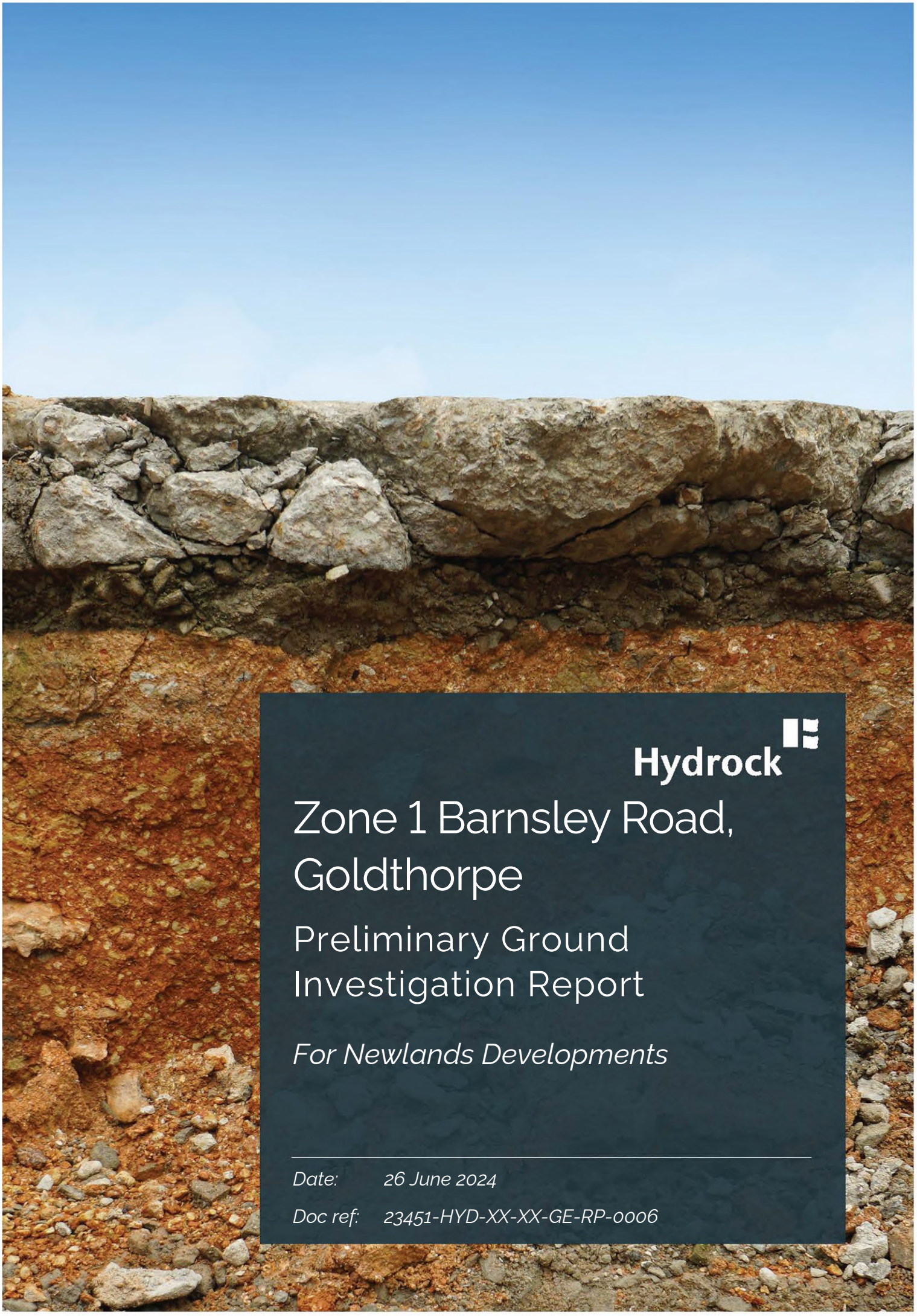

Hydrock

Zone 1 Barnsley Road, Goldthorpe

Preliminary Ground Investigation Report

For Newlands Developments

Date: *26 June 2024*

Doc ref: *23451-HYD-XX-XX-GE-RP-0006*

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Executive summary

Site information and setting	
Objectives	Preliminary investigation to further assess any geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023), and to provide preliminary geotechnical recommendations for design.
Client	Newlands Developments.
Site name and location	Zone 1, Barnsley Road, Goldthorpe.
Proposed development	The site development proposals are understood to comprise a single commercial warehouse unit with associated drainage infrastructure, parking and roadways.
Site description	The site currently comprises Agricultural Fields with a watercourse (Carr Dike) running through the centre of the site. Zone 1 occupies the northern side of the wider site between Carr Dike to the south and east and the A635 to the north.
Ground model proven by investigation	
Ground and groundwater conditions encountered by investigation	The ground conditions as proven by the investigation comprise: » Topsoil (Made Ground) was recorded across the entire site with an average thickness of 0.31m. Comprises a soft to firm dark brown sandy slightly gravelly clay with rare rootlets. » Opencast Backfill, has been encountered within the former quarry area in the north of the site and generally comprises reworked natural materials, with occasional man-made constituents and is a product of the material processing and crushing operations undertaken in opencast mining. The Opencast Backfill is generally described as firm brown slightly sandy gravelly clay. » The Alluvium was encountered in the centre and south of the site, in the area not historically mined. Alluvium is recorded with an average of 1.46m Alluvium was generally deepest towards the south of the site at the location of Carr Dike, as expected with historic deposition. The material generally varied between firm to stiff light orangish brown very sandy slightly gravelly Clay and orange brown mottled grey slightly clayey sandy Gravel. » Pennine Middle Coal Measures is recorded to an unproven thickness. This material generally consisted of light grey Siltstone and Mudstone. A thin coal seam was recorded at 15.0m and there was evidence of workings (presented as a void) in RO02 at 16.0m. RO01 located on the southern side of the recorded coal seam outcrop encountered fractured ground between 10.5m and 12.0m bgl. It is noted that subordinate coal and thinner seams were noted in a number of other exploratory holes that are not included on the geological maps and these should be investigated further. Groundwater was encountered at depths between 1.4 bgl and 2.6m bgl during the investigation. Water levels recorded post-fieldwork ranged from 0.0m bgl to 2.76m bgl (22.71m OD to 22.33m OD). There is shallow groundwater in the Opencast Backfill, Alluvium. Based on field monitoring of groundwater, the Pennine Middle Coal Measures present sub artesian conditions.

Summary of geotechnical conclusions	
Groundwork	Obstructions associated with former opencast mining uncontrolled fill should be anticipated. Excavation to proposed founding depth generally should be readily achievable with standard excavation plant. Heavy duty excavation plant/breaking equipment may be required to excavate the shallow rockhead. Excavations during investigation were unstable and spalling should be expected from the Opencast Backfill and Alluvium and within the sands and gravels below the water table. Water seepages into excavations are unlikely to be adequately controlled by sump pumping and alternative methods of dewatering are likely to be required.
Foundations and floor slabs	Foundations are recommended to comprise: » Pad foundations at 300mm into competent strata and following ground improvement where deep Made Ground is present. Alternative foundation options and ground improvement are provided in Section 6.7 and 6.8. Allowable net bearing pressure of 150 kN/m^2 for pad foundations subject to ground improvement. Deepening of foundations/heave protection is likely to be required to allow for the effects of trees particularly at field boundaries unless soils dealt with during enabling works. Ground bearing floor slabs are feasible following ground improvement
Roads and pavements	It is considered likely an equilibrium CBR of 4.0% will be achievable over the majority of the site. However, without ground improvement a CBR of >2.5% should be used for design in the area of the former opencast quarry
Ground Improvement	Areas of the site have been identified that will require ground improvement. Initial findings indicate the following may be feasible: » Full or partial over-excavation and replacement of soils associated with the backfilled opencast workings below foundations and concrete slabs; » Surface treatment, potentially including hydraulic binders, of subgrades supporting roads and pavements; » Preloading and surface monitoring where significant embankments or land raising is proposed.
Sustainable drainage	Soakaway drainage is considered unsuitable for this site.
Buried concrete	Design Chemical Class[1] of: » DC-1 for the shallow soils (Made Ground-Opencast Backfill and Alluvium); and » DC-2 for the deeper soils (Pennine Middle Coal Measures).
Summary of geo-environmental assessment	
Human Health	Results indicate that all chemicals of potential concern (CoPC) are below the relevant GAC.
Phytotoxicity	Hydrock does not believe there to be an unacceptable risk to plant life from site soils and no any additional consideration is required with regard to risks to plant life).
Controlled waters	The risk to controlled waters is low.
Radon:	The site is in a Radon Affected Area (1 - 3% of existing homes affected).
Construction materials:	Plastic or bitumastic products will not be at risk from soils on site
Potable water supply pipes	The site is partially brownfield and the presumption in the guidance is that barrier pipe will be used. However, the investigation and assessment has indicated no significant

	Contaminants of Concern and as such standard pipework may be suitable for the site following negotiations with the supply company.
Ground gases or vapours:	Low risk from ground gases (subject to additional monitoring) and CS1 conditions apply. Pending further investigation into the gas regime in the Alluvium.
Enabling works	
Proposed mitigation measures	No geo-environmental remedial measures are considered necessary at the site.
Earthworks	In order to undertake the proposed cut to fill earthworks and allow reuse of excavated materials, a site specific earthworks design and specification will be required to allow reuse of suitable materials along with the production of a Materials Management Plan and its approval and declaration by a Qualified Person. Verification reports by competent independent geotechnical specialists will be required following completion of any earthworks.
Waste and material management	Excavated soils to be disposed of as waste are likely to be classed as non-hazardous, however WAC testing and further classification testing should be undertaken as part of a supplementary investigation. Excavation and re-use of materials on site should be undertaken in accordance with an appropriate MMP. Specific re-use of materials within the opencast backfill may be subject to additional environmental permitting and this should be confirmed by early dialogue with the Environment Agency waste team.
Future considerations	
Further work	Following the ground investigation works undertaken to date, the following further works will be required: » supplementary ground investigation to allow design requirements relating to environmental uncertainties and detailed geotechnical properties of soils on site Future phases of ground investigation should address the following: » Potential Environmental Sources not addressed in the Preliminary GI, including the landfill at the northern site boundary; » Surface water sampling and chemical analysis; » Further investigation of the groundwater regime on site, including the installation of further monitoring wells; » Further investigation of the uncontrolled Opencast Backfill regarding geotechnical properties, highwall geometry and assessment of waste acceptance criteria; » Gas monitoring of the Alluvium, particularly in identified deep areas; and » Additional Geotechnical testing to characterise lateral variability, and cover areas of low data coverage, including supplementary sulphate testing and further earthworks data in areas of proposed cutting. » supplementary ground investigation to allow design requirements relating to mining. Future phases of ground investigation should address the following: » Further investigation of the extent of the shallow worked Shafton seam including the area south of the subcrop; » Further investigation of the fault in the north west area of the site; » Further investigation of the extent and nature of voids and broken ground found on site.

	» discussion with the Environment Agency waste team regarding re-use of materials on site; » discussion and agreement with utility providers regarding the materials suitable for pipework; » Discussions with the EA waste team to establish whether the reuse of opencast backfill material is acceptable under an MMP; » discussions with regulatory bodies and the warranty provider regarding the conclusions of this report; » assessment of tree influence on foundations and design of foundations; » discussions with ground improvement Contractors (RI/CMC) regarding the viability of potential improvement; » provision of geotechnical design for the Category 2 structures; » provision of a mine treatment design and specification; » production of a design statement for Route B in accordance with the DoW CoP to provide lines of evidence that the soils are uncontaminated; » production of a Materials Management Plan relating to reuse of soils at the site and import of soils to the site; » writing of a Materials Management Strategy relating to reuse of soils at the site, and: » verification of the earthworks, remediation and mitigation works.

This Executive Summary forms part of Hydrock Consultants Limited report number 23451-HYD-XX-XX-GE-RP-0006 and should not be used as a separate document.

1. Introduction

1.1 Terms of reference

In February 2024, Hydrock Consultants Limited (Hydrock) was commissioned by Newlands Developments (the Client) to undertake site investigation, comprising a Phase 2 preliminary ground

investigation at a site referred to as Zone 1, Barnsley Road, Goldthorpe located off the A635, Doncaster Rd, Barnsley, S72 0JE.

The site is currently Agricultural Fields with a watercourse (Carr Dike) running through the centre of the wider site. Zone 1 occupies the northern side of the wider site between Carr Dike to the south and east and the A635 to the north

Hydrock understands that the proposed development is to comprise commercial warehouse units with associated drainage infrastructure, parking and roadways. A proposed parameters layout (UMC Architects Drawing 22081 P0520), and Illustrative Masterplan (UMC Architects Drawing 22081 P0601C), is presented in Appendix A.

The investigation works have been undertaken in accordance with Hydrock's proposal via email from Hydrock to Newlands dated 12/02/2024 and the Client's instructions to proceed via email.

1.2 Objectives

The works have been commissioned to support the discharge of anticipated planning conditions and to assist with the design of the Zone 1 development.

The objectives of the preliminary Phase 2 Ground Investigation are:

- to further assess any geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023);
- to identify any geo-environmental mitigation requirements to enable development to progress; and
- to provide preliminary geotechnical recommendations for design.

1.3 Scope

The site investigation includes a preliminary Phase 2 Ground Investigation. Additional ground investigation works have been designed for the site and are proposed to be completed as a supplementary phase of works.

The scope of the preliminary Phase 2 Ground Investigation comprises:

- trial pitting, Cone Penetration Testing (CPT), cable percussive boring and rotary open hole drilling to:
  - obtain an initial data set covering the ground and groundwater conditions of the site;
  - allow collection of samples for geotechnical and chemical laboratory analysis;
  - allow geotechnical field tests to be undertaken;
  - installation of gas and groundwater monitoring wells;
- gas concentration and groundwater level monitoring;
- geotechnical and chemical laboratory analysis;
- updating of the preliminary Ground Model determined as part of the Phase 1 study;
- preparation of a geotechnical risk register;
- presentation of initial geotechnical design recommendations;
- formulation of an updated Conceptual Site Model (CSM), including identification of any plausible contaminant linkages;
- completion of a generic quantitative risk assessment of any identified chemical contaminants to establish 'suitability for use' under the current planning regime;

- discussion of any potential environmental liabilities associated with land contamination (soil, water and gas); and
- identification of outline mitigation requirements to ensure the site is 'suitable for use'.

1.4 Available information

The following documents and reports have been produced by Hydrock and used in the preparation of this report:

- Hydrock. November 2023. 'Ground Condition Desk Study Report', Ref: 23451-HYD-XX-XX-RP-GE-0001 P02;
- Hydrock. November 2023. 'Coal Mining Risk Assessment', Ref: 23451-HYD-XX-XX-RP-GE-0002 P02;

The following documents have been provided by the client and used in the preparation of this report:

- UMC Architects Drawing 'Parameters Plan', Drawing Number; 22081 P0520 (UMC, November 2023)
- UMC Architects/Hydrock Drawing 'Proposed Earthworks Volumes' Drawing Number; 23451-HYD-XX-XX-DR-D-0201 (UMC/HYD, March 2024)
- Stafsurv Drawing 'Proposed Plateau Levels', Drawing Number; 12147-Fl-4 (Stafsurv June 2022)

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+A2:2017, EA LCRM (2023) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

Phase 2 comprises intrusive ground investigation work and testing. The factual information from the desk study and the ground investigation are used to develop the Conceptual Site Model (CSM). This CSM is based on a ground model of the site physical conditions and an exposure model of the possible contaminant linkages. The CSM forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines. This GQRA might lead to more Detailed Quantitative Risk Assessment (DQRA). Professional judgement is then used to evaluate the findings of the risk assessments and to provide recommendations for the development.

The geotechnical section of this report is prepared in general accordance with BS EN 1997-1+A1: 2013, BS EN 1997-2:2007 and BS 8004:2015. This report constitutes a Ground Investigation Report (GIR) as described in Part 2 of Eurocode 7 (BS EN 1997-2) (EC7). However, it is not intended to fulfil the requirements of a Geotechnical Design Report (GDR) as specified in EC7.

The geo-environmental and geotechnical aspects are discussed in separate sections. Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. Designers should take all aspects of the investigation into account.

2. Desk Study and Coal Mining Risk Assessment summary

2.1 Desk Study summary

Hydrock have previously produced a Desk Study and a Coal Mining Risk Assessment for Newlands as detailed in section 1.4. The summary of which are reproduced below. Reference should be made to the above listed reports for full details.

2.1.1 Site referencing

Table 2.1: Site referencing information

Item	Brief Description
Site name	Land south of Dearne Valley Parkway.
Site address	Billingley, Bolton upon Dearne, Barnsley, Yorkshire, S72 0JE.
Site location and grid reference	The site is located directly south of the A635, 800m east of the A619 and 400m west of Goldthorpe Industrial Estate. The National Grid Reference of the approximate centre of the site is 444093E, 403622N.

Figure 2-1: Aerial Photograph

(Reproduced with permission from Groundsure)

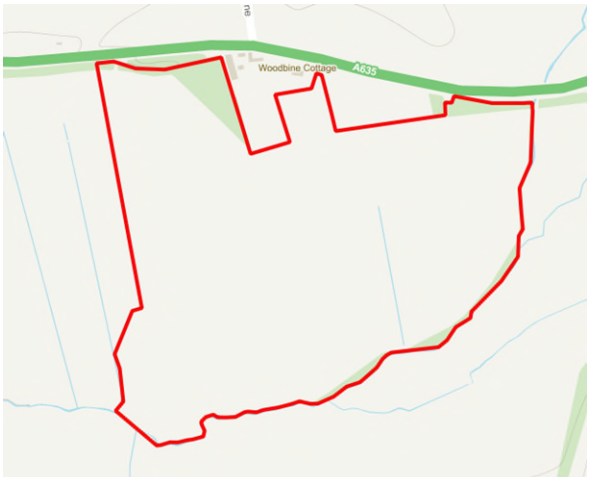

Figure 2-2: Extract from the Ordnance Survey Map.

(OS licence 100023353).

A site location plan (Hydrock Drawing 23451-HYD-XX-XX-DR-GE-1001) is presented in Appendix A

2.1.2 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 2nd August 2022 to visually assess potential geotechnical hazards, contaminant sources and receptors.

Table 2.2: Site description

Item	Brief Description
Elevation, topography and any geomorphic features	Elevations generally fall north to south toward Carr Dike in the south of the site which flows from the north-east to the west. Ground level on the banks of Carr Dike vary between approximately 25m AOD in the north-east falling to 21m AOD in the west., comprising the southern site boundary. Along the A635 road on the northern boundary, elevations are higher near the north-west corner of the site (between 34 – 35m AOD) and falls toward Carr Dike (between 22 – 24m AOD). Carr Dike enters the site in the north beneath the A635 via a culvert, flowing in a southwest orientation toward the western boundary. A small tributary is located with its spring, off site to the east of Carr Dike, and a secondary tributary is located off site in the north-west corner of the Aldi depot.
Present land use	The site consists of two large agricultural fields used for crop farming separated by hedgerow boundaries, with two drainage ditches running in a north south orientation toward Carr Dike which bounds the fields on the south. High voltage electricity pylons on wooden poles are present in the north and east. There are no buildings present on site.
General site sensitivity	The site is agricultural land within a semi-rural setting, however the site is situated on the edge of an industrial/logistics area to the east which comprises Goldthorpe industrial estate and includes the Aldi depot. Dearne Valley Wetlands SSSI is located approximately c. 400m to the southwest of the site.

2.1.3 Site history

A study of historical Ordnance Survey maps as part of the desk study has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development.

- From 1850 the site is mainly occupied by open fields, off site c.300m north east corner is a bindstone quarry (assumed to be backfilled by 1890). Further quarries are present surrounding the site.
- In the 1960s several drains are created in the north of the site.
- From the historical mapping, the site is marked as a quarry (Opencast coal mine) from 2001 and 2010. No significant changes are shown to present day.
- A historical landfill is shown off site adjacent to the sites northern boundary, registered as accepting domestic refuse, although the landfill is not shown on historical mapping.
- Regulatory information shows the site historically possessed a licence for processing of coal and coke as part of the mining works on site.

2.1.4 Geology

The general geology of the site area is shown on the 1:10,000 British Geological Survey (BGS) map (Figure 2-3) and is summarised below:

- Geological mapping indicates that the area of the former opencast site comprises Infilled Deposits (northern half of the site).
- The superficial geology at the site consists of Alluvium across a large area north of Carr Dike,
- The bedrock geology comprises the Pennine Middle Coal Measures in the north of the site and Mexborough Rock – Sandstone (the parent unit is the Pennine Middle Coal Measures Formation) in the south.
- A fault zone is located in the centre west of the site with the downthrow to the south.

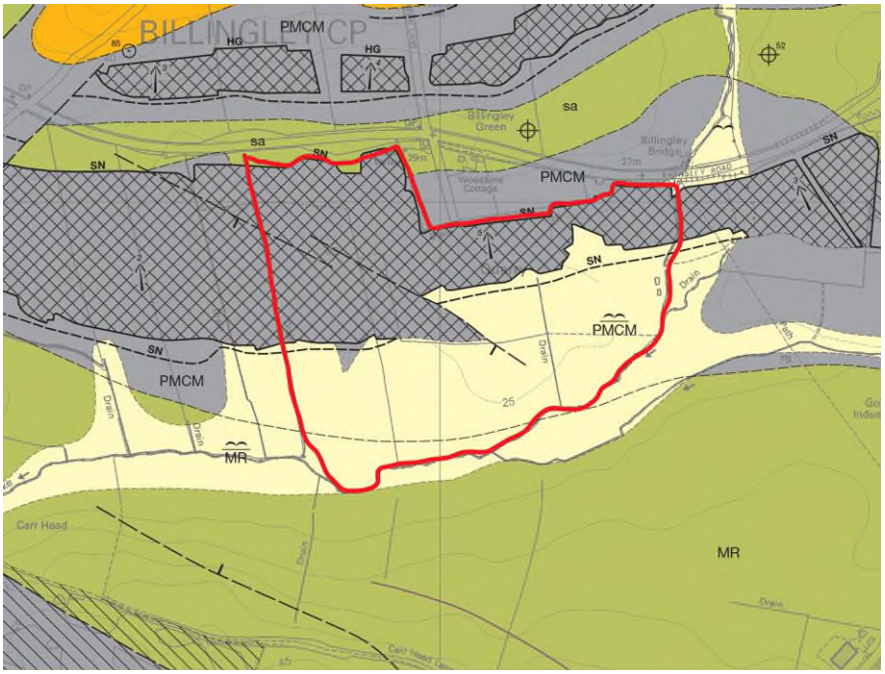

Figure 2-3: 1:10,000 Geological Map reference SE40SW (approximate site boundary)

2.1.5 Aquifer designations

Table 2.3: Aquifer system

Stratum	Aquifer Designation	Comments
Infilled Made Ground (Imported Fill)	Unclassified/unproductive	Infilled ground not included in the classification system. Likely to be moderate to high porosity because of unconsolidated nature, but permeability is likely to be constrained to low, or low to moderate because of poor sorting and potentially high clay content.
Superficial Deposits		

Alluvium	Secondary A Aquifer	Intergranular permeability. Dominated by moderate to high permeability layers of sand and gravel, interbedded with very low to low permeability clays and silts. Groundwater flow is likely to be variable and discontinuous as water migrates around low permeability areas.
Solid Geology		
Pennine Middle Coal Measures	Secondary A Aquifer	Other than in respect of worked coal seams, likely to be Generally characterised by low permeability and isotropic. Potentially faulted and fractured, with high secondary permeability. Coal workings are likely to have created a significant secondary porosity and permeability and large volumes of groundwater can be present in abandoned workings, with associated potentially high rates of flow.

2.1.6 *Mining and mineral extraction*

Geological mapping shows the Shafton Coal seam (between 0.2m and 2.3m in thickness) to outcrop along the southern boundary of the opencast area, along A635 Barnsley Road. This coal seam is shown to dip by 2 degrees to 5 degrees to the north in the local area.

The Highgate Coal is shown to outcrop near the north western corner of the site, parallel to the Shafton Coal seam. This coal seam is indicated to be 0.7m in thickness.

The northern half of the site is within an area defined by the Coal Authority (CA) as a Development High Risk Area, with a historical unlicenced opencast site present in the north of the site, and past Shallow Coal Mine Workings recorded.

Two mine entries are recorded in the north of the site, the mine entry further to the west is referenced 44403-008, and the mine entry further east is referenced 444403-007. One mine entry is present off site but is within a 20m zone of influence outside of the site boundary.

2.1.7 *Natural ground instability*

The risks of natural ground subsidence as given by the environmental data report and Hydrock's professional judgement are summarised in Table 2.4 below.

Table 2.4 Summary of natural ground subsidence risks

Risk	Hazard Rating	Geology	Comments
Shrink swell clays	Moderate	Alluvium and Made Ground/Infilled Ground	Trees and hedges are present around the site boundaries and sporadically across the site. Cohesive deposits may be affected by potential for shrink-swell ground movements in clays as a result of changes in moisture content from removal or growth of trees. During the site walkover desiccation cracks

Risk	Hazard Rating	Geology	Comments
			at surface level were apparent in areas underlain by Alluvium.
	Negligible	Where superficial deposits are absent in the southern half of the site.	-
Running sands	Moderate	Alluvium	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.
	Very low	Made Ground	Running sand conditions unlikely.
	Negligible	Where superficial deposits are absent in the southern half of the site.	-
Compressible deposits	Moderate	Alluvium and Made Ground/Infilled Ground.	Compressibility and uneven settlement hazards are probably present due to the unconsolidated nature of these strata
	Very low	Where superficial deposits are absent in the southern half of the site.	-
Collapsible deposits	Negligible	Alluvium	-
	Moderate	Made Ground (opencast backfill material)	It is likely that the backfilling of the opencast workings includes voids susceptible to creep and inundation settlement
	Moderate	Pennine Middle Coal Measures	Potential to contain worked coal seams which may be open or partially collapsed
Landslides	Very low	Alluvium and where there are no superficial deposits on the site.	-
Ground dissolution of soluble rocks	Negligible	Pennine Middle Coal Measures and Mexborough Rock.	-

2.2 Coal Mining Risk Assessment summary

Hydrock has previously carried out a Coal Mining Risk Assessment for the site (reference 23451-HYD-XX-XX-GE-RP-0002), the information provided is summarised in the following sections.

2.2.1 Coal Mining Reporting Area

The site is located in a Coal Mining Reporting area. The Coal Mining Reporting Area is used to determine whether a coal mining report is required for property transactions and the conveyance process.

2.2.2 Development High Risk Area

The northern part of the site associated with subcropping and shallow coal seams is within a Development High Risk Area.

2.2.3 Mine Entries

Two mine entries are indicated to be present within the site. The two mine shafts are located in the northern part of the site to the south of Barnsley Road and to the east of Woodbine Cottage. The mine entry further to the west is referenced 44403-008. The mine entry further east is referenced 444403-007. These two shafts fall within an area of opencast coal workings and therefore, will likely have been removed by the opencast workings.

2.2.4 Surface Coal Resource Area

Much of the central and southern part of the site lies within a Surface Coal Resource Area. The Surface Coal Resource Area define the coal resources capable of being extracted by surface mining methods, referred to as opencast.

2.2.5 Fissures and Break-lines

There are no fissures or break-lines shown to be present on the site by The Coal Authority interactive viewer.

2.2.6 Surface Mining

Surface mining (i.e., opencast coal workings) has taken place in the northern part of the site area. These areas of historical open-cast workings are broadly equivalent with the areas of infilled ground (hatched shading) as shown on the 1: 50,000 scale BGS geological map.

2.2.7 Past Shallow Coal Mine Workings

There are no areas of past shallow coal workings shown to be located on site. There are several areas of past shallow coal workings located just to the north of Barnsley Road. These areas of past shallow coal mine workings are based on The Coal Authority's records of underground workings, or parts thereof, whose depth is 30m or less from the ground surface.

2.2.8 Probable Shallow Coal Mine Workings

Areas of probable shallow coal mine workings are shown in the eastern part of the site and coincide with areas of opencast coal workings. Probable coal mine workings contain locations and estimated extents of probable shallow underground workings for which no recorded plans exist, but where it is likely that workable coal at shallow depth has been mined before records were kept (pre-1872).

2.2.9 Coal Outcrops

The Shafton Coal seam is shown on the 1:10,000 BGS map to subcrop through the approximate centre of the site. The outcrop of this seam is marked on the map on the southern and northern sides of the opencast workings.

2.2.10 Spontaneous Combustion

The Shafton Coal seam is listed on The Coal Authority's register as being known to experience occurrences of spontaneous combustion, and consequently is regarded as at 'high risk' of succumbing to spontaneous combustion when being entered, worked or disturbed.

Spontaneous combustion of coal is most often associated with former coal workings. In operating mines, it is usually found in collapsed ground, which contains coal, or in fractured coal around roadways. In these situations, it is the replenishment of potentially oxidising gas conditions by ventilation air in the workings which allows continued heating. It is also found where coal outcrops at the surface especially where it has been disturbed by mining or quarrying operations which allows air to come into close contact with the coal.

2.2.11 Mine Abandonment Plans

Six mining abandonment plans were obtained from The Coal Authority which are relevant to the proposed development site.

2.2.11.1 NE54-999999-(Custom). Jpg. Abandonment Plan 7107 (Ref. YO.2.K022)

Abandonment Plan showing Bolton Upon Dearne opencast workings, dated 9.09.1949, Scale 1: 2500. The plan shows the extent of opencast workings on the northern and north eastern part of the development site, south of the Doncaster Barnsley Road. The opencast mine worked the Shafton coal seam between 12.04.1948 to 16.06.1949. The coal workings extended over and area of 51.73 acres and a total of 326.915 tons of coal was extracted from the opencast workings. The Shafton seam was worked to a depth of 28.05m depth bgl. The area of opencast extended between Pasture Lane in the west to Woodbine Cottages in the east. The workings are just to the south of the Doncaster Barnsley Road. The Opencast workings were backfilled in October 1950. No details of the backfilling/restoration are provided on the abandonment plan.

2.2.11.2 NE209-444204 (Custom). Jpg. Billingley Drift Mine Abandonment Plan

Abandonment Plan showing the location of the Billingley Drift Mine in the northern part of the proposed Development site, just to the south of the Doncaster Barnsley Road. The plan was completed in 1952 at a scale of 1: 2500. The plan also shows the northern extent of the Bolton Upon Dearne opencast workings shown on Plan NE54-999999. The plan shows extensive underground drift workings relating to the Highgate Colliery to the north east of the Billingley Drift Mine with workings in the Shafton Coal seam. The plan also shows underground drift workings associated with the Dearne Valley Colliery further to the north of the Billingley and Highgate Collieries. The Dearne Valley Colliery also worked the Shafton Coal seam.

2.2.11.3 NE209-444203 (Custom), jpg. Billingley Drift Mine Abandonment Plan

Abandonment Plan showing the southern extent of the Billingley Drift Mine which encroaches on the Bolton Upon Dearne opencast workings which were backfilled and restored in October 1950. The plan provides further details about the two adits relating to the Billingley Drift Mine which extend just within the Bolton Upon Dearne opencast workings described on plan NE2-444204. Note that these adits are located beyond the western boundary of the proposed development site. Details of the adits are as follows:

2.2.11.4 16924-999999, 1 of 3 (Custom), jpg. Woodbine and Woodbine Extension

Abandonment Plan showing Woodbine and Woodbine Extension opencast coal sites, scale 1: 2500, July 1997. These workings are located in the north/northeast part of the proposed site development. Opencast excavations started in January 1996 and finished in 1997. The total coal removed was 138.402 tonnes by Cobex Ltd. The Shafton Top Leaf (1.38m thick) and the Shafton Bottom leaf (0.15m thick) was worked.

2.2.11.5 16924-999999, 2 of 3 (Custom). Jpg. Woodbine Extension Opencast site.

The plan shows the Woodbine Extension opencast, dated 22.05.1997, scale 1: 1250, worked by Cobex Ltd. Both the Shafton Top Leaf and Bottom Leaf were worked within these opencast workings. A sewer is shown running north-south through the centre of the Woodbine Extension opencast. Excavation depths west of the sewer ranged between 26.2m and 30,0m depth bgl and to the east of the sewer between 16.6m and 27.5m depth bgl.

2.2.11.6 16924-999999, 3 of 3 (Custom), jpg. Woodbine Opencast site.

Plan showing the Woodbine opencast site, dated 26.02.1997, scale, 1: 1250 worked by Cobex Ltd. Both the Shafton Top Leaf and Bottom leaf were worked. The plan shows the spatial extent of opencast workings in the eastern part of the Woodbine Opencast site. The extent of workings was between 23.0m depth bgl in the south east and 29.1m depth bgl in the north of the workings.

2.2.11.7 Opencast Plan - Abandonment Plan No. 7107. Bolton upon Dearne, incorporating Billingley Green & Goldthorpe. Scale: 1 to 2500. Dated: 9th Feb. 1949.

The plan shows that the former opencast mining area was located within the site south of the A635 road, between Billingley Green and Pasture Lane. The opencast site generally remains approximately 20 to 50m north of the Shafton Coal outcrop. A representative section of the underlying soils shows that the Shafton Coal is approximately 4.39' (1.34m) in thickness.

The Shafton seam is shown to dip to the north with a gradient of 1 in 25.5. The current width of the highwall was calculated by comparing the elevations at the bottom of the opencast site described on the abandonment plans to today's surveyed site elevations, which are included within Appendix A. Following this method, the bottom of the highwall is shown to lie at depths ranging between 1.6 and 5.2m bgl along the southern wall of the excavation. Along the northern wall, it is shown to lie at depths ranging between 11.6 and 19.1m bgl.

In addition to the main seam, an in situ thickness of 0.83ft and 0.92ft (0.25 and 0.28m) was recovered from two areas along the eastern boundary of the opencast mining area. An in situ thickness of 12.5ft (3.81m) was also recovered from an area located approximately 170m south of the junction between Pasture Lane and Barnsley Road, in the vicinity of the two adits mentioned in section 3.2 of the JPG Desk Study report.

3. Initial conceptual site model

3.1 Introduction

The initial Conceptual Site Model (CSM) incorporates evidence from the site walkover and the Desk Study and Coal Mining Risk Assessment. The formulation of an initial CSM is a key component of the LCRM methodology, and incorporates: a ground model of the site physical conditions; and an exposure model of the possible contaminant linkages. It forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

3.2 Ground model

The preliminary ground model presented in Hydrock Desk Study Section 23451-HYD-XX-XX-RP-GE-0001 P02 provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4)

3.3 Geotechnical hazard identification

3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table J.1 in Appendix G for further information).

3.3.2 Plausible geotechnical hazards

Plausible geotechnical hazards identified at the site are:

- Historical coal mining and mining features including mine shafts and underground workings.
- Uncontrollable Made Ground and deep Infilled Ground associated with the backfill of opencast workings.
- Soft / loose compressible ground (low strength and high settlement potential) associated with the alluvial soils and opencast backfill material.
- Shrinkage / swelling of the clay fraction of soils under the influence of vegetation particularly in the centre of the site where hedgerows and trees are present.
- Variable lateral and vertical changes in ground conditions (highwalls) particularly at the interface with the opencast workings.
- Obstructions potentially including oversize particles within the opencast backfill.
- Shallow groundwater.
- Changing groundwater conditions and seasonal fluctuation.
- Risk from flooding.
- Running sands and loose Made Ground/Infilled Ground, leading to difficulty with excavation and collapse of side walls.
- Earthworks – poor bearing capacity of new fill.
- Fault below the western side of the site.

3.3.3 Potential development elements affected

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs
- Roads and pavements.
- Services.
- Embankment slopes.
- Construction staff, vehicles and plant operators.
- Earthworks control, inability to place and compact fill.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment. The investigation is presented in Section 5 and the assessment is presented in Section 6.

3.4 Geo-environmental exposure model

3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential contaminant linkages, based on the source-pathway-receptor (SPR) approach.

A viable contaminant linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

3.4.2.1 Potential on-site sources of contamination

- Made Ground/Infilled Ground, associated with the backfilled opencast sites and bindstone quarry, possibly including elevated concentrations of metals, metalloids, polycyclic aromatic hydrocarbons (PAH), petroleum hydrocarbons (PHC), asbestos fibres, and Asbestos Containing Materials (ACM) (S1).
- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground / Infilled Ground / alluvial deposits (S2).
- Mine gases (carbon dioxide, methane, carbon monoxide and hydrogen sulphide) from shallow mine workings (S3).
- Historical Licenced pollutant release site (Part B permit) for the processing of coal and coke (S4) resulting in contaminants of concern potentially impacting superficial deposits/bedrock/Infilled Ground and controlled water.

3.4.2.2 Potential off-site sources of contamination

- Quarry backfill, associated with the former brick pit located on the eastern boundary of the site, possibly including PHC and PAH with the potential to migrate onto site (S5).
- Ground gases (carbon dioxide and methane) from organic materials within the quarry backfill (S6).
- Dismantled railway 80m south east possibly containing elevated concentrations of metals, metalloids, PAH and PHC (S7).
- Active surface water discharge of sewage, discharged into the tributary of Carr Dike located 209m east (S8).

- Historical landfill comprising household waste potentially containing metals, metalloids, asbestos fibres, ACM(S9).
- Ground gases (carbon dioxide and methane) from organic materials in the landfill (S10).

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- People (neighbours, site end users) (R1).
- Development end use (buildings, utilities and landscaping) (R2).
- Groundwater: Secondary A aquifer status of the Alluvium, Pennine Middle Coal Measures and Mexborough Rock (R3).
- Surface water: on-site Carr Dike (R4).

3.4.4 Potential pathways

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P1).
- Methane and carbon dioxide ingress via permeable soils and/or construction gaps (P2).
- Migration of contaminant via leachate migration through the unsaturated zone in the Alluvium (P3).
- Migration of contaminant from the groundwater within the Alluvium to the groundwater within the Mexborough Rock and Pennine Middle Coal Measures aquifer (P4).
- Surface water via base flow from groundwater within the Alluvium (P5).
- Active discharge to surface water via drainage from proposed development (P6)

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2023), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment. The investigation is presented in Section 3 and the assessment is presented in Section 5. An assessment of the Source – Pathway – Receptor linkages is undertaken following the assessment (Section 6) and is presented in Appendix H (Table K.1).

3.4.5 Potential implications of climate change

Climate change has the potential to change the risk profile for conceptual site models and associated contaminant linkages. The impact of climate change on the CSM is site-specific, and a qualitative assessment of the potential impact of climate change on the CSM for this site is summarised below. The assessment has primarily utilised the guidance in Environment Agency (2010)[2] and SoBRA (2022)[3] which set out the UK context to climate change and land contamination. Both guidance documents advocate a "what if" scenario approach in the context of changes in ambient temperatures, an increase in the frequency of extreme rainfall/storm events and heatwaves/droughts, and long-term changes in groundwater and sea levels.

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[2] *Environment Agency, 2010. Guiding Principles for Land Contamination. Part 2. FAQs, technical information, detailed advice and references, March 2010.*

[3] *SoBRA, 2022. Guidance on Assessing Risk to Controlled Waters from UK Land Contamination Under Conditions of Future Climate Change, Society of Brownfield Risk Assessment, August 2022.*

Those "what if" scenarios that are relevant to this CSM are:

- Increased long-term rainfall leading to increased infiltration and seasonally higher groundwater and water levels in surface waters.
- Increased frequency and/or magnitude of extreme rainfall events leading to short-term surface flooding, surface water run-off, groundwater flooding, and/or land-based erosion.
- Increased frequency and/or magnitude of storm events leading to short-term drops in barometric pressure and/or high winds.
- Occurrence of extreme cold and hot weather events leading to changes in ground conditions such as soil temperature, evapo(trans)piration, and soil moisture (for example freeze-thaw effects and desiccation), decreased infiltration and fall in groundwater and surface water levels.
- Long-term decrease in rainfall leading to lower infiltration and fall in groundwater and surface water levels.

4. Ground investigations

4.1 Site works

The ground investigation works, including the rationale which was based on the findings of the preliminary risk assessment is summarised in Table 4.1.

The fieldwork took place between 20th March and 5th April 2024. The ground investigation locations were surveyed in using a topographic survey quality GPS are shown on the Exploratory Hole Location Plan (Hydrock Drawing 23451-HYD-XX-XX-DR-GE-0010) in Appendix A.

The logs, including details of ground conditions, soil sampling, in situ testing and any installations, are also presented in Appendix B.

The weather conditions during the Hydrock fieldwork and for the previous week were changeable ranging from cold overcast rainy to clear and mild.

Table 4.1: Summary of site works

Activity	Method	No.	Name	Depth Range (m bgl)	In situ tests	Rationale
Drilling, Pitting and Probing						
Boreholes	Cable percussive	3	CP101-CP103	4.45 - 7.45	SPT	To investigate strength profile of the Opencast Backfill and Weathered Pennine Middle Coal Measures
	Rotary open hole	2	RO101-RO102	12.00 - 18.4	-	To investigate the potential presence of workings in the Pennine Middle Coal Measures coal seams, and determine the boundary between weathered and competent rock.
Trial pits	Machine (JCB 360)	13	TP107 - TP129	1.2 - 2.6	-	For general site coverage and collection of samples. Locations TP101, TP103, TP105 and TP109 were not completed due to ground conditions and the location of a ground bird nesting area
Trial Trench		9	TT112 - TT127	1.6 - 2.6	-	For determination of Opencast/natural soils boundary as well as site coverage and collection of samples
Probes	CPT piezocone	14	CP101 - CP114	1.46 - 7.07	-	To investigate strength profile and depth of the Opencast Backfill/ Alluvium

					and Weathered Pennine Middle Coal Measures

Wells for monitoring groundwater levels and ground gas concentrations, and to facilitate the sampling of groundwater, were installed in all of the Cable Percussion and Rotary Open boreholes. A summary of the monitoring well installations is presented in Table 4.2.

Table 4.2: Summary of monitoring installations

Location	Ground level (m OD)	Standpipe / piezometer diameter	Screen top and base depth (m bgl)	Screen top and base elevation (m OD)	Strata targeted
CP101	24.16	50	1.0 – 6.0	23.16 - 18.16	Opencast Backfill
CP102	25.08	50	1.0 – 2.0	24.08 - 23.08	Alluvium
CP103	22.71	50	0.5 - 1.5	22.21 - 21.21	Opencast Backfill
RO01	24.84	50	4.0 – 10.0	20.84 - 14.84	Pennine Middle Coal Measures
RO02	23.64	50	12.0 – 14.0	11.64 - 9.64	Weathered Pennine Middle Coal Measures

4.2 Geo-environmental testing

4.2.1 Sampling strategy and protocols

Exploratory hole positions were determined by reference to the site conditions and uncertainties identified in the Initial Conceptual Model.

Certain specific features such as the opencast backfill and areas of alluvium were targeted for specific investigation, but a reasonably even spacing was used for the remainder of the site.

Samples were taken, stored and transported in general accordance with BS 10175:2011+A2:2017.

4.2.2 Geo-environmental monitoring

Gas monitoring boreholes have been monitored on 4 occasions. The results are presented in Appendix D.

4.2.3 Geo-environmental laboratory analyses

The chemical test certificates for testing undertaken as part of Hydrock's investigation are provided in Appendix E and summarised in the table below. Wherever possible, UKAS and MCERTS accredited procedures have been used.

The chemical test certificates for testing undertaken as part of historical investigations are provided in the relevant reports.

The geo-environmental analyses undertaken on soils are summarised in Table 4.3.

Table 4.3: Geo-environmental analyses of soils or other solids

Determinand Suite	Made Ground (Topsoil)	Alluvium	Opencast Backfill	Weathered PMCM
Hydrock minimum suite of determinands for solids*	8	23	13	1

*Hydrock minimum soil suite comprises: As, B (water soluble), Be, Cd, Cr (total), Cr (VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulfide, pH, asbestos fibres, speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID), total phenols and fraction of organic carbon

The soils chemical test data (including both Hydrock and historical data) are interpreted and assessed in Sections 7.3 and 7.4.

4.3 Geotechnical testing

4.3.1 Geotechnical laboratory testing

The geotechnical tests undertaken by Hydrock are summarised in Table 4.4 and the test certificates are provided in Appendix C. Wherever possible, UKAS accredited procedures have been used.

The geotechnical tests undertaken as part of historical investigations are provided in the relevant reports.

Table 4.4: Summary of sample numbers for geotechnical tests

Test	Alluvium	Opencast Backfill	Pennine Coal Measures
Natural moisture content	10	7	7
Atterberg limits	6	5	4
Particle size distribution (sieve)	4	1	3
Particle size distribution (sedimentation)	2	2	3
Sulfate and aggressive chemical environment classification for buried concrete classification (full BRE SD1 suite)	5	5	6
Remoulded California Bearing Ratio at natural moisture content (soaked)	1	1	2
Organic Matter	5	5	6
Earthworks Suite	1	1	1

The geotechnical test data (including both Hydrock and historical data) are summarised in Section 5.4 and interpreted in Section 6.

4.4 Constraints

Locations in the west of the site, TP101, TP103, TP105 and TP109 could not be investigated due to the presence of a ground nesting bird reserve area. this area coincided with the proposed flood attenuation zone and borrow pit.

5. Ground investigation records and data

5.1 Physical ground conditions

5.1.1 Summary of strata encountered

The following presents a summary of the properties of the ground and groundwater conditions encountered, based on field observations, interpretation of the field data and laboratory test results, taking into account drilling, excavation and sampling methods, transport, handling and specimen preparation.

Details of the Hydrock ground investigation works are provided in the logs in Appendix B. A summary of the ground model is presented in Table 5.1 and the individual strata are described in the sections below..

Table 5.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
Made Ground (Topsoil)	0.00 -0.30	0.10 - 1.00	0.10 - 1.00	0.51
Opencast Backfill	0.00 - 0.90	1.00 - 6.50	0.90 - 6.20	3.06
Alluvium	0.20 - 1.30	0.40 - 6.00	0.20 - 5.70	1.46
Weathered Pennine Coal Measures	0.40 - 6.00	1.60 – 15.0	0.20 - 1.80	1.20
Pennine Coal Measures	2.00 - 16.7	Not proven	Not proven	Not proven

5.1.2 Made Ground

5.1.2.1 Topsoil (Made Ground)

The surface covering of topsoil (Made Ground) was recorded across the entire

'Topsoil' Made Ground, to depths of between 0.10m and 1.0m, with an average thickness of 0.31m. Comprises a soft to firm dark brown sandy slightly gravelly clay with rare rootlets. The gravel component is angular to subrounded fine to coarse of sandstone. The Topsoil and Made ground surface cover is differentiated by the inclusion of rare brick and plastic fragments.

5.1.2.2 Opencast Backfill Made Ground

Opencast Backfill, has been encountered within the former opencast mine area in the north of the site and generally comprises reworked natural materials, with occasional man-made constituents and is a product of the material processing and crushing operations undertaken in opencast mining. The base level and general distribution is shown on Hydrock drawing 23451-HYD-XX-XX-DR-GE-0016 presented in Appendix A.

The Opencast Backfill is generally described as firm brown slightly sandy gravelly clay. Gravel is angular to subrounded fine to medium of sandstone and rare coal. The Opencast Backfill occasionally contains rare small fragments of timber.

The Opencast Backfill is shown terminating at varying depths over the area of site, with the base becoming shallower the further south the location is situated. This is expected to be consistent with the extent of the Opencast mine as shown on the abandonment plans.

Figure 5-1 presents the distribution and depth of the Made Ground overlaid onto the proposed masterplan and includes data from the ground investigation and the mine abandonment plans. The quarry highwall is defined along the northern elevation of the proposed unit with the backfill

increasing in depth towards the north. The maximum depth of Made Ground below the building is indicated to be up to 5m and up to 8m below the northwestern corner of the service yard.

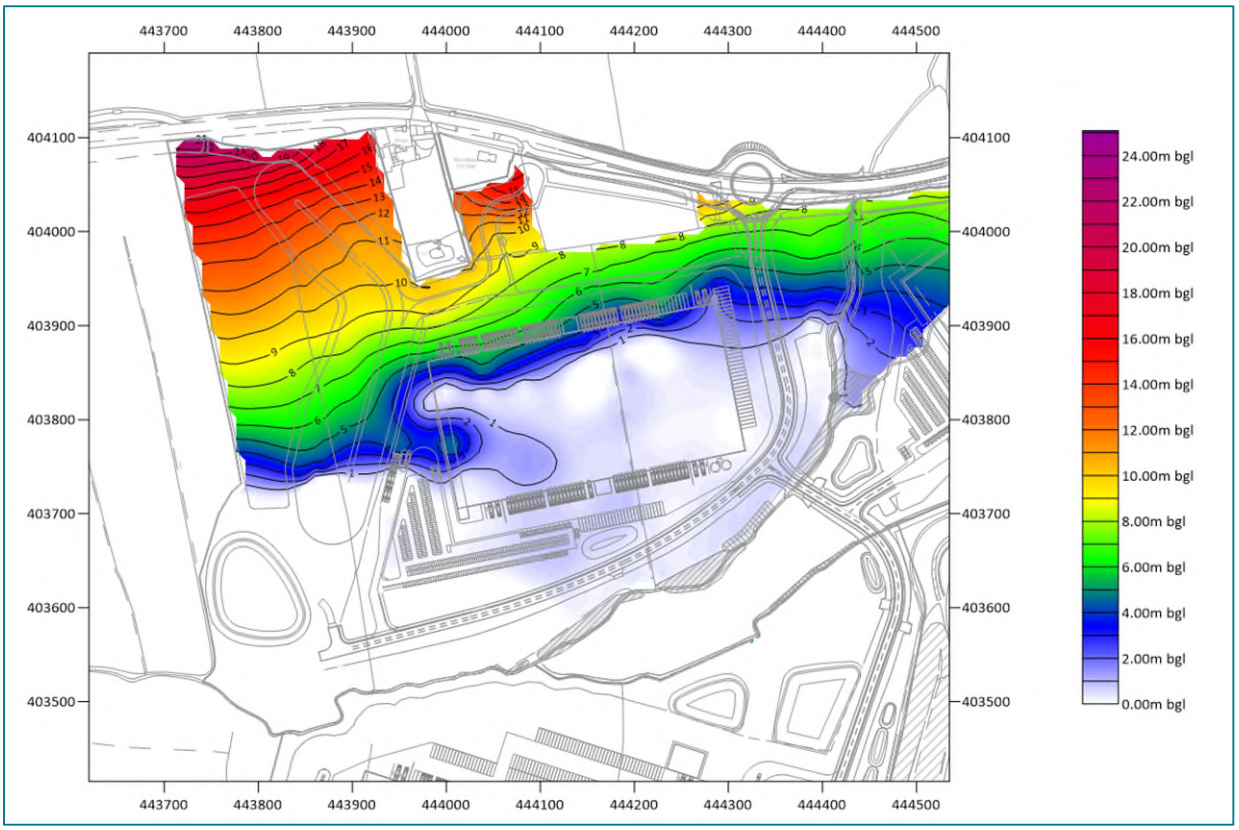


Figure 5-1: Depth and distribution of Made Ground

5.1.3 *Alluvium*

The superficial deposits recorded below the topsoil and overlying the weathered coal measures is considered to be the Alluvium shown on geological mapping and was encountered in the centre and south of the site, in the area not historically mined. Alluvium is recorded between 0.2 and 5.7m thick, with an average of 1.46m, and is shown on Hydrock drawing 23451-HYD-XX-XX-DR-GE-0015 presented in Appendix A.

Alluvium was recorded in the north of the site up to 6m bgl in RO02, however due to the nature of the drilling method, this data point has been excluded from models until it can be verified by further geotechnical investigation.

Alluvium was generally deepest towards the south of the site at the location of Carr Dike, as expected with historic deposition.

The material generally varied between firm to stiff light orangish brown very sandy slightly gravelly clay and orange brown mottled grey slightly clayey sandy Gravel. The gravel proportion was recorded as subangular and subrounded fine to coarse of sandstone and mudstone. Localised pockets of brown mottled orange and grey gravelly clayey sand with fine to coarse gravel of sandstone and mudstone was also recorded on the logs.

5.1.4 *Weathered Pennine Coal Measures*

Weathered Pennine Coal Measures was encountered underlying the Alluvium across the site and is between 0.2m and 1.8m thick, with an average thickness of 1.2m.

This material was generally recovered as greyish brown slightly sandy slightly clayey 'gravel'. The gravel particles were recorded as angular to subangular fine to coarse of mudstone and sandstone.

The weathered Pennine Coal Measures is recorded as occasionally having weathered staining between 0.4 and 1.9m bgl in areas not affected by opencast mining.

5.1.5 *Pennine Coal Measures*

Pennine Coal Measures strata was encountered underlying the weathered Pennine Coal Measures across the site and is recorded to an unproven thickness. The depth to the top of the Pennine Coal Measures based on the exploratory hole records is shown on Hydrock drawing 23451-HYD-XX-XX-DR-GE-0017 presented in Appendix A.

This material generally consisted of light grey Siltstone and Mudstone. A thin coal seam was recorded at 15.0m and there was evidence of workings in RO02 at 16.0m (see Section 6.6)

RO01 located on the southern side of the recorded coal seam outcrop encountered fractured ground between 10.5m and 12.0m bgl. Further investigation will be required to assess whether this relates to unrecorded workings.

It is noted that subordinate coal and thinner seams were noted in a number of other exploratory holes that are not included on the geological maps and these should be investigated further.

5.2 Groundwater

5.2.1 *Groundwater observations and levels*

Groundwater encountered during the investigation is listed in Table 5.2. A groundwater observation represents the depth at which groundwater was first observed and is likely to be deeper than the actual water table level at that location.

Table 5.2: Groundwater occurrence

Stratum	Date	Location	Fieldwork		Comment
			Groundwater observation (m bgl)	Rose to after 20 mins (m bgl)	
Alluvium	26/03/24	TP111	2.1	2.1	Slow inflow
	02/04/24	TP129	2.4	2.4	Slow inflow
	27/03/24	TT122	1.9	1.9	Slow inflow
Opencast Backfill	03/04/24	TP107	2.3	2.3	Slow inflow
	02/04/24	TP110	2.0	1.5	Fast inflow, Slow inflow
	04/04/24	TP124	1.4	1.4	
Pennine Middle Coal Measures	02/04/24	TP114	2.2	2.2	Slow inflow
	03/04/24	TP118	1.9	1.9	Slow Inflow
	27/03/24	TP119	2	2	Slow inflow
	29/03/24	TP121	2.4	2.4	Slow inflow
	02/04/24	TT112	2.6	2.6	Slow inflow
	02/04/24	TT115	2	2	Slow inflow
	28/03/24	TT125	2.3	2.3	Slow inflow

Groundwater levels recorded during post-fieldwork monitoring are summarised in Table 5.3.

Table 5.3: Groundwater level data summary

Stratum	Date range	Location	Post-fieldwork monitoring	
			Depth to groundwater (range) (m bgl)	Groundwater elevation (range) (m OD)
Alluvium	18/04/24 - 07/05/24	CP102	1.83 – 1.95	23.25 – 23.13
Opencast Backfill	18/04/24 - 07/05/24	CP101 CP103	1.70 - 1.87 0.00 - 0.17	22.46 - 22.29 22.71 - 22.54
Pennine Middle Coal Measures	18/04/24 - 07/05/24	RO01 RO02	2.51 - 2.76 1.56 - 1.84	22.08 - 22.33 21.80 - 22.08

5.2.2 Groundwater summary

In general, shallow groundwater was encountered within the Alluvium Deposits towards the base of the stratum and the monitoring indicates there is a shallow groundwater body sitting just above the Pennine Middle Coal Measures. The groundwater flows North to South across the site and appears to be topographically controlled flowing towards Carr Dike.

Shallow unconfined water was encountered in the Opencast Backfill, although this is not expected to be in continuity with the groundwater found in the Alluvium or Pennine Middle Coal Measures Formation.

5.3 Ground gases (carbon dioxide and methane)

Records from the gas monitoring boreholes are presented in Appendix D and summarised in Table 5.4.

Table 5.4: Range of ground gas data

Stratum	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Steady flow rate (l/hr)	Comment
Alluvium	0.0	0.7 - 1.8	5.6 - 8.8	0.1	Four out of the four carbon dioxide readings are below 5%.
Opencast Backfill	0.0	0.1 - 6.2	13.1 - 19.0	0.1	Three out of the four carbon dioxide readings are below 5%.
Pennine Middle Coal Measures	0.0	0.1 - 1.0	16.2 - 20.2	0.1	Four out of the four carbon dioxide readings are below 5%.

5.4 Geotechnical data

5.4.1 Introduction

Laboratory test results are contained in Appendix C with *in situ* test results shown on the relevant exploratory hole log or datasheet in Appendix B. The following sections summarise the main findings and provide interpretation where appropriate.

Weathered Pennine Middle Coal Measures and Pennine Middle Coal Measures have been tested separately and are shown separately where applicable throughout section 5.4.

5.4.2 Plasticity

The volume change potential in accordance with BRE Digest 240 with respect to building near trees have been determined from the results of plasticity index tests on samples of soil. These are summarised in Table 5.5.

Table 5.5: Volume change potential

Stratum	No. of tests	Plasticity Index			Modified Plasticity Index			Plasticity designation	Volume Change Potential
		Min.	Max.	Av.	Min.	Max.	Av.		
Alluvium	9	12	24	20.6	9.7	20.8	18.7	Low to High	Low to Medium
Opencast Backfill	5	14	24	21.6	9.7	20.2	14.7	Low to Medium	Low to Medium
Weathered Pennine Middle Coal Measures*	4	18	31	25.3	16.3	25.6	21.5	Medium to High	Low to Medium

*Out of 4 tests, one Atterberg Limits test indicated high volume change potential (PI = 56). This outlier has been discounted due to weight of evidence.

5.4.3 Particle size distribution

Particle Size Distribution test (PSDs) results are summarised in Table 5.6 and summary descriptions and PSD plots of the material analysed are presented in Appendix C.

Table 5.6: PSD results summary

Stratum	No. of tests	Silt/Clay %	Sand %	Gravel %	General description
Alluvium	7	19 - 95	4 - 48	1 - 44	Sandy slightly gravelly Clay
Opencast Backfill	4	12 - 76	5 - 10	11 - 56	Slightly sandy slightly gravelly Clay
Weathered Pennine Middle Coal Measures	6	16 - 96	3 - 61	1- 50	Slightly sandy slightly clayey Gravel

5.4.4 Soil strength

Table 5.7 summarises information pertaining to the shear strength of the soils according to geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. hand shear vane) and uncorrected Standard Penetration Tests (SPT). Where the SPT is used to infer shear strength by published correlation, this is also tabulated. A SPT N value versus depth profile is summarised in Figure 5-2 and additional plots are presented in Appendix C.

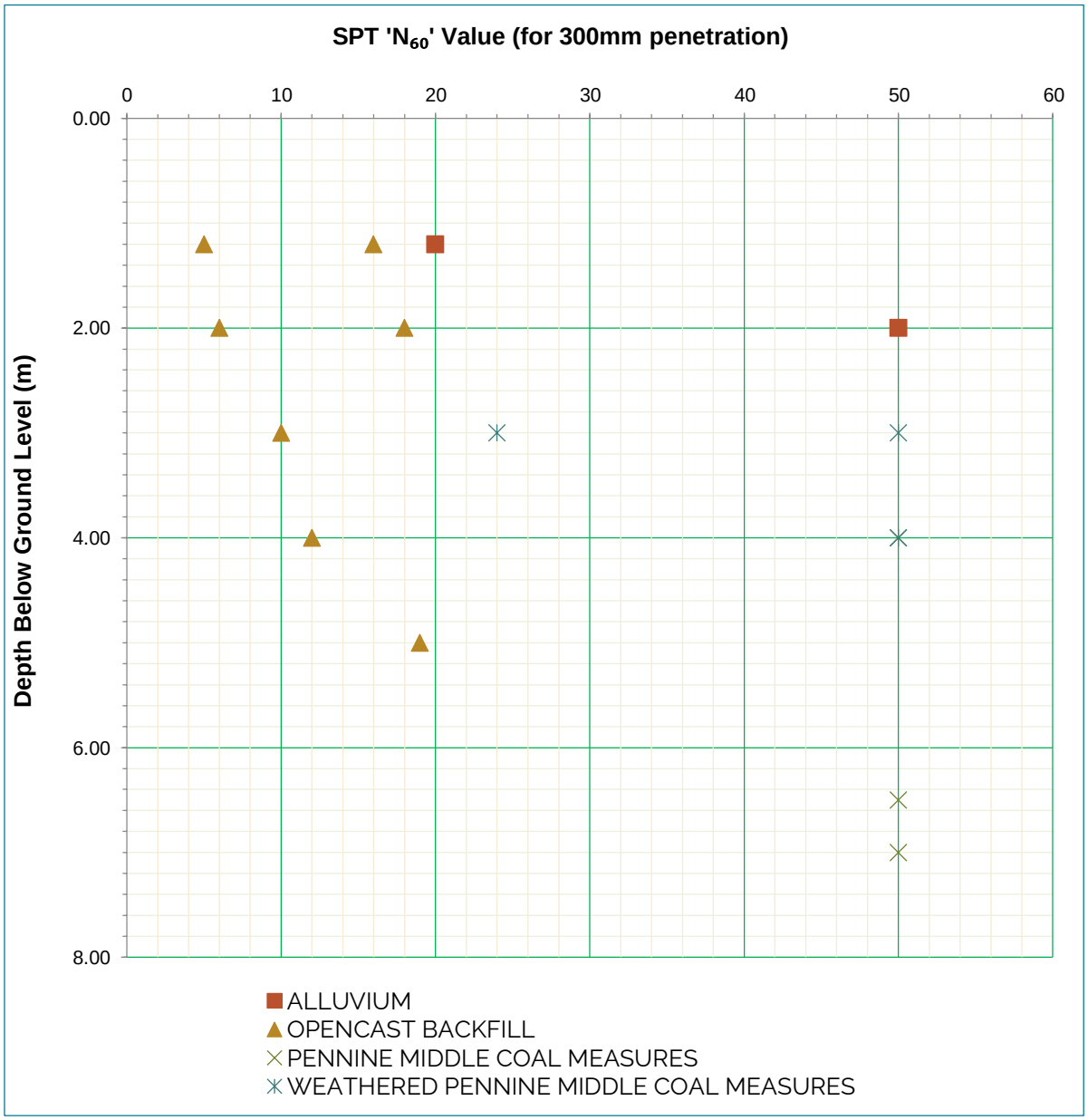
Table 5.7: Soil strength results and derived values

Stratum	No. of tests	SPT (N-value)	c_u (kPa)	c' (kPa)	phi' (°)	Method
Made Ground	14	-	5 - 90	-	-	CPT correlation
Opencast Backfill	7	5 - 19	23 - 86	-	-	SPT – cable percussion.
	6	-	9 - 180	-	-	CPT correlation
Alluvium (Cohesive)	0	-	-	-	-	SPT – cable percussion.
	5	-	27 - 225	-	-	CPT correlation
Alluvium (Granular)	1	20 - 50	90 - 225		35.0	SPT – cable percussion.
	3	-	23 - 36		25 - 27.6	CPT correlation
Weathered Pennine Middle Coal Measures	3	24 - 50	108-225	-	36.9-46.6	SPT – cable percussion.
	14	-	13 - 62	-	-	CPT correlation

Stratum	No. of tests	SPT (N-value)	c_u (kPa)	c' (kPa)	phi' (°)	Method
Pennine Middle Coal Measures	3	50	>225	-	46.6	SPT – cable percussion.
	14	-	12.6 - 62.32	-	-	CPT correlation

*Correlation with Stroud (1975) based on 'average' plasticity

Figure 5-2: SPT N value versus depth summary



As shown by Figure 5-2, the strength profile of the Opencast backfill indicates N values of 5 to 9 (22 - 85kN/m^2), increasing with depth, from 1.2m to 5m bgl in areas where the base of the deep Made Ground was encountered.

Alluvium found in the south of the site is typically higher strength with N values of 20 - 50 (90 - 225kN/m^2), between 1.2m and 2.00m below ground level.

Below 3.00m, the strength increases rapidly with depth, shown in places with shallow bedrock, with the boreholes and CPTs not able to penetrate further than approximately 7.00 - 7.50m bgl.

5.4.5 *Relative density*

Table 5.8 summarises information pertaining to the relative density of the granular soils according to geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. SPT, CPT). A SPT 'N' value versus depth profile is summarised in Figure 5-2. Plots are presented in Appendix C.

Table 5.8: Relative density results and derived values

Stratum	No. of tests	Method	SPT (N-value) (Range)	**Relative density**	Estimated phi' (°)
Alluvium (Granular)	2	SPT – cable percussion (Peck et. al. (1967).	20 - 50	Dense	33 - 41
	3	CPT Correlation	9-41	Loose to dense	29 - 38
Pennine Middle Coal Measures	3	SPT – cable percussion (Peck et. al. (1967).	50	Dense	41
	14	CPT Correlation	43 - 100	Dense	38 - 43

5.4.6 *Compressibility*

Table 5.9 presents a summary of the derived parameters for coefficient of volume compressibility. The data used is indicative of the average for the stratum and may vary over the site due to natural variability of ground conditions over the site.

Table 5.9: Summary of compressibility

Stratum	No. of tests / results	Method	Youngs Modulus (E_v) (m^2/MN)
Alluvium	2	Correlation with SPT*	10 - 25
	8	Derivation from CPTu Data	14.0 – 19.1
Opencast Backfill	7	Correlation with SPT*	3.25 – 11.7
	6	Derivation from CPTu Data	12.7 - 13.9
Pennine Middle Coal Measures	6	Correlation with SPT*	11.76 – 24.5
	14	Derivation from CPTu Data	49.7 – 178.8

* An f_2 value of 0.5 has been used based on a plasticity index of 19 for Alluvium Soils, an f_2 value of 0.65 has been used based on a plasticity index of 15 for Opencast Backfill, an f_2 value of 0.**5** has been used based on a plasticity index of 22 **f**or Pennine Middle Coal Measures (Tomlinson (2001), after Stroud).

5.4.7 Compaction and moisture content

Table 5.10 presents a summary of the moisture content tests and compaction studies undertaken at the site.

Table 5.10: Compaction study results

Stratum	No. tests	Method	Natural moisture content (%) (range)	Optimum moisture content (%) (range)	Particle density (Mg/m^3) (range)	Maximum dry density (Mg/m^3) (range)
Alluvium	1	2.5kg Rammer	17 - 29	24	-	1.51 - 1.58
	1	Gas Jar	-	-	2.81	-
Opencast Backfill	1	2.5kg Rammer	7.4 - 18	14	-	1.81 - 1.89
	1	Gas Jar	-	-	2.76	-
Weathered Pennine Middle Coal Measures	1	2.5kg Rammer	41.- 49	45	-	0.9 - 0.93
	1	Gas Jar	-	-	1.62	-

5.4.8 Subgrade stiffness

The subgrade stiffness (CBR and Subgrade Surface Modulus) results are summarised in Table 5.11.

Table 5.11: CBR results and derived values

Stratum	No. tests	Method	Subgrade Surface Modulus **(E**r) (**MPa** (Range)	CBR (%) (Range)
Alluvium	1	Laboratory remoulded sample at Optimum Moisture Content (OMC)	46	4.5
Opencast Backfill	1	Laboratory remoulded sample at Optimum Moisture Content (OMC)	43	4.0
Weathered Pennine Middle Coal Measures	2	Laboratory remoulded sample at Optimum Moisture Content (OMC)	32 - 45	2.5 - 4.3

Where using the method from DMRB CD225, 'Er' has been calculated from the Equivalent CBR determined from the laboratory tests.

5.4.9 *Sulfate content*

In accordance with BRE (Special Digest 1), the Design Sulfate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 5.12. The assessment summary sheets are presented in Appendix C.

Table 5.12: Aggressive chemical environment concrete classification

Stratum	No. tests	DS	ACEC
Opencast Backfill	6	DS-1	AC-4z
Alluvium	6	DS-1	AC-2z
Weathered Pennine Middle Coal Measures	4	DS-2	AC-3z

6. Geotechnical Assessment

6.1 Geotechnical categorization of the proposed development

Eurocode 7, Section 2 advocates the use of geotechnical categorization of the proposed structures to establish the design requirements.

The proposed development is shown as part of the Barnsley Borough Council 'Goldthorpe Masterplan framework'. Zone 1 is part of the wider development masterplan. Zone 1 currently comprises a single warehouse unit covering approximately 49,564m^2 with associated external service yards, access roads and infrastructure.

The layout includes a screening mound up to 12m high proposed on the west of the site, with two attenuation ponds located in the south of the site, and two flood compensation areas in the west and north of the site. A cut and fill exercise is required to create the development platforms across the proposed site area, with the northern and southern areas of the site generally in fill and the central area of the site within cut. The access road for the development is also proposed to be constructed on an embankment.

Based on the above, for the purposes of this investigation, the proposed structures have been classed as Geotechnical Category 2.

For Category 2 structures site specific geotechnical design is required and this should be presented in an appropriate Geotechnical Design Report (GDR).

Following the ground investigation and as part of the assessment provided in the following section, the preliminary geotechnical hazard identification undertaken in Section 3.3 has been updated.

Hydrock drawing 23451-HYD-XX-XX-DR-GE-1018 in Appendix A shows the hazards and risks associated with the development based on the desk study information and the results of the preliminary ground investigation.

Assessment has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The preliminary Geotechnical Risk Register following investigation is provided in Appendix G (Table J.3) and will need to be updated during future design works.

6.2 Characteristic design values

In accordance with BS EN ISO 1997-1 (EC 7), Hydrock consider the proposed structures would be classified as Category 2 structures. As part of the separate geotechnical design, the designer should determine an appropriate ground model and geotechnical design parameters.

Table 6.1 provides a number of characteristic geotechnical values to assist the outline design. These are based on laboratory testing, *in situ* testing and by professional judgement using published data together with knowledge and experience of the ground conditions. It should be noted that these characteristic values are currently based on very limited data. Therefore, care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing are required for certain purposes. The reader should refer to the original test results summarised in Section 5 and provided in Appendix B and Appendix C.

Table 6.1: Characteristic geotechnical values

Parameter Stratum	Unit Weight kN/m^3	Effective angle of internal friction (c'=0) °	Undrained shear strength kN/m^2	Compressibility Modulus MN/m^2	Subgrade Surface Modulus MN/m^2
	γ	ϕ'	c_u	E	k
Alluvium (granular)	18.0	33	-	10.0	4.0
Opencast Backfill (cohesive)	18.0	24	25	3.0	<2.5
Opencast Backfill (granular)	18.0	28	-	6.0	4.0
Weathered Pennine Middle Coal Measures (cohesive)	20.5	24	80	15.0	3.5
Pennine Middle Coal Measures	21.0	-	>200	50.0	-

6.3 Groundwork

6.3.1 Site preparation

The site is previously undeveloped and no buried man-made obstructions were encountered by this investigation. However, difficult excavation is anticipated where rock is present at shallow depth. This is likely to be particularly prevalent in the south of the site.

Hedges and trees should be removed from below the development platform including the root ball and any desiccated soils.

Topsoil and low strength subsoil should be removed from beneath all building and hardstanding areas.

6.3.2 Groundworks

Excavation of shallow soils should be readily undertaken by conventional plant and equipment. However, excavation through any intact rock quality strata may require heavy-duty excavation plant, ripping plant, or the use of specialist breaking equipment.

Significant collapse of trial pit faces was noted during trial pit excavation. This was noted particularly in the Opencast Backfill Made Ground and where groundwater ingress occurred in conjunction with granular soils.

Random and sudden falls should therefore be expected from the faces of near vertically sided excavations put down at the site.

Temporary trench support, or battering of excavation sides, is recommended for all excavations that are to be left open for any length of time and will definitely be required where entry is required.

Particular attention should be paid to excavation at, or close to, site boundaries, adjoining existing roads where collapse of excavation faces could have a disproportionate effect.

A risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations (2015); Construction Information Sheet 47: Inspections and Reports (2005) and HSG47: Avoiding Danger from Underground Services.

To ensure no loads are imposed on the sides of the excavation, spoil should not be placed immediately adjacent to the excavation. Spoil should be placed a suitable distance from the side of the excavation (as assessed by a competent person).

Based on site observations, the rate of water ingress to the proposed excavations is likely to be significant through the Alluvium and Opencast Backfill Made Ground or at depths below 1.5m. In these circumstances, groundwater control by sump pumping may not be sufficient to deal with anticipated flows and alternative methods of dewatering, such as well points, or use of impermeable cut-offs should be allowed for.

However, it should be recognised that groundwater levels may vary from those at the time of the investigation, for example in response to seasonal fluctuations and the timing of construction may dictate the extent of groundwater control required.

Any water pumped from excavations may need to be passed via settlement tanks (to reduce suspended solids) before being discharged to the sewer. Discharge consents may also be required.

6.3.3 *Earthworks/reuse of site-won materials*

It is understood that approximately 2.5m of cut and fill is required across the development platform at the location of the proposed warehouse unit. Part of the access road is also proposed to be constructed on an embankment between 2.0 – 3.0m in height.

As part of the works large landscape screening mounds are required in the west and north ranging in height between 6-12m.

The classification of earthworks materials depends on both the proposed end use and whether the material will meet the performance requirements of that end use. The investigation including an initial assessment of the materials suitability for use in the earthworks. It should be noted that due to ecological constraints the western borrow pit (a proposed source of a significant amount of fill) could not be investigated.

An initial assessment of the classification data is summarised in Table 6.2.

Table 6.2: Preliminary earthworks assessment

Stratum	Proposed end use	Preliminary classification (SHW Series 600)	Comment	Suitability for use
Made Ground (Opencast Backfill)	General fill / Selected Fill and Landscape Fill	Class 2B/2C	» NMC 13.4 – 27.8% » Generally dry of plastic limit » NMC 1% above OMC	Potentially suitable in as dug condition. Allow some processing to remove deleterious

Stratum	Proposed end use	Preliminary classification (SHW Series 600)	Comment	Suitability for use
			» 3.9% CBR at 4% above OMC	material/significant coal. Likely suitable for treatment with binders subject to further testing
Topsoil (surface strip)	Landscape Fill	Class 4	Limited earthworks data to date	Topsoil proposed for re-use in landscape mounds.
Alluvium (cohesive and granular)	General fill / Selected Fill and Landscape Fill	Class 2A and 2C	» NMC 16.2 – 27.8% » Generally at the plastic limit » NMC at OMC » 4.4% CBR at 4% above OMC	Potentially suitable in as dug condition. No significant organic material recorded Likely suitable for treatment with binders subject to further testing
Weathered Pennine Coal Measures	General fill / Selected Fill and Landscape Fill	Class 2A and 2C	» NMC 20.2 – 57.3% (high mc for material recovered as black 'gravel'. » Generally dry of plastic limit » More data needed for compaction studies » 2.8% CBR at 20% mc	Potentially suitable in as dug condition. Larger particles may need crushing and processing. Use of hydraulic binders on coal measures treated with caution due to potential pyrite content

The earthworks will need to be undertaken under a Materials Management Plan (see Section 8.3).

Before the use of hydraulic binders is approved, comprehensive testing will need to be completed by a specialist Contractor to satisfy both themselves and the Engineer of the suitability of the soils for treatment and to confirm that the requisite end-performance of the material is achievable. In all instances where improvement by the inclusion of binders is considered, a mix design is required and as part of this design, samples should be checked for swelling, even where very low sulfate values are recorded.

Where it is proposed to reuse site won materials as an engineered fill it will be necessary to develop an appropriate Site Specific Earthworks Design and Specification. The basis for the Specification should be BS 6031:2009 and the latest version of the SHW, Series 600 Earthworks.

6.3.4 Consolidation settlement from land raising

It is understood that land raising is proposed as follows:

» Up to around 2.5m below the northeast end of the building footprint;

- Up to 2.5m below the access road
- Up to approximately 11m at the location of the screening mound.

The land raising will induce consolidation settlement within the underlying alluvium, Made Ground and weathered coal measures. Based on the preliminary CPT analysis the predicted magnitude of total settlement is as follows:

- Building footprint (not including structural loads) – 10 to 15mm
- Access road – 10 to 15mm
- Landscape Bund (4.5m in height) – 25mm
- Landscape Bund (11m in height) – 60 to 90mm

Based on the granular horizons within the superficial deposits recorded in the exploratory holes, up to half of the consolidation settlement could occur during the construction period. Based on the above, specific ground improvement to mitigate settlement due to land raising is unlikely to be required.

It should be noted that the above is based on the results of preliminary investigation only, further investigation, particularly below the proposed landscape mound, is required. The settlement values above do not include the contribution from structural loads, self-weight or long-term creep/secondary compression.

A highwall does exist between the natural soils and the area of backfilled opencast workings along the northern elevation of the proposed building. The presence of the highwall is likely to result in significant differential settlement, which will need to be accounted for in the structure and infrastructure design (see Section 6.7 and 6.8).

A separate geotechnical design will be required to fully assess the impact of settlement and to design any ground improvement works. Site monitoring during the earthwork construction may be required to confirm the required settlements has been achieved.

6.4 Slope stability

There are no significant existing slopes on the site. Based on a review of the Zone 1 proposed levels a number of embankments and cuttings are proposed associated with the attenuation and flood compensation areas and as part of the proposed road embankment. It is understood that all slopes are currently designed to face angles of less than 1:3 (vertical to horizontal). In addition, a large landscape mound around 10m in height is proposed in the west of the Zone 1 site. Based on the latest levels proposals slope gradients of 1:4 to 1:6 have been designed for the western face.

Directly bordering the south of the site is Carr Brook, which is banked on both sides, while no slope stability investigation has been conducted in this area, the general stability of the slopes and the distance the proposed development will be from the river suggests that there will be no significant adverse effect on these slopes.

6.5 Retaining walls

At present there is no requirement for significant retaining walls at the site.

Where retaining walls are included as part of future design development, additional specific ground investigation may be required and this will be dependent on the wall type and designer's requirements.

6.6 Mineworkings

6.6.1 Abandoned mineworkings

The Coal Mining Risk Assessment highlighted the risk of possible unrecorded underground workings at locations north of the coal subcrop and in areas where no opencast mining is recorded to have taken place. It was an objective of this investigation to provide a preliminary assessment of the risk of potential unrecorded workings at the site.

Potential abandoned mineworkings have been identified to underlie the site at shallow depth at between 15 to 16.7m bgl in RO02. It is interpreted that these workings are in the Shafton coal seam. RO01 was drilled to the south of the subcrop of the Shafton coal seam in an area believed to be unaffected by workable coal seams. However, at 10.50mbgl fractured ground and a loss of flush was recorded by the drillers. This is potentially indicative of worked ground despite not aligning with the current ground model. This area should be included in future ground investigation to assess the risk of mineworkings.

Where underground mineworkings are present at shallow depth below structures and infrastructure with insufficient rock cover, it will be necessary to stabilise the affected ground to prevent the upward migration of voids. The local premise for suitable rock cover typically being ten times the thickness of the worked seam, although this is dependent on the type and condition of the rock cover. In this case, no rock cover is present at the location of RO02. Further information can be obtained from CIRIA Report C758D 'Abandoned Mine Workings Manual '(Parry and Chiverrell, 2019).

Once the proposed development layout has been finalised, the footprints of the new buildings and potentially external areas and roads should be treated by bulk infilling the underlying mineworkings with grout (drilling and grouting). The design of the treatment can only be undertaken following completion of additional ground investigation. Hydrock recommend that this is undertaken in advance of the treatment rather than concurrently.

Grout would be injected under pressure via an array of rotary boreholes (typically on a wider grid in the first instance, reducing to a tighter grid where grout takes are large).

A specification for stabilisation of mineworkings should be written, which should:

- demonstrate the site areas where shallow coal seams are present, where they are worked and where treatment is required;
- demonstrate the areas where there are sufficient intact strata exist above workings such that the risk of future instability occurring as a result of the workings can be reasonably discounted;
- detail how the mine stabilisation Contractor would delineate the extent of workings, which pose a risk to the development;
- detail how the mine stabilisation Contractor would stabilise the abandoned workings by bulk infilling;
- detail how the mine stabilisation Contractor would stabilise mineshafts by infilling or by consolidation of pre-existing infill material;
- detail the design and construction requirements of structural capping to mineshafts; and
- detail the verification requirements, which will, as a minimum, include hole locations, seams targeted, grout performance, grout takes etc.

It is recommended that Hydrock reviews, updates and amends the mine stabilisation works as they progress, and as the ground conditions require. It is cautioned that the scope of the investigation undertaken to date will likely not have identified all workings within the site boundary and additional investigation will be required prior to and potentially during the mine stabilisation works to verify the assumptions made in the design of the grouting scheme.

A licence will be required from the Coal Authority to undertake the drilling and grouting works. The Coal Authority may have requirements in respect of control of emissions of gas and minewater as a condition of issue of a licence. The Coal Authority terms and conditions may pose restrictions on the choice of drilling flushing medium in response to recent public safety issues.

The Shafton Coal seam is known to be susceptible to spontaneous combustion in certain circumstances. Gas monitoring undertaken during the rotary open hole drilling did not detect any carbon monoxide. However, this cannot be taken as conclusive proof that there is no future risk. Due to recorded shafts underlying neighbouring properties it is anticipated that monitoring of gases in neighbouring properties may require consideration as part of the drill and grout scheme.

It should be noted that the mine stabilisation works may create nuisance to local residents including noise, traffic and dust, and this will need to be considered by the Contractor.

6.6.2 *Mine shafts or entries*

There are known to be two recorded mine shafts lying within the site boundary and one shaft outside the boundary and considered to be outside the influencing distance of the site. The two on site shafts are referenced:

- 444403-007
- 444403-008

There is no specific record of any treatment having been undertaken on either of the shafts. However, the Coal Authority viewer indicates that they are treated.

It is noted that the recorded shaft locations 44404-007 and 444404-008 are shown respectively underlaying the proposed road embankment and the northern boundary of the development plot. It is Hydrock's belief that the mineshafts on site predate later phases of mining and have therefore been removed by opencast activities and as such no longer pose a risk to the proposed development. This is supported by the reported shaft depths of between 7.3m and 5.2, which coincide with the anticipated base of opencast workings. This indicates that open or unstable shafts are unlikely to extend below the base of the opencast workings. On this basis, further works in relation to the mine shafts is unlikely to be required.

As part of the discharge of conditions a verification report will be required to be submitted to the local planning authority following treatment of mine related hazards. The verification report should also be submitted to the Coal Authority as part of the permit closure and to the mining records team so that the data base can be updated.

6.6.3 *Surface mining (opencast workings)*

The northern and western sections of the site have been subject to past opencast mining. Based on abandonment records and the results of the preliminary site investigation the maximum depth of fill below the development platform is approximately 8m. This area of deep Made Ground forms a highwall located on the northern side of the proposed building (see Figure 5-1).

The presence of this deep Made Ground and associated highwall poses a significant risk to the development.

6.7 Foundation recommendations

In accordance with BS EN 1997-1+A1 (2013) (EC7), the proposed structures, earthworks and infrastructure works are considered to be Geotechnical Category 2. As such, foundation recommendations are presented to aid development proposals only and separate geotechnical design will be required.

6.7.1 Spread foundations

Pad foundations are considered suitable to support the columns for the proposed warehouse unit. However, this is subject to ground improvement within the deep Made Ground in the north and appropriately designed earthworks. The pad foundations should be founded at least 300mm into the re-engineered Structural Fill and / or firm (or better) clay of the superficial deposits.

On the basis that an appropriate Earthworks Specification is followed, including all comments relating to over-excavation, proof-rolling and removal of soft spots, then a permissible net bearing pressure (for a pad foundation of up to 3m by 3m) of 150kN/m^2 is recommended.

Foundations should not be supported by unimproved Made Ground.

If enlarging the foundations is considered (for example because loads are such that the quoted permissible bearing pressure is inadequate) this could lead to increased settlements and the above recommendations should be reviewed.

Based on the (low to medium volume change potential of the clay soils, the minimum founding depth for pad foundations is 0.9m below final ground level and 300mm into a suitable bearing stratum, whichever is deeper.

Potentially desiccated soils exist through the centre of the site associated with the hedge and trees defining the field boundary. All foundations should be designed to found beyond the influence of desiccation and include suitable heave precautions. Given that significant earthworks are proposed and mitigation is required for ground bearing floor slabs, it is recommended that the affected soils are over-excavated and removed as part of the cut and fill works.

Where trees are to be removed, the roots should be grubbed out and foundations extended to below the zone of disturbance created by this activity and to below any remaining root hairs.

It is recommended that a tree survey is undertaken by an arboriculturist in accordance with BS 5837:2012 to identify the type, and height of existing trees on the site and including any off-site trees, that could have an effect on foundation design.

Foundation formations should be inspected by a geotechnical engineer or other suitably competent person to ensure the founding conditions are suitable and as indicated in this report. Any formation materials deemed as unsuitable should be excavated and replaced with lean mix concrete or deepened to suitable strata.

Foundation excavations should be protected from rain and snow and inflow of surface water, frost and freezing conditions. They should also be protected from drying out in hot dry weather.

Any water that collects at the base of the foundation excavations should be removed by pumping from a sump in the base.

Where ground improvement (see Section 6.7.2) is not considered feasible and/or structural loads are such that shallow foundations are not suitable then piled foundations will be required.

6.7.2 Ground improvement

As identified above, the presence of deep Made Ground associated with the backfilled opencast workings pose a significant risk to shallow foundations (and ground bearing floor slabs). As an alternative to a fully piled solution, ground improvement should be considered in order to mitigate the risk of settlement.

The following sections describe potential ground improvement options in more detail with a summary provided in Section 6.13.

6.7.2.1 *Vibro stone columns (VSC)*

Treatment by vibro-replacement stone columns (VSC) at suitable spacing could lead to significant improvement of the soils by the creation of stone columns, and also by the densification of the existing essentially granular soil. However, the use of VSC is not recommended on this site for the following reasons:

- The design may not be able to mitigate the effects of long term creep or inundation settlement within the Made Ground; and
- Only part of the structure requires ground improvement and therefore obtaining a full warranty for the ground improvement may not be possible unless the entire structure is treated.

6.7.2.2 *Rigid Inclusions*

Rigid Inclusions (RI) comprise installation of vertical concrete columns using a displacement auger, which act in combination with the soil to reduce settlement. and support foundations and floor slabs. Column loads from foundations are normally transferred directly to the treated ground with floor slab loads transferred to the treated ground via a load transfer platform.

Rigid Inclusions can be used to improve Made Ground soils including landfill and deep fill and normally extend to the full depth.

As with VSC the design of RI may be less cost effective due to the presence of the highwall and the potential requirement to treat a significant proportion of the slab and structure outside of the highwall. Furthermore, it may not be possible to only partially treat the ground below the building footprint.

Where this is shown to be feasible, it is recommended that large scale verification testing including zone load testing is undertaken to validate the design.

6.7.2.3 *Preload and Surcharge*

The stiffness and load carry capability of the deep Made Ground in the northern section of the site could be improved by preloading with a temporary surcharge of fill. This fill could be won from site following excavation for the flood compensation areas, the attenuation ponds and removal of the topsoil.

The minimum height of the surcharge is a function of the required depth of improvement and is determined through the assessment of the variation in vertical effective stress at various stages:

- the maximum effective stress that existed in the past. For recent fill this is equivalent to the current effective stress;
- the current effective stress prior to surcharging;
- the effective stress with the structural and permanent loads in place; and
- the effective stress with the surcharge load in place.

BRE FB75 presents two effective stress ratios for outline design used to assess the depth of improvement and check that the effective stress from the surcharge is sufficient to treat the ground prior to further detailed analysis. On this basis, for a pad foundation exerting a pressure of 150kN/m^2 the height of surcharge would need to be in the order of 9m to satisfy both criteria. A reduced height of surcharge of between 3m and 5m would be required to treat the ground for the floor slab.

Based on the cohesive nature of the Made Ground to be improved it is likely that the installation of vertical drains will be required to reduce the consolidation period. Based on a relatively close spacing of between 1.0-1.5m the improvement period can typically be reduced to between two to three months but maybe quicker.

In the same way as the other foundation solutions and ground improvement methods their appropriateness will be based on the levels of permissible total and differential settlement. Given that the thick fill will be susceptible to ongoing secondary compression and self-weight settlement, total settlements may be locally high even after ground improvement.

6.7.2.4 *Dynamic Compaction (DC)*

Dynamic Compaction and other proprietary compactive techniques such as High Energy Impact Compaction (HEIC) and Rolling Dynamic Compaction (RDC) are not considered suitable due to the cohesive nature of the fill and the likely serviceability requirements for the structures.

6.7.2.5 *Over-excavation and Replacement*

Based on the investigation to date, the depth of Made Ground below the building footprint is anticipated to be in the order of 5m below current ground level. As part of the wider earthworks, it may be possible to undertake further over-excavation of the Made Ground and then re-engineer the material to a suitable specification. This could be designed to mitigate the risk to both foundations and the floor slab and remove the steep highwall currently thought to cross the building footprint.

This would require further investigation to delineate the extent of excavation and assess the suitability of the material for backfill.

Based on observations during the ground investigation groundwater management is likely to be required for excavations below 2m.

6.7.3 *Foundation works risk assessment*

As there is a low risk to Controlled Waters, Hydrock believes that a foundation works risk assessment will not be required where penetrative foundations or ground improvement is proposed as this will not result in a significant increase in risk of pollution to Controlled Waters.

6.7.4 *Working platform*

For piling or the installation of RIs, a working platform will be required prior to the arrival on site of tracked plant. This should be designed and installed in accordance with BR470 (BRE 2004) based on data on the RI or piling plant in accordance with an FPS certificate for the rig loadings.

6.8 Ground floor slabs

For a large ground bearing floor slab to be viable an assessment of the potential total and differential settlement is required to be checked against the serviceability requirements. The stiffness model based on the CPTu data is appropriate for estimating the potential settlement below proposed ground bearing floor slabs. Review of the data indicates a total settlement of approximately 15-20mm for a floor slab exerting a uniformly distributed load of 50kN/m^2. It should be noted that on-going self-weight settlement within the engineered fill and consolidation of the existing ground should be taken into consideration.

Based on the CPT and borehole investigation completed to date, it is considered that ground bearing floor slabs are suitable for the site where natural soils and engineered fill are present.

However, the presence of the deep Made Ground below the northern edge of the slab associated with the backfilled opencast workings presents an unacceptable risk to the slab for the following reasons:

- The Made Ground was likely placed without systematic compaction or control measures and therefore will be susceptible to long term secondary settlement and inundation settlement/collapse compression;

- The Made Ground comprises localised zones of low strength and low density material, which will be subject to excessive total settlement when loaded;
- The presence of a steep highwall will likely result in unacceptable differential settlement.

It should be noted that a significant proportion of the area of the backfilled opencast could not be probed at the time of investigation and as such the location and geometry of the highwall and any steps and benches has not been determined. Therefore, the magnitude of potential maximum differential settlement across the floor slab cannot currently be determined until further investigation is undertaken.

In summary, a ground bearing floor slab could be adopted for the site but will be subject to the following:

- Additional ground investigation to delineate the extent and geometry of the backfilled opencast with particular attention to the highwalls;
- The serviceability requirements of the floor slab;
- Geotechnical design and assessment;
- Ground improvement that will likely be required to mitigate the effects of total and differential settlement;
- Removal of shallow localised Made Ground and soft spots from across the remainder of the site where a ground bearing floor slab is proposed; and
- Removal of desiccated soils associated with the field boundary hedgerows and trees.

Where ground improvement of the underlying soils is required to support the floor slab appropriate techniques are described in the sections above.

All forms of ground improvement should be designed to ensure total and differential settlement including secondary compression is reduced to tolerable limits over the design life of the structure.

Following suitable ground improvement, a modulus of sub-grade reaction (k_{762}) of 32MN/m^3 can be used for preliminary slab design. This value could be increased during the geotechnical design by the inclusion of an appropriate sub-grade improvement capping layer.

Prior to the placement of the founding materials and the construction of the ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a competent person to ensure the ground conditions at time of construction are consistent with the Specification and the design parameters derived from this ground investigation. In addition to verification testing as part of the ground improvement, testing should be undertaken in accordance with The Concrete Society Technical Report 34 (The Concrete Society 2013) to measure the subgrade stiffness. It is recommended that the verification of the sub-formation and formation include, as a minimum, the measurement of modulus of sub-grade reaction (k) determined by static plate load testing.

6.9 Long Term Settlement

Given the thickness of material backfilling the former opencast mine, the contribution to the settlement over the design life from secondary compression has the potential to be significant. Secondary compression occurs on completion of primary consolidation under conditions of constant effective stress once all excess pore pressure has dissipated. It has been found that there is a linear relationship between settlement and the logarithm of time from the onset of loading. This settlement gradient is referred to as the coefficient of secondary compression (C_α).

Typical published values of the coefficient of secondary compression for stiff clay fill can range between 0.1 – 0.5% of the fill thickness per log cycle (BRE FB75). Therefore, assuming a depth of fill of 8m and a design life of 30 years settlements from secondary compression could be in the order of 40-60mm based on a conservative estimate of C_α.

Further to this, the design of any ground improvement, foundations and structural floor slabs should take into consideration the residual settlement over the design life from secondary compression within the areas of deep backfill.

6.10 Roads and pavements

Based on the test results and subject to *in situ* testing during construction, it is considered likely an equilibrium CBR of 4.0% will be achievable over the majority of the site. However, without ground improvement a CBR of >2.5% should be used for design in the area of the former opencast quarry (north of the site).

Based on the proposed earthworks the access road will be in both areas of cut and fill. The design of the earthworks should take into account the minimum design subgrade stiffness and this should form a performance requirement. In areas of the cut there is the potential to intercept groundwater and in such instances the subgrade stiffness will be much reduced.

On the basis of the above specific subgrade improvement will be required in the following instances:

- In areas of deep Made Ground in the north of the site. Over-excavation and replacement of the surface soils could be an effective treatment method; and
- In areas of cut where groundwater maybe intercepted. Specific subgrade drainage could be considered to ensure a suitable formation to construct the pavement foundation.

In general, proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.

Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with a site-specific specification and DMRB CD225 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

In addition, on account of the significant depth of Made Ground in the north of the site, it is it is considered that ground improvement will be required even if suitable CBR values exist at the surface or can be engineered by a capping layer and early consultation is recommended.

6.11 Drainage

Soakaways are considered unsuitable for the site based on the low permeability soils present, generally high water table and the potential for inundation settlement within the former backfilled opencast in the north of the site. It should be noted that special consideration should be given to preventing infiltration of surface waters into the backfill of the former opencast in order to reduce the risk of inundation and collapse settlement where soils are not fully remediated.

Given the likely high volume of surface runoff there is likely to be a requirement for on site attenuation.

6.12 Buried concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005) and the information presented in Section 5.4.9 (Table 5.12):

- The Made Ground-Opencast Backfill can be classified as Design Sulfate Class DS-1 and ACEC Class AC-4z.
- The Alluvium can be classified as Design Sulfate Class DS-1 and ACEC Class AC-2z.
- The deeper soils of the Pennine Middle Coal Measures) can be classified as Design Sulfate Class DS-2 and ACEC Class AC-2z for strip / trench fill / pad foundations.

This equates to a Design Chemical Class[4] of:

- DC-1 for the shallow soils (Made Ground-Opencast Backfill and Alluvium); and
- DC-2 for the deeper soils (Pennine Middle Coal Measures).

The designer should check and confirm the classification of concrete using the information presented in Appendix B and Appendix C during the design.

Note it is recommended that the design concrete class is increased where deep foundations are proposed to intercept the Pennine Middle Coal Measures. Additional testing will be required in such instances.

6.13 Geotechnical Options Assessment

Further to the geotechnical assessment undertaken in the preceding sections Table 6-3 summarises the recommended options for the site and lists some of the main advantages and disadvantages.

Table 6-3: Development Options Summary

Option Reference	Strategy	Comments	Design Requirements
Option 1	Over-excavation and replacement of the Made Ground on the north side of the development area.	Moderate cost and programme implications and low risk. Advantages: relatively simple and eliminates risk. Disadvantages: high quality and high performance of engineered fill required. Full improvement to external areas not possible. Groundwater management likely to be required for excavations below 2m.	Full over-excavation of Made Ground below the building footprint and partial over-excavation below external areas subject to specific earthworks design.
Option 2	Piled columns to strata of consistent strength. Piled floor slab.	Highest cost and lowest risk. Advantages: removes work from enabling phase. Lowest geotechnical risk. Disadvantages: Cost likely to make this option unfeasible. Consideration of differential settlement between	Piles subject to separate specialist geotechnical design. Earthworks can be designed as lower performance general fill.

[4] The calculated ACEC class can be used in accordance with BS 8500-1+A2 (2019), Table A.9 to select the Designated Concrete (DC) class for an intended working life of 50 years. However, the designer is referred to BS 8500-1+A2 (2019), for full details and notes to Table A.9, including any Additional Protective Measures (APMs).

Option Reference	Strategy	Comments	Design Requirements
		thresholds and connecting services required.	
Option 3	Combination of RI ground improvement in deep fill with shallow pads and ground bearing floor slab in engineered fill or natural soils.	Moderate cost and pushes programme implications to construction phase. Advantages: reduce requirement for additional earthworks and excavations Disadvantages: split design responsibility	Detailed settlement analysis and SLS check to assess differential settlement between columns. Detailed specialist design of ground improvement. Detailed design of engineered fill to support pads and slab.
Option 4	Preload and surcharge to allow support of shallow pads and ground bearing floor slab.	Potentially lowest cost but highest geotechnical and programme risk. Advantages: No ground improvement at construction phase. No/reduced over-excavation. Can cover external areas as well as building footprint. Disadvantages: Serviceability limits may still not be met due to long term secondary compression within backfill. Significant amount of fill required. Additional vertical drainage may be required. Significant programme implications including on-going monitoring.	Further analysis required to assess feasibility. Detailed design of ground improvement based on actual loadings and foundation layouts.
Option 5	Relocate settlement sensitive structures.	Differential settlement is the most significant geotechnical risk as the proposed structure currently spans the natural soils and deep opencast backfill. Advantages: significant reduction in ground improvement requirement. Disadvantages: Potentially reduced GIA/floor area. Subgrade improvement to externals still required	Detailed design of engineered fill to support pads and slab.

Table 6-3 is not a detailed options study and every advantage or disadvantage may not have been included. For each option further ground investigation, assessment and design is required.

7. Geo-environmental assessment

7.1 Updated conceptual model

7.1.1 Updated ground model

The initial CSM developed from the desk study and field reconnaissance survey Section 3) has been updated using the findings of the ground investigation and is presented in Section 5). The updated CSM is the basis for the geo-environmental assessment presented in this section.

7.1.2 Updated exposure model

Following the ground investigation, the plausible contaminant sources, receptors and pathways identified in the preliminary geo-environmental exposure model Section 3) have been updated or confirmed as follows.

7.1.2.1 Sources

The historical landfill (household waste) has been removed from an on site source to a potential off site source, this is since the sites northern boundary has changed which no longer includes the landfill.

7.1.2.2 Receptors

The following receptors have been removed from the updated CSM:

- Dearne Valley Wetlands SSSI – this receptor is c. 400m south west of Zone 1, and therefore due to proximity from site there is not considered to be a viable pathway, as such no linkage exists.
- Aquatic life – this is a secondary receptor to the primary receptor Carr Dike, and the risk to Carr Dike will need to be assessed in the first instance to understand the chemical characteristics of the water body.

7.1.2.3 Pathways

The following pathways have been removed from the updated CSM:

- Surface water via overland flow to Carr Dike – it is understood surface water will controlled by permanent drainage system and discharged to ground via an attenuation basin from the majority of surface water expected to infiltrate at surface.
- Active discharge to surface water – following further consideration of the preliminary CSM this pathway has been removed, and added to potential off site sources.

7.2 Risk assessment approach

Using the updated CSM, a Tier 2 generic quantitative risk assessment (GQRA) for identified receptors based on all media sampled has been undertaken in accordance with the principles of LCRM.

Firstly, the risks associated with the identified potential contaminant linkages have been estimated using standardised methods (typically involving comparison of site data with published 'screening values'). Secondly, where screening values are exceeded, the result has been evaluated in an authoritative review of the findings with other pertinent information to determine whether or not the exceedance is or is not acceptable in the site-specific circumstances.

The data sets used in the assessment comprise the analytical results obtained by Hydrock as listed in Section 4.

In cases where potentially unacceptable risks are indicated and/or the land is potentially unsuitable for its intended use, actions such as more advanced stages of risk assessment (Tier 3, detailed quantitative risk assessment (DQRA)) or remediation are proposed in Section 7.11.

7.3 Human health risk assessment

7.3.1 Soils Assessment

7.3.1.1 Generic Assessment Criteria

The soil screening values used are generic assessment criteria (GAC) (i.e. derived in accordance with EA CLEA guidance (2009) using the updated exposure model detailed in Defra SP1010 (2014), with the exception of published C4SLs. The term 'GAC' used in this report is inclusive of all generic soil screening values.

Based on the proposed development, generic assessment criteria (GAC) based on a default commercial / industrial CLEA land use scenarios have been adopted.

GAC are selected based on the following hierarchy:

- Category 4 Screening Levels (C4SL), where available.
- SoBRA Acute GAC for free cyanide, as acute dose toxicity is the primary risk driver.
- Hydrock GAC, derived by Hydrock as detailed in Appendix E.

The results of the assessment are presented in Appendix E.

7.3.1.2 Data sets

The data set(s) used in this report is based on the conceptual site model and the proposed development, and is taken to be the entire area of the site, with the data separated into Opencast Backfill, Alluvium, and Made Ground ('Topsoil').

7.3.1.3 Assessment Results

Results indicate that all chemicals of potential concern (CoPC) are below the relevant GAC, therefore the contaminant linkage is incomplete.

7.3.2 Asbestos

There was no visual evidence of asbestos containing materials (ACM) identified during the investigation and no fibres identified by laboratory analysis of the samples analysed, therefore the contaminant linkage is deemed to be incomplete.

7.4 Phytotoxicity risk assessment

7.4.1 Risk estimation

Priority phytotoxic chemical concentrations have been screened against published values to determine the likely risk to plant growth (phytotoxic GAC). Phytotoxic GAC based on a pH of >7% have been adopted for all soils based on laboratory results.

As with human health, individual sample test results are compared directly with the phytotoxic GAC.

Based on individual test results there are no exceedances of the GAC.

7.4.2 *Risk evaluation*

There are no exceedances of the GAC, Hydrock does not believe there to be an unacceptable risk to plant life from contamination, and no additional consideration is required with regard to risks to plant life.

7.5 Pollution of controlled waters risk assessment

Groundwater or leachate chemical analysis has not been undertaken as part of this investigation. However, based on the findings of the human health GQRA which identified no contaminants above the GAC or excessively elevated concentrations, in addition no significant sources of contamination identified during the investigation, Hydrock believes the risk to controlled waters is low, this should be confirmed by further investigation.

7.6 Ground gases risk assessment

7.6.1 *Data*

As per BS8576:2013 Decision Matrix for Initial Monitoring, it is judged from the available evidence that the gas generation potential at the site is low (While there is deep made ground in the location of the opencast mining area, these have been backfilled with natural materials, with little or no organic matter identified) and as per Tables 5.5a and 5.5b CIRIA C665, the sensitivity of the development is low (due to the planned commercial end use). Consequently, and in accordance with CIRIA C665 (Table 5.5a and 5.5b) and Figure 6 BS8576:2013, an appropriate minimum monitoring regime is six readings over two months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2015 +A1:2019 and CL:AIRE TB17 advocate that monitoring should include a period of rapidly falling atmospheric pressure).

Hydrock has undertaken four of the six recommended readings, including during periods of falling and low atmospheric pressure. As such, the conclusions presented below are provisional and are subject to change following completion of two further monitoring visits. In addition, this ground investigation is preliminary and further investigation including the installation and monitoring of shallow monitoring wells (specifically located in the Alluvium) is required to fully assess the risk posed by all potential sources of gas generation.

Therefore, this ground gas risk assessment relates only to monitoring points installed in the opencast backfill (ground gases) and the Pennine Middle Coal Measures Formation (mine gases).

Refer to CL:AIRE TB17 for identification of worst-case conditions

On a small number of occasions, high gas flow rates have been measured immediately on opening the gas taps (up to 12.2 l/hr), with the high initial flow rates, dropping below 0.2l/hr within 5 seconds. The incidence of initial high flow rates corresponds with a rise in the groundwater level between monitoring rounds and are likely to be caused by this change. The rise in the water level in the standpipe will compress the gas in the standpipe head-space, resulting in a short, high-pressure release on opening the monitoring tap. It was generally noted that the high initial flow rates only occurred when the water level rose above the response zone of the pipe, presumably because the gas would otherwise be able to disperse via the slotted pipe. As such, the temporary initial high gas flow rates are discounted as not being typical of emission rates to a built development.

7.6.2 Assessment

The risks associated with the ground gases methane (CH_4) and carbon dioxide (CO_2) have been assessed using BS 8485:2015 +A1:2019,

The assessment guidelines set out in Table 2 of BS 8485 are based on interpretation of the gas concentrations and the gas flow rates. The quantitative assessment has been carried out by comparing the individual gas concentrations and gas screening values (GSV[5]) in Appendix D with the published CS thresholds (BS 8485 Table 2), in addition to a worst-case GSV assessment in accordance with section 6.3.7 of BS 8485. The assessment is summarised in Table 7.1 and the full assessment is presented in **Appendix D**.

Table 7.1: Ground gas risk assessment (Opencast Backfill and Pennine Middle Coal Measures Formation)

	Min	Max	Typical [(i)]	Comment
Steady Flow Rate (l/hr)	0.0	0.2	<0.01	-
Methane (%)	<0.1	<0.1	<0.01	The typical methane concentration is less than 1% and the typical carbon dioxide concentration is less than 5%, with one instance of >5%
Carbon Dioxide (%)	0.0	6.2	<1	
Carbon Monoxide (ppm)	<0.1	8.0	1	-
Hydrogen Sulphide (ppm)	<0.1	2	0	-
Oxygen (%)	5.6	20.2	16.0	-
Carbon Dioxide GSV (l/hr)	<0.1	0.002	0.0008	CS1
Methane GSV (l/hr)	<0.1	<0.1	<0.1	CS1
Plausible worst-case GSV	<0.1	0.0124	-	CS1

For the purposes of the calculation, where the recorded gas flow rate is below the manufacturer's limit of detection for the instrument used, the detection limit has been adopted for the gas flow rate.

As indicated in Table 7.1, the computed GSV for carbon dioxide and methane indicates CS1 conditions and methane and carbon dioxide at concentrations are 'typically' below 1% and 5% respectively for onsite gas sources.

As such, the site is provisionally classified as Characteristic Situation 1, subject to further investigation and monitoring. It should be noted that there are no installations within the Alluvial soils and the gas risk posed should be assessed during the next phase of investigation.

7.6.3 Off-site risks from carbon dioxide and methane

The National Planning Policy Framework requires that a developed site should be incapable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990.

[5] Note: GSV is synonymous with 'site characteristic hazardous gas flow rate' (Q_{hgs}) of BS 8485:2015 +A1:2019 Table.

This position includes a consideration of the potential for off-site migration of ground gases that may impact on adjacent properties.

Consequently, it may be necessary to consider the imposition of measures to protect adjacent, off-site receptors. In this case further Gas monitoring relating to potential off site gas sources, such as the landfill on the northern site boundary may be necessary.

7.7 Construction materials risk assessment

7.7.1 Water pipelines

A formal water pipe investigation and risk assessment is beyond the scope of this report. However, the findings of this investigation have been compared to the threshold values in Water UK HBF (2014), Table 1 as far as is practicable.

The site is partially brownfield. However, the investigation has not detected organic contamination in exceedance of the threshold values and Hydrock believes standard pipework may be suitable for this area of the site. However, confirmation should be sought from the water supply company at the earliest opportunity.

The south of the site area is undeveloped and the preliminary risk assessment and investigation has indicated no plausible contaminant sources. It is envisaged that standard pipework will be suitable for this area of the site. However, confirmation should be sought from the water supply company at the earliest opportunity.

7.7.2 Other construction materials

Plastic pipes for drains and sewers are manufactured from unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) or polyethylene (PE). These materials may be affected by the presence of organic compounds in the soil.

In accordance with the British Plastics Federation Guidance (August, 2018), as the concentrations of PAH are below 100mg/kg, PVC-U, PP or PE pipework is considered suitable. However, BTEX and TPH has not assessed as part of this assessment.

The implications for buried concrete are discussed in Section 6.12.

7.8 Contamination risks to ground workers

7.8.1 Introduction

Whilst risks to construction workers are not discussed in detail, the following section discusses potential risks that should be considered.

Information presented in this document is provided to assist in managing the risk associated with contamination in soil and groundwater at the site but is not definitive. The Contractors are responsible for undertaking their own assessments and assessing what risks are present and what control measures are required.

Task specific risk assessments and method statements should be in place, and risks and required mitigation measures communicated to all relevant personnel prior to the works commencing. Appropriate PPE and, if required, RPE should be provided and utilised.

7.8.2 Metals, metalloids, PAH and petroleum hydrocarbons

Site soils do not contain excessively elevated concentrations metals, metalloids, PAH and petroleum hydrocarbons.

7.8.3 Ground Gas

Concentrations of carbon dioxide (an asphyxiant) in the soil exceed HSE Workplace Exposure Limits for personnel in the working environment of 1.5% for short term (15 minutes) exposure and 0.5% for long term exposure. Furthermore, soil concentrations of oxygen are below the HSE recommendations of 18%.

Soil gas concentrations are not necessarily reflected by those in the breathing zone, as such, all Contractors and maintenance workers should be made aware of the possible presence of carbon dioxide and should take all necessary health and safety precautions when working in trenches or confined spaces.

7.8.4 Asbestos

As no clearly identifiable ACM has been seen during the site walkover or during the ground investigation and no fibres have been detected in soil samples analysed by laboratory testing, CAR2012 does not apply. However, there is always the possibility of unexpected contamination and the Contractors should undertake a watching brief during the works. If any suspect material is encountered, works in that area of the site should stop, the area fenced off and Hydrock should be notified.

7.9 Findings of the generic contamination risk assessments

The potential sources, pathways and receptors identified in the desk study (Cross ref Usually Section 3) have been investigated (Sections 5) and assessed (Sections 7.2 to 7.7). A Source-Pathway-Receptor linkage assessment has been undertaken and is presented in Appendix H (Table K.2).

There are no Source-Pathway-Receptor contaminant linkages which require mitigation. However, surface water contamination from sewage in Carr Dike has not yet been resolved. Allowance for this risk should be made in the detailed ground investigation.

7.10 Climate Change

In considering the potential impact of climate change, the following factors have been considered

- The design life of the proposed development is 50 – 100 years.
- The location and elevation of the site in relation to projected increased flooding extents is set to increase from the site's current Flood Zone 2 and 3 statuses...
- The current depth to groundwater is <1.2m bgl.
- The superficial deposits and underlying geology at the site are unlikely to be physically adversely affected by desiccation, subsidence or erosion.
- The UK Climate Predictions published by the Met Office indicate that over the lifetime of the proposed development average:
  - Precipitation is forecast to increase by 0.05mm;
  - Temperature is forecast to increase by 5-6 degrees;
  - Groundwater recharge is forecast to increase by 0.05mm.
- Potential changes in soil moisture levels and soil temperature are not likely to have a significant impact on contaminant fate and transport (mobility and degradation) noting that a rise in soil temperature will likely increase the volatility and solubility of contaminants and increase the microbial degradation of contaminants. A reduction in soil moisture may decrease microbial degradation and increase vapour and gas diffusion.

The foreseeable potential implications of these scenarios on the CSM are:

Based on a review of the above scenarios, no foreseeable impacts of climate change on the CSM have been identified.

For further details on the considerations made, refer to Table L.1 in Appendix L.

7.11 Mitigation measures

As demonstrated in section 6.9 and subject to further investigation and regulatory agreement, there is no specific mitigation or geo-environmental remediation works necessary. It should be noted this is a preliminary investigation and these conclusions will need to be confirmed by further investigation.

8. Waste and materials management

8.1 Introduction

The Waste Framework Directive (WFD) (2009/98/EC) defines waste as '*any substance which the holder discards or intends to discard.*' In a geo-environmental context, the waste is most often 'soil' and the two main scenarios are offsite disposal of the material as a waste and/or reuse of the material on site. For cost and sustainability reasons, reuse is preferred to off-site disposal.

Section 8.2 below describes the key issues relating to off-site disposal to landfill and Section 8.3 considers requirements relating to reuse of soils and materials management.

8.2 Waste disposal

8.2.1 Principles

Based on the WFD, any material excavated on site may be classified as waste and it is the responsibility of the producer of a material to determine whether or not it is waste. Where off-site disposal is undertaken, the following guidance applies.

Classification is a staged process:

- A hazardous waste is defined under the WFD as one which possesses one or more of fifteen defined hazardous properties. If a waste is not defined as hazardous, then it is non-hazardous.
- Where the materials are soil, it is then be assigned using the 'List of Waste Codes', which classifies the material as either:
  - hazardous (17-05-03), which is defined as "*soil and stones containing hazardous substances*"; or
  - non-hazardous (17-05-04), which is defined as "*soil and stones other than those mentioned in 17-05-03*".
  - Hydrock utilise the proprietary assessment tool, HazWasteOnline™ to undertake this assessment.
- Waste Acceptance Criteria (WAC) testing is then undertaken if required, and are only applicable following classification of the waste, and only where the waste is destined for disposal to landfill. The WAC are both qualitative and quantitative. The WAC and the associated laboratory analyses (leaching tests) are not suitable for use in the determination of whether a waste is hazardous or non-hazardous.

It should be noted that some non-hazardous wastes may be suitable for disposal at an inert landfill as non-hazardous waste, subject to meeting the appropriate waste acceptance criteria.

It should be noted that classification must be undertaken on the waste produced, by the waste producer. Necessary sampling frequency to adequately characterise a soil population is defined within WM3.

Further discussion with regards to the characterisation process for different scenarios and waste types is provided below.

Topsoil and Peat

Topsoil and peat are biodegradable, therefore if they are surplus to requirements and cannot be re-used in accordance with a Materials Management Plan, they cannot be classified as inert. As such, topsoil and peat need to be classified by a staged assessment and sampling process and would either be classified as hazardous or non-hazardous, depending upon the results of the assessment.

Greenfield sites

Waste from completely greenfield sites may be accepted at a landfill as inert waste if it meets the requirements of paragraph 10 (wastes acceptable without testing at landfills for inert waste) of the Landfill (England and Wales) (Amendment) Regulations (2005) ('the Regulations') can be met. Paragraph 10 of the Regulations states, "*soils may be able to be classified as inert waste without testing, if:*

- *they are single stream waste of a single waste type;*
- *there is no suspicion of contamination and they do not contain other material or substances such as metals, asbestos, plastics, chemicals, etc…..*"

As such, where the site is greenfield and the waste producer is confident about the quality of a soil (i.e. naturally occurring and uncontaminated), further sampling and laboratory testing is not necessary for the Basic Characterisation and this can be undertaken on qualitative Waste Acceptance Criteria testing.

In this instance the waste producer can characterise the waste based on visual assessment and written description of the waste in addition to supporting evidence such as a desk study assessment of the greenfield status. However, it should be noted this characterisation is subject to agreement by the landfill operator who may require testing to be undertaken to confirm classification.

Contaminated or potentially contaminated sites

If the site is brownfield, contaminated or potentially contaminated, the waste must undergo an initial waste classification exercise using background information on the source and origin of the waste and assessment of chemical test data in accordance with Environment Agency Technical Guidance WM3.

If following the initial waste classification exercise, the soils are acceptable for disposal to a non-hazardous landfill, further qualitative Waste Acceptance Criteria (WAC) testing is not required.

However, if soils are potentially able to be disposed to an inert landfill as non-hazardous waste, or require testing to determine if they can be disposed of to a stable non-reactive hazardous or hazardous class of landfill, the next stage of assessment is to undertake qualitative WAC testing. This will determine the Basic Characterisation and the landfill category at which the soils can be accepted.

Hazardous material must be subjected to WAC testing to determine whether it requires treatment before it can be accepted at the hazardous landfill, while non-hazardous material can be tested to determine whether it may be suitable for placement in an inert landfill.

8.2.2 HazWasteOnline™ assessment

The site is classified as partially greenfield and partially brownfield, in order to inform the preliminary waste characterisation process, Hydrock has undertaken an exercise using the proprietary web-based tool HazWasteOnline™. The output of the HazWasteOnline™ assessment is provided in Appendix F and a summary of the preliminary waste classification is provided below in Section 8.2.4.

8.2.3 WAC testing

The site is classified as partially greenfield and partially brownfield However, WAC testing has not been undertaken to date but will be required on the excavated soils that are to be disposed of, to assist with waste disposal options prior to disposal. A summary of the preliminary waste disposal options is provided below in Section 9.2.4.

8.2.4 Preliminary waste disposal options

The southern portion of the site is greenfield (as proven by the desk study and a visual assessment of the soils). As long as no unexpected contamination is encountered and if suitable segregation of different types of natural waste streams is put in place, for soils to be disposed of, it is considered that:

- The Made Ground 'topsoil' is expected to have a high organic content and may to be classified as hazardous waste for disposal.
- The natural uncontaminated subsoils are likely to be classified as 'inert' waste and following WAC testing should be able to be disposed of at an 'inert' landfill.

The northern portion of the site is brownfield and based on the site history, and the HazWasteOnline™ assessment, if suitable segregation of different types of waste is put in place, for soils to be disposed of, it is considered that the Made Ground topsoil, Opencast Backfill and Alluvium is likely to be classified as non-hazardous waste.

8.2.5 General waste comments

It should be noted that:

- It is the waste producer's responsibility to segregate the waste at source and waste producers must not mix waste materials/streams or dilute hazardous components, for example by mixing with less or non-hazardous waste on site to meet WAC limit values.
- The above preliminary assessment has been made on the basis of the soils tested as part of the ground investigation, using the HazWasteOnline™ assessment. However, the formal classification of waste can only be undertaken on the material to be disposed of, and by the waste producer and the receiving landfill as license conditions vary from landfill to landfill.
- Basic Characterisation should be undertaken in accordance with Environment Agency guidance by the waste producer. Hydrock can assist if required and this report will assist the characterisation. However, Basic Characterisation does not form part of the current commission and would require further assessment and testing on the wastes actually to be disposed.
- Once the waste producer has undertaken an initial Basic Characterisation on each waste stream, they can manage the soils as part of the on-site processing programme (for example, stockpiling, treatment, screening and separation). The waste producer and landfill operator will then need to agree the suite of compliance testing for regularly generated waste to demonstrate compliance with the initial Basic Characterisation prior to disposal.
- At the time of disposal, additional testing on the excavated soils to be disposed of, will likely be necessary.

- Non-hazardous and hazardous soils require pre-treatment (separation, sorting and screening) prior to disposal.
- The costs for disposal of non-hazardous and hazardous soils are significant compared to disposal of inert material.
- In addition to disposal costs, landfill tax will be applicable. Non-hazardous and hazardous waste will generally be subject to the Standard Rate Landfill Tax. Inert or inactive waste will generally be subject to the Lower Rate Landfill Tax. The landfill tax value changes each April and can be found at https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013.
- Before a waste producer can move waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following[6]:
  - Duty of care transfer note / Hazardous Waste consignment note, including comment as to if pre-treatment has been undertaken; and
  - Basic Characterisation of the waste, to include: description of the waste; waste code (using list of wastes); composition of the waste (by testing, if necessary) and; WAC testing (if required).

8.3 Materials management

8.3.1 Introduction

Soils that are to remain on site, should be managed and reused in accordance with a Materials Management Plan (MMP), prepared in accordance with 'The Definition of Waste: Development Industry Code of Practice', Version 2 (CL:AIRE), known as the DoWCoP. Where all aspects of the DoWCoP are followed the soils are considered not to be waste, because they were never discarded in the first place.

Version 2 of the DoWCoP clearly sets out the principles and an outline of the requirements of a MMP. The following compliance criteria must be seen to apply to the MMP for the site:

- Factor 1: Protection of human health and protection of the environment.
- Factor 2: Suitability for use, without further treatment.
- Factor 3: Certainty of Use.
- Factor 4: Fixed Quantity of Material.

The reuse of soils at sites should be considered during the planning and development design process so that compliance with issues such as fixed quantity and certainty of use clearly relate to agreed site levels. Suitability of Use is normally evident from the remediation strategy or the design statement, which form an integral part of a MMP. However, some soils may need to be tested post-excavation to prove they are suitable for use.

Once the MMP is finalised, it must be declared by a Qualified Person (QP). The Declaration is an on-line submission as part of which the QP is required to confirm that the declaration is being made before the relevant works have commenced (i.e. it is not a retrospective application).

Once all material movements have been completed in accordance with the MMP a verification report must be produced, kept for 2 years and provided to the EA on request.

[6] ENVIRONMENT AGENCY. November 2010. Guidance on waste acceptance procedures and criteria. Waste acceptance at landfills. The Environment Agency.

It should be noted that failure to comply with the requirements of the DoWCoP when re-using materials has potentially significant consequences for the waste holder. The risk is that the reused materials are still regarded as a waste that has been illegally deposited. From 1 April 2018, the scope of Landfill Tax has been extended to sites operating without the appropriate environmental disposal permit, and operators of illegal waste sites will now be liable for Landfill Tax. Further information is available at: https://www.gov.uk/government/publications/landfill-tax-disposals-not-made-at-landfill-sites/landfill-tax-disposals-not-made-at-landfill-sites.

If soils are excavated and reused on sites (or moved to another site) without a MMP, exemption, or appropriate Permit in place, anyone who knowingly facilitates the disposal may be *'jointly and severally liable'* to any assessment of tax, fines or prosecution.

8.3.2 Materials management scenarios

The materials management scenarios present on site are discussed below.

It should be noted that more than one scenario may apply, dependent upon where the soils are proposed for reuse.

8.3.2.1 Clean, naturally occurring materials – reused on the site of origin

Where soils are naturally occurring, uncontaminated and are reused on the site they are excavated (i.e. greenfield site with documented site history, with no Made Ground), they will fall outside the Waste Framework Directive (WFD) (i.e. they will not be a waste when reused on the site of origin).

However, there needs to be certainty of that reuse, and evidence is necessary to support this strategy, for example through information provided during the planning process. The onus is on the developer to demonstrate that the materials are not a waste and will never become a waste. As such, a Materials Re-use Strategy is recommended to show certainty. Alternatively, if the volume of material is under 1,000 tonnes, then a U1 waste exemption may be applied for from the Environment Agency.

It may be noted that some 'clean naturally occurring materials' may still fail the 'suitable for use' test, for example, soils with a naturally high organic content may not be suitable for use because of their propensity to produce ground gases such as methane. Rules regarding other more unusual circumstances such as where natural soils contain an unacceptably high mineral content are described in the DoWCoP.

8.3.2.2 Clean, naturally occurring materials – transferred to other sites

Where soils are naturally occurring, uncontaminated and are transferred to other sites (i.e. direct transfer), they will not become waste as long as the transfer is undertaken in accordance with the DoWCoP. A MMP must be prepared for the receiving site and the materials movement must be noted in the MMP of the Donor site. This movement must have been declared to CL:AIRE prior to the works commencing.

8.3.2.3 Made Ground and other contaminated soils

On sites where Made Ground or contaminated soils are present, any soils excavated will be a waste as soon as they are excavated (even if they are clean, naturally occurring materials), unless they are subject to reuse in accordance with the DoWCoP. As such, for any brownfield site or a site where Made Ground is present and soils are being moved and reused, the materials could be deemed a waste, subject to either:

- a Materials Management Plan (MMP), to prevent the material being classified as a waste following reuse; or
- an exemption (for limited volumes); or

- an environmental permit, dependant on its status.

Made Ground exists at the site as part of the restoration of the former opencast mine workings. It could be argued that this material has been discarded as part of the mining operations and therefore already constitutes a waste. This may mean that the material could only be managed and re-used under an environmental permit. It is recommended that early discussion with the Environment Agency waste team is undertaken to clarify the regulatory requirements.

If the EA confirm the material cannot be reused under an MMP, then it will be a requirement of the EA Waste Regulations that permitting is applied, this will likely include:

» meeting end of waste criteria; and

» deposit for recovery permit (Waste Recovery Plan)

it should be noted that the above EA permitting process can take 12-18 months to complete.

Other commonly occurring circumstances are:

If Made Ground is being moved between sites, it must be ensured that appropriate permits are in place to ensure the soils are not classified as a waste. Made Ground cannot be moved between sites under DoWCoP alone and would require relevant permits as part of the MMP documentation for the Hub site the material is being treated at.

All recycled materials (6F2 etc.) must be produced under the 2013 WRAP 'Quality Protocol: Aggregates from inert waste', whether on site or off-site. If they are not, they will be deemed a waste and can only be used on site under a permit. More information can be found at https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-frm-inert-waste.

8.3.2.4 Geotechnical improvement requirements

Construction activities carried out on uncontaminated soils solely for the purpose of improving geotechnical properties e.g. lime / cement modification, are not generally regarded as waste treatment operations and do not require a permit.

However, should processing be needed (such as screening, treatment or improvement), that would constitute a waste activity and require a mobile treatment permit. This may be as simple as removing oversize material with an excavator bucket, to using a riddle bucket to remove hardcore to full mechanical screening.

9. Uncertainties and limitations

9.1 Site-specific comments

This ground investigation report is preliminary, and further investigation is required to infill data gaps, meet environmental sampling requirements, target specific features / delineate identified risks such as highwalls, shallow mineworkings, and further investigation of the alluvium. This report including the risk assessment is to be updated with the supplementary data, and the conclusions/recommendations may be subject to change.

The gas monitoring undertaken to date and included in this report is preliminary and insufficient to fully characterise the site in accordance with CIRIA Report C665. further monitoring is required and the conclusions of this report shall be updated following completion of the additional monitoring.

9.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Newlands Developments (the Client),under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in April 2024. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Hydrock has used reasonable skill, care and diligence in the design of the investigation of the site and in its interpretation of the information obtained. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Groundwater data are only representative of the dates on which they were obtained and both levels and quality may vary.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

The work has been carried out in general accordance with recognised best practice. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The chemical analyses reported were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional analysis will be required at the time of disposal to fully classify waste. Discussion and comment with regards to waste classification are preliminary and do not form the requirements of 'Basic Characterisation' as required.

Assessment and testing for the presence of coal tar has only been completed at the locations of exploratory holes undertaken for risk assessment purposes. This investigation is not designed to provide a definitive assessment of the risk from coal tar, nor the waste classification for bituminous bound pavement arisings at the site.

Unless otherwise stated, at the time of this investigation the future routes of water supply pipes had not been established. This investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling and chemical testing may be required at a later date once the routes of the supply pipes are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

Whilst the preliminary risk assessment process has identified potential risks to construction workers, consideration of occupational health and safety issues is beyond the scope of this report.

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

10. Recommendations for further work

Following the preliminary ground investigation works undertaken to date, the following further works will be required:

- discussion with specialists with regard to ecology, specifically ground nesting birds and any constraints in the western section of the site;
- supplementary ground investigation to allow design requirements relating to environmental uncertainties and detailed geotechnical properties of soils on site Future phases of ground investigation should address the following:
- Potential Environmental Sources not addressed in the Preliminary GI, including the landfill at the northern site boundary;
- Surface water sampling and chemical analysis;
- Further investigation of the groundwater regime on site, including the installation of further monitoring wells;
-
- Further investigation of the uncontrolled Opencast Backfill regarding geotechnical properties, highwall geometry and assessment of waste acceptance criteria;
- Gas monitoring of the Alluvium, particularly in identified deep areas; and
- Additional Geotechnical testing to characterise lateral variability, and cover areas of low data coverage, including supplementary sulphate testing and further earthworks data in areas of proposed cutting.
- supplementary ground investigation to allow design requirements relating to mining. Future phases of ground investigation should address the following:
- Further investigation of the extent of the shallow worked Shafton seam including the area south of the subcrop;
    - Further investigation of the fault in the north west area of the site;
    - Further investigation of the extent and nature of voids and broken ground found on site.
- discussion with the Environment Agency waste team regarding the re-use of materials at the site, particularly the opencast backfill;
- discussion and agreement with utility providers regarding the materials suitable for pipework;
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report;
- assessment of tree influence on foundations and design of foundations where this is not addressed by the earthworks;
- discussions with ground improvement Contractors (RI/CMC) regarding the viability of potential improvement options;
- provision of geotechnical design for the Category 2 structures;
- provision of a mine treatment design and specification;
- production of a design statement for Route B in accordance with the DoW CoP to provide lines of evidence that the soils are uncontaminated;
- production of a Materials Management Plan relating to reuse of soils at the site and import of soils to the site;
- writing of a Materials Management Strategy relating to reuse of soils at the site, and:
- verification of the earthworks, remediation and mitigation works.

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Appendix A Drawings

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

N

Key

Planning Application Boundary — 210.81 ac — 85.31 ha

Parameters Key

- Development Plot Boundary
- Green and Blue infrastructure
- Strategic Landscape screening
- Estate Road infrastructure
- Indicative access points (subject to reserved matters)
- Safeguarded land

Roundabout delivered under a separate planning application [Ref. No. 2021/1511]

Flood Compensation Area

Flood Compensation Area

Plot 1

Plot 2

Plot 3

Plot 4

Rose Valley

Woodbine Cottage

Billingley Green

Hollygrove Roundabout

A635 Barnsley Road

Dudley Drive

Aldi Goldthorpe RDC

Heather Garth Primary School

Lacewood Primary School

Carr Head Lane

Carr Dike

50m SCALE 1:2500

Development Schedule

Zone	Plot Size NDA (ha)	Maximum GIA Floor Space (m^2)	Plateau Height(in meters above ordnance datum)	Maximum Finished Floor Level (in meters above ordnance datum) [+1.000m above proposed plateau]	Maximum Building Height Measured to roof ridge / highest point (in meters above ordnance datum)	Ridge Height (above F.F.L. level)
Zone 1	11.35	**204,000m²** Total Area distributed across Zones 1,2, 3 & 4	24.50	25.50	43.50	18.00
Zone 2	8.46		25.00	26.00	44.00	18.00
Zone 3	17.92		33.70	34.70	52.70	18.00
Zone 4	6.29		33.70	34.70	52.70	18.00
Total	44.02					

The use class applied for within each zone is primarily Class B8 with up to 30% of the floorspace being for Class B2 together with ancillary office space

For the avoidance of doubt, the information shown within the development plots is indicative only, and will be subject to subsequent Reserved Matters Applications

PLANNING
THIS DRAWING IS FOR PLANNING CONSIDERATION ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE

rev	amendments	by	ckd	date

Barnsley Road, Goldthorpe

Parameters Plan

newlands developments

umc architects
Newark Beacon, Cafferata Way, Newark, Nottinghamshire NG24 2TN
t. +44 (0)1636 653027 e. info@umcarchitects.com

Drawing Status:	Planning
Drawn / Checked:	SS /SM
Date:	07/11/2023
Scale:	1:2500 A1
Drawing no:	Revision:
22081 P0520	E

N

Key

- Planning Application Boundary — 210.81 ac — 85.31 ha
- Development Plot Boundary
- Existing PRoW Retained
- Proposed PRoW Diversion
- Existing PRoW Removed
- Potential footpath link created
- Proposed Attenuation
- Existing Retained Vegetation
- Safeguarded land

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

Indicative Schedule of Accommodation

Unit 1	sq m	sq ft
Warehouse	49,564	533,500
2-Storey Mezzanine Office	2,323	25,000
2-Storey Pod Office	465	5,000
2-Storey Pod Office	465	5,000
Total	**52,815**	**568,500**

Unit 2	sq m	sq ft
Warehouse	32,214	346,750
2-Storey Mezzanine Office	1,695	18,250
2-Storey Pod Office	465	5,000
Total	**34,374**	**370,000**

Unit 3	sq m	sq ft
Warehouse	74,787	805,000
2-Storey Mezzanine Office	2,323	25,000
2-Storey Pod Office A	465	5,000
2-Storey Pod Office A	465	5,000
Total	**78,038**	**840,000**

Unit 4	sq m	sq ft
Warehouse	30,008	323,000
2-Storey Mezzanine Office	1,579	17,000
2-Storey Pod Office	465	5,000
Total	**32,052**	**345,000**
Development Total	**197,278**	**2,123,500**

NOTE:
All areas specified are Gross Internal Areas [GIA]

For the avoidance of doubt, the information shown within the development plots is indicative only, and will be subject to subsequent Reserved Matters Applications

Illustrative Plan Only

PLANNING
THIS DRAWING IS FOR PLANNING CONSIDERATION ONLY AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE

rev	amendments	by	ckd	date

Barnsley Road, Goldthorpe

Illustrative Masterplan

newlands developments

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Drawing Status:	Planning
Drawn / Checked:	SS /SM
Date:	07/11/2023
Scale:	1:2500 A1
Drawing no:	Revision:
22081 P0601	C

SURFACE LEVEL DATA		
MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
-10.00	-8.00	
-8.00	-6.00	
-6.00	-4.00	
-4.00	-2.00	
-2.00	0.00	
0.00	2.00	
2.00	4.00	
4.00	6.00	
6.00	8.00	
8.00	12.00	

This drawing is the copyright of Hydrock Consultants Ltd

Notes:

1. All dimensions are to be checked on site before commencement of works. Work to figured dimensions only. Do not scale off this drawing. Any discrepancies are to be reported to the Hydrock for clarification.
2. This drawing is to be read in conjunction with all relevant Hydrock drawings and specifications
3. Corresponding surface levels are shown on Hydrock drawing no 0200.
4. For attenuation ponds and flood compensation area IL's and volumes, refer to drawings 23451-HYD-XX-XX-DR-D-0500 to 0505.
5. Levels will be within +/- 300mm of those stated depending on suitability of site won soil.
6. Where buildings and plot layouts are shown these are indicative only for illustrative purposes. The layouts of the development plots will be subject to future Reserved Matters applications.
7. It is assumed that a 300mm deep layer of topsoil/surface material will be stripped prior to commencement of earthworks. Details of topsoil strip are shown on Hydrock drawing no 0202. Actual depth of strip will vary to suit actual depth of material. This will affect final earthworks volumes.
8. The following construction build-ups are assumed for the purposes of earthworks volume calculation only:

Estate Road	960mm
Footway/cycleway	230mm
Verge	350mm
Earthworks batters	250mm

9. Volumes are calculated as the difference between:
   - Ground level after topsoil/surface material strip
   - Plateau levels/underside of road construction build-up
10. No allowance has been made for bulking of materials.
11. Estimated infrastrucure arisings are 22,930m^3. This does not take into consideration the on-plot arisings. It is assumed at this stage that all site won material will be suitable for reuse.
12. The earthworks volumes for the attenuation ponds and ditch are included in the overall earthworks volumes figures.
13. There are two flood compensations areas. The first is to lower the area to the north of Zone 1 to a level of 21.20-21.10m AOD (approximately 30,620m^3 cut). The second is to lower the area to the west of Zone 1 to a level of 20.99-20.98m AOD (approximately 72,390m^3 cut). This is included in the overall cut/fill volumes.
14. Earthworks slopes are assumed to be 1:3 for the purposes of volume calculation only and this is subject to detailed geotechnical assessment prior to confirming final levels.
15. Preliminary earthworks volumes are as follows:
   - Cut = 749,850 cu m
   - Arisings = 22,930 cu m
   - Fill = 777,840 cu m
   - Shortfall = 5,060 cu m
   - Topsoil Strip = 200,120 cu m (assumed to be reused on site - see drawing 0202)
16. All volumes stated on this drawing are based on preliminary calculation by Hydrock and should be verified/finalised by the earthwork's contractors own calculations/modelling.
17. This drawing shows the minimum achievable plateau levels (and hence fill quantities) based on an outline gravity surface water drainage system design. It should be noted that plateau levels could potentially need to be raised slightly due to a number of factors, including clashes with foul drainage, discrepancies in the outfall levels, modification of drainage routes etc. Therefore it is recommended that a risk allowance be made for this possible eventuality by the client.

NOTE: FOR THE AVOIDANCE OF DOUBT, THE INFORMATION SHOWN WITHIN THE DEVELOPMENT PLOTS IS INDICATIVE ONLY, AND WILL BE SUBJECT TO SUBSEQUENT RESERVED MATTERS APPLICATIONS

Rev	Date	Description	By	Ckd
P5	16.04.2024	Levels amended to suit PROW route crossing Plot 2 access road	SJ	NB
P4	24.01.2024	Volume information added	SJ	NB
P3	31.05.2023	Ditch added south of cascading ponds, proposed footway link to bus stop amended	SJ	NB
P2	06.04.2023	Bund added between proposed pond and flood compensation area	SJ	NB
P1	21.02.2023	Planning issue	SJ	NB

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www.hydrock.com

Client :
newlands developments

Project Title:
BARNSLEY ROAD
GOLDTHORPE

Drawing Title:
PROPOSED EARTHWORKS VOLUMES

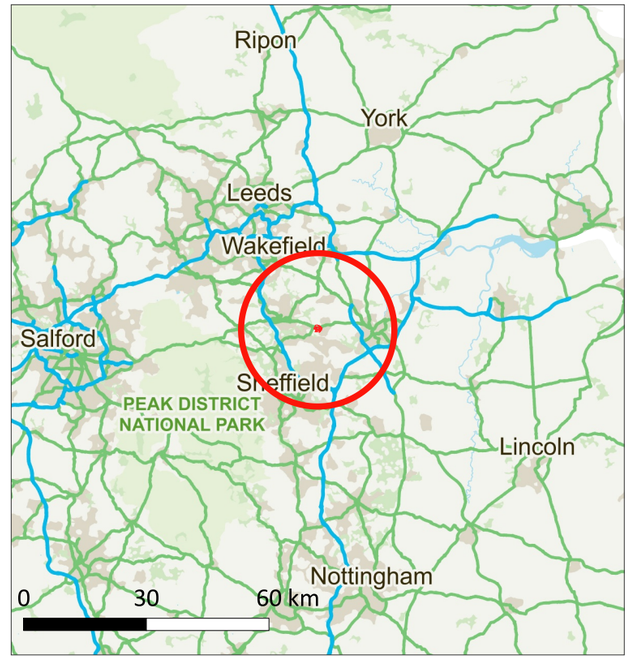
Drawing Status:
PLANNING

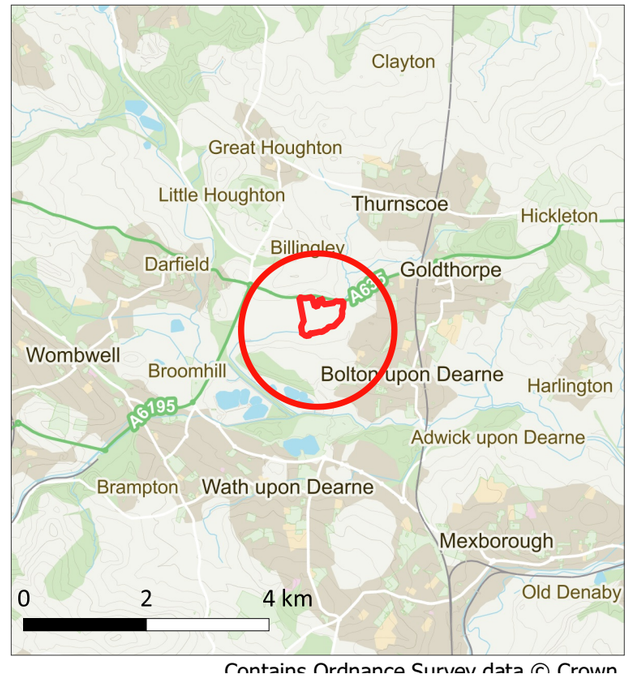
Hydrock Job No:
C23451

Drawn	Checked	Scale @ A1	Date	Issue Date
SJ	NB	1:2500	21.02.2023	21.02.2023

Drawing Number:
23451-HYD-XX-XX-DR-D-0201

Revision:
P5





Contains Ordnance Survey data © Crown

KEY PLAN

Site Boundary

NOTES

1. Contains OS data © Crown copyright and database right (2022)

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	GE	AC	25/07/22	First issue
P02	AL	JB	28/11/202:	Second Issue
P03	AL	JB	02/05/202-	Third Issue

Hydrock

TITLE
SITE LOCATION PLAN

HYDROCK PROJECT
23451

SCALE @ A3
1:10,000

CLIENT
Newlands Developments

PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
Barnsley Road, Goldthorpe

DRAWING NO.
23451-HYD-XX-XX-DR-GE-1001

REVISIC
P03

KEY PLAN

AC- Exploratory Holes [60]

- Trial Pit [30]
- Rotary Open [2]
- Cable Percussion [3]
- Cone Penetration Test [14]

NOTES

1. Contains OS data © Crown copyright and database right (2022)
2. Plan is suitable for reference, and is not accurate to actual area extents.
3. TP101, TP103, TP105 and TP109 were not completed due to ground conditions and the location of a ground bird nesting area.

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	AL	JB	01/03/202	First issue
P02	AL	JB	02/05/202	Second Issue
P03	AL	AC	06/06/202	Third issue

Hydrock

TITLE
Finalised Ground Investigation Plan

HYDROCK PROJECT
23451

SCALE @ A3
1:3,000

CLIENT
Newlands Developments

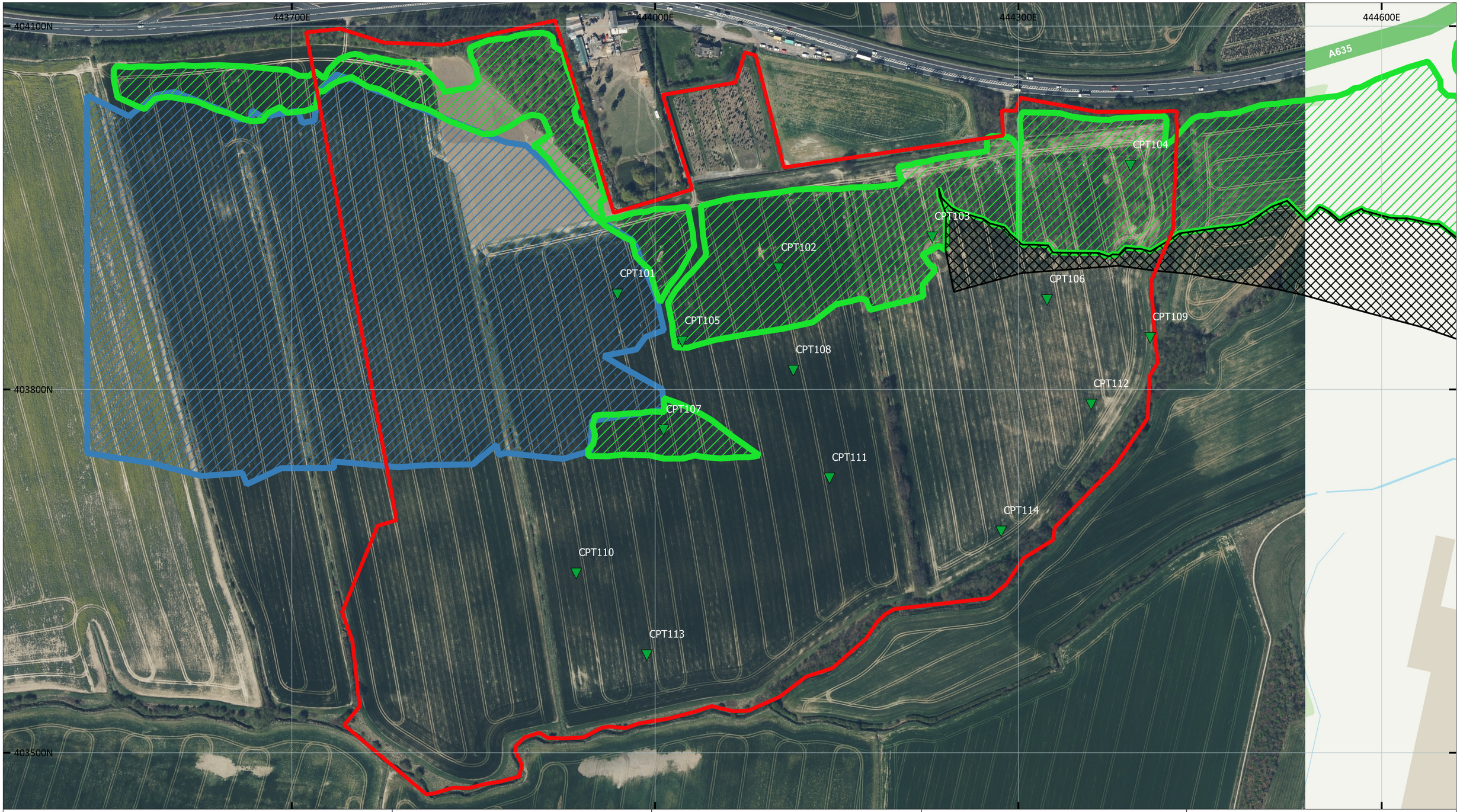
PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
Zone 1 Barnsley Road, Goldthorpe

DRAWING NO.
23451-HYD-XX-XX-DR-GE-0010

REVISION
P03



KEY PLAN

AC- Exploratory Holes [60]

Cone Penetration Test [14]

Current Site Features (Polygons)

OP/95/0195/S Woodbine Opencast Site

OP/96/0236/S Woodbine Ext Phase 1A

Possible Location of Shallow Mine Workings

NOTES

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2. Plan is suitable for reference, and is not accurate to actual area extents.

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	AL	JB	01/03/202	First issue
P02	AL	JB	02/05/202	Second Issue

Hydrock

TITLE
CPT Layout Plan

HYDROCK PROJECT
23451

SCALE @ A3
1:3,000

CLIENT
Newlands Developments

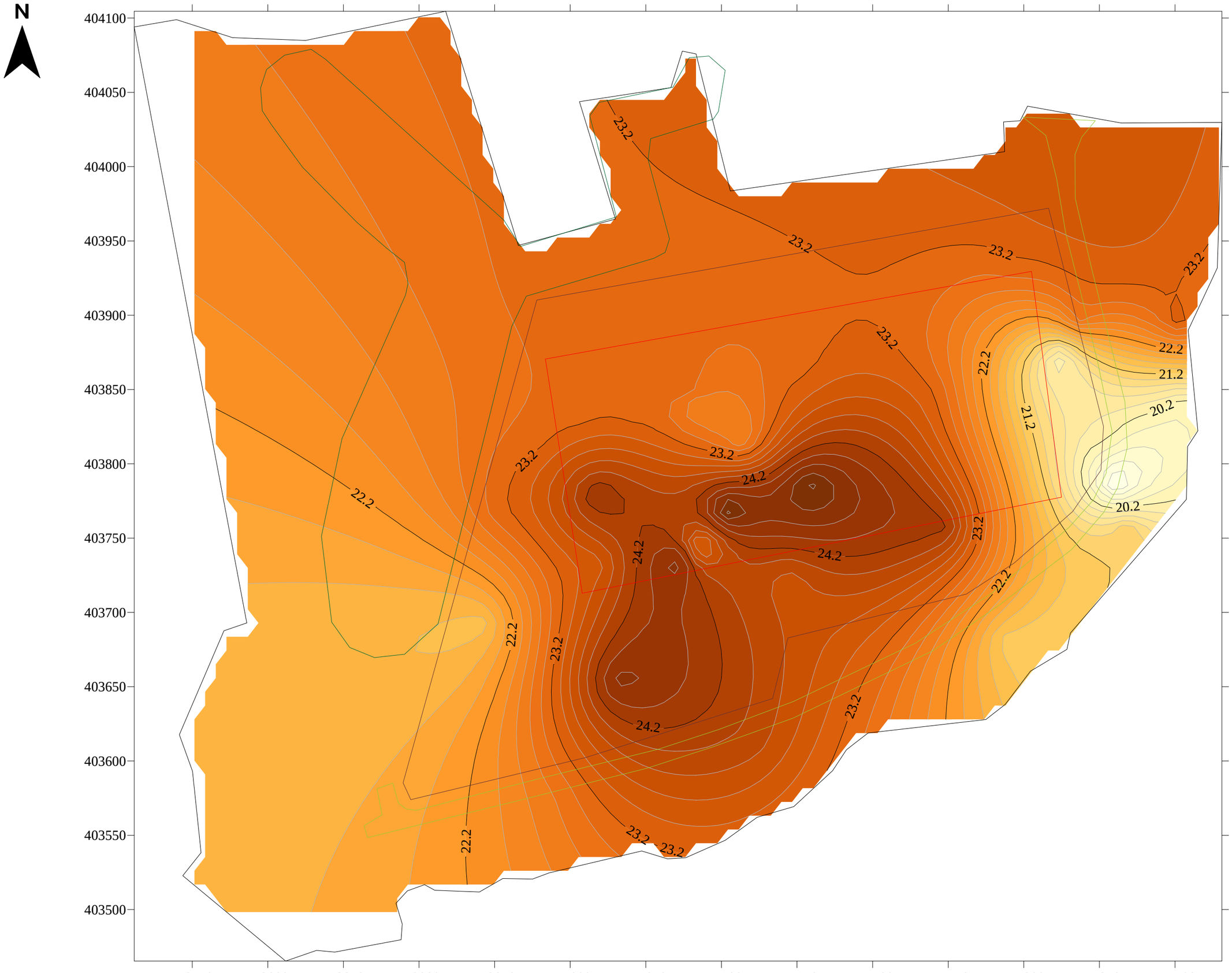
PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
Zone 1 Barnsley Road, Goldthorpe

DRAWING NO.
23451-HYD-XX-XX-DR-GE-0012

REVISION
P02



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2: Location of the Proposed Pad, Proposed Building, Screening Bund and Embanked Road are shown for illustrative purposes and should not be relied upon for design.

3. Data for this plot has been generated from Site investigation results.

Hydrock

Client:

Newlands Developments

Project Title:

Zone 1
Barnsley Road
Goldthorpe

Drawing Title:

Level of Base of Alluvium

Reference:

23451-HYD-XX-XX-DR-GE-0015

N

404100
404050
404000
403950
403900
403850
403800
403750
403700
403650
403600
403550
403500

443750 443800 443850 443900 443950 444000 444050 444100 444150 444200 444250 444300 444350 444400

Notes:

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3. Data for this plot has been generated from Site investigation results and abandonment plans.

Hydrock

Client:

Newlands Developments

Project Title:

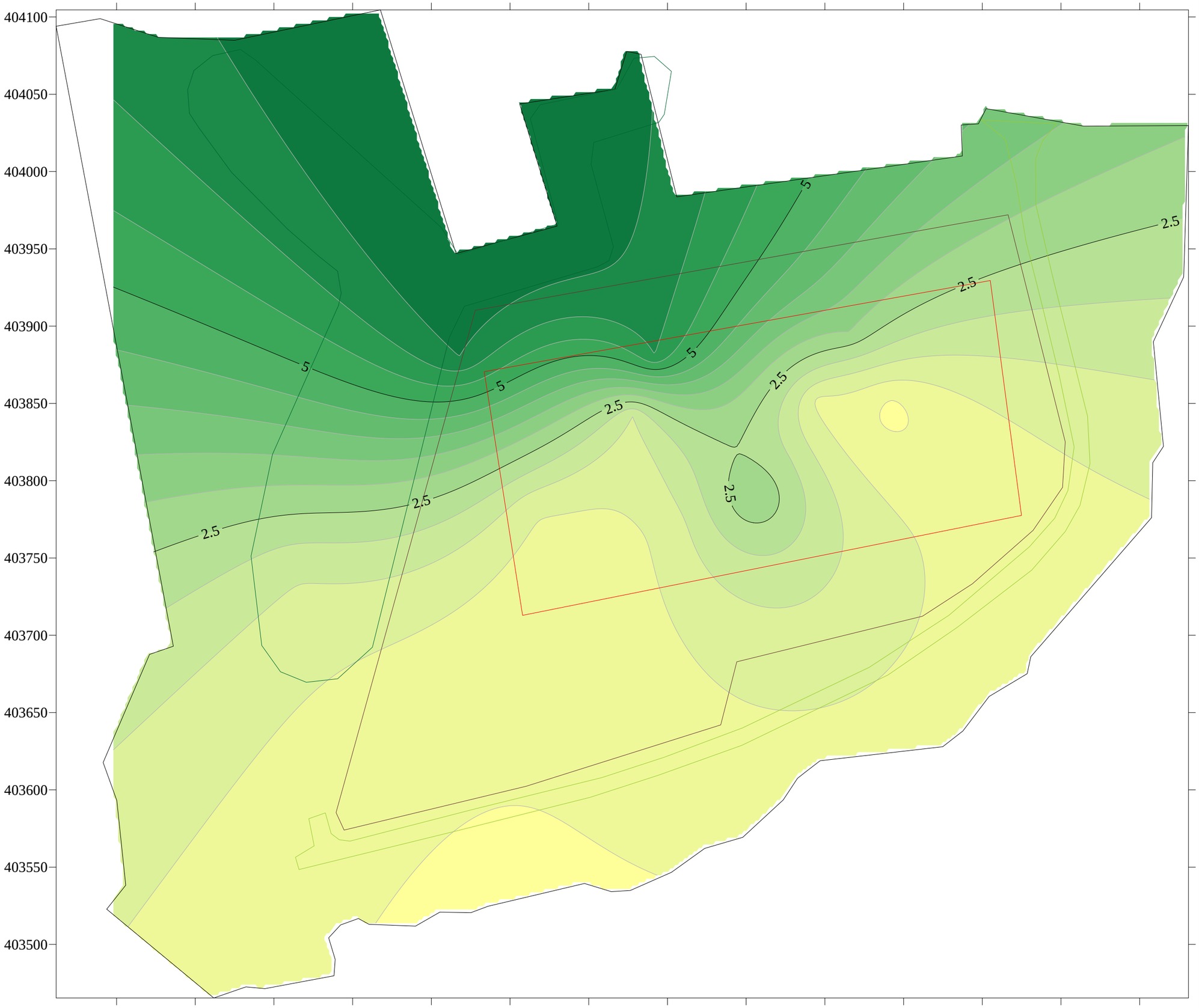
Zone 1
Barnsley Road
Goldthorpe

Drawing Title:

Level of Base of Opencast Backfill

Reference:

23451-HYD-XX-XX-DR-GE-0016



Notes:

1: Contains OS data © Crown copyright and database right (2022)

2: Location of the Proposed Pad, Proposed Building, Screening Bund and Embanked Road are shown for illustrative purposes and should not be relied upon for design.

