silty clay. Locally with frequent pockets of (<100mmx80mm) of black organic carbonaceous plant remains.	71.82	(2.00)	
3.90 3.95 3.95	17 15 16	LB ES D				Dark brown gravelly clayey fine to coarse SAND with occasional very thin lenses (up to 25mm) of firm dark brown slightly sandy silty clay. Gravel is subangular to rounded fine and medium of quartzite, mudstone, and flint. Trial pit terminated at 4.00m depth.	71.72	4.00	

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. Water seepage at 3.20m-3.90m - rose 5cm - 20min.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

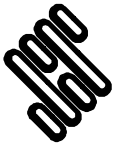
GINT LIBRARY_V10_01.GLB LibVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01.
Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:08 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP19
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 75.72	National Grid Co-ordinate: E:446353.6 N:324934.2	Sheet: 2 of 5



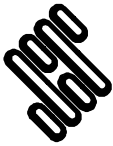
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP19
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 75.72	National Grid Co-ordinate: E:446353.6 N:324934.2	Sheet: 3 of 5



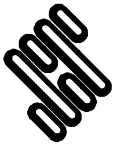
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP19
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 75.72	National Grid Co-ordinate: E:446353.6 N:324934.2	Sheet: 4 of 5



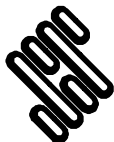
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP19
Contract Ref: 765514	Start: 28.09.22 End: 28.09.22	Ground Level (m AOD): 75.72	National Grid Co-ordinate: E:446353.6 N:324934.2	Sheet: 5 of 5

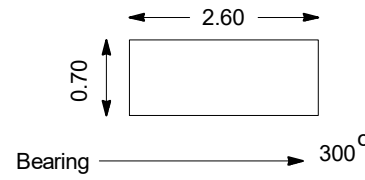


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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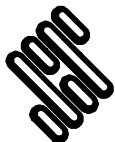


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP20
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 70.53	National Grid Co-ordinate: E:446370.4 N:324823.6		Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D	c _u =80			TOPSOIL	70.18	(0.35) 0.35	
0.50 0.50	3 4	ES D				Dark yellowish orangish brown slightly gravelly sandy CLAY.		(0.75)	
1.20 1.20	6 7	ES D				Dark reddish brown silty fine to coarse SAND.	69.43	1.10	
1.70 1.70-1.80 1.70 1.70	10 11 9	D B ES V				Firm to stiff dark reddish brown mottled greenish grey slightly sandy CLAY. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)		(1.20)	
2.90 2.90 2.90-3.00	12 13 14	ES D B				Very stiff friable dark reddish brown slightly sandy CLAY with frequent very thin beds (up to 40mm) of extremely weak reddish brown mudstone and very weak light grey siltstone. (MERCIA MUDSTONE GROUP)	67.73	2.80	
						Trial pit terminated at 3.30m depth.	67.23	3.30	

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

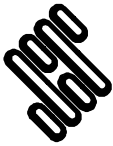
GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 ProjVersion: v8_07 | Log TRIAL PIT LOG - A4PJ 765514. EAST_MIDLAND_AIRPORT.GPJ - v10_01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Potters, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:08 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP20
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 70.53	National Grid Co-ordinate: E:446370.4 N:324823.6	Sheet: 2 of 5



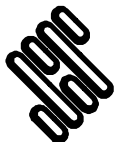
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP20
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 70.53	National Grid Co-ordinate: E:446370.4 N:324823.6	Sheet: 3 of 5



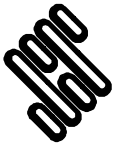
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP20
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 70.53	National Grid Co-ordinate: E:446370.4 N:324823.6	Sheet: 4 of 5



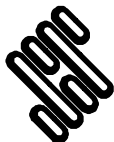
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP20
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 70.53	National Grid Co-ordinate: E:446370.4 N:324823.6	Sheet: 5 of 5

