GEOENVIRONMENTAL GROUND INVESTIGATION

The Airfields
Deeside
Plots B & C

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CONFIDENTIALITY STATEMENT

This report is addressed to and may be relied upon by the following:

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DOCUMENT HISTORY

VERSION	PURPOSE/DESCRIPTION	DATE
1	Final – For Issue to Client	December 2018

EXECUTIVE SUMMARY

Site Address	**Plots B & C, The Airfields, Deeside**
NGR	Approximate NGR 332500, 370000
Current Site Use & Proposed Development	Plots B & C of The Airfields development comprise generally undeveloped grassland with well-maintained low-lying vegetation. A commercial development comprising two warehouse units is proposed on the site.
Previous Reports	A geoenvironmental desk study report has been carried out by JPG in July 2014.
Fieldwork	Fieldwork comprised six cable percussion boreholes, 35 trial pits and 12 cone penetration tests. Samples of soil and groundwater were obtained and submitted for chemical and geotechnical analysis. All boreholes were installed with gas and groundwater wells, which were subsequently monitored.
Ground and Groundwater Conditions	Made ground topsoil, typically less than 0.20m thick, was encountered in all exploratory holes. The topsoil generally comprised dark brown silty sand with rootlets. The topsoil was found to be underlain by natural sand (Tidal Flat Deposits), which was locally silty or clayey. The base of the sand was not proven. The density of the sand deposits was found to increase with depth, from medium dense at shallow depths (up to 5m bgl) and becoming dense (generally below 5m bgl). Groundwater seepages were noted within trial pits at depths of between 1.80m and 3.10m bgl. All trial pits terminated due to instability, often due to water ingress. Groundwater strikes were encountered in all boreholes at depths of between 2.00m and 2.50m bgl, rising to a maximum of 1.80 m bgl. Standing groundwater levels of between approximately 1.40m and 1.83m bgl have been recorded during post-investigation monitoring.
Geotechnical and Engineering Assessment	**Foundations** - The shallow natural ground (medium dense sand) is considered suitable to support structural loads, through the use of a shallow foundation solution such as pads. An allowable bearing capacity of 100kN/m^2 will be available for total settlements of less than 25mm at approximately 1m bgl. An allowable bearing capacity of 140kN/m^2 will be available for total settlements of less than 25mm at approximately 2m bgl. Should higher loading be required, ground improvement may be considered to increase the bearing capacity of the underlying granular strata. Any ground improvement method would have to consider the high groundwater table and the potential for dilation due to vibration. **Ground Floor Construction** - Based on the nature of the shallow underlying natural ground, the construction of ground floor slabs on the natural granular strata could be considered. **Earthworks** - Where encountered, areas of high fines (clay and/or silt) should be stockpiled separately and used for general landscaping. Compaction of granular material may be carried out either by method specification, such as that prescribed in Table 6/4 of specification for Highway Works; Series 600 Earthworks or by site specific end product compaction. Trial compactions may be carried out to determine the optimum methods for compaction of the natural materials. The compaction method used should consider the groundwater level and possible dilation of the sand. Dilation of the sand may be minimised by the use of dead rollers in preference to vibratory rollers. **Roads, Pavements and Hardstanding Surfaces** - For the natural sand material, it is considered reasonable to adopt a CBR value of approximately 4% for preliminary design of roadways and hardstanding. For the silt/ clay material, a CBR value of <2.5% should be adopted and therefore some improvement would be required if the materials were to be used at formation level. **Obstructions** - The natural sand was observed to be free of obstructions. **Chemical Attack on Buried Concrete** - The site has been classified in accordance with BRE Special Digest 1. Based on the laboratory test results it is considered that a Design Sulphate Class of DS-1 and an ACEC of AC-1 class may adopted for the site.
Environmental Risk Assessment	Based on the results of the chemical tests carried out, no sources of contamination have been identified. Therefore there are no remediation requirements for the site with regard to soil or water.
Hazardous Gas	The site has been classified as Characteristic Situation 1 (CS1). Consequently ground gas protection measures are not considered to be necessary with respect to methane or carbon dioxide. Basic radon protective measures are required for new buildings on the site.
This sheet is intended as a summary only of the assessment of the site in relation to ground condition. It does not provide a definitive engineering analysis.	

1.0 INTRODUCTION

1.1 Introduction

JPG (Leeds) Limited has been instructed by Praxis Real Estate Management Limited to carry out a geoenvironmental ground investigation for a proposed commercial development at The Airfields, Deeside, North Wales.

1.2 Objectives

The main objective of the geoenvironmental ground investigation is to identify potential geotechnical and environmental issues that may represent constraints to the proposed development of the site.

1.3 Scope of Works

The scope of the investigation included the following works:

- A description of the ground investigation works carried out, i.e. factual reporting.

Interpretative reporting, including:

- Assessment of potential contaminants using generic assessment criteria specific to the proposed end use.
- A qualitative (Tier 1) screening assessment using source-pathway-receptor linkages.
- An assessment of the classification of materials for disposal off-site (not including WAC testing).
- Engineering assessment to include recommendations with respect to foundations, ground floor and pavement design.
- Comments on the likely requirements for remedial measures on the site, to address potential contamination and/or ground gas issues.
- Recommendations for further work where appropriate; and
- Presentation of the findings in a tabular non-technical summary.

1.4 Location

The site forms part of a proposed commercial development area of a larger mixed-use site at The Airfields, Deeside. The site is located to the west of the A548 Welsh Road, approximately 6km north west of Chester. The approximate centre of the site is located at NGR 332500, 370000. A site location plan is given as Figure 1 in Appendix A.

1.5 Site Description and Topography

The 'site' is irregular in shape and occupies an area of approximately 25 ha. The site is at a general elevation of 4.60m above ordnance datum (AOD) and is generally level.

The site forms Plots B & C of 'The Airfields' development, a wider scheme incorporating the whole former military base, occupying a total area of over 56 ha. Plot B is located within the eastern part of the site and Plot C is located within the west.

Access to the site is via a newly constructed road (the B5441), with the A548 Welsh Road immediately to the east. The newly constructed highway forms the southern boundary to plots B & C.

The site is currently unoccupied and comprises mostly grassland. Vegetation comprises well maintained grassland with peripheral planting. At the time of the ground investigation, heras fencing separated the two plots.

The north-eastern corner of Plot B comprises grassland with a bituminous hardstanding path and adjacent redundant street lighting. The path is no longer used.

The boundaries of the site and adjacent land use is described below:

- The northern boundary of the site comprises generally dense vegetation, beyond which is the Chester Millennium Greenway cycle route, running parallel to the northern boundary. A surface water drain runs between the site boundary and the cycle route along part of the northern boundary and also extending along the western boundary. Immediately beyond the cycle route is Deeside Industrial Park (approximately 50m to the north of the site).
- Temporary fencing and stockpiles of demolition rubble are present immediately beyond the eastern site boundary. Beyond this are several concrete slabs, with active demolition works being undertaken further east towards Welsh Road.
- The southern boundary comprises a newly constructed swale, beyond which is a newly constructed section of highway and roundabout. The road has several temporary egress points onto Plots B & C. The road is situated approximately 1m higher than the site. The River Dee is located approximately 600m to the south, beyond which is Queensferry.
- The western boundary comprises generally dense vegetation, beyond which are agricultural fields. A surface water drain extends between the site boundary and the adjacent field, connecting to the drain identified along the northern boundary.

An aerial photograph is provided as Figure 2 in Appendix A.

1.6 Development Proposals

The proposed commercial development comprises two large commercial units with associated parking, landscaping and roads. An electricity substation is proposed in the centre of the site.

A plan showing the proposed development is referenced below and a copy is contained in Appendix A.

- Fletcher Rae. June 2017. The Airfields, Deeside. Proposed Masterplan. Drawing No. 13001_SK116 for Crag Hill Estates Ltd.

1.7 Previous Reports

A desk study report has previously been issued by JPG for 'The Airfields' and is referenced below:

- JPG (Leeds) Limited. Geoenvironmental Desk Study Report. The Airfields, Deeside. Report Ref. MT/DS/4671.v1, dated July 2014 for Praxis Real Estate Management Ltd.

The desk study report should be read in conjunction with this report.

1.8 Limitations

The general limitations to the nature of the investigation are outlined in Appendix H.

2.0 FIELDWORK

2.1 Fieldwork

The ground investigation was designed to provide information on the general ground, groundwater and ground gas conditions at the site.

Trail pits were excavated across the site to assess the shallow ground conditions below the proposed development.

Cable percussive boreholes were advanced across the site to assess the deeper ground conditions below the proposed development and to provide in situ strength/density data and also obtain soil samples for laboratory testing. Gas and groundwater monitoring wells were installed in all cable percussive boreholes in order to assess the ground gas and groundwater regime in the natural ground beneath the site.

In addition, cone penetration tests (CPTs) were carried out across the site to obtain geotechnical parameters.

The rationale behind each exploratory location is summarised in Table 2.1.1 below.

Table 2.1.1 – Exploratory Hole Rationale

Potential Issue	Exploratory Holes
General coverage to assess ground conditions and features across the site.	TP201 – TP235
Cable percussive boreholes to assess ground conditions across the site, within the footprint of the proposed developments.	CP201 – CP206
Cone penetration testing to assess deeper ground conditions, within the footprint of the proposed development.	CPT201 – CPT212

The ground investigation fieldworks were carried out by JPG (Leeds) Ltd between 20 August and 29 August 2018. The works undertaken are summarised in Table 2.1.2 below.

Table 2.1.2 – Summary of Ground Investigation Works

Investigation Method	No of Positions	Maximum Depth (m bgl)	Monitoring Wells	Monitoring
Trial Pits	35 (TP201 – TP235)	3.10	-	-
Cable Percussive Boreholes	6 (CP201 – CP206)	15.00	6 x 50mm	GG and WL
Cone Penetration Testing	12 (CPT201 – CPT212)	15.00	-	-

bgl – below ground level
GG – ground gas monitoring (methane, carbon dioxide, oxygen, hydrogen sulphide, gas flow and atmospheric pressure using a portable gas meter)
WL – standing groundwater level using an electric contact dip meter

The ground investigation has been undertaken in general accordance with the techniques outlined in BS5930: 2015 Code of Practice for Site Investigations at the positions shown on the Exploratory Hole Location Plan, which is presented as Figure 3 in Appendix A.

The investigation was carried out under the full-time supervision of an engineer from JPG. The Exploratory Hole Logs are contained in Appendix B.

Due to the risk of unexploded ordnance (UXO) below the site, all exploratory hole locations were inspected and cleared by a qualified UXO Engineer using a magnetometer, to a maximum depth of 8 m bgl.

Gas and groundwater monitoring standpipes were installed in all six cable percussive boreholes.

Cone Penetration Testing was performed close to each of the cable percussive boreholes with additional locations targeting the footprint of the commercial units. The CPT logs are contained in Appendix D.

2.2 Surveying

The coordinates reported on the exploratory records were surveyed using a hand-held GPS unit.

3.0 LABORATORY TESTING

3.1 Chemical Analysis

The chemical analysis suite was designed to:

- Assess whether the existing topsoil on the site is suitable to be reused within landscaping on the future development.
- Characterise near surface contamination levels to provide an assessment of the risks associated with direct contact with soils onsite in its current state.
- Provide information on the general contamination concentrations in the various strata across the site.
- Characterise in detail visible or odorous contamination using targeted analytical testing techniques.
- Provide information on the solubility of contaminants and therefore the potential for impact on controlled waters; and
- Provide information on the groundwater beneath the site.

Chemical testing was carried out for the following determinands by Derwentside Environmental Testing Services Limited (DETS) in County Durham. Chemical analysis certificates are presented in Appendix G.

Soils – General
Selected samples of soil were tested for the following contaminants on a total concentration basis:

Arsenic	Mercury	Copper
Cadmium	Lead	Nickel
Chromium	Zinc	Selenium
Cyanide (free)	Phenol	
Speciated Poly Aromatic Hydrocarbons (PAH)		
Soil Organic Matter		
Sulphate (water soluble) and pH		

In addition, selected samples were submitted for the following analysis:

- Hexavalent chromium, total and water-soluble chloride, total sulphate, total sulphide and ammoniacal nitrogen.

Soils – Leachate
Selected samples of soil leachate were tested for the following contaminants:

Arsenic	Mercury	Copper
Cadmium	Lead	Nickel
Chromium	Zinc	Selenium
Cyanide (free)	Phenol	
Speciated Poly Aromatic Hydrocarbons (PAHs)		
Sulphate and pH		

3.2 Geotechnical Testing

In situ standard penetration tests (SPTs) were carried out within all six cable percussive boreholes. The results are presented on the Exploratory Hole Logs presented as Appendix B and presented graphically within Figure 4, Appendix A.

In situ cone penetration tests (CPTs) were performed across the proposed development area. The results are presented graphically within Appendix D.

Laboratory geotechnical testing was carried out in order to determine the physical characteristics of the substrata and comprised the following:

- Moisture content and Atterberg Limits tests to classify the materials.
- Particle size distributions (PSD)/sedimentations to confirm the field descriptions of the soils encountered and inform earthworks design.
- Compaction test (4.5kg rammer) and particle density testing in order to determine the compaction properties of the soils.
- Determination of maximum and minimum dry density of the soils.
- California Bearing Ratio (CBR) test (2.5kg) to determine the bearing characteristics of the underlying natural strata.
- pH, 2:1 water extract soluble sulphate to determine the potential for aggressive ground and inform the design of buried concrete.

The geotechnical testing was carried out in accordance with BS1377:1990, "Methods of Test for Soils for Civil Engineering Purposes". The results of the geotechnical testing are contained in Appendix F.

4.0 GROUND AND GROUNDWATER CONDITIONS

4.1 Introduction

The proven ground conditions encountered during the investigation were consistent with the anticipated sequence of strata encountered on previous ground investigations undertaken in 2017, for the residential and commercial plots at The Airfields.

4.2 Ground Conditions

A summary of the ground conditions encountered is provided below. The sequence of strata generally comprises a thin layer of made ground topsoil, underlain by silty sand with localised clay horizons. These deposits are representative of the Tidal Flat deposits of the Quaternary Period, indicated on geological mapping.

Made Ground Topsoil
Reworked topsoil was encountered at all exploratory hole locations across the site. The thickness of topsoil was typically less than 0.20 m. The topsoil generally comprised dark brown silty sand with abundant rootlets.

Anthropogenic inclusions were generally absent from the topsoil with the exception of four exploratory locations. Rare gravel of ceramic (generally angular fragments of brick) and coal were identified in two exploratory locations (TP215 and TP229) within the western extent of Plot C. A metal fragment (<1cm) was noted within one location (TP201 between 0 and 0.25m bgl) within the north-western corner of Plot C, and plastic debris was also noted within two locations (TP206 and TP235), in the southern central and north-eastern site area of Plot B.

Natural Strata - Granular
Natural Tidal Flat Deposits were found to underlie the reworked topsoil in all exploratory locations. The underlying natural deposits consisted of granular light greyish brown medium dense to dense sand, with frequent disseminated shell fragments. The granular strata were encountered to a maximum depth of 15m bgl; the base of the unit was not proven.

Natural Strata – Cohesive
Locally horizons of clay were noted during the investigation in eight exploratory hole locations. Generally, the cohesive natural strata were identified as lenses and thick laminations. The cohesive material comprised soft to firm, dark greyish brown, sandy clay. Clay horizons were noted within trial pits at depths of between 0.15m and 2.00m bgl and within boreholes at depths of between 7.50m and 9.00 m bgl.

The underlying bedrock was not encountered during the site investigation due to a maximum drilled depth of 15.0m bgl, with all exploratory holes terminating within dense sand.

4.3 In Situ Geotechnical Testing

Standard Penetration Testing
66 Standard Penetration Tests (SPT) were carried out within the natural ground and recorded 'SPT (N)' values ranging from 10 to greater than 50 between 1.00m and 15.00m bgl. Pertinent details are outlined below.

- Natural strata (silty sand) between 1.00m and 5.00m bgl was assessed as medium dense.
- Natural strata (silty sand) between 5.00m and 15.00m bgl was assessed as dense.

The results of the in-situ standard penetration testing have been corrected and plotted against depth (m bgl). The plot is presented as Figure 4 in Appendix A and the SPT data (uncorrected) is included on the borehole logs contained in Appendix B. The plot confirms that the natural strata increases in density with depth.

Cone Penetration Testing
12 cone penetration tests (CPTs) were carried out across the footprints of both units to a maximum depth of 15.00m bgl. A combined CPT/magnetometer was used.

Testing was carried out with a 20.5-tonne tracked-truck mounted CPT unit and was carried out in general accordance with BS ISO 22476-1:2012.

The testing generally indicated *'clean sand to silty sand'* ranging from medium dense to dense, the density increasing with depth. The equivalent N values correlate well with the values obtained in the cable percussive boreholes.

The probes were spread over the site and were generally terminated at their target depth of 15.00m, with CPT tests extending to depths of between 14.45m and 15.00m. It is assumed that the CPTs terminated within the dense sands.

4.4 Laboratory Testing

Samples of natural ground were submitted for geotechnical testing and a summary of the results is provided below.

Moisture Content and Atterberg Limit Testing
23 samples of natural ground were submitted for moisture content testing, the results of which are summarised in Table 4.5.1 below:

Table 4.4.1 – Summary of Moisture Content

Material	Moisture Content (%)	
	No of samples	Range
Granular Natural Ground – Sand	20	9.4 - 28
Natural Ground – Clay/ Silt	3	24 - 28

Figure 5 of Appendix A presents a plot of moisture content against depth. The plot confirms that moisture content increases with depth.

Atterberg Limit Testing

One sample of clayey silt (TP222) was submitted for Atterberg limit testing. The sample returned 'non-plastic'.

Particle Size Distribution Testing

Particle size distribution testing was carried out on 12 samples in order to confirm the field descriptions of the materials and determine the proportion of clay/silt minerals in the material. The results are summarised in Table 4.4.2 below.

Table 4.4.2 – Summary of Particle Side Distribution/Sedimentation Testing

Trial Pit	Depth (m bgl)	Material	Cobbles (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
TP204	0.50 – 1.00	Sand	0	0	98	2	
TP208	2.00	Sand	0	0	67	32	1
TP213	0.50 – 1.00	Sand	0	0	69	29	2
TP215	1.00 – 1.50	Sand	0	0	67	31	2
TP219	0.50 – 1.00	Sand	0	0	66	31	3
TP222	0.90 – 1.30	Clayey Silt	0	4	40	53	3
TP224	1.90 – 2.20	Sand	0	0	96	4	
TP225	0.80 – 1.10	Clay	0	0	21	42	37
TP228	0.90 – 1.00	Sand	0	0	95	5	
TP229	0.50 – 1.00	Sand	0	0	97	3	
TP233	0.60	Sand	0	0	70	28	2
TP235	0.80 – 1.00	Sand	0	0	79	19	2

Organic Matter Content Testing

Ten samples of made ground and 5 samples of natural ground were submitted for organic matter content testing at depths of between ground level and 2.20m bgl. The results are summarised in Table 4.4.3 below:

Table 4.4.3 – Summary of Organic Matter Content Results

Material	Organic Matter Content (%)		Mean
Granular Made Ground *(topsoil)*	10	0.2 – 6.3	3.77 %
Granular Natural Ground	4	<0.1 – 0.3	0.16 %
Cohesive Natural Ground	1	0.2	0.2 %

Compaction Testing

One sample of sandy clay was submitted for dry density/moisture content relationship testing. The compaction test was undertaken using a 4.5kg rammer, with the results summarised in Table 4.4.4 below:

Table 4.4.4 – Summary of Compaction Test Results

Exp. Hole	Depth (m bgl)	Material	Weight of Rammer	Natural Moisture Content (NMC)	Max. Dry Density (Mg/m3)	Optimum Moisture Content (OMC)	Suitability for Compaction and Range of Acceptable Moisture Contents*
TP225	0.80 – 1.10	Cohesive Natural Ground	4.5 kg	28	1.89	13	Too wet, 12 % - 17.5 %

*** To achieve >95% of maximum dry density and <5% air voids**

The one cohesive sample obtained from TP225 has been assessed as unsuitable to achieve >95% of the maximum dry density and <5% air voids as the material is too wet.

Four samples were submitted for particle density. Particle densities of 2.62 Mg/m^3 and 2.67 Mg/m^3 were recorded.

Eight samples were submitted for maximum and minimum dry density. The test results indicated that the materials could achieve a maximum dry density of between 1.49 Mg/m^3 and 1.61 Mg/m^3 (with an average of 1.55 Mg/m^3). The test results also indicated a minimum dry density of between 1.34 Mg/m^3 and 1.37 Mg/m^3.

California Bearing Ratio

Seven samples were submitted for California Bearing Ratio (CBR) testing. The results are summarised in Table 4.4.5 below.

Table 4.4.5 – Summary of CBR Results

Exp. Hole	Depth (m bgl)	Material	Initial Moisture Content (%)	CBR Value (%)	
				Top	Base
TP204	0.50 – 1.00	Sand	15	44.7	43.0
TP215	1.00 – 1.50	Sand	24	28.1	34.0
TP219	0.50 – 1.00	Sand	24	8.5	9.4
TP222	0.90 – 1.30	Silt	24	2.5	3.0
TP225	0.80 – 1.10	Clay	28	0.3	0.3
TP228	0.90 – 1.00	Sand	25	12.6	15.8
TP229	0.50 – 1.00	Sand	9.4	57.6	62.0

The CBR values ranged between 8.5% and 62% within the granular strata. The CBR values ranged between 0.3% and 3% within the cohesive/silt strata.

Overall, given the nature of the natural ground, the granular tidal flat deposits are considered generally suitable for use as re-engineered fill. However, strata in which the fines content (clay or silt particles) is greater than 15% or the moisture content is greater than optimum may be unsuitable.

4.5 Groundwater

During the investigation, groundwater was encountered in 33 of the 35 trial pits and all six borehole locations. Groundwater seepages were noted within trial pits at depths of between 1.80m and 3.10m bgl. All trial pits terminated due to instability, often due to water ingress.

Groundwater strikes were encountered in all boreholes at depths of between 2.00m and 2.50m bgl, rising to a maximum of 1.80m bgl. A summary of monitored groundwater levels is presented in Table 4.5.1 below.

Table 4.5.1 – Summary of Monitored Groundwater Levels

Location	Water Level During Monitoring (m bgl)					
TIDE	N/A	Low	Low	N/A	N/A	High
CP201	1.82	1.83	1.83	1.81	1.82	1.77
CP202	1.71	1.73	1.70	1.69	1.70	1.70
CP203	1.55	1.49	1.49	1.54	1.54	1.51
CP204	1.64	1.62	1.66	1.64	1.67	1.52
CP205	1.51	1.55	1.58	1.45	1.40	1.28
CP206	1.73	1.63	1.63	1.76	1.77	1.47

N/A where boreholes were monitored between tide times.

All six monitoring wells were installed within the tidal flat deposits (water-bearing sands). Groundwater monitoring has been carried out on six occasions. Given the proximity of the site to the River Dee estuary, some groundwater monitoring visits were targeted at reported high and low tide times for Connah's Quay to assess if the groundwater was tidally influenced. The groundwater levels remained fairly consistent during the monitoring, showing little variation in some boreholes, with no noticeable change in others.

It should be noted that the groundwater conditions recorded are based on observations made at the time of the site work and subsequent monitoring. Groundwater levels are likely to vary owing to seasonal and weather-related effects and higher groundwater levels should be anticipated.

4.6 Ground Gas

Ground gas monitoring has been undertaken on six occasions. The works were carried out using a portable gas meter to measure concentrations of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and atmospheric pressure.

The results of the gas monitoring are presented in Appendix E and discussed in Section 7 of this report.

4.7 Stability

The trial pits excavated across the site were generally unstable between 2.40m and 3.10m bgl and frequently collapsed on groundwater ingress.

Based on the ground conditions encountered in the trial pits, the stability of the shallow natural granular ground is considered poor, decreasing in stability with depth and groundwater.

It is considered likely that if excavations were left unsupported, then collapse would occur and this is likely to increase in the presence of groundwater.

5.0 GEOTECHNICAL AND ENGINEERING ASSESSMENT

5.1 Development Proposals

The proposed commercial development comprises two large commercial units with associated parking, landscaping and roads. An electricity substation is proposed in the centre of the site.

A plan showing the proposed extent of the development is referenced below and a copy is contained in Appendix A.

- Fletcher Rae. June 2017. The Airfields, Deeside. Proposed Masterplan. Drawing No. 13001_SK116 for Crag Hill Estates Ltd.

5.2 Mining

The JPG desk study report indicated that the site is in an area unlikely to be affected by mine workings. Based on this and the investigative works carried out to date, the risk to the site from instability due to shallow mine workings is considered to be low. The JPG desk study report also indicates that movements associated with brine extraction are also considered to be unlikely.

5.3 Foundations

The ground conditions at the site comprise made ground topsoil to a maximum depth of 0.20m bgl, underlain by Tidal Flat Deposits, generally comprising medium dense (1-5m bgl) to dense sands (>5m bgl) confirmed to a maximum depth of 15.00m bgl. The base of the Tidal Flat Deposits was not proven as part of this investigation and hence the depth to the bedrock geology was not confirmed below the site.

Any made ground/topsoil would be unsuitable for the support of structural loads due to variations in material properties. If shallow spread foundations were to be used within any made ground, the underlying materials would become overstressed, leading to significant settlements. It is therefore recommended that foundation loads are transferred to natural strata of suitable bearing capacity.

The shallow natural ground (medium dense sand) is considered suitable to support structural loads, through the use of a shallow foundation solution such as pads. An allowable bearing capacity of 100kN/m^2 will be available for total settlements of less than 25mm at approximately 1m bgl. An allowable bearing capacity of 140kN/m^2 will be available for total settlements of less than 25mm at approximately 2m bgl.

Given the shallow groundwater level, excavations extending below groundwater may cause a decrease in allowable bearing pressure and increased difficulties relating to groundwater control and excavation stability.

Should higher loading be required, ground improvement may be considered to increase the bearing capacity of the underlying granular strata. Any ground improvement method would have to consider the high groundwater table and the potential for dilation due to vibration. It is recommended that specialist ground improvement contractors are contacted to discuss possible methods that may be suitable on this site. Alternatively, a piled foundation solution should be adopted.

5.4 Ground Floor Construction

Based on the nature of the shallow underlying natural ground, the construction of ground floor slabs on the natural granular strata could be considered.

Any deleterious or soft material should be removed and replaced with properly compacted granular fill. The compaction method used should consider the groundwater level and dilation of the sand. This may exclude the use of vibratory rollers.

5.5 Earthworks

Earthworks will be required for hardstanding areas, parking areas and for backfilling of excavations.

12 samples were submitted for particle size distribution and grading, to determine their grading class, as outlined in Table 4.4.4.

Four of the samples classify as a 'granular fill', with between 95% and 98% sand content.

Eight of the samples classified as a Class 2C 'stoney cohesive fill' due to the high fines content. These high fines contents are consistent with the clay and silt content of the tidal flat deposits. Where encountered these materials should be stockpiled separately and should be used for general landscaping.

Based on particle size distribution tests most of the natural sand may be classified as Class 2A/ 2B or 1B; cohesive/ granular fill.

Compaction of Class 2A, 2B or 1B material may be carried out either by method specification, such as that prescribed in Table 6/4 of specification for Highway Works; Series 600 Earthworks or by site specific end product compaction. Trial compactions may be carried out to determine the optimum methods for site compaction of the natural materials.

The compaction method used should consider the groundwater level and possible dilation of the sand. Dilation of the sand may be minimised by the use of dead rollers in preference to vibratory rollers.

5.6 Roads, Pavements and Hardstanding Surfaces

The structural design of a road or hard standing is based on the strength of the subgrade, which is assessed on the California Bearing Ratio (CBR).

The CBR values for natural ground have been derived from laboratory CBR tests. The CBR values ranged between 0.3% and 62% (an average CBR value of 22.9%) within the natural ground.

Five CBR measurements undertaken on the natural sand recorded values between 8.5% and 62% with an average of 31.57% for material obtained at depths of between 0.50m and 1.50m bgl.

For the natural sand material, it is considered reasonable to adopt a CBR value of approximately 4% for preliminary design of roadways and hardstanding.

Two CBR measurements undertaken on both silt/ clays recorded CBR values of between 0.3% and 3% at material obtained from depths of between 0.8m bgl and 1.30m bgl. For the silt/ clay material, a CBR value of <2.5% should be adopted and therefore some improvement would be required if the materials were to be used at formation level.

Formations should be proof rolled and any areas of soft/ loose or otherwise deleterious material should be excavated and replaced with a properly compacted granular fill, e.g. any areas where clayey/silty soils are present. The compaction method used should take into consideration the groundwater level and possible dilation of the sand. This may exclude the use of vibratory rollers.

5.7 Excavations

If foundation excavations extend below the water table, then running sands may be encountered. Groundwater control would be required in these circumstances. Excavation across most of the site will be carried out through topsoil and natural sand. Excavation should be achievable by standard plant.

Based on observations on site, together with the results of in-situ and laboratory tests, it is considered that shallow excavations will not stand unsupported in the short term. Side support for safety purposes should be provided to all excavations which appear unstable, and those more than 1.20m deep, in accordance with Health and Safety Regulations.

Excavations greater than 1.00m, e.g. for services/ drainage may encounter groundwater. Excavations to depths greater than approximately 1m may encounter standing water and/or running sands, especially if left open for prolonged periods.

5.8 Obstructions

During the intrusive investigation, no obstructions were encountered. During development, some localised obstructions may be encountered, for example the north-eastern site area comprising a former pathway and associated street lighting. Any such obstructions will need to be broken out and removed prior to development.

5.9 Chemical Attack on Buried Concrete

Laboratory testing has been undertaken on samples of the natural ground to determine the sulphate content and acidity and hence the concrete class required for buried concrete.

Laboratory testing of the fifteen natural ground samples tested recorded water-soluble sulphate contents between <10mg/l and 490mg/l and pH values of between 8.0 and 9.0. In addition, two samples of groundwater were tested as part of the JPG investigation. Sulphate concentrations of 7mg/l and 37mg/l were recorded.

Foundations are likely to come into contact with natural ground and groundwater.

On this basis, it is recommended that concrete be designed to Aggressive Chemical Environment for Concrete (ACEC) Design Sulphate Class DS-1 and ACEC Class AC-1.

This assessment has been made in accordance with BRE Special Digest 1:2005, entitled 'Concrete in Aggressive Ground'.

6.0 ENVIRONMENTAL RISK ASSESSMENT

6.1 Introduction

Legislation and guidance on the assessment of contaminated sites acknowledges the need for a tiered risk-based approach comprising:

Tier 1 Assessment	Comparison of site contaminant concentrations against generic assessment criteria (GAC), i.e. a generic quantitative risk assessment (GQRA). Including an assessment of risk using the source-pathway-receptor model.
Tier 2 Assessment	Derivation of site specific risk assessment criteria and calculation of site specific clean up goals, i.e. a detailed quantitative risk assessment (DQRA).

A Tier 1 Assessment has been completed; however, a Tier 2 Assessment has not been undertaken as part of this report.

The statutory definition of contaminated land is given in the Environmental Protection Act, Part IIA, Section 78, 1990, which was introduced by the Environment Act, Section 57, Department of Environment, 1995 and is defined as:

Land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and/or,
- Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused (by the land).

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. The potential for harm to occur requires three conditions to be satisfied:

- **Sources** – The presence of substances (potential contaminants/pollutants), in or under the ground, that may cause harm or pollution.
- **Receptors** - The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora; and,
- **Pathway** - The existence of a linkage between the Source and the Receptor.

In order to assess the contamination risk at the site, the above rationale has been applied and is discussed in the context of Contamination Sources and Potential Pollutant Linkages.

In summary, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and an unacceptable risk of harm to available receptors.

The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the sensitivity of the intended end use of the site and the sites characteristics and environmental setting.

6.2 Assessment Approach

Human Health
The results of the chemical analysis for each determinand will be assessed against their respective GAC.

These include the LQM/CIEH Suitable 4 Use Levels (S4UL) and Category 4 Screening Levels (C4SL), which were developed using the UK Contaminated Land Exposure Assessment (CLEA) Framework Documents and Software.

The CLEA model uses generic assumptions about the fate and transport of chemicals in the environment and a generic conceptual model (referred to as generic land use scenarios) for site conditions and human behaviour, to estimate child and adult exposures to soil contaminants for those living, working and/or playing on contaminated sites over long-time periods.

The S4UL and C4SL screening levels have been derived for a variety of land uses including residential, allotments, commercial and public open space.

In the absence of S4UL and C4SL for potential contaminants, appropriate alternative GAC will be used.

Controlled Waters
No standards currently exist in the UK which provides threshold values for potential contamination in groundwater. Alternative guidance is therefore used, against which the significance of potential contaminants can be assessed. For this site, based on the conceptual site model, Drinking Water Standards (DWS) are considered the most appropriate screening values when considering groundwater and leachate results.

6.3 Evaluation of Soils Analysis

Initially, the results of the chemical analysis for each potential contaminant will be compared directly with their respective GAC. Based on the development proposals for the site, GACs for a commercial end use have been adopted.

If any significant exceedances of the GAC are noted, then the results will be subject to statistical analysis if appropriate. An outline of the methodology of the statistical analysis is presented in Appendix G.

In total, 14 samples were submitted for chemical analysis with selected samples analysed for asbestos screen.

14 soil samples were obtained from the area proposed for a commercial end-use. The samples comprised nine of made ground topsoil and five of the underlying granular natural strata.

Table 6.3.1 summarises the results with respect to the proposed commercial land-use.

Table 6.3.1 – Summary of Chemical Analysis Results – Commercial

Determinands	Commercial GAC	Sample Mean (mg/kg)	Sample Range (mg/kg)	Exceedances of Commercial GAC
Arsenic	640(2)	9.6	5.1 - 13	0
Cadmium	190(2)	0.36	<0.1 – 0.7	0
Chromium	8600(1)	14.57	9.5 - 25	0
Chromium, hexavalent	33(2)	1.0	<1 - <1	0
Copper	68000(1)	16.7	5.2 - 81	0
Lead	2330(2)	79.1	24 - 110	0
Mercury (Inorganic)	58(1)	0.08	<0.05 - 0.12	0
Nickel	980(1)	12.2	7.9 - 25	0
Selenium	12000(1)	0.55	0.5 – 0.9	0
Zinc	730000(1)	129	40 - 230	0
Total Phenols	440(1)	0.35	<0.3 – 0.7	0
Naphthalene	190(1)	0.1	<0.1 - <0.1	0
Acenaphthylene	83000(1)	0.1	<0.1 - <0.1	0
Acenaphthene	84000(1)	0.1	<0.1 - <0.1	0
Fluorene	63000(1)	0.1	<0.1 - <0.1	0
Phenanthrene	22000(1)	0.1	<0.1 - <0.1	0
Anthracene	520000(1)	0.1	<0.1 - <0.1	0
Fluoranthene	23000(1)	0.1	<0.1 - <0.1	0
Pyrene	54000(1)	0.1	<0.1 - <0.1	0
Benzo(a)anthracene	170(1)	0.1	<0.1 - <0.1	0
Chrysene	350(1)	0.1	<0.1 - <0.1	0
Benzo(b)fluoranthene	44(1)	0.1	<0.1 - <0.1	0
Benzo(k)fluoranthene	1200(1)	0.1	<0.1 - <0.1	0
Benzo(a)pyrene	35(2)	0.1	<0.1 - <0.1	0
Indeno(123-cd)pyrene	500(1)	0.1	<0.1 - <0.1	0
Dibenzo(ah)anthracene	3.5(1)	0.1	<0.1 - <0.1	0
Benzo(ghi)perylene	3900(1)	0.1	<0.1 - <0.1	0

(1) S4UL
(2) C4SL
*** BASED ON 1% SOM**

No exceedances were identified for samples obtained from both the made ground topsoil and natural ground across the site with respect to a commercial end-use.

In total, nine samples of topsoil and five samples of natural ground were submitted for an asbestos screen. No asbestos was detected within any samples submitted.

6.4 Evaluation of Controlled Waters Analysis

6.4.1 Leachability Analysis

Four samples were submitted for leachability analysis, three of made ground topsoil and one of the granular natural stratum. The results for each determinand were compared directly to Drinking Water Standards (DWS) for freshwater.

The results are summarised in Table 6.4.1 below.

Table 6.4.1 – Summary of Leachability Results

Determinands	Drinking Water Standard (ug/l)	NATURAL	TOPSOIL		
		TP231 (0.3 – 0.35m)	TP203 (0 – 0.2m)	TP227 (0 – 0.3m)	TP230 (0 – 0.2m)
pH	6.5 – 9.5	7.5	7.6	8.0	8.2
Arsenic	50(1)	0.50	0.48	0.49	0.49
Cadmium	5(1)	< 0.03	< 0.03	<0.03	<0.03
Chromium	50(1)	< 0.25	< 0.25	<0.25	0.44
Copper	2000(1)	0.8	0.9	2.3	2.8
Lead	10(1)	0.87	1.2	0.40	0.23
Mercury	1(1)	0.01	0.05	<0.01	<0.01
Nickel	20(1)	< 0.5	1.4	<0.5	<0.5
Selenium	10(1)	< 0.25	< 0.25	<0.25	<0.25
Zinc	5000(1) *	< 1.3	< 1.3	2.1	3.7
Cyanide free	50(1)	< 20	< 20	<20	< 20
Monohydric phenol	7.7	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	4.24 (2)	0.27	0.15	0.13	0.05
Acenaphthylene	NA	0.18	0.04	< 0.01	< 0.01
Acenaphthene	NA	0.02	0.02	< 0.01	< 0.01
Fluorene	NA	0.02	< 0.01	< 0.01	< 0.01
Phenanthrene	NA	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	0.193(2)	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	0.0122(2)	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	NA	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	NA	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	NA	< 0.01	< 0.01	< 0.01	< 0.01
Sum of: benzo(b)fluoranthene, benzo(k)fluoranthene, indeno (1,2,3-c, d) pyrene benzo (g, h, i) perylene	0.1(1)	All <0.01	All <0.01	All <0.01	All <0.01
Benzo(a)pyrene	0.01(1)	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(ah)anthracene	NA	< 0.01	< 0.01	< 0.01	< 0.01
Sulphate as SO4	250000(1)	< 0.50	< 0.50	0.60	0.33

(1) Water Supply (Water Quality) Regulations 2000
*Historical 1989 Threshold Value.
(2) Water Framework Directive 2015, Surface Water, Maximum Threshold Value.

No determinands were found to exceed the appropriate screening value.

6.4.2 Groundwater Analysis

Two natural groundwater samples were submitted for analysis. The results for each determinand were compared directly to the appropriate Drinking Water Standard. The results are summarised in Table 6.4.1 below.

Table 6.4.2 – Summary of Groundwater Results

Determinands	Drinking Water Standard (ug/l)	CP201	CP202
pH	6.5 – 9.5	7.9	8.0
Arsenic	50(1)	2.9	1.7
Cadmium	5(1)	< 0.03	< 0.03
Chromium	50(1)	< 7.0	< 7.0
Copper	2000(1)	2.7	1.3
Lead	10(1)	< 0.09	< 0.09
Mercury	1(1)	< 0.01	< 0.01
Nickel	20(1)	< 0.5	1.1
Selenium	10(1)	< 0.25	< 0.25
Zinc	5000(1) *	6.6	13
Cyanide free	50(1)	< 20	< 20
Monohydric phenol	7.7	< 0.05	< 0.05
Naphthalene	4.24 (2)	< 0.01	< 0.01
Acenaphthylene	NA	< 0.01	< 0.01
Acenaphthene	NA	< 0.01	< 0.01
Fluorene	NA	< 0.01	< 0.01
Phenanthrene	NA	< 0.01	< 0.01
Anthracene	0.193(2)	< 0.01	0.02
Fluoranthene	0.0122(2)	< 0.01	0.05
Pyrene	NA	< 0.01	< 0.01
Benzo(a)anthracene	NA	< 0.01	< 0.01
Chrysene	NA	< 0.01	< 0.01
Sum of: benzo(b)fluoranthene, benzo(k)fluoranthene, indeno (1,2,3-c, d) pyrene benzo (g, h, i) perylene	0.1(1)	All <0.01	All <0.01
Benzo(a)pyrene	0.01(1)	0.05	< 0.01
Dibenzo(ah)anthracene	NA	< 0.01	< 0.01
Phenol	14.9 (2)	< 0.50	< 0.50
Sulphate as SO4	250,000(1)	7000	27,000

(1) Water Supply (Water Quality) Regulations 2000.
*Historical 1989 Threshold Value.
(2) Water Framework Directive 2015, Surface Water, Maximum Threshold Value.

A slightly elevated concentration of 0.05 µg/l benzo(a)pyrene was recorded within the groundwater sample obtained from CP201 when compared to the DWS assessment criteria of 0.01 µg/l from the Water Supply Regulations published in 2000. The guideline value is based upon compliance of potable water supplies. No other elevated polyaromatic hydrocarbons were noted within both groundwater samples.

As benzo(a)pyrene has not been detected in any soil sample or leachate sample tested as part of this investigation, it is not considered plausible that the slightly elevated benzo(a)pyrene concentration in the groundwater below the site is a result of the shallow ground conditions proven on the site. It is therefore considered likely that the recorded concentration is the result of an off-site source and is not considered further.

6.5 Evaluation of Hazardous Gases

Based on the desk study information, it is considered that there is a low risk potential for the presence of hazardous gases on the site.

6.6 Ground Gas Monitoring

In order to assess the potential risks posed to the proposed development from hazardous gases, monitoring wells were installed within the natural ground in all six of the cable percussive boreholes.

Ground gas monitoring has been undertaken on six occasions. The works were carried out using a portable infra-red gas meter in accordance with the standard JPG methodology and included the measurement of methane, carbon dioxide, oxygen, hydrogen sulphide, carbon monoxide, gas flows and atmospheric pressure.

6.7 Summary of Results

The results of the gas monitoring are presented on the site visit record sheets in Appendix E and are summarised below:

- The highest concentration of methane was recorded at 0.3% v/v within one borehole location (CP202)
- No steady concentrations of carbon dioxide in excess of 5% v/v were recorded. The maximum recorded CO2 was 1.2% v/v within CP201 during visit 5.
- Reduced oxygen concentrations (i.e. <16%v/v) have been recorded on one occasion within CP203. CP203 recorded a minimum concentration of 15.9% v/v during visit 2. All other oxygen concentrations ranged between 17.1% - 21.5%.
- In general, no significant steady flow rates have been encountered, with recorded flows ranging from non-detectable to 0.3 l/hr within CP201 – CP205. However, CP206 returned one slightly elevated steady flow of -2.6 l/hr during visit 6. Slightly elevated peak flows were noted during visit 4 and 6.

6.8 Requirements for Gas Protection Measures

The results of the gas monitoring have been assessed in accordance with BS8485:2015, 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

The Gas Screening Value (GSV) for carbon dioxide has been calculated as 0.0016 l/hr. Based on this result the site has been classified as Characteristic Situation (CS) 1.

6.9 Radon Risks

The site is located in an area where between 5% and 10% of buildings are affected by radon. Therefore, basic radon protective measures are required.

6.10 Mitigation Measures

Although no sources of contamination have been identified on the site, consideration should be given to implementing the following mitigation measures for development and maintenance workers:

- Site workers involved in groundworks should use appropriate PPE, i.e. overalls and gloves and if appropriate, facemasks. Appropriate health and safety measures, e.g. washing hands prior to eating or drinking, should also be enforced.
- During development of the site, all workers should remain vigilant to the possible risk of encountering areas of potentially contaminated material. Should potentially contaminated material be encountered, site management should be informed. Further testing may then be required to assess the risk to health and safety of the site workers and the environment.
- Site workers involved in groundworks should take the necessary measures to ensure that all works in excavations and confined spaces are carried out in accordance with best practice.
- All employers involved in works at the site should produce an appropriate method statement and risk assessment, to which all employees should comply. Reference should also be made to appropriate HSE and other guidance for working on contaminated and potentially contaminated sites.

6.11 Classification of Materials for Disposal Offsite

Ten samples of made ground (topsoil) were assessed using HazWasteOnline^{tm} in order to determine the classification of the materials for disposal offsite.

Based on the results of the chemical analysis, all ten samples could be classified as non-hazardous. It should be noted that six soil samples had an organic matter content above 3% but less than 7%. Due to the organic matter content, the materials would not be classified as 'inert' and would be classified as Stable None Reactive Hazardous Waste (SNRHW), if disposed of off-site.

Details of the classification generated by HazWasteOnline^{tm} are included in Appendix G.

M Peckham
BSc
For and on behalf of JPG (Leeds) Limited

December 2018

Appendix A Figures/Drawings

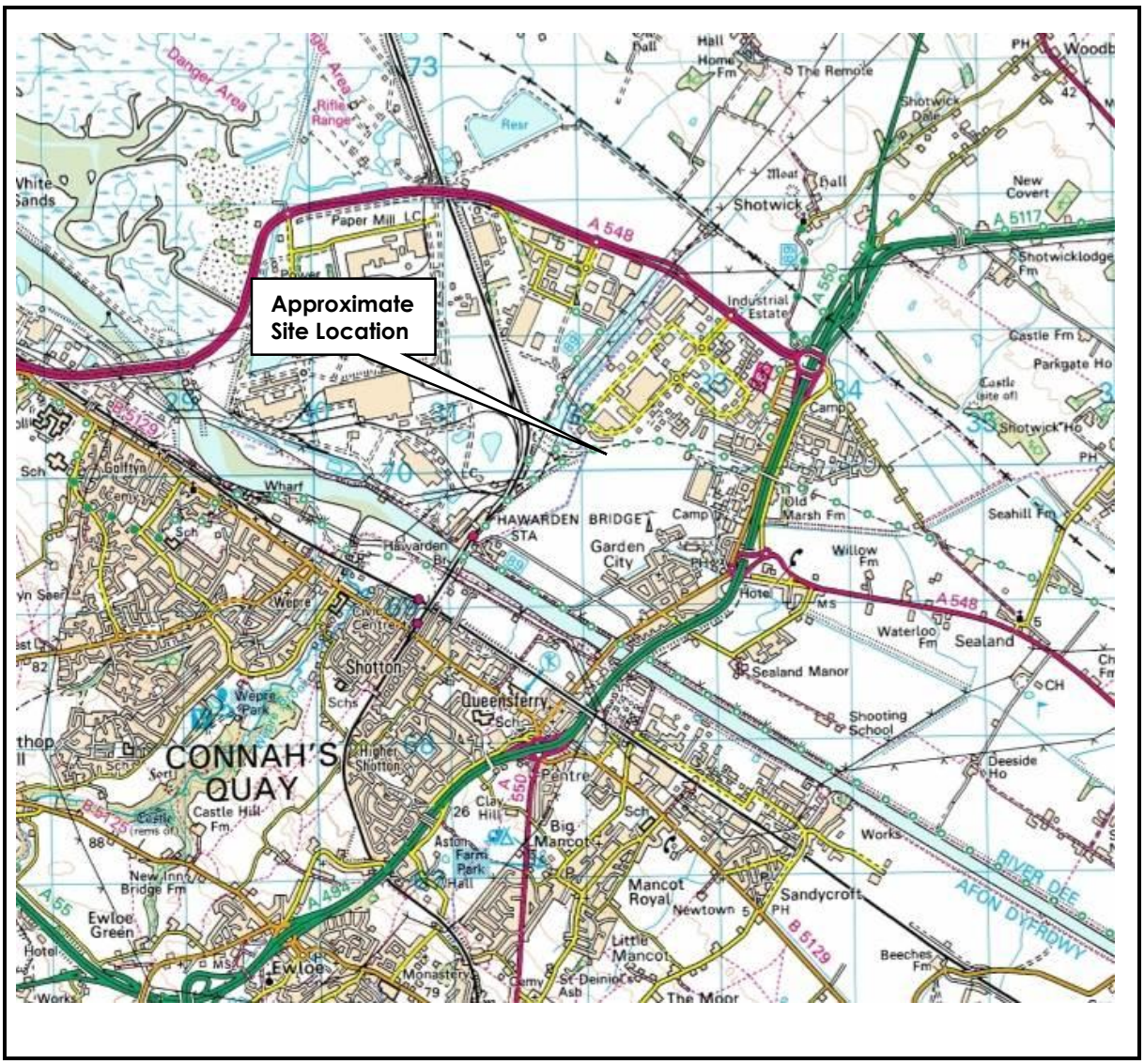


Figure 1 – Site Location Plan	
Site	**Plots B & C, The Airfields, Deeside**
Client	**Praxis Real Estate Management Limited**
Job Number	**4671**
Scale	**NTS**

Figure 2 – Aerial Photograph	
Site	**Plots B & C, The Airfields, Deeside**
Client	**Praxis Real Estate Management Ltd**
Job Number	**4671**
Scale	**NTS**

DO NOT SCALE

NOTES

KEY:

- TP201 — TRIAL PITS CARRIED OUT BY JPG.
- CP201 — CABLE PERCUSSIVE BOREHOLES CARRIED OUT BY JPG.
- CPT201 — CONE PENETRATION TESTING CARRIED OUT BY JPG.