3. Data for this plot has been generated from Site investigation results and mine abandonment plans

Hydrock

Client:

Newlands Developments

Project Title:

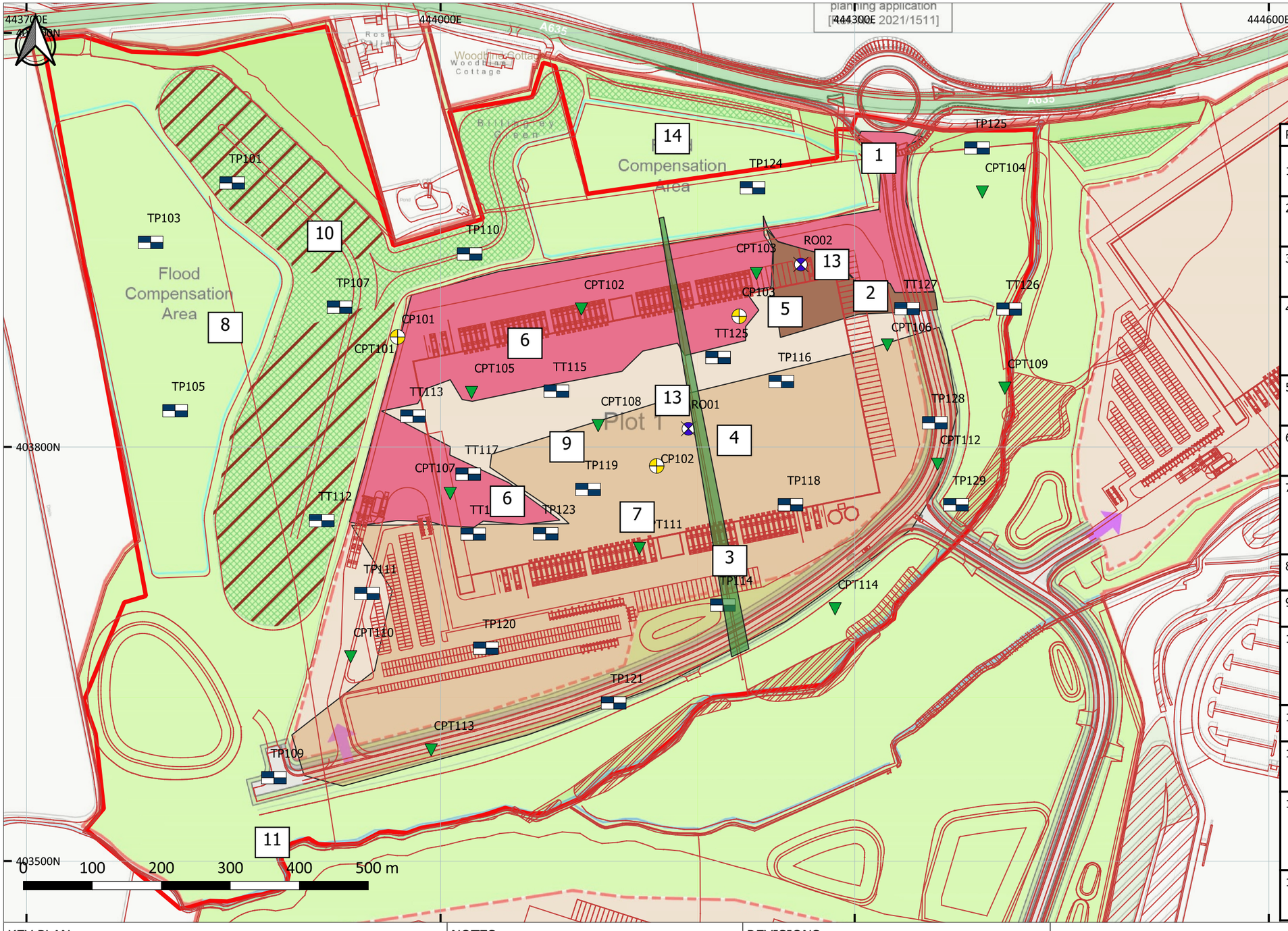
Zone 1
Barnsley Road
Goldthorpe

Drawing Title:

Depth to Pennine Middle Coal Measures

Reference:

23451-HYD-XX-XX-DR-GE-0017



Risk ID	Hazard	Potential Risk
1	Backfilled opencast workings	Excessive settlement of access road embankment and infrastructure (including culverts)
2	Shallow underground mine workings	Excessive settlement and collapse of access road embankment and associated infrastructure
3	Low strength alluvium	Excessive settlement of access road embankment and infrastructure. Pavement foundation failure.
4	Potentially desiccated soils following removal of trees and hedgerow	Ground heave on rehydration and damage to concrete slabs and foundations
5	Shallow underground mine workings	Collapse and subsidence causing damage to ground bearing slabs and foundations
6	Backfilled opencast workings and associated highwall	Excessive settlement including differential settlement of ground bearing slabs and foundations
7	Low strength alluvium	Excessive settlement of ground bearing floor slabs and structural foundations. Difficulty trafficking site in temporary condition
8	Lack of investigation data	Soils won from borrow pit are not suitable as engineered fill
9	Uncertainty with investigation data	Underground mine workings more extensive than anticipated
10	Backfilled opencast workings in conjunction with proposed landscape mounds	Excessive settlement and/or failure of proposed culvert
11	Site strip and exposed subsoils	Excessive runoff and silt entering watercourse
12	Limit of Preliminary Investigation scope	Hazards may be greater or smaller than anticipated based on limited scope of investigation
13	Void and Coal deposits encountered outside expected area	Underground mine workings more extensive than anticipated
14	Risk from Known Landfill not yet fully categorised.	Geotechnical properties of this area are unknown

KEY PLAN

- Zone 1 Site Boundary
- Hedgerows and Trees
- Borrow pits
- Area affected by Alluvium
- Potential shallow workings area
- Proposed Development over Opencast Backfill

NOTES

1. Contains OS data © Crown copyright and database right (2022)

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	AL	DF	28/05/202	First issue
P02	AL	AC	06/06/202	Second issue

Hydrock

TITLE
Site Geohazard Risk Plan

HYDROCK PROJECT
23451

SCALE @ A3
1:3,000

CLIENT
Newlands Developments

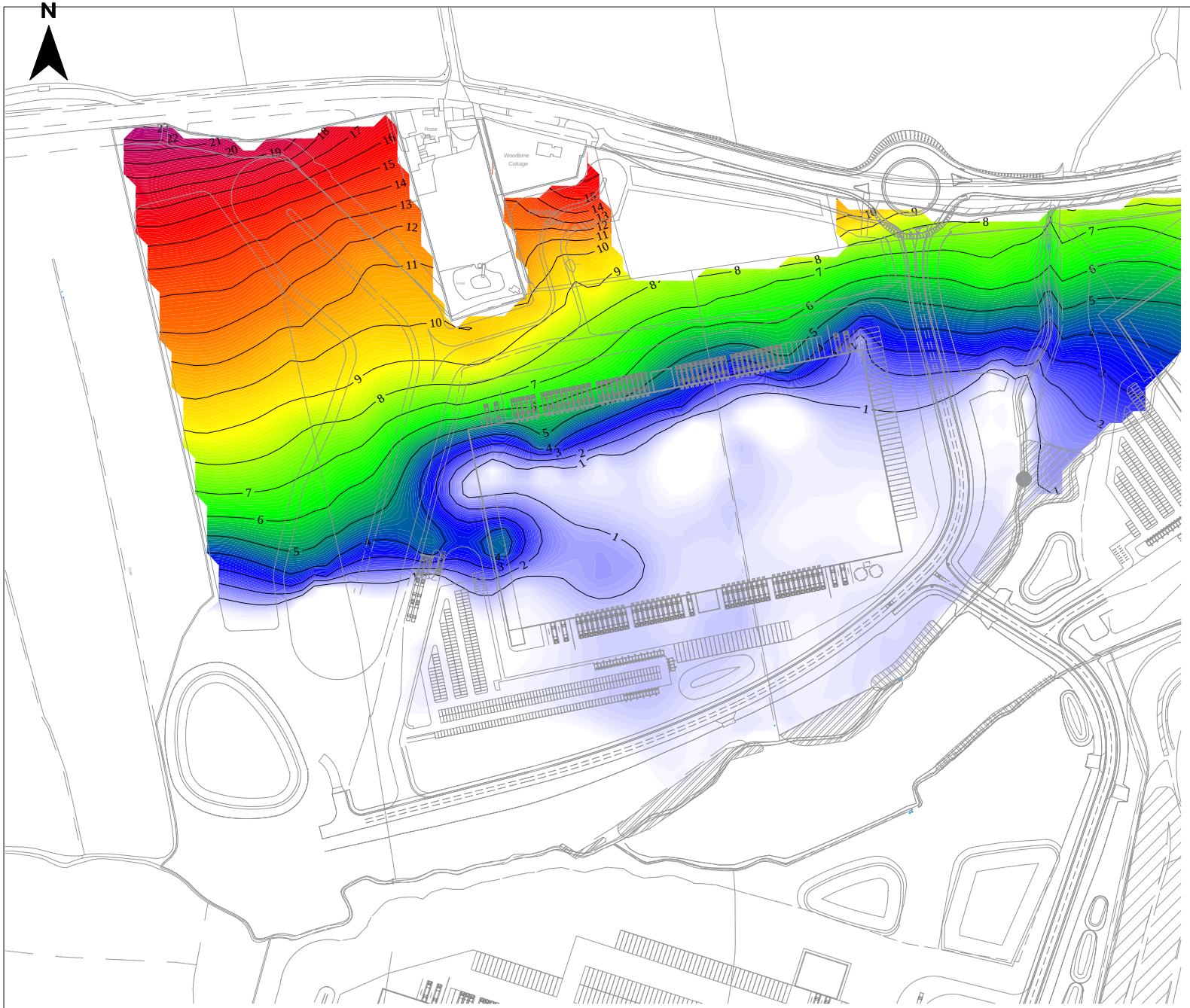
PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
Zone 1 Barnsley Road, Goldthorpe

DRAWING NO.
23451-HYD-XX-XX-DR-GE-1018

REVISION
P02



Notes:

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3. Data for this plot has been generated from Site investigation results and abandonment plans.

Hydrock

Client:

Newlands Developments

Project Title:

Zone 1
Barnsley Road
Goldthorpe

Drawing Title:

Depth and distribution of Made Ground

Reference:

23451-HYD-XX-XX-DR-GE-0019

Appendix B Exploratory hole location plan, exploratory hole logs and photographs

Exploratory hole location plan

KEY PLAN

AC- Exploratory Holes [60]

- Trial Pit [30]
- Rotary Open [2]
- Cable Percussion [3]
- Cone Penetration Test [14]

NOTES

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3. TP101, TP103, TP105 and TP109 were not completed due to ground conditions and the location of a ground bird nesting area.

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	AL	JB	01/03/202	First issue
P02	AL	JB	02/05/202	Second Issue
P03	AL	AC	06/06/202	Third issue

Hydrock

TITLE
Finalised Ground Investigation Plan

HYDROCK PROJECT
23451

SCALE @ A3
1:3,000

CLIENT
Newlands Developments

PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
Zone 1 Barnsley Road, Goldthorpe

DRAWING NO.
23451-HYD-XX-XX-DR-GE-0010

REVISION
P03

Exploratory hole logs

Hydrock

Project: Goldthorpe

Borehole No
CP101
Page No. 1 of 1

Method: Cable Percussion	Date(s): 04/04/2023	Logged By: AL	Drilled By: DMW Drilling
Client: Newlands Developments	Co-ords: 443969.25, 403878.86	Checked By: JB	Flush:
Hydrock Project No: 23451	Ground Level: 24.16m OD		Scale: 1:50

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Depth (m)	Type	Results							
0.00	D			Soft to firm dark brown sandy slightly gravelly CLAY with rare rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare brick and plastic. (MADE GROUND)	0.30	(0.30)	23.86		
0.00	D								
0.00 - 0.30	B								
0.30	ES			Soft to firm dark brown mottled grey slightly sandy gravelly CLAY with rare rootlets. Gravel is angular to subrounded fine to coarse of coal, sandstone, ironstone and rare timber. (OPENCAST BACKFILL)					
0.50 - 1.00	B								
0.50 - 1.00	B								
0.60	ES								
1.00	D				1				
1.20	SPT	N=5 (1,1,2,1,1,1)		*... At 1.2 - 2m bgl: Becoming firm.*					
1.20	ES								
1.20 - 1.65	B								
1.20 - 1.65	B								
2.00	SPT	N=6 (1,2,2,1,2,1)			2				
2.00	D								
2.50 - 3.00	B								
3.00	SPT	N=10 (1,2,2,2,3,3)		*... At 3m bgl: Becoming stiff.*	3				
3.00	D								
3.00 - 3.50	B					(6.20)			
3.50	D								
3.50 - 4.00	B								
4.00	SPT	N=12 (3,3,2,3,3,4)			4				
4.00	D								
4.00 - 4.50	B								
4.00 - 4.50	B								
4.50 - 5.00	B								
5.00	SPT	N=19 (5,4,4,5,5,5)		*... At 5m bgl: Becoming very stiff.* *... At 5.0 - 6.5m bgl: With occasional medium to coarse gravel of COAL.*	5				
5.00	D								
5.50 - 6.00	B								
6.00	D				6				
6.50	SPT	N=50 (10,15,30,20,0,0)			6.50		17.66		
6.50	D			Weak to strong light grey SILTSTONE (PENNINE MIDDLE COAL MEASURES)					
6.50 - 7.00	B								
6.50 - 7.00	B				7	(0.95)			
7.00	SPT	N=50 (25,50,50,0,0,0)			7.45		16.71		
				End of Borehole at 7.45m					
					8				
					9				
					10				

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)
6.50	7.00	01:00

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using cable percussion from 1.20m to 7.45m bgl. 3) Hole terminated at 7.45m bgl due to refusal on bedrock. 4) Installed upon completion with a response zone from 1.00m and 6.00m bgl.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Borehole No
CP102
Page No. 1 of 1

Method: Cable Percussion	Date(s): 21/03/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Newlands Developments	Co-ords: 444157.03, 403786.99	Checked By: JB	Flush:
Hydrock Project No: 23451	Ground Level: 25.08m OD		Scale: 1:50

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Depth (m)	Type	Results							
0.00	B			Soft to firm dark brown sandy slightly gravelly CLAY with rare rootlets and coarse gravel-sized pockets of organic clay. Gravel is angular to subrounded fine to coarse of sandstone and rare brick and plastic. (MADE GROUND)	0.50	(0.50)	24.58		
0.00	D								
0.30	ES								
0.50	B			Medium dense light brown sandy clayey GRAVEL. Gravel is angular to subangular fine to medium of sandstone. (ALLUVIUM)					
0.50	B								
0.50	D								
0.50	ES								
1.00	B			*... At 1.0 - 3.0m bgl: With rare black staining*	1	(1.50)			
1.00	B								
1.00	D								
1.00	D								
1.00	ES								
1.20	SPT	N=20 (3,4,5,5,5,5)							
1.20 - 1.65	B				2.00		23.08		
1.50	B			Very dense greyish brown slightly sandy slightly clayey GRAVEL. Gravel is angular to subangular fine to coarse of mudstone and sandstone. (WEATHERED PENNINE MIDDLE COAL MEASURES)					
1.50	D			*... At 2m bgl: Becoming Very Dense*					
2.00	SPT	N=50 (6,8,15,21,14,0)							
2.00	B				3	(2.00)			
2.00	B								
2.00	D								
2.50	B								
2.50	D								
3.00	SPT	N=50 (12,13,15,15,20,0)							
3.00	D				4.00		21.08		
3.00 - 3.45	B			Extremely Weak grey SILTSTONE recovered as angular fine to coarse Gravel. (PENNINE MIDDLE COAL MEASURES)		(0.45)			
3.00 - 3.45	B				4.45		20.63		
3.50	B			End of Borehole at 4.45m					
3.50	D								
4.00	SPT	N=50 (9,10,12,15,17,6)							
4.00	D								
4.00 - 4.45	B								

Progress and Observations								
Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling		
From (m)	To (m)	Duration (HH:MM)
3.75	4.00	01:00

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using cable percussion from 1.20m to 4.45m bgl. 3) Hole terminated at 4.45m bgl due to refusal on bedrock. 4) Installed upon completion with a response zone from 1.00m and 2.00m bgl.

Logged in general accordance with BS5930:2015

Hydrock	Project: Goldthorpe	Borehole No CP103 Page No. 1 of 1

Method: Cable Percussion	Date(s): 20/03/2024 - 21/03/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Newlands Developments	Co-ords: 444216.40, 403894.94	Checked By: JB	Flush:
Hydrock Project No: 23451	Ground Level: 22.71m OD		Scale: 1:50

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Depth (m)	Type	Results							
0.30	ES			Soft to firm dark brown sandy slightly gravelly CLAY with rare rootlets and coarse gravel-sized pockets of organic clay. Gravel is angular to subrounded fine to coarse of sandstone and rare brick and plastic. (MADE GROUND) *... At 0.3 - 0.60m bgl: Becoming soft to firm* *... At 0.6 - 1.0m bgl: Becoming firm*	1.00	(1.00)	21.71		
0.50	D								
0.50	ES								
0.80	ES								
1.00	B								
1.00	B								
1.00	D								
1.20	SPT	N=16 (3,3,4,4,4,4)		Firm brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to medium of sandstone and rare coal (OPENCAST BACKFILL)	1.50	(0.50)	21.21		
1.20	B								
1.20	ES								
1.50	B								
1.50	D								
2.00	SPT	N=18 (3,4,4,4,5,5)		Firm grey brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to medium of coal, ironstone and rare sandstone. (OPENCAST BACKFILL)	2.00	(0.50)	20.71		
2.00 - 2.45	B			Firm to stiff black sandy slightly gravelly CLAY with occasional coarse gravel-sized pockets of stiff grey Clay. Gravel is angular to subrounded fine to medium of Coal. (OPENCAST BACKFILL) *... At 2.0m bgl: Becoming firm to stiff, grey brown*	3.00	(1.00)	19.71		
2.50	B								
2.50	D								
3.00	SPT	N=24 (2,4,6,6,6,6)		Stiff grey mottled black sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of Coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	3.50	(0.50)	19.21		
3.00	B								
3.00	B								
3.50	B								
3.50	B								
3.50	D								
4.00	SPT	N=50 (8,12,50,0,0,0)		Weak to strong light grey SILTSTONE recovered as grey mottled black sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of Coal. (PENNINE MIDDLE COAL MEASURES) *... At 3.5m bgl: Becoming stiff to very stiff*	4.50	(1.00)	18.21		
				End of Borehole at 4.50m					

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)
4.00	4.50	01:00

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using cable percussion from 1.20m to 4.45m bgl. 3) Hole terminated at 4.5m bgl due to refusal on bedrock. 4) Installed upon completion with a response zone from 0.50m and 1.50m bgl.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Borehole No
RO01
Page No. 1 of 1

Method: Rotary Open	Date(s): 25/03/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Newlands Developments	Co-ords: 444179.38, 403812.70	Checked By: JB	Flush: Water
Hydrock Project No: 23451	Ground Level: 24.84m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
								TOPSOIL (Drillers description). (TOPSOIL)	0.20	(0.20)	24.64		
								Clay (Drillers description). (ALLUVIUM)		(1.80)			
									2.00		22.84		
								Grey mudstone/ siltstone (Drillers description). (PENNINE MIDDLE COAL MEASURES)		(8.50)			
									10.50		14.34		
								No flush return, Fractured Ground (Drillers description). (VOID)		(1.50)			
									12.00		12.84		
								End of Borehole at 12.00m					

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
Commachio 305	22/04	1700	12.00	12.00	110		Water	

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using rotary open hole drilling from 1.20m to 12.00m bgl. 3) Hole terminated at 12.00m bgl due to loss of flush. 4) Installed upon completion with a response zone from 4.00m and 10.00m bgl.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Borehole No
RO02
Page No. 1 of 1

Method: Rotary Open	Date(s): 20/03/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Newlands Developments	Co-ords: 444093.05, 403879.62	Checked By: JB	Flush: Water
Hydrock Project No: 23451	Ground Level: 23.64m OD		Scale: 1:100

Run (m)	Samples / Tests			Drilling Record			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	Weight (Kg)	Mins	Secs							
								TOPSOIL (Drillers description). (TOPSOIL)	0.30	(0.30)	23.34		
								Clay (Drillers description). (ALLUVIUM)					
										(5.70)			
									6.00		17.64		
								Clayey gravel with coal fragments (Drillers description). (WEATHERED PENNINE MIDDLE COAL MEASURES)					
										(9.00)			
									15.00		8.64		
								COAL (Drillers description). (COAL)	15.30	(0.30)	8.34		
								... Loss of flush		(0.70)			
								Grey mudstone/ siltstone (Drillers description). (WEATHERED PENNINE MIDDLE COAL MEASURES)	16.00		7.64		
								VOID (Drillers description). (VOID)		(0.70)			
								... Loss of flush	16.70		6.94		
								Grey mudstone/ siltstone (Drillers description). (PENNINE MIDDLE COAL MEASURES)		(1.70)			
									18.40		5.24		
								End of Borehole at 18.40m					

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)
Commachio 305	21/04	1700	18.40	15.00	110		Water	

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using rotary open drilling from 1.20m to 18.40m bgl. 3) Hole terminated at 18.40m bgl due to loss of flush. 4) Installed upon completion with a response zone from 12m and 14m bgl.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP107
Page No. 1 of 1

Method: Trial Pit	Date(s): 03/04/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 443922.36, 403901.36	Stability: Stable	Dimensions: 2.90m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.84m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (OPENCAST BACKFILL)		(0.30)		
0.30	ES				0.30		23.54	
				Soft greyish brown sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, siltstone, coal and small fragments of timber. (OPENCAST BACKFILL)				
0.50	D							
0.80	ES							
1.00	B				1			
1.00	B					(2.00)		
1.50	D							
2.00	B				2			
2.30	D				2.30		21.54	
				Base of Excavation at 2.30m				
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.3m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2.3m bgl: Fast groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP110
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444016.80, 403940.02	Stability: Stable	Dimensions: 2.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.78m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (OPENCAST BACKFILL)	0.20	(0.20)	22.58	
0.30	ES			Light grey clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse of sandstone, siltstone, coal and rare small fragments of timber. (OPENCAST BACKFILL)				
0.50	D							
0.60	ES					(1.30)		
1.00	B				1			
1.00	B							
1.50	D		▼		1.50		21.28	
				Dark grey clayey sandy GRAVEL. Gravel is angular to subangular fine to coarse of siltstone, coal and rare small fragments of timber. (OPENCAST BACKFILL) *... At 1.5m bgl: Slow groundwater ingress.*		(0.60)		
2.00	B		▼	*... At 2m bgl: Fast groundwater ingress.*	2			
				Base of Excavation at 2.10m	2.10		20.68	
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.1m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit unstable 7) At 1.5m bgl: Slow groundwater intrusion. At 2m bgl: Fast groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP111
Page No. 1 of 1

Method: Trial Pit	Date(s): 26/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 443941.94, 403693.62	Stability: Stable	Dimensions: 2.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.61m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	23.31	
0.30	ES			Firm to Stiff light orangish brown very sandy slightly gravelly clayey CLAY. Gravel is subangular and subrounded fine to coarse of sandstone and mudstone. (ALLUVIUM)	0.70	(0.40)	22.91	
0.50	ES			Brown mottled orange and grey gravelly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone and mudstone. (ALLUVIUM)	2.10	(1.40)	21.51	
1.00	D			Base of Excavation at 2.10m				
1.50 - 2.00	B							
1.50 - 2.00	B							

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.1m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2.1m bgl: Slow groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP114
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444200.95, 403684.84	Stability: Unstable	Dimensions: 2.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.56m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	24.26	
0.30	ES			Soft to firm light brown mottled orange and grey sandy slightly gravelly CLAY with coarse gravel-sized pockets of fine to medium sand. Gravel is angular to subangular, fine to coarse of sandstone. (ALLUVIUM)	0.70	(0.40)	23.86	
0.50	D							
0.60	ES							
				Light brown mottled orange and grey clayey slightly gravelly SAND. Gravel is angular to subangular, fine to medium of sandstone and rare coal. (ALLUVIUM)	1.20	(0.50)	23.36	
1.00	B							
1.00	B							
				Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to medium of sandstone and rare coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)		(1.00)		
1.50	D			*... At 1.8 - 2.2m bgl: Becoming stiff to very stiff, with gravelly fine to medium angular and subangular of sandstone and siltstone.*				
2.00	B							
				Base of Excavation at 2.20m	2.20		22.36	

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.2m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2.2m bgl: Slow groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP116
Page No. 1 of 1

Method: Trial Pit	Date(s): 03/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444243.30, 403847.82	Stability: Stable	Dimensions: 2.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.15m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.20	(0.20)	22.95	
0.20	ES			Orange brown mottled grey gravelly slightly clayey SAND. Gravel is rounded to subrounded fine and medium of sandstone. (ALLUVIUM)	0.40	(0.20)	22.75	
0.40	D			*... At 0.2 - 1.2m bgl: Sidewalls unstable.*				
0.50	B			Grey mottled orange brown sandy clayey GRAVEL. Gravel is angular to subrounded fine to coarse of weathered/stained sandstone. (WEATHERED PENNINE MIDDLE COAL MEASURES)				
0.50	B							
1.00	D				1	(1.20)		
1.50	B				1.60		21.55	
				Base of Excavation at 1.60m				
					2			
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 1.6m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit unstable 7) No Groundwater encountered

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP118
Page No. 1 of 1

Method: Trial Pit	Date(s): 03/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444248.53, 403758.32	Stability: Stable	Dimensions: 2.20m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.26m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.25	(0.25)	24.01	
0.30	ES			Orange brown mottled grey gravelly slightly clayey SAND. Gravel is rounded to subrounded fine and medium of sandstone. (ALLUVIUM)				
0.50	D							
0.60	ES					(0.85)		
1.00	B				1.10		23.16	
				Grey mottled orange brown sandy clayey GRAVEL. Gravel is angular to subrounded fine to coarse of weathered/stained sandstone. (WEATHERED PENNINE MIDDLE COAL MEASURES)				
1.50	D					(0.80)		
1.90	B		▼	Base of Excavation at 1.90m	1.90		22.36	

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 1.9m bgl and backfilled with arisings. 4) Hole terminated due to Machine limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit unstable 7) No Groundwater encountered

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP119
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444102.62, 403769.68	Stability: Stable	Dimensions: 2.90m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 25.15m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY with occasional rootlets. Gravel is angular to subangular, fine to coarse of sandstone and mudstone. (TOPSOIL)	0.30	(0.30)	24.85	
0.50	D			Soft to firm light brown mottled orange and grey sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone. (ALLUVIUM)		(0.90)		
1.00	B				1			
1.00	B							
				Firm light brown mottled orange and light grey sandy clayey GRAVEL with a medium cobble content of angular to subangular sandstone. Gravel is angular to subangular, fine to coarse of sandstone. (WEATHERED PENNINE MIDDLE COAL MEASURES)	1.20		23.95	
1.50	D					(0.80)		
2.00	B		▼		2			
				Base of Excavation at 2.00m	2.00		23.15	
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2m bgl: Slow groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP120
Page No. 1 of 1

Method: Trial Pit	Date(s): 26/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444029.01, 403654.54	Stability: Stable	Dimensions: 2.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.68m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Dark brown clayey Slightly gravelly SAND. Gravel is fine to medium angular to subrounded of limestone, sandstone and rare brick. (MADE GROUND)	0.15	(0.15)	24.53	
0.20	ES			Orange brown mottled grey slightly clayey sandy GRAVEL. Gravel is fine and medium angular to subangular plainar sandstone. (ALLUVIUM)				
0.60	ES					(1.25)		
1.00	D			*... At 1.0m bgl: Becoming fine to coarse with occasional cobbles*	1			
1.00	D			*... At 1.0 - 1.4m bgl: With rare cobble-sized pockets of grey slightly gravelly Clay.*				
1.40	B				1.40		23.28	
				Base of Excavation at 1.40m				
					2			
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 1.4m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) No Groundwater encountered

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP121
Page No. 1 of 1

Method: Trial Pit	Date(s): 29/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444120.99, 403613.91	Stability: Stable	Dimensions: 2.20m / 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.90m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.20	(0.20)	23.70	
0.30	ES			Soft to firm red brown mottled grey sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine to medium of sandstone and rare coal. (ALLUVIUM)				
0.60	ES					(0.60)		
0.70 - 0.80	B				0.80		23.10	
0.75	B							
0.75 - 0.80	B			Firm to very stiff greyish yellow slightly silty CLAY. (WEATHERED PENNINE MIDDLE COAL MEASURES)				
1.00	D							
1.50	B							
1.50	B			*... At 1.7 - 2.6m bgl: With closely spaced thin beds of black friable coal and weak sandstone*		(1.80)		
2.00	D							
				... At 2.4m bgl: Slow groundwater ingress.				
2.50	B							
				Base of Excavation at 2.60m	2.60		21.30	

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.6m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2.4m bgl: Slow groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP124
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Method: Trial Pit	Date(s): 04/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444221.69, 403987.80	Stability: Unstable	Dimensions: 2.20m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.55m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (OPENCAST BACKFILL)	0.40	(0.40)	22.15	
0.50	D			Soft to firm orangish brown mottled grey sandy slightly gravelly CLAY. Gravel is subrounded, fine to coarse of sandstone. (OPENCAST BACKFILL)	0.80	(0.40)	21.75	
0.50	ES							
0.90	ES			Dark grey slightly sandy clayey GRAVEL. Gravel is fine to coarse Angular to subrounded of Coal, mudstone, rare small fragments of timber and stained/weathered ironstone. (OPENCAST BACKFILL)	1.40	(0.60)	21.15	
1.00	B							
1.00	B							
1.40	D			Base of Excavation at 1.40m				

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 1.4m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 1.4m bgl: Fast groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP125
Page No. 1 of 1

Method: Trial Pit	Date(s): 29/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444374.17, 404013.27	Stability: Unstable	Dimensions: 2.20m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.82m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and brick. (MADE GROUND)	0.30	(0.30)	22.52	
0.50	D			Firm light brown mottled orange and grey sandy gravelly CLAY with rare rootlets. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (MADE GROUND)	0.90	(0.60)	21.92	
1.00	B			Firm to stiff dark grey to black slightly sandy gravelly CLAY. Gravel is angular, fine to coarse of coal, shale and siltstone. (OPENCAST BACKFILL)	1.30	(0.40)	21.52	
1.50	D			Firm to stiff light brown mottled orange and light grey sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, siltstone, mudstone and coal. (OPENCAST BACKFILL)		(1.00)		
2.00	B				2.30		20.52	
				Base of Excavation at 2.30m				

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.3m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit unstable 7) At 1.4m bgl: Fast groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP128
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444354.07, 403818.31	Stability: Stable	Dimensions: 3.50m / 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.79m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and brick. (MADE GROUND)	0.30	(0.30)	22.49	
0.50	D			Soft greyish brown sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, siltstone and coal. (ALLUVIUM)				
0.60	ES				0.70	(0.40)	22.09	
1.00	B			Firm light brown mottled orange and grey sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. (ALLUVIUM)				
1.00	D							
1.50	D				1.80	(1.10)	20.99	
2.00	B			Soft grey mottled orange very sandy slightly gravelly CLAY. Gravel is angular to subangular of sandstone and coal. (ALLUVIUM)				
2.50	B				2.50	(0.70)	20.29	
				Base of Excavation at 2.50m				

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.5m bgl and backfilled with arisings. 4) Hole terminated due to Machine limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) No Groundwater encountered

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TP129
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444368.04, 403758.51	Stability: Stable	Dimensions: 3.80m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.55m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and brick. (MADE GROUND)	0.30	(0.30)	23.25	
0.30	ES			Light greyish brown mottled orange slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone. (ALLUVIUM)				
0.50	D							
0.60	ES					(0.70)		
1.00	B				1.00		22.55	
				Soft to firm orangish brown mottled grey sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. (ALLUVIUM)				
1.50	D					(1.40)		
2.40	B			Base of Excavation at 2.40m	2.40		21.15	

General Remarks:
1) Location cleared for services. 2) Trial Pit excavated using 8T tracked excavator. 3) Trial Pit completed at 2.4m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Pit stable 7) At 2.4m bgl: Slow groundwater intrusion.

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT112
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 443865.64, 403741.89	Stability: Stable	Dimensions: 33.00m / 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.56m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	23.26	
0.30	ES			Soft light brownish grey slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to medium of sandstone. (ALLUVIUM)	0.50	(0.20)	23.06	
0.50	D			Soft to firm light brown mottled orange and grey sandy slightly gravelly CLAY with coarse gravel-sized pockets of fine to medium sand. Gravel is angular to subangular, fine to coarse of sandstone. (ALLUVIUM)	0.90	(0.40)	22.66	
0.60	ES			Light brown mottled orange and grey clayey slightly gravelly SAND. Gravel is angular to subangular, fine to medium of sandstone and rare coal. (ALLUVIUM)	1.60	(0.70)	21.96	
1.00	B			Blackish brown clayey GRAVEL. Gravel is angular to subangular, fine to medium of sandstone. Siltstone, ironstone and rare coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	2.60	(1.00)	20.96	
1.50	D			Base of Excavation at 2.60m				
2.00	B							
2.50	B							
2.50	B		▼					

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 2.6m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) At 2.6m bgl: Slow groundwater intrusion.8) Trial trench excavated 33m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT113
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 443977.91, 403814.62	Stability: Stable	Dimensions: 15.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.74m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	24.44	
0.50	D			Firm to Stiff light orangish brown very sandy slightly gravelly clayey CLAY. Gravel is subangular and subrounded fine to coarse of sandstone and mudstone. (ALLUVIUM)	0.70	(0.40)	24.04	
1.40	B			Light orange brown mottled grey slightly clayey sandy GRAVEL. Gravel is angular to subrounded fine to medium of siltstone, ironstone, limestone with rare medium gravel-sized pockets of black coal. (ALLUVIUM)	1.60	(0.90)	23.14	
				Base of Excavation at 1.60m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.6m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 15m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT115
Page No. 1 of 1

Method: Trial Pit	Date(s): 02/04/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444079.26, 403840.82	Stability: Stable	Dimensions: 15.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.12m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.30	ES			Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	23.82	
0.50 0.50 0.60	D D ES			Soft to firm light brown mottled orange and grey sandy slightly gravelly CLAY with coarse gravel-sized pockets of fine to medium sand. Gravel is angular to subangular, fine to coarse of sandstone. (ALLUVIUM)	0.70	(0.40)	23.42	
1.00	D			Light brown mottled orange and grey clayey slightly gravelly SAND. Gravel is angular to subangular, fine to medium of sandstone and rare coal. (ALLUVIUM)	1.50	(0.80)	22.62	
1.50	B			Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to medium of sandstone and rare coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	2.00	(0.50)	22.12	
2.00 2.00 2.00	B D D			Base of Excavation at 2.00m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 2m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) At 2m bgl: Slow groundwater intrusion.8) Trial trench excavated 15m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT117
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444016.13, 403780.19	Stability: Stable	Dimensions: 23.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.42m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20	ES			Soft dark brown sandy slightly gravelly CLAY with occasional rootlets. Gravel is angular to subangular, fine to coarse of mudstone, sandstone and coal. (TOPSOIL)	0.25	(0.25)	24.17	
0.50 0.50	D ES			Light brown mottled orange and grey gravelly clayey SAND with rare rootlets. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (ALLUVIUM)	1.10	(0.85)	23.32	
1.00 1.00	B B							
1.50	D			Brown clayey SAND and GRAVEL. Gravel is angular to subangular, fine to coarse of sandstone, siltstone, mudstone and coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	1.80	(0.70)	22.62	
				Base of Excavation at 1.80m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.8m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 23m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT122A
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444019.11, 403734.48	Stability: Unstable	Dimensions: 4.00m / 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.43m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.30	(0.30)	24.13	
0.40	ES			Firm to Stiff light orangish brown very sandy slightly gravelly clayey CLAY. Gravel is subangular and subrounded fine to coarse of sandstone and mudstone. (ALLUVIUM)	0.50	(0.20)	23.93	
0.50	B							
0.60	ES			Light orange brown mottled grey slightly clayey sandy GRAVEL. Gravel is angular to subrounded fine to medium of siltstone, ironstone, limestone with rare medium gravel-sized pockets of black coal. (ALLUVIUM)				
1.00	D					(1.40)		
1.30	B							
1.50	D				1.90		22.53	
				Base of Excavation at 1.90m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.9m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) At 1.9m bgl: Slow groundwater intrusion.8) Trial trench excavated 4m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT122B
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444019.11, 403742.48	Stability: Stable	Dimensions: 4.50m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.43m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.25	ES			Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (OPENCAST BACKFILL)	0.30	(0.30)	24.13	
0.50	D			Firm to Stiff light orangish brown very sandy slightly gravelly clayey CLAY. Gravel is subangular and subrounded fine to coarse of sandstone and mudstone. (OPENCAST BACKFILL)	0.50	(0.20)	23.93	
0.50	ES			Soft greyish brown sandy gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, siltstone, coal and small fragments of timber. (OPENCAST BACKFILL)		(0.80)		
1.00	B				1			
1.00	B							
1.30	D				1.30		23.13	
				Base of Excavation at 1.30m				
					2			
					3			
					4			
					5			

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.3m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 4.5m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT123
Page No. 1 of 1

Method: Trial Pit	Date(s): 27/03/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444072.29, 403736.21	Stability: Stable	Dimensions: 14.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 24.75m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY with occasional rootlets. Gravel is angular to subangular, fine to coarse of mudstone, sandstone and coal. (TOPSOIL)	0.30	(0.30)	24.45	
0.40	ES			Soft light yellowish brown mottled orange and grey very sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (ALLUVIUM)	0.80	(0.50)	23.95	
0.50	B							
0.90	ES			Firm to stiff dark grey to black slightly sandy gravelly CLAY. Gravel is angular, fine to coarse of coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	1.40	(0.60)	23.35	
1.00	D							
1.50	B			Stiff light grey mottled orange and brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)	1.60	(0.20)	23.15	
				Base of Excavation at 1.60m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.6m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 14m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT125A

Method: Trial Pit	Date(s): 28/03/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444196.77, 403850.34	Stability: Stable	Dimensions: 14.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.52m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.25	ES			Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and brick. (MADE GROUND)	0.30	(0.30)	23.22	
0.50 0.50	D ES			Firm light brown mottled orange and grey sandy gravelly CLAY with rare rootlets. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (ALLUVIUM)	0.90	(0.60)	22.62	
1.00 1.00	B B			Firm to stiff dark grey to black slightly sandy gravelly CLAY. Gravel is angular, fine to coarse of coal, shale and siltstone. (WEATHERED PENNINE MIDDLE COAL MEASURES)	1.30	(0.40)	22.22	
1.50	D			Firm to stiff light brown mottled orange and light grey sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, siltstone, mudstone and coal. (WEATHERED PENNINE MIDDLE COAL MEASURES)		(1.00)		
2.00	B				2.30		21.22	
				Base of Excavation at 2.30m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 2.3m bgl and backfilled with arisings. 4) Hole terminated due to Groundwater intrusion 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) At 2.3m bgl: Slow groundwater intrusion.8) Trial trench excavated 14m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT125B
Page No. 1 of 1

Method: Trial Pit	Date(s): 28/03/2024	Logged By: AL	Checked By: JB
Client: Newlands Developments	Co-ords: 444196.77, 403874.34	Stability: Stable	Dimensions: 10.00m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 23.52m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft to firm dark brown sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse of sandstone and rare plastic. (MADE GROUND)	0.10	(0.10)	23.42	
				Orange brown mottled grey gravelly slightly clayey SAND. Gravel is rounded to subrounded fine and medium of sandstone. (OPENCAST BACKFILL)	0.25	(0.15)	23.27	
				Light oringish grey clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse of sandstone, siltstone, coal and rare small fragments of timber. (OPENCAST BACKFILL)	0.70	(0.45)	22.82	
				Light greyish brown clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse of sandstone, siltstone, frequent coal and small fragments of timber. (OPENCAST BACKFILL)	1.00	(0.30)	22.52	
				Base of Excavation at 1.00m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 10m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT126
Page No. 1 of 1

Method: Trial Pit	Date(s): 03/04/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444402.88, 403894.29	Stability: Stable	Dimensions: 10.00m x 0.80m / Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.91m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (MADE GROUND)	0.30	(0.30)	22.61	
0.50 0.50	B ES			Firm light brown mottled grey very sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. (ALLUVIUM)	0.90	(0.60)	22.01	
1.00	D			Firm orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone and coal. (ALLUVIUM)	1.60	(0.70)	21.31	
1.50 1.50	B D			Base of Excavation at 1.60m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.6m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 10m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

Hydrock

Project: Goldthorpe

Trialpit No
TT127
Page No. 1 of 1

Method: Trial Pit	Date(s): 03/04/2024	Logged By: JH	Checked By: JB
Client: Newlands Developments	Co-ords: 444335.25, 403894.53	Stability: Stable	Dimensions: 5.20m x 0.80m; Scale: 1:25
Hydrock Project No: 23451	Ground Level: 22.78m OD	Plant: Tracked Excavator 8T	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone, mudstone and coal. (TOPSOIL)	0.30	(0.30)	22.48	
0.50	B			Firm light brown mottled orange and grey sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse of sandstone and coal. (ALLUVIUM)		(0.75)		
0.50	B							
0.50	ES							
1.00	D				1.05		21.73	
				Base of Excavation at 1.05m				

General Remarks:
1) Location cleared for services. 2) Trial Trench excavated using 8T tracked excavator. 3) Trial Trench completed at 1.05m bgl and backfilled with arisings. 4) Hole terminated due to time limitations 5) HSV not recorded due to Sand and Gravel content of soils. 6) Trial Trench stable 7) No Groundwater encountered8) Trial trench excavated 5.2m long, bearing North to South across the opencast to natural ground boundary

Logged in general accordance with BS5930:2015

IN SITU
SITE INVESTIGATION

STATIC CONE PENETRATION TEST

FACTUAL REPORT

CLIENT: Hydrock

PROJECT: Barnsley Road, Goldthorpe

Project	**Barnsley Road, Goldthorpe**
Project No.	**1240176**
Client	**Hydrock**
Address	**Northern Assurance Bldg, 9-21 Princess Street, Albert Square, Manchester M2 4DN**

Attention: Alex Lee

Dear Alex,

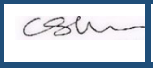
We have pleasure in providing a digital copy of our report and data in AGS format for the above project.

We hope that you are satisfied with the performance of our staff, equipment and reporting on this project. If you should have any queries about any aspect of the works carried out, please do not hesitate to contact us. We look forward to being of service to you in the future.

Yours faithfully,
In Situ Site Investigation Limited

Darren Ward
Director

Report Issue

Issue	Date	Prepared	Sign	Checked	Sign	Approved	Sign
02	23/04/2024	Chloe Donovan		Darren Ward		Darren Ward	

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1.0 INTRODUCTION

In Situ Site Investigation Limited (In Situ) was engaged in a geotechnical site investigation at Barnsley Road, Goldthorpe at the request of Hydrock. The site investigation consisted of completing 16 Static Piezocone Penetration Tests (CPTU), to provide information on the soil conditions and derived geotechnical parameters at:

Barnsley Road,
Barnsley ,
S72 0JE

All test locations were provided by the client. A site map is included in the end of Appendix A of this report (if provided by the client). The tests were stopped when they reached the target depth as per the client's technical specifications or for other technical reasons, as detailed in the *Project Summary Table* in *Appendix A.1* and on each CPTU log included in Appendix B of this report.

The fieldwork was carried out from 21st March 2024 to 22nd March 2024 as per the client's request.

The work on site and the final factual reporting have been undertaken in accordance with the international technical standard *ISO 22476-1:2022(E)*.

2.0 FIELDWORK

2.1 CONE PENETRATION TESTS

The fieldwork activity is summarised in Table 2.1.

Table 2.1 Fieldwork Summary	
CPT Operator/s	Ian Musson & Ryan Robinson
Date Started	21st March 2024
Date Finished	22nd March 2024
In Situ S.I. Project Manager	Darren Ward
Main Contractor's Site Manager	Alex Lee

2.1.1 Rig Information

Details of CPTU rig used in this project are shown in Table 2.2. Full data sheet for the rig is presented in *Appendix A.2*.

Table 2.2 Rig Summary	
Rig Name	**Rig Description**
CPT006	14 Tonne Track Mounted CPT Rig

2.1.2 CPTU Cone

Details of electric CPTU cone (Type TE2) used in this project conforming to the requirements of Application Class 2 of *ISO 22476-1:2022*, are shown in Table 2.3.

Table 2.3 Cone Summary		
Number	**Cross-section area**	**Filter position**
S15-CFIP.1867	15cm^2	u_2

A full datasheet of the cone used is shown in *Appendix A.3*.

The cone's measured parameters are shown in Table 2.4.

Table 2.4 Completed Fieldwork Summary
16 CPTU to a maximum depth of 7.07m. Each test measured Cone Resistance, q_c, Sleeve Friction, f_s, Porewater Pressure in the shoulder position, u_2, Inclination in X and Y axes.
Provision of factual report with estimated soil type, derived geotechnical parameters & AGS data file.

2.1.3 CPTU Cone Calibration

The cone resistance and sleeve friction are recorded by calibrated load cells in the cone. The CPTU load cells and pressure transducers are regularly calibrated in line with *ISO 22476-1:2022(E)* standard by the cone manufacturer. The cone calibration certificate for the cone used at this site are presented in *Appendix A.4*.

2.1.4 CPTU Cone Saturation

The pore water pressure is recorded using a calibrated pressure transducer located in the piezocone. To ensure pore water pressure measurements are not affected by the presence of air in the measuring transducer, a de-airing procedure is carried out prior to each test. The cone and filter are saturated using a glycerine fluid with a viscosity of 10,000 CST.

2.1.5 Test Procedure

The tests are carried out in accordance with the *International Standard for Electrical Cone and Piezocone Penetration Test ISO 22476-1:2022(E)*.

The final depths of the tests were determined by either completion to the specified test depth or when the maximal safe capacity of the equipment was reached. A schedule of the tests performed is shown in *Appendix A.1*, which has been compiled from the operators' daily progress reports.

The data is transmitted from the digital CPTU through an umbilical cable that runs through the push rods to the data acquisition system. Results are displayed instantaneously on the computer logging screen. The results are recorded on the computer hard disc.

The rate of penetration is kept constant at 20 mm/s ± 5 mm/s except when penetrating very dense or hard strata. Before each test is carried out zero values are taken of the cone to check if it is within calibration. At the end of each test, zero values are taken again to see if there has been any drift during the test. These values are inspected during the post processing stage. This is a quality check on the data and the testing procedure. Individual test zero values are shown on their corresponding test results in *Appendix B*.

2.1.6 In Situ Pore Pressure (u_0)

The in situ or hydrostatic pore pressure is required for the calculation of several derived parameters included in this report. For this report, the groundwater level is assumed at 0.5m below ground surface, for calculation purposes. The in situ pore pressure, u_0 values are presented on the pore pressure plot, on *CPT Log 01,* which is included in *Appendix B*.

2.2 POSITIONING

Positioning and surveying of all investigated locations was the responsibility of the client.

3.0 CONE PENETRATION MEASURED PARAMETERS

All measured parameters of tests carried with the CPTU cone are shown in *Appendix B* and all the information about data processing and results are given in sections *3.1*, *3.2* and *3.3*.

3.1 DATA PROCESSING

The measured parameters, cone end resistance, q_c, sleeve friction, f_s, porewater pressure measurements with filter in shoulder position, u_2 and inclination for *x* and *y* axis, I_x, I_y, were recorded for every *10 mm* of penetration keeping a constant speed of *20 mm/s ± 5 mm/s*, which may slightly change when the cone is penetrating hard strata.

The measured data from the site works is processed and presented using specialised CPT software. The interpretations on the CPTU results were carried out following the recommendations of *ISO 22476-1:2022(E)*, *Lunne et al. (1997)* and *Robertson (2015)*. Measured parameters, mentioned in *Sections 3.2* and *3.3*, were used to derive all the geotechnical parameters, which are presented in *Chapter 4.0*. The soil behaviour type method used on this report is *Robertson et al. (1986)*, shown in *Figure 3.2*.

3.1.1 Zero Measurements

Before and after each CPTU test, zero measurements are recorded for each channel of the cone. The zero measurements are presented on the logs in *Appendix B*. This is a routine quality check carried out on site.

3.2 MEASURED PARAMETERS

3.2.1 Cone Resistance (q_c)

Cone resistance, q_c, is measured as the total force acting on the cone, divided by the projected area of the cone. The results are presented in *MPa*, on *CPT Log 01*, in *Appendix B*, scale *0-20 MPa* with a minor scale printing on the same graph at *0-4 MPa*.

3.2.2 Sleeve Friction (f_s)

Sleeve friction, f_s, is measured as the total frictional force acting on the friction sleeve divided by its surface area. The results are presented in *kPa*, on *CPT Log 01*, in *Appendix B*, using a scale of *0-500 kPa*.

3.2.3 Porewater pressure (u_2)

The pore pressure, u_2, is measured during the test. If the material is free draining and saturation is maintained it will normally measure hydrostatic pore pressure. In materials that are not free draining, it will record the total pore pressure (hydrostatic plus any excess pore pressures generated) created by the cone penetration through this material.

The filter element can be mounted in one of three positions. For all tests carried out in this project the filter was mounted in the u_2 position (see *Figure 3.1*).

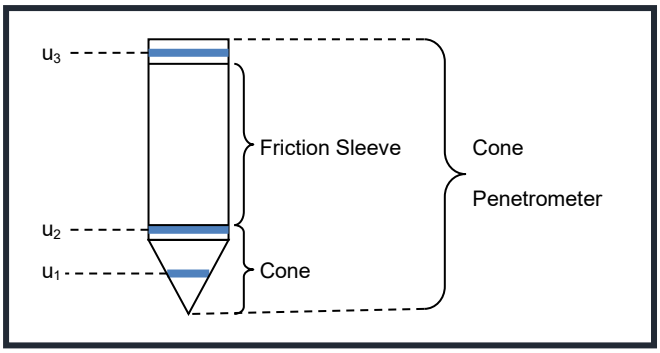

Figure 3.1: *Diagram showing pore pressure filter locations (after Lunne et al., 1997)*

3.2.4 Inclination (I_x, I_y)

The CPT rig was set up to obtain a thrust direction as near as possible to vertical. The CPTU cones have inclinometers incorporated to measure the non-verticality of the test. For test depths less than *15 m*, significant non-verticality is unusual, provided the initial thrust direction is vertical.

3.3 ESTIMATED SOIL BEHAVIOUR TYPE

3.3.1 Friction Ratio (R_f)

The friction ratio, R_f is the ratio between the sleeve friction and the cone resistance (Lunne *et al.,* 1997).

$$Fricton\ Ratio\ (R_f) = \left(\frac{Sleeve\ Friction\ (f_s)}{Cone\ Resistance\ (q_c)}\right) \times 100$$

3.3.2 Estimated Soil Behaviour Type (SBT)

The estimation of soil behaviour type, *SBT*, using measurements of cone resistance and sleeve friction is based upon the variations of the friction ratio and cone resistance. The friction

ratio varies depending upon whether the soil is cohesive or granular. The cone resistance varies depending on the strength and densities of the soil.

The interpretation used in this report is *Robertson et al. (1986)*, which is shown in Figure 3.2. The results are presented on *CPT Log 01*, in *Appendix B*.

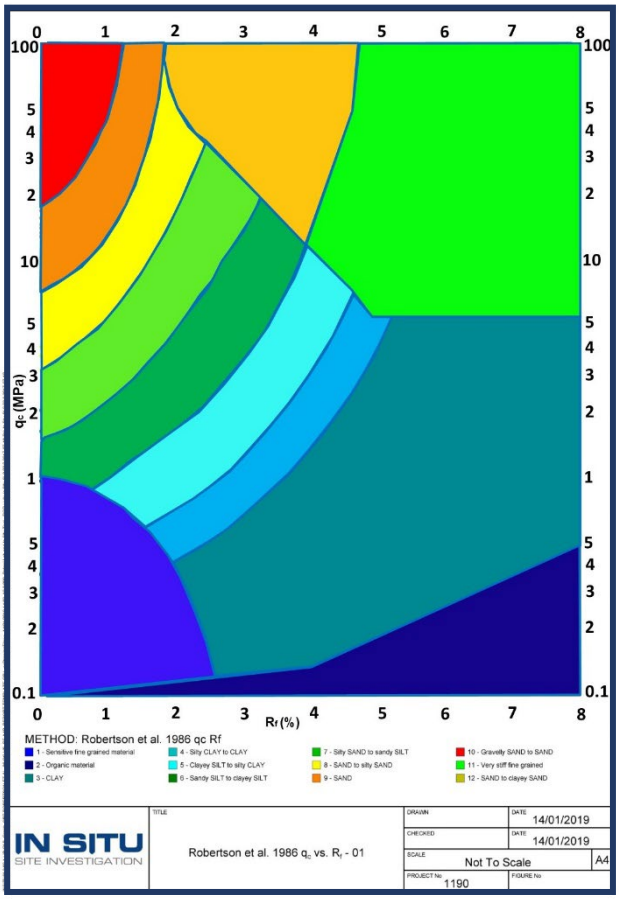

Figure 3.2: *Robertson et al., 1986 soil behaviour type chart.*

3.3.3 Pore Pressure Ratio (B_q)

Pore pressure ratio, B_q is the ratio between the measured pore pressure generated during penetration and the corrected cone resistance minus the total overburden stress.

Pore pressure ratio as defined by *Senneset and Janbu (1985)* is defined as:

$$B_q = \frac{u_2 - u_0}{q_t - \sigma_{vo}}$$

where

u_2	is pore pressure measured between the cone and the friction sleeve
u_0	is equilibrium pore pressure
σ_{vo}	is total overburden stress
q_t	is cone resistance corrected for unequal end area effects

3.4 APPLIED CORRECTIONS

3.4.1 Corrected Cone Resistance (q_t)

For each penetration test, the measured cone resistance, q_c, can be corrected for the ‘‘unequal area effect’’ due to the influence of the ambient pore water pressure acting on the cone.

The correction has been applied using the following equation by Lunne et *al.,* 1997:

$$q_t = q_c + [u_2.(1 - \alpha)]$$

where

α is the cone area ratio

The cone area ratio used for this project is stated on both the cone calibration certificate and the data footer. This value is geometrically measured.

3.4.2 Depth Correction

All tests in the report have been corrected for depth difference caused by inclination. This has been calculated using the method described in *ISO 22476-1:2022*.

To calculate the corrected depth the following formula is used:

$$z = \int_0^l C_{inc} \cdot dl$$

where

z is penetration depth, in *m*
l is penetration length, in *m*
C_{inc} is correction factor for the effect of the inclination of the CPTU relative to the vertical axis.

The equation for calculating the correction factor for the influence of the inclination for a bi-axial inclinometer is:

$$C_{inc} = \frac{1}{\sqrt{(1 + tan^2\beta_1 + tan^2\beta_2}}$$

where

β_1 is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane, in degrees
β_2 is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane that is perpendicular to the plane of angle β_1, in degrees

4.0 GEOTECHNICAL DERIVED PARAMETERS

A number of empirical correlations can be used to derive geotechnical parameters from CPTU data. This report includes only the parameters which are described in this chapter. The results of all correlations used to obtain the geotechnical derived parameters are presented on *CPT Log 02* and *CPT Log 03* in *Appendix B*.

Please, note that each empirical correlation is derived for a certain type of soil, and may not be appropriate for all the soil types encountered on this project.

4.1 SOIL BEHAVIOUR TYPE INDEX (I_c)

The soil behaviour type index, I_c, was derived by *Jefferies and Davies (1991)*, and was created to simplify the application of CPTU SBT chart shown in *Chapter 3*, *Figure 3.2*. This approach has been modified for use with the *Robertson (1990)* normalised CPT soil classification chart, *Figure 4.1*. The normalised cone parameters Q_t and F_r (for definitions see *Appendix A5* Symbol List) can be combined into one Soil Behaviour Type Index, I_c, *(Lunne et al., 1997)*.

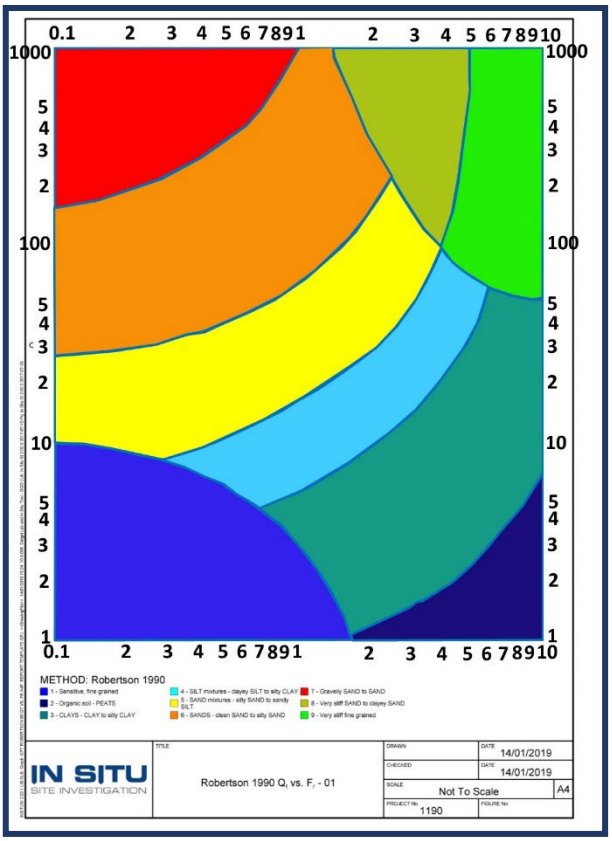

Figure 4.1: *Robertson 1990 soil behaviour type chart.*

The soil behaviour type index, I_c, can then be defined using *Robertson (2010)* formula, given below:

$$I_c = ((3.47 - logQ_t)^2 + (logF_r + 1.22)^2)^{0.5}$$

where

Q_t is the normalized cone resistance which represents the simple normalization with a stress exponent (n) of *1.0*, which applies well to clay-like soils

F_R is the normalized friction ratio, in *%*

The boundaries of soil behaviour type are then given in terms of the index, I_c, presented in *Table 4.1* below.

The soils behaviour type index does not apply to zones *1*, *8* and *9*. The profiles of I_c provide a simple guide to the continuous variation of soil behaviour type in a given soil profile based on CPTU results, with a reliability greater than *80%* compared with soil samples *(Robertson, 2015).*

Zone	Soil Behaviour Type	I_c
1	Sensitive fine grained	N/A
2	Organic Soils – clay	>3.6
3	Clays – silty clay to clay	2.95 – 3.6
4	Silt mixtures – clayey silt to silty clay	2.60 – 2.95
5	Sand mixtures – silty sand to sandy silt	2.05 – 2.6
6	Sands – clean sand to silty sand	1.31 – 2.05
7	Gravelly sand to dense sand	<1.31
8	Very stiff sand to clayey sand*	N/A
9	Very stiff fine grained *	N/A

** Heavily over consolidated or cemented*

Table 4.1: *Normalized CPTU Soil Behaviour Type (SBT_n) Index values, I_c.(Robertson, 2010)*

4.2 N VALUE OF STANDARD PENETRATION TEST (SPT) (N_{60})

The derived *N* value of *SPT, N_{60}*, is strongly and directly related to the cone resistance, q_c.

In this report the N_{60} value is derived using the following correlations, developed by *Robertson and Wride (1998)*, *Jefferies and Davies (1998)* and Robertson (2012):

1) *Robertson & Wride (1998)*

$$N_{60} = \frac{q_c}{8.5 \cdot p_a \left(1 - \frac{I_C}{4.6}\right)}$$

2) *Jefferies and Davies (1993)*

$$N_{60} = \frac{q_c}{0.85 \cdot \left(1 - \frac{I_C}{4.75}\right)}$$

3) *Robertson (2012)*

$$N_{60} = \frac{\frac{q_c}{p_a}}{10^{1.1268 - 0.2817 I_C}}$$

where

q_c	is the cone resistance
p_a	is the atmospheric pressure equal to *100 kPa*
I_c	is the soil behaviour type index calculated as given in *section 4.1*

It is suggested that these methods provide a better estimation of the N_{60} value than the actual measured *N*, due to the poor repeatability of SPT test. However, in fine grained soil with high sensitivity these methods may overestimate N_{60} *(Jefferies and Davies, 1991)*. The third method suggested by *Robertson (2012)* provides improved estimates of N_{60} for insensitive clays.

4.3 RELATIVE DENSITY (D_r)

Relative density, D_r, is an intermediate parameter for coarse grained soils, widely used to describe sand deposits. All the research on deriving the relative density from CPTU tests results are carried out for ***clean predominantly quartz sands***. The studies have shown that CPTU resistance in granular soils is controlled by sand relative density, in situ effective stresses and compressibility. The more compressible sands tend to give lower penetration resistance for a given relative density then less compressible sands.

In this report relative density is calculated using the methods suggested by *Baldi et al., (1986)*, *Jamiolkowski et al., (2001)* and *Kulhawy and Mayne (1990)* as shown in the equations below:

1) Baldi et al., (1986)

$$D_r = \frac{1}{C_2} \cdot ln\left(\frac{q_c \cdot Wehr}{C_1 \cdot (\sigma'_{v0})^{0.55}}\right) \cdot 100$$

where

C_1 is a consolidation coefficient which is *157* for normally consolidated soils and *181* for over consolidated soils

C_2 is a consolidation coefficient which is *2.41* for normally consolidated soils and *2.46* for over consolidated soils

Wehr is a correction coefficient for calcareous soils

2) Jamiolkowski et al., (2001)

$$D_r = 100 \cdot \left[0.268 \cdot ln\left(\frac{q_t/\sigma_{atm}}{\sqrt{\sigma'_{v0}/\sigma_{atm}}}\right) + C_1\right]$$

where

C_1 is a compressibility coefficient which is *-0.675* for average compressible soils, ≤*1.0* for high compressible soils and carbonate or calcareous sands and ≥*-2.0* for low compressible soils

q_t is corrected cone resistance

σ_{atm} is the atmospheric pressure

3) Kulhawy and Mayne, (1990)

$$D_r = \left[\frac{q_{c1}}{305 \cdot C_1 \cdot OCR^{0.18} \cdot \left(1.2 + 0.05 \cdot log(t/100)\right)}\right]^{0.5} \cdot 100$$

where

q_{c1} is the cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula

$$q_{c1} = \frac{q_c}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

where

q_c is the cone resistance in *kPa*

σ'_{v0} is the initial vertical effective stress in *kPa*

C_1 is a compressibility coefficient which is *-0.91* for low compressible sands, *1.0* for medium compressible sands and *1.09* for high compressible sands

t is time in years

4.4 FRICTION ANGLE (φ')

Friction angle, *φ*', is used to express the shear strength of uncemented, coarse grained soils. In this report friction angle is derived by the correlations of *Mayne and Campanella (2005)*, *Robertson and Campanella (1983)* and *Kulhawy and Mayne (1990)*.

1) Mayne and Campanella, (2005)

$$\varphi' = 29.5^0 \cdot B_q^{0.121} \cdot \left[0.256 + 0.336 \cdot B_q + logQ_t\right]$$

where

B_q is the pore pressure ratio, calculated as in Session 3.3

Q_t is the normalized cone resistance

2) Robertson and Campanella, (1983)

$$\varphi' = \tan^{-1}\left(0.1 + 0.38 \cdot log\left(\frac{q_t}{\sigma'_{v0}}\right)\right)$$

where

q_c is the cone resistance in *kPa*

σ'_{v0} is the initial vertical effective stress in *kPa*

3) Kulhawy and Mayne, (1990)

$$\varphi' = 17.6^0 + 11.0^0 \cdot log(q_{t1})$$

where

q_{t1} is the corrected cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula

$$q_{t1} = \frac{q_t}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

The method suggested by *Mayne and Campanella (2005)* will not provide reliable results for heavily over consolidated soils, fissured geomaterials and highly cemented or structures clays. This approach gives reliable results when pore pressure is positive and varies $0.1 < B_q < 1.0$. The correlation suggested by *Robertson and Campanella (1983)* estimates the peak friction angle for uncemented, unaged, moderately compressible, predominately quartz sands. For sands of higher compressibility, the method will tend to predict low friction angles. The method suggested by *Kulhawy and Mayne (1990)* is an alternate relationship for clean, rounded, uncemented, quartz sands.

4.5 FINES CONTENT (*FC*)

The fines content, *FC*, in this report is estimated using two different methods, one from *Robertson and Wride (1998)* and the other, *Suzuki et al. (1998)* as presented below:

1) Robertson and Wride (1998)

$$I_C < 1.26: FC = 0$$
$$1.26 \leq I_C \leq 3.5: FC(\%) = 1.75I_C^{3.25} - 3.7$$
$$3.5 < I_C: \ FC = 100\%$$

2) Suzuki et al. (1998)

$$FC(\%) = 2.8I_C^{2.6}$$

where

I_c is the soil behaviour type index, calculated as in section 4.1

4.6 UNDRAINED SHEAR STRENGTH (s_u)

Estimation of undrained shear strength, s_u, from CPTU tests using corrected cone resistance is carried out using the following correlation from *Lunne et al. (1981)*:

$$S_u = \frac{(q_t - \sigma_{v0})}{N_{kt}}$$

where

N_{kt} is the empirical cone factor, which varies from *10* (*6* for very soft sensitive fine grained soils) to *20*. In this report 3 values are considered: *15*, *17.5* and *20*. N_{kt} tends to increase with increasing plasticity and decrease with increasing soil sensitivity. It decreases as B_q increases. (*Lunne et al., 1997*)
σ_{vo} = total overburden stress.

This report only presents the undrained shear strength data on soils with soil behaviour type index, I_c values greater than *2.60*.

The value of undrained shear strength, s_u to be used in analysis depends on the design problem. In general, the simple shear in the direction of loading often represents the average undrained strength. For larger, moderate to high risk projects, where high quality field and laboratory data may be available, site specific correlations should be developed based on appropriate and reliable values of s_u.

4.7 SENSITIVITY (S_t)

The sensitivity, S_t of clays is defined as the ratio of undisturbed peak undrained shear strength to totally remoulded undrained shear strength.

In this report S_t is calculated using two correlations developed by *Schmertmann (1978)* and *Mayne (2007)*.

1) Schmertmann (1978)

$$S_t = \frac{s_u}{s_{u(rem)}} = \frac{q_t - \sigma_v}{N_{kt}} \left(\frac{1}{f_s}\right)$$

where

$s_{u(rem)}$ is the remoulded undrained shear strength. It can be assumed equal to the sleeve resistance, f_s.

2) Mayne (2007)

$$S_t = \frac{0.073 \cdot (q_t - \sigma_{v0})}{f_s}$$

For relatively sensitive clays, S_t > *10*, the value of f_s can be very low and not very accurate, hence the estimate of sensitivity should be used as a guide only.

4.8 SOIL UNIT WEIGHT (γ)

Soil unit weight, *γ* in this report is calculated by using one method for sands, considered under dry conditions and two methods for clays, considered under saturated conditions. These relationships are developed by *Mayne (2007)* and the equations are presented below:

Dry unit weight for sands:

$$\gamma_{dry} = 1.89 \cdot log(q_{t1}) + 11.82$$

Saturated unit weight for clays method 1

$$\gamma_{sat} = 8.32 \cdot log(V_S) - 1.61 \cdot log(z)$$

Saturated unit for clays method 2

$$\gamma_{sat} = 2.60 \cdot log(f_s) + 15 \cdot G_s - 26.5$$

where

q_{t1} is the corrected cone resistance corrected for initial vertical effective stress and atmospheric pressure, calculated by the following formula:

$$q_{t1} = \frac{q_t}{\sqrt{\sigma'_{v0} \cdot \sigma_{atm}}}$$

z is the depth

V_s is the shear wave velocity, calculated as $V_S = 118.8 \cdot log\left(f_s\right) + 18.5$

G_s is the specific gravity of solids, typically between *2.40* and *2.90*

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APPENDIX A

APPENDIX A1 – Project Summary Sheet

Piezocone Tests Summary Sheet

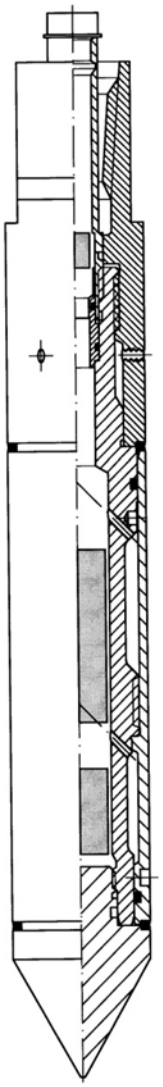
HOLE ID	Final Depth (m)	Date of Test	Cone Used	Test Remarks
CPT101	7.07	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT102	5.50	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT103	5.40	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT104	6.74	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT105	3.62	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT105T2	3.67	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT106	3.11	22/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT107	4.75	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT108	2.33	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT109	3.53	22/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT110	2.13	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT111	1.70	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT111T2	1.46	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT112	4.13	22/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT113	2.20	21/03/2024	S15-CFIP.1867	Test refused on total pressure.
CPT114	3.61	22/03/2024	S15-CFIP.1867	Test refused on total pressure.

Piezocone Test Coordinates

HOLE ID	Eastings	Northings	Elevation
CPT101	443969.26	403878.86	24.17
CPT102	444102.55	403894.66	23.34
CPT103	444228.43	403927.74	22.59
CPT104	444392.07	403984.52	22.70
CPT105	444022.20	403838.11	24.26
CPT105T2	444022.20	403838.11	24.26
CPT106	444323.66	403873.94	22.82
CPT107	444006.54	403766.60	24.40
CPT108	444113.39	403815.36	24.50
CPT109	444405.76	403842.78	22.81
CPT110	443934.69	403647.44	23.93
CPT111	444143.96	403726.39	25.21
CPT111T2	444143.96	403726.39	25.21
CPT112	444360.51	403786.29	23.07
CPT113	443993.12	403580.59	22.87
CPT114	444285.78	403682.58	24.33

APPENDIX A2 – CPT Rig Datasheet

GeoPoint Systems bv
Rijksstraatweg 22F
2171 AL Sassenheim
Tel. : +31 71 301 92 51
Fax : +31 71 301 92 52
E-mail : info@geopoint.nl
ING bank : 68.23.01.396
Postbank : 5226758
BTW nr. : NL806331677B01



SPECIFICATIONS S15 SERIES ELECTRICAL CONES

The electronic subtraction cones have been developed to address the durability problems inherent in other cone designs. The unit consists of a single element temperature compensated strain gauge transducer for measuring both cone resistance and local sleeve friction. This design is therefore more robust than a compression type cone. The cone support electronics package is located directly behind the transducer. The precision strain gauge amplifiers and power supply eliminate the effects of cable resistance on the measurements. A standard subtraction cone is capable of measuring simultaneously the following channels: Tip, Local friction, Pore pressure, Temperature and Inclination.

GENERAL SPECIFICATIONS

Cone Tip Section Area	1,500 mm2
Friction Sleeve Surface	22,500 mm2
Total Length	325 mm
Weight	4200 g
Power Supply	± 15 VDC, 100 mA.
Output	0 – 10 VDC*
Working Temperature	0 - 60˚C
Storage Temperature	- 40 to + 85˚C
Connector	Lemo 10 pins (others on request)

TIP RESISTANCE

Range	100/150* kN
Accuracy	0.25 % FS
Maximum Load	150 % of range
Cone Area Ratio	0.75

LOCAL SLEEVE FRICTION

Range	100/150* kN
Accuracy	0.50 % FS
Maximum Load	150 %
Sleeve Area Ratio	1.0 (EA)

PORE PRESSURE

Range	1/2/5/10* MPa
Accuracy	0.5 % FS
Maximum Load	150 % of range

INCLINATION

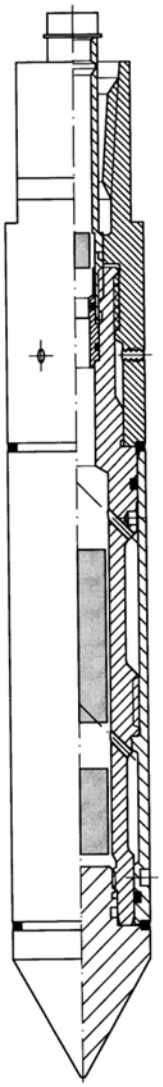
Range	25 ˚ (biaxial)
Accuracy	< 2 ˚

All our equipment complies with the ISSMGE, ASTM, DIN and NEN Standards.

**Other output and voltage ranges available on request. Loadcells may be calibrated for lower ranges.*

APPENDIX A3 – Cone Datasheet

GeoPoint Systems bv
Rijksstraatweg 22F
2171 AL Sassenheim
Tel. : +31 71 301 92 51
Fax : +31 71 301 92 52
E-mail : info@geopoint.nl
ING bank : 68.23.01.396
Postbank : 5226758
BTW nr. : NL806331677B01



SPECIFICATIONS S15 SERIES ELECTRICAL CONES

The electronic subtraction cones have been developed to address the durability problems inherent in other cone designs. The unit consists of a single element temperature compensated strain gauge transducer for measuring both cone resistance and local sleeve friction. This design is therefore more robust than a compression type cone. The cone support electronics package is located directly behind the transducer. The precision strain gauge amplifiers and power supply eliminate the effects of cable resistance on the measurements. A standard subtraction cone is capable of measuring simultaneously the following channels: Tip, Local friction, Pore pressure, Temperature and Inclination.

GENERAL SPECIFICATIONS

Cone Tip Section Area	1,500 mm2
Friction Sleeve Surface	22,500 mm2
Total Length	325 mm
Weight	4200 g
Power Supply	± 15 VDC, 100 mA.
Output	0 – 10 VDC*
Working Temperature	0 - 60˚C
Storage Temperature	- 40 to + 85˚C
Connector	Lemo 10 pins (others on request)

TIP RESISTANCE

Range	100/150* kN
Accuracy	0.25 % FS
Maximum Load	150 % of range
Cone Area Ratio	0.75

LOCAL SLEEVE FRICTION

Range	100/150* kN
Accuracy	0.50 % FS
Maximum Load	150 %
Sleeve Area Ratio	1.0 (EA)

PORE PRESSURE

Range	1/2/5/10* MPa
Accuracy	0.5 % FS
Maximum Load	150 % of range

INCLINATION

Range	25 ˚ (biaxial)
Accuracy	< 2 ˚

All our equipment complies with the ISSMGE, ASTM, DIN and NEN Standards.

**Other output and voltage ranges available on request. Loadcells may be calibrated for lower ranges.*

APPENDIX A4 – Cone Calibration Certificate

Eijkelkamp GeoPoint
SoilSolutions

Rijksstraatweg 22F
2171 AL Sassenheim
The Netherlands

T +31 71 301 9251
E info@eijkelkamp-geopoint.com
I eijkelkamp-geopoint.com

Cone Calibration Certificate

Certificate:	**GS-1867-004**
Instrument Type:	Electric Subtraction Cone
Model:	S15-CFIIP
Serial number:	1867
Calibration date:	27-12-2023
Client:	In Situ
Calibrated by:	D.den Haas
Calibration instruments	
Manufacturer:	Hottinger Baldwin Messtechnik GmbH
NMi certificate	2461165.00501
Calibration conditions	
Ambient temperature:	21.3 °C
Atmospheric pressure:	1011 mBar
Cone specifications	
Cone base area:	1500 mm2
Load tip resistance (nom.):	100 kN
Friction sleeve area:	22500 mm2
Load tip + local friction (nom.):	100 kN
Load friction sleeve (nom.):	22.5 kN
Load pore pressure (nom.):	2 MPa
Inclination (nom.):	+/- 20 °
Temperature compensation (all channels):	0...+40 °C
Maximum overload capacity (all channels):	100 %
Cone area ratio (a):	0.79
Max. Inaccuracy, relative to measurement value:	1.0 %

	Tip:		Sleeve:		Pore Pressure:		Inclinometer:		
	qc in kN	mV	fs in kN	mV	MPa	mV	Degrees	X (mV)	Y (mV)
Zero points:		0189		0250		0248			
	0	0	0	0	0	0	0	2502	2461
	5	0305	5	0315	0.4	1472	-20	0511	0424
	10	0613	10	0631	0.8	2943	20	4481	4512
	15	0918	15	0948	1.2	4412			
	20	1226	20	1266	1.6	5875			
	25	1534	25	1583	2	7338			
	30	1840	30	1901					
	35	2146	35	2217					
	40	2452	40	2534					
	45	2759	45	2850					
	50	3065	50	3166					
	75	4594	75	4749					
	100	6119	100	6326					

Max. eror, abs. qc:	35 kPa
Max. error, abs. fs:	5 kPa
Max. error, abs. u2:	10 kPa
Max. error, abs. I:	1 °

This calibration is compliant with Eijkelkamp GeoPoint SoilSolutions internal quality system, internal calibration procedures and meets the requirements of NEN2649, NEN-EN-ISO 22476-1, NORSOK G-001, ISSMFE and ASTM using calibration equipment traceable to (Inter-)National Standards.

Approved by: R. Mosterd
Date: 27-12-2023

Eijkelkamp GeoPoint SoilSolutions
V.A.T. NO. NL 8584.21.422.B01
Trade Reg. Arnhem no. 70686149

IBAN NL43 RABO 0326 7904 38
BIC: RABONL2U

APPENDIX A5 – Symbol List

English

a	is area ratio of the cone ($= {}^{A_n}/_{A_c}$)
A	is area
A_c	is projected area of the cone
A_n	is cross sectional area of load cell or shaft
A_s	is area of friction sleeve
A_{sb}	is bottom end area of friction sleeve
A_{st}	is top end area of friction sleeve
B_q	is pore pressure parameter ($= {}^{(u_2 - u_0)}/_{(q_t - \sigma_{v0})}$)
c_h	is horizontal coefficient of consolidation
c_v	is vertical coefficient of consolidation
D	is diameter
D_r	is relative density ($= \frac{e_{max} - e}{e_{max} - e_{min}} x100\%$)
e	is void ratio
e_{max}	is maximum void ratio
e_{min}	is minimum void ratio
E	is Young's modulus
f_s	is unit sleeve friction resistance
f_t	is sleeve friction corrected for pore pressure effects
F_s	is total force acting on friction sleeve
F_R	is normalized friction ratio ($= {}^{f_s}/_{(q_t - \sigma_{v0})}$)
FoS	is factor of safety
FC	is fines content
g	is acceleration due to gravity
G_0	is initial or maximum shear modulus, shear stiffness
I_c	is soil behavior type index
I_r	is rigidity index ($= {}^{G}/_{s_u}$)
I_p	is plasticity index
k	is coefficient of permeability
k_h	is coefficient of permeability in horizontal direction
k_v	is coefficient of permeability in vertical direction
K_0	is coefficient of earth pressure at rest ($= {}^{\sigma'_{h0}}/_{\sigma'_{v0}}$)
L	is length
m_v	is coefficient of volume change
M	is constrained deformation modulus
M7.5	is earthquake magnitude of 7.5 Richter scale
N	is number of blows of SPT
N_{60}	is SPT energy ratio
N_k	is cone factor
N_{ke}	is cone factor
N_{kt}	is cone factor
$N_{\Delta u}$	is cone factor
p_a	is reference stress ($= 100\ kPa$)
q_c	is measured cone resistance
q_e	is effective cone resistance ($= q_t - u_2$)
q_n	is net cone resistance ($= q_t - \sigma_{v0}$)
q_t	is corrected cone resistance ($= q_c - (1 - a)u_2$)
Q_c	is total force acting on the cone
Q_t	is normalized cone resistance ($= {}^{q_t - \sigma_{v0}}/_{\sigma'_{v0}}$)

R_f	is friction ratio ($= \left({}^{f_t}/_{q_t}\right) x100\%$ or alternatively $= \left({}^{f_t}/_{q_t}\right) x100\%$)
s_u	is undrained shear strength
s_{ur}	is remoulded undrained shear strength
S_t	is sensitivity
t	is time
t_{50}	is time for 50% dissipation of excess pore water pressure
T_{50}	is time factor at $U = 50\ \%$
u	is pore water pressure
u_0	is in situ pore pressure
u_1	is pore pressure measured on the cone
u_2	is pore pressure measured behind the cone
u_3	is pore pressure measured behind sleeve friction
Δu	is excess pore water pressure
U	is normalized excess pore pressure
V_s	is shear wave velocity
z	is depth

Greek

α	is constant
α	is cone roughness
β	is constant
β_1	is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane, in degrees
β_2	is the angle between the vertical axis and the projection of the axis of the CPTU on a vertical plane that is perpendicular to the plane of angle β_1, in degrees
γ	is unit weight of soil
γ_w	unit weight of water
Δ	is change
Δu	is excess pore pressure ($= u - u_0$)
μ	is Poisson's ratio
ρ	is density
ψ	is state parameter
σ, σ'	is normal stress (total, effective)
σ_h, σ_h'	is horizontal stress (total, effective)
σ_v, σ_v'	is horizontal stress (total, effective)
σ_{v0},σ_{v0}'	is overburden stress (total, effective)
τ_{av}	is average cyclic shear stress
τ_{cy}	is cyclic shear stress
φ'	is effective friction angle

APPENDIX A6 – Abbreviations

ASTM	American Society for Testing and Materials
CPTU	Cone Penetration Test with Pore Pressure Measurement (Piezocone Test)
CRR	Cyclic Resistance Ratio
CSR	Cyclic Stress Ratio
GWT	Ground Water Table
NC	Normally Consolidated
OC	Over consolidated
OCR	Over consolidation Ratio
PL	Limit Pressure
SCPT	Seismic Cone Penetration
SDMT	Seismic Dilatometer Marchetti
SPT	Standard Penetration Test
TC	Technical Committee

APPENDIX A7 – Glossary

CPT
Cone Penetration Test.

Cone
The part of the cone penetrometer on which the end bearing is developed.

Cone Penetrometer
The assembly containing the *cone*, *friction sleeve*, any other sensors and measuring systems, as well as the connections to the *push-rods.*

Cone resistance, q_c
The total force acting on the cone, Q_c, divided by the projected area of the cone, A_c. $q_c = {Q_c}/{A_c}$

Corrected cone resistance, q_t
The *cone resistance*, q_c corrected for pore water pressure effects.

Corrected sleeve friction, f_t
The *sleeve friction* corrected for pore water pressure effects on the ends of the *friction sleeve*.

Data acquisition system
The system used to measure and record the measurements made by the *cone penetrometer*.

Dissipation Test
A test when the decay of the pore water pressure is monitored during a pause in penetration.

Filter element
The porous element inserted into the cone penetrometer to allow transmission of the pore water pressure to the pore pressure sensor, while maintaining the correct profile of the *cone penetrometer*.

Friction ratio, R_f
The ratio, expressed as a percentage of the *sleeve friction*, f_s, to the *cone resistance*, q_c, both measured at the same depth.

Friction reducer
A local enlargement on the push-rod surface, placed at a distance above the cone penetrometer, and provided to reduce the friction on the *push-rods*.

Friction sleeve
The section of the *cone penetrometer* upon which the *sleeve friction* is measured.

Normalized cone resistance, Q_c or Q_t
The *cone resistance* expressed in a non-dimensional form and taking account of stress changes *in situ*, $Q_c = {(q_c - \sigma_{v0})}/{\sigma'_{v0}}$, or when the *corrected cone resistance* is used $Q_t = {(q_t - \sigma_{v0})}/{\sigma'_{v0}}$. where σ_{v0} and σ'_{v0} are the total and effective vertical stress respectively.

Net cone resistance, q_n
The *corrected cone resistance* minus the vertical total stress. $q_n = q_t - \sigma_{v0}$

Normalized friction ratio, F_r
The *sleeve friction* normalized by the *net cone resistance*.

Piezocone
A *cone penetrometer* containing a pore pressure sensor.

Pore pressure, *u*
The pore pressure generated during penetration and measured by a pore pressure sensor, u_1 when measured on the cone, u_2 when measured just behind the cone and u_3 when measured just behind the friction sleeve.

Pore pressure ratio, B_q
The *net pore pressure* normalized with respect to the *net cone resistance*.

Push-rods
The thick-walled tubes or rods used for advancing the cone penetrometer.

Rig machine
The equipment which pushes the cone penetrometer and rods into the ground.

Sleeve friction, f_s
The total frictional force acting on the *friction sleeve*, F_s, divided by its *surface area*, A_s. $f_s = {F_s}/{A_s}$

APPENDIX A8 – Soils Description Tables

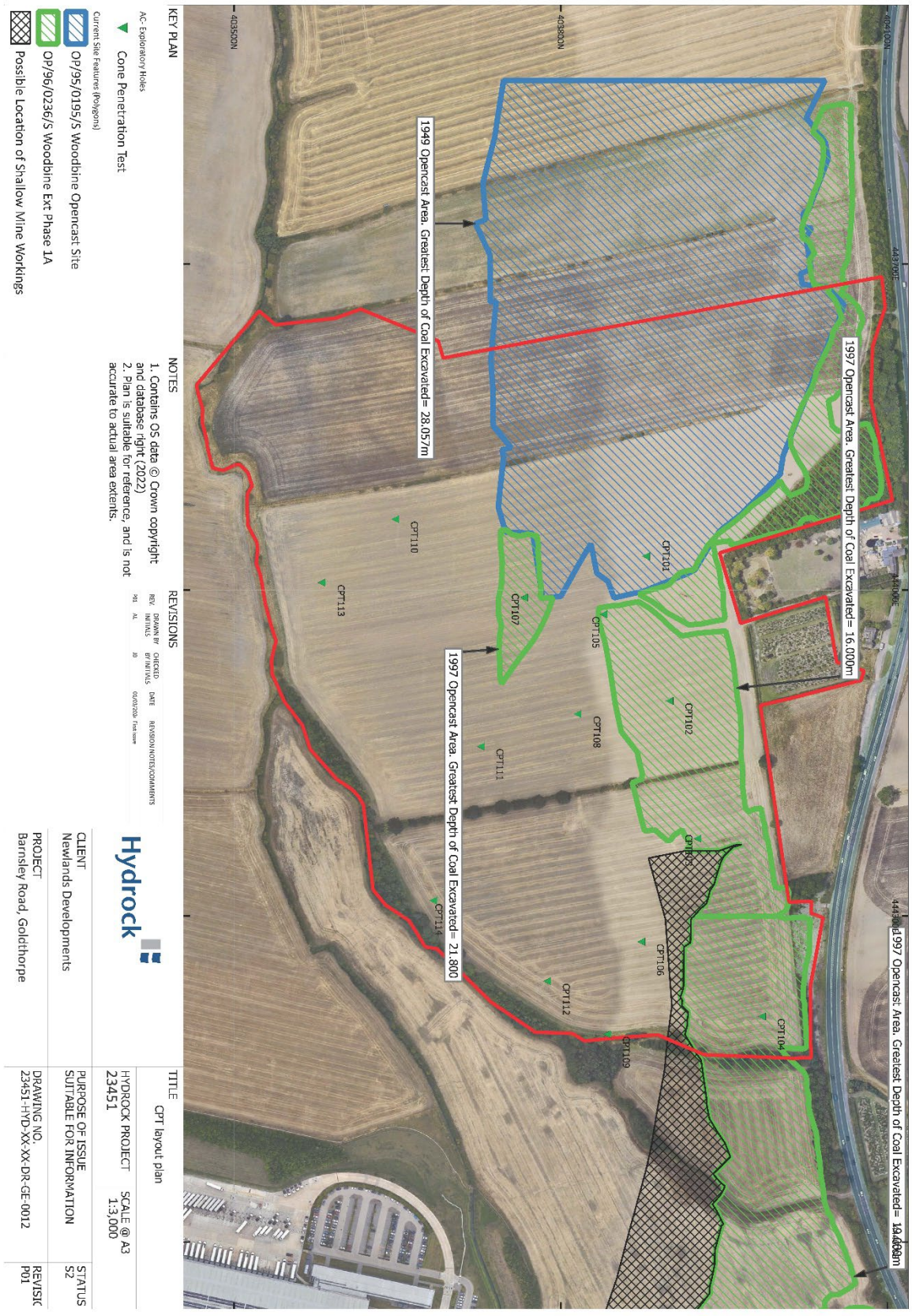
GRANULAR SOILS (Sands and Gravels)

Description	Relative Density D_r (%)	SPT N value, N_{SPT}
Very Loose	0 – 15	0 - 4
Loose	15 – 35	4 - 10
Medium Dense	35 – 65	10 - 30
Dense	65 – 85	30 - 50
Very Dense	>85	>50

COHESIVE SOILS (Clays and Silts)

Term based on measurement	Undrained Shear Strength Classification, s_u (kPa)
Extremely low	<10
Very low	10 - 20
Low	20 - 40
Medium	40 - 75
High	75 - 150
Very high	150 - 300
Extremely high	>300

APPENDIX A9 – Site Map



APPENDIX B

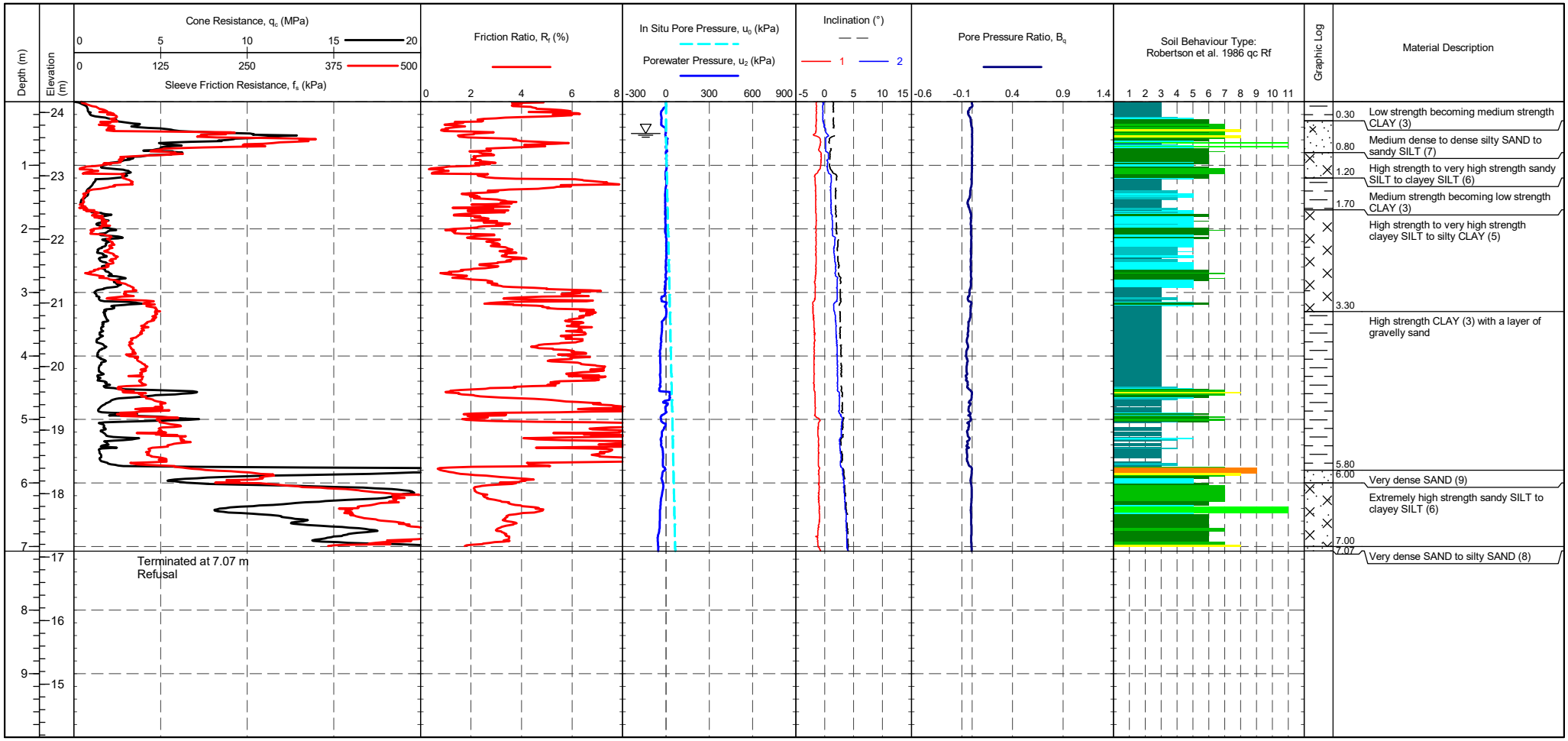
Cone Penetration Measured Parameters and Geotechnical Derived Parameters

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT101**

CLIENT : Hydrock	EASTING : 443969.257 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403878.862 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.167 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	249 mV	247 mV	-0.022 MPa
Sleeve	294 mV	295 mV	0.001 kPa
Pore Pressure 2	363 mV	327 mV	-0.01 kPa
X-Y Inclinometer	2374 mV	2372 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

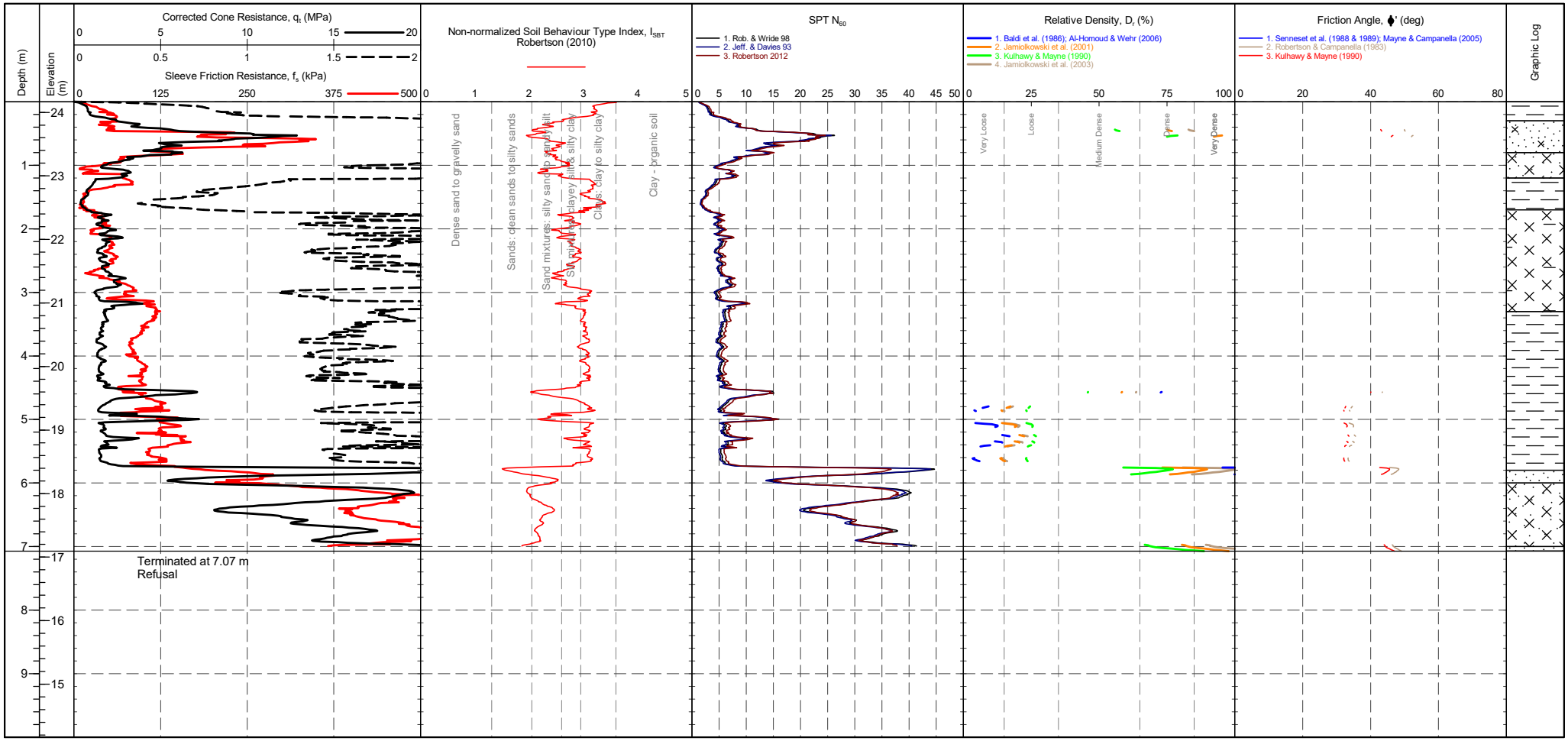
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT101**

CLIENT : Hydrock	EASTING : 443969.257 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403878.862 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.167 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	249 mV	247 mV
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	294 mV	295 mV
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	363 mV	327 mV
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2374 mV	2372 mV

Transducer	Difference
Tip	-0.022 MPa
Sleeve	0.001 kPa
Pore Pressure 2	-0.01 kPa
X-Y Inclinometer	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

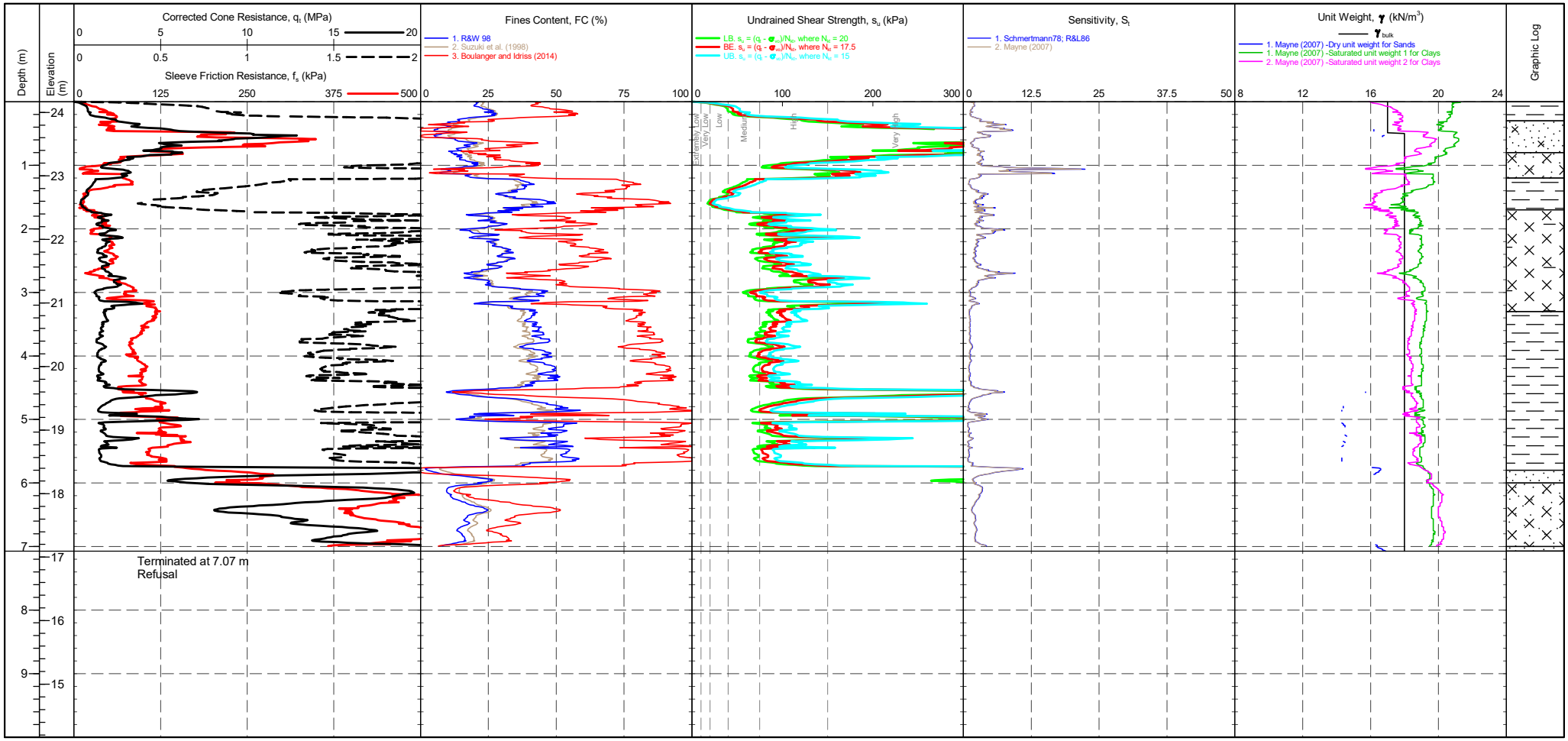
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT101**

CLIENT : Hydrock	EASTING : 443969.257 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403878.862 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.167 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



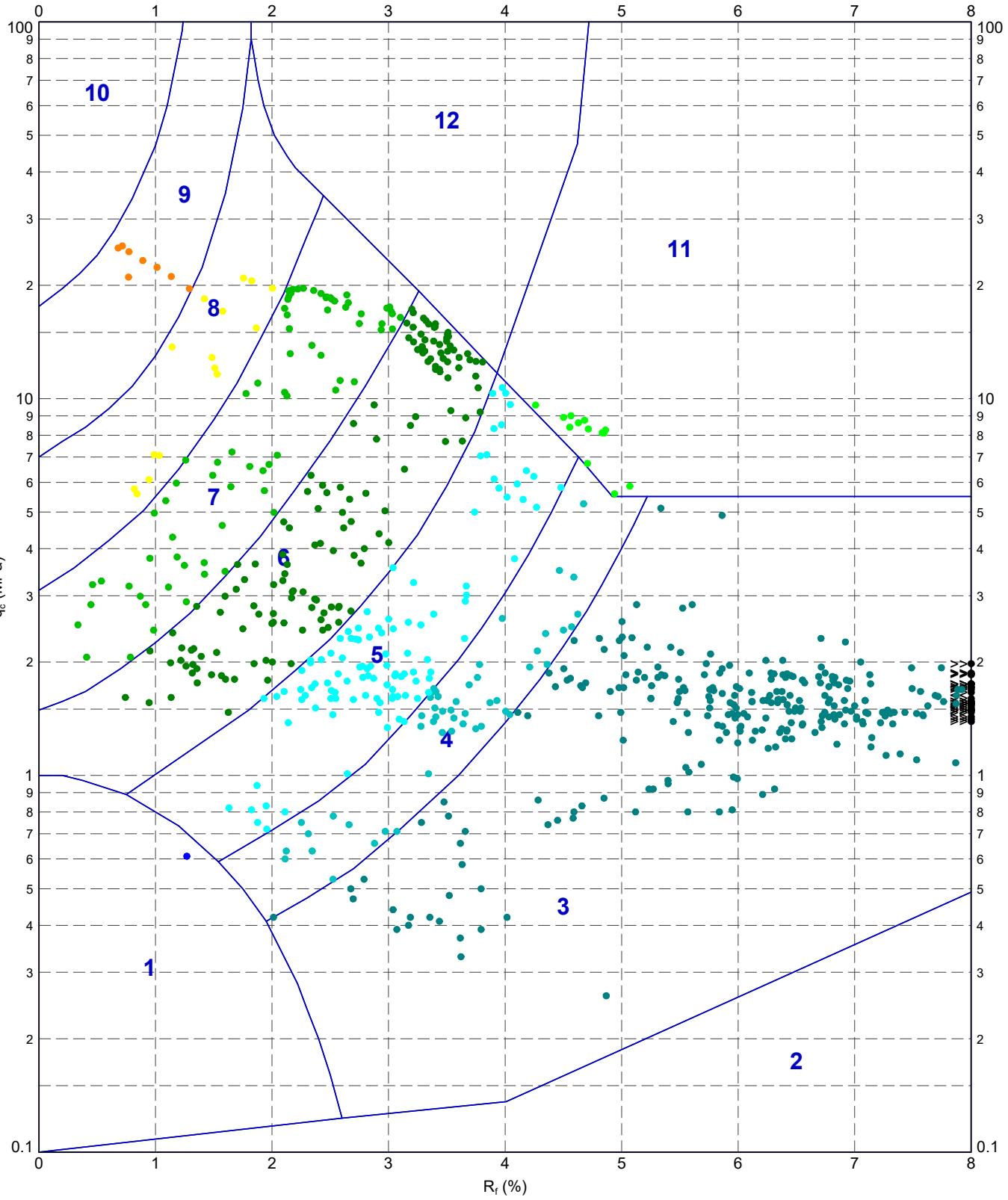
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	249 mV	247 mV	-0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	294 mV	295 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	363 mV	327 mV	-0.01 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2374 mV	2372 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT101

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

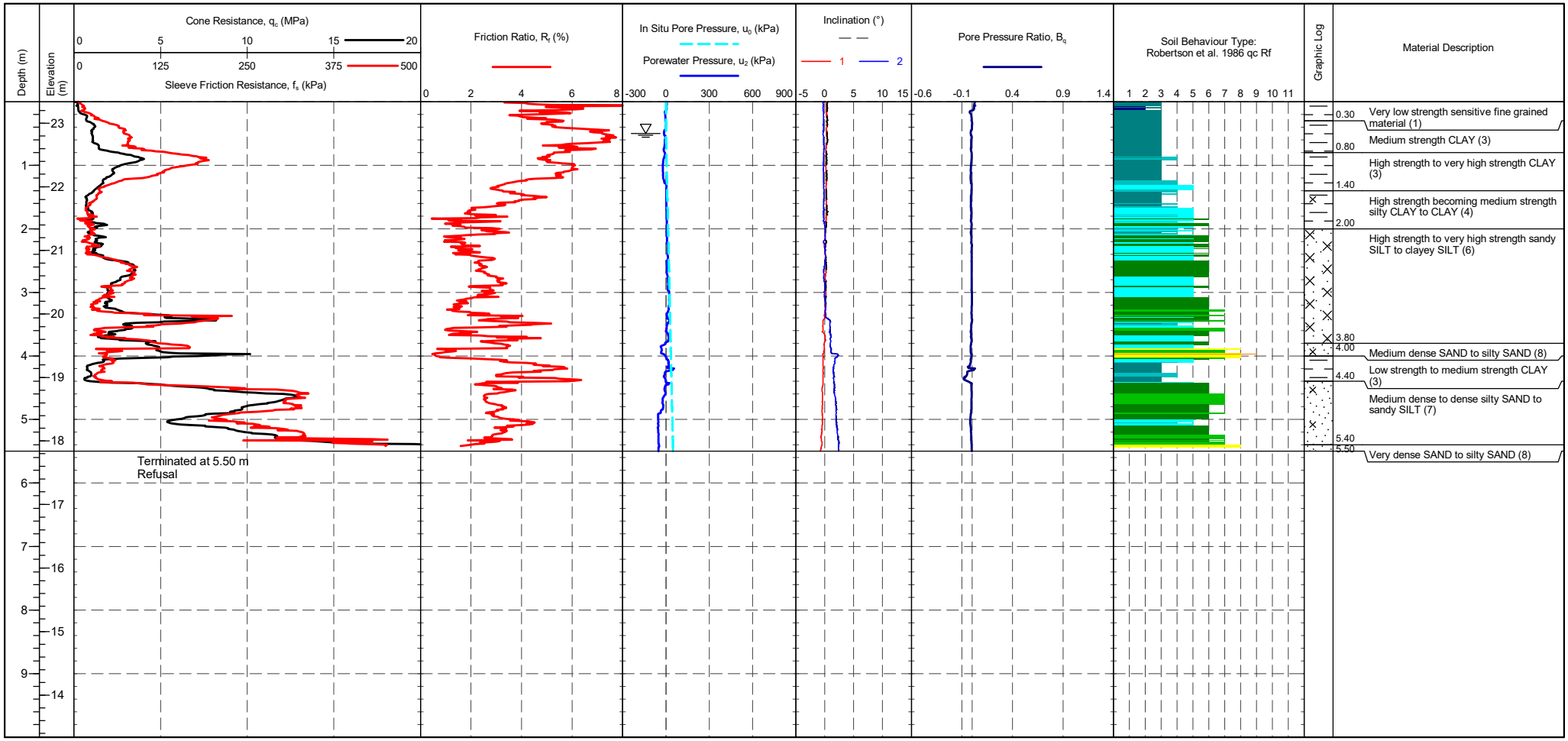
220629-ADVANCED REPORT INSITUSI 2.02.1.LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:15 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT102**

CLIENT : Hydrock	EASTING : 444102.553 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403894.657 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.339 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	250 mV	247 mV	-0.033 MPa
Sleeve	298 mV	290 mV	-0.006 kPa
Pore Pressure 2	327 mV	336 mV	0.002 kPa
X-Y Inclinometer	2561 mV	2532 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

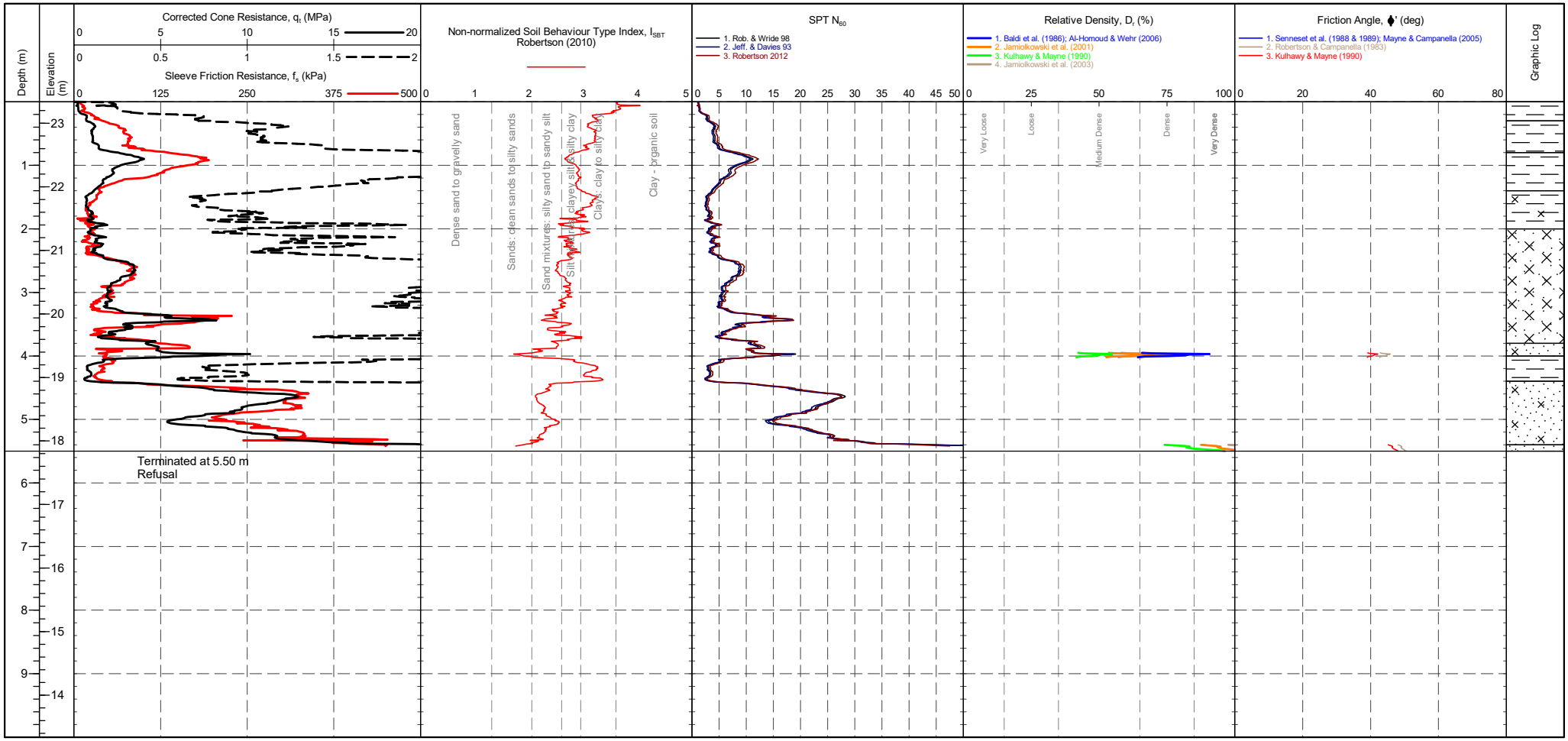
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT102**

CLIENT : Hydrock	EASTING : 444102.553 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403894.657 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.339 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	250 mV	247 mV	-0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	298 mV	290 mV	-0.006 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	327 mV	336 mV	0.002 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2561 mV	2532 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

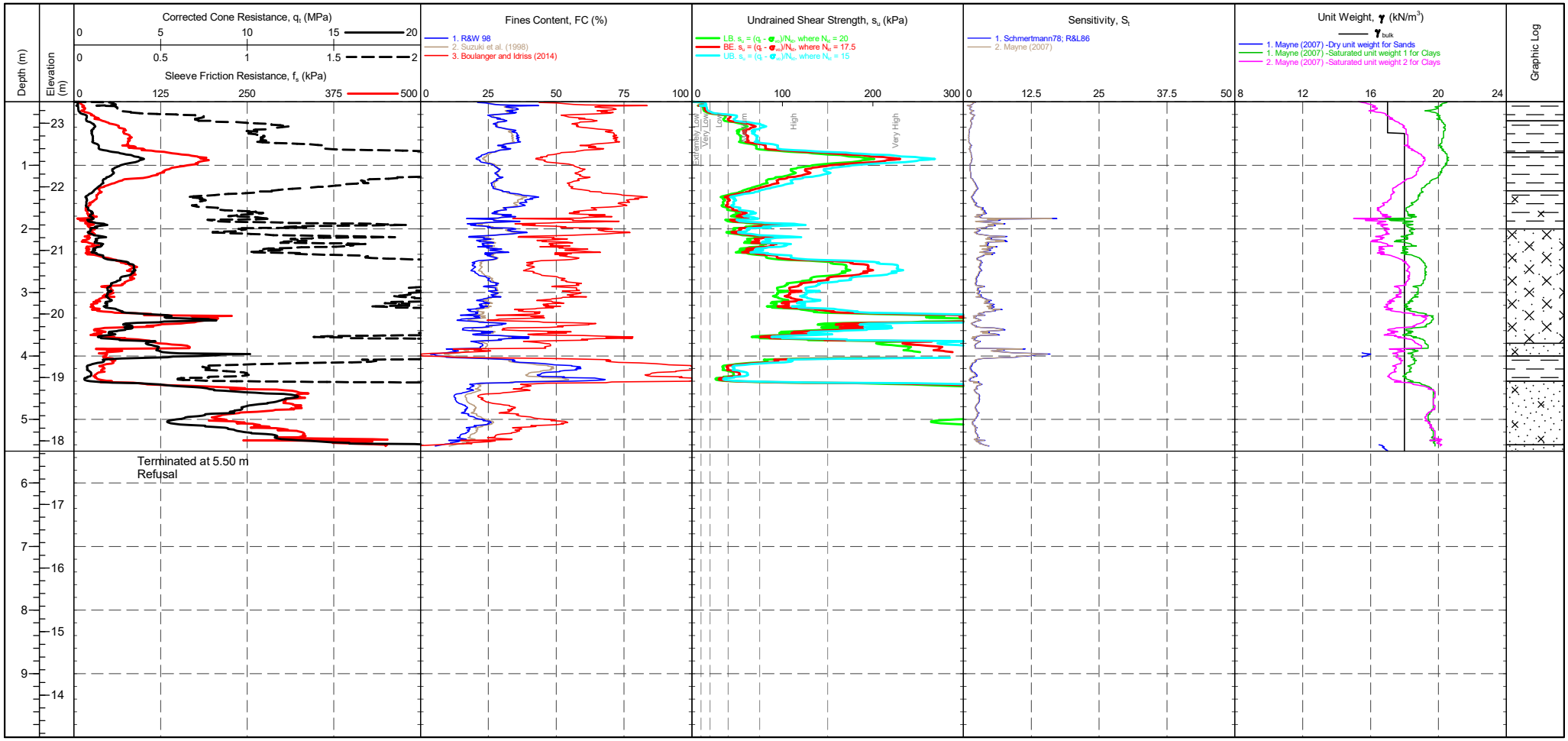
PointID: **CPT102**

CLIENT : Hydrock
PROJECT : Barnsley Road
LOCATION : Goldthorpe
PROJECT No. : 1240176

EASTING : 444102.553 m
NORTHING : 403894.657 m
ELEVATION : 23.339 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 21/03/2024
PLOT DATE : 22/04/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2				
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2				
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe				
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle				
FILTER POSITION	: u2	FRICTION REDUCER	: None				
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild				

CPTU ZERO VALUES

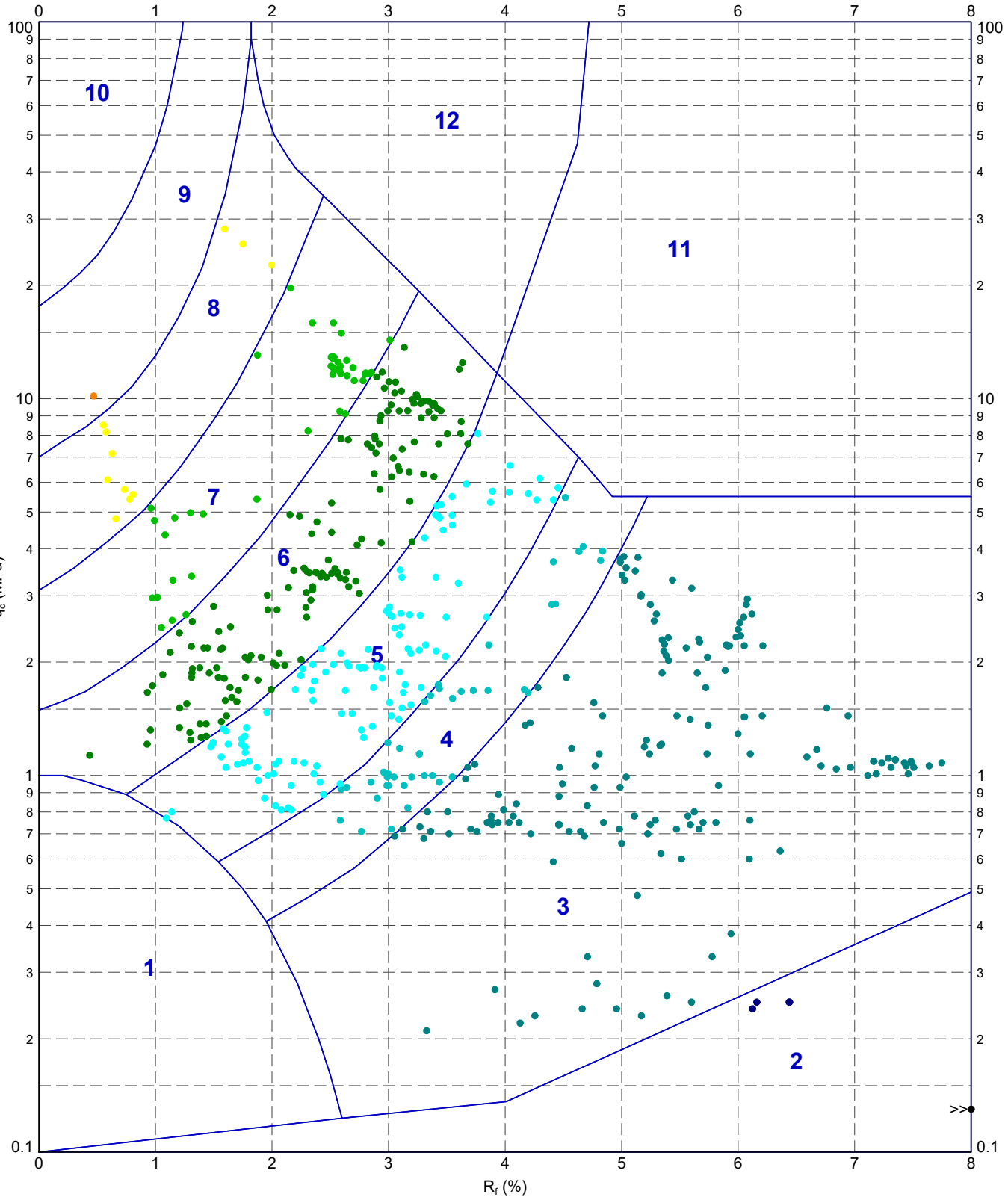
Transducer	Pre	Post	Difference
Tip	250 mV	247 mV	-0.033 MPa
Sleeve	298 mV	290 mV	-0.006 kPa
Pore Pressure 2	327 mV	336 mV	0.002 kPa
X-Y Inclinometer	2561 mV	2532 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT102

DRAWN	DATE 22/04/2024	
CHECKED	DATE 22/04/2024	
SCALE Not To Scale		A4
PROJECT No 1240176	FIGURE No	

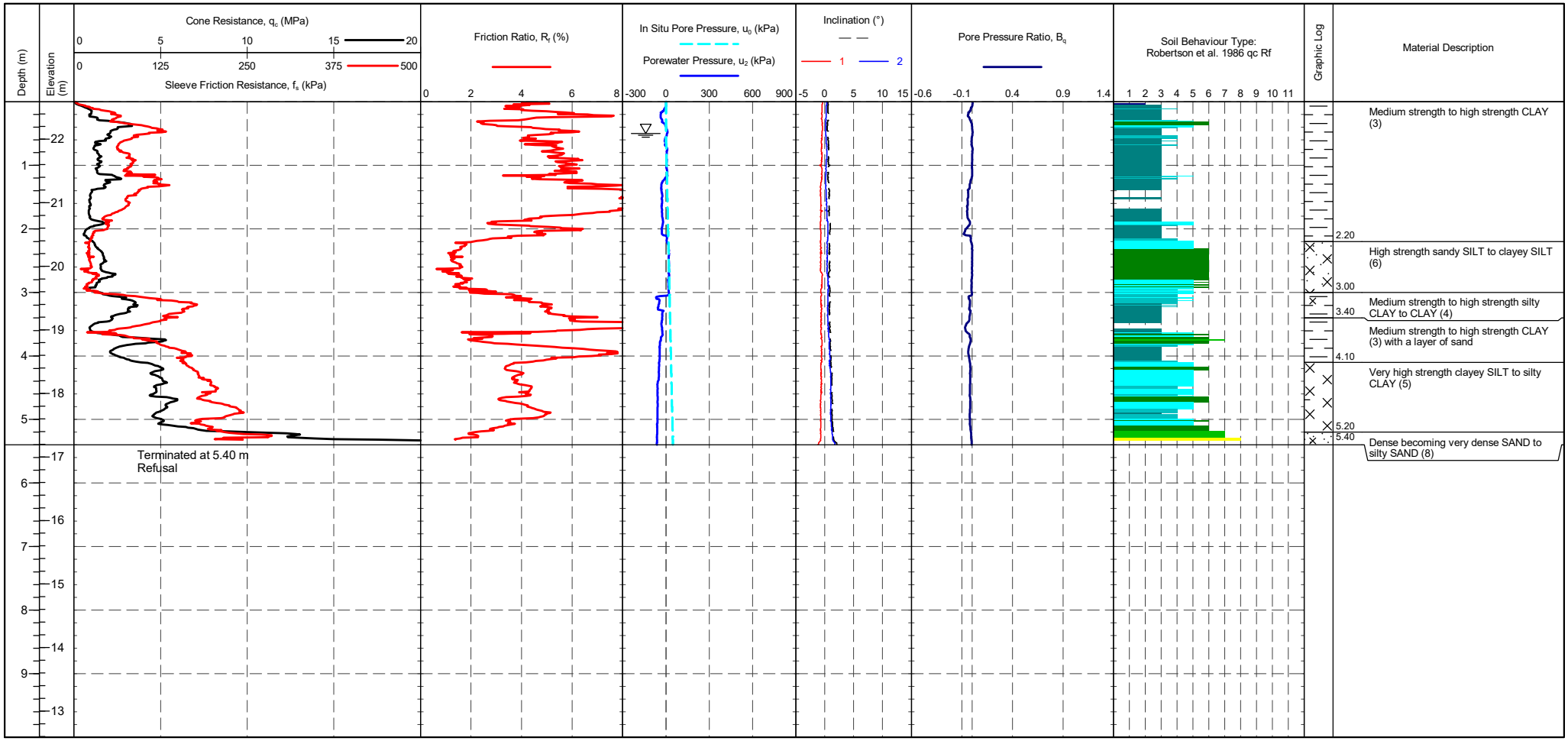
220629-ADVANCED REPORT INSITUSI 2.02.1.UB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:16 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT103**

CLIENT : Hydrock	EASTING : 444228.428 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403927.740 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.590 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm²	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	251 mV	244 mV	-0.076 MPa
Sleeve	298 mV	289 mV	-0.006 kPa
Pore Pressure 2	342 mV	363 mV	0.006 kPa
X-Y Inclinometer	2453 mV	2461 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

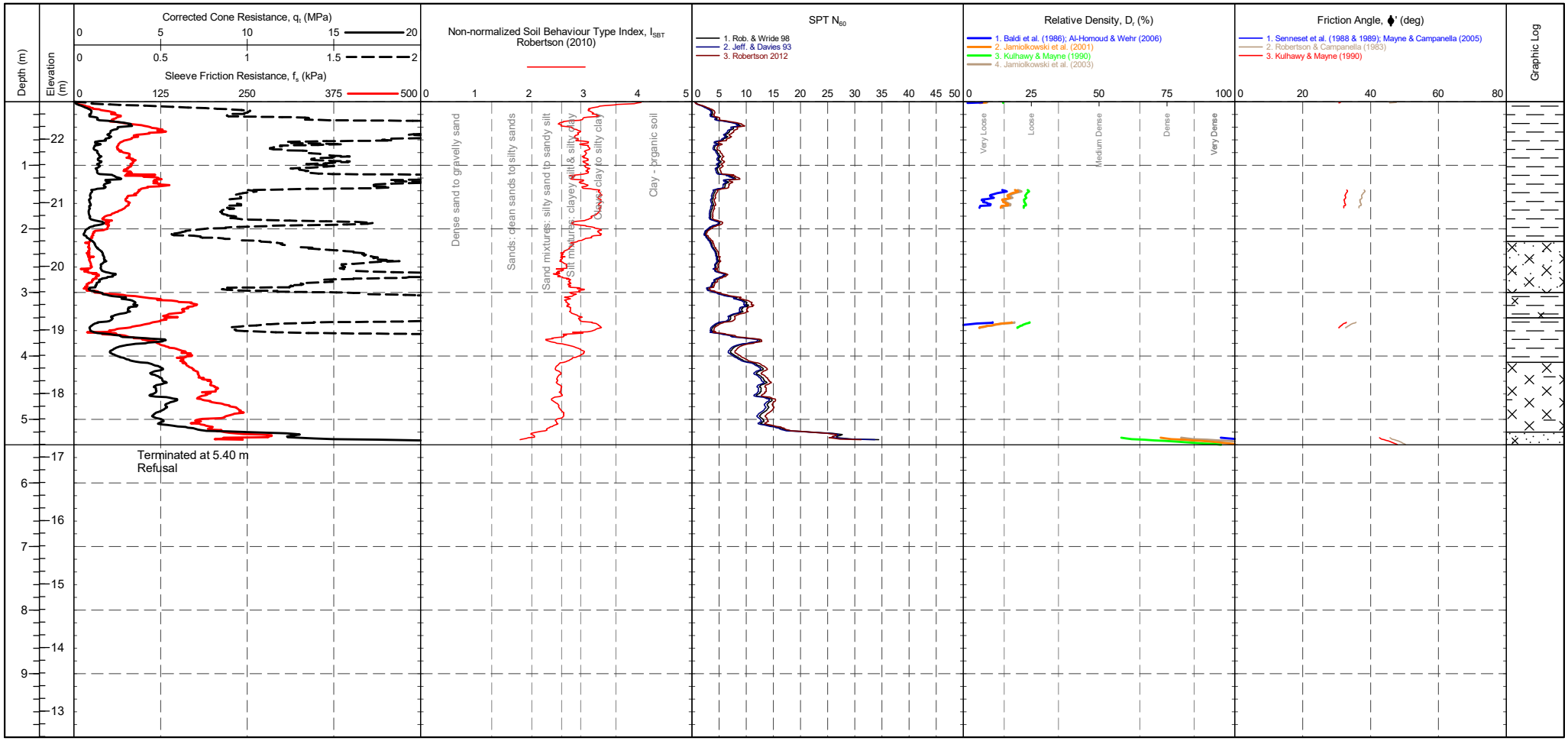
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT103**

CLIENT : Hydrock	EASTING : 444228.428 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403927.740 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.590 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	251 mV	244 mV	-0.076 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	298 mV	289 mV	-0.006 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	342 mV	363 mV	0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2453 mV	2461 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

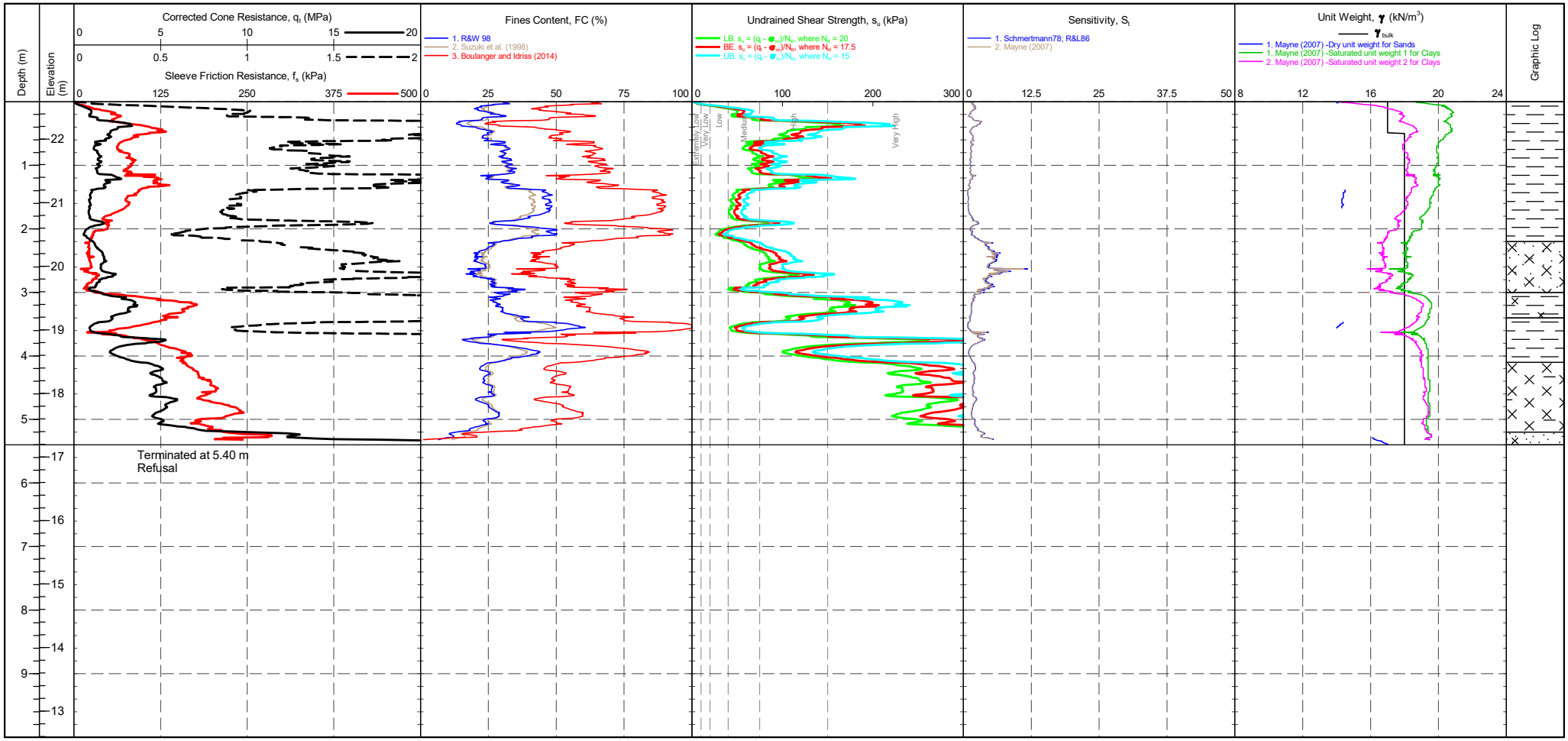
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT103**

CLIENT : Hydrock	EASTING : 444228.428 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403927.740 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.590 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



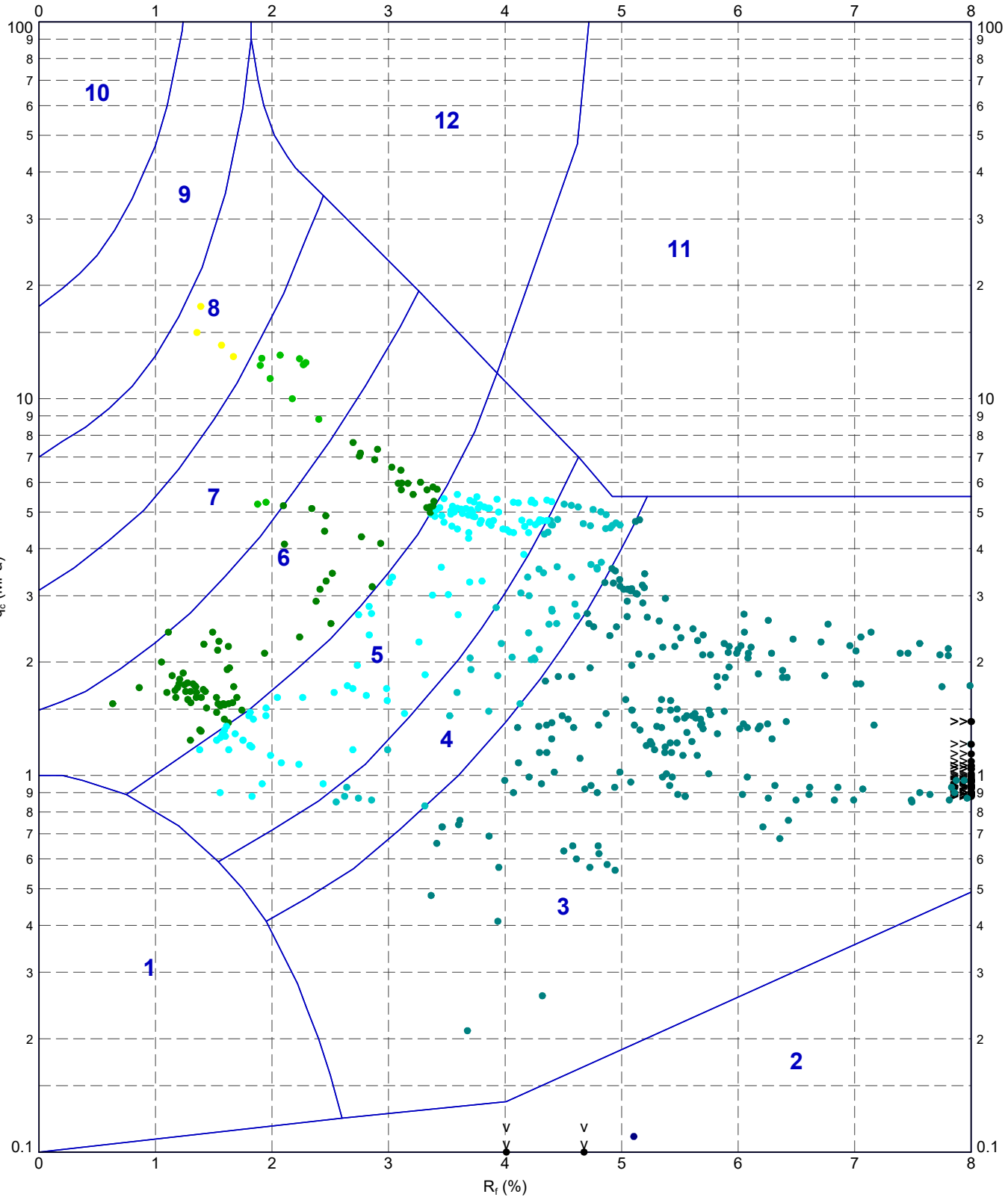
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	251 mV	244 mV	-0.076 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	298 mV	289 mV	-0.006 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	342 mV	363 mV	0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2453 mV	2461 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT103

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

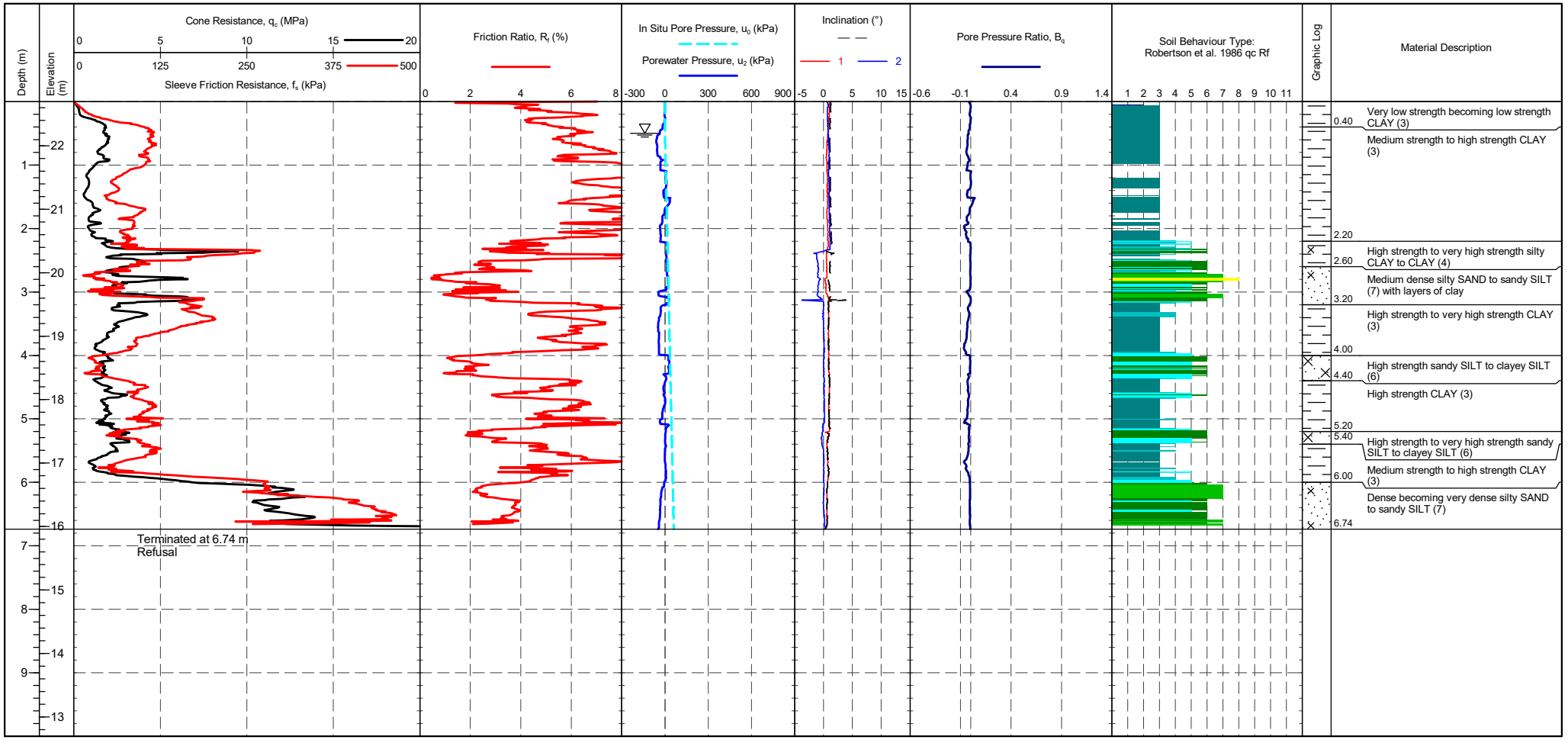
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:16 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT104**

CLIENT : Hydrock	EASTING : 444392.074 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403984.515 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.696 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	249 mV	245 mV	-0.044 MPa
Sleeve	293 mV	286 mV	-0.005 kPa
Pore Pressure 2	369 mV	371 mV	0.001 kPa
X-Y Inclinometer	2623 mV	2611 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

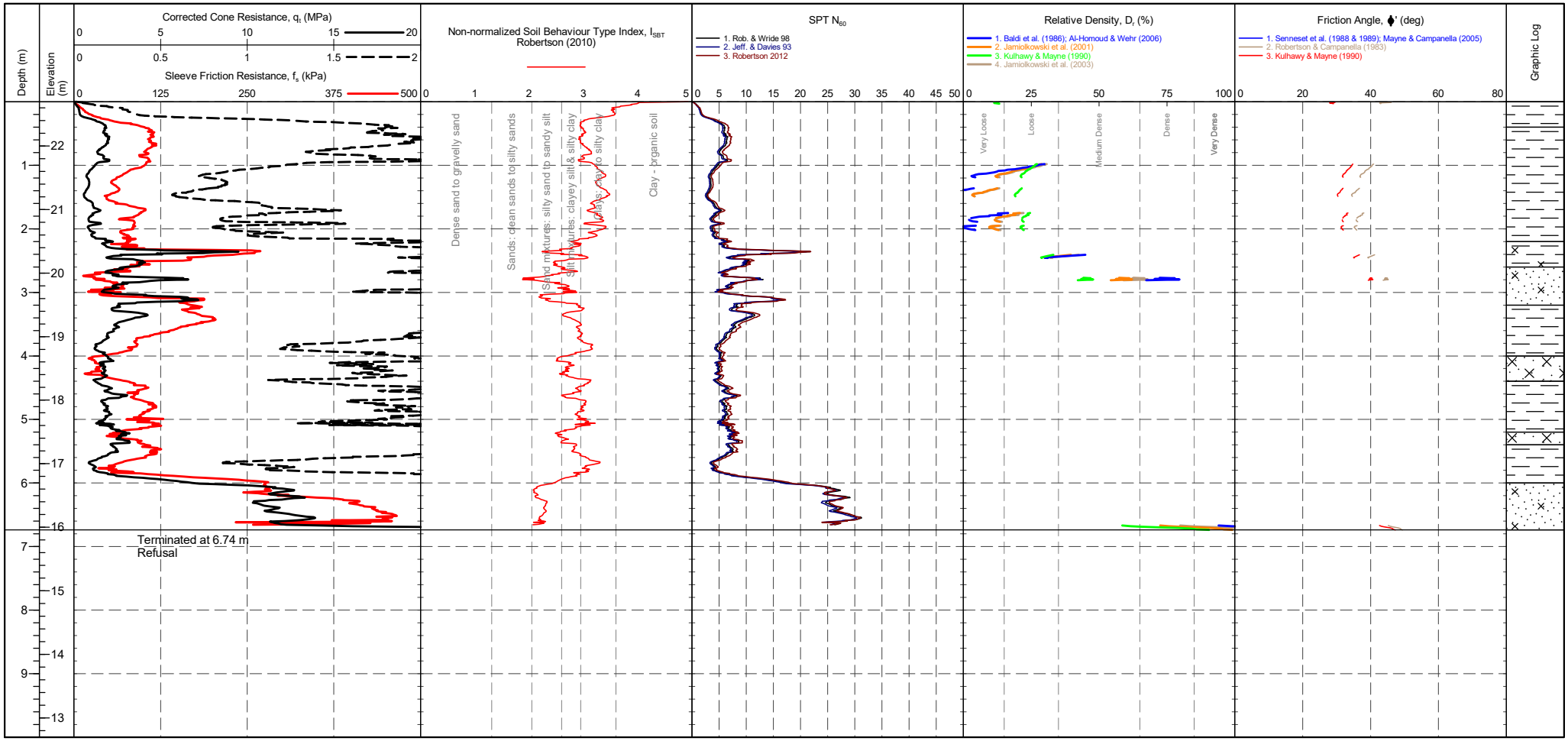
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT104**

CLIENT : Hydrock	EASTING : 444392.074 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403984.515 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.696 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	249 mV	245 mV
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	293 mV	286 mV
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	369 mV	371 mV
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2623 mV	2611 mV

Transducer	Difference
Tip	-0.044 MPa
Sleeve	-0.005 kPa
Pore Pressure 2	0.001 kPa

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

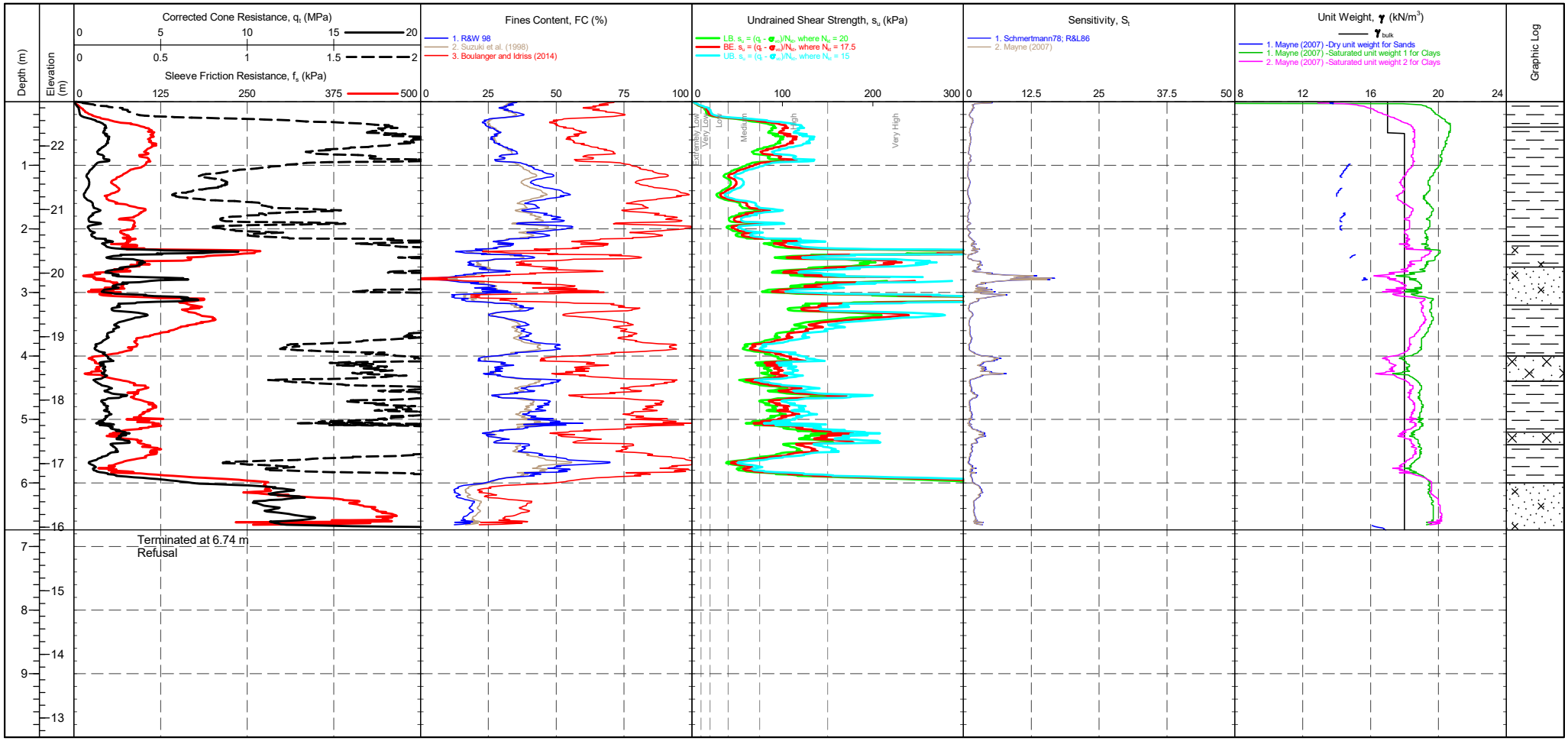
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT104**

CLIENT : Hydrock	EASTING : 444392.074 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403984.515 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.696 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



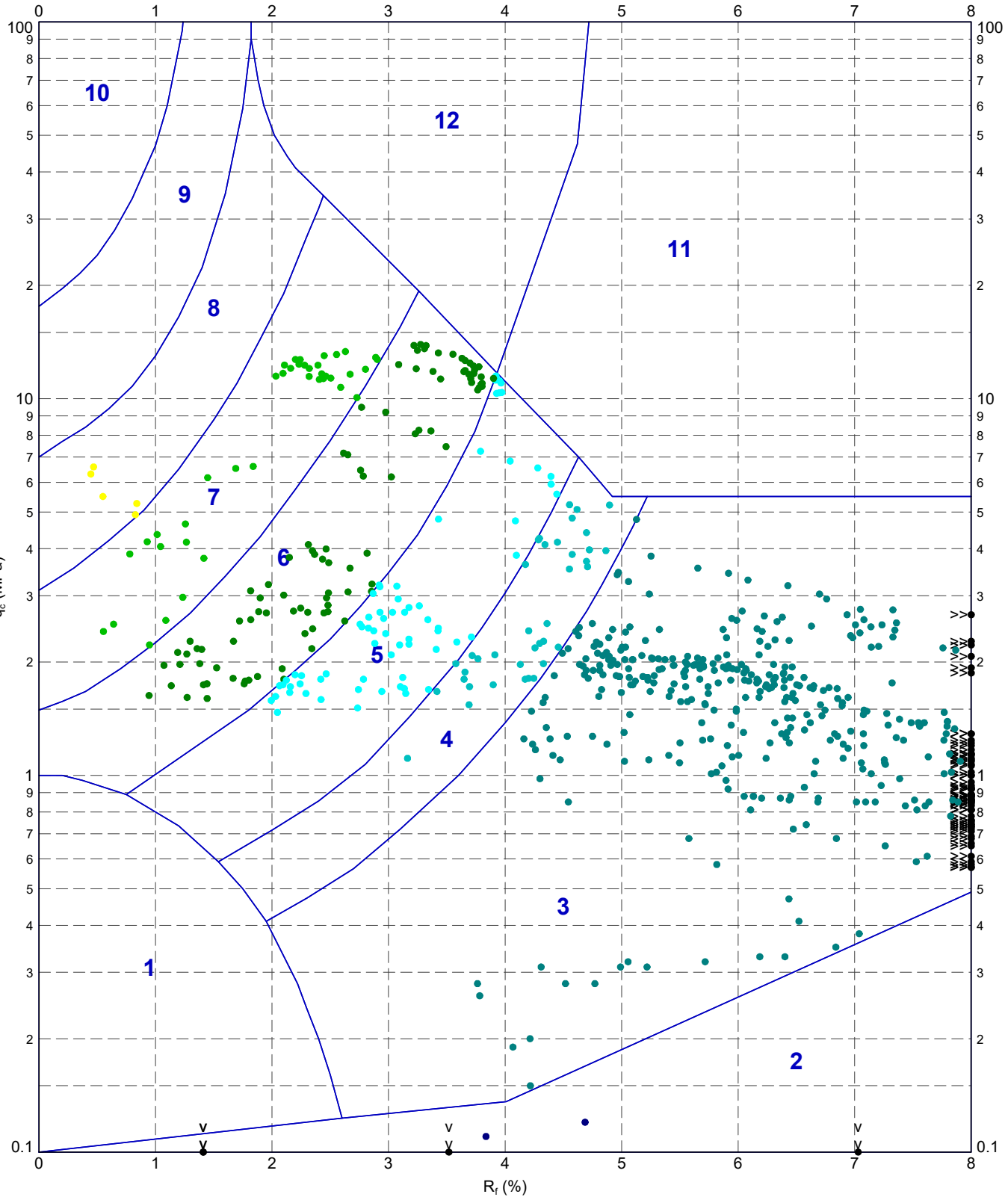
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	249 mV	245 mV	-0.044 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	293 mV	286 mV	-0.005 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	369 mV	371 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2623 mV	2611 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT104

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

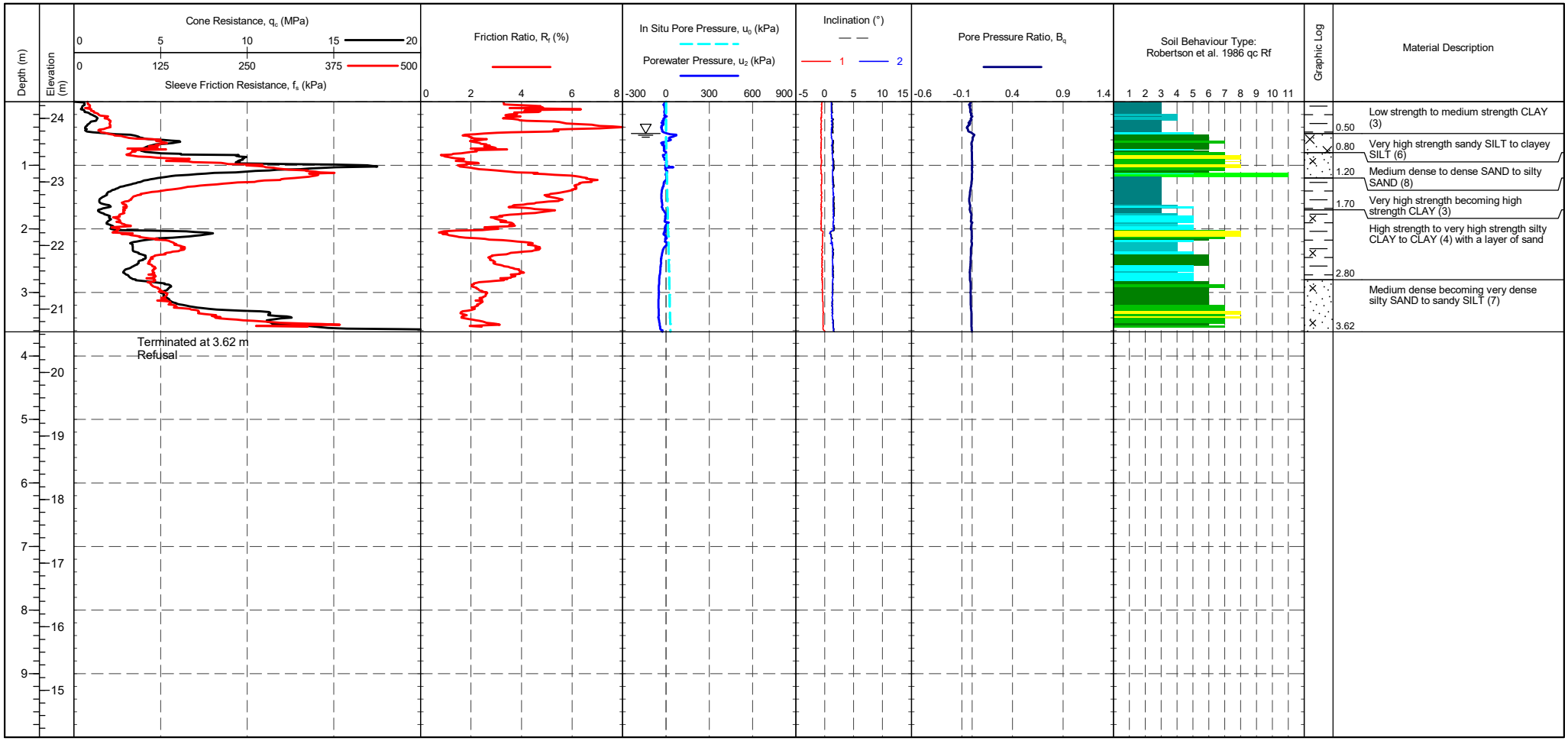
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:17 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT105**

CLIENT : Hydrock	EASTING : 444022.202 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403838.112 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.261 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	248 mV	251 mV	0.033 MPa
Sleeve	290 mV	295 mV	0.004 kPa
Pore Pressure 2	367 mV	320 mV	-0.013 kPa
X-Y Inclinometer	2462 mV	2485 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