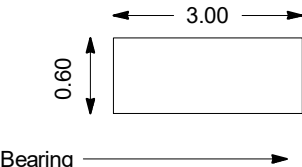


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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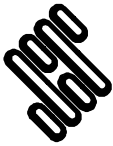


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0		Sheet: 1 of 6

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D	c _u => 140			TOPSOIL	72.53	(0.30)	
0.50 0.50	3 4	ES D				Very stiff dark reddish brown mottled grey slightly sandy CLAY with occasional very thin beds (up to 25mm) of very weak light grey siltstone. Sand is fine to coarse. (MERCIA MUDSTONE GROUP) ... Below 0.80m, friable.	71.83	(0.70)	
1.10 1.10 1.10-1.20 1.10	6 7 8	ES D B V				Stiff to very stiff friable dark reddish brown slightly sandy CLAY with frequent beds (up to 40mm) of extremely weak dark reddish brown mudstone and very weak light grey siltstone. (MERCIA MUDSTONE GROUP) ... Below 2.90m: grading to extremely weak mudstone.		(2.20)	
3.10-3.20 3.20	9 10	B D				Trial pit terminated at 3.20m depth.	69.63	3.20	

<div>Plan (Not to Scale)</div> <div></div>		<div>General Remarks</div> <div><div>1. All faces similar and stable.</div><div>2. No groundwater encountered during excavation.</div></div>			
		All dimensions in metres		Scale: 1:25	
		Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL

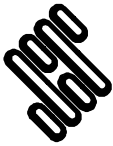
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0	Sheet: 2 of 6



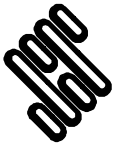
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0	Sheet: 3 of 6



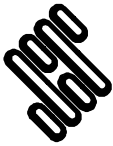
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0	Sheet: 4 of 6



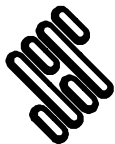
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0	Sheet: 5 of 6



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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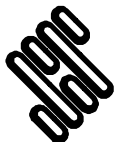


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP21
Contract Ref: 765514	Start: 06.10.22 End: 06.10.22	Ground Level (m AOD): 72.83	National Grid Co-ordinate: E:446314.3 N:324790.0	Sheet: 6 of 6



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Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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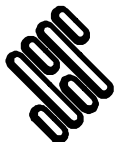


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP22
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6		Sheet: 1 of 5

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.15 0.15	1 2	ES D				TOPSOIL	71.66	(0.30) 0.30	
0.40 0.40 0.50-0.50	3 4 5	ES D B				Stiff yellowish brown and orangish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite and flint.		(0.90)	
1.30 1.30 1.30-1.40	6 7 8	ES D B				Firm stiff dark orangish brown and reddish brown slightly sandy slightly gravelly silty CLAY with frequent pockets (up to 50x30mm) of yellow and orange silt and sand with occasional very thin lenses (up to 40mm) of reddish brown fine to coarse sand. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite, flint, chalk, siltstone, sandstone, and mudstone.	70.76	1.20	
3.40 3.40-3.50 3.40	10 11 9	D B ES				Dark orangish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to rounded fine to coarse of quartzite and flint.	68.66 68.36	3.30 (0.30) 3.60	
						Trial pit terminated at 3.60m depth.			

Plan (Not to Scale)		General Remarks			
		1. All faces similar and stable. 2. Slight water seepage at base of trial pit.			
		All dimensions in metres		Scale:	1:25
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By:		

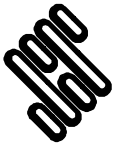
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP22
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6	Sheet: 2 of 5



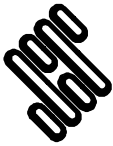
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP22
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6	Sheet: 3 of 5