PLOT B

PLOT C

TP201 TP202 TP203 TP204 TP205 TP206 TP207 TP208 TP209 TP210 TP211 TP212 TP213 TP214 TP215 TP216 TP217 TP218 TP219 TP220 TP221 TP222 TP223 TP224 TP225 TP226 TP227 TP228 TP229 TP230 TP231 TP232 TP233 TP234 TP235

CP201 CP202 CP203 CP204 CP205 CP206

CPT201 CPT202 CPT203 CPT204 CPT205 CPT206 CPT207 CPT208 CPT209 CPT210 CPT211 CPT212

REV	DESCRIPTION	DATE	BY

Job Title
THE AIRFIELDS, DEESIDE

Drawing Title
EXPLORATORY HOLE LOCATION PLAN: PLOTS B AND C

Architect

JPG
www.jpg.group
Leeds: 0113 263 1155 | London: 020 7947 4148

Checked	Date	Scale		Drawn
	DEC '18	1:2000	A1	OLT

Drawing No 4671-EHLP

Figure 4 - SPT 'N' Value Vs. Depth

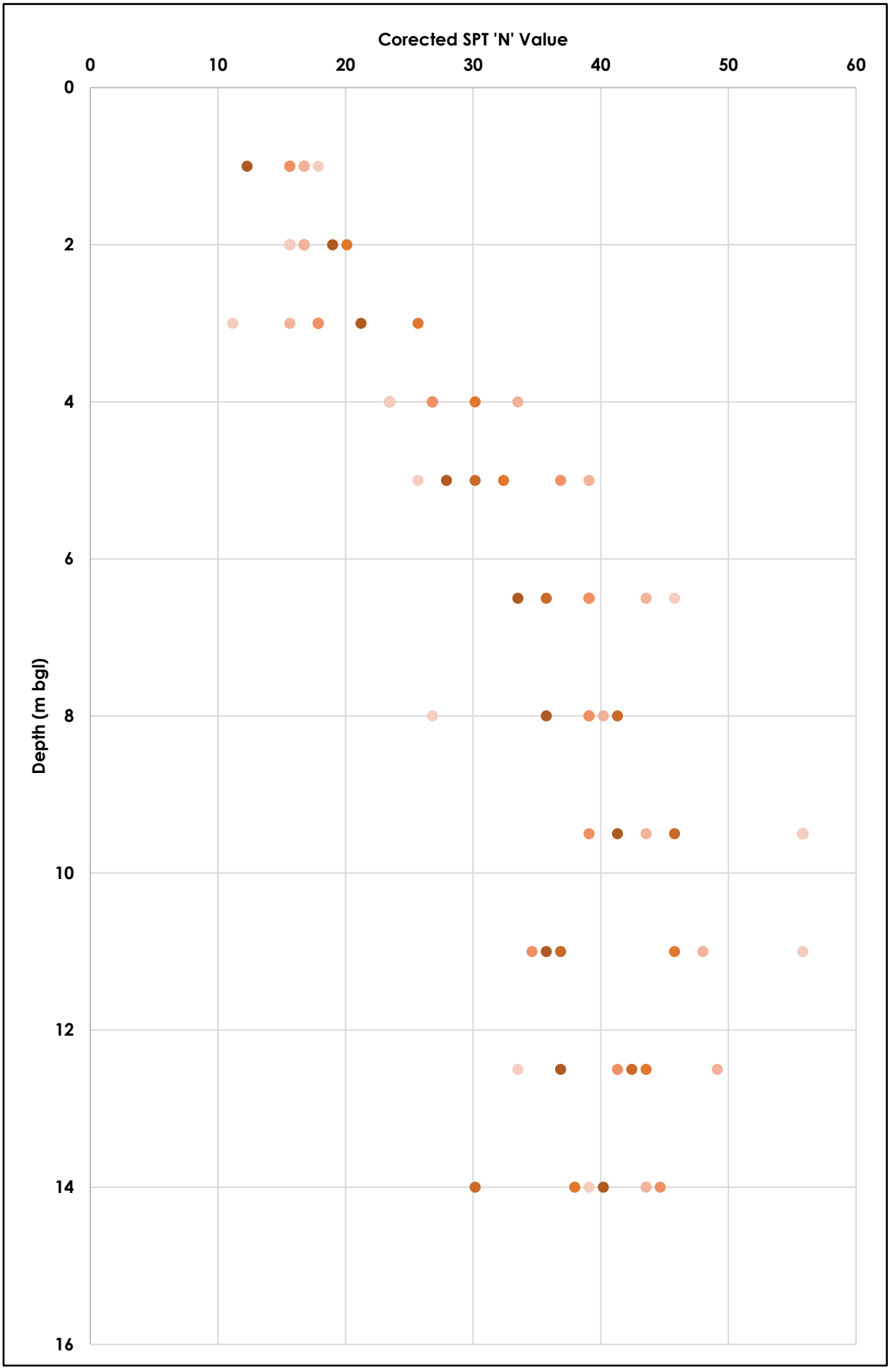
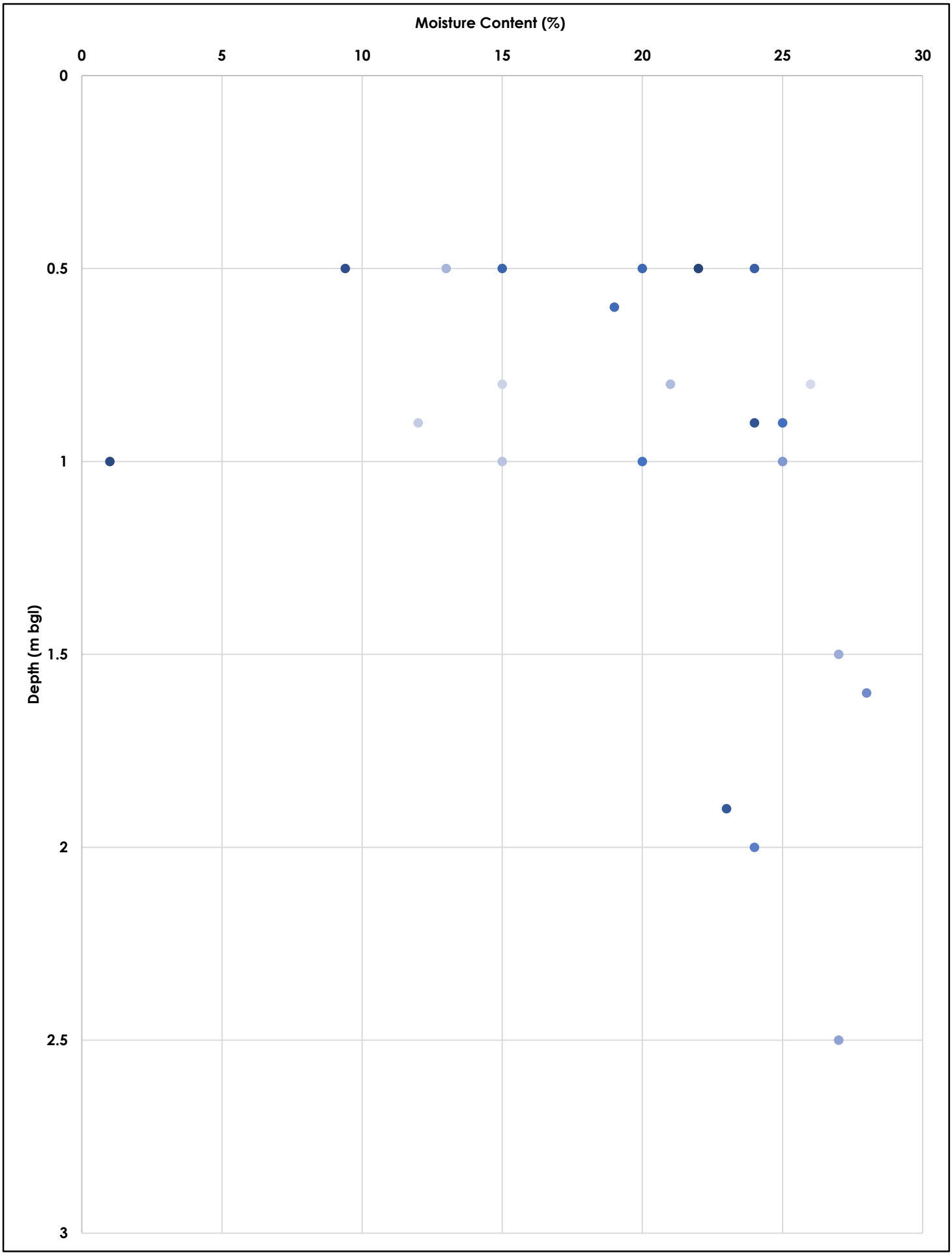
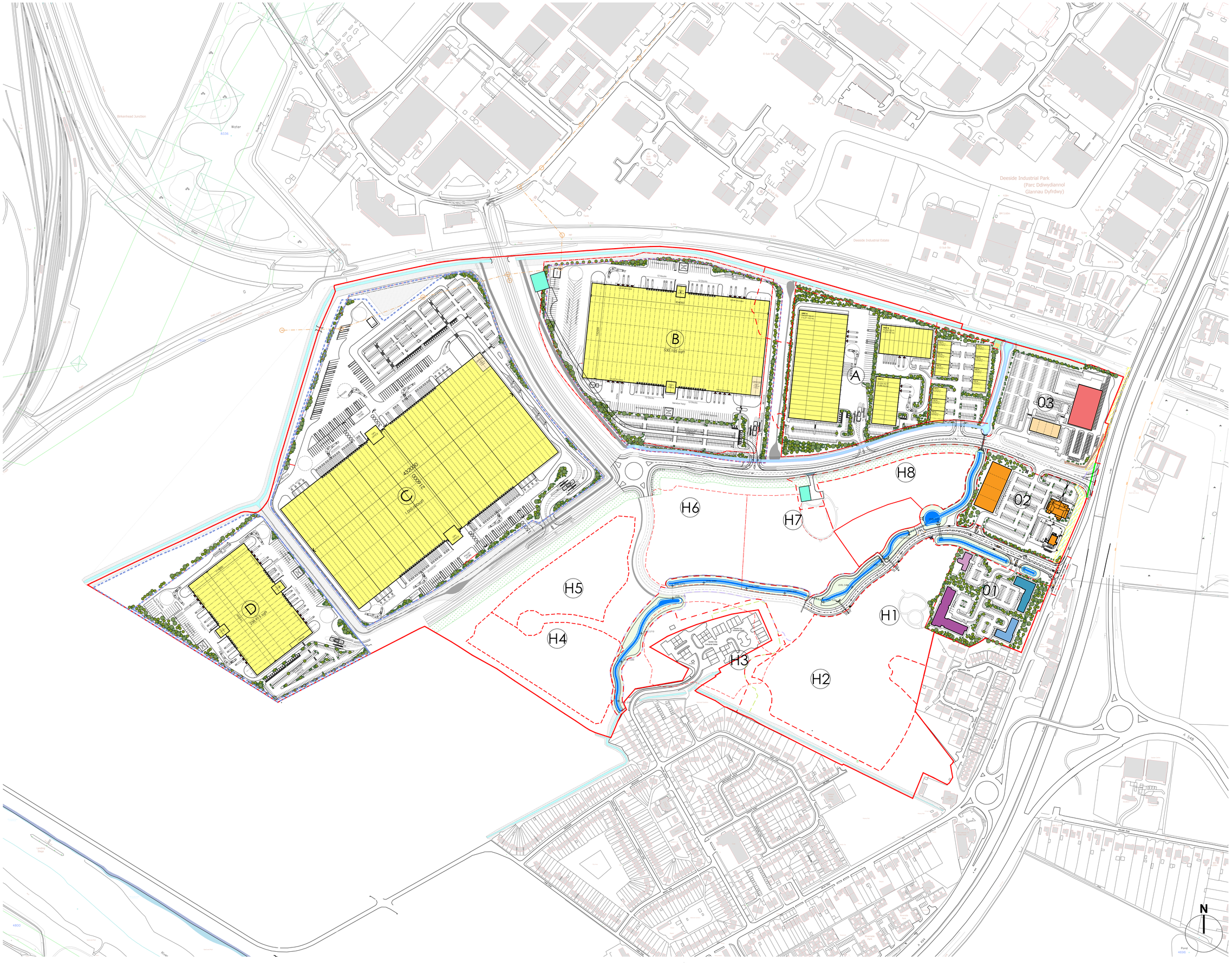


Figure 5 - Moisture Content Vs. Depth





General Notes

All site dimensions shall be verified by the Contractor on site prior to commencing any works.

Do not scale from this drawing.

Only work to written dimensions.

Note

This drawing is for information purposes only and is not to be used as a contract drawing

Plot 01
Site Area - 5.69 Acres /2.3 Ha
- Apartments - 60 dwellings over 3 storey
- Hotel - 60 beds over 3 storey
- Hotel - 70 beds over 3 storey
- Crèche - 371.60sqm / 4,000 sqft single storey

Plot 02
Site Area - 6.08 Acres / 2.46 Ha
- Coffee shop - 167.22 sqm / 1,800 sqft
- Food Outlet - 856 sqm / 9,214 sqft
- Retail Unit - 2,800 sqm / 30,000 sqft

Plot 03
Site Area - 7.51 Acres / 3.04 Ha
- Car showroom - 2,871 sqm / 30,903 sqft
- Unit - 1,100 sqm / 11,840 sqft

Plot A
Site Area -18.68 Acres / 7.56 Ha
- Trade Counter - 4,645 sqm / 50,000 sqft
- Industrial - 15,271 sqm / 164,377 sqft
- Industrial - 4,259 sqm / 45,845 sqft
- Industrial - 3,280 sqm / 35,305 sqft

Plot B
Site Area - 27.68 Acres / 11.205 Ha
- Warehouse - 48,424 sqm / 521,236sqft
- Office GF - 465 sqm / 5,005 sqft
- Office FF - 465 sqm / 5,005 sqft
- Office SF - 465 sqm / 5,005 sqft
- Ancillary / Ops Office - 550 sqm / 5,920 sqft
- VMU - 165 sqm / 1,776 sqft
  Total - 50,534 sqm / 543,948 sqft

Plot C
Site Area - 48.75 Acres / 19.732 Ha
- Warehouse - 92,250 sqm / 992,979 sqft
- Office GF - 465 sqm / 5,005 sqft
- Office FF - 465 sqm / 5,005 sqft
- Office SF - 465 sqm / 5,005 sqft
- Ancillary / Ops Office - 1,100 sqm / 11,840 sqft
- VMU - 165 sqm / 1,776 sqft
  Total - 94,910 sqm / 1,021,611 sqft

Plot D
Site Area - 15.38 Acres / 6.227 Ha
- Warehouse - 22,196 sqm / 238,918 sqft
- Office GF - 348 sqm / 3,746 sqft
- Office FF - 348 sqm / 3,746 sqft
- Ancillary / Ops Office - 550 sqm / 5,920 sqft
  Total - 23,442 sqm / 252,330 sqft

Revision			
	L	Updated Plot 2 and Plot 3	25.05.18 LP
	K	Updated Plot 1 and Plot 3	23.05.18 LP
	J	Updated the location of the substations	15.05.18 LP
	H	Commercial plots access amended in line with JPG Sketch. Amended Plot 2 & 3 to suit commmens.	08.05.18 AE
	G	Commercial plots access amended in line with JPG drawing.	30.04.18 CF
	F	Overall update in line with JPG drawing	09.04.18 CF
	E	Updated plot 3 layout and schedule	24.10.17 LP
	D	Amended plot 3 to suit client design	21.08.17 CF
	C	Amended plot 3 to suit client design	02.08.17 CF
	B	Overall Update in line with JPG drawing	27.07.17 CF
	A	Overall Update	30.06.17 CF

Scale 1:2000@A0
Status SKETCH
Drawn by LL
Date 02.06.17

Client
CRAG HILL ESTATES LTD

Project
THE AIRFIELDS, DEESIDE

Drawing Description
PROPOSED MASTERPLAN

Drawing No. 13001_SK116 Rev. L

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Appendix B Exploratory Hole Logs

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LEEDS LS12 6QD
Telephone: 0113 263 1155

BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP201
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.55	E 332,059.0 N 369,579.7	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.25		0.30	MADE GROUND: Dark brown slightly gravelly silty SAND with frequent rootlets. Sand is fine to coarse. Gravel is angular fine of mudstone and sandstone. (TOPSOIL)		
1.00		N11					Medium dense light brown silty SAND with rare disarticulated shell fragments. Sand is fine. (TIDAL FLAT DEPOSITS)		
2.00		N17							
3.00		N19				(6.20)			
4.00		N21							
5.00		N25							
				-1.95		6.50			
6.50		N30					Dense brown silty SAND. Sand is fine. (TIDAL FLAT DEPOSITS)		
							7.50 - 8.10 ... dark grey mottled black slightly sandy clay.		
8.00		N32							
							9.00 - 14.45 ... disarticulated shell fragments.		
9.50		N37							
						(7.95)			
11.00		N32							
12.50		N33							
14.00		N36		-9.90		14.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
									2	15	Groundwater encountered at 2.00m bgl, rose to 1.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination. EOD Magnetometer used at 2.00m bgl and 5.00m bgl.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP202
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	24-08-18 24-08-18	4.43	E 332,042.0 N 339,789.6	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.13		0.30	Dark brown slightly gravelly silty SAND. Sand is fine to medium. Gravel is angular fine of mixed lithology. (TOPSOIL)		
1.00		N14					Medium dense brown silty SAND with rare fragments of disarticulated shell. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.00		N15				(4.70)			
3.00		N16							
4.00		N24							
				-0.57		5.00			
5.00		N27					Dense brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
6.50		N32							
8.00		N37							
9.50		N41				(9.45)	9.85 - 10.00 ... angular medium gravel of quartzite.		
11.00		N33							
12.50		N38							
14.00		N27							
				-10.02		14.45			

Boring Progress and Water Observations						Chiselling			Water Added	
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To
									2.5	15

GENERAL REMARKS

Groundwater encountered at 2.10m bgl, rose to 2.50m bgl. No visual or olfactory evidence of potential hydrocarbon contamination. EOD Magnetometer used at 2.00m bgl and 5.00m bgl.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

AGS3 UK BH 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
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BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP203
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	28-08-18 28-08-18	4.50	E 332,237.4 N 369,719.6	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.20		0.30	Dark brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is angular fine of mixed lithology. (TOPSOIL)		
1.00		N15					Medium dense brown silty SAND with rare fragments of disartculated shell. Sand is fine. (TIDAL FLAT DEPOSITS)		
2.00		N18				(4.70)			
3.00		N23							
4.00		N27							
				-0.50		5.00			
5.00		N29					Dense brown silty SAND with rare fragments of disarticulated shell. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
6.50		N35				(3.00)			
				-3.50		8.00			
8.00		N35				(1.00)	Firm dark greyish brown sandy CLAY. (TIDAL FLAT DEPOSITS)		
				-4.50		9.00			
9.50		N50/ 285 mm					Dense brown silty SAND with rare fragments of disarticulated shell. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
11.00		N41				(5.45)			
12.50		N39							
14.00		N34		-9.95		14.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
									2.1	15	Groundwater encountered at 2.10m bgl, rose to 1.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

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BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP204
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 23-08-18	4.56	E 332,259.2 N 369,966.4	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.26		0.30	Dark brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is angular fine of mixed lithology. (TOPSOIL)		
1.00		N14					Medium dense dark grey mottled dark grey slightly clayey silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.00		N14				(4.00)			
3.00		N16							
4.00		N24		0.26		4.30			
5.00		N33					Dense greyish brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
6.50		N35							
8.00		N35							
9.50		N35				(10.15)			
11.00		N31							
12.50		N37							
14.00		N40		-9.89		14.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
									1	15	Groundwater encountered at 2.50m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

JPG (Leeds) Limited
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Telephone: 0113 263 1155

BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP205
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 22-08-18	4.52	E 332,515.4 N 369,952.8	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.22		0.30	Dark brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is angular fine of mixed lithology. (TOPSOIL)		
1.00		N15					Medium brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.00		N15				(3.70)			
3.00		N14							
				0.52		4.00			
4.00		N30					Dense brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
5.00		N35							
6.50		N39							
8.00		N36							
						(10.45)			
9.50		N39							
11.00		N43							
12.50		N44							
14.00		N39		-9.93		14.45	14.00 - 14.45 … rare shell fragments.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To
			1.5	15

GENERAL REMARKS

Groundwater encountered at 2.30m bgl, rose to 1.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

BOREHOLE LOG

Project				BOREHOLE No
Plots B & C, The Airfields				CP206
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.72	E 332,736.5 N 370,058.2	
Contractor				Sheet
DP Drilling Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.42		0.30	Dark brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is angular fine of mixed lithology. (TOPSOIL)		
1.00		N16					Medium dense brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.00		N14				(4.70)			
3.00		N10							
4.00		N21							
				-0.28		5.00			
5.00		N23					Dense brown silty SAND with rare shell fragments. Sand is fine to medium. Rare organic matter (TIDAL FLAT DEPOSITS)		
6.60		N41							
8.00		N24					8.00 - 8.45 ... rare wood/ organic matter.		
9.50		N50/ 260 mm				(9.45)			
11.00		N50/ 245 mm							
12.50		N30							
14.00		N35		-9.73		14.45			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
									2	15	Groundwater encountered at 2.50m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:100	Client Praxis Real Estate Management Ltd	Method/ Plant Used	Logged By MHP

JPG (Leeds) Limited
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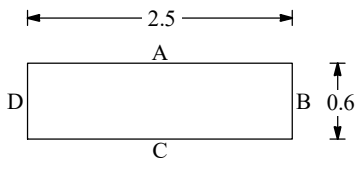
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP201
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.55	E 332,041.5 N 370,068.5	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.25	ES			4.30		(0.25) 0.25	MADE GROUND. Dark brown slightly gravelly silty SAND with rootlets and metal fragments. Sand is fine. (TOPSOIL)		
				2.30		(2.00) 2.25	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.75		(0.55) 2.80	Light grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.25 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 1.4m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.25m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

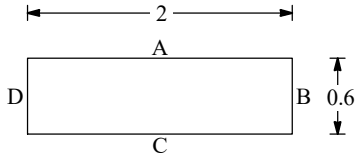
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP202**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	24-08-18 24-08-18	4.49	E 332,099.1 N 369,894.8	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.29		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
1.00-1.20	D			2.19		(2.10) 2.30	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.49		(0.70) 3.00	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.90 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.8m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.9m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

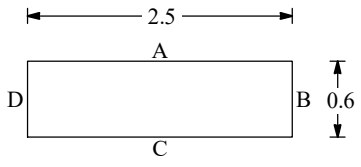
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP203
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.58	E 332,242.7 N 370,114.1	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.38		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.60)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.78		1.80			
						(1.30)	Dark and light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 1.80 … groundwater seepage.		
				1.48		3.10			
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable from 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 1.8m and 3.1m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
5 John Charles Way
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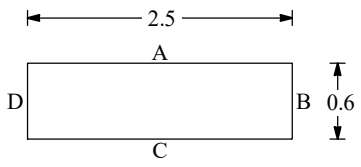
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP204**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.50	E 332,303.7 N 370,129.3	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.30		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.50-1.00	B					(2.00)	Light brown silty SAND. Sand is fine to medium. Assessed as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS)		
				2.30		2.20			
				2.10		(0.20) 2.40	Dark grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							2.20 … groundwater seepage.		
							… terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
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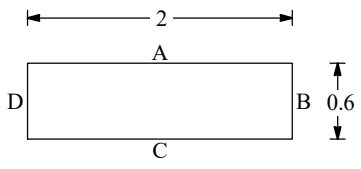
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP205**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.01	E 332,396.4 N 370,121.2	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			3.81		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.20)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.61		1.40			
						(1.20)	Dark grey moist slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.41		2.60	2.50 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable 0.6m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.5m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

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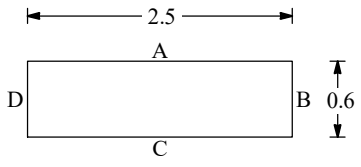
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP206**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.76	E 332,544.6 N 370,132.2	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.66		0.10	MADE GROUND. Dark brown silty SAND with rootlets and plastic fragments. Sand is fine to medium. (TOPSOIL)		
				4.41		(0.25) 0.35	MADE GROUND. Light grey sandy GRAVEL. Gravel is angular to subangular of limestone. (SUB-BASE TYPE MATERIAL)		
0.50-0.60	ES					(1.25)	Light orangish brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 0.35 … piece of fabric membrane.		
				3.16		1.60			
						(1.50)	Dark grey slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.00 … groundwater seepage. 2.90 … groundwater seepage.		
				1.66		3.10			
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable 0.35m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m and 2.9m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

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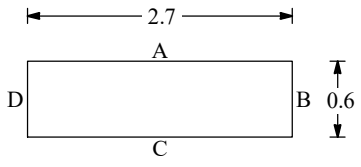
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP207**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.44	E 332,708.0 N 370,093.0	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.24		(0.20) 0.20	MADE GROUND. Dark brown slightly gravelly silty SAND with rootlets. Sand is fine. Gravel is angular, of ceramics. (TOPSOIL)		
				3.14		(1.10) 1.30	Light orangish brown silty SAND. Sand is fine to medium. Assessed as very loose as very easy to excavate with a spade. (TIDAL FLAT DEPOSITS)		
				2.14		(1.00) 2.30	Dark and light grey slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.00 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

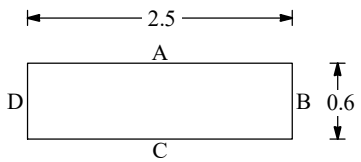
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP208**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.49	E 332,588.3 N 370,079.1	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.29		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.20)	Orangish brown mottled grey silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				3.09		1.40			
						(0.80)	Dark and light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.00	D			2.29		2.20	2.00 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.4m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

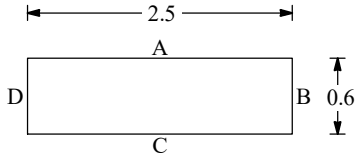
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP209
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.30	E 332,466.6 N 370,088.8	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.00		(0.30) 0.30	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
				3.10		(0.90) 1.20	Light orangish brown moist silty SAND. Sand is fine to medium. Assessed as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS)		
1.60	D			1.50		(1.60) 2.80	Dark grey moist organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.00 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.4m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

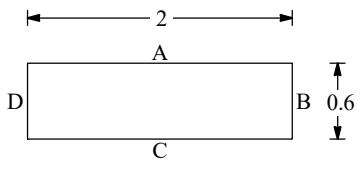
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP210
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.60	E 332,321.1 N 370,066.1	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.40		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
1.00-1.50	D			3.00		(1.40) 1.60	Light brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.60		(1.40) 3.00	Dark grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable from 1.9m bgl



GENERAL REMARKS

Groundwater seepage encountered at 3m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

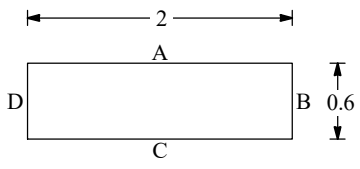
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP211
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.59	E 332,204.8 N 370,043.0	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.39		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(2.50)	Light brown silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
2.50	D			1.89		2.70	2.50 … groundwater seepage.		
						(0.40)	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.49		3.10	3.00 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.5m and 3m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

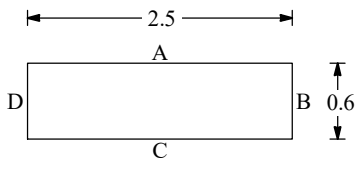
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP212
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	24-08-18 24-08-18	4.47	E 332,100.4 N 369,986.6	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.27		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
1.50-2.00	D					(2.00)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 1.90 … groundwater seepage. 2.00 … groundwater seepage.		
				2.27		2.20			
				1.77		(0.50) 2.70	Light grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.8m bgl



GENERAL REMARKS

Groundwater seepage encountered at 1.9m and 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

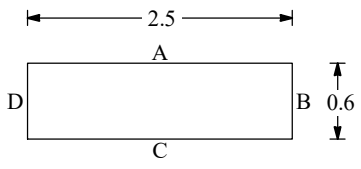
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP213
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.70	E 331,996.2 N 369,939.8	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.45		(0.25) 0.25	Dark brown friable silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.50-1.00	D						Orange mottled brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							1.10 … becoming light brown.		
						(2.35)			
				2.10		2.60			
				2.00		2.70	Light grey moist silty SAND with bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable from 1.1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.7m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

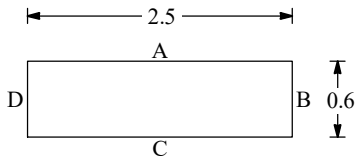
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP214**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.26	E 331,997.0 N 369,824.0	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.11		0.15	MADE GROUND. Dark brown friable silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.15-0.30	ES			3.96		0.30	MADE GROUND. Dark brown friable sandy silty CLAY. [Reworked Natural Tidal Flat Deposit]		
							Light orangish brown moist silty SAND. Sand is fine to medium. [Tidal Flat Deposit]		
							1.00 … becoming light brown.		
						(1.70)			
				2.26		2.00			
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable from 0.3m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
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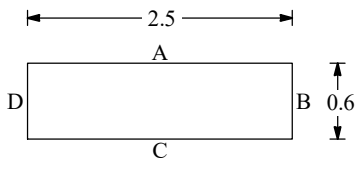
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP215
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.53	E 332,034.0 N 369,770.0	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.38		0.15	MADE GROUND. Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
				4.23		0.30	MADE GROUND. Dark brown slightly gravelly clayey SAND. Sand is fine to medium. Gravel is angular to rounded fine to medium, of clinker and coal.		
0.50-1.00	D						Light brown moist silty SAND with bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
1.00-1.50	B					(2.70)			
				1.53		3.00			
				1.43		3.10	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable 0.3m bgl



GENERAL REMARKS

Moist ground but no groundwater seepage. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

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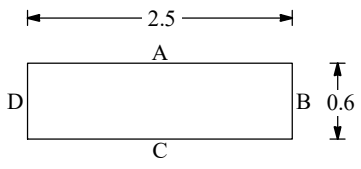
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP216
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	24-08-18 24-08-18	4.34	E 332,127.6 N 369,856.3	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.14		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.80-1.00	D					(1.85)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.29		2.05			
						(0.65)	Light grey moist silty SAND with bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.64		2.70	2.60 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.6m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
5 John Charles Way
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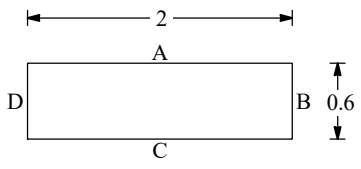
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP217**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.55	E 332,229.9 N 369,895.9	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.35		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.80)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.55		2.00			
						(1.00)	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.30 … groundwater seepage.		
				1.55		3.00			
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.3m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

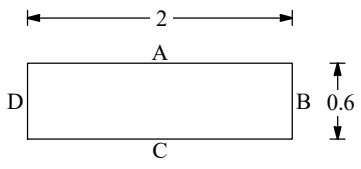
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP218**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.66	E 332,533.0 N 369,998.0	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.46		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.40)	Light orangish brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				3.06		1.60			
						(1.00)	Dark grey moist slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.20 … becoming light grey and no longer organic.		
				2.06		2.60	2.50 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.5m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

JPG (Leeds) Limited
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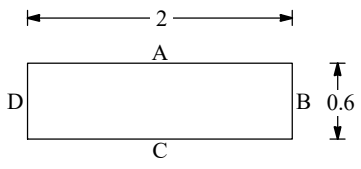
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP219**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.58	E 332,391.0 N 370,032.2	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.38		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.50-1.00	B					(1.50)	Light orangish brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.88		1.70			
						(0.90)	Grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.98		2.60			
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable from 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.6m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

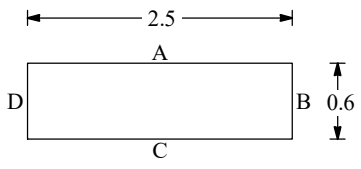
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP220**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.53	E 332,023.3 N 369,667.9	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.33		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
1.00-1.50	D					(2.30)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.03		2.50			
				1.13		(0.90) 3.40	Light grey wet silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.50 … groundwater seepage. 3.00 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 1.8m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.5m and 3m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

JPG (Leeds) Limited
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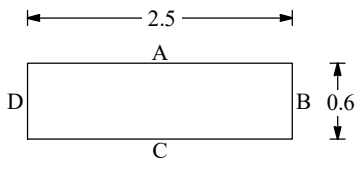
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP221
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	24-08-18 24-08-18	4.54	E 332,188.0 N 369,778.9	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.34		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.90-1.00	D					(2.30)	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.04		2.50			
				1.44		(0.60) 3.10	Light grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable from 0.2m bgl



GENERAL REMARKS

Moist ground but no groundwater seepage. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

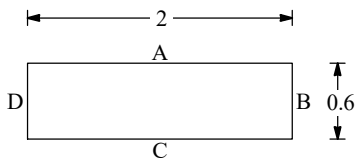
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP222
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.56	E 332,344.6 N 369,730.7	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.36		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.40-0.60	ES			3.86		(0.50) 0.70	Brown mottled orangish brown slightly clayey silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.96		(0.90) 1.60	Orangish brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 0.90 - 1.30 … dark grey very organic silty SAND with, complete and fragmented bivalves, a very organic odour and oxidised/fossilised burrows surrounded by a dense orangish brown sandy matrix.		
				1.46		(1.50) 3.10	Light grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 1.5m bgl



GENERAL REMARKS

Groundwater seepage encountered at 3.1m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

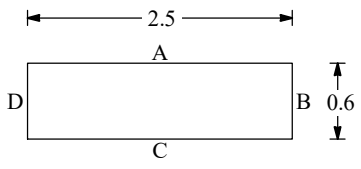
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP223
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.24	E 332,299.2 N 369,813.9	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				3.94		(0.30) 0.30	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.80-1.00	D			2.04		(1.90) 2.20	Light brown moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.54		(0.50) 2.70	Grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.7m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

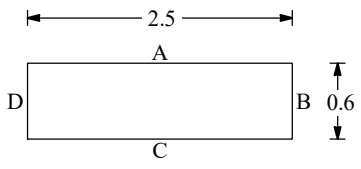
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP224**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	22-08-18 22-08-18	4.46	E 332,322.3 N 369,882.3	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.31		0.15	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.75)	Light brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				2.56		1.90			
1.90-2.20	B			2.46		2.00	Grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
1.90-2.20	D						… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 0.9m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

JPG (Leeds) Limited
5 John Charles Way
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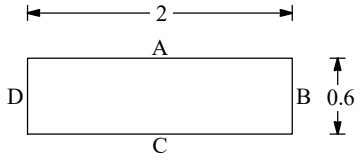
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP225**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.51	E 332,385.2 N 369,941.2	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.31		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.80-1.10 0.80-1.10 0.90	B D	26				(2.00)	Light orangish brown moist silty SAND with dark orangish brown staining. Sand is fine to medium. Assessed as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS) 0.90 - 1.05 … soft low strength dark brown sandy silty clay. 1.90 … groundwater seepage.		
				2.31		2.20			
						(0.50)	Light and dark grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.81		2.70	… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 1.9m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

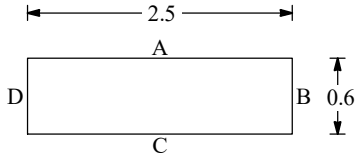
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP226**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.66	E 332,458.6 N 369,960.1	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.41		(0.25) 0.25	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(1.75)	Light orangish brown moist silty SAND. Sand is fine to medium. [Tidal Flat Deposit]		
				2.66		2.00			
						(0.50)	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.00 … groundwater seepage.		
				2.16		2.50			
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 1.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

JPG (Leeds) Limited
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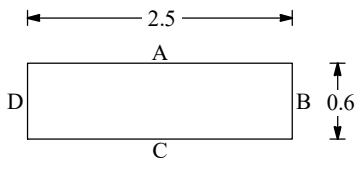
TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP227
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.54	E 332,579.2 N 369,945.5	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.30	ES			4.24		(0.30) 0.30	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
				3.04		(1.20) 1.50	Light orangish brown silty SAND with occasioanal thick laminations of slightly sandy silty clay. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.74		(1.30) 2.80	Dark grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

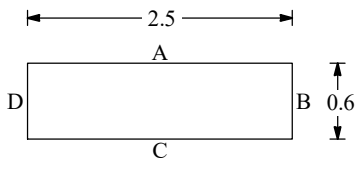
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP228
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.74	E 332,721.3 N 369,941.7	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.54		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.90-1.00	B			2.44		(2.10) 2.30	Light orangish brown silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.74		(0.70) 3.00	Dark grey slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 0.2m bgl



GENERAL REMARKS

Groundwater not encountered. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

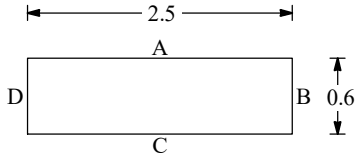
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP229**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.63	E 332,139.6 N 369,672.7	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.43		(0.20) 0.20	Dark brown slightly gravelly silty SAND. Sand is fine to medium. Gravel is angular fine, of coal. (TOPSOIL)		
0.50-1.00	B					(3.00)	Light orangish brown silty SAND. Sand is fine to medium with rare bivalve fragments. (TIDAL FLAT DEPOSITS)		
				1.43		3.20			
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 1.8m bgl



GENERAL REMARKS

Groundwater seepage encountered at 3.2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

JPG (Leeds) Limited
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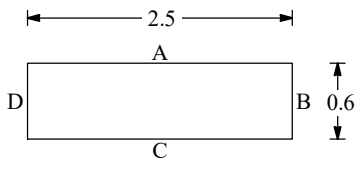
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP230
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	23-08-18 23-08-18	4.55	E 332,154.7 N 369,592.2	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.35		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(2.50)	Light brown moist silty SAND with dark orangish brown discolouration and rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.85		2.70			
				1.65		(0.20) 2.90	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 0.5m bgl



GENERAL REMARKS

Moist ground but no groundwater seepage. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

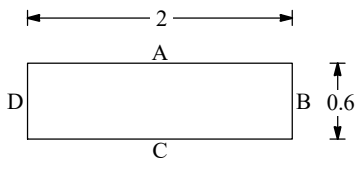
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP231
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.56	E 332,426.7 N 369,877.5	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.36		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.30-0.55	ES					(1.80)	Light orangish brown moist silty SAND with dark orangish brown staining and lenses of soft to firm brown sandy silty clay. Sand is fine to medium. Assessed as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS)		
				2.56		2.00			
						(0.60)	Dark grey moist silty SAND with rare bivalve fragments. Sand is fine to medium. (TIDAL FLAT DEPOSITS)		
				1.96		2.60			
							… groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 1.1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.6m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

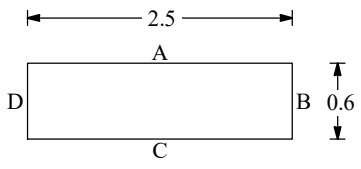
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP232**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.56	E 332,504.2 N 369,881.7	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.36		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
						(2.00)	Light orangish brown silty SAND occasional dark orangish brown staining. Sand is fine to medium. Assessesd as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS) 0.60 - 0.70 … firm dark brown slightly sandy silty clay. 0.75 - 0.80 … firm thinly bedded dark brown silty sandy silty clay. 1.20 … becoming light brown.		
				2.36		2.20			
						(0.80)	Light grey moist silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.90 … groundwater seepage.		
				1.56		3.00			
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.9m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

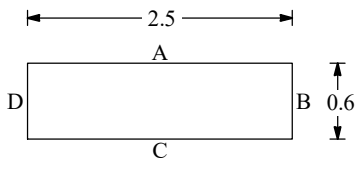
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP233
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.46	E 332,594.5 N 369,856.3	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.26		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.50-1.00 0.60	B D					(1.90)	Light orangish brown silty SAND. Sand is fine to medium. Assessed as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS) 0.90 … becoming light greyish brown.		
				2.36		2.10			
				2.26		2.20	Dark grey silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) … groundwater seepage.		

Shoring/Support: None
Stability: Sides unstable at 0.2m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.2m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

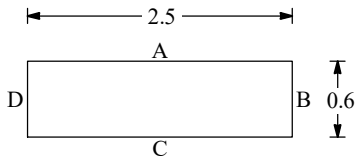
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				**TP234**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	20-08-18 20-08-18	4.50	E 332,705.5 N 369,837.9	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.00-0.20	ES			4.30		(0.20) 0.20	Dark brown silty SAND with rootlets. Sand is fine to medium. (TOPSOIL)		
0.50		73				(2.00)	Light orangish brown silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 0.45 - 0.55 … brown medium strength dark brown slightly sandy silty clay. 1.50 … becoming light greyish brown.		
				2.30		2.20			
				1.50		(0.80) 3.00	Dark grey slightly organic silty SAND. Sand is fine to medium. (TIDAL FLAT DEPOSITS) 2.80 …groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 0.3m bgl



GENERAL REMARKS

Groundwater seepage encountered at 2.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

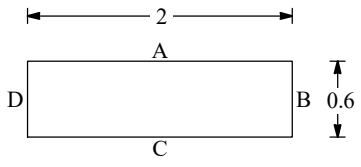
JPG (Leeds) Limited
5 John Charles Way
LEEDS LS12 6QD
Telephone: 0113 263 1155

TRIAL PIT LOG

Project				TP No
Plots B & C, The Airfields				TP235
Job No	Date	Ground Level (m)	Co-Ordinates ()	
4671	21-08-18 21-08-18	4.63	E 332,477.3 N 369,815.6	
Contractor				Sheet
AH Plant				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result kPa		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
				4.38		(0.25) 0.25	MADE GROUND. Dark brown silty SAND with rootlets and plastic fragments. Sand is fine to medium. (TOPSOIL)		
0.80-1.00	D			2.93		(1.45) 1.70	Light orangish brown moist silty SAND with dark orangish brown staining. Assessesd as loose as fairly easy to excavate with a spade. (TIDAL FLAT DEPOSITS)		
				1.73		(1.20) 2.90	Light and dark grey moist slightly organic silty SAND. Sand is fine to medium. Slight organic odour. (TIDAL FLAT DEPOSITS) 1.80 … groundwater seepage.		
							… hole terminated due to instability.		

Shoring/Support: None
Stability: Sides unstable at 1m bgl



GENERAL REMARKS

Groundwater seepage encountered at 1.8m bgl. No visual or olfactory evidence of potential hydrocarbon contamination.

All dimensions in metres Scale 1:25	Client Praxis Real Estate Management Ltd	Method/ Plant Used 360 Tracked Excavator	Logged By JAM

TP VOG V9 4671 AIRFIELDS DEESIDE PLOTS B & C.GPJ GINT STD AGS 3_1.GDT 11/12/18

Appendix C Photographs

Photograph 1: General site view, looking southeast.

Photograph 2: CP206, general view of sand drilling returns.

Photograph 3: TP232, example of general sand unit underlaying the site.

Photograph 4: TP232, example of sand unit underlaying the site.

Photograph 5: TP224, example of general sand unit underlaying the site with base collapsing.

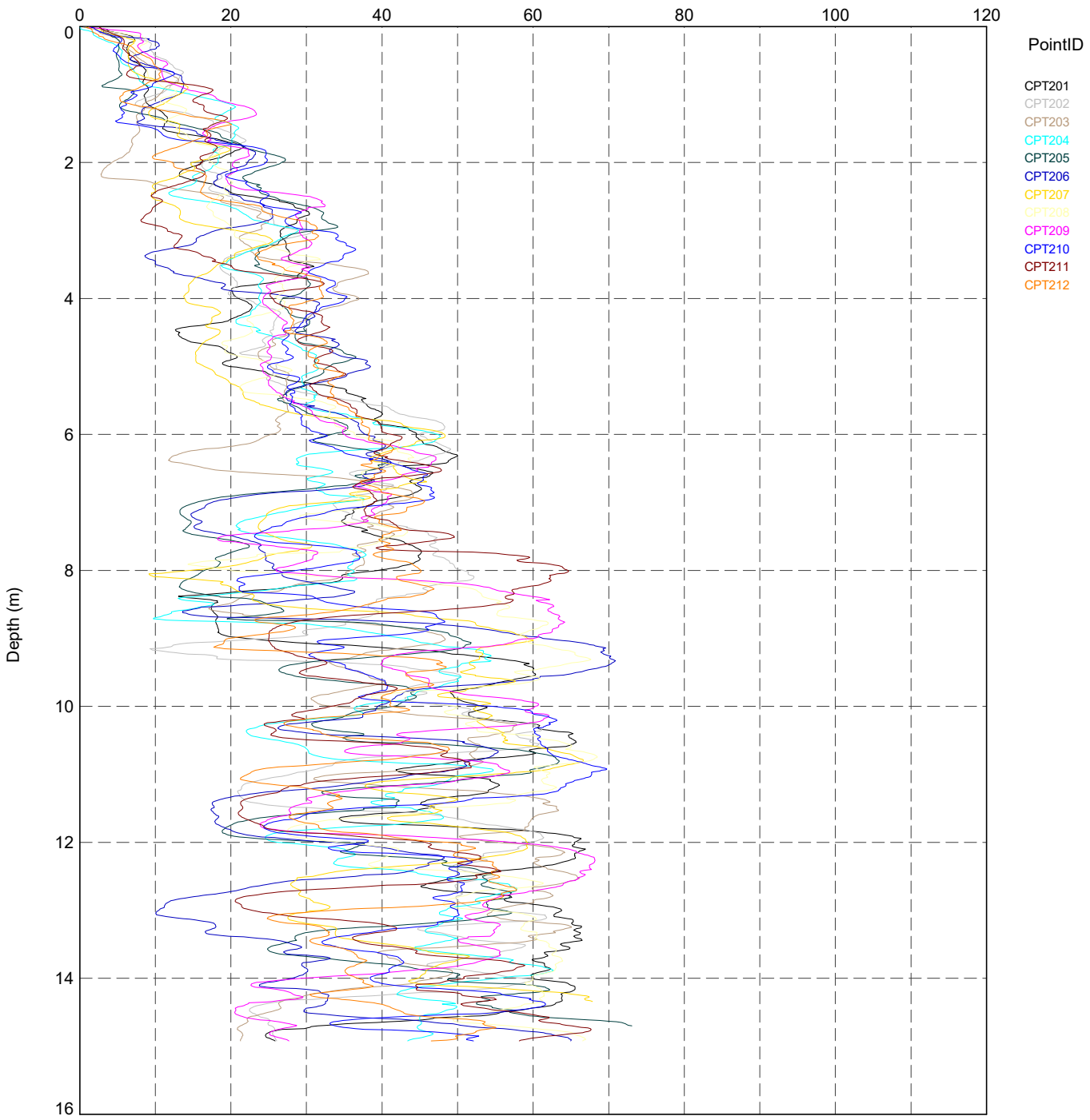
Photograph 6: TP223, example of sandy clay horizon.

Photograph 7: TP223, example of dense sand features.

Photograph 8: TP225, water ingress at the base of the pit.

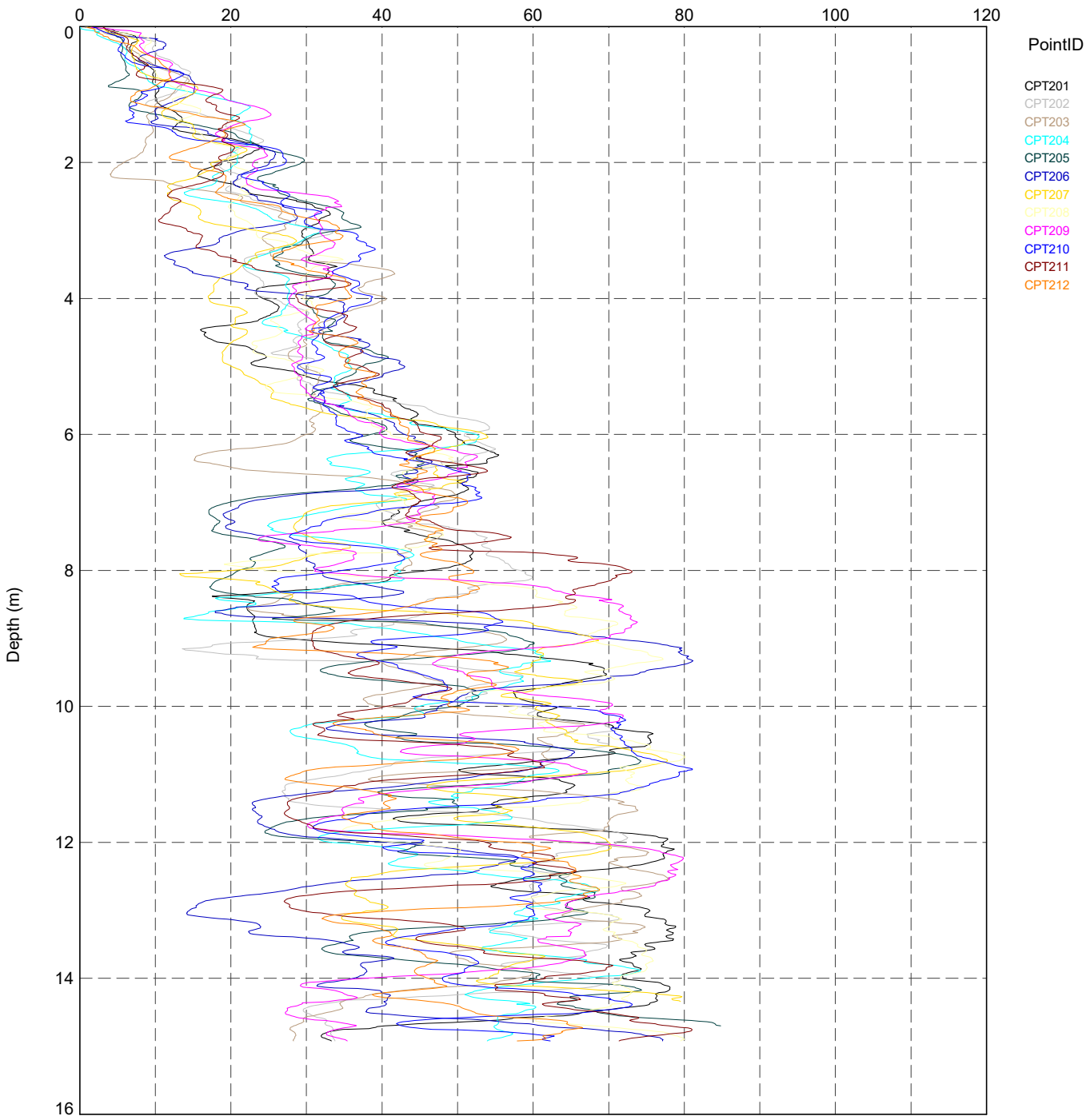
Appendix D Cone Penetration Testing Report

SPT N60 - Lunne *et al.* **(1997)** - Overlay Plot



LANKELMA	TITLE JPG GROUP Chris Player Flintshire, UK DEESIDE SPT N60 (Lunne et al. 1997) vs Depth	DRAWN Christopher Player	DATE 11/09/2018
		CHECKED Joseph Hobbs	DATE 11/09/2018
		SCALE	
		PROJECT No P-106982-7	FIGURE No

SPT N60 - Robertson **(2012)** - Overlay Plot



LANKELMA	TITLE JPG GROUP Chris Player Flintshire, UK DEESIDE SPT N60 (Robertson 2012) vs Depth	DRAWN Christopher Player	DATE 11/09/2018
		CHECKED Joseph Hobbs	DATE 11/09/2018
		SCALE	
		PROJECT No P-106982-7	FIGURE No

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DEESIDE

SOIL INVESTIGATION

CPT REPORT

Cone penetration test
Magnetometer test
Geotechnical data interpretation

Project ref.: P-106982-7




PROJECT:	Deeside

CLIENT:	JPG Group

FIELDWORK

CPT rig(s)	20.5 tonne track-truck mounted CPT unit (UK15)
Date fieldwork started	29th August 2018
Date fieldwork completed	29th August 2018
Lankelma's representative	Paul Dimelow
Client's representative	Molly Peckham

REPORT

Status	Revision	Action	Date	Name
Revised	00	**Completed**	30/08/18	Chris Player
		Checked	31/08/18	Emma Stickland
		Approved	31/08/18	Joseph Hobbs
Final	01	**Completed**	11/09/18	Chris Player
		Checked	11/09/18	Emma Stickland
		Approved	11/09/18	Joseph Hobbs

CONTENTS

1 INTRODUCTION

At the request of JPG Group, a CPT led soils investigation was carried out on project *Deeside*.