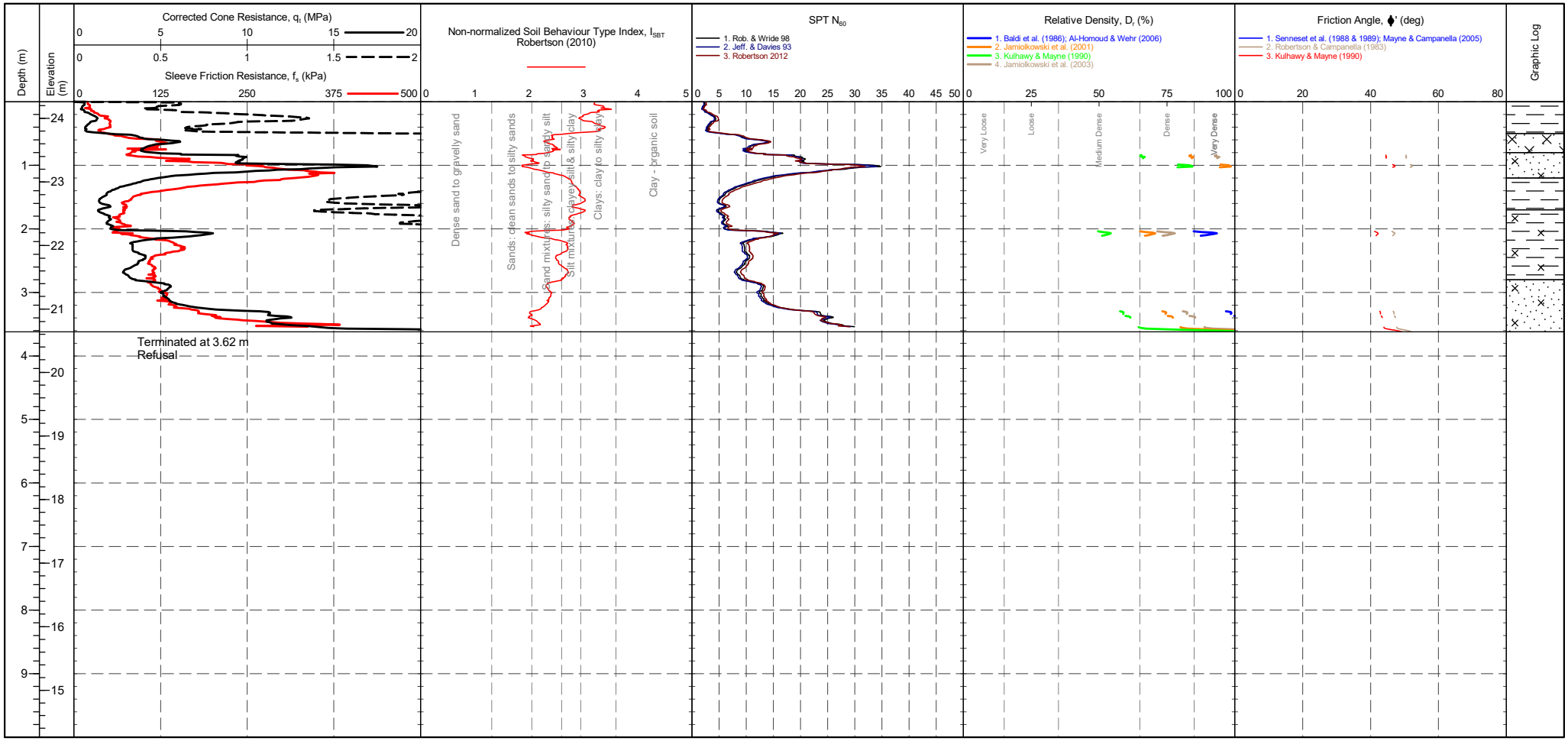
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT105**

CLIENT : Hydrock	EASTING : 444022.202 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403838.112 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.261 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	248 mV	251 mV	0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	290 mV	295 mV	0.004 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	367 mV	320 mV	-0.013 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2462 mV	2485 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

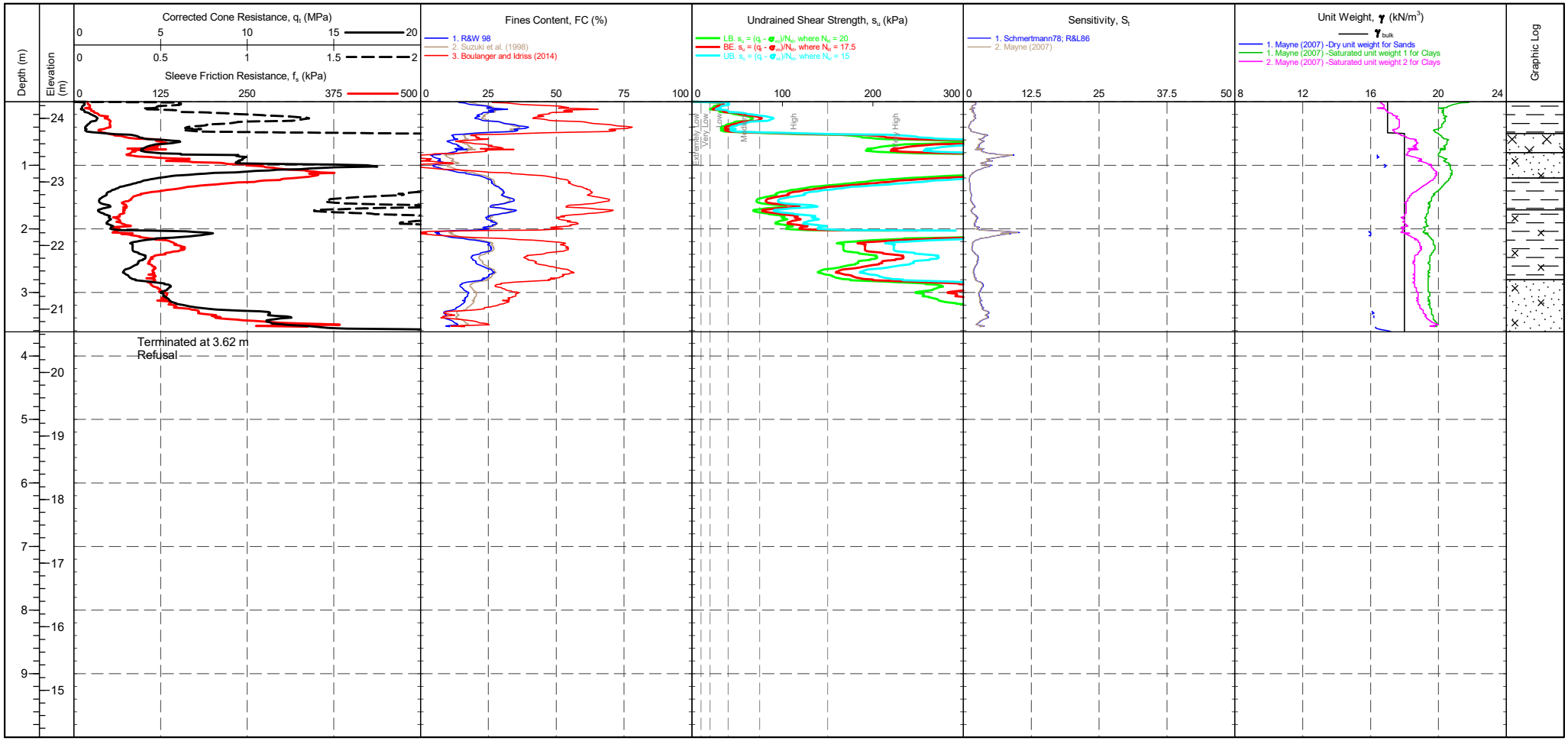
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT105**

CLIENT : Hydrock	EASTING : 444022.202 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403838.112 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.261 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



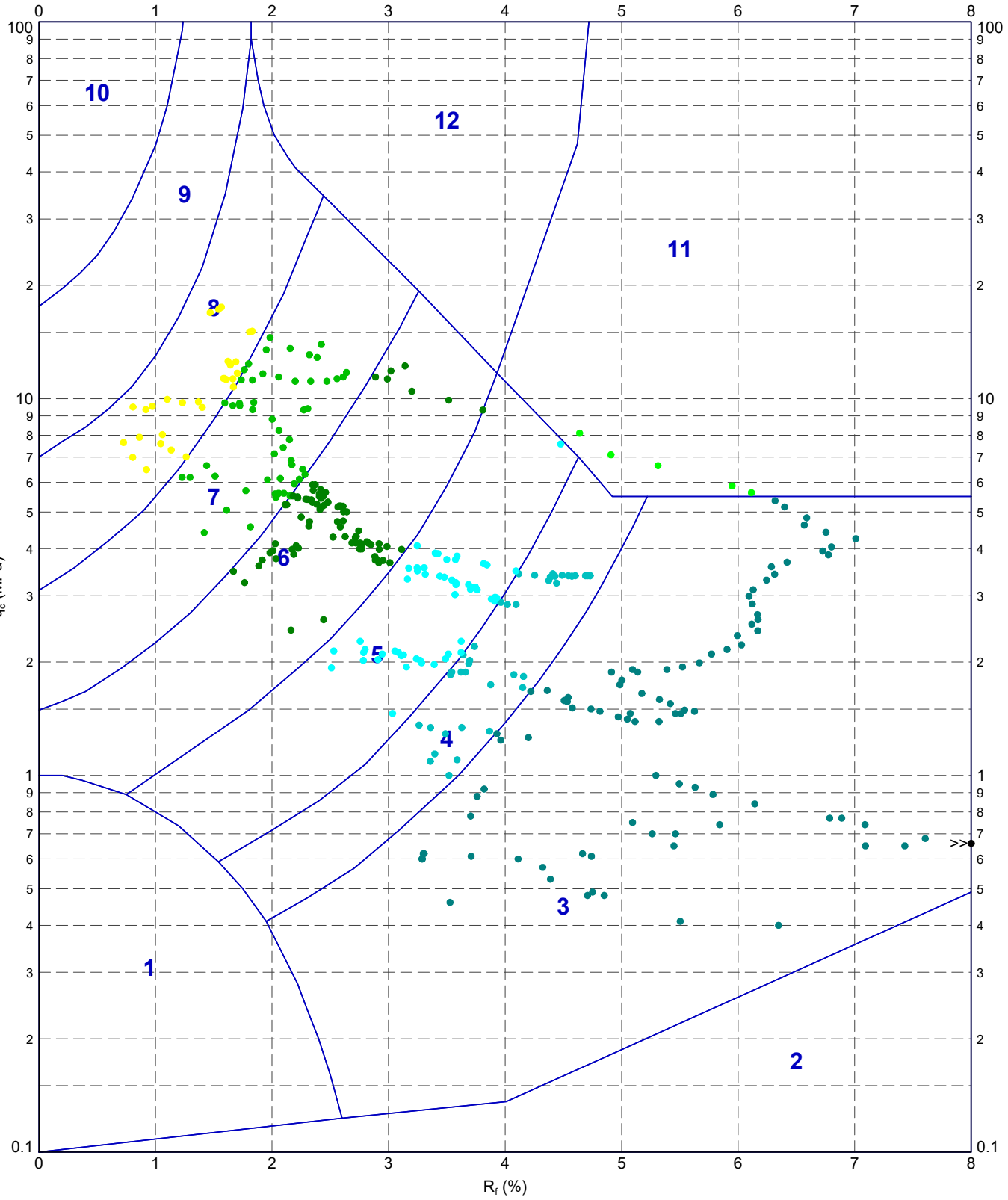
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	248 mV	251 mV	0.033 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	290 mV	295 mV	0.004 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	367 mV	320 mV	-0.013 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2462 mV	2485 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT105

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

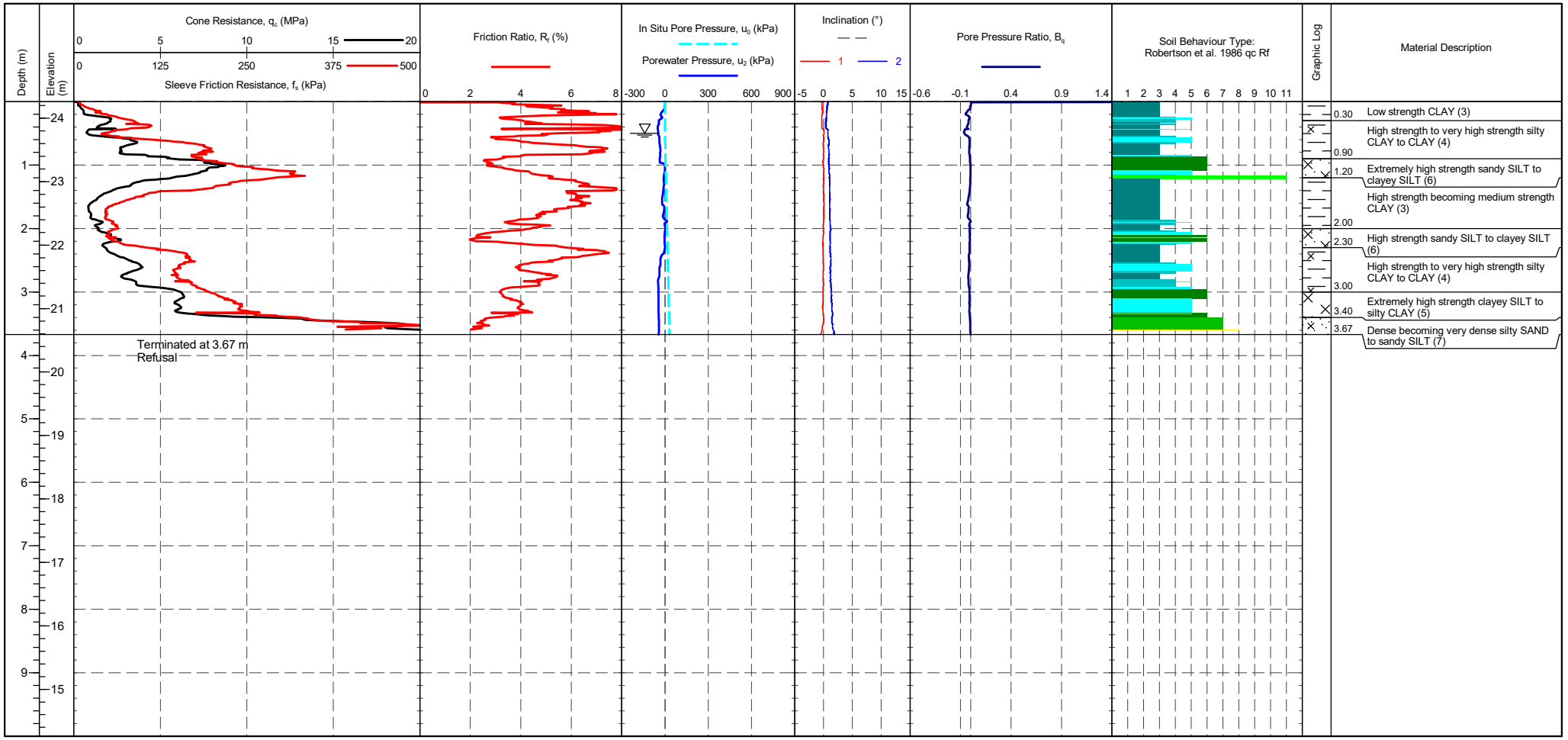
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:17 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT105T2**

CLIENT : Hydrock	EASTING : 444022.202 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403838.112 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.261 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	249 mV	248 mV	-0.011 MPa
Sleeve	296 mV	295 mV	-0.001 kPa
Pore Pressure 2	349 mV	327 mV	-0.006 kPa
X-Y Inclinometer	2511 mV	2491 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

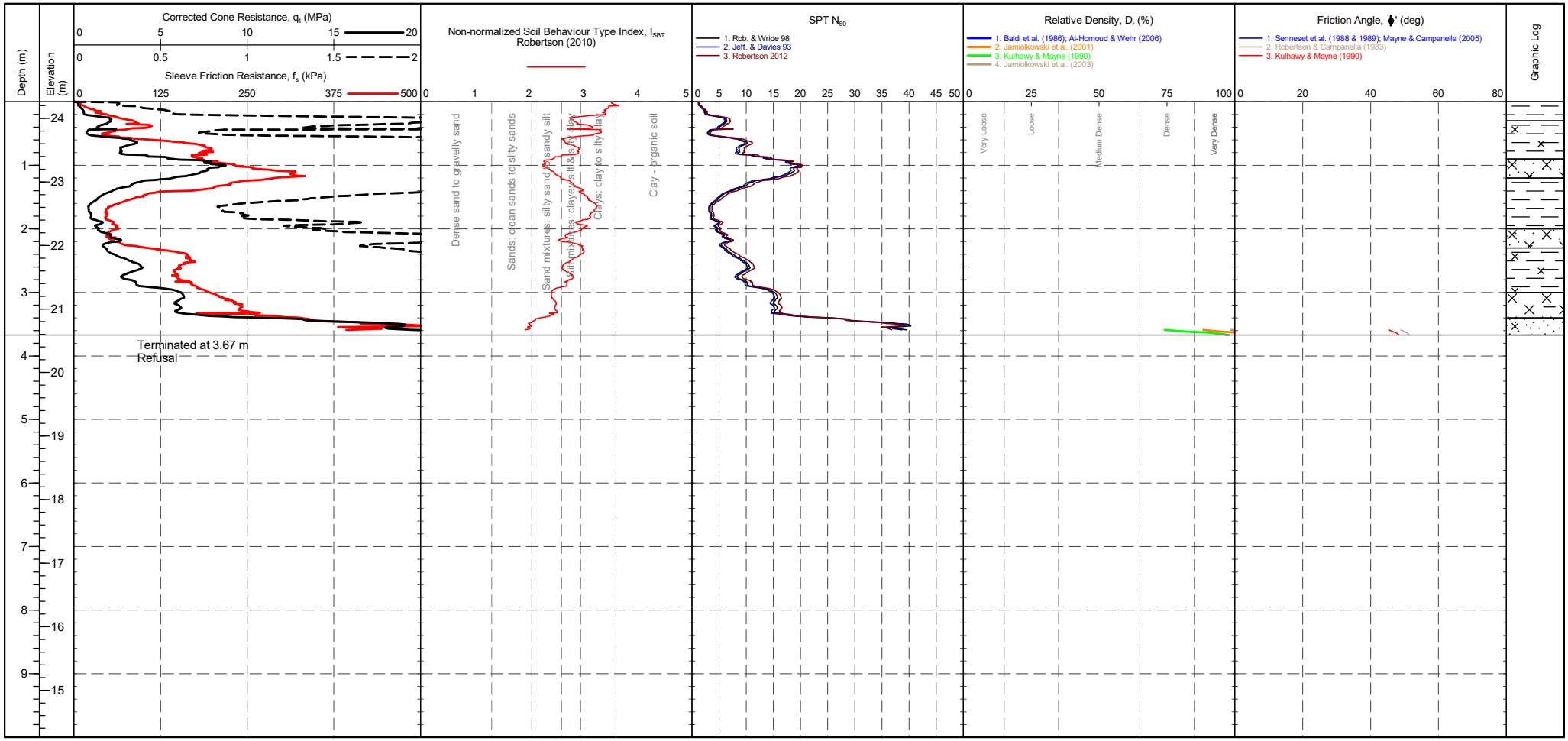
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT105T2**

CLIENT : Hydrock PROJECT : Barnsley Road LOCATION : Goldthorpe PROJECT No. : 1240176	EASTING : 444022.202 m NORTHING : 403838.112 m ELEVATION : 24.261 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 21/03/2024 PLOT DATE : 22/04/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	249 mV	248 mV	-0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	296 mV	295 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	349 mV	327 mV	-0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2511 mV	2491 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

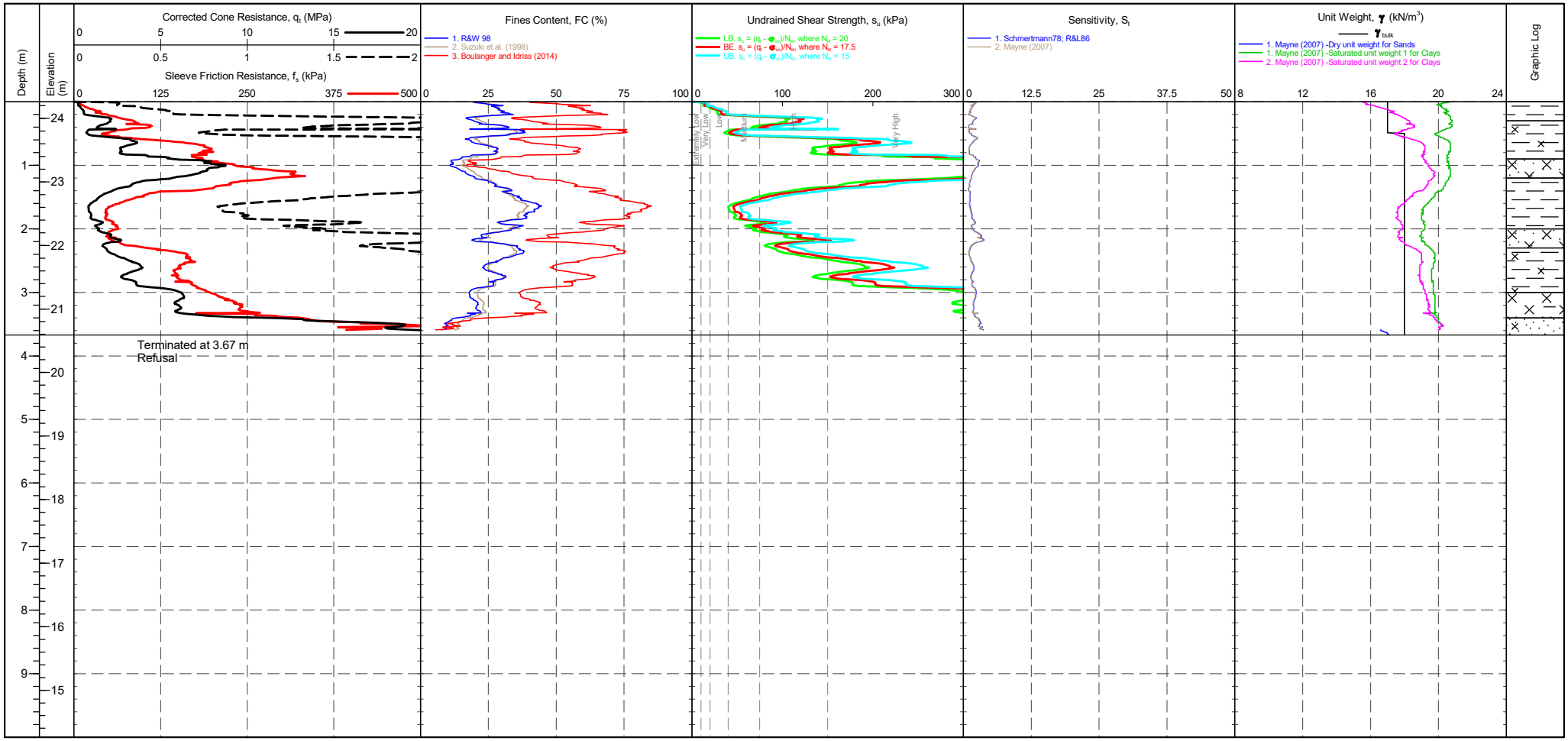
PointID: **CPT105T2**

CLIENT : Hydrock
PROJECT : Barnsley Road
LOCATION : Goldthorpe
PROJECT No. : 1240176

EASTING : 444022.202 m
NORTHING : 403838.112 m
ELEVATION : 24.261 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 21/03/2024
PLOT DATE : 22/04/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle
FILTER POSITION	: u2	FRICTION REDUCER	: None
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild

CPTU ZERO VALUES

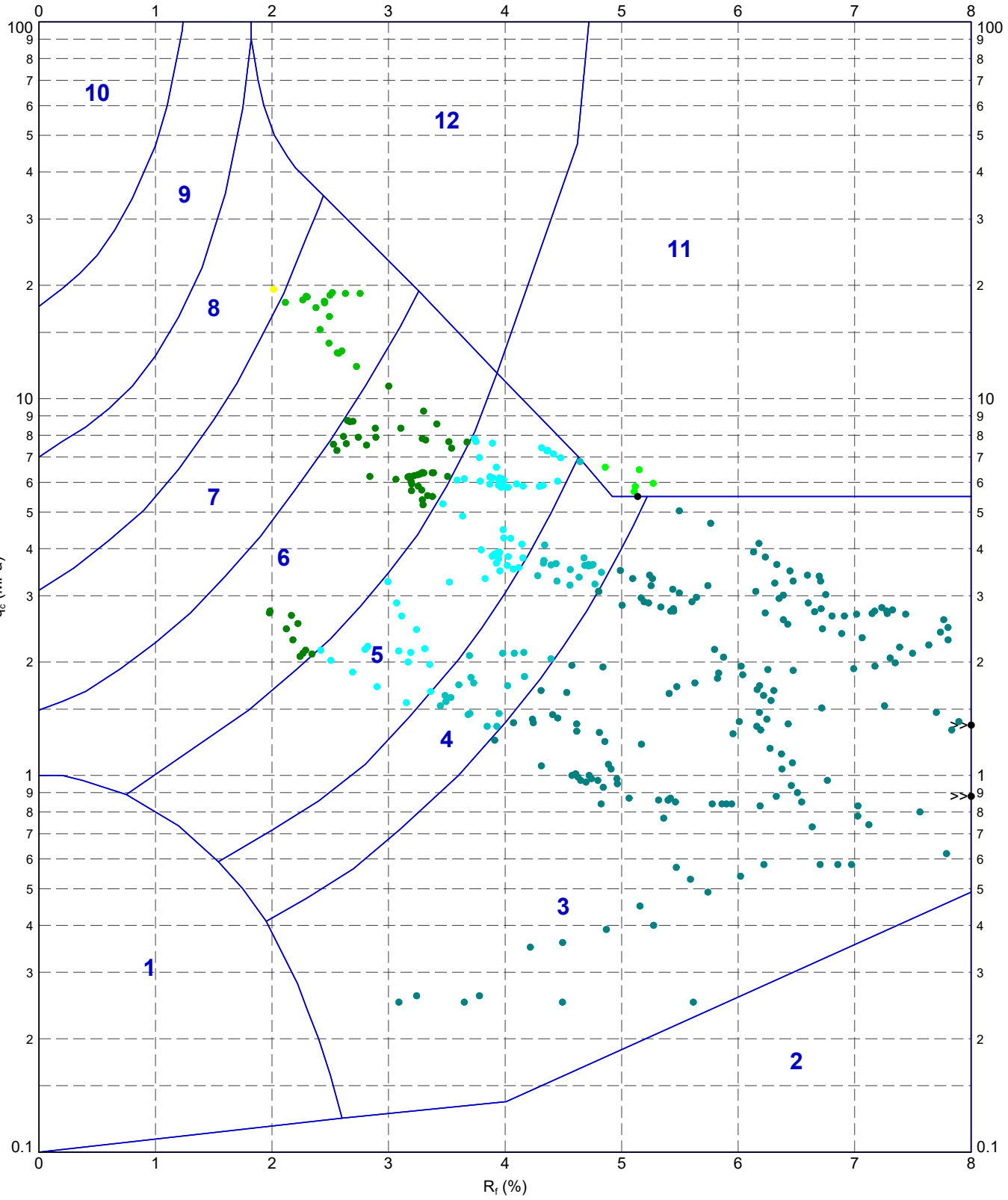
Transducer	Pre	Post	Difference
Tip	249 mV	248 mV	-0.011 MPa
Sleeve	296 mV	295 mV	-0.001 kPa
Pore Pressure 2	349 mV	327 mV	-0.006 kPa
X-Y Inclinometer	2511 mV	2491 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)
Extremely low strength	<10
Very low strength	10-20
Low strength	20-40
Medium strength	40-75
High strength	75-150
Very high strength	150-300
Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT105T2

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

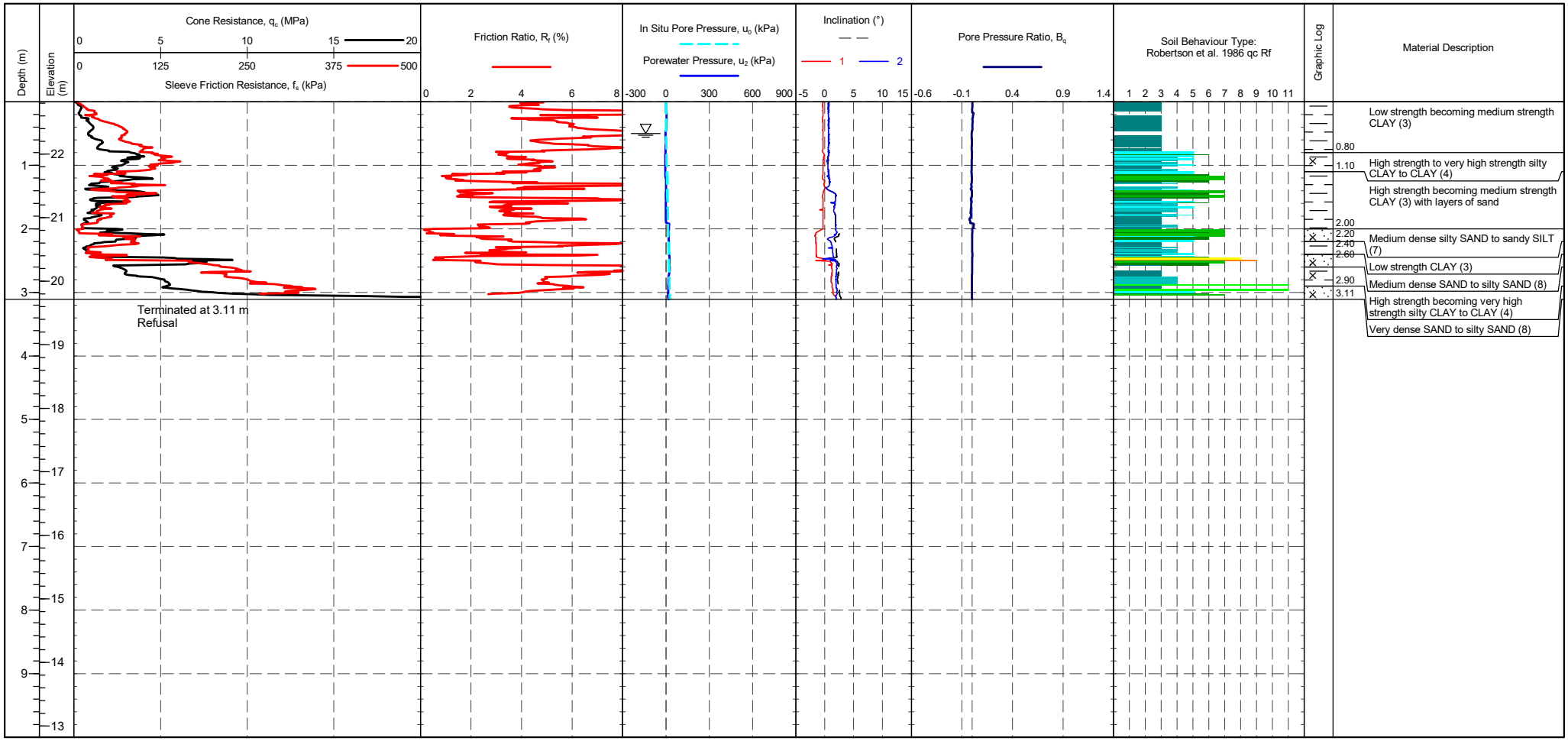
220629-ADVANCED REPORT INSITUSI 2.02.1.UB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:18 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT106**

CLIENT : Hydrock	EASTING : 444323.664 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403873.938 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.824 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	252 mV	253 mV	0.011 MPa
Sleeve	300 mV	300 mV	0 kPa
Pore Pressure 2	314 mV	287 mV	-0.007 kPa
X-Y Inclinometer	2453 mV	2474 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

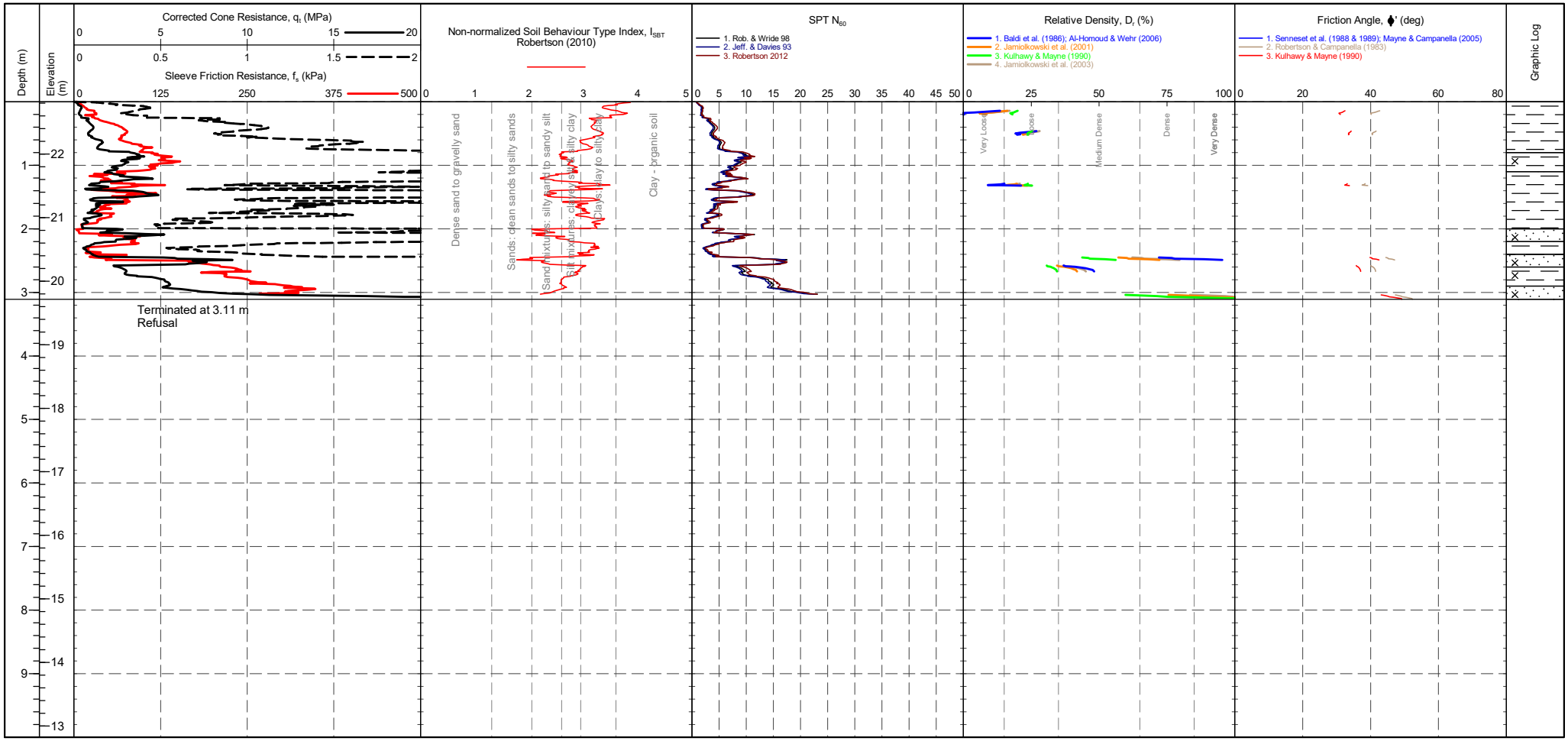
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT106**

CLIENT : Hydrock	EASTING : 444323.664 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403873.938 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.824 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	252 mV	253 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	300 mV	300 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	314 mV	287 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2453 mV	2474 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

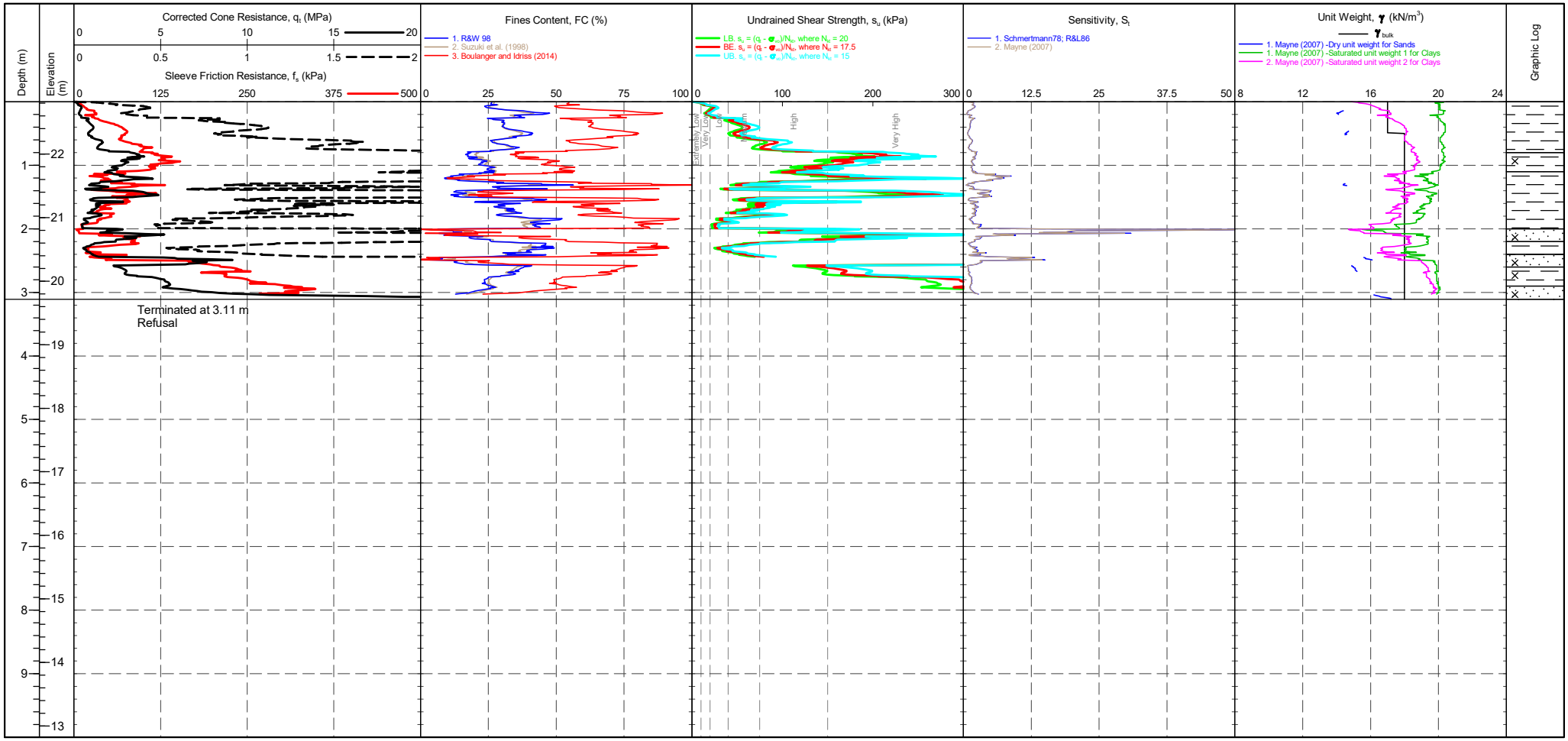
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT106**

CLIENT : Hydrock	EASTING : 444323.664 m	Remark: Test refused on total pressure.	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403873.938 m		STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.824 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



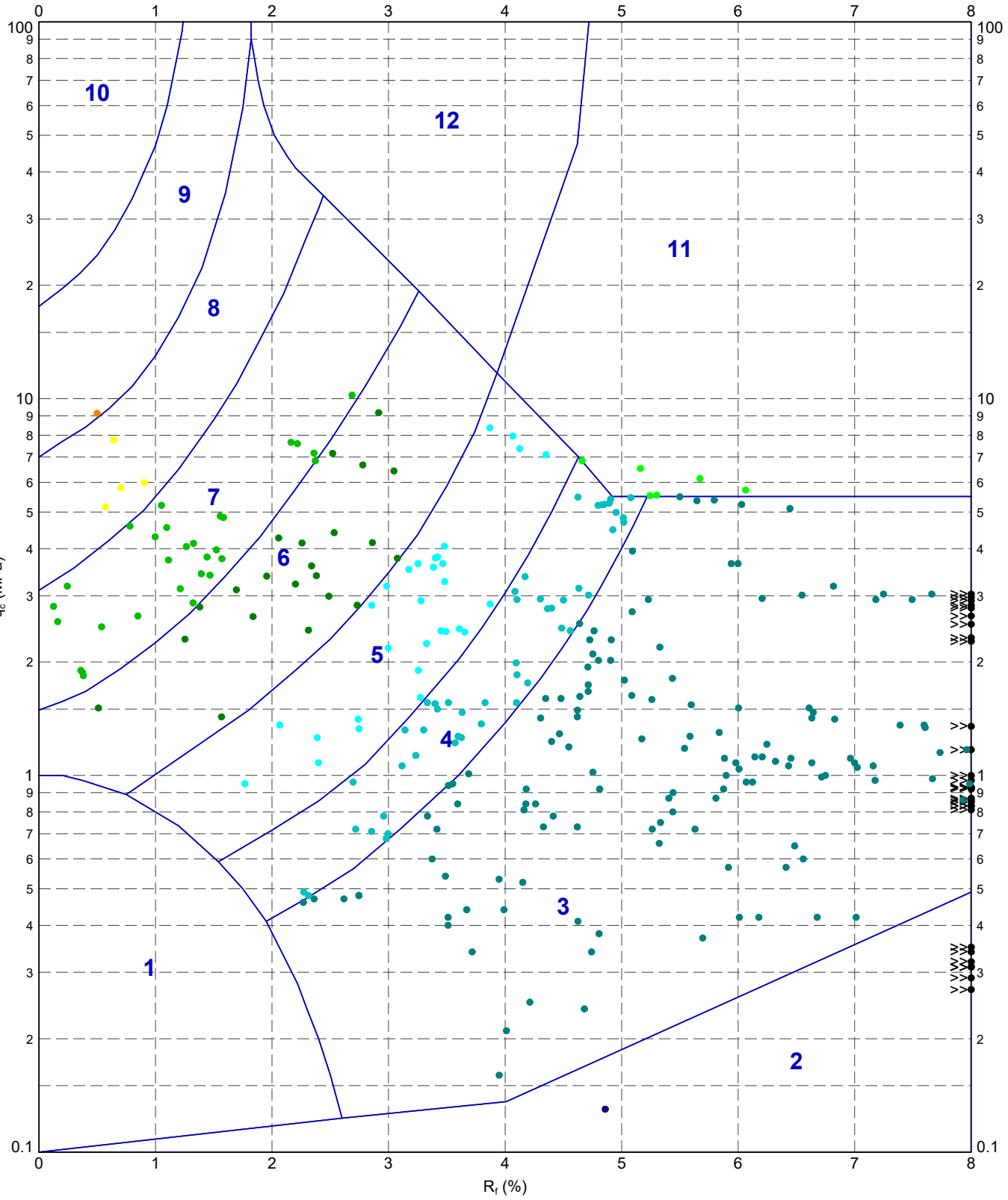
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	252 mV	253 mV	0.011 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	300 mV	300 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	314 mV	287 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2453 mV	2474 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT106

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

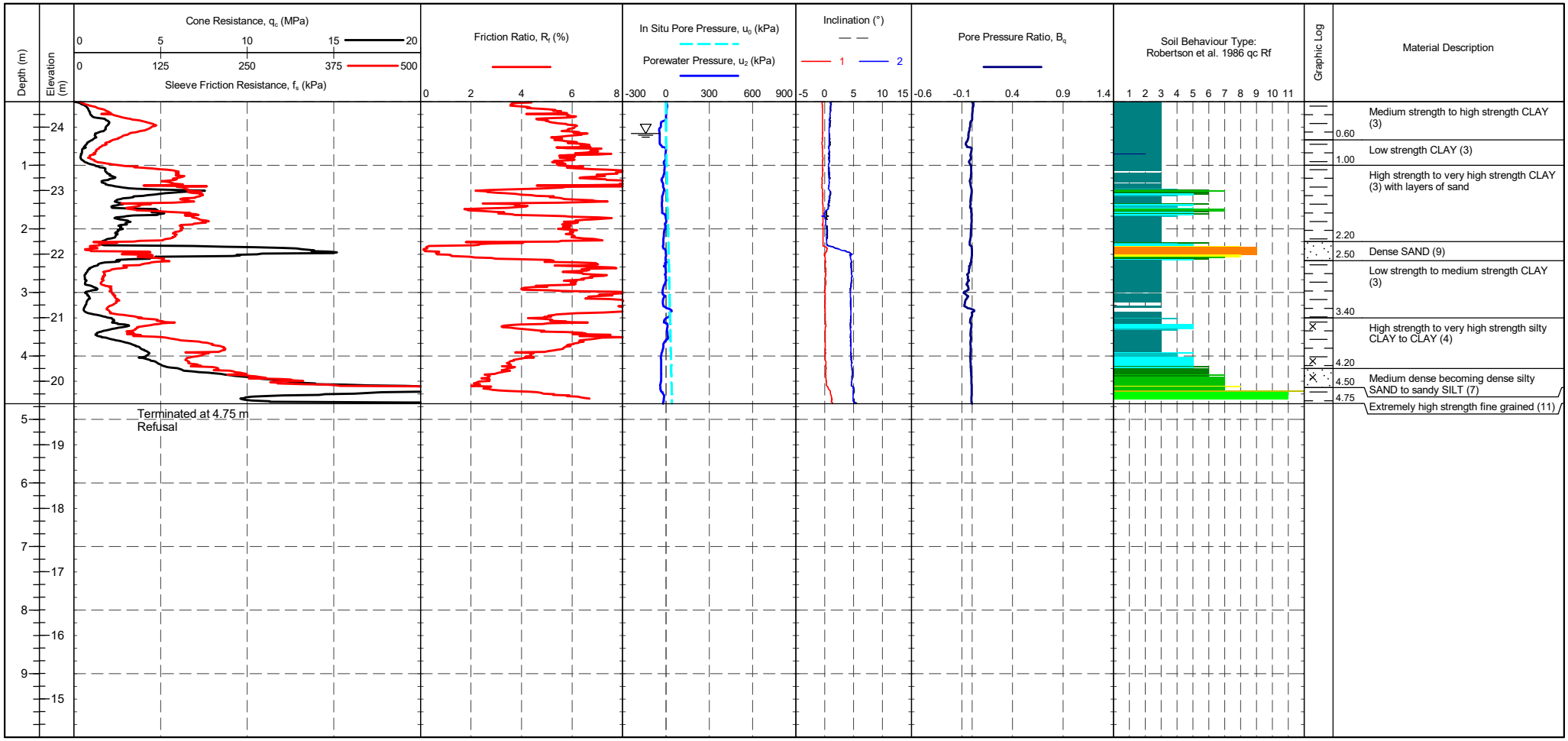
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:19 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT107**

CLIENT : Hydrock	EASTING : 444006.536 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403766.596 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.398 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	250 mV	250 mV	0 MPa
Sleeve	297 mV	297 mV	0 kPa
Pore Pressure 2	358 mV	323 mV	-0.01 kPa
X-Y Inclinometer	2472 mV	2472 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

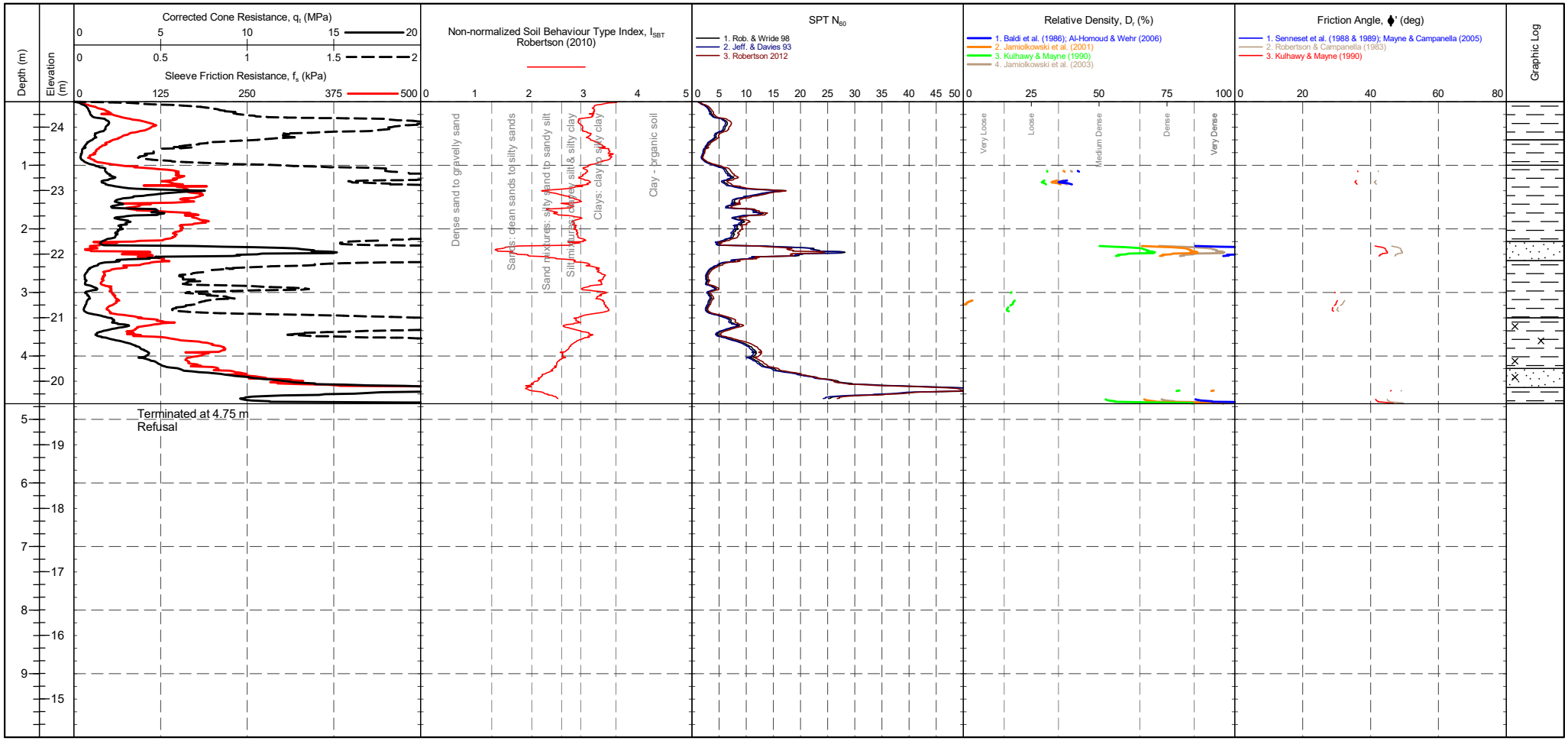
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT107**

CLIENT : Hydrock	EASTING : 444006.536 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403766.596 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.398 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	250 mV	250 mV
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	297 mV	297 mV
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	358 mV	323 mV
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2472 mV	2472 mV

Transducer	Difference
Tip	0 MPa
Sleeve	0 kPa
Pore Pressure 2	-0.01 kPa
X-Y Inclinometer	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

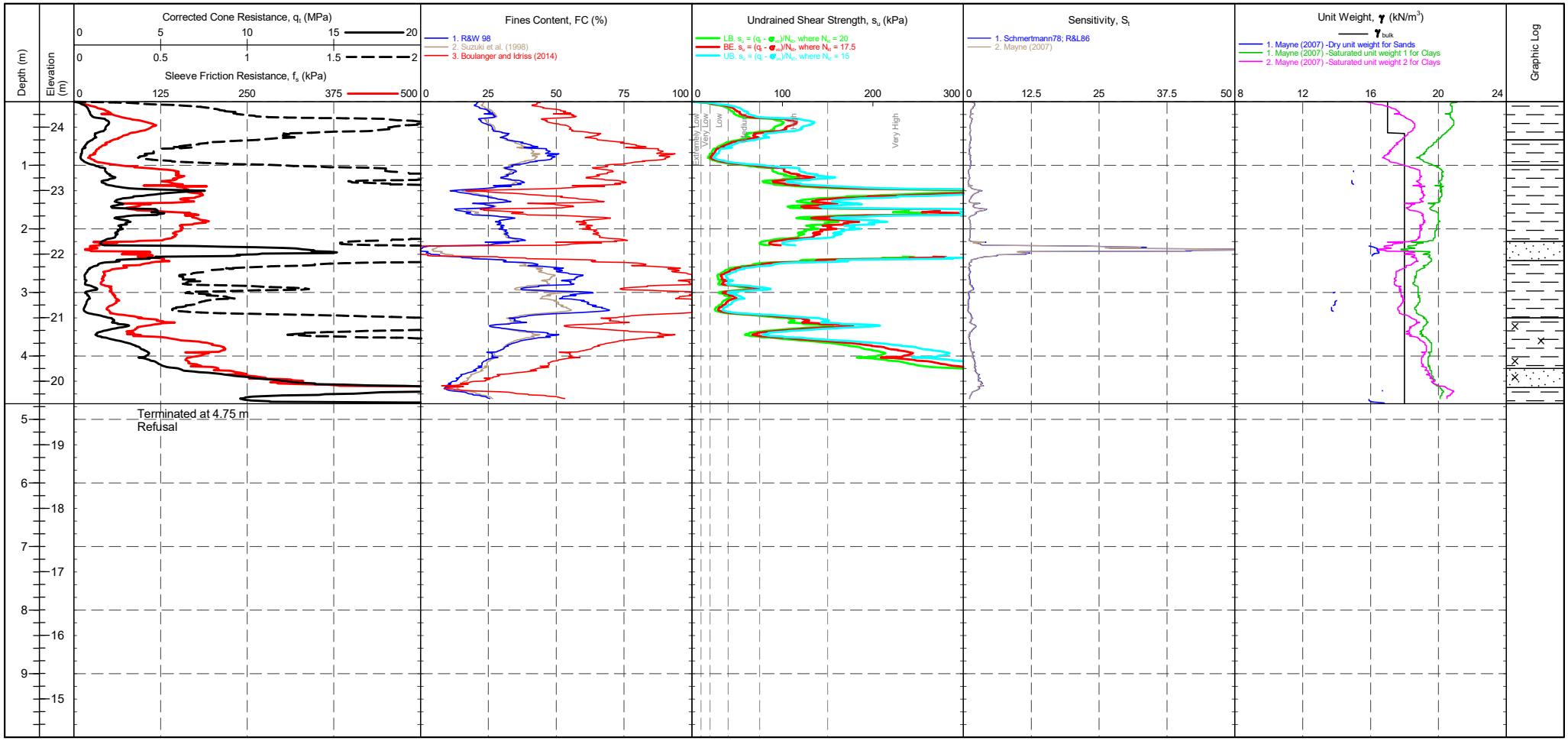
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT107**

CLIENT : Hydrock	EASTING : 444006.536 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403766.596 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.398 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



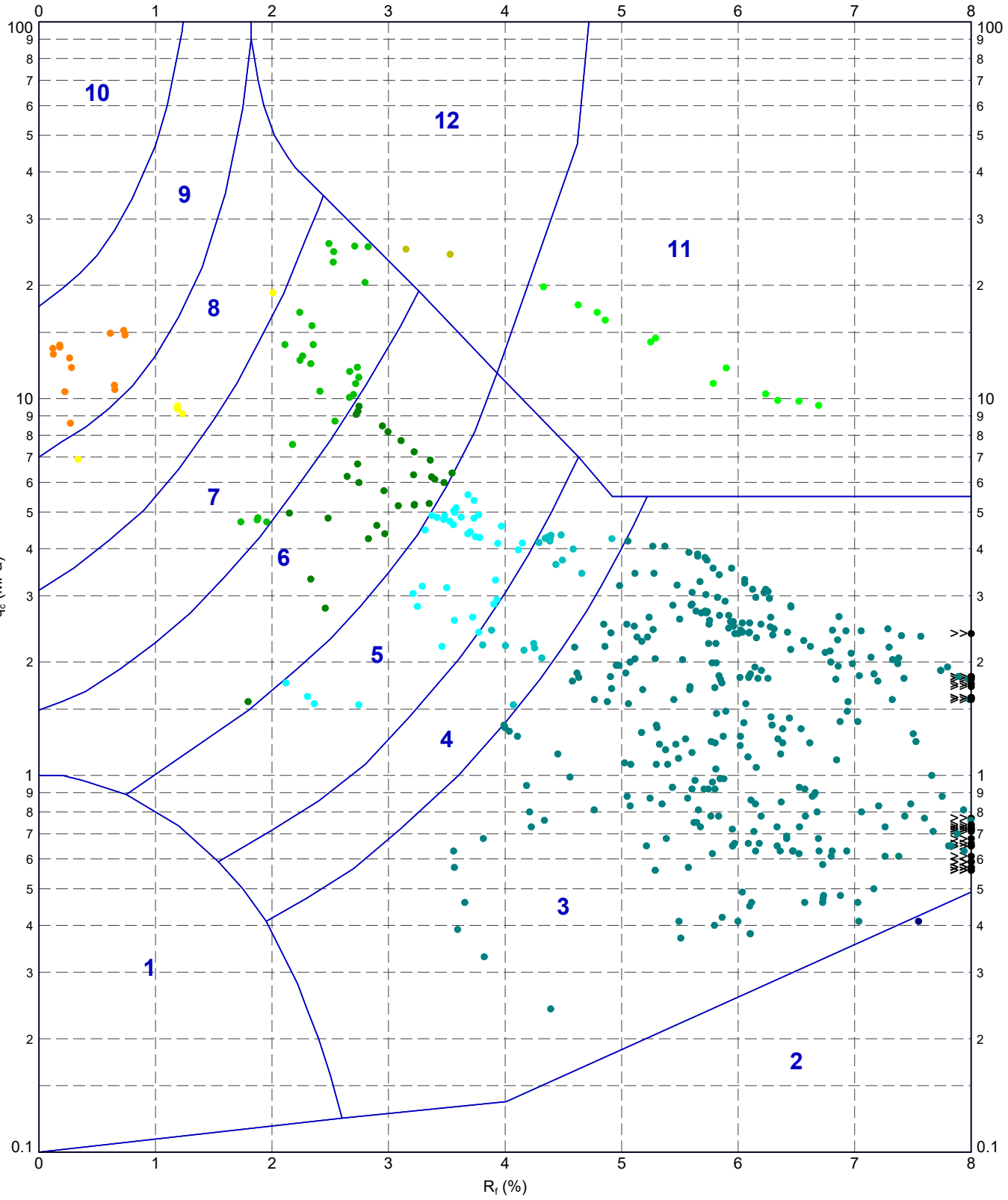
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	250 mV	250 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	297 mV	297 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	358 mV	323 mV	-0.01 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2472 mV	2472 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT107

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

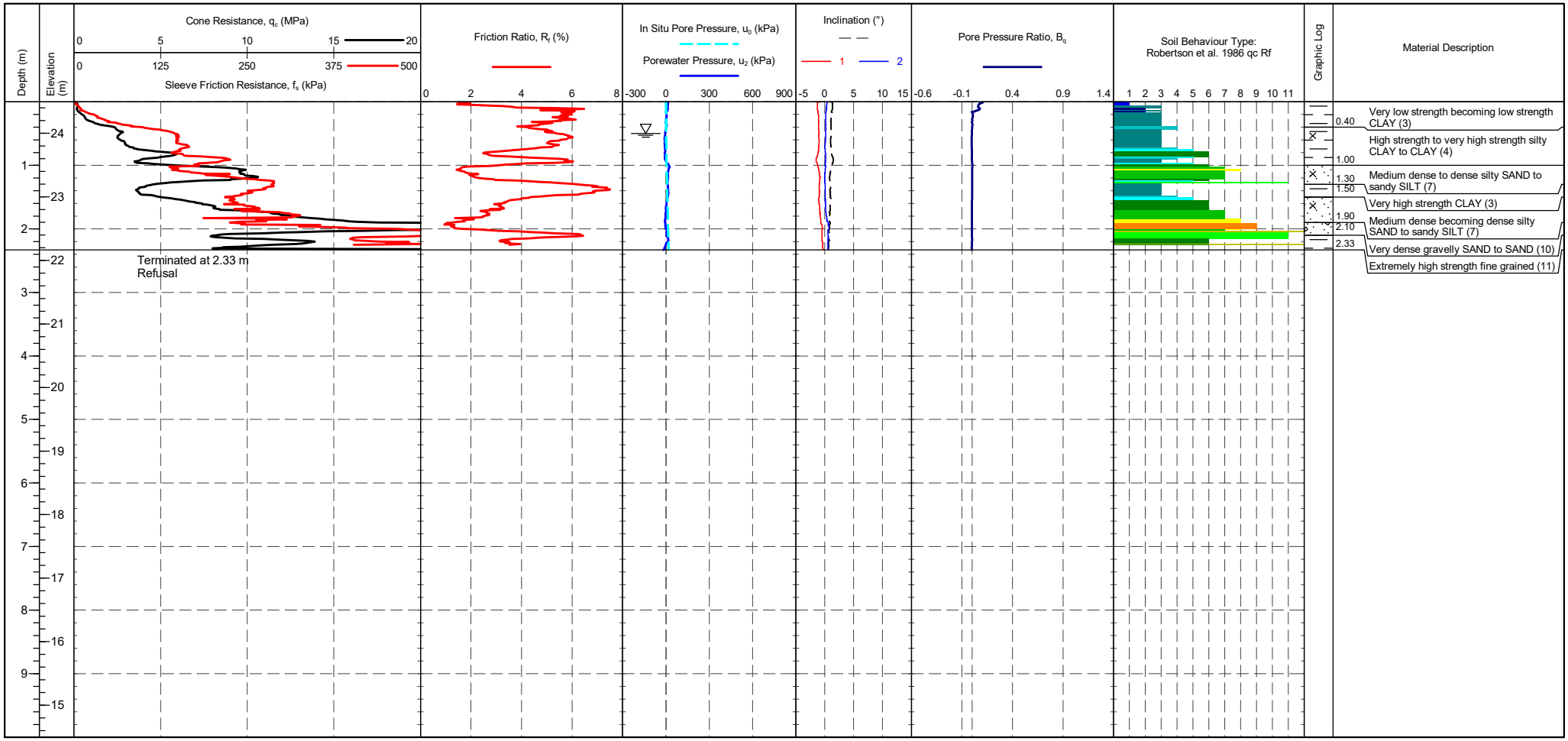
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:19 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT108**

CLIENT : Hydrock	EASTING : 444113.387 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403815.364 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.497 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm²	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	250 mV	258 mV	0.087 MPa
Sleeve	298 mV	303 mV	0.004 kPa
Pore Pressure 2	341 mV	314 mV	-0.007 kPa
X-Y Inclinometer	2434 mV	2413 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

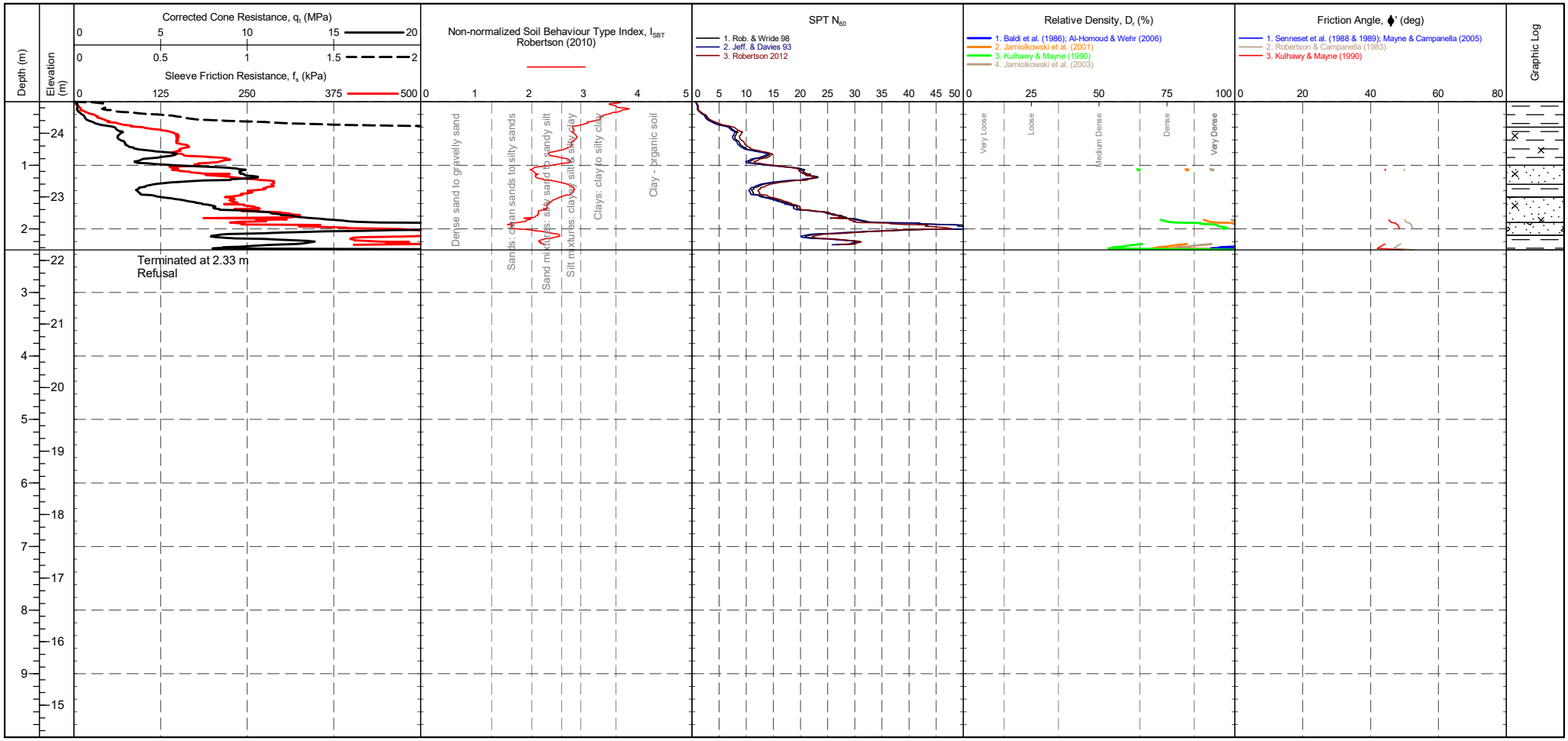
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT108**

CLIENT : Hydrock PROJECT : Barnsley Road LOCATION : Goldthorpe PROJECT No. : 1240176	EASTING : 444113.387 m NORTHING : 403815.364 m ELEVATION : 24.497 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 21/03/2024 PLOT DATE : 22/04/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	250 mV	258 mV	0.087 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	298 mV	303 mV	0.004 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	341 mV	314 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2434 mV	2413 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

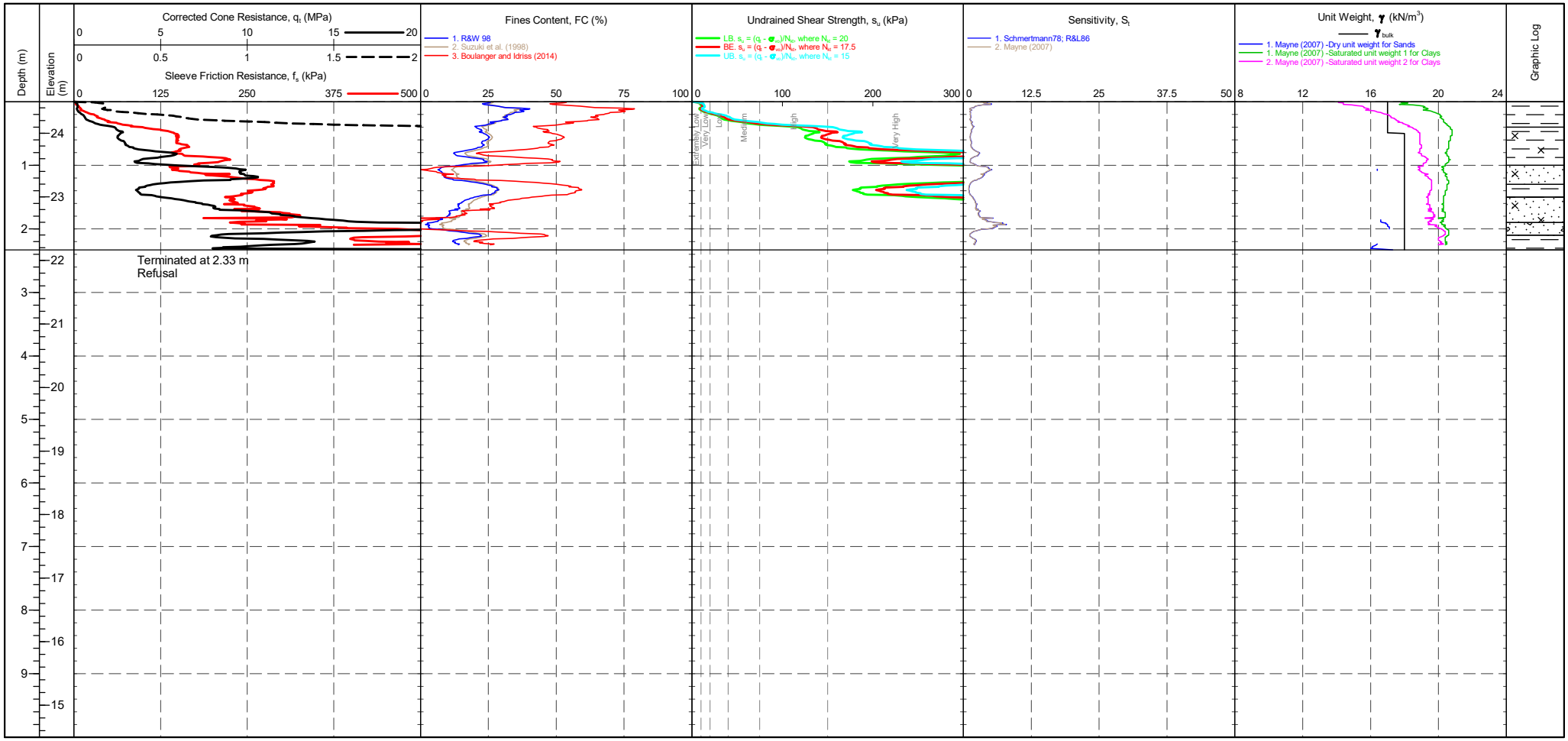
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT108**

CLIENT : Hydrock	EASTING : 444113.387 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403815.364 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.497 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



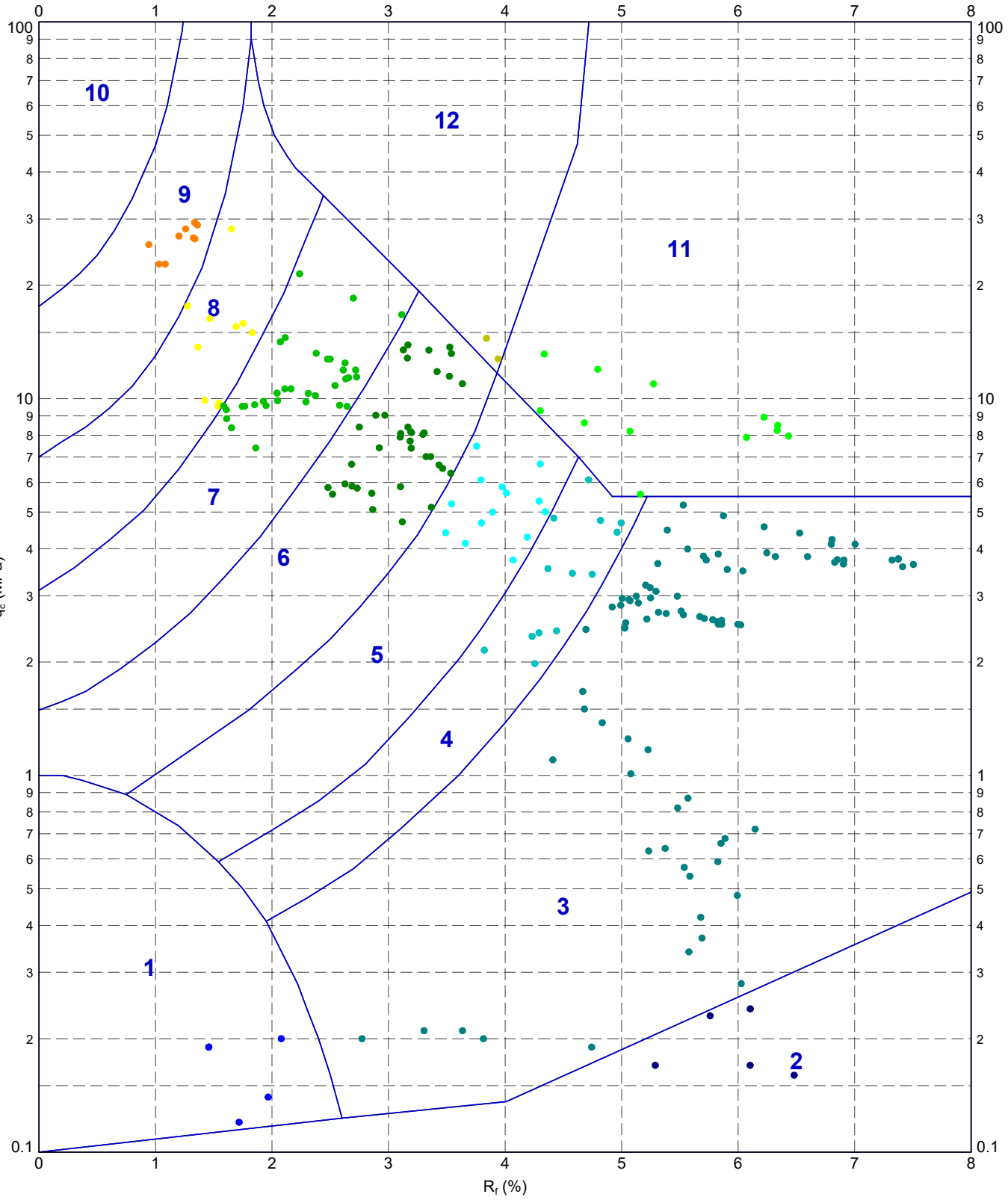
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	250 mV	258 mV	0.087 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	298 mV	303 mV	0.004 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	341 mV	314 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2434 mV	2413 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT108

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

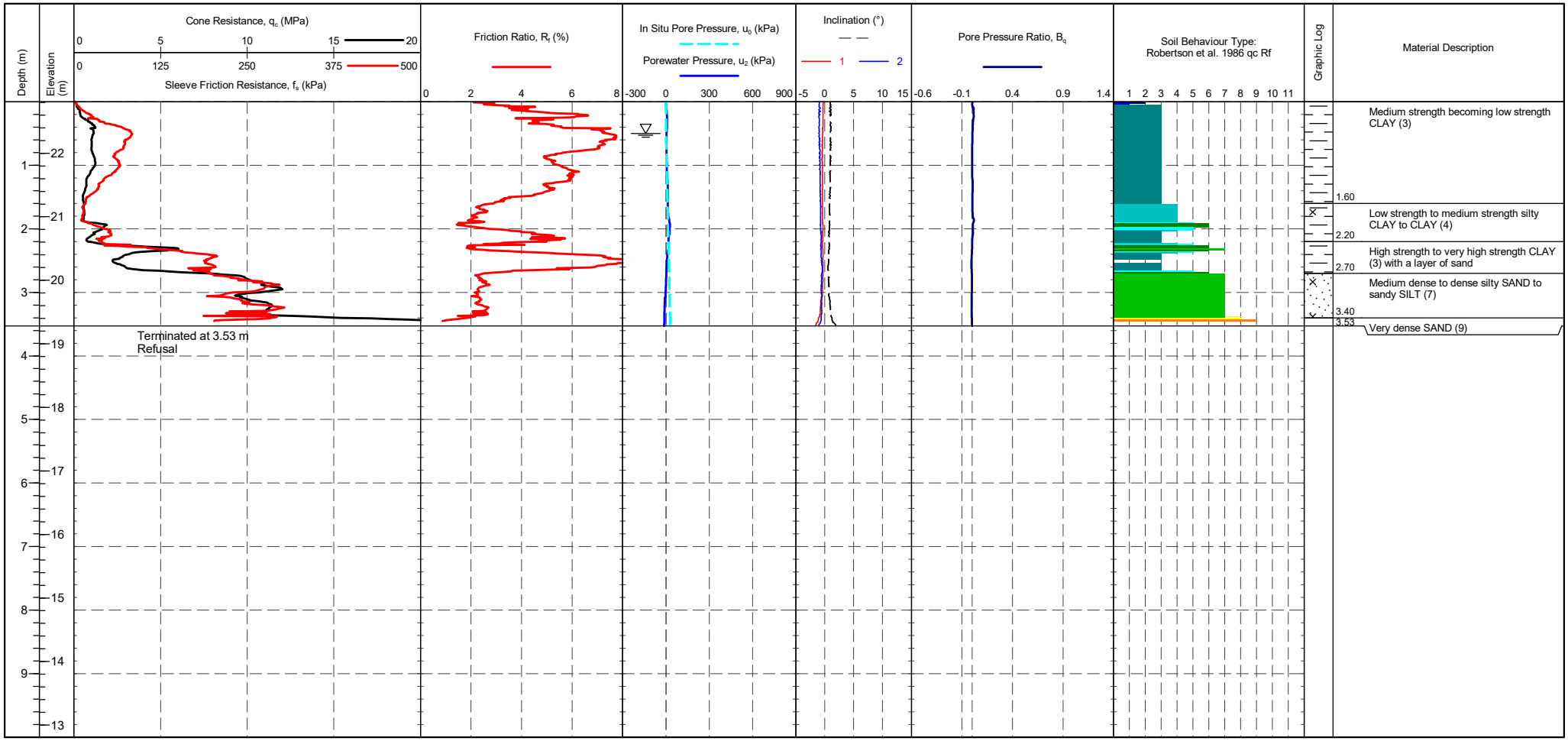
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:20 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT109**

CLIENT : Hydrock	EASTING : 444405.764 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403842.776 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.810 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	252 mV	254 mV	0.022 MPa
Sleeve	300 mV	300 mV	0 kPa
Pore Pressure 2	358 mV	270 mV	-0.024 kPa
X-Y Inclinometer	2481 mV	2487 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

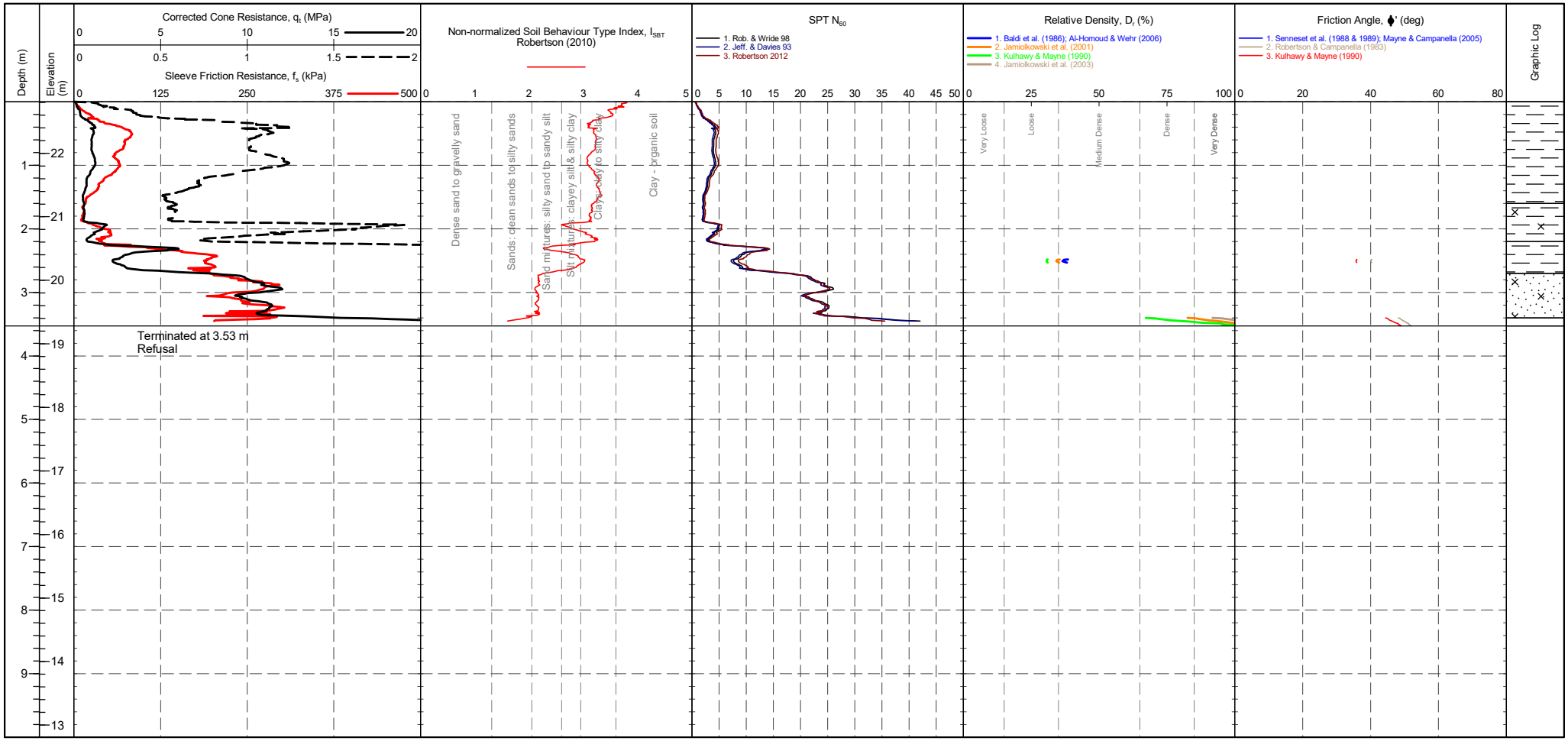
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT109**

CLIENT : Hydrock	EASTING : 444405.764 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403842.776 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.810 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	252 mV	254 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	300 mV	300 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	358 mV	270 mV	-0.024 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2487 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

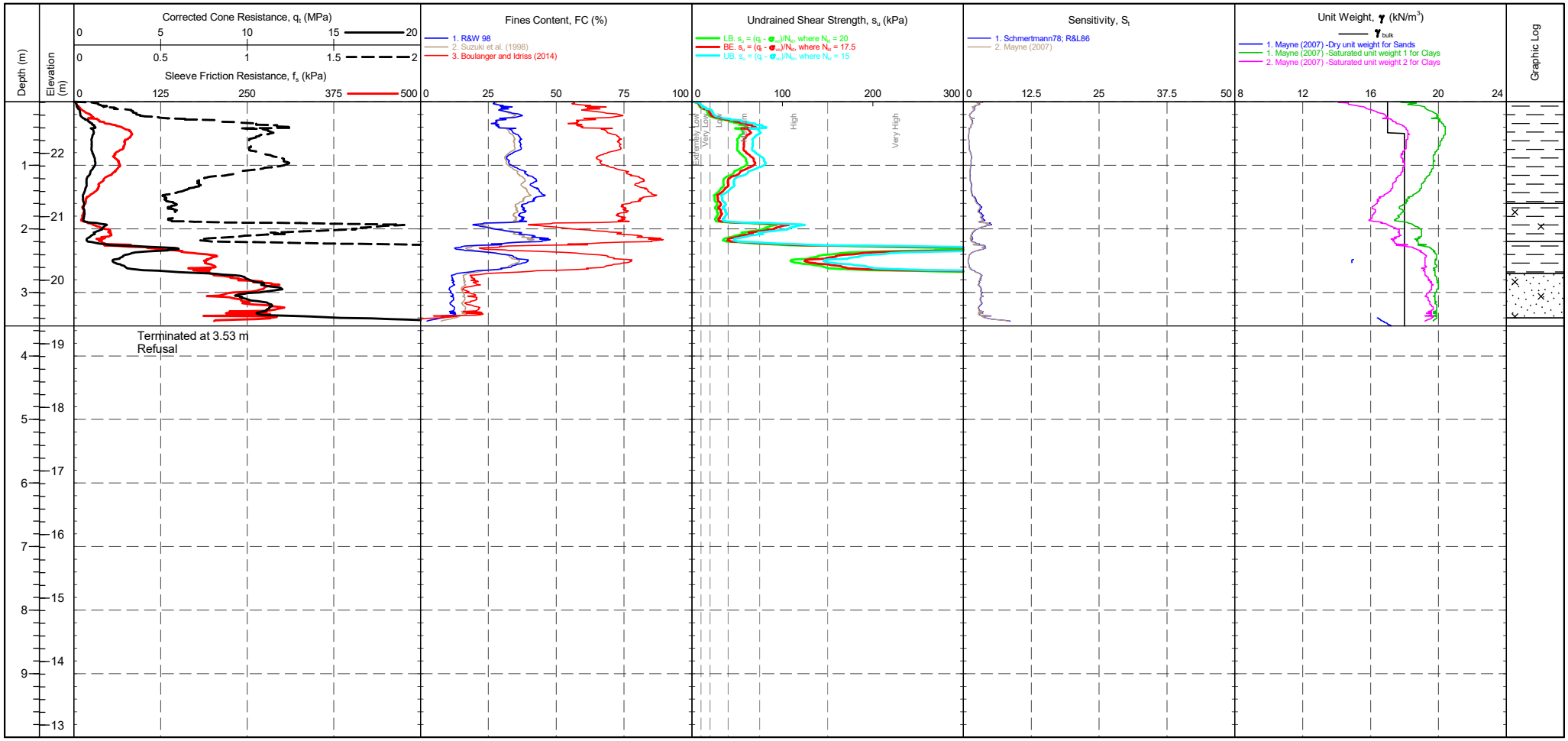
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT109**

CLIENT : Hydrock	EASTING : 444405.764 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403842.776 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.810 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



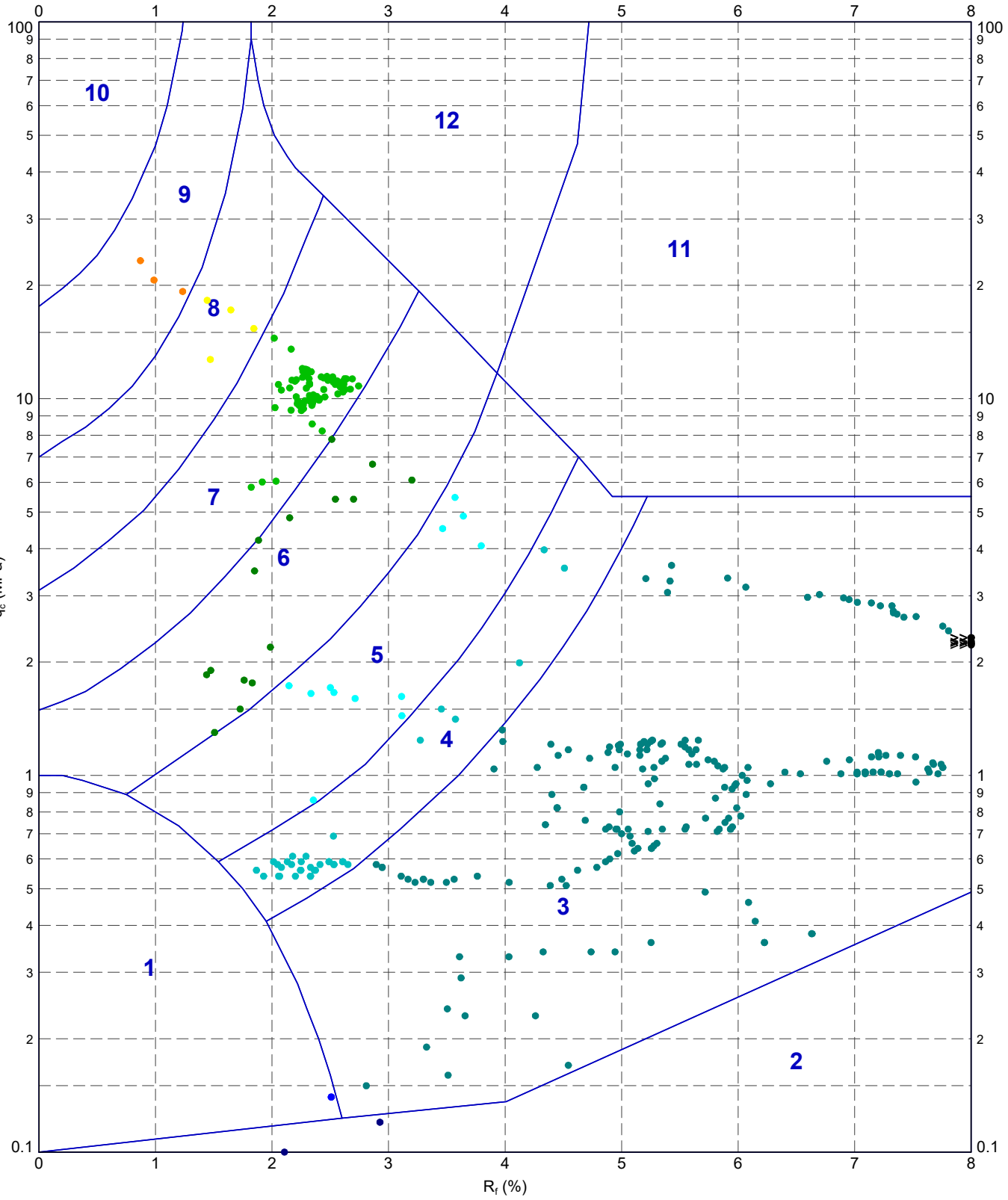
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	252 mV	254 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	300 mV	300 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	358 mV	270 mV	-0.024 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2487 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT109

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

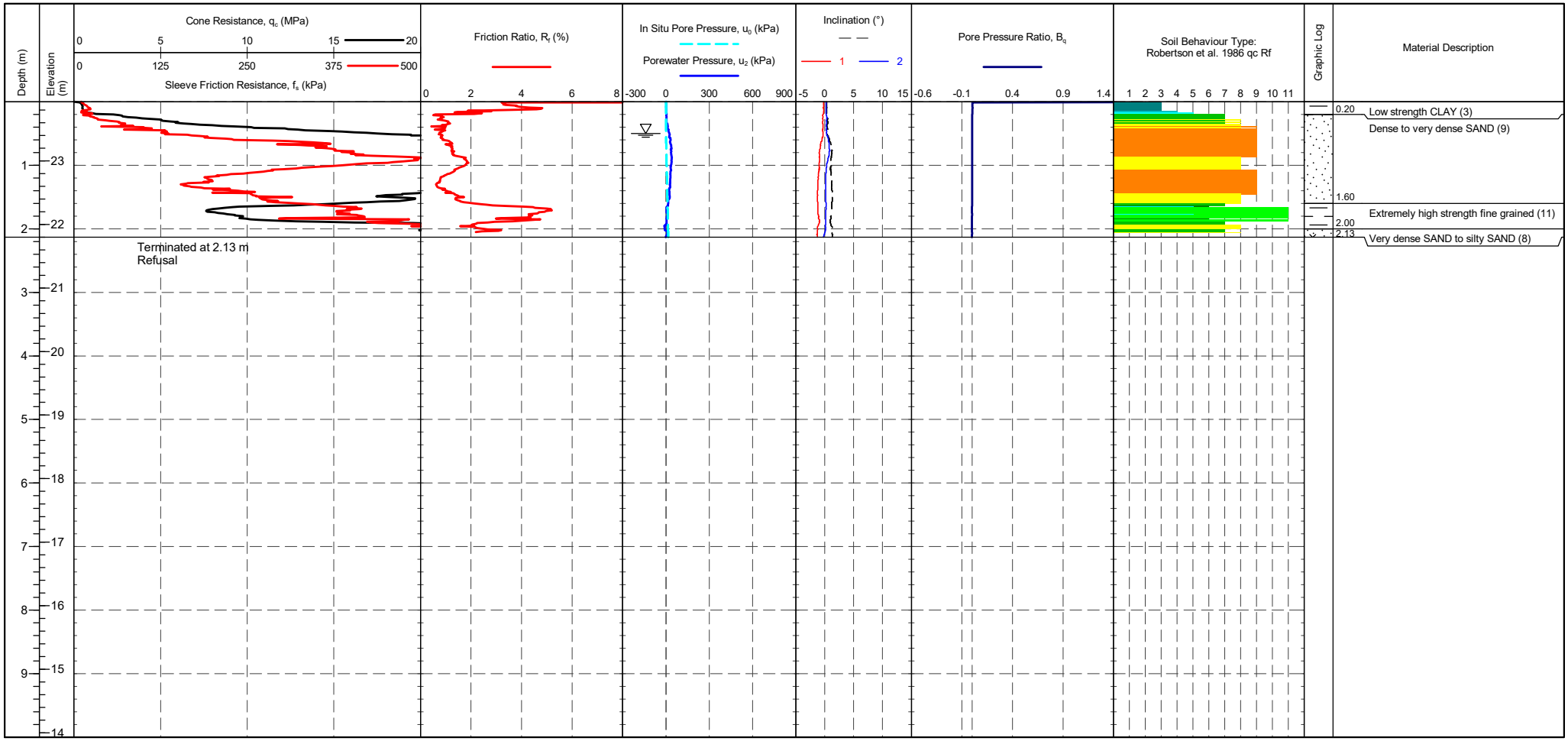
220629-ADVANCED REPORT INSITUSI 2.02.1.LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:20 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT110**

CLIENT : Hydrock	EASTING : 443934.690 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403647.444 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.931 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	249 mV	259 mV	0.109 MPa
Sleeve	297 mV	302 mV	0.004 kPa
Pore Pressure 2	344 mV	273 mV	-0.019 kPa
X-Y Inclinometer	2481 mV	2481 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

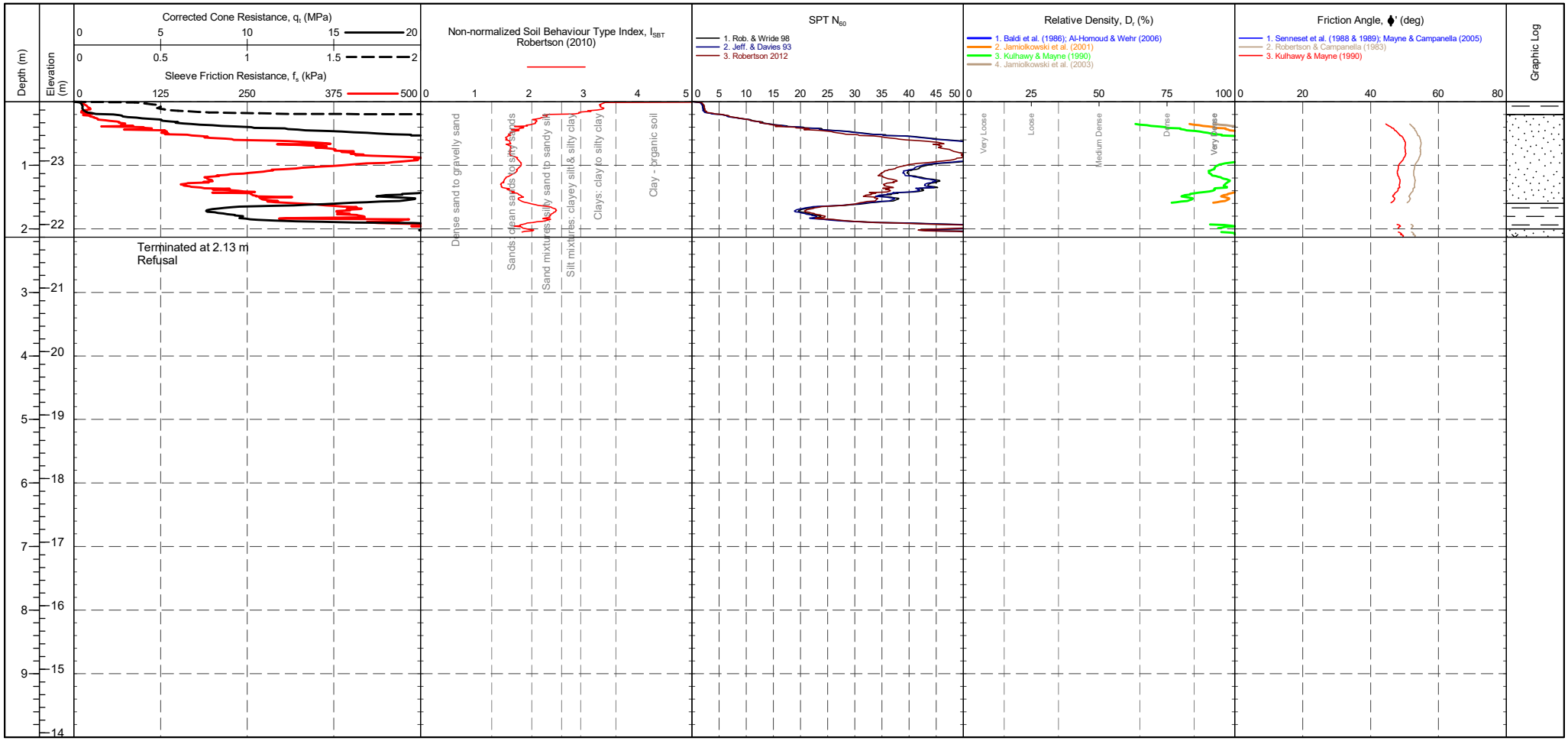
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT110**

CLIENT : Hydrock	EASTING : 443934.690 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403647.444 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.931 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	249 mV	259 mV
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	297 mV	302 mV
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	344 mV	273 mV
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2481 mV

CPTU ZERO VALUES			
Transducer	Pre	Post	Difference
Tip	249 mV	259 mV	0.109 MPa
Sleeve	297 mV	302 mV	0.004 kPa
Pore Pressure 2	344 mV	273 mV	-0.019 kPa
X-Y Inclinometer	2481 mV	2481 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

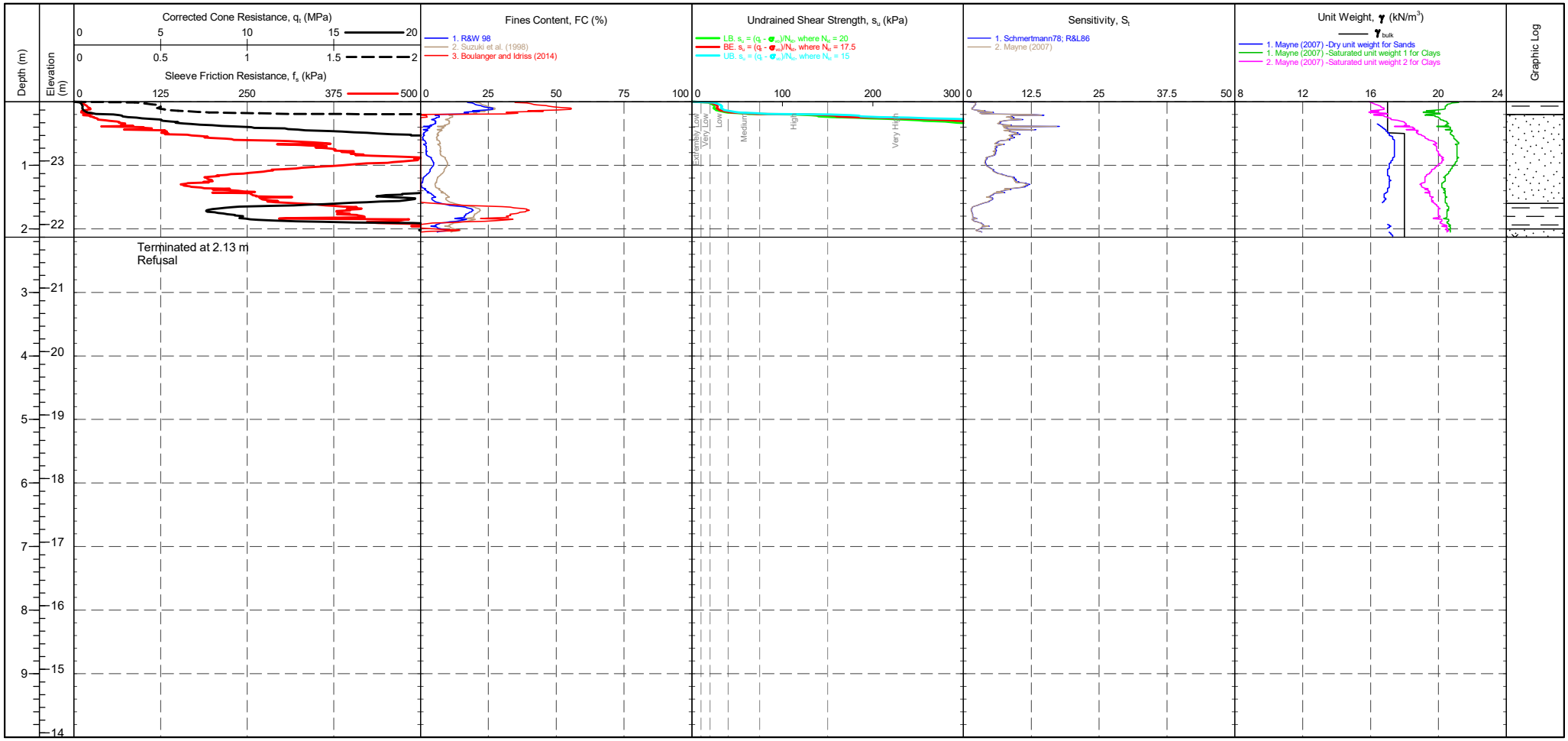
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT110**

CLIENT : Hydrock	EASTING : 443934.690 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403647.444 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.931 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



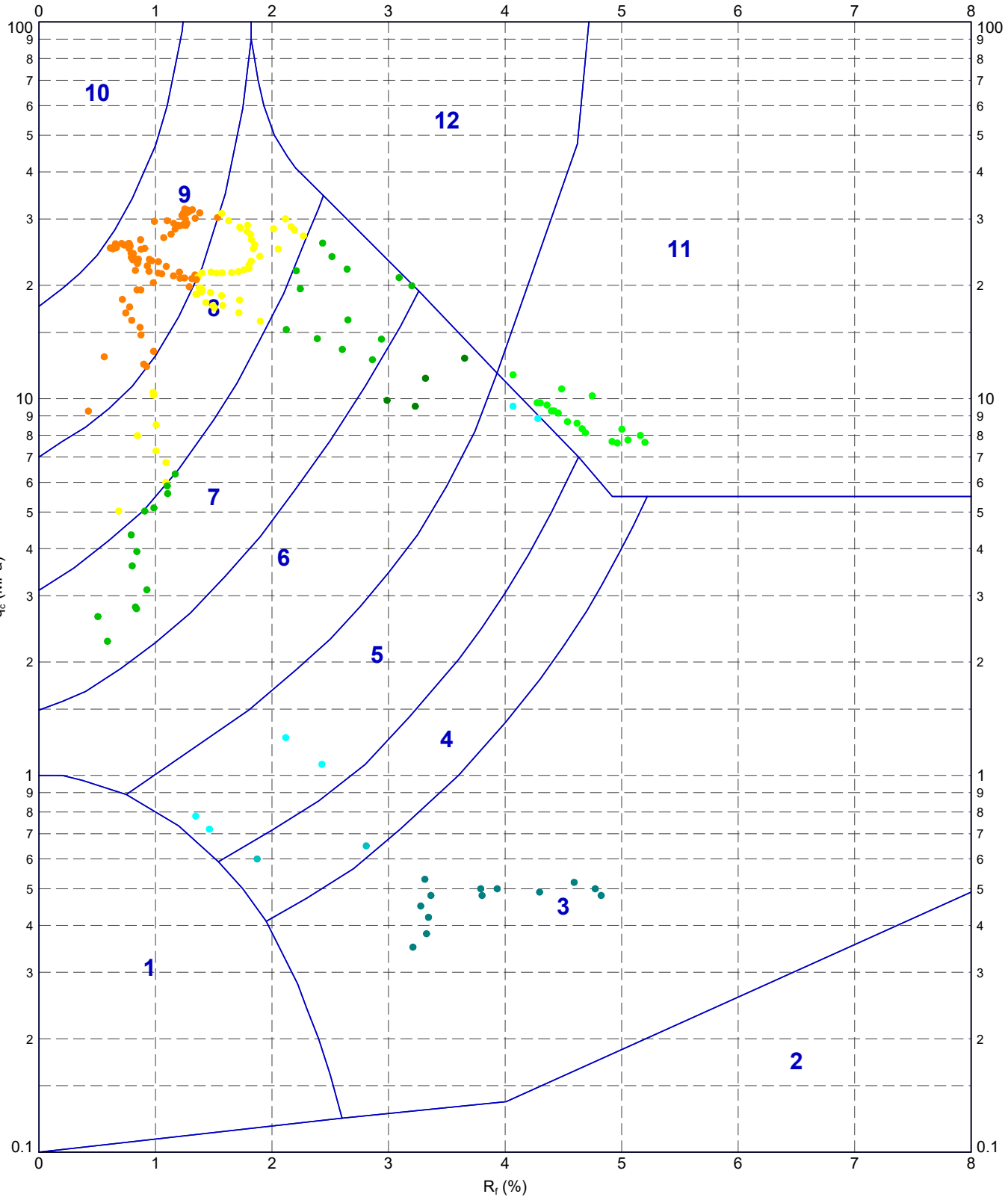
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	249 mV	259 mV	0.109 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	297 mV	302 mV	0.004 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	344 mV	273 mV	-0.019 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2481 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT110

DRAWN	DATE 22/04/2024	
CHECKED	DATE 22/04/2024	
SCALE Not To Scale		A4
PROJECT No 1240176	FIGURE No	

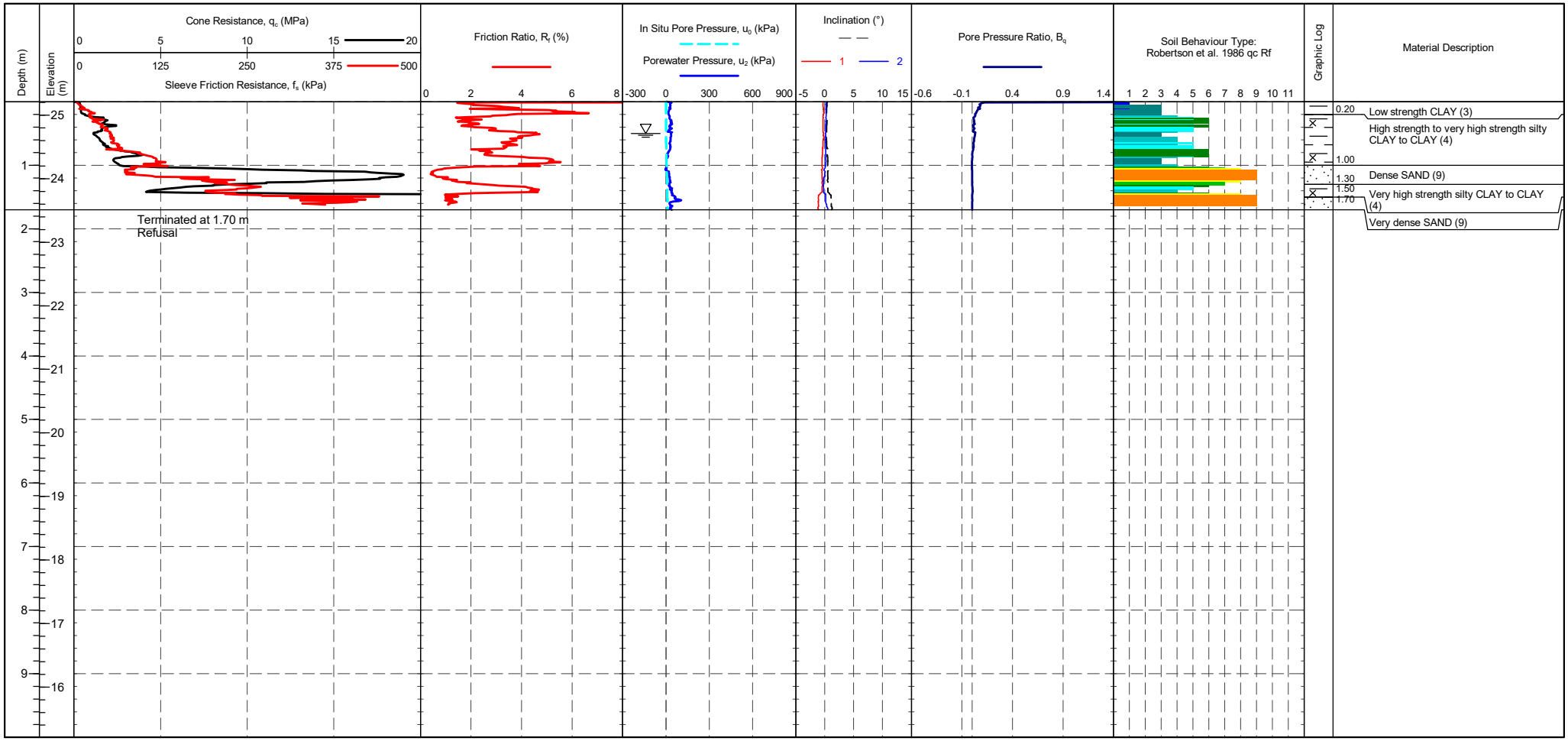
220629-ADVANCED REPORT INSITUSI 2.02.1.UB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:21 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT111**

CLIENT : Hydrock	EASTING : 444143.964 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403726.393 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 25.211 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm²	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	251 mV	253 mV	0.022 MPa
Sleeve	299 mV	298 mV	-0.001 kPa
Pore Pressure 2	302 mV	319 mV	0.005 kPa
X-Y Inclinometer	2472 mV	2490 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

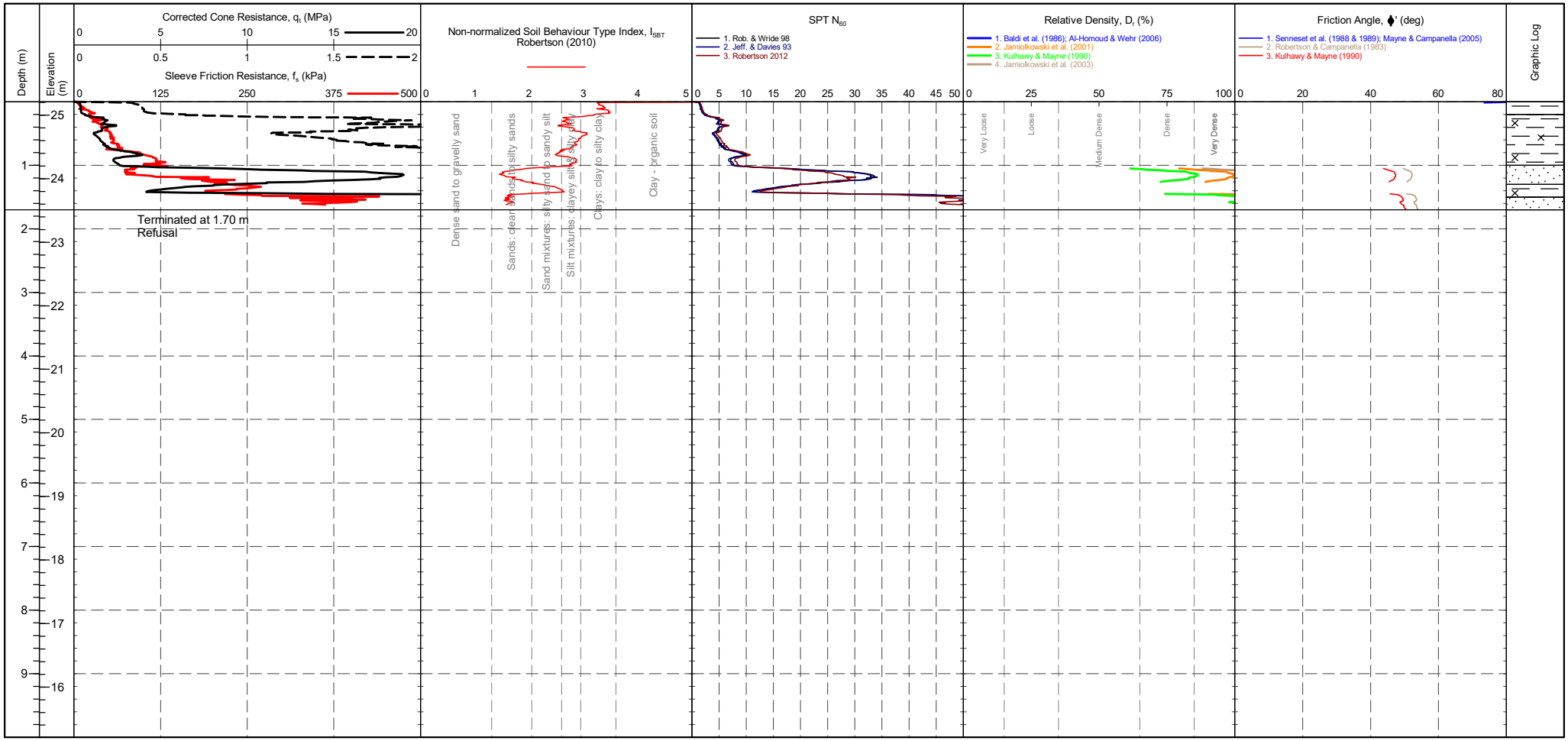
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT111**

CLIENT : Hydrock PROJECT : Barnsley Road LOCATION : Goldthorpe PROJECT No. : 1240176	EASTING : 444143.964 m NORTHING : 403726.393 m ELEVATION : 25.211 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 21/03/2024 PLOT DATE : 22/04/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	251 mV	253 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	299 mV	298 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	302 mV	319 mV	0.005 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2472 mV	2490 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

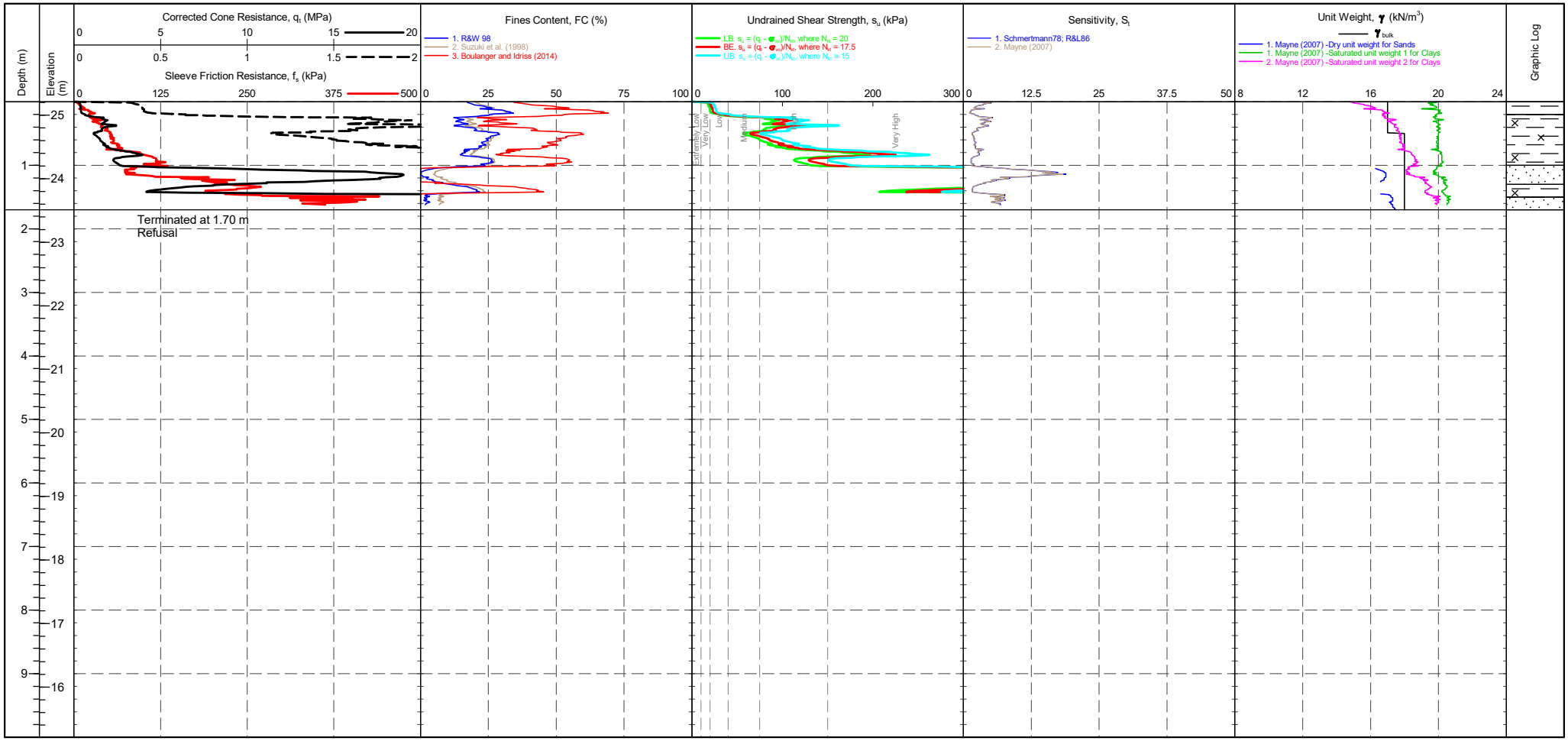
PointID: **CPT111**

CLIENT : Hydrock
PROJECT : Barnsley Road
LOCATION : Goldthorpe
PROJECT No. : 1240176

EASTING : 444143.964 m
NORTHING : 403726.393 m
ELEVATION : 25.211 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 21/03/2024
PLOT DATE : 22/04/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe		
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild		

CPTU ZERO VALUES

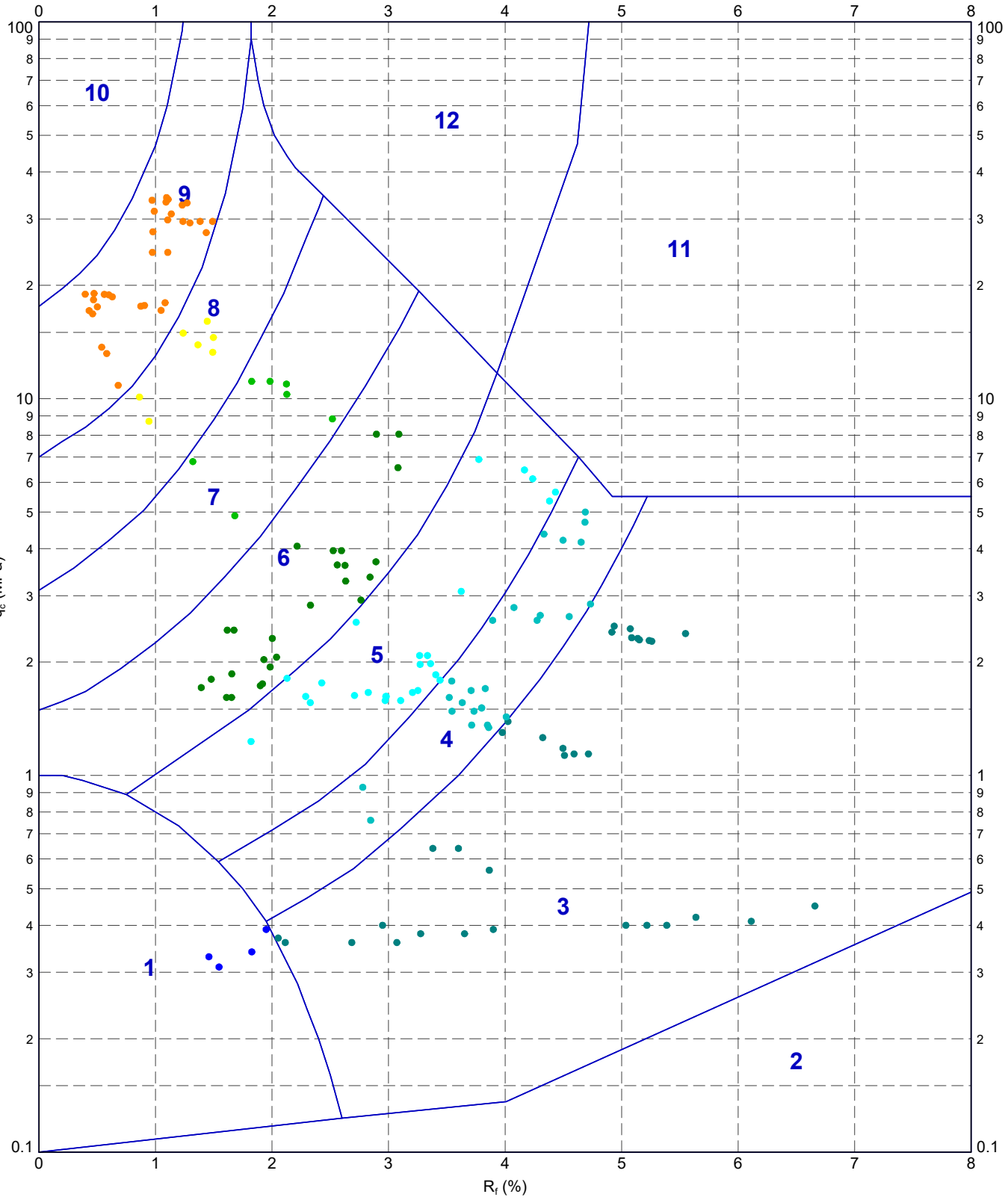
	Pre	Post	Difference
Transducer	251 mV	253 mV	0.022 MPa
Tip	299 mV	298 mV	-0.001 kPa
Sleeve	302 mV	319 mV	0.005 kPa
Pore Pressure 2	2472 mV	2490 mV	
X-Y Inclinometer			

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT111

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

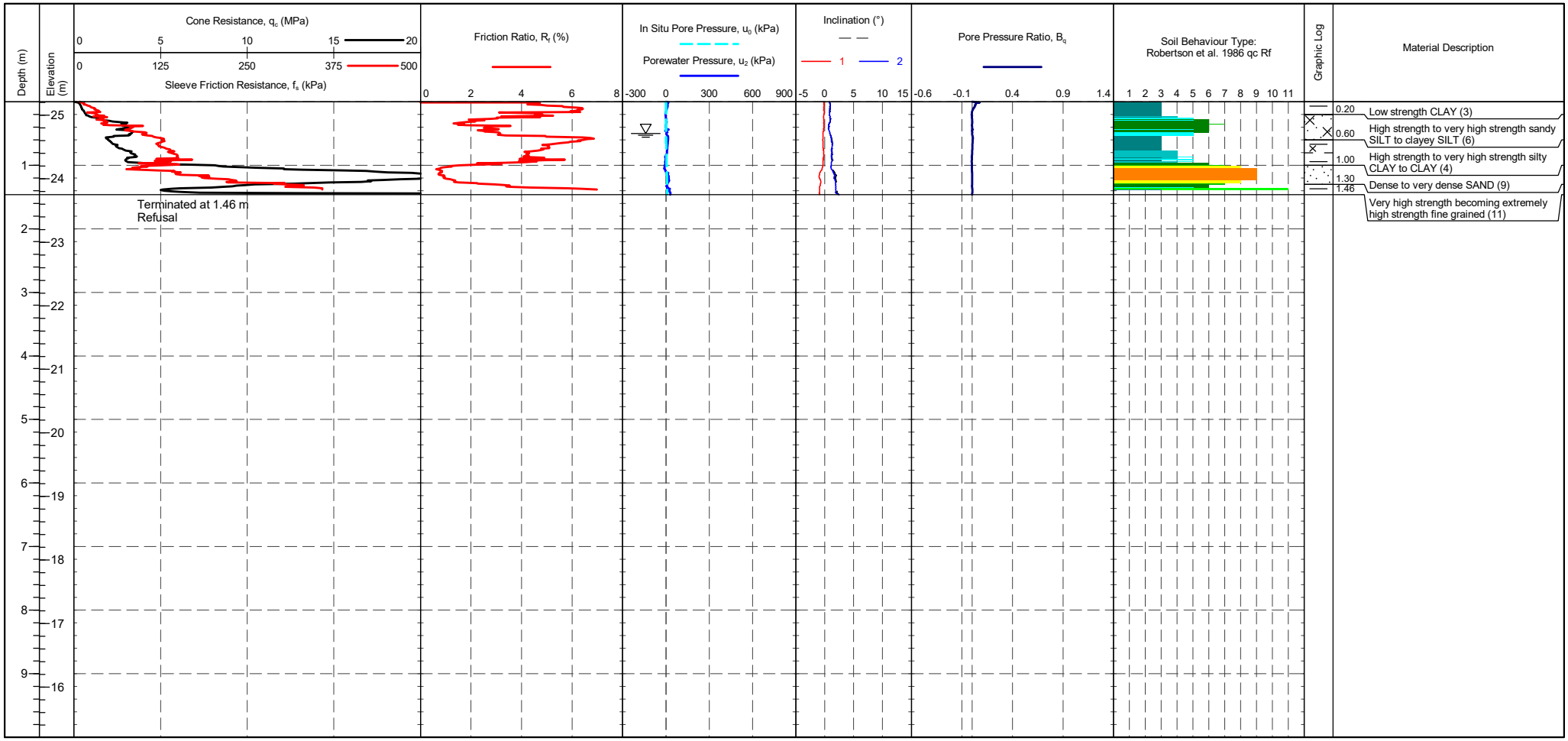
220629-ADVANCED REPORT INSITUSI 2.02.1.UB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:21 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT111T2**

CLIENT : Hydrock	EASTING : 444143.964 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403726.393 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 25.211 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm²	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	251 mV	253 mV	0.022 MPa
Sleeve	296 mV	299 mV	0.002 kPa
Pore Pressure 2	325 mV	328 mV	0.001 kPa
X-Y Inclinometer	2481 mV	2482 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

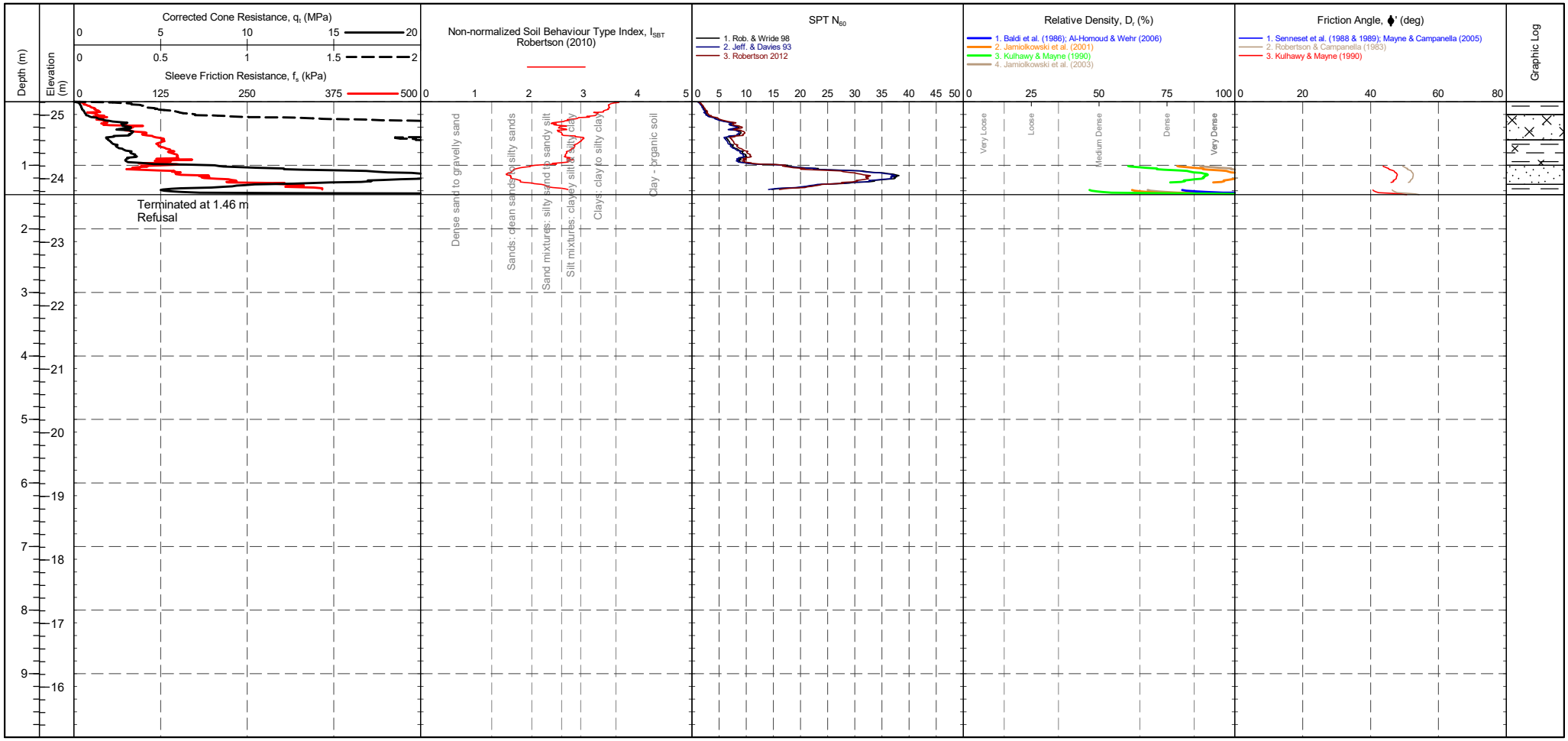
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT111T2**

CLIENT : Hydrock	EASTING : 444143.964 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403726.393 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 25.211 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	251 mV	253 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	296 mV	299 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	325 mV	328 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2482 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

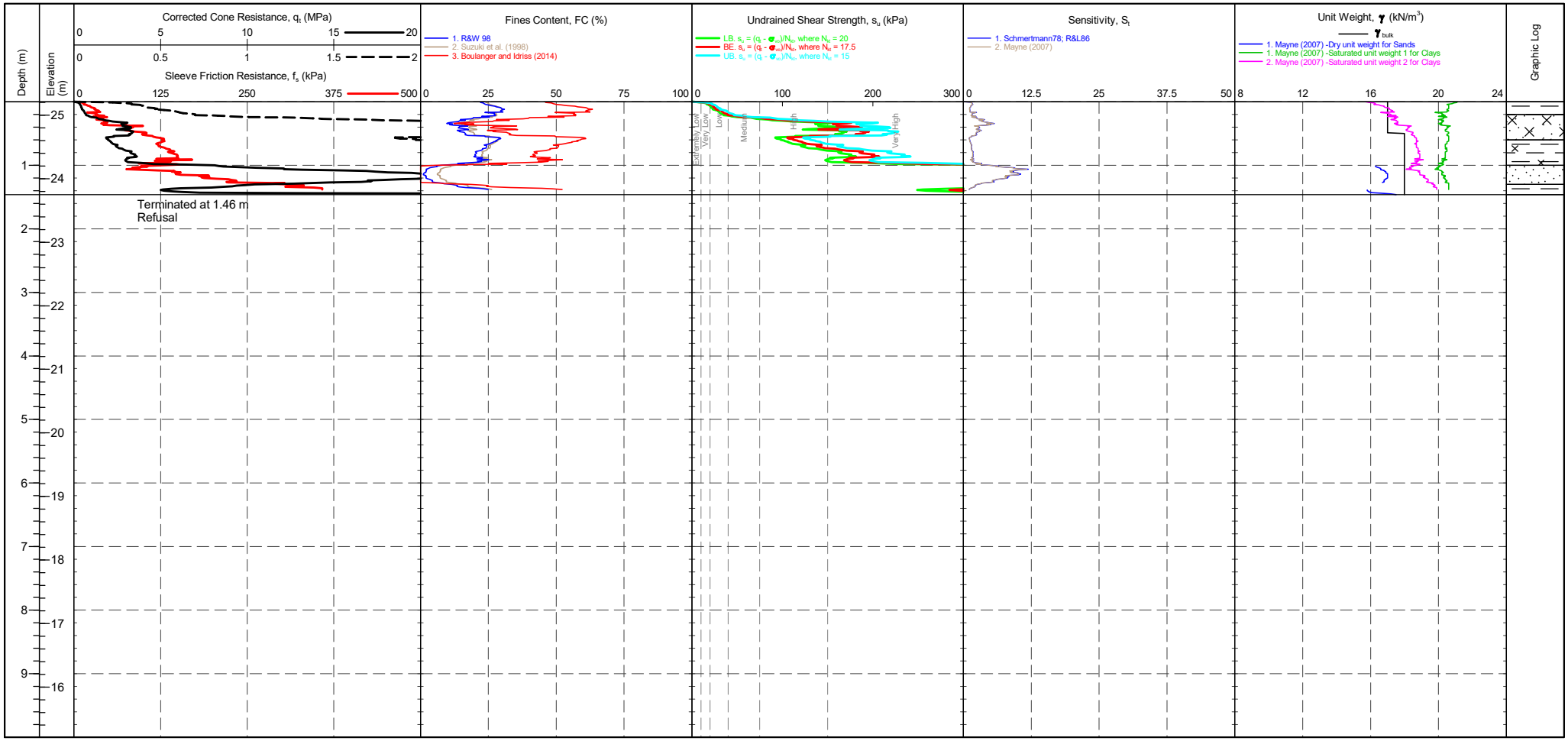
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT111T2**

CLIENT : Hydrock	EASTING : 444143.964 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403726.393 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 25.211 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



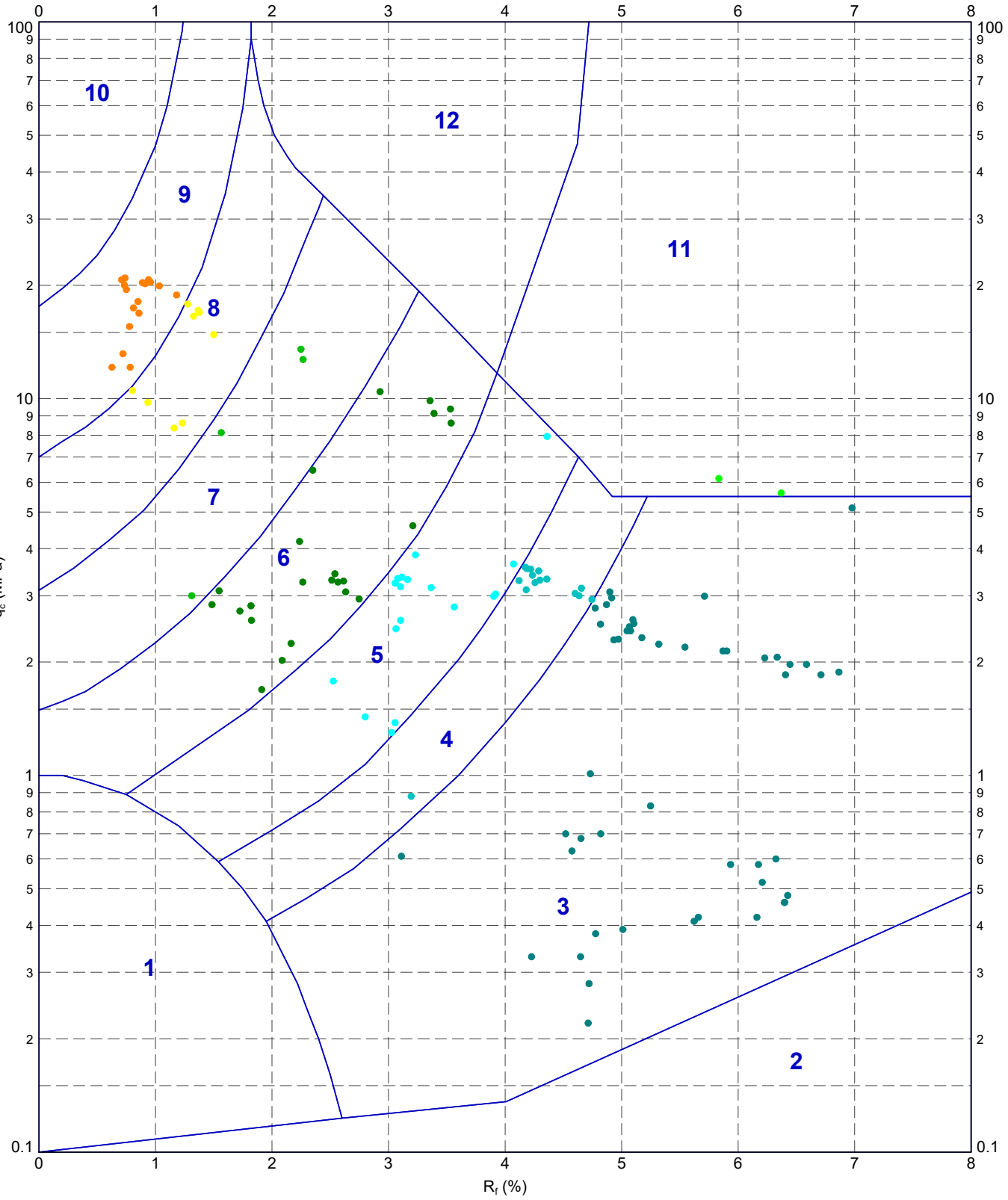
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	251 mV	253 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	296 mV	299 mV	0.002 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	325 mV	328 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2481 mV	2482 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT111T2

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

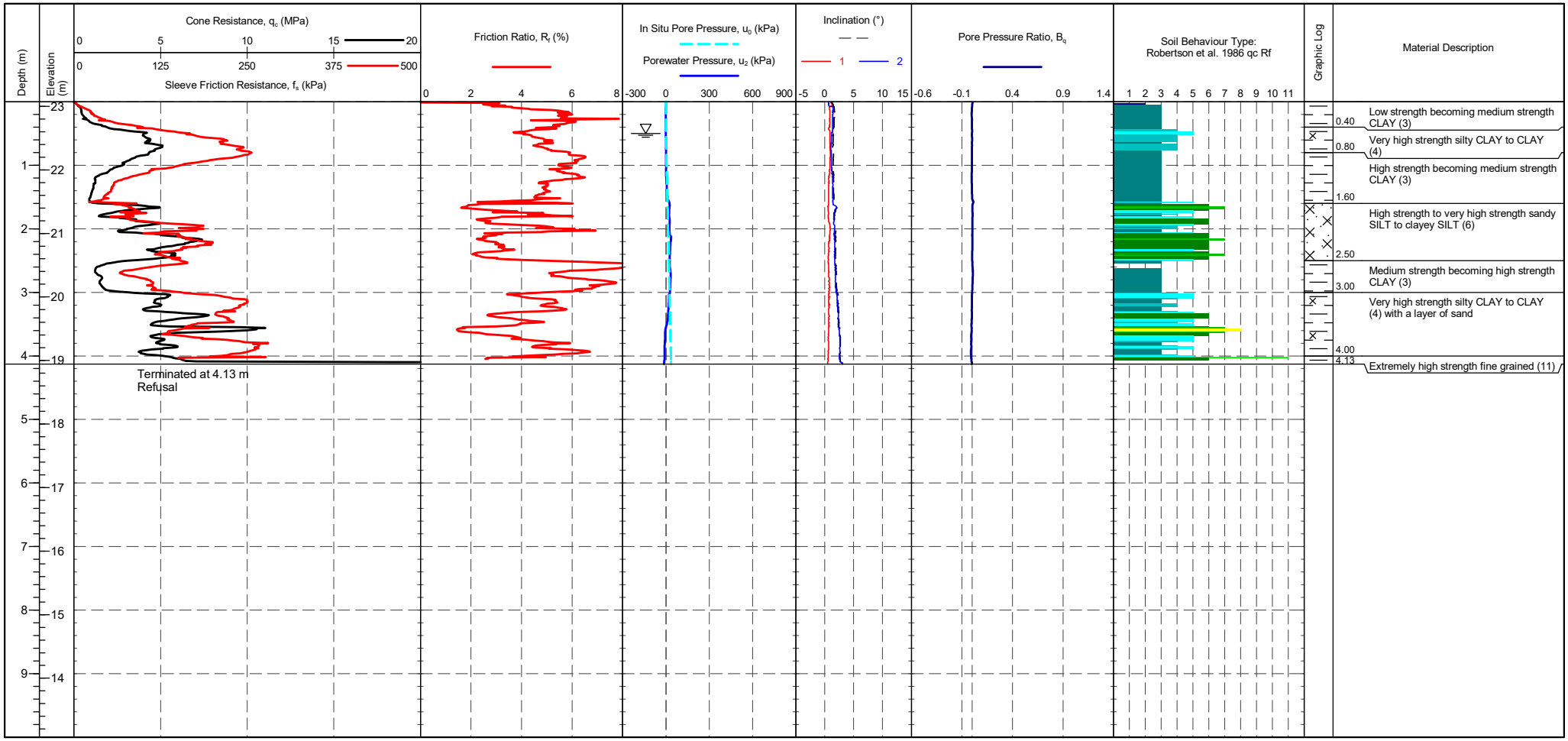
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:22 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT112**

CLIENT : Hydrock	EASTING : 444360.506 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403786.286 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 23.072 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm²	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	252 mV	252 mV	0 MPa
Sleeve	299 mV	299 mV	0 kPa
Pore Pressure 2	348 mV	351 mV	0.001 kPa
X-Y Inclinometer	2584 mV	2566 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

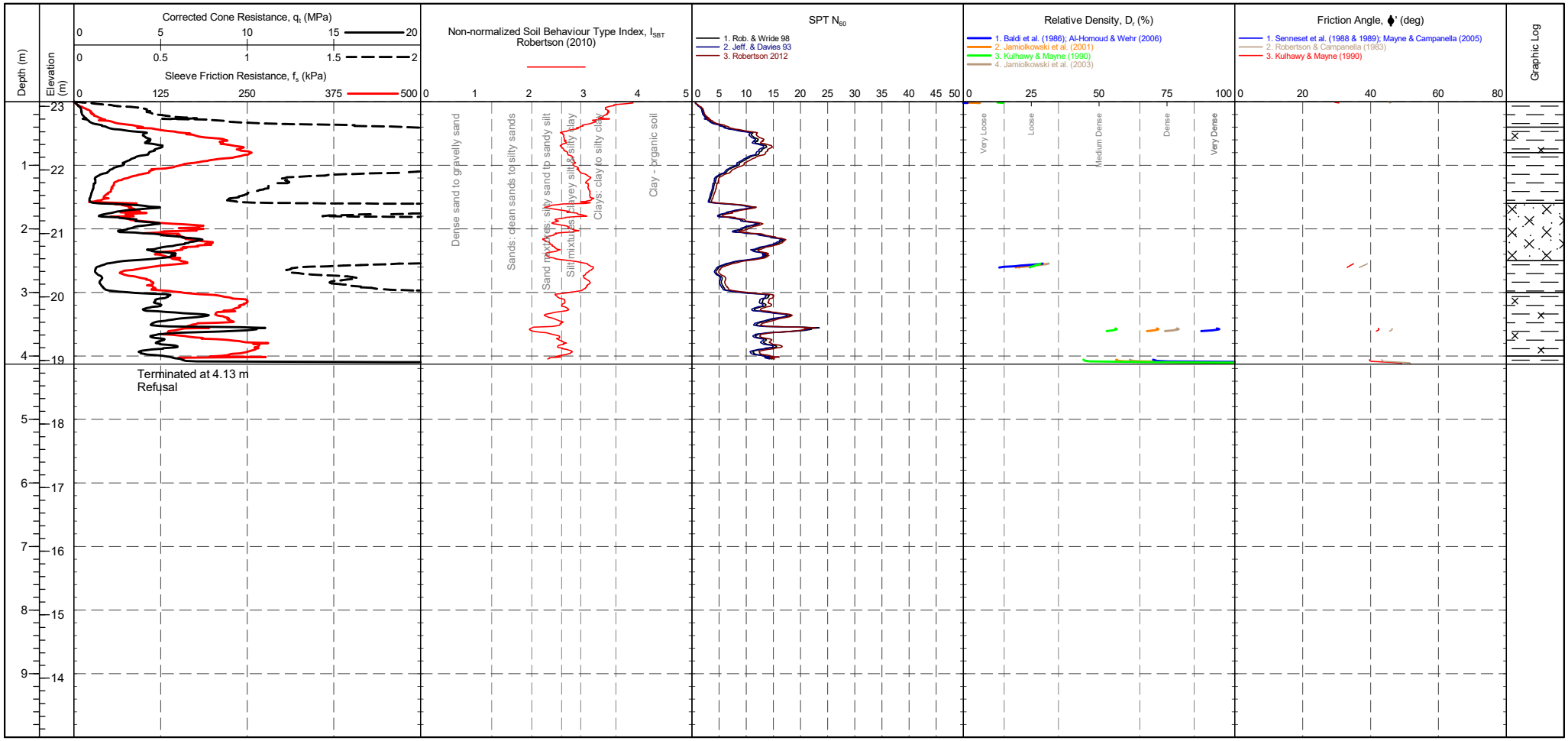
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID **CPT112**

CLIENT : Hydrock PROJECT : Barnsley Road LOCATION : Goldthorpe PROJECT No. : 1240176	EASTING : 444360.506 m NORTHING : 403786.286 m ELEVATION : 23.072 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on total pressure.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 22/03/2024 PLOT DATE : 22/04/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	252 mV	252 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	299 mV	299 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	348 mV	351 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2584 mV	2566 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

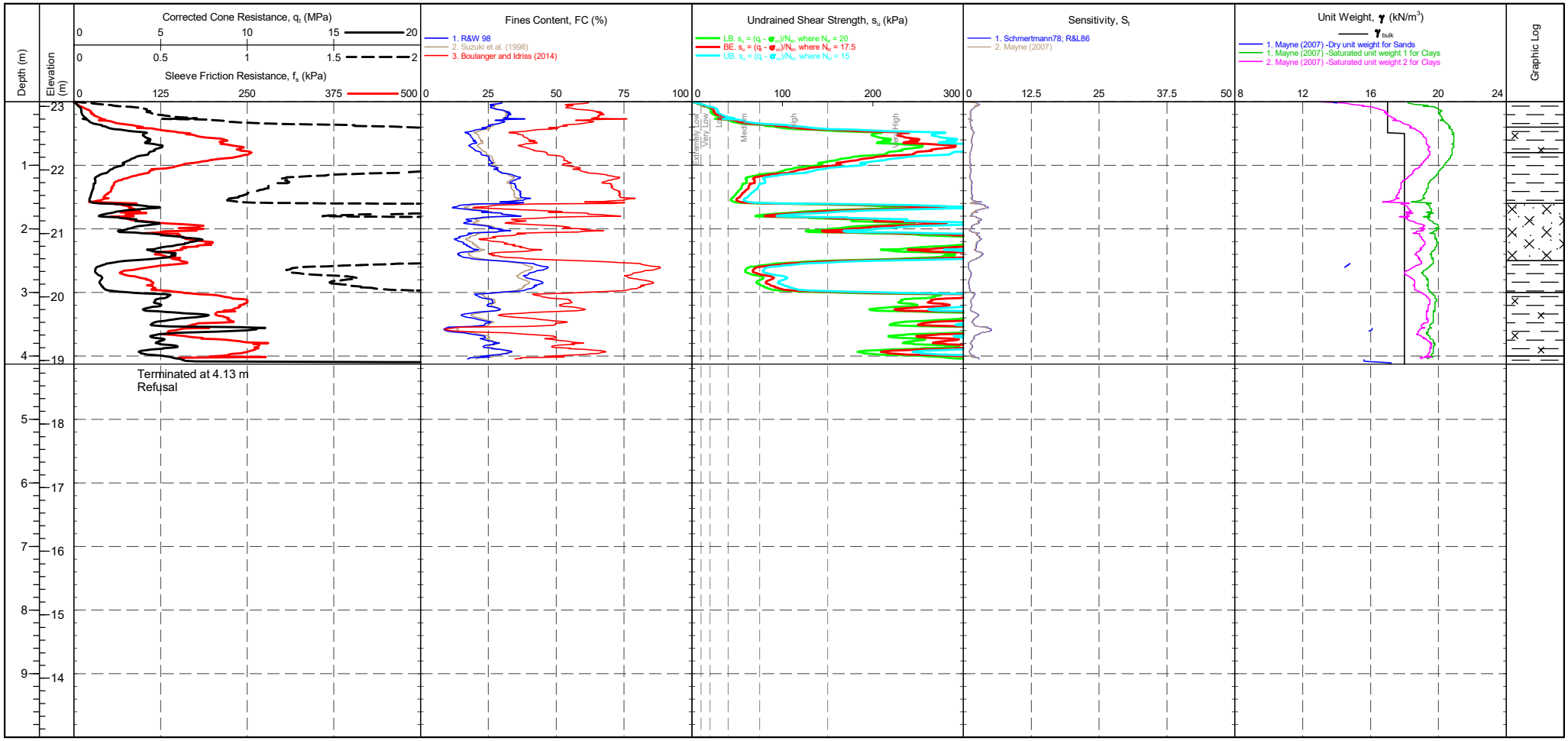
PointID: **CPT112**

CLIENT : Hydrock
PROJECT : Barnsley Road
LOCATION : Goldthorpe
PROJECT No. : 1240176

EASTING : 444360.506 m
NORTHING : 403786.286 m
ELEVATION : 23.072 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 22/03/2024
PLOT DATE : 22/04/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe		
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild		

CPTU ZERO VALUES

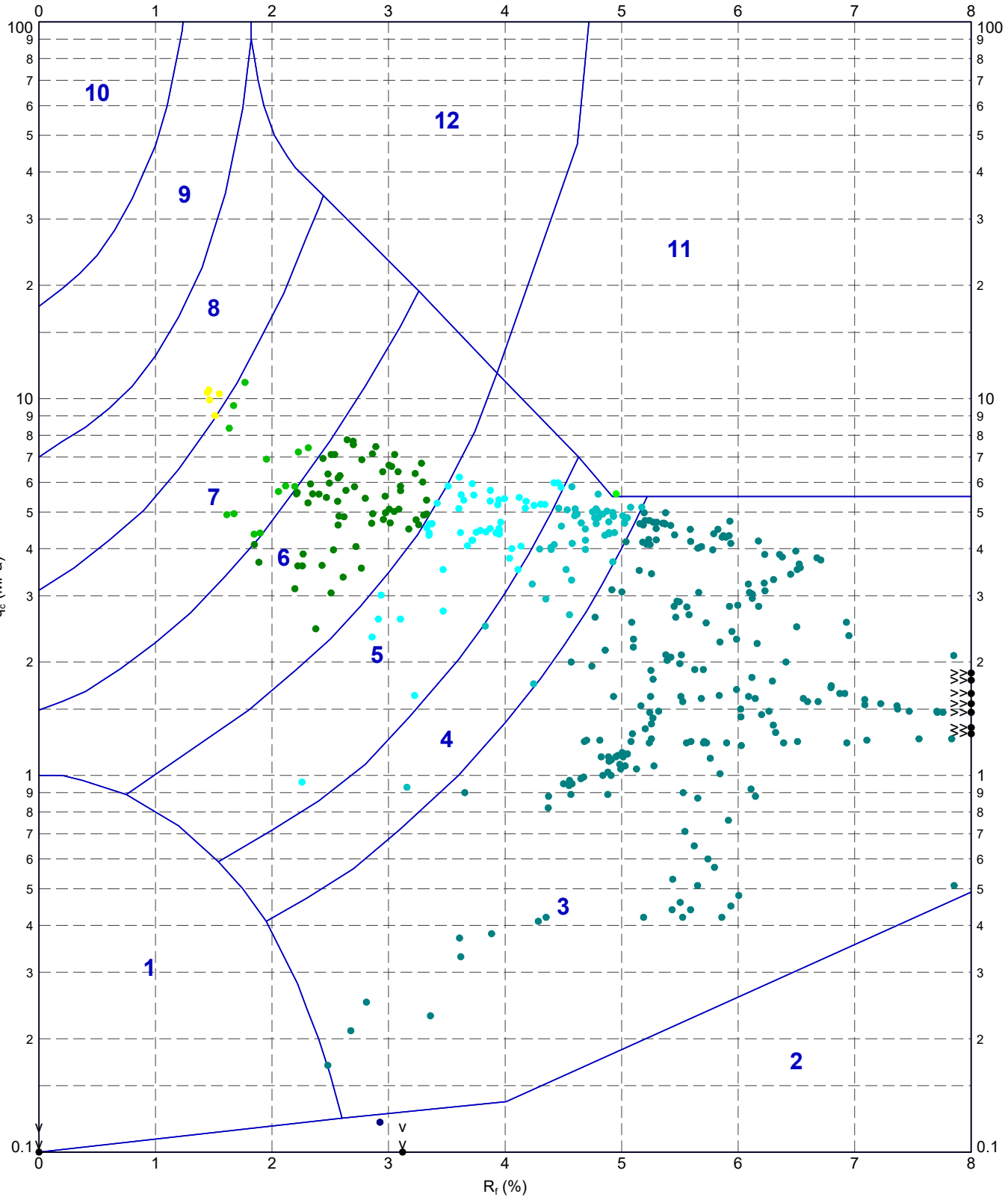
Transducer	Pre	Post	Difference
Tip	252 mV	252 mV	0 MPa
Sleeve	299 mV	299 mV	0 kPa
Pore Pressure 2	348 mV	351 mV	0.001 kPa
X-Y Inclinometer	2584 mV	2566 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material	4 - Silty CLAY to CLAY	7 - Silty SAND to sandy SILT	10 - Gravelly SAND to SAND
2 - Organic material	5 - Clayey SILT to silty CLAY	8 - SAND to silty SAND	11 - Very stiff fine grained
3 - CLAY	6 - Sandy SILT to clayey SILT	9 - SAND	12 - SAND to clayey SAND

IN SITU SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT112

DRAWN		DATE	22/04/2024
CHECKED		DATE	22/04/2024
SCALE	Not To Scale		A4
PROJECT No	1240176	FIGURE No	

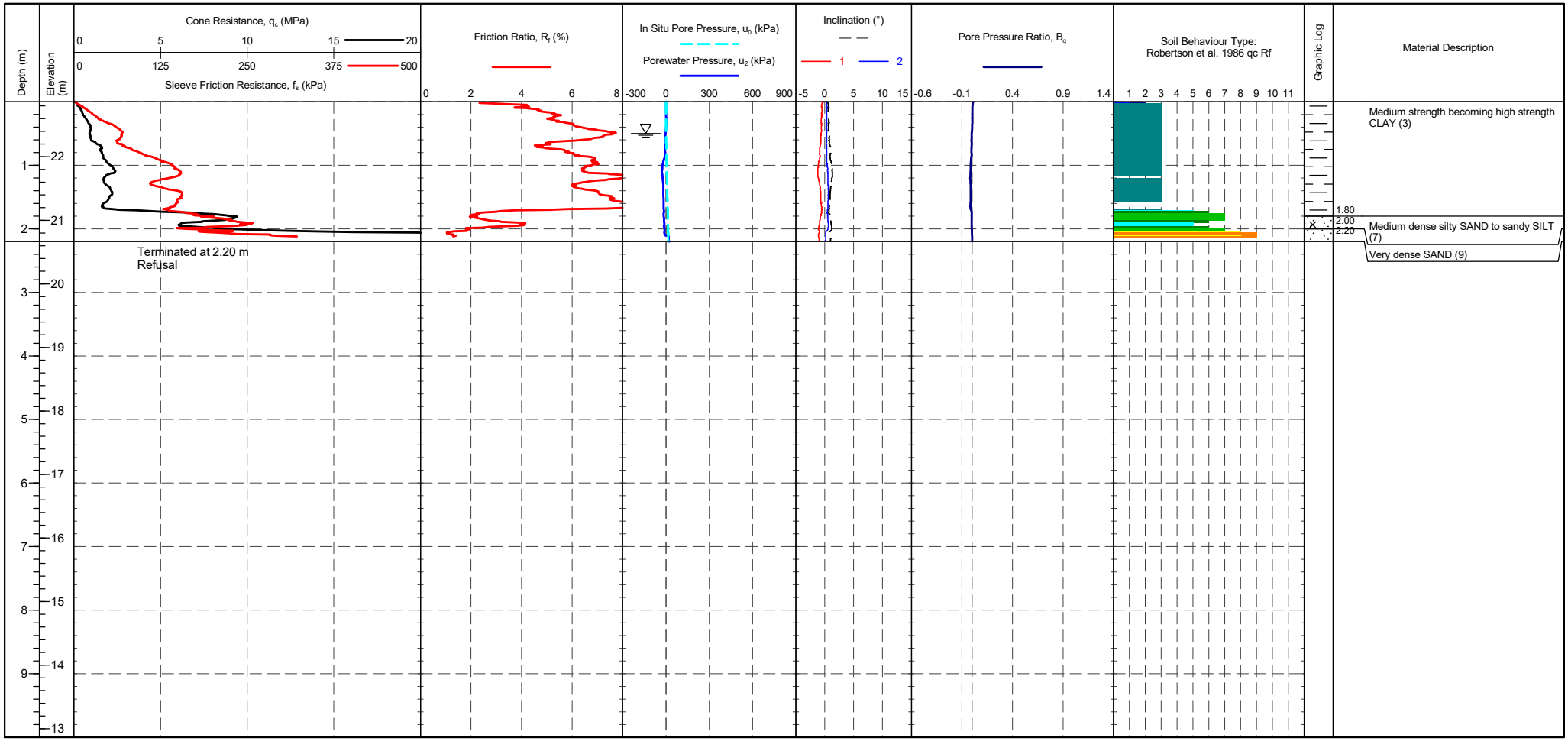
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:22 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT113**