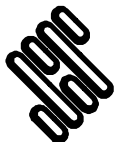
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP22
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6	Sheet: 4 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: AS	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP22
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.96	National Grid Co-ordinate: E:445927.4 N:324535.6	Sheet: 5 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalahar	Checked By: AS	
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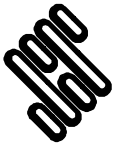


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP23
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.31	National Grid Co-ordinate: E:446025.7 N:324549.2		Sheet: 1 of 3

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D	c _u =120			TOPSOIL	70.91	(0.40)	
0.50 0.50 0.50-0.60 0.70-1.00	3 4 5 8	ES D B B				Very stiff dark reddish brown slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite and flint.	70.51	(0.40)	
0.90 0.90 0.90	6 7 7	ES D V				Stiff to very stiff friable dark reddish brown slightly sandy CLAY with occasional very thin beds (up to 25mm) of light greenish grey siltstone. (MERCIA MUDSTONE GROUP)		(2.40)	
2.90-3.00 3.00	9 10	B D				Trial pit terminated at 3.20m depth.	68.11	3.20	

Plan (Not to Scale) Bearing → 30°	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By:	

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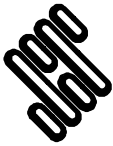


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP23
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.31	National Grid Co-ordinate: E:446025.7 N:324549.2	Sheet: 2 of 3



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Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: AS	
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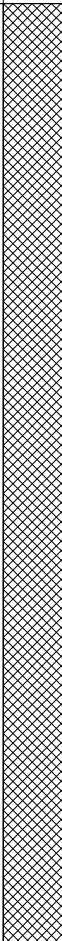

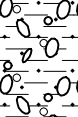


Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP23
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 71.31	National Grid Co-ordinate: E:446025.7 N:324549.2	Sheet: 3 of 3



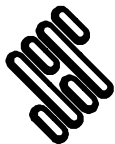
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: AS	
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GINT_LIBRARY_V10_01.GLB LibVersion: v8_07_001 PrjVersion: v8_07 | Log TRIAL PIT LOG - A4P | 765514_EAST_MIDLAND_AIRPORT GPJ - v10_01.
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Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend			
Depth	No	Type	Results									
0.05	1	ES	c _u =110			TOPSOIL	68.99	0.10				
0.05	2	D				Dark yellowish brown slightly sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite and flint. Cobbles (up to 100x90x60mm) are rounded of quartzite.		(0.40)				
0.30	3	ES				Stiff to very stiff friable dark reddish brown and light grey slightly sandy CLAY with frequent very thin beds (up to 60mm) of very weak light grey siltstone. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)	68.59	0.50				
0.30	4	D										
0.30-0.40	5	B										
0.60	6	ES				c _u =120			Stiff to very stiff dark reddish brown slightly sandy CLAY with frequent very thin beds (up to 40mm) of extremely weak to very weak dark reddish brown mudstone. (MERCIA MUDSTONE GROUP)	67.99	1.10	
0.60	7	D										
0.60-0.70	8	B										
0.60		V										
1.20	10	D						(2.00)				
1.20-1.30	11	B										
1.20	9	ES										
1.20		V										
							65.99	3.10				
						Trial pit terminated at 3.10m depth.						

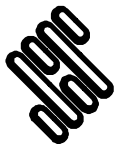
		General Remarks	
		1. All faces similar and stable. 2. No groundwater encountered during excavation.	
		All dimensions in metres <div> Scale: <div>1:25</div> </div>	
Method Used: <div>Machine dug</div>	Plant Used: <div>Tracked excavator</div>	Logged By: <div>GKalaher</div>	Checked By: <div>RL</div> <div>AGS</div>



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP24
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 69.09	National Grid Co-ordinate: E:446132.1 N:324501.5	Sheet: 2 of 5



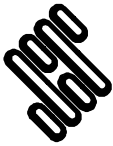
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP24
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 69.09	National Grid Co-ordinate: E:446132.1 N:324501.5	Sheet: 3 of 5



