Chorlton Baths, Manchester

Final Phase 2 Geo-Environmental Investigation Risk Assessment & Remediation Strategy



Job Number: LKC241317

Date: April 2025

Client: Caddick Construction (NW) Ltd

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EXECUTIVE SUMMARY

Site Details

Location	Former Chorlton Leisure Centre, in between Manchester Road and the South Manchester Rail Line, Chorlton-Cum-Hardy. National Grid Reference 381706E 394517N.
Area	3,400m^2.
Topography	28 metres above ordnance datum (AOD). Site is formed of two levels with the floor slab of the former building being higher than the original ground level. The base of the former swimming pool is lower than the current ground level.
Current Site Use	Former building has been demolished. Eastern corner of site has been stripped of surfacing and treated for Japanese Knotweed. This area has been filled in with crush. Enabling works have now been completed creating a level platform for development.
Proposed Development	Residential apartments including soft landscaping and car parking.

Site Setting

Main Historical Features	Onsite: Field, Public baths. Surrounding Area: Agricultural fields, marl pits (150m S), brick kilns, railway.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Glaciofluvial sheet deposits (sand and gravel). Secondary A Aquifer. Bedrock: Wilmslow Sandstone Formation (sandstone). Principle Aquifer.
Landfills / Infilled Ground	No recorded landfills or made ground within influencing distance of site.

Ground Investigation Work Undertaken

Date of Investigation:	12th September 2024.	28th October – 3st December 2024
	Post Demolition Investigation	Post Enabling Works Investigation
Intrusive Investigation Work Undertaken:	5no. mechanically excavated trial pits. Contamination and geotechnical testing.	6no. Cable Percussion Boreholes. 5no. Window Sample Boreholes. 6no. Cone Penetrometer Tests. Contamination and geotechnical testing.

Ground Conditions

Made Ground	Sandy gravel with brick and sandy gravel with ash, brick, concrete, tarmacadam, glass and ceramic encountered to maximum depths of 2.50mbgl.	Gravelly sand with frequent brick and concrete encountered to depths between 0.60-3.33mbgl. Rare ash, clinker, plastic fragments, slate fragments, coal fragments, textile fragments and timber fragments noted within the made ground.
Superficial	Gravelly sand from depths of between 0.30-1.00mbgl in the north and centre of the site. Soft to stiff sandy clay encountered in the south of the site from ground level to depths greater than 3.00mbgl.	Gravelly sand from depths of between 0.80-3.10mbgl. Firm consistency gravelly sandy silty clay encountered site wide from depths of between 3.00-4.70mbgl. Deeper boreholes encountered stiff to very stiff gravelly sandy silty clay to base of boreholes with bands of gravelly

		sand and sand and gravel present.
Bedrock	Not encountered.	Not encountered.
Groundwater	None encountered.	Encountered in window sample boreholes between 2.80-3.00mbgl. Encountered within cable percussion boreholes at 13.90mbgl and 16.60mbgl.
Obstructions	Brick floor at 1.80mbgl within TP104. Foundations of recently demolished building likely still in place.	None encountered.
Permeability	No soakaway tests undertaken. Natural sand deposits likely have good drainage characteristics.	No soakaway tests undertaken. Natural sand deposits likely have good drainage characteristics.
Other Observations	No visual and olfactory evidence of contamination encountered.	No visual and olfactory evidence of contamination encountered.

Geotechnical Assessment

Anticipated Foundation Type	Piled foundations or Vibro Stone Columns supporting traditional shallow foundations.
Shallow Groundwater	No groundwater encountered during the investigation.
Concrete Requirements	Based on BRE Digest 2005[1] – DS-1 AC-1 across most of the site. DS-3 AC-2 may be required in the vicinity of TP04, CP104 and WS105 in the south of the site.
Services	Services – consideration to the presence of services running through the site. Services may need to be re-routed.
Temporary support of excavation	Trial pits recorded as unstable in natural sand. Open excavations likely to require support.
Plasticity	Consideration will need to be given to the shrink / swell of the clay strata if it is to be used as founding strata, particularly where trees/hedges are present. Foundations may need to be deepened. The clay is classed as having a medium volume change potential..
Road / Pavement Design	A design CBR value of 2.0% should be adopted for the made ground and gravelly natural sand.
Slope Stability	No significant slopes on site. No further consideration required.

Contamination Risk Assessment

PL	Contaminant	Risk	Recommendations
1	Metals, PAHs, Petroleum hydrocarbons	Moderate	Further site investigation recommended. Remediation is soft landscaping likely.
	Asbestos	Low	No remediation recommended at this stage.
	SVOC and VOCs	Low	Further site investigation recommended. No remediation recommended at this stage.
2	Naphthalene and other volatile contaminants	Low	Further site investigation recommended. No remediation recommended at this stage.
3	Carbon dioxide, methane	Moderate	Further site investigation required. Remediation to be confirmed following further SI.
4	Groundwater (mobile contaminants)	Low	No remediation recommended at this stage..
	Surface Water: (mobile contaminants)	Low	No remediation recommended at this stage..
5	Organic contaminants.	Moderate	Utility provider risk assessment to be completed. The site will likely require barrier piping.