CLIENT : Hydrock	EASTING : 443993.123 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403580.586 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.866 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID : S15-CFIP.1867	TEST TYPE : TE2		
CALIBRATION DATE : 07/06/2023	APPLICATION CLASS : 2		
CONE MODEL : Subtraction	RIG : CPT 006 - Zoe		
CONE AREA : 15cm²	OPERATOR : J Cougle		
CONE AREA RATIO : 0.79	FRICTION REDUCER : None		
FILTER POSITION : u2	WEATHER : Overcast & Mild		
FILTER TYPE : HDPE	GROUNDWATER DEPTH : Assumed for calculation purposes.		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	250 mV	252 mV	0.022 MPa
Sleeve	296 mV	297 mV	0.001 kPa
Pore Pressure 2	306 mV	331 mV	0.007 kPa
X-Y Inclinometer	2467 mV	2434 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

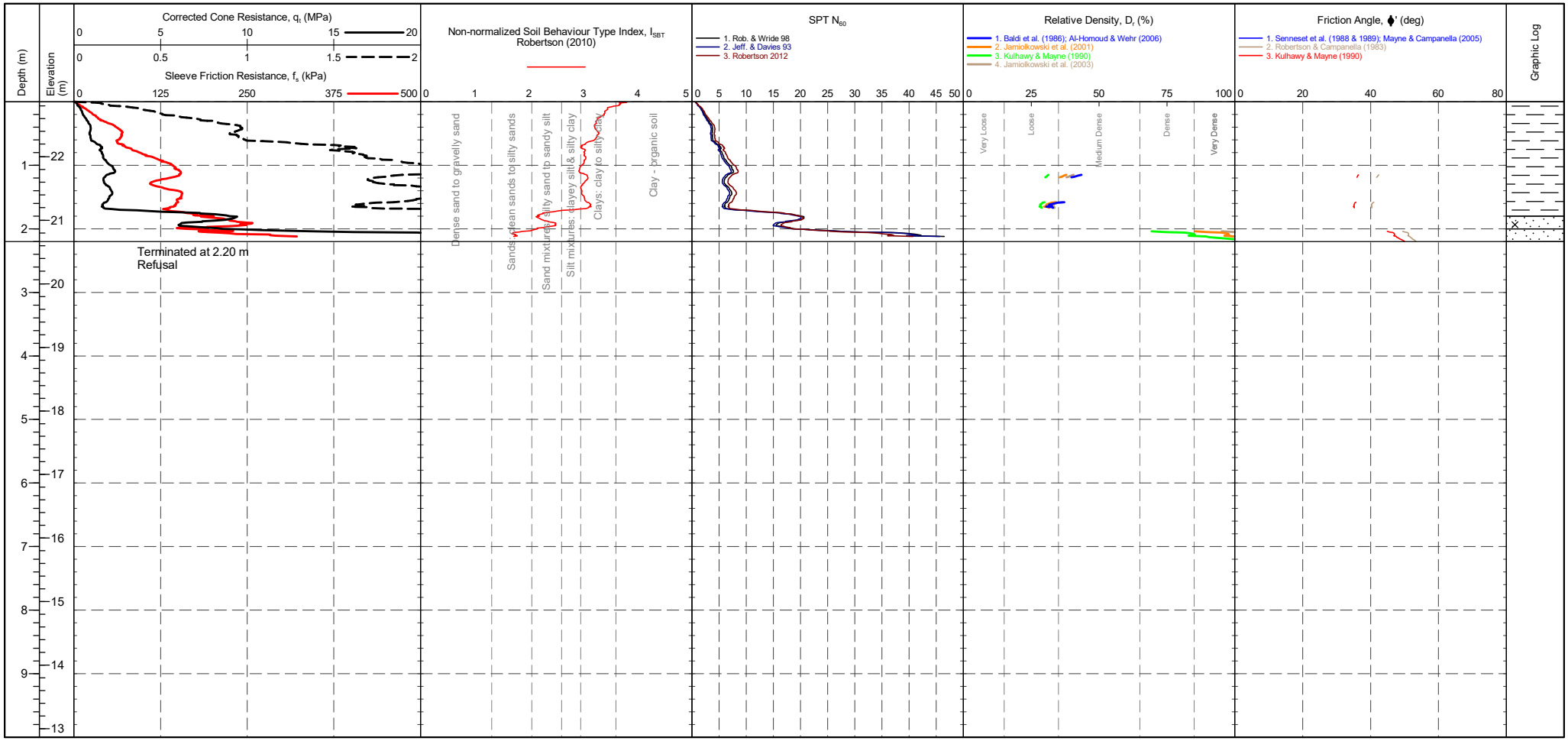
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT113**

CLIENT : Hydrock	EASTING : 443993.123 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403580.586 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.866 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	250 mV	252 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	296 mV	297 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	306 mV	331 mV	0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2467 mV	2434 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

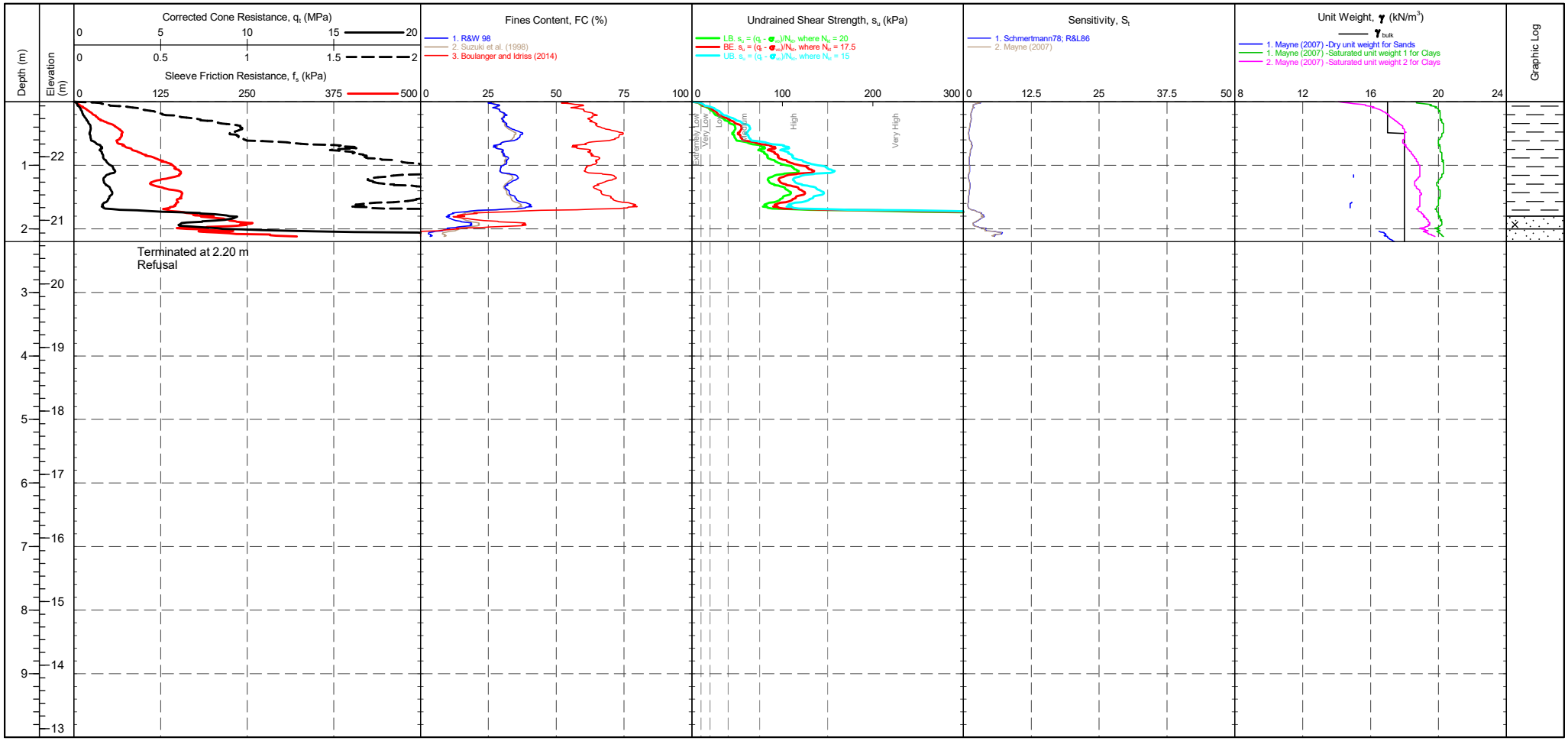
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT113**

CLIENT : Hydrock	EASTING : 443993.123 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403580.586 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 22.866 m OD		TEST DATE : 21/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



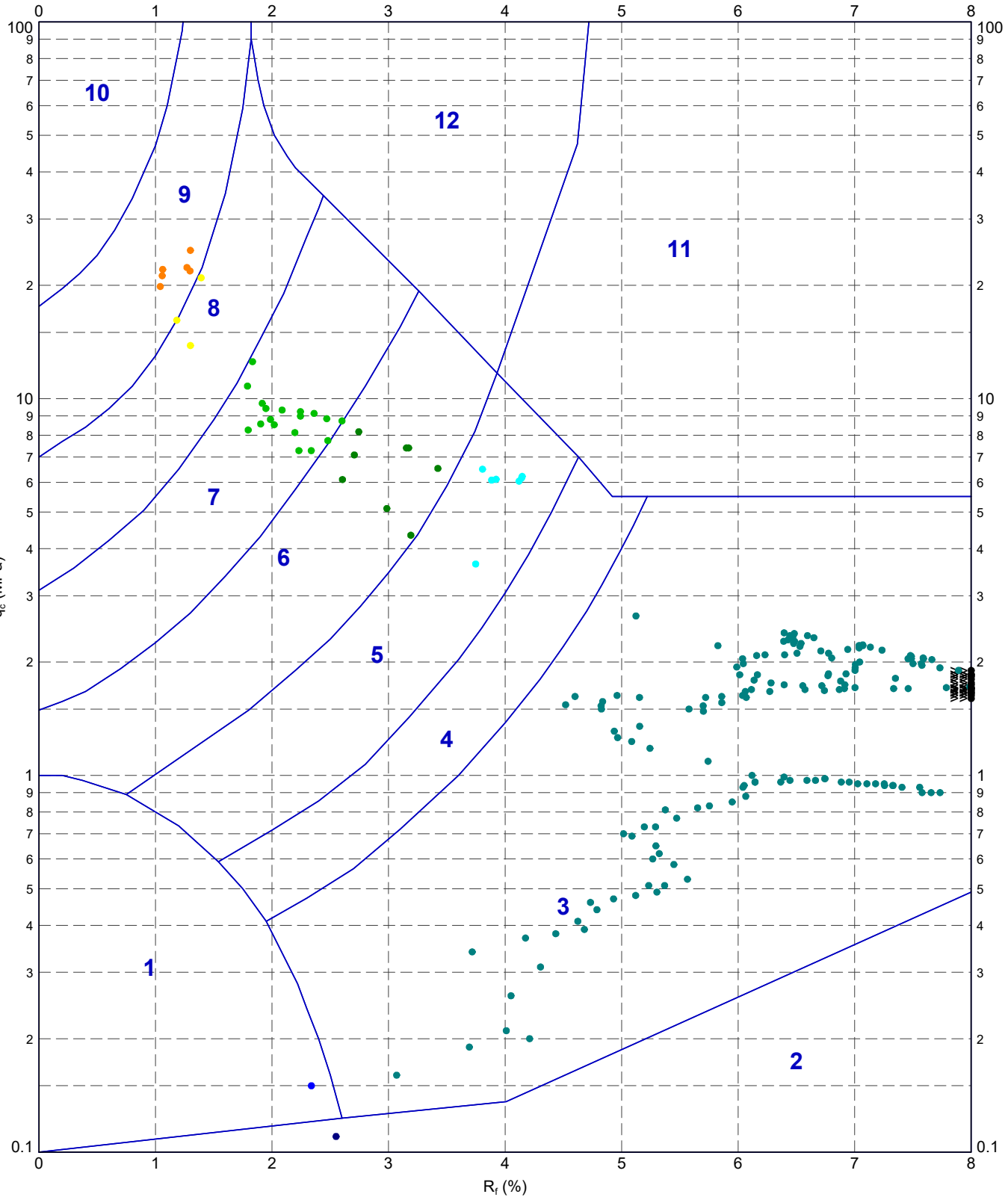
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	250 mV	252 mV	0.022 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	296 mV	297 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	306 mV	331 mV	0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2467 mV	2434 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT113

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

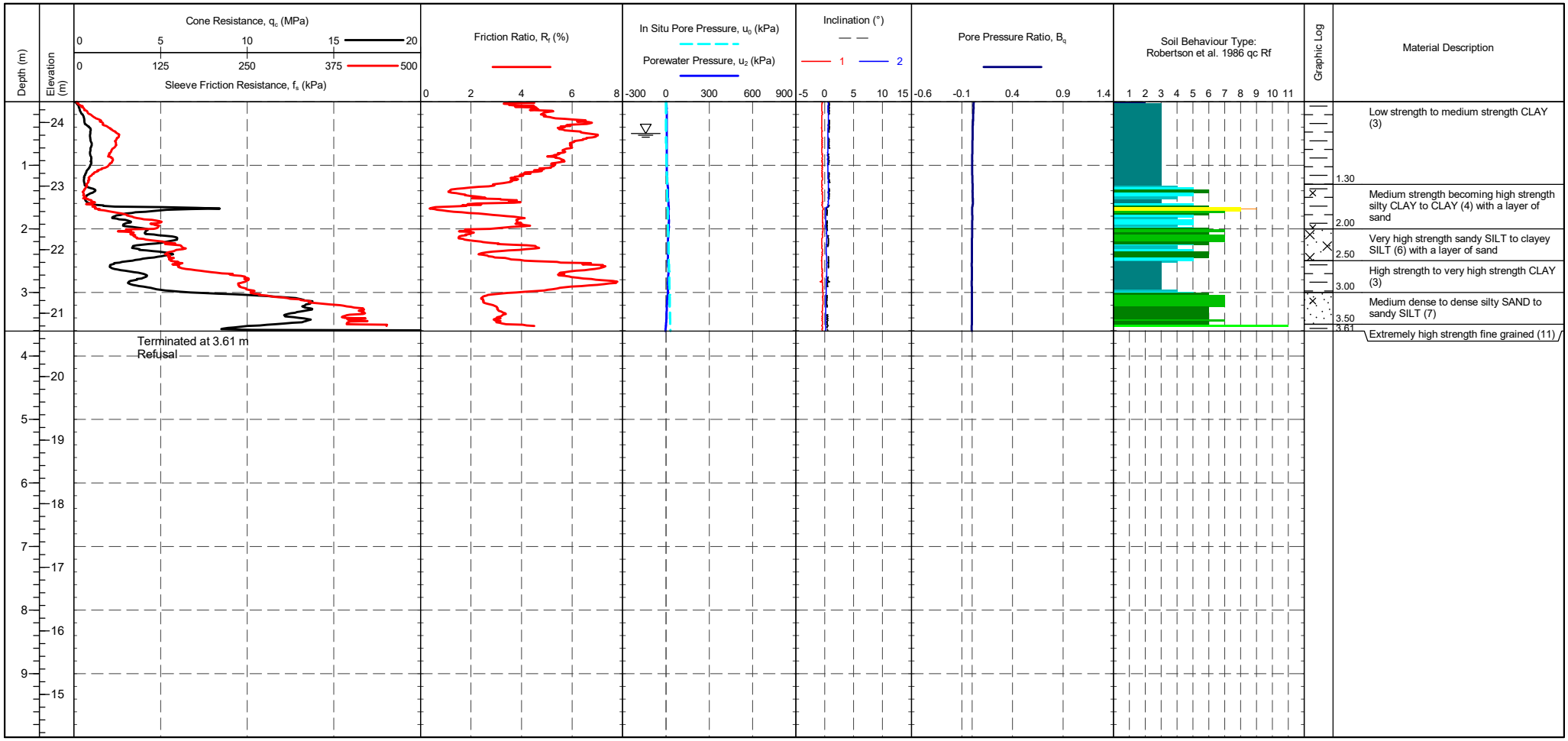
220629-ADVANCED REPORT INSITUSI 2.02.1.UB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:23 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 01

PointID: **CPT114**

CLIENT : Hydrock	EASTING : 444285.781 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403682.579 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.327 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2
CALIBRATION DATE	: 07/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 006 - Zoe
CONE AREA	: 15cm^2	OPERATOR	: J Cougle
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Overcast & Mild
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	252 mV	252 mV	0 MPa
Sleeve	299 mV	298 mV	-0.001 kPa
Pore Pressure 2	344 mV	323 mV	-0.006 kPa
X-Y Inclinometer	2432 mV	2456 mV	

METHOD: Robertson et al. 1986 qc Rf

1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Groundwater Level

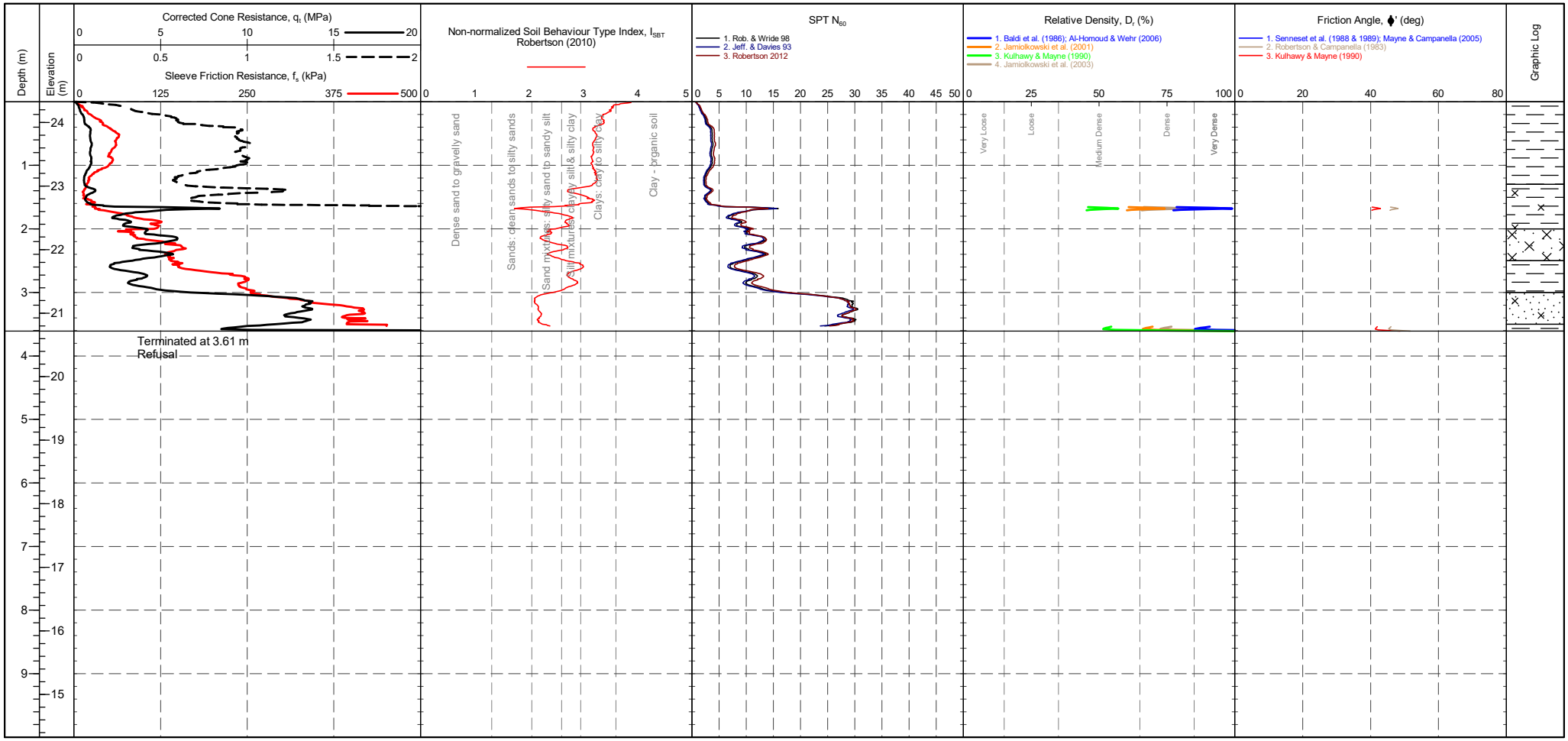
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 02

PointID: **CPT114**

CLIENT : Hydrock	EASTING : 444285.781 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403682.579 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.327 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 006 - Zoe	Tip	252 mV	252 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	299 mV	298 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	344 mV	323 mV	-0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2432 mV	2456 mV	

GRANULAR SOILS (Sands & Gravels) Robertson et al. 1986 Zones 7-10 and Zone 12

Description	SBT Index, Ic	Description	SPT N value, NSPT	Description	Relative Density Dr (%)
Clays	2.95-3.60	Very Loose	0 - 4	Very Loose	0 - 15
Silt mixtures	2.60-2.95	Loose	4 - 10	Loose	15 - 35
Sand mixtures	2.05-2.60	Medium Dense	10 - 30	Medium Dense	35 - 65
Sands	1.31-2.05	Dense	30 - 50	Dense	65 - 85
Gravelly sand	<1.31	Very Dense	>50	Very Dense	>85

Groundwater Level

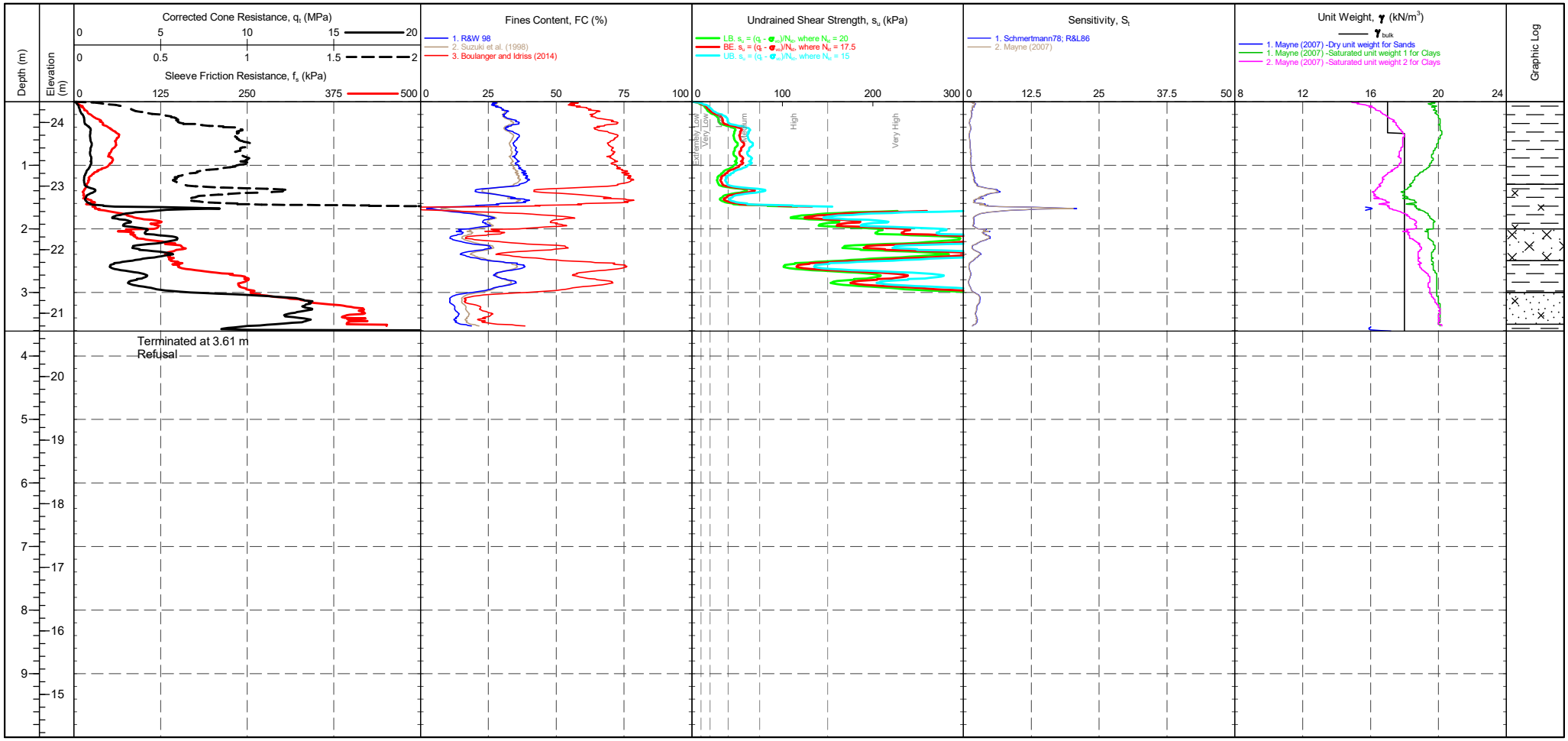
Dissipation Test

IN SITU SITE INVESTIGATION Working with: Hydrock

CPT LOG 03

PointID: **CPT114**

CLIENT : Hydrock	EASTING : 444285.781 m	Remark:	SHEET : 1 OF 1
PROJECT : Barnsley Road	NORTHING : 403682.579 m	Test refused on total pressure.	STATUS : Final
LOCATION : Goldthorpe	ELEVATION : 24.327 m OD		TEST DATE : 22/03/2024
PROJECT No. : 1240176	CHECKED BY : DW		PLOT DATE : 22/04/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



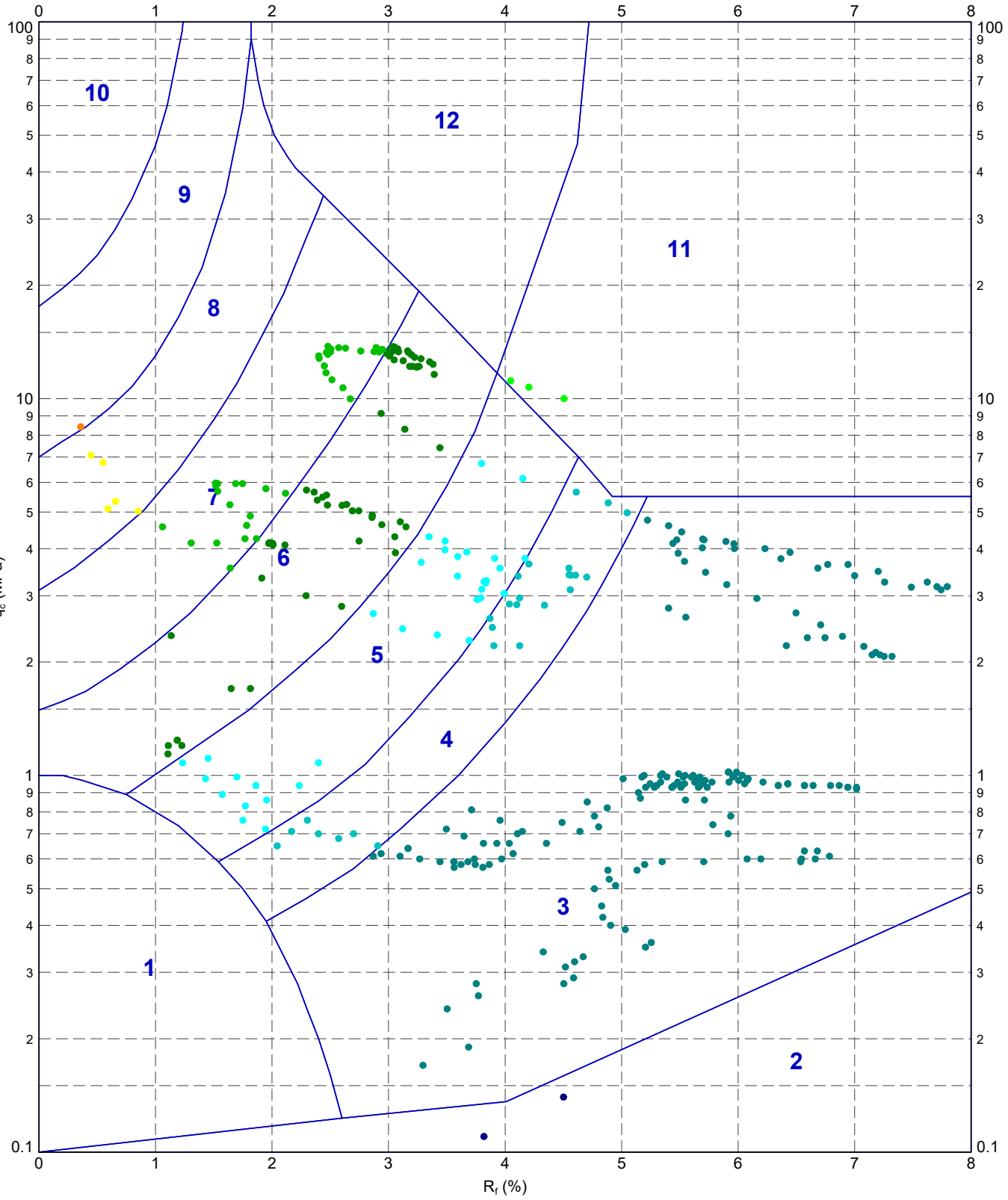
CONE ID	: S15-CFIP.1867	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 006 - Zoe	Tip	252 mV	252 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: J Cougle	Sleeve	299 mV	298 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	344 mV	323 mV	-0.006 kPa
FILTER TYPE	: HDPE	WEATHER	: Overcast & Mild	X-Y Inclinometer	2432 mV	2456 mV	

COHESIVE SOILS (Clays & Silts) Robertson et al. 1986 Zones 1-6 and Zone 11

Term based on measurement	su (kPa)	Term based on measurement	su (kPa)
Extremely low strength	<10	Medium strength	40-75
Very low strength	10-20	High strength	75-150
Low strength	20-40	Very high strength	150-300
		Extremely high strength	>300

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

- 1 - Sensitive fine grained material
- 2 - Organic material
- 3 - CLAY
- 4 - Silty CLAY to CLAY
- 5 - Clayey SILT to silty CLAY
- 6 - Sandy SILT to clayey SILT
- 7 - Silty SAND to sandy SILT
- 8 - SAND to silty SAND
- 9 - SAND
- 10 - Gravelly SAND to SAND
- 11 - Very stiff fine grained
- 12 - SAND to clayey SAND

IN SITU
SITE INVESTIGATION

TITLE

Hydrock
Goldthorpe
Barnsley Road
Robertson et al. 1986 q_c vs. R_f - CPT114

DRAWN	DATE 22/04/2024
CHECKED	DATE 22/04/2024
SCALE Not To Scale	A4
PROJECT No 1240176	FIGURE No

220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240176 BARNSLEY ROAD GOLDSHORPE HYDROCK.GPJ <<DrawingFile>> 22/04/2024 15:24 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION

Unit 23 Hastings Innovation Centre,
Highfield Drive
St. Leonards on Sea, East Sussex,
TN38 9UH, U.K.

Company No.: 6339499
VAT No.: 922 3561 41

Exploratory hole photographs

Site Work Photograph 1

Date: 3/4/24

Direction Photograph Taken:

N/A

Description: Showing TP107 with Groundwater intrusion excavated to 2.3m bgl

Site Work Photograph 2

Date: 2/4/24

Direction Photograph Taken:

N/A

Description: Showing TP110 with Groundwater intrusion excavated to 2.1m bgl

Site Work Photograph 3

Date: 26/3/24

Direction Photograph Taken:

N/A

Description: Showing TP111 with Groundwater intrusion excavated to 2.1m bgl

Site Work Photograph 4

Date: 2/4/2024

Direction Photograph Taken:

N/A

Description: Showing TP114 with no groundwater intrusion excavated to 2.1m bgl

Site Work Photograph 5

Date: 3/4/24

Direction Photograph Taken:

N/A

Description:
Showing TP116 with groundwater intrusion excavated to 1.6m bgl

Site Work Photograph 6

Date: 3/4/24

Direction Photograph Taken:

N/A

Description:
Showing TP118 with groundwater intrusion excavated to 1.9m bgl

Site Work Photograph 7

Date: 20/3/24

Direction Photograph Taken:

N/A

Description: Showing TP119 with groundwater intrusion excavated to 2.0m bgl

Site Work Photograph 8

Date: 26/3/2024

Direction Photograph Taken:

N/A

Description: Showing TP120 with no groundwater intrusion excavated to 1.40m bgl

Site Work Photograph 9

Date: 29/3/24

Direction Photograph Taken:

N/A

Description: Showing TP121 with no groundwater intrusion excavated to 2.6m bgl

Site Work Photograph 10

Date: 4/4/2024

Direction Photograph Taken:

N/A

Description: Showing TP124 with groundwater intrusion excavated to 1.4m bgl

Site Work Photograph 11

Date: 29/3/24

Direction Photograph Taken:

N/A

Description: Showing TP125 with groundwater intrusion excavated to 2.3m bgl

Site Work Photograph 12

Date: 2/4/2024

Direction Photograph Taken:

N/A

Description: Showing TP128 with groundwater intrusion excavated to 2.5m bgl

Site Work Photograph 1

Date: 2/4/24

Direction Photograph Taken:

N/A

Description: TT112 showing ground water inflow at base.

Site Work Photograph 2

Date: 5/4/2024

Direction Photograph Taken: N/A

Description: TT112 showing ground water inflow at base.

Site Work Photograph 3

Date: 27/3/24

Direction Photograph Taken:

N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 4

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 5

Date: 27/3/24

Direction Photograph Taken:

N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 6

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 7

Date: 27/3/24

Direction Photograph Taken:

N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 8

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 9

Date: 27/3/24

Direction Photograph Taken:

N/A

Description: TT113 showing progression along trial trench.

Site Work Photograph 10

Date: 2/4/2024

Direction Photograph Taken: N/A

Description: TT115 showing Alluvial soils at a depth of 2.0m bgl.

Site Work Photograph 11

Date: 20/3/24

Direction Photograph Taken:

N/A

Description: TT117 showing Alluvial soils at a depth of 2.0m bgl.

Site Work Photograph 12

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 13

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 14

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 15

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 16

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 17

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT122 showing progression along trial trench.

Site Work Photograph 18

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT123 showing progression along trial trench.

Site Work Photograph 19

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT123 showing progression along trial trench.

Site Work Photograph 20

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT123 showing progression along trial trench.

Site Work Photograph 21

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT123 showing progression along trial trench.

Site Work Photograph 22

Date: 27/3/24

Direction Photograph Taken: N/A

Description: TT123 showing progression along trial trench.

Site Work Photograph 23

Date: 3/4/24

Direction Photograph Taken: N/A

Description: TT125 showing progression along trial trench.

Site Work Photograph 24

Date: 3/4/24

Direction Photograph Taken: N/A

Description: TT125 showing progression along trial trench.

Site Work Photograph 25

Date: 3/4/24

Direction Photograph Taken: N/A

Description: TT125 showing progression along trial trench.

Site Work Photograph 26

Date: 3/4/24

Direction Photograph Taken: N/A

Description: TT125 showing progression along trial trench.

Appendix C Geotechnical test results and geotechnical plots

Geotechnical laboratory test results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

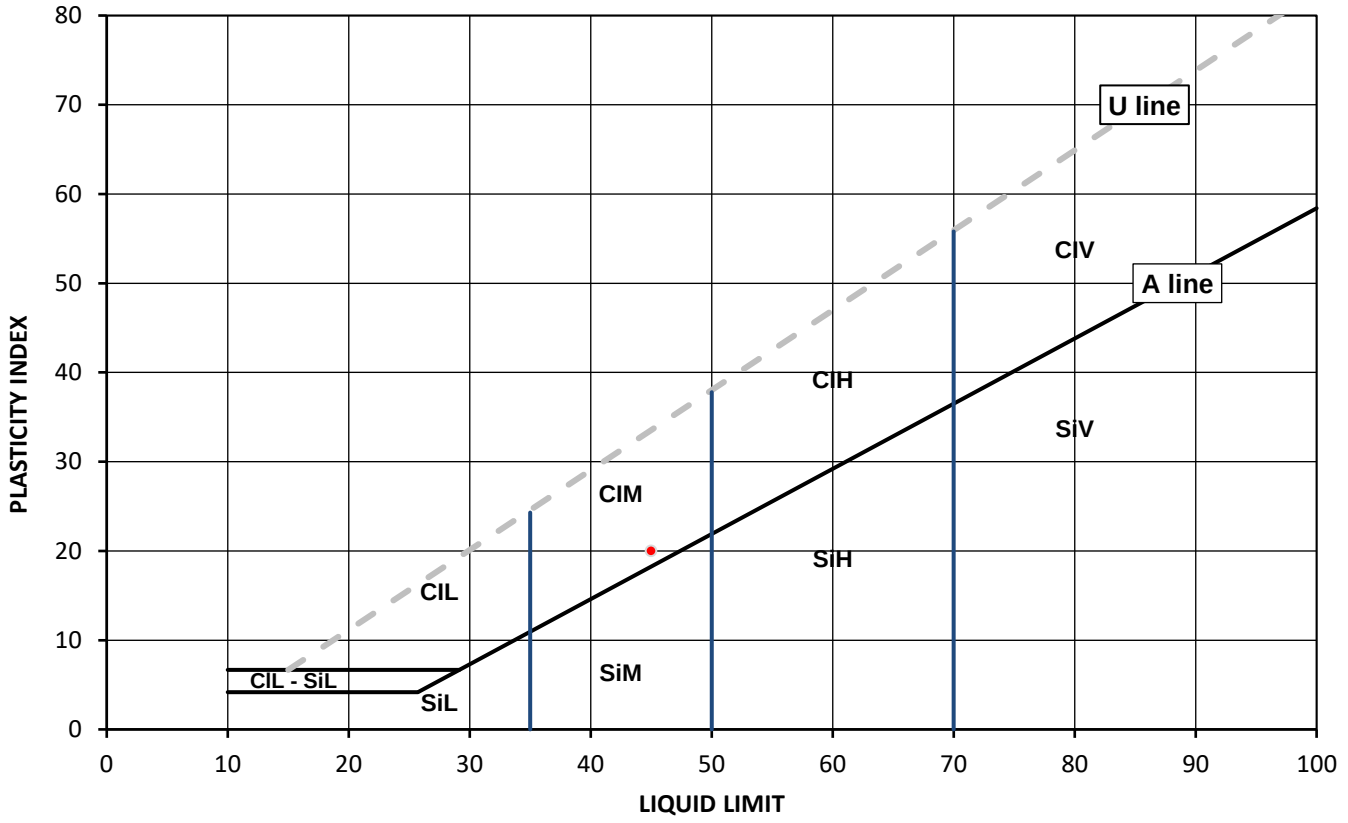
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175822	Depth Top [m]:	1.20
Hole No.:	CP101	Depth Base [m]:	1.65
Sample Reference:	3	Sample Type:	B
Sample Description:	Brownish brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.5	45	25	20	-0.25	1.25	80



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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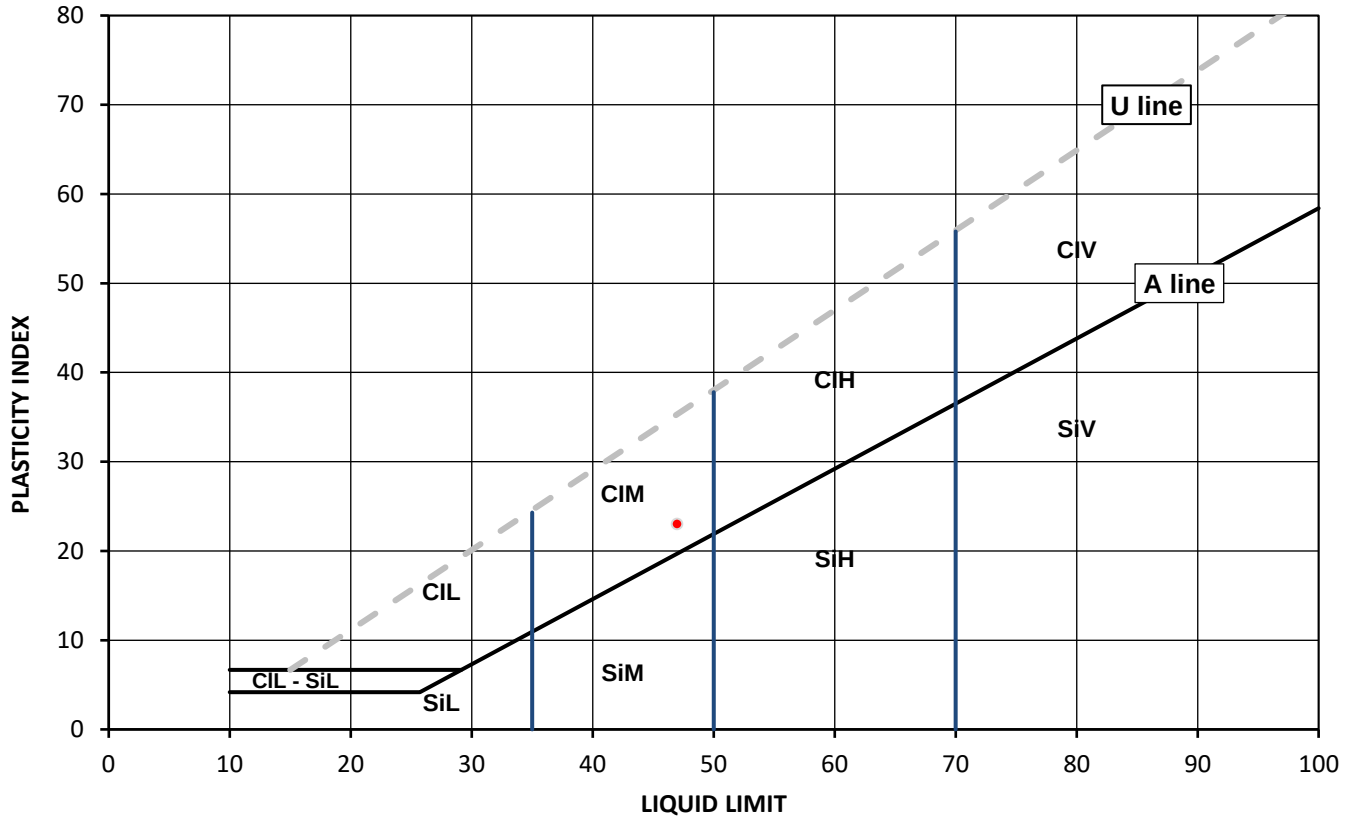
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175823	Depth Top [m]:	4.00
Hole No.:	CP101	Depth Base [m]:	4.50
Sample Reference:	7	Sample Type:	B
Sample Description:	Greyish brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
27.8	47	24	23	0.17	0.83	88



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
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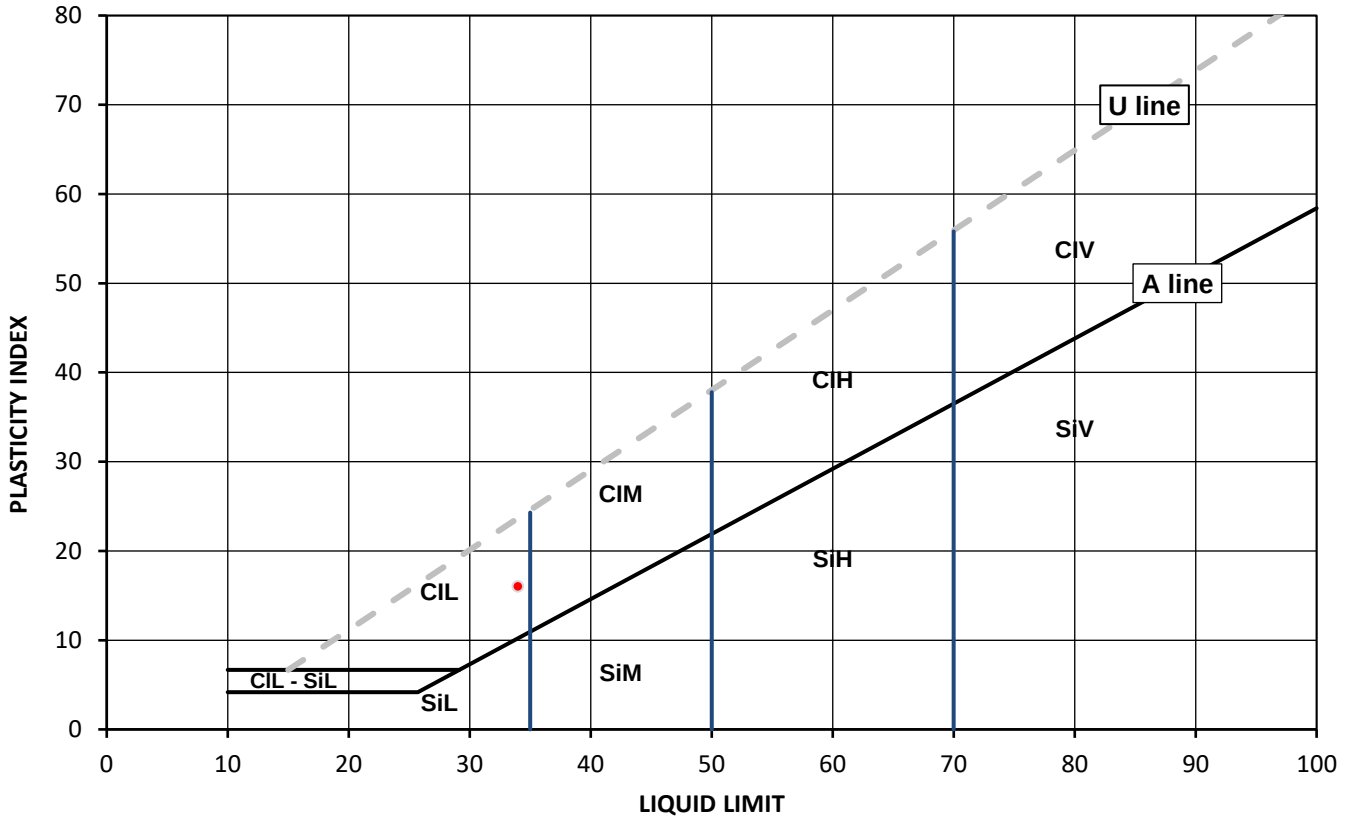
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175826	Depth Top [m]:	1.00
Hole No.:	CP102	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
16.2	34	18	16	-0.13	1.13	78



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

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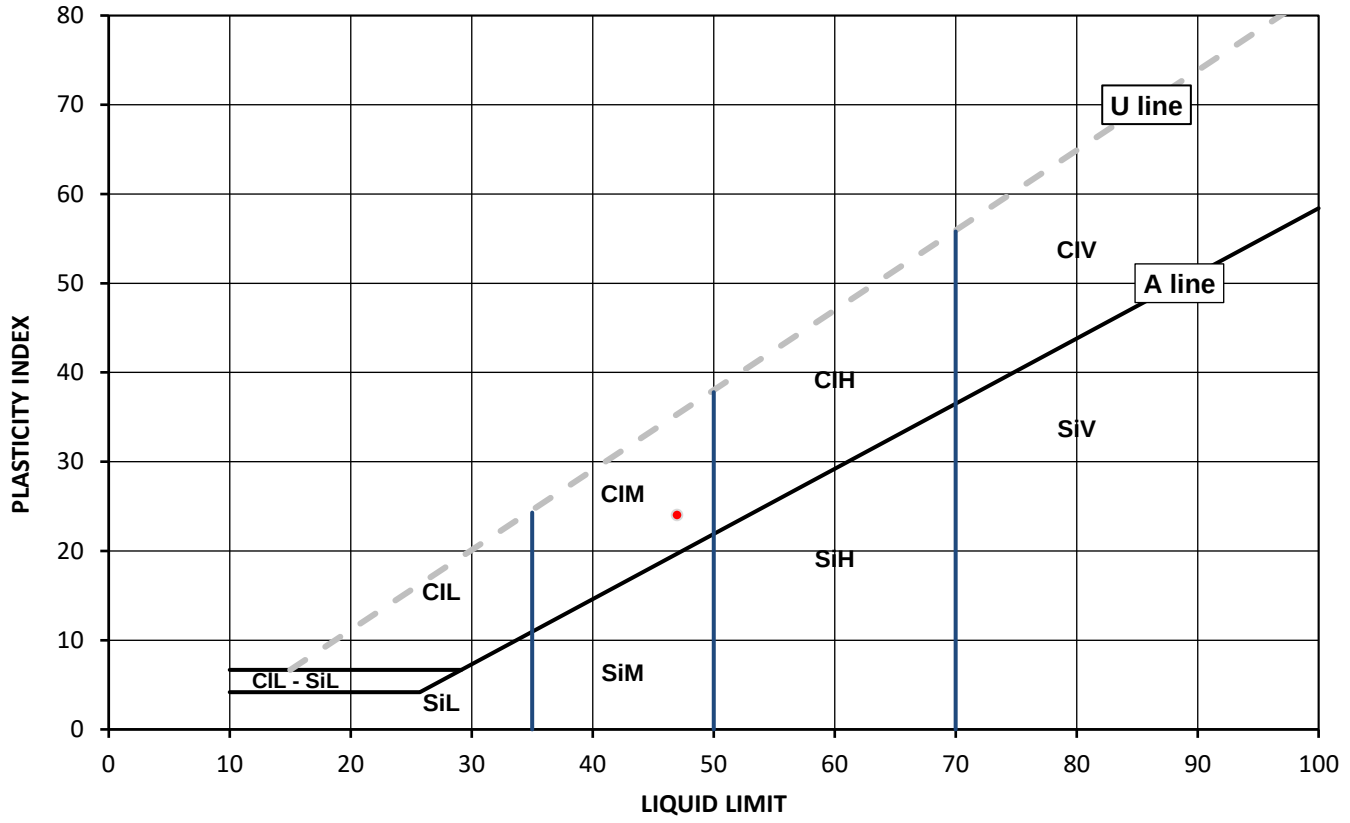
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175833	Depth Top [m]:	1.00
Hole No.:	TP107	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
13.4	47	23	24	-0.42	1.42	62



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

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Northampton NN4 7EB

Environmental Science

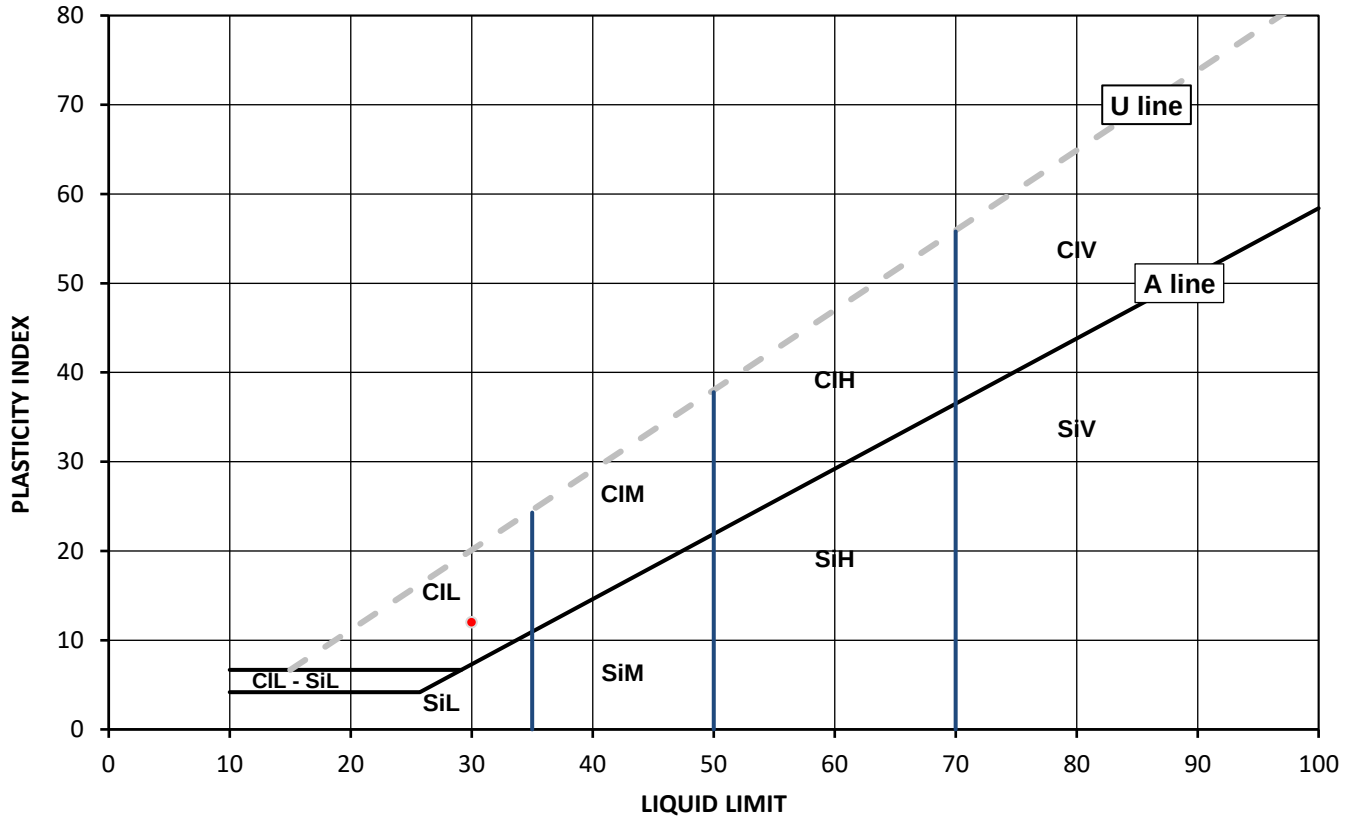
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175836	Depth Top [m]:	1.00
Hole No.:	TP114	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
21.3	30	18	12	0.25	0.75	81



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
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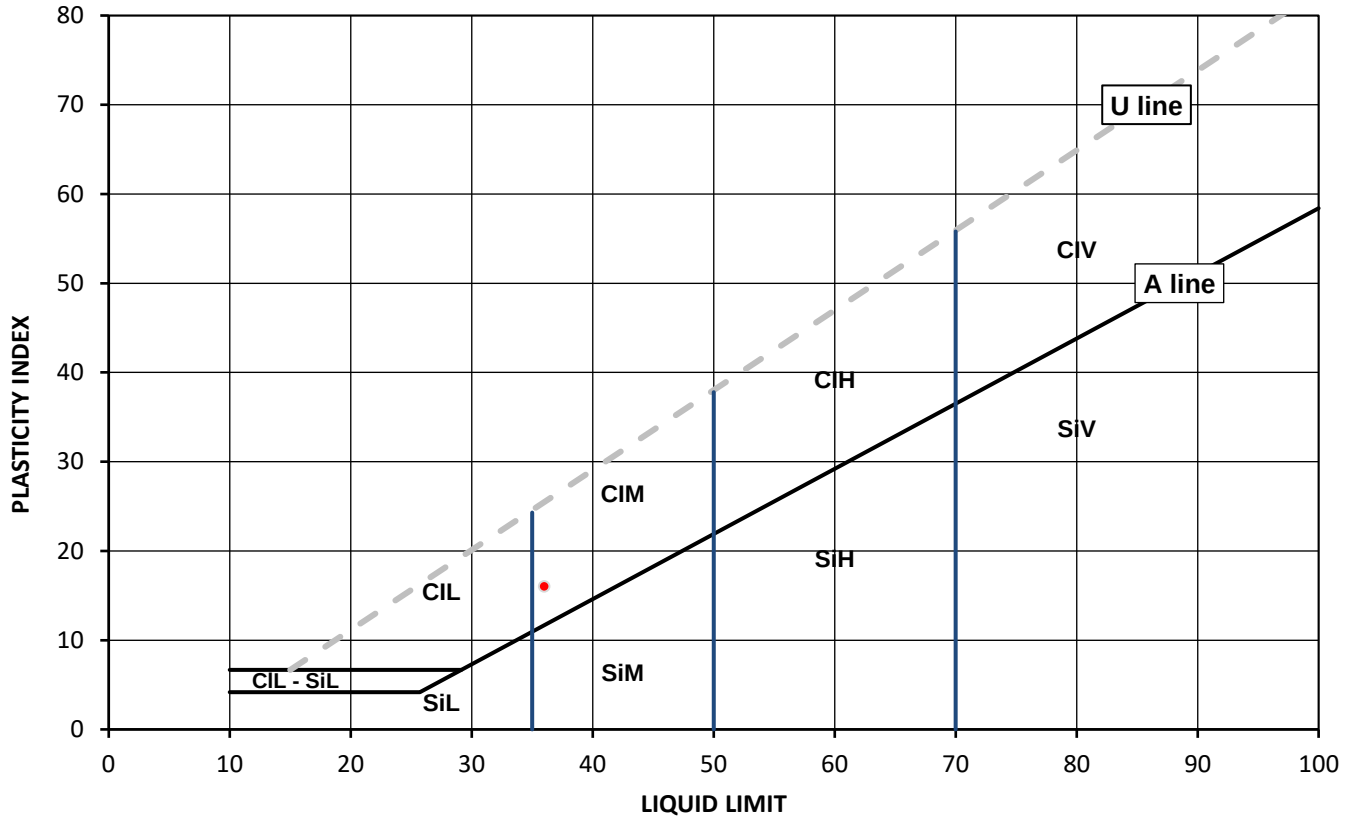
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175838	Depth Top [m]:	1.00
Hole No.:	TP119	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.8	36	20	16	0.06	0.94	77



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
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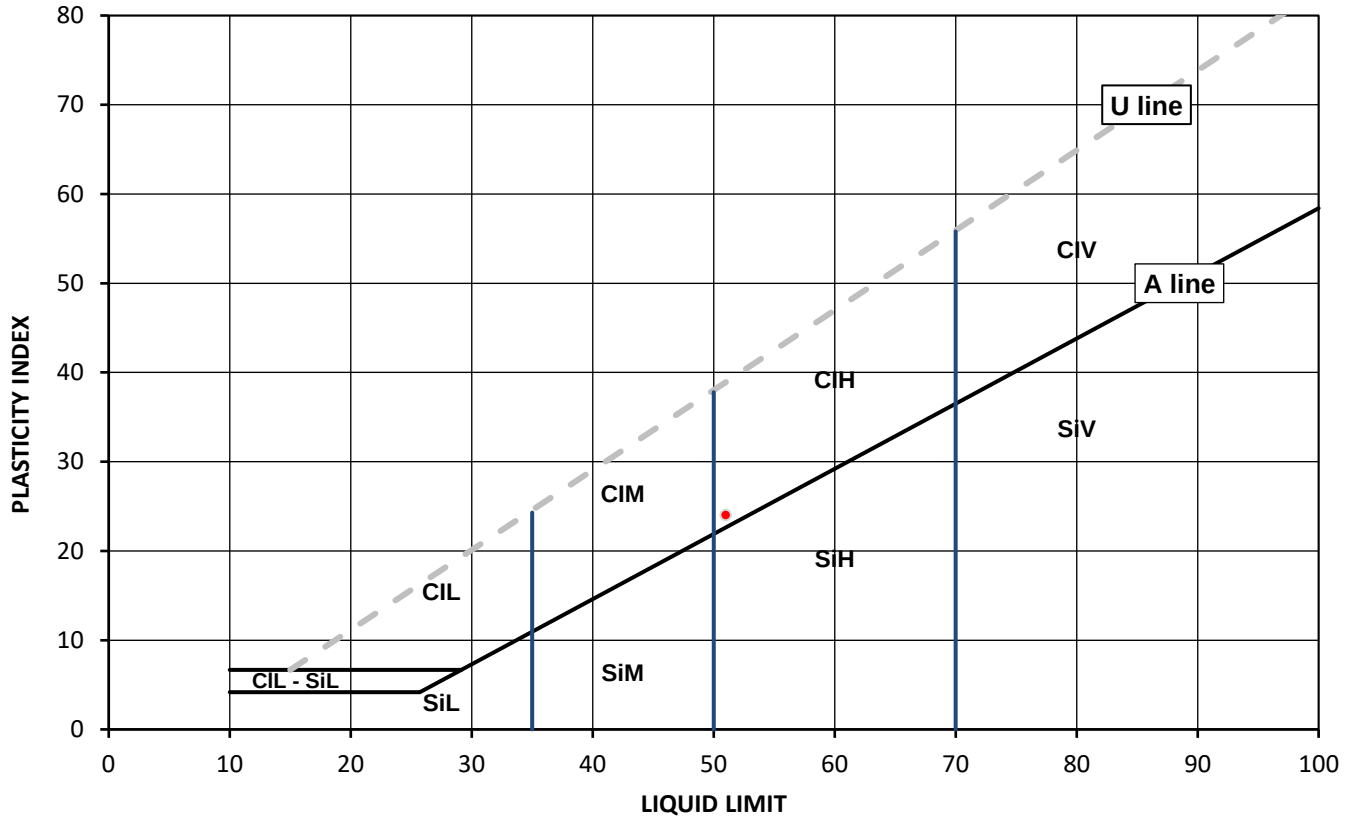
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175840	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	0.80
Sample Reference:	1	Sample Type:	B
Sample Description:	Orangish brown slightly sandy silty CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
27.4	51	27	24	0.00	1.00	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
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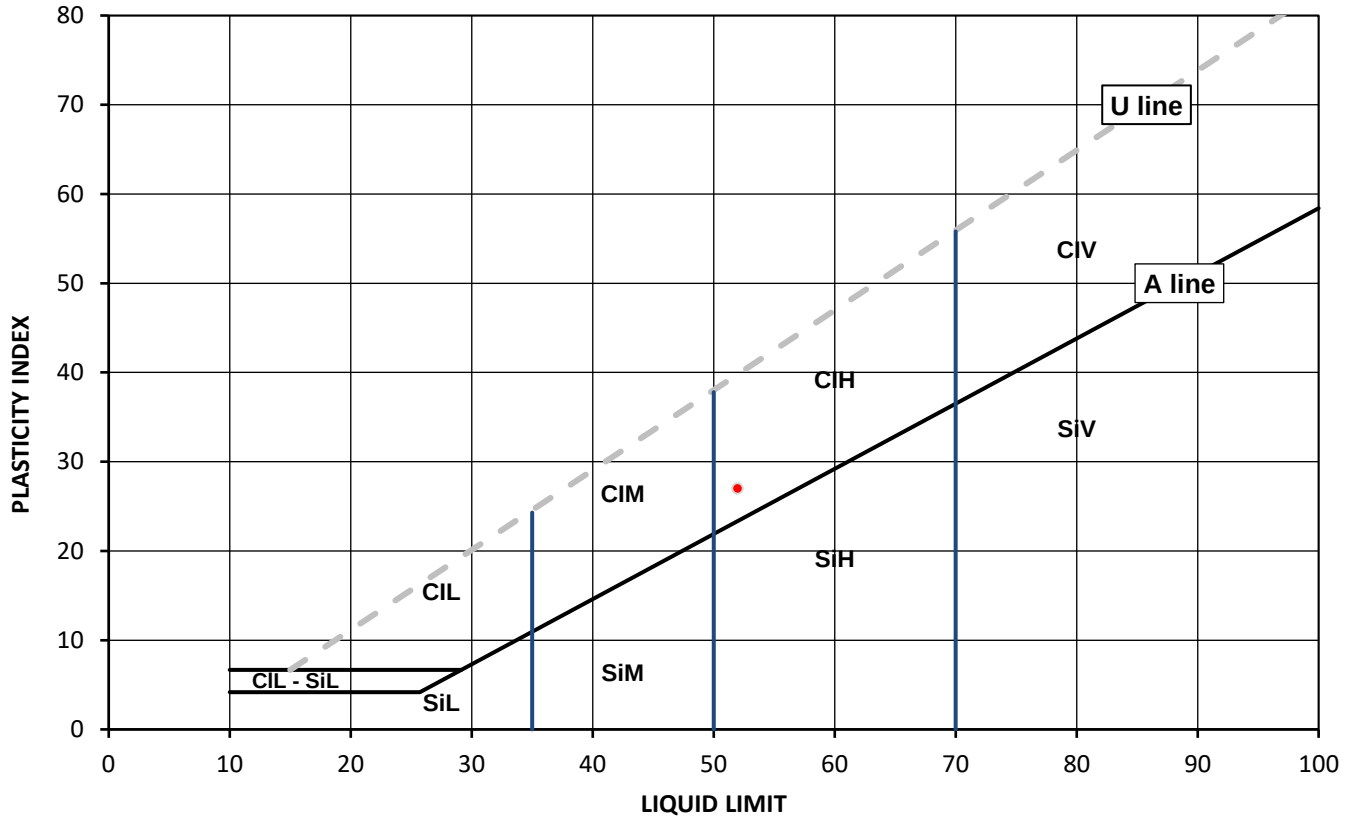
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175841	Depth Top [m]:	1.50
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.2	52	25	27	-0.19	1.19	95



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
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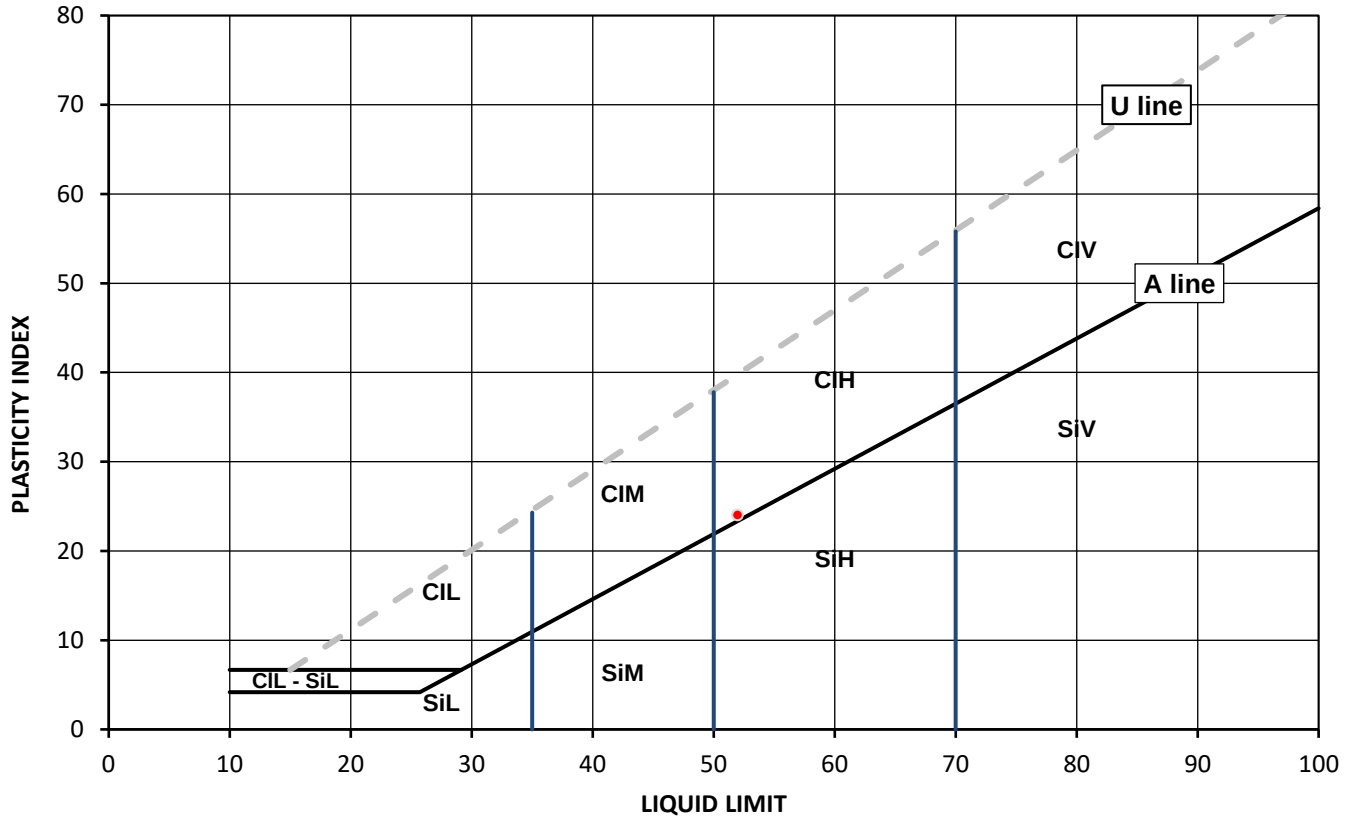
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175842	Depth Top [m]:	1.00
Hole No.:	TP128	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	D
Sample Description:	Dark brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
27.8	52	28	24	0.00	1.00	87



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
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Northampton NN4 7EB

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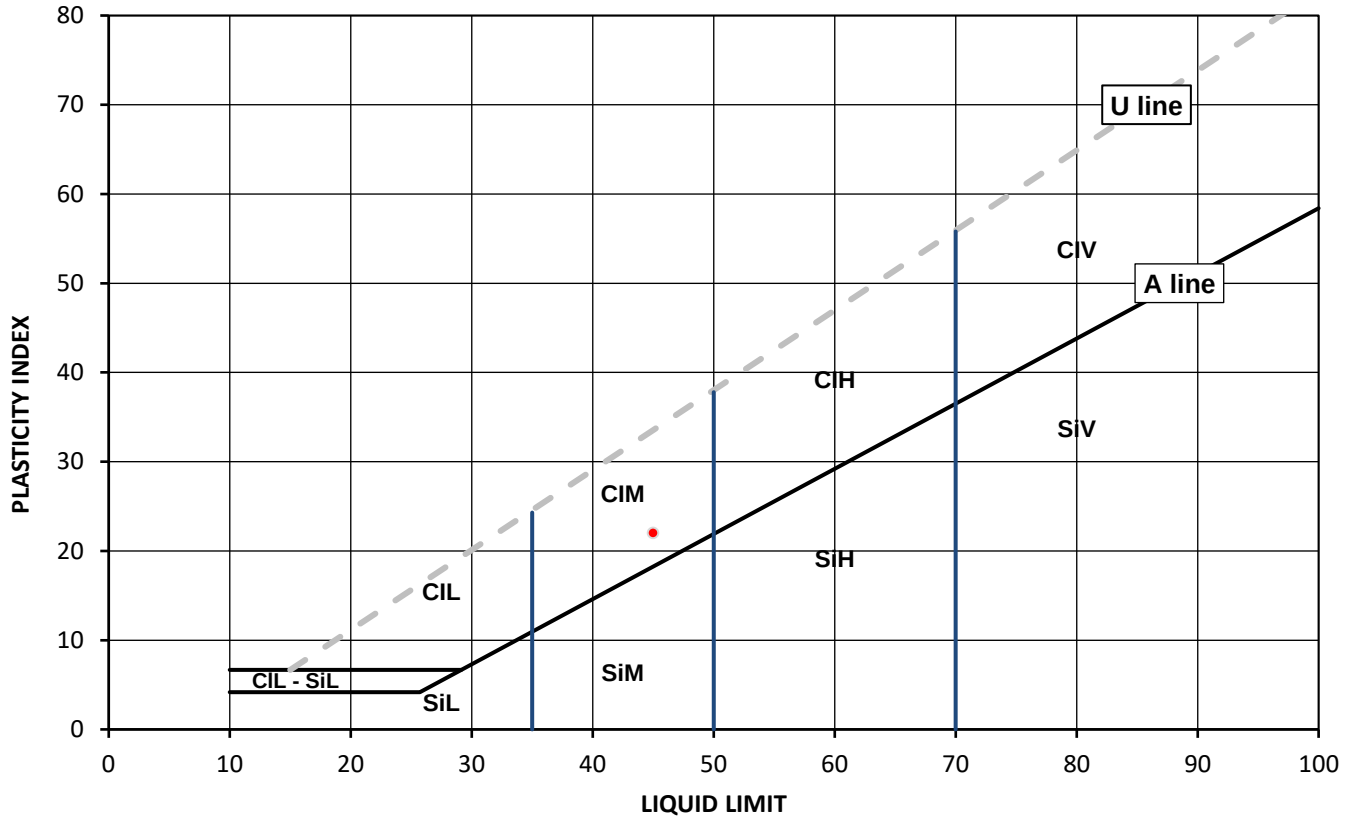
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175843	Depth Top [m]:	0.50
Hole No.:	TT115	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	D
Sample Description:	Dark brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
23.7	45	23	22	0.05	0.95	80



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

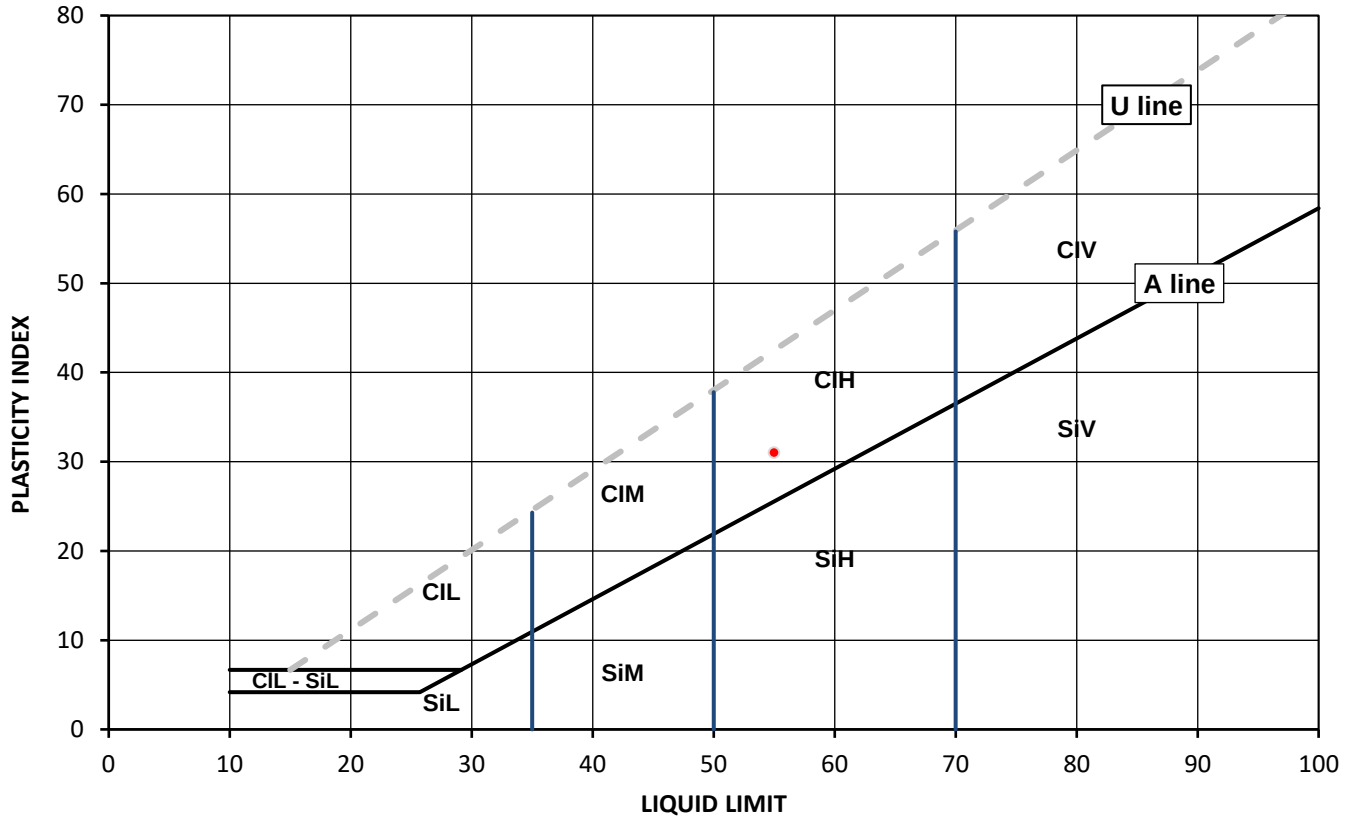
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175844	Depth Top [m]:	2.00
Hole No.:	TT115	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Brownish grey slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
22.9	55	24	31	-0.03	1.03	73



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

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Date Reported: 06/05/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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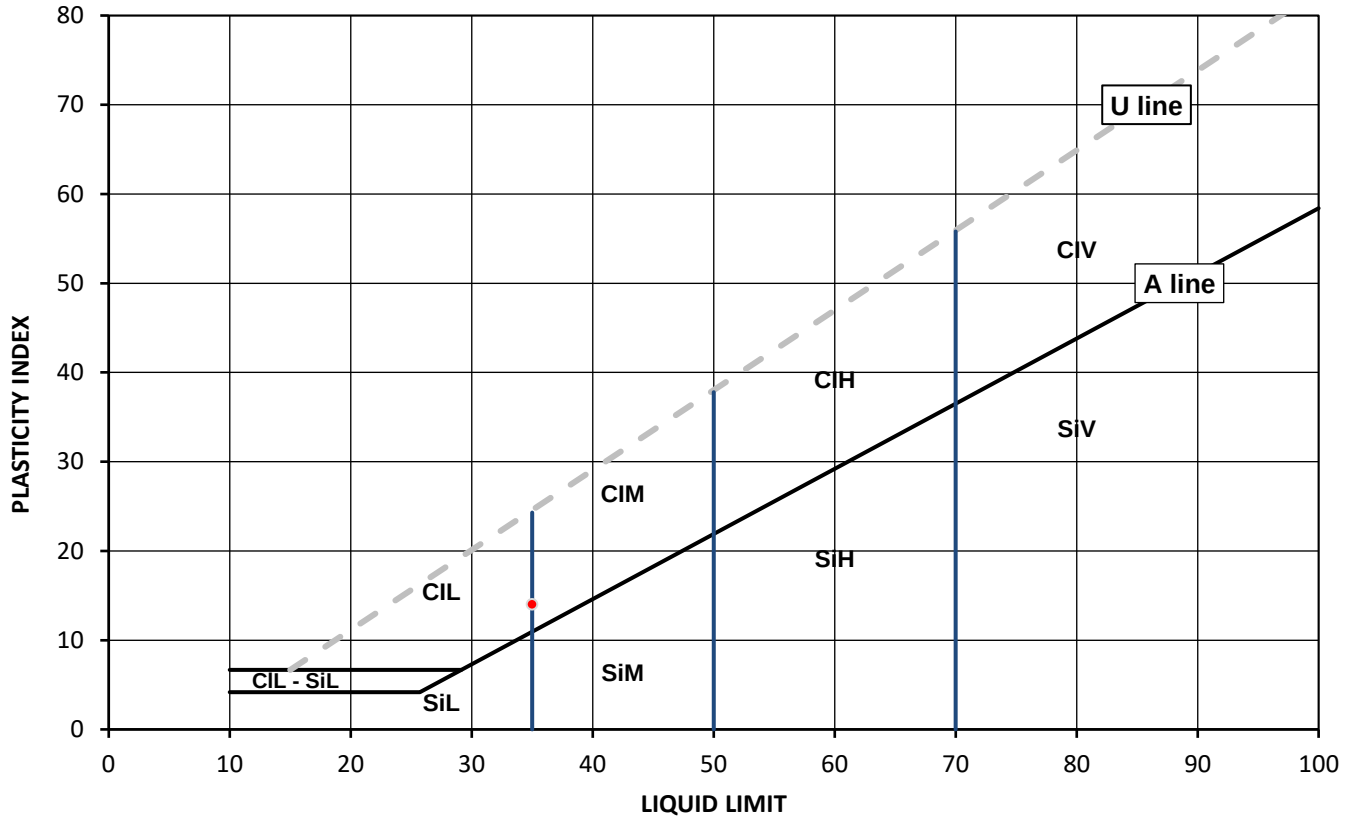
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175846	Depth Top [m]:	1.00
Hole No.:	TT122B	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
19.9	35	21	14	-0.07	1.07	92



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Date Reported: 06/05/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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Northampton NN4 7EB

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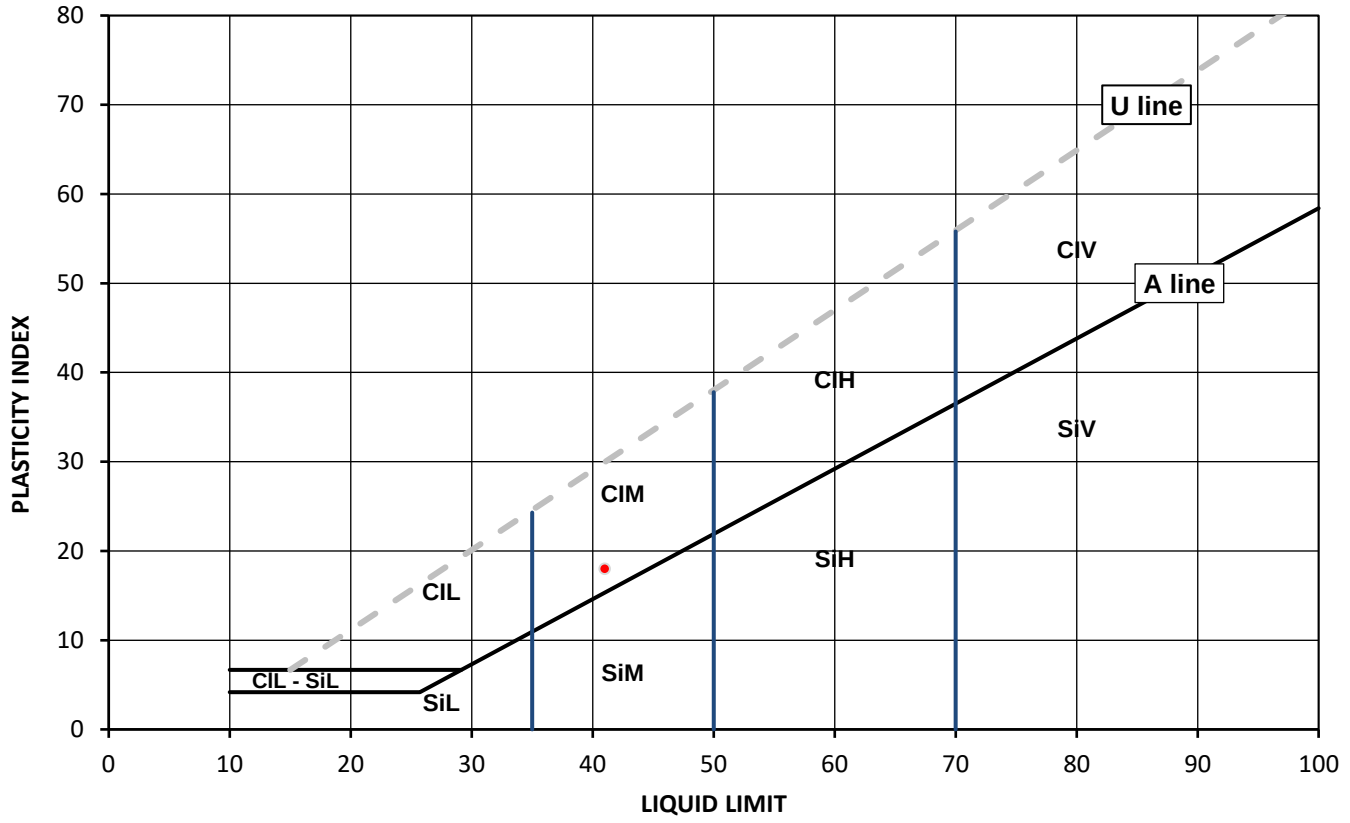
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175847	Depth Top [m]:	1.00
Hole No.:	TT125A	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
20.3	41	23	18	-0.17	1.17	91



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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Northampton NN4 7EB

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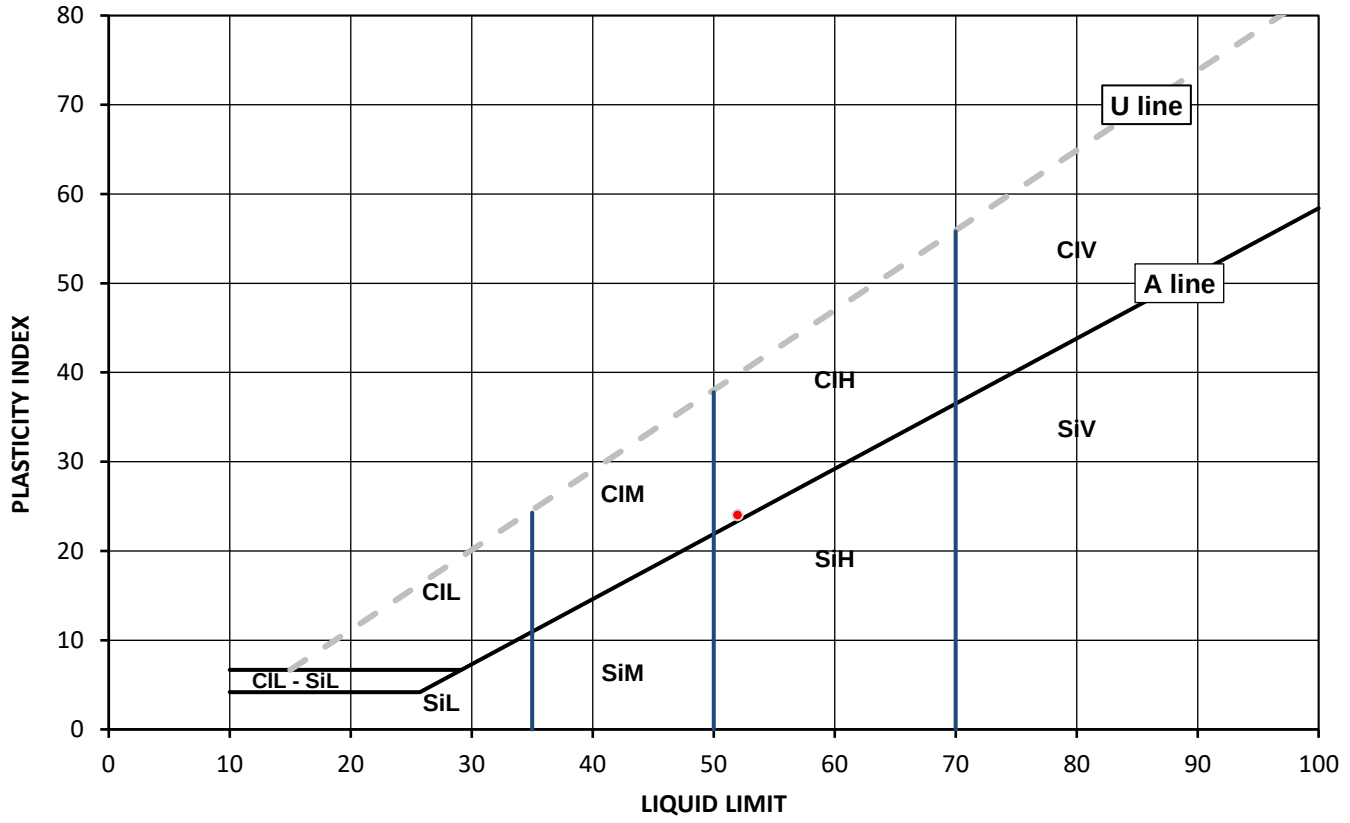
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175850	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
24.5	52	28	24	-0.13	1.13	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

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Date Reported: 06/05/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

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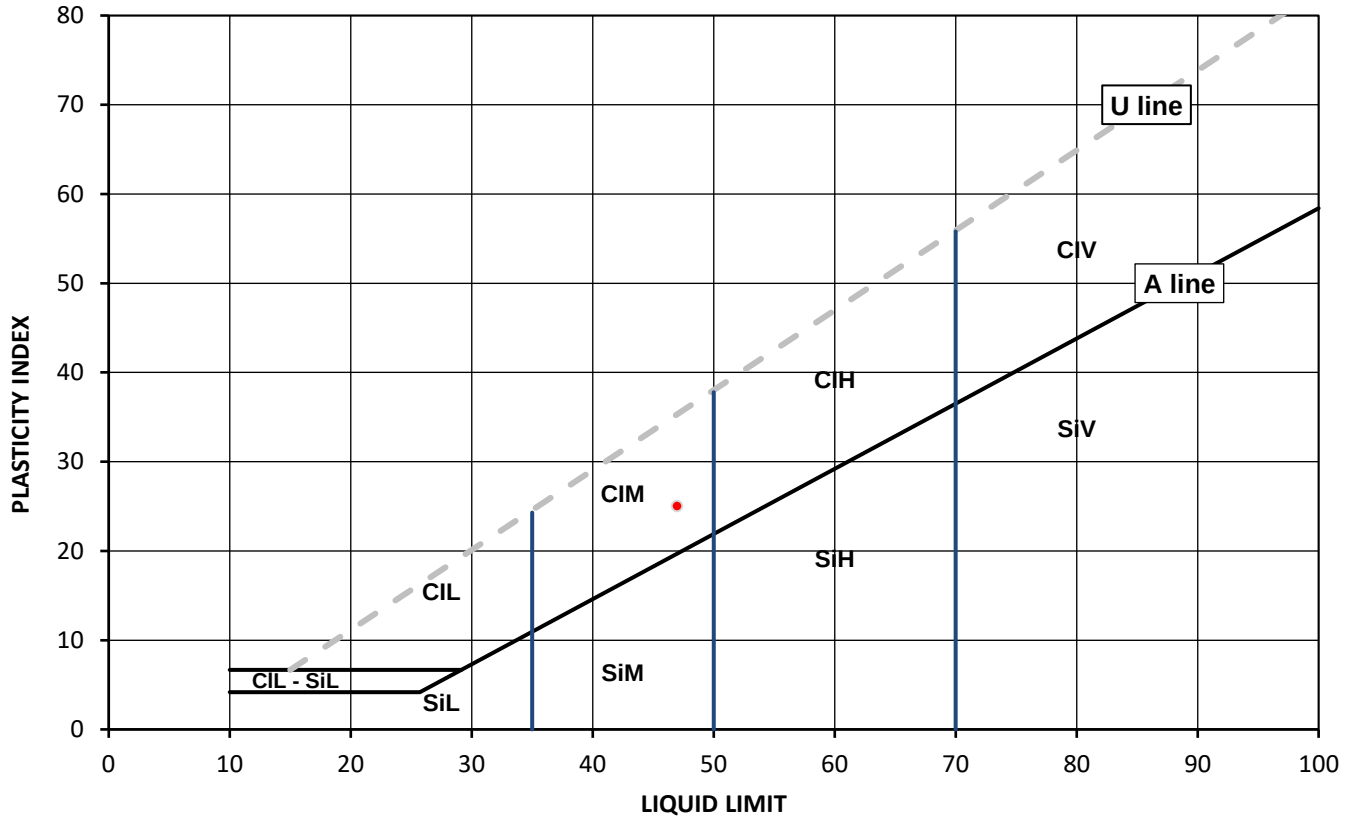
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175851	Depth Top [m]:	1.00
Hole No.:	TP124	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Dark grey very gravelly slightly sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
14.9	47	22	25	-0.28	1.28	39



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 337.13

4041

TEST CERTIFICATE

DETERMINATION OF PLASTIC LIMIT

Tested in Accordance with: BS EN ISO 17892-12:2018+A1:2021

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

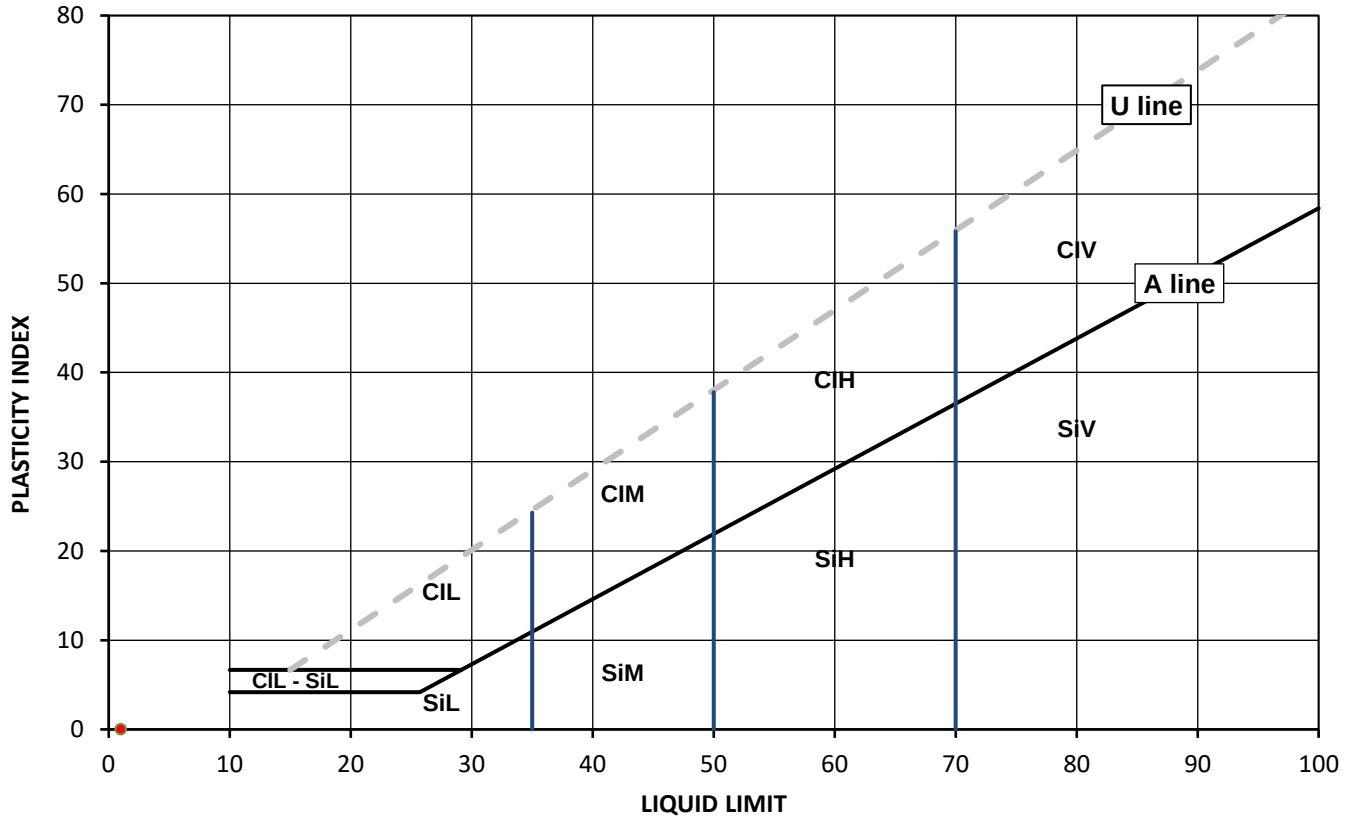
Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175852	Depth Top [m]:	2.50
Hole No.:	TT112	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	WEATHERED PENNINE MIDDLE COAL		
Sample Preparation:	Tested after washing to remove >0.425mm;		
Cone Type:	N/A		

As Received Water Content [W] %	Corrected Liquid Limit [WL] %	Correlation Factor	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
57.3	N/A	N/A	56	N/A	40



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Remarks:

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 494.2

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN 17892-1:2014.

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Hydrock Consultants Ltd

Client Address: 4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY

Contact: Alexander Lee

Site Address: Goldthorpe

Client Reference: 23451
Job Number: 24-015167-1
Date Sampled: Not Given
Date Received: 05/04/2024
Date Tested: 25/04 - 26/04/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
175821	CP101	2	0.50	1.00	B	Dark grey gravelly slightly sandy silty CLAY		11.0										
175822	CP101	3	1.20	1.65	B	Brownish brown slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	19.5	80	45	-	25	20	80g/30 deg	W / I			
175823	CP101	7	4.00	4.50	B	Greyish brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	27.8	88	47	-	24	23	80g/30 deg	W / I			
175824	CP101	10	6.50	7.00	B	Grey slightly gravelly CLAY		18.4										
175825	CP102	2	0.50	Not Given	B	Yellowish brown slightly gravelly slightly gravelly CLAY		19.7										
175826	CP102	3	1.00	Not Given	B	Yellowish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	16.2	78	34	-	18	16	80g/30 deg	W / I			
175828	CP102	6	2.00	Not Given	B	Yellowish brown slightly gravelly slightly sandy clayey SILT		13.6										
175829	CP102	8	3.00	3.45	B	Light brown slightly sandy CLAY		13.0										
175830	CP103	1	1.00	Not Given	B	Yellowish brown slightly gravelly CLAY		20.9										
175832	CP103	7	3.50	Not Given	B	Grey slightly clayey SAND		13.6										

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024 **GF 362.14**

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN 17892-1:2014.

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Hydrock Consultants Ltd

Client Address: 4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY

Contact: Alexander Lee

Site Address: Goldthorpe

Client Reference: 23451
Job Number: 24-015167-1
Date Sampled: Not Given
Date Received: 05/04/2024
Date Tested: 25/04 - 26/04/2024
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
175833	TP107	1	1.00	Not Given	B	Brown slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	13.4	62	47	-	23	24	80g/30 deg	W / I			
175834	TP110	1	1.00	Not Given	B	Brown slightly gravelly slightly sandy CLAY		22.7										
175835	TP111	1	1.50	2.00	B	Yellowish brown slightly gravelly slightly sandy CLAY		21.5										
175836	TP114	1	1.00	Not Given	B	Yellowish brown slightly gravelly sandy CLAY	Atterberg 4 Point	21.3	81	30	-	18	12	80g/30 deg	W / I			
175837	TP116	1	0.50	Not Given	B	Yellowish brown sandy very clayey GRAVEL		12.5										
175838	TP119	1	1.00	Not Given	B	Yellowish brown slightly gravelly sandy CLAY	Atterberg 4 Point	20.8	77	36	-	20	16	80g/30 deg	W / I			
175839	TP120	1	1.00	Not Given	D	Yellowish brown very gravelly clayey SAND		13.0										
175840	TP121	1	0.75	0.80	B	Orangish brown slightly sandy silty CLAY	Atterberg 4 Point	27.4	100	51	-	27	24	80g/30 deg	N / I			
175841	TP121	2	1.50	Not Given	B	Yellowish brown slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	20.2	95	52	-	25	27	80g/30 deg	W / I			
175842	TP128	1	1.00	Not Given	D	Dark brown slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	27.8	87	52	-	28	24	80g/30 deg	R / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

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Date Reported: 06/05/2024 **GF 362.14**

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN 17892-1:2014. Particle Density by gas jar BS 1377-2:2022.

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Unit 8 Harrowden Road
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Client: Hydrock Consultants Ltd

Client Address: 4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY

Contact: Alexander Lee

Site Address: Goldthorpe

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: 23451
Job Number: 24-015167-1
Date Sampled: Not Given
Date Received: 05/04/2024
Date Tested: 25/04 - 26/04/2024
Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
175843	TT115	1	0.50	Not Given	D	Dark brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	23.7	80	45	-	23	22	80g/30 deg	R / I			
175844	TT115	3	2.00	Not Given	D	Brownish grey slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	22.9	73	55	-	24	31	80g/30 deg	R / I			
175846	TT122B	1	1.00	Not Given	B	Yellowish brown slightly gravelly sandy CLAY	Atterberg 4 Point	19.9	92	35	-	21	14	80g/30 deg	W / I			
175847	TT125A	1	1.00	Not Given	B	Yellowish brown slightly gravelly sandy CLAY	Atterberg 4 Point	20.3	91	41	-	23	18	80g/30 deg	W / I			
175848	TT127	1	0.50	Not Given	B	Brownish grey CLAY		23.8										
175850	TP121	1	0.75	Not Given	B	Brown slightly sandy CLAY	Atterberg 4 Point	24.5	100	52	-	28	24	80g/30 deg	N / I			2.81
175851	TP124	1	1.00	Not Given	B	Dark grey very gravelly slightly sandy CLAY	Atterberg 4 Point	14.9	39	47	-	22	25	80g/30 deg	W / I			2.76
175852	TT112	1	2.50	Not Given	B	WEATHERED PENNINE MIDDLE COAL	Plastic Limit	57.3	40	N/A	-	56	N/A	N/A	R			1.62

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024 **GF 362.14**

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

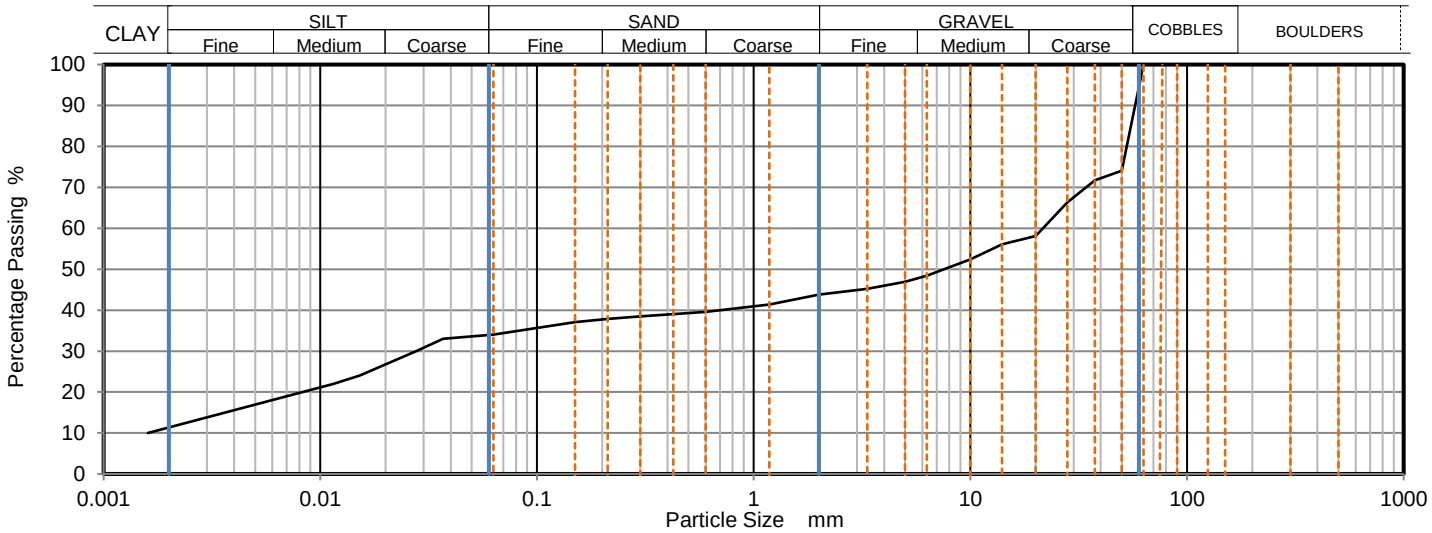
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175821	Depth Top [m]:	0.50
Hole No.:	CP101	Depth Base [m]:	1.00
Sample Reference:	2	Sample Type:	B
Sample Description:	Dark grey gravelly slightly sandy silty CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0369	33
300	100	0.0276	30
150	100	0.0205	27
125	100	0.0152	24
90	100	0.0115	22
75	100	0.0016	10
63	100		
50	74		
37.5	72		
28	66		
20	58		
14	56		
10	52		
6.3	48		
5	47		
3.35	45		
2	44		
1.18	41		
0.6	40	Particle density	(assumed)
0.425	39	2.65	Mg/m3
0.3	39		
0.212	38		
0.15	37		
0.063	34		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	56.00
Sand	10.00
Silt	22.00
Clay	12.00

Grading Analysis		
D100	mm	63
D60	mm	21.6
D30	mm	0.0275
D10	mm	
Uniformity Coefficient		340
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

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Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

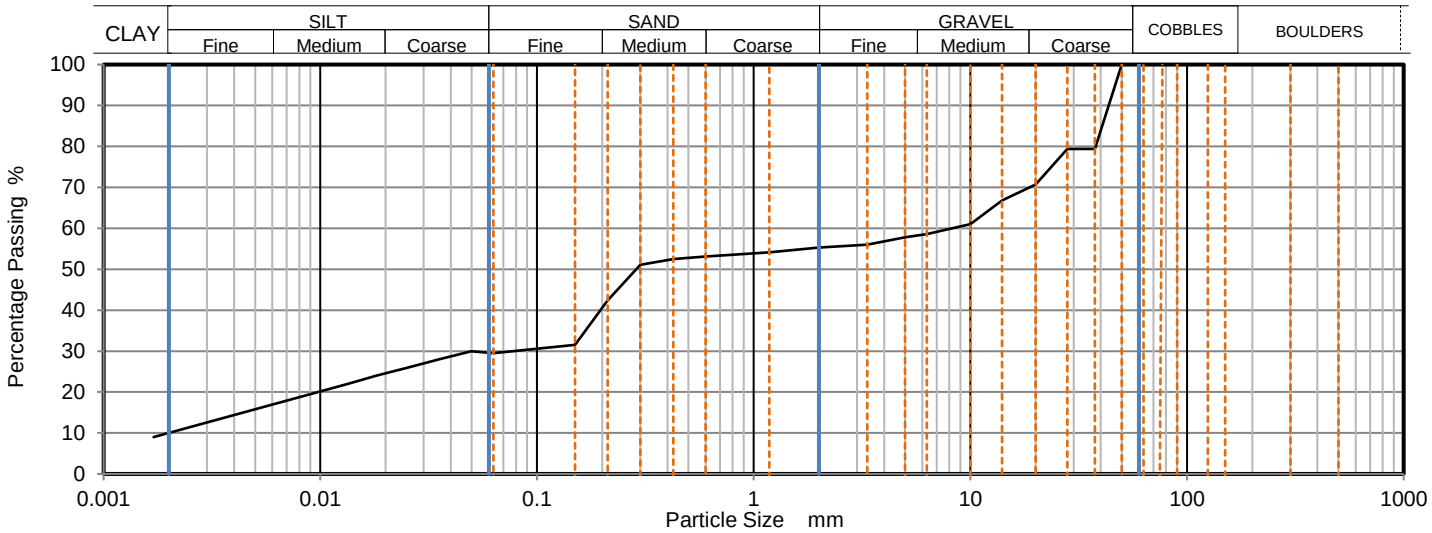
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175827	Depth Top [m]:	1.00
Hole No.:	CP102	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Yellowish brown gravelly slightly sandy silty CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0498	30
300	100	0.0354	28
150	100	0.0254	26
125	100	0.0182	24
90	100	0.0134	22
75	100	0.0017	9
63	100		
50	100		
37.5	79		
28	79		
20	71		
14	67		
10	61		
6.3	59		
5	58		
3.35	56		
2	55		
1.18	54		
0.6	53	Particle density	(assumed)
0.425	53	2.65	Mg/m3
0.3	51		
0.212	42		
0.15	32		
0.063	30		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	44.00
Sand	26.00
Silt	20.00
Clay	10.00

Grading Analysis		
D100	mm	50
D60	mm	8.21
D30	mm	0.0782
D10	mm	0.00207
Uniformity Coefficient		4000
Curvature Coefficient		0.36

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

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Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

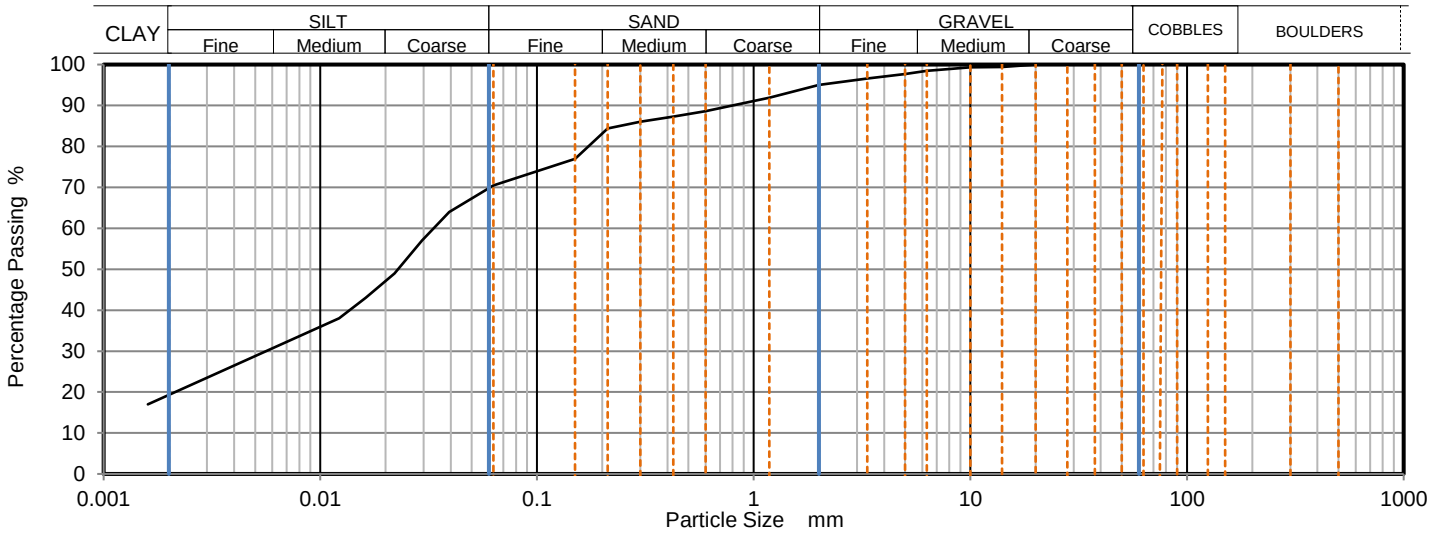
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175828	Depth Top [m]:	2.00
Hole No.:	CP102	Depth Base [m]:	Not Given
Sample Reference:	6	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly slightly sandy clayey SILT		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0394	64
300	100	0.0295	57
150	100	0.0220	49
125	100	0.0162	43
90	100	0.0122	38
75	100	0.0016	17
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	99		
5	98		
3.35	97		
2	95		
1.18	92		
0.6	89	Particle density	(assumed)
0.425	87	2.65	Mg/m3
0.3	86		
0.212	84		
0.15	77		
0.063	71		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.00
Sand	25.00
Silt	50.00
Clay	20.00

Grading Analysis		
D100	mm	20
D60	mm	0.0333
D30	mm	0.00545
D10	mm	
Uniformity Coefficient		0.53
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:

Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

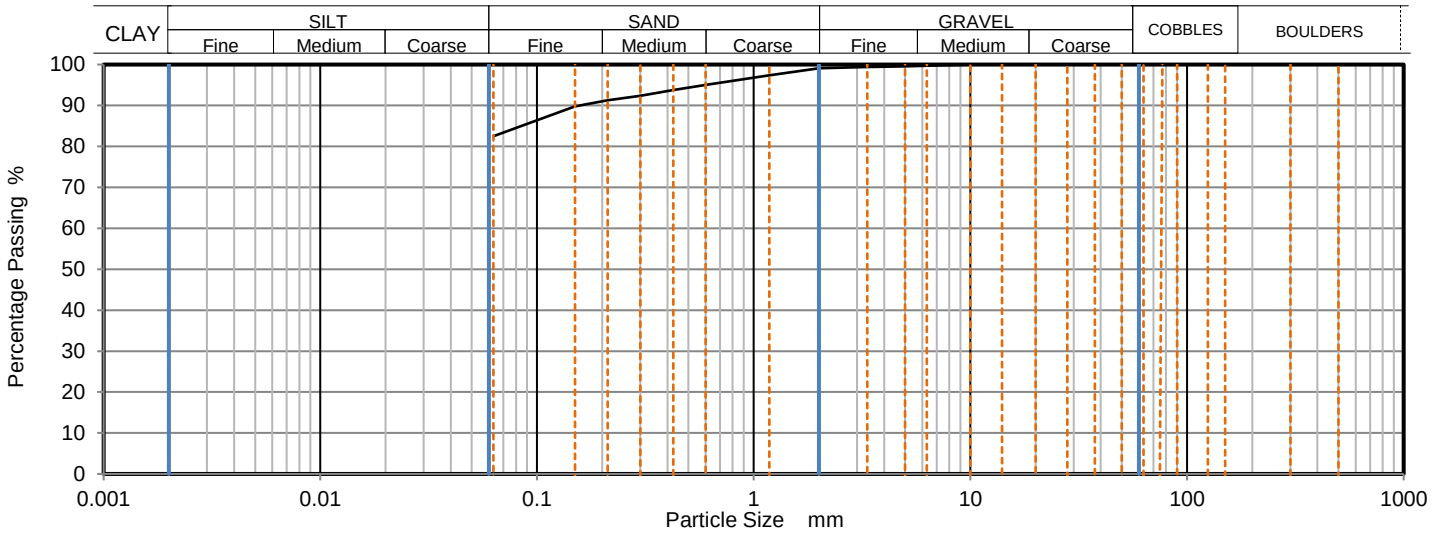
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175829	Depth Top [m]:	3.00
Hole No.:	CP102	Depth Base [m]:	3.45
Sample Reference:	8	Sample Type:	B
Sample Description:	Light brown slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	97		
0.6	95		
0.425	94		
0.3	92		
0.212	91		
0.15	90		
0.063	83		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.00
Sand	17.00
Fines <0.063 mm	82.00

Grading Analysis		
D100	mm	10
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

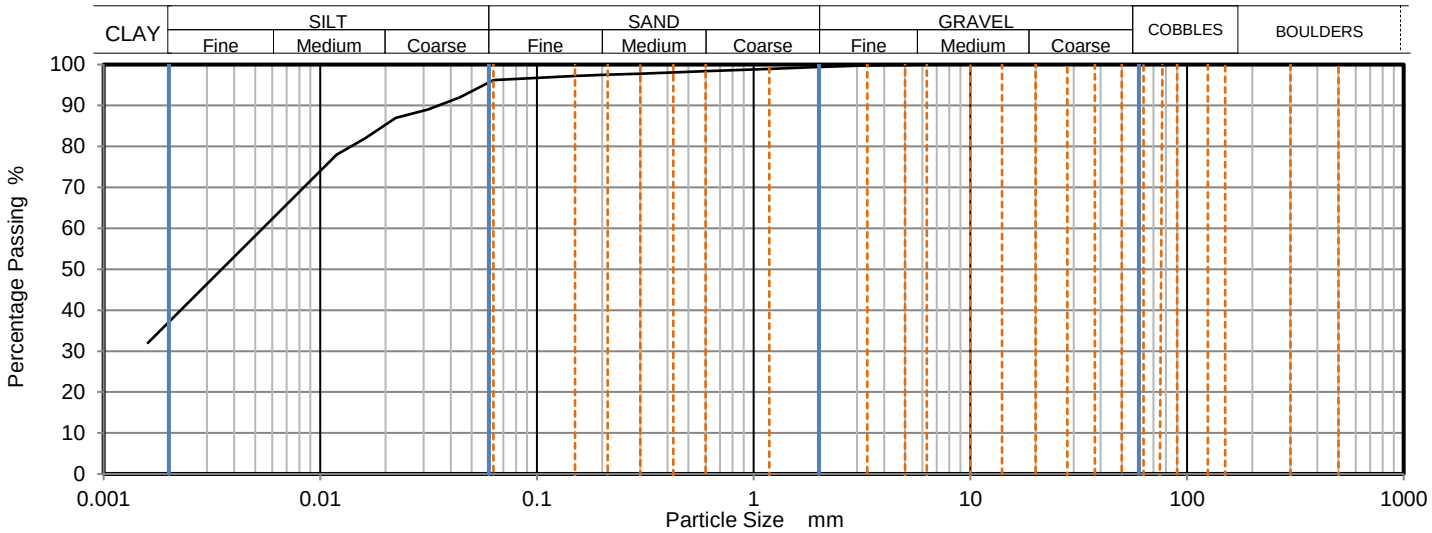
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175831	Depth Top [m]:	3.00
Hole No.:	CP103	Depth Base [m]:	Not Given
Sample Reference:	6	Sample Type:	B
Sample Description:	Grey slightly sandy clayey SILT		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0440	92
300	100	0.0313	89
150	100	0.0223	87
125	100	0.0161	82
90	100	0.0119	78
75	100	0.0016	32
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98	Particle density	(assumed)
0.425	98	2.65	Mg/m3
0.3	98		
0.212	98		
0.15	97		
0.063	96		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.00
Sand	3.00
Silt	59.00
Clay	37.00

Grading Analysis		
D100	mm	10
D60	mm	0.00544
D30	mm	
D10	mm	
Uniformity Coefficient		0.086
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

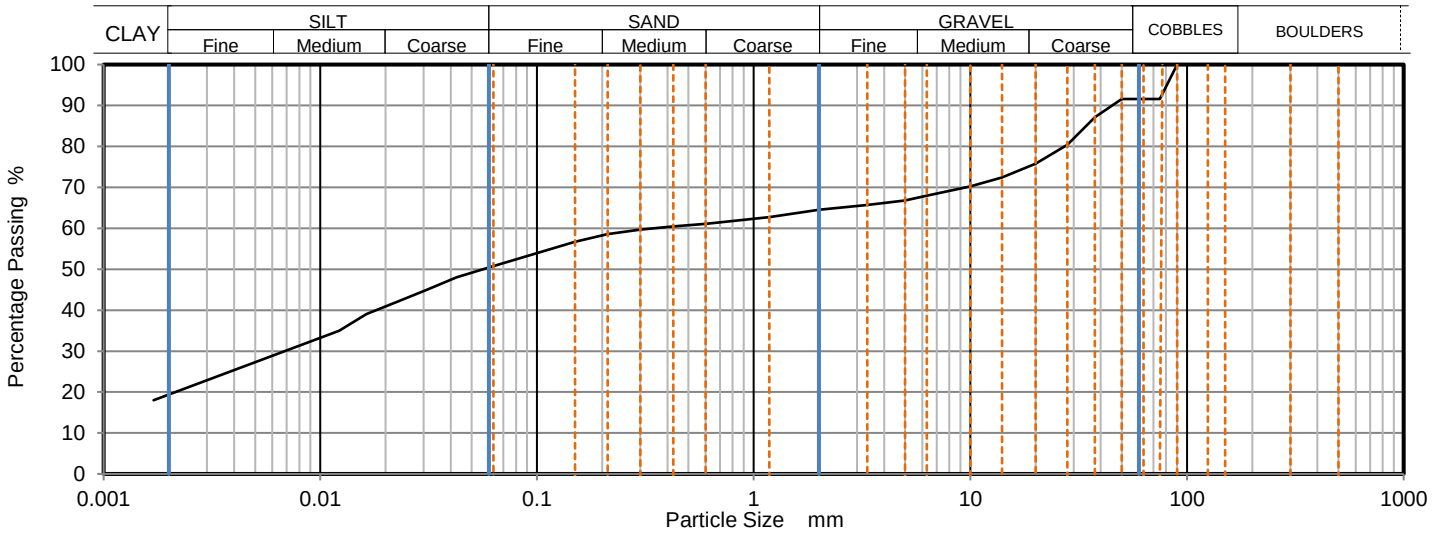
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175833	Depth Top [m]:	1.00
Hole No.:	TP107	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0426	48
300	100	0.0310	45
150	100	0.0225	42
125	100	0.0163	39
90	100	0.0122	35
75	92	0.0017	18
63	92		
50	92		
37.5	87		
28	80		
20	76		
14	72		
10	70		
6.3	68		
5	67		
3.35	66		
2	65		
1.18	63		
0.6	61	Particle density	(assumed)
0.425	61	2.65	Mg/m3
0.3	60		
0.212	59		
0.15	57		
0.063	51		

Sample Proportions	% dry mass
Very coarse	8.00
Gravel	27.00
Sand	14.00
Silt	31.00
Clay	20.00

Grading Analysis		
D100	mm	90
D60	mm	0.346
D30	mm	0.00703
D10	mm	
Uniformity Coefficient		5.5
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

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Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

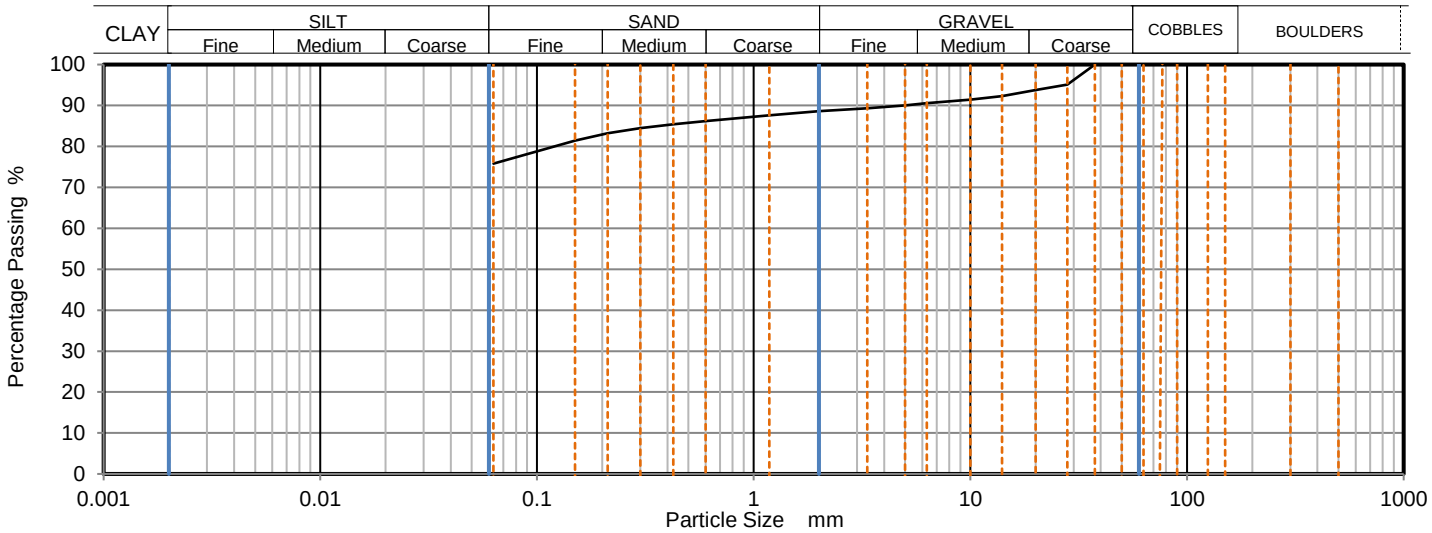
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175834	Depth Top [m]:	1.00
Hole No.:	TP110	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	94		
14	92		
10	91		
6.3	91		
5	90		
3.35	89		
2	89		
1.18	88		
0.6	86		
0.425	85		
0.3	85		
0.212	83		
0.15	81		
0.063	76		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	11.00
Sand	13.00
Fines <0.063 mm	76.00

Grading Analysis		
D100	mm	37.5
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

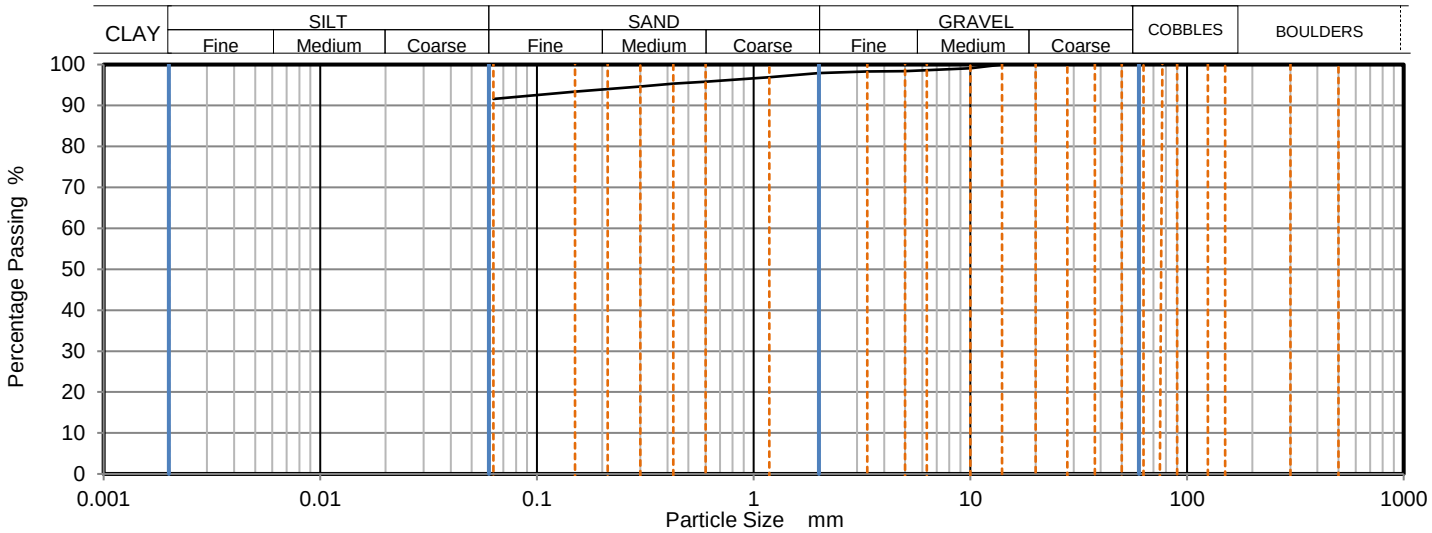
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175835	Depth Top [m]:	1.50
Hole No.:	TP111	Depth Base [m]:	2.00
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	98		
3.35	98		
2	98		
1.18	97		
0.6	96		
0.425	95		
0.3	95		
0.212	94		
0.15	93		
0.063	92		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	2.00
Sand	6.00
Fines <0.063 mm	92.00

Grading Analysis		
D100	mm	14
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

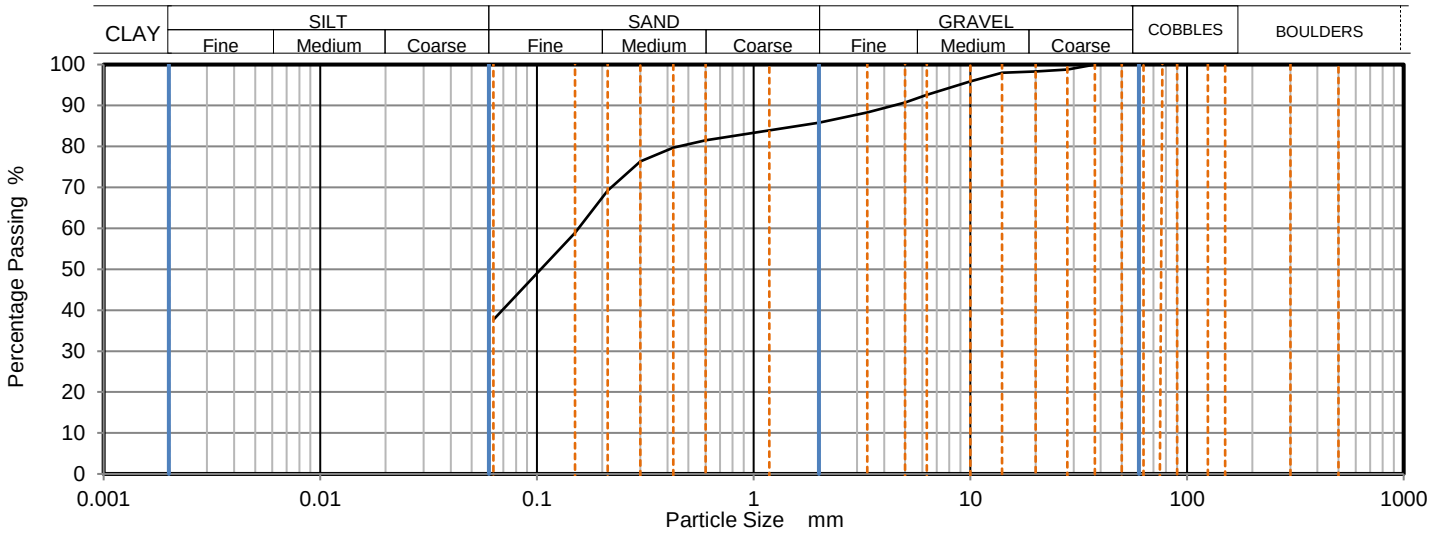
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175836	Depth Top [m]:	1.00
Hole No.:	TP114	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	98		
14	98		
10	96		
6.3	93		
5	91		
3.35	88		
2	86		
1.18	84		
0.6	82		
0.425	80		
0.3	76		
0.212	69		
0.15	59		
0.063	38		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	14.00
Sand	48.00
Fines <0.063 mm	38.00

Grading Analysis		
D100	mm	37.5
D60	mm	0.156
D30	mm	
D10	mm	
Uniformity Coefficient		2.5
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

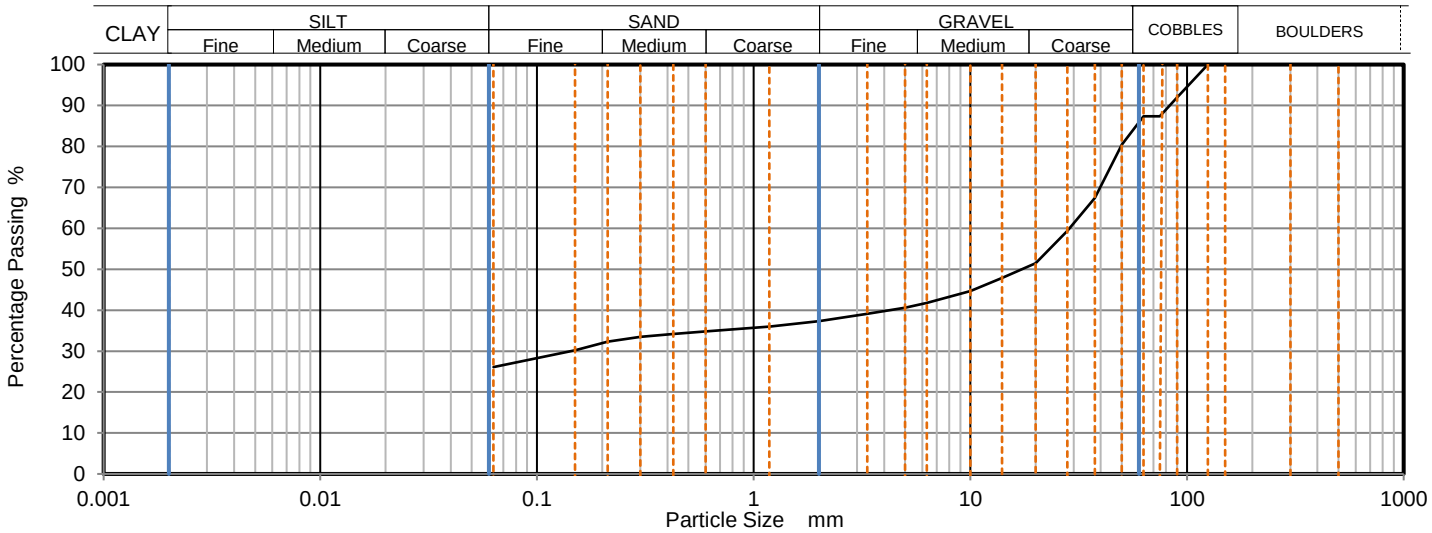
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175837	Depth Top [m]:	0.50
Hole No.:	TP116	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown sandy very clayey GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	92		
75	87		
63	87		
50	80		
37.5	67		
28	59		
20	52		
14	48		
10	45		
6.3	42		
5	41		
3.35	39		
2	37		
1.18	36		
0.6	35		
0.425	34		
0.3	34		
0.212	32		
0.15	30		
0.063	26		

Sample Proportions	% dry mass
Very coarse	13.00
Gravel	50.00
Sand	11.00
Fines <0.063 mm	26.00

Grading Analysis		
D100	mm	125
D60	mm	28.6
D30	mm	0.144
D10	mm	
Uniformity Coefficient		450
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

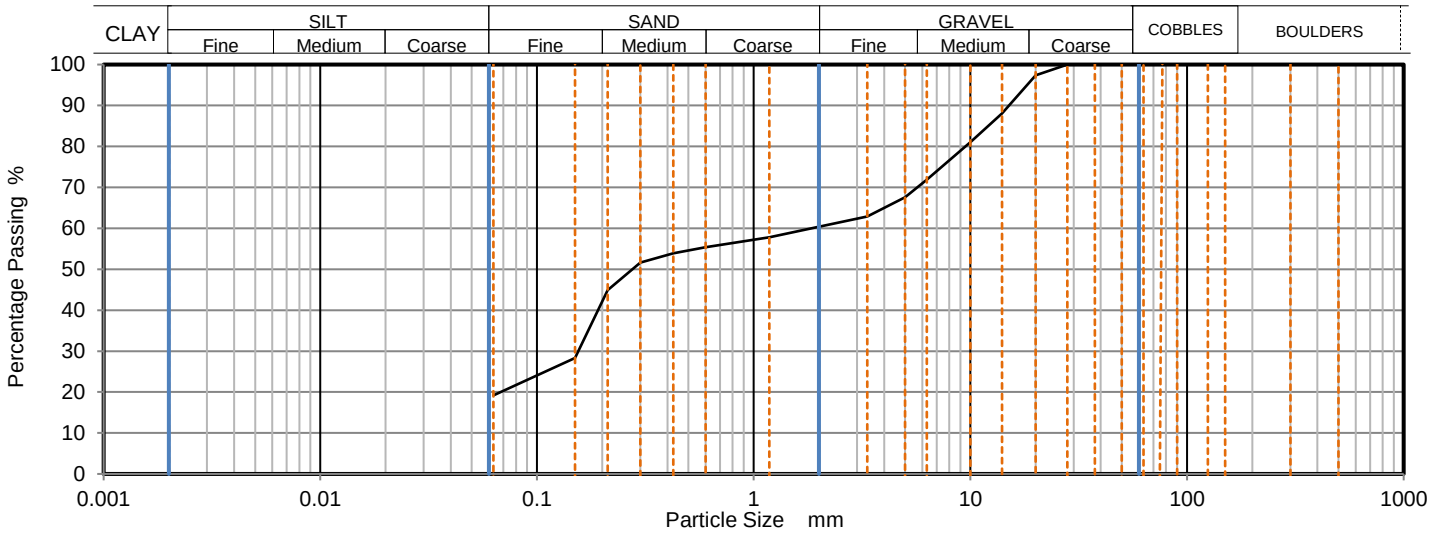
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175839	Depth Top [m]:	1.00
Hole No.:	TP120	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	D
Sample Description:	Yellowish brown very gravelly clayey SAND		
Sample Preparation:	Sample was quartered, oven dried at 108.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	88		
10	81		
6.3	72		
5	68		
3.35	63		
2	60		
1.18	58		
0.6	55		
0.425	54		
0.3	52		
0.212	45		
0.15	28		
0.063	19		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	40.00
Sand	41.00
Fines <0.063 mm	19.00

Grading Analysis		
D100	mm	28
D60	mm	1.85
D30	mm	0.155
D10	mm	
Uniformity Coefficient		29
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

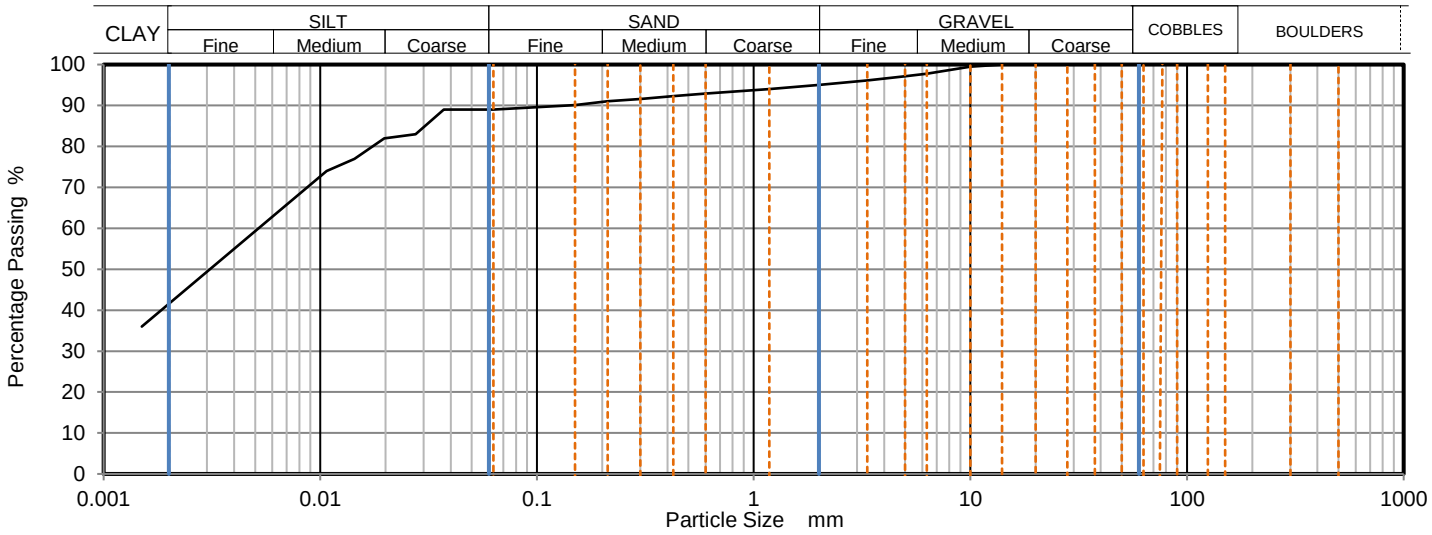
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175841	Depth Top [m]:	1.50
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	2	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0372	89
300	100	0.0275	83
150	100	0.0197	82
125	100	0.0144	77
90	100	0.0107	74
75	100	0.0015	36
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	97		
3.35	96		
2	95		
1.18	94		
0.6	93	Particle density	(assumed)
0.425	92	2.65	Mg/m3
0.3	92		
0.212	91		
0.15	90		
0.063	89		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.00
Sand	6.00
Silt	48.00
Clay	41.00

Grading Analysis		
D100	mm	14
D60	mm	0.0052
D30	mm	
D10	mm	
Uniformity Coefficient		0.083
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

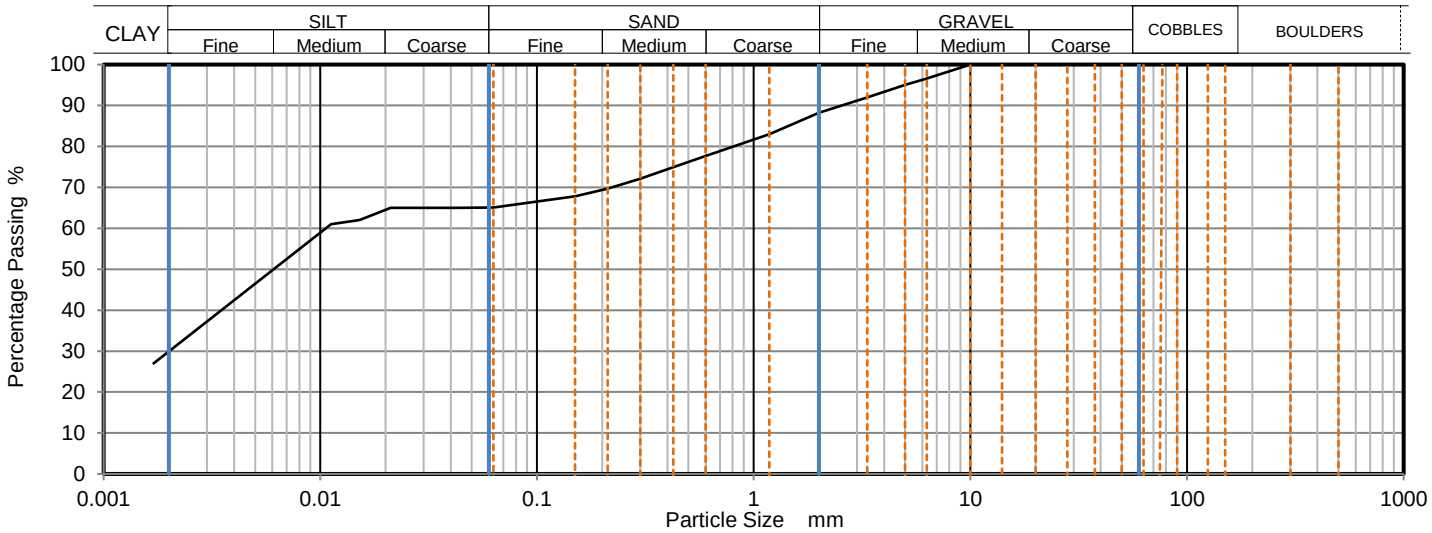
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175844	Depth Top [m]:	2.00
Hole No.:	TT115	Depth Base [m]:	Not Given
Sample Reference:	3	Sample Type:	D
Sample Description:	Brownish grey slightly gravelly slightly sandy silty CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0423	65
300	100	0.0299	65
150	100	0.0211	65
125	100	0.0152	62
90	100	0.0112	61
75	100	0.0017	27
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	97		
5	95		
3.35	92		
2	88		
1.18	83		
0.6	78	Particle density	(assumed)
0.425	75	2.65	Mg/m3
0.3	72		
0.212	70		
0.15	68		
0.063	65		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	12.00
Sand	23.00
Silt	35.00
Clay	30.00

Grading Analysis		
D100	mm	10
D60	mm	0.0106
D30	mm	0.00199
D10	mm	
Uniformity Coefficient		0.17
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving and hydrometer sedimentation

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

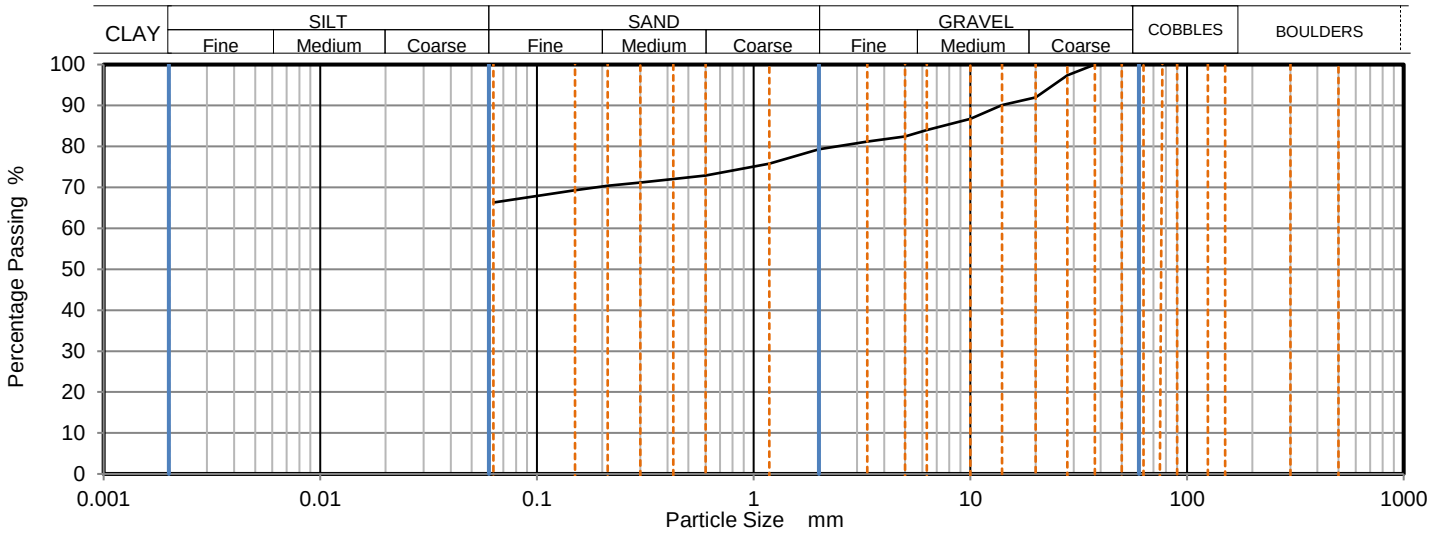
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175845	Depth Top [m]:	1.00
Hole No.:	TT117	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brownish grey slightly gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	92		
14	90		
10	87		
6.3	84		
5	82		
3.35	81		
2	79		
1.18	76		
0.6	73		
0.425	72		
0.3	71		
0.212	70		
0.15	69		
0.063	66		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	21.00
Sand	13.00
Fines <0.063 mm	66.00

Grading Analysis		
D100	mm	37.5
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

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for and on behalf of i2 Analytical Ltd

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

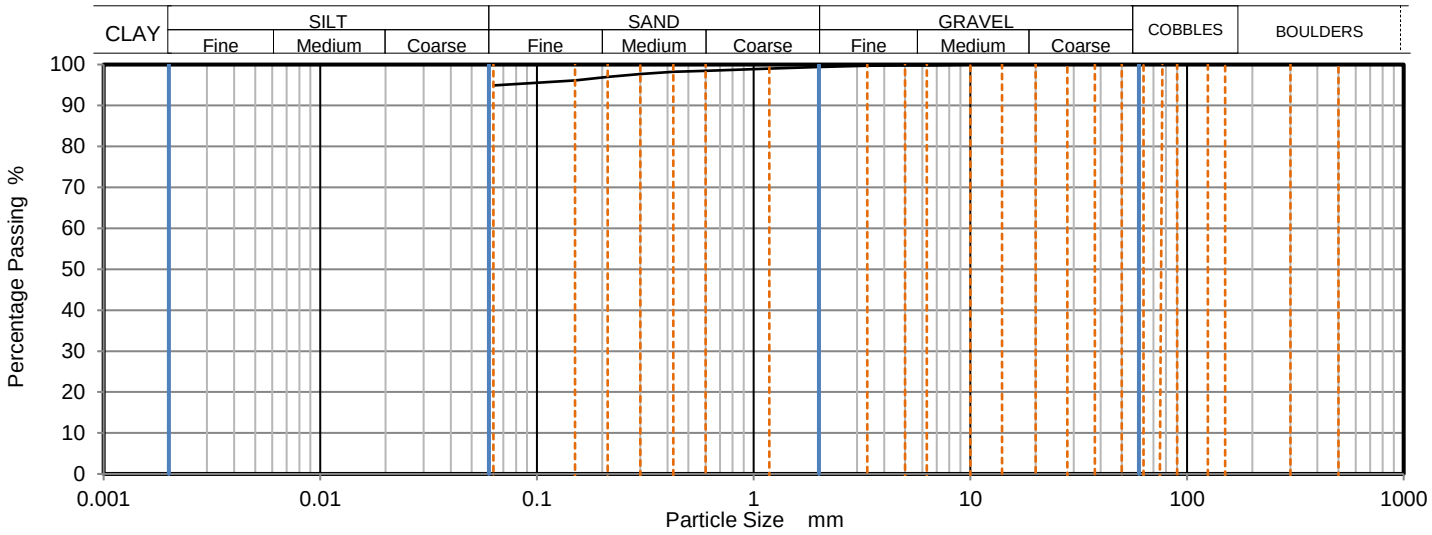
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175850	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 106.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	98		
0.3	98		
0.212	97		
0.15	96		
0.063	95		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.00
Sand	4.00
Fines <0.063 mm	95.00

Grading Analysis		
D100	mm	10
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

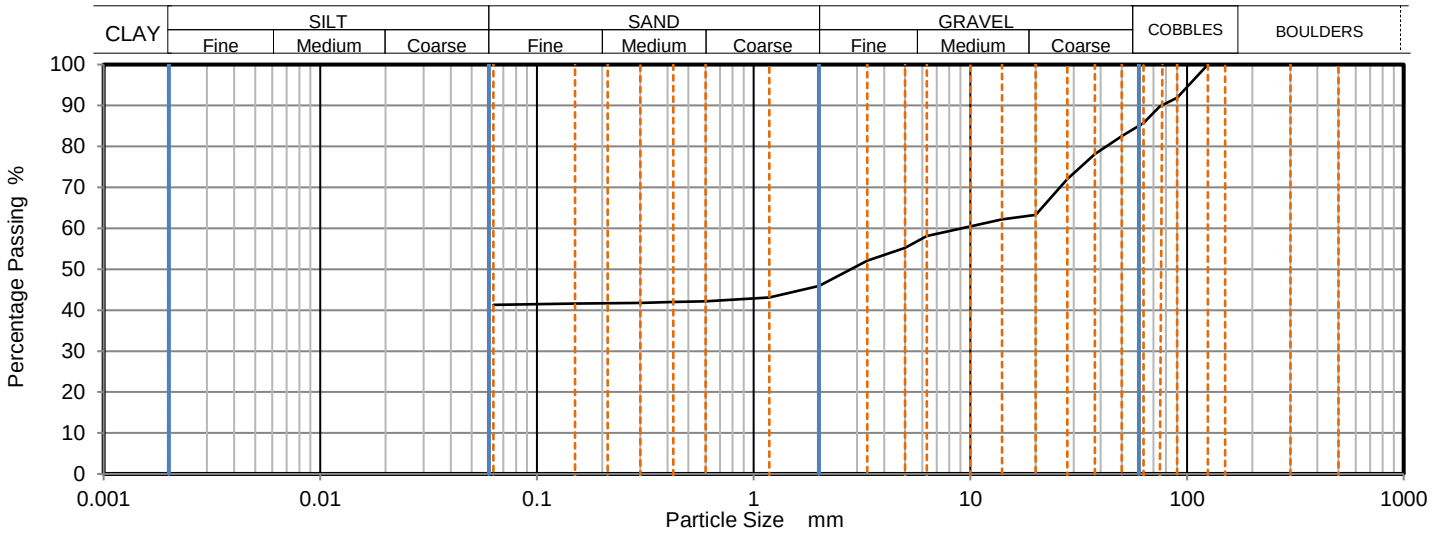
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	25/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175851	Depth Top [m]:	1.00
Hole No.:	TP124	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Dark grey very gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	92		
75	90		
63	86		
50	83		
37.5	78		
28	72		
20	63		
14	62		
10	61		
6.3	58		
5	55		
3.35	52		
2	46		
1.18	43		
0.6	42		
0.425	42		
0.3	42		
0.212	42		
0.15	42		
0.063	41		

Sample Proportions	% dry mass
Very coarse	14.00
Gravel	40.00
Sand	5.00
Fines <0.063 mm	41.00

Grading Analysis		
D100	mm	125
D60	mm	9.12
D30	mm	
D10	mm	
Uniformity Coefficient		140
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024

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TEST CERTIFICATE

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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

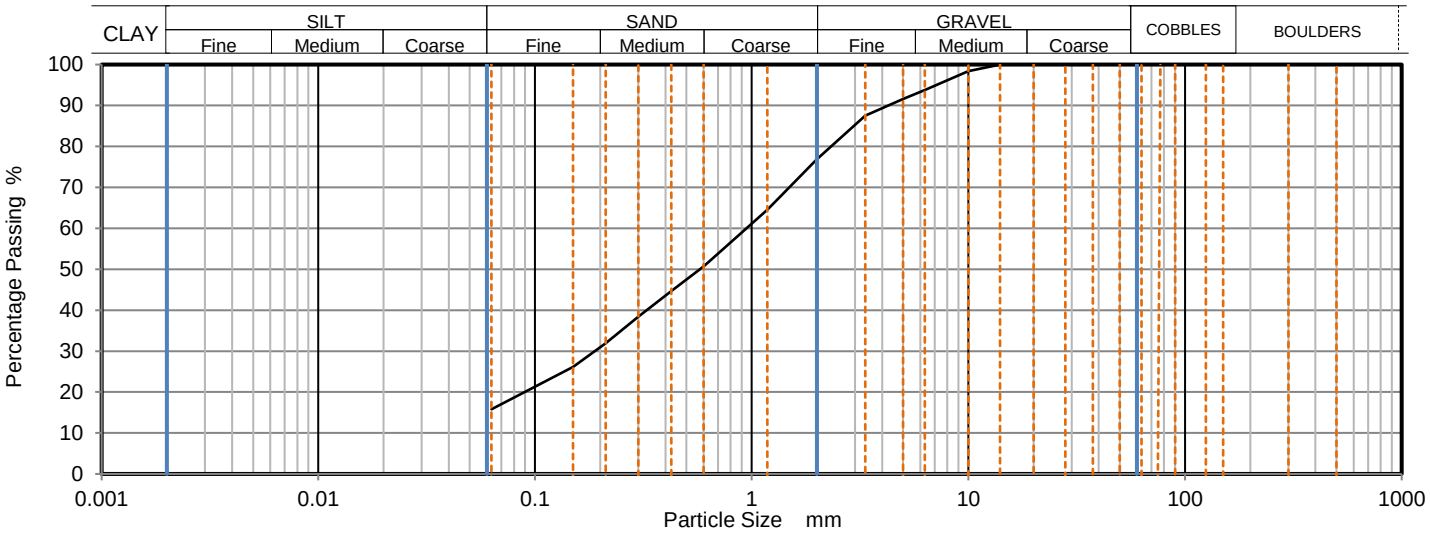
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175852	Depth Top [m]:	2.50
Hole No.:	TT112	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	WEATHERED PENNINE MIDDLE COAL		
Sample Preparation:	Sample was quartered, oven dried at 107.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	98		
6.3	94		
5	92		
3.35	88		
2	77		
1.18	65		
0.6	51		
0.425	45		
0.3	38		
0.212	32		
0.15	26		
0.063	16		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	23.00
Sand	61.00
Fines <0.063 mm	16.00

Grading Analysis		
D100	mm	14
D60	mm	0.945
D30	mm	0.189
D10	mm	
Uniformity Coefficient		15
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024

GF 366.11

4041

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/WATER CONTENT RELATIONSHIP COMPACTION METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-2:2022, cl. 11.3, 11.4

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

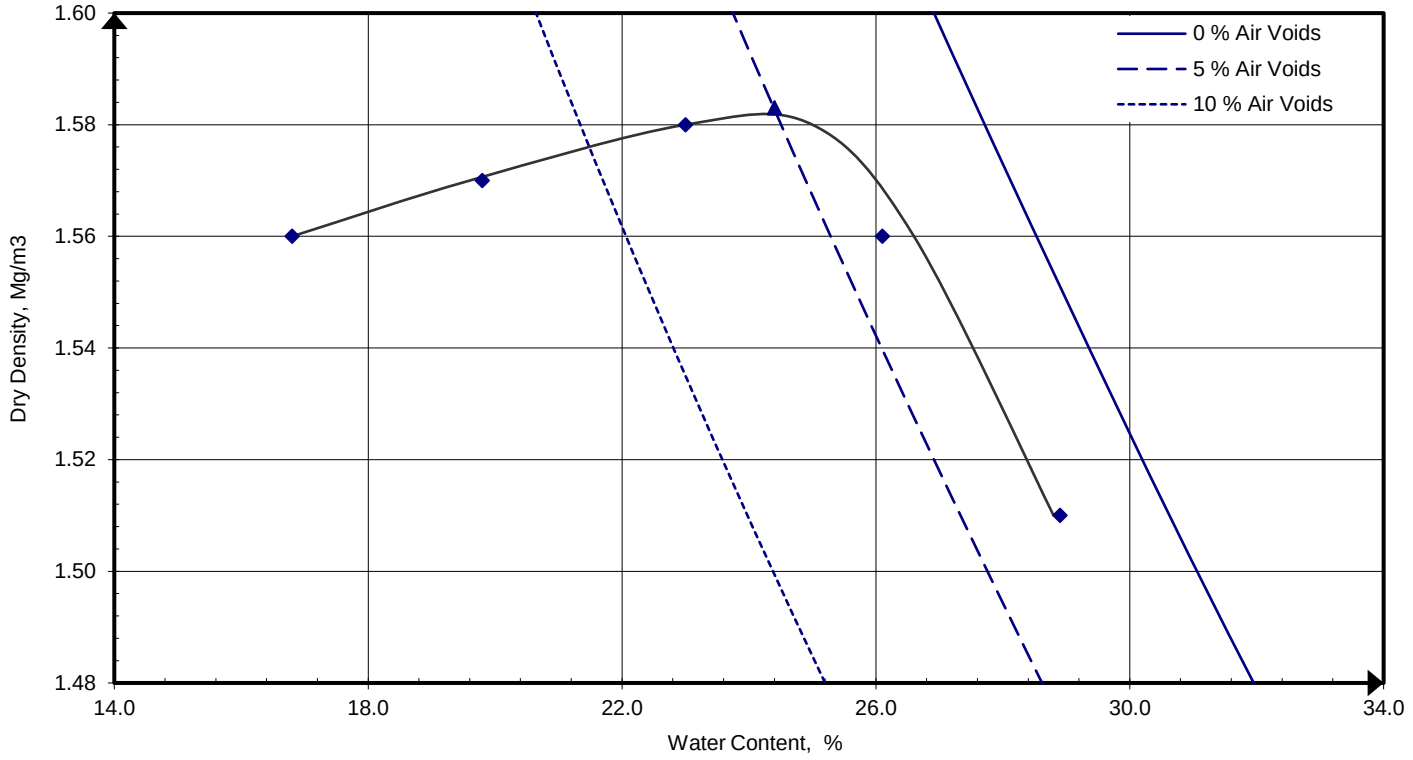
Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	29/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175850	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Water Content	%	17.0	20.0	23.0	26.0	29.0
Dry Density	Mg/m³	1.56	1.57	1.58	1.56	1.51

Grading zone	1
Mould Type	1 Litre
Samples Used	Single sample tested

Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.81
As received Water Content	%	24
Maximum Dry Density	Mg/m³	**1.58**

Optimum Water Content	%	**24**

Remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 599.1

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/WATER CONTENT RELATIONSHIP COMPACTION METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-2:2022, cl. 11.3, 11.4

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

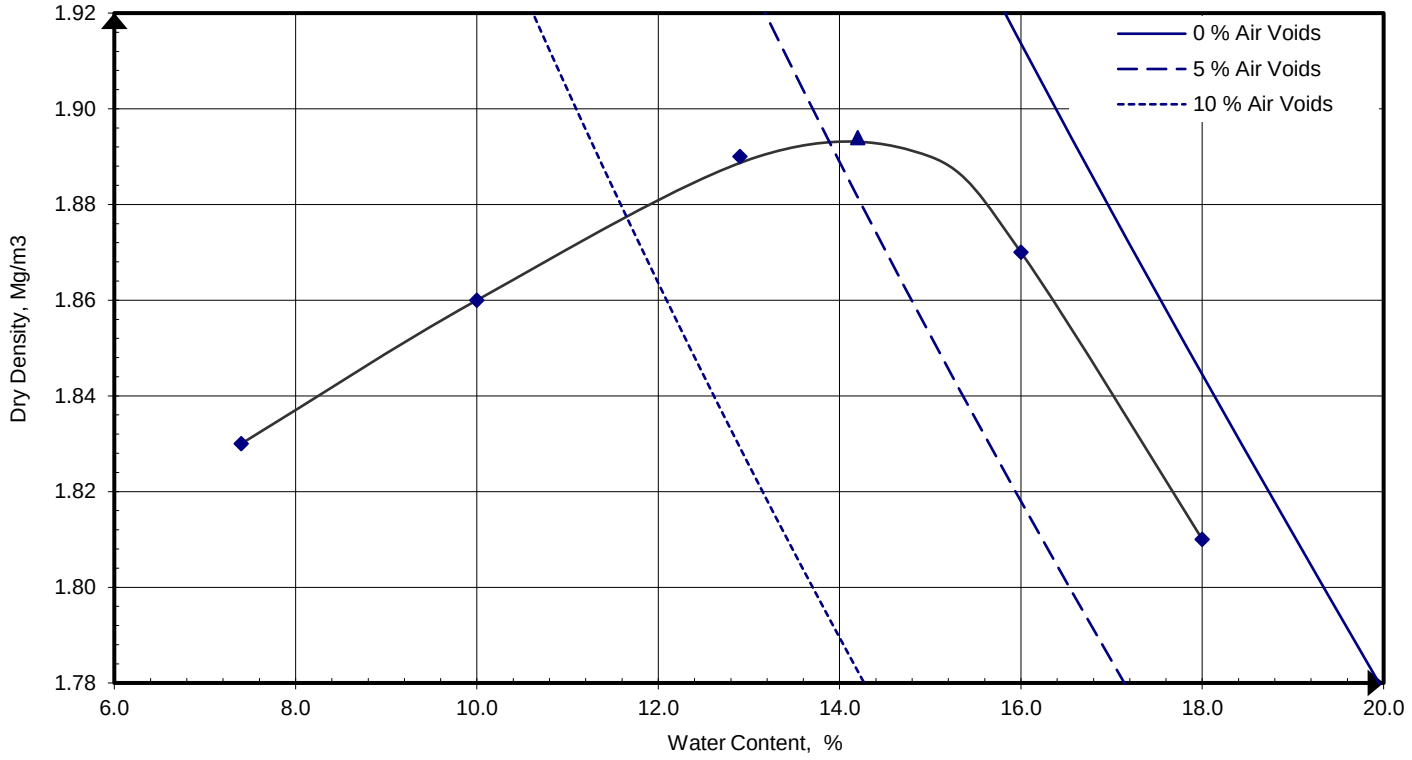
4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	02/05/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175851	Depth Top [m]:	1.00
Hole No.:	TP124	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Dark grey very gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Water Content	%	7.40	10.0	13.0	16.0	18.0
Dry Density	Mg/m³	1.83	1.86	1.89	1.87	1.81

Grading zone	X
Mould Type	CBR
Samples Used	Single sample tested

Material Retained on 37.5 mm Sieve	%	22
Material Retained on 20.0 mm Sieve	%	37
Particle Density - Measured using gas jar	Mg/m³	2.76
As received Water Content	%	15
Maximum Dry Density	Mg/m³	**1.89**

Optimum Water Content	%	**14**

Remarks: Zone X - test carried out with clients consent.