Site location:

Sandy Lane
Garden City
Deeside
CH5 2JF

2 DISCLAIMER

The investigation information, raw data and interpretations provided in this report are for the sole benefit of the Client identified at the front of the report.

Lankelma has exercised reasonable skill, care and diligence in the fieldwork and preparation of this report. This report has been completed based on information available to Lankelma at the time of preparation. The measurement and interpreted data in this report do not constitute recommendations for design purposes. An appropriately qualified person must review and interpret the data given in this report, together with any assumptions we have made that affect the data, before using the data for design or recommendation.

Lankelma accepts no responsibility for the accuracy or appropriateness of any assumptions, derived soil parameters or soil units contained in this report.

3 COMPLETED WORKS

- 12 nr. cone penetration tests (CPT) without piezo measurement; and
- Factual report plus additional geotechnical data interpretation.

The *Summary Tables* section contains tabulated summaries of the works completed together with analysis results where necessary.

4 FIELDWORK

4.1 CONE PENETRATION TESTING

Cone penetration tests were performed with a 20.5-tonne track-truck mounted CPT unit (UK15) equipped with a 17-tonne capacity hydraulic ram set. Testing was carried out in general accordance with BS ISO 22476-1:2012.

Penetrometer measurements included cone tip resistance and friction sleeve resistance, sampled at a 10mm resolution.

The penetrometer was calibrated in accordance with BS8422:2003 and ASTM E74-13a. The management of calibration records is in accordance with ISO 10012. Copies of all calibration certificates for the cones used are presented in Appendix A. Penetrometer details and calibration certificates are reported in Table 1 and Appendix A respectively.

4.2 MAGNETOMETER TESTING

A combined CPT/magnetometer was used at prescribed locations in order to provide the data for in-site safety management of UXO risk. As such, no data has been processed or reported here in.

The magnetometer used in the Lankelma magcone system comprises a Bartington Instruments 3-axis flux gate magnetometer that is capable of measuring disturbances in the Earth's field of less than 1 part in a million. Buried ferrous items, such as UXO, result in localized distortions of the magnetic field. The detection radius of the works undertaken was dependent upon the level of magnetic field distortion noise and the size of the ferrous object(s) of interest. The UXO data was reviewed real-time.

The magnetometer probe was pushed into the soil using a standard CPT rig up to a maximum applied pressure of 15 Tonnes.

4.3 POSITIONING AND TEST TERMINATION DEPTHS

The Client was responsible for the positioning and re-survey of all investigative locations.

The target depth for the investigation was 15m below ground level. Table 1 details the final test depths and reasons for test termination (*refusal factor)*. *W*here penetration refusal was encountered the termination depth was advised to, and agreed with, the Client's on-site representative.

5 RAW DATA REDUCTION AND PRESENTATION

The CPT results are presented in Appendix B. The corrected cone resistance (q_t), local side friction (f_s), friction ratio (R_f) and inclination are all presented against depth and elevation in accordance with recommendations of the BS ISO 22476-1:2012. CPT data and the associated derived geotechnical parameters are included in the AGS 3.1 and 4.0 data files provided.

The cone tip resistance and sleeve force measurements have been converted to pressures using the nominal dimensions of the penetrometer.

For tests without u_2 pore pressure measurement it is not possible to derive the corrected tip resistance which is found from the formula:

$$q_t = q_c + u_2 \times (1 - a)$$

Where a is the 'area ratio' and (1- a) is the proportion of cross sectional area between the cone tip and cone body where pore pressures (positive or negative) can act to add or subtract from the total external axial force on the tip. The difference between measured and corrected values is largest in low strength soils with large excess pore pressures. The relationship between measured resistance, excess pressure and correction difference is described by the curves in the following chart for alpha factor of 0.8:

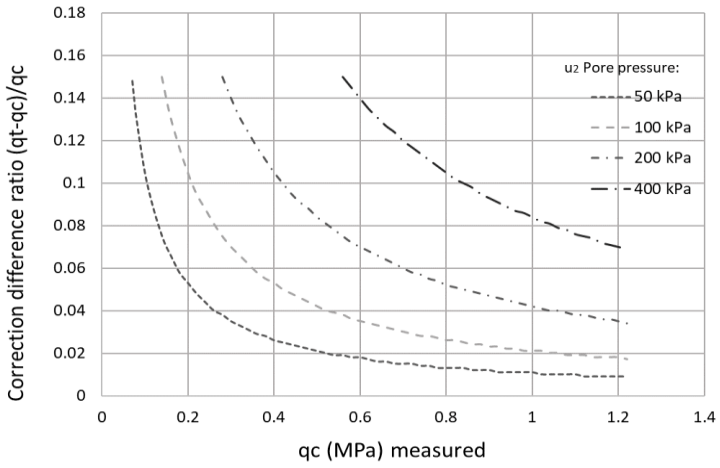

Figure 5-1 corrected tip resistance fraction with measured tip resistance

Penetration length readings are corrected for inclination and sleeve readings are depth corrected for the dimensional offset between cone tip and sleeve during post processing. An additional shift of -80mm is applied to the sleeve to account for tip failure zone offset (see 'CPT Interpretation Notes'). 'Rod spikes' (artefacts of the 1m interval pause for rod string addition) are filtered from the cone tip and sleeve data.

The raw (or corrected) data are presented in Appendix B.

6 INTERPRETATION

Geotechnical parameters appropriate for drained and undrained cone penetration conditions are derived for corresponding drained and undrained derived soil behaviour types (SBTs) respectively, however to account for uncertainty in the SBT correlation with drainage behaviour, all parameters are derived over the range of mixed soil types 'silt mixtures' and 'sand mixtures' or *Ic* 2.05-2.95 (Robertson, 2010).

Note: All derived parameters, soil type interpretation and assumptions should be regarded as provisional and subject to review by an appropriately qualified person.

6.1 IN-SITU STRESS CONDITIONS

The in-situ total and effective stress state has been calculated based on an assumed total unit weight of 17kN/m^3 above the principal phreatic surface and 18kN/m^3 below.

The depth of the principal phreatic surface, or groundwater table, has been assumed at an arbitrary value of 1.5mBGL for parameter calculations.

Note: The term phreatic surface is used here, however when it is based on piezocone measurements it is assumed that the piezometric level (under hydrostatic conditions) and groundwater table coincide. The phreatic or piezometric surface reported is only intended to provide information about the assumed pore pressure distribution for calculation of relevant derived parameters from the CPT and may not represent the true position of the groundwater table or perched water bodies. Complex groundwater pressure distributions, if they are observed from the measurements, will be applied to relevant derived parameters.

6.2 SOIL BEHAVIOUR TYPE

The soil behaviour type (SBT) has been interpreted using the Robertson (1990) classification system based on the normalised cone resistance (Qt) and normalised friction sleeve resistance (Fr). A copy of the chart is given in Appendix A titled 'CPT Soil Behaviour Type Chart'.

The results are presented on the plots of Appendix C – *Standard interpretation results (set 1).*

6.3 SOIL BEHAVIOUR TYPE – *IC* INDEX

The SBT is presented as the soil behaviour type index, I_c, for both stress-normalised and non-normalised evaluations according to the charts of Robertson (1998 & 2010) applicable to predominantly silicate soils.

The index provides a continuous profile of SBT variation with depth allowing the selection of appropriate layer boundaries. The basis of I_c and its approximation of the original chart classification zones may be seen from Appendix A figure 'CPT Soil Behaviour Type Chart'. The method does not identify zones 1 (*sensitive fine grained)* and zones 8 & 9 (*overconsolidated or cemented*).

Non-stress normalised SBT index I_c:

$$I_c = \left[\left(3.47 - \log\left(\frac{q_c}{\sigma_{atm}}\right)\right)^2 + (logR_f + 1.22)^2\right]^{0.5}$$

Stress-normalised SBT index I_c:

$$I_c = ((3.47 - \log Q_t)^2 + (\log F_r + 1.22)^2)^{0.5}$$

(See glossary of terms and symbols Appendix A)

The results are presented on the plots of Appendix C – *Standard interpretation results (set 1).*

6.4 GEOTECHNICAL PARAMETERS

6.4.1 RELATIVE DENSITY

The relative density of sands is calculated based on an empirical relationship proposed by Jamiolkowski *et al.* (2001) based on a large database of undisturbed frozen samples and calibration chamber tests. The expected accuracy may be evaluated from the figures presented below.

$$D_r = 100\left[0.268 \cdot \ln\left(\frac{q_t/\sigma_{atm}}{\sqrt{\sigma_{vo}'/\sigma_{atm}}}\right) - k\right]$$

(See glossary of terms and symbols appendix A – *General information*)

k = Compressibility dependant constant can be taken as -0.675 for medium compressibility (applied value in our interpretation), <= 1 for high compressibility and >= 2 for compressible sands.

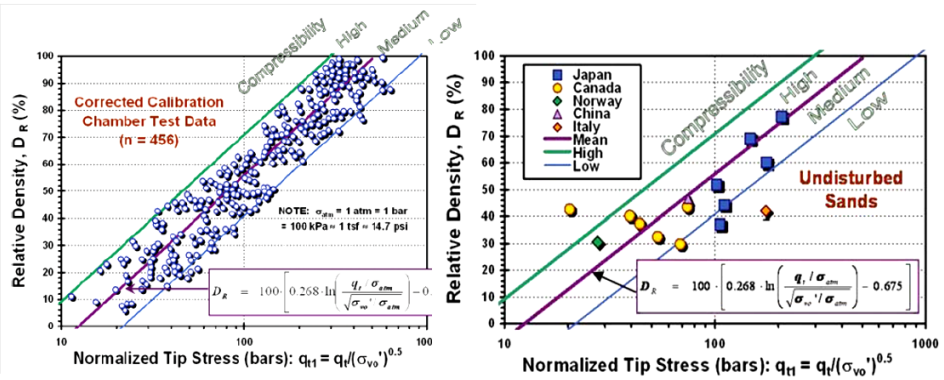

Figure 6-1 Relative density with normalised tip stress and sand compressibility from calibration chamber tests (left) and undisturbed frozen samples (right). Jamiolkowski *et al.* (2001). Reproduced from Mayne (2007).

The results are presented on the plots of Appendix D – *Standard interpretation results (set 2).*

6.4.2 UNDRAINED SHEAR STRENGTH

S_u is usually estimated as a factor of net cone tip resistance (Lunne *et al*, 1981):

$$s_u = \frac{q_c - \sigma_{v0}}{N_k}$$

where N_k is an empirical cone factor.

(See glossary of terms and symbols appendix A – *General information*)

S_U values are presented for N_{kt} factors of 15 and 20 as standard.

Mayne and Peuchen (2018) performed and evaluation of 407 high-quality triaxial compression tests against net tip resistance and proposed N_{kt} factors with regression analysis details for five categories of clays shown in Table 1.

Table 1 Summary of CAUC s_u versus q_{net} for clays. Reproduced from Mayne and Peuchen (2018).

Clay Group	Number of sites	No. Data	Correlation Coefficient r_2	Factor N_{kt}	Mean Pore Pressure Parameter B_q
Offshore NC-LOC	17	115	0.98	12.32	0.51
Onshore NC-LOC	30	191	0.867	12	0.53
Sensitive NC-LOC	5	43	0.507	10.33	0.84
OC Intact	5	36	0.862	13.57	0.49
OC Fissured	5	22	0.393	22.47	-0.01
All clays	62	407	0.923	13.33	0.55

Alternatively, a variable N_{kt} factor can be estimated for the profile as a function of the pore pressure parameter Bq, applicable for Bq values of > -0.01. The equation below is proposed by Mayne and Peuchen based on the same database evaluation:

$$N_{kt} = 10.5 - 4.6 \cdot \ln(B_q + 0.1)$$

Where the pore pressure parameter B_q is the ratio of excess pore pressure to net tip resistance:

$$B_q = \frac{u_2 - u_0}{q_t - \sigma_{v0}}$$

The N_{kt} estimate has a standard error of 2.4 Nk and correlation coefficient of 0.645.

The estimate based on B_q is presented as 'S_U3' on the parameter plots and is only suitable and calculated for tests that have a high-quality pore pressure data, often indicated by a positive, repeatable and dynamic response. For tests that have a reliable pore pressure response throughout the evaluation on a point by point basis is warranted. For projects with variable response quality and with possible piezo desaturation (for example in the unsaturated zone or by dilation/cavitation) it is preferable to identify zones with reliable pore pressure response for representative soils and select a characteristic value of B_q for evaluation of N_{kt}. Lankelma are not always in view of the effort that has been made in preparation of the test location to maintain saturation of the piezo sensor.

Note: N_{kt} (with subscript 't') indicates an Nk factor that has been established using the corrected tip resistance qt. Nkt can be applied to the uncorrected tip resistance (qc) of non-piezocone tests but will result in a slightly lower estimate of Su depending on the correction magnitude qc - qt relevant to lower strength soils.

All undrained shear strength derivations are presented on the plots of Appendix C – *Standard interpretation results (set 1).*

6.4.3 OVERCONSOLIDATION RATIO

The preconsolidation stress of clays is calculated based on the method proposed by Mayne (1995) and Demers and Leroueil (2002):

$$\sigma_p' = k \cdot (q_t - \sigma_{vo})$$

$$OCR = \sigma_p'/\sigma_{v0}'$$

(See glossary of terms and symbols Appendix A)

The factor k may be expected to lie within the range 0.2 to 0.5. A first order value of 0.33 represents the trend proposed by Mayne (1995). Higher values of k are recommended for fissured heavily overconsolidated clays. Figure 6-2 illustrates the expected accuracy of the estimate.

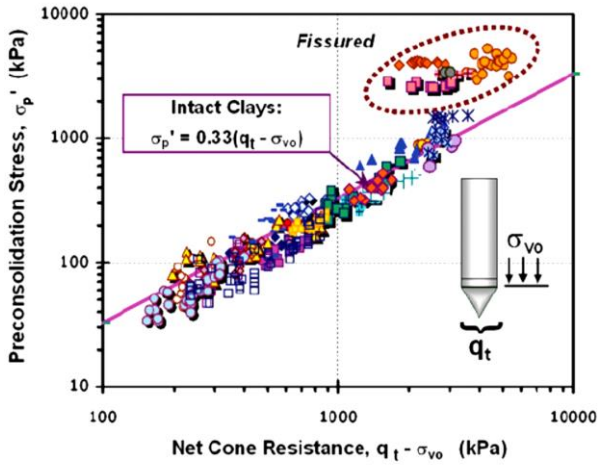

Figure 6-2 Preconsolidation stress from net cone resistance in clays (reproduced from Mayne (2007)).

6.4.4 SENSITIVITY

The approximate sensitivity of the soil, as defined by the ratio of undrained shear strength to remoulded shear strength, is calculated using the factored normalised cone resistance (S_u) and remoulded shear strength taken as equal to the direct friction sleeve measurement:

$$s_t = 0.073 \cdot \frac{q_t - \sigma_{v0}}{f_s}$$ Mayne (2007)

(See glossary of terms and symbols Appendix A – *General information*)

The derived sensitivity is only indicative for sensitive soils because the sensitivity to error of the friction sleeve and tip increases markedly at the very low range.

The results are presented on the plots of Appendix C – *Standard interpretation results (set 1).*

6.4.5 SPT N60 VALUES

Equivalent SPT N60 Values defined as the non-normalised SPT blow count over a 30cm interval. The results of the two correlations below are presented together in the results section for comparison.

$$N_{60} = \frac{q_t}{8.5 \cdot \sigma_{atm} \cdot (1 - \frac{I_C}{4.6})}$$ Lunne *et al.* (1997)

$$\frac{\left(\frac{q_t}{p_a}\right)}{N_{60}} = 10^{(1.268 - 0.2817 I_c)}$$ Robertson (2012)

(See glossary of terms and symbols Appendix A)

The correlation is intended for clays, silts and sands and not for cemented geo-materials i.e. chalk.

The results are presented in Appendix D – *Standard interpretation results (set 2).*

6.4.6 FRICTION ANGLE

Sands

The peak friction angle of granular materials is calculated using the Kulhawy and Mayne (1990) method and is an empirical relationship as a function of stress normalised cone tip resistance. The relationship is based on a calibration chamber database from 24 sands of varying mineralogy. The relationship has the form:

$$\phi' = 17.6 + 11.0 \cdot \log(q_{t1})$$

Where:

ϕ' = Peak friction angle (degrees)

q_{t1} = stress normalised cone resistance = $(\frac{q_t}{\sigma_{atm}})/(\frac{\sigma_{v0}'}{\sigma_{atm}})^{0.5}$

The expected error with respect to the sand types used in development of the relationship may be assessed from the figure below. It can be seen that the presence of compressible minerals results in a conservative estimate of friction angle.

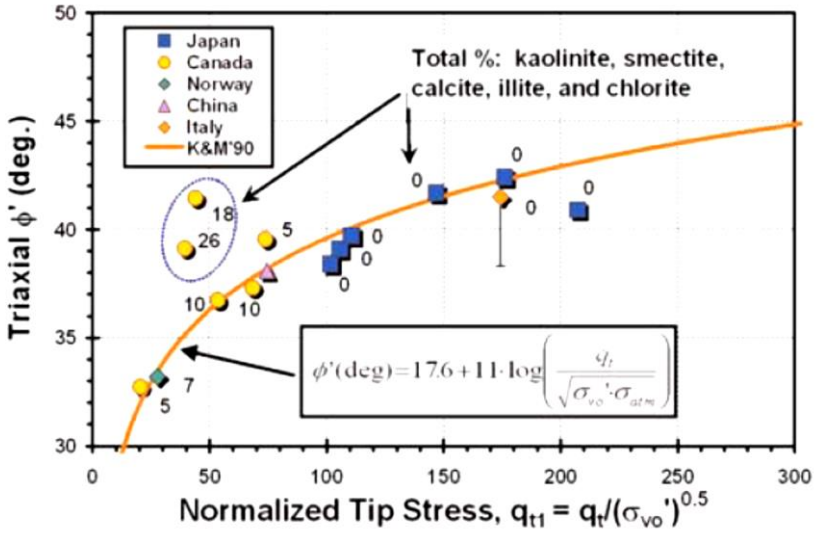

Figure 6-3 Peak triaxial friction angle from undisturbed sands with normalised cone resistance.

File grained soils

The effective friction angle for fine grained soils been calculated based on the Senneset *et al.* (1988, 1989) Norwegian Institute of Technology (NTH) using an approximate solution by Mayne & Campanella (2005) as a direct function of the pore pressure parameter Bq and normalised tip resistance Q. The method is applicable where $0.1 < B_q < 1.0$ and $20^\circ < \phi' < 45^\circ$ and generally appropriate for non-cemented NC-LOC soft to stiff soils.

$$\phi' = 29.5^\circ \, B_q^{0.121} [0.256 + 0.336 \, B_q + \log Q]$$

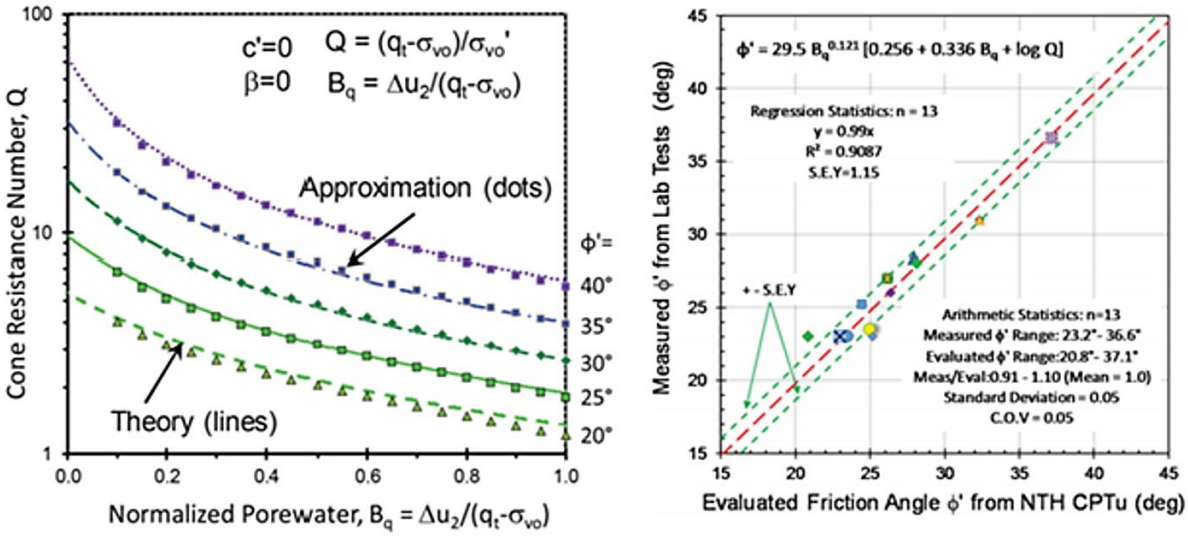

Figure 6-4 ([Left] Theoretical curves with function approximation (dots) overlay [Right] calibration data from geotechnical centrifuge tests for a variety of soils. Redrawn from Ouyang & Mayne (2018).

The results are presented in Appendix D – *Standard interpretation results (set 2).*

6.4.7 COEFFICIENT OF VOLUME CHANGE

Coefficient of volume change (m_v) defined as the inverse of the constrained modulus (M), is evaluated for all soil types using the constrained modulus method proposed by Mayne (2006) cited in Mayne (2007) applicable to the present state of vertical effective stress up to the pre-consolidation stress.

$$m_v = \frac{1}{M}$$

Where:

$$M = \alpha \cdot (q_t - \sigma_v)$$

$$\alpha = 5$$

An alpha factor of 8.25 reported by Kulhawy & Mayne (1990) for fine grained soils appears to provide a better fit through the data for intact non-organic clays, reducing to around 1 to 2 for organic plastic clays.

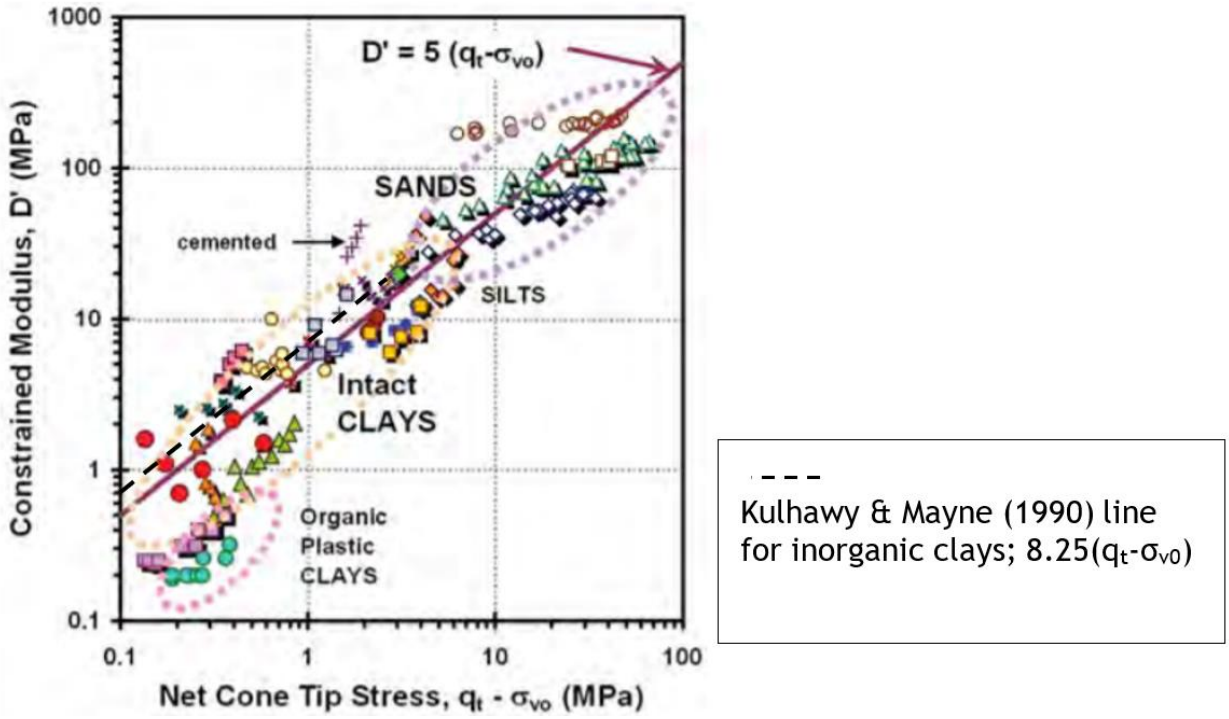

Figure 6-5 Constrained modulus of Mayne (2006). Annotated/redrawn from NCHRP Synthesis 368 (2007).

The results are presented on the plots of Appendix C – *Standard interpretation results (set 1)*.

6.4.8 YOUNG'S MODULUS

The Young's Modulus at 25% strain (FOS = 4) calculated using the general empirical formula (Robertson, 2009):

$E' = \alpha(q_t - \sigma_v)$

Where:

$\alpha = 0.015(10^{0.55\boldsymbol{Ic}+1.68})$

(See glossary of terms and symbols Appendix A)

Using methods described in Robertson (2009) this formula may be adapted to estimate E' for loading at different percentages of yield stress.

The results are presented in Appendix D – *Standard interpretation results (set 2)*.

7 CPT DATA INTERPRETATION NOTES

Provided below is a non-exhaustive set of notes on interpretation of the acquired CPT data with reference to examples within the dataset where appropriate.

SOIL BEHAVIOUR TYPE

The soil behaviour type (SBT) as defined by Robertson *et al.* (1986) is not intended to replace soil classification based on particle size fractions. Rather, the SBT will generally show bias in the classification towards the soil fraction that dominates soil behaviour in response to penetration. In general, the normalised SBT will be more accurate, but may be less reliable at very shallow depths (1-2m) due to very low vertical effective stresses (applied in normalisation) relative to variable horizontal stresses affecting penetration resistance.

DRAINED AND UNDRAINED SOIL BEHAVIOUR

Geotechnical parameters appropriate for drained and undrained cone penetration conditions are derived for drained and undrained soil behaviour types (SBTs) respectively, however to help mitigate the uncertainty in the SBT correlation with drainage behaviour, all parameters are derived over the range of mixed soil types 'silt mixtures' and 'sand mixtures' or *Ic* 2.05-2.95 (Robertson, 2010). For partially drained conditions in low permeability soils, error will be introduced within derived parameters.

Piezocone dynamic pore water pressures behaviour, dissipations or other site-specific information may be used to identify the appropriate limits of application. Dissipations to t_{50} exceeding 50 seconds indicate undrained penetration behaviour based on findings of Kim *et al.*, 2010.

In partially drained materials the friction sleeve resistance may rise significantly immediately following a pause in penetration due to consolidation and increase in effective stress on the friction sleeve casing.

DYNAMIC PORE PRESSURE DATA (CPTu)

During penetration, dilation pressures at the cone shoulder may result in desaturation of the piezo sensor which may or may not re-saturate at higher excess pressures. The pore pressure response in saturated contractive soils normally have a dynamic 'peaky' appearance.

The tip resistance in lower strength contractive soils without pore pressure measurement in the u2 position is likely to be significantly lower than the equivalent corrected tip resistance depending on the magnitude of pore pressure acting in the gap between cone tip and cone body.

CONE TIP AND SLEEVE OFFSET

The accuracy of the SBT over thin layers and at layer boundaries is sensitive to offset error in the friction ratio often seen as sharp spikes or drops at boundaries. The friction ratio is often inaccurate in heavily disturbed soils with a 'blocky' macro fabric.

For this investigation a friction sleeve depth offset correction of -80mm was applied together with a 5-point moving average on the friction ratio to minimise the influence of this effect.

CONE TYPE

The reference cone type has a 10cm^2 projected cone tip area and 150cm^2 friction sleeve area, however it is common to use the larger 15cm^2 cone with 225cm^2 friction sleeve area for improved sensitivity and penetration depth potential. Use of the 15cm^2 cone will produce more pronounced transitions zones and thin layer effects (larger zone of influence and failure zone).

TRANSITION ZONES AND THIN LAYER EFFECTS

During penetration at the boundary between soils of contrasting stiffness, a transition zone is often evident prior to mobilization of the true soil stiffness. These should be cautiously ignored in assessment of soil behaviour type and parameter evaluation. Where the stiff layer is thin (<~0.5m) the true stiffness will not be fully mobilised. The effect for thin low stiffness layers is less significant. Procedures for thin-layer effect correction are provided by Robertson and Wride (1998). In choosing characteristic values of the tip, sleeve and derived parameter results, large scale peak and trough values may be more representative of the local value.

GRAVELS

The presence of gravel or larger clasts in a soil is often characterised by short peaks in the CPT tip and sleeve readings, possibly with associate inclinometer 'shake' and/or sharp reductions in pore water readings due to dilation effects. Frequent gravels in soft or loose soils may generate erroneous friction ratio values. Where gravels are matrix supported the tip and sleeve peaks may be ignored or filtered in choosing characteristic values for bulk behaviour.

This report has been completed based on current standards and the best information available at the time of preparation. Any data in this report that has been derived using incorrect or inappropriate assumption(s) or inappropriate methods must be rejected or adjusted at the discretion of the appropriately qualified person interpreting the data for design or recommendation.

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SUMMARY TABLES

Table 1 CPT test summary

Test ID	Final depth (mBGL)	**Cone ID** {**C**=Cone tip; **F**=Friction Sleeve; **I**= Inclination; **P** = Piezo; **S**=Subtraction cone; **15/10** = cone projected area (cm2))}	CPT rig	Pre-drilled / inspection pit (m)	Casing depth (m)	Refusal factor	Dissipations	Seismic cone	Samples	Easting	Northing	Elevation (m)	Date of test	Remarks
CPT201	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT202	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT203	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT204	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT205	14.78	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT206	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT207	14.42	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT208	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT209	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT210	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT211	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	
CPT212	15.00	S15-CFIP.1528	UK15			Target depth							29/08/2018	

CPT test plots are presented in Appendices B, C & D

APPENDIX A GENERAL INFORMATION

LIST OF FIGURES

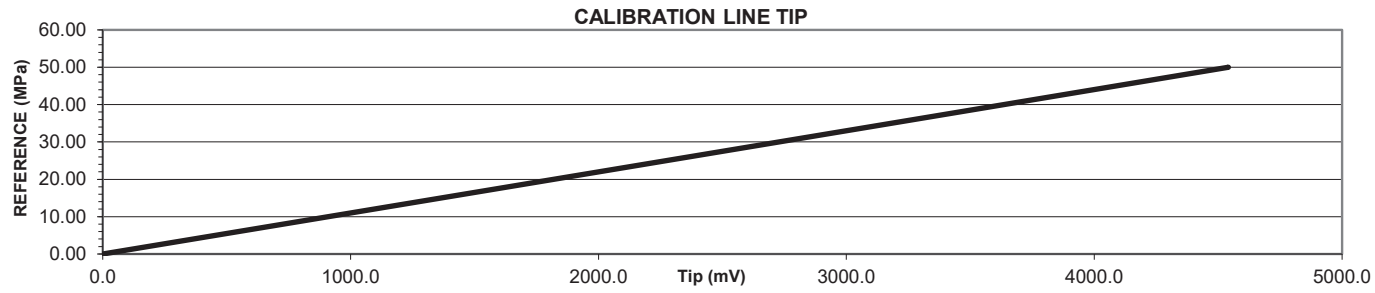
Description	Pages included
Cone calibration certificate: S15-CFIP.1528	1
Data sheet: 20.5 tonne track-truck mounted CPT unit (UK15)	1
CPT soil behaviour type chart	1
Glossary of terms	1

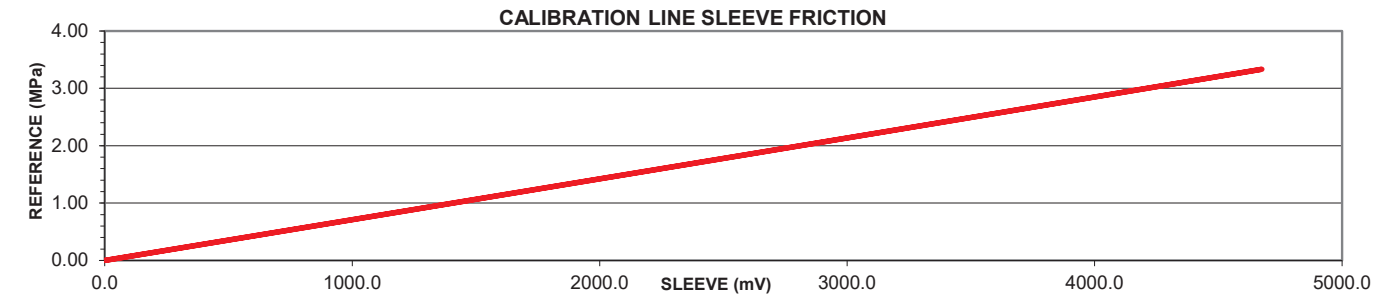
CALIBRATION CERTIFICATE

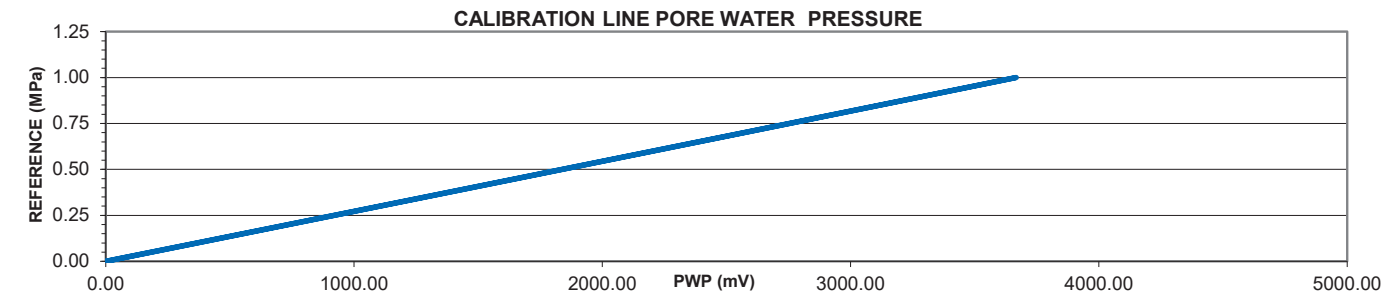
Geopoint -S15-150kN-2MPa

Cone Serial Number: S15.CFIIP-1528

REFERENCE INSTRUMENTS:	CONE END RESISTANCE	SLEEVE FRICTION	PORE WATER PRESSURE
ID	51998	51998	4009509
TYPE	AM DSCC-100kN	AM DSCC-100kN	Druck DPI 104
UNCERTAINTY (±%)	0.024	0.024	0.05
Nominal pressure (MPa,MPa,MPa)	50.00	3.33	1.00
Maximum pressure (MPa,MPa,MPa)	100.00	6.67	2.00
Area (cm²)	15	225	N/A
Sensitivity (mV/MPa)	90.84	1403.12	3666.51
Calibration file scaling factor:			
Nominal cal force (kN, kN, BAR)	75	75	10
Calibration number (mV)	4542	4677	3667
Zero point (mV)	340	189	263
Sensitivity (mV/kN, mV/kN, mV/BAR)	60.562	62.361	366.651
Inclination factors (mV)	X -20°= 408, 0°= 2577, 20°= 4239 / Y -20°= 498, 0°= 2503, 20°= 4176		
Measured alpha factor:	0.69		
Uncertainty (%):			
Reproducibility	0.17	0.07	0.03
Linearity	0.12	0.09	0.12
Hysteresis	0.05	0.06	0.06
Combined expanded (k=2)	0.38	0.56	0.20
Application class	1	1	1







Instrument:	S15-150kN	Location:	Lankelma Calibration Laboratory
Serial Number:	S15.CFIIP-1528	Temperature(° C)	21.0
Manufacturer:	Geopoint	Calibration Engineer	ed f. white
Date of calibration:	12/07/2018	Calibration Expiry	11/10/2018

Calibration signed and dated by:	Calibration checked and dated by:
Digitally signed by Ed f. white DN: cn=Ed f. white, o=Lankelma, ou, email=edmundforder-white@lankelma.co.uk, c=GB Date: 2018.07.12 14:50:25 +01'00'	Paul Dimelow 2018.07.12 15:15:50 +01'00'

UK15
TRACK-TRUCK RIG

Our track-truck is suitable for most geotechnical sites. This rig is driven as a self-contained HGV to site where it can deploy its tracks to cope with soft or uneven terrain.

The track-truck can be driven from the front and back, and complies with Euro 4 emission standards for use in London's low emissions zones (LEZ).

Performance Rates

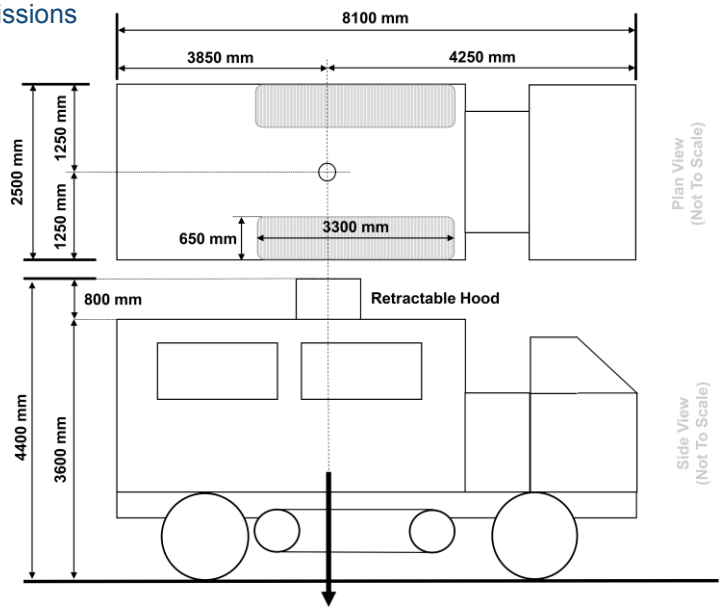
An expected 100m+ of standard CPTu testing can be executed in a day (dependent on site conditions and access).

Applications

- Specialist testing
  - Seismic
  - Pressuremeter
  - Magnetometer
  - Videocone
  - Wing cone
  - Push-in Vane
- Installations
  - VWP
  - Piezometer
  - Inclinometer
- Sampling
  - MOSTAP
  - Shelby

TECHNICAL DETAILS

Rig Weight	20.5 T
Maximum Operating Ram Capacity	17 T
Maximum Travelling Speed	86 km/h
Track Material	Steel
Track Length	3.30 m
Track Width	0.65 m
Jack Plate Dimensions	Tracks act as jacks
Jack Arrangements	1 on each side
Maximum Ground Clearance On Jacks	0.21 m
Maximum Ground Bearing Pressure	Tracking / Pushing – 51 kPa Pulling – 95 kPa
Maximum Testing Gradient	10 degrees
Maximum Traversing Gradient	30 degrees (operator assessed)
Noise Output at 2 m	Testing – 81 dBA Driving – 89 dBA
Clamp Arrangement	Hydraulic Dial Clamp
Ram Stroke	1.24 m
Maximum Casing Size	60 mm

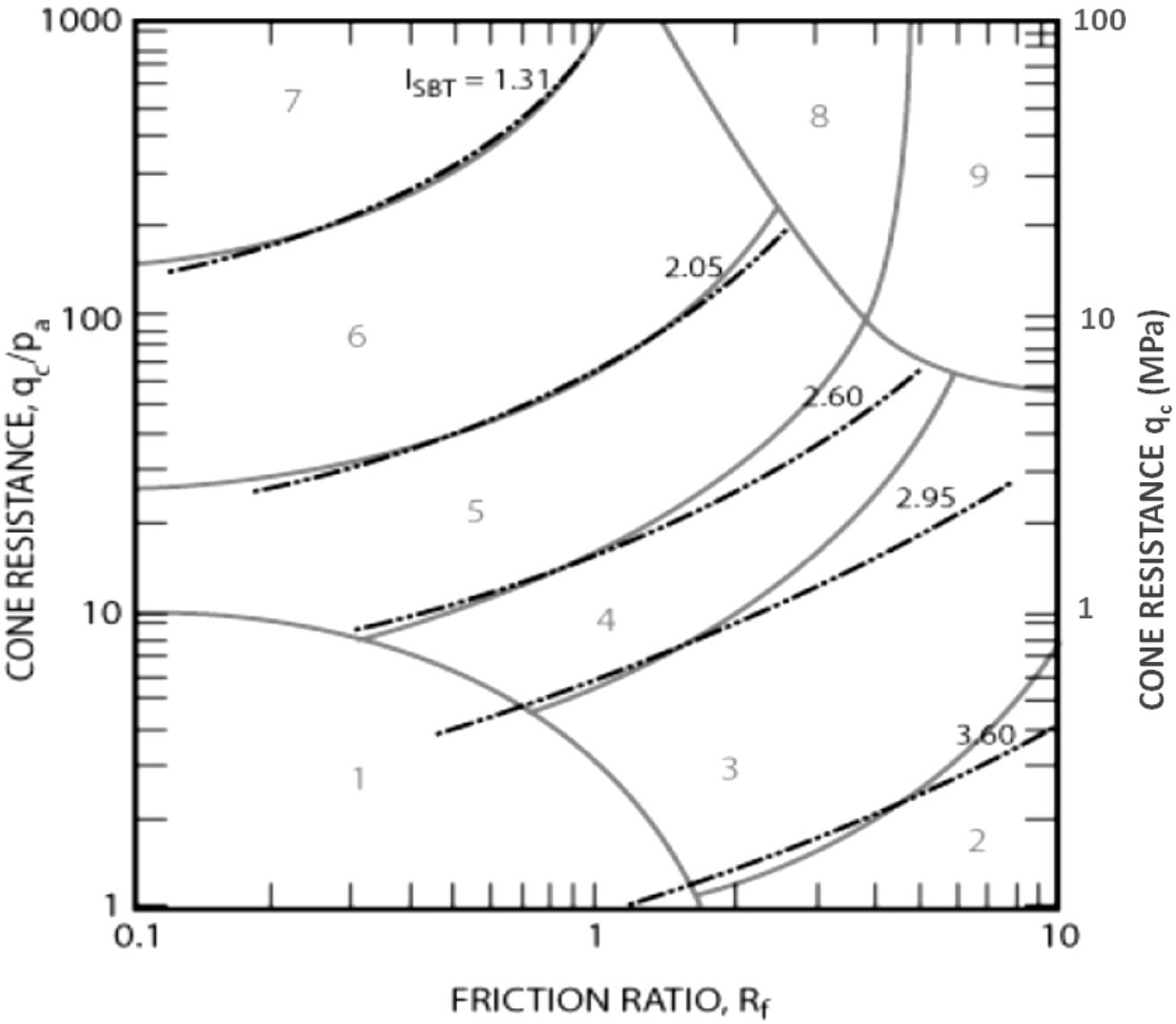


www.lankelma.com

Tel: **+44 (0)1797 280050** Fax: **+44 (0)1797 280195** Email: **info@lankelma.com**

Lankelma Limited, Cold Harbour Barn, Cold Harbour Lane, Iden, East Sussex. TN31 7UT

CPT SOIL BEHAVIOUR TYPE CHART



Non-normalised SBT chart by Robertson *et al.* (2010) based on dimensionless cone resistance (qc/Pa) and friction ration, Rf, showing contours of *Ic* index. The chart is also applicable to stress-normalised tip/sleeve values Q_t and F_r.

Zone	Soil Behaviour Type (SBT)		
1	Sensitive fine-grained	6	Sands: clean sand to sandy silt
2	Clay – organic soil	7	Dense sand to gravelly sand
3	Clays: Clay to silty clay	8	Stiff sand to clayey sand*
4	Silt mixtures: clayey silt to silty clay	9	Stiff fine grained*
5	Sand mixtures: Silty sand to sandy silt	*Overconsolidated or cemented	

GLOSSARY OF CPT TERMS AND SYMBOLS

SYMBOLS

q_c :- **Cone resistance.** 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)**.

f_s :- **Friction sleeve resistance.** The total frictional force acting on the friction sleeve, F_s, divided by its surface area, A_s.**f_s= F_s/A_s.**

q_t :- **Corrected cone resistance.** The cone resistance q_c corrected for unequal pore water pressure effects on the cone face and shoulder.

R_f :- **Friction ratio** The ratio, expressed as a percentage, of the sleeve friction, f_s, to the cone resistance, q_c, both measured at the same depth; **[R_f= (f_s/q_c) · 100].**

Q_t :- **Stress normalised cone resistance** (Method 1) **= (q_c – σ_v)/σ'_v**

q_{t1}:- **Stress normalised cone resistance** (Method 2) **= (q_t)/(σ'_v)$^{0.5}$**

F_r:- **Normalised friction sleeve resistance = f_s /(q_c- σ_v)**

σ_v:- **Total overburden stress**

σ'_v:- **Effective overburden stress**

σ_{atm}, or, P_a:- **Reference atmospheric stress = 100kPa**

***I_c*:-** **Soil Behaviour Type Index**

B_q :- **Pore pressure ratio.** The net pore pressure normalized with respect to the net cone resistance. = **(u_2 – u_0)/(q_t .σ_v)**

TERMS

Cone tip:- The conical tip section of the cone penetrometer.

Friction sleeve:- The section of the cone penetrometer upon which the sleeve friction is measured, located behind the cone tip.

Piezocone:- A cone penetrometer with a pore pressure measurement system.

Dynamic pore pressure:- The pore pressure generated during penetration and measured by a pore pressure sensor. u_1 when measured on the conical tip face, u_2 when measured just behind the conical tip.