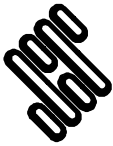
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP24
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 69.09	National Grid Co-ordinate: E:446132.1 N:324501.5	Sheet: 4 of 5



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP24
Contract Ref: 765514	Start: 05.10.22 End: 05.10.22	Ground Level (m AOD): 69.09	National Grid Co-ordinate: E:446132.1 N:324501.5	Sheet: 5 of 5

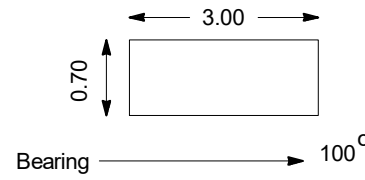


Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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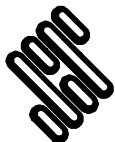


Contract: EMG Phase 2			Client: SEGRO		Trial Pit: TP25
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 65.37	National Grid Co-ordinate: E:446080.2 N:324450.2		Sheet: 1 of 4

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20 0.20	1 2	ES D				MADE GROUND: Firm dark brown slightly sandy slightly gravelly silty CLAY with occasional fragments of plastic sheet (up to 100x40mm). Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of quartzite, mudstone, and brick. (TOPSOIL)	64.97	(0.40) 0.40	
0.60 0.60 0.60-0.70	3 4 5	ES D LB				Very stiff dark orangish brown slightly sandy slightly gravelly SILT with occasional pockets (up to 10x10mm) of black organic carbonised plant remains. Sand is fine to coarse. Gravel is subangular fine to coarse of quartzite.	64.47	(0.50) 0.90	
1.10 1.10 1.10-1.20	6 7 8	ES D LB				Firm to stiff dark reddish brown mottled grey slightly sandy CLAY with occasional very thin beds (up to 30mm) of very weak light grey siltstone with frequent mudstone lithorelicts (up to 20x20mm). (MERCIA MUDSTONE GROUP)	63.57	(0.90) 1.80	
2.00 2.00-2.10 2.00	10 11 9	D LB ES				Stiff to very stiff friable dark reddish brown slightly sandy CLAY with frequent very thin beds (up to 40mm) of very weak reddish brown mudstone and light greenish grey siltstone. Sand is fine to coarse. (MERCIA MUDSTONE GROUP)	62.27	(1.30) 3.10	
3.20 3.20	12 13	ES D				Very stiff locally friable dark reddish brown slightly sandy CLAY with frequent very thin beds (up to 30mm) of very weak light grey siltstone. (MERCIA MUDSTONE GROUP) Trial pit terminated at 3.20m depth.	62.17	3.20	

Plan (Not to Scale) 	General Remarks 1. All faces similar and stable. 2. No groundwater encountered during excavation.			
All dimensions in metres		Scale: 1:25		
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	

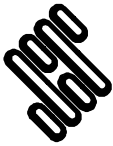
GINT LIBRARY V10.01.GLB LibVersion: v8.07.001 ProjVersion: v8.07 | Log TRIAL PIT LOG - A4P | 765514. EAST_MIDLAND_AIRPORT.GPJ - v10.01. Structural Soils Ltd, Branch Office - Castleford, The Potteries, Pottery Street, Castleford, West Yorkshire, WF10 1NJ. Tel: 01977-552255, Fax: 01977-552299, Web: www.soils.co.uk, Email: ask@soils.co.uk | 08/05/23 - 21:09 | AJ4 |



Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP25
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 65.37	National Grid Co-ordinate: E:446080.2 N:324450.2	Sheet: 2 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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Contract: EMG Phase 2		Client: SEGRO		Trial Pit: TP25
Contract Ref: 765514	Start: 27.09.22 End: 27.09.22	Ground Level (m AOD): 65.37	National Grid Co-ordinate: E:446080.2 N:324450.2	Sheet: 3 of 4



Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: GKalaher	Checked By: RL	
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