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Date Reported: 06/05/2024

GF 599.1

4041

TEST CERTIFICATE

DETERMINATION OF DRY DENSITY/WATER CONTENT RELATIONSHIP COMPACTION METHOD USING 2.5 KG RAMMER

Tested in Accordance with: BS 1377-2:2022, cl. 11.3, 11.4

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

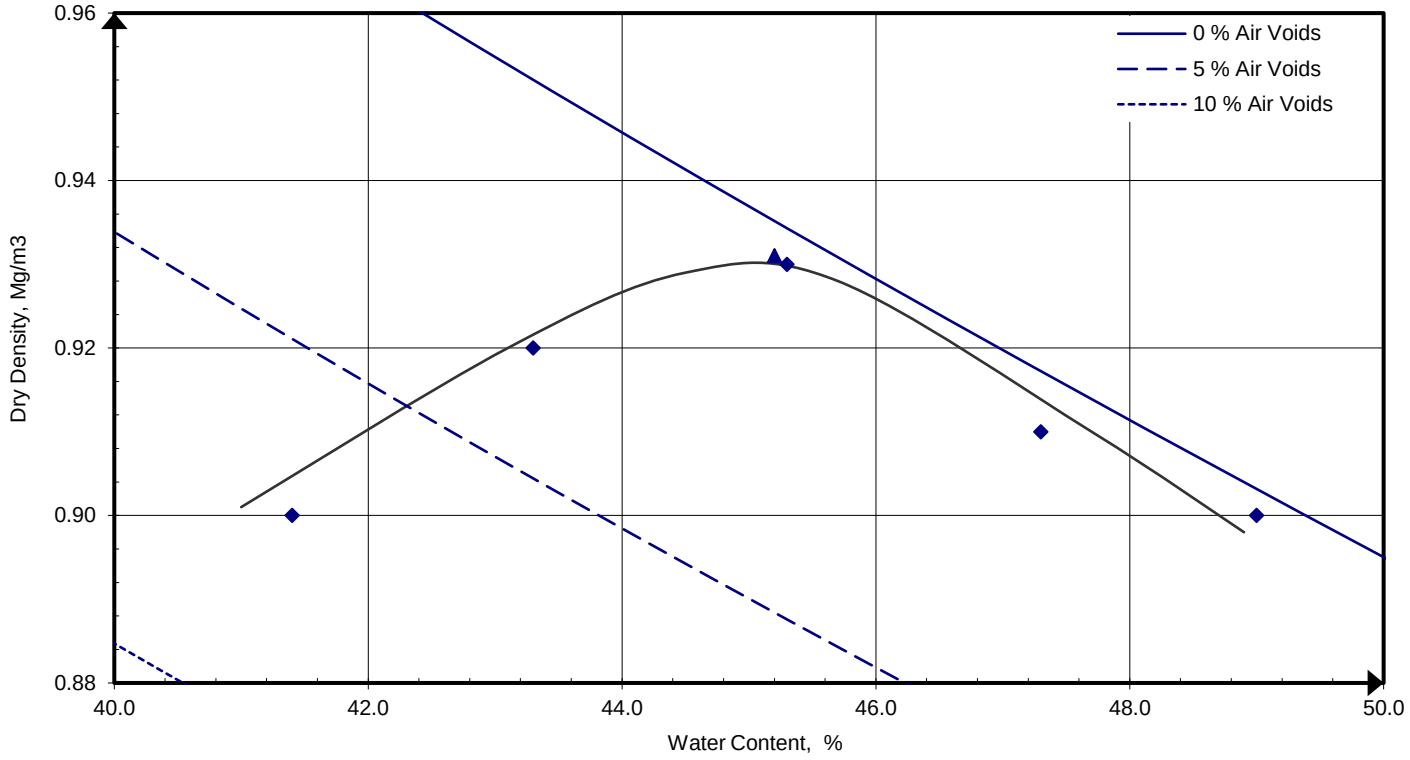
Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175852	Depth Top [m]:	2.50
Hole No.:	TT112	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	WEATHERED PENNINE MIDDLE COAL		
Sample Preparation:	Sample was quartered and broken down by hand. Material used was natural.		



Compaction Point No.		1	2	3	4	5
Water Content	%	41.0	43.0	45.0	47.0	49.0
Dry Density	Mg/m³	0.900	0.920	0.930	0.910	0.900

Grading zone	1
Mould Type	CBR
Samples Used	Single sample tested

Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	1.62
As received Water Content	%	57
Maximum Dry Density	Mg/m³	**0.93**

Optimum Water Content	%	**45**

Remarks:

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Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 599.1

4041

TEST CERTIFICATE

DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)

Tested in Accordance with: BS 1377-2:2022 Cl. 15

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	29/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

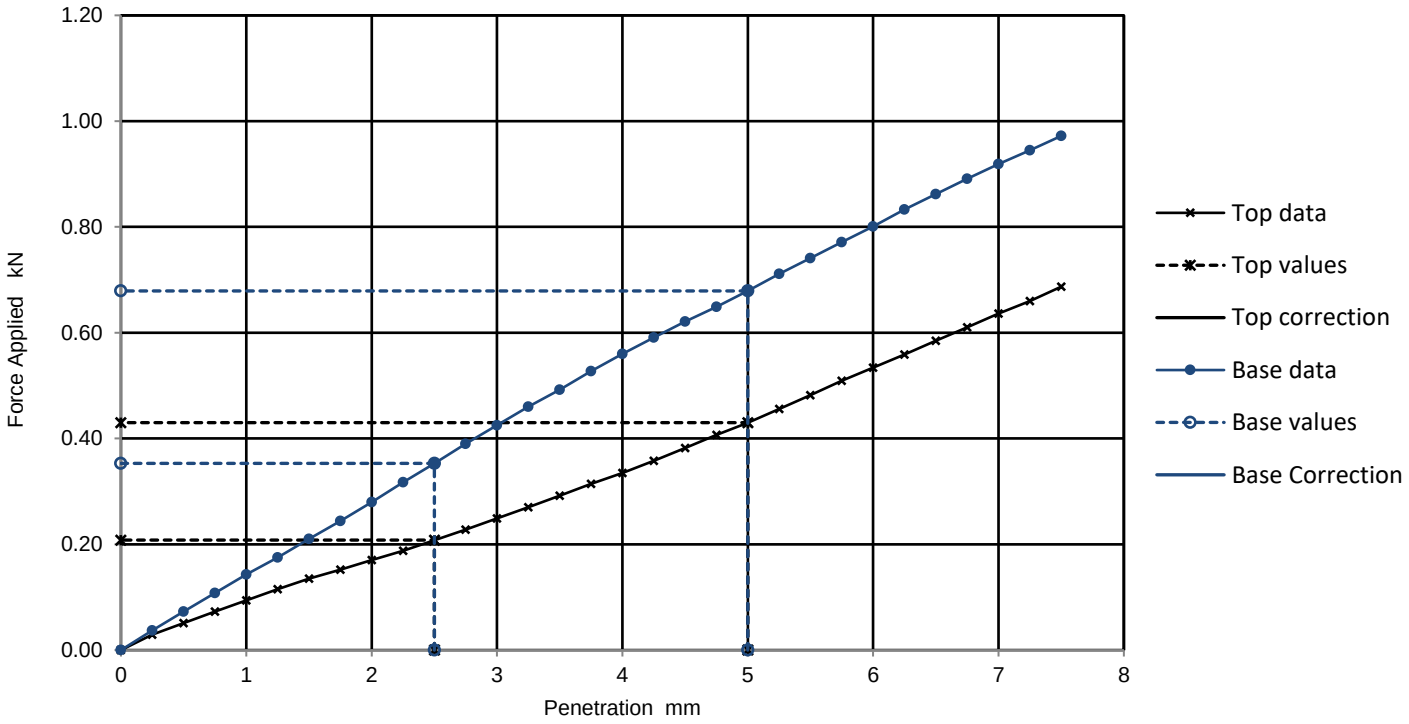
Laboratory Reference:	175847	Depth Top [m]:	1.00
Hole No.:	TT125A	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly sandy CLAY		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	2.05	Mg/m3	Surcharge applied	8 kg
	Dry density	1.71	Mg/m3		4.8 kPa
	Water content	20	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Water Content %
TOP	No	1.6	2.2	2.2		20
BASE	No	2.7	3.4	3.4		19

Remarks:

Test/ Specimen specific remarks:

Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 06/05/2024

GF 593.1

4041

TEST CERTIFICATE

DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)

Tested in Accordance with: BS 1377-2:2022 Cl. 15

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	29/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

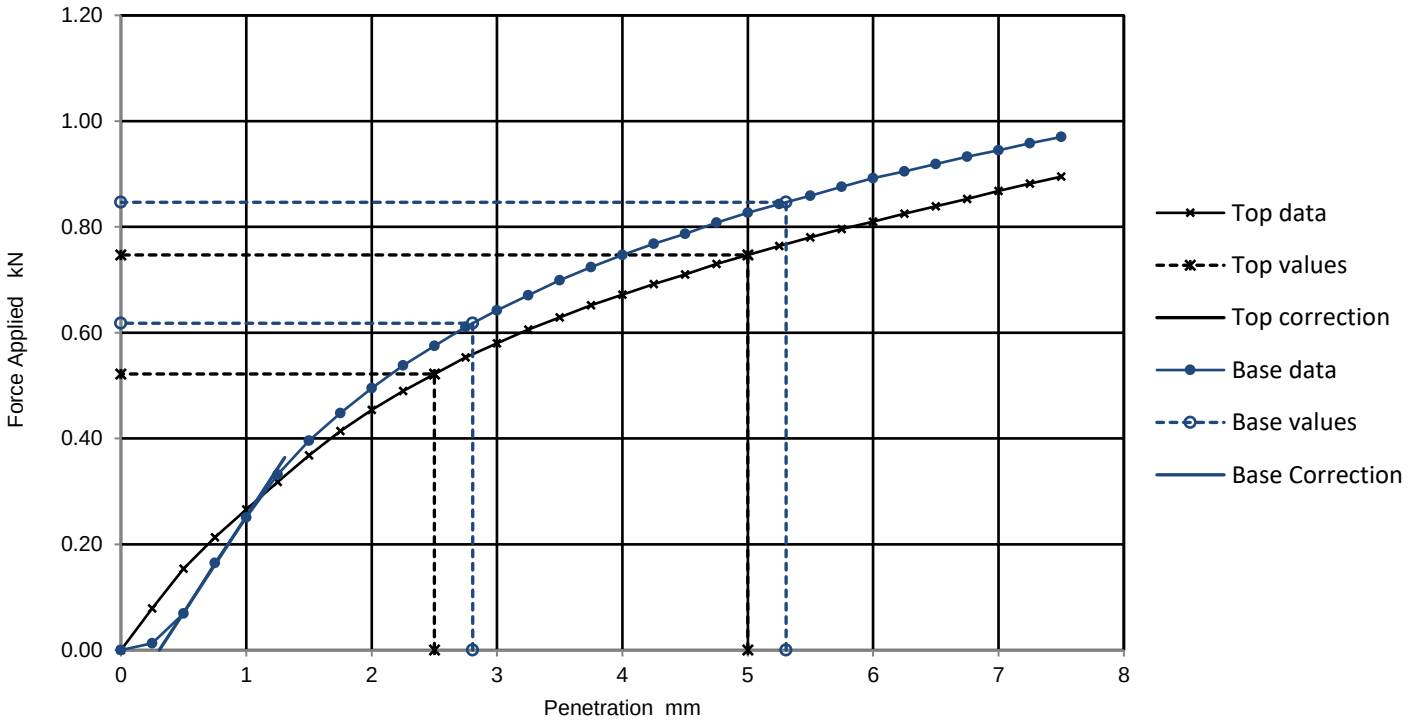
Laboratory Reference:	175850	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Brown slightly sandy CLAY		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.94	Mg/m3	Surcharge applied	8 kg
	Dry density	1.52	Mg/m3		4.9 kPa
	Water content	28	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Water Content %
TOP	No	4	3.7	4	4.3	28
BASE	Yes	4.7	4.2	4.7		29

Remarks:

Test/ Specimen specific remarks:

Signed:

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Senior Reporting Specialist
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Date Reported: 06/05/2024

GF 593.1

TEST CERTIFICATE

DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)

Tested in Accordance with: BS 1377-2:2022 Cl. 15

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	02/05/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

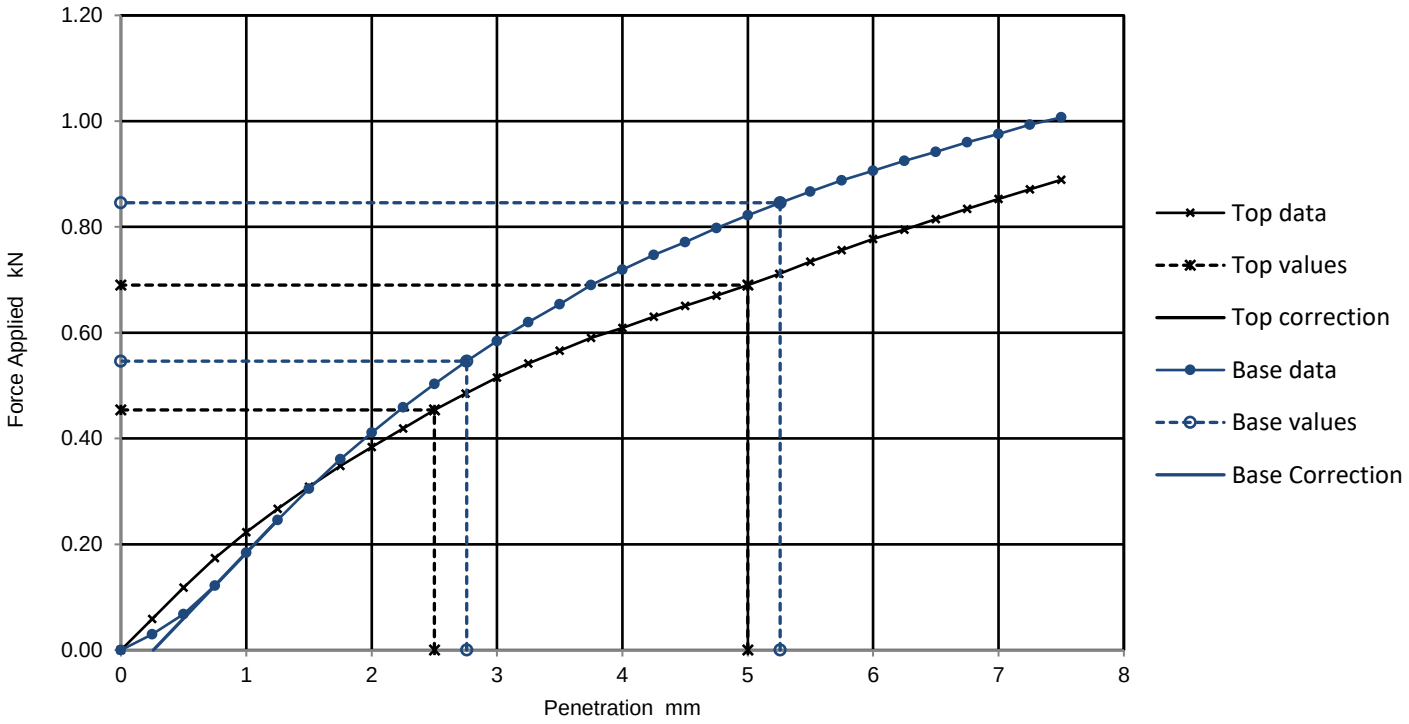
Laboratory Reference:	175851	Depth Top [m]:	1.00
Hole No.:	TP124	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	Dark grey very gravelly slightly sandy CLAY		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	37 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	2.09	Mg/m3	Surcharge applied	8 kg
	Dry density	1.77	Mg/m3		4.8 kPa
	Water content	18	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Water Content %
TOP	No	3.4	3.5	3.5		18
BASE	Yes	4.1	4.2	4.2		18

Remarks:

Test/ Specimen specific remarks: Sample has >25% retained on 20mm sieve. Test carried out as per client request.

Signed: Katarzyna Koziel

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Date Reported: 06/05/2024

GF 593.1

4041

TEST CERTIFICATE

DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)

Tested in Accordance with: BS 1377-2:2022 Cl. 15

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

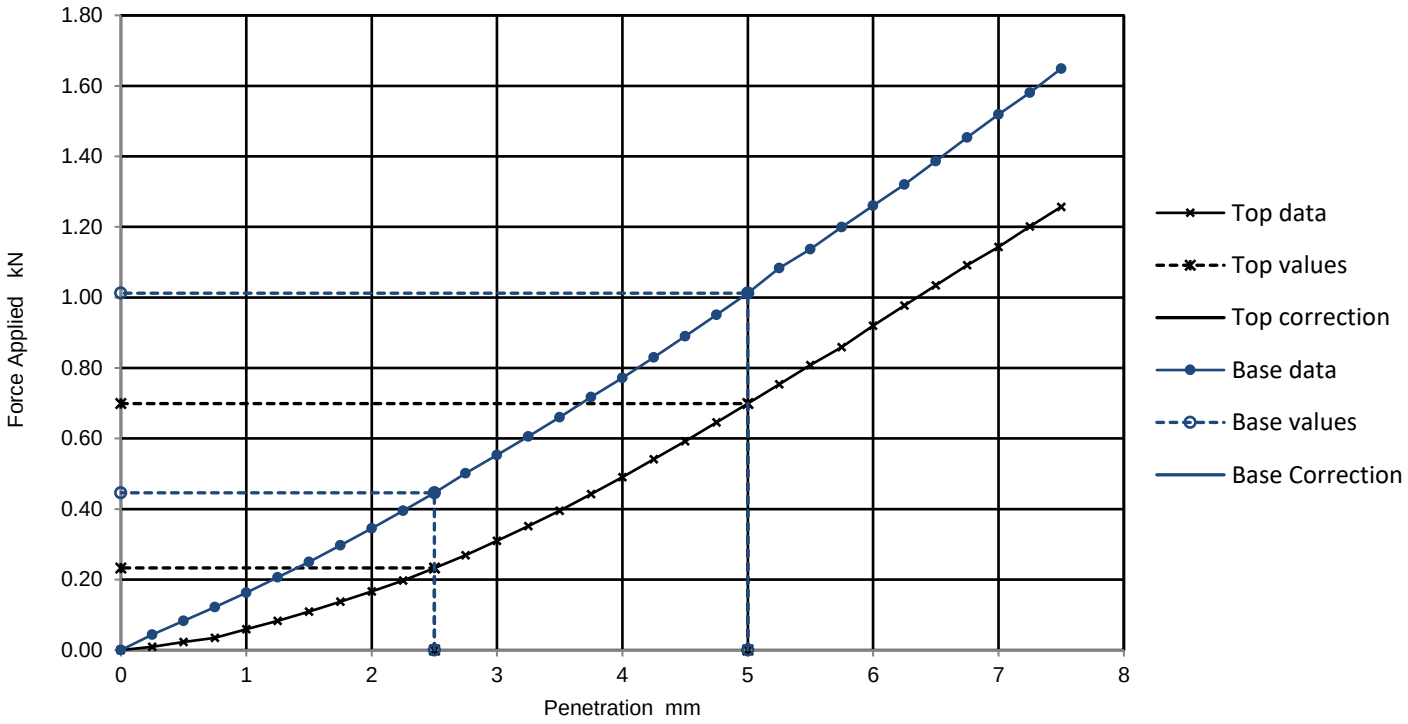
Laboratory Reference:	175852	Depth Top [m]:	2.50
Hole No.:	TT112	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Sample Description:	WEATHERED PENNINE MIDDLE COAL		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	3 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.33	Mg/m3	Surcharge applied	8 kg
	Dry density	0.85	Mg/m3		4.9 kPa
	Water content	56	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Water Content %
TOP	No	1.8	3.5	3.5		56
BASE	No	3.4	5.1	5.1		56

Remarks:

Test/ Specimen specific remarks:

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 593.1

TEST CERTIFICATE

DETERMINATION OF UNDRAINED SHEAR STRENGTH AT EACH COMPACTION POINT USING HAND VANE APPARATUS

Tested in Accordance with: Guideline for Hand Shear Vane Test*

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	29/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175850	Depth Top [m]:	0.75
Hole No.:	TP121	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Soil Description:	Brown slightly sandy CLAY		

Moisture Content	Shear Vane Reading					
	1	2	3	4	Average	Tv
%	kPa	kPa	kPa	kPa	kPa	kPa
17	UTP	UTP	UTP	UTP	UTP	
20	UTP	UTP	UTP	UTP	UTP	
23	UTP	UTP	UTP	UTP	UTP	
26	UTP	UTP	UTP	UTP	UTP	
29	80	76	84	86	82	

Note: UTP - Unable To Penetrate; * - Guideline for Hand Held Shear Vane Test, New Zealand Geotechnical Society INC, August 2001

Remarks: Compacted by: Light Compaction 2.5kg (BS1377:Part 4:1990).

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 275.12

TEST CERTIFICATE

DETERMINATION OF UNDRAINED SHEAR STRENGTH AT EACH COMPACTION POINT USING HAND VANE APPARATUS

Tested in Accordance with: Guideline for Hand Shear Vane Test*

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	02/05/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175851	Depth Top [m]:	1.00
Hole No.:	TP124	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Soil Description:	Dark grey very gravelly slightly sandy CLAY		

Moisture Content	Shear Vane Reading					
	1	2	3	4	Average	Tv
%	kPa	kPa	kPa	kPa	kPa	kPa
7.4	UTP	UTP	UTP	UTP	UTP	
10	UTP	UTP	UTP	UTP	UTP	
13	UTP	UTP	UTP	UTP	UTP	
16	UTP	UTP	UTP	UTP	UTP	
18	102	70	70	80	81	

Note: UTP - Unable To Penetrate; * - Guideline for Hand Held Shear Vane Test, New Zealand Geotechnical Society INC, August 2001

Remarks: Compacted by: Light Compaction 2.5kg (BS1377:Part 4:1990).

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Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 275.12

TEST CERTIFICATE

DETERMINATION OF UNDRAINED SHEAR STRENGTH AT EACH COMPACTION POINT USING HAND VANE APPARATUS

Tested in Accordance with: Guideline for Hand Shear Vane Test*

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	23451
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-015167-1
		Date Sampled:	Not Given
		Date Received:	05/04/2024
Contact:	Alexander Lee	Date Tested:	26/04/2024
Site Address:	Goldthorpe	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	175852	Depth Top [m]:	2.50
Hole No.:	TT112	Depth Base [m]:	Not Given
Sample Reference:	1	Sample Type:	B
Soil Description:	WEATHERED PENNINE MIDDLE COAL		

Moisture Content	Shear Vane Reading					
	1	2	3	4	Average	Tv
%	kPa	kPa	kPa	kPa	kPa	kPa
41	UTP	UTP	UTP	UTP	UTP	
43	UTP	UTP	UTP	UTP	UTP	
45	UTP	UTP	UTP	UTP	UTP	
47	UTP	UTP	UTP	UTP	UTP	
49	UTP	UTP	UTP	UTP	UTP	

Note: UTP - Unable To Penetrate; * - Guideline for Hand Held Shear Vane Test, New Zealand Geotechnical Society INC, August 2001

Remarks: Compacted by: Light Compaction 2.5kg (BS1377:Part 4:1990).

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Signed: Katarzyna Koziel

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 06/05/2024

GF 275.12

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Analytical Report Number : 24-015170

Project / Site name:	Goldthorpe	**Samples received on:**	05/04/2024
Your job number:	23451	**Samples instructed on/ Analysis started on:**	18/04/2024
Your order number:	PO33547	**Analysis completed by:**	26/04/2024
Report Issue Number:	1	**Report issued on:**	26/04/2024
Samples Analysed:	16 soil samples		

Signed:

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-015170
Project / Site name: Goldthorpe
Your Order No: PO33547

Lab Sample Number				175853	175854	175855	175856	175857
Sample Reference				CP101	CP101	CP101	CP102	CP102
Sample Number				2	7	10	2	6
Depth (m)				0.50-1.00	4.00-4.50	6.50-7.00	0.50	2.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.2	15	14	14	11
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.5
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.7	7	7.7	6.6	5.5
Total Sulphate as SO_4	mg/kg	50	MCERTS	240	790	380	260	380
Total Sulphate as SO_4	%	0.005	MCERTS	0.024	0.079	0.038	0.026	0.038
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	80	460	340	21	87
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0401	0.231	0.172	0.0106	0.0435
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	40.1	231	172	10.6	43.5
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	1.2	13	10	3	2.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	0.6	6.3	5	1.5	1.4
Total Sulphur	mg/kg	50	MCERTS	440	1000	1500	160	920
Total Sulphur	%	0.005	MCERTS	0.044	0.104	0.151	0.016	0.092
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	1.1	1.4	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	0.07	0.1	< 0.05	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	1.1	1	0.7	0.7	0.4
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	8.1	< 2.0	< 2.0	19	4.5
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	9.3	< 5.0
Heavy Metals / Metalloids								
Magnesium (leachate equivalent)	mg/l	2.5	NONE	9.8	36	22	3.9	5.4
Magnesium (water soluble)	mg/kg	5	NONE	20	72	44	7.9	11

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-015170
Project / Site name: Goldthorpe
Your Order No: PO33547

Lab Sample Number				175858	175859	175860	175861	175862
Sample Reference				CP102	CP103	CP103	CP103	TP110
Sample Number				8	1	6	7	1
Depth (m)				3.00-3.45	1.00	3.00	3.50	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	10	15	11	11	17
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5	0.5	0.3
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.3	6.9	4.3	4.3	7.9
Total Sulphate as SO_4	mg/kg	50	MCERTS	210	440	630	470	170
Total Sulphate as SO_4	%	0.005	MCERTS	0.021	0.044	0.063	0.047	0.017
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	50	130	250	140	53
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0248	0.0633	0.123	0.0709	0.0267
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	24.8	63.3	123	70.9	26.7
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	4.5	3	4	3	3
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.2	1.5	2	1.5	1.5
Total Sulphur	mg/kg	50	MCERTS	120	190	1300	980	61
Total Sulphur	%	0.005	MCERTS	0.012	0.019	0.131	0.098	0.006
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5	6.3	4.2	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	0.44	0.29	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	1.3	2	2	1.7	0.4
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	3.5	7.6	< 2.0	< 2.0	3.4
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (leachate equivalent)	mg/l	2.5	NONE	6	19	11	3.9	4.6
Magnesium (water soluble)	mg/kg	5	NONE	12	38	23	7.9	9.2

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Analytical Report Number: 24-015170
Project / Site name: Goldthorpe
Your Order No: PO33547

Lab Sample Number				175863	175864	175865	175866	175867
Sample Reference				TP118	TP119	TT115	TT117	TT122B
Sample Number				2	1	1	1	1
Depth (m)				1.50	1.00	1.50	0.50	1.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	10	14	12	16	15
Total mass of sample received	kg	0.1	NONE	0.6	0.5	0.5	0.5	0.5
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	8.1	5.9	6.8	7.7	8
Total Sulphate as SO_4	mg/kg	50	MCERTS	200	730	640	340	460
Total Sulphate as SO_4	%	0.005	MCERTS	0.02	0.073	0.064	0.034	0.046
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	79	200	95	73
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0169	0.0396	0.101	0.0477	0.0363
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.9	39.6	101	47.7	36.3
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	1.7	4.4	13	6.7	1.9
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	0.9	2.2	6.3	3.3	0.9
Total Sulphur	mg/kg	50	MCERTS	71	210	270	130	190
Total Sulphur	%	0.005	MCERTS	0.007	0.021	0.027	0.013	0.019
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	< 0.1	0.3	1.2	1	1
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	10	7	< 2.0	13	7.2
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	5	< 5.0	< 5.0	6.3	< 5.0
Heavy Metals / Metalloids								
Magnesium (leachate equivalent)	mg/l	2.5	NONE	3	8.6	15	13	7.8
Magnesium (water soluble)	mg/kg	5	NONE	5.9	17	30	25	16

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Analytical Report Number: 24-015170
Project / Site name: Goldthorpe
Your Order No: PO33547

Lab Sample Number				175868
Sample Reference				TT127
Sample Number				1
Depth (m)				0.50
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	18
Total mass of sample received	kg	0.1	NONE	0.2
General Inorganics				
pH (L099)	pH Units	N/A	MCERTS	7.8
Total Sulphate as SO_4	mg/kg	50	MCERTS	640
Total Sulphate as SO_4	%	0.005	MCERTS	0.064
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.101
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	101
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	2.3
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.1
Total Sulphur	mg/kg	50	MCERTS	250
Total Sulphur	%	0.005	MCERTS	0.025
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	0.6
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	2.8
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0
Heavy Metals / Metalloids				
Magnesium (leachate equivalent)	mg/l	2.5	NONE	16
Magnesium (water soluble)	mg/kg	5	NONE	32

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Analytical Report Number : 24-015170
Project / Site name: Goldthorpe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
175853	CP101	2	0.50-1.00	Brown clay and sand with gravel
175854	CP101	7	4.00-4.50	Grey clay and sand
175855	CP101	10	6.50-7.00	Grey clay and sand with gravel
175856	CP102	2	0.5	Brown loam and clay with gravel and vegetation
175857	CP102	6	2	Brown sandy clay with gravel
175858	CP102	8	3.00-3.45	Brown clay and loam
175859	CP103	1	1	Brown clay and sand with gravel
175860	CP103	6	3	Grey clay and sand
175861	CP103	7	3.5	Light grey clay and sand
175862	TP110	1	1	Brown clay and sand with gravel
175863	TP118	2	1.5	Brown clay and sand with gravel
175864	TP119	1	1	Brown clay and sand with stones
175865	TT115	1	1.5	Brown loam and clay with gravel and vegetation
175866	TT117	1	0.5	Brown clay and loam
175867	TT122B	1	1	Brown loam and clay with gravel and vegetation
175868	TT127	1	0.5	Brown clay and sand

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Analytical Report Number : 24-015170
Project / Site name: Goldthorpe

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 24-015170
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CP101	10	S	175855	a	Ammonium as NH4 in soil	L082B	a
CP101	10	S	175855	a	Chloride, water soluble, in soil	L082B	a
CP101	10	S	175855	a	Magnesium, water soluble, in soil	L038B	a
CP101	10	S	175855	a	Nitrate, water soluble, in soil	L078	a
CP101	10	S	175855	a	Organic matter (Automated) in soil	L009B	a
CP101	10	S	175855	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP101	10	S	175855	a	Total Sulphur in soil	L038B	a
CP101	10	S	175855	a	Total sulphate (as SO4 in soil)	L038B	a
CP101	10	S	175855	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP101	10	S	175855	a	pH in soil (automated)	L099	a
CP101	2	S	175853	a	Ammonium as NH4 in soil	L082B	a
CP101	2	S	175853	a	Chloride, water soluble, in soil	L082B	a
CP101	2	S	175853	a	Magnesium, water soluble, in soil	L038B	a
CP101	2	S	175853	a	Nitrate, water soluble, in soil	L078	a
CP101	2	S	175853	a	Organic matter (Automated) in soil	L009B	a
CP101	2	S	175853	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP101	2	S	175853	a	Total Sulphur in soil	L038B	a
CP101	2	S	175853	a	Total sulphate (as SO4 in soil)	L038B	a
CP101	2	S	175853	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP101	2	S	175853	a	pH in soil (automated)	L099	a
CP101	7	S	175854	a	Ammonium as NH4 in soil	L082B	a
CP101	7	S	175854	a	Chloride, water soluble, in soil	L082B	a
CP101	7	S	175854	a	Magnesium, water soluble, in soil	L038B	a
CP101	7	S	175854	a	Nitrate, water soluble, in soil	L078	a
CP101	7	S	175854	a	Organic matter (Automated) in soil	L009B	a
CP101	7	S	175854	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP101	7	S	175854	a	Total Sulphur in soil	L038B	a
CP101	7	S	175854	a	Total sulphate (as SO4 in soil)	L038B	a
CP101	7	S	175854	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP101	7	S	175854	a	pH in soil (automated)	L099	a
CP102	2	S	175856	a	Ammonium as NH4 in soil	L082B	a
CP102	2	S	175856	a	Chloride, water soluble, in soil	L082B	a
CP102	2	S	175856	a	Magnesium, water soluble, in soil	L038B	a
CP102	2	S	175856	a	Nitrate, water soluble, in soil	L078	a
CP102	2	S	175856	a	Organic matter (Automated) in soil	L009B	a
CP102	2	S	175856	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP102	2	S	175856	a	Total Sulphur in soil	L038B	a
CP102	2	S	175856	a	Total sulphate (as SO4 in soil)	L038B	a
CP102	2	S	175856	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP102	2	S	175856	a	pH in soil (automated)	L099	a
CP102	6	S	175857	a	Ammonium as NH4 in soil	L082B	a
CP102	6	S	175857	a	Chloride, water soluble, in soil	L082B	a
CP102	6	S	175857	a	Magnesium, water soluble, in soil	L038B	a
CP102	6	S	175857	a	Nitrate, water soluble, in soil	L078	a
CP102	6	S	175857	a	Organic matter (Automated) in soil	L009B	a
CP102	6	S	175857	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP102	6	S	175857	a	Total Sulphur in soil	L038B	a
CP102	6	S	175857	a	Total sulphate (as SO4 in soil)	L038B	a
CP102	6	S	175857	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP102	6	S	175857	a	pH in soil (automated)	L099	a
CP102	8	S	175858	a	Ammonium as NH4 in soil	L082B	a
CP102	8	S	175858	a	Chloride, water soluble, in soil	L082B	a
CP102	8	S	175858	a	Magnesium, water soluble, in soil	L038B	a
CP102	8	S	175858	a	Nitrate, water soluble, in soil	L078	a
CP102	8	S	175858	a	Organic matter (Automated) in soil	L009B	a
CP102	8	S	175858	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP102	8	S	175858	a	Total Sulphur in soil	L038B	a
CP102	8	S	175858	a	Total sulphate (as SO4 in soil)	L038B	a
CP102	8	S	175858	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP102	8	S	175858	a	pH in soil (automated)	L099	a
CP103	1	S	175859	a	Ammonium as NH4 in soil	L082B	a

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Analytical Report Number : 24-015170
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CP103	1	S	175859	a	Chloride, water soluble, in soil	L082B	a
CP103	1	S	175859	a	Magnesium, water soluble, in soil	L038B	a
CP103	1	S	175859	a	Nitrate, water soluble, in soil	L078	a
CP103	1	S	175859	a	Organic matter (Automated) in soil	L009B	a
CP103	1	S	175859	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP103	1	S	175859	a	Total Sulphur in soil	L038B	a
CP103	1	S	175859	a	Total sulphate (as SO4 in soil)	L038B	a
CP103	1	S	175859	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP103	1	S	175859	a	pH in soil (automated)	L099	a
CP103	6	S	175860	a	Ammonium as NH4 in soil	L082B	a
CP103	6	S	175860	a	Chloride, water soluble, in soil	L082B	a
CP103	6	S	175860	a	Magnesium, water soluble, in soil	L038B	a
CP103	6	S	175860	a	Nitrate, water soluble, in soil	L078	a
CP103	6	S	175860	a	Organic matter (Automated) in soil	L009B	a
CP103	6	S	175860	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP103	6	S	175860	a	Total Sulphur in soil	L038B	a
CP103	6	S	175860	a	Total sulphate (as SO4 in soil)	L038B	a
CP103	6	S	175860	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP103	6	S	175860	a	pH in soil (automated)	L099	a
CP103	7	S	175861	a	Ammonium as NH4 in soil	L082B	a
CP103	7	S	175861	a	Chloride, water soluble, in soil	L082B	a
CP103	7	S	175861	a	Magnesium, water soluble, in soil	L038B	a
CP103	7	S	175861	a	Nitrate, water soluble, in soil	L078	a
CP103	7	S	175861	a	Organic matter (Automated) in soil	L009B	a
CP103	7	S	175861	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
CP103	7	S	175861	a	Total Sulphur in soil	L038B	a
CP103	7	S	175861	a	Total sulphate (as SO4 in soil)	L038B	a
CP103	7	S	175861	a	Water Soluble Nitrate (leachate equivalent)	L078	a
CP103	7	S	175861	a	pH in soil (automated)	L099	a
TP110	1	S	175862	a	Ammonium as NH4 in soil	L082B	a
TP110	1	S	175862	a	Chloride, water soluble, in soil	L082B	a
TP110	1	S	175862	a	Magnesium, water soluble, in soil	L038B	a
TP110	1	S	175862	a	Nitrate, water soluble, in soil	L078	a
TP110	1	S	175862	a	Organic matter (Automated) in soil	L009B	a
TP110	1	S	175862	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TP110	1	S	175862	a	Total Sulphur in soil	L038B	a
TP110	1	S	175862	a	Total sulphate (as SO4 in soil)	L038B	a
TP110	1	S	175862	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TP110	1	S	175862	a	pH in soil (automated)	L099	a
TP118	2	S	175863	a	Ammonium as NH4 in soil	L082B	a
TP118	2	S	175863	a	Chloride, water soluble, in soil	L082B	a
TP118	2	S	175863	a	Magnesium, water soluble, in soil	L038B	a
TP118	2	S	175863	a	Nitrate, water soluble, in soil	L078	a
TP118	2	S	175863	a	Organic matter (Automated) in soil	L009B	a
TP118	2	S	175863	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TP118	2	S	175863	a	Total Sulphur in soil	L038B	a
TP118	2	S	175863	a	Total sulphate (as SO4 in soil)	L038B	a
TP118	2	S	175863	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TP118	2	S	175863	a	pH in soil (automated)	L099	a
TP119	1	S	175864	a	Ammonium as NH4 in soil	L082B	a
TP119	1	S	175864	a	Chloride, water soluble, in soil	L082B	a
TP119	1	S	175864	a	Magnesium, water soluble, in soil	L038B	a
TP119	1	S	175864	a	Nitrate, water soluble, in soil	L078	a
TP119	1	S	175864	a	Organic matter (Automated) in soil	L009B	a
TP119	1	S	175864	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TP119	1	S	175864	a	Total Sulphur in soil	L038B	a
TP119	1	S	175864	a	Total sulphate (as SO4 in soil)	L038B	a
TP119	1	S	175864	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TP119	1	S	175864	a	pH in soil (automated)	L099	a
TT115	1	S	175865	a	Ammonium as NH4 in soil	L082B	a
TT115	1	S	175865	a	Chloride, water soluble, in soil	L082B	a

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 24-015170
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TT115	1	S	175865	a	Magnesium, water soluble, in soil	L038B	a
TT115	1	S	175865	a	Nitrate, water soluble, in soil	L078	a
TT115	1	S	175865	a	Organic matter (Automated) in soil	L009B	a
TT115	1	S	175865	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TT115	1	S	175865	a	Total Sulphur in soil	L038B	a
TT115	1	S	175865	a	Total sulphate (as SO4 in soil)	L038B	a
TT115	1	S	175865	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TT115	1	S	175865	a	pH in soil (automated)	L099	a
TT117	1	S	175866	a	Ammonium as NH4 in soil	L082B	a
TT117	1	S	175866	a	Chloride, water soluble, in soil	L082B	a
TT117	1	S	175866	a	Magnesium, water soluble, in soil	L038B	a
TT117	1	S	175866	a	Nitrate, water soluble, in soil	L078	a
TT117	1	S	175866	a	Organic matter (Automated) in soil	L009B	a
TT117	1	S	175866	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TT117	1	S	175866	a	Total Sulphur in soil	L038B	a
TT117	1	S	175866	a	Total sulphate (as SO4 in soil)	L038B	a
TT117	1	S	175866	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TT117	1	S	175866	a	pH in soil (automated)	L099	a
TT122B	1	S	175867	a	Ammonium as NH4 in soil	L082B	a
TT122B	1	S	175867	a	Chloride, water soluble, in soil	L082B	a
TT122B	1	S	175867	a	Magnesium, water soluble, in soil	L038B	a
TT122B	1	S	175867	a	Nitrate, water soluble, in soil	L078	a
TT122B	1	S	175867	a	Organic matter (Automated) in soil	L009B	a
TT122B	1	S	175867	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TT122B	1	S	175867	a	Total Sulphur in soil	L038B	a
TT122B	1	S	175867	a	Total sulphate (as SO4 in soil)	L038B	a
TT122B	1	S	175867	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TT122B	1	S	175867	a	pH in soil (automated)	L099	a
TT127	1	S	175868	a	Ammonium as NH4 in soil	L082B	a
TT127	1	S	175868	a	Chloride, water soluble, in soil	L082B	a
TT127	1	S	175868	a	Magnesium, water soluble, in soil	L038B	a
TT127	1	S	175868	a	Nitrate, water soluble, in soil	L078	a
TT127	1	S	175868	a	Organic matter (Automated) in soil	L009B	a
TT127	1	S	175868	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TT127	1	S	175868	a	Total Sulphur in soil	L038B	a
TT127	1	S	175868	a	Total sulphate (as SO4 in soil)	L038B	a
TT127	1	S	175868	a	Water Soluble Nitrate (leachate equivalent)	L078	a
TT127	1	S	175868	a	pH in soil (automated)	L099	a

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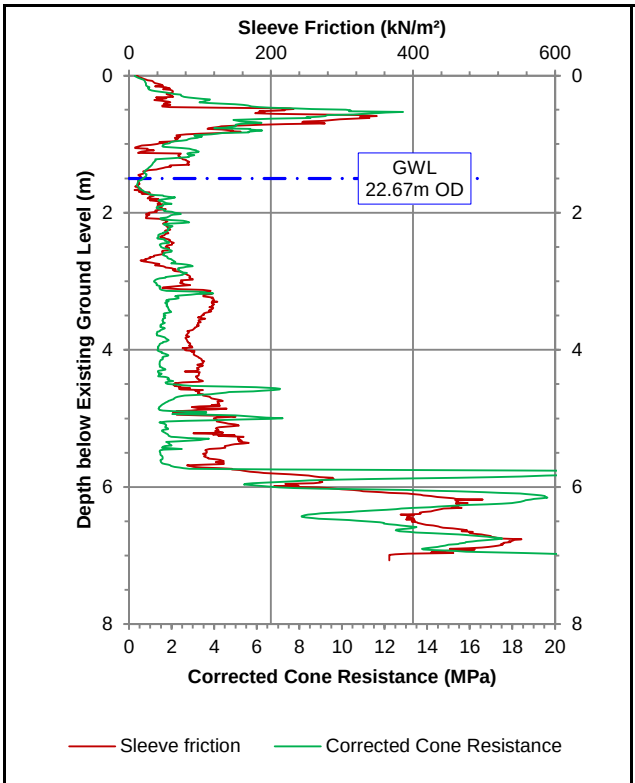
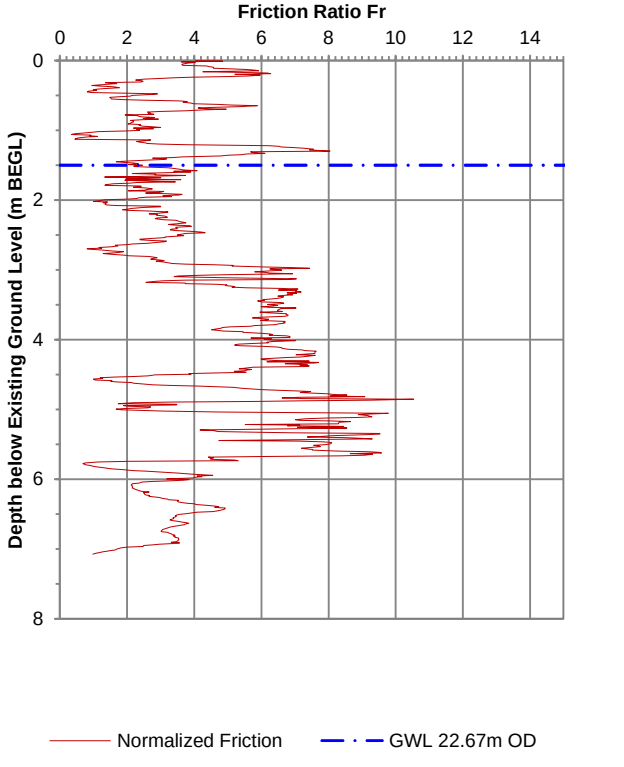
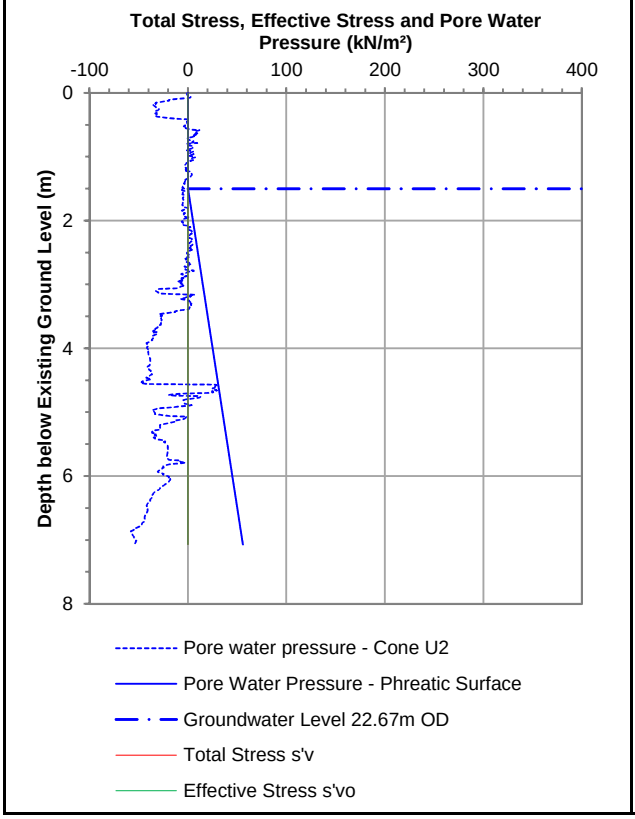
The results included within the report are representative of the samples submitted for analysis.

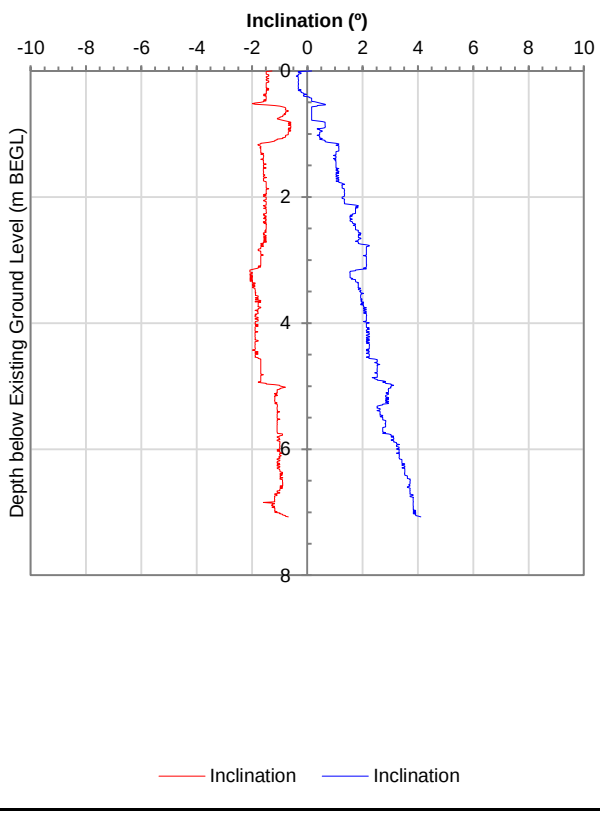
Geotechnical plots

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT101	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD

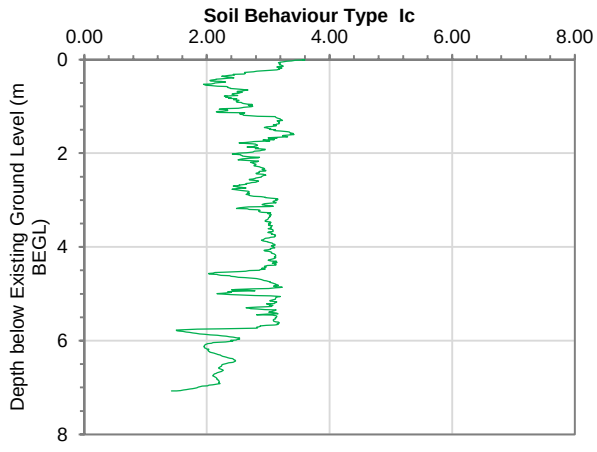


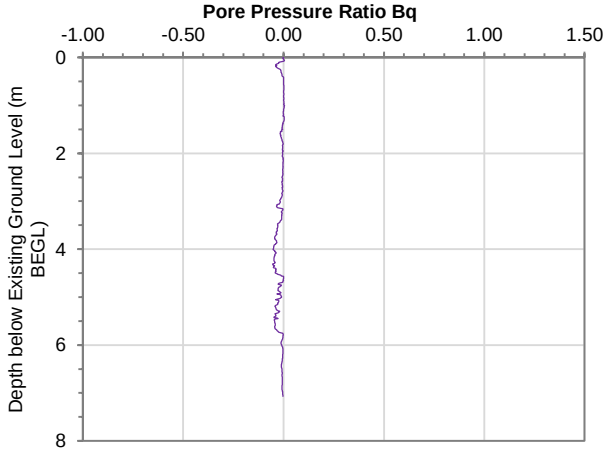


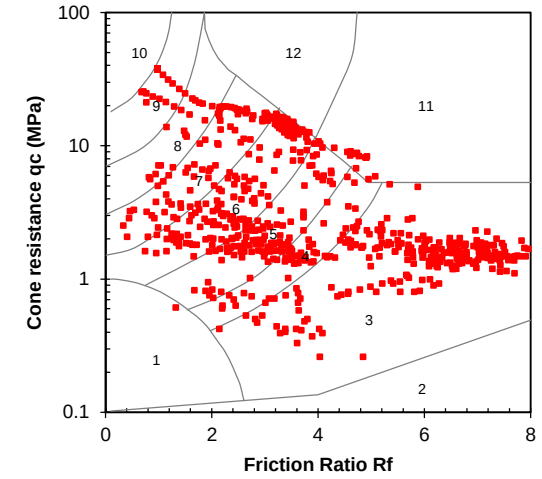




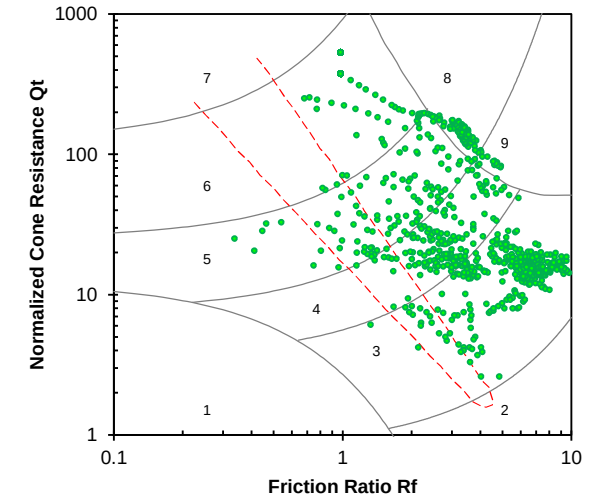
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT101	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD



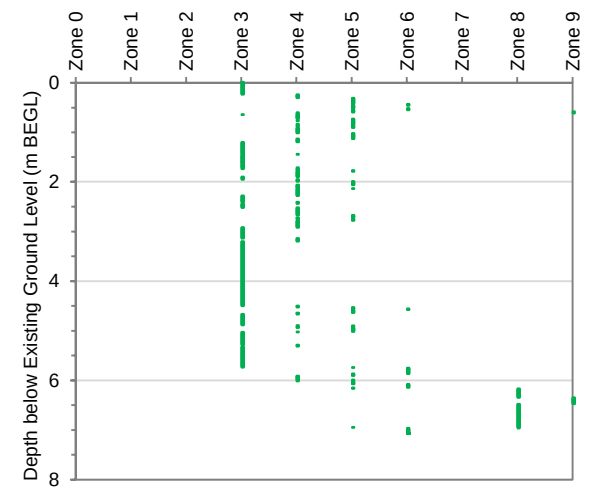




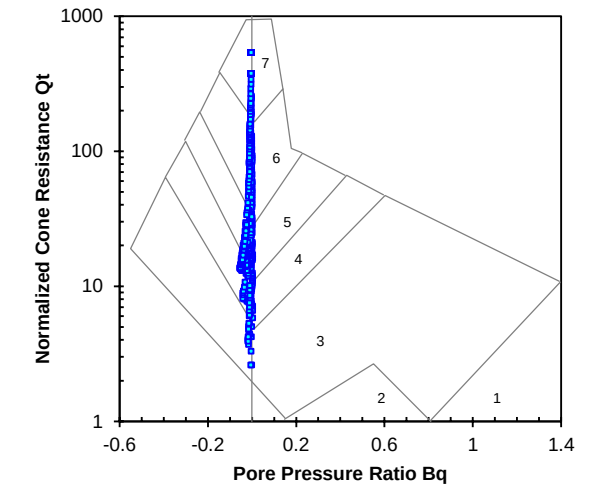
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



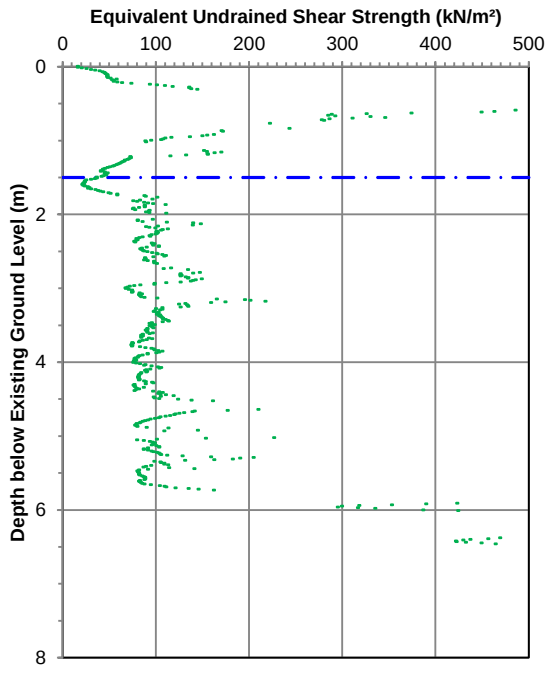
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

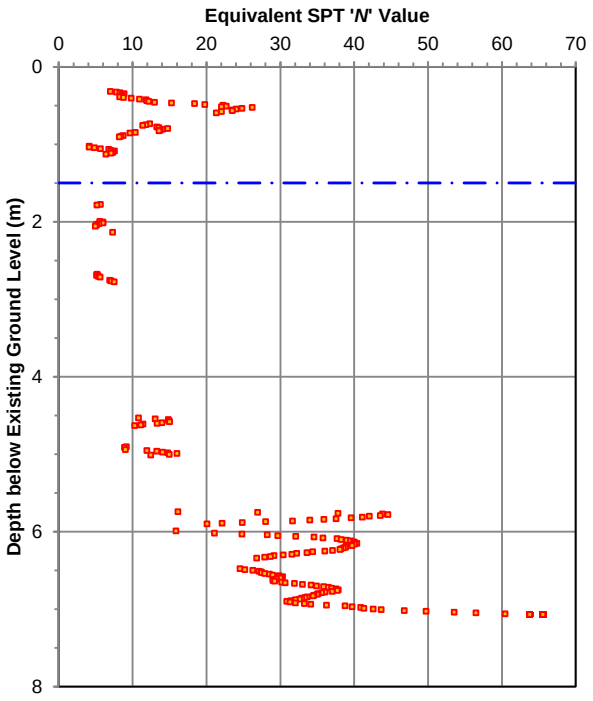
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

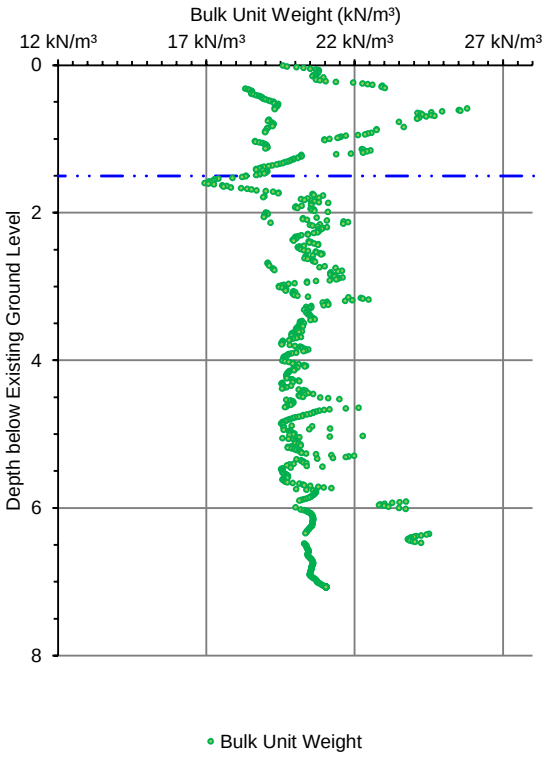
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT101	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD

Undrained Shear Strength

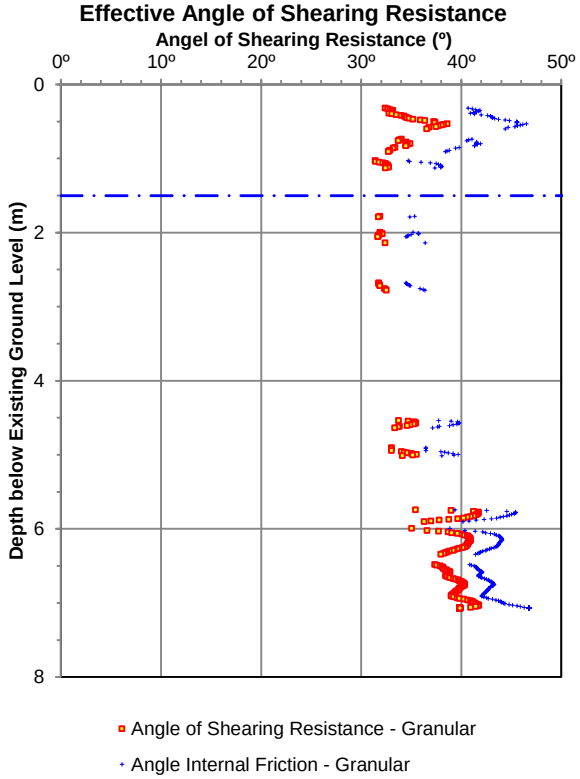


SPT 'N' Value

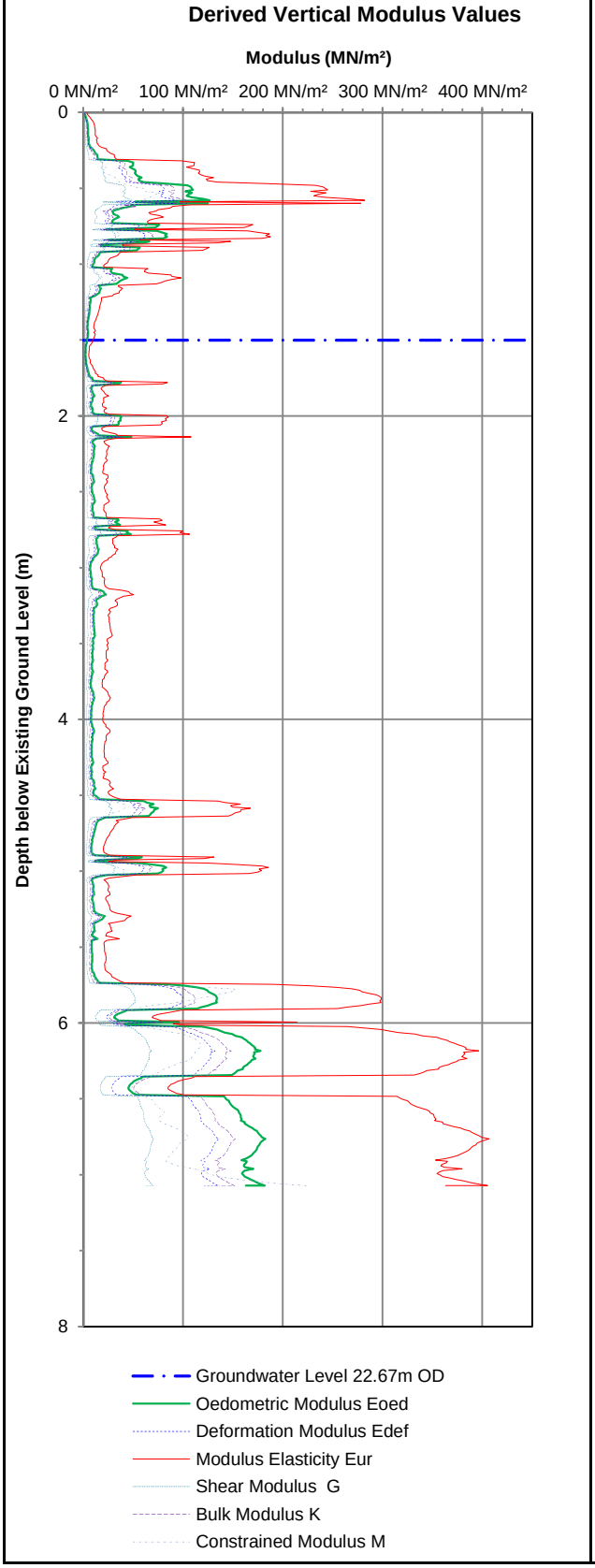


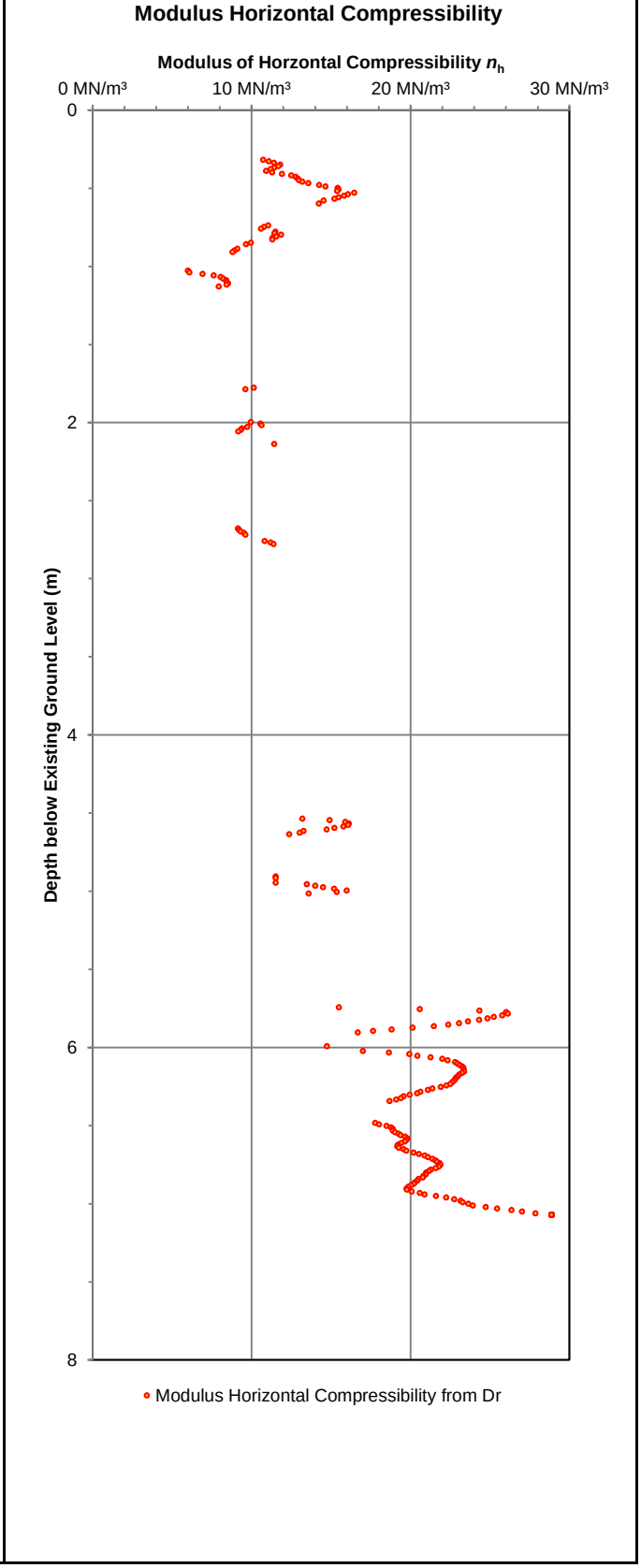


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT101	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD



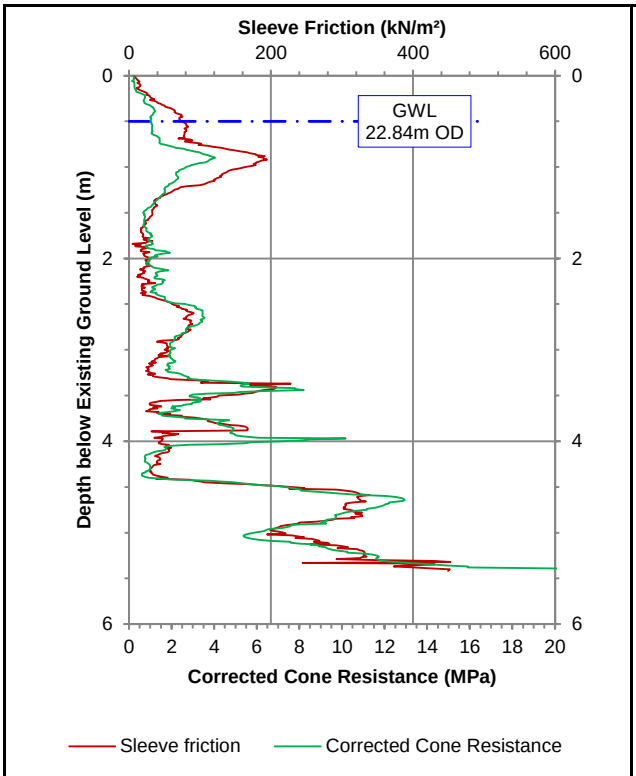


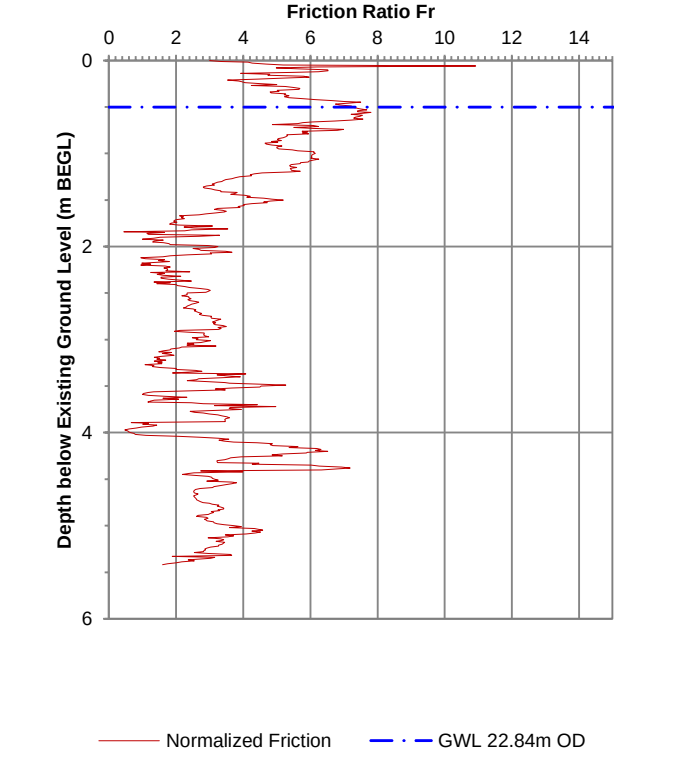
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT101	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD

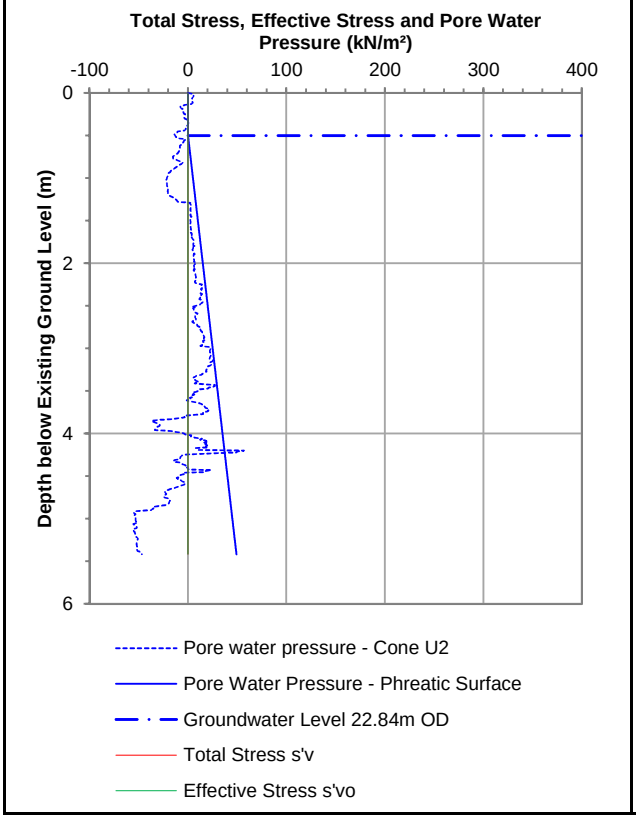
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	3.27 MPa	2.73 MPa	24.17m OD	10	3272 kN/m²	5043 kN/m²	0.25
2	5.04 MPa	4.20 MPa	24.07m OD	10	5043 kN/m²	10099 kN/m²	0.25
3	10.10 MPa	7.79 MPa	23.97m OD	10	10099 kN/m²	45428 kN/m²	0.28
4	45.43 MPa	33.75 MPa	23.87m OD	10	45428 kN/m²	70131 kN/m²	0.30
5	70.13 MPa	52.10 MPa	23.77m OD	10	70131 kN/m²	104146 kN/m²	0.30
6	104.15 MPa	76.67 MPa	23.67m OD	10	104146 kN/m²	36440 kN/m²	0.31
7	36.44 MPa	26.72 MPa	23.57m OD	10	36440 kN/m²	54022 kN/m²	0.30
8	54.02 MPa	40.13 MPa	23.47m OD	10	54022 kN/m²	54545 kN/m²	0.30
9	54.55 MPa	40.52 MPa	23.37m OD	10	54545 kN/m²	17993 kN/m²	0.30
10	17.99 MPa	13.37 MPa	23.27m OD	10	17993 kN/m²	28357 kN/m²	0.30
11	28.36 MPa	21.07 MPa	23.17m OD	10	28357 kN/m²	22627 kN/m²	0.30
12	22.63 MPa	16.81 MPa	23.07m OD	10	22627 kN/m²	7511 kN/m²	0.30
13	7.51 MPa	6.26 MPa	22.97m OD	10	7511 kN/m²	5315 kN/m²	0.25
14	5.31 MPa	4.43 MPa	22.87m OD	10	5315 kN/m²	4484 kN/m²	0.25
15	4.48 MPa	3.69 MPa	22.77m OD	10	4484 kN/m²	2658 kN/m²	0.26
16	2.66 MPa	2.21 MPa	22.67m OD	10	2658 kN/m²	3188 kN/m²	0.25
17	3.19 MPa	2.66 MPa	22.57m OD	10	3188 kN/m²	13474 kN/m²	0.25
18	13.47 MPa	10.16 MPa	22.47m OD	10	13474 kN/m²	9242 kN/m²	0.29
19	9.24 MPa	6.87 MPa	22.37m OD	10	9242 kN/m²	11850 kN/m²	0.30
20	11.85 MPa	9.17 MPa	22.27m OD	10	11850 kN/m²	25377 kN/m²	0.28
21	25.38 MPa	18.85 MPa	22.17m OD	10	25377 kN/m²	15628 kN/m²	0.30
22	15.63 MPa	11.61 MPa	22.07m OD	10	15628 kN/m²	10361 kN/m²	0.30
23	10.36 MPa	7.87 MPa	21.97m OD	10	10361 kN/m²	8454 kN/m²	0.29
24	8.45 MPa	7.04 MPa	21.87m OD	10	8454 kN/m²	9377 kN/m²	0.25
25	9.38 MPa	7.53 MPa	21.77m OD	10	9377 kN/m²	10278 kN/m²	0.27
26	10.28 MPa	7.81 MPa	21.67m OD	10	10278 kN/m²	17100 kN/m²	0.29
27	17.10 MPa	12.70 MPa	21.57m OD	10	17100 kN/m²	27472 kN/m²	0.30
28	27.47 MPa	20.41 MPa	21.47m OD	10	27472 kN/m²	13985 kN/m²	0.30
29	13.98 MPa	10.39 MPa	21.37m OD	10	13985 kN/m²	9642 kN/m²	0.30
30	9.64 MPa	7.79 MPa	21.27m OD	10	9642 kN/m²	7825 kN/m²	0.26

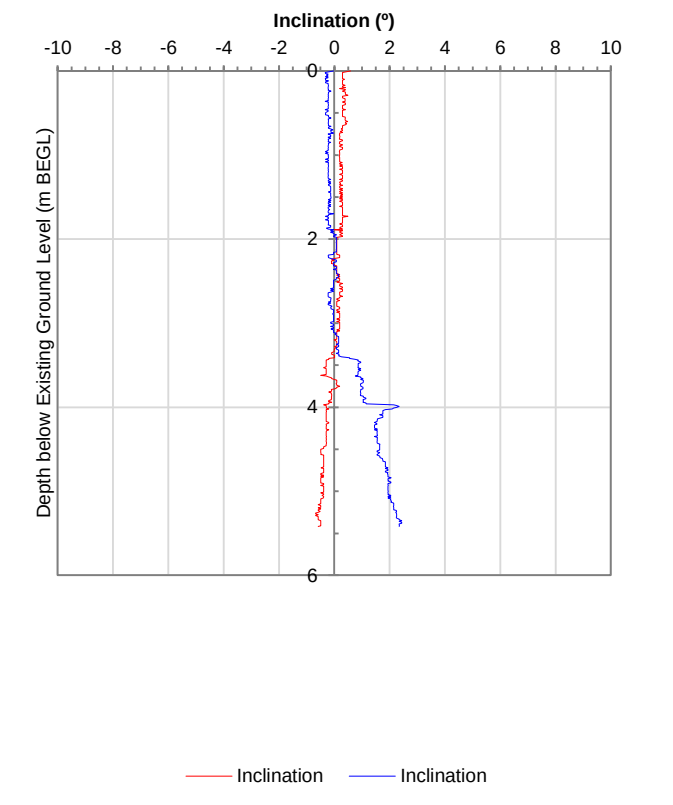
31	7.83 MPa	6.52 MPa	21.17m OD	10	7825 kN/m²	15242 kN/m²	0.25
32	15.24 MPa	11.65 MPa	21.07m OD	10	15242 kN/m²	12235 kN/m²	0.28
33	12.24 MPa	10.20 MPa	20.97m OD	10	12235 kN/m²	10424 kN/m²	0.25
34	10.42 MPa	8.69 MPa	20.87m OD	10	10424 kN/m²	10615 kN/m²	0.25
35	10.62 MPa	8.85 MPa	20.77m OD	10	10615 kN/m²	9428 kN/m²	0.25
36	9.43 MPa	7.86 MPa	20.67m OD	10	9428 kN/m²	9120 kN/m²	0.25
37	9.12 MPa	7.60 MPa	20.57m OD	10	9120 kN/m²	7987 kN/m²	0.25
38	7.99 MPa	6.66 MPa	20.47m OD	10	7987 kN/m²	9966 kN/m²	0.25
39	9.97 MPa	8.31 MPa	20.37m OD	10	9966 kN/m²	8132 kN/m²	0.25
40	8.13 MPa	6.78 MPa	20.27m OD	10	8132 kN/m²	9345 kN/m²	0.25
41	9.35 MPa	7.79 MPa	20.17m OD	10	9345 kN/m²	8746 kN/m²	0.25
42	8.75 MPa	7.29 MPa	20.07m OD	10	8746 kN/m²	8878 kN/m²	0.25
43	8.88 MPa	7.40 MPa	19.97m OD	10	8878 kN/m²	8303 kN/m²	0.25
44	8.30 MPa	6.92 MPa	19.87m OD	10	8303 kN/m²	10764 kN/m²	0.25
45	10.76 MPa	8.97 MPa	19.77m OD	10	10764 kN/m²	51884 kN/m²	0.25
46	51.88 MPa	38.54 MPa	19.67m OD	10	51884 kN/m²	36674 kN/m²	0.30
47	36.67 MPa	27.61 MPa	19.57m OD	10	36674 kN/m²	10730 kN/m²	0.29
48	10.73 MPa	8.94 MPa	19.47m OD	10	10730 kN/m²	8791 kN/m²	0.25
49	8.79 MPa	7.22 MPa	19.37m OD	10	8791 kN/m²	58798 kN/m²	0.26
50	58.80 MPa	43.68 MPa	19.27m OD	10	58798 kN/m²	24994 kN/m²	0.30
51	24.99 MPa	19.23 MPa	19.17m OD	10	24994 kN/m²	9824 kN/m²	0.27
52	9.82 MPa	8.19 MPa	19.07m OD	10	9824 kN/m²	12474 kN/m²	0.25
53	12.47 MPa	10.20 MPa	18.97m OD	10	12474 kN/m²	13495 kN/m²	0.26
54	13.50 MPa	10.89 MPa	18.87m OD	10	13495 kN/m²	9702 kN/m²	0.26
55	9.70 MPa	8.08 MPa	18.77m OD	10	9702 kN/m²	8812 kN/m²	0.25
56	8.81 MPa	7.34 MPa	18.67m OD	10	8812 kN/m²	9526 kN/m²	0.25
57	9.53 MPa	7.94 MPa	18.57m OD	10	9526 kN/m²	73050 kN/m²	0.25
58	73.05 MPa	54.79 MPa	18.47m OD	10	73050 kN/m²	130092 kN/m²	0.28
59	130.09 MPa	96.64 MPa	18.37m OD	10	130092 kN/m²	49600 kN/m²	0.30
60	49.60 MPa	36.85 MPa	18.27m OD	10	49600 kN/m²	120466 kN/m²	0.30
61	120.47 MPa	89.49 MPa	18.17m OD	10	120466 kN/m²	168953 kN/m²	0.30
62	168.95 MPa	125.51 MPa	18.07m OD	10	168953 kN/m²	167367 kN/m²	0.30
63	167.37 MPa	124.33 MPa	17.97m OD	10	167367 kN/m²	103905 kN/m²	0.30
64	103.91 MPa	73.94 MPa	17.87m OD	10	103905 kN/m²		0.33

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT102	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443969.26	403878.86	24.17m OD	7.07 m BEGL	22.67m OD

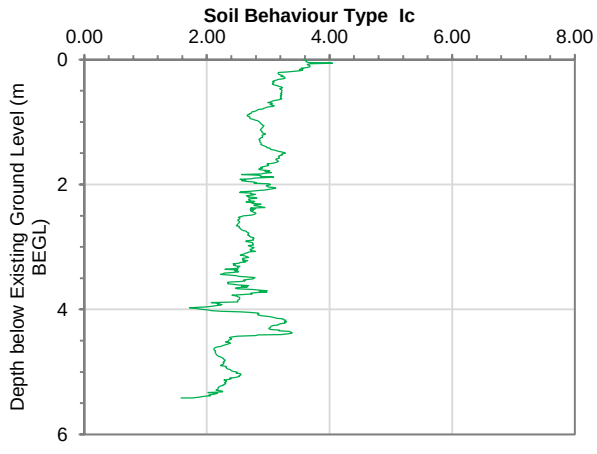


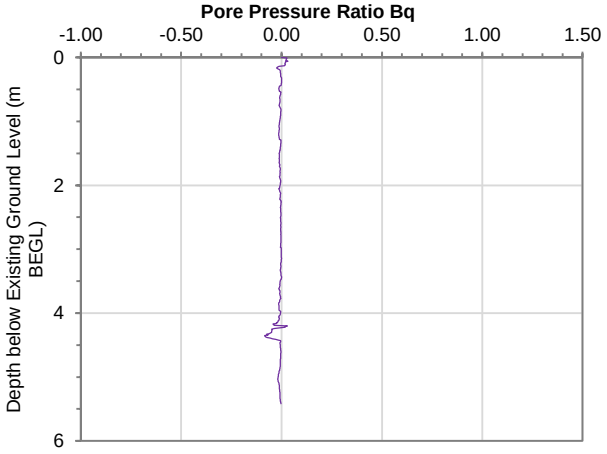


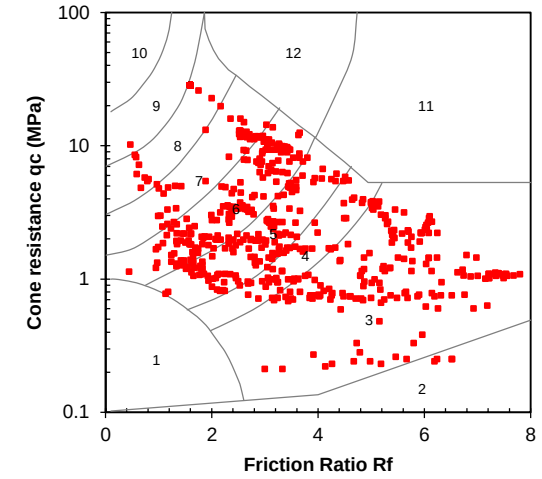




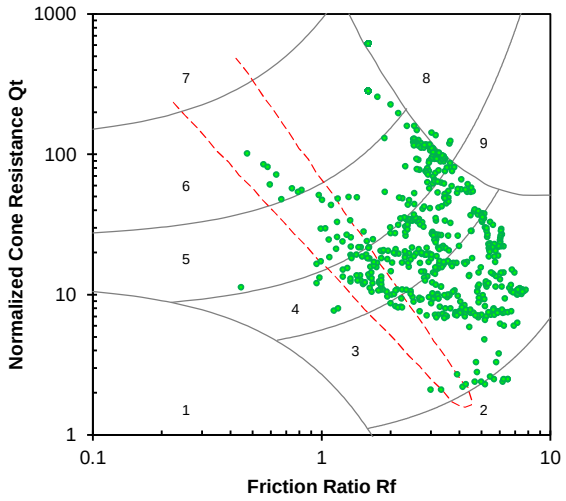
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT102	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444102.55	403894.66	23.34m OD	5.42 m BEGL	22.84m OD



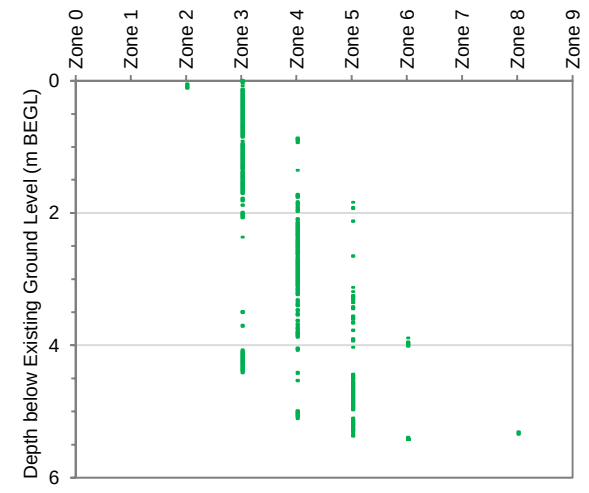




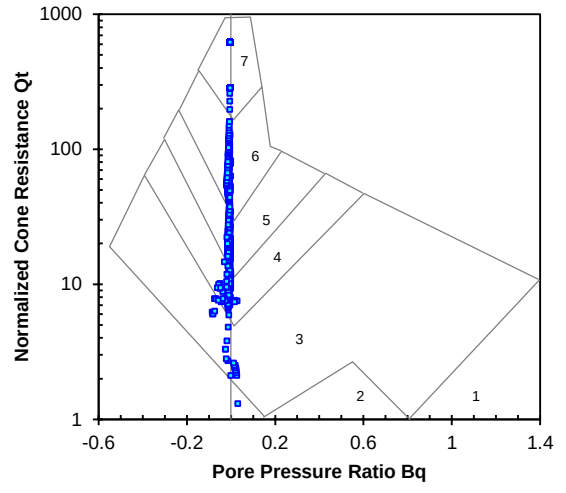
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



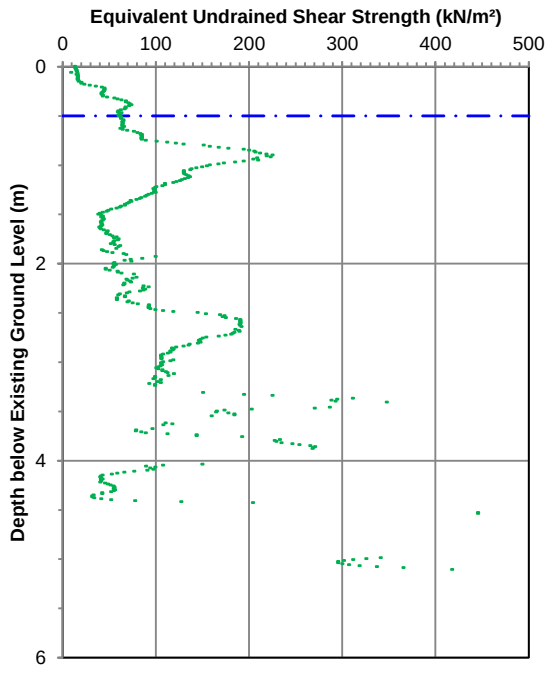
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

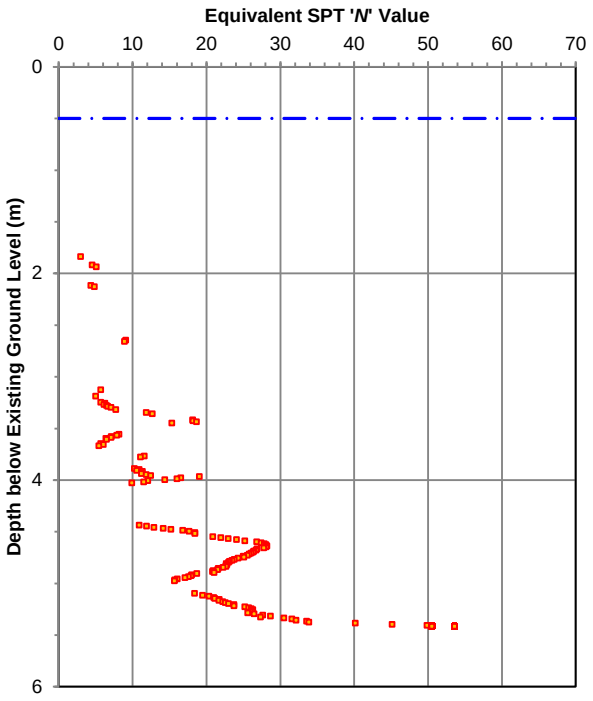
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

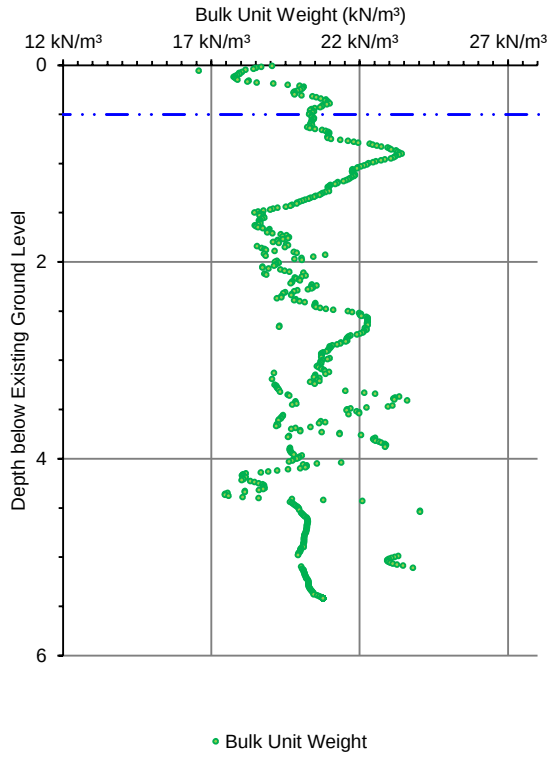
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT102	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444102.55	403894.66	23.34m OD	5.42 m BEGL	22.84m OD

Undrained Shear Strength

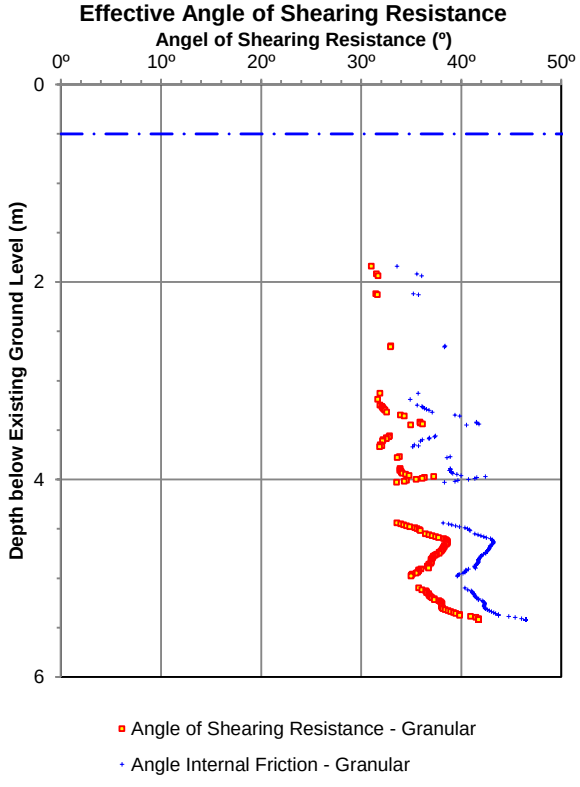


SPT 'N' Value

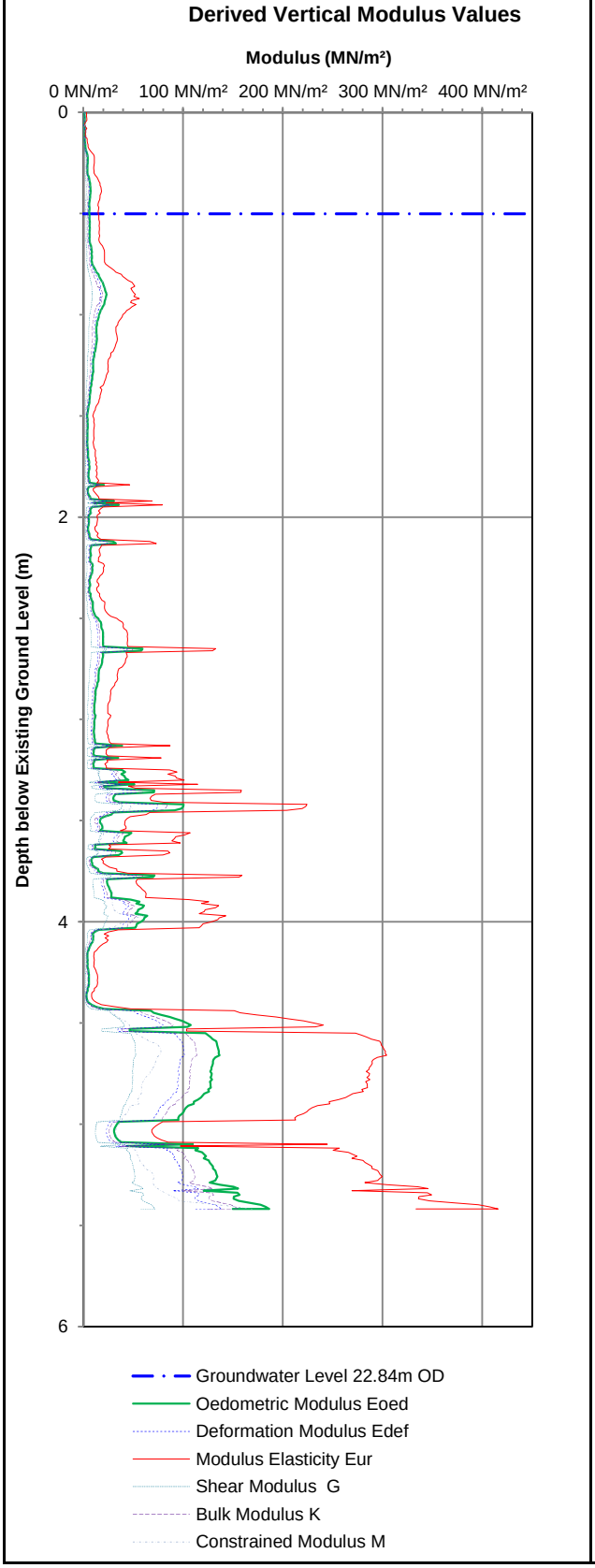


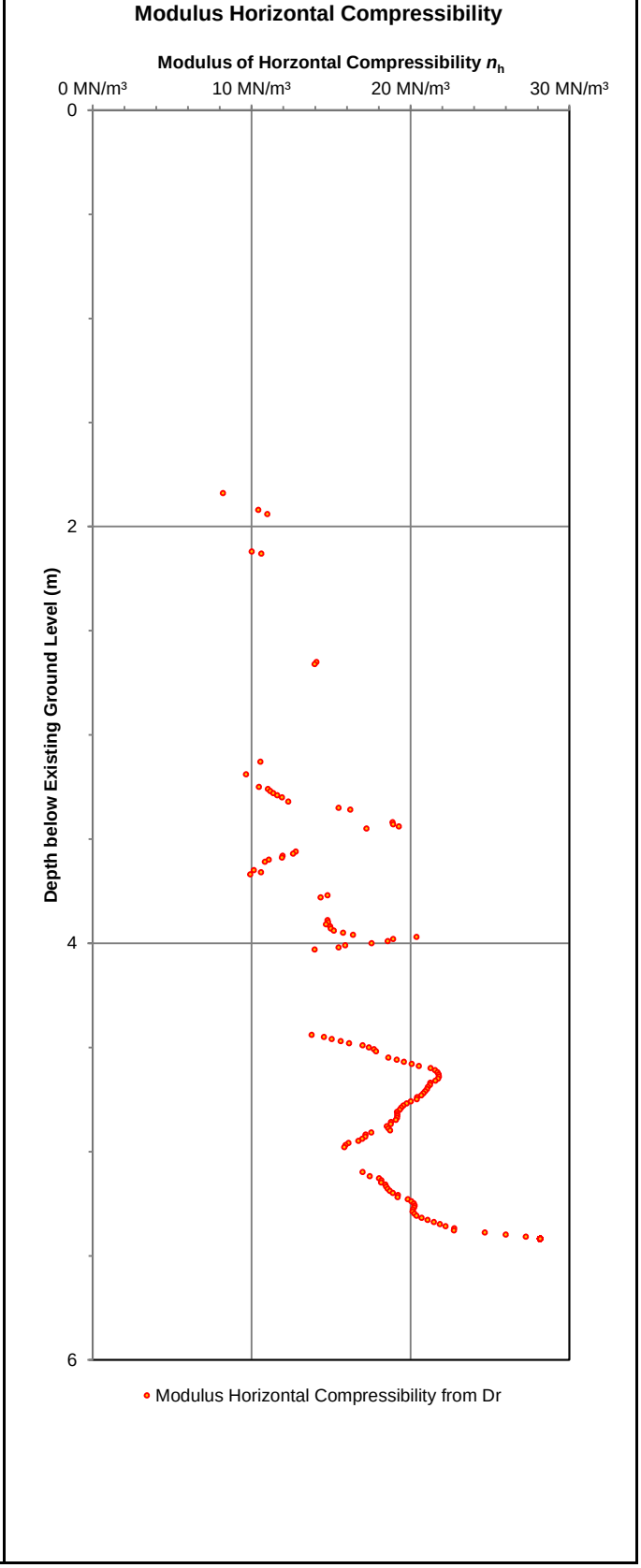


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT102	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444102.55	403894.66	23.34m OD	5.42 m BEGL	22.84m OD

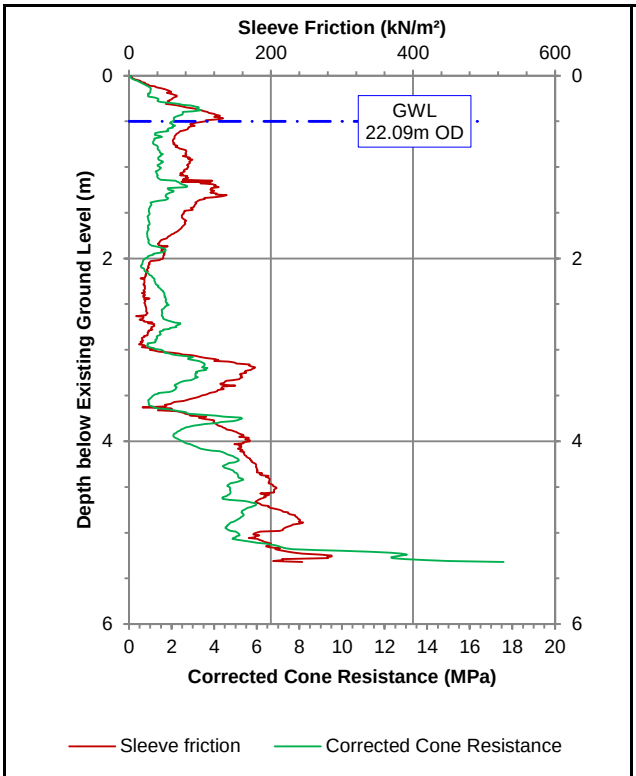


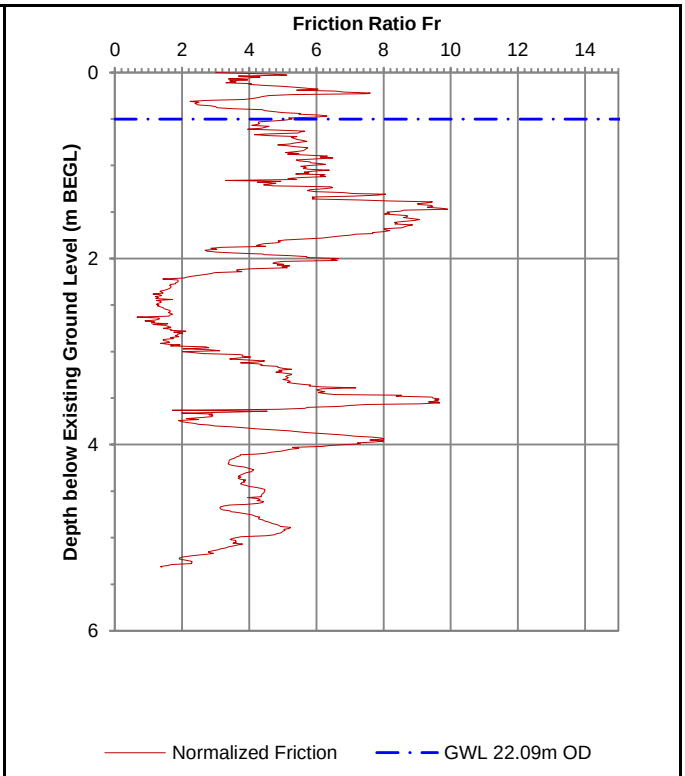


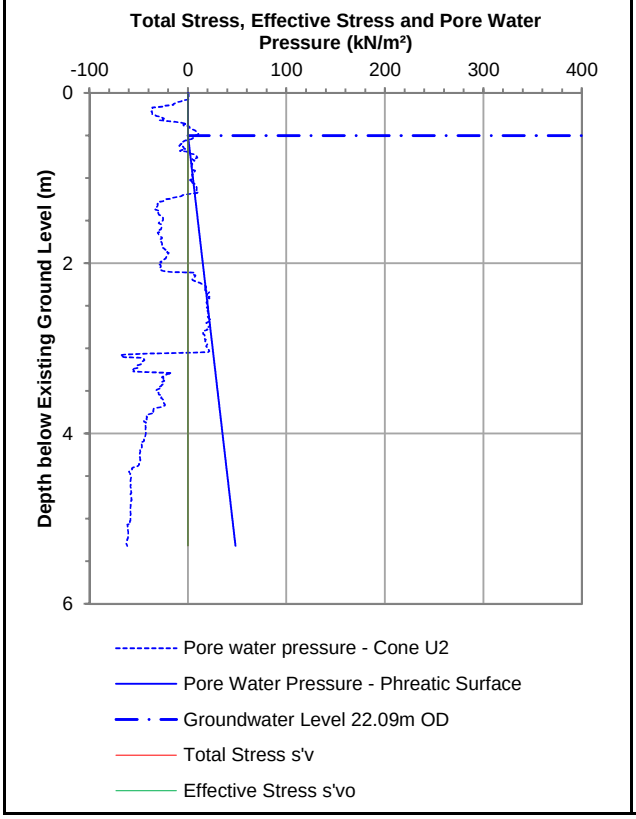
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT102	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444102.55	403894.66	23.34m OD	5.42 m BEGL	22.84m OD
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.33 MPa	0.90 MPa	23.34m OD	10	1329 kN/m²	1872 kN/m²	0.32
2	1.87 MPa	1.44 MPa	23.24m OD	10	1872 kN/m²	4300 kN/m²	0.28
3	4.30 MPa	3.58 MPa	23.14m OD	10	4300 kN/m²	6388 kN/m²	0.25
4	6.39 MPa	5.32 MPa	23.04m OD	10	6388 kN/m²	6298 kN/m²	0.25
5	6.30 MPa	5.25 MPa	22.94m OD	10	6298 kN/m²	6386 kN/m²	0.25
6	6.39 MPa	5.32 MPa	22.84m OD	10	6386 kN/m²	7233 kN/m²	0.25
7	7.23 MPa	6.03 MPa	22.74m OD	10	7233 kN/m²	9955 kN/m²	0.25
8	9.95 MPa	8.30 MPa	22.64m OD	10	9955 kN/m²	19684 kN/m²	0.25
9	19.68 MPa	15.74 MPa	22.54m OD	10	19684 kN/m²	20175 kN/m²	0.27
10	20.17 MPa	16.15 MPa	22.44m OD	10	20175 kN/m²	13906 kN/m²	0.27
11	13.91 MPa	11.59 MPa	22.34m OD	10	13906 kN/m²	12772 kN/m²	0.25
12	12.77 MPa	10.64 MPa	22.24m OD	10	12772 kN/m²	10001 kN/m²	0.25
13	10.00 MPa	8.33 MPa	22.14m OD	10	10001 kN/m²	7985 kN/m²	0.25
14	7.99 MPa	6.58 MPa	22.04m OD	10	7985 kN/m²	5357 kN/m²	0.26
15	5.36 MPa	4.46 MPa	21.94m OD	10	5357 kN/m²	4257 kN/m²	0.25
16	4.26 MPa	3.55 MPa	21.84m OD	10	4257 kN/m²	4372 kN/m²	0.25
17	4.37 MPa	3.64 MPa	21.74m OD	10	4372 kN/m²	5717 kN/m²	0.25
18	5.72 MPa	4.41 MPa	21.64m OD	10	5717 kN/m²	7100 kN/m²	0.28
19	7.10 MPa	5.50 MPa	21.54m OD	10	7100 kN/m²	13400 kN/m²	0.28
20	13.40 MPa	10.01 MPa	21.44m OD	10	13400 kN/m²	5431 kN/m²	0.29
21	5.43 MPa	4.46 MPa	21.34m OD	10	5431 kN/m²	12923 kN/m²	0.26
22	12.92 MPa	9.60 MPa	21.24m OD	10	12923 kN/m²	8401 kN/m²	0.30
23	8.40 MPa	6.24 MPa	21.14m OD	10	8401 kN/m²	6572 kN/m²	0.30
24	6.57 MPa	4.94 MPa	21.04m OD	10	6572 kN/m²	10068 kN/m²	0.29
25	10.07 MPa	7.48 MPa	20.94m OD	10	10068 kN/m²	18511 kN/m²	0.30
26	18.51 MPa	13.75 MPa	20.84m OD	10	18511 kN/m²	28435 kN/m²	0.30
27	28.44 MPa	21.12 MPa	20.74m OD	10	28435 kN/m²	16793 kN/m²	0.30
28	16.79 MPa	12.47 MPa	20.64m OD	10	16793 kN/m²	13180 kN/m²	0.30
29	13.18 MPa	9.79 MPa	20.54m OD	10	13180 kN/m²	11416 kN/m²	0.30
30	11.42 MPa	8.48 MPa	20.44m OD	10	11416 kN/m²	10936 kN/m²	0.30

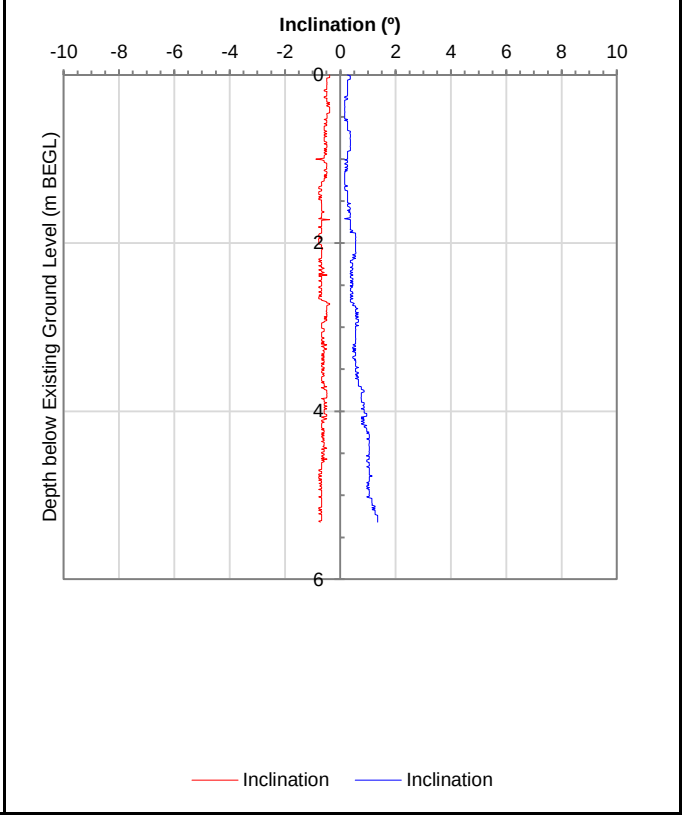
31	10.94 MPa	8.12 MPa	20.34m OD	10	10936 kN/m²	16903 kN/m²	0.30
32	16.90 MPa	12.56 MPa	20.24m OD	10	16903 kN/m²	27087 kN/m²	0.30
33	27.09 MPa	20.12 MPa	20.14m OD	10	27087 kN/m²	38453 kN/m²	0.30
34	38.45 MPa	28.57 MPa	20.04m OD	10	38453 kN/m²	58199 kN/m²	0.30
35	58.20 MPa	43.41 MPa	19.94m OD	10	58199 kN/m²	29643 kN/m²	0.29
36	29.64 MPa	22.19 MPa	19.84m OD	10	29643 kN/m²	23320 kN/m²	0.29
37	23.32 MPa	17.32 MPa	19.74m OD	10	23320 kN/m²	27284 kN/m²	0.30
38	27.28 MPa	20.36 MPa	19.64m OD	10	27284 kN/m²	28894 kN/m²	0.29
39	28.89 MPa	21.46 MPa	19.54m OD	10	28894 kN/m²	57858 kN/m²	0.30
40	57.86 MPa	42.98 MPa	19.44m OD	10	57858 kN/m²	25033 kN/m²	0.30
41	25.03 MPa	18.80 MPa	19.34m OD	10	25033 kN/m²	5300 kN/m²	0.29
42	5.30 MPa	4.42 MPa	19.24m OD	10	5300 kN/m²	5144 kN/m²	0.25
43	5.14 MPa	4.29 MPa	19.14m OD	10	5144 kN/m²	4208 kN/m²	0.25
44	4.21 MPa	3.51 MPa	19.04m OD	10	4208 kN/m²	59649 kN/m²	0.25
45	59.65 MPa	44.44 MPa	18.94m OD	10	59649 kN/m²	104824 kN/m²	0.29
46	104.82 MPa	77.87 MPa	18.84m OD	10	104824 kN/m²	133895 kN/m²	0.30
47	133.89 MPa	99.46 MPa	18.74m OD	10	133895 kN/m²	128321 kN/m²	0.30
48	128.32 MPa	95.32 MPa	18.64m OD	10	128321 kN/m²	120194 kN/m²	0.30
49	120.19 MPa	89.29 MPa	18.54m OD	10	120194 kN/m²	86578 kN/m²	0.30
50	86.58 MPa	64.32 MPa	18.44m OD	10	86578 kN/m²	40588 kN/m²	0.30
51	40.59 MPa	30.15 MPa	18.34m OD	10	40588 kN/m²	113611 kN/m²	0.30
52	113.61 MPa	84.40 MPa	18.24m OD	10	113611 kN/m²	132188 kN/m²	0.30
53	132.19 MPa	98.20 MPa	18.14m OD	10	132188 kN/m²	154047 kN/m²	0.30
54	154.05 MPa	114.44 MPa	18.04m OD	10	154047 kN/m²	156919 kN/m²	0.30
55	156.92 MPa	116.57 MPa	17.94m OD	10	156919 kN/m²		0.30
56			17.84m OD	10			
57			17.74m OD	10			
58			17.64m OD	10			
59			17.54m OD	10			
60			17.44m OD	10			
61			17.34m OD	10			
62			17.24m OD	10			
63			17.14m OD	10			
64			17.04m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444228.43	403927.74	22.59m OD	5.32 m BEGL	22.09m OD

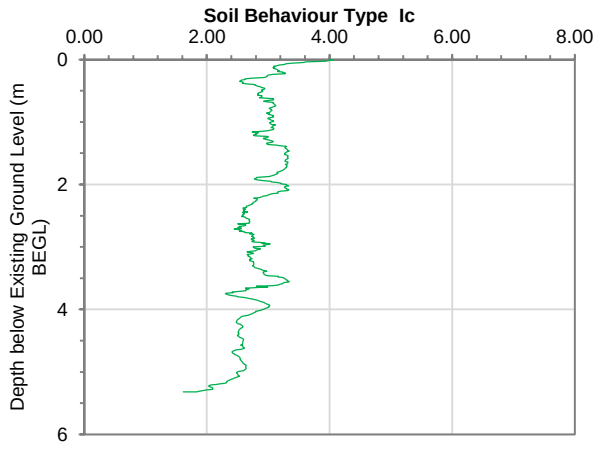


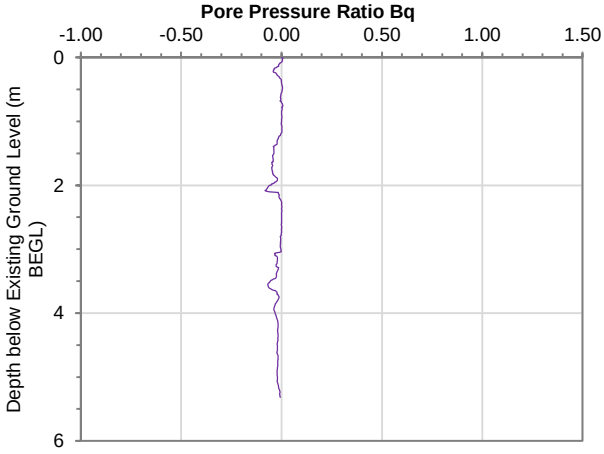


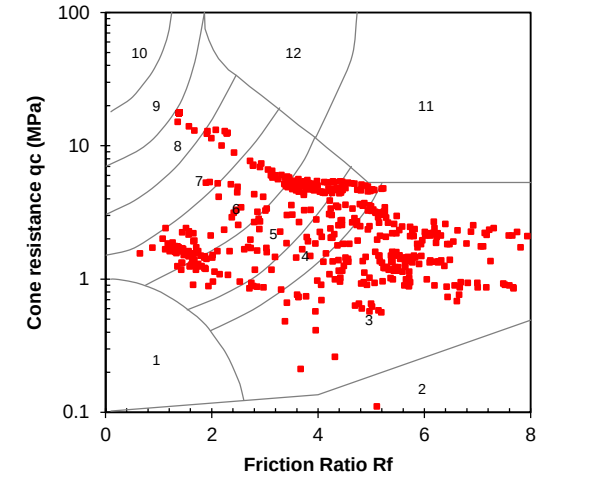




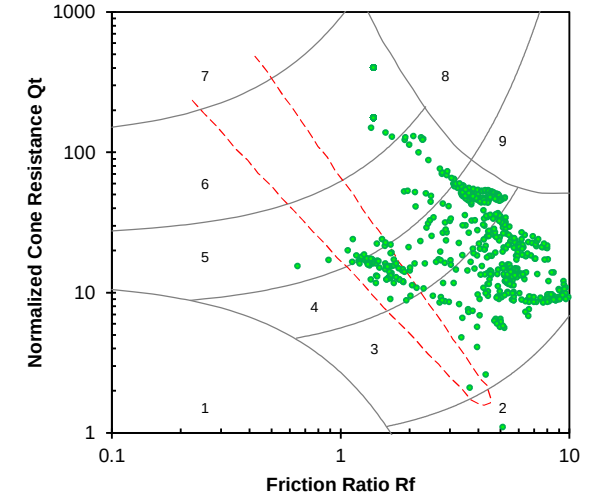
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444228.43	403927.74	22.59m OD	5.32 m BEGL	22.09m OD



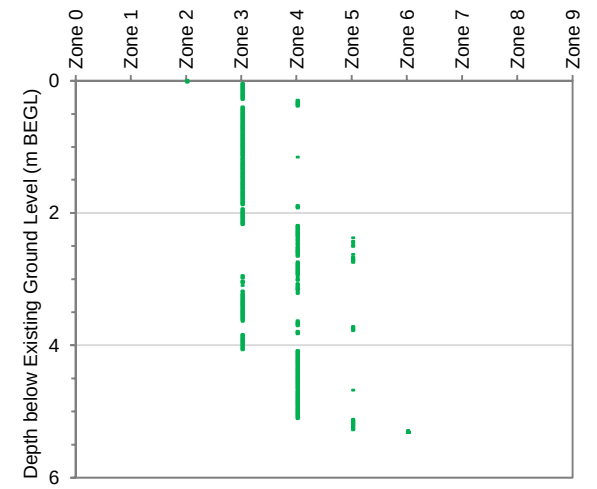




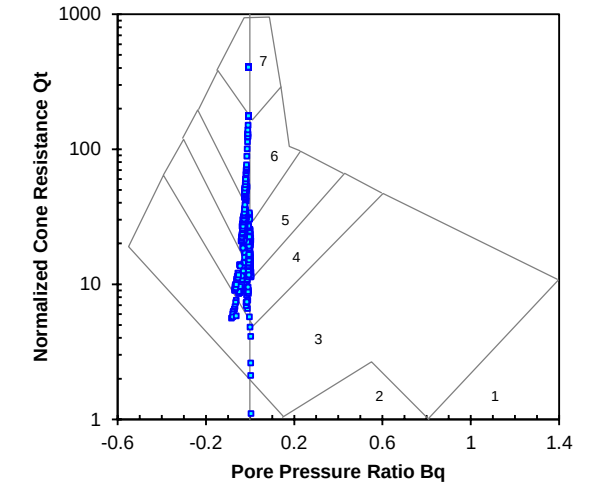
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



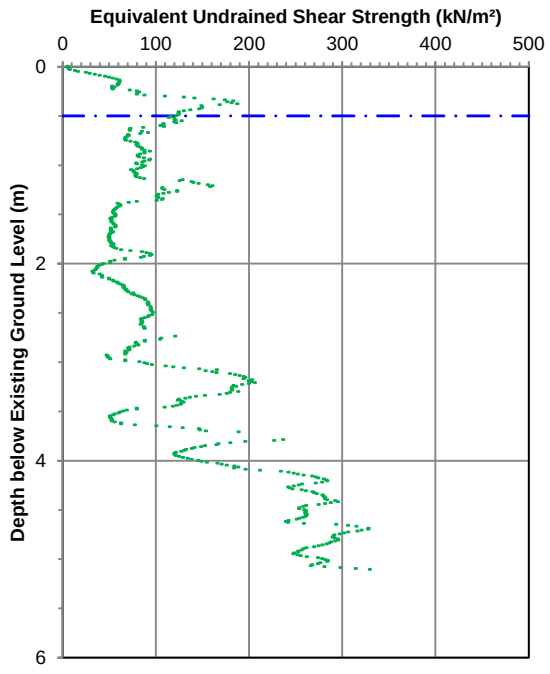
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

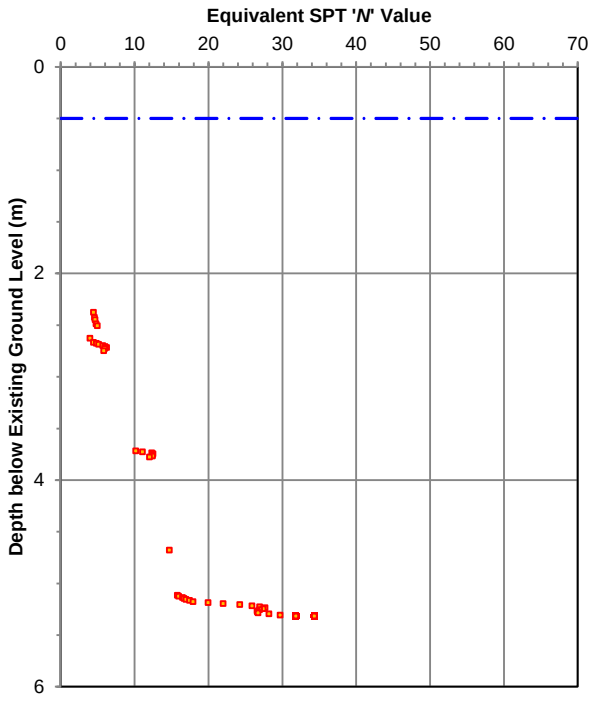
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

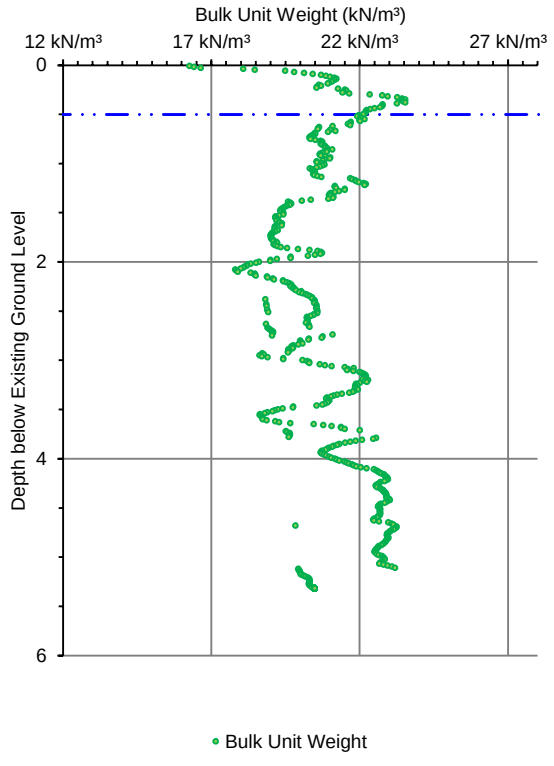
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444228.43	403927.74	22.59m OD	5.32 m BEGL	22.09m OD

Undrained Shear Strength

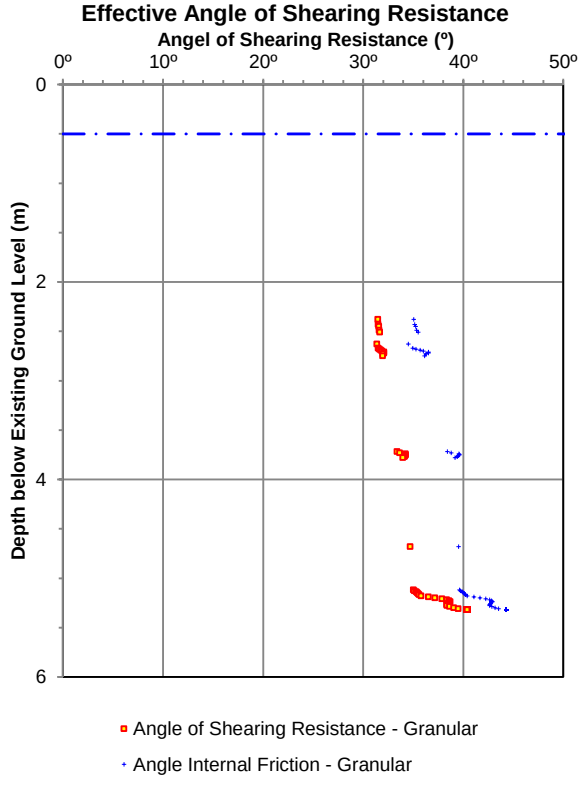


SPT 'N' Value

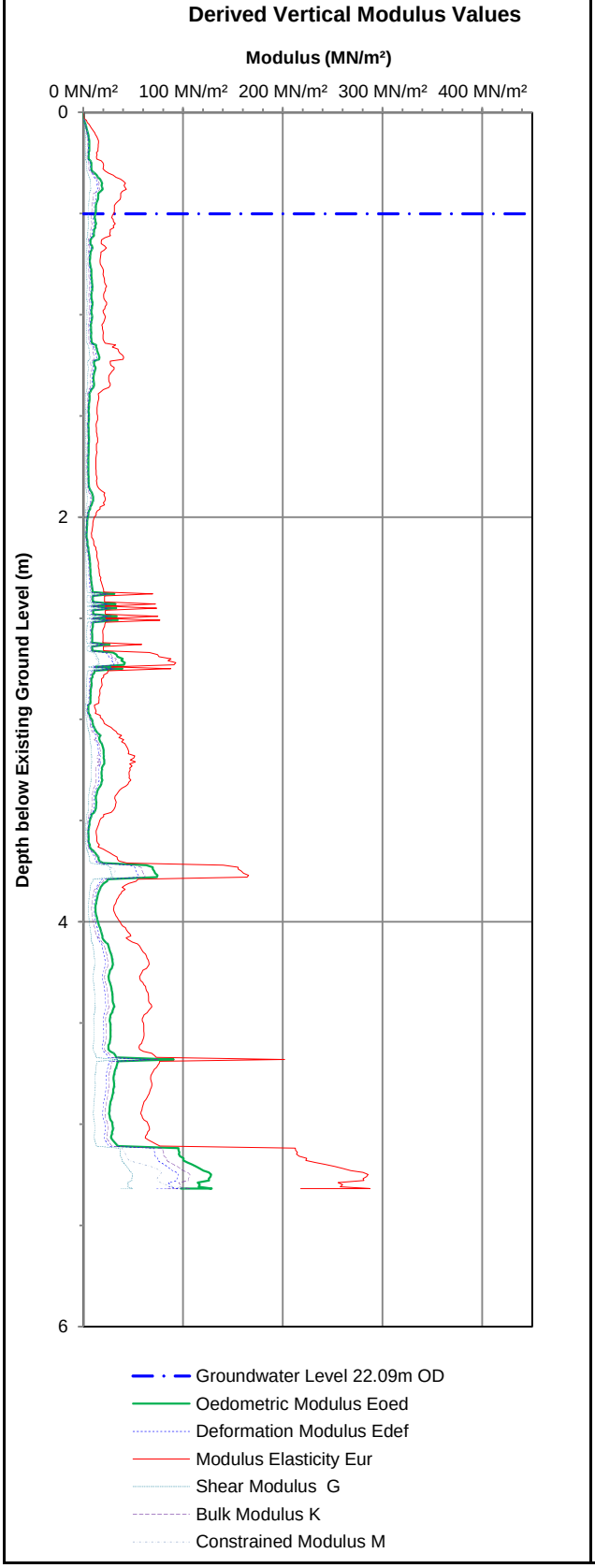


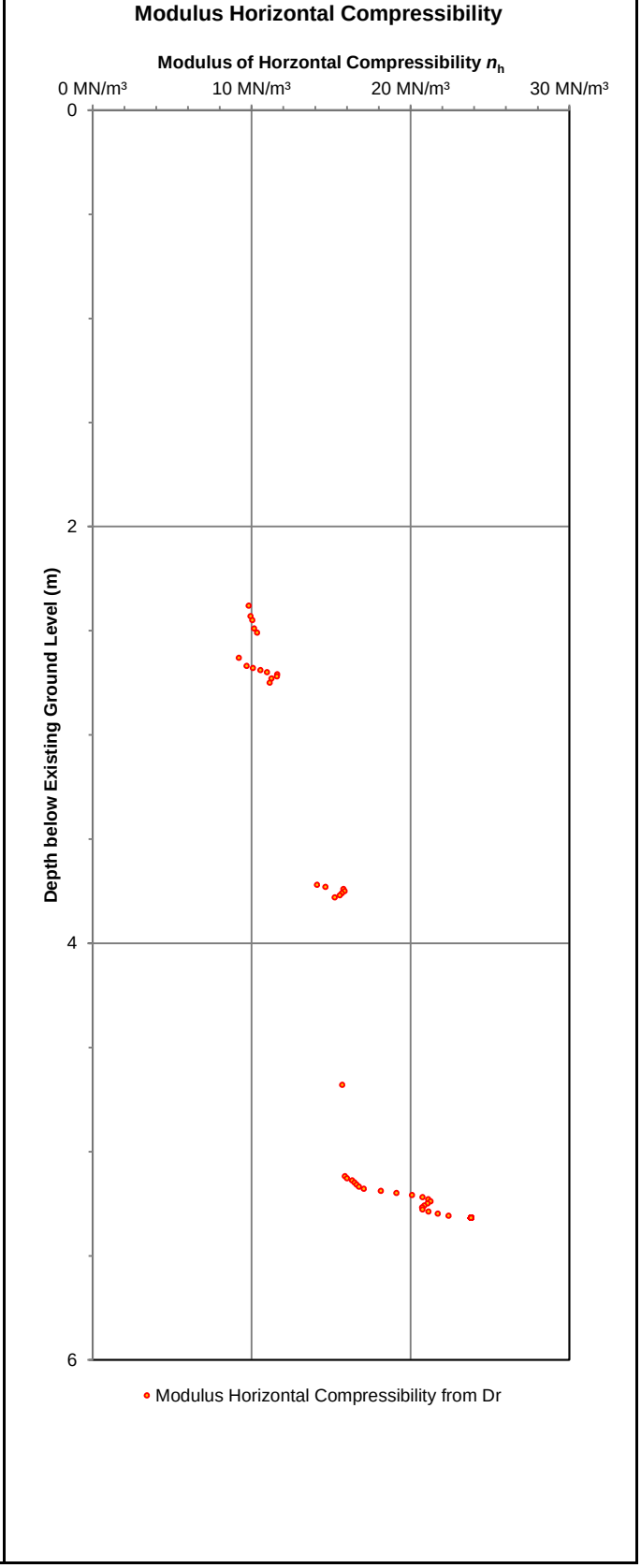


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444228.43	403927.74	22.59m OD	5.32 m BEGL	22.09m OD



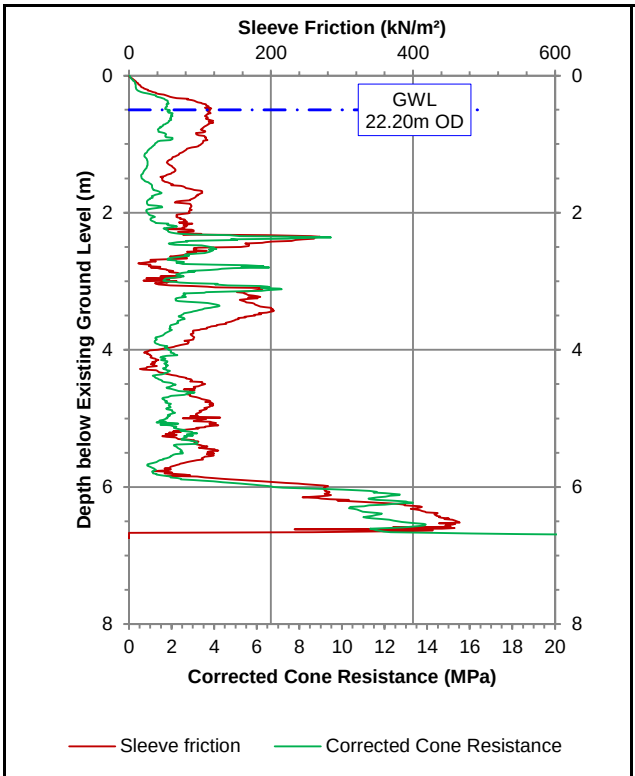


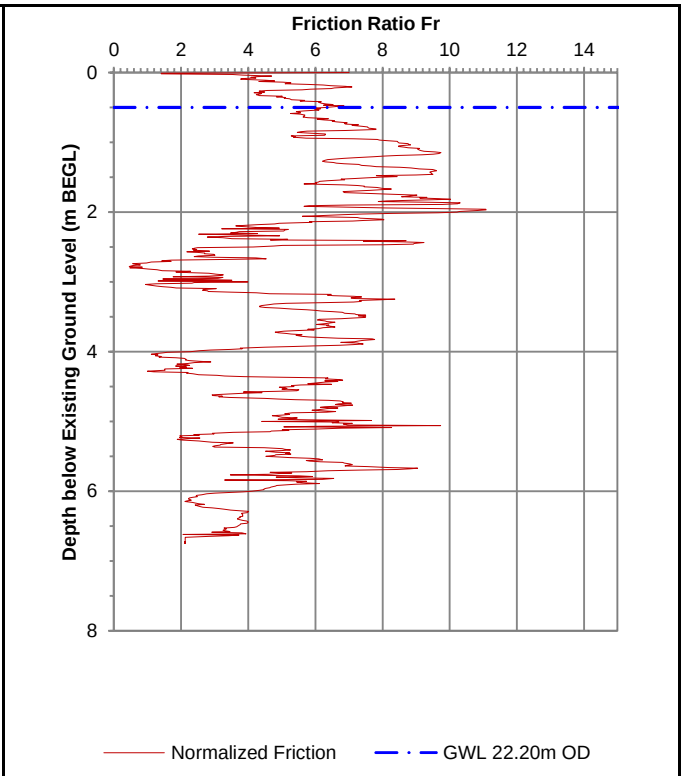
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444228.43	403927.74	22.59m OD	5.32 m BEGL	22.09m OD

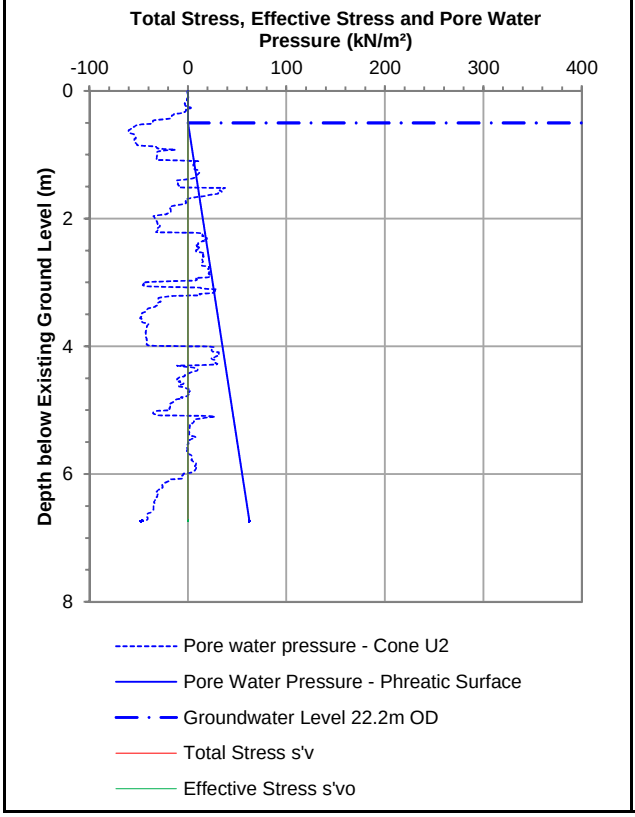
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.89 MPa	1.51 MPa	22.59m OD	10	1891 kN/m²	5763 kN/m²	0.30
2	5.76 MPa	4.80 MPa	22.49m OD	10	5763 kN/m²	7132 kN/m²	0.25
3	7.13 MPa	5.94 MPa	22.39m OD	10	7132 kN/m²	17293 kN/m²	0.25
4	17.29 MPa	12.85 MPa	22.29m OD	10	17293 kN/m²	13505 kN/m²	0.30
5	13.50 MPa	11.25 MPa	22.19m OD	10	13505 kN/m²	11777 kN/m²	0.25
6	11.78 MPa	9.81 MPa	22.09m OD	10	11777 kN/m²	8260 kN/m²	0.25
7	8.26 MPa	6.88 MPa	21.99m OD	10	8260 kN/m²	7226 kN/m²	0.25
8	7.23 MPa	6.02 MPa	21.89m OD	10	7226 kN/m²	8634 kN/m²	0.25
9	8.63 MPa	7.20 MPa	21.79m OD	10	8634 kN/m²	8563 kN/m²	0.25
10	8.56 MPa	7.14 MPa	21.69m OD	10	8563 kN/m²	8044 kN/m²	0.25
11	8.04 MPa	6.70 MPa	21.59m OD	10	8044 kN/m²	11293 kN/m²	0.25
12	11.29 MPa	9.28 MPa	21.49m OD	10	11293 kN/m²	12404 kN/m²	0.26
13	12.40 MPa	10.34 MPa	21.39m OD	10	12404 kN/m²	9277 kN/m²	0.25
14	9.28 MPa	7.73 MPa	21.29m OD	10	9277 kN/m²	5728 kN/m²	0.25
15	5.73 MPa	4.77 MPa	21.19m OD	10	5728 kN/m²	5373 kN/m²	0.25
16	5.37 MPa	4.48 MPa	21.09m OD	10	5373 kN/m²	5402 kN/m²	0.25
17	5.40 MPa	4.50 MPa	20.99m OD	10	5402 kN/m²	5068 kN/m²	0.25
18	5.07 MPa	4.22 MPa	20.89m OD	10	5068 kN/m²	6566 kN/m²	0.25
19	6.57 MPa	5.38 MPa	20.79m OD	10	6566 kN/m²	7392 kN/m²	0.26
20	7.39 MPa	5.87 MPa	20.69m OD	10	7392 kN/m²	3661 kN/m²	0.27
21	3.66 MPa	3.05 MPa	20.59m OD	10	3661 kN/m²	4879 kN/m²	0.25
22	4.88 MPa	4.00 MPa	20.49m OD	10	4879 kN/m²	6919 kN/m²	0.26
23	6.92 MPa	5.14 MPa	20.39m OD	10	6919 kN/m²	11212 kN/m²	0.30
24	11.21 MPa	8.33 MPa	20.29m OD	10	11212 kN/m²	17513 kN/m²	0.30
25	17.51 MPa	13.01 MPa	20.19m OD	10	17513 kN/m²	12008 kN/m²	0.30
26	12.01 MPa	8.92 MPa	20.09m OD	10	12008 kN/m²	18718 kN/m²	0.30
27	18.72 MPa	13.91 MPa	19.99m OD	10	18718 kN/m²	23636 kN/m²	0.30
28	23.64 MPa	17.56 MPa	19.89m OD	10	23636 kN/m²	7764 kN/m²	0.30
29	7.76 MPa	5.77 MPa	19.79m OD	10	7764 kN/m²	5898 kN/m²	0.30
30	5.90 MPa	4.62 MPa	19.69m OD	10	5898 kN/m²	12588 kN/m²	0.28

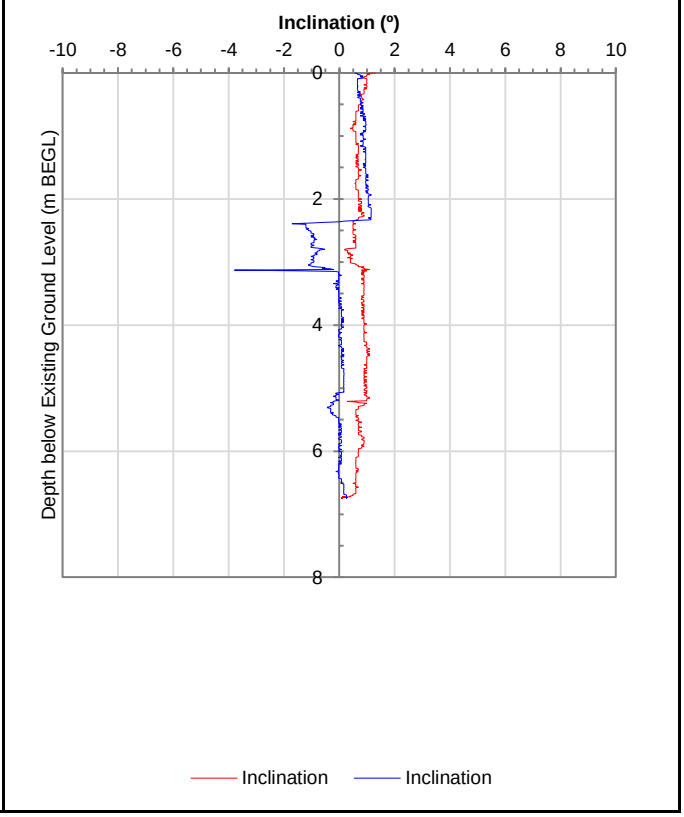
31	12.59 MPa	9.81 MPa	19.59m OD	10	12588 kN/m²	19635 kN/m²	0.28
32	19.64 MPa	15.00 MPa	19.49m OD	10	19635 kN/m²	19137 kN/m²	0.29
33	19.14 MPa	15.74 MPa	19.39m OD	10	19137 kN/m²	15064 kN/m²	0.26
34	15.06 MPa	12.55 MPa	19.29m OD	10	15064 kN/m²	10854 kN/m²	0.25
35	10.85 MPa	9.04 MPa	19.19m OD	10	10854 kN/m²	5568 kN/m²	0.25
36	5.57 MPa	4.64 MPa	19.09m OD	10	5568 kN/m²	10367 kN/m²	0.25
37	10.37 MPa	7.90 MPa	18.99m OD	10	10367 kN/m²	59770 kN/m²	0.28
38	59.77 MPa	44.40 MPa	18.89m OD	10	59770 kN/m²	16215 kN/m²	0.30
39	16.22 MPa	12.94 MPa	18.79m OD	10	16215 kN/m²	12842 kN/m²	0.27
40	12.84 MPa	10.70 MPa	18.69m OD	10	12842 kN/m²	17829 kN/m²	0.25
41	17.83 MPa	14.46 MPa	18.59m OD	10	17829 kN/m²	27005 kN/m²	0.26
42	27.00 MPa	20.06 MPa	18.49m OD	10	27005 kN/m²	26948 kN/m²	0.30
43	26.95 MPa	20.02 MPa	18.39m OD	10	26948 kN/m²	28695 kN/m²	0.30
44	28.70 MPa	21.32 MPa	18.29m OD	10	28695 kN/m²	28523 kN/m²	0.30
45	28.52 MPa	21.19 MPa	18.19m OD	10	28523 kN/m²	27137 kN/m²	0.30
46	27.14 MPa	20.16 MPa	18.09m OD	10	27137 kN/m²	35717 kN/m²	0.30
47	35.72 MPa	26.53 MPa	17.99m OD	10	35717 kN/m²	31341 kN/m²	0.30
48	31.34 MPa	23.28 MPa	17.89m OD	10	31341 kN/m²	29140 kN/m²	0.30
49	29.14 MPa	21.65 MPa	17.79m OD	10	29140 kN/m²	26974 kN/m²	0.30
50	26.97 MPa	20.04 MPa	17.69m OD	10	26974 kN/m²	29562 kN/m²	0.30
51	29.56 MPa	21.96 MPa	17.59m OD	10	29562 kN/m²	92820 kN/m²	0.30
52	92.82 MPa	68.95 MPa	17.49m OD	10	92820 kN/m²	121470 kN/m²	0.30
53	121.47 MPa	90.23 MPa	17.39m OD	10	121470 kN/m²	103939 kN/m²	0.30
54	103.94 MPa	77.21 MPa	17.29m OD	10	103939 kN/m²		0.30
55			17.19m OD	10			
56			17.09m OD	10			
57			16.99m OD	10			
58			16.89m OD	10			
59			16.79m OD	10			
60			16.69m OD	10			
61			16.59m OD	10			
62			16.49m OD	10			
63			16.39m OD	10			
64			16.29m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444392.07	403984.52	22.70m OD	6.73 m BEGL	22.20m OD

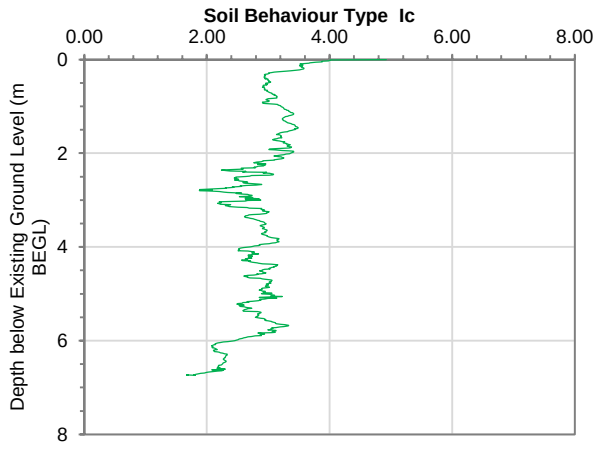


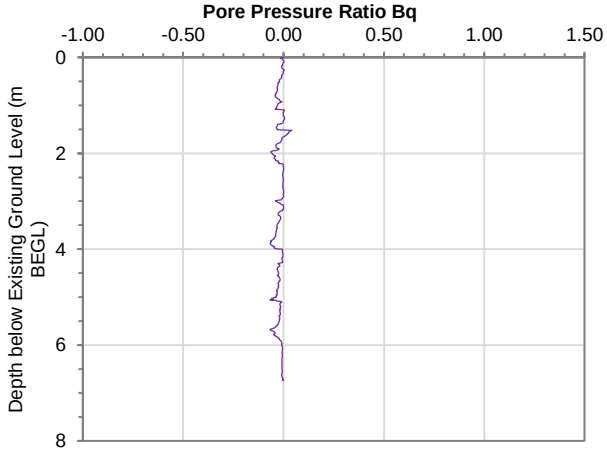


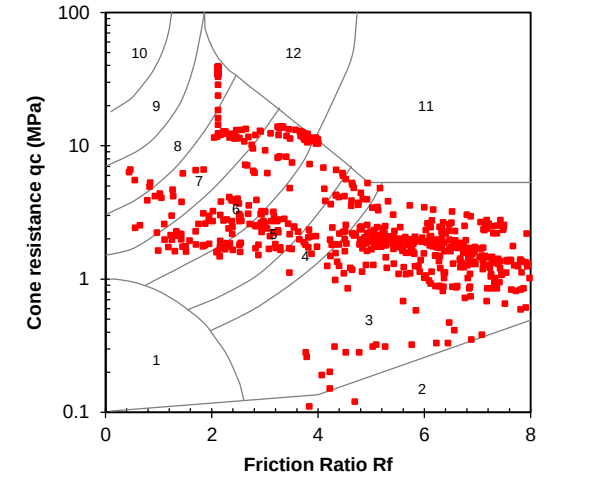




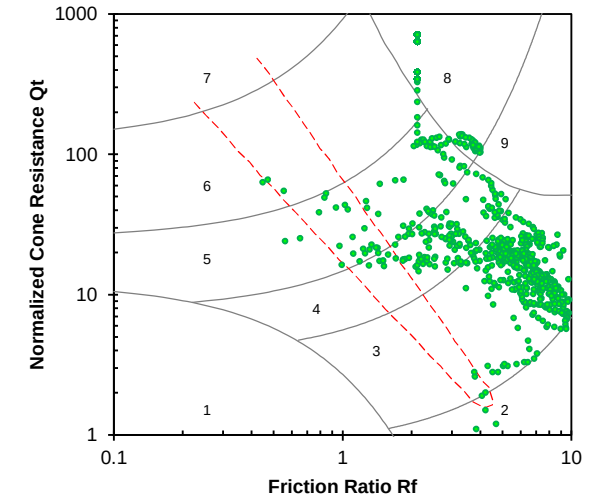
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT104	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444392.07	403984.52	22.70m OD	6.73 m BEGL	22.20m OD



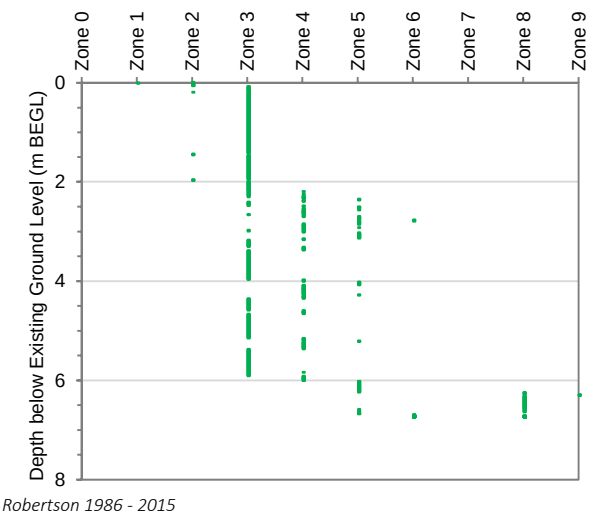




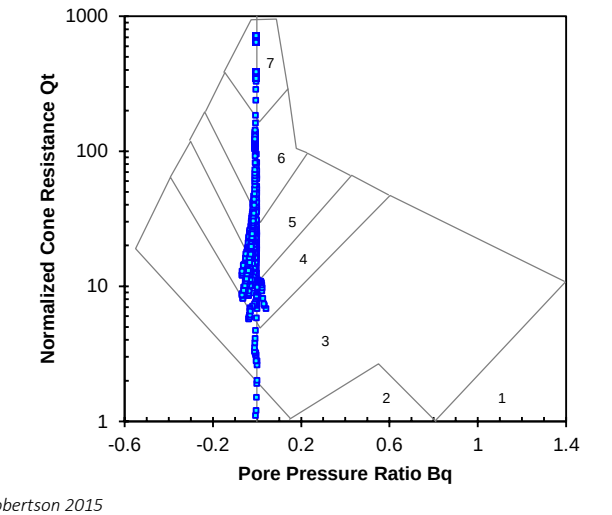
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



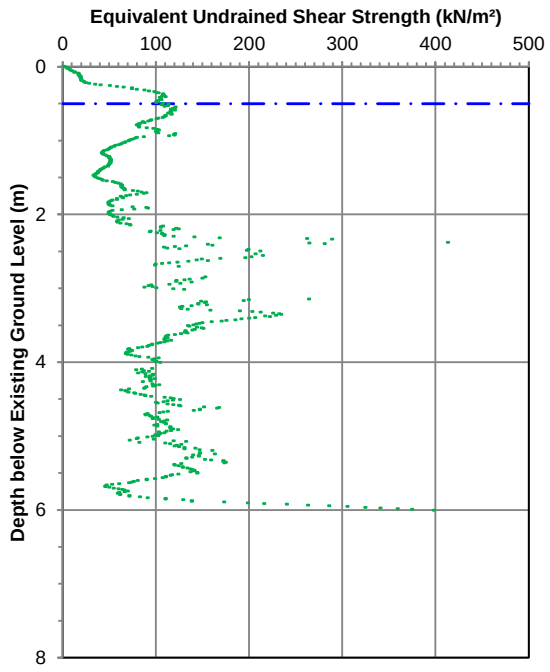
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