APPENDIX B CONE PENETRATION TEST RESULTS

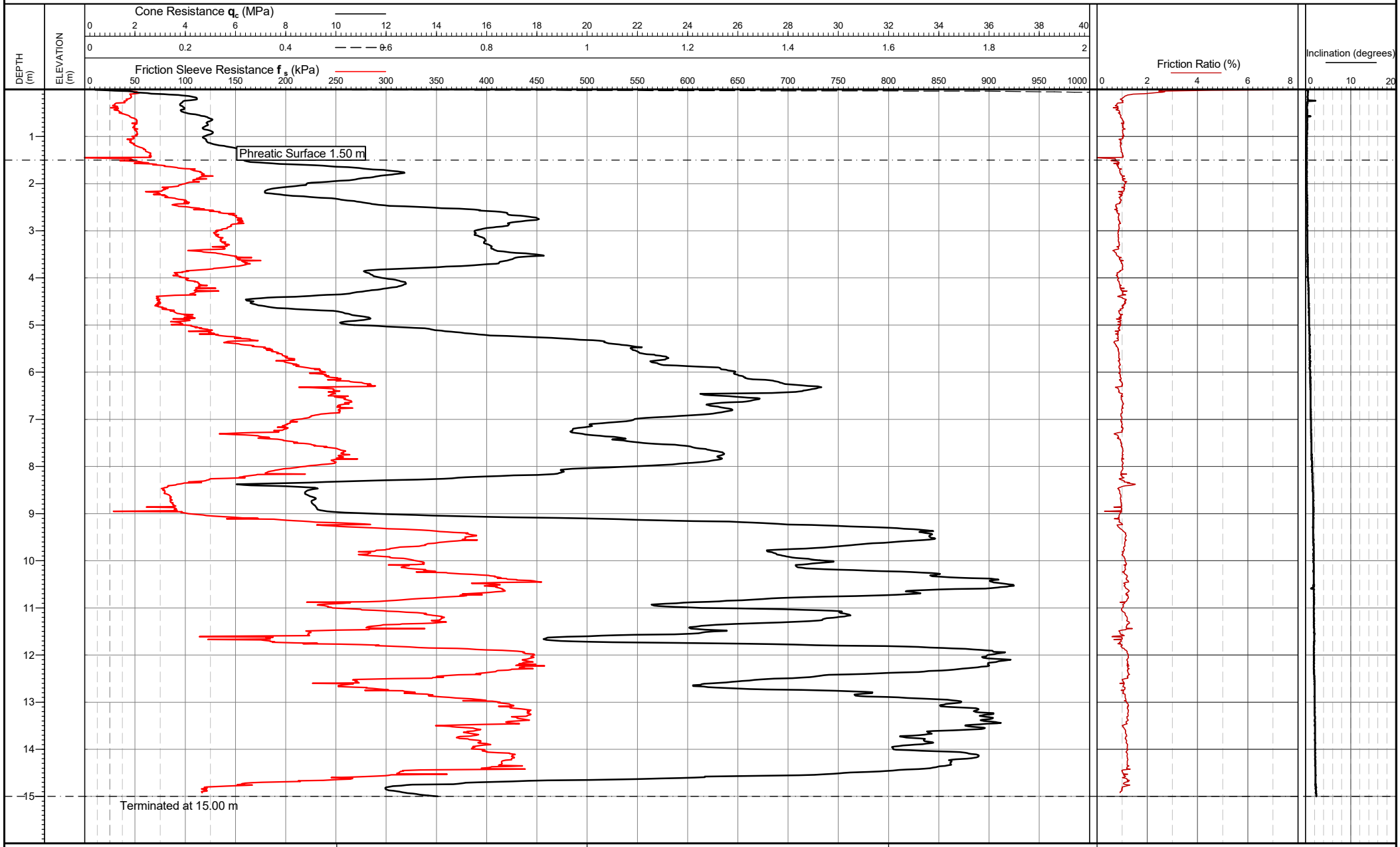
RAW DATA PLOTS

LIST OF FIGURES:

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 11:06:25

Location: Flintshire, UK

Coordinates: ,
Elevation:

Remarks:
*Phreatic surface origin: Arbitrary value

Refusal criteria: Target depth

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

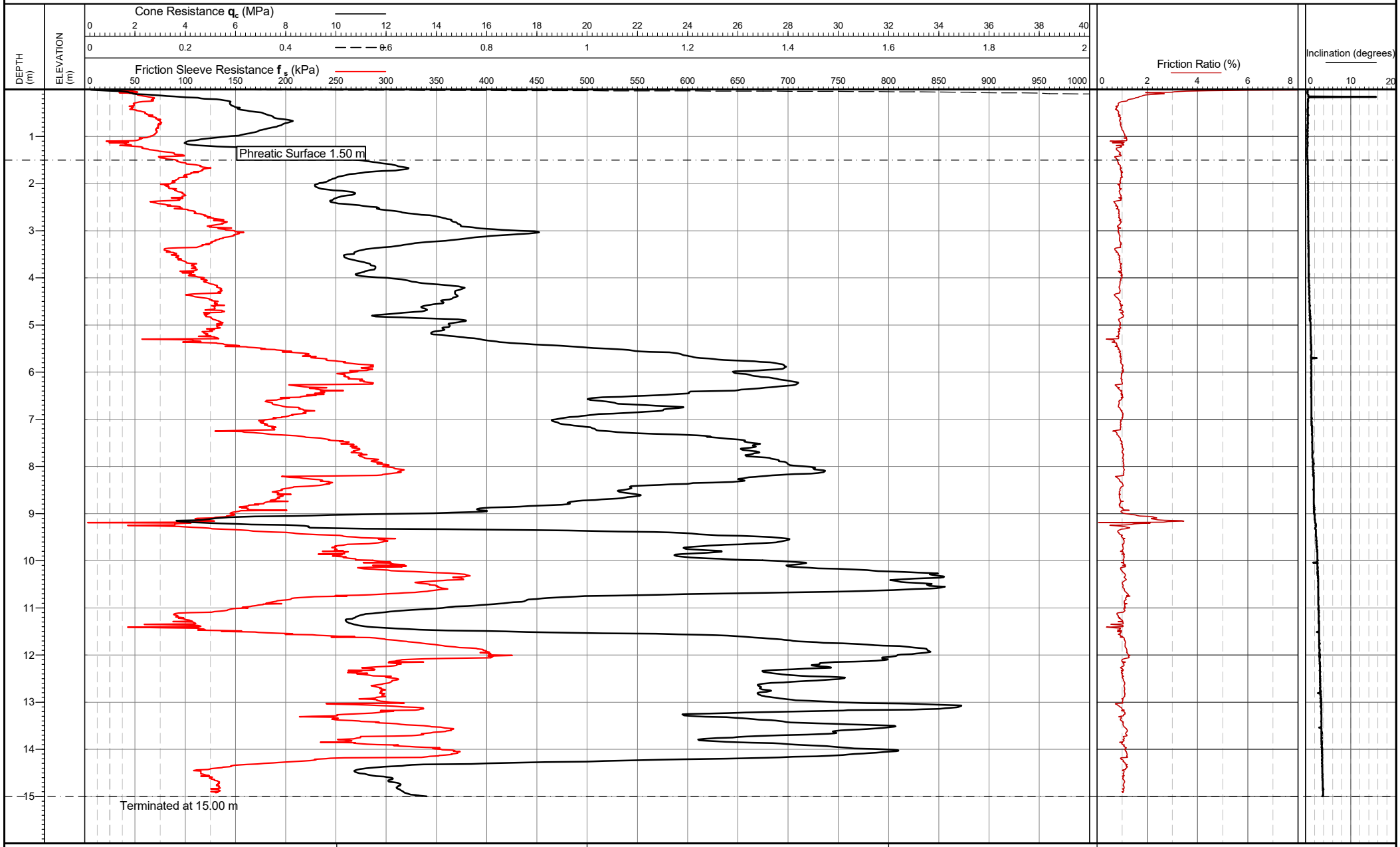
Checked by: Chris Player

TEST ID: CPT201

Client: JPG GROUP

Project: DEESIDE

LANKELMA



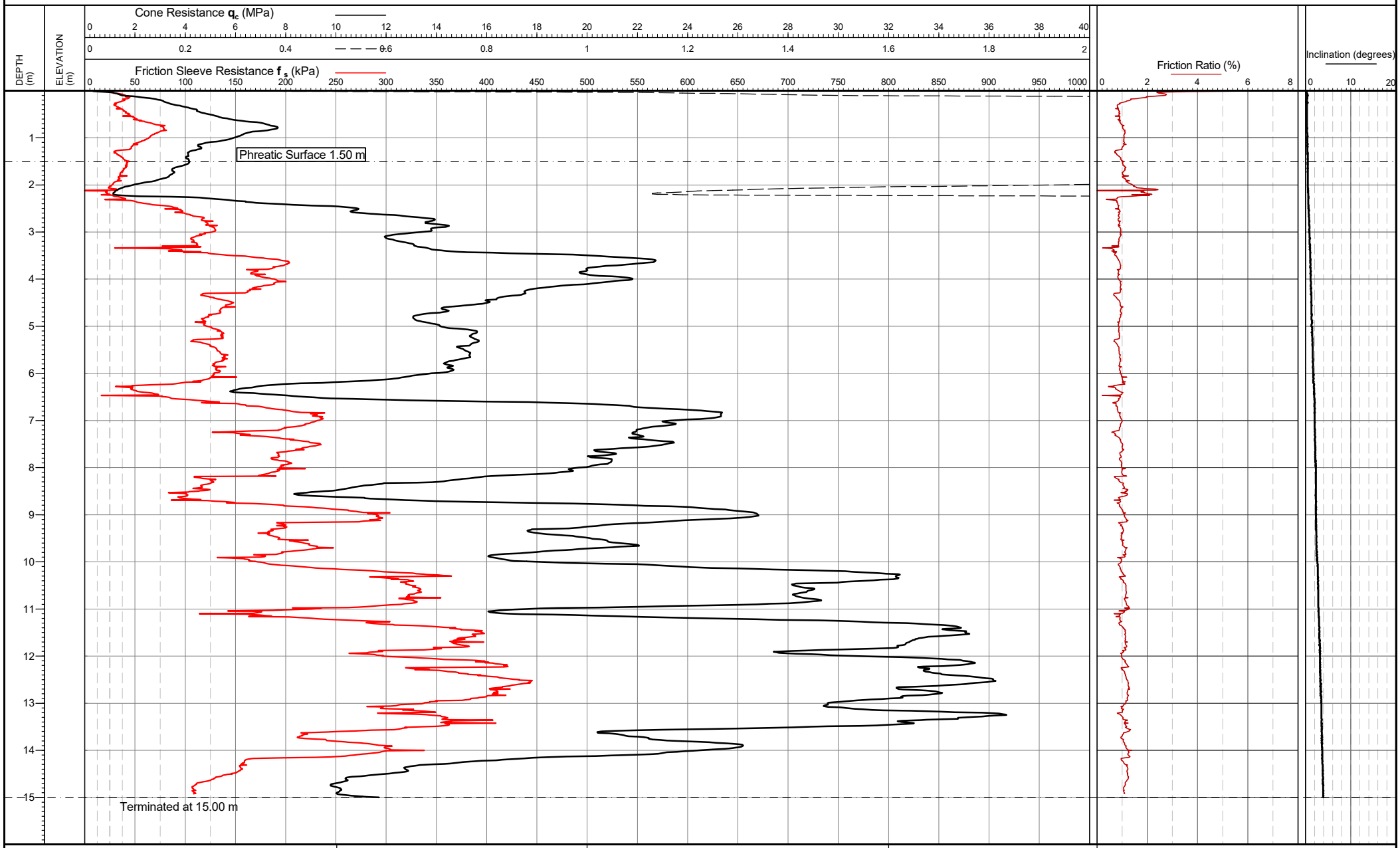
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 12:47:28	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT202

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 13:58:17

Location: Flintshire, UK

Coordinates: ,
Elevation:

Remarks:
*Phreatic surface origin: Arbitrary value

Refusal criteria: Target depth

Date of plot: 29-08-18

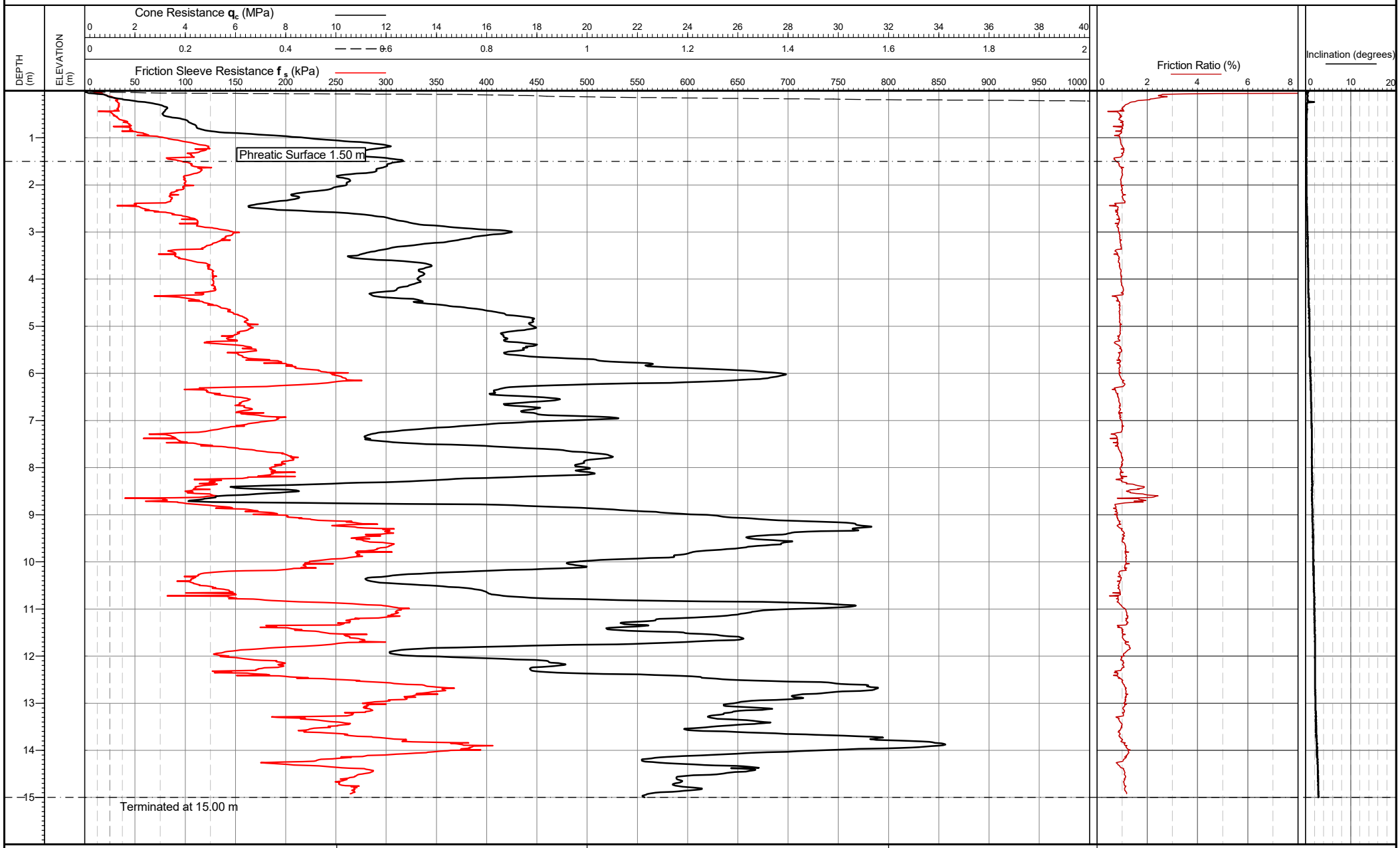
Lankelma Project Ref: P-106982-7

Checked by: Chris Player

TEST ID: CPT203

Client: JPG GROUP

Project: DEESIDE



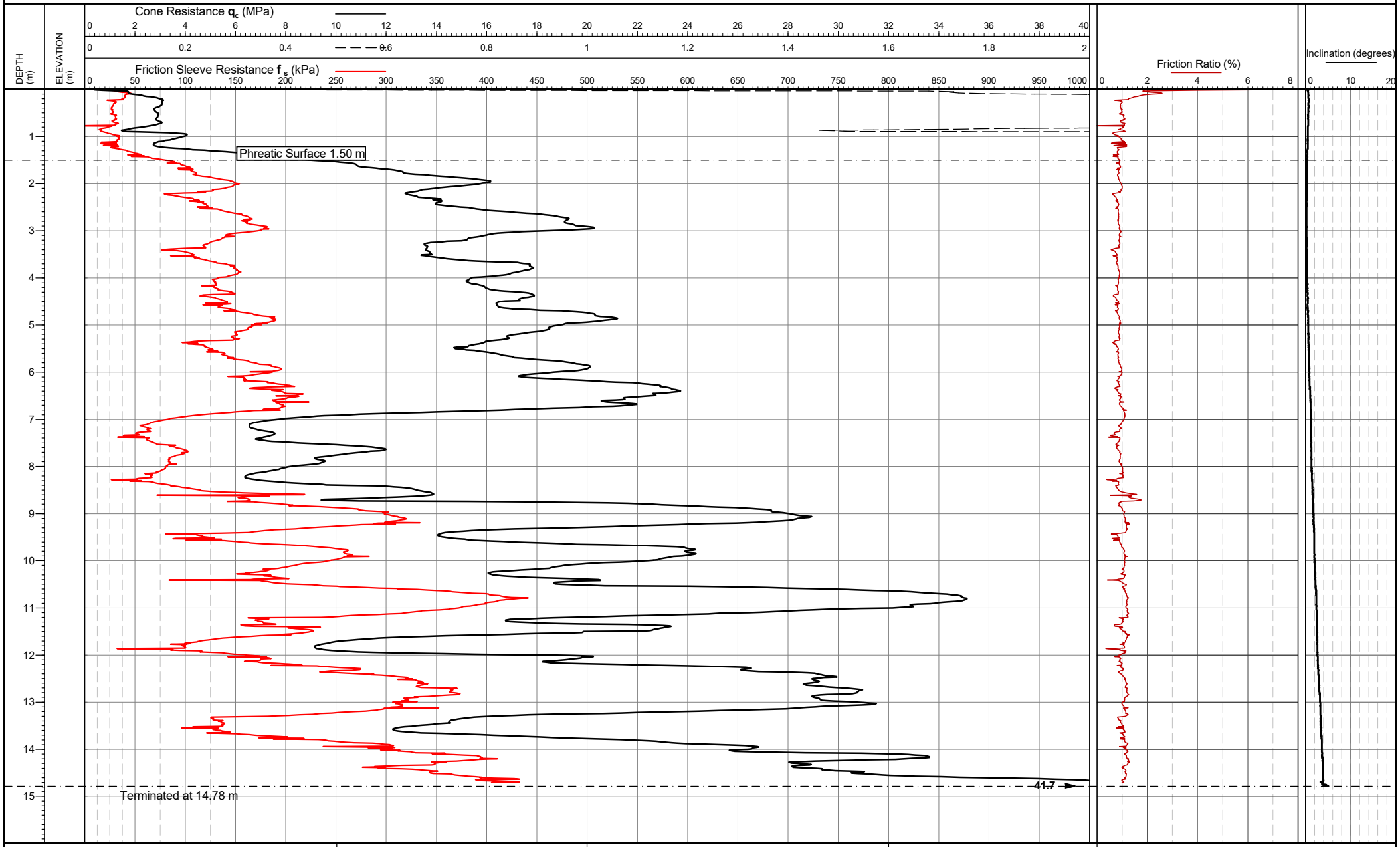
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 12:14:55	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT204

Client: JPG GROUP

Project: DEESIDE

LANKELMA



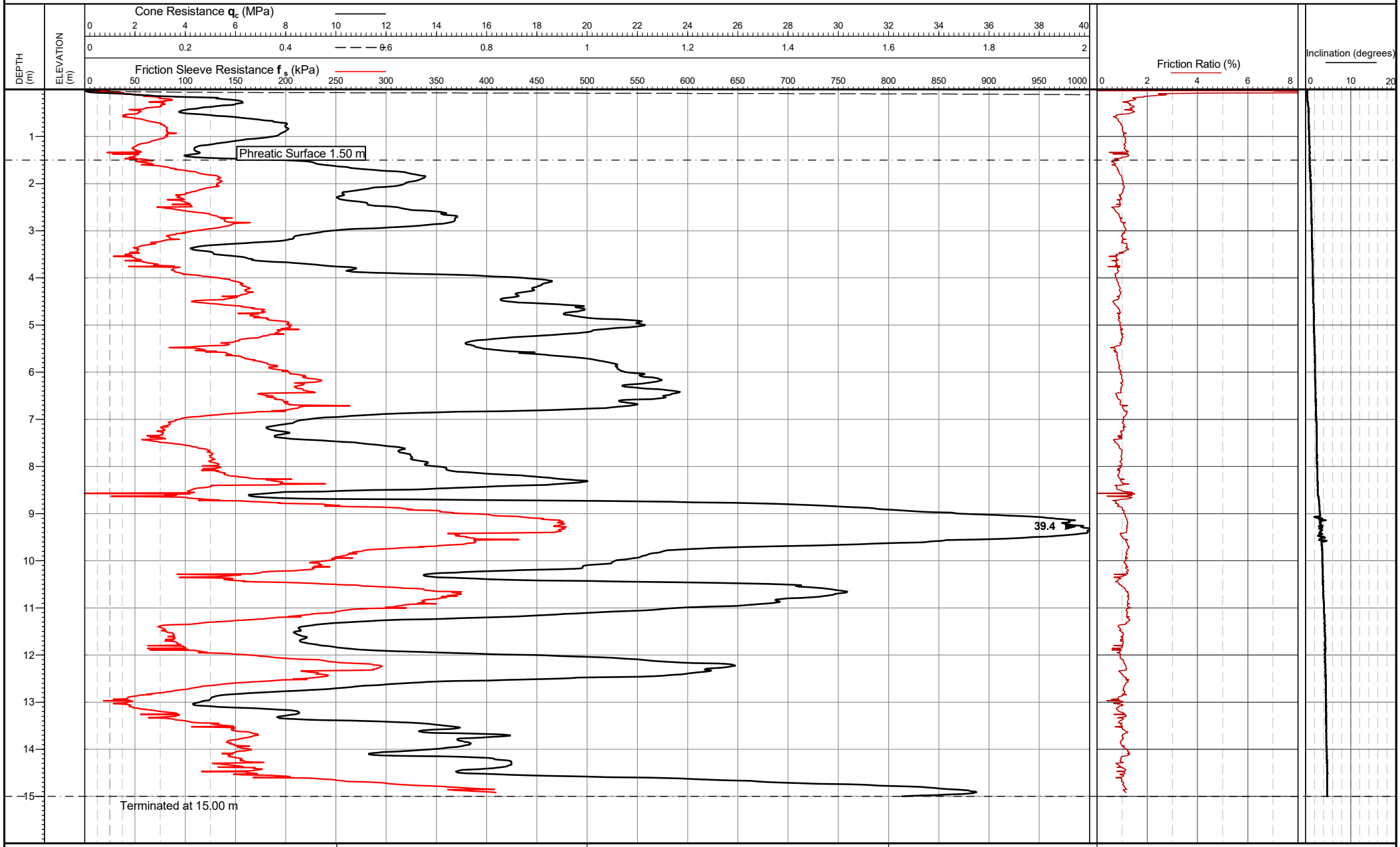
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 10:04:16	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT205

Client: JPG GROUP

Project: DEESIDE

LANKELMA



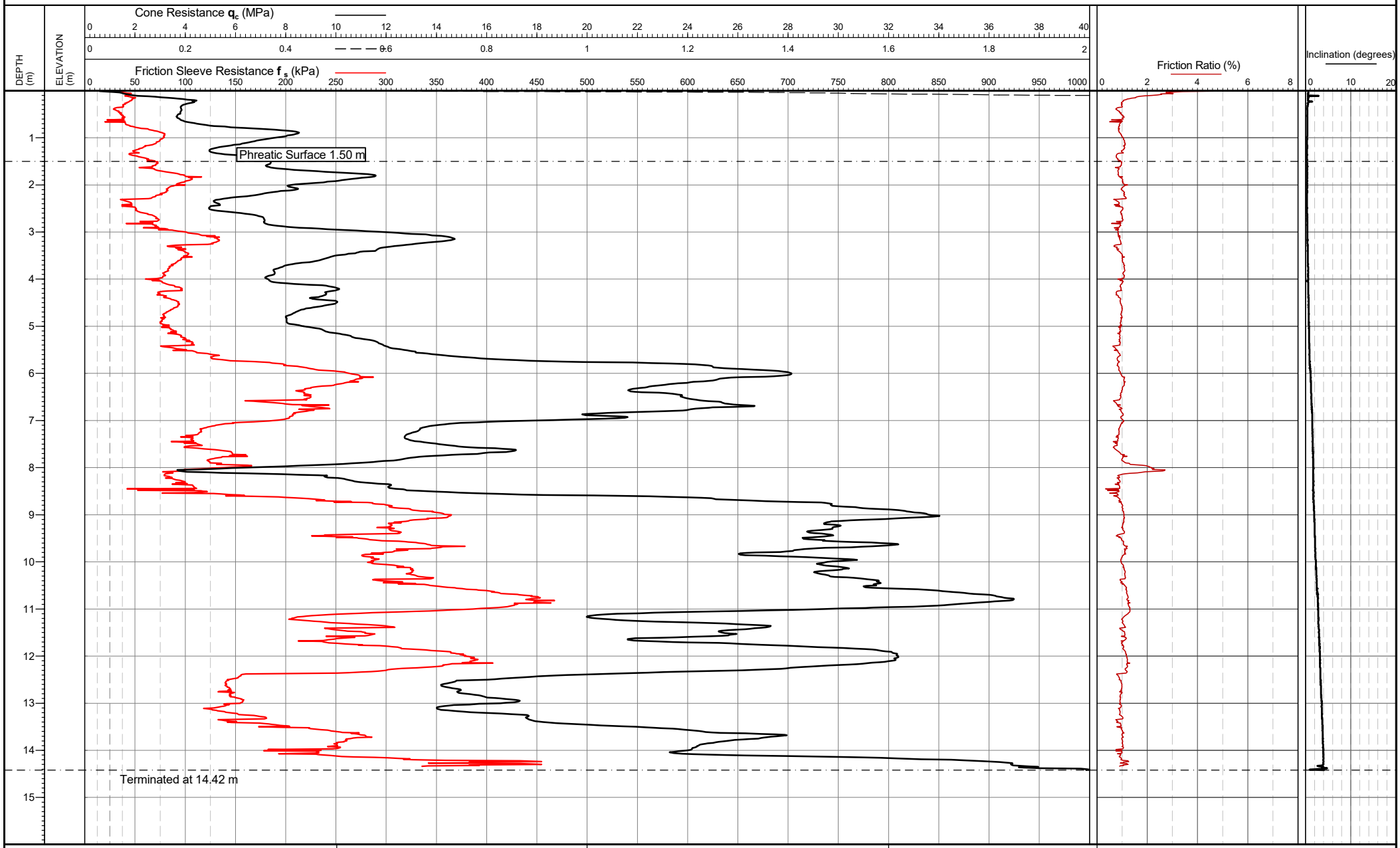
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 09:04:30	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT206

Client: JPG GROUP

Project: DEESIDE

LANKELMA



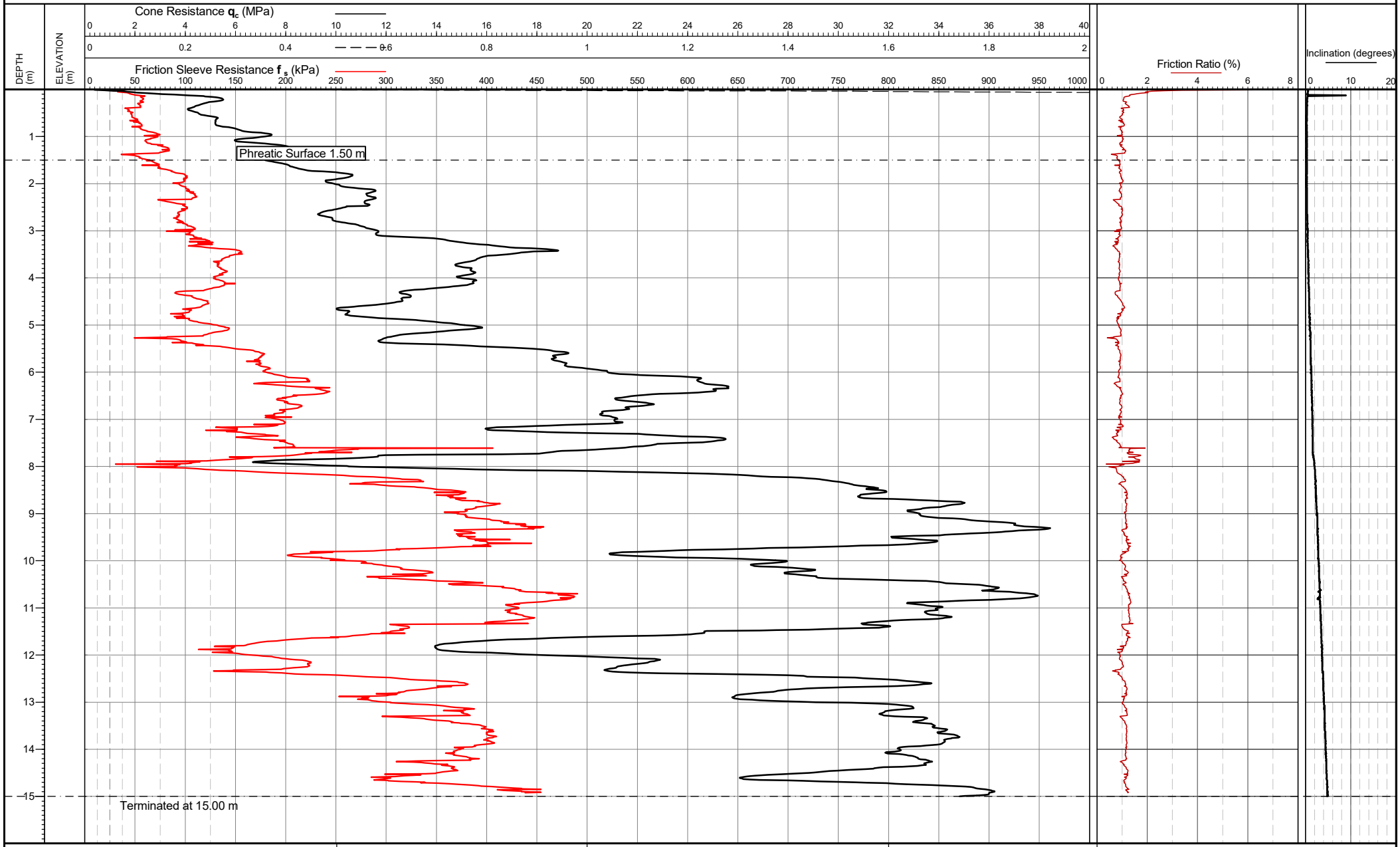
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 11:39:31	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT207

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 13:20:03

Location: Flintshire, UK

Coordinates: ,
Elevation:

Remarks:
*Phreatic surface origin: Arbitrary value

Refusal criteria: Target depth

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

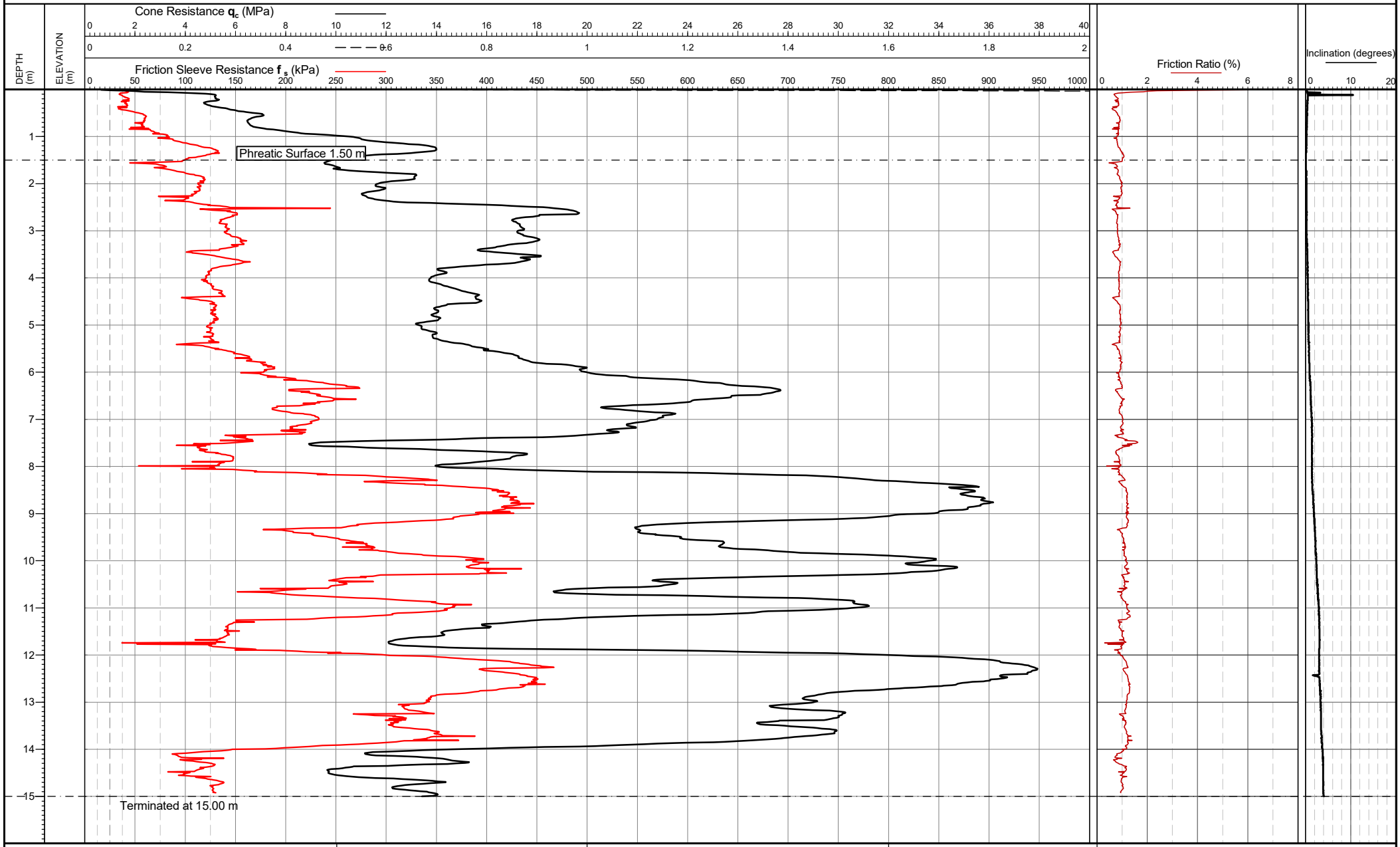
Checked by: Chris Player

TEST ID: CPT208

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 10:32:17

Location: Flintshire, UK

Coordinates: ,
Elevation:

Remarks:
*Phreatic surface origin: Arbitrary value

Refusal criteria: Target depth

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

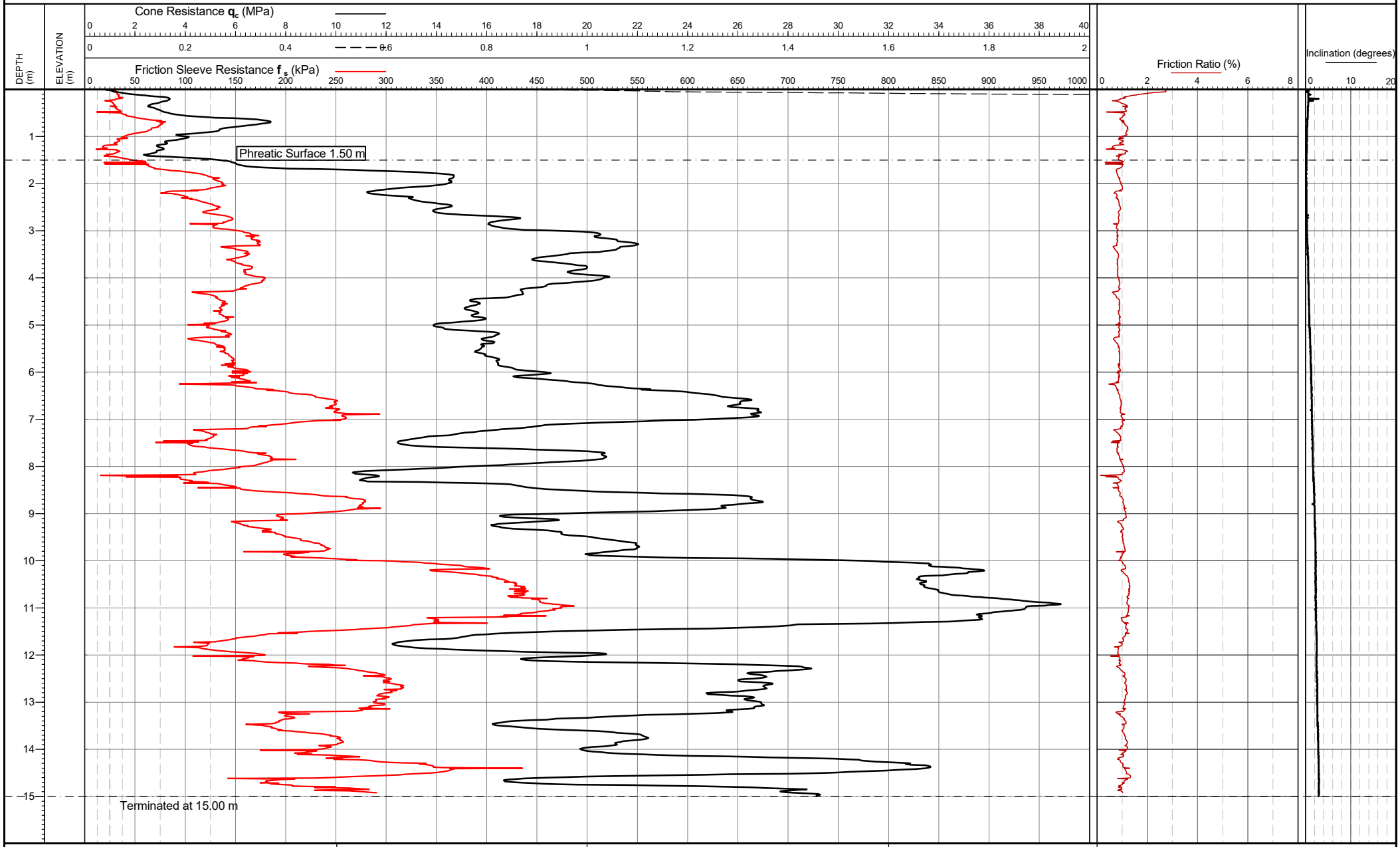
Checked by: Chris Player

TEST ID: CPT209

Client: JPG GROUP

Project: DEESIDE

LANKELMA



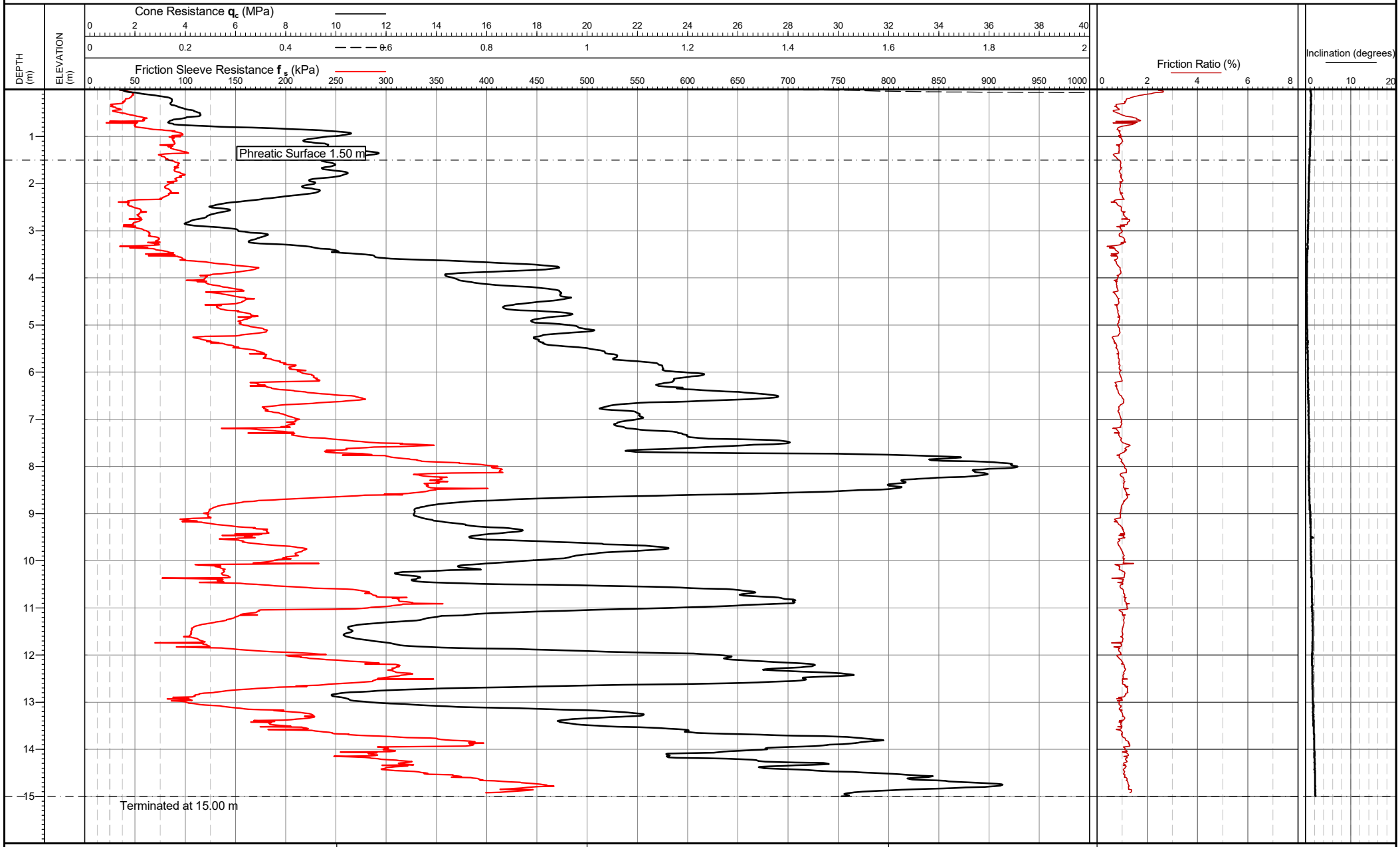
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 14:33:43	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT210

Client: JPG GROUP

Project: DEESIDE

LANKELMA



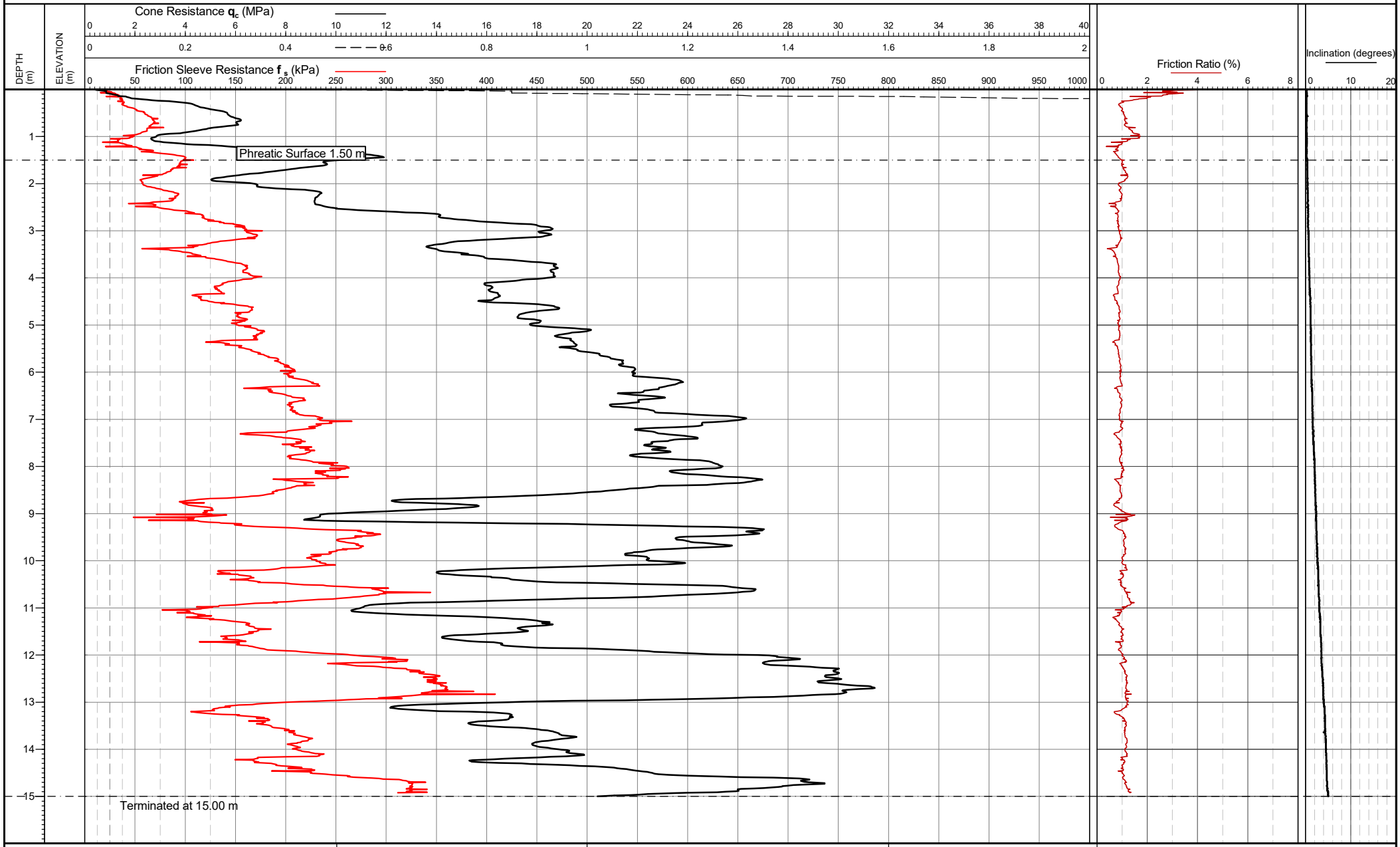
Cone area (mm2):1500 Cone ID: S15-CFIP.1528 Operator: Walter Geddes Rig Used: UK15 Date of test: 29/08/2018 15:02:55	Location: Flintshire, UK Coordinates: , Elevation:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 29-08-18 Checked by: Chris Player	Lankelma Project Ref: P-106982-7

TEST ID: CPT211

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 09:34:03

Location: Flintshire, UK

Coordinates: ,
Elevation:

Remarks:
*Phreatic surface origin: Arbitrary value

Refusal criteria: Target depth

Date of plot: 29-08-18

Checked by: Chris Player

Lankelma Project Ref: P-106982-7

TEST ID: CPT212

APPENDIX C STANDARD INTERPRETATION RESULTS (SET 1)

UNDRAINED SHEAR STRENGTH
SENSITIVITY
COEFFICIENT OF VOLUME CHANGE
OVERCONSOLIDATION RATIO

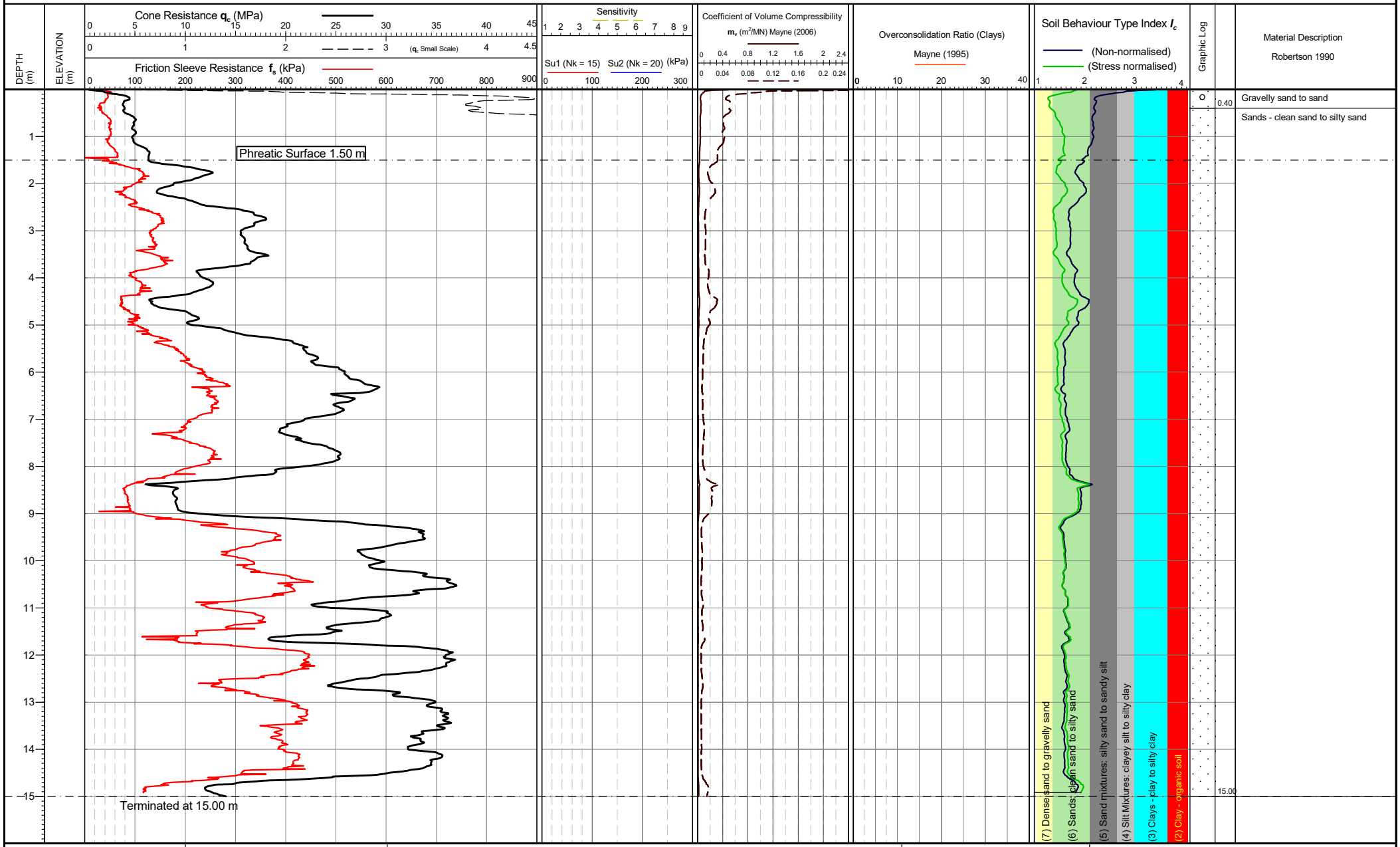
LIST OF FIGURES:

Test ID		Pages included
Cone Penetration Test	CPT201	1
Cone Penetration Test	CPT202	1
Cone Penetration Test	CPT203	1
Cone Penetration Test	CPT204	1
Cone Penetration Test	CPT205	1
Cone Penetration Test	CPT206	1
Cone Penetration Test	CPT207	1
Cone Penetration Test	CPT208	1
Cone Penetration Test	CPT209	1
Cone Penetration Test	CPT210	1
Cone Penetration Test	CPT211	1
Cone Penetration Test	CPT212	1