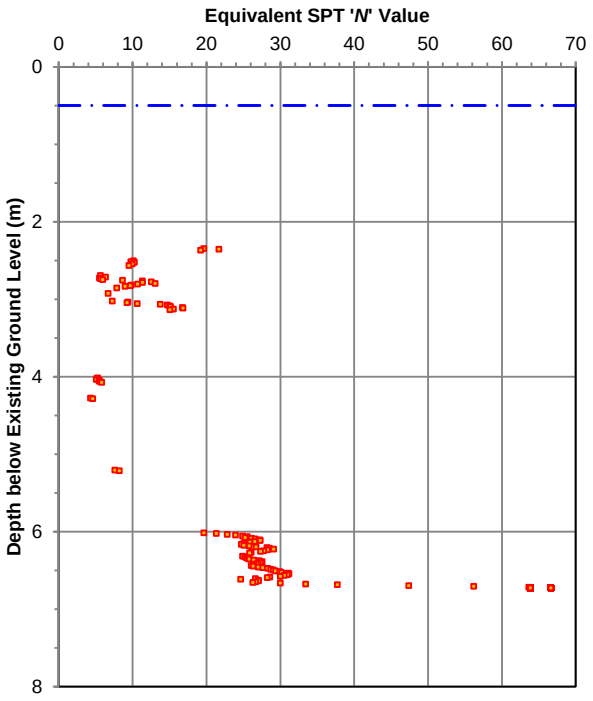
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

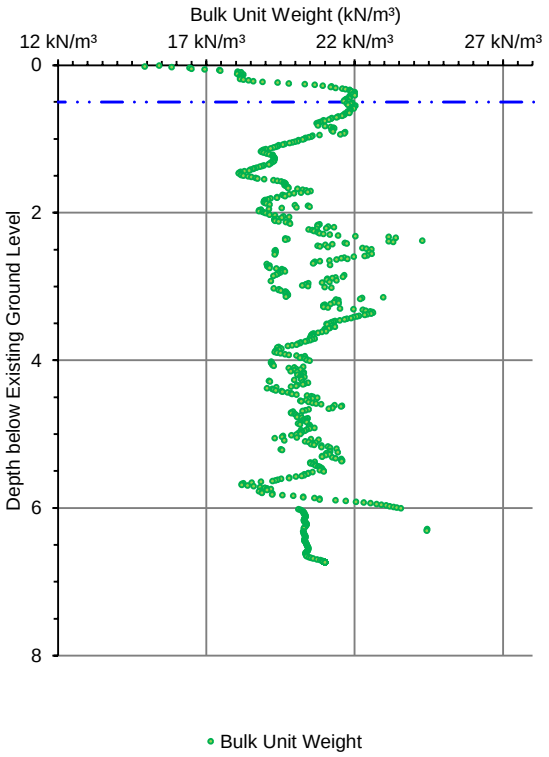
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT104	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444392.07	403984.52	22.70m OD	6.73 m BEGL	22.20m OD

Undrained Shear Strength

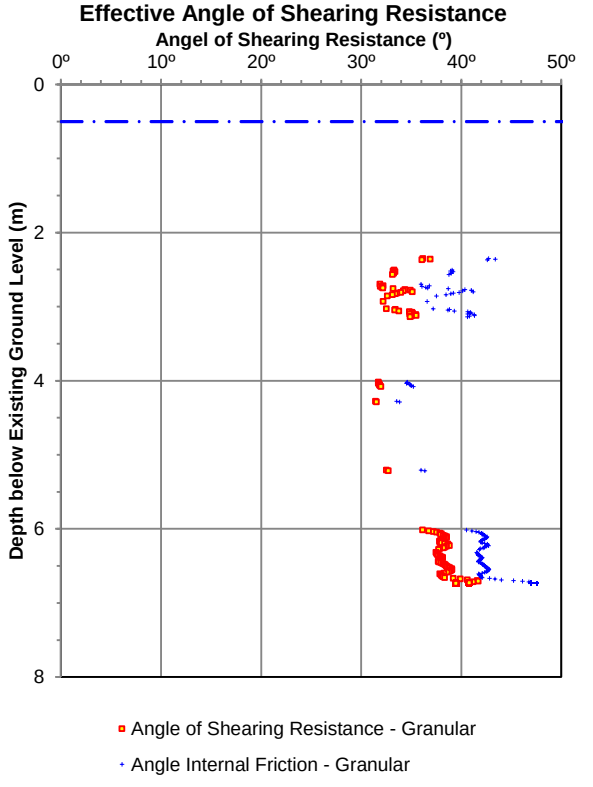


SPT 'N' Value

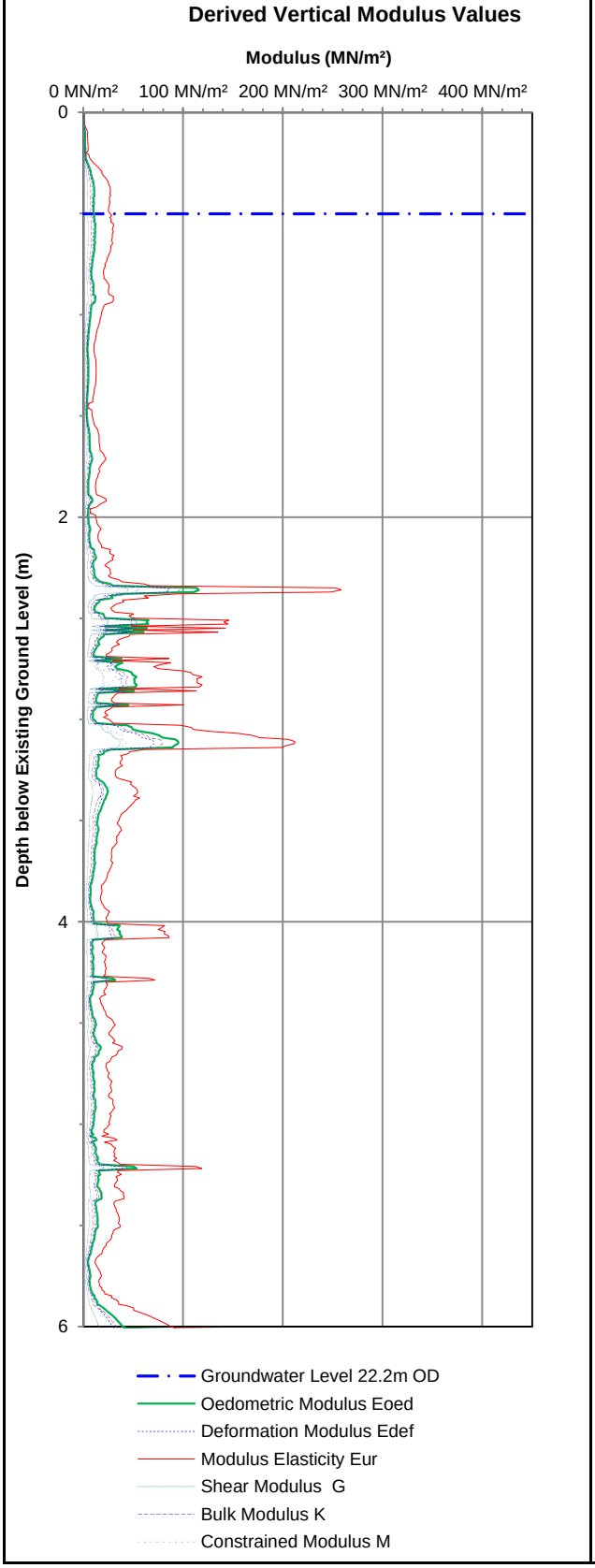


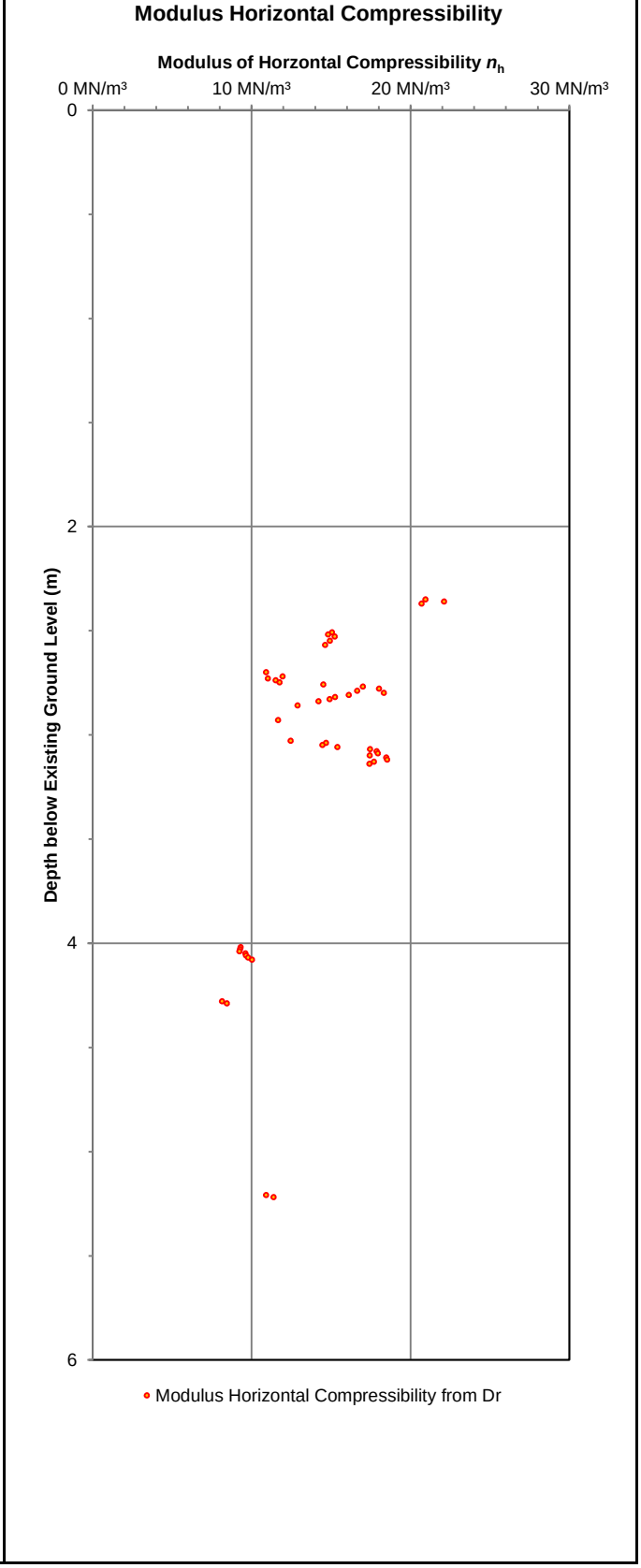


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT104	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444392.07	403984.52	22.70m OD	6.73 m BEGL	22.20m OD



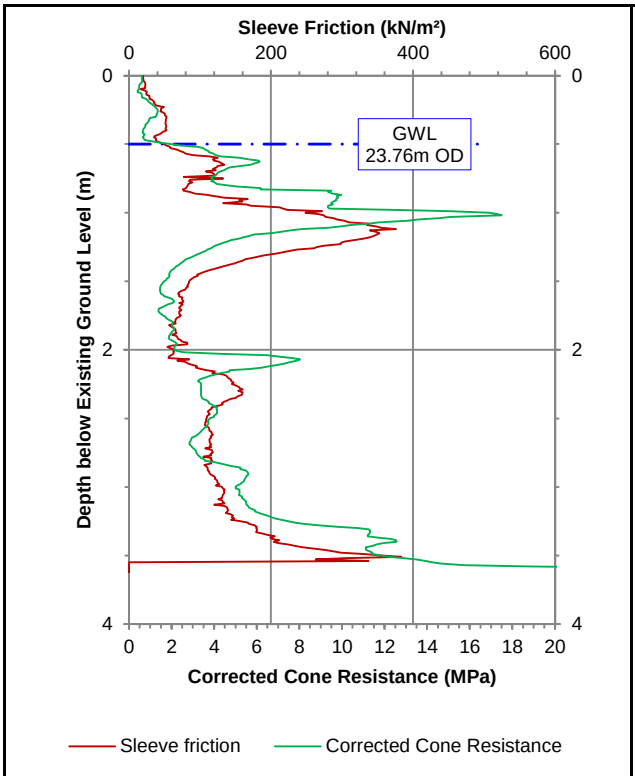


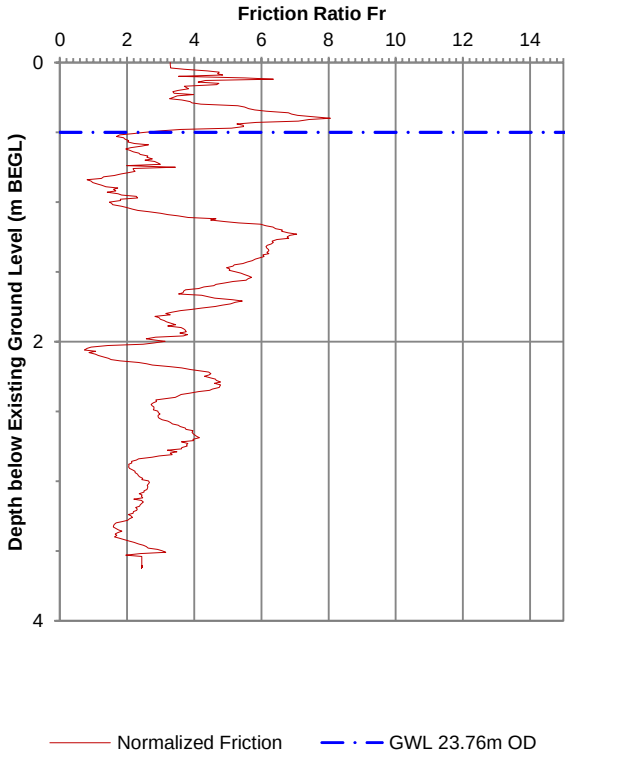
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT104	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444392.07	403984.52	22.70m OD	6.73 m BEGL	22.20m OD

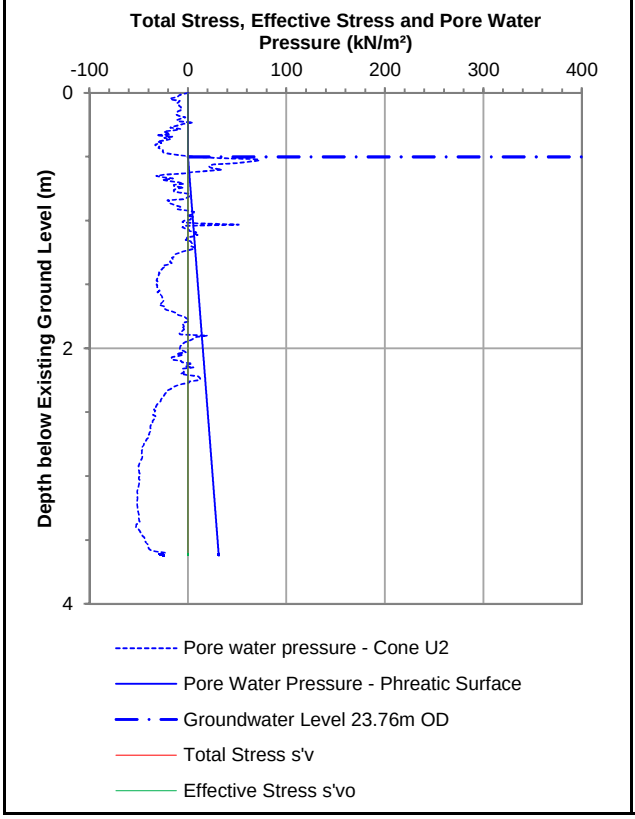
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	0.81 MPa	0.51 MPa	22.70m OD	10	814 kN/m²	1835 kN/m²	0.34
2	1.84 MPa	1.53 MPa	22.60m OD	10	1835 kN/m²	4412 kN/m²	0.25
3	4.41 MPa	3.68 MPa	22.50m OD	10	4412 kN/m²	9853 kN/m²	0.25
4	9.85 MPa	8.21 MPa	22.40m OD	10	9853 kN/m²	10429 kN/m²	0.25
5	10.43 MPa	8.69 MPa	22.30m OD	10	10429 kN/m²	11579 kN/m²	0.25
6	11.58 MPa	9.65 MPa	22.20m OD	10	11579 kN/m²	11330 kN/m²	0.25
7	11.33 MPa	9.44 MPa	22.10m OD	10	11330 kN/m²	8922 kN/m²	0.25
8	8.92 MPa	7.44 MPa	22.00m OD	10	8922 kN/m²	9571 kN/m²	0.25
9	9.57 MPa	7.98 MPa	21.90m OD	10	9571 kN/m²	9692 kN/m²	0.25
10	9.69 MPa	8.08 MPa	21.80m OD	10	9692 kN/m²	6176 kN/m²	0.25
11	6.18 MPa	5.15 MPa	21.70m OD	10	6176 kN/m²	4527 kN/m²	0.25
12	4.53 MPa	3.77 MPa	21.60m OD	10	4527 kN/m²	5058 kN/m²	0.25
13	5.06 MPa	4.21 MPa	21.50m OD	10	5058 kN/m²	4703 kN/m²	0.25
14	4.70 MPa	3.92 MPa	21.40m OD	10	4703 kN/m²	3598 kN/m²	0.25
15	3.60 MPa	2.57 MPa	21.30m OD	10	3598 kN/m²	4926 kN/m²	0.30
16	4.93 MPa	4.10 MPa	21.20m OD	10	4926 kN/m²	6803 kN/m²	0.25
17	6.80 MPa	5.67 MPa	21.10m OD	10	6803 kN/m²	7234 kN/m²	0.25
18	7.23 MPa	6.03 MPa	21.00m OD	10	7234 kN/m²	5117 kN/m²	0.25
19	5.12 MPa	4.26 MPa	20.90m OD	10	5117 kN/m²	6388 kN/m²	0.25
20	6.39 MPa	4.72 MPa	20.80m OD	10	6388 kN/m²	6032 kN/m²	0.30
21	6.03 MPa	5.03 MPa	20.70m OD	10	6032 kN/m²	8695 kN/m²	0.25
22	8.69 MPa	7.25 MPa	20.60m OD	10	8695 kN/m²	10677 kN/m²	0.25
23	10.68 MPa	8.69 MPa	20.50m OD	10	10677 kN/m²	55618 kN/m²	0.26
24	55.62 MPa	41.46 MPa	20.40m OD	10	55618 kN/m²	15534 kN/m²	0.29
25	15.53 MPa	12.56 MPa	20.30m OD	10	15534 kN/m²	42150 kN/m²	0.26
26	42.15 MPa	31.31 MPa	20.20m OD	10	42150 kN/m²	15522 kN/m²	0.30
27	15.52 MPa	11.73 MPa	20.10m OD	10	15522 kN/m²	39968 kN/m²	0.29
28	39.97 MPa	29.69 MPa	20.00m OD	10	39968 kN/m²	33146 kN/m²	0.30
29	33.15 MPa	24.62 MPa	19.90m OD	10	33146 kN/m²	14607 kN/m²	0.30
30	14.61 MPa	11.03 MPa	19.80m OD	10	14607 kN/m²	54210 kN/m²	0.29

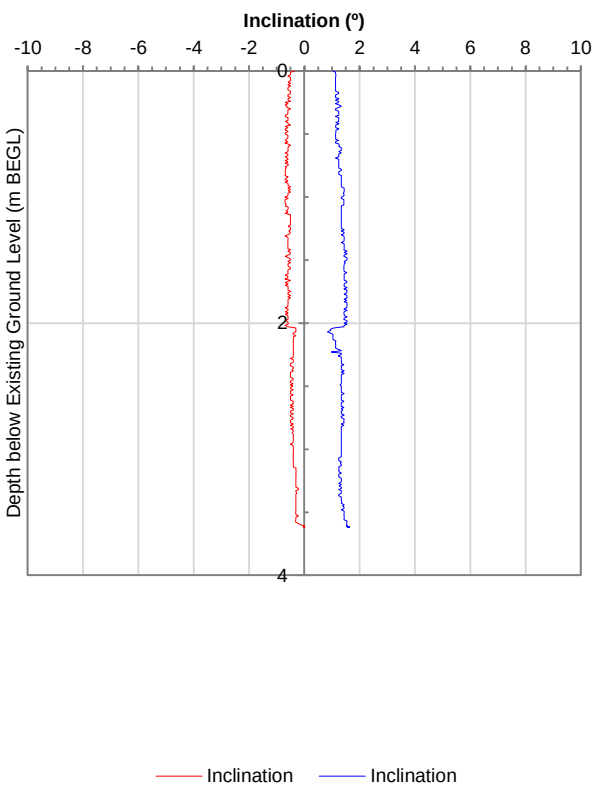
31	54.21 MPa	40.27 MPa	19.70m OD	10	54210 kN/m²	48564 kN/m²	0.30
32	48.56 MPa	36.49 MPa	19.60m OD	10	48564 kN/m²	14053 kN/m²	0.29
33	14.05 MPa	11.71 MPa	19.50m OD	10	14053 kN/m²	22486 kN/m²	0.25
34	22.49 MPa	17.27 MPa	19.40m OD	10	22486 kN/m²	16882 kN/m²	0.29
35	16.88 MPa	14.07 MPa	19.30m OD	10	16882 kN/m²	14120 kN/m²	0.25
36	14.12 MPa	11.77 MPa	19.20m OD	10	14120 kN/m²	11786 kN/m²	0.25
37	11.79 MPa	9.82 MPa	19.10m OD	10	11786 kN/m²	10236 kN/m²	0.25
38	10.24 MPa	8.53 MPa	19.00m OD	10	10236 kN/m²	7332 kN/m²	0.25
39	7.33 MPa	6.11 MPa	18.90m OD	10	7332 kN/m²	9498 kN/m²	0.25
40	9.50 MPa	7.63 MPa	18.80m OD	10	9498 kN/m²	28552 kN/m²	0.27
41	28.55 MPa	21.21 MPa	18.70m OD	10	28552 kN/m²	9370 kN/m²	0.30
42	9.37 MPa	6.96 MPa	18.60m OD	10	9370 kN/m²	14088 kN/m²	0.30
43	14.09 MPa	10.47 MPa	18.50m OD	10	14088 kN/m²	8695 kN/m²	0.30
44	8.70 MPa	6.79 MPa	18.40m OD	10	8695 kN/m²	9466 kN/m²	0.28
45	9.47 MPa	7.89 MPa	18.30m OD	10	9466 kN/m²	11771 kN/m²	0.25
46	11.77 MPa	9.69 MPa	18.20m OD	10	11771 kN/m²	13904 kN/m²	0.26
47	13.90 MPa	10.71 MPa	18.10m OD	10	13904 kN/m²	10104 kN/m²	0.28
48	10.10 MPa	8.42 MPa	18.00m OD	10	10104 kN/m²	11085 kN/m²	0.25
49	11.09 MPa	9.24 MPa	17.90m OD	10	11085 kN/m²	11187 kN/m²	0.25
50	11.19 MPa	9.32 MPa	17.80m OD	10	11187 kN/m²	9863 kN/m²	0.25
51	9.86 MPa	8.22 MPa	17.70m OD	10	9863 kN/m²	13708 kN/m²	0.25
52	13.71 MPa	10.75 MPa	17.60m OD	10	13708 kN/m²	22584 kN/m²	0.28
53	22.58 MPa	16.78 MPa	17.50m OD	10	22584 kN/m²	15717 kN/m²	0.30
54	15.72 MPa	12.02 MPa	17.40m OD	10	15717 kN/m²	13870 kN/m²	0.29
55	13.87 MPa	11.56 MPa	17.30m OD	10	13870 kN/m²	11394 kN/m²	0.25
56	11.39 MPa	9.49 MPa	17.20m OD	10	11394 kN/m²	6303 kN/m²	0.25
57	6.30 MPa	5.25 MPa	17.10m OD	10	6303 kN/m²	6507 kN/m²	0.25
58	6.51 MPa	5.42 MPa	17.00m OD	10	6507 kN/m²	11520 kN/m²	0.25
59	11.52 MPa	9.51 MPa	16.90m OD	10	11520 kN/m²	30400 kN/m²	0.26
60	30.40 MPa	22.77 MPa	16.80m OD	10	30400 kN/m²	113795 kN/m²	0.30
61	113.80 MPa	84.53 MPa	16.70m OD	10	113795 kN/m²	124638 kN/m²	0.30
62	124.64 MPa	92.59 MPa	16.60m OD	10	124638 kN/m²	124665 kN/m²	0.30
63	124.66 MPa	91.21 MPa	16.50m OD	10	124665 kN/m²	137329 kN/m²	0.31
64	137.33 MPa	101.32 MPa	16.40m OD	10	137329 kN/m²		0.31

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT103	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444022.2	403838.11	24.26m OD	3.61 m BEGL	23.76m OD

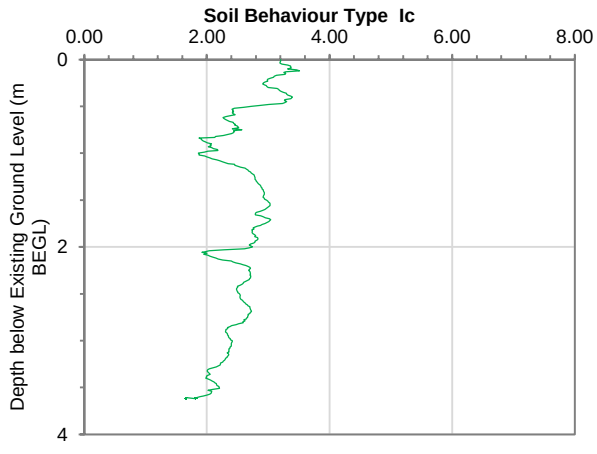


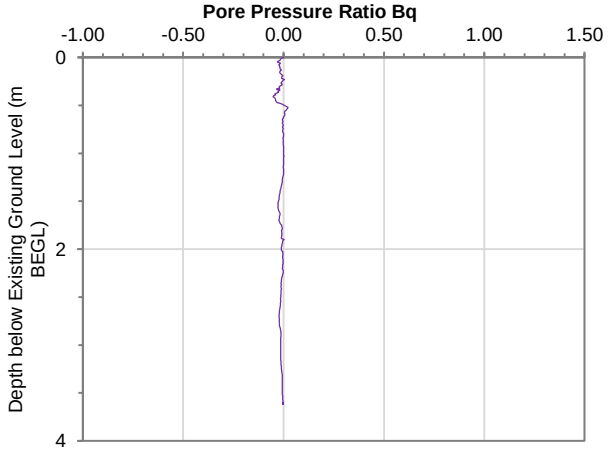


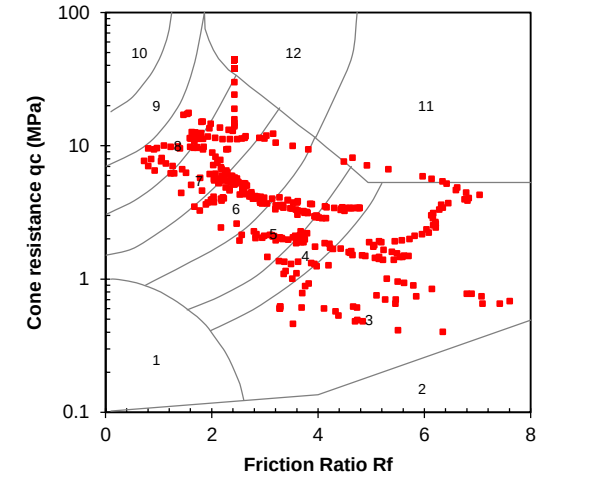




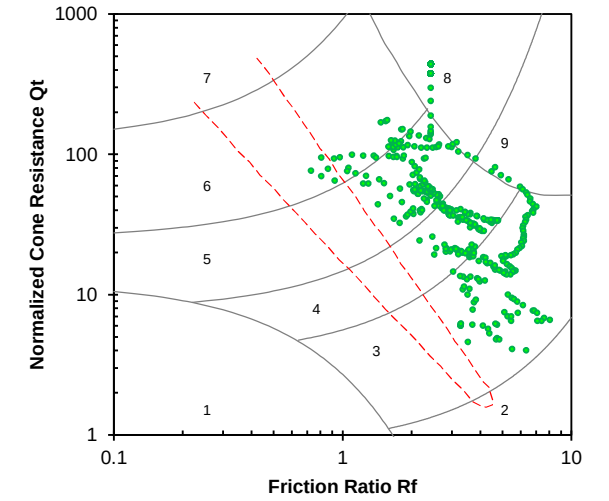
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT105	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444022.2	403838.11	24.26m OD	3.61 m BEGL	23.76m OD



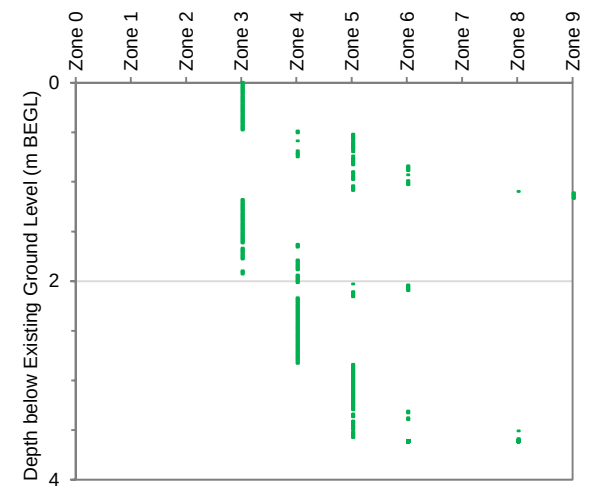




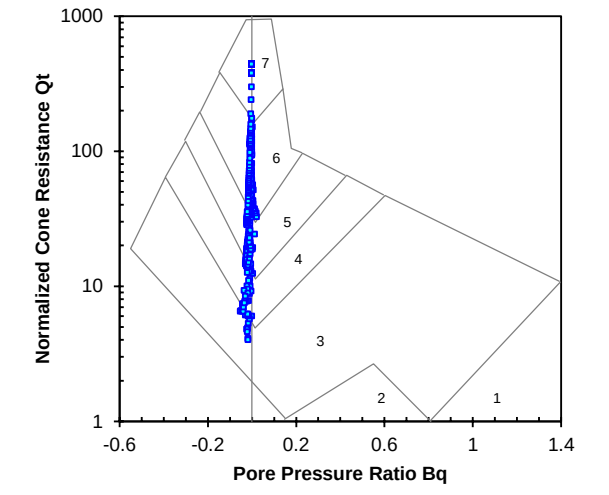
Robertson 1986



Robertson 2015



Robertson 1986 - 2015

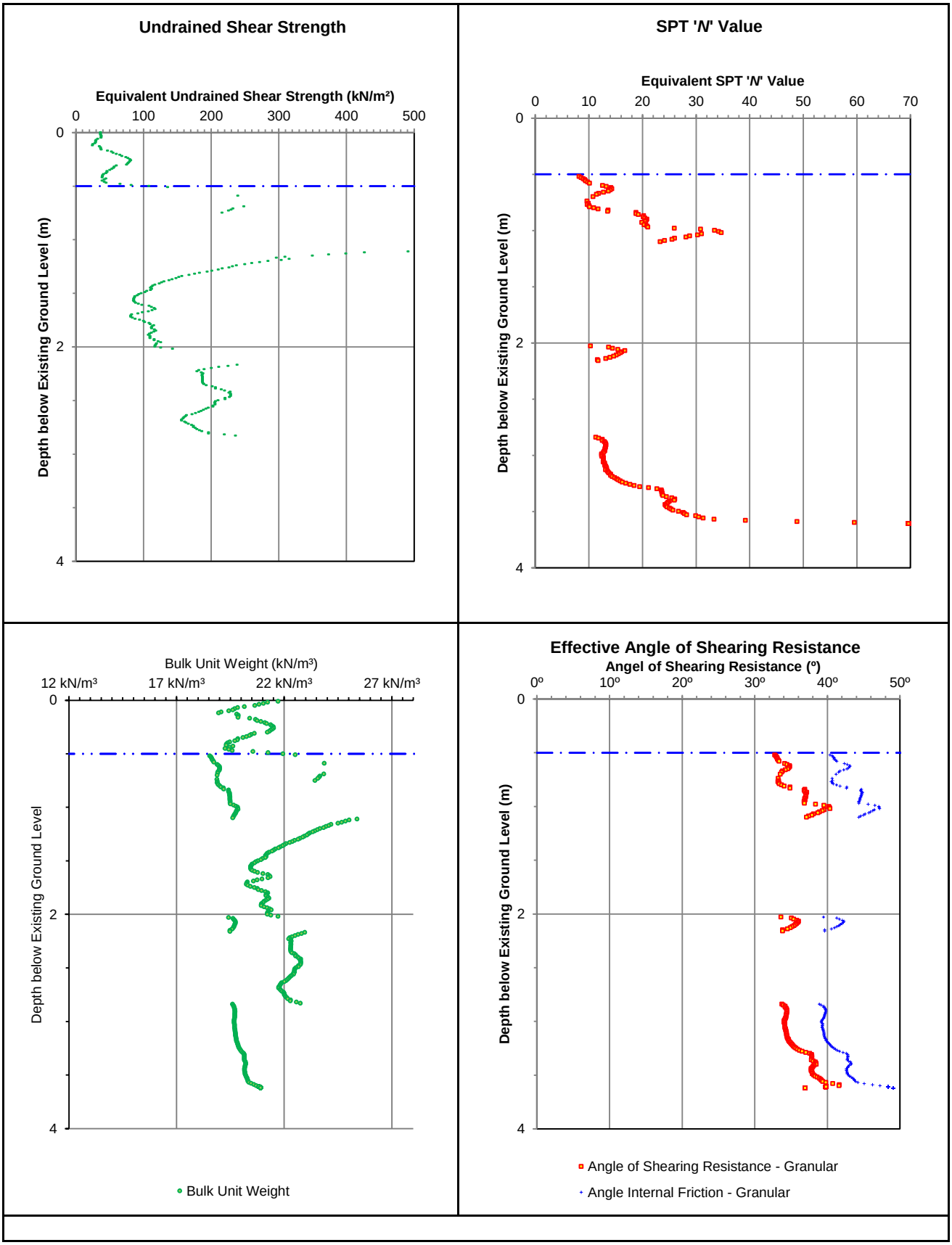


Robertson 2015

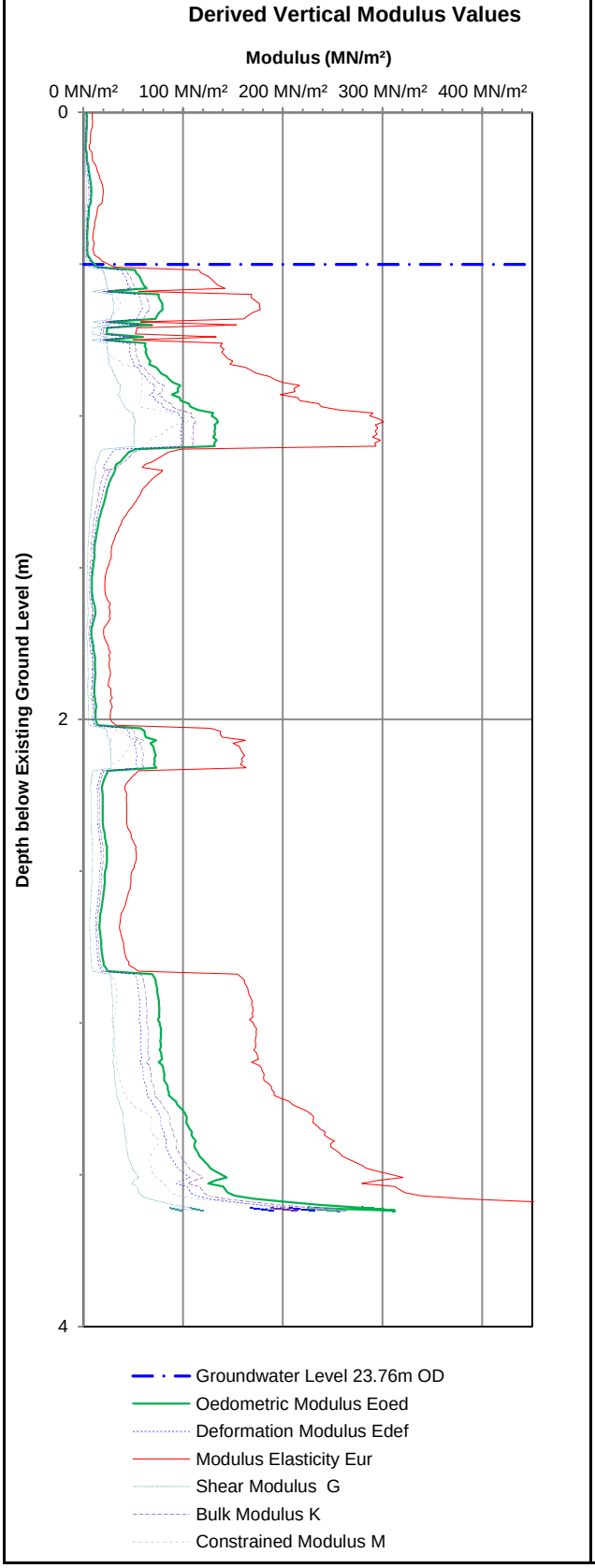
Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

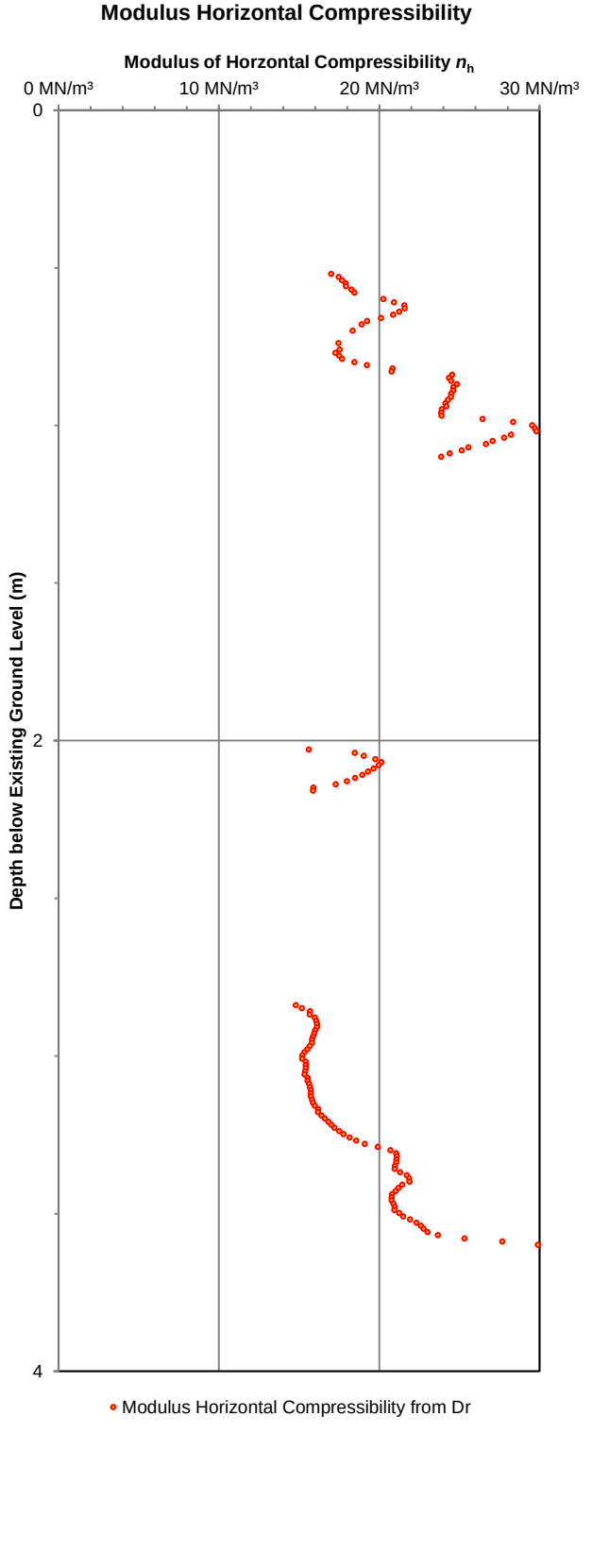
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT105	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444022.2	403838.11	24.26m OD	3.61 m BEGL	23.76m OD



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT105	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444022.2	403838.11	24.26m OD	3.61 m BEGL	23.76m OD



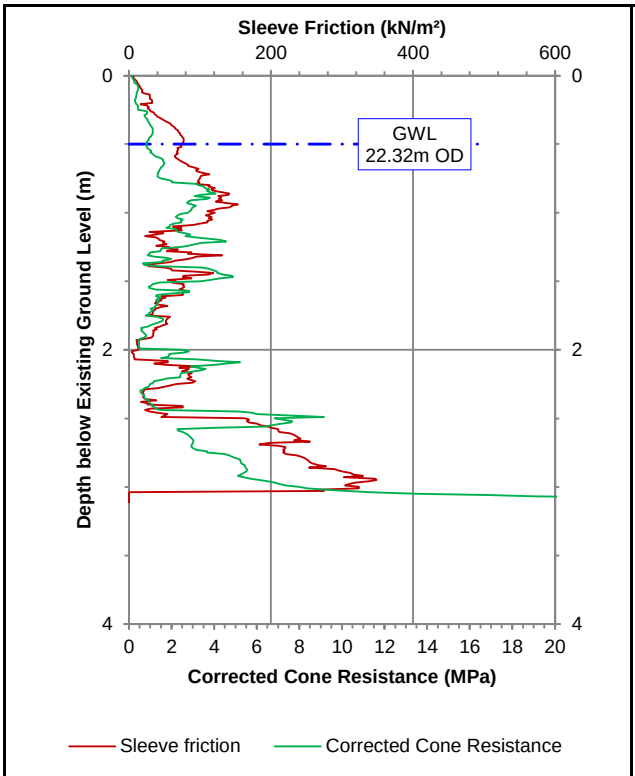


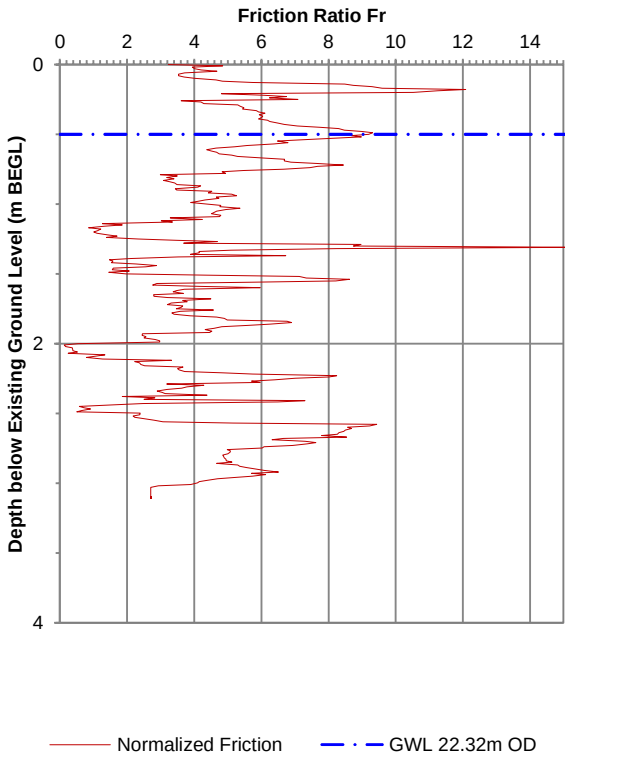
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT105	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444022.2	403838.11	24.26m OD	3.61 m BEGL	23.76m OD

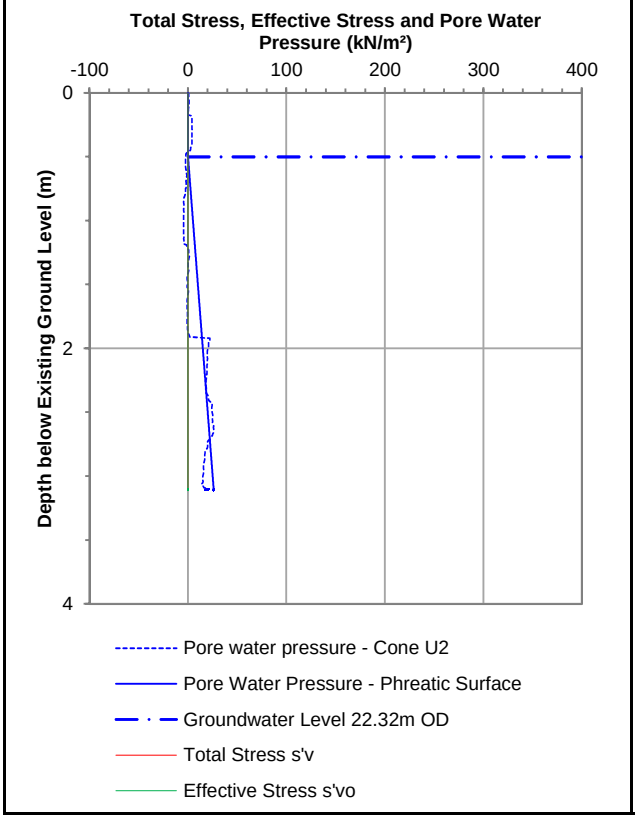
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	3.32 MPa	2.77 MPa	24.26m OD	10	3318 kN/m²	3816 kN/m²	0.25
2	3.82 MPa	3.18 MPa	24.16m OD	10	3816 kN/m²	7514 kN/m²	0.25
3	7.51 MPa	6.26 MPa	24.06m OD	10	7514 kN/m²	4982 kN/m²	0.25
4	4.98 MPa	4.15 MPa	23.96m OD	10	4982 kN/m²	4839 kN/m²	0.25
5	4.84 MPa	3.95 MPa	23.86m OD	10	4839 kN/m²	49050 kN/m²	0.26
6	49.05 MPa	36.44 MPa	23.76m OD	10	49050 kN/m²	70999 kN/m²	0.30
7	71.00 MPa	52.74 MPa	23.66m OD	10	70999 kN/m²	44796 kN/m²	0.30
8	44.80 MPa	33.28 MPa	23.56m OD	10	44796 kN/m²	76003 kN/m²	0.30
9	76.00 MPa	56.46 MPa	23.46m OD	10	76003 kN/m²	103423 kN/m²	0.30
10	103.42 MPa	76.83 MPa	23.36m OD	10	103423 kN/m²	132278 kN/m²	0.30
11	132.28 MPa	98.26 MPa	23.26m OD	10	132278 kN/m²	38332 kN/m²	0.30
12	38.33 MPa	25.34 MPa	23.16m OD	10	38332 kN/m²	23566 kN/m²	0.33
13	23.57 MPa	19.64 MPa	23.06m OD	10	23566 kN/m²	15586 kN/m²	0.25
14	15.59 MPa	12.99 MPa	22.96m OD	10	15586 kN/m²	11237 kN/m²	0.25
15	11.24 MPa	9.36 MPa	22.86m OD	10	11237 kN/m²	8865 kN/m²	0.25
16	8.86 MPa	7.39 MPa	22.76m OD	10	8865 kN/m²	10640 kN/m²	0.25
17	10.64 MPa	8.44 MPa	22.66m OD	10	10640 kN/m²	9758 kN/m²	0.27
18	9.76 MPa	7.92 MPa	22.56m OD	10	9758 kN/m²	11627 kN/m²	0.26
19	11.63 MPa	8.74 MPa	22.46m OD	10	11627 kN/m²	12042 kN/m²	0.30
20	12.04 MPa	9.25 MPa	22.36m OD	10	12042 kN/m²	55210 kN/m²	0.29
21	55.21 MPa	41.01 MPa	22.26m OD	10	55210 kN/m²	52214 kN/m²	0.30
22	52.21 MPa	38.79 MPa	22.16m OD	10	52214 kN/m²	19330 kN/m²	0.30
23	19.33 MPa	14.36 MPa	22.06m OD	10	19330 kN/m²	20399 kN/m²	0.30
24	20.40 MPa	15.15 MPa	21.96m OD	10	20399 kN/m²	23294 kN/m²	0.30
25	23.29 MPa	17.30 MPa	21.86m OD	10	23294 kN/m²	20718 kN/m²	0.30
26	20.72 MPa	15.39 MPa	21.76m OD	10	20718 kN/m²	17153 kN/m²	0.30
27	17.15 MPa	12.74 MPa	21.66m OD	10	17153 kN/m²	18425 kN/m²	0.30
28	18.42 MPa	13.69 MPa	21.56m OD	10	18425 kN/m²	57523 kN/m²	0.30
29	57.52 MPa	42.73 MPa	21.46m OD	10	57523 kN/m²	75797 kN/m²	0.30
30	75.80 MPa	56.31 MPa	21.36m OD	10	75797 kN/m²	77495 kN/m²	0.30

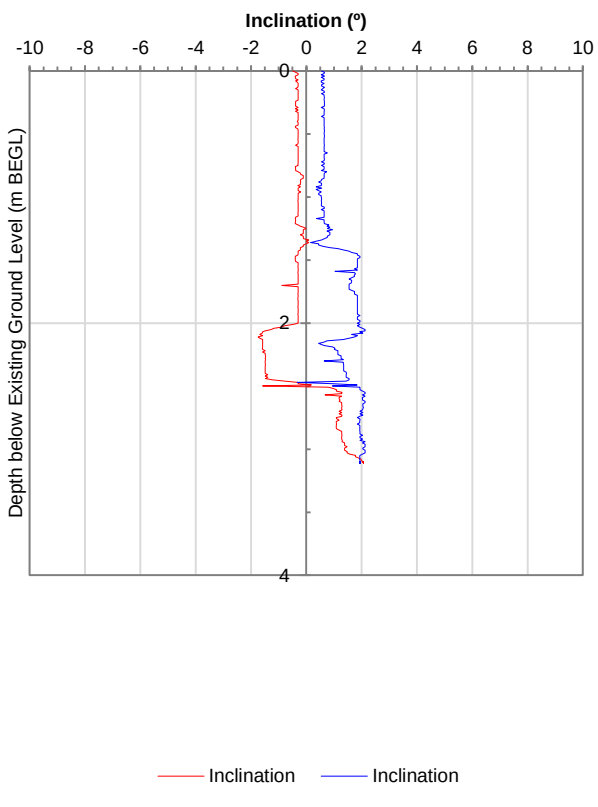
31	77.49 MPa	57.57 MPa	21.26m OD	10	77495 kN/m²	79961 kN/m²	0.30
32	79.96 MPa	59.40 MPa	21.16m OD	10	79961 kN/m²	91658 kN/m²	0.30
33	91.66 MPa	68.09 MPa	21.06m OD	10	91658 kN/m²	107385 kN/m²	0.30
34	107.39 MPa	79.77 MPa	20.96m OD	10	107385 kN/m²	122217 kN/m²	0.30
35	122.22 MPa	90.79 MPa	20.86m OD	10	122217 kN/m²	158846 kN/m²	0.30
36	158.85 MPa	118.00 MPa	20.76m OD	10	158846 kN/m²	253648 kN/m²	0.30
37	253.65 MPa	188.42 MPa	20.66m OD	10	253648 kN/m²		0.30
38			20.56m OD	10			
39			20.46m OD	10			
40			20.36m OD	10			
41			20.26m OD	10			
42			20.16m OD	10			
43			20.06m OD	10			
44			19.96m OD	10			
45			19.86m OD	10			
46			19.76m OD	10			
47			19.66m OD	10			
48			19.56m OD	10			
49			19.46m OD	10			
50			19.36m OD	10			
51			19.26m OD	10			
52			19.16m OD	10			
53			19.06m OD	10			
54			18.96m OD	10			
55			18.86m OD	10			
56			18.76m OD	10			
57			18.66m OD	10			
58			18.56m OD	10			
59			18.46m OD	10			
60			18.36m OD	10			
61			18.26m OD	10			
62			18.16m OD	10			
63			18.06m OD	10			
64			17.96m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444323.66	403873.94	22.82m OD	3.11 m BEGL	22.32m OD

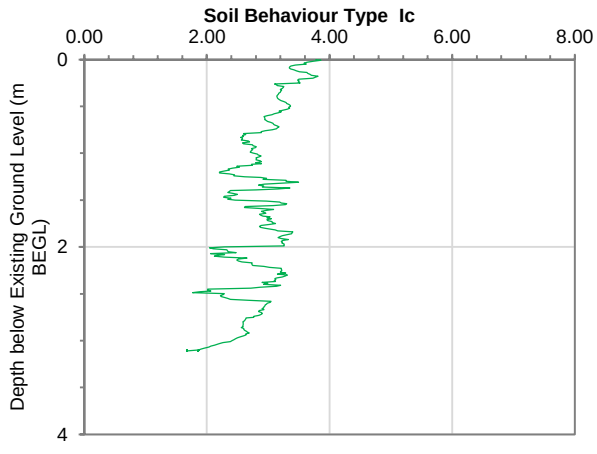


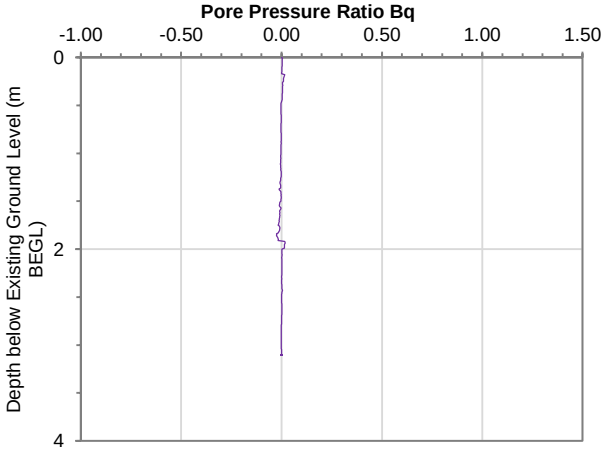


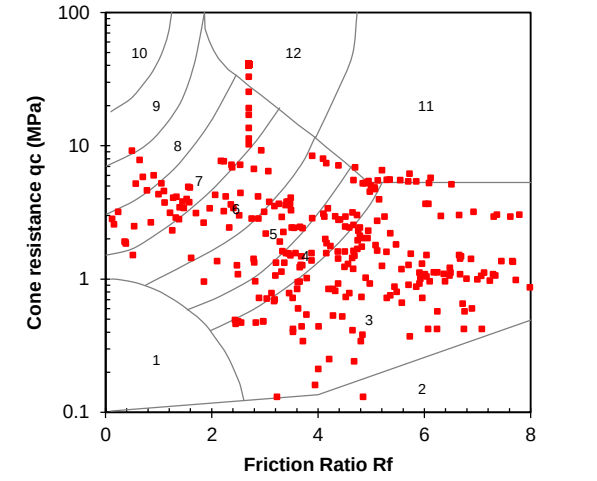




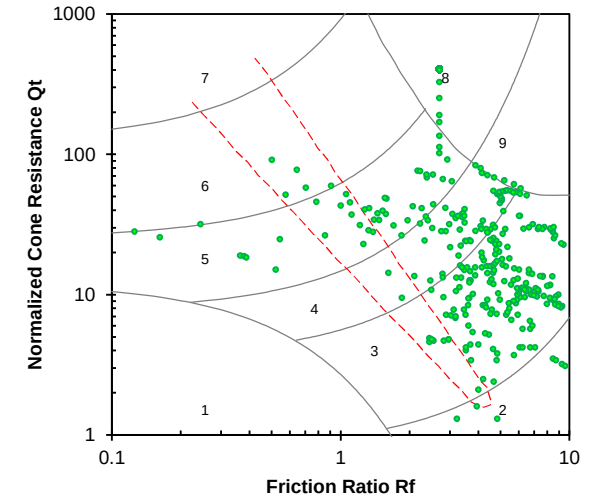
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444323.66	403873.94	22.82m OD	3.11 m BEGL	22.32m OD



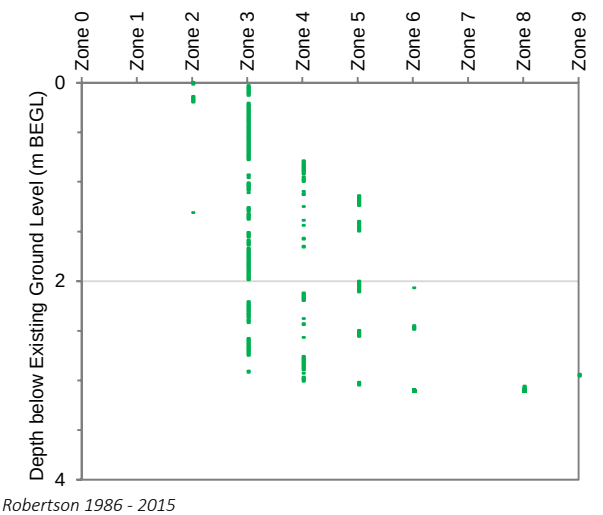




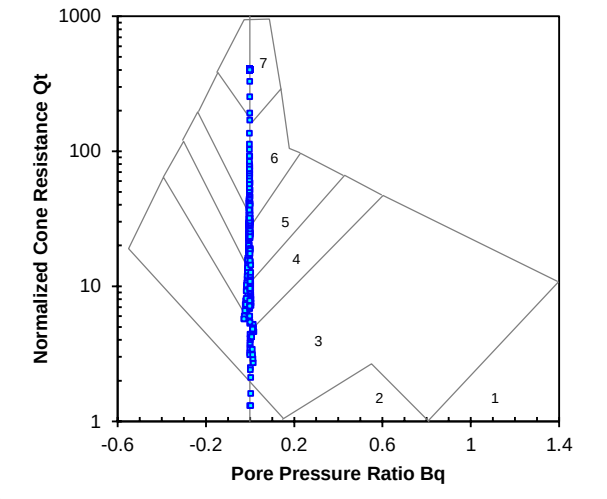
Robertson 1986



Robertson 2015



Robertson 1986 - 2015

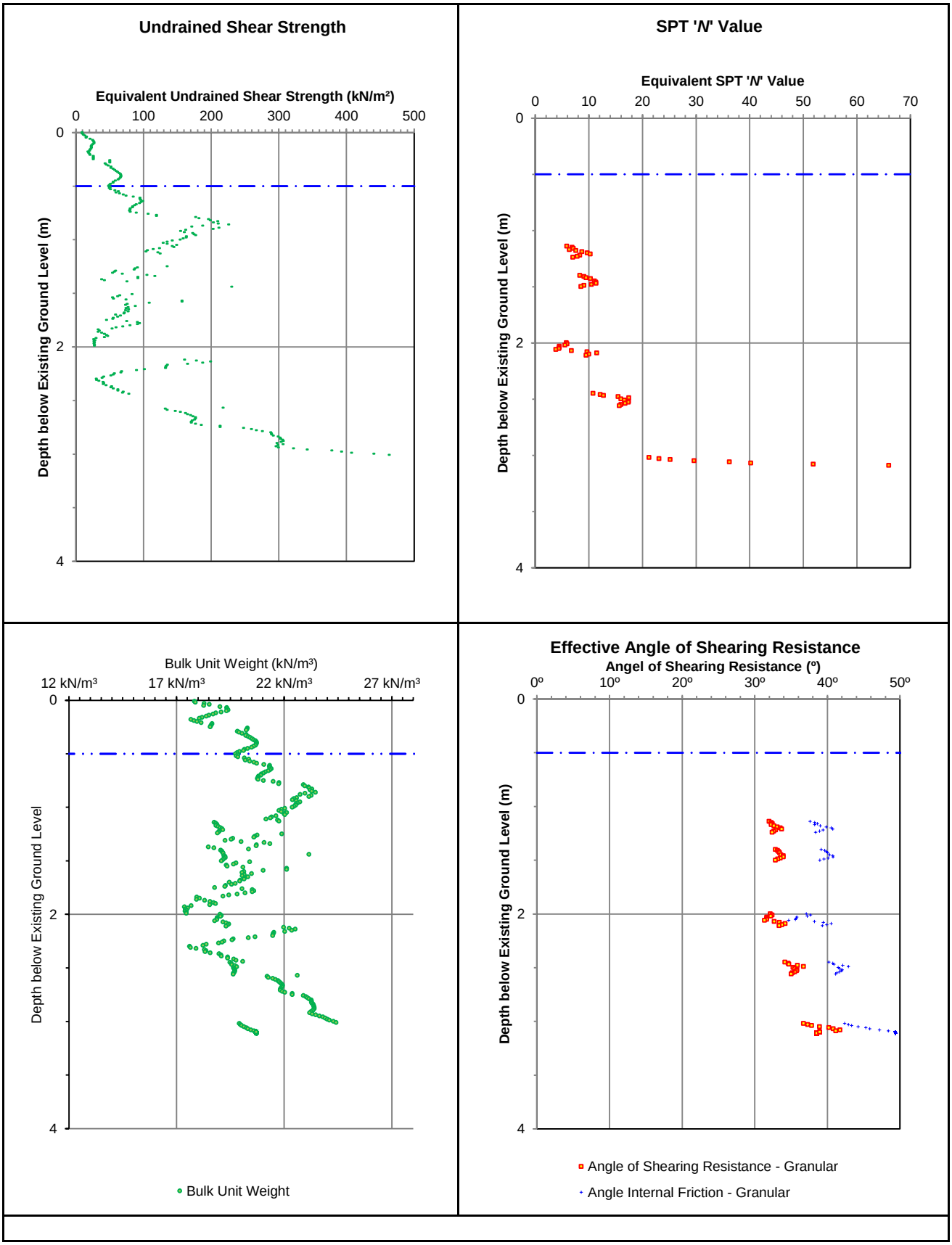


Robertson 2015

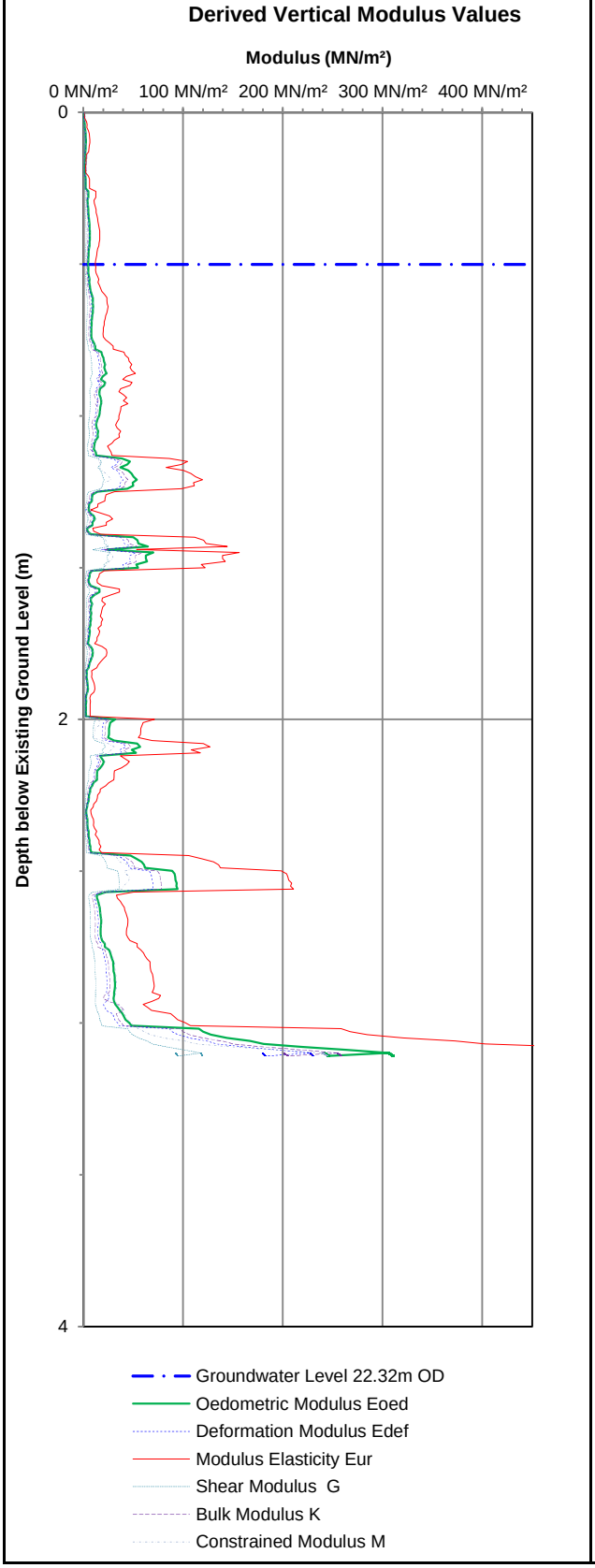
Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

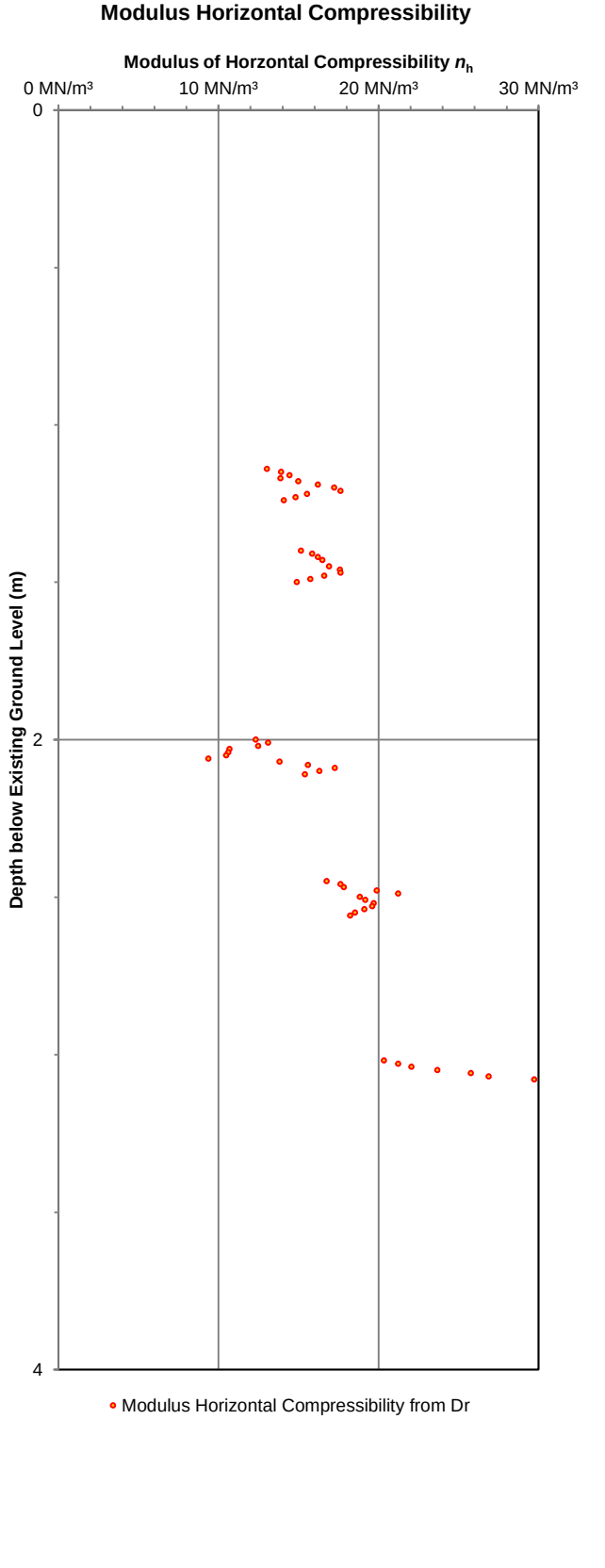
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444323.66	403873.94	22.82m OD	3.11 m BEGL	22.32m OD



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444323.66	403873.94	22.82m OD	3.11 m BEGL	22.32m OD



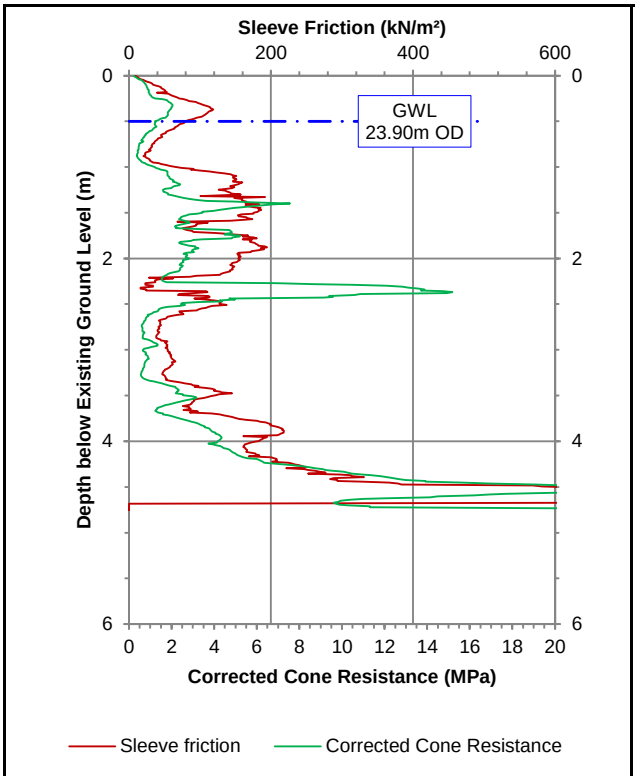


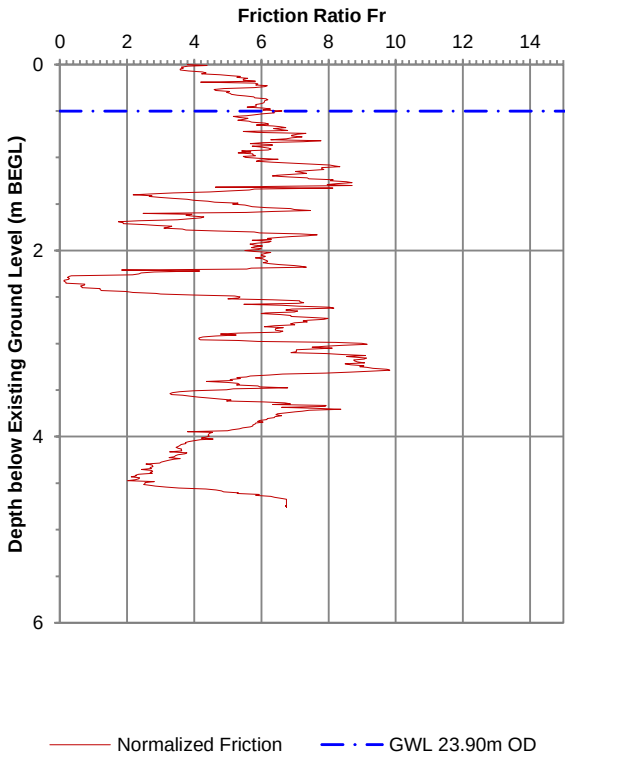
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444323.66	403873.94	22.82m OD	3.11 m BEGL	22.32m OD

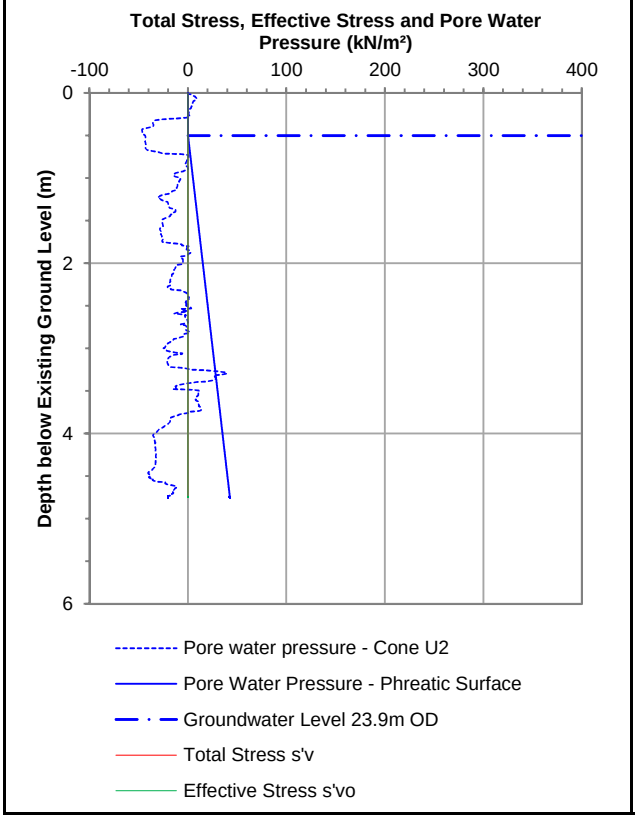
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.71 MPa	1.36 MPa	22.82m OD	10	1713 kN/m²	2038 kN/m²	0.28
2	2.04 MPa	1.23 MPa	22.72m OD	10	2038 kN/m²	3461 kN/m²	0.35
3	3.46 MPa	2.88 MPa	22.62m OD	10	3461 kN/m²	5695 kN/m²	0.25
4	5.69 MPa	4.75 MPa	22.52m OD	10	5695 kN/m²	5842 kN/m²	0.25
5	5.84 MPa	4.87 MPa	22.42m OD	10	5842 kN/m²	5976 kN/m²	0.25
6	5.98 MPa	4.98 MPa	22.32m OD	10	5976 kN/m²	9285 kN/m²	0.25
7	9.29 MPa	7.74 MPa	22.22m OD	10	9285 kN/m²	10438 kN/m²	0.25
8	10.44 MPa	8.51 MPa	22.12m OD	10	10438 kN/m²	20892 kN/m²	0.26
9	20.89 MPa	15.52 MPa	22.02m OD	10	20892 kN/m²	16947 kN/m²	0.30
10	16.95 MPa	13.10 MPa	21.92m OD	10	16947 kN/m²	13575 kN/m²	0.28
11	13.58 MPa	11.31 MPa	21.82m OD	10	13575 kN/m²	32906 kN/m²	0.25
12	32.91 MPa	24.55 MPa	21.72m OD	10	32906 kN/m²	27088 kN/m²	0.29
13	27.09 MPa	20.45 MPa	21.62m OD	10	27088 kN/m²	7631 kN/m²	0.28
14	7.63 MPa	6.07 MPa	21.52m OD	10	7631 kN/m²	56723 kN/m²	0.27
15	56.72 MPa	42.14 MPa	21.42m OD	10	56723 kN/m²	9229 kN/m²	0.30
16	9.23 MPa	7.36 MPa	21.32m OD	10	9229 kN/m²	7700 kN/m²	0.26
17	7.70 MPa	6.26 MPa	21.22m OD	10	7700 kN/m²	7097 kN/m²	0.26
18	7.10 MPa	5.91 MPa	21.12m OD	10	7097 kN/m²	4558 kN/m²	0.25
19	4.56 MPa	3.80 MPa	21.02m OD	10	4558 kN/m²	2930 kN/m²	0.25
20	2.93 MPa	2.44 MPa	20.92m OD	10	2930 kN/m²	33068 kN/m²	0.25
21	33.07 MPa	24.56 MPa	20.82m OD	10	33068 kN/m²	20077 kN/m²	0.30
22	20.08 MPa	14.91 MPa	20.72m OD	10	20077 kN/m²	6058 kN/m²	0.30
23	6.06 MPa	5.05 MPa	20.62m OD	10	6058 kN/m²	4600 kN/m²	0.25
24	4.60 MPa	3.79 MPa	20.52m OD	10	4600 kN/m²	39973 kN/m²	0.26
25	39.97 MPa	29.82 MPa	20.42m OD	10	39973 kN/m²	62187 kN/m²	0.29
26	62.19 MPa	46.58 MPa	20.32m OD	10	62187 kN/m²	17153 kN/m²	0.29
27	17.15 MPa	14.29 MPa	20.22m OD	10	17153 kN/m²	23629 kN/m²	0.25
28	23.63 MPa	18.43 MPa	20.12m OD	10	23629 kN/m²	31095 kN/m²	0.28
29	31.10 MPa	23.10 MPa	20.02m OD	10	31095 kN/m²	36375 kN/m²	0.30
30	36.38 MPa	26.34 MPa	19.92m OD	10	36375 kN/m²	256515 kN/m²	0.31

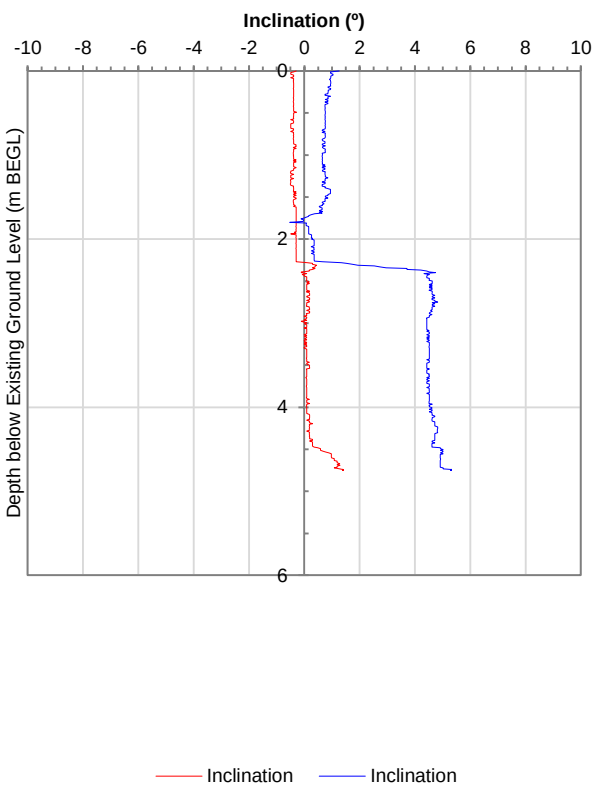
31	256.51 MPa	190.55 MPa	19.82m OD	10	256515 kN/m²	262025 kN/m²	0.30
32	262.02 MPa	194.65 MPa	19.72m OD	10	262025 kN/m²		0.30
33			19.62m OD	10			
34			19.52m OD	10			
35			19.42m OD	10			
36			19.32m OD	10			
37			19.22m OD	10			
38			19.12m OD	10			
39			19.02m OD	10			
40			18.92m OD	10			
41			18.82m OD	10			
42			18.72m OD	10			
43			18.62m OD	10			
44			18.52m OD	10			
45			18.42m OD	10			
46			18.32m OD	10			
47			18.22m OD	10			
48			18.12m OD	10			
49			18.02m OD	10			
50			17.92m OD	10			
51			17.82m OD	10			
52			17.72m OD	10			
53			17.62m OD	10			
54			17.52m OD	10			
55			17.42m OD	10			
56			17.32m OD	10			
57			17.22m OD	10			
58			17.12m OD	10			
59			17.02m OD	10			
60			16.92m OD	10			
61			16.82m OD	10			
62			16.72m OD	10			
63			16.62m OD	10			
64			16.52m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT106	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444006.54	403766.6	24.40m OD	4.74 m BEGL	23.90m OD

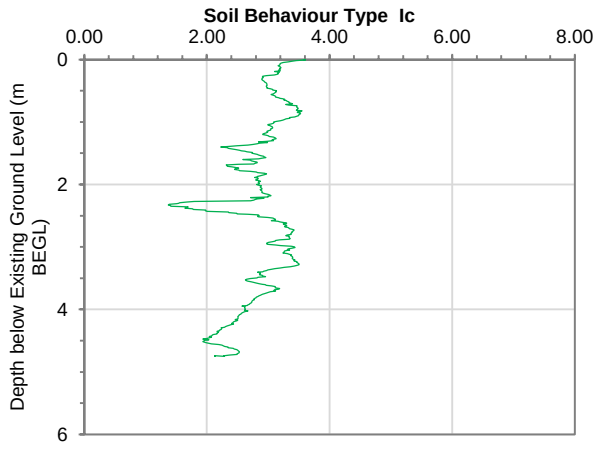


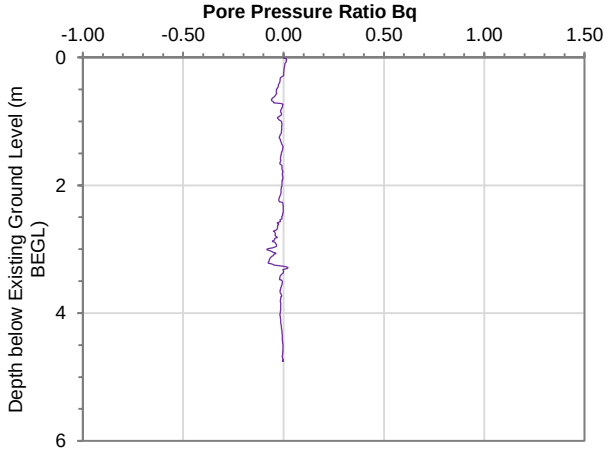


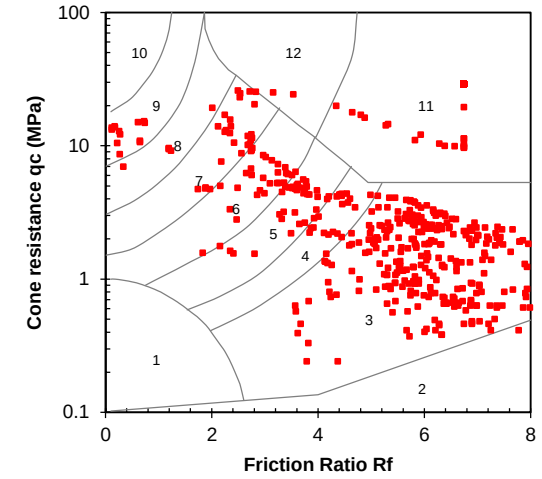




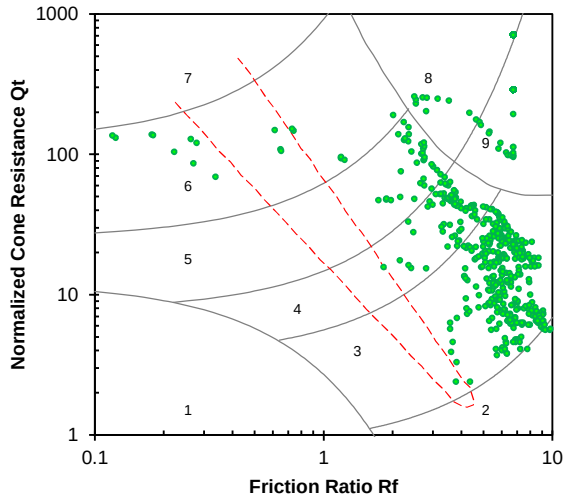
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT107	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444006.54	403766.6	24.40m OD	4.74 m BEGL	23.90m OD



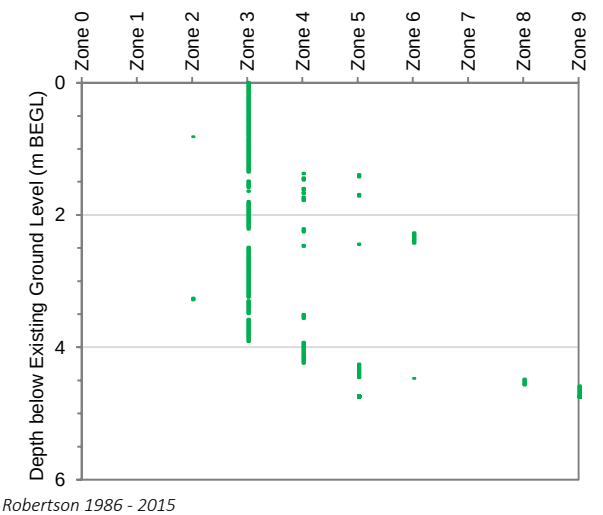




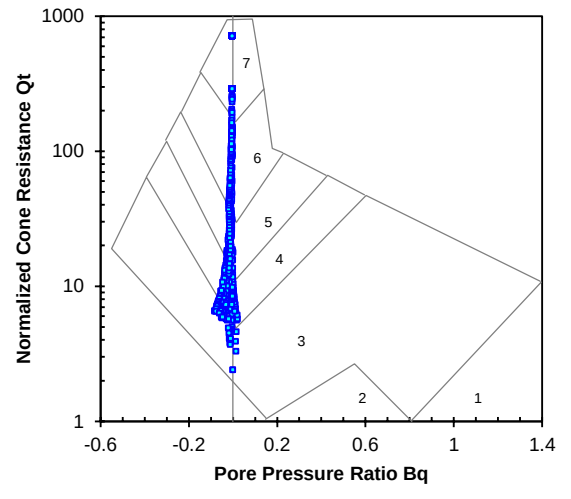
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



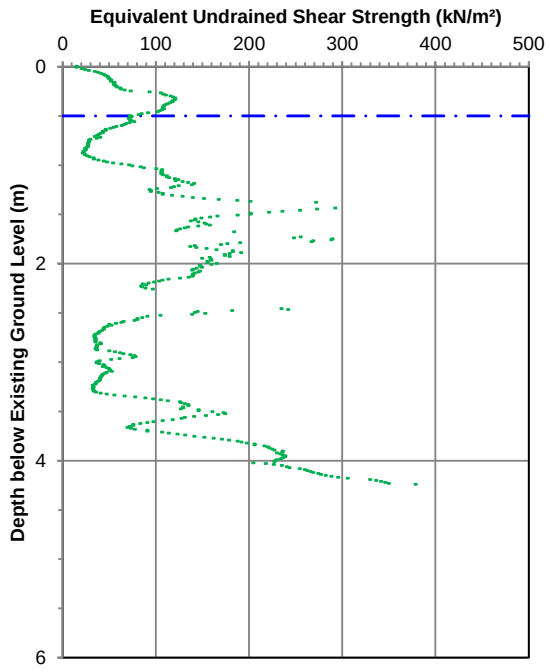
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

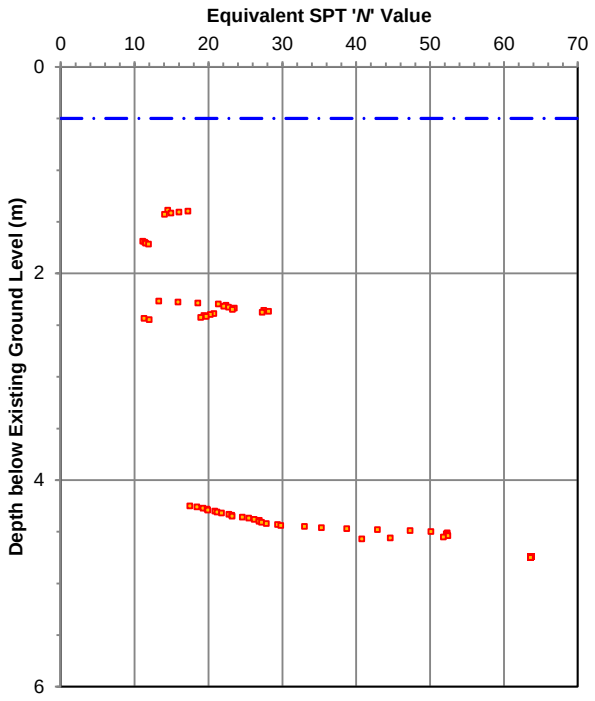
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

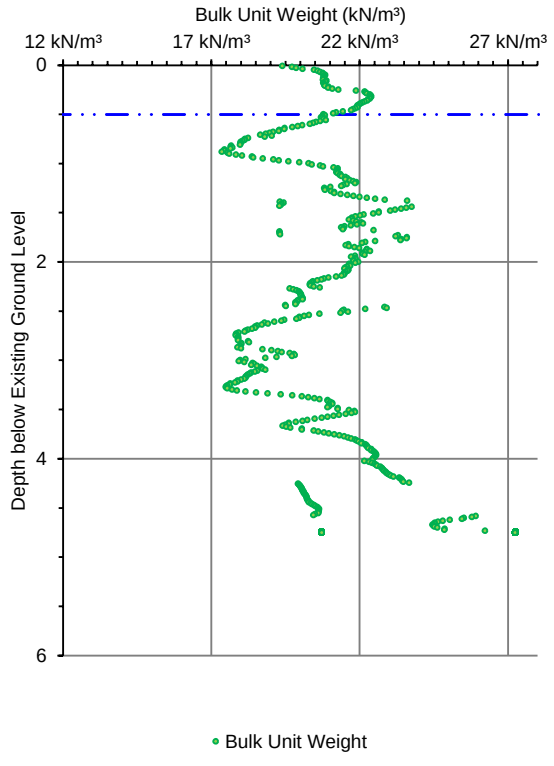
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT107	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444006.54	403766.6	24.40m OD	4.74 m BEGL	23.90m OD

Undrained Shear Strength

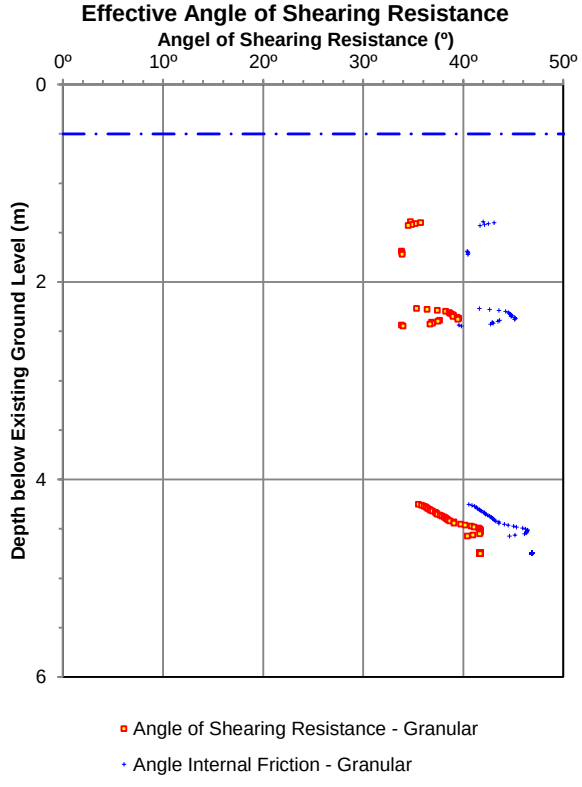


SPT 'N' Value

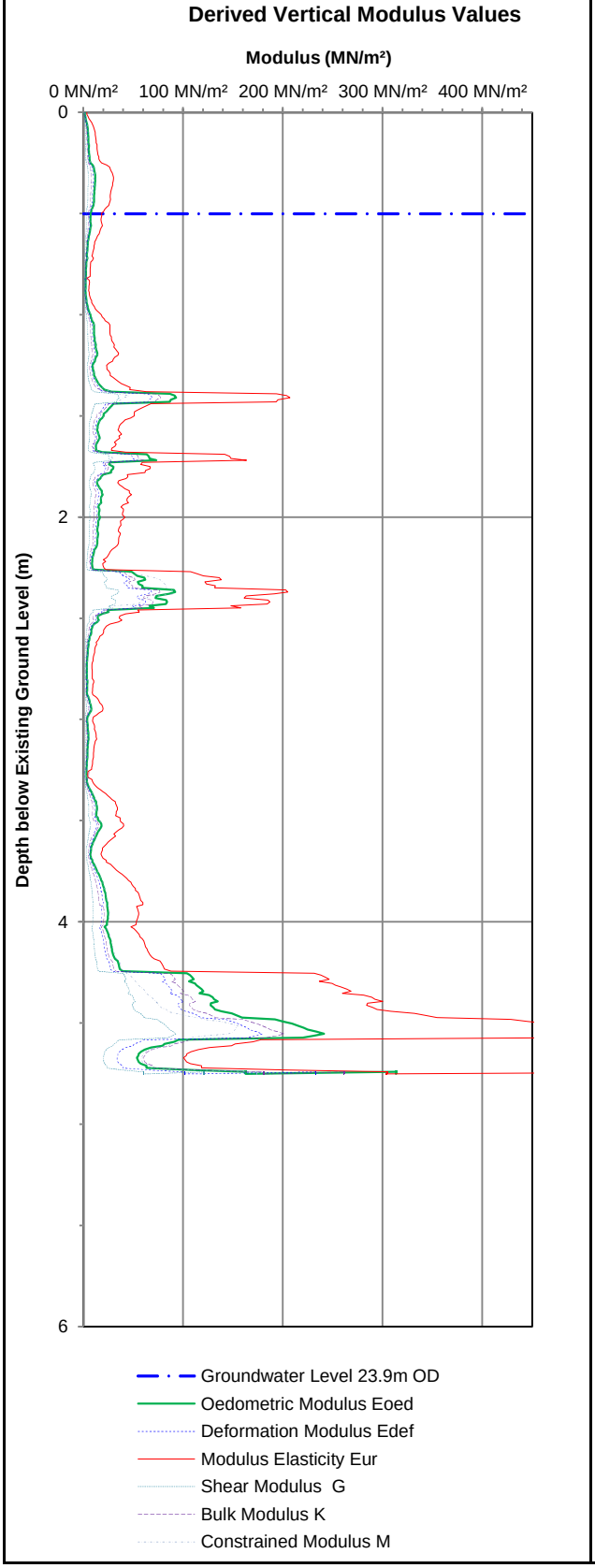


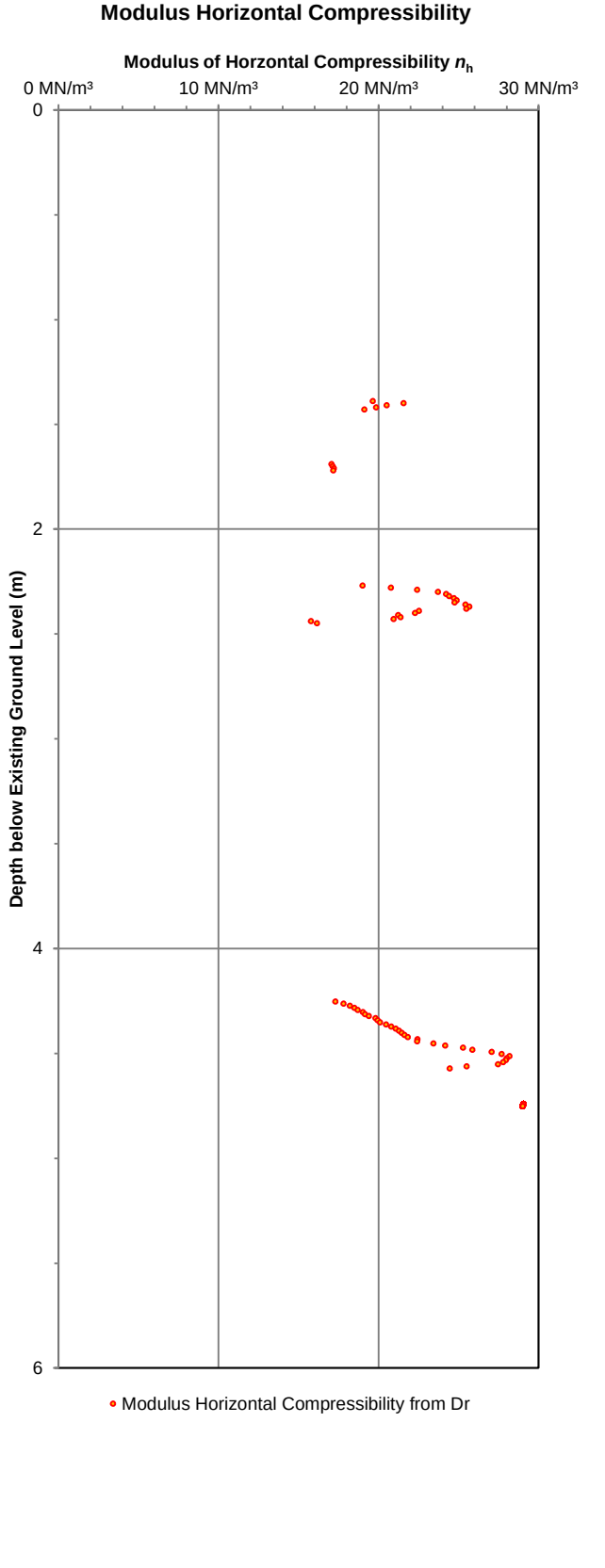


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT107	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444006.54	403766.6	24.40m OD	4.74 m BEGL	23.90m OD



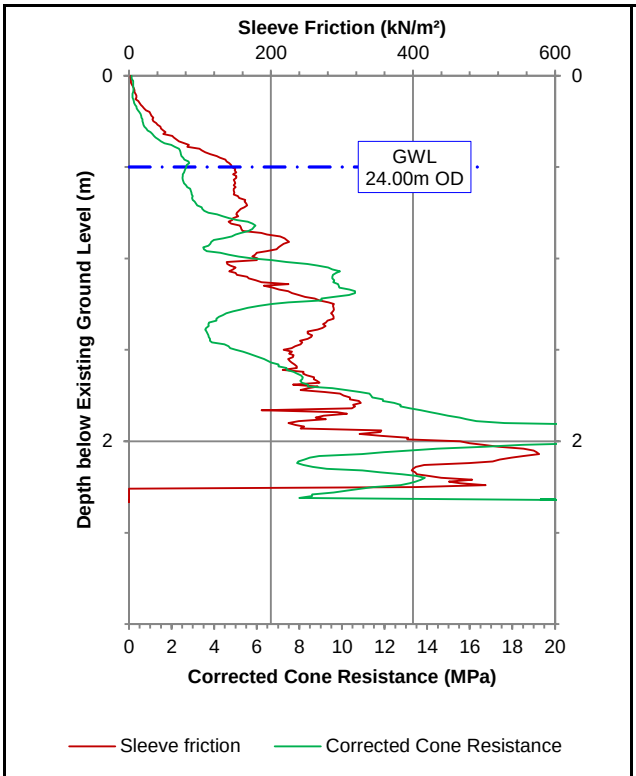


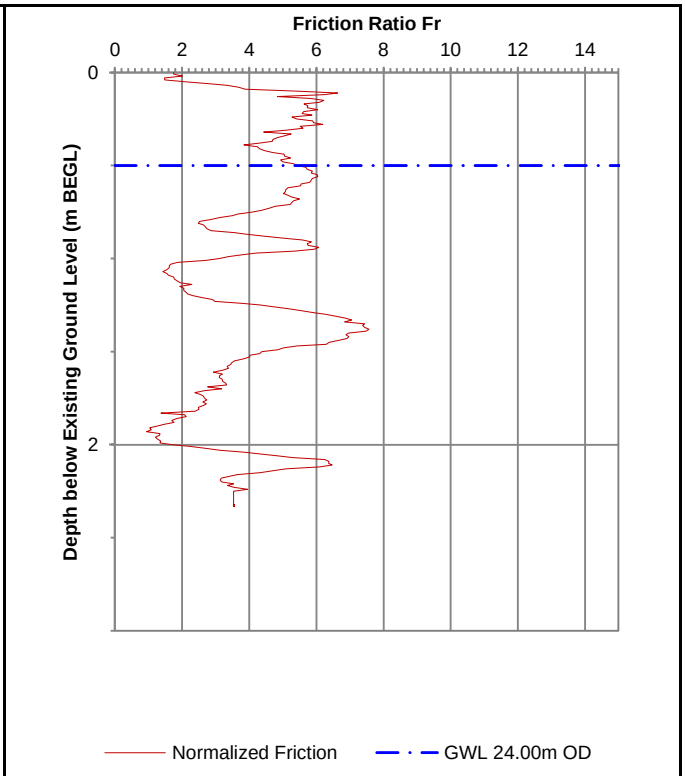
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT107	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444006.54	403766.6	24.40m OD	4.74 m BEGL	23.90m OD

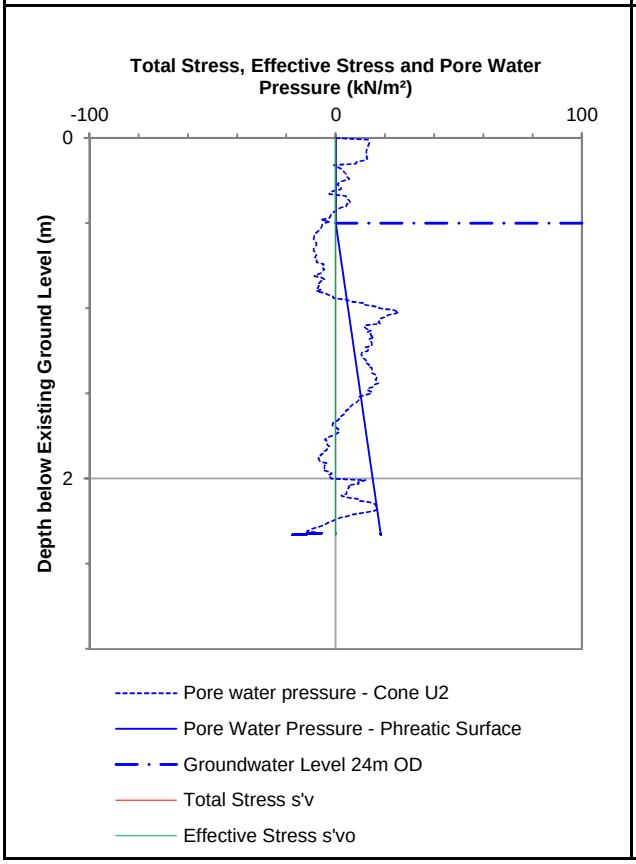
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	3.16 MPa	2.63 MPa	24.40m OD	10	3160 kN/m²	5235 kN/m²	0.25
2	5.23 MPa	4.36 MPa	24.30m OD	10	5235 kN/m²	8214 kN/m²	0.25
3	8.21 MPa	6.85 MPa	24.20m OD	10	8214 kN/m²	11728 kN/m²	0.25
4	11.73 MPa	9.77 MPa	24.10m OD	10	11728 kN/m²	9960 kN/m²	0.25
5	9.96 MPa	8.30 MPa	24.00m OD	10	9960 kN/m²	7176 kN/m²	0.25
6	7.18 MPa	5.98 MPa	23.90m OD	10	7176 kN/m²	4657 kN/m²	0.25
7	4.66 MPa	3.88 MPa	23.80m OD	10	4657 kN/m²	3088 kN/m²	0.25
8	3.09 MPa	2.57 MPa	23.70m OD	10	3088 kN/m²	2372 kN/m²	0.25
9	2.37 MPa	1.88 MPa	23.60m OD	10	2372 kN/m²	4096 kN/m²	0.27
10	4.10 MPa	3.41 MPa	23.50m OD	10	4096 kN/m²	9788 kN/m²	0.25
11	9.79 MPa	8.16 MPa	23.40m OD	10	9788 kN/m²	12384 kN/m²	0.25
12	12.38 MPa	10.32 MPa	23.30m OD	10	12384 kN/m²	10663 kN/m²	0.25
13	10.66 MPa	8.89 MPa	23.20m OD	10	10663 kN/m²	25101 kN/m²	0.25
14	25.10 MPa	19.55 MPa	23.10m OD	10	25101 kN/m²	46705 kN/m²	0.27
15	46.71 MPa	34.90 MPa	23.00m OD	10	46705 kN/m²	15472 kN/m²	0.29
16	15.47 MPa	12.89 MPa	22.90m OD	10	15472 kN/m²	19947 kN/m²	0.25
17	19.95 MPa	15.08 MPa	22.80m OD	10	19947 kN/m²	36406 kN/m²	0.29
18	36.41 MPa	27.04 MPa	22.70m OD	10	36406 kN/m²	16465 kN/m²	0.30
19	16.47 MPa	13.72 MPa	22.60m OD	10	16465 kN/m²	16427 kN/m²	0.25
20	16.43 MPa	13.69 MPa	22.50m OD	10	16427 kN/m²	14817 kN/m²	0.25
21	14.82 MPa	12.35 MPa	22.40m OD	10	14817 kN/m²	12376 kN/m²	0.25
22	12.38 MPa	10.31 MPa	22.30m OD	10	12376 kN/m²	23151 kN/m²	0.25
23	23.15 MPa	17.29 MPa	22.20m OD	10	23151 kN/m²	70334 kN/m²	0.29
24	70.33 MPa	52.25 MPa	22.10m OD	10	70334 kN/m²	48457 kN/m²	0.30
25	48.46 MPa	36.26 MPa	22.00m OD	10	48457 kN/m²	9519 kN/m²	0.29
26	9.52 MPa	7.93 MPa	21.90m OD	10	9519 kN/m²	4714 kN/m²	0.25
27	4.71 MPa	3.93 MPa	21.80m OD	10	4714 kN/m²	3599 kN/m²	0.25
28	3.60 MPa	3.00 MPa	21.70m OD	10	3599 kN/m²	4153 kN/m²	0.25
29	4.15 MPa	3.46 MPa	21.60m OD	10	4153 kN/m²	6305 kN/m²	0.25
30	6.31 MPa	5.25 MPa	21.50m OD	10	6305 kN/m²	4679 kN/m²	0.25

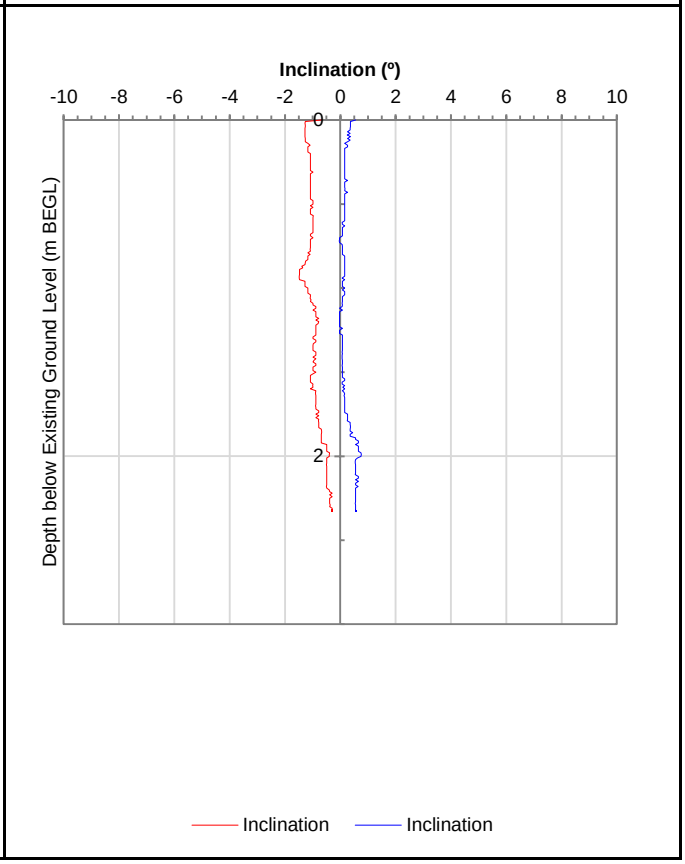
31	4.68 MPa	3.90 MPa	21.40m OD	10	4679 kN/m²	4288 kN/m²	0.25
32	4.29 MPa	3.57 MPa	21.30m OD	10	4288 kN/m²	3430 kN/m²	0.25
33	3.43 MPa	2.38 MPa	21.20m OD	10	3430 kN/m²	7416 kN/m²	0.31
34	7.42 MPa	6.18 MPa	21.10m OD	10	7416 kN/m²	13513 kN/m²	0.25
35	13.51 MPa	11.26 MPa	21.00m OD	10	13513 kN/m²	15081 kN/m²	0.25
36	15.08 MPa	11.53 MPa	20.90m OD	10	15081 kN/m²	8227 kN/m²	0.29
37	8.23 MPa	6.86 MPa	20.80m OD	10	8227 kN/m²	13932 kN/m²	0.25
38	13.93 MPa	11.61 MPa	20.70m OD	10	13932 kN/m²	21305 kN/m²	0.25
39	21.30 MPa	17.75 MPa	20.60m OD	10	21305 kN/m²	24385 kN/m²	0.25
40	24.39 MPa	18.55 MPa	20.50m OD	10	24385 kN/m²	24406 kN/m²	0.29
41	24.41 MPa	18.13 MPa	20.40m OD	10	24406 kN/m²	29750 kN/m²	0.30
42	29.75 MPa	22.10 MPa	20.30m OD	10	29750 kN/m²	71904 kN/m²	0.30
43	71.90 MPa	53.41 MPa	20.20m OD	10	71904 kN/m²	121875 kN/m²	0.30
44	121.87 MPa	90.54 MPa	20.10m OD	10	121875 kN/m²	151043 kN/m²	0.30
45	151.04 MPa	112.20 MPa	20.00m OD	10	151043 kN/m²	198217 kN/m²	0.30
46	198.22 MPa	145.02 MPa	19.90m OD	10	198217 kN/m²	62264 kN/m²	0.31
47	62.26 MPa	38.80 MPa	19.80m OD	10	62264 kN/m²	281624 kN/m²	0.35
48	281.62 MPa	205.10 MPa	19.70m OD	10	281624 kN/m²		0.31
49			19.60m OD	10			
50			19.50m OD	10			
51			19.40m OD	10			
52			19.30m OD	10			
53			19.20m OD	10			
54			19.10m OD	10			
55			19.00m OD	10			
56			18.90m OD	10			
57			18.80m OD	10			
58			18.70m OD	10			
59			18.60m OD	10			
60			18.50m OD	10			
61			18.40m OD	10			
62			18.30m OD	10			
63			18.20m OD	10			
64			18.10m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT108	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444113.39	403815.36	24.50m OD	2.33 m BEGL	24.00m OD

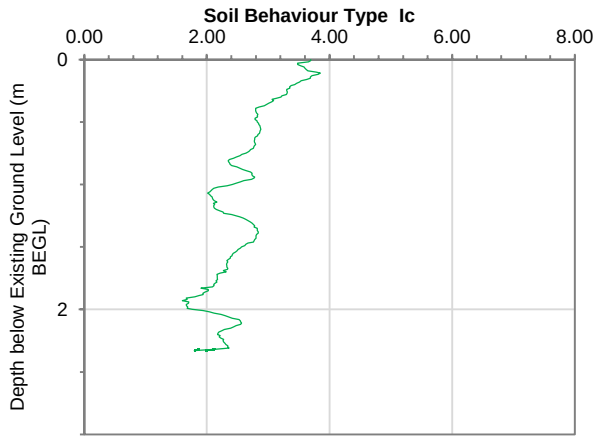


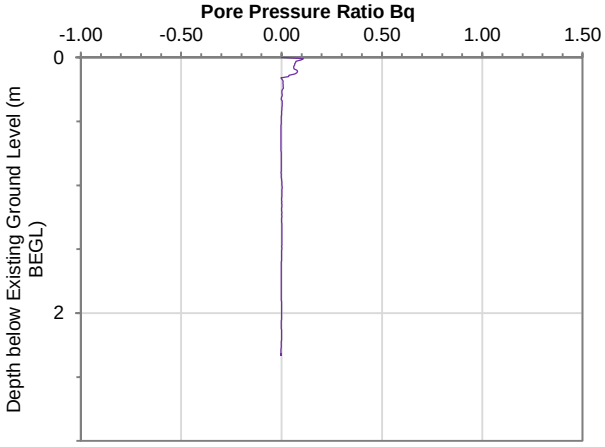


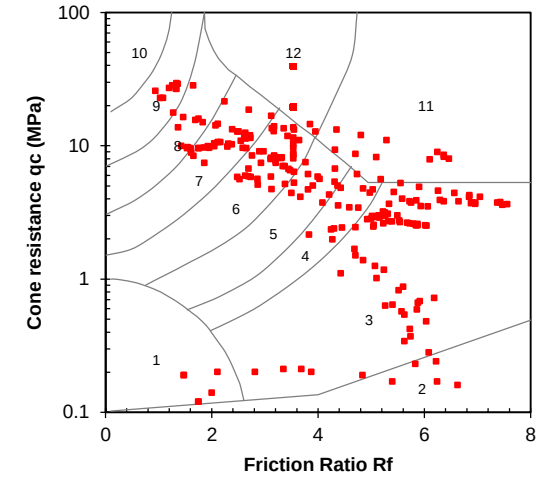




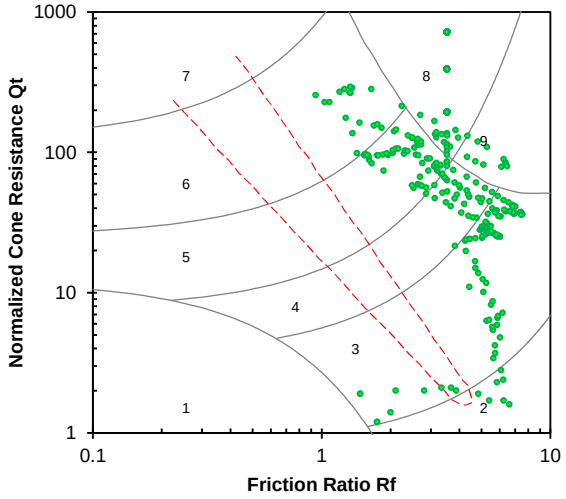
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT108	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444113.39	403815.36	24.50m OD	2.33 m BEGL	24.00m OD



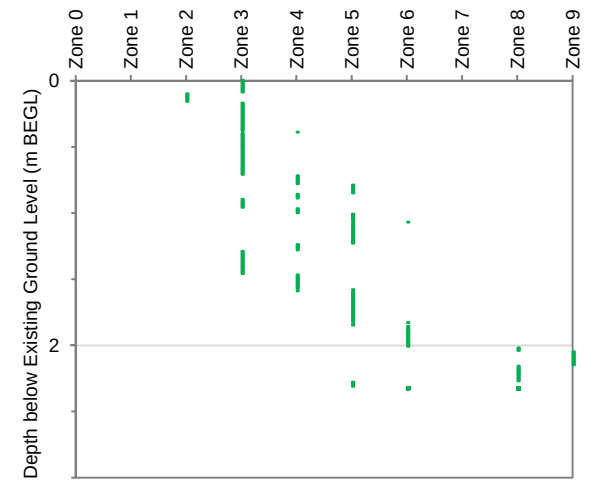




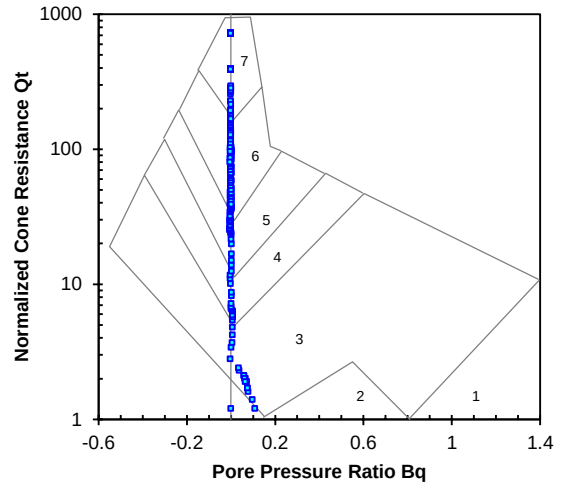
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



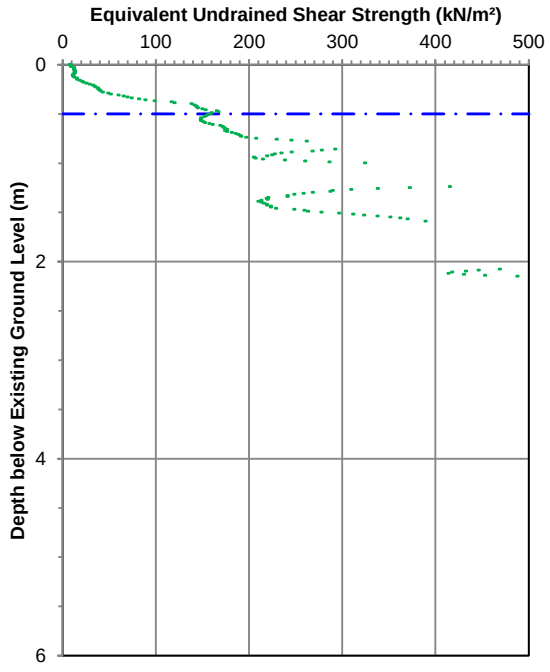
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

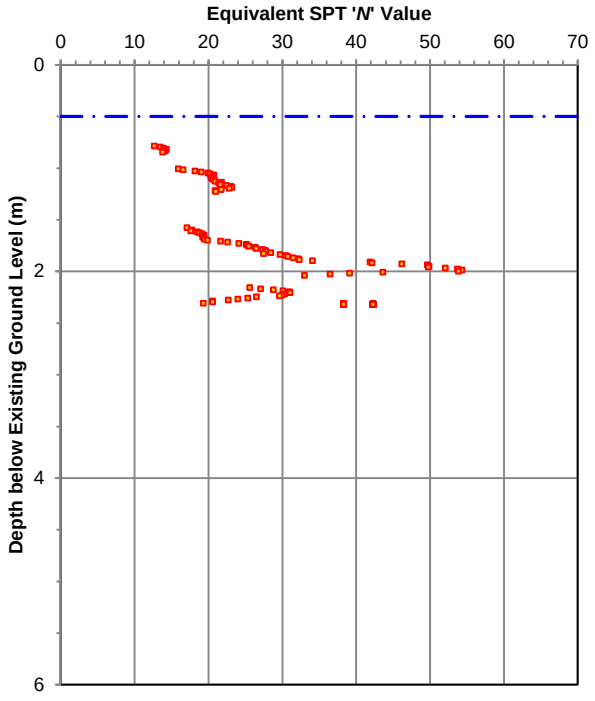
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

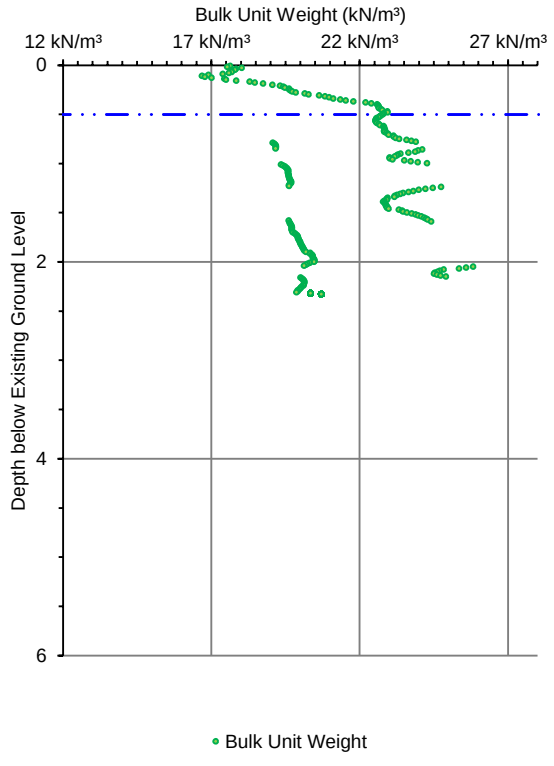
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT108	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444113.39	403815.36	24.50m OD	2.33 m BEGL	24.00m OD

Undrained Shear Strength

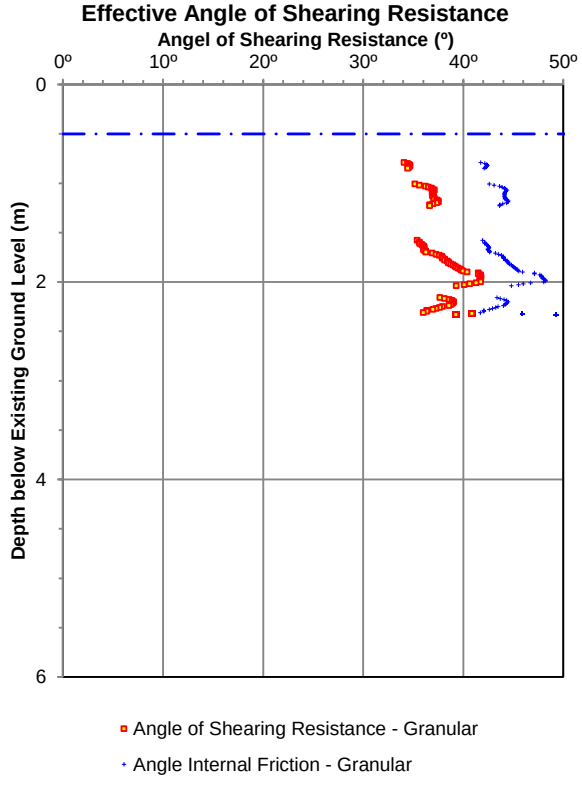


SPT 'N' Value

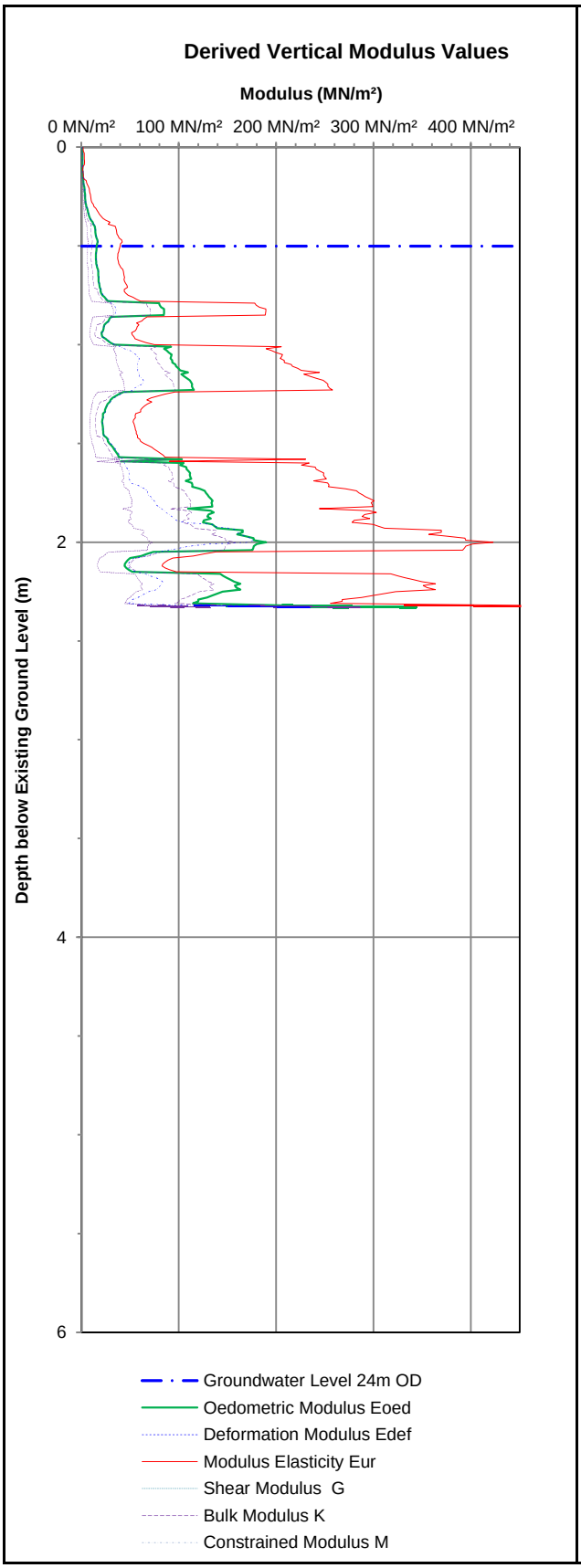


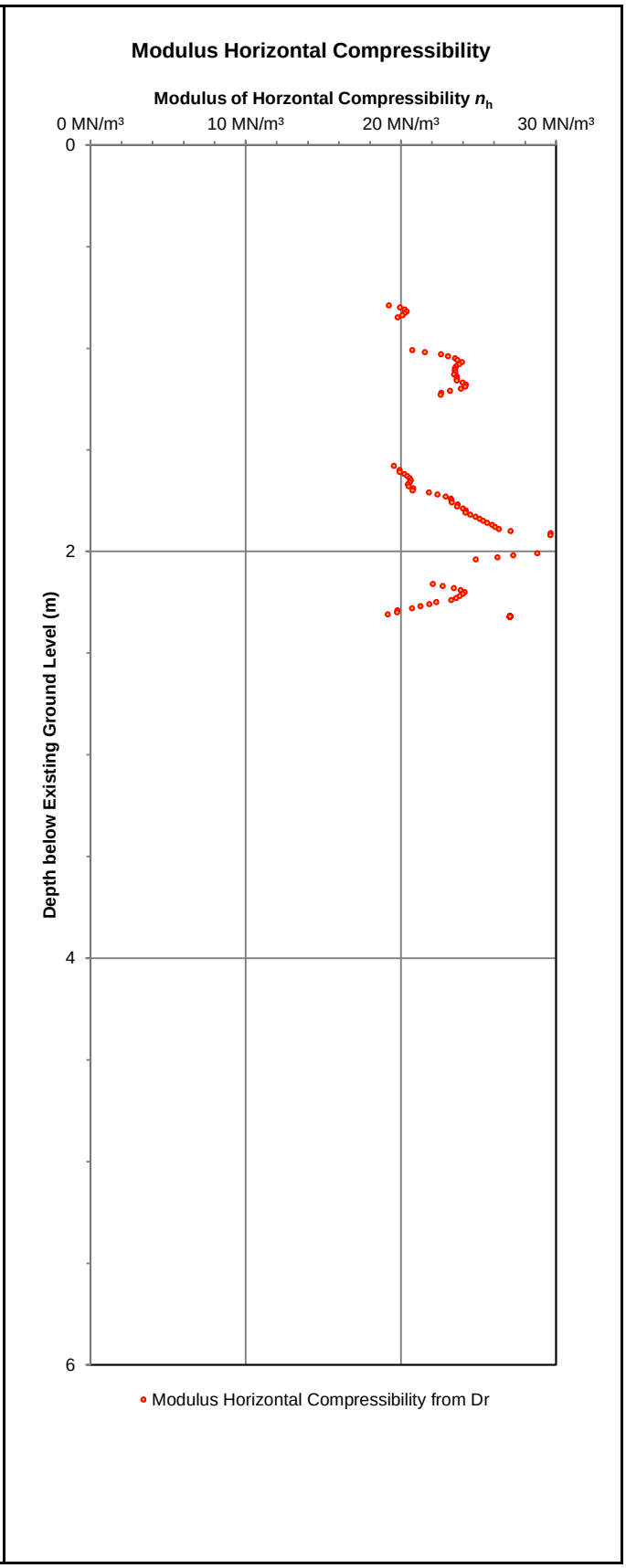


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT108	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444113.39	403815.36	24.50m OD	2.33 m BEGL	24.00m OD

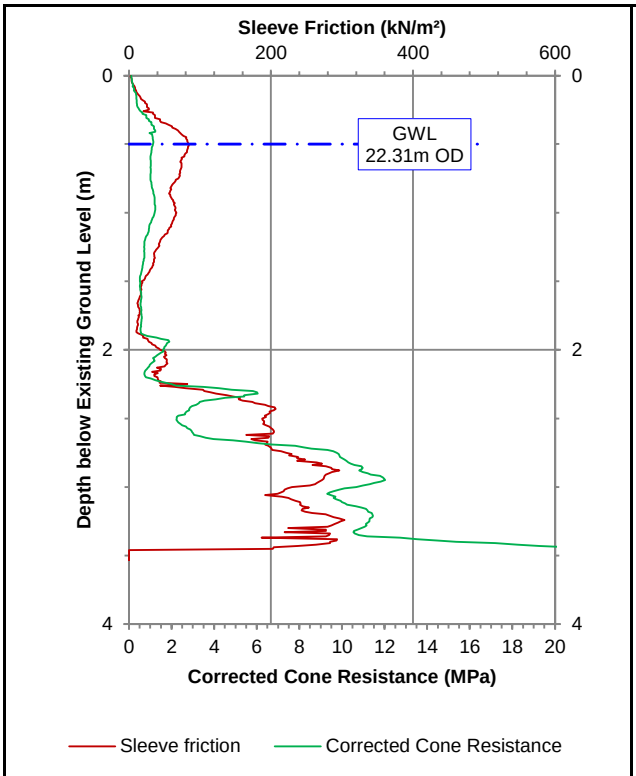


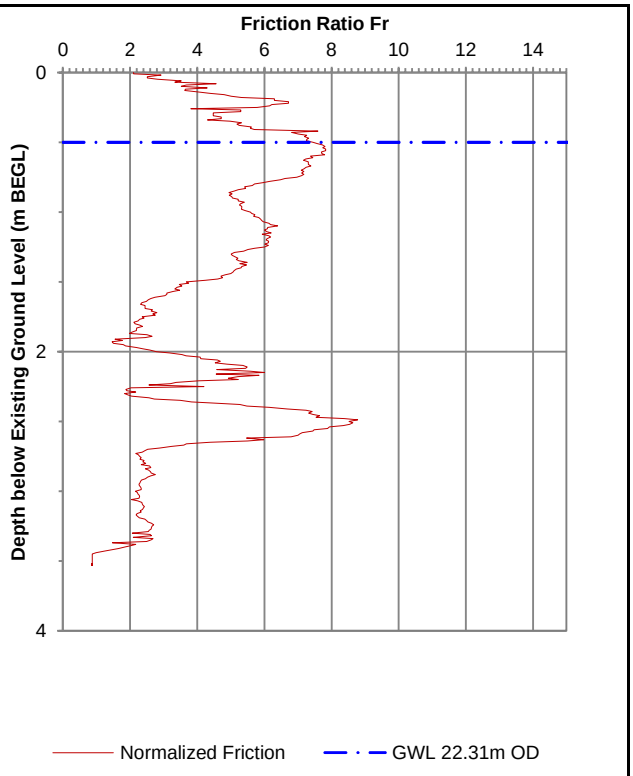


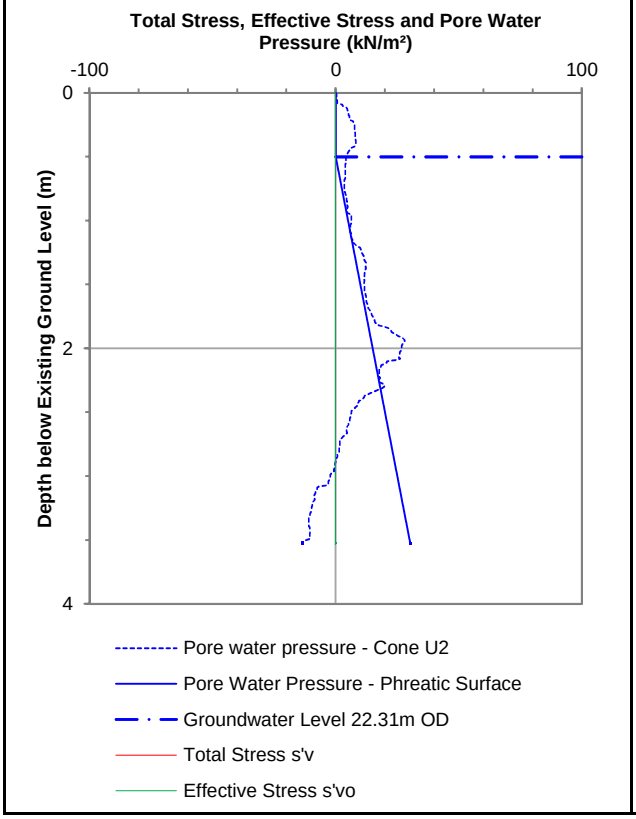
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT108	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444113.39	403815.36	24.50m OD	2.33 m BEGL	24.00m OD
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.09 MPa	0.91 MPa	24.50m OD	10	1094 kN/m²	1603 kN/m²	0.25
2	1.60 MPa	1.02 MPa	24.40m OD	10	1603 kN/m²	3851 kN/m²	0.35
3	3.85 MPa	3.21 MPa	24.30m OD	10	3851 kN/m²	8666 kN/m²	0.25
4	8.67 MPa	7.10 MPa	24.20m OD	10	8666 kN/m²	15288 kN/m²	0.26
5	15.29 MPa	12.74 MPa	24.10m OD	10	15288 kN/m²	15190 kN/m²	0.25
6	15.19 MPa	12.66 MPa	24.00m OD	10	15190 kN/m²	17402 kN/m²	0.25
7	17.40 MPa	14.50 MPa	23.90m OD	10	17402 kN/m²	28536 kN/m²	0.25
8	28.54 MPa	21.39 MPa	23.80m OD	10	28536 kN/m²	59350 kN/m²	0.29
9	59.35 MPa	44.09 MPa	23.70m OD	10	59350 kN/m²	23592 kN/m²	0.30
10	23.59 MPa	18.84 MPa	23.60m OD	10	23592 kN/m²	90894 kN/m²	0.27
11	90.89 MPa	67.52 MPa	23.50m OD	10	90894 kN/m²	105299 kN/m²	0.30
12	105.30 MPa	78.22 MPa	23.40m OD	10	105299 kN/m²	61315 kN/m²	0.30
13	61.31 MPa	45.84 MPa	23.30m OD	10	61315 kN/m²	23229 kN/m²	0.29
14	23.23 MPa	19.36 MPa	23.20m OD	10	23229 kN/m²	23818 kN/m²	0.25
15	23.82 MPa	19.04 MPa	23.10m OD	10	23818 kN/m²	43149 kN/m²	0.27
16	43.15 MPa	32.05 MPa	23.00m OD	10	43149 kN/m²	109151 kN/m²	0.30
17	109.15 MPa	81.08 MPa	22.90m OD	10	109151 kN/m²	125823 kN/m²	0.30
18	125.82 MPa	93.47 MPa	22.80m OD	10	125823 kN/m²	129443 kN/m²	0.30
19	129.44 MPa	96.16 MPa	22.70m OD	10	129443 kN/m²	158333 kN/m²	0.30
20	158.33 MPa	117.62 MPa	22.60m OD	10	158333 kN/m²	112262 kN/m²	0.30
21	112.26 MPa	79.39 MPa	22.50m OD	10	112262 kN/m²	91776 kN/m²	0.33
22	91.78 MPa	65.04 MPa	22.40m OD	10	91776 kN/m²	145745 kN/m²	0.33
23	145.75 MPa	108.27 MPa	22.30m OD	10	145745 kN/m²	227791 kN/m²	0.30
24	227.79 MPa	169.22 MPa	22.20m OD	10	227791 kN/m²		0.30
25			22.10m OD	10			
26			22.00m OD	10			
27			21.90m OD	10			
28			21.80m OD	10			
29			21.70m OD	10			
30			21.60m OD	10			

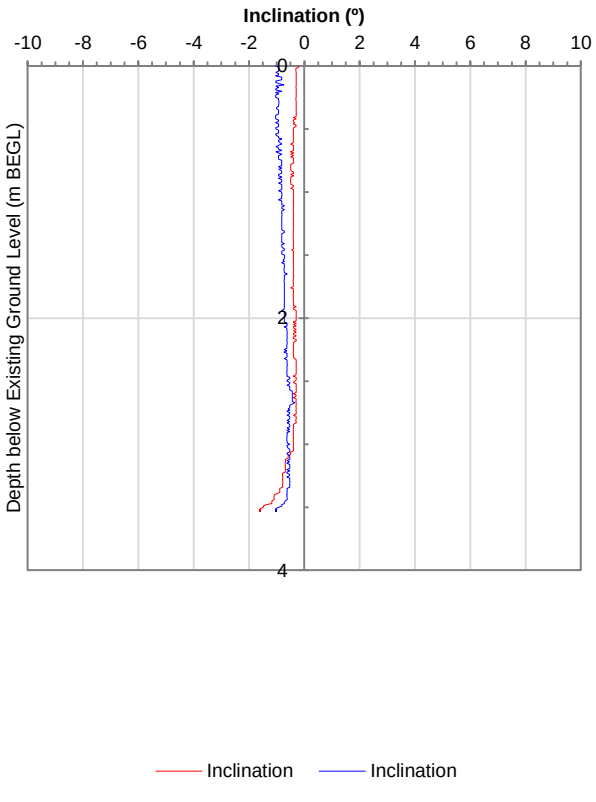
31			21.50m OD	10			
32			21.40m OD	10			
33			21.30m OD	10			
34			21.20m OD	10			
35			21.10m OD	10			
36			21.00m OD	10			
37			20.90m OD	10			
38			20.80m OD	10			
39			20.70m OD	10			
40			20.60m OD	10			
41			20.50m OD	10			
42			20.40m OD	10			
43			20.30m OD	10			
44			20.20m OD	10			
45			20.10m OD	10			
46			20.00m OD	10			
47			19.90m OD	10			
48			19.80m OD	10			
49			19.70m OD	10			
50			19.60m OD	10			
51			19.50m OD	10			
52			19.40m OD	10			
53			19.30m OD	10			
54			19.20m OD	10			
55			19.10m OD	10			
56			19.00m OD	10			
57			18.90m OD	10			
58			18.80m OD	10			
59			18.70m OD	10			
60			18.60m OD	10			
61			18.50m OD	10			
62			18.40m OD	10			
63			18.30m OD	10			
64			18.20m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT109	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	3.53 m BEGL	22.31m OD

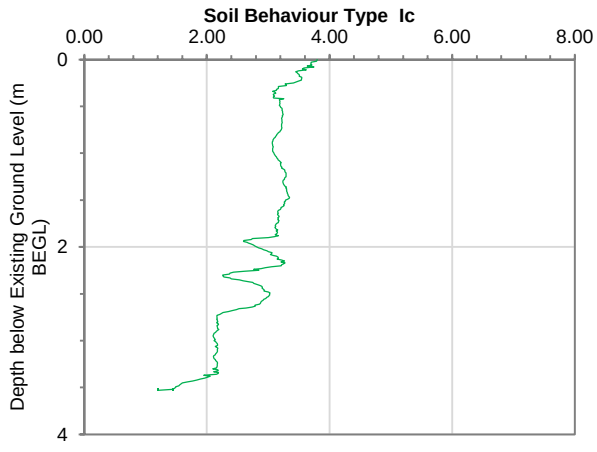


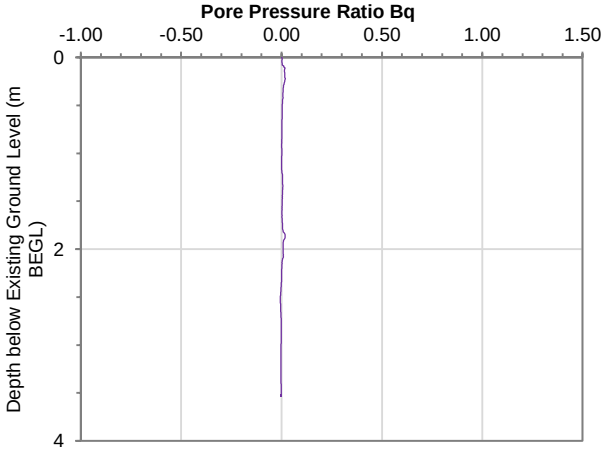


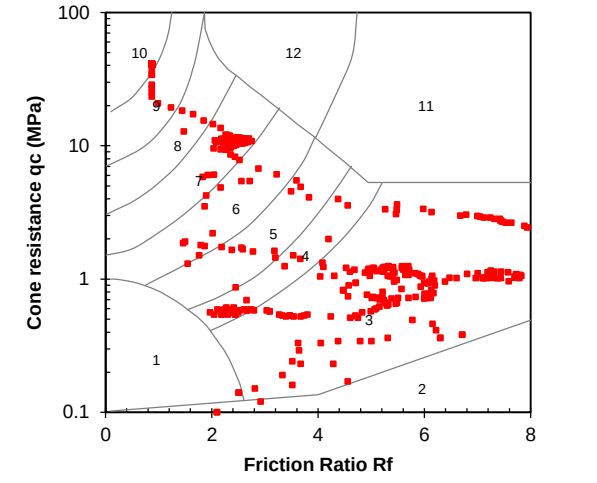




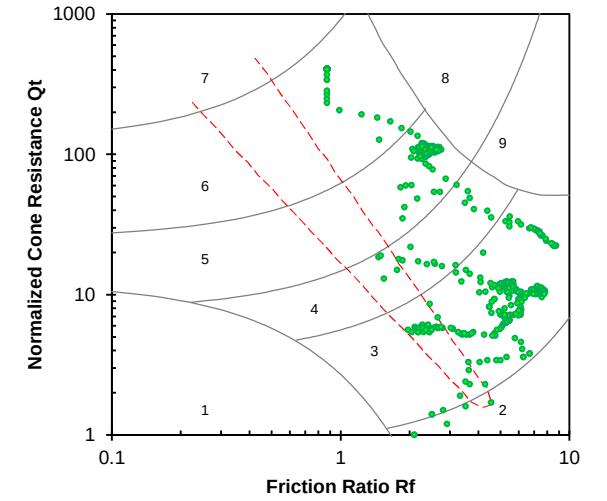
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT109	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	3.53 m BEGL	22.31m OD



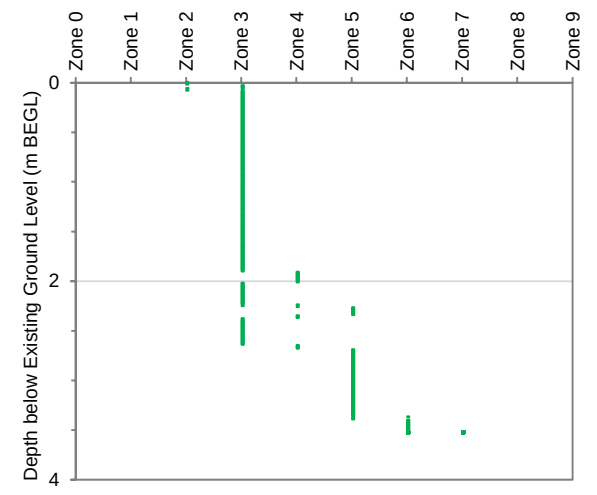




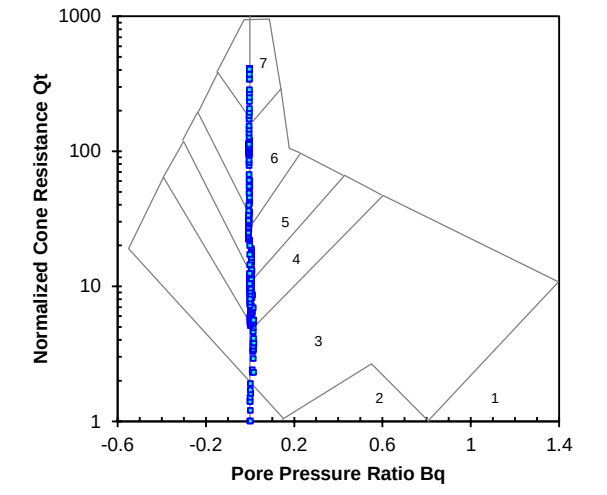
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



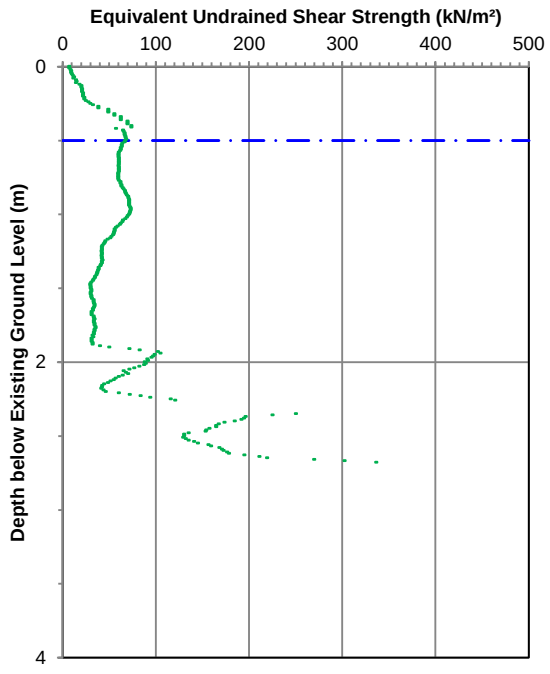
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

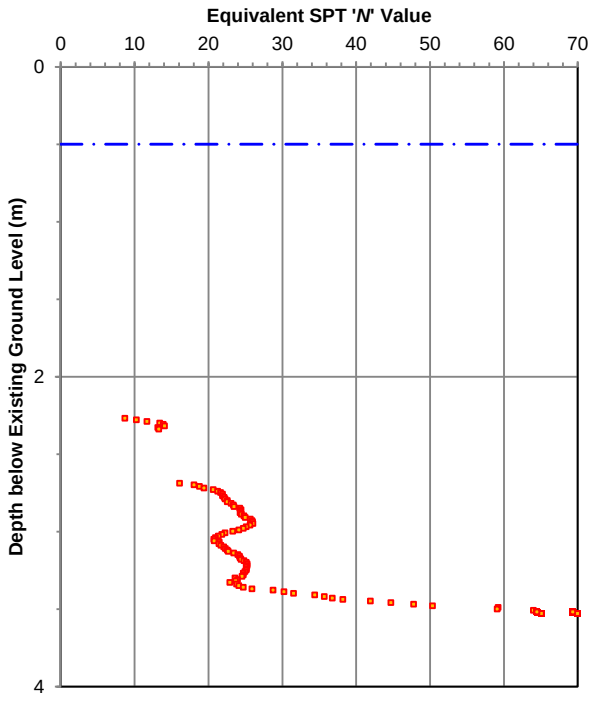
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

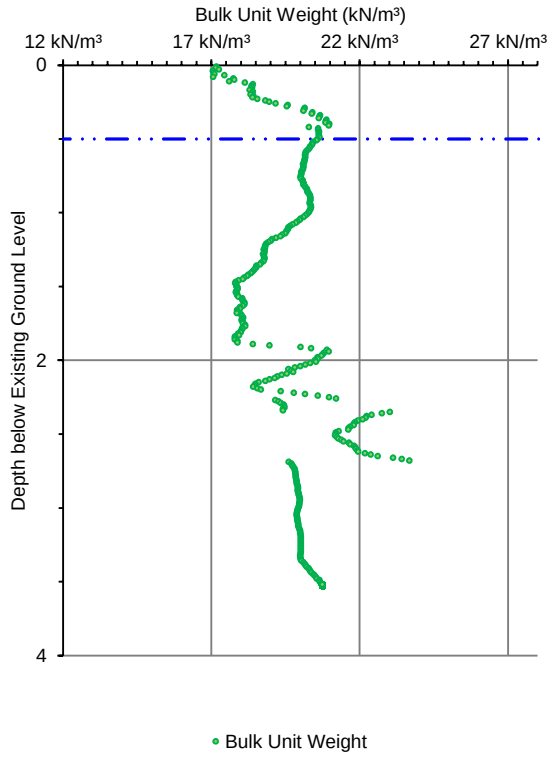
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT109	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	3.53 m BEGL	22.31m OD

Undrained Shear Strength

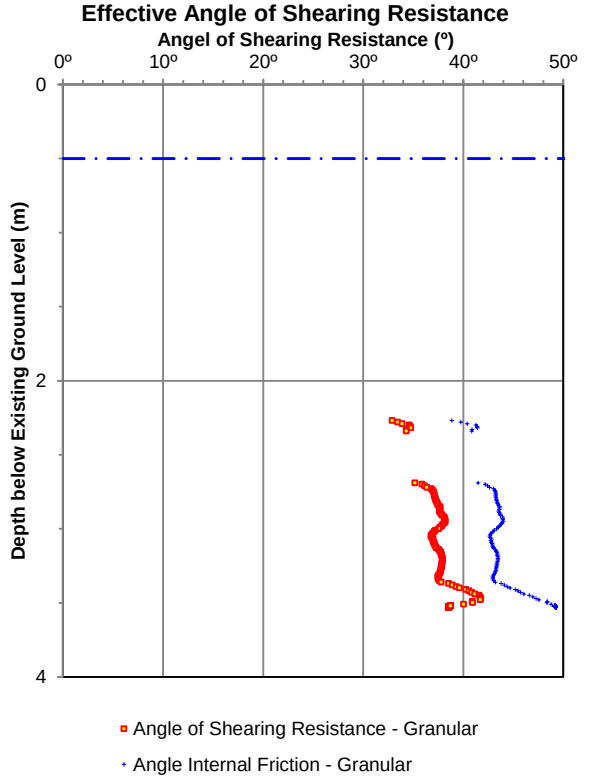


SPT 'N' Value

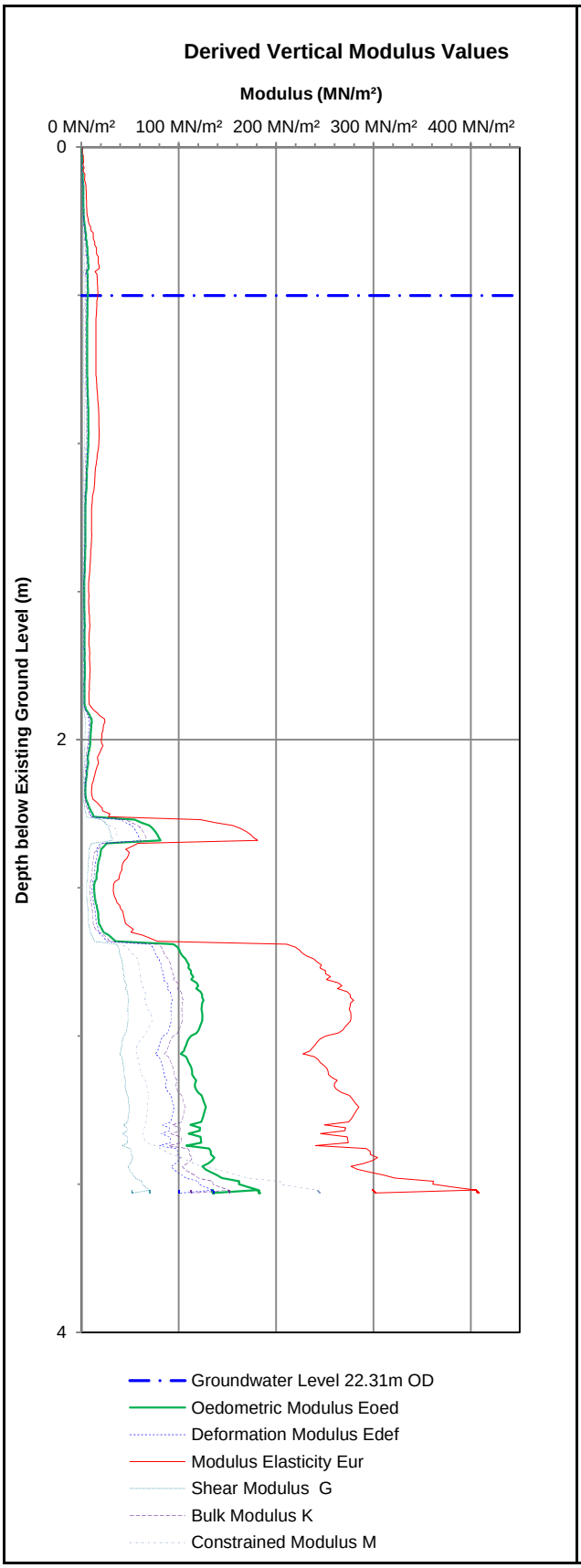


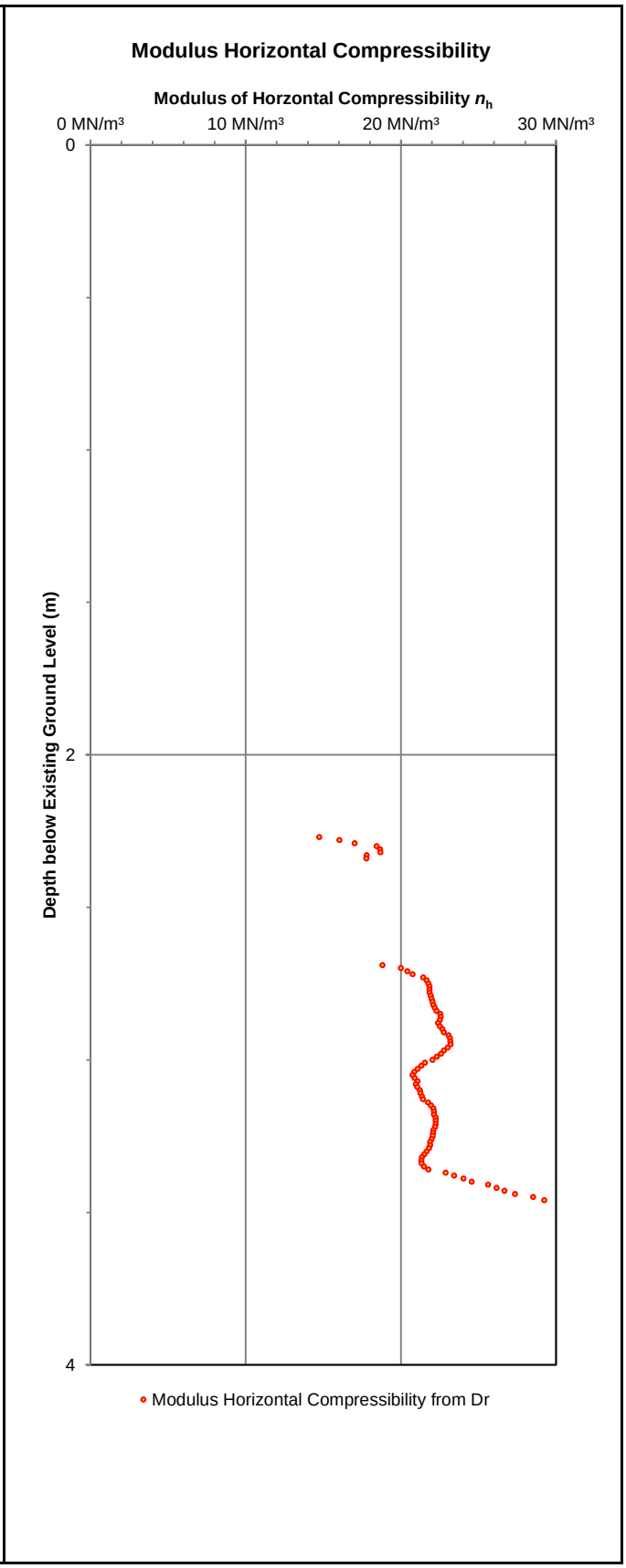


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT109	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	3.53 m BEGL	22.31m OD



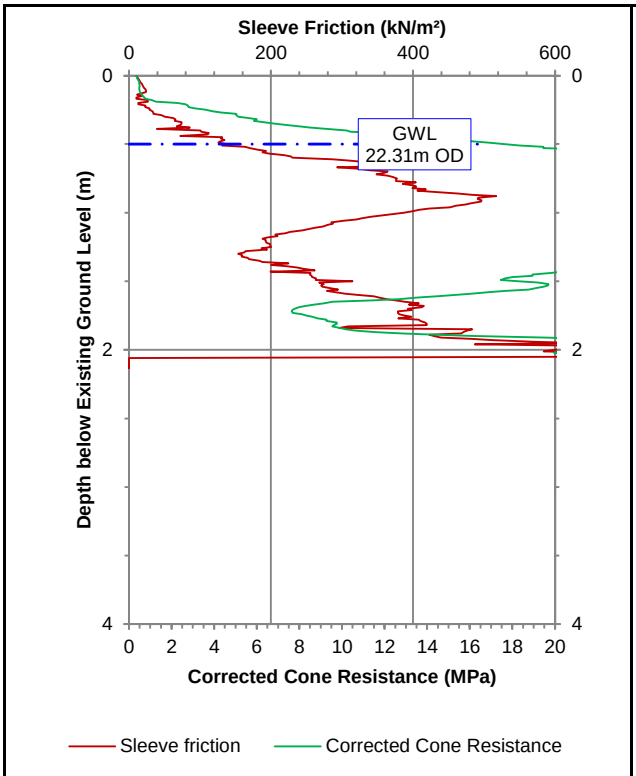


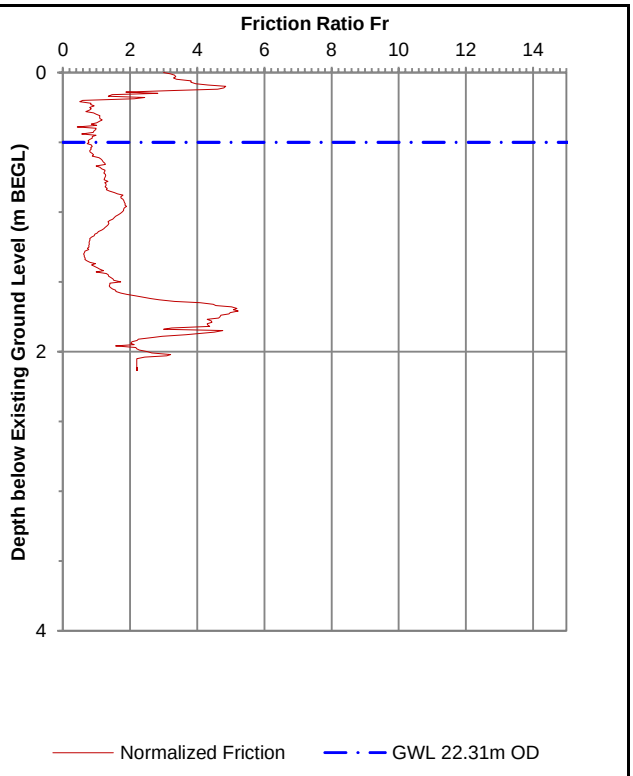
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT109	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	3.53 m BEGL	22.31m OD