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 11:06:25

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

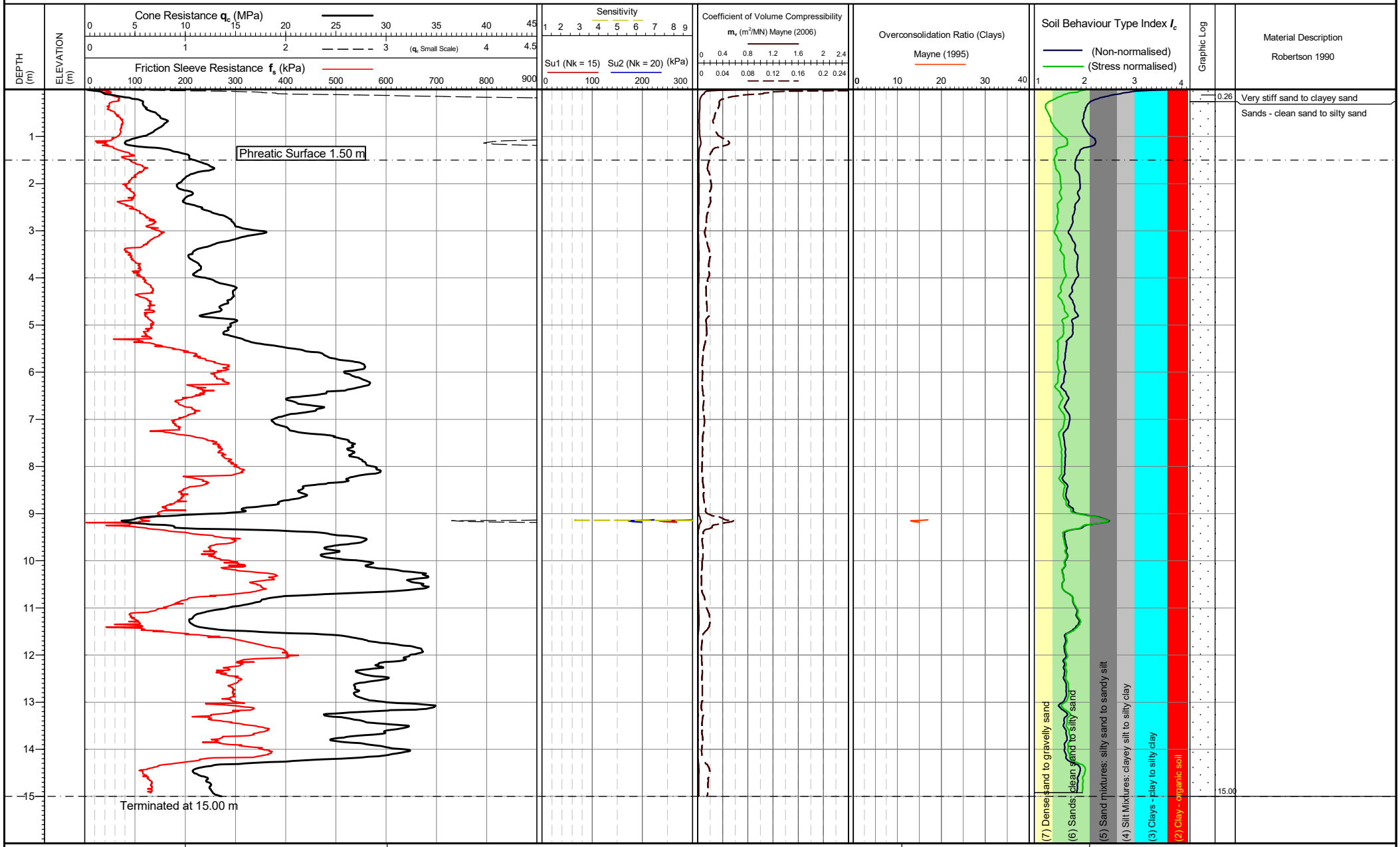
Checked by: Chris Player

TEST ID: CPT201

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 12:47:28

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

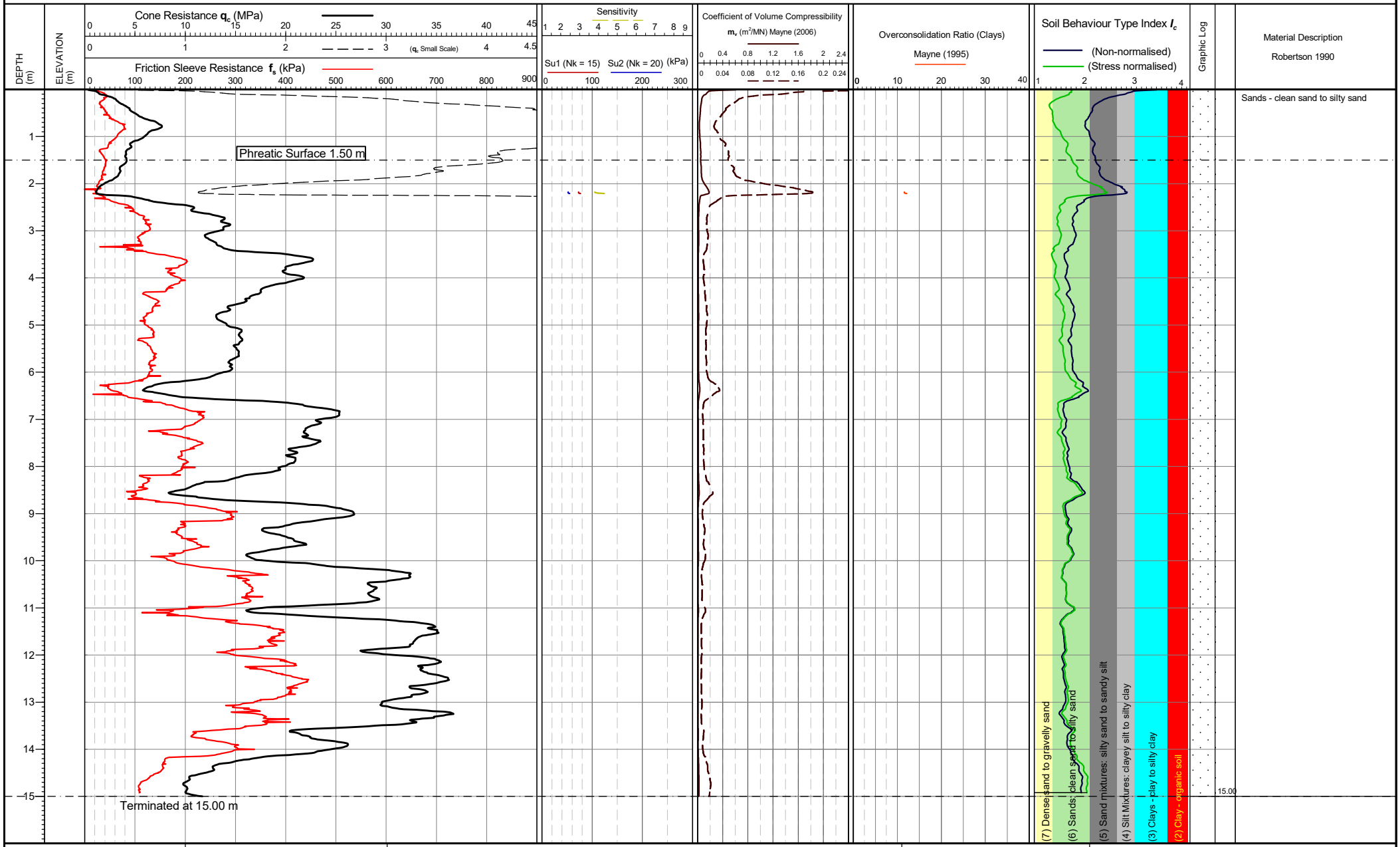
Checked by: Chris Player

TEST ID: CPT202

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 13:58:17

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

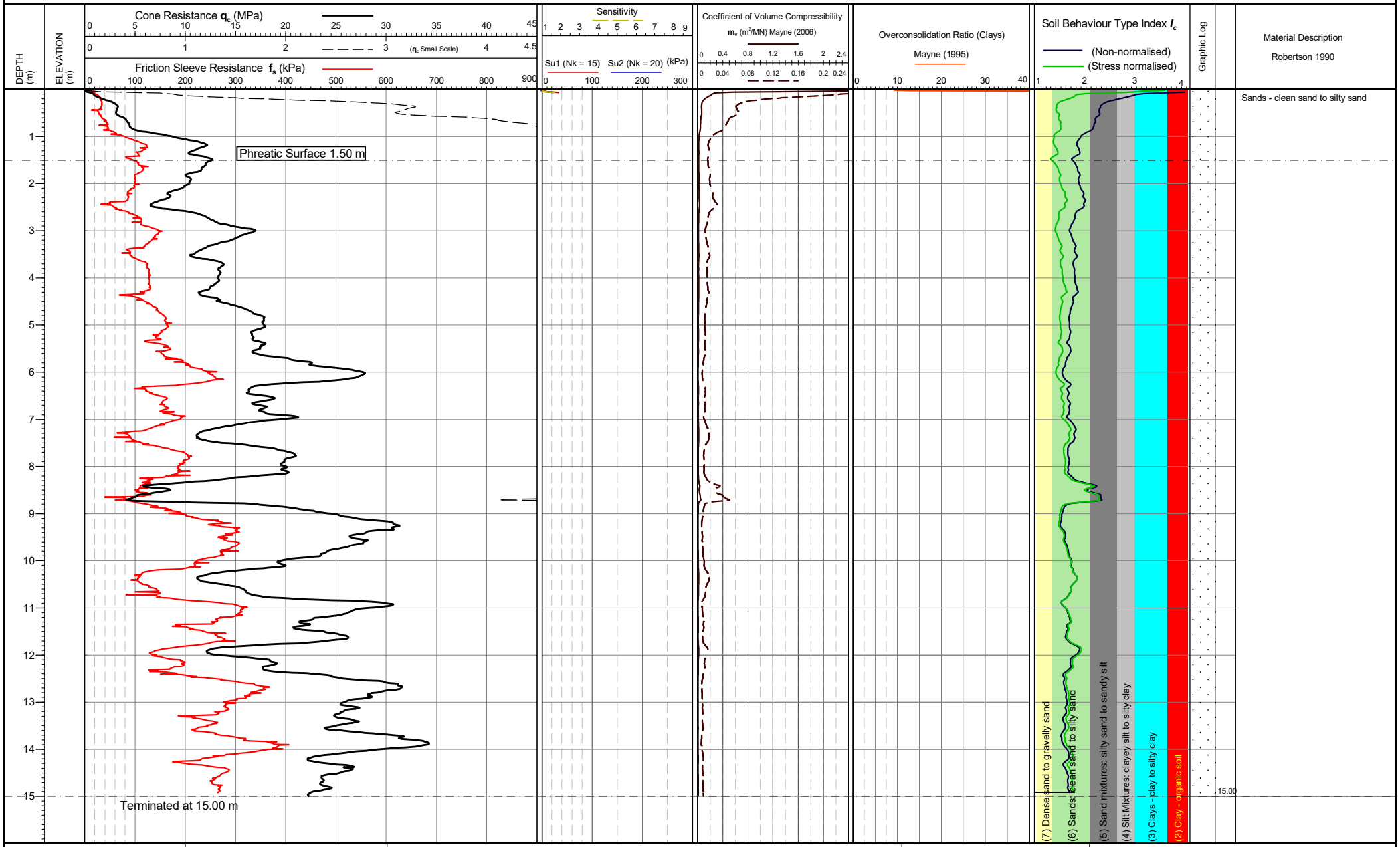
Checked by: Chris Player

TEST ID: CPT203

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 12:14:55

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

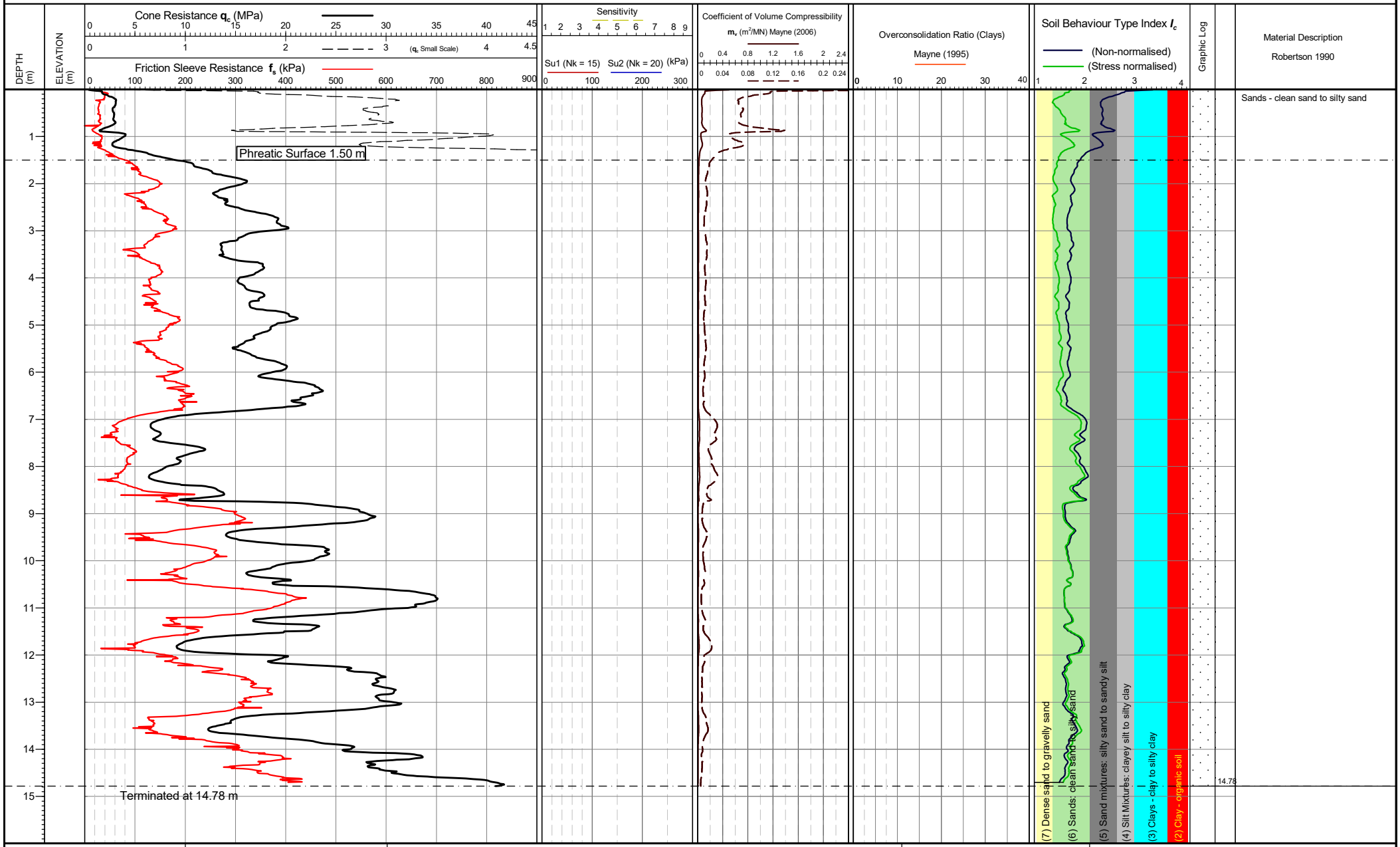
Checked by: Chris Player

TEST ID: CPT204

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 10:04:16

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

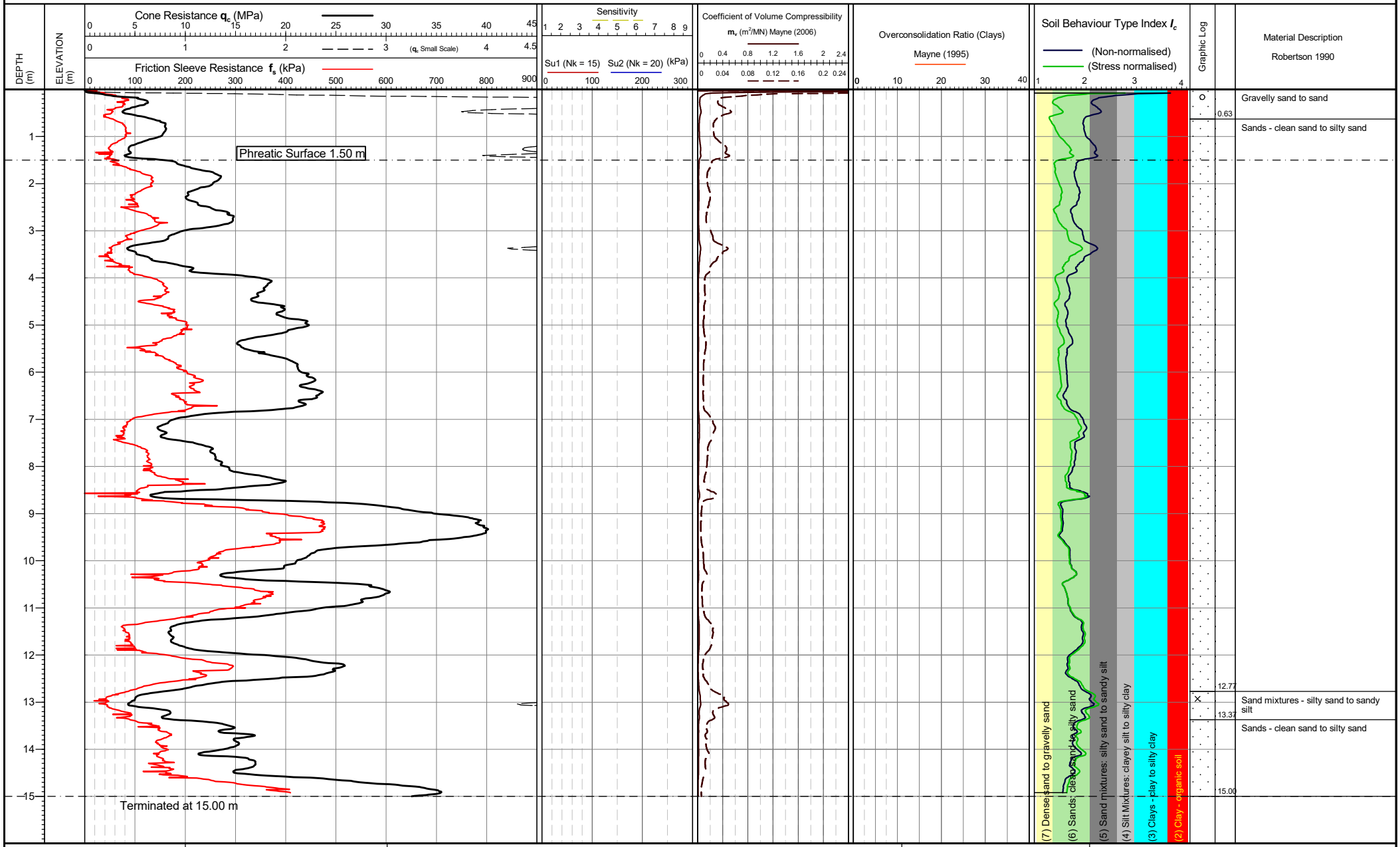
Checked by: Chris Player

TEST ID: CPT205

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 09:04:30

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

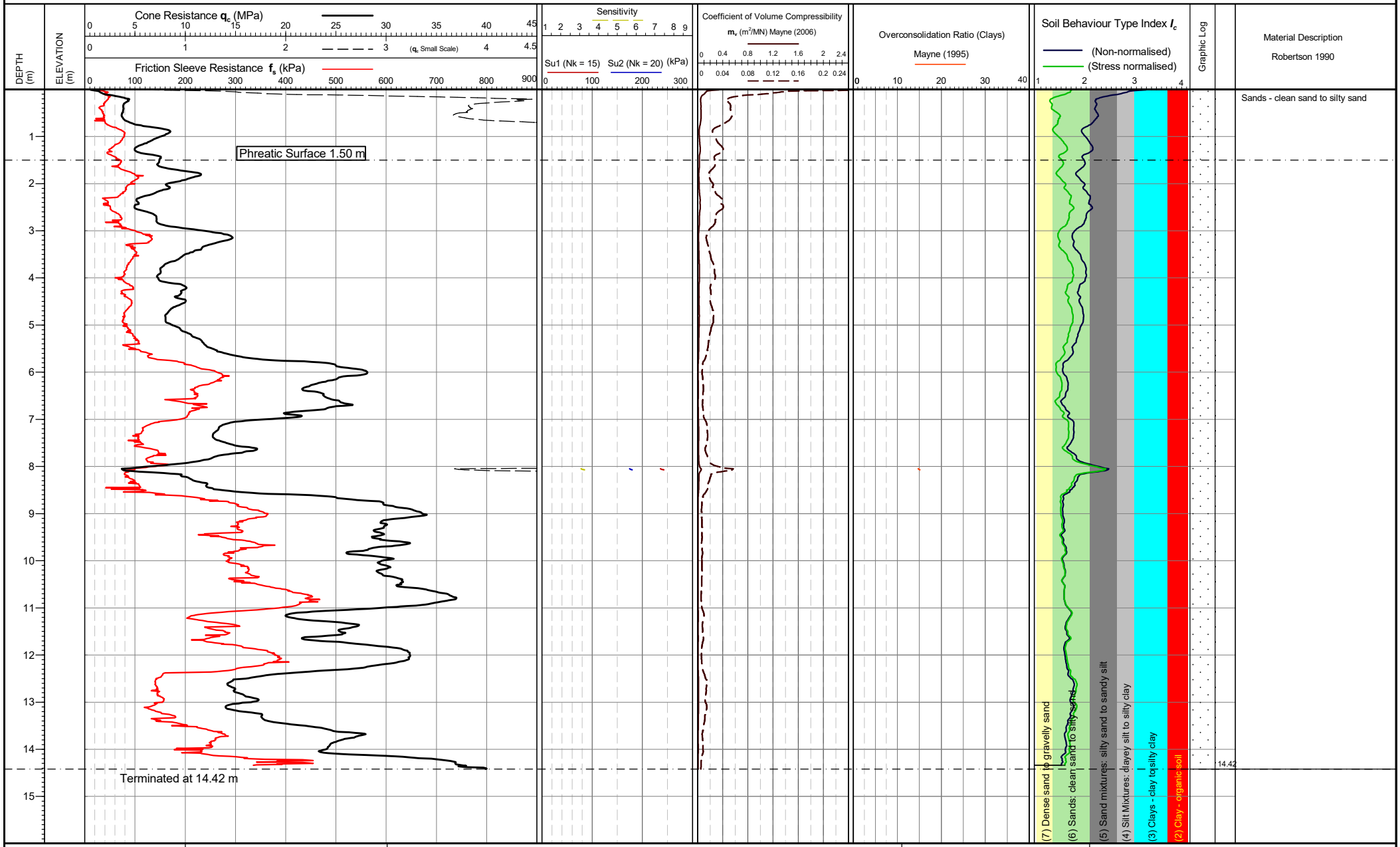
Checked by: Chris Player

TEST ID: CPT206

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 11:39:31

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

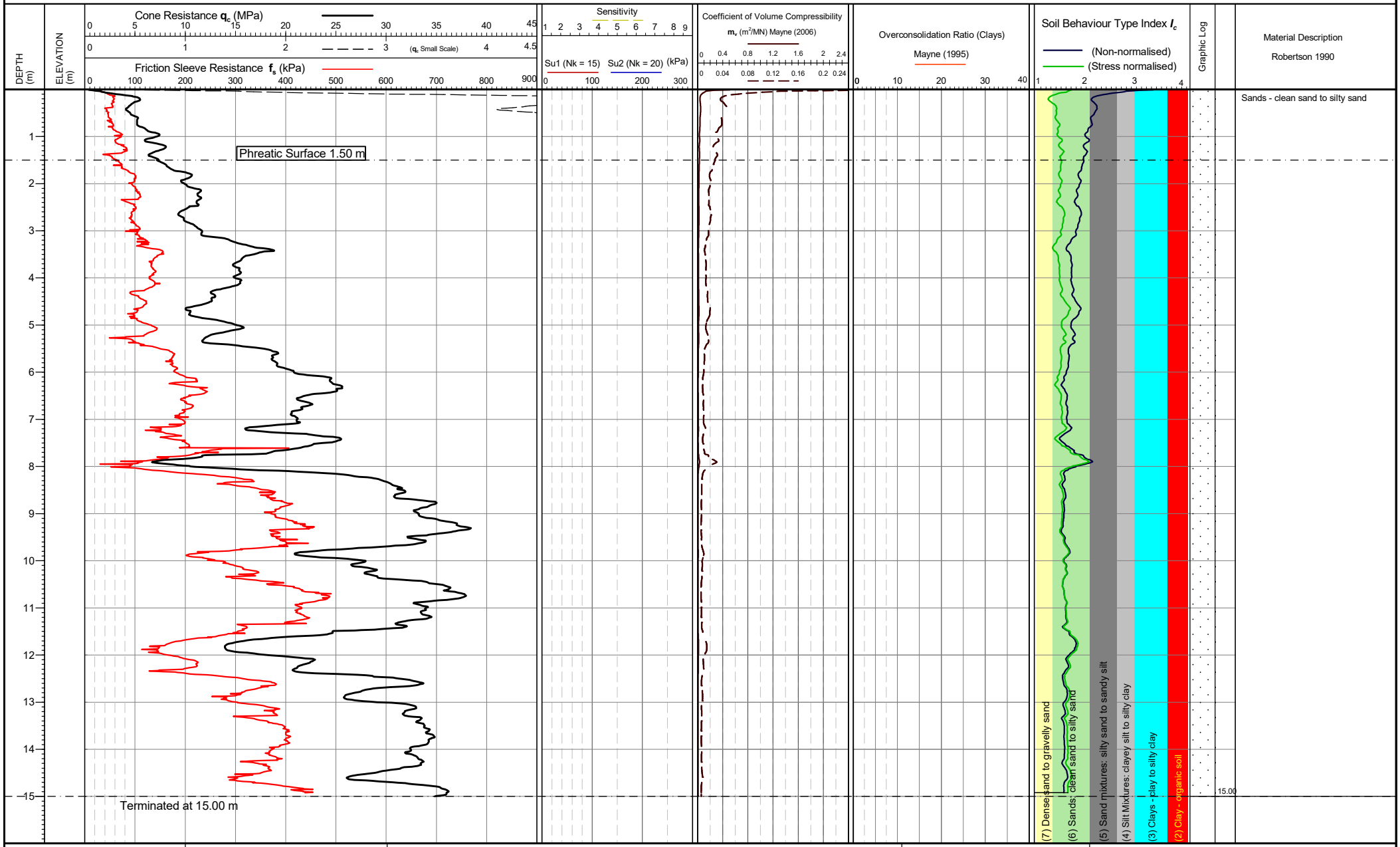
Checked by: Chris Player

TEST ID: CPT207

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 13:20:03

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

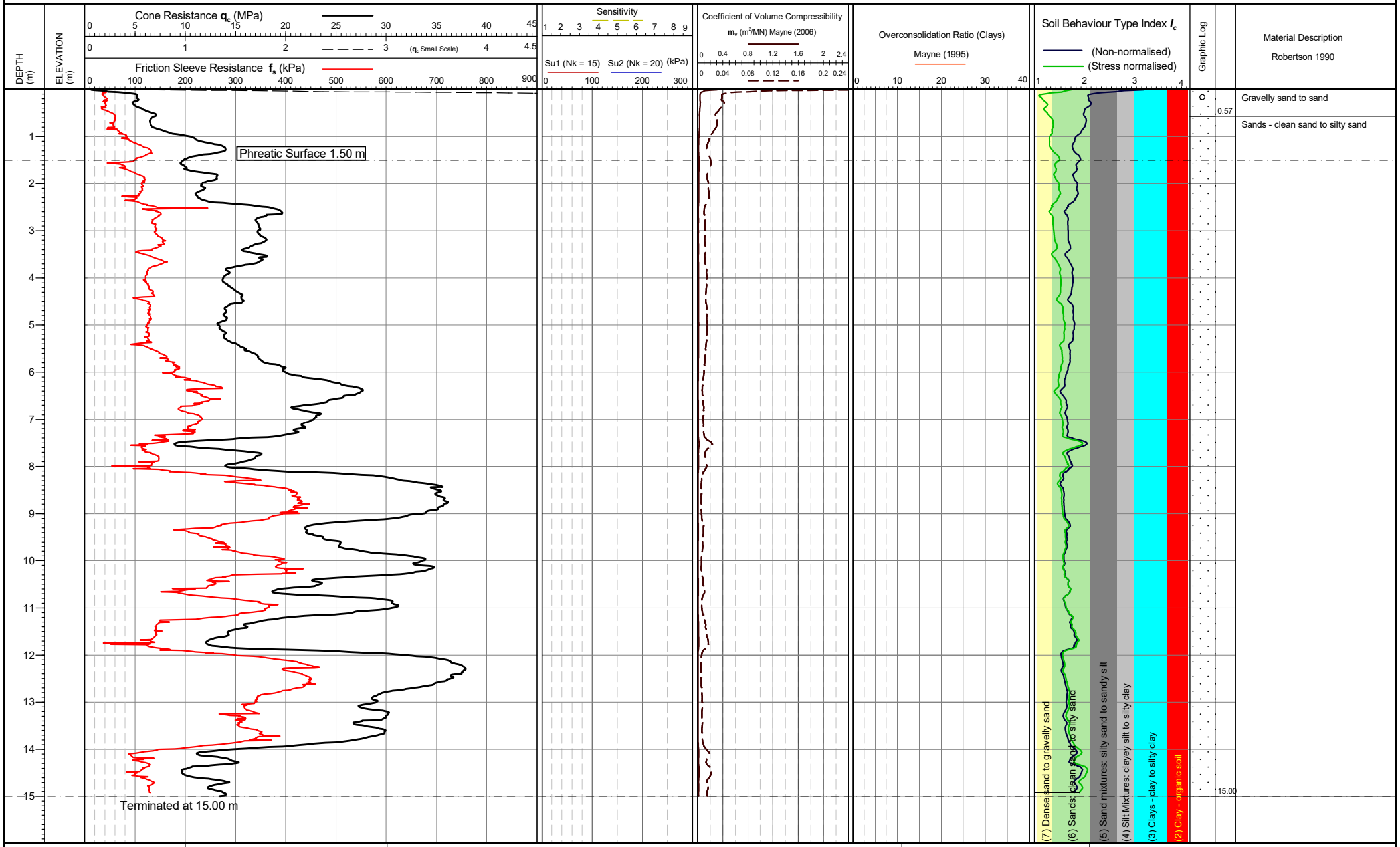
Checked by: Chris Player

TEST ID: CPT208

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 10:32:17

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

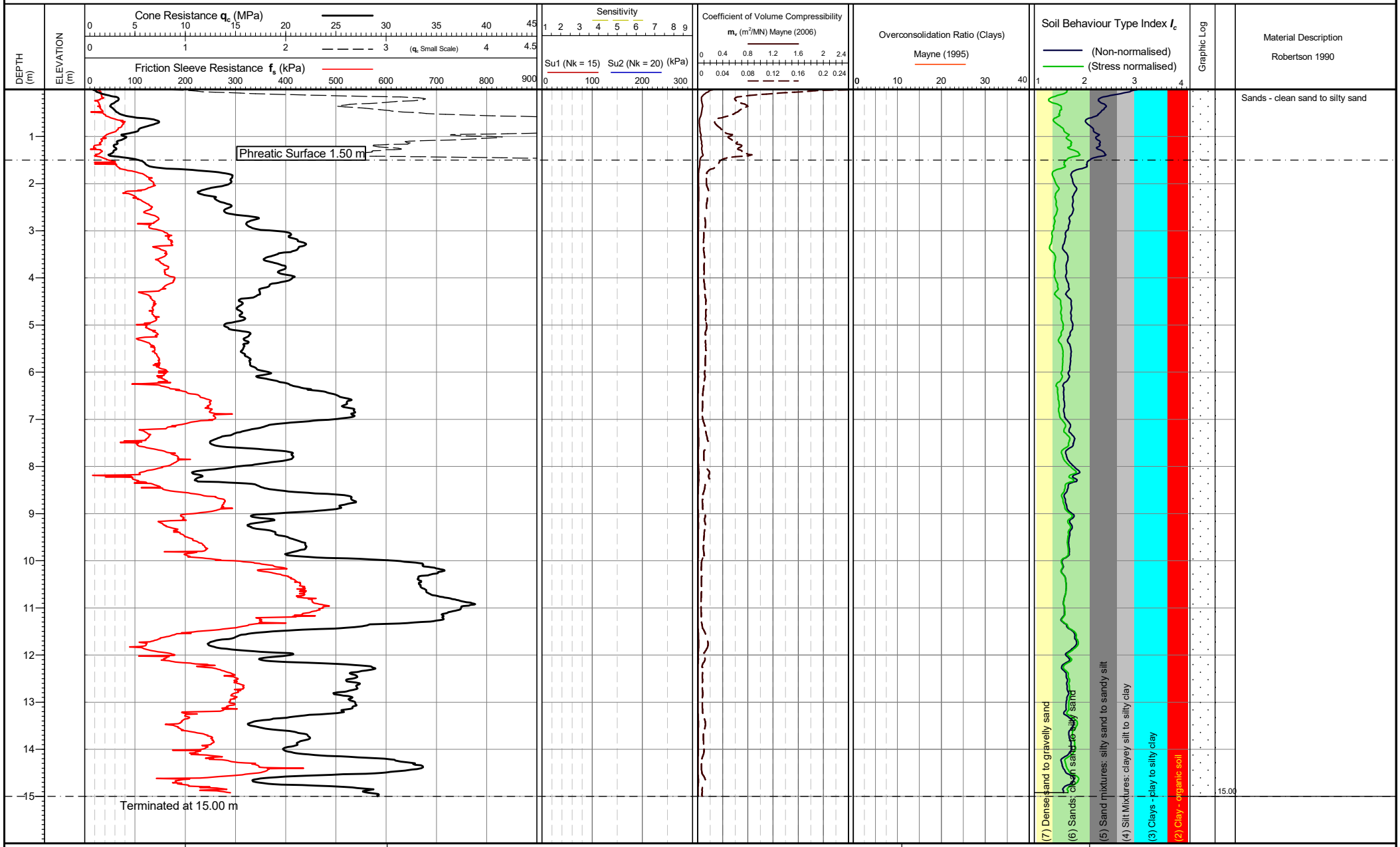
Checked by: Chris Player

TEST ID: CPT209

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 14:33:43

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

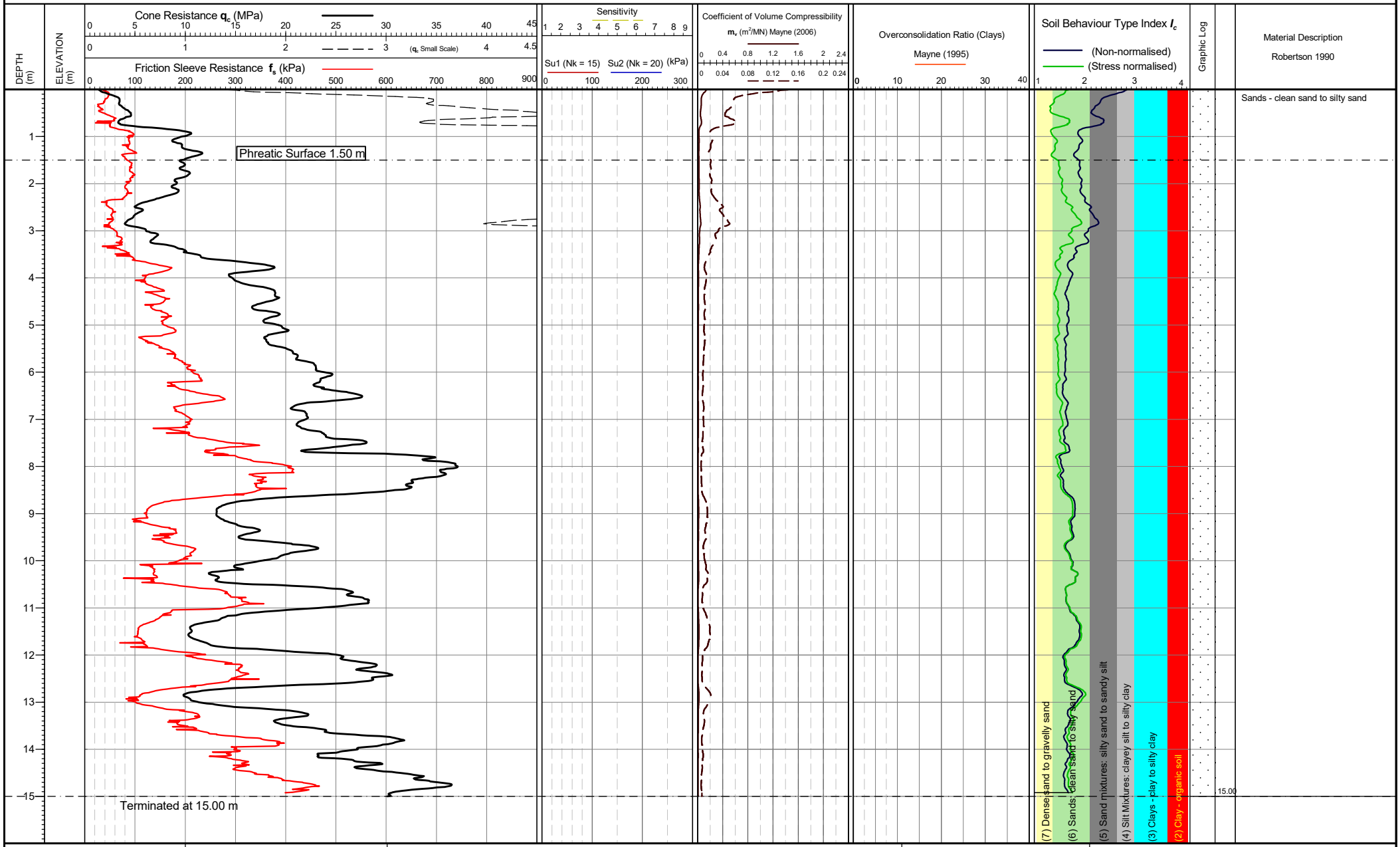
Checked by: Chris Player

TEST ID: CPT210

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 15:02:55

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

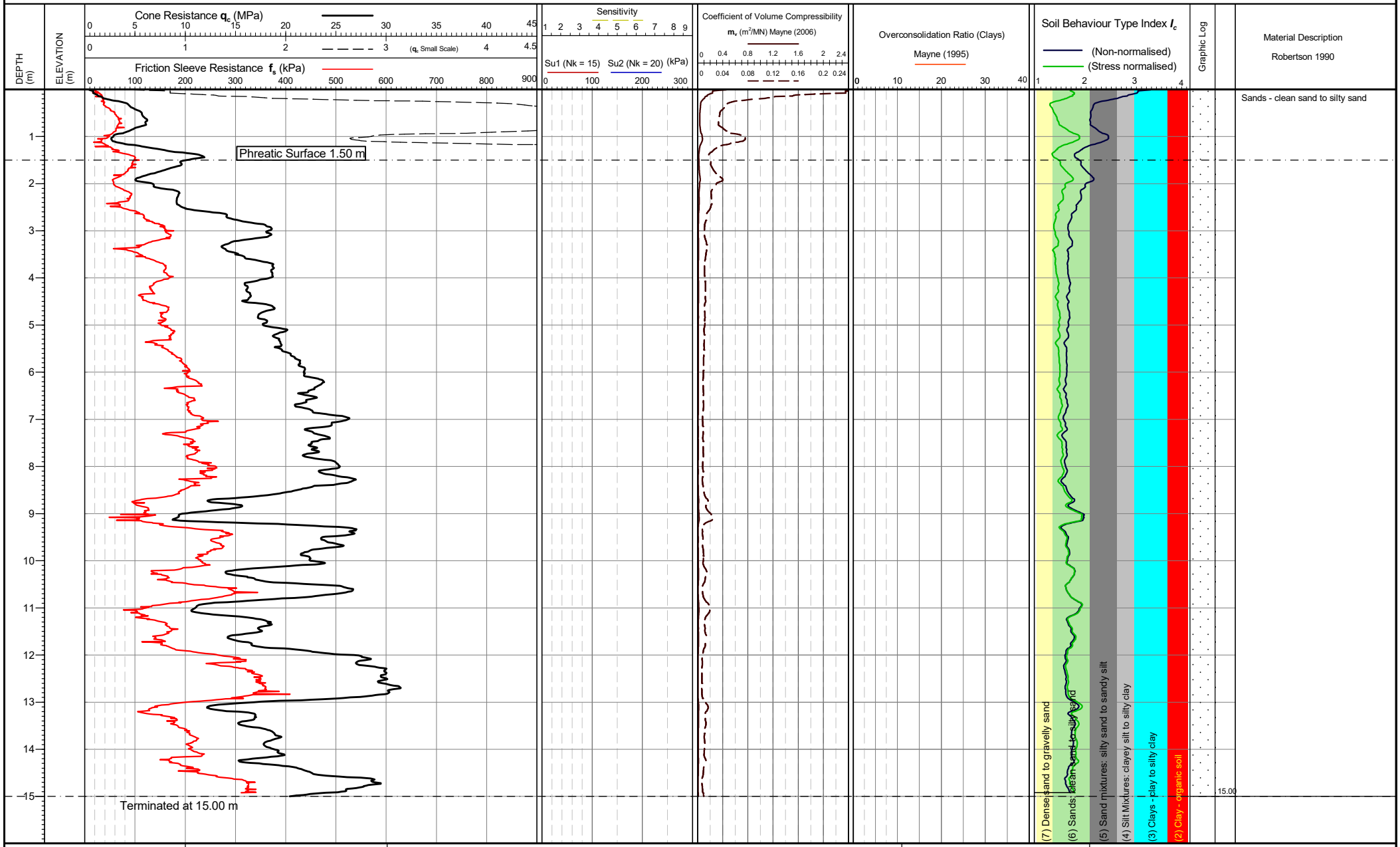
Checked by: Chris Player

TEST ID: CPT211

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1528
Operator: Walter Geddes
Rig Used: UK15
Date of test: 29/08/2018 09:34:03

Location: Flintshire, UK

Coordinates: ,

Elevation:

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 29-08-18

Lankelma Project Ref: P-106982-7

Checked by: Chris Player

TEST ID: CPT212

APPENDIX D STANDARD INTERPRETATION RESULTS (SET 2)

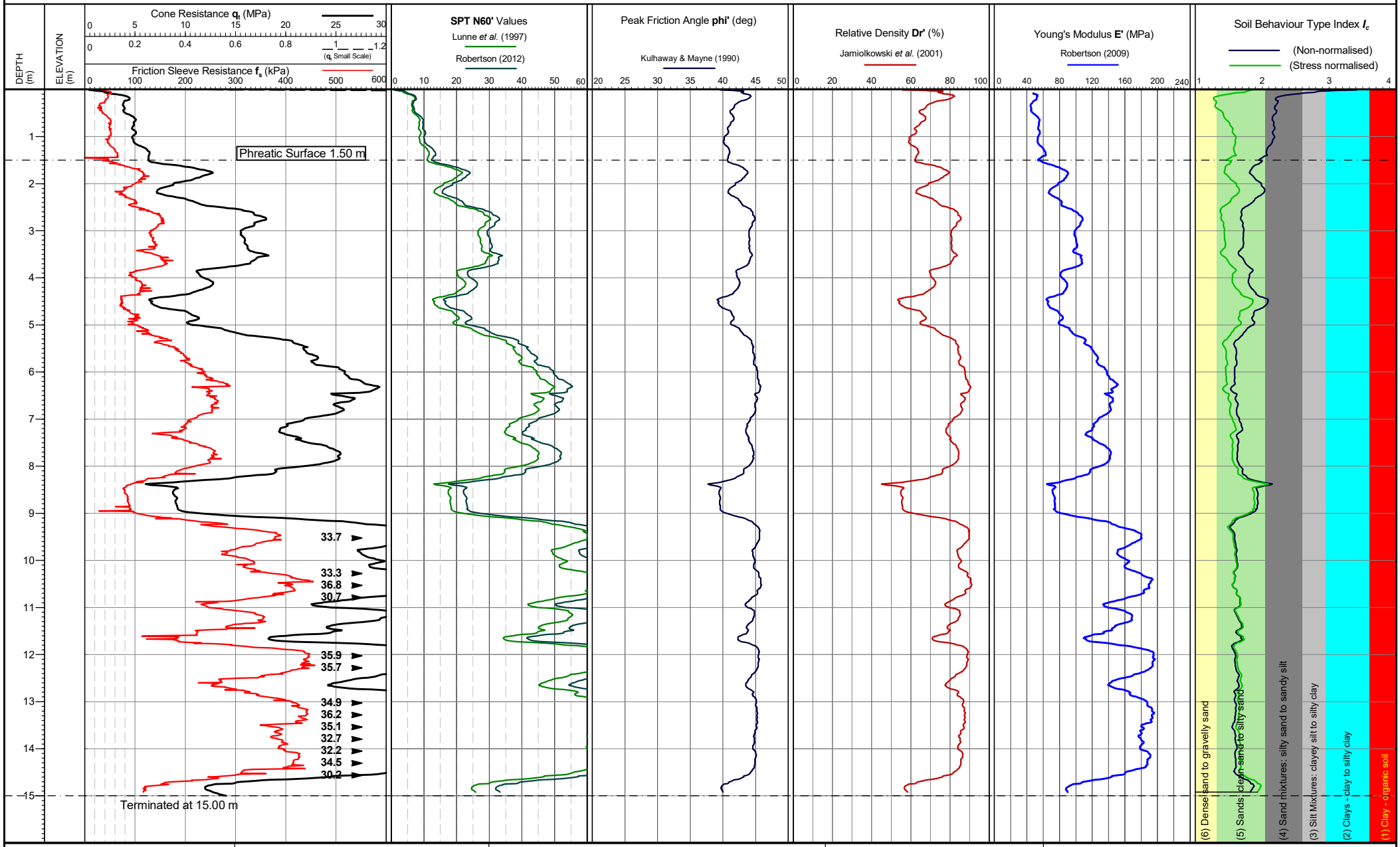
SPT N60
PEAK FRICTION ANGLE
RELATIVE DENSITY
YOUNG'S MODULUS

LIST OF FIGURES:

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 11:06:25

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

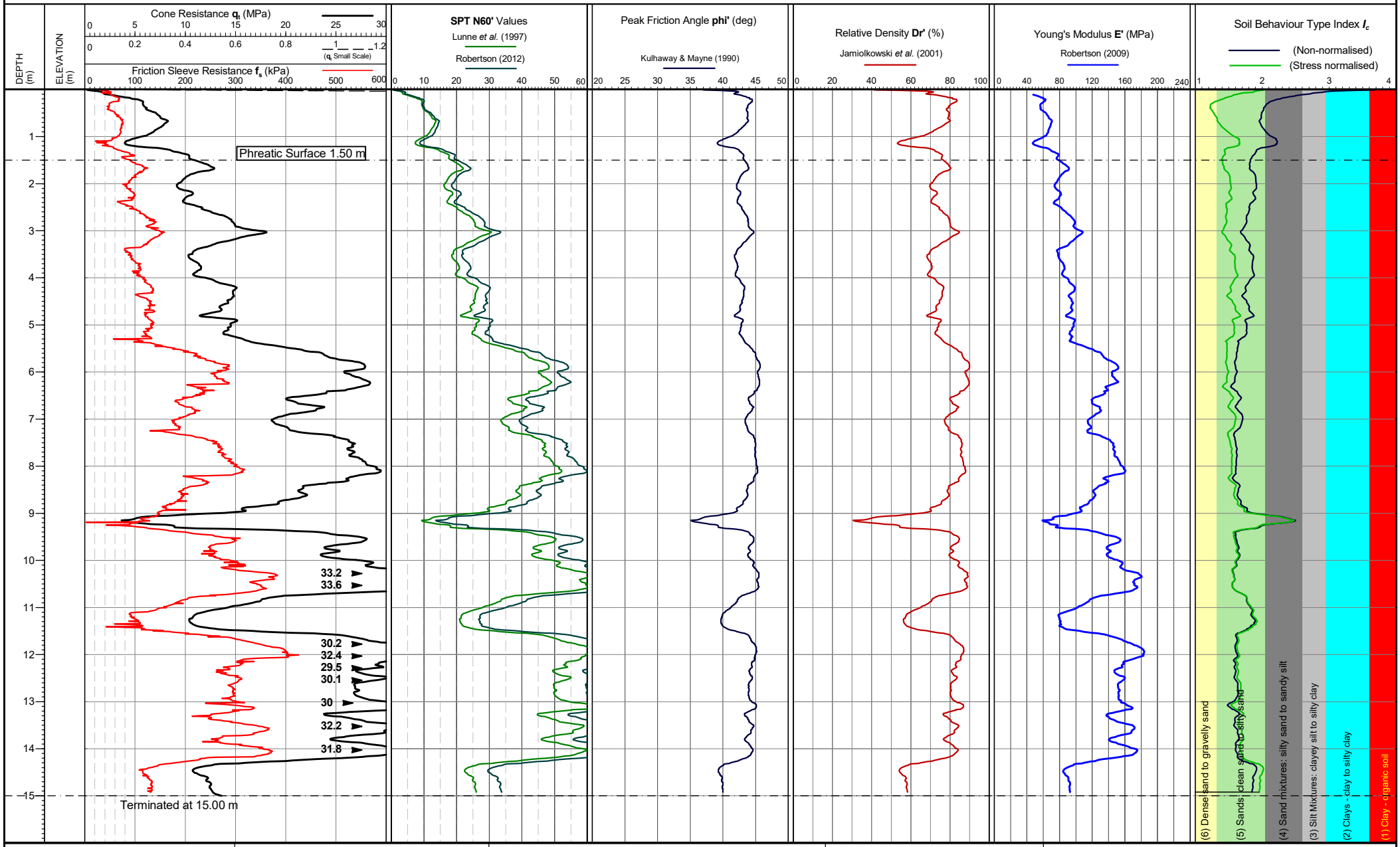
Lankelma Project Ref: P-106982-7

TEST ID: CPT201

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 12:47:28

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

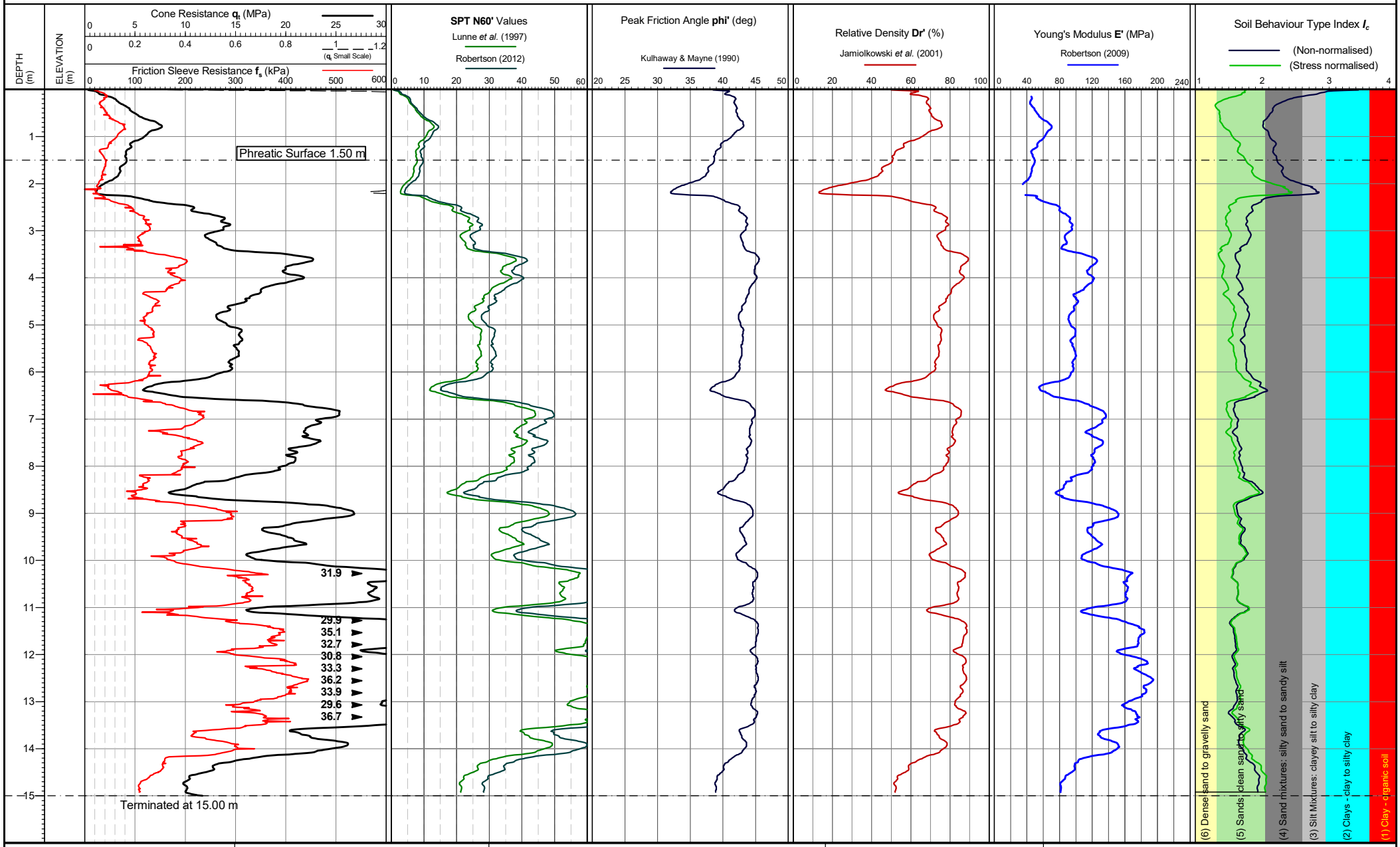
Lankelma Project Ref: P-106982-7

TEST ID: CPT202

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 13:58:17

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

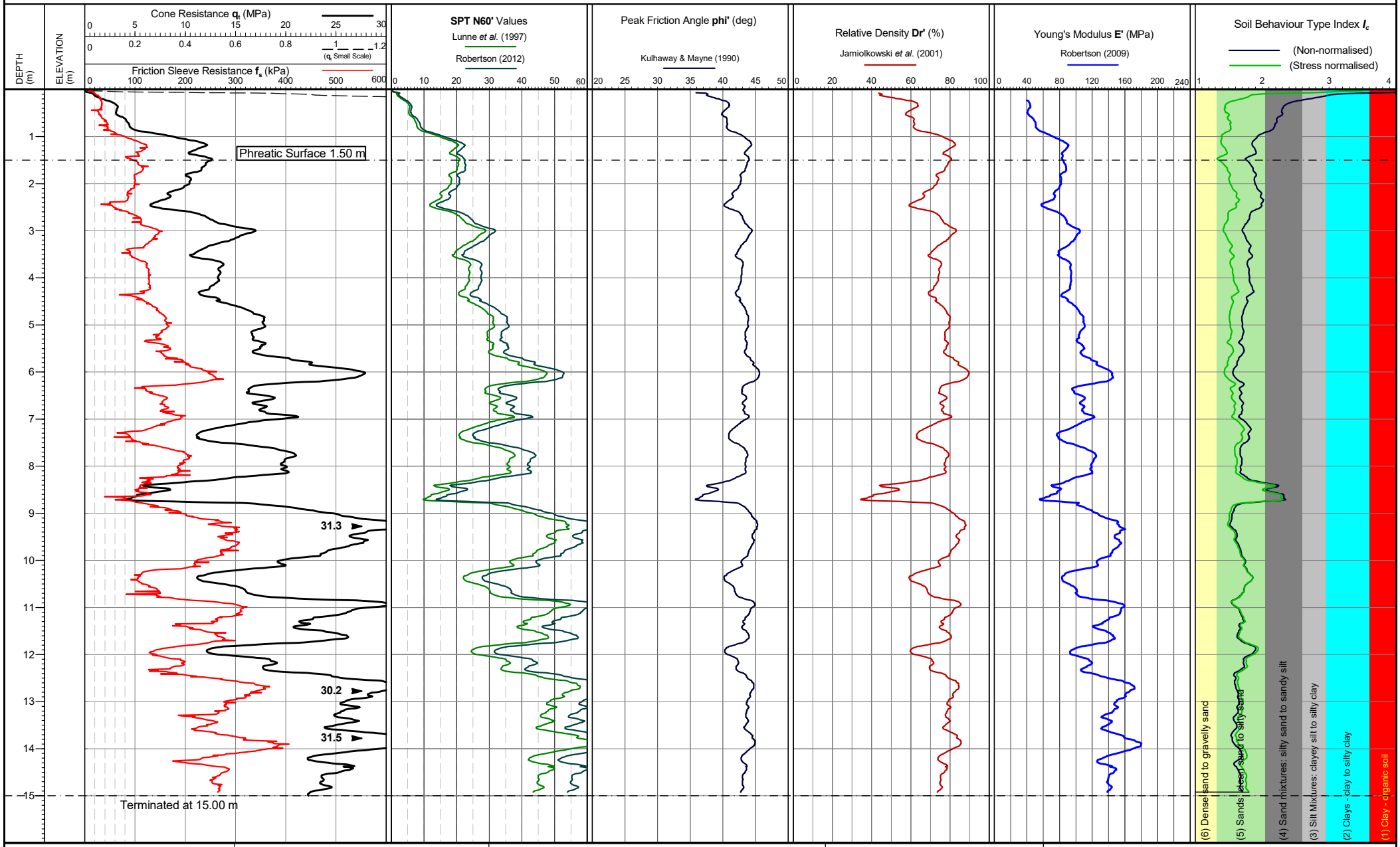
Lankelma Project Ref: P-106982-7

TEST ID: CPT203

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 12:14:55

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

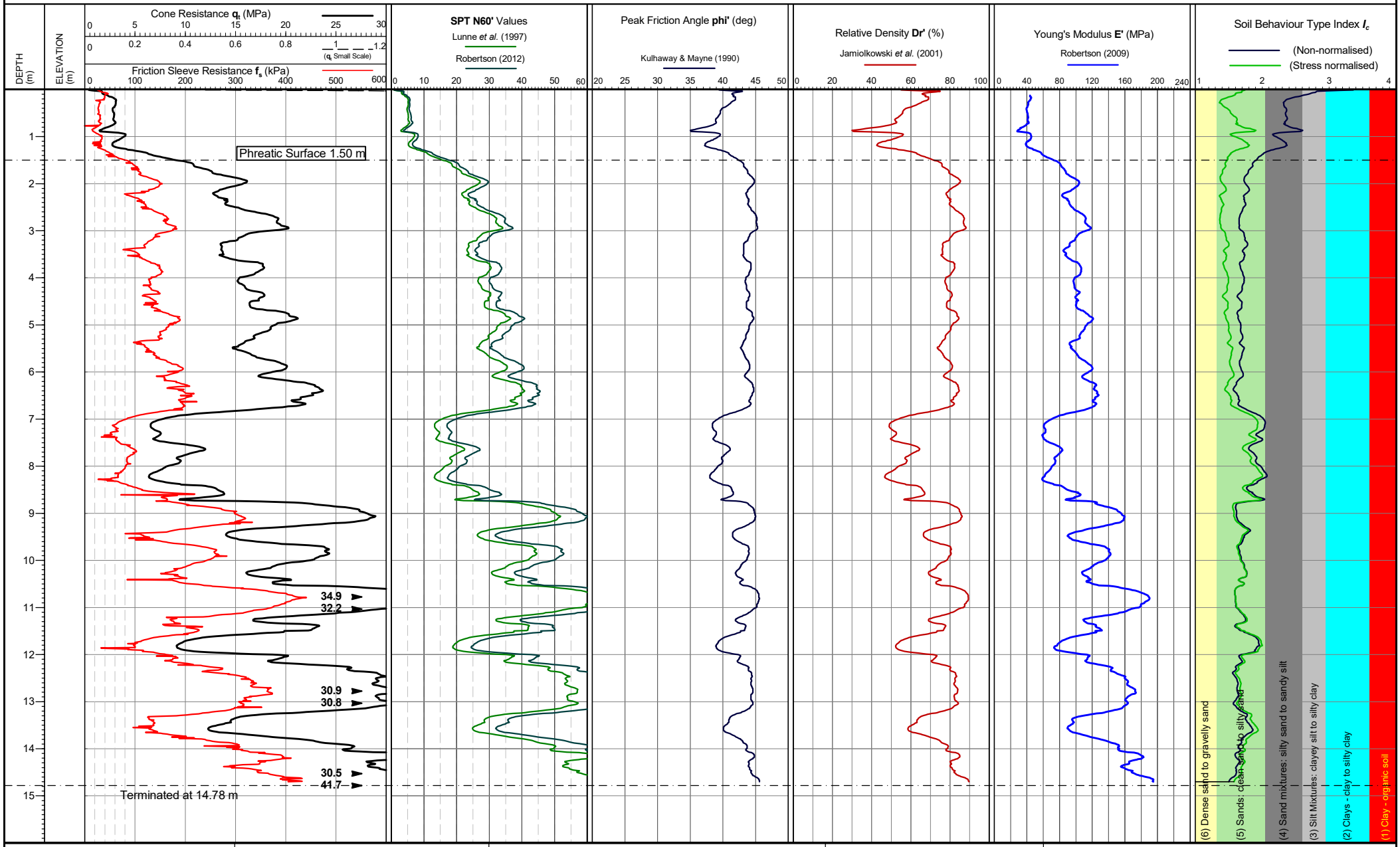
Lankelma Project Ref: P-106982-7

TEST ID: CPT204

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 10:04:16

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

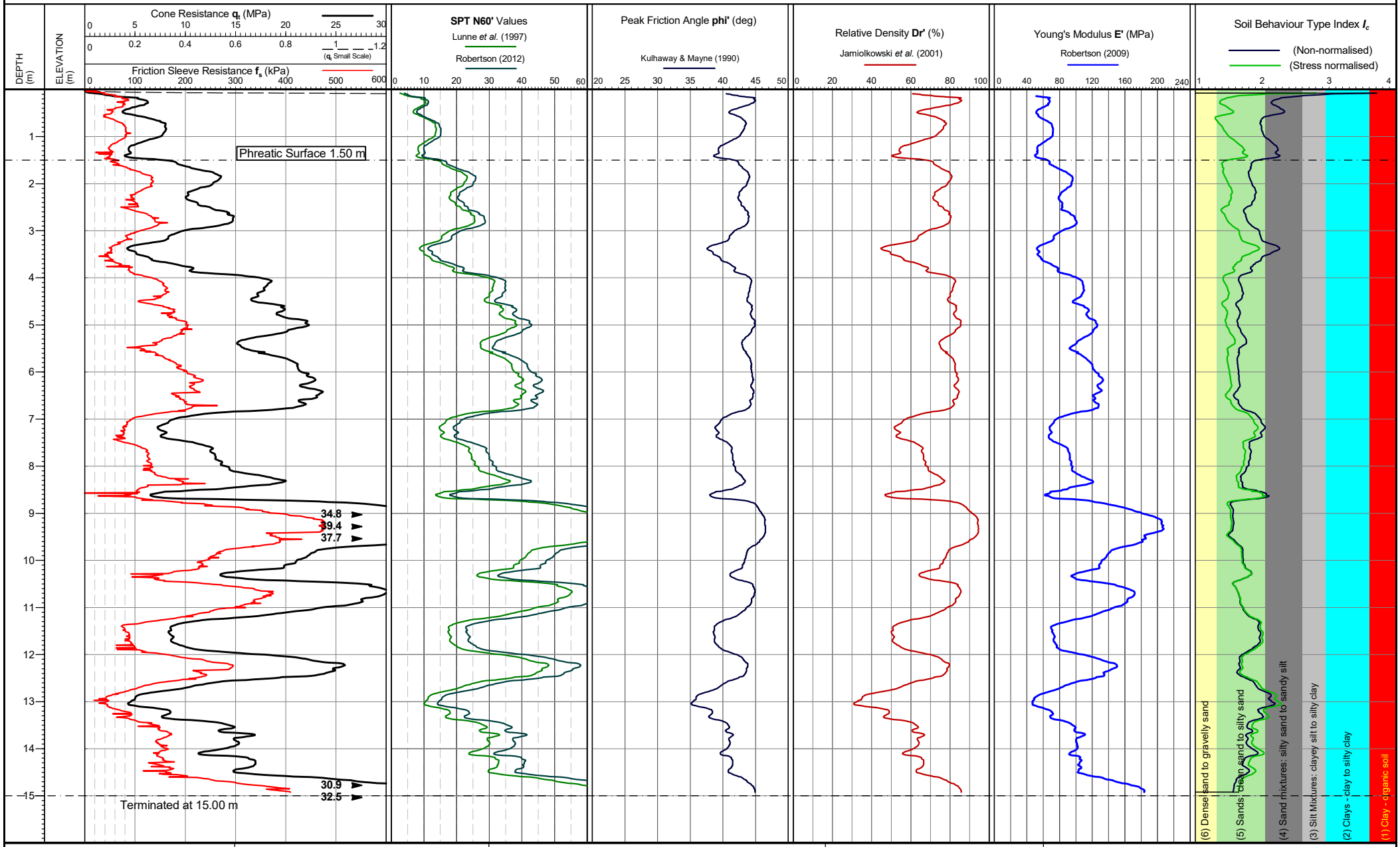
Lankelma Project Ref: P-106982-7

TEST ID: CPT205

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 09:04:30

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

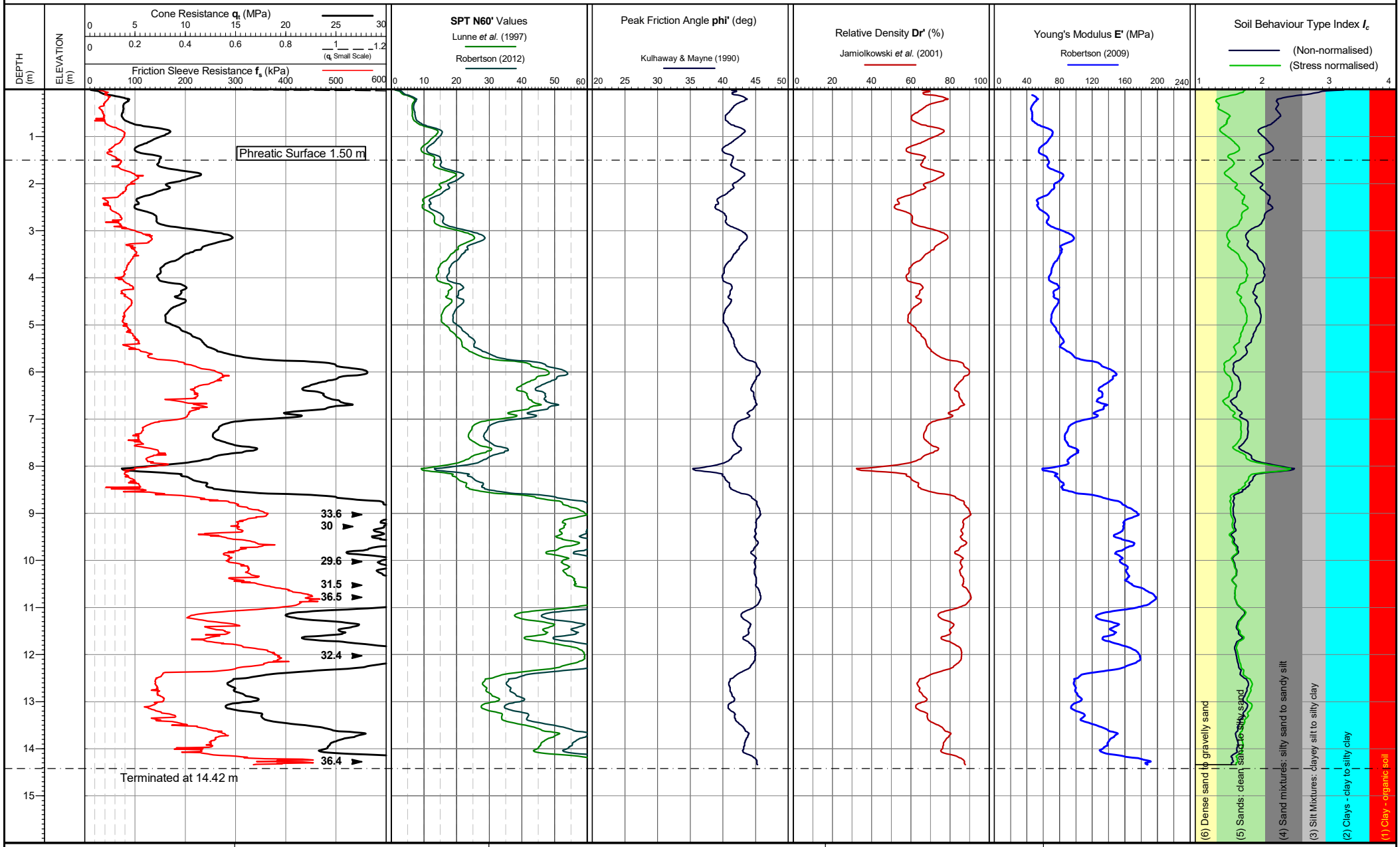
Checked by: Chris Player

Lankelma Project Ref: P-106982-7

TEST ID: CPT206

Client: JPG GROUP

Project: DEESIDE



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 11:39:31

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

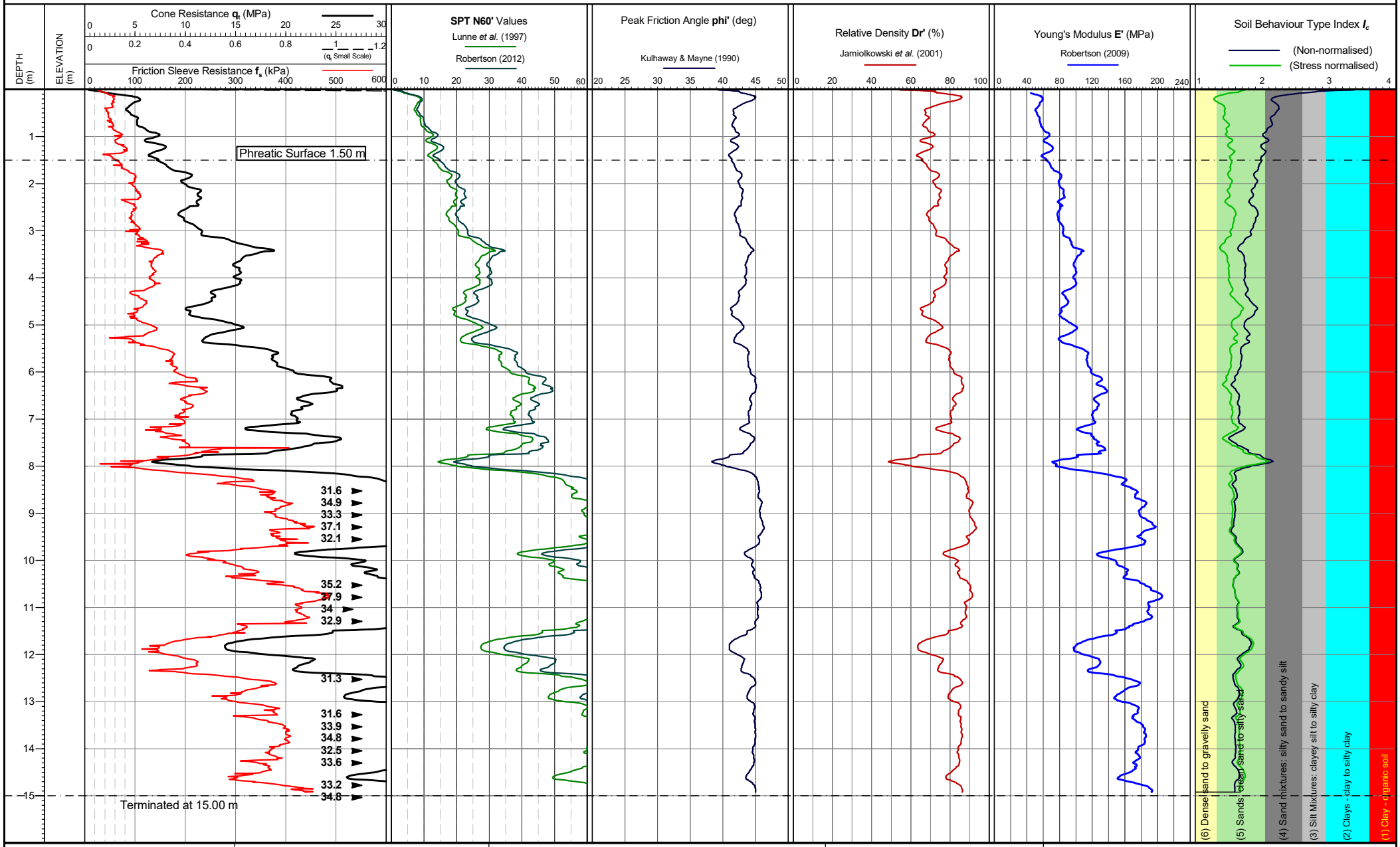
Lankelma Project Ref: P-106982-7

TEST ID: CPT207

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 13:20:03

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

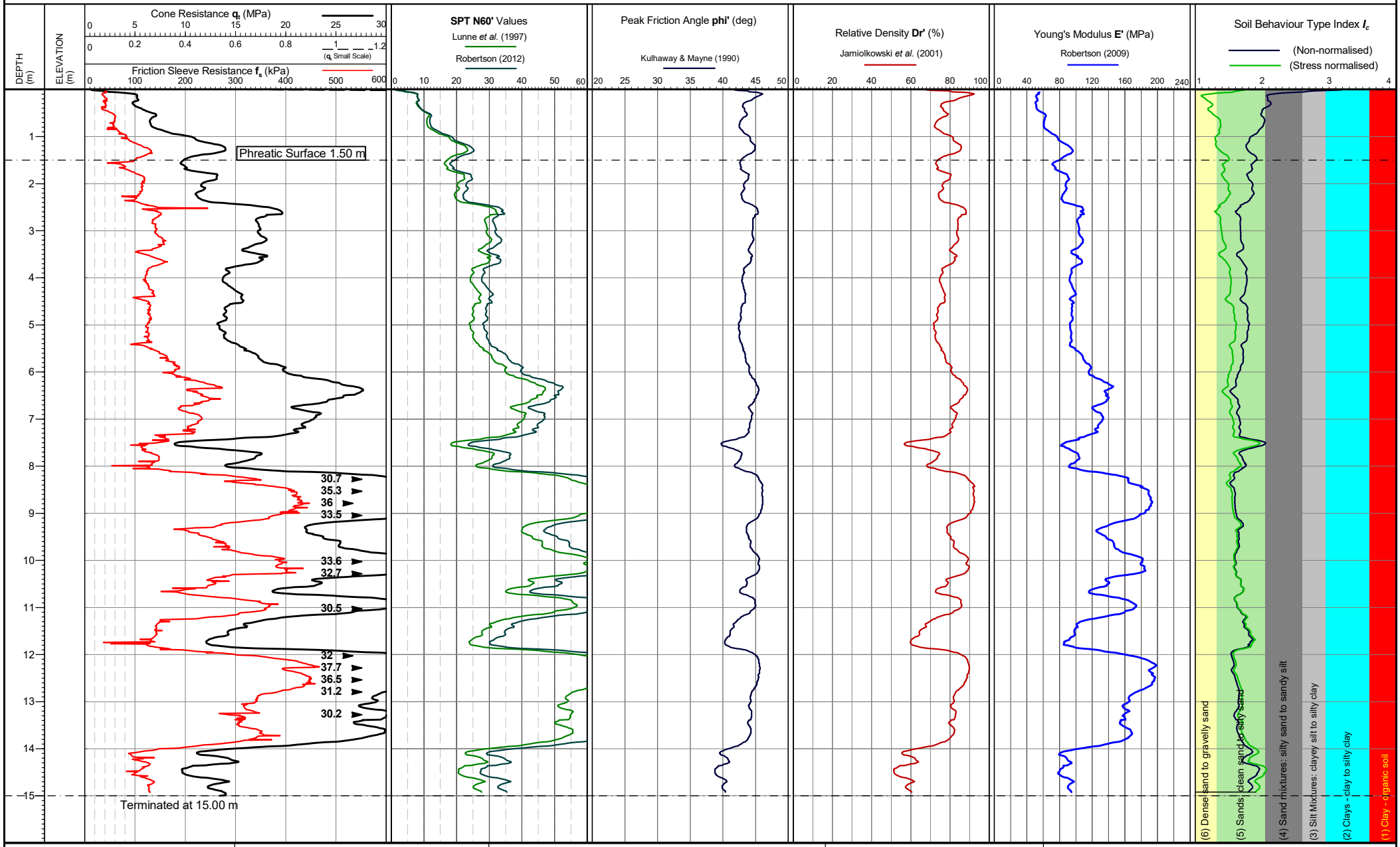
Lankelma Project Ref: P-106982-7

TEST ID: CPT208

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 10:32:17

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

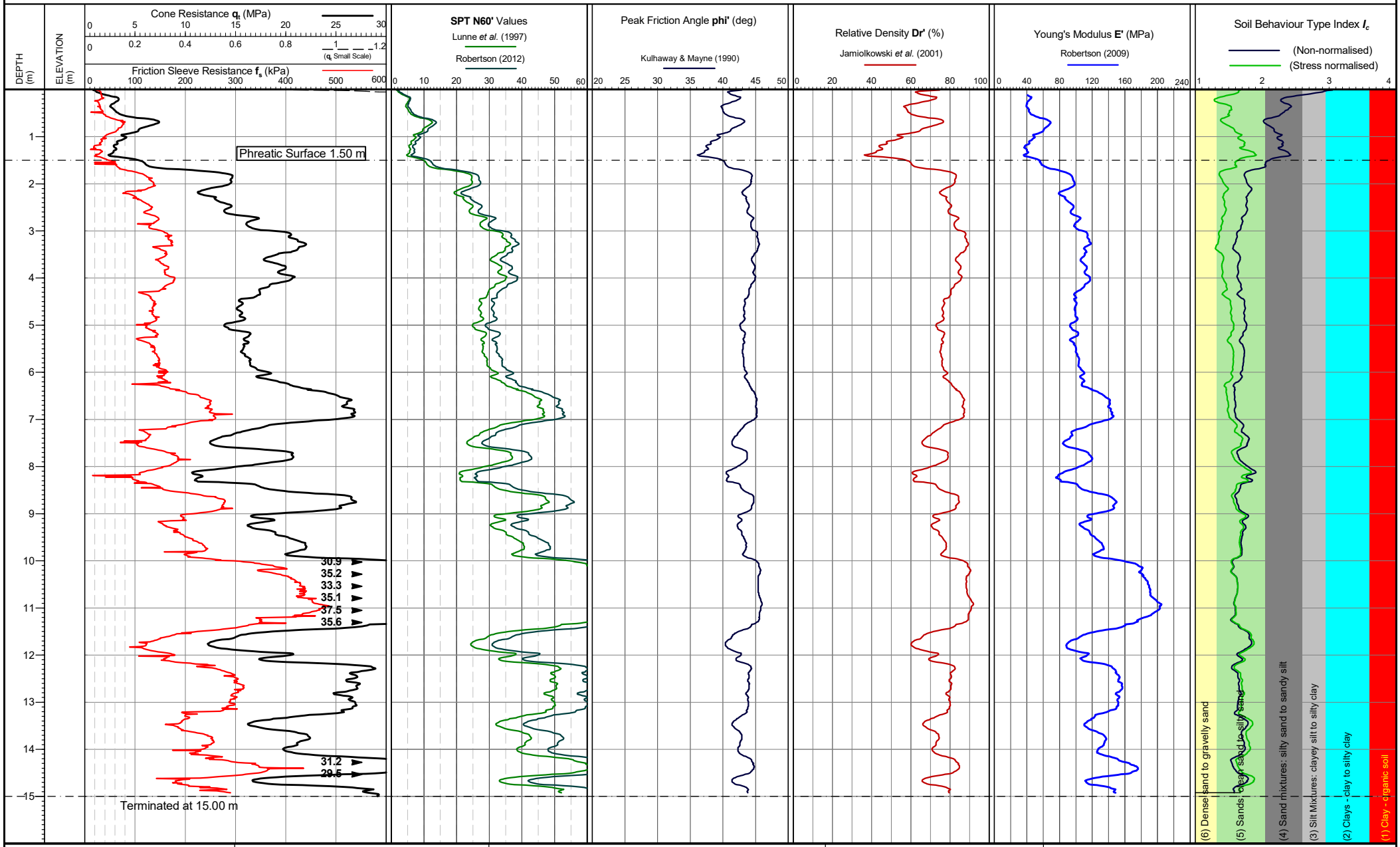
Lankelma Project Ref: P-106982-7

TEST ID: CPT209

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 14:33:43

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

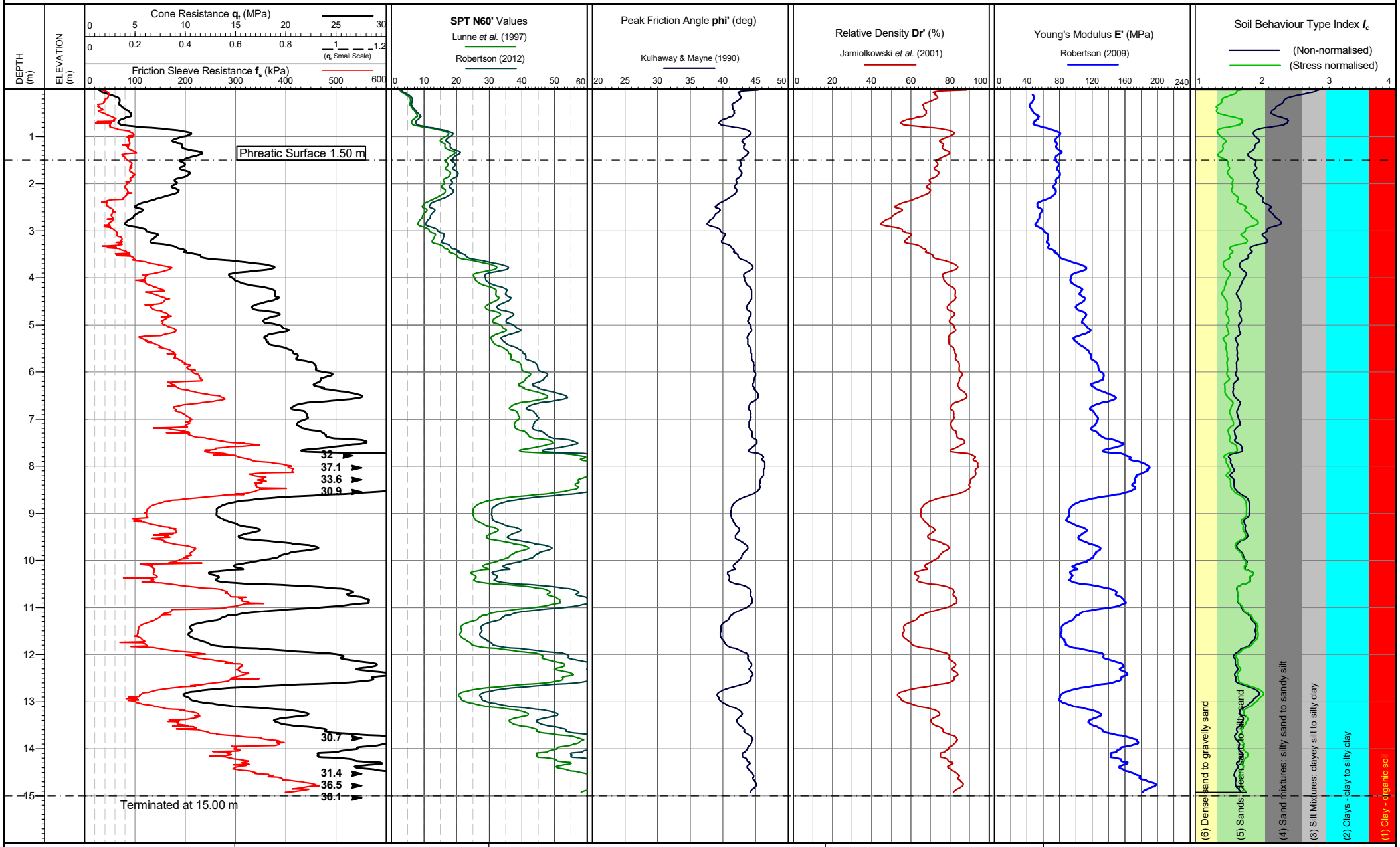
Lankelma Project Ref: P-106982-7

TEST ID: CPT210

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 15:02:55

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

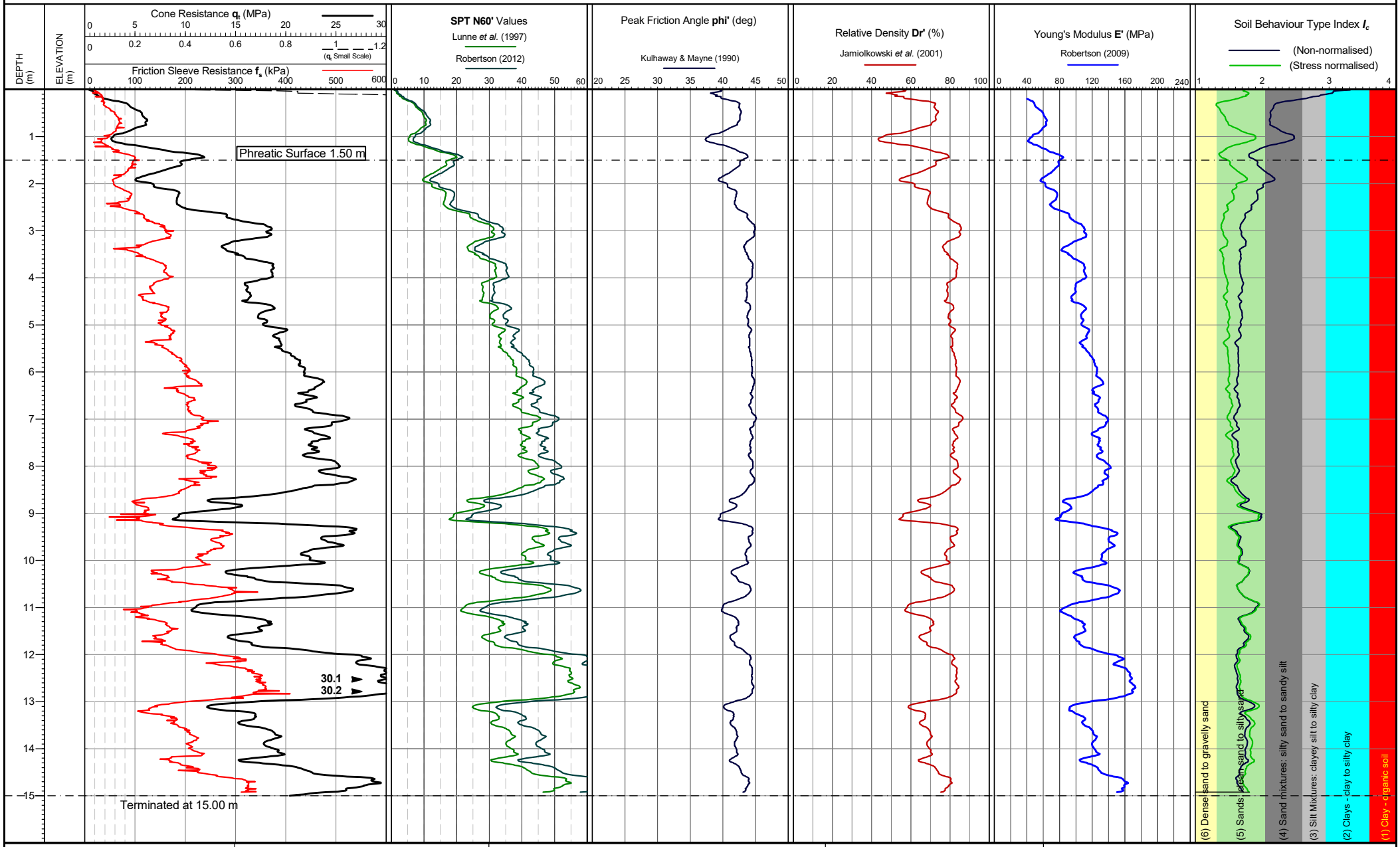
Lankelma Project Ref: P-106982-7

TEST ID: CPT211

Client: JPG GROUP

Project: DEESIDE

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1528
Operator: Walter Geddes
Date of test: 29/08/2018 09:34:03

Location: Flintshire, UK
Coordinates: ,
Elevation:
Coordinate system:

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.05-2.95. See report section 'Drained and Undrained Behaviour' for discussion.

See report section 'Interperative Data' for methods and discussion of parameter evaluation.

Date of plot: 11-09-18

Checked by: Chris Player

Lankelma Project Ref: P-106982-7

TEST ID: CPT212

Appendix E Groundwater and Gas Monitoring Results

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 1 **Date:** 07.09.2018

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	21.0	0.1	0.1	1.82	4.83
CP202	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	20.9	0.2	0.1	1.71	14.47
CP203	0.0	0.0	1.0	0.0	0.0	0.7	0.0	0.0	17.1	0.1	0.1	1.55	2.00
CP204	0.0	0.0	0.8	0.0	0.0	0.8	0.0	0.0	20.5	0.1	0.1	1.64	4.69
CP205	0.0	0.0	0.9	0.0	0.0	0.4	0.0	0.0	19.0	0.1	0.1	1.51	4.54
CP206	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	21.2	0.1	0.1	1.73	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 20.1 %v/v

Barometric Pressure: **Start** 1014
End 1015
Barometric Pressure Trend: Steady.
Weather: Overcast, slight breeze and light rain.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

Key	Remarks
NR - Not Recorded NA - Not Applicable	Potentially tidal influence on groundwater levels.

Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 2 **Date:** 13.09.2018

JPG
CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.0	0.5	0.0	0.0	0.5	0.0	3.0	20.2	0.1	0.0	1.83	4.83
CP202	0.0	0.0	0.2	0.0	0.0	0.1	0.0	1.0	20.9	0.1	0.1	1.73	14.47
CP203	0.0	0.0	1.2	0.0	0.0	0.7	0.0	2.0	15.9	0.0	0.0	1.49	2.00
CP204	0.0	0.0	0.7	0.0	0.0	0.7	0.0	1.0	20.5	0.1	0.1	1.62	4.69
CP205	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0	19.8	0.1	0.1	1.55	4.54
CP206	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1.0	21.4	0.1	0.1	1.63	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 21.4 %v/v

Barometric Pressure: **Start** 1022
End 1022
Barometric Pressure Trend: Falling.
Weather: Overcast, slightly windy.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

Key	Remarks
NR - Not Recorded NA - Not Applicable	Potentially tidal influence on groundwater levels.
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 3 **Date:** 20/09/2018

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	19.2	0.2	0.1	1.83	4.83
CP202	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	20.1	0.1	0.1	1.70	14.47
CP203	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	18.9	0.1	0.0	1.49	2.00
CP204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.1	0.1	0.1	1.66	4.69
CP205	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.1	0.1	1.58	4.54
CP206	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	20.1	0.0	0.0	1.63	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 20.2 %v/v

Barometric Pressure: **Start** 1015
End 1015
Barometric Pressure Trend: Falling.
Weather: Raining.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

NR - Not Recorded
NA - Not Applicable

Remarks

Potentially tidal influence on groundwater levels.

Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 4 **Date:** 26/09/2018

CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.0	0.0	0.0	0.0	0.0	1	1	21.3	0.0	0.0	1.81	4.83
CP202	0.0	0.0	0.0	0.0	0.0	0.0	0	0	21.3	0.1	0.1	1.69	14.47
CP203	0.0	0.0	1.0	0.0	0.0	0.5	0	0	18.5	0.1	0.1	1.54	2.00
CP204	0.0	0.0	0.1	0.0	0.0	0.1	1	0	21.0	0.1	0.1	1.64	4.69
CP205	0.0	0.0	0.7	0.0	0.0	0.2	0	0	20.3	0.1	0.1	1.45	4.54
CP206	0.0	0.0	0.0	0.0	0.0	0.0	0	1	21.5	-3.0	0.1	1.76	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 21.1 %v/v

Barometric Pressure: **Start** 1030
End 1031
Barometric Pressure Trend: Steady high.
Weather: Overcast, slightly breezy and warm.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

Key	Remarks
NR - Not Recorded NA - Not Applicable	Potentially tidal influence on groundwater levels.
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 5 **Date:** 05/10/2018

CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.2	1.1	0.0	0.2	1.0	0.0	0.0	18.6	-1.3	0.0	1.82	4.83
CP202	0.0	0.3	1.6	0.0	0.2	1.2	0.0	0.0	18.1	0.0	0.1	1.70	14.47
CP203	0.0	0.2	0.1	0.0	0.2	0.1	0.0	0.0	21.4	0.1	0.1	1.54	2.00
CP204	0.0	0.2	1.0	0.0	0.2	0.4	0.0	0.0	20.4	0.1	0.1	1.67	4.69
CP205	0.0	0.2	0.1	0.0	0.2	0.1	0.0	0.0	20.9	0.3	0.1	1.40	4.54
CP206	0.0	0.2	0.3	0.0	0.2	0.3	0.0	0.0	20.6	0.0	0.1	1.77	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 20.1 %v/v

Barometric Pressure: **Start** 1015
End 1014
Barometric Pressure Trend: Steady.
Weather: Bright, slightly windy.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

Key	Remarks
NR - Not Recorded NA - Not Applicable	Potentially tidal influence on groundwater levels.
	Checked: **Approved:**

GAS AND GROUNDWATER MONITORING RESULTS

Site: Airfields, Deeside
Job No: 4671 **Client:** Praxis Real Estate Management Ltd
Visit No: 6 **Date:** 23/10/2018

JPG CIVIL & STRUCTURAL ENGINEERING

Monitoring Location	Gas Concentration									Gas Emission Rate		GWL	Base of Standpipe
	Peak			Steady			Highest	Highest	Lowest				
BH	CH_4		CO_2	CH_4		CO_2	H_2S	CO	O_2	Litre/Hour			
	% lel	%v/v	%	% lel	%v/v	%	ppm	ppm	%	Peak	Steady	(m) bgl	
CP201	0.0	0.0	0.9	0.0	0.0	0.9	0.0	0.0	20.1	0.2	0.2	1.77	4.83
CP202	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0	19.2	0.1	0.1	1.70	14.47
CP203	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	20.1	0.1	0.1	1.51	2.00
CP204	0.0	0.0	1.0	0.0	0.0	0.9	0.0	0.0	20.1	0.2	0.2	1.52	4.69
CP205	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	20.7	0.1	0.1	1.28	4.54
CP206	0.0	0.1	0.3	0.0	0.0	0.3	0.0	0.0	20.2	-10.9	-2.6	1.47	12.02

Ambient Concentration (% volume): CH_4 0.0 %v/v CO_2 0.0 %v/v
O_2 20.3 %v/v

Barometric Pressure: **Start** 1032
End 1032
Barometric Pressure Trend: High.
Weather: High Tide, extremely windy.

Monitoring Equipment: GA5000
Serial Number of Equipment: G505491
Date of Last Calibration: 24.May.2018
Operator: MHP

Key	Remarks
NR - Not Recorded NA - Not Applicable	Potentially tidal influence on groundwater levels.
	Checked: **Approved:**

Appendix F Geotechnical Testing Results

LABORATORY REPORT

4043

Contract Number: PSL18/4597

Report Date: 02 October 2018

Client's Reference: 4671

Client Name: JPG
5 John Charles Way
Leeds
West Yorkshire
LS12 6QD

For the attention of: Molly Peckham

Contract Title: Airfields Deeside

Date Received: 13/9/2018
Date Commenced: 13/9/2018
Date Completed: 2/10/2018

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
R Berriman (Quality Manager)

L Knight (Senior Technician)
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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP215		D	0.50	1.00	Brown very silty SAND.
TP215		B	1.00	1.50	Brown very silty SAND.
TP229		B	0.50	1.00	Brown slightly silty SAND.
TP222		B	0.90	1.30	Brown mottled grey slightly gravelly slightly clayey very sandy SILT.
TP224		B	1.90	2.20	Brown slightly silty SAND.
TP224		D	1.90	2.20	Brown slightly silty SAND.
TP225		B	0.80	1.10	Brown very sandy CLAY.
TP225		D	0.80	1.10	Brown very sandy CLAY.
TP219		B	0.50	1.00	Brown very silty SAND.
TP204		B	0.50	1.00	Brown slightly silty SAND.
TP233		B	0.50	1.00	Brown very silty SAND.
TP233		D	0.60		Brown very silty SAND.
TP228		B	0.90	1.00	Brown silty SAND.
TP202		D	1.00	1.20	Brown silty SAND.
TP208		D	2.00		Brown very silty SAND.
TP209		D	1.60		Brown very silty SAND.
TP210		D	1.00	1.50	Brown very silty SAND.
TP211		D	2.50		Brown very silty SAND.
TP212		D	1.50	2.00	Brown very silty SAND.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP213		D	0.50	1.00	Brown very silty SAND.
TP216		D	0.80	1.00	Brown very silty SAND.
TP220		D	1.00	1.50	Brown silty SAND.
TP221		D	0.90	1.00	Brown silty SAND.
TP223		D	0.80	1.00	Brown silty SAND.
TP235		D	0.80	1.00	Brown very silty SAND.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP215		D	0.50	1.00	22		2.67					
TP215		B	1.00	1.50	24							
TP229		B	0.50	1.00	9.4							
TP222		B	0.90	1.30	24				NP			
TP224		D	1.90	2.20	23		2.66					
TP225		D	0.80	1.10	28		2.62					
TP219		B	0.50	1.00	24							
TP204		B	0.50	1.00	15							
TP233		B	0.50	1.00	20		2.66					
TP233		D	0.60		19							
TP228		B	0.90	1.00	25							
TP202		D	1.00	1.20	20							
TP208		D	2.00		24							
TP209		D	1.60		28							
TP210		D	1.00	1.50	25							
TP211		D	2.50		27							
TP212		D	1.50	2.00	27							
TP213		D	0.50	1.00	13							
TP216		D	0.80	1.00	21							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No:

PSL18/4597

Client Ref:

4671

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP220		D	1.00	1.50	15							
TP221		D	0.90	1.00	12							
TP223		D	0.80	1.00	15							
TP235		D	0.80	1.00	26							

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No:

PSL18/4597

Client Ref:

4671

PARTICLE SIZE DISTRIBUTION TEST

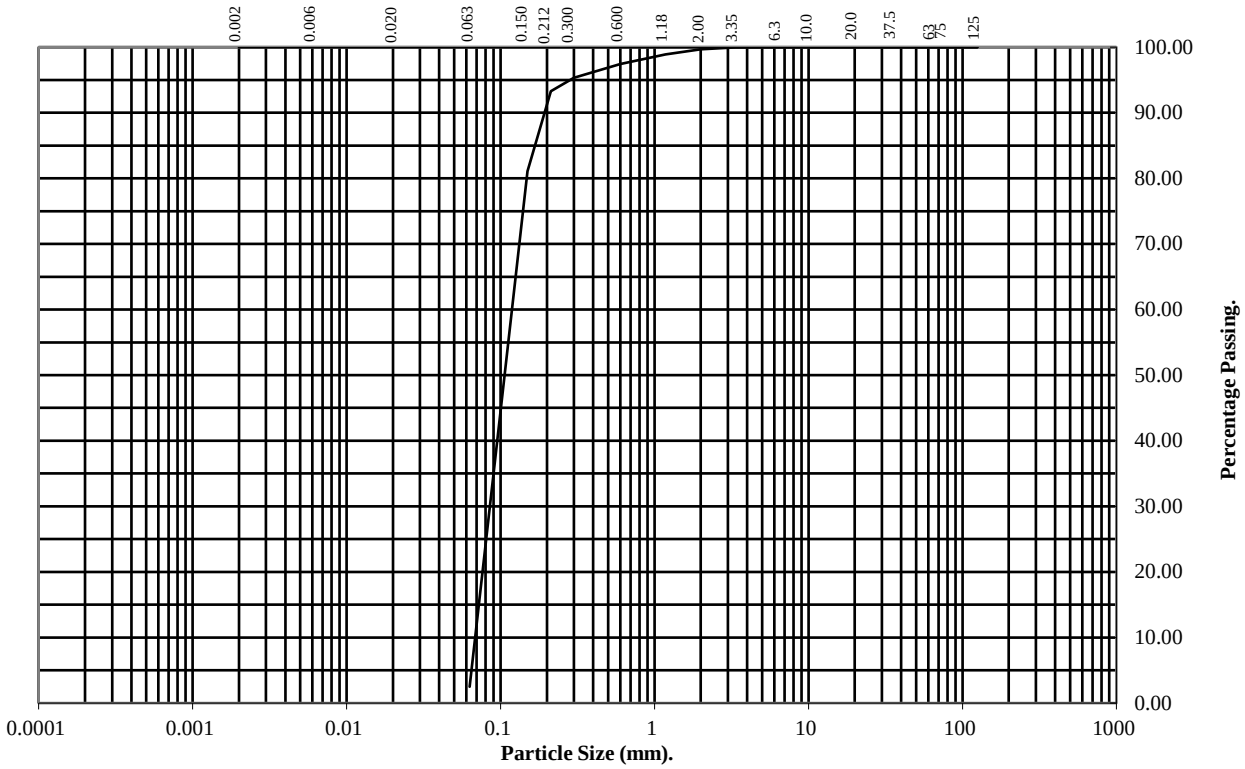
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP204** **Top Depth (m):** **0.50**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	97
0.3	95
0.212	93
0.15	81
0.063	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	98
Silt/Clay	2