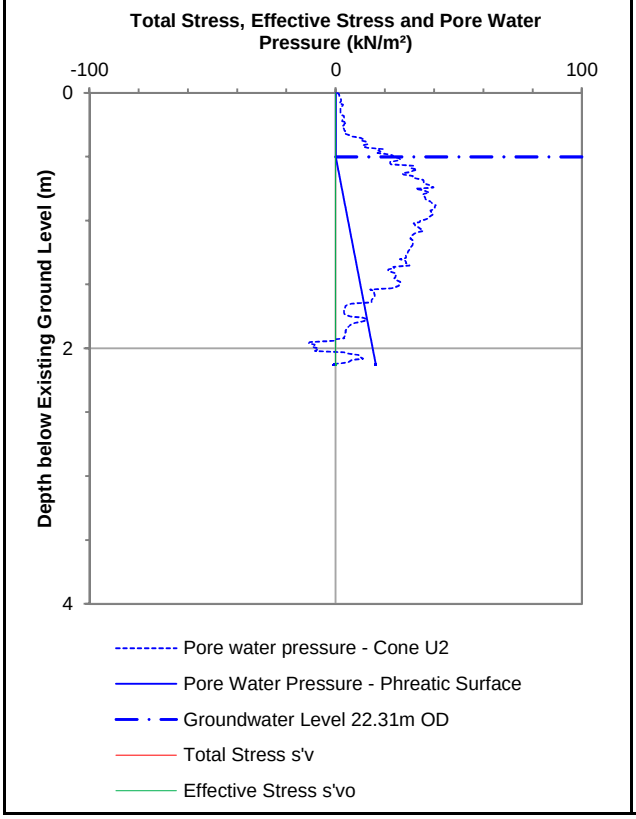
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	0.93 MPa	0.64 MPa	22.81m OD	10	933 kN/m²	1921 kN/m²	0.32
2	1.92 MPa	1.60 MPa	22.71m OD	10	1921 kN/m²	3131 kN/m²	0.25
3	3.13 MPa	2.61 MPa	22.61m OD	10	3131 kN/m²	6150 kN/m²	0.25
4	6.15 MPa	5.13 MPa	22.51m OD	10	6150 kN/m²	6614 kN/m²	0.25
5	6.61 MPa	5.51 MPa	22.41m OD	10	6614 kN/m²	6254 kN/m²	0.25
6	6.25 MPa	5.21 MPa	22.31m OD	10	6254 kN/m²	6018 kN/m²	0.25
7	6.02 MPa	5.02 MPa	22.21m OD	10	6018 kN/m²	6034 kN/m²	0.25
8	6.03 MPa	5.03 MPa	22.11m OD	10	6034 kN/m²	6729 kN/m²	0.25
9	6.73 MPa	5.61 MPa	22.01m OD	10	6729 kN/m²	7220 kN/m²	0.25
10	7.22 MPa	6.02 MPa	21.91m OD	10	7220 kN/m²	6397 kN/m²	0.25
11	6.40 MPa	5.33 MPa	21.81m OD	10	6397 kN/m²	5144 kN/m²	0.25
12	5.14 MPa	4.29 MPa	21.71m OD	10	5144 kN/m²	4216 kN/m²	0.25
13	4.22 MPa	3.51 MPa	21.61m OD	10	4216 kN/m²	4013 kN/m²	0.25
14	4.01 MPa	3.34 MPa	21.51m OD	10	4013 kN/m²	3243 kN/m²	0.25
15	3.24 MPa	2.70 MPa	21.41m OD	10	3243 kN/m²	3127 kN/m²	0.25
16	3.13 MPa	2.61 MPa	21.31m OD	10	3127 kN/m²	3274 kN/m²	0.25
17	3.27 MPa	2.73 MPa	21.21m OD	10	3274 kN/m²	3441 kN/m²	0.25
18	3.44 MPa	2.87 MPa	21.11m OD	10	3441 kN/m²	3311 kN/m²	0.25
19	3.31 MPa	2.76 MPa	21.01m OD	10	3311 kN/m²	9638 kN/m²	0.25
20	9.64 MPa	7.16 MPa	20.91m OD	10	9638 kN/m²	7604 kN/m²	0.30
21	7.60 MPa	6.24 MPa	20.81m OD	10	7604 kN/m²	4776 kN/m²	0.26
22	4.78 MPa	3.98 MPa	20.71m OD	10	4776 kN/m²	26896 kN/m²	0.25
23	26.90 MPa	20.32 MPa	20.61m OD	10	26896 kN/m²	47058 kN/m²	0.28
24	47.06 MPa	35.35 MPa	20.51m OD	10	47058 kN/m²	15738 kN/m²	0.29
25	15.74 MPa	13.12 MPa	20.41m OD	10	15738 kN/m²	15027 kN/m²	0.25
26	15.03 MPa	12.52 MPa	20.31m OD	10	15027 kN/m²	32101 kN/m²	0.25
27	32.10 MPa	24.62 MPa	20.21m OD	10	32101 kN/m²	107458 kN/m²	0.28
28	107.46 MPa	79.83 MPa	20.11m OD	10	107458 kN/m²	120976 kN/m²	0.30
29	120.98 MPa	89.87 MPa	20.01m OD	10	120976 kN/m²	122520 kN/m²	0.30
30	122.52 MPa	91.01 MPa	19.91m OD	10	122520 kN/m²	107426 kN/m²	0.30

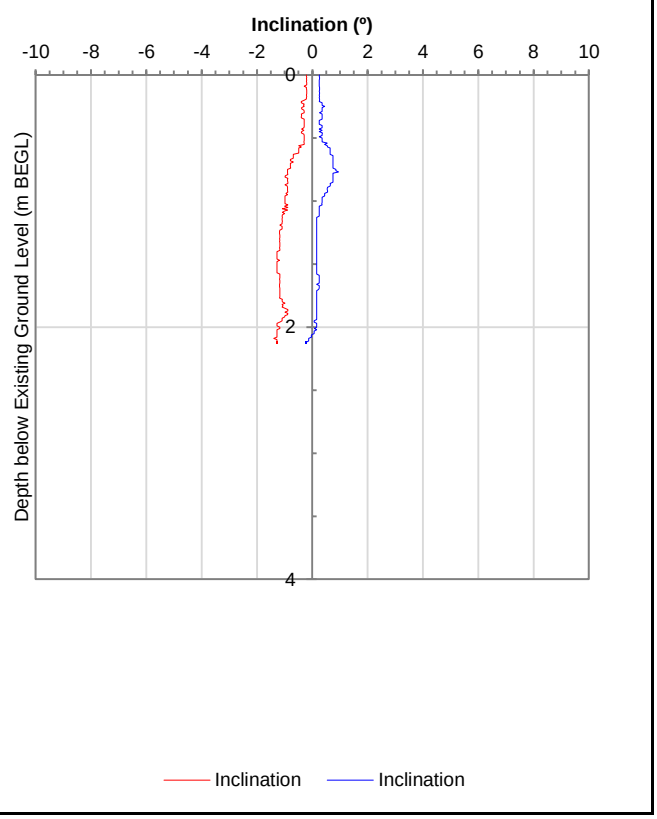
31	107.43 MPa	79.80 MPa	19.81m OD	10	107426 kN/m²	116067 kN/m²	0.30
32	116.07 MPa	86.22 MPa	19.71m OD	10	116067 kN/m²	125592 kN/m²	0.30
33	125.59 MPa	93.30 MPa	19.61m OD	10	125592 kN/m²	121556 kN/m²	0.30
34	121.56 MPa	90.30 MPa	19.51m OD	10	121556 kN/m²	136791 kN/m²	0.30
35	136.79 MPa	101.62 MPa	19.41m OD	10	136791 kN/m²	146137 kN/m²	0.30
36	146.14 MPa	108.56 MPa	19.31m OD	10	146137 kN/m²		0.30
37			19.21m OD	10			
38			19.11m OD	10			
39			19.01m OD	10			
40			18.91m OD	10			
41			18.81m OD	10			
42			18.71m OD	10			
43			18.61m OD	10			
44			18.51m OD	10			
45			18.41m OD	10			
46			18.31m OD	10			
47			18.21m OD	10			
48			18.11m OD	10			
49			18.01m OD	10			
50			17.91m OD	10			
51			17.81m OD	10			
52			17.71m OD	10			
53			17.61m OD	10			
54			17.51m OD	10			
55			17.41m OD	10			
56			17.31m OD	10			
57			17.21m OD	10			
58			17.11m OD	10			
59			17.01m OD	10			
60			16.91m OD	10			
61			16.81m OD	10			
62			16.71m OD	10			
63			16.61m OD	10			
64			16.51m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT110	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	2.13 m BEGL	22.31m OD

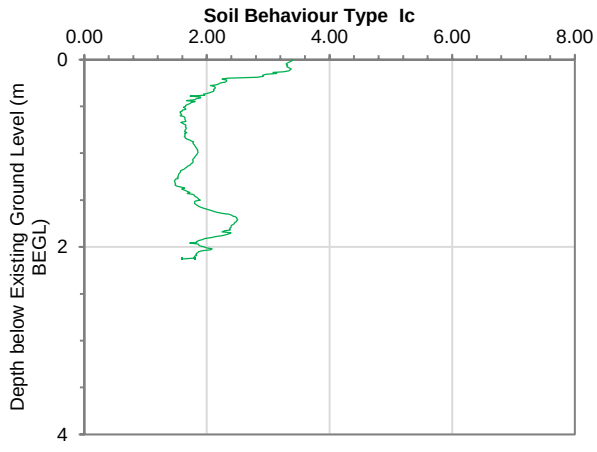


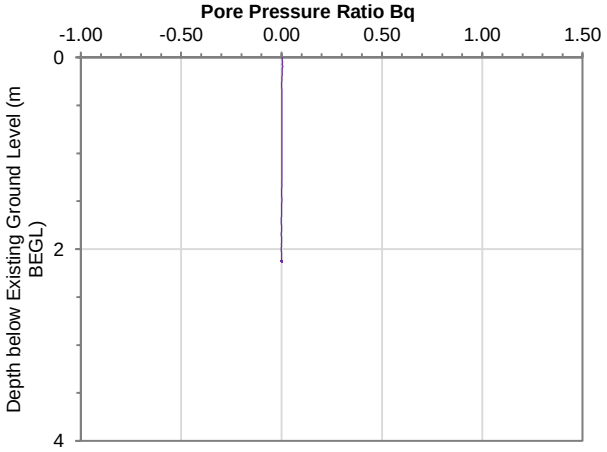


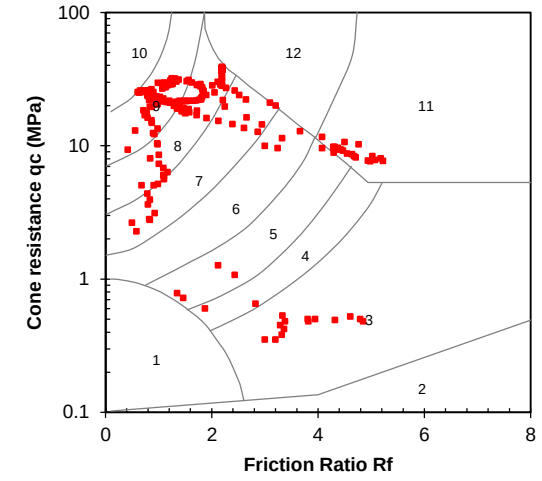




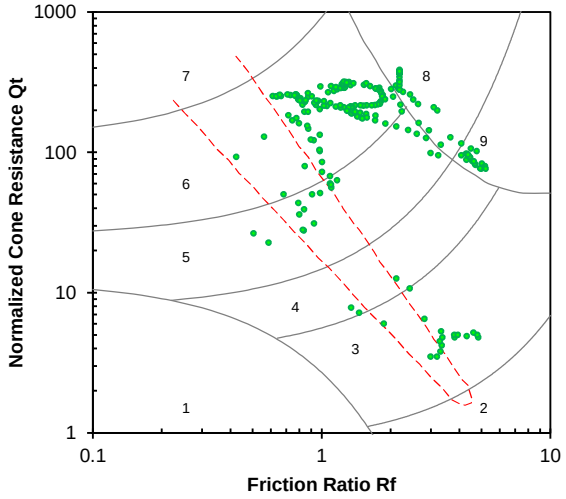
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT110	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	2.13 m BEGL	22.31m OD



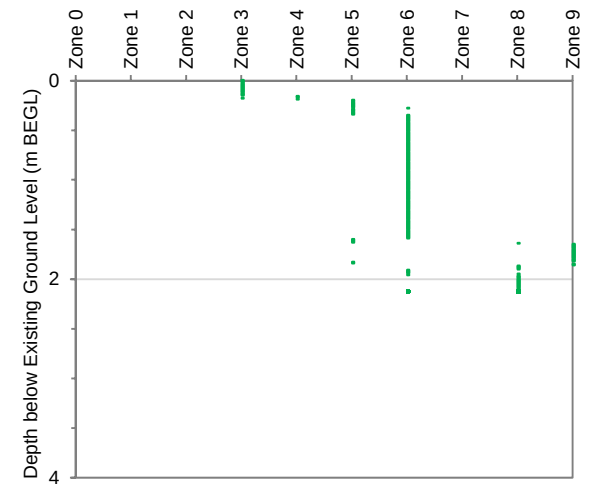




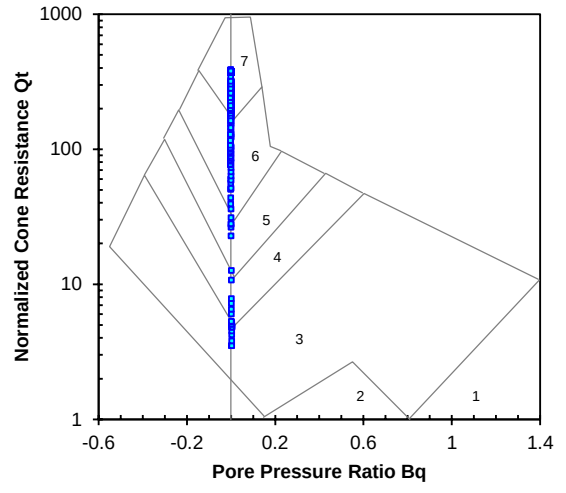
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



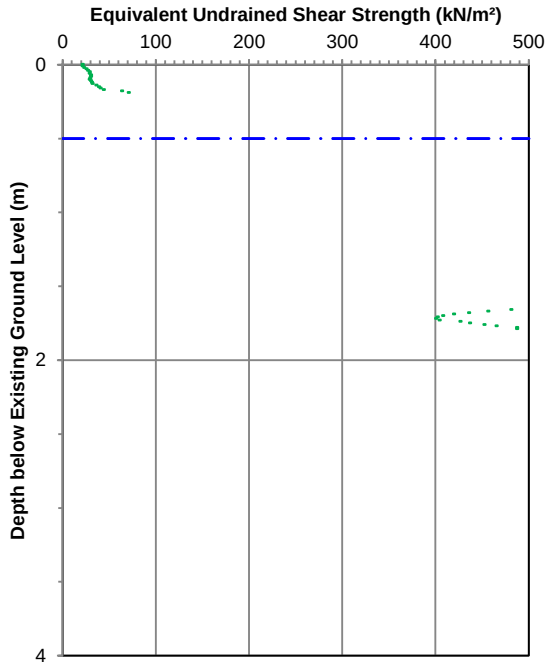
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

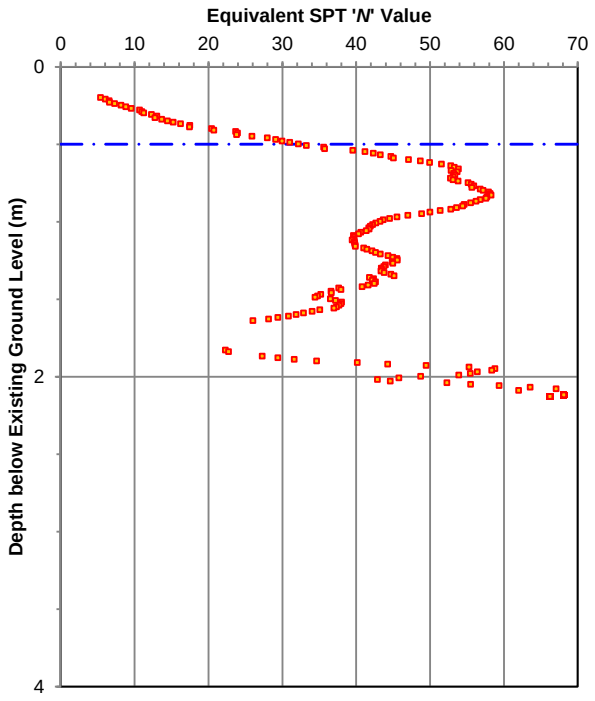
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

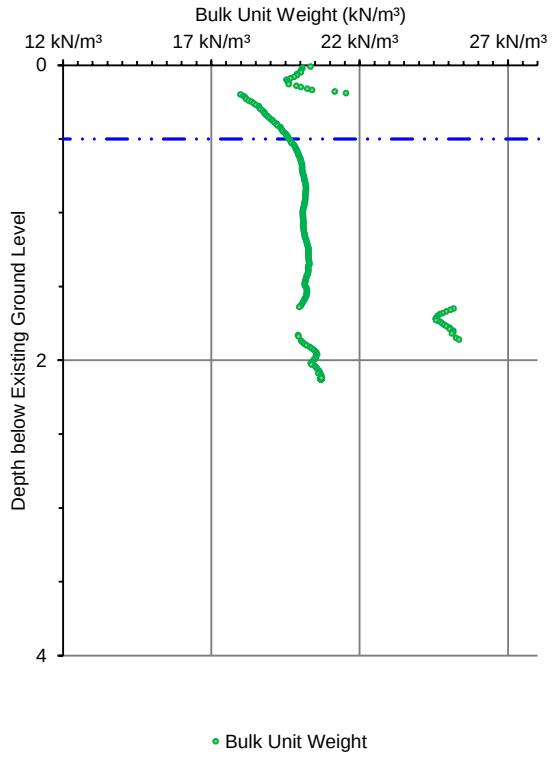
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT110	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	2.13 m BEGL	22.31m OD

Undrained Shear Strength

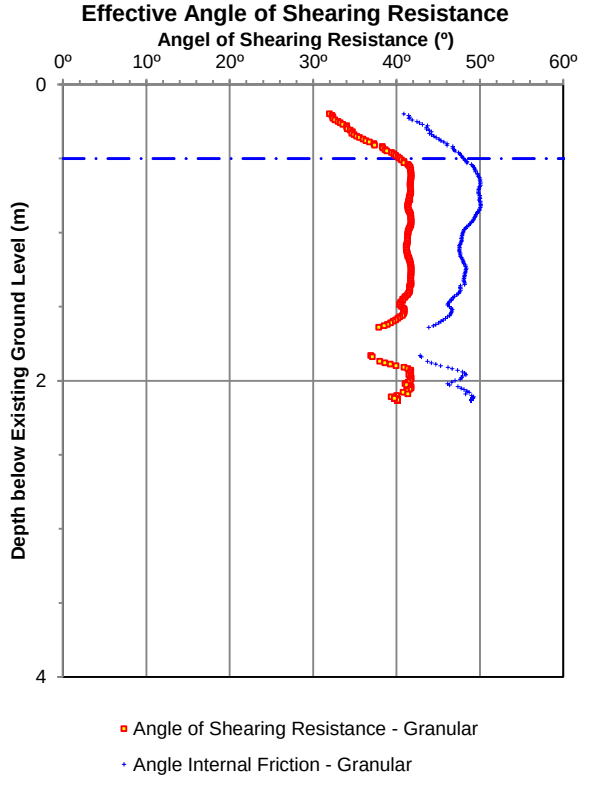


SPT 'N' Value

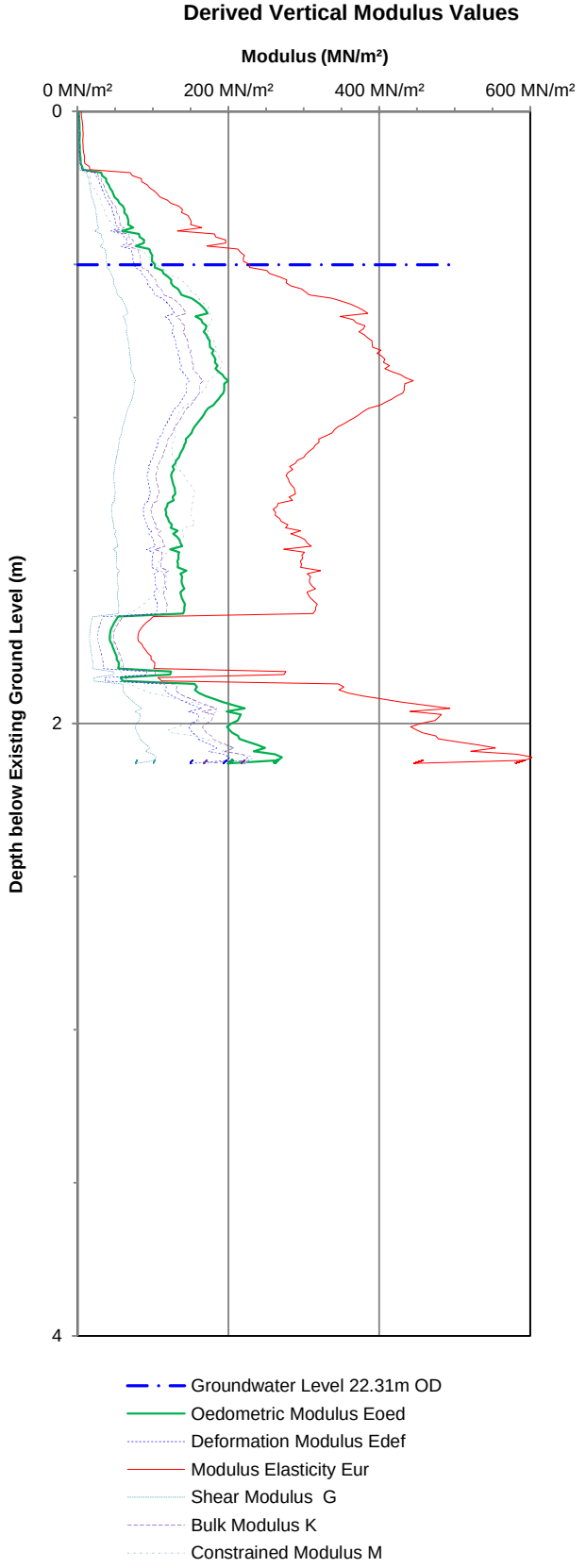


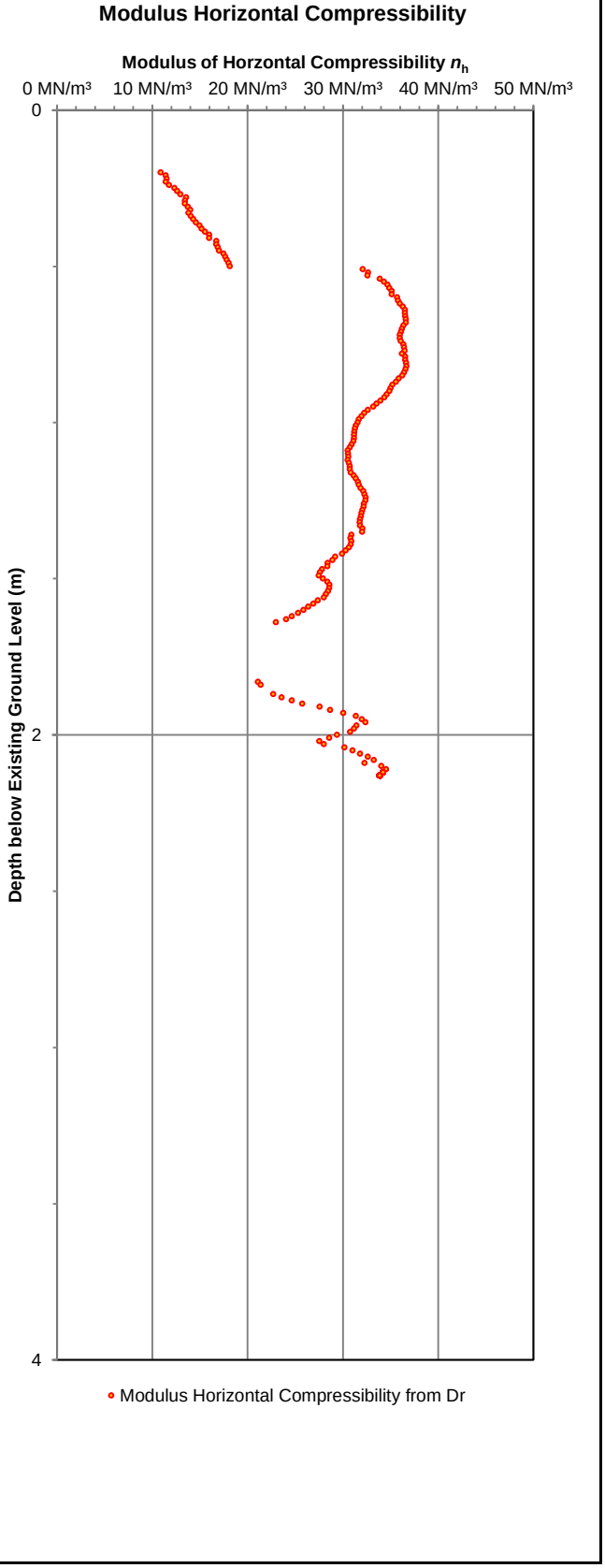


Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT110	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	2.13 m BEGL	22.31m OD



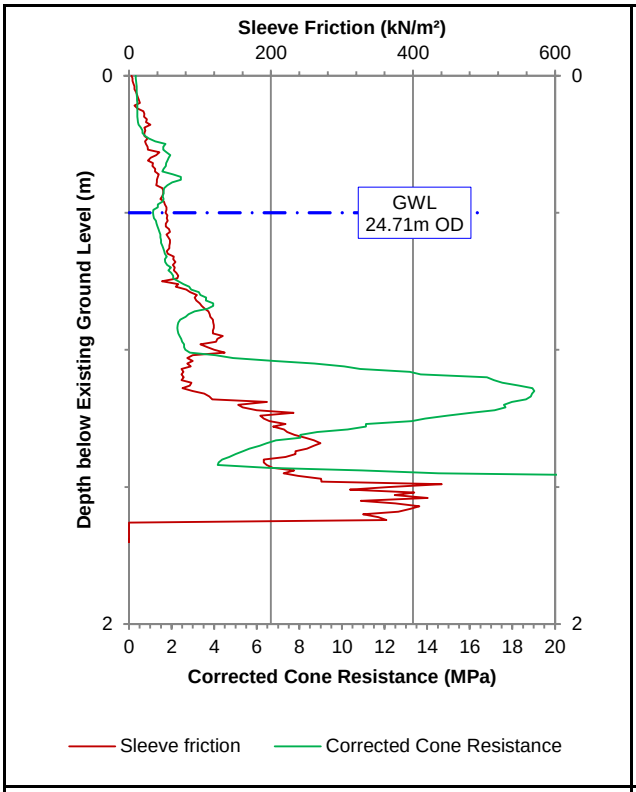


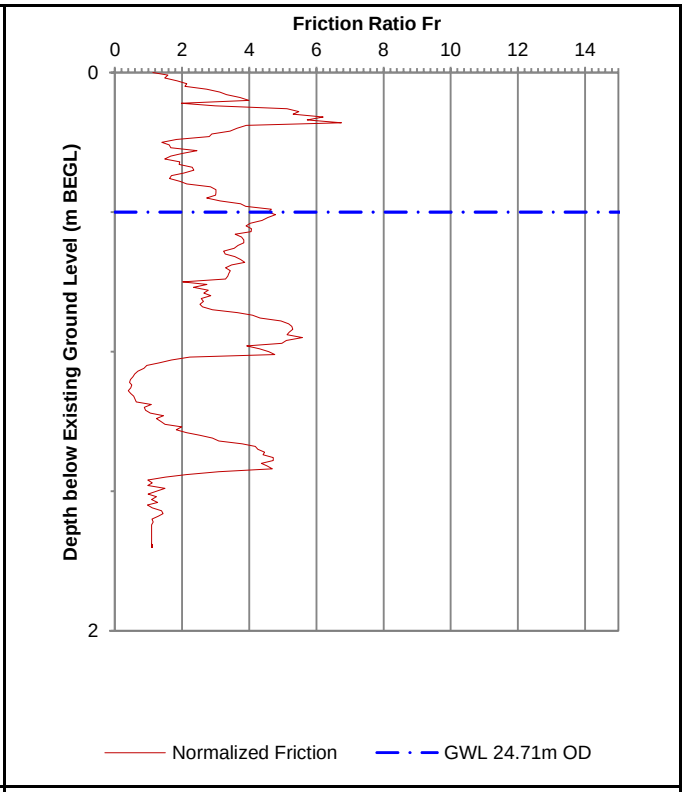
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT110	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444405.76	403842.78	22.81m OD	2.13 m BEGL	22.31m OD

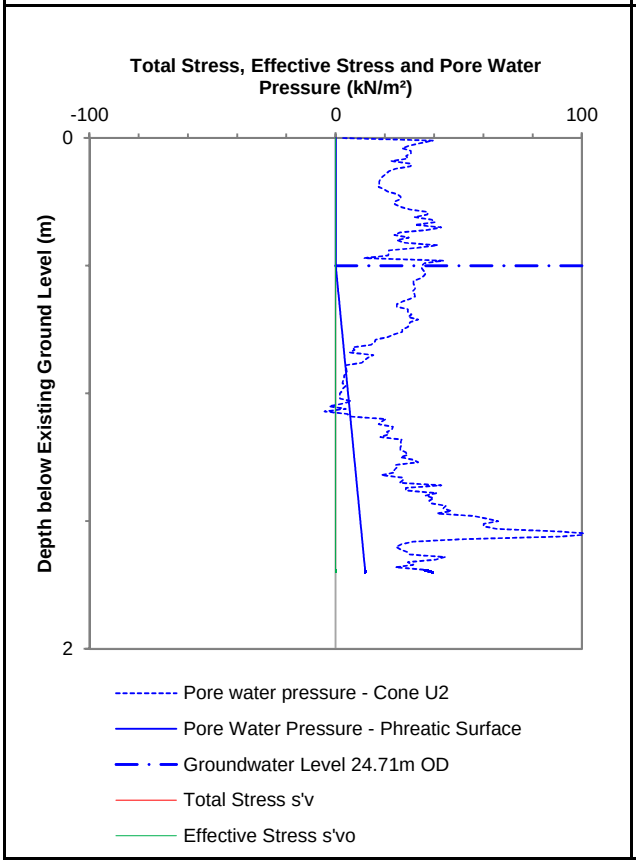
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	2.67 MPa	2.23 MPa	22.81m OD	10	2671 kN/m²	4320 kN/m²	0.25
2	4.32 MPa	3.44 MPa	22.71m OD	10	4320 kN/m²	43298 kN/m²	0.27
3	43.30 MPa	32.16 MPa	22.61m OD	10	43298 kN/m²	65069 kN/m²	0.30
4	65.07 MPa	48.34 MPa	22.51m OD	10	65069 kN/m²	91628 kN/m²	0.30
5	91.63 MPa	68.07 MPa	22.41m OD	10	91628 kN/m²	121525 kN/m²	0.30
6	121.52 MPa	90.28 MPa	22.31m OD	10	121525 kN/m²	162974 kN/m²	0.30
7	162.97 MPa	121.07 MPa	22.21m OD	10	162974 kN/m²	173950 kN/m²	0.30
8	173.95 MPa	129.22 MPa	22.11m OD	10	173950 kN/m²	189089 kN/m²	0.30
9	189.09 MPa	140.47 MPa	22.01m OD	10	189089 kN/m²	182065 kN/m²	0.30
10	182.07 MPa	135.25 MPa	21.91m OD	10	182065 kN/m²	150694 kN/m²	0.30
11	150.69 MPa	111.94 MPa	21.81m OD	10	150694 kN/m²	130234 kN/m²	0.30
12	130.23 MPa	96.75 MPa	21.71m OD	10	130234 kN/m²	125874 kN/m²	0.30
13	125.87 MPa	93.51 MPa	21.61m OD	10	125874 kN/m²	124184 kN/m²	0.30
14	124.18 MPa	92.25 MPa	21.51m OD	10	124184 kN/m²	133246 kN/m²	0.30
15	133.25 MPa	98.98 MPa	21.41m OD	10	133246 kN/m²	138318 kN/m²	0.30
16	138.32 MPa	102.75 MPa	21.31m OD	10	138318 kN/m²	90188 kN/m²	0.30
17	90.19 MPa	63.73 MPa	21.21m OD	10	90188 kN/m²	47125 kN/m²	0.33
18	47.12 MPa	29.36 MPa	21.11m OD	10	47125 kN/m²	104636 kN/m²	0.35
19	104.64 MPa	74.72 MPa	21.01m OD	10	104636 kN/m²	201574 kN/m²	0.32
20	201.57 MPa	149.74 MPa	20.91m OD	10	201574 kN/m²	219979 kN/m²	0.30
21	219.98 MPa	163.41 MPa	20.81m OD	10	219979 kN/m²	218775 kN/m²	0.30
22	218.77 MPa	162.52 MPa	20.71m OD	10	218775 kN/m²		0.30
23			20.61m OD	10			
24			20.51m OD	10			
25			20.41m OD	10			
26			20.31m OD	10			
27			20.21m OD	10			
28			20.11m OD	10			
29			20.01m OD	10			
30			19.91m OD	10			

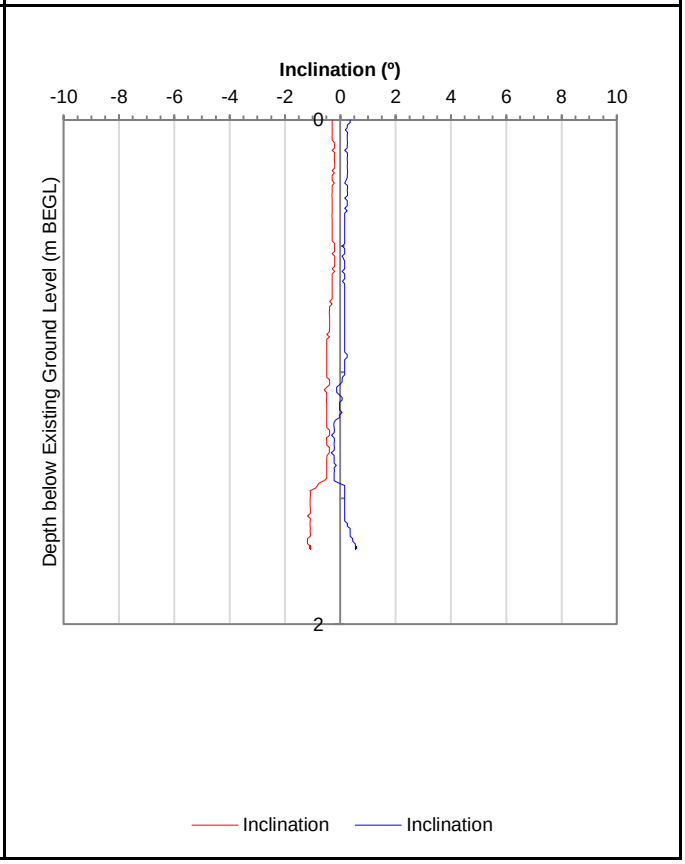
31			19.81m OD	10			
32			19.71m OD	10			
33			19.61m OD	10			
34			19.51m OD	10			
35			19.41m OD	10			
36			19.31m OD	10			
37			19.21m OD	10			
38			19.11m OD	10			
39			19.01m OD	10			
40			18.91m OD	10			
41			18.81m OD	10			
42			18.71m OD	10			
43			18.61m OD	10			
44			18.51m OD	10			
45			18.41m OD	10			
46			18.31m OD	10			
47			18.21m OD	10			
48			18.11m OD	10			
49			18.01m OD	10			
50			17.91m OD	10			
51			17.81m OD	10			
52			17.71m OD	10			
53			17.61m OD	10			
54			17.51m OD	10			
55			17.41m OD	10			
56			17.31m OD	10			
57			17.21m OD	10			
58			17.11m OD	10			
59			17.01m OD	10			
60			16.91m OD	10			
61			16.81m OD	10			
62			16.71m OD	10			
63			16.61m OD	10			
64			16.51m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT111	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444143.96	403726.39	25.21m OD	1.69 m BEGL	24.71m OD

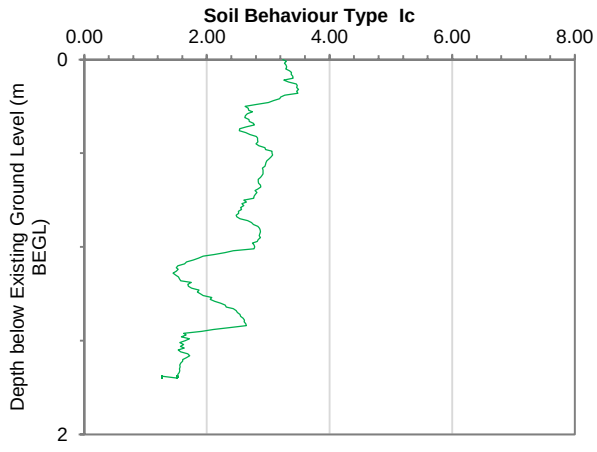


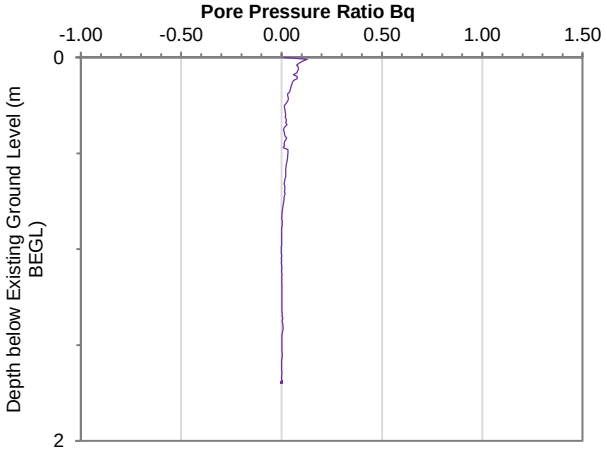


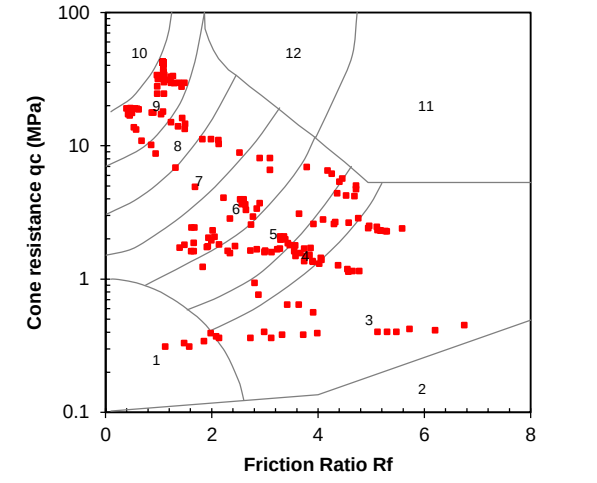




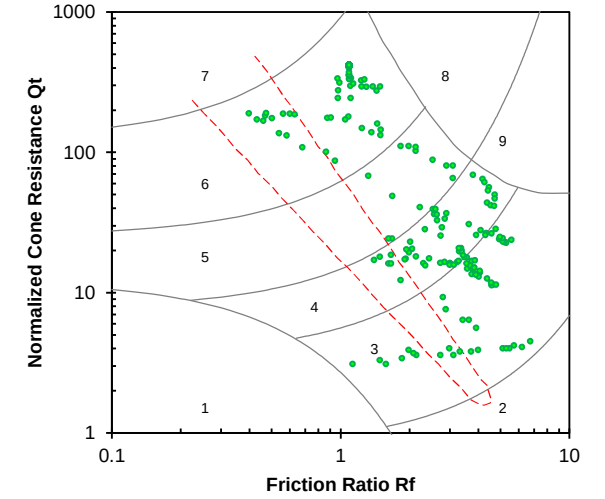
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT111	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444143.96	403726.39	25.21m OD	1.69 m BEGL	24.71m OD



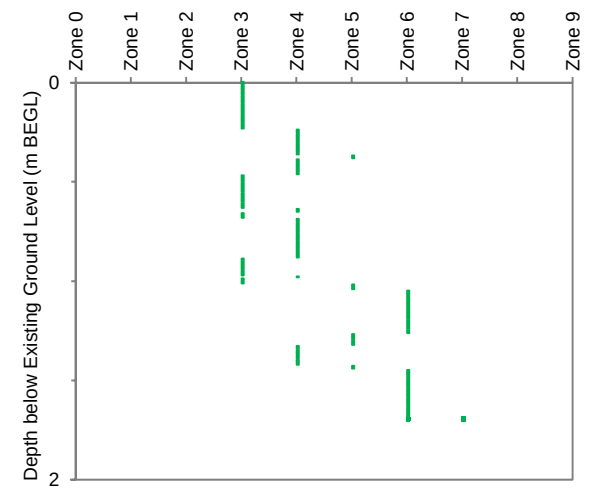




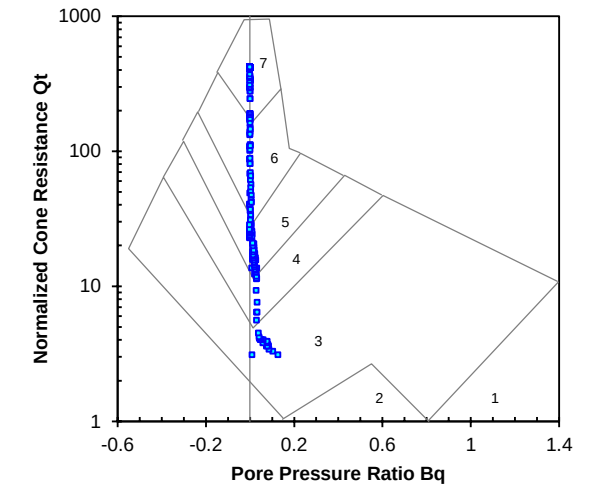
Robertson 1986



Robertson 2015



Robertson 1986 - 2015

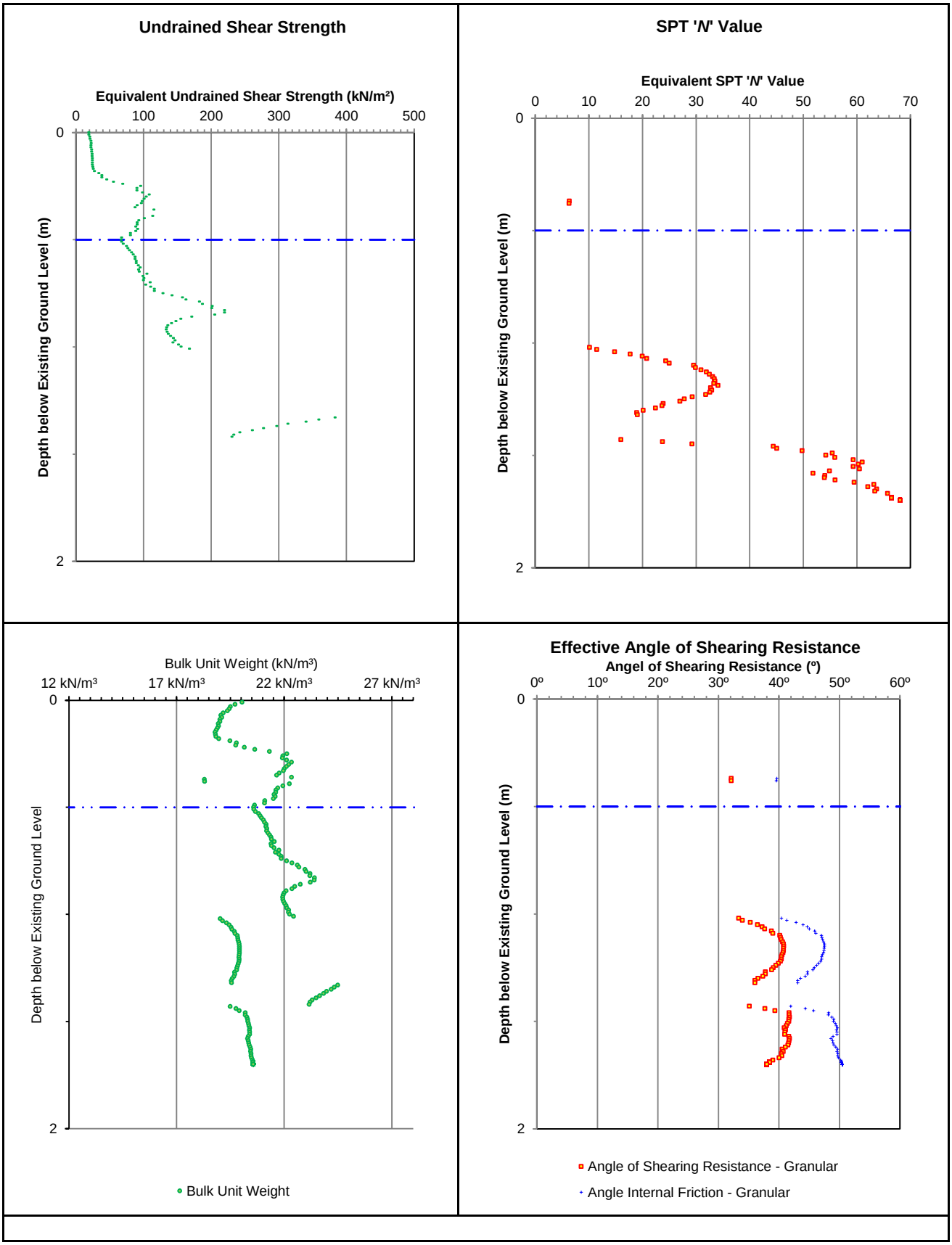


Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT111	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444143.96	403726.39	25.21m OD	1.69 m BEGL	24.71m OD



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT111	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
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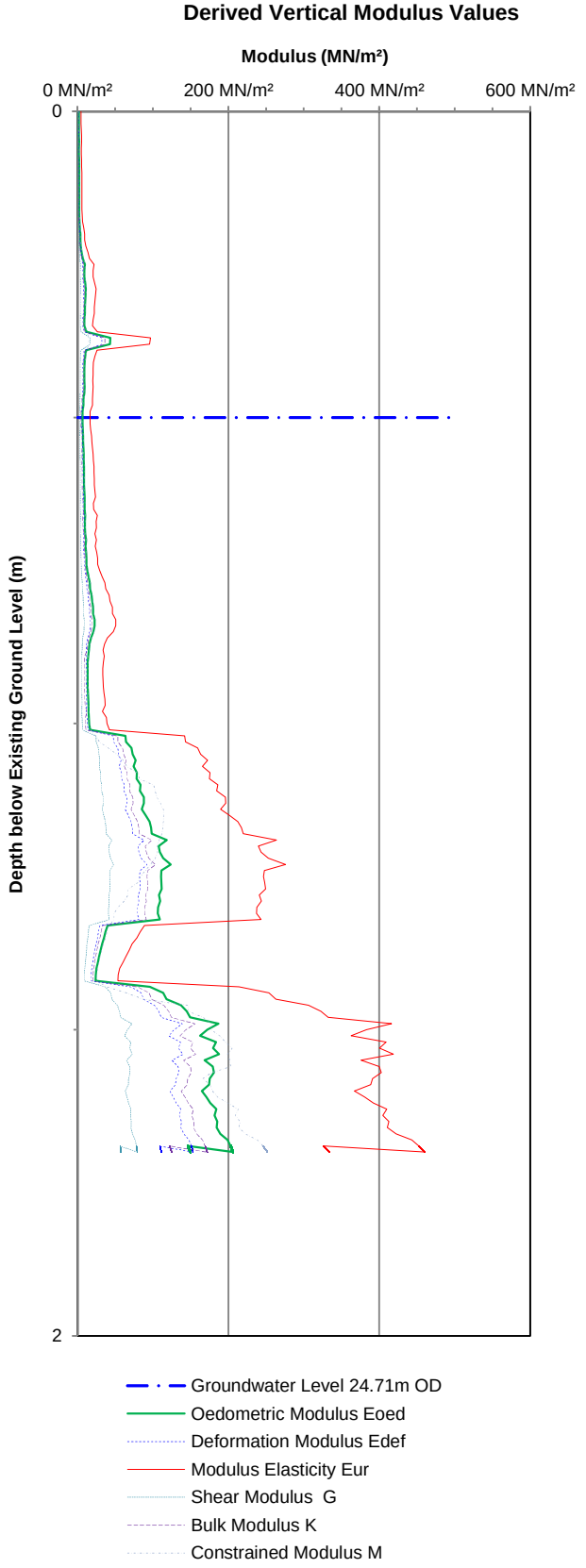

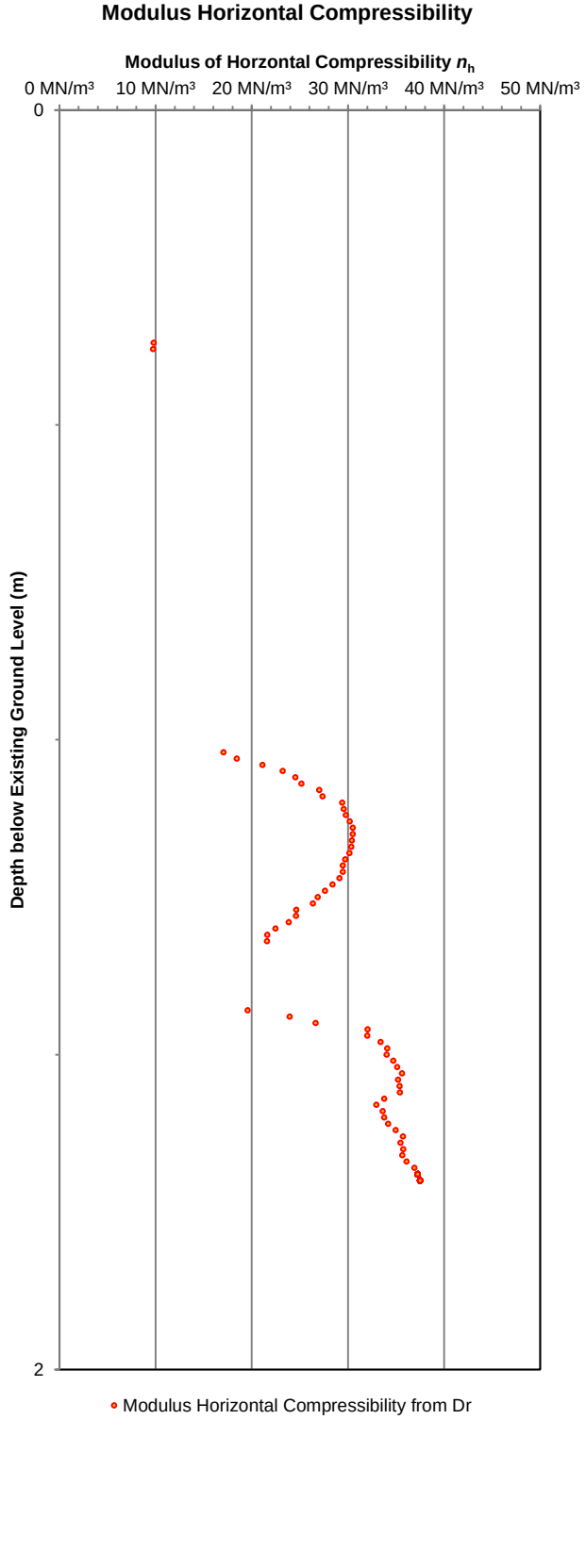

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT111	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444143.96	403726.39	25.21m OD	1.69 m BEGL	24.71m OD
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	2.10 MPa	1.75 MPa	25.21m OD	10	2104 kN/m²	2522 kN/m²	0.25
2	2.52 MPa	2.10 MPa	25.11m OD	10	2522 kN/m²	7857 kN/m²	0.25
3	7.86 MPa	5.98 MPa	25.01m OD	10	7857 kN/m²	17652 kN/m²	0.28
4	17.65 MPa	13.11 MPa	24.91m OD	10	17652 kN/m²	8749 kN/m²	0.30
5	8.75 MPa	6.73 MPa	24.81m OD	10	8749 kN/m²	7896 kN/m²	0.28
6	7.90 MPa	6.58 MPa	24.71m OD	10	7896 kN/m²	9759 kN/m²	0.25
7	9.76 MPa	7.84 MPa	24.61m OD	10	9759 kN/m²	14013 kN/m²	0.27
8	14.01 MPa	10.41 MPa	24.51m OD	10	14013 kN/m²	19103 kN/m²	0.30
9	19.10 MPa	14.33 MPa	24.41m OD	10	19103 kN/m²	14193 kN/m²	0.29
10	14.19 MPa	11.68 MPa	24.31m OD	10	14193 kN/m²	66551 kN/m²	0.26
11	66.55 MPa	49.61 MPa	24.21m OD	10	66551 kN/m²	93797 kN/m²	0.29
12	93.80 MPa	69.68 MPa	24.11m OD	10	93797 kN/m²	112156 kN/m²	0.30
13	112.16 MPa	83.32 MPa	24.01m OD	10	112156 kN/m²	49726 kN/m²	0.30
14	49.73 MPa	36.94 MPa	23.91m OD	10	49726 kN/m²	110498 kN/m²	0.30
15	110.50 MPa	82.08 MPa	23.81m OD	10	110498 kN/m²	176946 kN/m²	0.30
16	176.95 MPa	131.45 MPa	23.71m OD	10	176946 kN/m²	162002 kN/m²	0.30
17	162.00 MPa	120.34 MPa	23.61m OD	10	162002 kN/m²		0.30
18			23.51m OD	10			
19			23.41m OD	10			
20			23.31m OD	10			
21			23.21m OD	10			
22			23.11m OD	10			
23			23.01m OD	10			
24			22.91m OD	10			
25			22.81m OD	10			
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27			22.61m OD	10			
28			22.51m OD	10			
29			22.41m OD	10			
30			22.31m OD	10			

31			22.21m OD	10			
32			22.11m OD	10			
33			22.01m OD	10			
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40			21.31m OD	10			
41			21.21m OD	10			
42			21.11m OD	10			
43			21.01m OD	10			
44			20.91m OD	10			
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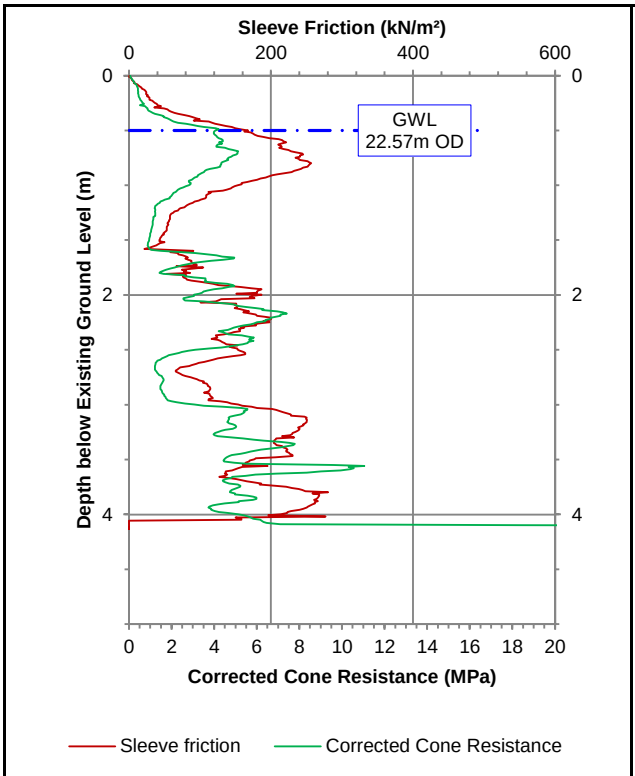
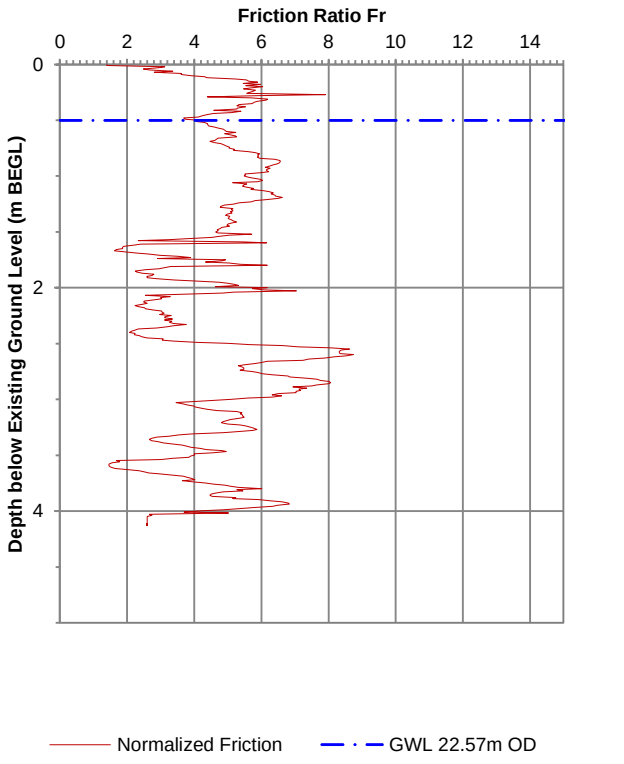
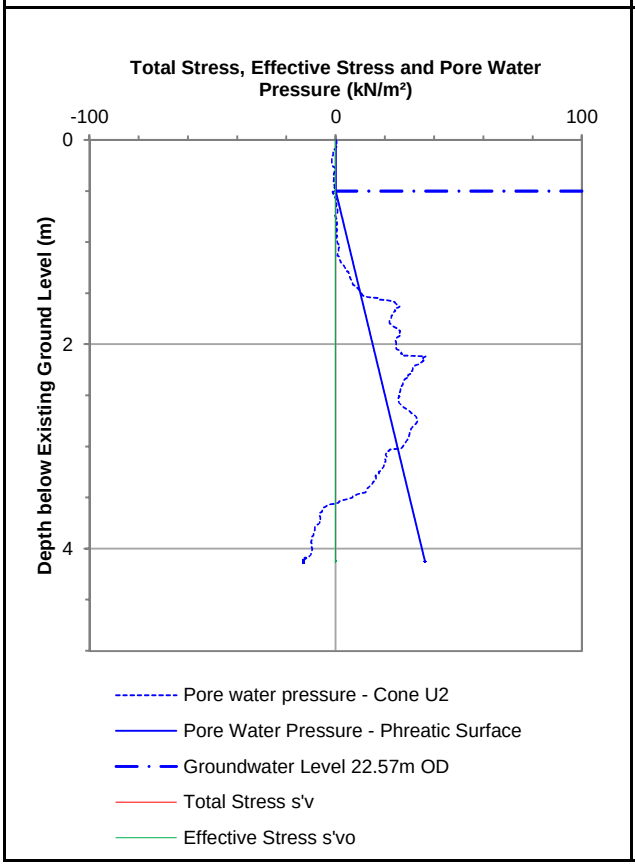
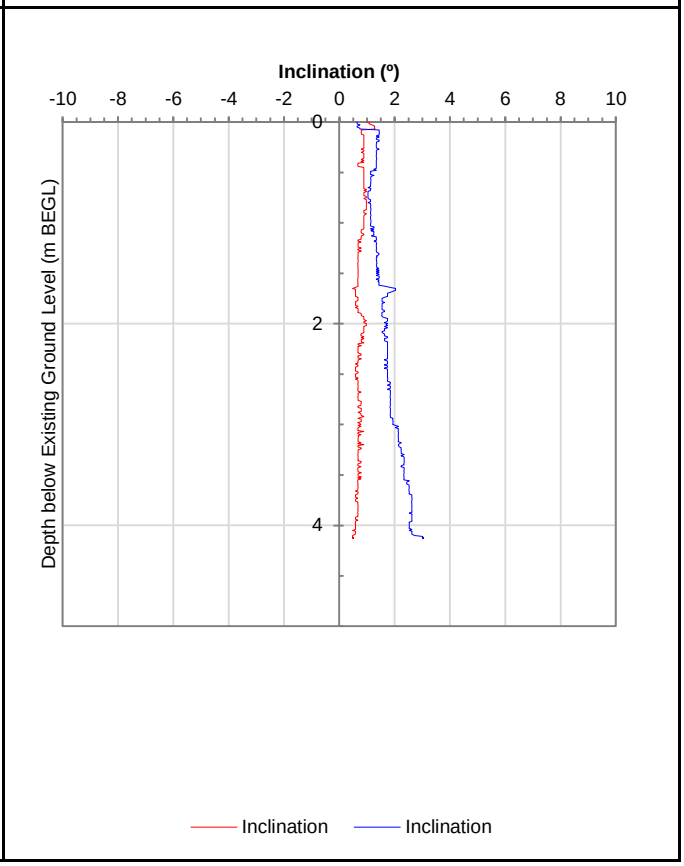
60			19.31m OD	10			
61			19.21m OD	10			
62			19.11m OD	10			
63			19.01m OD	10			
64			18.91m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT112	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444360.51	403786.29	23.07m OD	4.13 m BEGL	22.57m OD

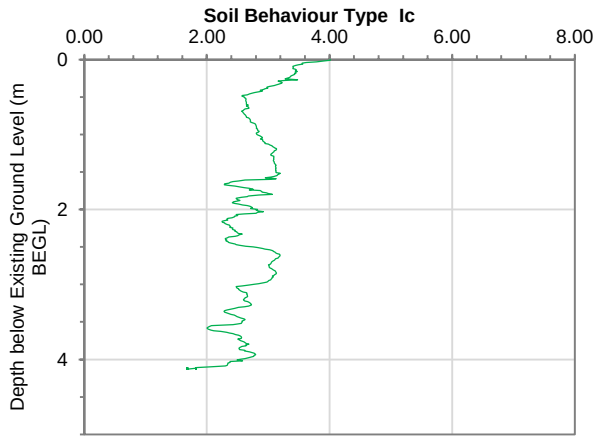


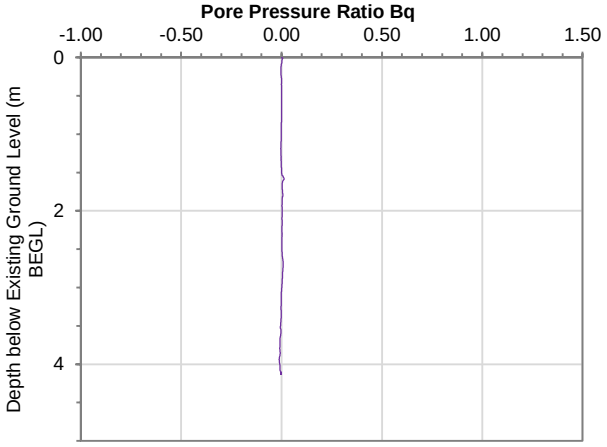


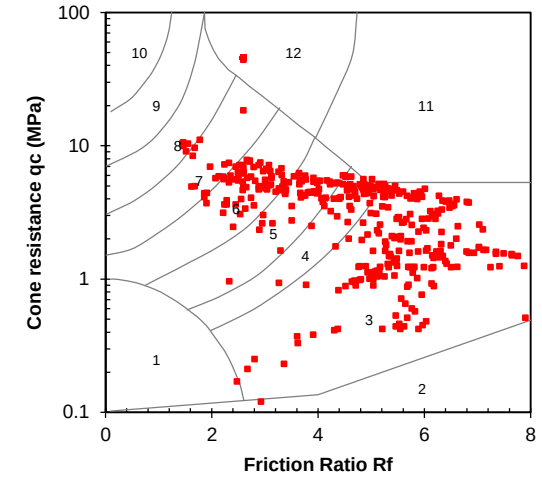




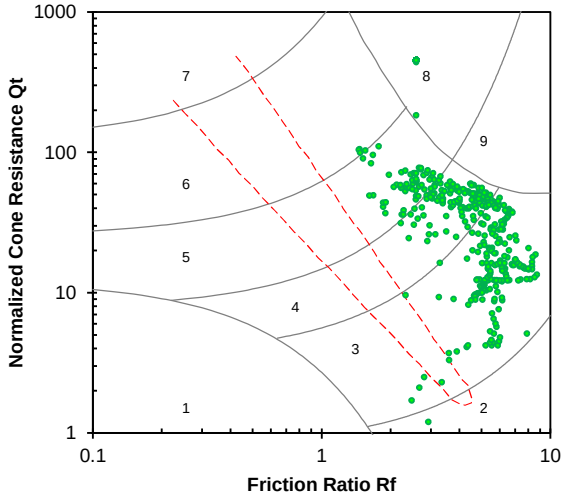
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT112	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444360.51	403786.29	23.07m OD	4.13 m BEGL	22.57m OD



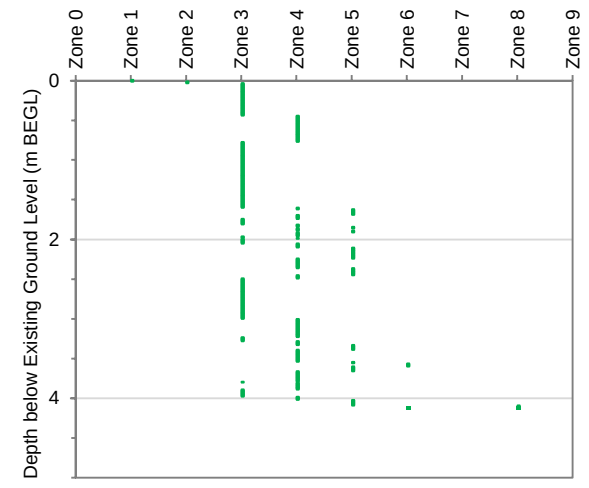




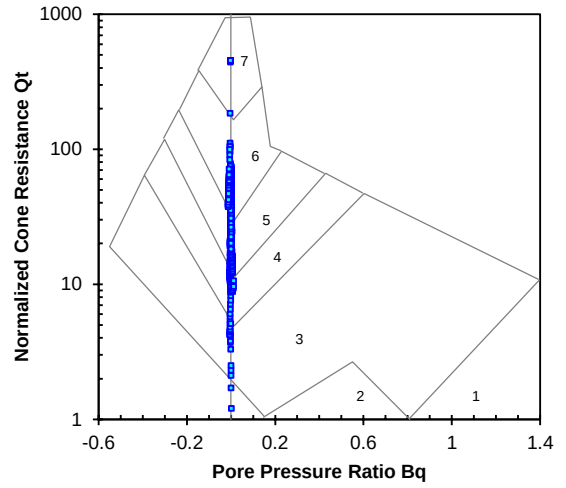
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



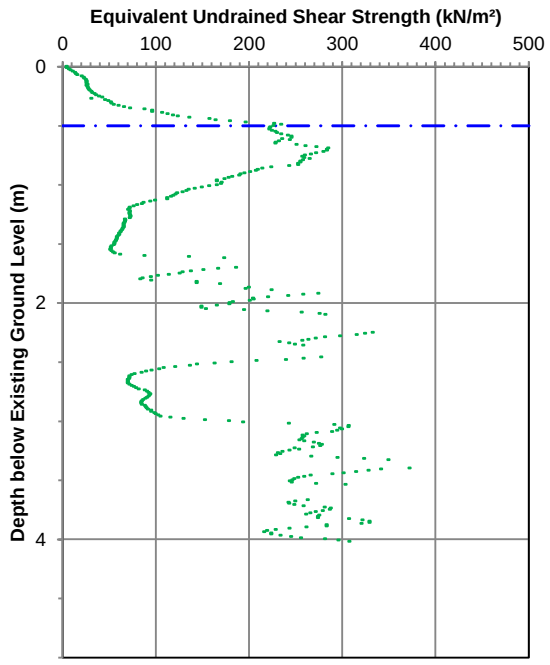
Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

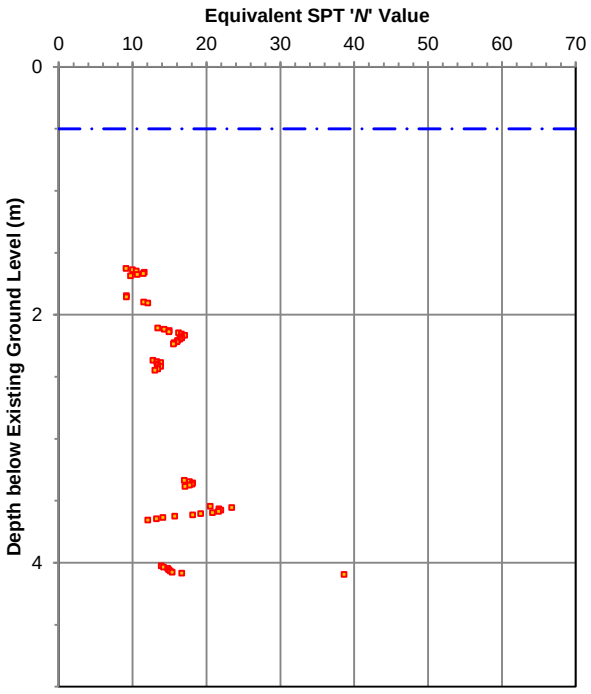
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

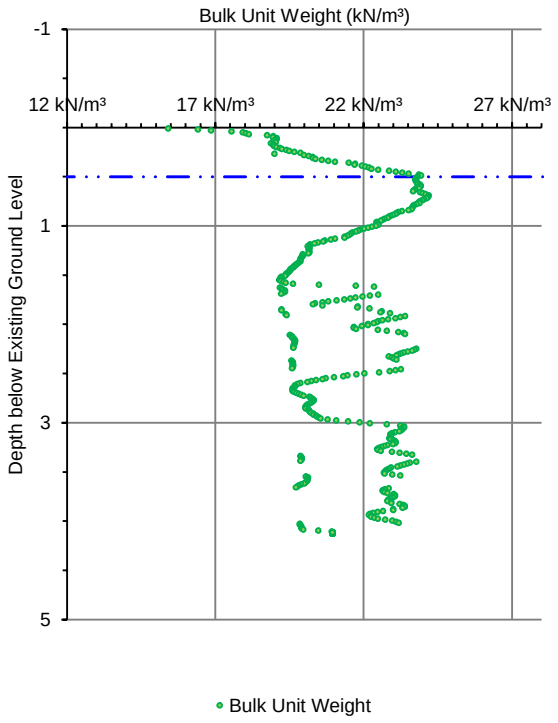
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT112	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444360.51	403786.29	23.07m OD	4.13 m BEGL	22.57m OD

Undrained Shear Strength

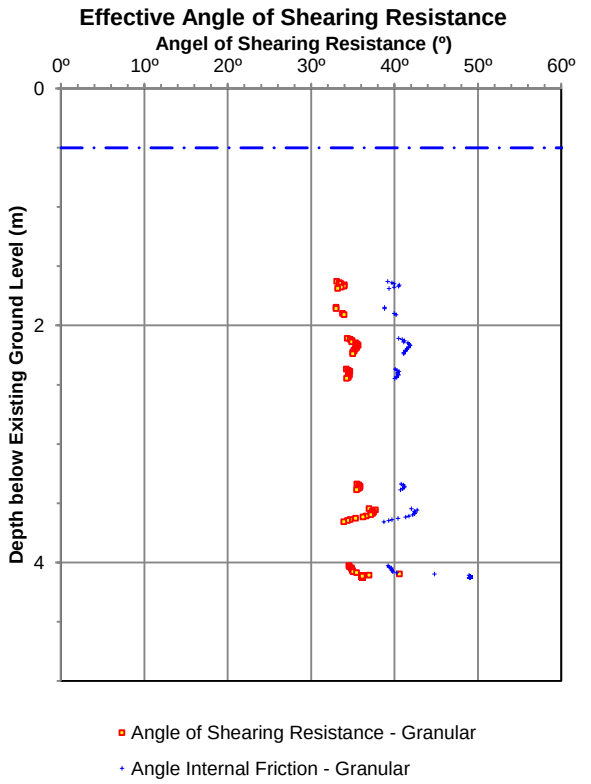


SPT 'N' Value

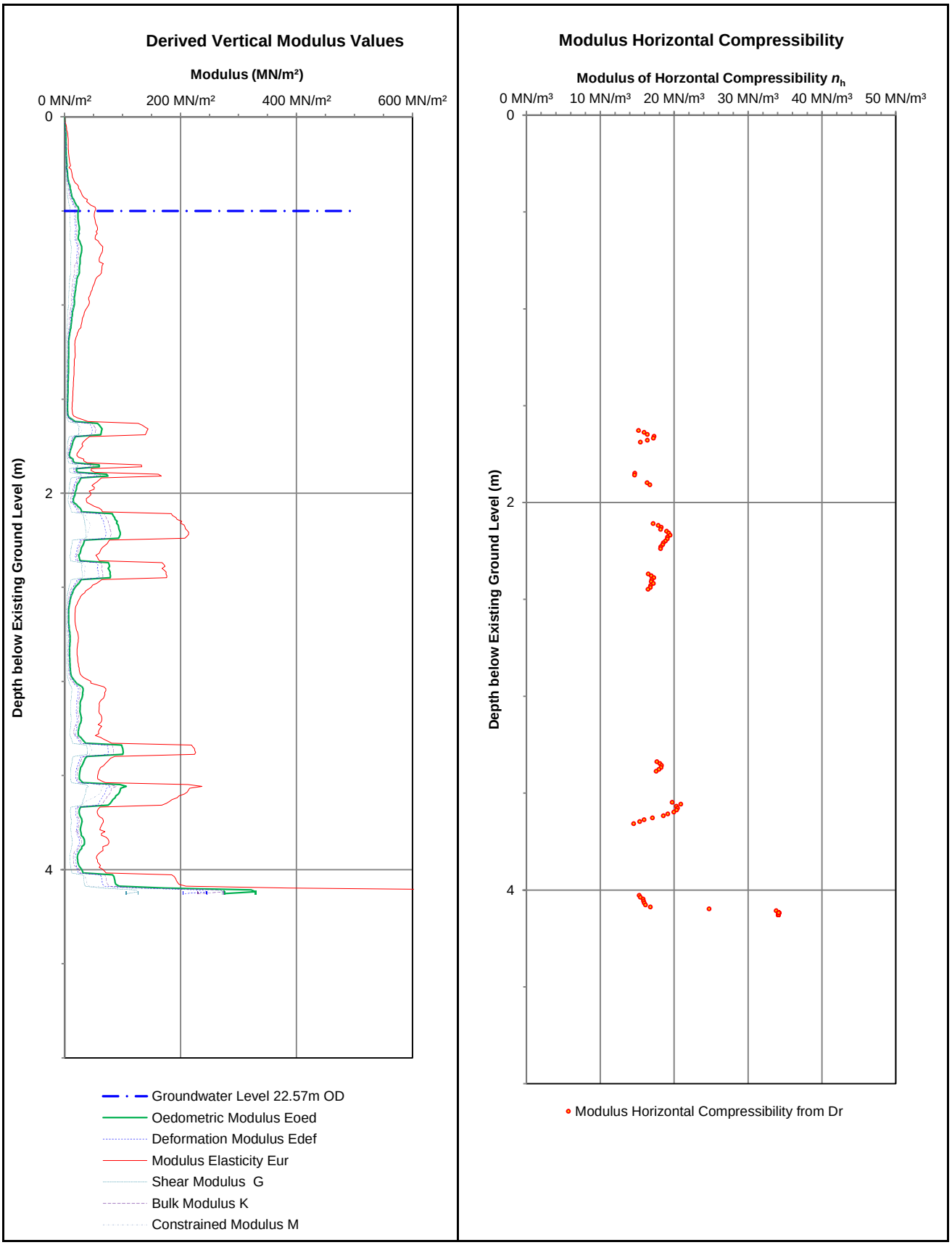




Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT112	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444360.51	403786.29	23.07m OD	4.13 m BEGL	22.57m OD

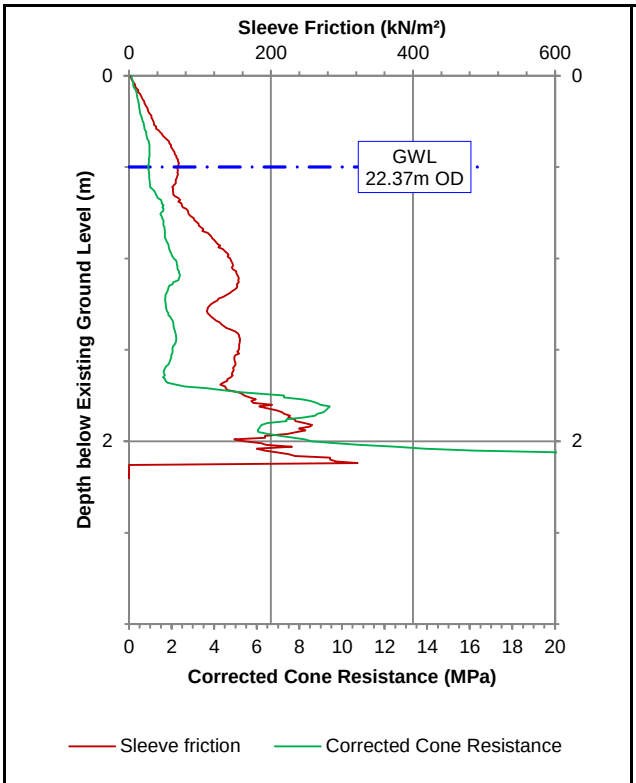


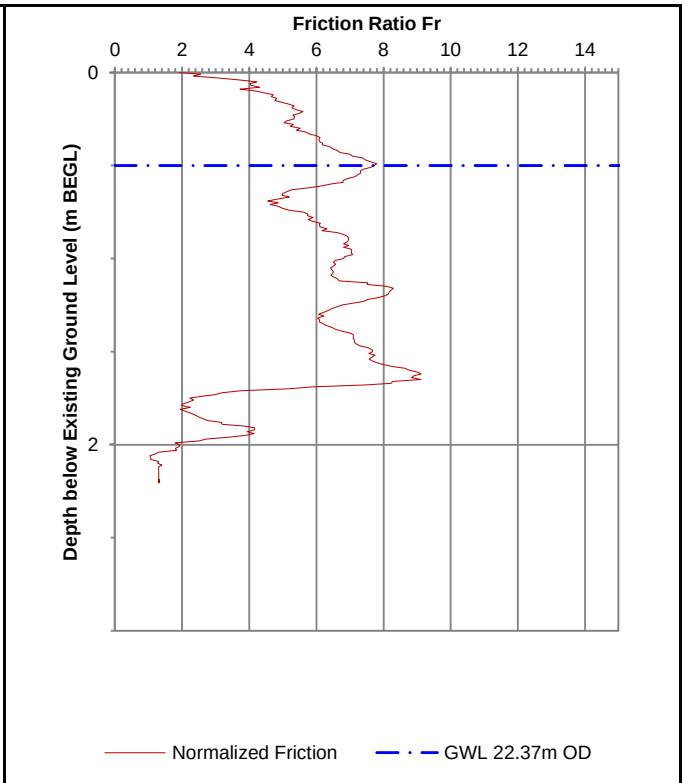
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT112	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444360.51	403786.29	23.07m OD	4.13 m BEGL	22.57m OD

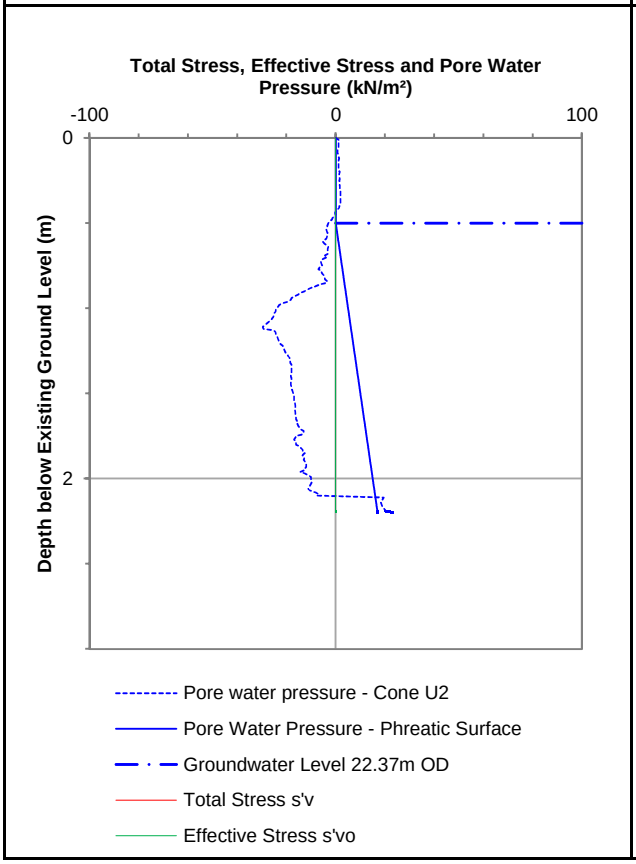
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.21 MPa	0.95 MPa	23.07m OD	10	1206 kN/m²	2555 kN/m²	0.29
2	2.55 MPa	2.13 MPa	22.97m OD	10	2555 kN/m²	3725 kN/m²	0.25
3	3.73 MPa	3.10 MPa	22.87m OD	10	3725 kN/m²	7682 kN/m²	0.25
4	7.68 MPa	6.40 MPa	22.77m OD	10	7682 kN/m²	17491 kN/m²	0.25
5	17.49 MPa	13.53 MPa	22.67m OD	10	17491 kN/m²	23850 kN/m²	0.28
6	23.85 MPa	17.72 MPa	22.57m OD	10	23850 kN/m²	25771 kN/m²	0.30
7	25.77 MPa	19.14 MPa	22.47m OD	10	25771 kN/m²	27499 kN/m²	0.30
8	27.50 MPa	20.96 MPa	22.37m OD	10	27499 kN/m²	23048 kN/m²	0.29
9	23.05 MPa	19.21 MPa	22.27m OD	10	23048 kN/m²	17735 kN/m²	0.25
10	17.73 MPa	14.78 MPa	22.17m OD	10	17735 kN/m²	13504 kN/m²	0.25
11	13.50 MPa	11.25 MPa	22.07m OD	10	13504 kN/m²	9136 kN/m²	0.25
12	9.14 MPa	7.61 MPa	21.97m OD	10	9136 kN/m²	7171 kN/m²	0.25
13	7.17 MPa	5.98 MPa	21.87m OD	10	7171 kN/m²	6539 kN/m²	0.25
14	6.54 MPa	5.45 MPa	21.77m OD	10	6539 kN/m²	5832 kN/m²	0.25
15	5.83 MPa	4.86 MPa	21.67m OD	10	5832 kN/m²	5775 kN/m²	0.25
16	5.77 MPa	4.81 MPa	21.57m OD	10	5775 kN/m²	48497 kN/m²	0.25
17	48.50 MPa	36.03 MPa	21.47m OD	10	48497 kN/m²	12176 kN/m²	0.30
18	12.18 MPa	9.60 MPa	21.37m OD	10	12176 kN/m²	31335 kN/m²	0.27
19	31.33 MPa	23.36 MPa	21.27m OD	10	31335 kN/m²	27762 kN/m²	0.30
20	27.76 MPa	21.16 MPa	21.17m OD	10	27762 kN/m²	20811 kN/m²	0.29
21	20.81 MPa	16.19 MPa	21.07m OD	10	20811 kN/m²	89419 kN/m²	0.28
22	89.42 MPa	66.43 MPa	20.97m OD	10	89419 kN/m²	56930 kN/m²	0.30
23	56.93 MPa	42.29 MPa	20.87m OD	10	56930 kN/m²	46195 kN/m²	0.30
24	46.20 MPa	34.32 MPa	20.77m OD	10	46195 kN/m²	51331 kN/m²	0.30
25	51.33 MPa	38.30 MPa	20.67m OD	10	51331 kN/m²	11380 kN/m²	0.30
26	11.38 MPa	9.48 MPa	20.57m OD	10	11380 kN/m²	7258 kN/m²	0.25
27	7.26 MPa	6.05 MPa	20.47m OD	10	7258 kN/m²	8911 kN/m²	0.25
28	8.91 MPa	7.43 MPa	20.37m OD	10	8911 kN/m²	8871 kN/m²	0.25
29	8.87 MPa	7.39 MPa	20.27m OD	10	8871 kN/m²	11896 kN/m²	0.25
30	11.90 MPa	9.91 MPa	20.17m OD	10	11896 kN/m²	29115 kN/m²	0.25

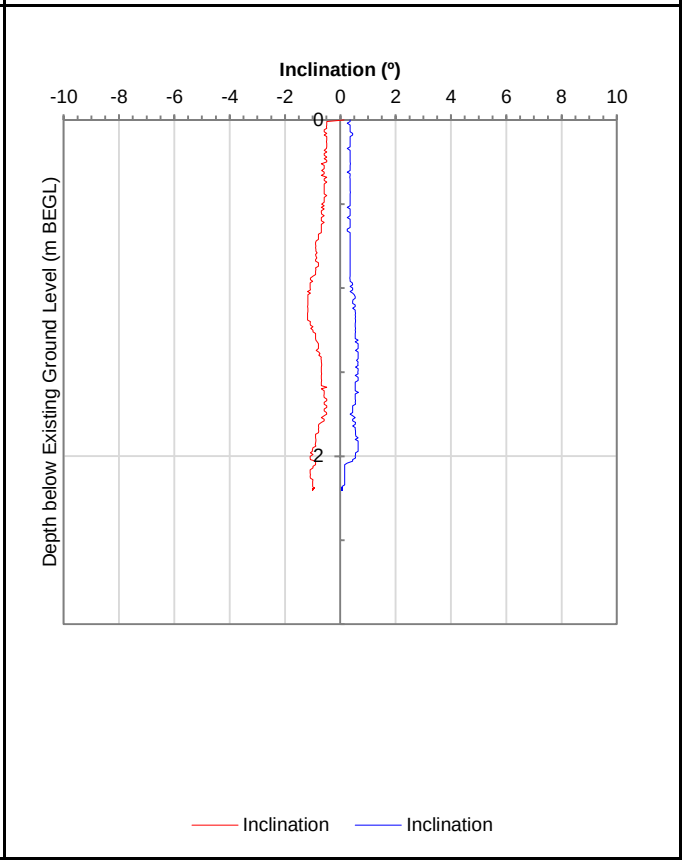
31	29.11 MPa	21.63 MPa	20.07m OD	10	29115 kN/m²	27388 kN/m²	0.30
32	27.39 MPa	20.35 MPa	19.97m OD	10	27388 kN/m²	25570 kN/m²	0.30
33	25.57 MPa	20.09 MPa	19.87m OD	10	25570 kN/m²	74054 kN/m²	0.28
34	74.05 MPa	55.01 MPa	19.77m OD	10	74054 kN/m²	29699 kN/m²	0.30
35	29.70 MPa	22.06 MPa	19.67m OD	10	29699 kN/m²	69315 kN/m²	0.30
36	69.31 MPa	51.49 MPa	19.57m OD	10	69315 kN/m²	59799 kN/m²	0.30
37	59.80 MPa	44.42 MPa	19.47m OD	10	59799 kN/m²	28251 kN/m²	0.30
38	28.25 MPa	21.24 MPa	19.37m OD	10	28251 kN/m²	31055 kN/m²	0.30
39	31.06 MPa	23.31 MPa	19.27m OD	10	31055 kN/m²	24222 kN/m²	0.30
40	24.22 MPa	19.68 MPa	19.17m OD	10	24222 kN/m²	84653 kN/m²	0.26
41	84.65 MPa	62.89 MPa	19.07m OD	10	84653 kN/m²	287630 kN/m²	0.30
42	287.63 MPa	213.67 MPa	18.97m OD	10	287630 kN/m²		0.30
43			18.87m OD	10			
44			18.77m OD	10			
45			18.67m OD	10			
46			18.57m OD	10			
47			18.47m OD	10			
48			18.37m OD	10			
49			18.27m OD	10			
50			18.17m OD	10			
51			18.07m OD	10			
52			17.97m OD	10			
53			17.87m OD	10			
54			17.77m OD	10			
55			17.67m OD	10			
56			17.57m OD	10			
57			17.47m OD	10			
58			17.37m OD	10			
59			17.27m OD	10			
60			17.17m OD	10			
61			17.07m OD	10			
62			16.97m OD	10			
63			16.87m OD	10			
64			16.77m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT113	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			443993.12	403580.59	22.87m OD	2.19 m BEGL	22.37m OD









Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT113	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
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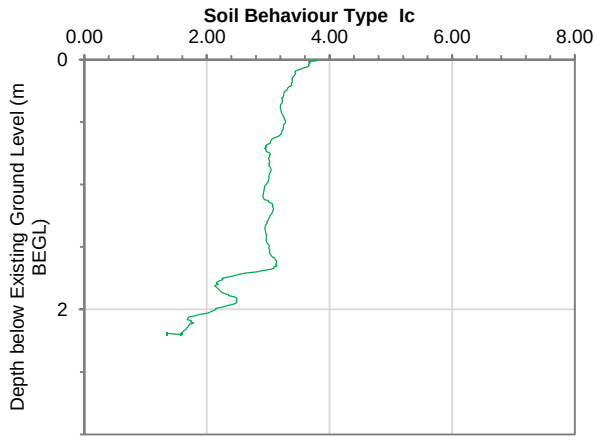
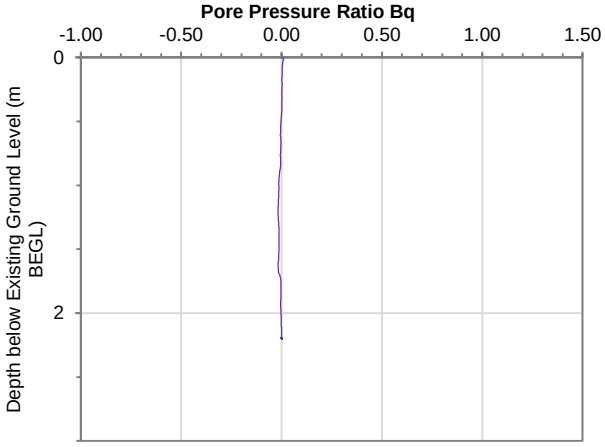
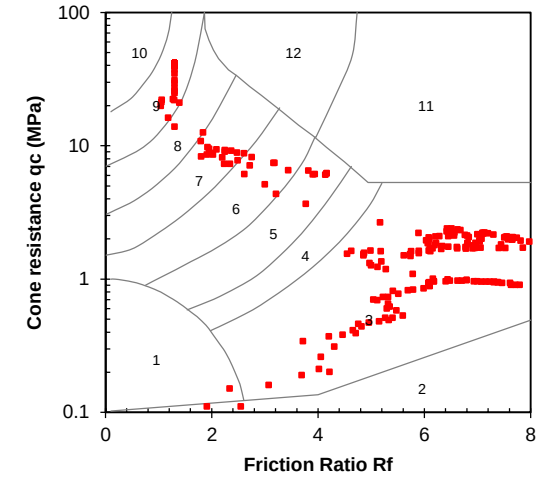
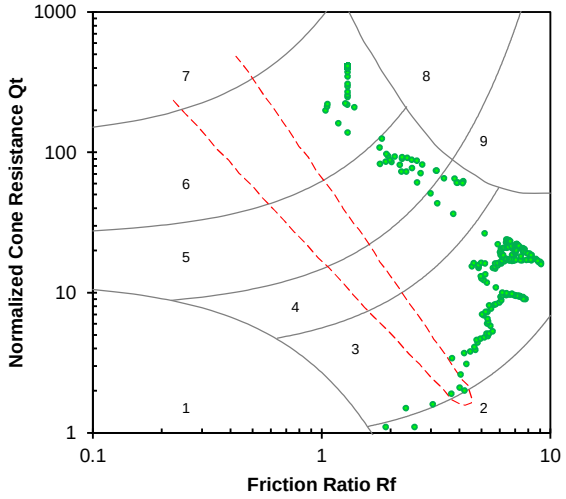


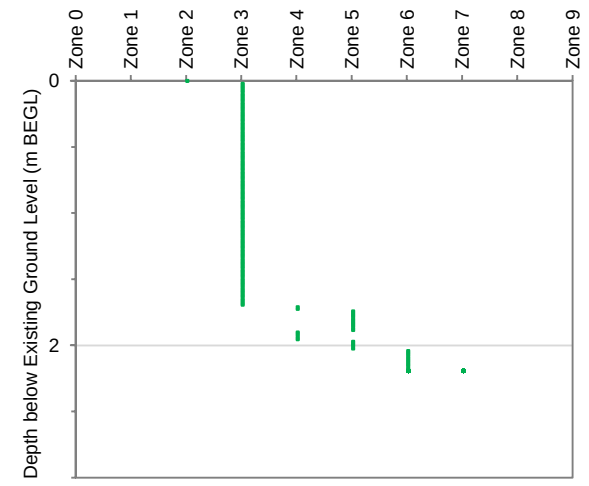




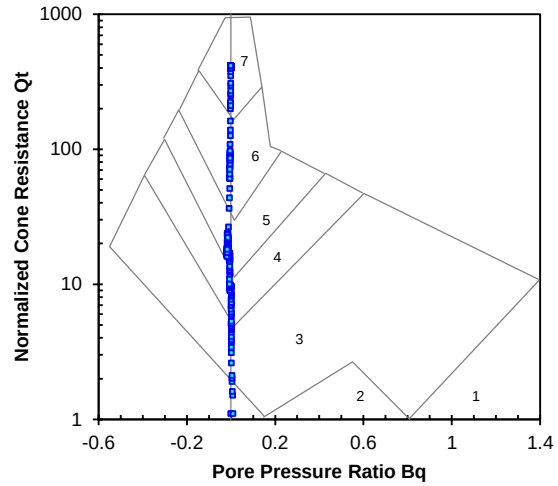
Robertson 1986



Robertson 2015



Robertson 1986 - 2015



Robertson 2015

Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT113	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
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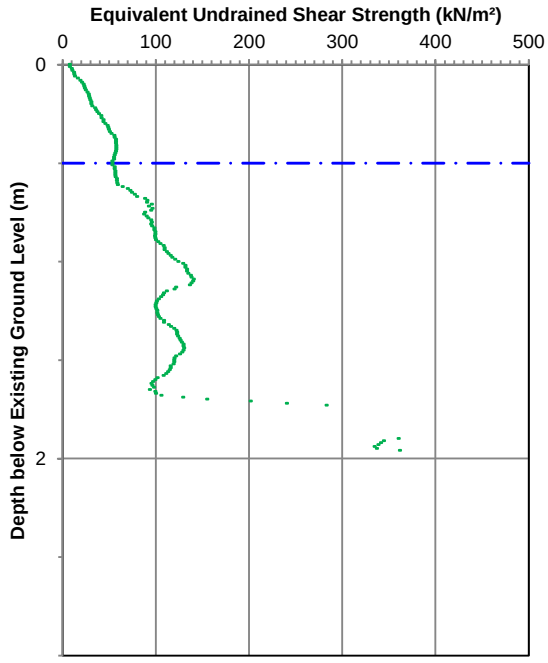
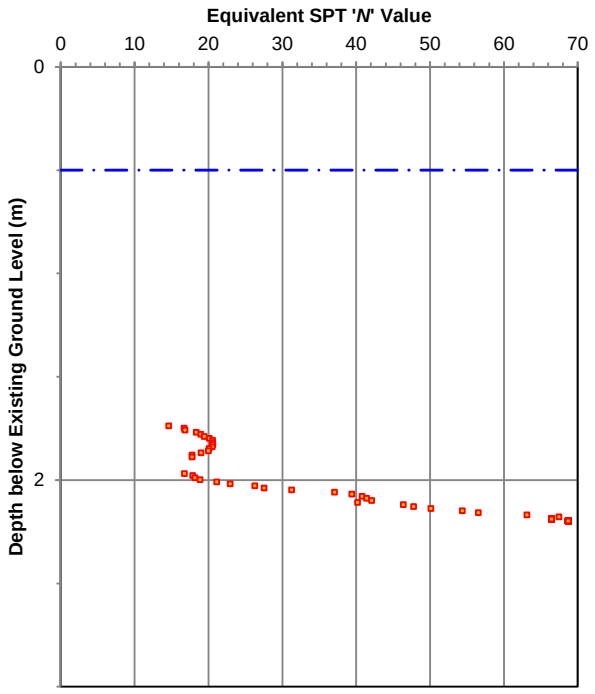
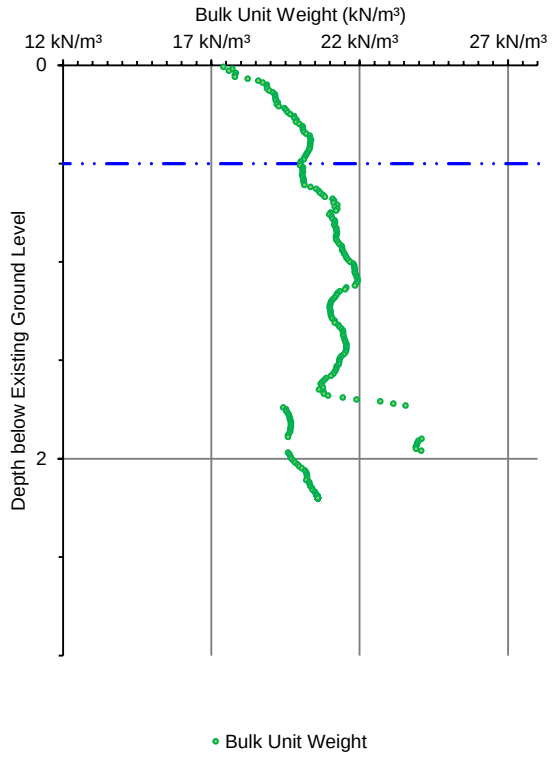
Undrained Shear Strength

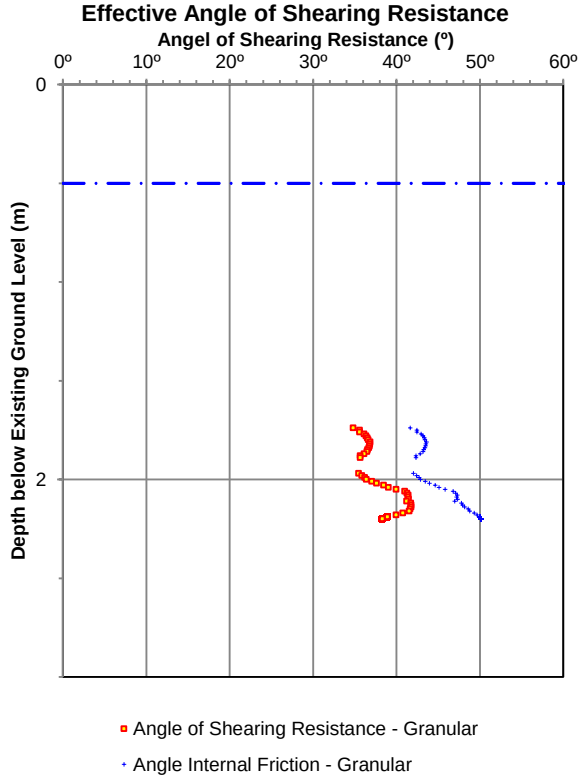


SPT 'N' Value





Effective Angle of Shearing Resistance



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT113	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
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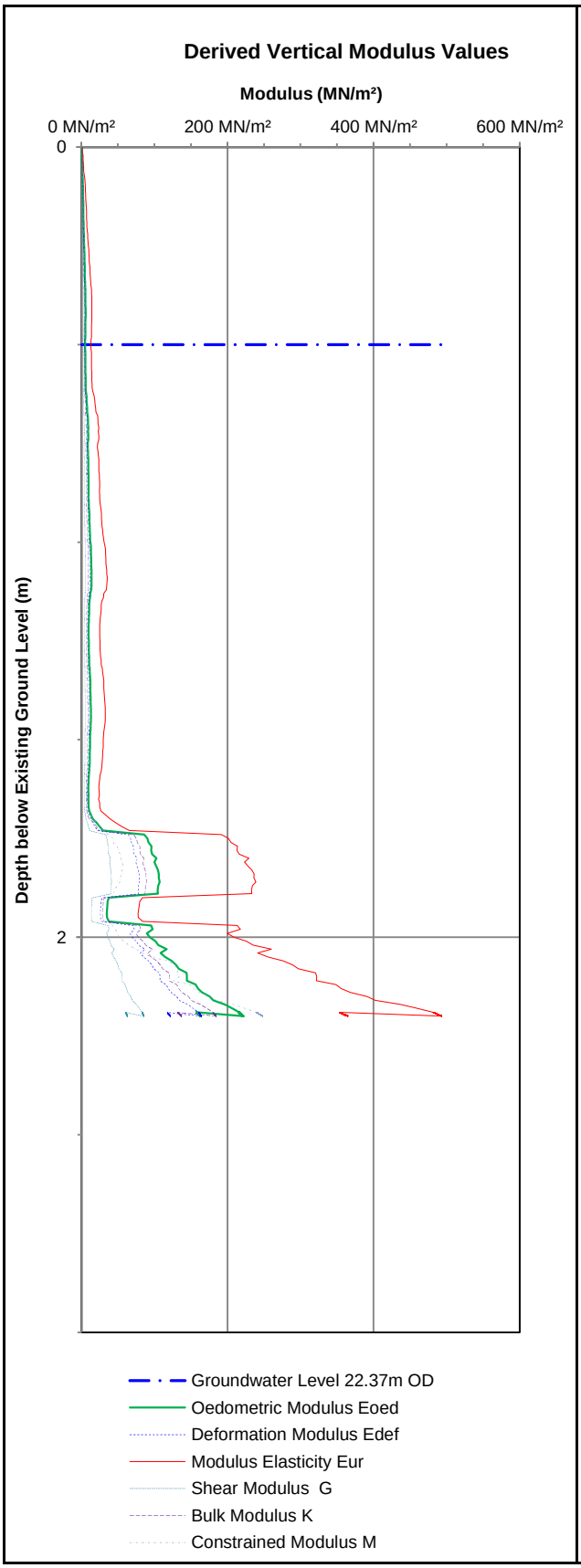

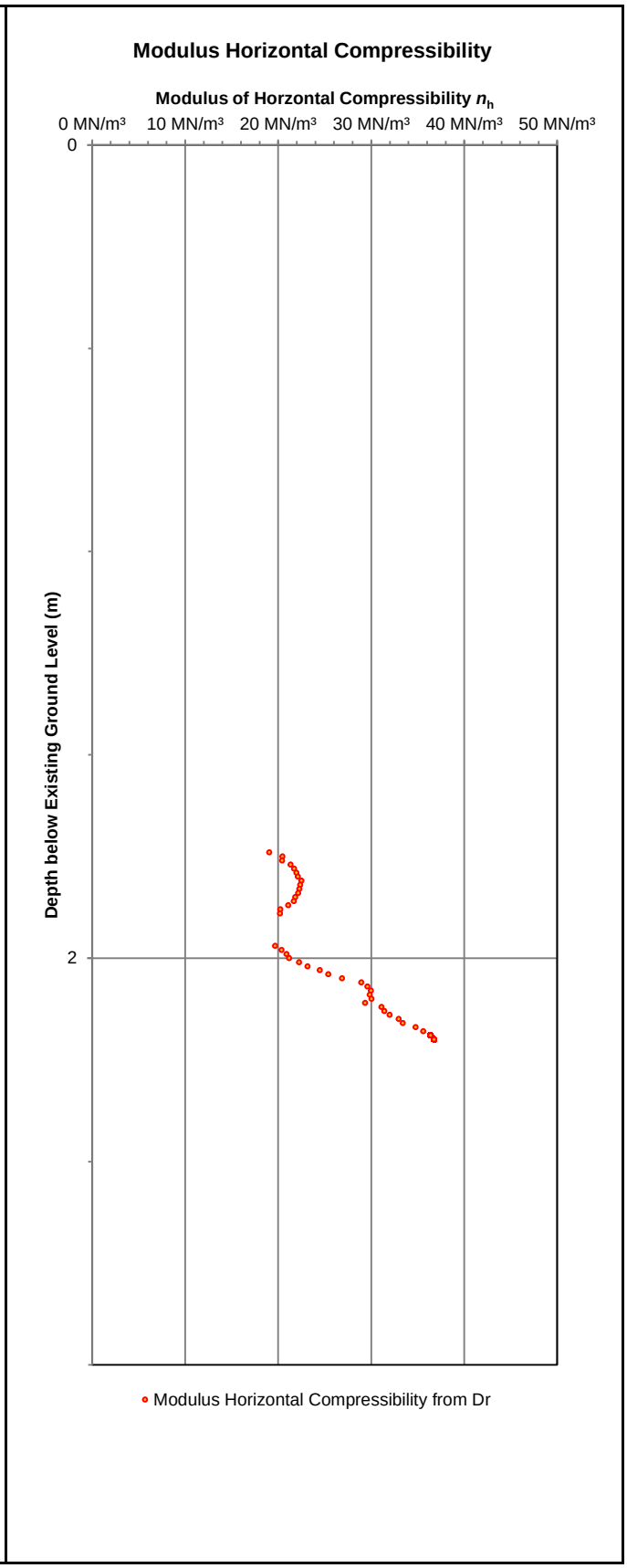

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT113	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
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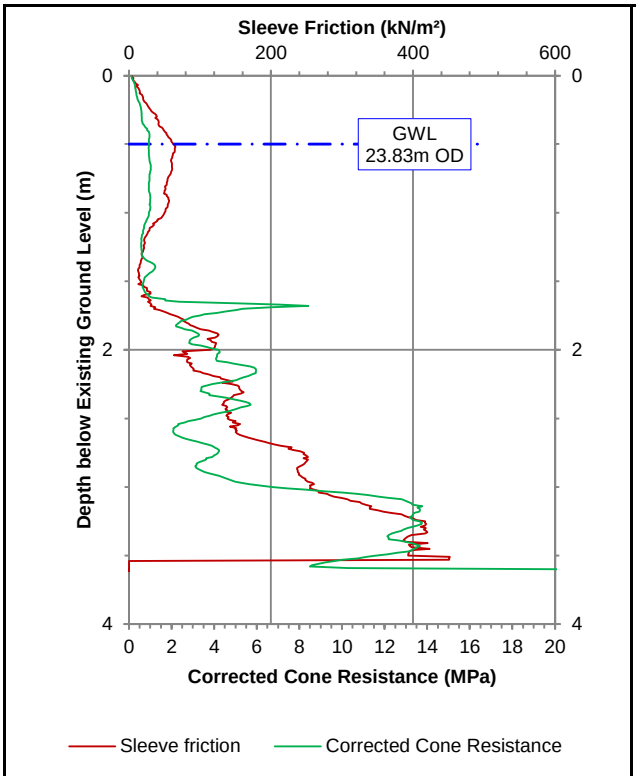
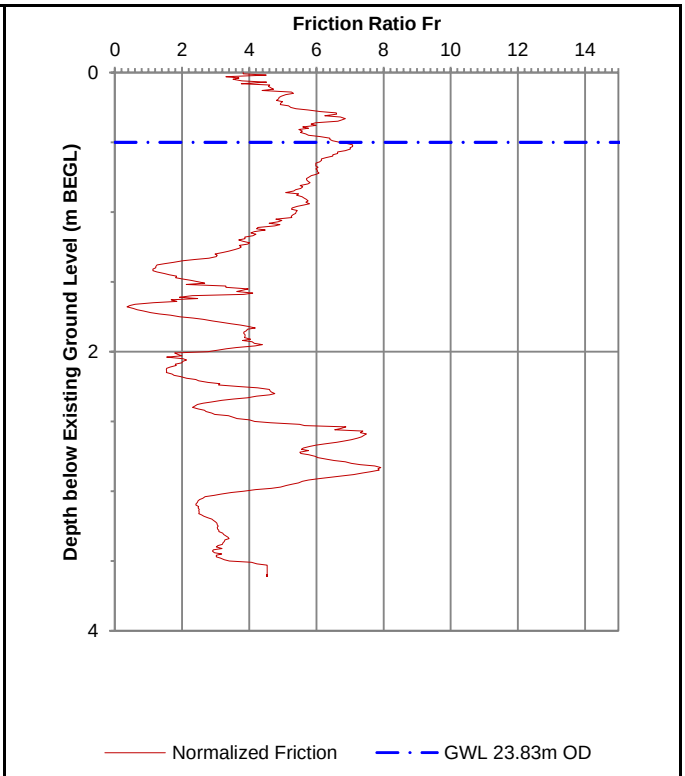
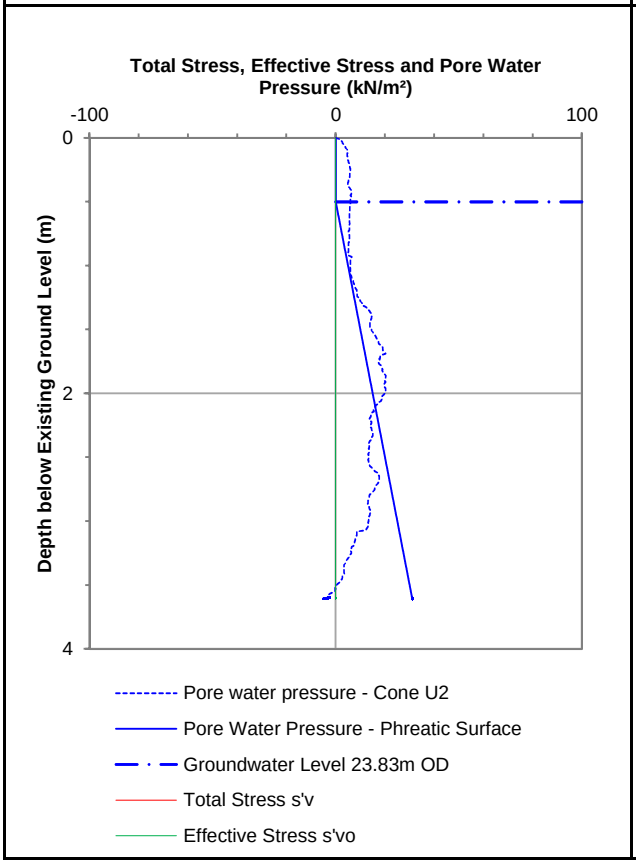
Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.27 MPa	1.03 MPa	22.87m OD	10	1274 kN/m²	2654 kN/m²	0.27
2	2.65 MPa	2.21 MPa	22.77m OD	10	2654 kN/m²	3838 kN/m²	0.25
3	3.84 MPa	3.20 MPa	22.67m OD	10	3838 kN/m²	5252 kN/m²	0.25
4	5.25 MPa	4.38 MPa	22.57m OD	10	5252 kN/m²	5604 kN/m²	0.25
5	5.60 MPa	4.67 MPa	22.47m OD	10	5604 kN/m²	5620 kN/m²	0.25
6	5.62 MPa	4.68 MPa	22.37m OD	10	5620 kN/m²	7536 kN/m²	0.25
7	7.54 MPa	6.28 MPa	22.27m OD	10	7536 kN/m²	9281 kN/m²	0.25
8	9.28 MPa	7.73 MPa	22.17m OD	10	9281 kN/m²	9883 kN/m²	0.25
9	9.88 MPa	8.24 MPa	22.07m OD	10	9883 kN/m²	11304 kN/m²	0.25
10	11.30 MPa	9.42 MPa	21.97m OD	10	11304 kN/m²	13544 kN/m²	0.25
11	13.54 MPa	11.29 MPa	21.87m OD	10	13544 kN/m²	11776 kN/m²	0.25
12	11.78 MPa	9.81 MPa	21.77m OD	10	11776 kN/m²	10220 kN/m²	0.25
13	10.22 MPa	8.52 MPa	21.67m OD	10	10220 kN/m²	12030 kN/m²	0.25
14	12.03 MPa	10.03 MPa	21.57m OD	10	12030 kN/m²	12804 kN/m²	0.25
15	12.80 MPa	10.67 MPa	21.47m OD	10	12804 kN/m²	11419 kN/m²	0.25
16	11.42 MPa	9.52 MPa	21.37m OD	10	11419 kN/m²	10253 kN/m²	0.25
17	10.25 MPa	8.54 MPa	21.27m OD	10	10253 kN/m²	70231 kN/m²	0.25
18	70.23 MPa	52.17 MPa	21.17m OD	10	70231 kN/m²	104542 kN/m²	0.30
19	104.54 MPa	77.66 MPa	21.07m OD	10	104542 kN/m²	55228 kN/m²	0.30
20	55.23 MPa	41.03 MPa	20.97m OD	10	55228 kN/m²	119734 kN/m²	0.30
21	119.73 MPa	88.95 MPa	20.87m OD	10	119734 kN/m²	173721 kN/m²	0.30
22	173.72 MPa	129.05 MPa	20.77m OD	10	173721 kN/m²		0.30
23			20.67m OD	10			
24			20.57m OD	10			
25			20.47m OD	10			
26			20.37m OD	10			
27			20.27m OD	10			
28			20.17m OD	10			
29			20.07m OD	10			
30			19.97m OD	10			

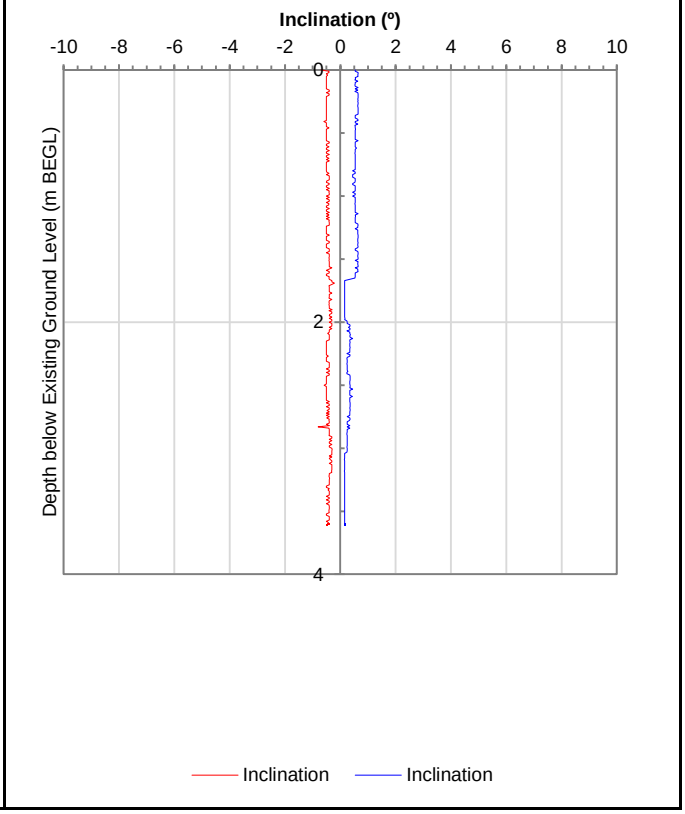
31			19.87m OD	10			
32			19.77m OD	10			
33			19.67m OD	10			
34			19.57m OD	10			
35			19.47m OD	10			
36			19.37m OD	10			
37			19.27m OD	10			
38			19.17m OD	10			
39			19.07m OD	10			
40			18.97m OD	10			
41			18.87m OD	10			
42			18.77m OD	10			
43			18.67m OD	10			
44			18.57m OD	10			
45			18.47m OD	10			
46			18.37m OD	10			
47			18.27m OD	10			
48			18.17m OD	10			
49			18.07m OD	10			
50			17.97m OD	10			
51			17.87m OD	10			
52			17.77m OD	10			
53			17.67m OD	10			
54			17.57m OD	10			
55			17.47m OD	10			
56			17.37m OD	10			
57			17.27m OD	10			
58			17.17m OD	10			
59			17.07m OD	10			
60			16.97m OD	10			
61			16.87m OD	10			
62			16.77m OD	10			
63			16.67m OD	10			
64			16.57m OD	10			

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT114	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444285.78	403682.58	24.33m OD	3.61 m BEGL	23.83m OD

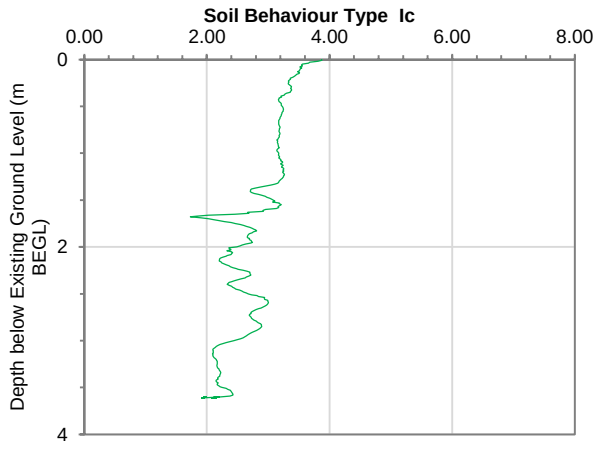


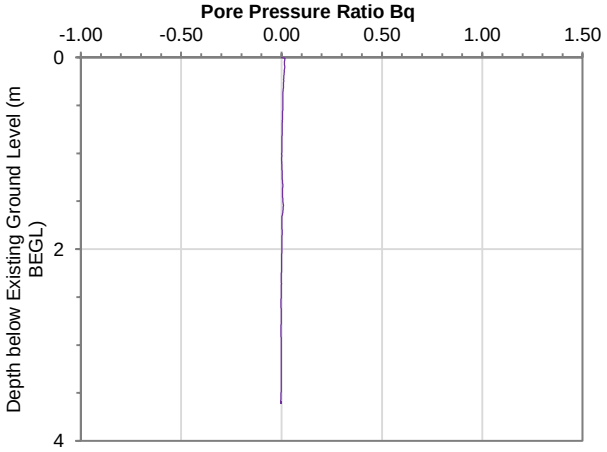


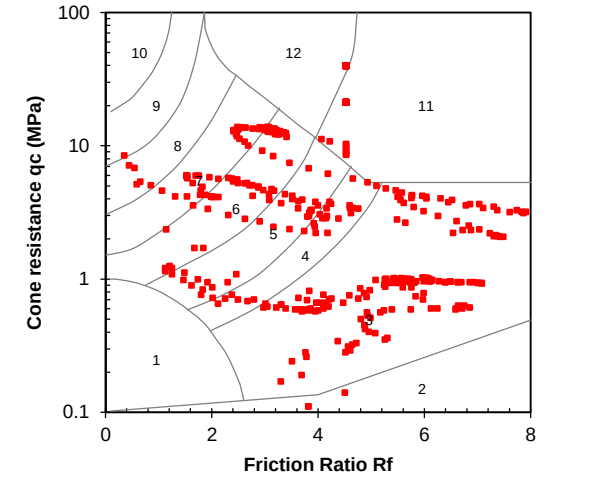




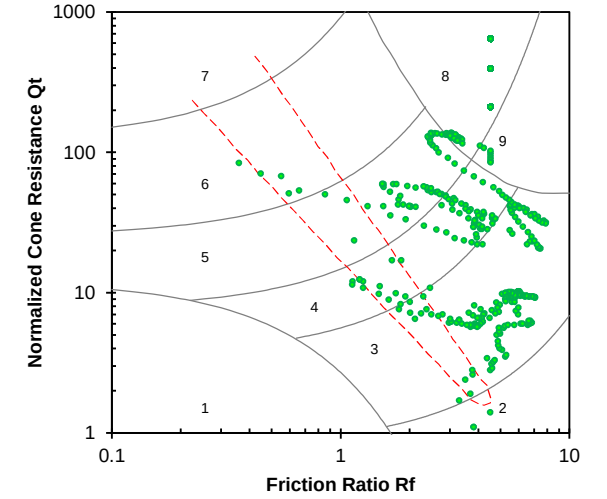
Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT114	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444285.78	403682.58	24.33m OD	3.61 m BEGL	23.83m OD



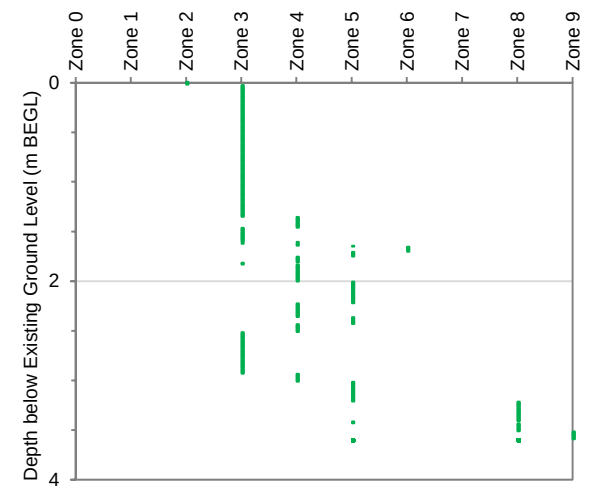




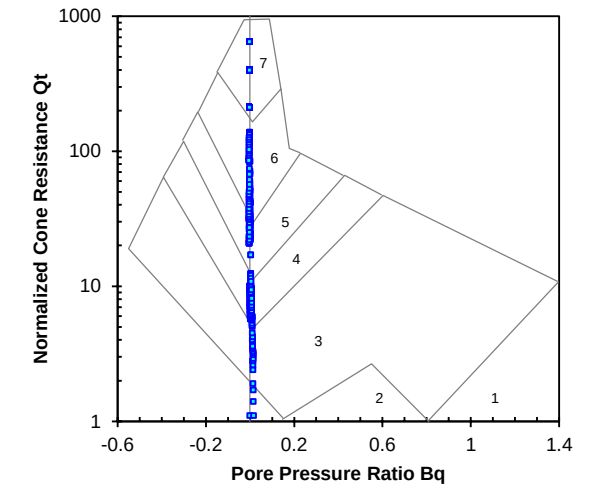
Robertson 1986



Robertson 2015



Robertson 1986 - 2015

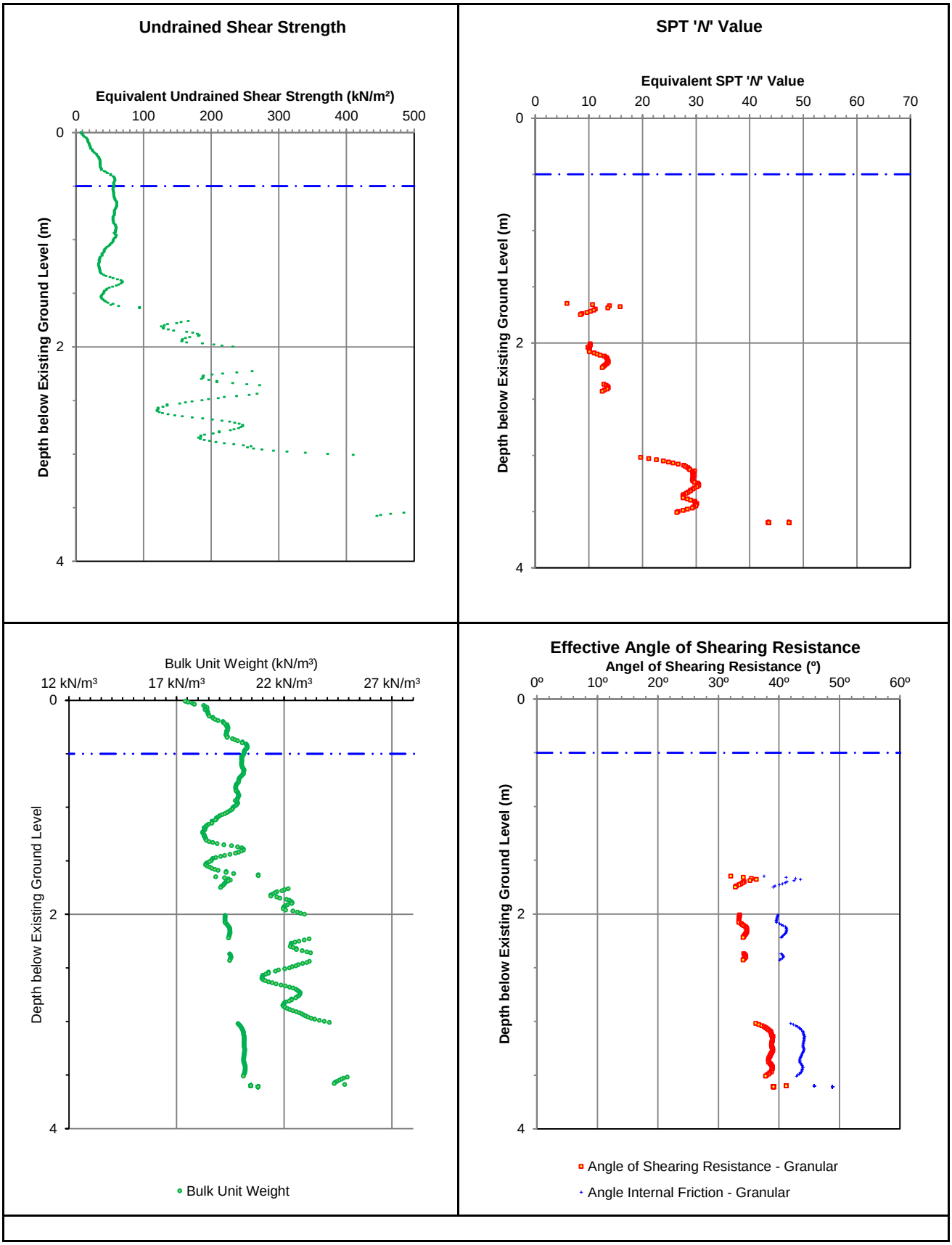


Robertson 2015

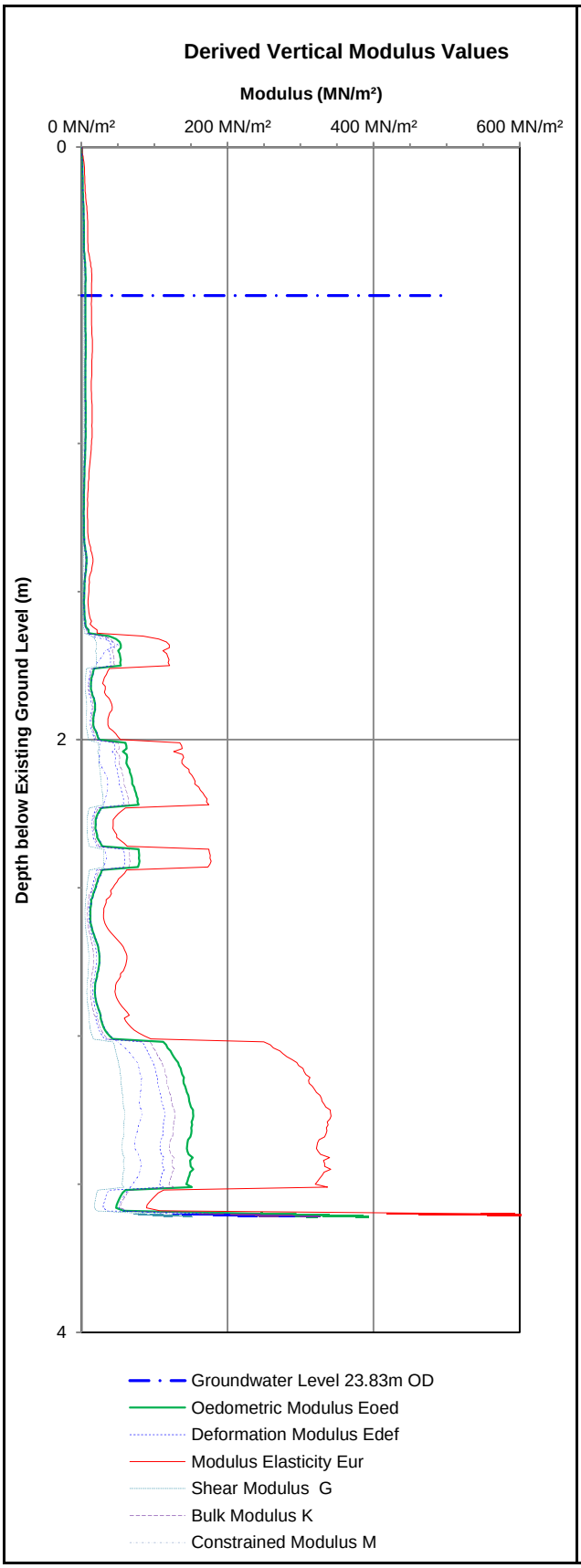
Zone	Soil Behavior - Normalised Qt vs Rf	Zone 5	Sand mixtures - silty sand to sandy silt
Zone 1	Sensitive Fine Grained	Zone 6	Sands - clean sand to silty sand
Zone 2	Organic Soils - Clays	Zone 7	gravelly sand to dense sand
Zone 3	Clays - silty clay to clay	Zone 8	very stiff sand to clayey sand
Zone 4	Silt mixtures - clayey silt to silty clay	Zone 9	very stiff, fine grained

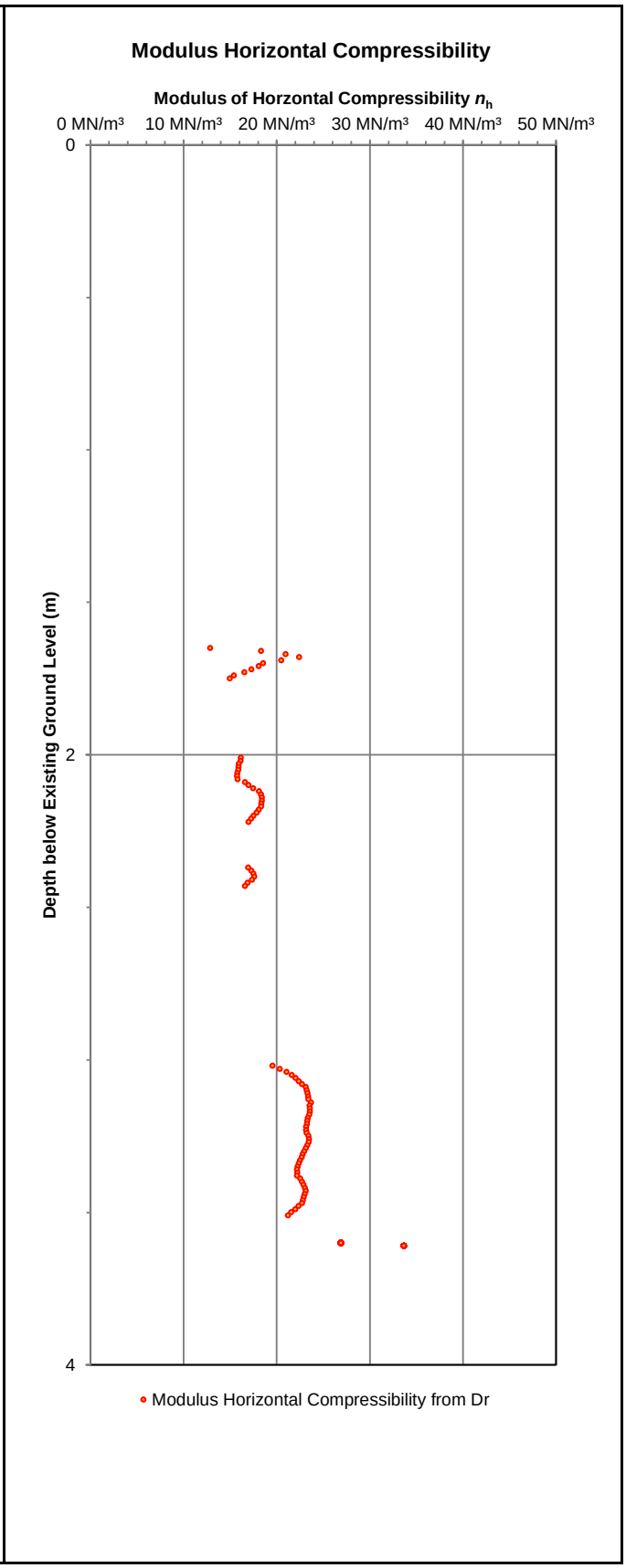
Robertson et al 1986, updated by Robertson 2015. Soil Behavior based on Friction Ratio & Pore Pressure Ratio

Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT114	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444285.78	403682.58	24.33m OD	3.61 m BEGL	23.83m OD



Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT114	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444285.78	403682.58	24.33m OD	3.61 m BEGL	23.83m OD





Project	Barnsley Road, Goldthorpe						
CPT Refernce	CPT114	CPT Location	Easting	Northing	GEO-Model Level	Max Depth	Groundwater
			444285.78	403682.58	24.33m OD	3.61 m BEGL	23.83m OD

Layer	Characteristic Parameters		Level at Top	No of Intermediate levels	Young's modulus [kPa]		Mean Poisson's Ratio
	E_{oed}	E_{def}			Top	Bottom	
1	1.30 MPa	1.02 MPa	24.33m OD	10	1297 kN/m²	2211 kN/m²	0.28
2	2.21 MPa	1.84 MPa	24.23m OD	10	2211 kN/m²	3362 kN/m²	0.25
3	3.36 MPa	2.80 MPa	24.13m OD	10	3362 kN/m²	4044 kN/m²	0.25
4	4.04 MPa	3.37 MPa	24.03m OD	10	4044 kN/m²	5631 kN/m²	0.25
5	5.63 MPa	4.69 MPa	23.93m OD	10	5631 kN/m²	5534 kN/m²	0.25
6	5.53 MPa	4.61 MPa	23.83m OD	10	5534 kN/m²	5919 kN/m²	0.25
7	5.92 MPa	4.93 MPa	23.73m OD	10	5919 kN/m²	5664 kN/m²	0.25
8	5.66 MPa	4.72 MPa	23.63m OD	10	5664 kN/m²	5686 kN/m²	0.25
9	5.69 MPa	4.74 MPa	23.53m OD	10	5686 kN/m²	5827 kN/m²	0.25
10	5.83 MPa	4.86 MPa	23.43m OD	10	5827 kN/m²	4944 kN/m²	0.25
11	4.94 MPa	4.12 MPa	23.33m OD	10	4944 kN/m²	3771 kN/m²	0.25
12	3.77 MPa	3.14 MPa	23.23m OD	10	3771 kN/m²	3430 kN/m²	0.25
13	3.43 MPa	2.86 MPa	23.13m OD	10	3430 kN/m²	5226 kN/m²	0.25
14	5.23 MPa	4.09 MPa	23.03m OD	10	5226 kN/m²	5313 kN/m²	0.27
15	5.31 MPa	4.08 MPa	22.93m OD	10	5313 kN/m²	4057 kN/m²	0.28
16	4.06 MPa	3.38 MPa	22.83m OD	10	4057 kN/m²	30809 kN/m²	0.25
17	30.81 MPa	22.95 MPa	22.73m OD	10	30809 kN/m²	36659 kN/m²	0.29
18	36.66 MPa	27.23 MPa	22.63m OD	10	36659 kN/m²	15658 kN/m²	0.30
19	15.66 MPa	11.89 MPa	22.53m OD	10	15658 kN/m²	18154 kN/m²	0.29
20	18.15 MPa	13.49 MPa	22.43m OD	10	18154 kN/m²	61436 kN/m²	0.30
21	61.44 MPa	45.64 MPa	22.33m OD	10	61436 kN/m²	70938 kN/m²	0.30
22	70.94 MPa	52.70 MPa	22.23m OD	10	70938 kN/m²	34357 kN/m²	0.30
23	34.36 MPa	25.52 MPa	22.13m OD	10	34357 kN/m²	42063 kN/m²	0.30
24	42.06 MPa	31.25 MPa	22.03m OD	10	42063 kN/m²	42294 kN/m²	0.30
25	42.29 MPa	31.42 MPa	21.93m OD	10	42294 kN/m²	14092 kN/m²	0.30
26	14.09 MPa	11.56 MPa	21.83m OD	10	14092 kN/m²	16499 kN/m²	0.26
27	16.50 MPa	13.75 MPa	21.73m OD	10	16499 kN/m²	23913 kN/m²	0.25
28	23.91 MPa	19.93 MPa	21.63m OD	10	23913 kN/m²	19366 kN/m²	0.25
29	19.37 MPa	16.14 MPa	21.53m OD	10	19366 kN/m²	28394 kN/m²	0.25
30	28.39 MPa	21.84 MPa	21.43m OD	10	28394 kN/m²	113649 kN/m²	0.28

31	113.65 MPa	84.42 MPa	21.33m OD	10	113649 kN/m²	140073 kN/m²	0.30
32	140.07 MPa	104.05 MPa	21.23m OD	10	140073 kN/m²	150806 kN/m²	0.30
33	150.81 MPa	112.03 MPa	21.13m OD	10	150806 kN/m²	147424 kN/m²	0.30
34	147.42 MPa	109.52 MPa	21.03m OD	10	147424 kN/m²	149113 kN/m²	0.30
35	149.11 MPa	110.77 MPa	20.93m OD	10	149113 kN/m²	64137 kN/m²	0.30
36	64.14 MPa	41.97 MPa	20.83m OD	10	64137 kN/m²	338851 kN/m²	0.34
37	338.85 MPa	251.72 MPa	20.73m OD	10	338851 kN/m²		0.30
38			20.63m OD	10			
39			20.53m OD	10			
40			20.43m OD	10			
41			20.33m OD	10			
42			20.23m OD	10			
43			20.13m OD	10			
44			20.03m OD	10			
45			19.93m OD	10			
46			19.83m OD	10			
47			19.73m OD	10			
48			19.63m OD	10			
49			19.53m OD	10			
50			19.43m OD	10			
51			19.33m OD	10			
52			19.23m OD	10			
53			19.13m OD	10			
54			19.03m OD	10			
55			18.93m OD	10			
56			18.83m OD	10			
57			18.73m OD	10			
58			18.63m OD	10			
59			18.53m OD	10			
60			18.43m OD	10			
61			18.33m OD	10			
62			18.23m OD	10			
63			18.13m OD	10			
64			18.03m OD	10			

Hydrock

Client	Location or material to which this assessment applies
Newlands	Alluvium
Project	
Goldthorpe	
Job number	
23451	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	6	6	6
No. tests in 20% data set	1	1	1
No. tests with suspected pyrite		0	
Maximum value	113.355	0.3	16
Mean of highest two values	110	0	16
Mean of highest 20%			
Characteristic Value	**110**	**0**	**16**

	[no pyrite]	[pyrite suspected]
DS Class	**DS-1**	**DS-1**

If pyrite suspected, DS Class limited to **DS-1**

Is pyrite assumed to be present? No **Adopted DS Class =** **DS-1**

Water data

	(Adjusted) soluble sulfate (mg/l)	Soluble magnesium (mg/l)
Characteristic Value (Maximum Level)	0	0

DS Class

pH data

	Soil	Water
Number of tests	6	0
No. tests in 20% data set	1	
Lowest pH	5.5	
Mean of lowest 20%	5.5	
Characteristic value	**5.5**	
Design value	**5.5**	
Number of soil pH results less than 5.5	0	

DS Class design value

Based on higher of soil and water data **DS-1**

ACEC Class design value

Natural ground

Mobile groundwater **AC-2z**

Hydrock

Client	Location or material to which this assessment applies
Newlands	Opencast Backfill
Project	
Goldthorpe	
Job number	
23451	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	6	6	6
No. tests in 20% data set	1	1	1
No. tests with suspected pyrite		1	
Maximum value	243.355	0.4	36
Mean of highest two values	186	0	28
Mean of highest 20%			
Characteristic Value	**186**	**0**	**28**
			Mg not required
	[no pyrite]	**[pyrite suspected]**	
DS Class	**DS-1**	**DS-1**	

If pyrite suspected, DS Class limited to **DS-1**

Is pyrite assumed to be present? No **Adopted DS Class =** **DS-1**

Water data

	(Adjusted) soluble sulfate (mg/l)	Soluble magnesium (mg/l)
Characteristic Value (Maximum Level)	0	0 **Mg not required**
DS Class		

pH data

	Soil	Water
Number of tests	6	0
No. tests in 20% data set	1	
Lowest pH	4.3	
Mean of lowest 20%	4.3	
Characteristic value	**4.3**	
Design value	**4.3**	
Number of soil pH results less than 5.5	1	

DS Class design value

Based on higher of soil and water data **DS-1**

ACEC Class design value

Brownfield

Mobile groundwater **AC-4z**

Hydrock

Client	Location or material to which this assessment applies
Newlands	Pennine Coal Measures
Project	
Goldthorpe	
Job number	
23451	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	4	4	4
No. tests in 20% data set	1	1	1
No. tests with suspected pyrite		1	
Maximum value	182.6	0.5	22
Mean of highest two values	130	0	14
Mean of highest 20%			
Characteristic Value	**182.6**	**0.5**	**22**

	[no pyrite]	[pyrite suspected]
DS Class	**DS-1**	**DS-2**

If pyrite suspected, DS Class limited to **DS-2**

Is pyrite assumed to be present? Yes **Adopted DS Class =** **DS-2**

Water data

	(Adjusted) soluble sulfate (mg/l)	Soluble magnesium (mg/l)
Characteristic Value (Maximum Level)	0	0

DS Class

pH data

	Soil	Water
Number of tests	4	0
No. tests in 20% data set	1	
Lowest pH	4.3	
Mean of lowest 20%	4.3	
Characteristic value	**4.3**	
Design value	**4.3**	
Number of soil pH results less than 5.5	1	

DS Class design value

Based on higher of soil and water data **DS-2**

ACEC Class design value

Natural ground

Mobile groundwater **AC-3z**

Appendix D Site monitoring data and ground gas risk assessment

Ground gas risk assessment

Hydrock

Site: Goldthorpe
Job number: 23451
Client: Hydrock

Gas analyser: G505316
Equipment check OK: Y
Service in date: Y
Calibration check OK: Y
Name of person monitoring: I.Sidgwick

Notes on site conditions: Dry. Sunny spells, Light breeze. Ground mainly dry, some waterlogged patches

Notes: LEL = lower explosive limit = 5%v/v. * where the flow is less than the limit of detection of the instrument, the detection limit is reported. GSVs are rounded to 3 places.