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

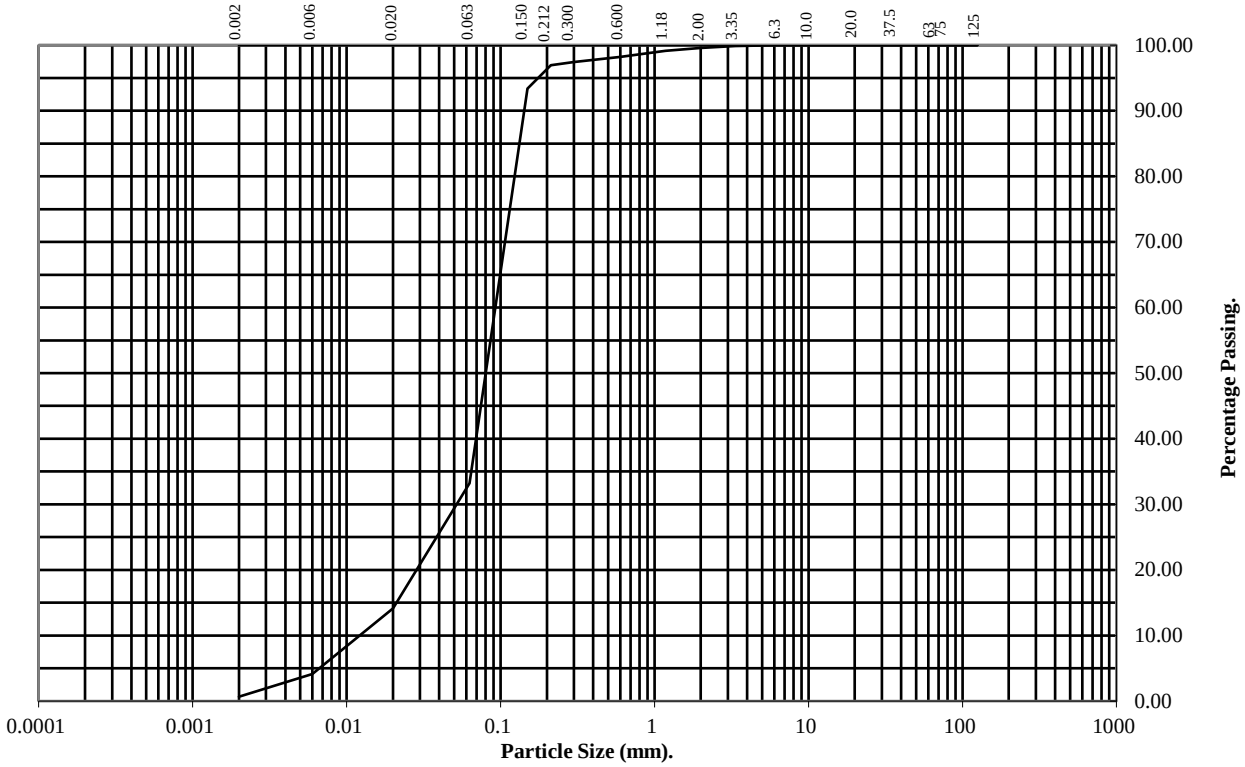
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP208** **Top Depth (m):** **2.00**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	97
0.212	97
0.15	93
0.063	33

Particle Diameter	Percentage Passing
0.02	14
0.006	4
0.002	1

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	67
Silt	32
Clay	1

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

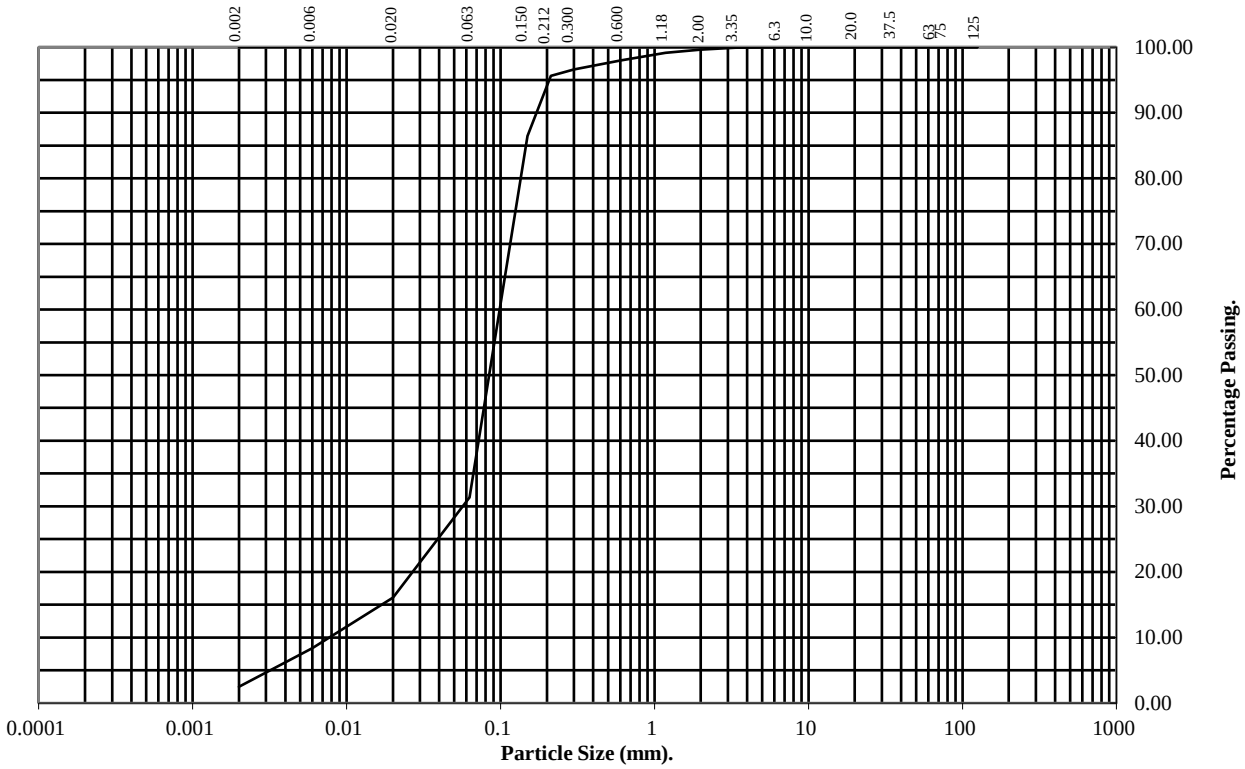
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP213** **Top Depth (m):** **0.50**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	97
0.212	96
0.15	86
0.063	31

Particle Diameter	Percentage Passing
0.02	16
0.006	8
0.002	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	69
Silt	29
Clay	2

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

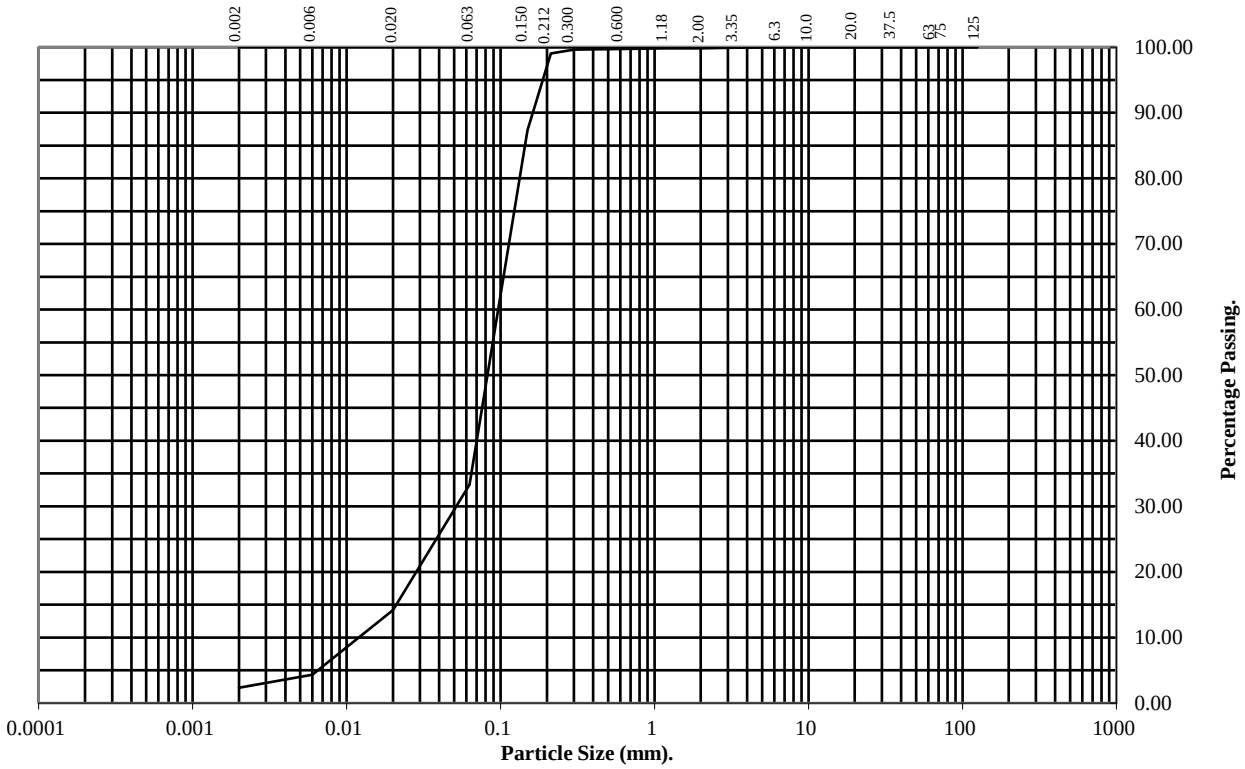
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP215** **Top Depth (m):** **1.00**

Sample Number: **Base Depth(m):** **1.50**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	99
0.15	87
0.063	33

Particle Diameter	Percentage Passing
0.02	14
0.006	4
0.002	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	67
Silt	31
Clay	2

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

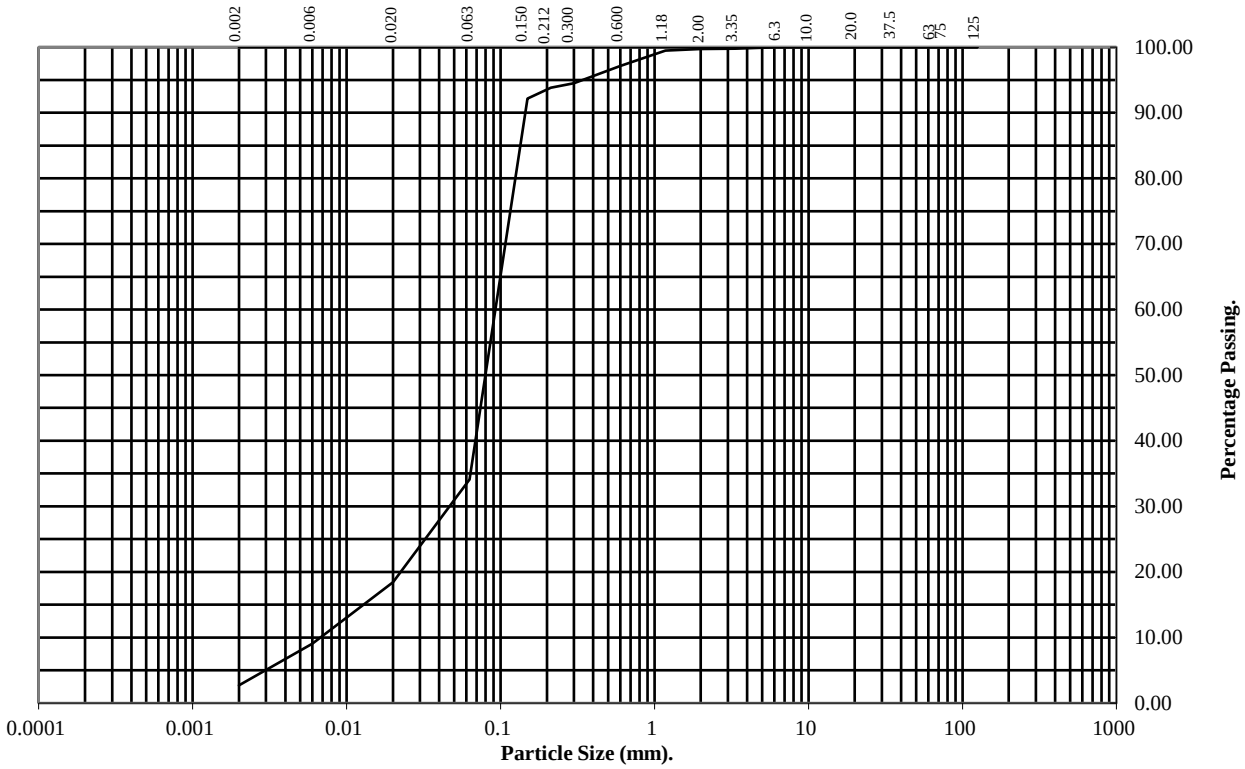
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP219** **Top Depth (m):** **0.50**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	97
0.3	95
0.212	94
0.15	92
0.063	34

Particle Diameter	Percentage Passing
0.02	18
0.006	9
0.002	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	66
Silt	31
Clay	3

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

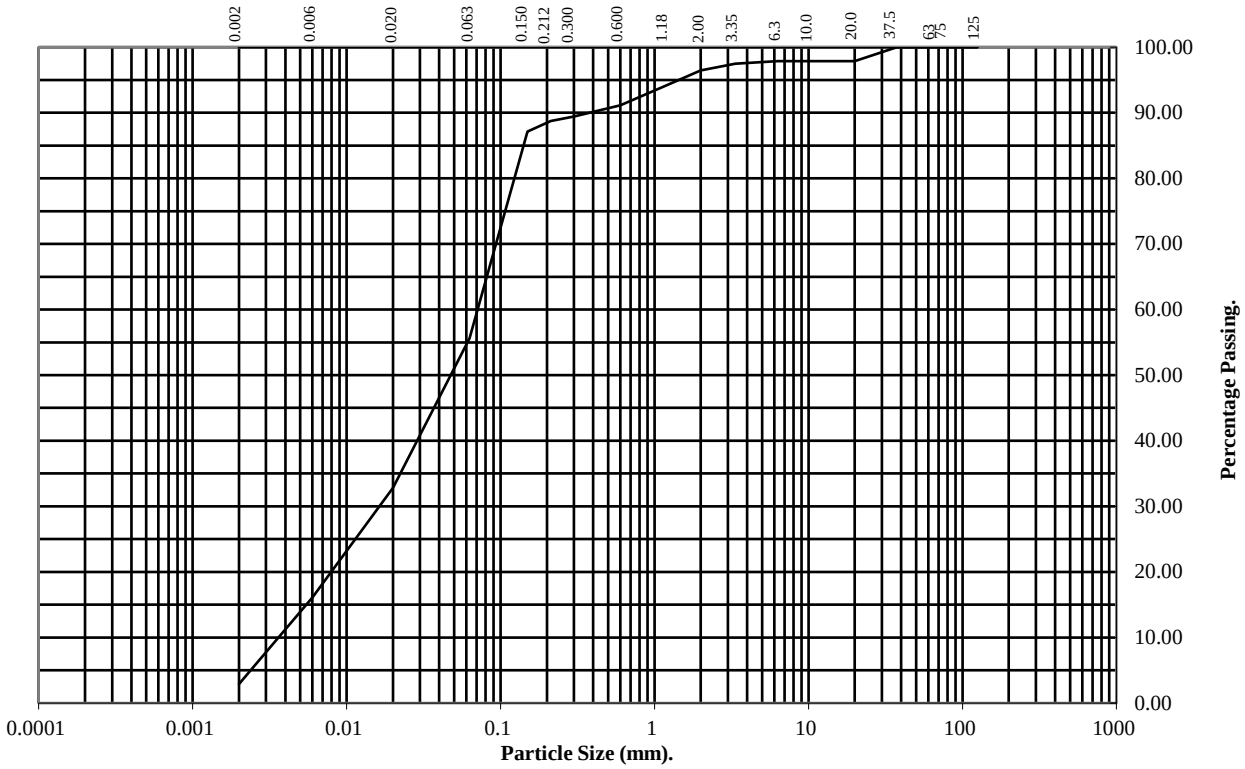
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP222** **Top Depth (m):** **0.90**

Sample Number: **Base Depth(m):** **1.30**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	98
6.3	98
3.35	97
2	96
1.18	94
0.6	91
0.3	89
0.212	89
0.15	87
0.063	56

Particle Diameter	Percentage Passing
0.02	33
0.006	16
0.002	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	40
Silt	53
Clay	3

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

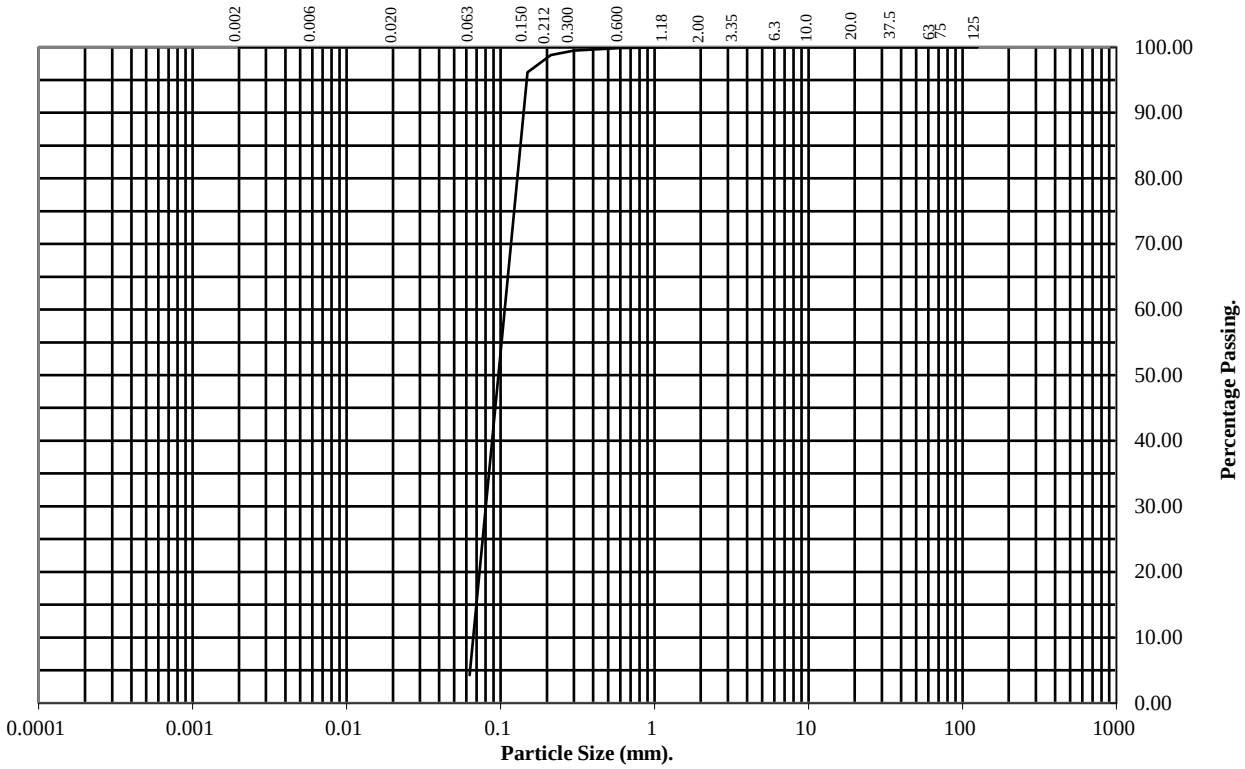
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP224** **Top Depth (m):** **1.90**

Sample Number: **Base Depth(m):** **2.20**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	99
0.212	99
0.15	96
0.063	4

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	96
Silt/Clay	4

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

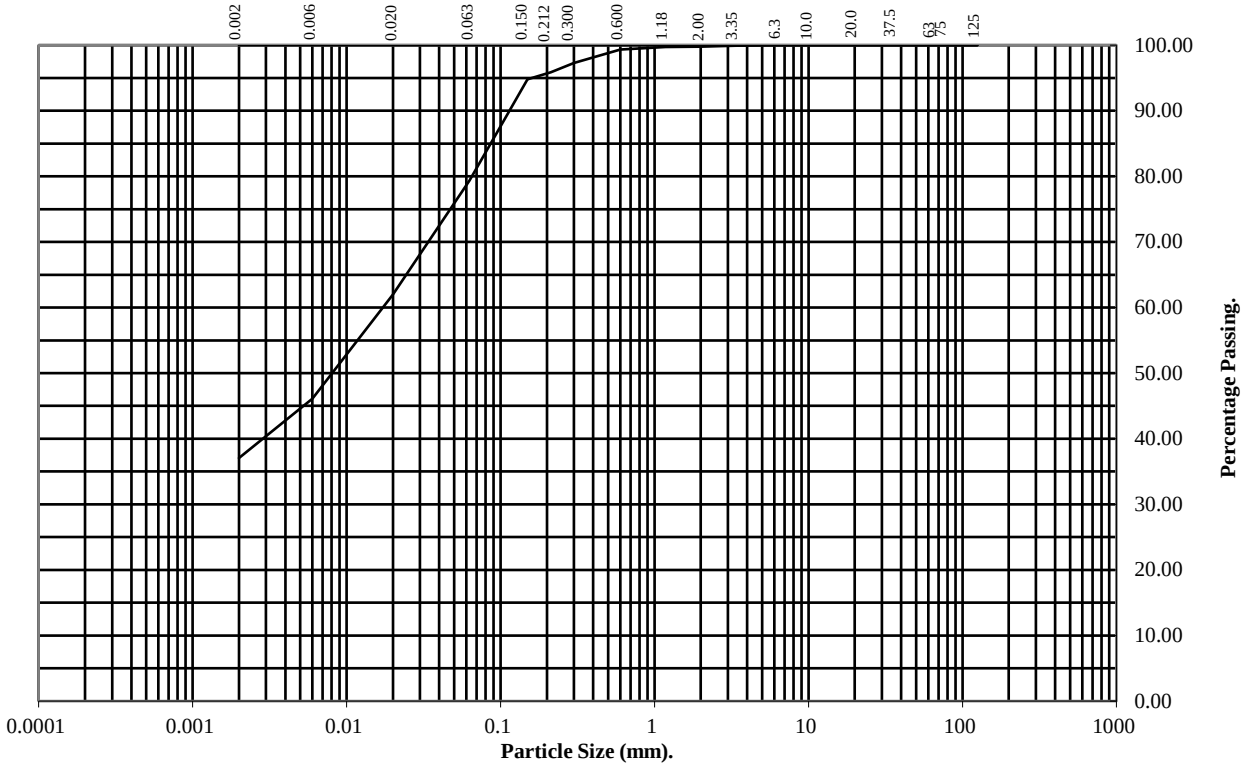
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP225** **Top Depth (m):** **0.80**

Sample Number: **Base Depth(m):** **1.10**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	97
0.212	96
0.15	95
0.063	79

Particle Diameter	Percentage Passing
0.02	62
0.006	46
0.002	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	21
Silt	42
Clay	37

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

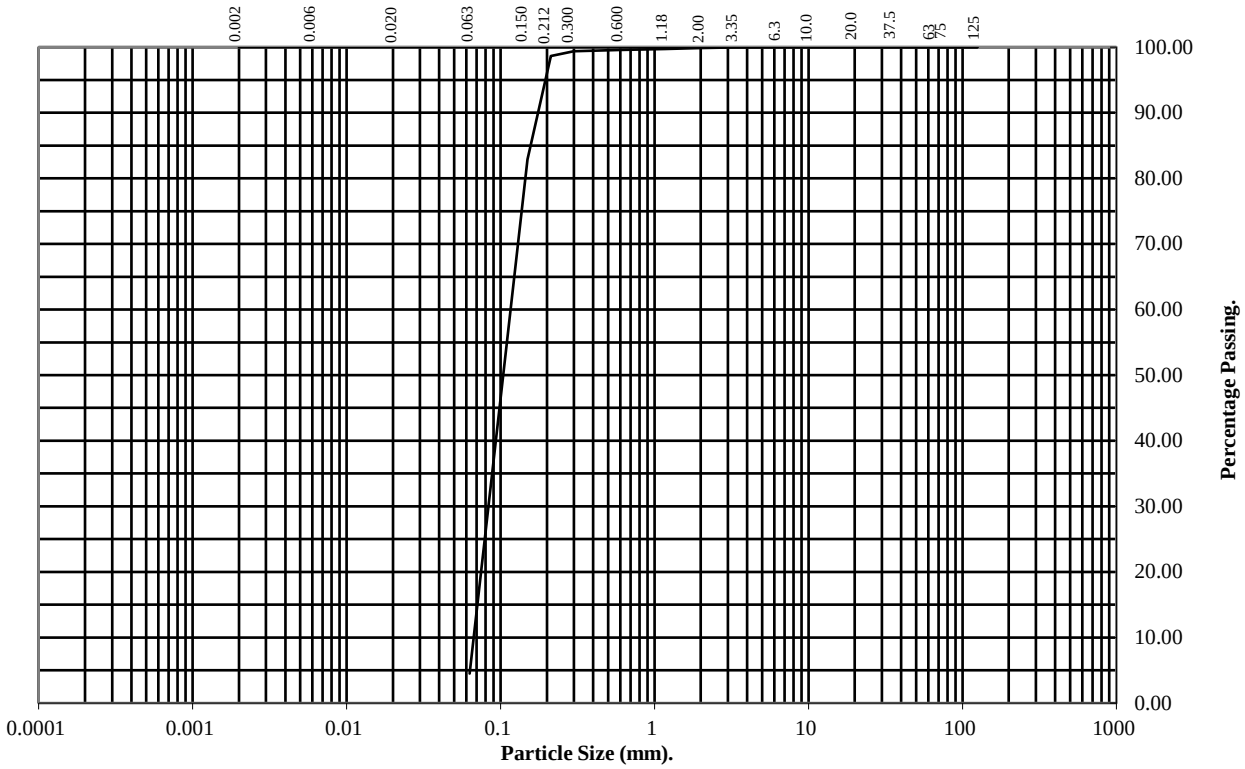
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP228** **Top Depth (m):** **0.90**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	99
0.212	99
0.15	83
0.063	5

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	95
Silt/Clay	5

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

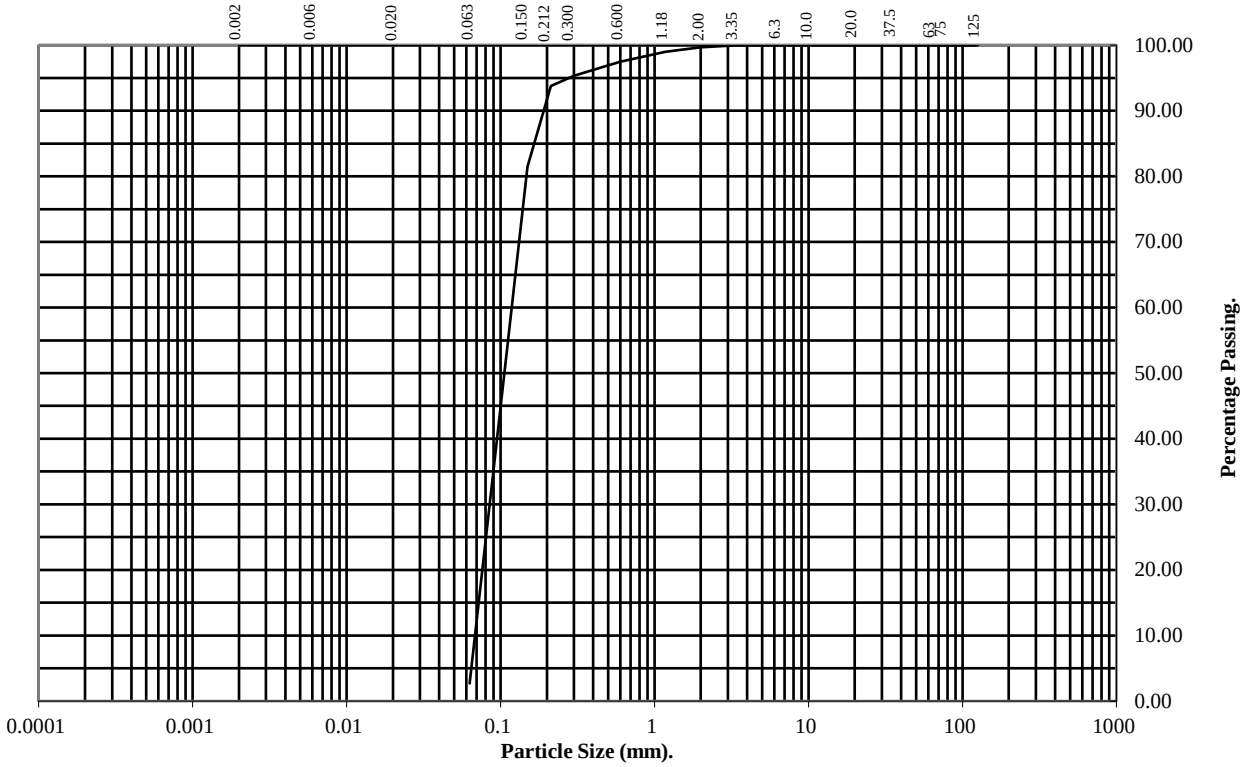
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **TP229** **Top Depth (m):** **0.50**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	97
0.3	95
0.212	94
0.15	81
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	97
Silt/Clay	3

Remarks:

See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

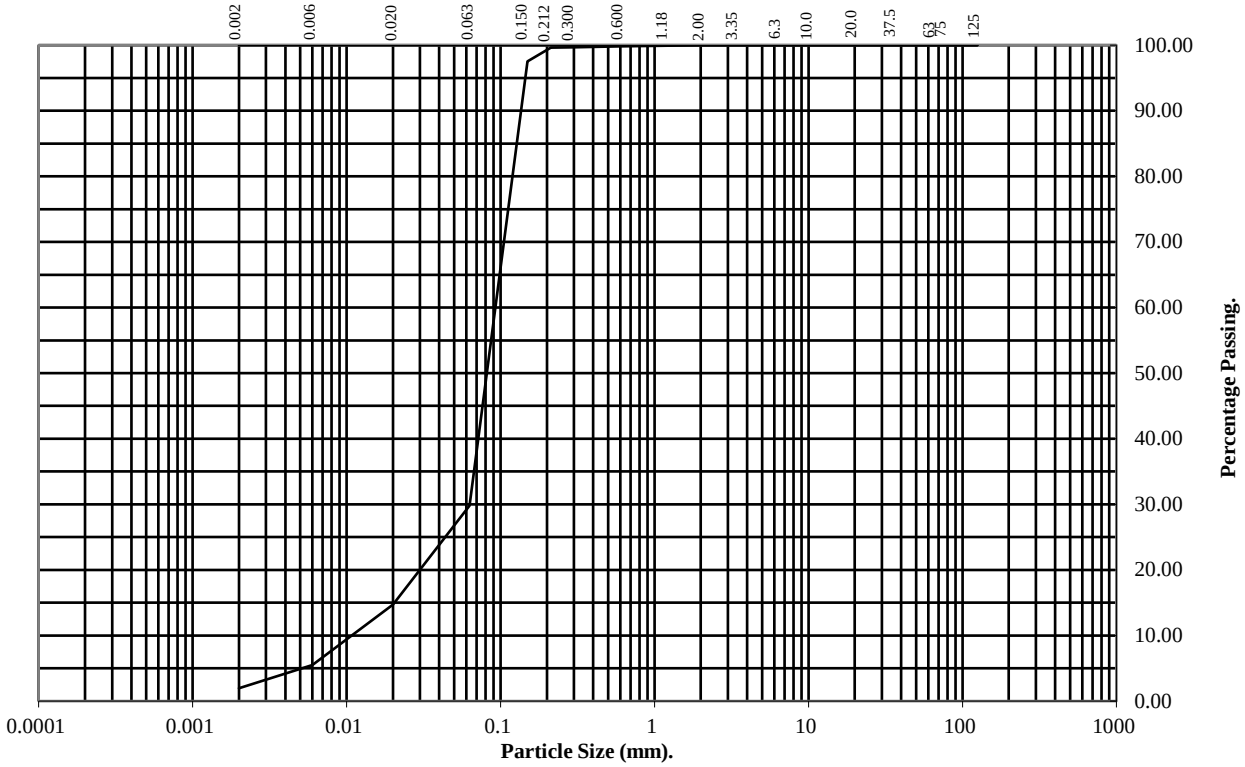
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP233** **Top Depth (m):** **0.60**

Sample Number: **Base Depth(m):**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	100
0.15	98
0.063	30

Particle Diameter	Percentage Passing
0.02	15
0.006	5
0.002	2

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	70
Silt	28
Clay	2

Remarks:
See Summary of Soil Descriptions

PARTICLE SIZE DISTRIBUTION TEST

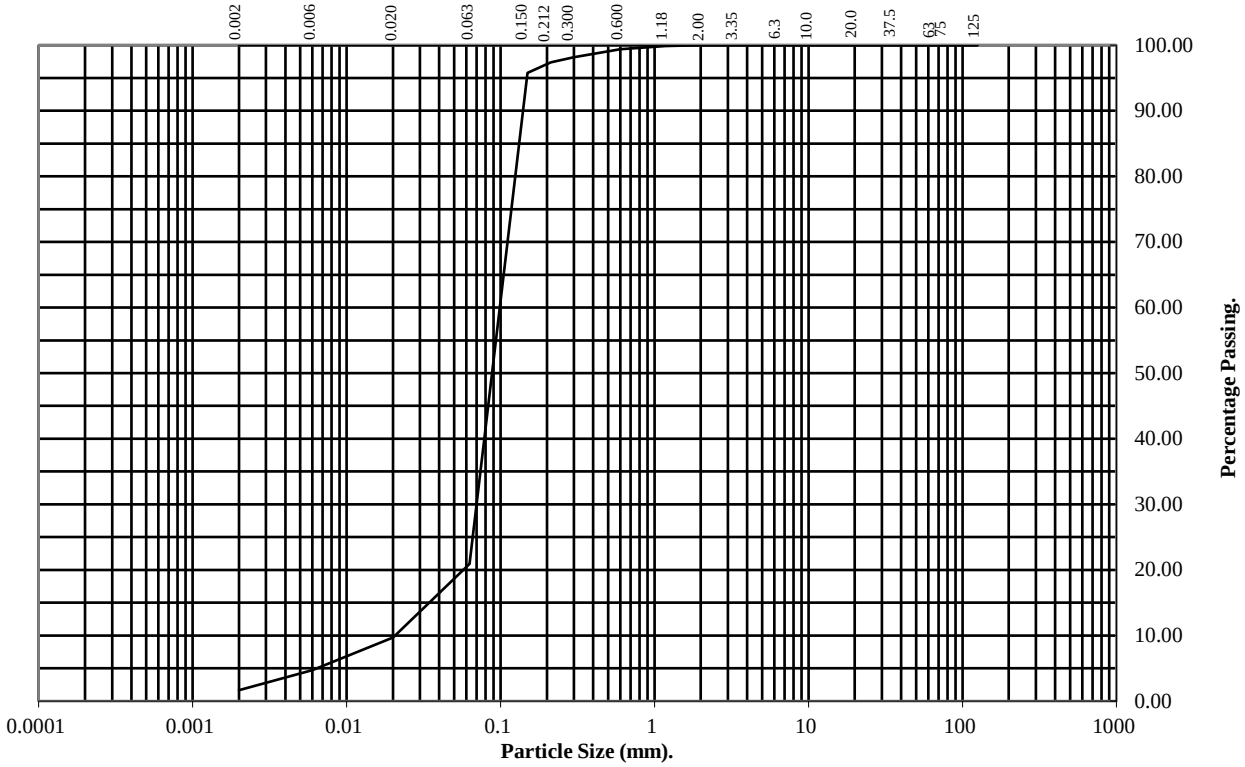
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **TP235** **Top Depth (m):** **0.80**

Sample Number: **Base Depth(m):** **1.00**

Sample Type: **D**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	98
0.212	97
0.15	96
0.063	21

Particle Diameter	Percentage Passing
0.02	10
0.006	5
0.002	2

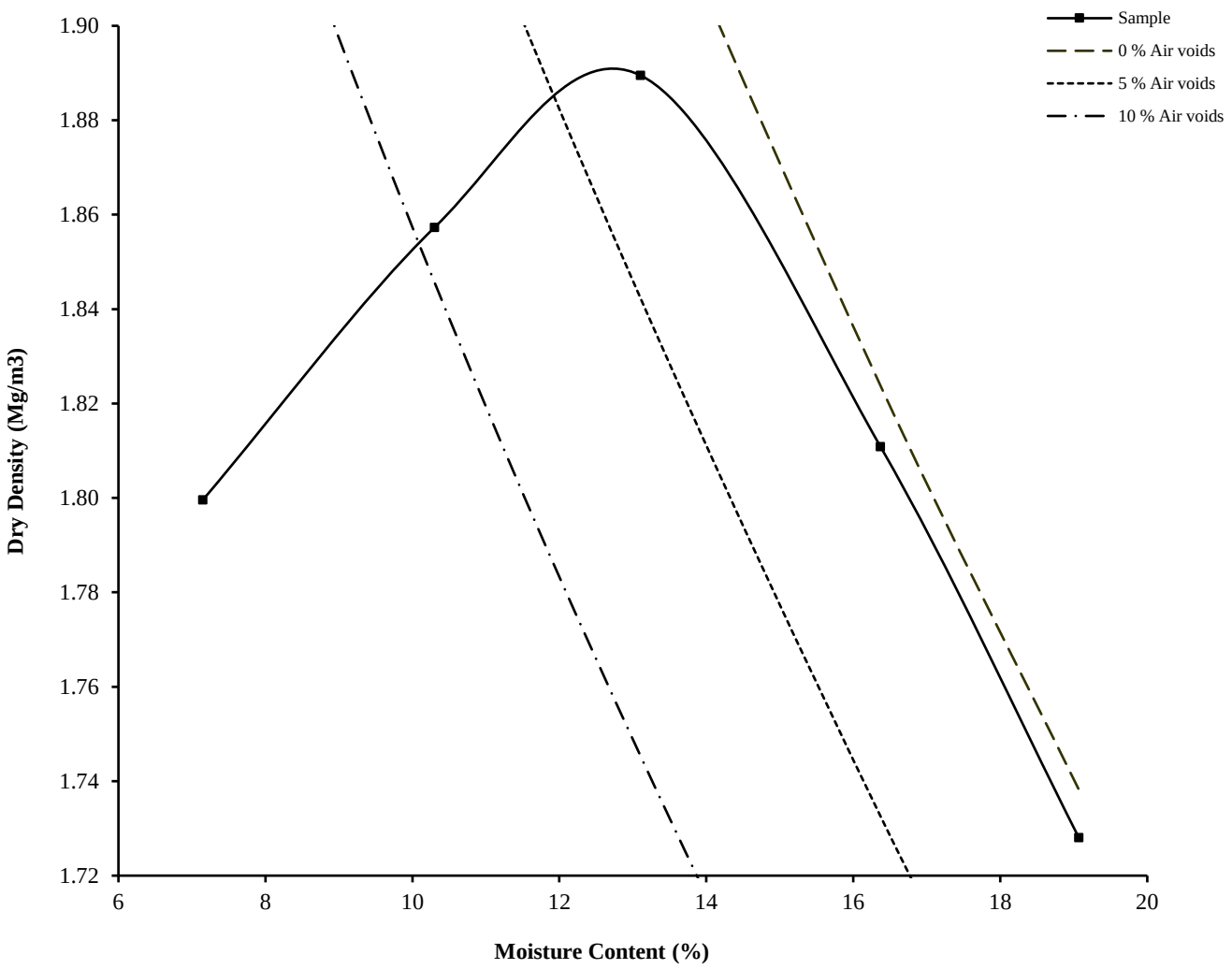
Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	79
Silt	19
Clay	2

Remarks:
See Summary of Soil Descriptions

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number:	**TP225**	**Top Depth (m) :**	**0.80**
Sample Number:		**Base Depth (m) :**	**1.10**
Sample Type:	**B**		



Initial Moisture Content:		28	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.89	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions.					

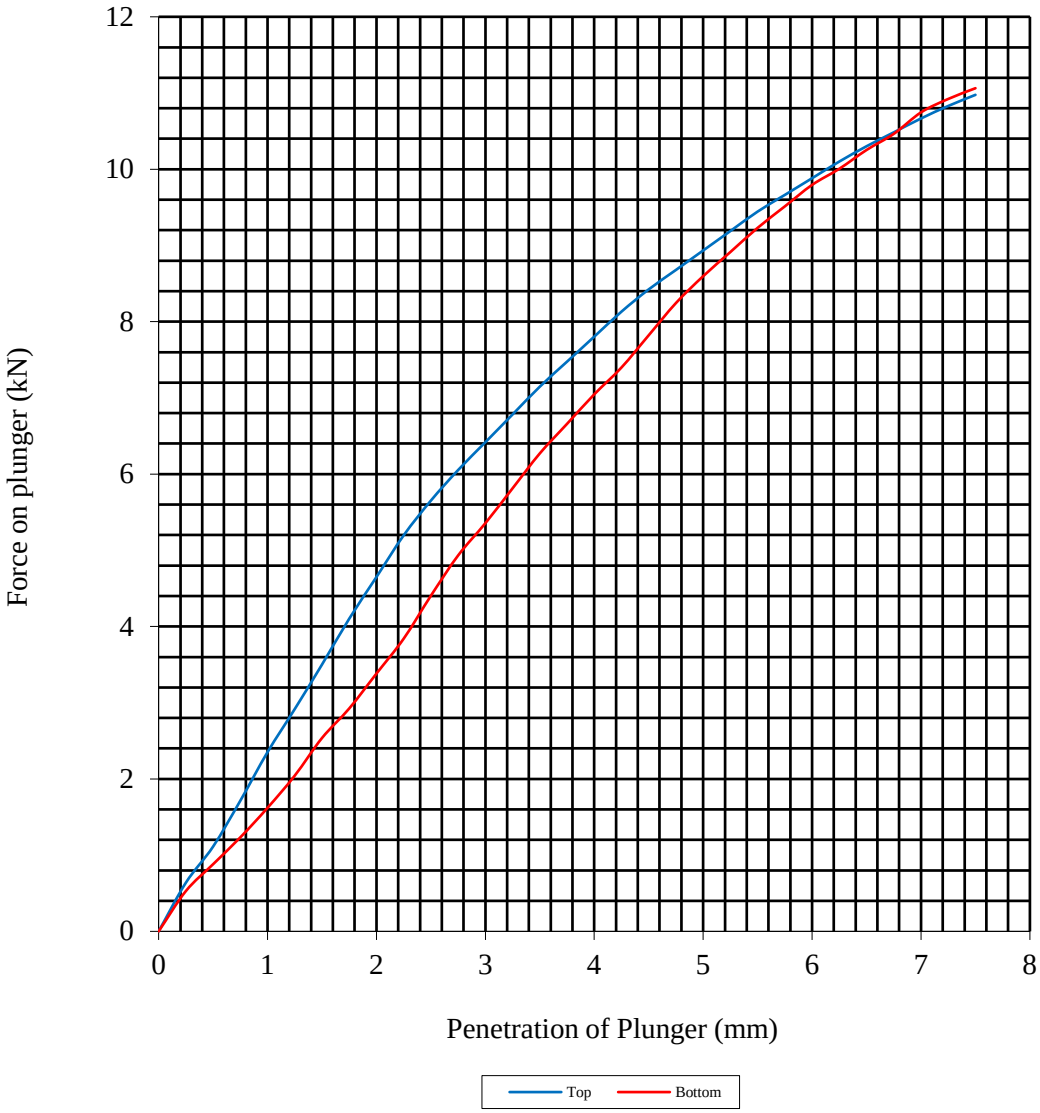
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP204 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):** 1.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	15	Surcharge Kg:	4.20	Sample Top	15	Sample Top	44.7
Bulk Density Mg/m3:	1.79	Soaking Time hrs	0	Sample Bottom	15	Sample Bottom	43.0
Dry Density Mg/m3:	1.55	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

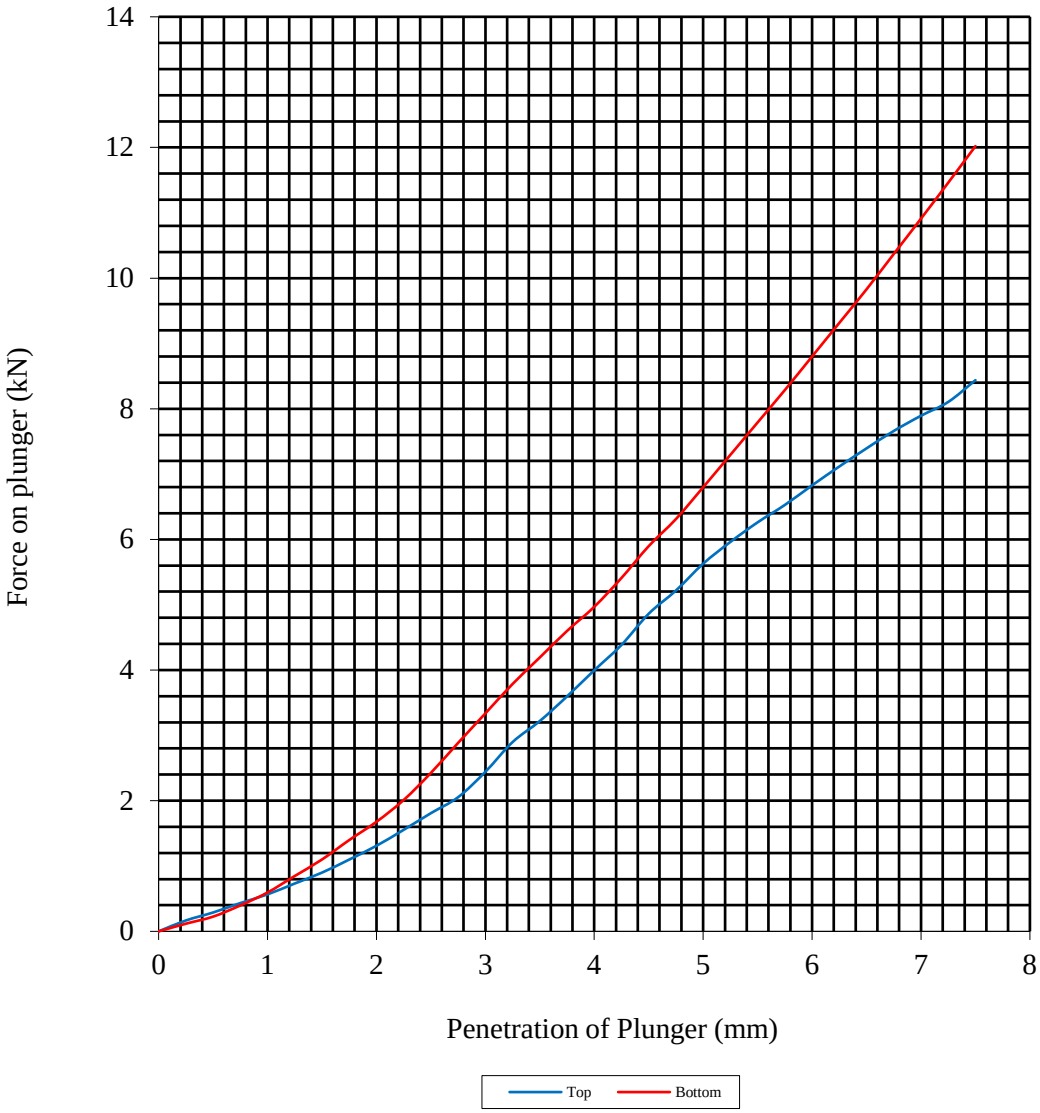
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP215 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):** 1.50

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	24	Surcharge Kg:	4.20	Sample Top	24	Sample Top	28.1
Bulk Density Mg/m3:	1.84	Soaking Time hrs	0	Sample Bottom	24	Sample Bottom	34.0
Dry Density Mg/m3:	1.48	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

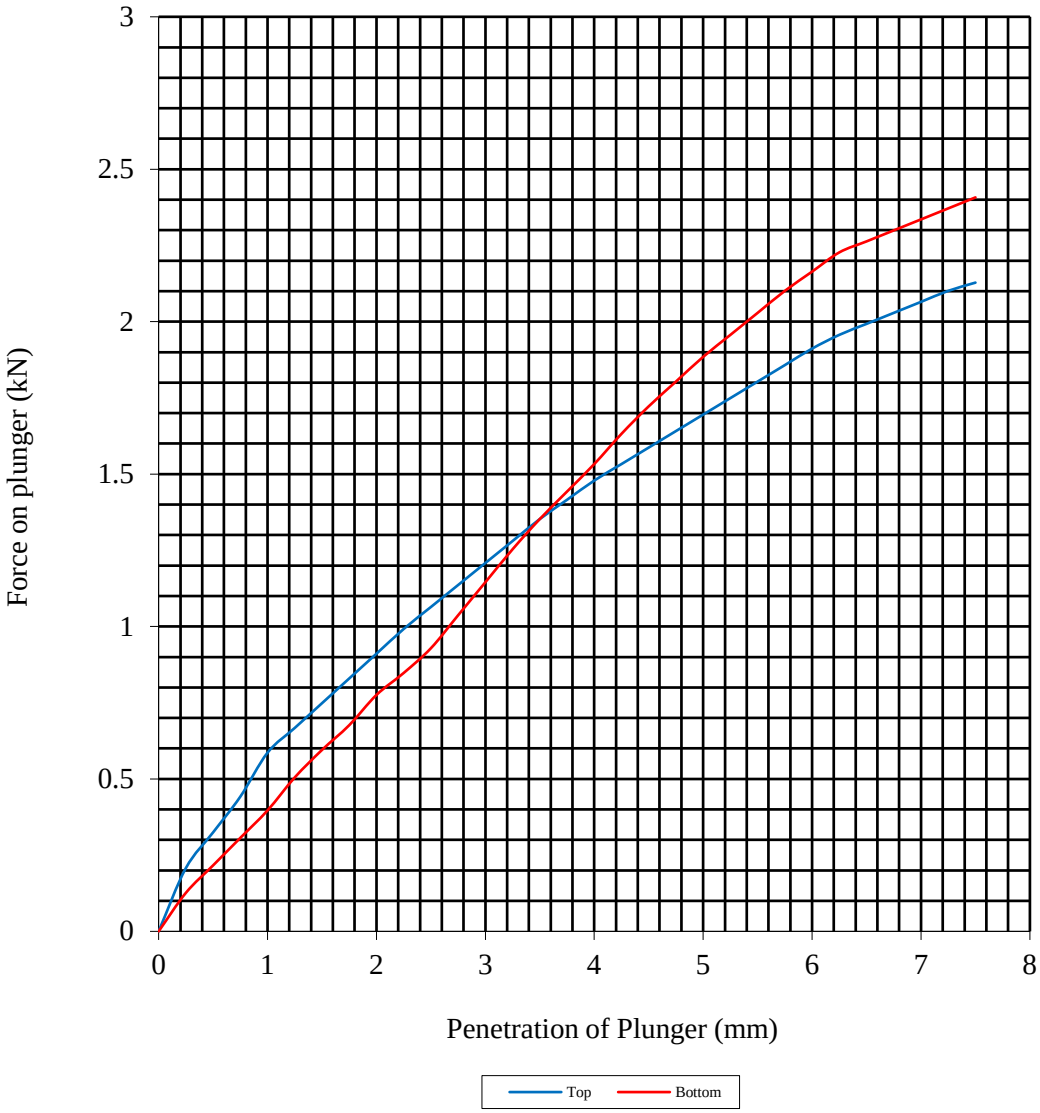
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP219 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):** 1.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	24	Surcharge Kg:	4.20	Sample Top	24	Sample Top	8.5
Bulk Density Mg/m3:	1.81	Soaking Time hrs	0	Sample Bottom	24	Sample Bottom	9.4
Dry Density Mg/m3:	1.46	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