Monitoring round		Borehole details						Pressure and flow					Gas concentrations										GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipie & filter pack) (m^3)	Atmospheric pressure (hPa)	Atm pressure falling / rising /	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	VOC (as ppm using PID)	CH_4 (%v/v)	CH_4 (%LEL)	CO_2 (%v/v)	O_2 (%v/v)	CO (PPM)	H2S (PPM)	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
								Max. individual values:			**0.2**			**0.0**	**0.0**	**6.2**	**20.2**	**8.0**	**2.0**	**0**	**0.002**	
								Min. individual values:			0.0			0.0	0.0	0.0	5.6	0.0	0.0	0	0	**Summary statistics for this monitoring period.**
								Worst-case GSVs based on max. individual flow and max. individual conc. over the duration of this table:												**0**	**0.0124**	
18/04/24	09:21	CP101	S	1	1.70		0.00634	1023		-0.1	0.0	0.0	0	0	0	0	0	3.2	3.2	14.1	14.1	1	ND	0	0	Base of hole: 5.52m
18/04/24	09:36	CP102	S	1	1.83		0.00683	1023		-0.1	0.0	0.0	0	0	0	0	0	0.7	0.7	8.8	8.8	1	ND	0	0	Base of hole: 2.59m
18/04/24	09:45	CP103	S	0.5	0.00			1023		1.5	0.2	0.2	0	0	0	0	0	0.2	0.0	19.0	19.0	1	1	0	0	Base of hole: 1.87m. Peak flow 2.2l/hr. Water at ground leve
18/04/24	09:31	RO101	S	4	2.51		0.00936	1023		0.5	0.1	0.1	0	0	0	0	0	0.3	0.2	19.8	20.0	1	ND	0	0.0002	Base of hole: 9.29m
18/04/24	09:50	RO103	S	12	1.56		0.00582	1023		-0.1	0.0	0.0	0	0	0	0	0	0.1	0.0	16.2	16.2	8	1	0	0	Base of hole: 13.25m
26/04/24	08:22	CP101	S	1	1.75		0.00653	1001		-0.2	0.0	0.0	0	0	0	0	0	4.3	4.3	12.5	12.5	0	0	0	0	Base of hole: 5.51m
26/04/24	08:38	CP102	S	1	1.89		0.00705	1001		0.0	0.0	0.0	0	0	0	0	0	0.9	0.9	7.5	7.5	0	0	0	0	Base of hole: 2.58m
26/04/24	08:45	CP103	S	0.5	0.05		0.00019	1001		-11.9	-0.1	0.1	0	0	0	0	0	0.1	0.0	17.0	17.0	0	0	0	0	Base of hole: 1.90m. Peak flow -7.4l/hr
26/04/24	08:33	RO101	S	4	2.58		0.00963	1001		-3.6	-0.2	0.2	0	0	0	0	0	0.4	0.4	20.0	20.2	1.0	0	0	0.0008	Base of hole: 9.24m. Peak flow: -3.5l/hr
26/04/24	08:51	RO103	S	12	1.67		0.00623	1001		2.3	0.1	0.1	0	0	0	0	0	0.1	0	16.8	16.8	0	0	0	0	Base of hole: 13.25m. Peak flow - 2.5l/hr
07/05/24	08:11	CP101	S	1	1.87		0.00698	1017		-0.1	0.0	0.0	0	0	0	0	0	4.3	4.3	13.6	13.6	0	0	0	0	Base of hole: 5.50m
07/05/24	08:26	CP102	S	1	1.95		0.00727	1017		-0.1	0.0	0.0	0	0	0	0	0	1.2	1.2	6.1	6.1	0	0	0	0	Base of hole: 2.58m
07/05/24	08:35	CP103	S	0.5	0.17		0.00063	1017		-12.4	-0.2	0.2	0	0	0	0	0	0.1	0.1	17.9	17.9	0	0	0	0.0002	Base of hole: 1.86m. Peak flow -8.7l/hr
07/05/24	08:21	RO101	S	4	2.76		0.01030	1017		-17.3	-0.2	0.2	0	0	0	0	0	0.6	0.6	20.1	20.1	1.0	1	0	0.0012	Base of hole: 9.18m. Peak flow: -10.9l/hr
07/05/24	08:42	RO103	S	12	1.84		0.00686	1018		-11.7	-0.1	0.1	0	0	0	0	0	0.1	0.0	16.9	16.9	1.0	2	0	0	Base of hole: 13.25m. Peak flow -8.2l/hr
16/05/24	08:02	CP101	S	1	1.95		0.00727	1002		-0.1	0.0	0.0	0	0	0	0	0	6.2	6.2	13.1	13.1	0	0	0	0	Base of hole: 5.51m
16/05/24	08:10	CP102	S	1	2.07		0.00772	1003		-0.2	0.0	0.0	0	0	0	0	0	1.8	1.8	5.6	5.6	0	0	0	0	Base of hole: 2.58m
16/05/24	08:22	CP103	S	0.5	0.35		0.00131	1003		-19.7	-0.2	0.2	0	0	0	0	0	0.2	0.2	18.9	18.9	0	0	0	0.0004	Base of hole: 1.86m. Peak flow: -12.2l/hr
16/05/24	08:15	RO101	S	4	2.90		0.01082	1002		-5.4	-0.2	0.2	0	0	0	0	0	1.0	1.0	19.6	19.7	0	0	0	0.002	Base of hole: 9.13m. Peak flow: -4.9l/hr
16/05/24	08:27	RO103	S	12	1.87		0.00698	1003		1.6	0.0	0.0	0	0	0	0	0	0.1	0.0	17.3	17.3	0	0	0	0	Base of hole: 13.24m. Peak flow: 1.2l/hr

Appendix E Contamination test results and GQRA

Contamination test results

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Analytical Report Number : 24-011894

Project / Site name:	Goldthorpe	**Samples received on:**	22/03/2024
Your job number:	23451	**Samples instructed on/ Analysis started on:**	02/04/2024
Your order number:	PO33193	**Analysis completed by:**	08/04/2024
Report Issue Number:	1	**Report issued on:**	09/04/2024
Samples Analysed:	4 soil samples		

Izabela Wójcik
Signed:

Izabela Wójcik
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-011894
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				159772	159773	159774	159775
Sample Reference				BH103	BH103	BH102	BH102
Sample Number				ES1	ES3	ES1	ES2
Depth (m)				0.30	0.80	0.30	0.50
Date Sampled				21/03/2024	21/03/2024	21/03/2024	21/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	28	15	21	14
Total mass of sample received	kg	0.1	NONE	1	1	1.1	1.2
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	6.8	8	7	7.6
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	48	160	57	66
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0239	0.0782	0.0287	0.0332
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	23.9	78.2	28.7	33.2
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.027	0.014	0.022	0.0039
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.07	< 0.05	0.06	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.19	< 0.05	0.12	0.08
Pyrene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.11	0.08
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.1	< 0.05	0.06	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.11	< 0.05	0.06	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.12	< 0.05	0.07	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.08	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.07	0.06
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	< 0.05
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.11	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 24-011894
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				159772	159773	159774	159775
Sample Reference				BH103	BH103	BH102	BH102
Sample Number				ES1	ES3	ES1	ES2
Depth (m)				0.30	0.80	0.30	0.50
Date Sampled				21/03/2024	21/03/2024	21/03/2024	21/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	8.5	14	6.9
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.5	0.83	0.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1	< 0.2	0.8	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	25	26	19	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	26	15	7.8
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	17	34	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	41	13	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	31	28	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	80	92	66	51

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 24-011894
Project / Site name: Goldthorpe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
159772	BH103	ES1	0.3	Brown clay with vegetation
159773	BH103	ES3	0.8	Brown clay and sand
159774	BH102	ES1	0.3	Brown clay and sand with vegetation
159775	BH102	ES2	0.5	Brown clay and sand

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Analytical Report Number : 24-011894
Project / Site name: Goldthorpe

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 24-011894
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH102	ES1	S	159774	c	Free cyanide in soil	L080	c
BH102	ES2	S	159775	c	Free cyanide in soil	L080	c
BH103	ES1	S	159772	c	Free cyanide in soil	L080	c
BH103	ES3	S	159773	c	Free cyanide in soil	L080	c

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Analytical Report Number : 24-012239

Replaces Analytical Report Number: 24-012239, issue no. 1
Client sampling date amended.
Adding sampling dates as per client's request

Project / Site name:	Goldthorpe	**Samples received on:**	28/03/2024
Your job number:	23451	**Samples instructed on/ Analysis started on:**	04/04/2024
Your order number:	PO33193	**Analysis completed by:**	09/04/2024
Report Issue Number:	2	**Report issued on:**	11/04/2024
Samples Analysed:	12 soil samples		

Signed:

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161412	161413	161414	161415	161416
Sample Reference				TP111	TP111	TP120	TP121	TP121
Sample Number				ES1	ES2	ES1	ES1	ES2
Depth (m)				0.30	0.50	0.20	0.30	0.60
Date Sampled				26/03/2024	26/03/2024	26/03/2024	29/03/2024	29/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	19	17	21	11
Total mass of sample received	kg	0.1	NONE	1.2	1.2	1.3	1.3	1.2
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.6	7.8	7.7	7.7	6
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	25	21	19	25	71
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0123	0.0104	0.00968	0.0123	0.0353
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.3	10.4	9.68	12.3	35.3
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.023	0.0085	0.02	0.021	0.0051
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.09	0.06	< 0.05	0.08	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.21	0.08	0.18	0.14	0.05
Pyrene	mg/kg	0.05	MCERTS	0.18	0.07	0.15	0.11	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.1	0.08	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.17	< 0.05	0.12	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	0.06	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.07	0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.01	< 0.80	< 0.80	< 0.80	< 0.80

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161412	161413	161414	161415	161416
Sample Reference				TP111	TP111	TP120	TP121	TP121
Sample Number				ES1	ES2	ES1	ES1	ES2
Depth (m)				0.30	0.50	0.20	0.30	0.60
Date Sampled				26/03/2024	26/03/2024	26/03/2024	29/03/2024	29/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	15	16	14	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.98	0.83	0.79	1.3	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.6	1	1.1	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	22	20	19	22	17
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	20	19	22	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	7.5	14	14	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	22	30	34	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	8.6	15	17	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	34	27	36	28
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	47	95	74	90

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161417	161418	161419	161420	161421
Sample Reference				TP125	TT113	TT117	TT117	TT122
Sample Number				ES1	ES1	ES1	ES2	ES1
Depth (m)				0.30	0.30	0.20	0.50	0.40
Date Sampled				28/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	11	21	14	20
Total mass of sample received	kg	0.1	NONE	1.2	2	1.1	1.2	1.2
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.3	7.3	7.8	7.2	7.7
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	79	44	21	30	19
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0396	0.0221	0.0105	0.0151	0.00964
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	39.6	22.1	10.5	15.1	9.64
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.03	0.028	0.024	0.0095	0.023
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.2	< 0.05	0.44
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.1	0.31	0.29	0.13	0.62
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.12
Fluoranthene	mg/kg	0.05	MCERTS	0.18	0.22	0.48	0.18	0.93
Pyrene	mg/kg	0.05	MCERTS	0.16	0.21	0.41	0.15	0.84
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	< 0.05	0.44
Chrysene	mg/kg	0.05	MCERTS	0.08	< 0.05	0.23	0.08	0.49
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.11	0.13	0.3	0.09	0.52
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	0.25
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.24	< 0.05	0.49
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.14	< 0.05	0.26
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.07	0.15	< 0.05	0.31
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	0.94	2.44	< 0.80	5.79

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Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161417	161418	161419	161420	161421
Sample Reference				TP125	TT113	TT117	TT117	TT122
Sample Number				ES1	ES1	ES1	ES2	ES1
Depth (m)				0.30	0.30	0.20	0.50	0.40
Date Sampled				28/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	13	14	11	20
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.4	1.5	1.3	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.6	1.8	0.8	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	26	23	26	27	26
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	23	26	27	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	25	24	18	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	15	37	21	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	31	27	26	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	41	27	37	31	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77	63	100	78	99

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161422	161423
Sample Reference				TT122	TT123
Sample Number				ES2	ES2
Depth (m)				0.60	0.90
Date Sampled				27/03/2024	27/03/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	20
Total mass of sample received	kg	0.1	NONE	1.3	1.1
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	7.6	5.6
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	29	150
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0147	0.0764
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14.7	76.4
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.011	-
Fraction Organic Carbon (FOC)	N/A	0.001	MCERTS	-	0.15
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.09
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.07	0.18
Fluorene	mg/kg	0.05	MCERTS	0.06	0.15
Phenanthrene	mg/kg	0.05	MCERTS	0.74	1.9
Anthracene	mg/kg	0.05	MCERTS	0.18	0.5
Fluoranthene	mg/kg	0.05	MCERTS	0.78	2.7
Pyrene	mg/kg	0.05	MCERTS	0.68	2.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28	1.2
Chrysene	mg/kg	0.05	MCERTS	0.3	1.4
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.27	1.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.14	0.59
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.27	1.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.14	0.82
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	0.92
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.06	16.4

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Analytical Report Number: 24-012239
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				161422	161423
Sample Reference				TT122	TT123
Sample Number				ES2	ES2
Depth (m)				0.60	0.90
Date Sampled				27/03/2024	27/03/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	31
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.89	5.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	20	22
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.4	87
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	52
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	69
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.5
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	35	45

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Analytical Report Number : 24-012239
Project / Site name: Goldthorpe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
161412	TP111	ES1	0.3	Brown clay and sand with vegetation
161413	TP111	ES2	0.5	Brown clay and sand with vegetation
161414	TP120	ES1	0.2	Brown sand with vegetation and stones
161415	TP121	ES1	0.3	Brown clay and sand with vegetation
161416	TP121	ES2	0.6	Brown sand with gravel
161417	TP125	ES1	0.3	Brown clay and sand with gravel and vegetation
161418	TT113	ES1	0.3	Brown sand with gravel
161419	TT117	ES1	0.2	Brown clay and sand with vegetation
161420	TT117	ES2	0.5	Brown clay and sand with gravel
161421	TT122	ES1	0.4	Brown clay and loam with gravel
161422	TT122	ES2	0.6	Brown clay and sand with gravel
161423	TT123	ES2	0.9	Brown clay and sand with gravel

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Analytical Report Number : 24-012239
Project / Site name: Goldthorpe

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L023B	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 24-012239
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP111	ES1	S	161412	c	Free cyanide in soil	L080	c
TP111	ES2	S	161413	c	Free cyanide in soil	L080	c
TP120	ES1	S	161414	c	Free cyanide in soil	L080	c
TT113	ES1	S	161418	c	Free cyanide in soil	L080	c
TT117	ES1	S	161419	c	Free cyanide in soil	L080	c
TT117	ES2	S	161420	c	Free cyanide in soil	L080	c
TT122	ES1	S	161421	c	Free cyanide in soil	L080	c
TT122	ES2	S	161422	c	Free cyanide in soil	L080	c
TT123	ES2	S	161423	c	Free cyanide in soil	L080	c

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Analytical Report Number : 24-013259

Replaces Analytical Report Number: 24-013259, issue no. 1
Additional analysis undertaken.
Sampling dates added as per client's request

Project / Site name:	Goldthorpe	**Samples received on:**	05/04/2024
Your job number:	23451	**Samples instructed on/ Analysis started on:**	10/04/2024
Your order number:	PO33193	**Analysis completed by:**	15/04/2024
Report Issue Number:	2	**Report issued on:**	16/04/2024
Samples Analysed:	24 soil samples		

Signed: JSzwagrak

Joanna Szwagrzak
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166198	166199	166200	166201	166202
Sample Reference				CP101	CP101	CP101	TP107	TP107
Sample Number				ES1	ES2	ES3	ES1	ES2
Depth (m)				0.30	0.60	1.20	0.30	0.80
Date Sampled				03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	22	13	15	26	12
Total mass of sample received	kg	0.1	NONE	0.7	0.7	0.7	0.6	0.6
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	DSO	DSO	DSO
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.7	8.2	8.1	7.6	7.6
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	28	96	50	55	420
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.048	0.025	0.0276	0.208
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14	48	25	27.6	208
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.024	0.014	0.014	0.026	0.011
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.07	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.09	0.17	0.16	0.15	0.08
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.15	< 0.05	0.05	0.22	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.14	0.08	0.05	0.21	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	0.1	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	0.14	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.12	< 0.05	< 0.05	0.16	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.1	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	1.14	< 0.80

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166198	166199	166200	166201	166202
Sample Reference				CP101	CP101	CP101	TP107	TP107
Sample Number				ES1	ES2	ES3	ES1	ES2
Depth (m)				0.30	0.60	1.20	0.30	0.80
Date Sampled				03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	13	12	15	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.2	1.2	1.4	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.7	0.9	0.5	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	29	29	30	29	26
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	29	30	29	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	24	26	29	25
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	19	18	32	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	33	35	29	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	32	31	36	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	89	87	85	91	80

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166203	166204	166205	166206	166207
Sample Reference				TP110	TP110	TP114	TP114	TP116
Sample Number				ES1	ES2	ES1	ES2	ES1
Depth (m)				0.30	0.60	0.30	0.60	0.20
Date Sampled				02/04/2024	02/04/2024	02/04/2024	02/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	17	18	13	22
Total mass of sample received	kg	0.1	NONE	0.7	0.6	0.5	0.5	0.8
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	DSO	DSO	DSO
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.9	7.6	7.5	7.8	6.3
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	34	49	17	37	25
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.0247	0.00846	0.0183	0.0126
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17	24.7	8.46	18.3	12.6
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.02	0.0047	0.016	0.0033	0.021
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	< 0.05	0.08
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.14	< 0.05	0.1	< 0.05	0.14
Pyrene	mg/kg	0.05	MCERTS	0.13	< 0.05	0.1	< 0.05	0.13
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.06	< 0.05	0.07	< 0.05	0.06
Chrysene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.06	< 0.05	0.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.1	< 0.05	< 0.05	< 0.05	0.06
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	0.08
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.07
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166203	166204	166205	166206	166207
Sample Reference				TP110	TP110	TP114	TP114	TP116
Sample Number				ES1	ES2	ES1	ES2	ES1
Depth (m)				0.30	0.60	0.30	0.60	0.20
Date Sampled				02/04/2024	02/04/2024	02/04/2024	02/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	8.6	16	10	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.2	1.1	0.88	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	< 0.2	0.9	< 0.2	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	24	27	21	15	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	27	21	15	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	21	17	18	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	22	35	11	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	32	18	20	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	30	31	21	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	81	92	80	46	78

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166208	166209	166210	166211	166212
Sample Reference				TP118	TP124	TP124	TP124	TP128
Sample Number				ES1	ES1	ES2	ES3	ES1
Depth (m)				0.30	0.30	0.50	0.90	0.30
Date Sampled				03/04/2024	04/04/2024	04/04/2024	04/04/2024	02/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	20	16	12	19
Total mass of sample received	kg	0.1	NONE	0.8	0.7	0.4	0.7	0.7
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.5	7.1	7.4	7.3	7.2
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	33	51	94	71	47
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0167	0.0254	0.0472	0.0353	0.0235
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.7	25.4	47.2	35.3	23.5
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.015	0.021	0.0082	0.0065	0.018
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.1	< 0.05	< 0.05	< 0.05	0.06
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.13	0.09	< 0.05	< 0.05	0.17
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.19	0.13	< 0.05	< 0.05	0.19
Pyrene	mg/kg	0.05	MCERTS	0.17	0.14	< 0.05	< 0.05	0.19
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	0.06	< 0.05	< 0.05	0.1
Chrysene	mg/kg	0.05	MCERTS	0.14	0.13	< 0.05	< 0.05	0.12
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.11	0.1	< 0.05	< 0.05	0.18
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.08	0.05	< 0.05	< 0.05	0.19
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.1	0.08	< 0.05	< 0.05	0.06
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.07
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.11	< 0.80	< 0.80	< 0.80	1.33

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166208	166209	166210	166211	166212
Sample Reference				TP118	TP124	TP124	TP124	TP128
Sample Number				ES1	ES1	ES2	ES3	ES1
Depth (m)				0.30	0.30	0.50	0.90	0.30
Date Sampled				03/04/2024	04/04/2024	04/04/2024	04/04/2024	02/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	24	20	17	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.6	1.9	1.6	1.5	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	0.7	0.5	0.7	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	27	37	23	22	26
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	37	23	22	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	34	17	56	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	50	23	26	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	34	26	33	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	51	41	25	42
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	97	110	69	85	86

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166213	166214	166215	166216	166217
Sample Reference				TP129	TP129	TP112	TP112	TP115
Sample Number				ES1	ES2	ES1	ES2	ES1
Depth (m)				0.30	0.60	0.30	0.60	0.30
Date Sampled				02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	24	12	23	15
Total mass of sample received	kg	0.1	NONE	0.6	0.5	0.6	0.6	0.6
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.3	7.3	7.6	7.1	7.8
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	33	22	48	80	60
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0166	0.0108	0.0238	0.04	0.0301
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.6	10.8	23.8	40	30.1
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.024	0.025	0.014	0.0068	0.011
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.06	0.08	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.17	0.11	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.42	0.24	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.37	0.22	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.18	0.12	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.21	0.15	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.26	0.2	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.11	0.08	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	0.08	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.13	0.1	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.31	1.38	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166213	166214	166215	166216	166217
Sample Reference				TP129	TP129	TP112	TP112	TP115
Sample Number				ES1	ES2	ES1	ES2	ES1
Depth (m)				0.30	0.60	0.30	0.60	0.30
Date Sampled				02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	17	14	22	16
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.6	1.5	1.8	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.9	0.6	0.7	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	30	27	28	26	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	27	28	26	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	25	28	17	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	41	40	19	21	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	28	36	11	41
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	42	39	32	49	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	100	76	66	120

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166218	166219	166220	166221
Sample Reference				TP115	TP125	TP126	TP127
Sample Number				ES2	ES2	ES1	ES1
Depth (m)				0.60	0.60	0.50	0.50
Date Sampled				02/04/2024	28/03/2024	03/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	10	22	20
Total mass of sample received	kg	0.1	NONE	0.6	0.6	0.5	0.5
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	WEM	WEM	WEM	WEM
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	7.2	7.9	7.4	7.5
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	240	75	80	190
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.121	0.0373	0.04	0.0931
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	121	37.3	40	93.1
Fraction Organic Carbon (FOC) Automated	%	0.001	MCERTS	0.007	0.014	0.016	0.0062
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.07	0.14
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.12
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 24-013259
Project / Site name: Goldthorpe
Your Order No: PO33193

Lab Sample Number				166218	166219	166220	166221
Sample Reference				TP115	TP125	TP126	TP127
Sample Number				ES2	ES2	ES1	ES1
Depth (m)				0.60	0.60	0.50	0.50
Date Sampled				02/04/2024	28/03/2024	03/04/2024	03/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	11	21	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.3	1.5	1.9
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.5	1	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	22	29	25	30
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	29	25	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	28	23	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	18	30	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	38	22	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	39	33	38	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85	85	73	100

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
166198	CP101	ES1	0.3	Brown clay with gravel and vegetation
166199	CP101	ES2	0.6	Brown sandy clay with gravel
166200	CP101	ES3	1.2	Brown clay and sand with gravel
166201	TP107	ES1	0.3	Brown clay and sand with vegetation
166202	TP107	ES2	0.8	Brown clay and sand with gravel
166203	TP110	ES1	0.3	Brown clay and sand
166204	TP110	ES2	0.6	Brown clay and sand with gravel
166205	TP114	ES1	0.3	Brown loam with vegetation
166206	TP114	ES2	0.6	Brown clay and sand with stones
166207	TP116	ES1	0.2	Brown clay and sand with vegetation and gravel
166208	TP118	ES1	0.3	Brown clay and sand with gravel
166209	TP124	ES1	0.3	Brown clay and sand with gravel
166210	TP124	ES2	0.5	Brown clay and sand with gravel
166211	TP124	ES3	0.9	Brown clay and sand with stones and gravel
166212	TP128	ES1	0.3	Brown clay and sand with gravel
166213	TP129	ES1	0.3	Brown clay and sand with gravel
166214	TP129	ES2	0.6	Brown clay and sand with gravel
166215	TP112	ES1	0.3	Brown loam and clay with gravel and vegetation
166216	TP112	ES2	0.6	Brown clay and sand
166217	TP115	ES1	0.3	Brown clay and sand with gravel
166218	TP115	ES2	0.6	Brown clay and sand with gravel
166219	TP125	ES2	0.6	Brown clay and sand with gravel
166220	TP126	ES1	0.5	Brown clay and sand with gravel
166221	TP127	ES1	0.5	Brown sandy clay

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 24-013259
Project / Site name: Goldthorpe

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP110	ES1	S	166203	c	Free cyanide in soil	L080	c
TP110	ES2	S	166204	c	Free cyanide in soil	L080	c
TP112	ES1	S	166215	c	Free cyanide in soil	L080	c
TP112	ES2	S	166216	c	Free cyanide in soil	L080	c
TP114	ES1	S	166205	c	Free cyanide in soil	L080	c
TP114	ES2	S	166206	c	Free cyanide in soil	L080	c
TP115	ES1	S	166217	c	Free cyanide in soil	L080	c
TP115	ES2	S	166218	c	Free cyanide in soil	L080	c
TP125	ES2	S	166219	c	Free cyanide in soil	L080	c
TP128	ES1	S	166212	c	Free cyanide in soil	L080	c
TP129	ES1	S	166213	c	Free cyanide in soil	L080	c
TP129	ES2	S	166214	c	Free cyanide in soil	L080	c

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GAC derivation

Background

Initially, the Hydrock GAC were derived following the publishing of soil guideline values (SGV), toxicological (TOX) reports and associated publications by the Environment Agency (EA) in 2009 referenced under Science Report SC050021 (EA, 2009a, b, c, d). The Hydrock GAC have then been periodically updated following publication of new information on toxicological, physico-chemical, land use or receptor parameters, namely:

- LQM/CIEH, 2009. LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment, second edition. Nathanial, C. P., McCaffrey, C., Ashmore, M., Cheng, Y., Gillet, A. G., Ogden, R. C. and Scott, D.
- CL:AIRE, 2010. 'The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment'. Environmental Industries Commission, The Association of Geotechnical and Geoenvironmental Specialists and Contaminated Land: Applications in Real Environment.
- CL:AIRE, 2014. 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010. Contaminated Land: Applications in Real Environment.
- LQM/CIEH, 2015. 'The LQM/CIEH S4ULs for Human Health Risk Assessment'. Nathanial, C. P., McCaffrey, C., Gillet, A. G., Ogden, R. C. and Nathanial, J. F.
- CL:AIRE, 2021. 'C4SL Phase 2 Technical Reports'. Contaminated Land: Applications in Real Environment.

Land use scenarios

Hydrock has derived generic assessment criteria (GAC) for human health based on the six exposure scenarios defined in CL:AIRE (2014) using generic default assumptions from published guidance. GAC for each exposure scenario have been derived for three soil organic matter (SOM) contents, 1%, 2.5% and 6%.

All GAC have been rounded to two significant figures.

Exposure parameters

The exposure parameters used for the Hydrock GAC are the default parameters stated in SR3, unless updated in CL:AIRE (2014) where the CL:AIRE (2014) values have been adopted.

Approach to consumption rates

Hydrock have adopted the 90th percentile consumption rates from Table 3.4 of CL:AIRE (2014) for all produce types. This is noted to be more conservative than the "top two" approach taken in the derivation of C4SLs.

Approach to plant uptake for GAC omitted in CL:AIRE (2010)

Plant uptake factors were not identified in CL:AIRE (2010) for antimony, barium and molybdenum. Hydrock has sourced the required parameter values from ORNL (1984) in order to derive GAC that are inclusive of the homegrown produce exposure pathway.

Chemical and toxicity parameters

The chemical and toxicity parameters have been adopted based on the following documents:

- IRIS, 2016. 'Toxicological Review of Trimethylbenzenes'. Integrated Risk Information System, National Centre for Environmental Assessment, office of Research and Development, U.S. Environmental Protection Agency.
- LQM/CIEH, 2015.

- ORNL, 1984. 'ORNL-5786. A Review and Analysis of Parameters for Assessing Transport of Environmentally released Radionuclides through Agriculture'. Oak Ridge National Laboratory.
- CL:AIRE, 2010.
- RIVM, 2001. RIVM Report 711701 025 'HCV Re-evaluation of human-toxicological maximum-permissible risk levels'. National Institute of Public Health and the Environment.
- LQM/CIEH, 2009.
- EA, 2009a.

Approach to Cyanide GAC

The Hydrock GAC for free cyanide have been derived based on ingestion of a bolus of contaminated soil. The GAC are derived for acute exposure of a child (0-6 years old) for all land uses except commercial, where the GAC are derived for acute exposure of an adult (16-65 years old). For the purpose of GQRA, the child value may be adopted for all land use scenarios.

For complex cyanide, the GAC have been derived based on chronic exposure, using the default exposure scenarios but excluding the consumption of homegrown produce, soil attached to homegrown produce, indoor vapour and outdoor vapour pathways. The chronic health criteria value (HCV) for complex cyanide is based on the EA (2009a) HCV for free cyanide and the ratio of toxicity between free and complex cyanide proposed by RIVM (2001).

Approach to Phenol GAC

In accordance with the EA Science Report SC050021 / Phenol SGV, a $GAC_{ing/inh}$ has been derived for ingested and inhaled phenol using the CLEA model, with a GAC_{derm} derived for dermal contact using Equation 5.7 within SR3. The lower of the $GAC_{ing/inh}$ and GAC_{derm} has been adopted as the final GAC.

Approach to PCB GAC

GAC for assessing the non-dioxin-like risk from PCBs have been based on the "Dutch 7". As the TDI used by the authors of the Dutch guidance is for the sum of the 7 individual congeners, the TDI has been divided by 7 to create a TDI for each congener. The non-dioxin-like risk from PCBs is therefore assessed using a Hazard Index approach as for total petroleum hydrocarbons (TPH).

Sub-surface soil to indoor air correction factors

Reflecting the approach taken by the Environment Agency in the development of revised SGV in 2009 for BTEX, a sub-surface soil to indoor air correction factor of 10 has been applied for petroleum hydrocarbons in order to account for over-prediction of vapour intrusion into building using the Johnson and Ettinger approach.

The correction factor of 10 has been applied to the following petroleum hydrocarbons (it makes negligible difference to less volatile TPH and PAH compounds):

- TPHCWG fractions, namely aliphatic EC>5-44 and aromatic EC>6-44;
- PAHs (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene), benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h,)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene);
- BTEX;
- Isopropylbenzene;
- Propylbenzene;
- 1,2,4- and 1,3,5-trimethylbenzene; and
- Styrene.

Approach to saturation limits

The CLEA model includes a traffic light colour system to highlight when saturated soil conditions have potentially been exceeded for the vapour pathways during calculation of assessment criteria. The colours represent:

- Green: the assessment criteria do not exceed the saturated soil concentration.
- Amber: the assessment criteria exceed the saturated soil concentration but the contribution of the indoor and outdoor vapour pathway to total exposure is less than 10% and will not significantly affect the assessment criteria.
- Red: the assessment criteria exceed the saturated soil concentration and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10% and will significantly affect the assessment criteria.

Hydrock have not applied any further calculations or assessment in relation to saturation limits during GAC derivation, with the CLEA-modelled GAC being presented as the GAC. Consideration of saturation limits is undertaken during the data assessment stage.

References

CL:AIRE, 2010. 'The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment'. Environmental Industries Commission, The Association of Geotechnical and Geoenvironmental Specialists and Contaminated Land: Applications in Real Environment.

CL:AIRE, 2014. 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010. Contaminated Land: Applications in Real Environment

CL:AIRE, 2021. C4SL Phase 2 Technical Reports for tetrachloroethene, trichloroethene and vinyl chloride. Contaminated Land: Applications in Real Environment.

EA, 2009a. 'Science Reports SC050021 – SGV and TOX reports for: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs'; 'Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs'. Environment Agency.

EA, 2009b. 'Science Report – SC050021/SR2. Human health toxicological assessment of contaminants in soil'. Environment Agency.

EA, 2009c. 'Science Report – SC050021/SR3. Updated technical background to the CLEA model'. Environment Agency.

EA, 2009d. 'Science Report – SC050021/SR4. CLEA Software (version 1.05) Handbook'. Environment Agency.

IRIS, 2016. 'Toxicological Review of Trimethylbenzenes'. Integrated Risk Information System, National Centre for Environmental Assessment, office of Research and Development, U.S. Environmental Protection Agency.

LQM/CIEH, 2009. LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment, second edition. Nathanial, C. P., McCaffrey, C., Ashmore, M., Cheng, Y., Gillet, A. G., Ogden, R. C. and Scott, D.

LQM/CIEH, 2015. 'The LQM/CIEH S4ULs for Human Health Risk Assessment'. Nathanial, C. P., McCaffrey, C., Gillet, A. G., Ogden, R. C. and Nathanial, J. F.

ORNL, 1984. 'ORNL-5786. A Review and Analysis of Parameters for Assessing Transport of Environmentally released Radionuclides through Agriculture'. Oak Ridge National Laboratory.

RIVM, 2001. RIVM Report 711701 025 'HCV Re-evaluation of human-toxicological maximum-permissible risk levels'. National Institute of Public Health and the Environment.

Human health GQRA

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	ALLUVIUM
Strata	ALLUVIUM
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean SOM%	2.52
Scenario SOM%	2.5

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Strata	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset	Dataset
Date															26/03/2024	26/03/2024	26/03/2024	29/03/2024	29/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024	21/03/2024	02/04/2024	02/04/2024	03/04/2024	03/04/2024	02/04/2024	02/04/2024	02/04/2024
Zone															ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM
Location															TP111	TP111	TP120	TP121	TP121	TT113	TT117	TT122	TT122	BH102	TP114	TP114	TP116	TP118	TP128	TP129	TP129
Depth (m bgl)															0.3	0.5	0.2	0.3	0.6	0.3	0.5	0.4	0.6	0.5	0.3	0.6	0.2	0.3	0.3	0.3	0.6
-	**Asbestos**																														
P1020	Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-																		
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-																		
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-																		
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-																		
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-																		
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-																		
-	**Hydrock Default Suite - FOC / SOM / pH**										-																				
P1085	FOC (dimensionless)	||	0.001	23	0.003	0.028	0.015	0.015	0.01		-	-	-		0.023	0.0085	0.02	0.021	0.0051	0.028	0.0095	0.023	0.011	0.0039	0.016	0.0033	0.021	0.015	0.018	0.024	0.025
-	SOM (calculated)	%	0.1724	23	0.57	4.83	2.52	2.59	1.30		-	-	-		3.9652	1.4654	3.448	3.6204	0.87924	4.8272	1.6378	3.9652	1.8964	0.67236	2.7584	0.56892	3.6204	2.586	3.1032	4.1376	4.31
P1334	pH (su)	pH Units	0.1	23	6.00	7.80	7.38	7.50	0.44		-	-	-		7.6	7.8	7.7	7.7	6	7.3	7.2	7.7	7.6	7.6	7.5	7.8	6.3	7.5	7.2	7.3	7.3
-	**Hydrock Default Suite - Metals & PAH**																														
7440-38-2	Arsenic	mg/kg	1	23	6.90	22.00	15.87	16.00	3.66	0	NR	640	C4SL - CL:AIRE 2014		18	15	16	14	12	13	11	20	19	6.9	16	10	18	18	18	19	17
7440-41-7	Beryllium	mg/kg	0.06	23	0.60	1.90	1.33	1.40	0.36	0	NR	12	Hydrock Derived		0.98	0.83	0.79	1.3	1.6	1.4	1.3	1.4	0.89	0.6	1.1	0.88	1.1	1.6	1.5	1.7	1.6
7440-42-8	Boron	mg/kg	0.2	23	0.20	1.80	0.82	0.80	0.39	0	NR	240000	Hydrock Derived		1.2	0.6	1	1.1	<0.2	0.6	0.8	1.8	1	0.3	0.9	<0.2	0.9	1.1	0.7	1.5	0.9
7440-43-9	Cadmium	mg/kg	0.2	23	0.20	0.20	0.20	0.20	0.00	0	NR	410	C4SL - CL:AIRE 2014		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg	1	23	1.80	27.00	10.19	1.80	10.07	0	NR	8400	Hydrock Derived		22	20	19	22	17	23	27	26	20	15	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg	1.8	23	1.80	30.00	15.04	21.00	12.32	0	NR	49	C4SL - CL:AIRE 2014		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	21	15	21	27	26	30	27
7440-47-3	Chromium (Total)	mg/kg	1	22	15.00	30.00	23.82	24.00	4.26			-			22	20	19	22	17	23	27	26	20		21	15	21	27	26	30	27
7440-50-8	Copper	mg/kg	1	23	7.40	28.00	18.99	19.00	6.15	0	NR	68000	Hydrock Derived		17	7.5	14	14	19	25	18	25	7.4	7.8	17	18	18	28	19	24	25
7439-92-1	Lead	mg/kg	1	23	11.00	43.00	27.26	25.00	8.94	0	NR	2300	C4SL - CL:AIRE 2014		43	22	30	34	23	15	21	41	20	18	35	11	31	34	27	41	40
7439-97-6	Mercury, inorganic	mg/kg	0.3	23	0.30	0.30	0.30	0.30	0.00	0	NR	1100	Hydrock Derived		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
7440-02-0	Nickel	mg/kg	1	23	8.60	41.00	23.20	25.00	8.83	0	NR	980	Hydrock Derived		14	8.6	15	17	32	31	26	25	10	13	18	20	21	30	26	29	28
7782-49-2	Selenium	mg/kg	1	23	1.00	1.10	1.00	1.00	0.02	0	NR	12000	Hydrock Derived		<1	<1	1.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
7440-62-2	Vanadium	mg/kg	1	23	18.00	49.00	34.17	35.00	7.15	0	NR	9000	Hydrock Derived		35	34	27	36	28	27	31	37	39	18	31	21	29	39	42	42	39
7440-66-6	Zinc	mg/kg	1	23	35.00	120.00	79.09	78.00	21.45	0	NR	730000	Hydrock Derived		70	47	95	74	90	63	78	99	35	51	80	46	78	97	86	110	100
P1095	Cyanide (free)	mg/kg	1	23	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	23	1.00	1.00	1.00	1.00	0.00	0	38058	690	Hydrock Derived		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	23	0.05	0.10	0.06	0.05	0.01	0	141	110000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.07	<0.05	<0.05	<0.05	<0.05	0.1	0.06	0.06	0.08
208-96-8	Acenaphthylene	mg/kg	0.05	23	0.05	0.05	0.05	0.05	0.00	0	212	110000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
120-12-7	Anthracene	mg/kg	0.05	23	0.05	0.18	0.06	0.05	0.03	0	2.91	540000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	23	0.05	0.44	0.08	0.05	0.09	0	4.28	180	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.44	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
50-32-8	Benzo(a)pyrene	mg/kg	0.05	23	0.05	0.49	0.10	0.05	0.10	0	2.28	77	C4SL - CL:AIRE 2014		0.12	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	0.49	0.27	0.06	0.07	<0.05	0.06	0.09	0.1	0.18	0.12
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	23	0.05	0.52	0.10	0.05	0.11	0	3.04	45	Hydrock Derived		0.17	<0.05	0.12	<0.05	<0.05	0.13	0.09	0.52	0.27	<0.05	<0.05	<0.05	0.07	0.1	0.06	0.21	<0.05
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	23	0.05	0.31	0.09	0.05	0.08	0	0.04	3900	Hydrock Derived		<0.05	<0.05	0.07	0.05	<0.05	0.07	<0.05	0.31	0.15	<0.05	<0.05	<0.05	0.06	0.11	0.18	0.26	0.2
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	23	0.05	0.25	0.07	0.05	0.05	0	1.72	1200	Hydrock Derived		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.25	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.13	0.1
218-01-9	Chrysene	mg/kg	0.05	23	0.05	0.49	0.10	0.05	0.10	0	1.10	350	Hydrock Derived		0.12	<0.05	0.1	0.08	<0.05	<0.05	0.08	0.49	0.3	<0.05	<0.05	<0.05	0.08	0.08	0.19	0.11	0.08
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	23	0.05	0.21	0.07	0.05	0.04	0	0.010	3.6	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.1	0.14	0.12	0.21	0.15
206-44-0	Fluoranthene	mg/kg	0.05	23	0.05	0.93	0.15	0.05	0.23	0	47	23000	Hydrock Derived		0.21	0.08	0.18	0.14	0.05	0.22	0.18	0.93	0.78	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
86-73-7	Fluorene	mg/kg	0.05	23	0.05	0.42	0.10	0.05	0.09	0	77	72000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.1	<0.05	0.14	0.19	0.19	0.42	0.24
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	23	0.05	0.26	0.06	0.05	0.05	0	0.15	510	Hydrock Derived		0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.26	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
91-20-3	Naphthalene	mg/kg	0.05	23	0.05	0.44	0.07	0.05	0.08	0	183	3900	Hydrock Derived		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.44	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	0.08
85-01-8	Phenanthrene	mg/kg	0.05	23	0.05	0.74	0.14	0.06	0.18	0	90	23000	Hydrock Derived		0.09	0.06	<0.05	0.08	<0.05	0.31	0.13	0.62	0.74	<0.05	<0.05	<0.05	0.08	0.13	0.17	0.17	0.11
129-00-0	Pyrene	mg/kg	0.05	23	0.05	0.84	0.18	0.12	0.20	0	5.5	55000	Hydrock Derived		0.18	0.07	0.15	0.11	<0.05	0.21	0.15	0.84	0.68	0.08	0.1	<0.05	0.13	0.17	0.19	0.37	0.22
P1310	PAH 16 Total	mg/kg	0.8	23	0.80	5.79	1.30	0.80	1.22			-			1.01	<0.8	<0.8	<0.8	<0.8	0.94	<0.8	5.79	4.06	<0.8	<0.8	<0.8	<0.8	1.11	1.33	2.31	1.38

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	ALLUVIUM
Strata	ALLUVIUM
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean SOM%	2.52
Scenario SOM%	2.5

Hydrock

/kg unless otherwise stated

Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	02/04/2024 ALLUVIUM TP112 0.3	02/04/2024 ALLUVIUM TP112 0.6	02/04/2024 ALLUVIUM TP115 0.3	02/04/2024 ALLUVIUM TP115 0.6	03/04/2024 ALLUVIUM TP126 0.5	03/04/2024 ALLUVIUM TP127 0.5
Asbestos																		
Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-	N	N	N	N	N	N
Asbestos Screen Name	text		0	-	-	-	-	-		-		-						
Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-						
Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-						
Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-						
Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-						
Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-						
Hydrock Default Suite - FOC / SOM / pH										-								
FOC (dimensionless)	[]	0.001	23	0.003	0.028	0.015	0.015	0.01		-	-	-	0.014	0.0068	0.011	0.007	0.016	0.0062
SOM (calculated)	%	0.1724	23	0.57	4.83	2.52	2.59	1.30		-	-	-	2.4136	1.17232	1.8964	1.2068	2.7584	1.06888
pH (su)	pH Units	0.1	23	6.00	7.80	7.38	7.50	0.44		-	-	-	7.6	7.1	7.8	7.2	7.4	7.5
Hydrock Default Suite - Metals & PAH																		
Arsenic	mg/kg	1	23	6.90	22.00	15.87	16.00	3.66	0	NR	640	C4SL - CL:AIRE 2014	14	22	16	17	21	14
Beryllium	mg/kg	0.06	23	0.60	1.90	1.33	1.40	0.36	0	NR	12	Hydrock Derived	1.5	1.8	1.6	1.7	1.5	1.9
Boron	mg/kg	0.2	23	0.20	1.80	0.82	0.80	0.39	0	NR	240000	Hydrock Derived	0.6	0.7	0.7	0.3	1	0.7
Cadmium	mg/kg	0.2	23	0.20	0.20	0.20	0.20	0.00	0	NR	410	C4SL - CL:AIRE 2014	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (III)	mg/kg	1	23	1.80	27.00	10.19	1.80	10.07	0	NR	8400	Hydrock Derived	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Chromium (VI)	mg/kg	1.8	23	1.80	30.00	15.04	21.00	12.32	0	NR	49	C4SL - CL:AIRE 2014	28	26	30	22	25	30
Chromium (Total)	mg/kg	1	22	15.00	30.00	23.82	24.00	4.26			-		28	26	30	22	25	30
Copper	mg/kg	1	23	7.40	28.00	18.99	19.00	6.15	0	NR	68000	Hydrock Derived	28	17	27	19	23	19
Lead	mg/kg	1	23	11.00	43.00	27.26	25.00	8.94	0	NR	2300	C4SL - CL:AIRE 2014	19	21	24	22	30	25
Mercury, inorganic	mg/kg	0.3	23	0.30	0.30	0.30	0.30	0.00	0	NR	1100	Hydrock Derived	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg	1	23	8.60	41.00	23.20	25.00	8.83	0	NR	980	Hydrock Derived	36	11	41	28	22	32
Selenium	mg/kg	1	23	1.00	1.10	1.00	1.00	0.02	0	NR	12000	Hydrock Derived	<1	<1	<1	<1	<1	<1
Vanadium	mg/kg	1	23	18.00	49.00	34.17	35.00	7.15	0	NR	9000	Hydrock Derived	32	49	33	39	38	40
Zinc	mg/kg	1	23	35.00	120.00	79.09	78.00	21.45	0	NR	730000	Hydrock Derived	76	66	120	85	73	100
Cyanide (free)	mg/kg	1	23	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020	<1	<1	<1	<1	<1	<1
Total Phenols (Monohydric)	mg/kg	1	23	1.00	1.00	1.00	1.00	0.00	0	38058	690	Hydrock Derived	<1	<1	<1	<1	<1	<1
Acenaphthene	mg/kg	0.05	23	0.05	0.10	0.06	0.05	0.01	0	141	110000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	mg/kg	0.05	23	0.05	0.05	0.05	0.05	0.00	0	212	110000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	0.05	23	0.05	0.18	0.06	0.05	0.03	0	2.91	540000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	mg/kg	0.05	23	0.05	0.44	0.08	0.05	0.09	0	4.28	180	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	mg/kg	0.05	23	0.05	0.49	0.10	0.05	0.10	0	2.28	77	C4SL - CL:AIRE 2014	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	mg/kg	0.05	23	0.05	0.52	0.10	0.05	0.11	0	3.04	45	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg	0.05	23	0.05	0.31	0.09	0.05	0.08	0	0.04	3900	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	mg/kg	0.05	23	0.05	0.25	0.07	0.05	0.05	0	1.72	1200	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	mg/kg	0.05	23	0.05	0.49	0.10	0.05	0.10	0	1.10	350	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(ah)anthracene	mg/kg	0.05	23	0.05	0.21	0.07	0.05	0.04	0	0.010	3.6	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	mg/kg	0.05	23	0.05	0.93	0.15	0.05	0.23	0	47	23000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	0.05	23	0.05	0.42	0.10	0.05	0.09	0	77	72000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	0.07	0.14
Indeno(123cd)pyrene	mg/kg	0.05	23	0.05	0.26	0.06	0.05	0.05	0	0.15	510	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	mg/kg	0.05	23	0.05	0.44	0.07	0.05	0.08	0	183	3900	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg	0.05	23	0.05	0.74	0.14	0.06	0.18	0	90	23000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	mg/kg	0.05	23	0.05	0.84	0.18	0.12	0.20	0	5.5	55000	Hydrock Derived	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
PAH 16 Total	mg/kg	0.8	23	0.80	5.79	1.30	0.80	1.22			-		<0.8	<0.8	<0.8	<0.8	<0.8	<0.8

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	GROUND - Fine
Strata	GROUND - Fine
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean SOM%	4.22
Scenario SOM%	2.5

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Strata	Date	21/03/2024	21/03/2024
															Zone	ADE GROUND - Fi	ADE GROUND - Fi
															Location	BH103	BH102
															Depth (m bgl)	0.3	0.3
-	**Asbestos**																
P1020	Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-			N	N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-				
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-				
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-				
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-				
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-				
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-				
-	**Hydrock Default Suite - FOC / SOM / pH**										-						
P1085	FOC (dimensionless)	II	0.001	2	0.022	0.027	0.025	0.025	0.00		-	-	-			0.027	0.022
-	SOM (calculated)	%	0.1724	2	3.79	4.65	4.22	4.22	0.61		-	-	-			4.6548	3.7928
P1334	pH (su)	pH Units	0.1	2	6.80	7.00	6.90	6.90	0.14		-	-	-			6.8	7
-	**Hydrock Default Suite - Metals & PAH**																
7440-38-2	Arsenic	mg/kg	1	2	14.00	14.00	14.00	14.00	0.00	0	NR	640	C4SL - CL:AIRE 2014			14	14
7440-41-7	Beryllium	mg/kg	0.06	2	0.83	1.30	1.07	1.07	0.33	0	NR	12	Hydrock Derived			1.3	0.83
7440-42-8	Boron	mg/kg	0.2	2	0.80	1.00	0.90	0.90	0.14	0	NR	240000	Hydrock Derived			1	0.8
7440-43-9	Cadmium	mg/kg	0.2	2	0.20	0.20	0.20	0.20	0.00	0	NR	410	C4SL - CL:AIRE 2014			<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg	1	2	19.00	25.00	22.00	22.00	4.24	0	NR	8400	Hydrock Derived			25	19
18540-29-9	Chromium (VI)	mg/kg	1.8	2	1.80	1.80	1.80	1.80	0.00	0	NR	49	C4SL - CL:AIRE 2014			<1.8	<1.8
7440-47-3	Chromium (Total)	mg/kg	1	0													
7440-50-8	Copper	mg/kg	1	2	15.00	24.00	19.50	19.50	6.36	0	NR	68000	Hydrock Derived			24	15
7439-92-1	Lead	mg/kg	1	2	29.00	34.00	31.50	31.50	3.54	0	NR	2300	C4SL - CL:AIRE 2014			29	34
7439-97-6	Mercury, inorganic	mg/kg	0.3	2	0.30	0.30	0.30	0.30	0.00	0	NR	1100	Hydrock Derived			<0.3	<0.3
7440-02-0	Nickel	mg/kg	1	2	13.00	23.00	18.00	18.00	7.07	0	NR	980	Hydrock Derived			23	13
7782-49-2	Selenium	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	NR	12000	Hydrock Derived			<1	<1
7440-62-2	Vanadium	mg/kg	1	2	28.00	34.00	31.00	31.00	4.24	0	NR	9000	Hydrock Derived			34	28
7440-66-6	Zinc	mg/kg	1	2	66.00	80.00	73.00	73.00	9.90	0	NR	730000	Hydrock Derived			80	66
P1095	Cyanide (free)	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020			<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	38058	690	Hydrock Derived			<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	141	110000	Hydrock Derived			<0.05	<0.05
208-96-8	Acenaphthylene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	212	110000	Hydrock Derived			<0.05	<0.05
120-12-7	Anthracene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	2.91	540000	Hydrock Derived			<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	2	0.06	0.10	0.08	0.08	0.03	0	4.28	180	Hydrock Derived			0.1	0.06
50-32-8	Benzo(a)pyrene	mg/kg	0.05	2	0.07	0.12	0.10	0.10	0.04	0	2.28	77	C4SL - CL:AIRE 2014			0.12	0.07
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	2	0.07	0.12	0.10	0.10	0.04	0	3.04	45	Hydrock Derived			0.12	0.07
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	2	0.05	0.08	0.07	0.07	0.02	0	0.04	3900	Hydrock Derived			0.08	<0.05
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	2	0.05	0.08	0.07	0.07	0.02	0	1.72	1200	Hydrock Derived			0.08	<0.05
218-01-9	Chrysene	mg/kg	0.05	2	0.06	0.11	0.09	0.09	0.04	0	1.10	350	Hydrock Derived			0.11	0.06
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	0.010	3.6	Hydrock Derived			<0.05	<0.05
206-44-0	Fluoranthene	mg/kg	0.05	2	0.12	0.19	0.16	0.16	0.05	0	47	23000	Hydrock Derived			0.19	0.12
86-73-7	Fluorene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	77	72000	Hydrock Derived			<0.05	<0.05
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	2	0.05	0.06	0.06	0.06	0.01	0	0.15	510	Hydrock Derived			0.06	<0.05
91-20-3	Naphthalene	mg/kg	0.05	2	0.05	0.05	0.05	0.05	0.00	0	183	3900	Hydrock Derived			<0.05	<0.05
85-01-8	Phenanthrene	mg/kg	0.05	2	0.06	0.07	0.07	0.07	0.01	0	90	23000	Hydrock Derived			0.07	0.06
129-00-0	Pyrene	mg/kg	0.05	2	0.11	0.18	0.15	0.15	0.05	0	5.5	55000	Hydrock Derived			0.18	0.11
P1310	PAH 16 Total	mg/kg	0.8	2	0.80	1.11	0.96	0.96	0.22			-				1.11	<0.8

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	CAST BACKFILL
Strata	CAST BACKFILL
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean SOM%	2.75
Scenario SOM%	2.5

Hydrock

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Strata	Date	Zone	Location	Depth (m bgl)
															28/03/2024	21/03/2024	03/04/2024	03/04/2024
															PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI
															TP125	BH103	CP101	CP101
															0.3	0.8	0.3	0.6
-	**Asbestos**																	
P1020	Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-		N	N	N	N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-					
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-					
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-					
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-					
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-					
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-					
-	**Hydrock Default Suite - FOC / SOM / pH**										-							
P1085	FOC (dimensionless)	II	0.001	13	0.005	0.030	0.016	0.014	0.01		-	-	-		0.03	0.014	0.024	0.014
-	SOM (calculated)	%	0.1724	13	0.81	5.17	2.75	2.41	1.34		-	-	-		5.172	2.4136	4.1376	2.4136
P1334	pH (su)	pH Units	0.1	13	6.30	8.20	7.59	7.60	0.50		-	-	-		6.3	8	7.7	8.2
-	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	13	8.50	24.00	14.70	15.00	4.46	0	NR	640	C4SL - CL:AIRE 2014		17	8.5	16	13
7440-41-7	Beryllium	mg/kg	0.06	13	1.20	1.90	1.38	1.30	0.20	0	NR	12	Hydrock Derived		1.4	1.5	1.3	1.2
7440-42-8	Boron	mg/kg	0.2	13	0.20	1.40	0.59	0.50	0.31	0	NR	240000	Hydrock Derived		1.4	<0.2	0.5	0.7
7440-43-9	Cadmium	mg/kg	0.2	13	0.20	0.20	0.20	0.20	0.00	0	NR	410	C4SL - CL:AIRE 2014		<0.2	<0.2	<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg	1	13	1.80	26.00	5.52	1.80	9.09	0	NR	8400	Hydrock Derived		26	26	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg	1.8	13	1.80	37.00	23.74	27.00	10.44	0	NR	49	C4SL - CL:AIRE 2014		<1.8	<1.8	29	29
7440-47-3	Chromium (Total)	mg/kg	1	12	22.00	37.00	27.58	28.00	3.96			-			26		29	29
7440-50-8	Copper	mg/kg	1	13	17.00	56.00	27.23	25.00	9.60	0	NR	68000	Hydrock Derived		21	26	24	24
7439-92-1	Lead	mg/kg	1	13	17.00	50.00	26.62	23.00	10.00	0	NR	2300	C4SL - CL:AIRE 2014		34	17	34	19
7439-97-6	Mercury, inorganic	mg/kg	0.3	13	0.30	0.30	0.30	0.30	0.00	0	NR	1100	Hydrock Derived		<0.3	<0.3	<0.3	<0.3
7440-02-0	Nickel	mg/kg	1	13	19.00	41.00	30.62	33.00	6.67	0	NR	980	Hydrock Derived		20	41	24	33
7782-49-2	Selenium	mg/kg	1	13	1.00	1.00	1.00	1.00	0.00	0	NR	12000	Hydrock Derived		<1	<1	<1	<1
7440-62-2	Vanadium	mg/kg	1	13	25.00	51.00	34.69	33.00	6.94	0	NR	9000	Hydrock Derived		41	31	39	32
7440-66-6	Zinc	mg/kg	1	13	69.00	110.00	86.38	85.00	9.64	0	NR	730000	Hydrock Derived		77	92	89	87
P1095	Cyanide (free)	mg/kg	1	13	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020		<1	<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	13	1.00	1.00	1.00	1.00	0.00	0	38058	690	Hydrock Derived		<1	<1	<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	13	0.05	0.07	0.05	0.05	0.01	0	141	110000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
208-96-8	Acenaphthylene	mg/kg	0.05	13	0.05	0.05	0.05	0.05	0.00	0	212	110000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
120-12-7	Anthracene	mg/kg	0.05	13	0.05	0.05	0.05	0.05	0.00	0	2.91	540000	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	13	0.05	0.08	0.05	0.05	0.01	0	4.28	180	Hydrock Derived		0.08	<0.05	<0.05	<0.05
50-32-8	Benzo(a)pyrene	mg/kg	0.05	13	0.05	0.10	0.06	0.05	0.01	0	2.28	77	C4SL - CL:AIRE 2014		<0.05	<0.05	0.07	<0.05
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	13	0.05	0.11	0.06	0.05	0.02	0	3.04	45	Hydrock Derived		0.11	<0.05	<0.05	<0.05
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	13	0.05	0.16	0.07	0.05	0.04	0	0.04	3900	Hydrock Derived		<0.05	<0.05	0.12	<0.05
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	13	0.05	0.05	0.05	0.05	0.00	0	1.72	1200	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
218-01-9	Chrysene	mg/kg	0.05	13	0.05	0.08	0.05	0.05	0.01	0	1.10	350	Hydrock Derived		0.08	<0.05	<0.05	<0.05
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	13	0.05	0.14	0.07	0.05	0.03	0	0.010	3.6	Hydrock Derived		<0.05	<0.05	0.08	<0.05
206-44-0	Fluoranthene	mg/kg	0.05	13	0.05	0.18	0.06	0.05	0.04	0	47	23000	Hydrock Derived		0.18	<0.05	<0.05	<0.05
86-73-7	Fluorene	mg/kg	0.05	13	0.05	0.22	0.08	0.05	0.06	0	77	72000	Hydrock Derived		<0.05	<0.05	0.15	<0.05
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	13	0.05	0.05	0.05	0.05	0.00	0	0.15	510	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
91-20-3	Naphthalene	mg/kg	0.05	13	0.05	0.06	0.05	0.05	0.00	0	183	3900	Hydrock Derived		<0.05	<0.05	<0.05	<0.05
85-01-8	Phenanthrene	mg/kg	0.05	13	0.05	0.17	0.10	0.09	0.05	0	90	23000	Hydrock Derived		0.1	<0.05	0.09	0.17
129-00-0	Pyrene	mg/kg	0.05	13	0.05	0.21	0.09	0.05	0.06	0	5.5	55000	Hydrock Derived		0.16	<0.05	0.14	0.08
P1310	PAH 16 Total	mg/kg	0.8	13	0.80	1.14	0.83	0.80	0.09			-			<0.8	<0.8	<0.8	<0.8

CAS No / P Code	Chemical of Potential Concern	Units	Strata	Date	Zone	Location	Depth (m bgl)
				03/04/2024	03/04/2024	03/04/2024	03/04/2024
				PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI
				CP101	TP107	TP107	TP110
				0.3	0.3	0.8	0.3
-	**Asbestos**						
P1020	Asbestos Identified	text		N	N	N	N
P1889	Asbestos Screen Name	text					
P1885	Asbestos Quant. (Stage 2)	%					
P1935	Asbestos Quant. Total	%					
P1826	Asbestos Quant. (Stage 3)	%					
-	Asbestos Quant. Total (Stages 2+3)	%					
P1880	Asbestos Containing Material Types Detected (ACM)	text					
-	**Hydrock Default Suite - FOC / SOM / pH**						
P1085	FOC (dimensionless)	II		0.024	0.026	0.011	0.02
-	SOM (calculated)	%		4.1376	4.4824	1.8964	3.448
P1334	pH (su)	pH Units		7.7	7.6	7.6	7.9
-	**Hydrock Default Suite - Metals & PAH**						
7440-38-2	Arsenic	mg/kg		16	15	12	17
7440-41-7	Beryllium	mg/kg		1.3	1.4	1.3	1.2
7440-42-8	Boron	mg/kg		0.5	0.5	0.5	0.4
7440-43-9	Cadmium	mg/kg		<0.2	<0.2	<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg		<1.8	<1.8	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg		29	29	26	24
7440-47-3	Chromium (Total)	mg/kg		29	29	26	24
7440-50-8	Copper	mg/kg		24	29	25	23
7439-92-1	Lead	mg/kg		34	32	17	36
7439-97-6	Mercury, inorganic	mg/kg		<0.3	<0.3	<0.3	<0.3
7440-02-0	Nickel	mg/kg		24	29	34	19
7782-49-2	Selenium	mg/kg		<1	<1	<1	<1
7440-62-2	Vanadium	mg/kg		39	36	27	34
7440-66-6	Zinc	mg/kg		89	91	80	81
P1095	Cyanide (free)	mg/kg		<1	<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg		<1	<1	<1	<1
83-32-9	Acenaphthene	mg/kg		<0.05	<0.05	<0.05	<0.05
208-96-8	Acenaphthylene	mg/kg		<0.05	<0.05	<0.05	<0.05
120-12-7	Anthracene	mg/kg		<0.05	<0.05	<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg		<0.05	<0.05	<0.05	<0.05
50-32-8	Benzo(a)pyrene	mg/kg		0.07	0.1	<0.05	0.06
205-99-2	Benzo(b)fluoranthene	mg/kg		<0.05	0.1	<0.05	<0.05
191-24-2	Benzo(ghi)perylene	mg/kg		0.12	0.16	<0.05	0.1
207-08-9	Benzo(k)fluoranthene	mg/kg		<0.05	<0.05	<0.05	<0.05
218-01-9	Chrysene	mg/kg		<0.05	<0.05	<0.05	<0.05
53-70-3	Dibenz(ah)anthracene	mg/kg		0.08	0.14	<0.05	0.09
206-44-0	Fluoranthene	mg/kg		<0.05	<0.05	<0.05	<0.05
86-73-7	Fluorene	mg/kg		0.15	0.22	<0.05	0.14
193-39-5	Indeno(123cd)pyrene	mg/kg		<0.05	<0.05	<0.05	<0.05
91-20-3	Naphthalene	mg/kg		<0.05	0.06	<0.05	<0.05
85-01-8	Phenanthrene	mg/kg		0.09	0.15	0.08	0.07
129-00-0	Pyrene	mg/kg		0.14	0.21	<0.05	0.13
P1310	PAH 16 Total	mg/kg		<0.8	1.14	<0.8	<0.8

CAS No / P Code	Chemical of Potential Concern	Units	Strata	Date	Zone	Location	Depth (m bgl)
				03/04/2024	02/04/2024	02/04/2024	04/04/2024
				PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI
				CP101	TP110	TP110	TP124
				1.2	0.3	0.6	0.3
-	**Asbestos**						
P1020	Asbestos Identified	text		N	N	N	N
P1889	Asbestos Screen Name	text					
P1885	Asbestos Quant. (Stage 2)	%					
P1935	Asbestos Quant. Total	%					
P1826	Asbestos Quant. (Stage 3)	%					
-	Asbestos Quant. Total (Stages 2+3)	%					
P1880	Asbestos Containing Material Types Detected (ACM)	text					
-	**Hydrock Default Suite - FOC / SOM / pH**						
P1085	FOC (dimensionless)	II		0.014	0.02	0.0047	0.021
-	SOM (calculated)	%		2.4136	3.448	0.81028	3.6204
P1334	pH (su)	pH Units		8.1	7.6	7.6	7.1
-	**Hydrock Default Suite - Metals & PAH**						
7440-38-2	Arsenic	mg/kg		12	17	8.6	24
7440-41-7	Beryllium	mg/kg		1.2	1.2	1.2	1.9
7440-42-8	Boron	mg/kg		0.9	0.5	<0.2	0.7
7440-43-9	Cadmium	mg/kg		<0.2	<0.2	<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg		<1.8	<1.8	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg		30	29	27	37
7440-47-3	Chromium (Total)	mg/kg		30	29	27	37
7440-50-8	Copper	mg/kg		26	29	21	34
7439-92-1	Lead	mg/kg		18	32	22	50
7439-97-6	Mercury, inorganic	mg/kg		<0.3	<0.3	<0.3	<0.3
7440-02-0	Nickel	mg/kg		35	29	32	34
7782-49-2	Selenium	mg/kg		<1	<1	<1	<1
7440-62-2	Vanadium	mg/kg		31	36	30	51
7440-66-6	Zinc	mg/kg		85	91	92	110
P1095	Cyanide (free)	mg/kg		<1	<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg		<1	<1	<1	<1
83-32-9	Acenaphthene	mg/kg		0.07	<0.05	<0.05	<0.05
208-96-8	Acenaphthylene	mg/kg		<0.05	<0.05	<0.05	<0.05
120-12-7	Anthracene	mg/kg		<0.05	<0.05	<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg		<0.05	<0.05	<0.05	<0.05
50-32-8	Benzo(a)pyrene	mg/kg		0.1	0.06	<0.05	0.06
205-99-2	Benzo(b)fluoranthene	mg/kg		0.1	<0.05	<0.05	0.08
191-24-2	Benzo(ghi)perylene	mg/kg		0.16	<0.05	0.1	<0.05
207-08-9	Benzo(k)fluoranthene	mg/kg		<0.05	<0.05	<0.05	<0.05
218-01-9	Chrysene	mg/kg		<0.05	<0.05	<0.05	0.05
53-70-3	Dibenz(ah)anthracene	mg/kg		0.14	0.09	<0.05	0.13
206-44-0	Fluoranthene	mg/kg		<0.05	<0.05	<0.05	<0.05
86-73-7	Fluorene	mg/kg		0.05	0.14	<0.05	0.13
193-39-5	Indeno(123cd)pyrene	mg/kg		<0.05	<0.05	<0.05	<0.05
91-20-3	Naphthalene	mg/kg		0.06	<0.05	<0.05	<0.05
85-01-8	Phenanthrene	mg/kg		0.16	0.08	0.07	<0.05
129-00-0	Pyrene	mg/kg		0.05	0.13	<0.05	0.14
P1310	PAH 16 Total	mg/kg		1.14	<0.8	<0.8	<0.8

CAS No / P Code	Chemical of Potential Concern	Units	Strata	Date	Zone	Location	Depth (m bgl)
				04/04/2024	04/04/2024	04/04/2024	28/03/2024
				PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI	PENCAST BACKFI
				TP124	TP124	TP124	TP125
				0.5	0.9	0.9	0.6
-	**Asbestos**						
P1020	Asbestos Identified	text		N	N	N	N
P1889	Asbestos Screen Name	text					
P1885	Asbestos Quant. (Stage 2)	%					
P1935	Asbestos Quant. Total	%					
P1826	Asbestos Quant. (Stage 3)	%					
-	Asbestos Quant. Total (Stages 2+3)	%					
P1880	Asbestos Containing Material Types Detected (ACM)	text					
-	**Hydrock Default Suite - FOC / SOM / pH**						
P1085	FOC (dimensionless)	II		0.0082	0.0065	0.014	
-	SOM (calculated)	%		1.41368	1.1206	2.4136	
P1334	pH (su)	pH Units		7.4	7.3	7.9	
-	**Hydrock Default Suite - Metals & PAH**						
7440-38-2	Arsenic	mg/kg		20	17	11	
7440-41-7	Beryllium	mg/kg		1.6	1.5	1.3	
7440-42-8	Boron	mg/kg		0.5	0.7	0.5	
7440-43-9	Cadmium	mg/kg		<0.2	<0.2	<0.2	
16065-83-1	Chromium (III)	mg/kg		<1.8	<1.8	<1.8	
18540-29-9	Chromium (VI)	mg/kg		23	22	29	
7440-47-3	Chromium (Total)	mg/kg		23	22	29	
7440-50-8	Copper	mg/kg		17	56	28	
7439-92-1	Lead	mg/kg		23	26	18	
7439-97-6	Mercury, inorganic	mg/kg		<0.3	<0.3	<0.3	
7440-02-0	Nickel	mg/kg		26	33	38	
7782-49-2	Selenium	mg/kg		<1	<1	<1	
7440-62-2	Vanadium	mg/kg		41	25	33	
7440-66-6	Zinc	mg/kg		69	85	85	
P1095	Cyanide (free)	mg/kg		<1	<1	<1	
P1186	Total Phenols (Monohydric)	mg/kg		<1	<1	<1	
83-32-9	Acenaphthene	mg/kg		<0.05	<0.05	<0.05	
208-96-8	Acenaphthylene	mg/kg		<0.05	<0.05	<0.05	
120-12-7	Anthracene	mg/kg		<0.05	<0.05	<0.05	
56-55-3	Benz(a)anthracene	mg/kg		<0.05	<0.05	<0.05	
50-32-8	Benzo(a)pyrene	mg/kg		<0.05	<0.05	<0.05	
205-99-2	Benzo(b)fluoranthene	mg/kg		<0.05	<0.05	<0.05	
191-24-2	Benzo(ghi)perylene	mg/kg		<0.05	<0.05	<0.05	
207-08-9	Benzo(k)fluoranthene	mg/kg		<0.05	<0.05	<0.05	
218-01-9	Chrysene	mg/kg		<0.05	<0.05	<0.05	
53-70-3	Dibenz(ah)anthracene	mg/kg		<0.05	<0.05	<0.05	
206-44-0	Fluoranthene	mg/kg		<0.05	<0.05	<0.05	
86-73-7	Fluorene	mg/kg		<0.05	<0.05	<0.05	
193-39-5	Indeno(123cd)pyrene	mg/kg		<0.05	<0.05	<0.05	
91-20-3	Naphthalene	mg/kg		<0.05	<0.05	<0.05	
85-01-8	Phenanthrene	mg/kg		<0.05	<0.05	0.17	
129-00-0	Pyrene	mg/kg		<0.05	<0.05	<0.05	
P1310	PAH 16 Total	mg/kg		<0.8	<0.8	<0.8	

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	TOPSOIL
Strata	TOPSOIL
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean SOM%	4.14
Scenario SOM%	2.5

Date	27/03/2024
Zone	TOPSOIL
Location	TT117
Depth (m bgl)	0.2

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Strata	TOPSOIL
-	**Asbestos**														
P1020	Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-		N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-		
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-		
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-		
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-		
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-		
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-		
-	**Hydrock Default Suite - FOC / SOM / pH**										-				
P1085	FOC (dimensionless)	||	0.001	1	0.024	0.024	0.024	0.024	-		-	-	-		0.024
-	SOM (calculated)	%	0.1724	1	4.14	4.14	4.14	4.14	-		-	-	-		4.1376
P1334	pH (su)	pH Units	0.1	1	7.80	7.80	7.80	7.80	-		-	-	-		7.8
-	**Hydrock Default Suite - Metals & PAH**														
7440-38-2	Arsenic	mg/kg	1	1	14.00	14.00	14.00	14.00	-	0	NR	640	C4SL - CL:AIRE 2014		14
7440-41-7	Beryllium	mg/kg	0.06	1	1.50	1.50	1.50	1.50	-	0	NR	12	Hydrock Derived		1.5
7440-42-8	Boron	mg/kg	0.2	1	1.80	1.80	1.80	1.80	-	0	NR	240000	Hydrock Derived		1.8
7440-43-9	Cadmium	mg/kg	0.2	1	0.20	0.20	0.20	0.20	-	0	NR	410	C4SL - CL:AIRE 2014		<0.2
16065-83-1	Chromium (III)	mg/kg	1	1	26.00	26.00	26.00	26.00	-	0	NR	8400	Hydrock Derived		26
18540-29-9	Chromium (VI)	mg/kg	1.8	1	1.80	1.80	1.80	1.80	-	0	NR	49	C4SL - CL:AIRE 2014		<1.8
7440-47-3	Chromium (Total)	mg/kg	1	1	26.00	26.00	26.00	26.00	-			-			26
7440-50-8	Copper	mg/kg	1	1	24.00	24.00	24.00	24.00	-	0	NR	68000	Hydrock Derived		24
7439-92-1	Lead	mg/kg	1	1	37.00	37.00	37.00	37.00	-	0	NR	2300	C4SL - CL:AIRE 2014		37
7439-97-6	Mercury, inorganic	mg/kg	0.3	1	0.30	0.30	0.30	0.30	-	0	NR	1100	Hydrock Derived		<0.3
7440-02-0	Nickel	mg/kg	1	1	27.00	27.00	27.00	27.00	-	0	NR	980	Hydrock Derived		27
7782-49-2	Selenium	mg/kg	1	1	1.00	1.00	1.00	1.00	-	0	NR	12000	Hydrock Derived		<1
7440-62-2	Vanadium	mg/kg	1	1	37.00	37.00	37.00	37.00	-	0	NR	9000	Hydrock Derived		37
7440-66-6	Zinc	mg/kg	1	1	100.00	100.00	100.00	100.00	-	0	NR	730000	Hydrock Derived		100
P1095	Cyanide (free)	mg/kg	1	1	1.00	1.00	1.00	1.00	-	0	NR	24	Acute Risk - SoBRA 2020		<1
P1186	Total Phenols (Monohydric)	mg/kg	1	1	1.00	1.00	1.00	1.00	-	0	38058	690	Hydrock Derived		<1
83-32-9	Acenaphthene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	141	110000	Hydrock Derived		<0.05
208-96-8	Acenaphthylene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	212	110000	Hydrock Derived		<0.05
120-12-7	Anthracene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	2.91	540000	Hydrock Derived		<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	4.28	180	Hydrock Derived		<0.05
50-32-8	Benzo(a)pyrene	mg/kg	0.05	1	0.24	0.24	0.24	0.24	-	0	2.28	77	C4SL - CL:AIRE 2014		0.24
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	1	0.30	0.30	0.30	0.30	-	0	3.04	45	Hydrock Derived		0.3
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	1	0.15	0.15	0.15	0.15	-	0	0.04	3900	Hydrock Derived		0.15
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	1.72	1200	Hydrock Derived		<0.05
218-01-9	Chrysene	mg/kg	0.05	1	0.23	0.23	0.23	0.23	-	0	1.10	350	Hydrock Derived		0.23
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	0.010	3.6	Hydrock Derived		<0.05
206-44-0	Fluoranthene	mg/kg	0.05	1	0.48	0.48	0.48	0.48	-	0	47	23000	Hydrock Derived		0.48
86-73-7	Fluorene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	77	72000	Hydrock Derived		<0.05
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	1	0.14	0.14	0.14	0.14	-	0	0.15	510	Hydrock Derived		0.14
91-20-3	Naphthalene	mg/kg	0.05	1	0.20	0.20	0.20	0.20	-	0	183	3900	Hydrock Derived		0.2
85-01-8	Phenanthrene	mg/kg	0.05	1	0.29	0.29	0.29	0.29	-	0	90	23000	Hydrock Derived		0.29
129-00-0	Pyrene	mg/kg	0.05	1	0.41	0.41	0.41	0.41	-	0	5.5	55000	Hydrock Derived		0.41
P1310	PAH 16 Total	mg/kg	0.8	1	2.44	2.44	2.44	2.44	-			-			2.44

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter:	Default - Human Health - commercial (2.5%SOM)
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone: INE MIDDLE COAL MEASURES

Strata: INE MIDDLE COAL MEASURES

Depth Min (m bgl): 0.2

Depth Max (m bgl): 1.2

Dataset mean SOM%

Scenario SOM%: 2.5

Hydrock

Date	27/03/2024
Zone	ENNINE MIDDLE C
Location	TT123
Depth (m bgl)	0.9

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Strata	WEATHERED PENNINE MIDDLE COAL MEASURES
-	**Asbestos**														
P1020	Asbestos Identified	text	Y/N	38	-	-	-	-	No. of detects:	0	-	-	-		N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-		
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-		
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-		
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-		
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-		
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-		
-	**Hydrock Default Suite - FOC / SOM / pH**										-				
P1085	FOC (dimensionless)	||	0.001	0							-		-		
-	SOM (calculated)	%	0.1724	0							-		-		
P1334	pH (su)	pH Units	0.1	1	5.60	5.60	5.60	5.60	-		-	-	-		5.6
-	**Hydrock Default Suite - Metals & PAH**														
7440-38-2	Arsenic	mg/kg	1	1	31.00	31.00	31.00	31.00	-	0	NR	640	C4SL - CL:AIRE 2014		31
7440-41-7	Beryllium	mg/kg	0.06	1	5.30	5.30	5.30	5.30	-	0	NR	12	Hydrock Derived		5.3
7440-42-8	Boron	mg/kg	0.2	1	0.30	0.30	0.30	0.30	-	0	NR	240000	Hydrock Derived		0.3
7440-43-9	Cadmium	mg/kg	0.2	1	0.20	0.20	0.20	0.20	-	0	NR	410	C4SL - CL:AIRE 2014		<0.2
16065-83-1	Chromium (III)	mg/kg	1	1	22.00	22.00	22.00	22.00	-	0	NR	8400	Hydrock Derived		22
18540-29-9	Chromium (VI)	mg/kg	1.8	1	1.80	1.80	1.80	1.80	-	0	NR	49	C4SL - CL:AIRE 2014		<1.8
7440-47-3	Chromium (Total)	mg/kg	1	1	22.00	22.00	22.00	22.00	-			-			22
7440-50-8	Copper	mg/kg	1	1	87.00	87.00	87.00	87.00	-	0	NR	68000	Hydrock Derived		87
7439-92-1	Lead	mg/kg	1	1	52.00	52.00	52.00	52.00	-	0	NR	2300	C4SL - CL:AIRE 2014		52
7439-97-6	Mercury, inorganic	mg/kg	0.3	1	0.30	0.30	0.30	0.30	-	0	NR	1100	Hydrock Derived		<0.3
7440-02-0	Nickel	mg/kg	1	1	69.00	69.00	69.00	69.00	-	0	NR	980	Hydrock Derived		69
7782-49-2	Selenium	mg/kg	1	1	3.50	3.50	3.50	3.50	-	0	NR	12000	Hydrock Derived		3.5
7440-62-2	Vanadium	mg/kg	1	1	36.00	36.00	36.00	36.00	-	0	NR	9000	Hydrock Derived		36
7440-66-6	Zinc	mg/kg	1	1	45.00	45.00	45.00	45.00	-	0	NR	730000	Hydrock Derived		45
P1095	Cyanide (free)	mg/kg	1	1	1.00	1.00	1.00	1.00	-	0	NR	24	Acute Risk - SoBRA 2020		<1
P1186	Total Phenols (Monohydric)	mg/kg	1	1	1.00	1.00	1.00	1.00	-	0	38058	690	Hydrock Derived		<1
83-32-9	Acenaphthene	mg/kg	0.05	1	0.18	0.18	0.18	0.18	-	0	141	110000	Hydrock Derived		0.18
208-96-8	Acenaphthylene	mg/kg	0.05	1	0.05	0.05	0.05	0.05	-	0	212	110000	Hydrock Derived		<0.05
120-12-7	Anthracene	mg/kg	0.05	1	0.50	0.50	0.50	0.50	-	0	2.91	540000	Hydrock Derived		0.5
56-55-3	Benz(a)anthracene	mg/kg	0.05	1	1.20	1.20	1.20	1.20	-	0	4.28	180	Hydrock Derived		1.2
50-32-8	Benzo(a)pyrene	mg/kg	0.05	1	1.40	1.40	1.40	1.40	-	0	2.28	77	C4SL - CL:AIRE 2014		1.4
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	1	1.60	1.60	1.60	1.60	-	0	3.04	45	Hydrock Derived		1.6
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	1	0.92	0.92	0.92	0.92	-	0	0.04	3900	Hydrock Derived		0.92
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	1	0.59	0.59	0.59	0.59	-	0	1.72	1200	Hydrock Derived		0.59
218-01-9	Chrysene	mg/kg	0.05	1	1.40	1.40	1.40	1.40	-	0	1.10	350	Hydrock Derived		1.4
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	1	0.30	0.30	0.30	0.30	-	0	0.010	3.6	Hydrock Derived		0.3
206-44-0	Fluoranthene	mg/kg	0.05	1	2.70	2.70	2.70	2.70	-	0	47	23000	Hydrock Derived		2.7
86-73-7	Fluorene	mg/kg	0.05	1	0.15	0.15	0.15	0.15	-	0	77	72000	Hydrock Derived		0.15
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	1	0.82	0.82	0.82	0.82	-	0	0.15	510	Hydrock Derived		0.82
91-20-3	Naphthalene	mg/kg	0.05	1	0.09	0.09	0.09	0.09	-	0	183	3900	Hydrock Derived		0.09
85-01-8	Phenanthrene	mg/kg	0.05	1	1.90	1.90	1.90	1.90	-	0	90	23000	Hydrock Derived		1.9
129-00-0	Pyrene	mg/kg	0.05	1	2.50	2.50	2.50	2.50	-	0	5.5	55000	Hydrock Derived		2.5
P1310	PAH 16 Total	mg/kg	0.8	1	16.40	16.40	16.40	16.40	-			-			16.4

Phytotoxic GQRA

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	Phytotoxic pH 7
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	ALLUVIUM
Strata	ALLUVIUM
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean pH	7.38
Scenario pH	7

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Strata	26/03/2024	26/03/2024	26/03/2024	29/03/2024	29/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024	21/03/2024	02/04/2024	02/04/2024	03/04/2024	03/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Date														26/03/2024	26/03/2024	26/03/2024	29/03/2024	29/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024	21/03/2024	02/04/2024	02/04/2024	03/04/2024	03/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Zone														ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM	ALLUVIUM
Location														TP111	TP111	TP120	TP121	TP121	TT113	TT117	TT122	TT122	BH102	TP114	TP114	TP116	TP118	TP128	TP129	TP129	TP112	TP112	TP115
Depth (m bgl)														0.3	0.5	0.2	0.3	0.6	0.3	0.5	0.4	0.6	0.5	0.3	0.6	0.2	0.3	0.3	0.3	0.6	0.3	0.6	0.3
-	**Hydrock Default Suite - FOC / SOM / pH**																																
P1334	pH (su)	pH Units	0.1	23	6.00	7.80	7.38	7.50	0.44		-	-		7.6	7.8	7.7	7.7	6	7.3	7.2	7.7	7.6	7.6	7.5	7.8	6.3	7.5	7.2	7.3	7.3	7.6	7.1	7.8
-	**Hydrock Default Suite - Metals & PAH**																																
7440-38-2	Arsenic	mg/kg	1	23	6.90	22.00	15.87	16.00	3.66	0	250	MAFF 1998		18	15	16	14	12	13	11	20	19	6.9	16	10	18	18	18	19	17	14	22	16
7440-42-8	Boron	mg/kg	0.2	23	0.20	1.80	0.82	0.80	0.39	0	5	Nable, et al. 1997		1.2	0.6	1	1.1	<0.2	0.6	0.8	1.8	1	0.3	0.9	<0.2	0.9	1.1	0.7	1.5	0.9	0.6	0.7	0.7
16065-83-1	Chromium (III)	mg/kg	1	23	1.80	27.00	10.19	1.80	10.07	0	400	MAFF 1998 (Cr(T))		22	20	19	22	17	23	27	26	20	15	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg	1.8	23	1.80	**30.00**	15.04	21.00	12.32	**9**	25	ICRCL 70/90 1990		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	21	15	21	27	26	30	27	28	26	30
7440-50-8	Copper	mg/kg	1	23	7.40	28.00	18.99	19.00	6.15	0	135	BS3882 2015		17	7.5	14	14	19	25	18	25	7.4	7.8	17	18	18	28	19	24	25	28	17	27
7440-02-0	Nickel	mg/kg	1	23	8.60	41.00	23.20	25.00	8.83	0	75	BS3882 2015		14	8.6	15	17	32	31	26	25	10	13	18	20	21	30	26	29	28	36	11	41
7440-66-6	Zinc	mg/kg	1	23	35.00	120.00	79.09	78.00	21.45	0	300	BS3882 2015		70	47	95	74	90	63	78	99	35	51	80	46	78	97	86	110	100	76	66	120

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
***<10**	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
+	represents a data point that is not included in the current filter settings

Template Version:

1.09: 11/03/24

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	**Phytotoxic pH 7**
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	**ALLUVIUM**
Strata	**ALLUVIUM**
Depth Min (m bgl)	**0.2**
Depth Max (m bgl)	**1.2**
Dataset mean pH	**7.38**
Scenario pH	**7**

Hydrock

ng/kg unless otherwise stated

Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	02/04/2024 ALLUVIUM TP115 0.6	03/04/2024 ALLUVIUM TP126 0.5	03/04/2024 ALLUVIUM TP127 0.5
Hydrock Default Suite - FOC / SOM / pH														
pH (su)	pH Units	0.1	23	6.00	7.80	7.38	7.50	0.44		-	-	7.2	7.4	7.5
Hydrock Default Suite - Metals & PAH														
Arsenic	mg/kg	1	23	6.90	22.00	15.87	16.00	3.66	0	250	MAFF 1998	17	21	14
Boron	mg/kg	0.2	23	0.20	1.80	0.82	0.80	0.39	0	5	Nable, et al. 1997	0.3	1	0.7
Chromium (III)	mg/kg	1	23	1.80	27.00	10.19	1.80	10.07	0	400	MAFF 1998 (Cr(T))	<1.8	<1.8	<1.8
Chromium (VI)	mg/kg	1.8	23	1.80	**30.00**	15.04	21.00	12.32	**9**	25	ICRCL 70/90 1990	22	25	30
Copper	mg/kg	1	23	7.40	28.00	18.99	19.00	6.15	0	135	BS3882 2015	19	23	19
Nickel	mg/kg	1	23	8.60	41.00	23.20	25.00	8.83	0	75	BS3882 2015	28	22	32
Zinc	mg/kg	1	23	35.00	120.00	79.09	78.00	21.45	0	300	BS3882 2015	85	73	100

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
<10	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
*	represents a data point that is not included in the current filter settings

sion:

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	Phytotoxic pH 7
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	DE GROUND - Fine
Strata	DE GROUND - Fine
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean pH	6.90
Scenario pH	7

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Date	21/03/2024	21/03/2024
													Zone	E GROUND -	E GROUND -
													Location	BH103	BH102
													Depth (m bgl)	0.3	0.3
													Strata	MADE GROUND - Fine	MADE GROUND - Fine
-	**Hydrock Default Suite - FOC / SOM / pH**														
P1334	pH (su)	pH Units	0.1	2	6.80	7.00	6.90	6.90	0.14		-	-		6.8	7
-	**Hydrock Default Suite - Metals & PAH**														
7440-38-2	Arsenic	mg/kg	1	2	14.00	14.00	14.00	14.00	0.00	0	250	MAFF 1998		14	14
7440-42-8	Boron	mg/kg	0.2	2	0.80	1.00	0.90	0.90	0.14	0	5	Nable, et al. 1997		1	0.8
16065-83-1	Chromium (III)	mg/kg	1	2	19.00	25.00	22.00	22.00	4.24	0	400	MAFF 1998 (Cr(T))		25	19
18540-29-9	Chromium (VI)	mg/kg	1.8	2	1.80	1.80	1.80	1.80	0.00	0	25	ICRCL 70/90 1990		<1.8	<1.8
7440-50-8	Copper	mg/kg	1	2	15.00	24.00	19.50	19.50	6.36	0	135	BS3882 2015		24	15
7440-02-0	Nickel	mg/kg	1	2	13.00	23.00	18.00	18.00	7.07	0	75	BS3882 2015		23	13
7440-66-6	Zinc	mg/kg	1	2	66.00	80.00	73.00	73.00	9.90	0	300	BS3882 2015		80	66

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
*<10	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
*	represents a data point that is not included in the current filter settings

Template Version:
1.09: 11/03/24

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	Phytotoxic pH 7
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	NCAST BACKFILL
Strata	NCAST BACKFILL
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean pH	7.59
Scenario pH	7

Hydrock

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Strata	Date	Zone	Location	Depth (m bgl)	Strata
														28/03/2024	NCAST BACK	TP125	0.3	OPENCAST BACKFILL
														21/03/2024	NCAST BACK	BH103	0.8	OPENCAST BACKFILL
														03/04/2024	NCAST BACK	CP101	0.3	OPENCAST BACKFILL
														03/04/2024	NCAST BACK	CP101	0.6	OPENCAST BACKFILL
														03/04/2024	NCAST BACK	CP101	1.2	OPENCAST BACKFILL
														03/04/2024	NCAST BACK	TP107	0.3	OPENCAST BACKFILL
														03/04/2024	NCAST BACK	TP107	0.8	OPENCAST BACKFILL
														02/04/2024	NCAST BACK	TP110	0.3	OPENCAST BACKFILL
														02/04/2024	NCAST BACK	TP110	0.6	OPENCAST BACKFILL
														04/04/2024	NCAST BACK	TP124	0.3	OPENCAST BACKFILL
														04/04/2024	NCAST BACK	TP124	0.5	OPENCAST BACKFILL
														04/04/2024	NCAST BACK	TP124	0.9	OPENCAST BACKFILL
														28/03/2024	NCAST BACK	TP125	0.6	OPENCAST BACKFILL
-	**Hydrock Default Suite - FOC / SOM / pH**																	
P1334	pH (su)	pH Units	0.1	13	6.30	8.20	7.59	7.60	0.50		-	-		6.3	8	7.7	8.2	8.1	7.6	7.6	7.9	7.6	7.1	7.4	7.3	7.9
-	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	13	8.50	24.00	14.70	15.00	4.46	0	250	MAFF 1998		17	8.5	16	13	12	15	12	17	8.6	24	20	17	11
7440-42-8	Boron	mg/kg	0.2	13	0.20	1.40	0.59	0.50	0.31	0	5	Nable, et al. 1997		1.4	<0.2	0.5	0.7	0.9	0.5	0.5	0.4	<0.2	0.7	0.5	0.7	0.5
16065-83-1	Chromium (III)	mg/kg	1	13	1.80	26.00	5.52	1.80	9.09	0	400	MAFF 1998 (Cr(T))		26	26	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
18540-29-9	Chromium (VI)	mg/kg	1.8	13	1.80	37.00	23.74	27.00	10.44	8	25	ICRCL 70/90 1990		<1.8	<1.8	29	29	30	29	26	24	27	37	23	22	29
7440-50-8	Copper	mg/kg	1	13	17.00	56.00	27.23	25.00	9.60	0	135	BS3882 2015		21	26	24	24	26	29	25	23	21	34	17	56	28
7440-02-0	Nickel	mg/kg	1	13	19.00	41.00	30.62	33.00	6.67	0	75	BS3882 2015		20	41	24	33	35	29	34	19	32	34	26	33	38
7440-66-6	Zinc	mg/kg	1	13	69.00	110.00	86.38	85.00	9.64	0	300	BS3882 2015		77	92	89	87	85	91	80	81	92	110	69	85	85

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
*<10	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
+	represents a data point that is not included in the current filter settings

Template Version:

1.09: 11/03/24

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	Phytotoxic pH 7
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	TOPSOIL
Strata	TOPSOIL
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean pH	7.80
Scenario pH	7

Hydrock

Date	27/03/2024
Zone	TOPSOIL
Location	TT117
Depth (m bgl)	0.2
Strata	TOPSOIL

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source
-	**Hydrock Default Suite - FOC / SOM / pH**											
P1334	pH (su)	pH Units	0.1	1	7.80	7.80	7.80	7.80	-		-	-
-	**Hydrock Default Suite - Metals & PAH**											
7440-38-2	Arsenic	mg/kg	1	1	14.00	14.00	14.00	14.00	-	0	250	MAFF 1998
7440-42-8	Boron	mg/kg	0.2	1	1.80	1.80	1.80	1.80	-	0	5	Nable, et al. 1997
16065-83-1	Chromium (III)	mg/kg	1	1	26.00	26.00	26.00	26.00	-	0	400	MAFF 1998 (Cr(T))
18540-29-9	Chromium (VI)	mg/kg	1.8	1	1.80	1.80	1.80	1.80	-	0	25	ICRCL 70/90 1990
7440-50-8	Copper	mg/kg	1	1	24.00	24.00	24.00	24.00	-	0	135	BS3882 2015
7440-02-0	Nickel	mg/kg	1	1	27.00	27.00	27.00	27.00	-	0	75	BS3882 2015
7440-66-6	Zinc	mg/kg	1	1	100.00	100.00	100.00	100.00	-	0	300	BS3882 2015

Strata		Value	
		TOPSOIL	
		-	-
			7.8
			14
			1.8
			26
			<1.8
			24
			27
			100

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
***<10**	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
+	represents a data point that is not included in the current filter settings

Template Version:
1.09: 11/03/24

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	Phytotoxic pH 7
Client:	Newlands
Site:	Goldthorpe
Job no.:	23451
Lab. report no(s).:	24-013259-2, 24-012239-2, 24-011894-1

Data Filters

Zone	NINE MIDDLE COAL MEASURES
Strata	NINE MIDDLE COAL MEASURES
Depth Min (m bgl)	0.2
Depth Max (m bgl)	1.2
Dataset mean pH	5.60
Scenario pH	7

Hydrock

Date	27/03/2024
Zone	NINE MIDDLE
Location	TT123
Depth (m bgl)	0.9
Strata	WEATHERED PENNINE MIDDLE COAL

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source		
-	**Hydrock Default Suite - FOC / SOM / pH**													
P1334	pH (su)	pH Units	0.1	1	5.60	5.60	5.60	5.60	-		-	-		5.6
-	**Hydrock Default Suite - Metals & PAH**													
7440-38-2	Arsenic	mg/kg	1	1	31.00	31.00	31.00	31.00	-	0	250	MAFF 1998		31
7440-42-8	Boron	mg/kg	0.2	1	0.30	0.30	0.30	0.30	-	0	5	Nable, et al. 1997		0.3
16065-83-1	Chromium (III)	mg/kg	1	1	22.00	22.00	22.00	22.00	-	0	400	MAFF 1998 (Cr(T))		22
18540-29-9	Chromium (VI)	mg/kg	1.8	1	1.80	1.80	1.80	1.80	-	0	25	ICRCL 70/90 1990		<1.8
7440-50-8	Copper	mg/kg	1	1	87.00	87.00	87.00	87.00	-	0	135	BS3882 2015		87
7440-02-0	Nickel	mg/kg	1	1	69.00	69.00	69.00	69.00	-	0	75	BS3882 2015		69
7440-66-6	Zinc	mg/kg	1	1	45.00	45.00	45.00	45.00	-	0	300	BS3882 2015		45

Legend:

MG	Made Ground
HH	Holt Heath Sand and Gravel
XX	XX Other Codes

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
***<10**	Value excluded from statistical analysis
***Y**	Text result
-	Represents a determinand that was not tested.
*	represents a data point that is not included in the current filter settings

Template Version:
1.09: 11/03/24

Appendix FWaste assessment

HazWasteOnline™ assessment

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

EU4VM-4Q25R-6HFHH

Job name

Barnsley, Goldthrope

Description/Comments

lab cert 24-011894; lab cert 24-012239; lab cert 24-013259

Project

Barnsley, Goldthorpe

Site

23451

Classified by

Name:
Annabel Edwards
Date:
22 Apr 2024 08:48 GMT
Telephone:
07909210962

Company:
Hydrock Consultants Ltd
Over Court Barns, Over Lane
Almondsbury
Bristol
BS32 4DF

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	07 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Land south of A635, Doncaster Rd, Barnsley **Post Code** S72 0JE

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Development of industrial units.

Description of the specific process, sub-process and/or activity that created the waste

Waste created during the excavation of soils for a new construction development.

Description of the waste

Light greyish brown clayey sandy GRAVEL. Gravel is angular to subrounded fine to coarse of sandstone, siltstone, frequent coal and small fragments of timber.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH103-ES1-21032024-0.30		Non Hazardous		3
2	BH103-ES3-21032024-0.80		Non Hazardous		5
3	BH102-ES1-21032024-0.30		Non Hazardous		7
4	BH102-ES2-21032024-0.50		Non Hazardous		9
5	TP111-ES1-26032024-0.30		Non Hazardous		11
6	TP111-ES2-26032024-0.50		Non Hazardous		13
7	TP120-ES1-26032024-0.20		Non Hazardous		15
8	TP121-ES1-29032024-0.30		Non Hazardous		17
9	TP121-ES2-29032024-0.60		Non Hazardous		19
10	TP125-ES1-28032024-0.30		Non Hazardous		21
11	TT113-ES1-27032024-0.30		Non Hazardous		23
12	TT117-ES1-27032024-0.20		Non Hazardous		25
13	TT117-ES2-27032024-0.50		Non Hazardous		27
14	TT122-ES1-27032024-0.40		Non Hazardous		29
15	TT122-ES2-27032024-0.60		Non Hazardous		31
16	TT123-ES2-27032024-0.90		Non Hazardous		33
17	CP101-ES1-03042024-0.30		Non Hazardous		35
18	CP101-ES2-03042024-0.60		Non Hazardous		37
19	CP101-ES3-03042024-1.20		Non Hazardous		39
20	TP107-ES1-03042024-0.30		Non Hazardous		41
21	TP107-ES2-03042024-0.80		Non Hazardous		43
22	TP110-ES1-02042024-0.30		Non Hazardous		45
23	TP110-ES2-02042024-0.60		Non Hazardous		47
24	TP114-ES1-02042024-0.30		Non Hazardous		49
25	TP114-ES2-02042024-0.60		Non Hazardous		51
26	TP116-ES1-03042024-0.20		Non Hazardous		53
27	TP118-ES1-03042024-0.30		Non Hazardous		55
28	TP124-ES1-04042024-0.30		Non Hazardous		57
29	TP124-ES2-04042024-0.50		Non Hazardous		59
30	TP124-ES3-04042024-0.90		Non Hazardous		61
31	TP128-ES1-02042024-0.30		Non Hazardous		63
32	TP129-ES1-02042024-0.30		Non Hazardous		65
33	TP129-ES2-02042024-0.60		Non Hazardous		67
34	TP112-ES1-02042024-0.30		Non Hazardous		69
35	TP112-ES2-02042024-0.60		Non Hazardous		71
36	TP115-ES1-02042024-0.30		Non Hazardous		73
37	TP115-ES2-02042024-0.60		Non Hazardous		75
38	TP125-ES2-28032024-0.60		Non Hazardous		77
39	TP126-ES1-03042024-0.50		Non Hazardous		79
40	TP127-ES1-03042024-0.50		Non Hazardous		81

Related documents

#	Name	Description
1	24-011894.batch.batch	i2 Analytical .batch file used to populate the Job
2	24-011894_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
3	24-012239_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
4	24-013259_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
5	Hydrock Standard plus Cresol (ammended Lead)	waste stream template used to create this Job

Report

Created by: Annabel Edwards

Created date: 22 Apr 2024 08:48 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	83
Appendix B: Rationale for selection of metal species	84
Appendix C: Version	85

Classification of sample: BH103-ES1-21032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH103-ES1-21032024-0.30
Moisture content:
28%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 28% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	13.309 mg/kg	0.00133 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1 mg/kg		0.072 mg/kg	0.0000072 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.12 mg/kg		0.0864 mg/kg	0.00000864 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.12 mg/kg		0.0864 mg/kg	0.00000864 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.08 mg/kg		0.0576 mg/kg	0.00000576 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.08 mg/kg		0.0576 mg/kg	0.00000576 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3 mg/kg	2.775	2.598 mg/kg	0.00026 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1 mg/kg	3.22	2.318 mg/kg	0.000232 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25 mg/kg	1.462	36.539 mg/kg	0.00365 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.11 mg/kg		0.0792 mg/kg	0.00000792 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24 mg/kg	1.126	19.455 mg/kg	0.00195 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.19	mg/kg		0.137	mg/kg	0.0000137 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.06	mg/kg		0.0432	mg/kg	0.00000432 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	29	mg/kg		20.88	mg/kg	0.00209 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		23	mg/kg	1.579	26.157	mg/kg	0.00262 %	✓	
26		pH			PH		6.8	pH		6.8	pH	6.8 pH		
27		phenanthrene		201-581-5	85-01-8		0.07	mg/kg		0.0504	mg/kg	0.00000504 %	✓	
28		pyrene		204-927-3	129-00-0		0.18	mg/kg		0.13	mg/kg	0.000013 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		80	mg/kg	1.245	71.696	mg/kg	0.00717 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		34	mg/kg	1.785	43.701	mg/kg	0.00437 %	✓	
											Total:	0.0246 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH103-ES3-21032024-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH103-ES3-21032024-0.80
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.5	mg/kg	1.32	9.539	mg/kg	0.000954 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.539	mg/kg	0.000354 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26	mg/kg	1.126	24.882	mg/kg	0.00249 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	17	mg/kg		14.45	mg/kg	0.00145 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				41	mg/kg	1.579	55.046	mg/kg	0.0055 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8	pH		8	pH	8pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
30		zinc { zinc oxide }				92	mg/kg	1.245	97.337	mg/kg	0.00973 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				31	mg/kg	1.785	47.04	mg/kg	0.0047 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.03 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH102-ES1-21032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH102-ES1-21032024-0.30
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	14.603	mg/kg	0.00146 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.06	mg/kg		0.0474	mg/kg	0.00000474 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.07	mg/kg		0.0553	mg/kg	0.00000553 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.07	mg/kg		0.0553	mg/kg	0.00000553 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.83	mg/kg	2.775	1.82	mg/kg	0.000182 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.8	mg/kg	3.22	2.035	mg/kg	0.000203 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.06	mg/kg		0.0474	mg/kg	0.00000474 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15	mg/kg	1.126	13.342	mg/kg	0.00133 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.12	mg/kg		0.0948	mg/kg	0.00000948 %	✓	
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	34	mg/kg		26.86	mg/kg	0.00269 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				13	mg/kg	1.579	16.221	mg/kg	0.00162 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7	pH		7	pH	7pH		
				PH									
27		phenanthrene				0.06	mg/kg		0.0474	mg/kg	0.00000474 %	✓	
			201-581-5	85-01-8									
28		pyrene				0.11	mg/kg		0.0869	mg/kg	0.00000869 %	✓	
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
30		zinc { zinc oxide }				66	mg/kg	1.245	64.899	mg/kg	0.00649 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				28	mg/kg	1.785	39.488	mg/kg	0.00395 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0216 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: BH102-ES2-21032024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
BH102-ES2-21032024-0.50
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.9	mg/kg	1.32	7.835	mg/kg	0.000783 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.06	mg/kg		0.0516	mg/kg	0.00000516 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.6	mg/kg	2.775	1.432	mg/kg	0.000143 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.3	mg/kg	3.22	0.831	mg/kg	0.0000831 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		7.8	mg/kg	1.126	7.552	mg/kg	0.000755 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.08	mg/kg		0.0688	mg/kg	0.00000688 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	18	mg/kg		15.48	mg/kg	0.00155 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		13	mg/kg	1.579	17.659	mg/kg	0.00177 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		0.08	mg/kg		0.0688	mg/kg	0.00000688 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		51	mg/kg	1.245	54.593	mg/kg	0.00546 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		18	mg/kg	1.785	27.635	mg/kg	0.00276 %	✓	
											Total:	0.0164 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP111-ES1-26032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP111-ES1-26032024-0.30
Moisture content:
23%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	18.3	mg/kg	0.00183 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.17	mg/kg		0.131	mg/kg	0.0000131 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.05	mg/kg		0.0385	mg/kg	0.00000385 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.98	mg/kg	2.775	2.094	mg/kg	0.000209 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.2	mg/kg	3.22	2.975	mg/kg	0.000298 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	14.738	mg/kg	0.00147 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.21	mg/kg		0.162	mg/kg	0.0000162 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.07	mg/kg		0.0539	mg/kg	0.00000539 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	43	mg/kg		33.11	mg/kg	0.00331 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		14	mg/kg	1.579	17.027	mg/kg	0.0017 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		0.09	mg/kg		0.0693	mg/kg	0.00000693 %	✓	
28		pyrene		204-927-3	129-00-0		0.18	mg/kg		0.139	mg/kg	0.0000139 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		70	mg/kg	1.245	67.09	mg/kg	0.00671 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		35	mg/kg	1.785	48.111	mg/kg	0.00481 %	✓	
											Total:	0.0245 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP111-ES2-26032024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP111-ES2-26032024-0.50
Moisture content:
19%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	16.042	mg/kg	0.0016 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.83	mg/kg	2.775	1.866	mg/kg	0.000187 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.6	mg/kg	3.22	1.565	mg/kg	0.000156 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20	mg/kg	1.462	29.231	mg/kg	0.00292 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		7.5	mg/kg	1.126	6.84	mg/kg	0.000684 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		0.08	mg/kg		0.0648	mg/kg	0.00000648 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	22	mg/kg		17.82	mg/kg	0.00178 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		8.6	mg/kg	1.579	11.003	mg/kg	0.0011 %	✓	
26		pH			PH		7.8	pH		7.8	pH	7.8 pH		
27		phenanthrene		201-581-5	85-01-8		0.06	mg/kg		0.0486	mg/kg	0.00000486 %	✓	
28		pyrene		204-927-3	129-00-0		0.07	mg/kg		0.0567	mg/kg	0.00000567 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		47	mg/kg	1.245	47.386	mg/kg	0.00474 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		34	mg/kg	1.785	49.164	mg/kg	0.00492 %	✓	
											Total:	0.019 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP120-ES1-26032024-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP120-ES1-26032024-0.20
Moisture content:
17%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.534	mg/kg	0.00175 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.12	mg/kg		0.0996	mg/kg	0.00000996 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.07	mg/kg		0.0581	mg/kg	0.00000581 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.79	mg/kg	2.775	1.82	mg/kg	0.000182 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1	mg/kg	3.22	2.672	mg/kg	0.000267 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.1	mg/kg		0.083	mg/kg	0.0000083 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14	mg/kg	1.126	13.083	mg/kg	0.00131 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.18	mg/kg		0.149	mg/kg	0.0000149 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	30	mg/kg		24.9	mg/kg	0.00249 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		15	mg/kg	1.579	19.665	mg/kg	0.00197 %	✓	
26		pH			PH		7.7	pH		7.7	pH	7.7 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		0.15	mg/kg		0.125	mg/kg	0.0000124 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.1	mg/kg	1.405	1.283	mg/kg	0.000128 %	✓	
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		95	mg/kg	1.245	98.146	mg/kg	0.00981 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		27	mg/kg	1.785	40.006	mg/kg	0.004 %	✓	
											Total:	0.0255 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP121-ES1-29032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP121-ES1-29032024-0.30
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	14.603	mg/kg	0.00146 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.06	mg/kg		0.0474	mg/kg	0.00000474 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
8		benzo[ghi]perylene		205-883-8	191-24-2		0.05	mg/kg		0.0395	mg/kg	0.00000395 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	2.85	mg/kg	0.000285 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.1	mg/kg	3.22	2.798	mg/kg	0.00028 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.08	mg/kg		0.0632	mg/kg	0.00000632 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14	mg/kg	1.126	12.452	mg/kg	0.00125 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.14	mg/kg		0.111	mg/kg	0.0000111 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	34	mg/kg		26.86	mg/kg	0.00269 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17	mg/kg	1.579	21.213	mg/kg	0.00212 %	✓	
26		pH			PH		7.7	pH		7.7	pH	7.7 pH		
27		phenanthrene		201-581-5	85-01-8		0.08	mg/kg		0.0632	mg/kg	0.00000632 %	✓	
28		pyrene		204-927-3	129-00-0		0.11	mg/kg		0.0869	mg/kg	0.00000869 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		74	mg/kg	1.245	72.766	mg/kg	0.00728 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		36	mg/kg	1.785	50.771	mg/kg	0.00508 %	✓	
											Total:	0.0246 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP121-ES2-29032024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP121-ES2-29032024-0.60
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	14.101	mg/kg	0.00141 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6	mg/kg	2.775	3.952	mg/kg	0.000395 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	19.039	mg/kg	0.0019 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.05	mg/kg		0.0445	mg/kg	0.00000445 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	23	mg/kg		20.47	mg/kg	0.00205 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		32	mg/kg	1.579	44.984	mg/kg	0.0045 %	✓	
26		pH			PH		6	pH		6	pH	6pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		90	mg/kg	1.245	99.702	mg/kg	0.00997 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		28	mg/kg	1.785	44.487	mg/kg	0.00445 %	✓	
											Total:	0.0281 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP125-ES1-28032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP125-ES1-28032024-0.30
Moisture content:
25%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 25% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	16.834	mg/kg	0.00168 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08	mg/kg		0.06	mg/kg	0.000006 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.11	mg/kg		0.0825	mg/kg	0.00000825 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4	mg/kg	2.775	2.914	mg/kg	0.000291 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.4	mg/kg	3.22	3.381	mg/kg	0.000338 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.08	mg/kg		0.06	mg/kg	0.000006 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	17.733	mg/kg	0.00177 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.18	mg/kg		0.135	mg/kg	0.0000135 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	34	mg/kg		25.5	mg/kg	0.00255 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		20	mg/kg	1.579	23.692	mg/kg	0.00237 %	✓	
26		pH			PH		6.3	pH		6.3	pH	6.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.1	mg/kg		0.075	mg/kg	0.0000075 %	✓	
28		pyrene		204-927-3	129-00-0		0.16	mg/kg		0.12	mg/kg	0.000012 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		77	mg/kg	1.245	71.882	mg/kg	0.00719 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		41	mg/kg	1.785	54.894	mg/kg	0.00549 %	✓	
											Total:	0.0264 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT113-ES1-27032024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT113-ES1-27032024-0.30
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.276	mg/kg	0.00153 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.13	mg/kg		0.116	mg/kg	0.0000116 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.07	mg/kg		0.0623	mg/kg	0.00000623 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4	mg/kg	2.775	3.458	mg/kg	0.000346 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.6	mg/kg	3.22	1.719	mg/kg	0.000172 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	25.051	mg/kg	0.00251 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		0.22	mg/kg		0.196	mg/kg	0.0000196 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	15	mg/kg		13.35	mg/kg	0.00134 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		31	mg/kg	1.579	43.578	mg/kg	0.00436 %	✓	
26		pH			PH		7.3	pH		7.3	pH	7.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.31	mg/kg		0.276	mg/kg	0.0000276 %	✓	
28		pyrene		204-927-3	129-00-0		0.21	mg/kg		0.187	mg/kg	0.0000187 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		63	mg/kg	1.245	69.791	mg/kg	0.00698 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		27	mg/kg	1.785	42.898	mg/kg	0.00429 %	✓	
											Total:	0.0258 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT117-ES1-27032024-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT117-ES1-27032024-0.20
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	14.603	mg/kg	0.00146 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.24	mg/kg		0.19	mg/kg	0.000019 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.3	mg/kg		0.237	mg/kg	0.0000237 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.15	mg/kg		0.119	mg/kg	0.0000119 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.289	mg/kg	0.000329 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.8	mg/kg	3.22	4.579	mg/kg	0.000458 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		**<LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		**<LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.23	mg/kg		0.182	mg/kg	0.0000182 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	21.347	mg/kg	0.00213 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.48	mg/kg		0.379	mg/kg	0.0000379 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.14	mg/kg		0.111	mg/kg	0.0000111 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	37	mg/kg		29.23	mg/kg	0.00292 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.2	mg/kg		0.158	mg/kg	0.0000158 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		27	mg/kg	1.579	33.691	mg/kg	0.00337 %	✓	
26		pH			PH		7.8	pH		7.8	pH	7.8 pH		
27		phenanthrene		201-581-5	85-01-8		0.29	mg/kg		0.229	mg/kg	0.0000229 %	✓	
28		pyrene		204-927-3	129-00-0		0.41	mg/kg		0.324	mg/kg	0.0000324 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		100	mg/kg	1.245	98.332	mg/kg	0.00983 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		37	mg/kg	1.785	52.181	mg/kg	0.00522 %	✓	
											Total:	0.0306 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT117-ES2-27032024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT117-ES2-27032024-0.50
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	12.49	mg/kg	0.00125 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.09	mg/kg		0.0774	mg/kg	0.00000774 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	3.103	mg/kg	0.00031 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.8	mg/kg	3.22	2.215	mg/kg	0.000222 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.08	mg/kg		0.0688	mg/kg	0.00000688 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	17.429	mg/kg	0.00174 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.18	mg/kg		0.155	mg/kg	0.0000155 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	21	mg/kg		18.06	mg/kg	0.00181 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		26	mg/kg	1.579	35.318	mg/kg	0.00353 %	✓	
26		pH			PH		7.2	pH		7.2	pH	7.2 pH		
27		phenanthrene		201-581-5	85-01-8		0.13	mg/kg		0.112	mg/kg	0.0000112 %	✓	
28		pyrene		204-927-3	129-00-0		0.15	mg/kg		0.129	mg/kg	0.0000129 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		78	mg/kg	1.245	83.495	mg/kg	0.00835 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		31	mg/kg	1.785	47.593	mg/kg	0.00476 %	✓	
											Total:	0.0269 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT122-ES1-27032024-0.40

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT122-ES1-27032024-0.40
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		0.06	mg/kg		0.048	mg/kg	0.0000048 %	✓	
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		0.12	mg/kg		0.096	mg/kg	0.0000096 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	21.125	mg/kg	0.00211 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.44	mg/kg		0.352	mg/kg	0.0000352 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.49	mg/kg		0.392	mg/kg	0.0000392 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.52	mg/kg		0.416	mg/kg	0.0000416 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.31	mg/kg		0.248	mg/kg	0.0000248 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.25	mg/kg		0.2	mg/kg	0.00002 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4	mg/kg	2.775	3.108	mg/kg	0.000311 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.8	mg/kg	3.22	4.637	mg/kg	0.000464 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.49	mg/kg		0.392	mg/kg	0.0000392 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	22.518	mg/kg	0.00225 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.93	mg/kg		0.744	mg/kg	0.0000744 %	✓	
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.26	mg/kg		0.208	mg/kg	0.0000208 %	✓	
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	41	mg/kg		32.8	mg/kg	0.00328 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.44	mg/kg		0.352	mg/kg	0.0000352 %	✓	
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				25	mg/kg	1.579	31.59	mg/kg	0.00316 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
27		phenanthrene				0.62	mg/kg		0.496	mg/kg	0.0000496 %	✓	
			201-581-5	85-01-8									
28		pyrene				0.84	mg/kg		0.672	mg/kg	0.0000672 %	✓	
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
30		zinc { zinc oxide }				99	mg/kg	1.245	98.581	mg/kg	0.00986 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				37	mg/kg	1.785	52.841	mg/kg	0.00528 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0318 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT122-ES2-27032024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT122-ES2-27032024-0.60
Moisture content:
17%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		0.07	mg/kg		0.0581	mg/kg	0.00000581 %	✓	
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		0.18	mg/kg		0.149	mg/kg	0.0000149 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	20.822	mg/kg	0.00208 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.28	mg/kg		0.232	mg/kg	0.0000232 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.27	mg/kg		0.224	mg/kg	0.0000224 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.27	mg/kg		0.224	mg/kg	0.0000224 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.15	mg/kg		0.125	mg/kg	0.0000124 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.14	mg/kg		0.116	mg/kg	0.0000116 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.89	mg/kg	2.775	2.05	mg/kg	0.000205 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1	mg/kg	3.22	2.672	mg/kg	0.000267 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20	mg/kg	1.462	29.231	mg/kg	0.00292 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.3	mg/kg		0.249	mg/kg	0.0000249 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		7.4	mg/kg	1.126	6.915	mg/kg	0.000692 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.78	mg/kg		0.647	mg/kg	0.0000647 %	✓	
20		fluorene		201-695-5	86-73-7		0.06	mg/kg		0.0498	mg/kg	0.00000498 %	✓	
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.14	mg/kg		0.116	mg/kg	0.0000116 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	20	mg/kg		16.6	mg/kg	0.00166 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		10	mg/kg	1.579	13.11	mg/kg	0.00131 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		0.74	mg/kg		0.614	mg/kg	0.0000614 %	✓	
28		pyrene		204-927-3	129-00-0		0.68	mg/kg		0.564	mg/kg	0.0000564 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		35	mg/kg	1.245	36.159	mg/kg	0.00362 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		39	mg/kg	1.785	57.786	mg/kg	0.00578 %	✓	
											Total:	0.0197 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TT123-ES2-27032024-0.90

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TT123-ES2-27032024-0.90
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		0.18	mg/kg		0.144	mg/kg	0.0000144 %	✓	
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		0.5	mg/kg		0.4	mg/kg	0.00004 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		31	mg/kg	1.32	32.744	mg/kg	0.00327 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		0.96	mg/kg	0.000096 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.4	mg/kg		1.12	mg/kg	0.000112 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.6	mg/kg		1.28	mg/kg	0.000128 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.92	mg/kg		0.736	mg/kg	0.0000736 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.59	mg/kg		0.472	mg/kg	0.0000472 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		5.3	mg/kg	2.775	11.767	mg/kg	0.00118 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.3	mg/kg	3.22	0.773	mg/kg	0.0000773 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		1.4	mg/kg		1.12	mg/kg	0.000112 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		87	mg/kg	1.126	78.362	mg/kg	0.00784 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.3	mg/kg		0.24	mg/kg	0.000024 %	✓	
19		fluoranthene		205-912-4	206-44-0		2.7	mg/kg		2.16	mg/kg	0.000216 %	✓	
20		fluorene		201-695-5	86-73-7		0.15	mg/kg		0.12	mg/kg	0.000012 %	✓	
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.82	mg/kg		0.656	mg/kg	0.0000656 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	52	mg/kg		41.6	mg/kg	0.00416 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.09	mg/kg		0.072	mg/kg	0.0000072 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		69	mg/kg	1.579	87.188	mg/kg	0.00872 %	✓	
26		pH			PH		5.6	pH		5.6	pH	5.6 pH		
27		phenanthrene		201-581-5	85-01-8		1.9	mg/kg		1.52	mg/kg	0.000152 %	✓	
28		pyrene		204-927-3	129-00-0		2.5	mg/kg		2	mg/kg	0.0002 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				3.5	mg/kg	1.405	3.934	mg/kg	0.000393 %	✓	
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		45	mg/kg	1.245	44.81	mg/kg	0.00448 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		36	mg/kg	1.785	51.413	mg/kg	0.00514 %	✓	
											Total:	0.0405 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP101-ES1-03042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
CP101-ES1-03042024-0.30
Moisture content:
22%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	16.478	mg/kg	0.00165 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.07	mg/kg		0.0546	mg/kg	0.00000546 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.12	mg/kg		0.0936	mg/kg	0.00000936 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	2.814	mg/kg	0.000281 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.256	mg/kg	0.000126 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	42.385	mg/kg	0.00424 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.08	mg/kg		0.0624	mg/kg	0.00000624 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	21.077	mg/kg	0.00211 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.15	mg/kg		0.117	mg/kg	0.0000117 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	34	mg/kg		26.52	mg/kg	0.00265 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		24	mg/kg	1.579	29.568	mg/kg	0.00296 %	✓	
26		pH			PH		7.7	pH		7.7	pH	7.7 pH		
27		phenanthrene		201-581-5	85-01-8		0.09	mg/kg		0.0702	mg/kg	0.00000702 %	✓	
28		pyrene		204-927-3	129-00-0		0.14	mg/kg		0.109	mg/kg	0.0000109 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		89	mg/kg	1.245	86.408	mg/kg	0.00864 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		39	mg/kg	1.785	54.305	mg/kg	0.00543 %	✓	
											Total:	0.029 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP101-ES2-03042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
CP101-ES2-03042024-0.60
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	14.933	mg/kg	0.00149 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2	mg/kg	2.775	2.897	mg/kg	0.00029 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.961	mg/kg	0.000196 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	42.385	mg/kg	0.00424 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	23.509	mg/kg	0.00235 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	19	mg/kg		16.53	mg/kg	0.00165 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				33	mg/kg	1.579	45.347	mg/kg	0.00453 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
27		phenanthrene				0.17	mg/kg		0.148	mg/kg	0.0000148 %	✓	
			201-581-5	85-01-8									
28		pyrene				0.08	mg/kg		0.0696	mg/kg	0.00000696 %	✓	
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				87	mg/kg	1.245	94.212	mg/kg	0.00942 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				32	mg/kg	1.785	49.7	mg/kg	0.00497 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0301 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: CP101-ES3-03042024-1.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
CP101-ES3-03042024-1.20
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	13.467	mg/kg	0.00135 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2	mg/kg	2.775	2.831	mg/kg	0.000283 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.9	mg/kg	3.22	2.463	mg/kg	0.000246 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26	mg/kg	1.126	24.882	mg/kg	0.00249 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		0.05	mg/kg		0.0425	mg/kg	0.00000425 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	18	mg/kg		15.3	mg/kg	0.00153 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.07	mg/kg		0.0595	mg/kg	0.00000595 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		35	mg/kg	1.579	46.99	mg/kg	0.0047 %	✓	
26		pH			PH		8.1	pH		8.1	pH	8.1 pH		
27		phenanthrene		201-581-5	85-01-8		0.16	mg/kg		0.136	mg/kg	0.0000136 %	✓	
28		pyrene		204-927-3	129-00-0		0.05	mg/kg		0.0425	mg/kg	0.00000425 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		85	mg/kg	1.245	89.931	mg/kg	0.00899 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		31	mg/kg	1.785	47.04	mg/kg	0.0047 %	✓	
											Total:	0.0296 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP107-ES1-03042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP107-ES1-03042024-0.30
Moisture content:
26%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 26% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15	mg/kg	1.32	14.656	mg/kg	0.00147 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1	mg/kg		0.074	mg/kg	0.0000074 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.1	mg/kg		0.074	mg/kg	0.0000074 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.16	mg/kg		0.118	mg/kg	0.0000118 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4	mg/kg	2.775	2.875	mg/kg	0.000288 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.191	mg/kg	0.000119 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	42.385	mg/kg	0.00424 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.14	mg/kg		0.104	mg/kg	0.0000104 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		29	mg/kg	1.126	24.162	mg/kg	0.00242 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.22	mg/kg		0.163	mg/kg	0.0000163 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.06	mg/kg		0.0444	mg/kg	0.00000444 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	32	mg/kg		23.68	mg/kg	0.00237 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		29	mg/kg	1.579	33.896	mg/kg	0.00339 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		0.15	mg/kg		0.111	mg/kg	0.0000111 %	✓	
28		pyrene		204-927-3	129-00-0		0.21	mg/kg		0.155	mg/kg	0.0000155 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		91	mg/kg	1.245	83.819	mg/kg	0.00838 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		36	mg/kg	1.785	47.557	mg/kg	0.00476 %	✓	
											Total:	0.0284 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP107-ES2-03042024-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP107-ES2-03042024-0.80
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	13.943	mg/kg	0.00139 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	3.175	mg/kg	0.000317 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.417	mg/kg	0.000142 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	24.77	mg/kg	0.00248 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	17	mg/kg		14.96	mg/kg	0.0015 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		34	mg/kg	1.579	47.259	mg/kg	0.00473 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		0.08	mg/kg		0.0704	mg/kg	0.00000704 %	✓	
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		80	mg/kg	1.245	87.628	mg/kg	0.00876 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		27	mg/kg	1.785	42.416	mg/kg	0.00424 %	✓	
											Total:	0.0283 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP110-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP110-ES1-02042024-0.30
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	18.405	mg/kg	0.00184 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.06	mg/kg		0.0492	mg/kg	0.00000492 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.1	mg/kg		0.082	mg/kg	0.0000082 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2	mg/kg	2.775	2.731	mg/kg	0.000273 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.4	mg/kg	3.22	1.056	mg/kg	0.000106 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24	mg/kg	1.462	35.077	mg/kg	0.00351 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.09	mg/kg		0.0738	mg/kg	0.00000738 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23	mg/kg	1.126	21.234	mg/kg	0.00212 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.14	mg/kg		0.115	mg/kg	0.0000115 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	36	mg/kg		29.52	mg/kg	0.00295 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		19	mg/kg	1.579	24.609	mg/kg	0.00246 %	✓	
26		pH			PH		7.9	pH		7.9	pH	7.9 pH		
27		phenanthrene		201-581-5	85-01-8		0.07	mg/kg		0.0574	mg/kg	0.00000574 %	✓	
28		pyrene		204-927-3	129-00-0		0.13	mg/kg		0.107	mg/kg	0.0000107 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		81	mg/kg	1.245	82.674	mg/kg	0.00827 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		34	mg/kg	1.785	49.771	mg/kg	0.00498 %	✓	
											Total:	0.0274 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP110-ES2-02042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP110-ES2-02042024-0.60
Moisture content:
17%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.6	mg/kg	1.32	9.424	mg/kg	0.000942 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2	mg/kg	2.775	2.764	mg/kg	0.000276 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	19.624	mg/kg	0.00196 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	22	mg/kg		18.26	mg/kg	0.00183 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		32	mg/kg	1.579	41.952	mg/kg	0.0042 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		92	mg/kg	1.245	95.046	mg/kg	0.0095 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		30	mg/kg	1.785	44.451	mg/kg	0.00445 %	✓	
											Total:	0.0281 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP114-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP114-ES1-02042024-0.30
Moisture content:
18%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.323	mg/kg	0.00173 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.07	mg/kg		0.0574	mg/kg	0.00000574 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.1	mg/kg	2.775	2.503	mg/kg	0.00025 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.9	mg/kg	3.22	2.376	mg/kg	0.000238 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21	mg/kg	1.462	30.693	mg/kg	0.00307 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.06	mg/kg		0.0492	mg/kg	0.00000492 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	15.695	mg/kg	0.00157 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.1	mg/kg		0.082	mg/kg	0.0000082 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	35	mg/kg		28.7	mg/kg	0.00287 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18	mg/kg	1.579	23.313	mg/kg	0.00233 %	✓	
26		pH			PH		7.5	pH		7.5	pH	7.5 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		0.1	mg/kg		0.082	mg/kg	0.0000082 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		80	mg/kg	1.245	81.653	mg/kg	0.00817 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		31	mg/kg	1.785	45.379	mg/kg	0.00454 %	✓	
											Total:	0.0257 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP114-ES2-02042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP114-ES2-02042024-0.60
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10	mg/kg	1.32	11.487	mg/kg	0.00115 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.88	mg/kg	2.775	2.125	mg/kg	0.000212 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	17.631	mg/kg	0.00176 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	11	mg/kg		9.57	mg/kg	0.000957 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		20	mg/kg	1.579	27.483	mg/kg	0.00275 %	✓	
26		pH			PH		7.8	pH		7.8	pH	7.8 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		46	mg/kg	1.245	49.813	mg/kg	0.00498 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		21	mg/kg	1.785	32.615	mg/kg	0.00326 %	✓	
											Total:	0.0182 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP116-ES1-03042024-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP116-ES1-03042024-0.20
Moisture content:
22%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	18.537	mg/kg	0.00185 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.06	mg/kg		0.0468	mg/kg	0.00000468 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.07	mg/kg		0.0546	mg/kg	0.00000546 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.06	mg/kg		0.0468	mg/kg	0.00000468 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.08	mg/kg		0.0624	mg/kg	0.00000624 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.1	mg/kg	2.775	2.381	mg/kg	0.000238 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.9	mg/kg	3.22	2.26	mg/kg	0.000226 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21	mg/kg	1.462	30.693	mg/kg	0.00307 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.1	mg/kg		0.078	mg/kg	0.0000078 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	15.807	mg/kg	0.00158 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		0.14	mg/kg		0.109	mg/kg	0.0000109 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	31	mg/kg		24.18	mg/kg	0.00242 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		21	mg/kg	1.579	25.872	mg/kg	0.00259 %	✓	
26		pH			PH		6.3	pH		6.3	pH	6.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.08	mg/kg		0.0624	mg/kg	0.00000624 %	✓	
28		pyrene		204-927-3	129-00-0		0.13	mg/kg		0.101	mg/kg	0.0000101 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		78	mg/kg	1.245	75.728	mg/kg	0.00757 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		29	mg/kg	1.785	40.381	mg/kg	0.00404 %	✓	
											Total:	0.0245 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP118-ES1-03042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP118-ES1-03042024-0.30
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	18.775	mg/kg	0.00188 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.09	mg/kg		0.0711	mg/kg	0.00000711 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.1	mg/kg		0.079	mg/kg	0.0000079 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.11	mg/kg		0.0869	mg/kg	0.00000869 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.08	mg/kg		0.0632	mg/kg	0.00000632 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6	mg/kg	2.775	3.508	mg/kg	0.000351 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.1	mg/kg	3.22	2.798	mg/kg	0.00028 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.14	mg/kg		0.111	mg/kg	0.0000111 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	24.905	mg/kg	0.00249 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.19	mg/kg		0.15	mg/kg	0.000015 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	34	mg/kg		26.86	mg/kg	0.00269 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.1	mg/kg		0.079	mg/kg	0.0000079 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		30	mg/kg	1.579	37.434	mg/kg	0.00374 %	✓	
26		pH			PH		7.5	pH		7.5	pH	7.5 pH		
27		phenanthrene		201-581-5	85-01-8		0.13	mg/kg		0.103	mg/kg	0.0000103 %	✓	
28		pyrene		204-927-3	129-00-0		0.17	mg/kg		0.134	mg/kg	0.0000134 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		97	mg/kg	1.245	95.382	mg/kg	0.00954 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		39	mg/kg	1.785	55.002	mg/kg	0.0055 %	✓	
											Total:	0.0314 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP124-ES1-04042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP124-ES1-04042024-0.30
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		24	mg/kg	1.32	25.35	mg/kg	0.00254 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.06	mg/kg		0.048	mg/kg	0.0000048 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.08	mg/kg		0.064	mg/kg	0.0000064 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.1	mg/kg		0.08	mg/kg	0.000008 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.05	mg/kg		0.04	mg/kg	0.000004 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.9	mg/kg	2.775	4.219	mg/kg	0.000422 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.803	mg/kg	0.00018 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37	mg/kg	1.462	54.078	mg/kg	0.00541 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.13	mg/kg		0.104	mg/kg	0.0000104 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		34	mg/kg	1.126	30.624	mg/kg	0.00306 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.13	mg/kg		0.104	mg/kg	0.0000104 %	✓	
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	50	mg/kg		40	mg/kg	0.004 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				34	mg/kg	1.579	42.962	mg/kg	0.0043 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.1	pH		7.1	pH	7.1 pH		
				PH									
27		phenanthrene				0.09	mg/kg		0.072	mg/kg	0.0000072 %	✓	
			201-581-5	85-01-8									
28		pyrene				0.14	mg/kg		0.112	mg/kg	0.0000112 %	✓	
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
30		zinc { zinc oxide }				110	mg/kg	1.245	109.535	mg/kg	0.011 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				51	mg/kg	1.785	72.836	mg/kg	0.00728 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0391 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP124-ES2-04042024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP124-ES2-04042024-0.50
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20	mg/kg	1.32	22.181	mg/kg	0.00222 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6	mg/kg	2.775	3.73	mg/kg	0.000373 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.352	mg/kg	0.000135 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23	mg/kg	1.462	33.616	mg/kg	0.00336 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	16.078	mg/kg	0.00161 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	23	mg/kg		19.32	mg/kg	0.00193 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				26	mg/kg	1.579	34.496	mg/kg	0.00345 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.4	pH		7.4	pH	7.4 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				69	mg/kg	1.245	72.144	mg/kg	0.00721 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				41	mg/kg	1.785	61.482	mg/kg	0.00615 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0274 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP124-ES3-04042024-0.90

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP124-ES3-04042024-0.90
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	19.752	mg/kg	0.00198 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.663	mg/kg	0.000366 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.983	mg/kg	0.000198 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		56	mg/kg	1.126	55.484	mg/kg	0.00555 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	26	mg/kg		22.88	mg/kg	0.00229 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				33	mg/kg	1.579	45.869	mg/kg	0.00459 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.3	pH		7.3	pH	7.3 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				85	mg/kg	1.245	93.105	mg/kg	0.00931 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				25	mg/kg	1.785	39.274	mg/kg	0.00393 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0323 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP128-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP128-ES1-02042024-0.30
Moisture content:
19%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18	mg/kg	1.32	19.25	mg/kg	0.00193 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1	mg/kg		0.081	mg/kg	0.0000081 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.06	mg/kg		0.0486	mg/kg	0.00000486 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.18	mg/kg		0.146	mg/kg	0.0000146 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.07	mg/kg		0.0567	mg/kg	0.00000567 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.19	mg/kg		0.154	mg/kg	0.0000154 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.372	mg/kg	0.000337 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.826	mg/kg	0.000183 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.12	mg/kg		0.0972	mg/kg	0.00000972 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	17.327	mg/kg	0.00173 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.19	mg/kg		0.154	mg/kg	0.0000154 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	27	mg/kg		21.87	mg/kg	0.00219 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.06	mg/kg		0.0486	mg/kg	0.00000486 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		26	mg/kg	1.579	33.264	mg/kg	0.00333 %	✓	
26		pH			PH		7.2	pH		7.2	pH	7.2 pH		
27		phenanthrene		201-581-5	85-01-8		0.17	mg/kg		0.138	mg/kg	0.0000138 %	✓	
28		pyrene		204-927-3	129-00-0		0.19	mg/kg		0.154	mg/kg	0.0000154 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		86	mg/kg	1.245	86.707	mg/kg	0.00867 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		42	mg/kg	1.785	60.732	mg/kg	0.00607 %	✓	
											Total:	0.0292 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP129-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP129-ES1-02042024-0.30
Moisture content:
23%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19	mg/kg	1.32	19.316	mg/kg	0.00193 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.18	mg/kg		0.139	mg/kg	0.0000139 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.21	mg/kg		0.162	mg/kg	0.0000162 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.26	mg/kg		0.2	mg/kg	0.00002 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.13	mg/kg		0.1	mg/kg	0.00001 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.11	mg/kg		0.0847	mg/kg	0.00000847 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.7	mg/kg	2.775	3.633	mg/kg	0.000363 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.5	mg/kg	3.22	3.719	mg/kg	0.000372 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		**<LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		**<LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.21	mg/kg		0.162	mg/kg	0.0000162 %	✓	
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24	mg/kg	1.126	20.806	mg/kg	0.00208 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.06	mg/kg		0.0462	mg/kg	0.00000462 %	✓	
19		fluoranthene		205-912-4	206-44-0		0.42	mg/kg		0.323	mg/kg	0.0000323 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	41	mg/kg		31.57	mg/kg	0.00316 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.06	mg/kg		0.0462	mg/kg	0.00000462 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		29	mg/kg	1.579	35.27	mg/kg	0.00353 %	✓	
26		pH			PH		7.3	pH		7.3	pH	7.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.17	mg/kg		0.131	mg/kg	0.0000131 %	✓	
28		pyrene		204-927-3	129-00-0		0.37	mg/kg		0.285	mg/kg	0.0000285 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		110	mg/kg	1.245	105.427	mg/kg	0.0105 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		42	mg/kg	1.785	57.733	mg/kg	0.00577 %	✓	
											Total:	0.0332 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP129-ES2-02042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP129-ES2-02042024-0.60
Moisture content:
24%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 24% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
2		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-917-1	208-96-8									
3		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
4		arsenic { arsenic trioxide }				17	mg/kg	1.32	17.059	mg/kg	0.00171 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
5		benzo[a]anthracene				0.12	mg/kg		0.0912	mg/kg	0.00000912 %	✓	
		601-033-00-9	200-280-6	56-55-3									
6		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
7		benzo[b]fluoranthene				0.2	mg/kg		0.152	mg/kg	0.0000152 %	✓	
		601-034-00-4	205-911-9	205-99-2									
8		benzo[ghi]perylene				0.1	mg/kg		0.076	mg/kg	0.0000076 %	✓	
			205-883-8	191-24-2									
9		benzo[k]fluoranthene				0.08	mg/kg		0.0608	mg/kg	0.00000608 %	✓	
		601-036-00-5	205-916-6	207-08-9									
10		beryllium { beryllium oxide }				1.6	mg/kg	2.775	3.375	mg/kg	0.000337 %	✓	
		004-003-00-8	215-133-1	1304-56-9									
11		boron { diboron trioxide }				0.9	mg/kg	3.22	2.202	mg/kg	0.00022 %	✓	
		005-008-00-8	215-125-8	1303-86-2									
12		cadmium { cadmium sulfide }			1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
		048-010-00-4	215-147-8	1306-23-6									
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
			215-160-9	1308-38-9									
14		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
15		chrysene				0.15	mg/kg		0.114	mg/kg	0.0000114 %	✓	
		601-048-00-0	205-923-4	218-01-9									
16		copper { dicopper oxide; copper (I) oxide }				25	mg/kg	1.126	21.392	mg/kg	0.00214 %	✓	
		029-002-00-X	215-270-7	1317-39-1									

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.24	mg/kg		0.182	mg/kg	0.0000182 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.08	mg/kg		0.0608	mg/kg	0.00000608 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	40	mg/kg		30.4	mg/kg	0.00304 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.08	mg/kg		0.0608	mg/kg	0.00000608 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		28	mg/kg	1.579	33.612	mg/kg	0.00336 %	✓	
26		pH			PH		7.3	pH		7.3	pH	7.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.11	mg/kg		0.0836	mg/kg	0.00000836 %	✓	
28		pyrene		204-927-3	129-00-0		0.22	mg/kg		0.167	mg/kg	0.0000167 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		100	mg/kg	1.245	94.598	mg/kg	0.00946 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		39	mg/kg	1.785	52.913	mg/kg	0.00529 %	✓	
											Total:	0.0305 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP112-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP112-ES1-02042024-0.30
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	16.266	mg/kg	0.00163 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.663	mg/kg	0.000366 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.6	mg/kg	3.22	1.7	mg/kg	0.00017 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		28	mg/kg	1.462	40.924	mg/kg	0.00409 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	27.742	mg/kg	0.00277 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	19	mg/kg		16.72	mg/kg	0.00167 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		36	mg/kg	1.579	50.039	mg/kg	0.005 %	✓	
26		pH			PH		7.6	pH		7.6	pH	7.6 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		76	mg/kg	1.245	83.246	mg/kg	0.00832 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		32	mg/kg	1.785	50.271	mg/kg	0.00503 %	✓	
											Total:	0.03 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP112-ES2-02042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP112-ES2-02042024-0.60
Moisture content:
23%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		22	mg/kg	1.32	22.366	mg/kg	0.00224 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.8	mg/kg	2.775	3.847	mg/kg	0.000385 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.736	mg/kg	0.000174 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		26	mg/kg	1.462	38	mg/kg	0.0038 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	14.738	mg/kg	0.00147 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	21	mg/kg		16.17	mg/kg	0.00162 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		11	mg/kg	1.579	13.378	mg/kg	0.00134 %	✓	
26		pH			PH		7.1	pH		7.1	pH	7.1 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		66	mg/kg	1.245	63.256	mg/kg	0.00633 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		49	mg/kg	1.785	67.355	mg/kg	0.00674 %	✓	
											Total:	0.025 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP115-ES1-02042024-0.30

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP115-ES1-02042024-0.30
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	17.956	mg/kg	0.0018 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6	mg/kg	2.775	3.774	mg/kg	0.000377 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.916	mg/kg	0.000192 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27	mg/kg	1.126	25.839	mg/kg	0.00258 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	24	mg/kg		20.4	mg/kg	0.00204 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				41	mg/kg	1.579	55.046	mg/kg	0.0055 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				120	mg/kg	1.245	126.961	mg/kg	0.0127 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				33	mg/kg	1.785	50.074	mg/kg	0.00501 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0355 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP115-ES2-02042024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP115-ES2-02042024-0.60
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	18.854	mg/kg	0.00189 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.7	mg/kg	2.775	3.963	mg/kg	0.000396 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.3	mg/kg	3.22	0.811	mg/kg	0.0000811 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	17.969	mg/kg	0.0018 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	22	mg/kg		18.48	mg/kg	0.00185 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		28	mg/kg	1.579	37.15	mg/kg	0.00371 %	✓	
26		pH			PH		7.2	pH		7.2	pH	7.2 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		85	mg/kg	1.245	88.873	mg/kg	0.00889 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		39	mg/kg	1.785	58.483	mg/kg	0.00585 %	✓	
											Total:	0.0286 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP125-ES2-28032024-0.60

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP125-ES2-28032024-0.60
Moisture content:
10%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	13.071	mg/kg	0.00131 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	3.247	mg/kg	0.000325 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5	mg/kg	3.22	1.449	mg/kg	0.000145 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	42.385	mg/kg	0.00424 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	28.372	mg/kg	0.00284 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	18	mg/kg		16.2	mg/kg	0.00162 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				38	mg/kg	1.579	54.019	mg/kg	0.0054 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
27		phenanthrene				0.17	mg/kg		0.153	mg/kg	0.0000153 %	✓	
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				85	mg/kg	1.245	95.221	mg/kg	0.00952 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				33	mg/kg	1.785	53.02	mg/kg	0.0053 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0316 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP126-ES1-03042024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP126-ES1-03042024-0.50
Moisture content:
22%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21	mg/kg	1.32	21.627	mg/kg	0.00216 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.5	mg/kg	2.775	3.247	mg/kg	0.000325 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1	mg/kg	3.22	2.512	mg/kg	0.000251 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23	mg/kg	1.126	20.198	mg/kg	0.00202 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.07	mg/kg		0.0546	mg/kg	0.00000546 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	30	mg/kg		23.4	mg/kg	0.00234 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		22	mg/kg	1.579	27.104	mg/kg	0.00271 %	✓	
26		pH			PH		7.4	pH		7.4	pH	7.4 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		73	mg/kg	1.245	70.874	mg/kg	0.00709 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		38	mg/kg	1.785	52.913	mg/kg	0.00529 %	✓	
											Total:	0.0268 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP127-ES1-03042024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP127-ES1-03042024-0.50
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	14.788	mg/kg	0.00148 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.9	mg/kg	2.775	4.219	mg/kg	0.000422 %	✓	
11		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.7	mg/kg	3.22	1.803	mg/kg	0.00018 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	17.114	mg/kg	0.00171 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.14	mg/kg		0.112	mg/kg	0.0000112 %	✓	
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	25	mg/kg		20	mg/kg	0.002 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		32	mg/kg	1.579	40.435	mg/kg	0.00404 %	✓	
26		pH			PH		7.5	pH		7.5	pH	7.5 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		pyrene		204-927-3	129-00-0		0.12	mg/kg		0.096	mg/kg	0.0000096 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		100	mg/kg	1.245	99.577	mg/kg	0.00996 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		40	mg/kg	1.785	57.126	mg/kg	0.00571 %	✓	
											Total:	0.0308 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

beryllium {beryllium oxide}

Worst case species based on hazard statements

boron {diboron trioxide}

Most likely worst case.

cadmium {cadmium sulfide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Worst case species

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case species based on hazard statements

mercury {mercury dichloride}

Worst case species based on hazard statements

nickel {nickel dihydroxide}

Worst case species based on hazard statements

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on hazard statements

zinc {zinc oxide}

Worst case species based on hazard statements

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case species based on hazard statements.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2024.110.6022.11160 (19 Apr 2024)
HazWasteOnline Database: 2024.110.6022.11160 (19 Apr 2024)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023
GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024

Appendix G Preliminary geotechnical risk register

Geotechnical hazard identification – desk study stage

Potential geotechnical hazards have been assessed in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The following pages set out the identified geotechnical risks and hazards which are associated with the proposed development and establish the approach which is to be taken to manage the risks including the geotechnical input and analysis.

Table J.1 is a preliminary assessment of possible geotechnical hazards at the site at Desk Study stage. This information is used to assist with ground investigation design.

Table J.1: Possible geotechnical hazards

Hazard	Comment	Hazard status based on desk study	
		Could be present and / or affect site (i.e. Plausible)	Unlikely to be present and/or affect site
Uncontrolled Made Ground (variable strength and compressibility).	Made ground/Infilled Ground present where quarries have been backfilled.	✓	-
Soft / loose compressible ground (low strength and high settlement potential).	Alluvium present at the site and potential for loose Made Ground/Infilled Ground.	✓	-
Shrink swell of the clay fraction of soils under the influence of vegetation.	Clay layers in the Alluvium could be influenced by the vegetation at the site.	✓	-
Variable lateral and vertical changes in ground conditions.	Varying superficial and solid deposits.	✓	-
High sulfates present in the soils.	Made Ground present in the north of the site.	✓	-
Adverse chemical ground conditions, (e.g. expansive slag).	Not anticipated at this site.	-	✓
Obstructions – historical drains and coal mining features.	Historical drains marked on the historical mapping in the north of the site.	✓	-

	The historical opencast site and buried highwall are present in the north of the site. Below ground Infrastructure is expected still be present.		
Existing below ground structures to remain (on or off-site tunnels, foundations, basements, and adjacent sub-structures).	Not a significant risk at this site.	-	✓
Shallow groundwater.	Shallow groundwater likely present within the Alluvium, Made Ground and Infilled Ground.	✓	-
Changing groundwater conditions.	Changing groundwater levels in association with Carr Dike.	✓	-
Risk from erosion.	Not a significant risk at this site.	-	✓
Risk from flooding.	Parts of the site are in a Flood zone 3 and 2.	✓	-
Running sands and / or loose Made Ground, leading to difficulty with excavation and collapse of side walls.	Potential for loose Made Ground/Infilled Ground in the north of the site.	✓	-
Slope stability issues – general slopes.	Not a significant risk at this site based on current topography. However, proposed earthworks includes significant embankments to be constructed.	✓	-
Slope stability issues – retaining walls.	Not a significant risk at this site.	-	✓
Earthworks – settlement (due to placement of fill on soft / loose ground).	Untreated Alluvial soils/Made Ground/Infilled Ground placed as new fill would be expected to have a poor bearing capacity and could result in significant settlements.	✓	-
Earthworks – poor bearing capacity of new fill.		✓	-

Earthworks – unsuitability of site won material to be reused as fill.	If untreated, the site won Made Ground/Infilled Ground and alluvial soils may be unsuitable due to organic material content and/or presence of deleterious material.	✓	-
Solution features in Chalk.	Not a significant risk at this site.	-	✓
Cavities in the Superficial Deposits due to solution features.	Not a significant risk at this site.	-	✓
Dissolution (associated with "wet rock head").	Not a significant risk at this site.	-	✓
Brine extraction.	Not a significant risk at this site.	-	✓
Mining.	Extensive coal mining has occurred at the site. A bindstone quarry was also present in the north-east.	✓	-
Cambered ground with gulls possibly present.	Not a significant risk at this site.	-	✓
Relict Slip Surfaces.	The fault beneath the south-western tip could lead to differential settlement of infrastructure. The nature of the soils and fault zone should be investigation.	✓	-
Solifluction.	Shallow groundwater and loose deposits likely.	✓	-
Problematic soils (silts and rewetting etc.).		✓	-

Geotechnical Hazard Identification – Following Ground Investigation

The preliminary Geotechnical Risk Register following Ground Investigation is set out in Table J.3.

The probability and impact of a hazard have been judged on a qualitative scale as set out in Table J.2. The degree of risk (R) is determined by combining tan assessment of the probability (P) of the hazard occurring with an assessment of the impact (I) of the hazard and associated mitigation it will require if it occurs (R = P x I).

Table J.2: Qualitative assessment of hazards and risks

P = Probability		I = Impact		R = Risk Rating (P x I)	
1	Very unlikely (VU)	1	Very Low	1 – 4	None / negligible
2	Unlikely (U)	2	Low	5 – 9	Minor
3	Plausible (P)	3	Medium	10 – 14	Moderate
4	Likely (Lk)	4	High	15 – 19	Substantial
5	Very Likely (VLk)	5	Very High	20 - 25	Severe

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Uncontrolled Made Ground (opencast backfill) (variable strength and compressibility).	There is Made Ground due to mining activity at the site. The Made Ground is up to 8m thick due to the infilling of the opencast mine in the north of the site area	Structures	Foundation bearing capacity failure, settlement (total and differential).	4	4	16	Design foundations to found below Made Ground or on Made Ground which has been improved. Alternatively, over-excavation and replacement of Made Ground.
			Floor slab failure.	4	4	16	Ground improvement to floor slabs to be founded on Made Ground.
			External yard slabs	4	3	12	Partial over-excavation and replacement. Increase subbase and capping as appropriate.
		Roads and Pavements.	Settlement (total and differential) of roads and pavements. Foundation failure/punch through	4	3	12	Design roads and pavements using suitable geotechnical parameters and increase the sub-base and capping and use geo-grids as appropriate. Consider settlement monitoring and delaying final road construction.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
		Services.	Settlement (differential), causing damage to services.	3	3	9	Anticipated settlements are low with regard to services. There is a requirement to improve the Made Ground prior to installation of services. It is also advisable to steepen falls in drainage to prevent back fall and use rocker boxes and flexible couplings especially where crossing into the deeper Made Ground.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	3	3	9	Where soft spots encountered, over-excavation and replacement with suitable fill. Design of working platform. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Soft / loose ground (low strength and high settlement potential).	The shallow natural soils comprise Alluvium which includes localised areas of soft clay and sand and gravel with a loose relative density.	Structures.	Foundation bearing capacity failure, settlement (total and differential).	2	4	8	Initial assessment indicates settlements unlikely to be excessive. Design foundations to found below any loose relative density sand and gravel or soft clay, or improve the Alluvium prior to founding where required as part of further assessment.
			Floor slab failure and external yard slabs.	2	4	8	Proof rolling of the surface and removal of soft spots and unsuitable material.
		Roads and Pavements.	Settlement (total and differential), of roads and pavements. Foundation failure/punch through	2	3	6	Design roads and pavements using suitable geotechnical parameters and increase the sub-base and capping as appropriate. Proof rolling of the surface and removal of soft spots and unsuitable material
		Services.	Settlement (differential), causing damage to services.	2	3	6	No specific mitigation anticipated based on preliminary investigation.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	3	3	9	Where soft spots encountered, over-excavate and replace with suitable fill. Design working platform to suit the ground conditions. Site inspection and watching brief by Contractor to review working platform frequently and regularly.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Shrinkage / swelling of the clay fraction of soils under the influence of vegetation.	The clays of the Alluvium and Opencast Backfill are low to medium heave potential and trees are present at field boundaries.	Foundations.	Shrinkage or heave of soils and associated damage to foundations.	3	4	12	Deepen foundations due to trees as appropriate. Over-excavation and removal of desiccated soils as part of the earthworks.
		Floor slabs.	Floor slab failure.	3	4	12	Over-excavation and removal of desiccated soils as part of the earthworks.
Variable lateral and vertical changes in ground conditions.	The Made Ground soils vary laterally and vertically, both in composition and strength. The shallow soils comprise Alluvium which vary laterally and vertically between soft clay and sand and gravel with a loose relative density.	Structures	Foundation bearing capacity failure, settlement (total and differential).	4	4	16	Ground improvement required to mitigate differential settlement. This could include over-excavation and the formation of a transition zone between the opencast backfill and natural soils. Foundations and floor slab to be designed with appropriate reinforcement.
			Floor slab failure.	4	4	16	
			Settlement (total and differential), of roads and pavements.	4	3	12	
		Services.	Settlement (differential), causing damage to services.	3	3	9	Specific design consideration required where services extend into the area of deeper Made Ground associated with opencast workings. This could include steeper falls and flexible joints.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	3	3	9	Where soft spots encountered, over-excavate and replace with suitable fill. Design working platform to suit the ground conditions. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Cont..							

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Sulfates present in the soils.	The ground investigation has proven that there is the potential for sulfate bearing soils to be present particularly associated with the coal measures.	Attack of buried concrete.	Damage to concrete and reduction in strength.	3	4	12	Classify concrete in accordance with BRE SD1 and design concrete accordingly.
		Earthworks.	Sulfate heave following the use of hydraulic binders.	3	4	12	Supplementary sulfate testing in accordance with BRE guidelines to be undertaken during earthworks. Before the use of hydraulic binders is approved, comprehensive testing and design will need to be completed by a Specialist Contractor to satisfy both themselves and the Engineer of the suitability of the soils for treatment, and confirm that the requisite end-performance of the material is achievable. The use of modification / stabilisation to be restricted to suitable materials following laboratory trials. In all instances where improvement by the inclusion of binders is considered, a mix design is required and as part of this design, samples should be checked for swelling, even where very low sulfate values are recorded.
Obstructions.	Obstructions have not been proven by the investigation. However there is a potential for obstructions to be present due to unknown fill in the Opencast Backfill	Construction staff, vehicles and plant operators.	Risk of collapse of excavation as obstructions are pulled out.	4	3	12	Risk assessment required prior to breaking ground.
		Foundations	Obstructions to penetrative foundations or ground improvement	2	3	6	No specific mitigation. Allow for reinstalling certain amount of piles/VSC/concrete columns.
		Roads and Pavements.	Hard spots in externals and roads / pavements.	4	2	8	Allow for a breaker to be present during construction and remove obstructions where encountered during construction.
Cont…							

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Shallow groundwater and changing groundwater conditions.	Monitoring during the ground investigations has proven a shallow groundwater table (at approximately 1.0 – 1.2m bgl), with relatively fast inflows of water seen during the ground investigation. Monitoring during the ground investigation has not shown the degree of variability in the groundwater table, as such further monitoring may be necessary.	Construction staff, vehicles and plant operators.	Difficulty with excavation.	5	2	10	Contractor to appoint competent Temporary Works Designer to design temporary works, in accordance with BS 5975:2008+A1:2011. Temporary Works Designer to consider in their analysis the impact of, and requirements for, de-watering of excavations. Any water that collects at the base of excavations to be removed as soon as practicable.
			Limit state failure, excessive deformation, trafficking of site plant, inability to place and compact fill.				
		Slopes and embankments	Serviceability issues.	3	4	12	The shallow groundwater is to be taken into account during geotechnical design of the permanent works and shall include suitable drainage to mitigate excess pore pressures.
Subject to risk from flooding.	The site is adjacent to an existing river (Carr Brook). The site is within an area of flood risk.	The entire development.	Damage to structures	4	4	16	The site is partially located within a Flood Zone 2 and 3, and as such is at risk of flooding. The planning of the site needs to take into account the risk of flooding. Flood mitigation is required as part of the design of the development.
Running sands and / or loose Made Ground, leading to difficulty with excavation and collapse of side walls.	The ground investigation has indicated that there is a potential for loose soils and Made Ground to be present at the site.	Construction staff, vehicles and plant operators.	Ground failure, instability of plant and machinery.	4	4	16	As instability has been noted in pits from surface, foundation options should be reviewed to ensure minimal excavation. Excavations and temporary slopes should be appropriately battered. Contractor to appoint competent Temporary Works Designer to design temporary works, in accordance with BS 5975:2008+A1:2011. Temporary Works Design to include recommendations for inspection of excavations. No person entry to unsupported excavations.
			Risk of collapse of excavation.	4	3	12	
		Roads and Pavements.	Serviceability issues.	4	3	12	
Cont…							

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Earthworks – Settlement (due to placement of fill on soft /Deep Made Ground).	The ground conditions at the site include up to 8m deep Made Ground. Levels are increasing across parts of the site to allow the construction of a bund, embanked road and development pad	Structures	Settlement (total and differential) of foundations and floor slabs.	2	4	8	Initial analysis has indicated that settlements due to land raising are unlikely to be excessive where structures are proposed.
			Settlement (total and differential), of roads and pavements.	2	3	6	Settlements are not anticipated to be significant with regard to roads and pavements. Consider settlement monitoring and delaying final road construction may be required.
		Services.	Settlement (differential), causing damage to services.	2	3	6	Settlements are anticipated to be minimal with regard to services. Detailed design works are required to assess the impact and design mitigation measures.
Earthworks – poor bearing capacity and / or settlement of new fill.	There is a requirement for cut to fill to create the development platform and filling of excavations. This will require reuse of soils excavated from the site.	Structures	Foundation bearing capacity failure, settlement (total and differential).	3	4	12	Design earthworks specifically to carry proposed structural loading. End product criteria required and linked to serviceability limits. Minimum engineering performance to be defined in an Earthworks Specification. Earthworks to be designed in accordance with 1) Manual of Contract Documents for Highway Works (MCHW), Volume 1; 2) Specification for Highway Works (SHW) Series 600; 3) 6031:2009, Code of practice for earthworks; and 4) BS 8000-1, workmanship on building sites. Site testing to be undertaken to confirm the works are in accordance with the design. A suitable watching brief and independent verification.
			Floor slab failure.	3	4	12	
		Services.	Settlement (differential), causing damage to services.	2	3	6	
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	4	3	12	
Cont…							

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required	
				P	I	R		
Earthworks – Unsuitability of site won material to be reused as fill.	There is a requirement for cut to fill to create the development platform and filling of remediation excavations. This will require reuse of soils excavated from the site.	Earthworks control, inability to place and compact fill.	Service limit state failure, excessive and intolerable total and differential settlement.	3	3	9	The design is to describe the processes required to produce suitable fill for reuse. Contractor to design site control measures, plant, equipment and arrangement to comply with processing requirements. Site testing to be undertaken to confirm the works are in accordance with the design. A suitable watching brief and independent verification. Adequate investigation required of soil types and characterisation of the soils to be undertaken during investigation. Some fill may be unsuitable for use.	
		Project Budgets - Insufficient fill to complete earthworks.	Additional Costs, due to importation of fill or having to modify designs.	3	3	12		
Mining	Current investigations indicate that unrecorded workings exist below the site	Structures	Reduction of lateral support potentially affecting stability of the structural foundations, floor slabs and external hardstanding.	4	5	20	Further investigation will be required to fully define the extent of the coal workings. If stabilisation works (grouting) is required, this will need to be designed and undertaken by a specialist.	Worked seams within influencing distance of the surface and where development is proposed are to be grouted and stabilised. Foundations to be designed in accordance with CIRIA publication C758D, 'Abandoned Mine Workings Manual'
		Services.	Damage to services. Leaking drainage causing inundation and further collapse.	4	4	16		No soakaway drainage within influencing distance of structures and roads. Use rocker boxes and flexible couplings where considered necessary (dependant on extent of treatment).
Cont..								

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Unforeseen ground conditions - risk associated with limited data.	Preliminary ground investigation has been undertaken to date. However, additional ground investigation will be required. Ground conditions are only defined at exploratory hole locations.	All aspects of the development		5	4	20	Additional investigation required to include investigation of: » Further investigation of the groundwater regime on site, including the installation of further monitoring wells, » Further investigation of the extent of the shallow worked Shafton seam including the area south of the subcrop. » Further investigation of the fault in the north west area of the site, » Further investigation of the uncontrolled Opencast Backfill regarding geotechnical properties, highwall geometry and assessment of waste acceptance criteria » Gas monitoring of the Alluvium, particularly in identified deep areas, and, » Additional Geotechnical testing to characterise lateral variability, and cover areas of low data coverage, including supplementary sulphate testing and further earthworks data in areas of proposed cutting. Designers to be contacted if conditions encountered are different to those identified during investigation. Regular inspections of excavations and earthworks for evidence of stability. Adequate investigation required to characterise the site and understand the potential risks.

Whilst the probability and impact of the hazard occurring can be reduced to a minimum by geotechnical design, the impact cannot be reduced below very low. The risk register will need to be up-dated, as necessary, to reflect design, additional information, data and experience as it is gained through the construction process.

Impacts of the design with regard to health and Safety considerations will need to be included by the designer at design stage.

Appendix H Plausible source-pathway-receptor contaminant linkages

Summary of potential contaminant linkages

Table K.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2023) and additional risk assessment is required.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but modified to add a 'no linkage' category and to remove low/moderate risk (See Table K.1).

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table K.1: Consequence versus probability assessment.

		Consequence			
Probability		Severe	Medium	Mild	Minor
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Table K.2: Exposure model – final source-pathway-receptor contaminant linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Made Ground/Infilled Ground, associated with the backfilled quarries and mineworking's across the site, possibly including elevated concentrations of metals, metalloids, PAH, PHC, asbestos fibres, Asbestos Containing Materials (S1).	Ingestion, inhalation or direct contact.	Site users	No Linkage			No source of contamination was identified during the ground investigation, and chemical analysis of soils has identified that there are no samples in exceedance of the GAC, as such there is no linkage. In addition, no asbestos fibres or ACM have been detected in samples by laboratory analysis or visually identified during the works. However, further investigation will be required to infill data gaps and satisfy sampling density requirements across the site area. This risk assessment should be updated following the supplementary investigation.
	Inhalation of fugitive dust.	Neighbours	No Linkage			
	Leaching through unsaturated zone.	Groundwater within secondary A aquifer bodies in the Alluvium, Pennine Middle Coal Measures and Mexborough Rock.	No Linkage			
	Surface run-off.	Carr Dike	No Linkage			
	Base flow from contaminated groundwater.		No Linkage			

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Historical landfilled household waste. (S2).	Ingestion, inhalation or direct contact.	Site Users	No Linkage			As the site area no longer encompasses the landfill to the north, there is no risk of direct contact by site users and no risk of inhalation of asbestos fibres assuming that the ground is not disturbed, as such there is no linkage.
	Leaching through unsaturated zone.	Groundwater within secondary A aquifer bodies in the Alluvium, Pennine Middle Coal Measures and Mexborough Rock.	Unlikely	Medium	Very Low Risk	As the landfill is now an off-site source, no direct analysis of the landfill material has been undertaken and therefore the leaching potential is unknown. No evidence has been identified of migrated contamination from the landfill to the site. Therefore, there remains a potential linkage although the risk the subject site is very low.
	Base flow from contaminated groundwater.	Carr Dike				
Ground gases (carbon dioxide and methane) from organic materials in the Made Ground / alluvial deposits (S3).	Migration, build up and asphyxiation.	Site users	Unlikely	Medium to Severe	Low Risk	Preliminary gas monitoring and assessment of the Opencast Backfill has provisionally categorised this stratum commensurate to CS1 conditions, with no mitigation required. It should be noted that only three monitoring points are installed in the Opencast Backfill and none within the Alluvium, therefore further investigation and monitoring is required to fully characterise the sites ground gas regime.
		Neighbours				
Cont						

Ground gases (carbon dioxide and methane) from organic materials in the landfill (S4).	Migration, build up and explosion.	Site users	Unlikely	Medium to Severe	Low Risk	The landfill is no longer located on site, and based upon monitoring undertaken in the Opencast Backfill, there has been no elevated concentrations of gases detected, therefore it is unlikely that gas migration from the landfill to site is happening on a significant scale. As part of the supplementary investigation shallow monitoring wells should be installed at northern boundary, adjacent to the off-site landfill to confirm low risk.
		Neighbours				
Mine gases from shallow coal workings (S5).	Migration, build up and explosion.	Site users.	Unlikely	Medium to Severe	Low Risk	Preliminary gas monitoring and assessment of the PMCM has provisionally categorised this stratum commensurate to CS1 conditions, with no mitigation required. It should be noted that only two monitoring points are installed in the PMCM, therefore further investigation and monitoring is required to fully characterise the sites mine gas regime.
		Neighbours				
Historical site with a Part B permit for the processing of coal and coke (S6).	Ingestion, inhalation or direct contact.	Site users	No Linkage			No source of contamination was identified during the ground investigation, and chemical analysis of soils has identified that there are no samples in exceedance of the GAC, as such there is no linkage
	Leaching through unsaturated zone.	Groundwater within secondary A aquifer bodies in the Alluvium, Pennine Middle Coal Measures and Mexborough Rock.	No Linkage			

Quarry backfill, associated with the former brick pit located on the eastern boundary of the site, possibly including metals, metalloids, asbestos (S7).	Leaching through unsaturated zone.	Groundwater within secondary A aquifer bodies in the Alluvium, Pennine Middle Coal Measures and Mexborough Rock.	No Linkage	This source is not present within the Zone 1 site, and is now offsite c. 300m to the east of Carr Dike, Groundwater between the source and Zone 1 are not considered to be in hydraulic continuity, therefore there is no linkage.
	Base flow from contaminated groundwater.	Carr Dike	No Linkage	
Dismantled railway 80m south east possibly containing elevated concentrations of metals, metalloids, PAH and PHC (S8).	Leaching through unsaturated zone.	Groundwater within secondary A aquifer bodies in the Alluvium, Pennine Middle Coal Measures and Mexborough Rock.	No Linkage	As proven by the ground investigation, there has been no evidence of contaminant migration from this off site source to Zone 1, therefore there is no linkage.

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Sewage, discharged into the tributary of Carr Dike located 209m east (S10).	Active discharge into surface water.	Controlled water – Carr Dike.	Likely	Medium	Moderate	An active licence registered at Highgate Industrial Estate (209m east) for the discharge of sewage into the tributary of Carr Dike, which flows through the site. The discharge is upstream of the site. The discharge of sewage into Carr Dike is likely to have an adverse effect of water quality and aquatic life.	As part of this preliminary investigation surface water testing was excluded from the scope, and therefore a residual risk remains. Surface water sampling and laboratory analysis should be undertaken as part of the supplementary investigation.

Appendix I Climate Change Considerations for C-S-M

Table L.1 summarises the considerations that have been made in relation the possible implications of predicted climate change. These considerations have been made with reference to prevailing guidance on climate change and land contamination (SoBRA (2022), CL:AIRE)2022), Environment Agency (2010)), and climate change information published by the Met Office and the Environment Agency .

Table L.1: Possible CSM considerations related to climate change.

Climate change type	Potential climate change induced effect	Possible considerations on CSM
Increase in frequency and severity of extreme rainfall events	Temporary increasing in groundwater levels	It is possible that future groundwater level rise could be sufficient to impact identified contaminant linkages. The risk of groundwater flooding is increased and could possibly result in a groundwater flooding given the current depth to groundwater.
	Increased surface run-off	Site is covered in soft-standing with no associated surface water drainage. Surface water run-off will impact drainage network (in terms of volume of water) but is not expected to impact underlying ground conditions.
	Land-based erosion	Potentially relevant given of the proximity of the site to the Dyke. Bank erosion caused by extreme river level events or surface erosion caused by the flooding. However, the proposed development takes flood attenuation in to account.
	River flooding	The site is already located within a Flood Zone 2 and 3 which means it is already at risk of flooding (>1% chance per year). An increase in frequency and severity of extreme rainfall events will only likely increase this risk further.
Increase in frequency and severity of extreme cold and hot weather events	Soil freezing	Could cause failure of surface water drainage network (requiring repair) due to freeze/thaw action but not evident that this would cause a significant change to identified contaminant linkages.
	Soil desiccation/shrinkage	Relatively granular nature of superficial deposits does not suggest a risk from shrinkage-related subsidence.
	Land fires	Not relevant to current nature and location of site.
	Temporary drop in water (GW and/or SW) levels due to increased water abstraction demand	Underlying shallow aquifer does not have any licenced abstractions registered within 1km of the site. Impact of a drop in water levels in the aquifer not expected to adversely affect identified contaminant linkages.
	Temporary drop in water levels (GW and/or SW) due to lower rainfall.	Water levels in the shallow aquifer may fall further in drier summer months. This will increase the thickness of the unsaturated zone and could result in greater soil vapour flux as a result of the greater thickness of unsaturated soil present. This significance of this is dependent on the current level of risk identified for vapour intrusion. A subsequent rise in groundwater level and re-saturation zone could course a short-term increase in ground gas concentrations.

Long-term sea level rise	Coastal erosion	Not relevant to current nature and location of site.
	Saline intrusion and marine inundation	Not relevant to current nature and location of site.
Long-term increase in rainfall	Increase in groundwater levels	The site is located within a river catchment that eFLAG predicts will see an increase of 0.05mm per day in groundwater recharge in winter months.
Long-term decrease in rainfall	Decrease in groundwater levels	See comment above for temporary change in groundwater levels above. Whilst it is expected that there will be an increase in winter rainfall it is also expected that there will be a reduction in summer rainfall such that there will be a long-term increase in the expected seasonal fluctuation in shallow groundwater depth.
Long-term change in seasonal temperatures	Change in soil temperature	Worst-case (RCP8.5) prediction for average summer temperatures in 2060-2080 in this area is 5-6 degrees Celsius. Soil temperature at depth below the site (considering the proposed surface cover of buildings and concrete hardstanding) is not expected to rise by this amount and may see a much smaller rise in average temperature as a result of seasonal variation in temperature. A small increase in average soil temperature is not expected to have a significant effect on contaminant fate and transport.