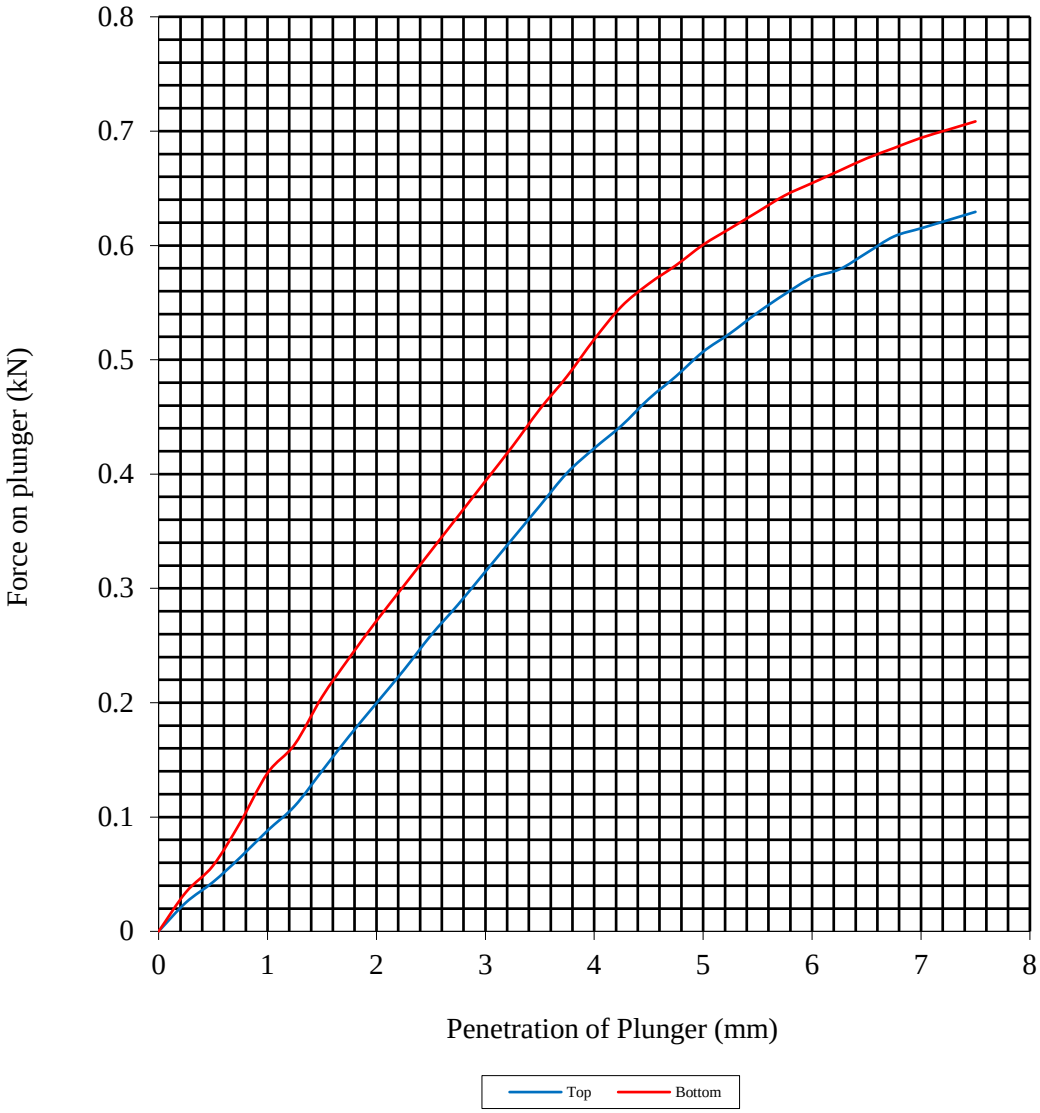
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP222 **Top Depth (m):** 0.90

Sample Number: **Base Depth (m):** 1.30

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	24	Surcharge Kg:	4.20	Sample Top	24	Sample Top	2.5
Bulk Density Mg/m3:	1.85	Soaking Time hrs	0	Sample Bottom	24	Sample Bottom	3.0
Dry Density Mg/m3:	1.49	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			2				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

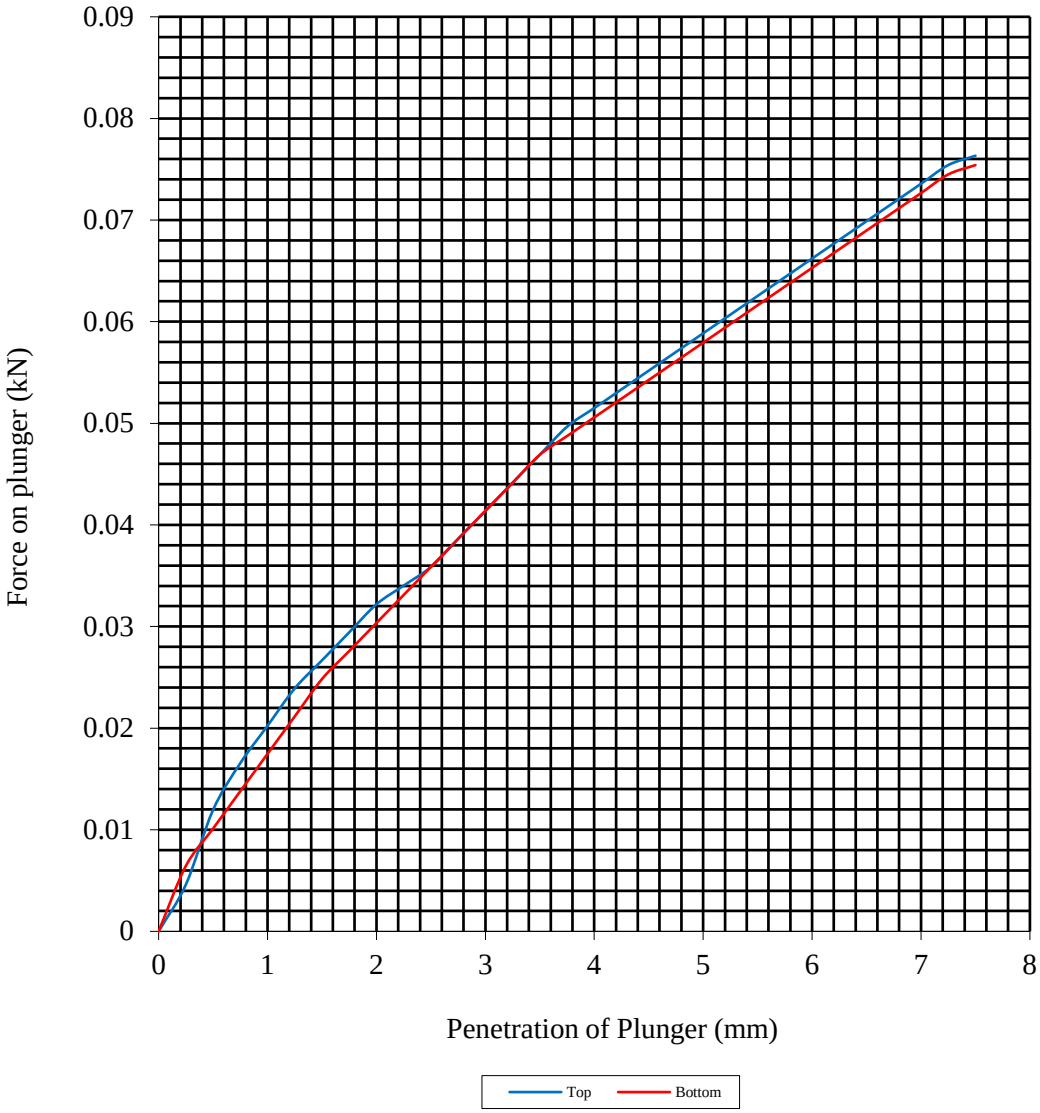
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP225 **Top Depth (m):** 0.80

Sample Number: **Base Depth (m):** 1.10

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	28	Surcharge Kg:	4.20	Sample Top	28	Sample Top	0.3
Bulk Density Mg/m3:	1.92	Soaking Time hrs	0	Sample Bottom	28	Sample Bottom	0.3
Dry Density Mg/m3:	1.49	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

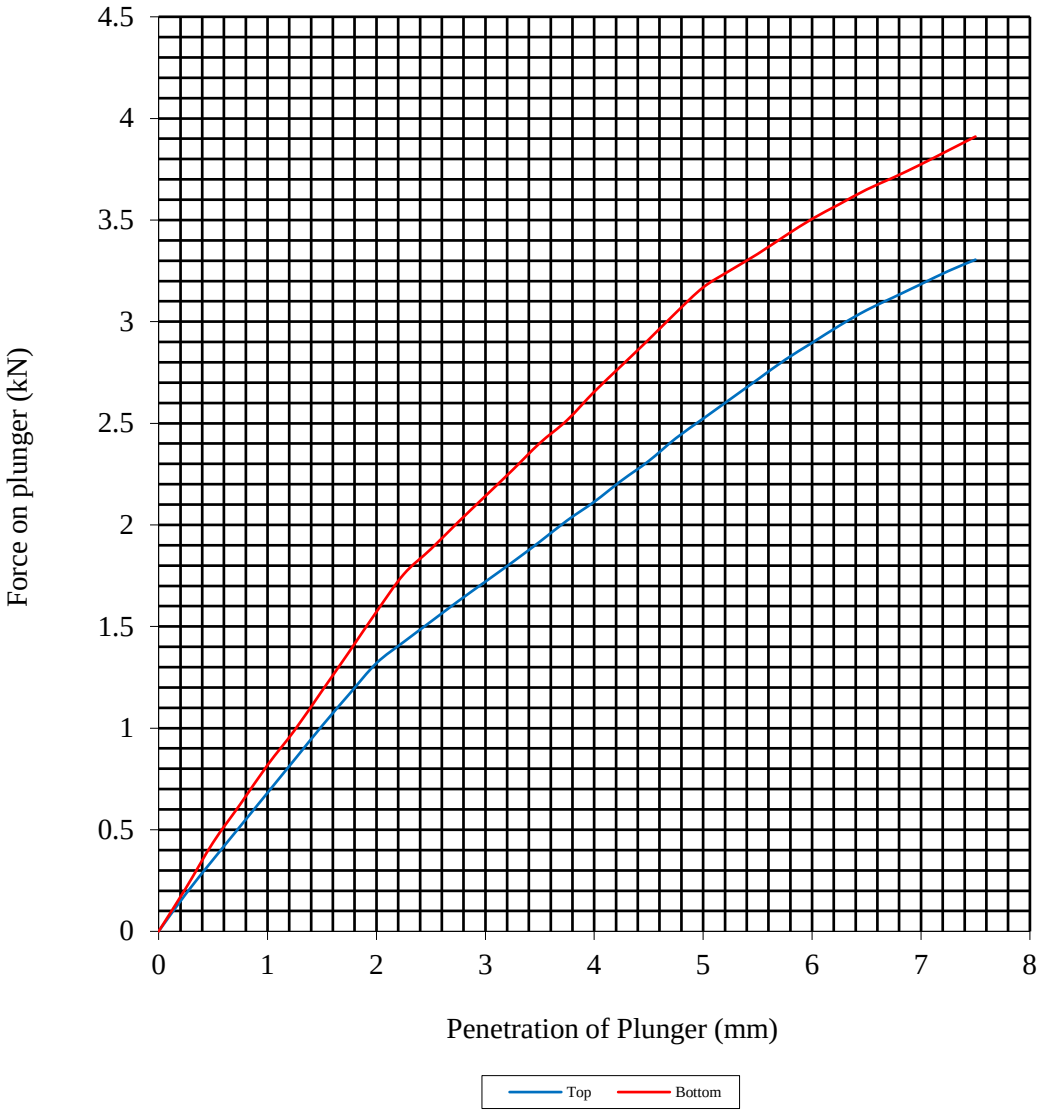
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP228 **Top Depth (m):** 0.90

Sample Number: **Base Depth (m):** 1.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	25	Surcharge Kg:	4.20	Sample Top	25	Sample Top	12.6
Bulk Density Mg/m3:	1.82	Soaking Time hrs	0	Sample Bottom	25	Sample Bottom	15.8
Dry Density Mg/m3:	1.45	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

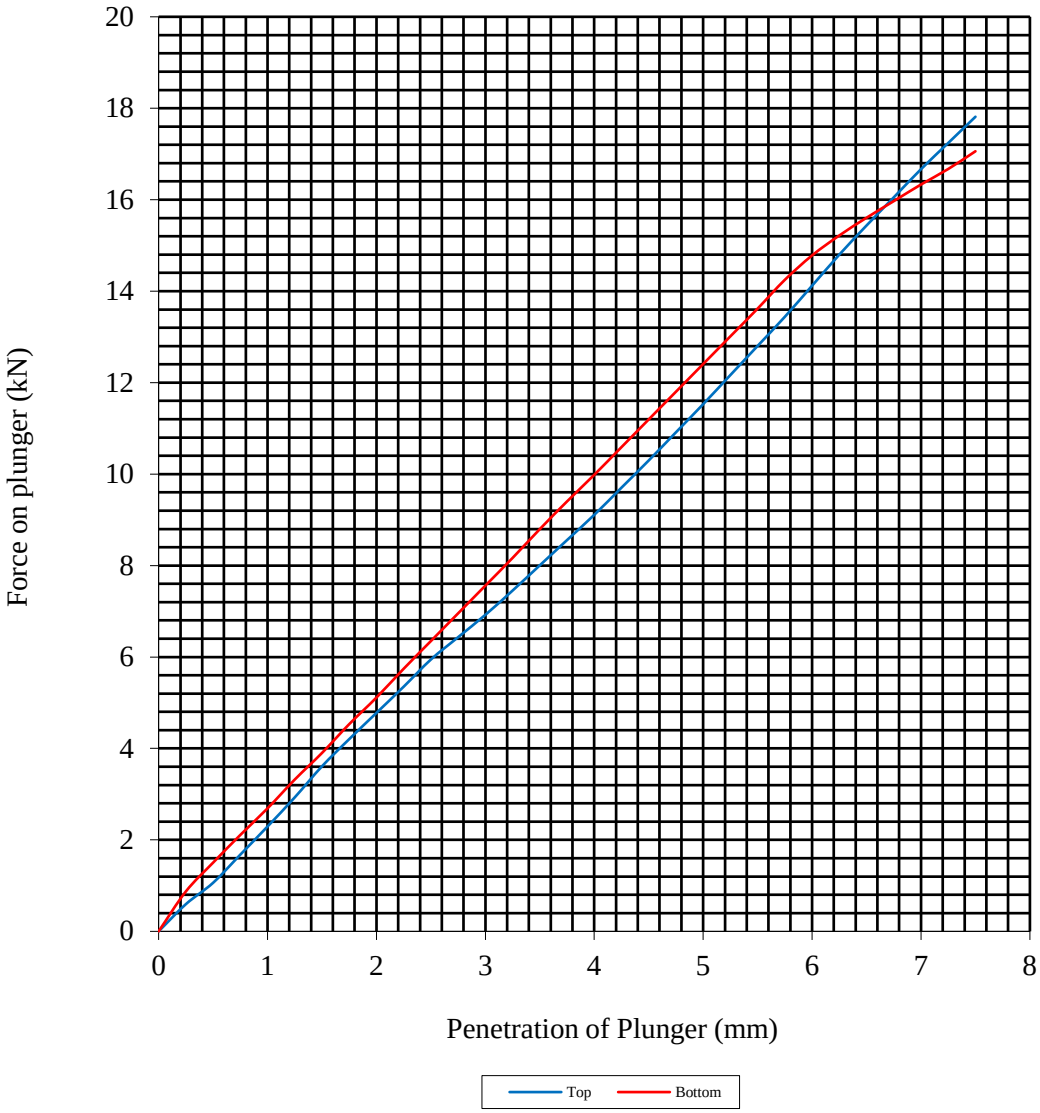
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP229 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):** 1.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	9.4	Surcharge Kg:	4.20	Sample Top	9.2	Sample Top	57.6
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Bottom	9.7	Sample Bottom	62.0
Dry Density Mg/m3:	1.51	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

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PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

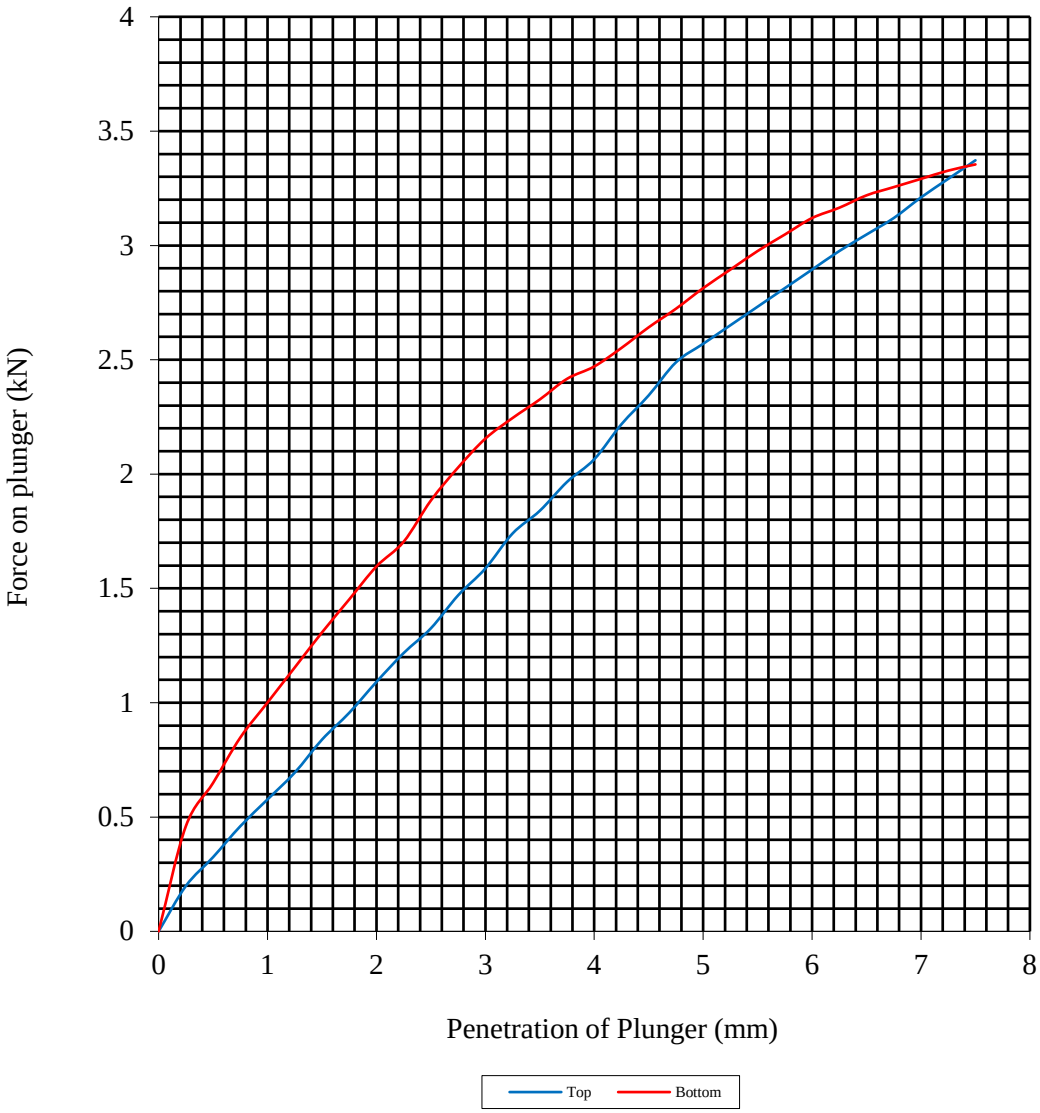
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP233 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):** 1.00

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	20	Surcharge Kg:	4.20	Sample Top	20	Sample Top	12.8
Bulk Density Mg/m3:	1.87	Soaking Time hrs	0	Sample Bottom	20	Sample Bottom	14.3
Dry Density Mg/m3:	1.55	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No: PSL18/4597

Client Ref: 4671

SUMMARY OF SOIL DENSITY RELATED TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Bulk Density Mg/m^3	Dry Density Mg/m^3	Retained 20mm %	Retained 37.5mm %	Method of compaction kg	Maximum Dry Density Mg/m^3	Minimum Dry Density Mg/m^3	Remarks
TP215		B	1.00	1.50	24		0.00				1.60	1.34	
TP229		B	0.50	1.00	9.4		0.00				1.50	1.35	
TP222		B	0.90	1.30	24		0.00				1.61	1.34	
TP224		B	1.90	2.20	23		0.00				1.61	1.34	
TP219		B	0.50	1.00	24		0.00				1.60	1.35	
TP204		B	0.50	1.00	15		0.00				1.49	1.37	
TP233		B	0.50	1.00	20		0.00				1.59	1.34	
TP228		B	0.90	1.00	25		0.00				1.60	1.35	

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PSL
Professional Soils Laboratory

AIRFIELDS DEESIDE

Contract No:
PSL18/4597
Client Ref:
4671

Certificate of Analysis

Certificate Number 18-22468

27-Sep-18

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 18-22468

Client Reference PSL18/4597

Order No (not supplied)

Contract Title AIRFEILDS DEESIDE

Description 18 Soil samples.

Date Received 21-Sep-18

Date Started 21-Sep-18

Date Completed 27-Sep-18

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 18-22468
Client Ref PSL18/4597
Contract Title AIRFEILDS DEESIDE

			Lab No	1395609	1395610	1395611	1395612	1395613	1395614	1395615	1395616	1395617	1395618	1395619
			Sample ID	TP125	TP229	TP222	TP224	TP204	TP233	TP233	TP228	TP208	TP209	TP210
			Depth	1.00-1.50	0.50-1.00	0.90-1.30	1.90-2.20	0.50-1.00	0.50-1.00	0.60-0.00	0.90-1.00	2.00-0.00	1.60-1.60	1.00-1.50
			Other ID											
			Sample Type	B	B	B	B	B	B	D	B	D	D	D
			Sampling Date	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**											
Inorganics														
pH	DETSC 2008#			8.8	8.9	8.0	8.9			8.9	8.7	8.9	8.3	8.7
Organic matter	DETSC 2002#	0.1	%	0.2	0.1		< 0.1	0.3	0.1					
Chloride Aqueous Extract	DETSC 2055	1	mg/l	8.2	4.9	6.2	6.5			11	6.0	9.7	6.8	12
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	21	19	490	36			23	17	33	230	28
Sulphur as S, Total	DETSC 2320	0.01	%	0.01	0.01		0.01			< 0.01	0.02	0.01	0.08	
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02	0.02		0.02			0.01	0.04	0.02	0.06	

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 18-22468
Client Ref PSL18/4597
Contract Title AIRFEILDS DEESIDE

			Lab No	1395620	1395621	1395622	1395623	1395624	1395625	1395626
			Sample ID	TP212	TP213	TP216	TP220	TP221	TP223	TP235
			Depth	1.50-2.00	0.50-1.00	0.80-1.00	1.00-1.50	0.90-1.00	0.80-1.00	0.80-1.00
			Other ID							
			Sample Type	D	D	D	D	D	D	D
			Sampling Date	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18	13/09/18
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Inorganics										
pH	DETSC 2008#			9.0	8.6	8.9	8.9	8.9	8.9	
Organic matter	DETSC 2002#	0.1	%							
Chloride Aqueous Extract	DETSC 2055	1	mg/l	5.6	8.4	11	9.5	4.6	9.2	8.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	18	22	18	< 10	19	
Sulphur as S, Total	DETSC 2320	0.01	%	< 0.01				< 0.01		
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.02				0.02		

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 18-22468
Client Ref PSL18/4597
Contract AIRFEILDS DEESIDE

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1395609	TP125 1.00-1.50 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395610	TP229 0.50-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395611	TP222 0.90-1.30 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395612	TP224 1.90-2.20 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395613	TP204 0.50-1.00 SOIL	13/09/18	PT 500ml		
1395614	TP233 0.50-1.00 SOIL	13/09/18	PT 500ml		
1395615	TP233 0.60-0.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395616	TP228 0.90-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395617	TP208 2.00-0.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395618	TP209 1.60-1.60 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395619	TP210 1.00-1.50 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395620	TP212 1.50-2.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395621	TP213 0.50-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395622	TP216 0.80-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395623	TP220 1.00-1.50 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395624	TP221 0.90-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395625	TP223 0.80-1.00 SOIL	13/09/18	PT 500ml	pH + Conductivity (7 days)	
1395626	TP235 0.80-1.00 SOIL	13/09/18	PT 500ml		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix G Chemical Testing Results

STATISTICAL ASSESSMENT OF CHEMICAL ANALYSIS

The results of the chemical analysis have been assessed in accordance with CL:AIRE (Contaminated Land: Applications in Real Environments) 'Guidance on Comparing Soil Contamination Data with a Critical Concentration' published by the CIEH, May 2008.

This guidance provides a statistical approach to objectively evaluate the evidence for and against particular propositions/hypothesis and has the useful attribute of enabling decision makers to reach conclusions about the available evidence, with at least some understanding of the validity of the results.

The guidance approaches this in the context of assessing the results from two different perspectives, the Planning Scenario and Part 2A.

When assessing in terms of the Planning Scenario, the key question would be 'can we confidently say that the level of contamination on this land is low relative to some appropriate measure of risk?' Under Part 2A, the question would be 'can we confidently say that the level of contamination is high relative to some appropriate measure of risk?'

These questions are addressed through the use of formal hypothesis – the "Null Hypothesis" and the "Alternative Hypothesis".

This assessment will be carried out in accordance with the Planning Scenario, where the aim is to demonstrate 'suitability for use'. The Null Hypothesis is that the level of contamination is the same as, or higher than the critical concentration/GAC. The Alternative Hypothesis is that the level of contamination is lower than the critical concentration/GAC. Under Part 2A the opposite set of propositions are applicable.

By convention, the Null Hypothesis is the starting proposition against which the key question, as expressed by the Alternative Hypothesis, can be tested.

The assessment of the results relies on there being a normal distribution of results for a particular contaminant and that the data set under consideration is representative of the particular material which is being assessed. If more than one dataset is present, then the hypothesis should be applied individually for each data set.

Under the Planning Scenario, the statistical test is used to demonstrate that there is a 95% probability that the true population mean falls below the critical concentration/GAC.

Appropriate data sets must be created to enable the statistical testing to be carried out and three key elements must be considered prior to statistical analysis. These are as follows:

- Dealing with non-detects;
- Understanding the statistical distribution of data; and
- Dealing with outliers.

The results can then be assessed and the results will be compared against the following:

- Sample Mean – if the sample mean of the data set is in excess of the GAC then the Upper Confidence Limit of the true population mean will be higher than the critical concentration.
- 95% of the Upper Confidence Limit.
- One Sample T Test (parametric test) carried out at the 95% confidence level.

On the basis of these tests, the validity of the Null Hypothesis can be assessed.

Certificate of Analysis

Certificate Number 18-20109

29-Aug-18

Client JPG (Leeds) LTD
Civil & Structural Engineers
5 John Charles Way
Leeds
LS12 6QA

Our Reference 18-20109

Client Reference 4671

Order No (not supplied)

Contract Title Airfields, Deeside

Description 4 Soil samples, 1 Leachate sample.

Date Received 22-Aug-18

Date Started 22-Aug-18

Date Completed 29-Aug-18

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 18-20109
Client Ref 4671
Contract Title Airfields, Deeside

			Lab No	1382901	1382902	1382903	1382904
			Sample ID	TP207	TP227	TP206	TP234
			Depth	0.00-0.20	0.00-0.30	0.50-0.60	0.00-0.20
			Other ID	TOPSOIL	TOPSOIL	TOPSOIL	NATURAL
			Sample Type	D	D	D	D
			Sampling Date	20/08/18	20/08/18	20/08/18	20/08/18
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	9.7	12	5.1	10
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.5	< 0.1	0.4
Chromium	DETSC 2301#	0.15	mg/kg	17	19	9.5	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	18	17	5.2	13
Lead	DETSC 2301#	0.3	mg/kg	89	110	24	73
Mercury	DETSC 2325#	0.05	mg/kg	0.06	0.06	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	14	16	7.9	12
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.5
Zinc	DETSC 2301#	1	mg/kg	140	180	40	130
Inorganics							
pH	DETSC 2008#			8.0	7.3	8.7	7.8
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.1	0.2	< 0.1	0.1
Organic matter	DETSC 2002#	0.1	%	5.0	6.3	0.4	4.8
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	7.3	9.4	3.4	6.2
Chloride	DETSC 2055	1	mg/kg	13.9	10.0	13.9	10.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	20	19	11	16
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	32
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.08	0.11	0.02	0.08
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	0.6	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 18-20109
Client Ref 4671
Contract Title Airfields, Deeside

			Lab No	1382905
			Sample ID	TP227
			Depth	0.00-0.30
			Other ID	TOPSOIL
			Sample Type	D
			Sampling Date	20/08/18
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Preparation				
NRA Leachate Preparation	DETS 036*			Y
Metals				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.49
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.3
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.40
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.1
Inorganics				
pH	DETSC 2008			8.0
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Sulphate as SO4	DETSC 2055	0.1	mg/l	0.60
PAHs				
Naphthalene	DETSC 3304	0.01	ug/l	0.13
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.04	ug/l	0.13
Phenols				
Phenol	DETSC 3451*	0.5	ug/l	< 0.50

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 18-20109
Client Ref 4671
Contract Title Airfields, Deeside

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1382901	TP207 TOPSOIL 0.00-0.20	SOIL	NAD	none	Michael Kay
1382902	TP227 TOPSOIL 0.00-0.30	SOIL	NAD	none	Michael Kay
1382903	TP206 TOPSOIL 0.50-0.60	SOIL	NAD	none	Michael Kay
1382904	TP234 NATURAL 0.00-0.20	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 18-20109
Client Ref 4671
Contract Airfields, Deeside

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1382901	TP207 0.00-0.20 SOIL	20/08/18	GJ 250ml, GJ 60ml, PT 1L		
1382902	TP227 0.00-0.30 SOIL	20/08/18	GJ 250ml, GJ 60ml, PT 1L		
1382903	TP206 0.50-0.60 SOIL	20/08/18	GJ 250ml, GJ 60ml, PT 1L		
1382904	TP234 0.00-0.20 SOIL	20/08/18	GJ 250ml, GJ 60ml, PT 1L		
1382905	TP227 0.00-0.30 LEACHATE	20/08/18	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Certificate of Analysis

Certificate Number 18-20319

03-Sep-18

Client JPG (Leeds) LTD
Civil & Structural Engineers
5 John Charles Way
Leeds
LS12 6QA

Our Reference 18-20319

Client Reference 4671

Order No (not supplied)

Contract Title Airfields, Deeside

Description 7 Soil samples, 2 Leachate samples.

Date Received 24-Aug-18

Date Started 24-Aug-18

Date Completed 03-Sep-18

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

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Summary of Chemical Analysis
Matrix Descriptions

Our Ref 18-20319
Client Ref 4671
Contract Title Airfields, Deeside

Sample ID	Depth	Lab No	Completed	Matrix Description
TP205	0.00-0.20	1383905	03/09/2018	Dark brown gravelly, sandy CLAY including odd rootlets
TP218	0.00-0.20	1383906	03/09/2018	Dark brown sandy CLAY including odd rootlets
TP232	0.00-0.20	1383907	03/09/2018	Dark brown sandy CLAY including numerous rootlets
TP231	0.30-0.55	1383908	03/09/2018	Brown clayey SAND
TP217	0.00-0.20	1383909	03/09/2018	Dark brown slightly sandy CLAY including odd rootlets
TP203	0.00-0.20	1383910	03/09/2018	Dark brown slightly sandy CLAY including odd rootlets
TP222	0.40-0.60	1383911	03/09/2018	Dark brown slightly sandy CLAY

Summary of Chemical Analysis
Soil Samples

Our Ref 18-20319
Client Ref 4671
Contract Title Airfields, Deeside

			Lab No	1383905	1383906	1383907	1383908	1383909	1383910	1383911
			Sample ID	TP205	TP218	TP232	TP231	TP217	TP203	TP222
			Depth	0.00-0.20	0.00-0.20	0.00-0.20	0.30-0.55	0.00-0.20	0.00-0.20	0.40-0.60
			Other ID							
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	21/08/18	21/08/18	21/08/18	21/08/18	21/08/18	21/08/18	21/08/18
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	12	11	13	6.3	12	12	9.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.5	0.6	< 0.1	0.5	0.5	0.1
Chromium	DETSC 2301#	0.15	mg/kg	16	15	17	9.6	17	15	14
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	13	11	15	5.3	14	12	7.5
Lead	DETSC 2301#	0.3	mg/kg	140	79	100	34	97	89	77
Mercury	DETSC 2325#	0.05	mg/kg	0.10	0.09	0.10	0.06	0.10	0.09	0.07
Nickel	DETSC 2301#	1	mg/kg	10	12	13	9.2	15	12	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.9	0.9	< 0.5	0.5	< 0.5	0.9
Zinc	DETSC 2301#	1	mg/kg	180	190	180	44	190	150	61
Inorganics										
pH	DETSC 2008#			7.9	7.9	7.8	8.7	8.1	7.9	8.4
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.3	< 0.1	0.1	0.2	< 0.1
Organic matter	DETSC 2002#	0.1	%	4.6	3.5	5.1	0.5	2.9	1.6	1.1
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	6.4	3.3	5.2	3.6	4.0	2.2	3.0
Chloride	DETSC 2055	1	mg/kg	17.5	6.6	11.8	3.8	9.2	6.1	8.2
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	21	11	20	< 10	13	12	14
Sulphide	DETSC 2024*	10	mg/kg	< 10	< 10	< 10	< 10	20	12	< 10
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07	0.06	0.10	0.03	0.06	0.05	0.04
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 18-20319
Client Ref 4671
Contract Title Airfields, Deeside

			Lab No	1383912	1383913
			Sample ID	TP231	TP203
			Depth	0.30-0.55	0.00-0.20
			Other ID		
			Sample Type	LEACHATE	LEACHATE
			Sampling Date	21/08/18	21/08/18
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Preparation					
NRA Leachate Preparation	DETS 036*			Y	Y
Metals					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.50	0.48
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.8	0.9
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.87	1.2
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01	0.05
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	1.4
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	< 1.3
Inorganics					
pH	DETSC 2008			7.5	7.6
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20
Sulphate as SO4	DETSC 2055	0.1	mg/l	1.8	0.55
PAHs					
Naphthalene	DETSC 3304	0.01	ug/l	0.27	0.15
Acenaphthylene	DETSC 3304	0.01	ug/l	0.18	0.04
Acenaphthene	DETSC 3304	0.01	ug/l	0.02	0.02
Fluorene	DETSC 3304	0.01	ug/l	0.02	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
PAH Total	DETSC 3304	0.04	ug/l	0.49	0.21
Phenols					
Phenol	DETSC 3451*	0.5	ug/l	< 0.50	< 0.50

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 18-20319
Client Ref 4671
Contract Title Airfields, Deeside

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1383905	TP205 0.00-0.20	SOIL	NAD	none	Rebecca Burgess
1383906	TP218 0.00-0.20	SOIL	NAD	none	Rebecca Burgess
1383907	TP232 0.00-0.20	SOIL	NAD	none	Rebecca Burgess
1383908	TP231 0.30-0.55	SOIL	NAD	none	Rebecca Burgess
1383909	TP217 0.00-0.20	SOIL	NAD	none	Rebecca Burgess
1383910	TP203 0.00-0.20	SOIL	NAD	none	Rebecca Burgess
1383911	TP222 0.40-0.60	SOIL	NAD	none	Rebecca Burgess

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 18-20319
Client Ref 4671
Contract Airfields, Deeside

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1383905	TP205 0.00-0.20 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383906	TP218 0.00-0.20 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383907	TP232 0.00-0.20 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383908	TP231 0.30-0.55 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383909	TP217 0.00-0.20 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383910	TP203 0.00-0.20 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383911	TP222 0.40-0.60 SOIL	21/08/18	GJ 250ml, GV, PT 1L		
1383912	TP231 0.30-0.55 LEACHATE	21/08/18	GJ 250ml, GV, PT 1L		
1383913	TP203 0.00-0.20 LEACHATE	21/08/18	GJ 250ml, GV, PT 1L		

Key: G-Glass P-Plastic J-Jar V-Vial T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

Certificate of Analysis

Certificate Number 18-20415

04-Sep-18

Client JPG (Leeds) LTD
Civil & Structural Engineers
5 John Charles Way
Leeds
LS12 6QA

Our Reference 18-20415

Client Reference 4671

Order No (not supplied)

Contract Title Airfields Deeside

Description 3 Soil samples, 1 Leachate sample.

Date Received 28-Aug-18

Date Started 28-Aug-18

Date Completed 04-Sep-18

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 18-20415
Client Ref 4671
Contract Title Airfields Deeside

			Lab No	1384302	1384303	1384304
			Sample ID	TP214	TP230	TP201
			Depth		0.00-0.20	
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	23/08/18	23/08/18	23/08/18
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Arsenic	DETSC 2301#	0.2	mg/kg	12	7.9	12
Cadmium	DETSC 2301#	0.1	mg/kg	0.1	0.4	0.7
Chromium	DETSC 2301#	0.15	mg/kg	25	13	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	81	13	21
Lead	DETSC 2301#	0.3	mg/kg	110	49	110
Mercury	DETSC 2325#	0.05	mg/kg	0.09	0.09	0.12
Nickel	DETSC 2301#	1	mg/kg	25	11	13
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	95	130	230
Inorganics						
pH	DETSC 2008#			8.3	8.6	8.2
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	0.2
Organic matter	DETSC 2002#	0.1	%	0.2	2.7	2.8
Ammoniacal Nitrogen as N	DETSC 2119#	0.5	mg/kg	2.7	3.0	6.0
Chloride	DETSC 2055	1	mg/kg	3.4	10.4	10.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	20	36	17
Sulphide	DETSC 2024*	10	mg/kg	< 10	64	56
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.04	0.06
PAHs						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.7	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Leachate Samples

Our Ref 18-20415
Client Ref 4671
Contract Title Airfields Deeside

			Lab No	1384305
			Sample ID	TP230
			Depth	0.00-0.20
			Other ID	
			Sample Type	LEACHATE
			Sampling Date	23/08/18
			Sampling Time	n/s
Test	**Method**	**LOD**	**Units**	
Preparation				
NRA Leachate Preparation	DETS 036*			Y
Metals				
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.49
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.44
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.8
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.23
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25
Zinc, Dissolved	DETSC 2306	1.3	ug/l	3.7
Inorganics				
pH	DETSC 2008			8.2
Cyanide, Free	DETSC 2130	20	ug/l	< 20
Sulphate as SO4	DETSC 2055	0.1	mg/l	0.60
PAHs				
Naphthalene	DETSC 3304	0.01	ug/l	0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01
PAH Total	DETSC 3304	0.04	ug/l	0.05
Phenols				
Phenol	DETSC 3451*	0.5	ug/l	< 0.50

Key: * -not accredited. n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 18-20415
Client Ref 4671
Contract Title Airfields Deeside

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1384302	TP214	SOIL	NAD	none	D Wilkinson
1384303	TP230 0.00-0.20	SOIL	NAD	none	D Wilkinson
1384304	TP201	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 18-20415
Client Ref 4671
Contract Airfields Deeside

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1384302	TP214 SOIL	23/08/18	GJ 250ml, GJ 60ml, PT 1L		
1384303	TP230 0.00-0.20 SOIL	23/08/18	GJ 250ml, GJ 60ml, PT 1L		
1384304	TP201 SOIL	23/08/18	GJ 250ml, PT 1L		
1384305	TP230 0.00-0.20 LEACHATE	23/08/18	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Certificate of Analysis

Certificate Number	18-25361
	31-Oct-18
Client	JPG (Leeds) LTD Civil & Structural Engineers 5 John Charles Way Leeds LS12 6QA
Our Reference	18-25361
Client Reference	4671
Order No	(not supplied)
Contract Title	4671 The Airfeilds Deeside
Description	2 Water samples.
Date Received	25-Oct-18
Date Started	25-Oct-18
Date Completed	31-Oct-18
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Water Samples

Our Ref 18-25361
Client Ref 4671
Contract Title 4671 The Airfeilds Deeside

			Lab No	1411662	1411663
			Sample ID	CP201	CP206
			Depth		
			Other ID		
			Sample Type	WATER	WATER
			Sampling Date	23/10/18	23/10/18
			Sampling Time	n/s	n/s
Test	**Method**	**LOD**	**Units**		
Metals					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	2.9	1.7
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	2.7	1.3
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	1.1
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25
Zinc, Dissolved	DETSC 2306	1.3	ug/l	6.6	13
Inorganics					
pH	DETSC 2008			7.9	8.0
Cyanide, Free	DETSC 2130	20	ug/l	< 20	< 20
Ammoniacal Nitrogen as N	DETSC 2207	0.015	mg/l	0.16	11
Chloride	DETSC 2055	0.1	mg/l	9.7	24
Sulphate as SO4	DETSC 2055	0.1	mg/l	7.0	27
Sulphide	DETSC 2208	10	ug/l	< 10	< 10
PAHs					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.02
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.05
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.05	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20
Phenols					
Phenol	DETSC 3451*	0.5	ug/l	< 0.50	< 0.50

Key: * -not accredited. n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 18-25361
Client Ref 4671
Contract 4671 The Airfeilds Deeside

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1411662	CP201 WATER	23/10/18	GB 1L, GV, PB 1L		
1411663	CP206 WATER	23/10/18	GB 1L, GV, PB 1L		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Waste Classification Report

TW4ES-T932J-Z775B

Job name

4671

Description/Comments

Project

4671 - Plots B & C

Site

The Airfields, Deeside

Related Documents

#	Name	Description
None		

Waste Stream Template

JPG CL WASTE STREAM V20

Classified by

Name:
Dominic Horne
Date:
20 Oct 2018 10:17 GMT
Telephone:
07814008742

Company:
JPG Leeds
5 John Charles Way
Leeds
LS12 6QA

Report

Created by: Dominic Horne
Created date: 20 Oct 2018 10:17 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP230	0.00-0.20	Non Hazardous		3
2	TP201	0.00-0.21	Non Hazardous		5
3	TP205	0.00-0.20	Non Hazardous		7
4	TP218	0.00-0.20	Non Hazardous		9
5	TP232	0.00-0.20	Non Hazardous		11
6	TP217	0.00-0.20	Non Hazardous		13
7	TP203	0.00-0.20	Non Hazardous		15
8	TP207	0.00-0.20	Non Hazardous		17
9	TP227	0.00-0.30	Non Hazardous		19
10	TP234	0.00-0.20	Non Hazardous		21

Classification of sample: TP230

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP230
Sample Depth:
0.00-0.20 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7.9	mg/kg	1.32	10.431	mg/kg	0.00104 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		13	mg/kg	1.462	19	mg/kg	0.0019 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	49	mg/kg	1.56	76.431	mg/kg	0.0049 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.09	mg/kg	1.16	0.104	mg/kg	0.0000104 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11	mg/kg	2.976	32.739	mg/kg	0.00327 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10	zinc { zinc chromate }	024-007-00-3				130	mg/kg	2.774	360.639	mg/kg	0.0361 %		
11	pH			PH		8.6	pH		8.6	pH	8.6 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				0.7	mg/kg		0.7	mg/kg	0.00007 %		
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0493 %		

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: TP201

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP201	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.00-0.21 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7	mg/kg	1.142	0.8	mg/kg	0.00008 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	110	mg/kg	1.56	171.58	mg/kg	0.011 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.12	mg/kg	1.16	0.139	mg/kg	0.0000139 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		13	mg/kg	2.976	38.691	mg/kg	0.00387 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3				230	mg/kg	2.774	638.054	mg/kg	0.0638 %		
11	pH			PH		8.2	pH		8.2	pH	8.2 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0857 %		

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: TP205

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP205
Sample Depth:
0.00-0.20 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		16	mg/kg	1.462	23.385	mg/kg	0.00234 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	140	mg/kg	1.56	218.374	mg/kg	0.014 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.116	mg/kg	0.0000116 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		10	mg/kg	2.976	29.763	mg/kg	0.00298 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3				180	mg/kg	2.774	499.346	mg/kg	0.0499 %		
11	pH			PH		7.9	pH		7.9	pH	7.9 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				0.3	mg/kg		0.3	mg/kg	0.00003 %		
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0729 %		

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: TP218

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP218	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.00-0.20 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	14.524	mg/kg	0.00145 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11	mg/kg	1.126	12.385	mg/kg	0.00124 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	79	mg/kg	1.56	123.225	mg/kg	0.0079 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.09	mg/kg	1.16	0.104	mg/kg	0.0000104 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.9	mg/kg	2.554	2.298	mg/kg	0.00023 %		
10	zinc { zinc chromate }	024-007-00-3				190	mg/kg	2.774	527.088	mg/kg	0.0527 %		
11	pH			PH		7.9	pH		7.9	pH	7.9 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0698 %		

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: TP232

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP232	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.00-0.20 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	17.164	mg/kg	0.00172 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	100	mg/kg	1.56	155.982	mg/kg	0.01 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.116	mg/kg	0.0000116 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		13	mg/kg	2.976	38.691	mg/kg	0.00387 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.9	mg/kg	2.554	2.298	mg/kg	0.00023 %		
10	zinc { zinc chromate }	024-007-00-3				180	mg/kg	2.774	499.346	mg/kg	0.0499 %		
11	pH			PH		7.8	pH		7.8	pH	7.8 pH		
12	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				0.3	mg/kg	1.884	0.565	mg/kg	0.0000565 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0704 %		

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: TP217

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP217
Sample Depth:
0.00-0.20 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14	mg/kg	1.126	15.762	mg/kg	0.00158 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	97	mg/kg	1.56	151.302	mg/kg	0.0097 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.1	mg/kg	1.16	0.116	mg/kg	0.0000116 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15	mg/kg	2.976	44.644	mg/kg	0.00446 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.5	mg/kg	2.554	1.277	mg/kg	0.000128 %		
10	zinc { zinc chromate }	024-007-00-3				190	mg/kg	2.774	527.088	mg/kg	0.0527 %		
11	pH			PH		8.1	pH		8.1	pH	8.1 pH		
12	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				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0731 %		

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: TP203

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP203	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.00-0.20 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	89	mg/kg	1.56	138.824	mg/kg	0.0089 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.09	mg/kg	1.16	0.104	mg/kg	0.0000104 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3				150	mg/kg	2.774	416.122	mg/kg	0.0416 %		
11	pH			PH		7.9	pH		7.9	pH	7.9 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0598 %		

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: TP207

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP207
Sample Depth:
0.00-0.20 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.7	mg/kg	1.32	12.807	mg/kg	0.00128 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	89	mg/kg	1.56	138.824	mg/kg	0.0089 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.06	mg/kg	1.16	0.0696	mg/kg	0.00000696 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14	mg/kg	2.976	41.668	mg/kg	0.00417 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		**<LOD**
10	zinc { zinc chromate }	024-007-00-3				140	mg/kg	2.774	388.381	mg/kg	0.0388 %		
11	pH			PH		8	pH		8	pH	8pH		
12	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				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0583 %		

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: TP227

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP227	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	
0.00-0.30 m	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.571	mg/kg	0.0000571 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	110	mg/kg	1.56	171.58	mg/kg	0.011 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		0.06	mg/kg	1.16	0.0696	mg/kg	0.00000696 %		
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16	mg/kg	2.976	47.62	mg/kg	0.00476 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3				180	mg/kg	2.774	499.346	mg/kg	0.0499 %		
11	pH			PH		7.3	pH		7.3	pH	7.3 pH		
12	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				0.2	mg/kg	1.884	0.377	mg/kg	0.0000377 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				0.4	mg/kg		0.4	mg/kg	0.00004 %		
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0726 %		

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: TP234

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP234
Sample Depth:
0.00-0.20 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10	mg/kg	1.32	13.203	mg/kg	0.00132 %		
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.457	mg/kg	0.0000457 %		
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	73	mg/kg	1.56	113.867	mg/kg	0.0073 %		
7	mercury { mercury(II) sulphide }		215-696-3	1344-48-5		<0.05	mg/kg	1.16	<0.058	mg/kg	<0.0000058 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12	mg/kg	2.976	35.715	mg/kg	0.00357 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				0.5	mg/kg	2.554	1.277	mg/kg	0.000128 %		
10	zinc { zinc chromate }	024-007-00-3				130	mg/kg	2.774	360.639	mg/kg	0.0361 %		
11	pH			PH		7.8	pH		7.8	pH	7.8 pH		
12	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				0.1	mg/kg	1.884	0.188	mg/kg	0.0000188 %		
13	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
15		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
16		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
17		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-581-5	85-01-8									
18		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
19		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-912-4	206-44-0									
20		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-927-3	129-00-0									
21		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
22		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
23		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
24		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
25		benzo[a]pyrene; benzo[def]chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
26		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-893-2	193-39-5									
27		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
28		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-883-8	191-24-2									
29		phenol				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0528 %		

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 CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

mercury(II) sulphide (EC Number: 215-696-3, CAS Number: 1344-48-5)

Conversion factor: 1.16
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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT RE 2 H373 , Acute Tox. 2 H300 , Acute Tox. 1 H310 , Acute Tox. 3 H331

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

CLP index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s)/Risk Phrase(s):
14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

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: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

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: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

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 Chronic 1 H410 , Aquatic Acute 1 H400

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: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

- **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: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

- **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

- **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 Chronic 1 H410 , Aquatic Acute 1 H400

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings.

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides.

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass.

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight.

mercury {mercury(II) sulphide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight.

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}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide]

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2018.279.3663.7481 (09 Oct 2018)
HazWasteOnline Database: 2018.279.3663.7481 (09 Oct 2018)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
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 Wastes 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
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

Appendix H Notes on Limitations

General
JPG (Leeds) Limited have prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from JPG (Leeds) Limited; a charge may be levied against such approval.

JPG (Leeds) Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
b) this document to any third party with whom an agreement has not been executed.

Phase I Desk Study Reports
The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, JPG (Leeds) Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Geo-Environmental Investigations
The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics and ground and groundwater conditions to allow a reasonable assessment of the environmental risks together with engineering and development implications. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

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