Recommendations and Remedial Strategy

PL	Recommendation
1	Environmental cover system required in soft landscaping areas.
2	No specific remediation required.
3	No remediation required.
4	No remediation required.
5	Potable water pipe assessment required. Barrier pipe likely.

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1. Introduction

1.1. Background

LK Consult Ltd (LKC) has been commissioned to carry out a post demolition Phase 2 Geo-Environmental Investigation and Risk Assessment for Chorlton Baths, Manchester. The investigation was undertaken in support of a planning application (136791/FO/2023) to develop the site for residential end use.

The following work has previously been undertaken:

- Phase 1 Preliminary Risk Assessment (PRA) report, undertaken by Carley and Daines and Partners Ltd (Ref: 23-B-13672/Chorlton Baths dated 6th March 2023).
- Phase 2 Geoenvironmental Report, undertaken by CC Geotechnical Ltd (Ref: CCG-C-24-14500 dated May 2024).
- Interim Phase 2 Geo-environmental Investigation & Risk Assessment, undertaken by LKC (Ref: LKC241317-BX-GI-Chorlton Baths, Manchester R0 dated 4th October 2024).

The interim investigation report was undertaken post demolition of the buildings on site. This report encompasses the findings of that report plus additional 'post-enabling works' site investigation.

This investigation has been undertaken to confirm the ground conditions below previously inaccessible areas of the site and to allow a contamination and geotechnical assessment to be undertaken.

The investigation will aim to confirm the risks of the potential pollutant linkages identified in the PRA and recommend further assessment, as required.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary plan. Figure 2 indicates the proposed development.

Location	Former Chorlton Leisure Centre, in between Manchester Road and the South Manchester Rail Line, Chorlton-Cum-Hardy. National Grid Reference 381706E 394517N.
Area	3,400m^2.
Topography	28 metres above ordnance datum (AOD). Site is formed of two levels with the floor slab of the former building being higher than the original ground level. The base of the former swimming pool is lower than the current ground level.
Current Site Use	Former building has been demolished. Eastern corner of site has been stripped of surfacing and treated for Japanese Knotweed. This area has been filled in with crush. Enabling works have now been completed creating a level platform for development.
Proposed Development	Residential apartments including soft landscaping and car parking.

Table 1-1: Summary of site details.

2. Summary of Previous Work

Pertinent information has been summarised from the PRA conducted by Carley Daines and Partners Ltd in Table 2-1.

Main Historical Features	Onsite: Field, Public baths. Surrounding Area: Agricultural fields, marl pits (150m S), brick kilns, railway.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Glaciofluvial sheet deposits (sand and gravel). Secondary A Aquifer. Bedrock: Wilmslow Sandstone Formation (sandstone). Principle Aquifer.
Landfills / Infilled Ground	No recorded landfills or made ground within influencing distance of site.

Table 2-1: Summary of site details, historical review, environmental settings, and site reconnaissance.

2.1. Previous Site Investigations

Scope	2 No. Cable percussive boreholes undertaken to depths of 15.45mbgl. 2 No. Dynamic sampling boreholes undertaken to depths of 5.45mbgl. 2No. Dynamic probing undertaken between 5.00m and 10.00mbgl. 1 No. trial pit undertaken to a depth of 2.00mbgl.		
Ground Conditions	**Surfacing:** Tarmac to 0.10mbgl. **Artificial:** Loose to medium dense sands and gravels and soft sandy gravelly clay with brick, glass, ash, clinker, ceramic and coal. **Superficial:** Very loose to medium dense sand and gravels to depths of between 3.60m and 4.20mbgl. Soft to stiff gravelly sandy clay encountered to a maximum depth of 15.45mbgl. **Bedrock:** Not encountered. **Groundwater:** Not encountered. No visual or olfactory evidence of contamination was encountered at the site.		
Geo-Environmental Assessment	**Contaminant**	**Elevated Results**	**Locations**
	Heavy metals	Lead (280-370mg/kg).	TP01, BH02
	PAHs	Naphthalene (38mg/kg).	TP01
		Benzo(a)pyrene (15-180mg/kg)	TP01, WS02, BH01, BH02
	TPHs	Aromatic EC16-21 (2000mg/kg) Aromatic EC21-35 (2500 mg/kg)	TP01
	VOC/SVOC	None above screening values.	-
	Asbestos	None detected.	-
	Ground Gas conditions classified as CS2 based on GSV of 0.00069l/hr (6.9%) for CO_2. This is only based on two monitoring visits from one location.		
Geotechnical Assessment	Concrete Classification	AC-1s, DS-2.	
	Foundations	Piled foundations installed using CFA methods, end bearing at 15mbgl.	
	Soakaways	Soil infiltration rate of $3.72x10^{-5}$m/sec.	

Table 2-2: Summary of previous SI undertaken by CC Geotechnical Ltd.

2.2. Conceptual Model

The contamination conceptual model in the CC Geotechnical Ltd report has been updated to be in line with LKC current risk assessment methodology (detailed below). The model is based on the contamination sources, pathways and receptors identified in the original report. LKC also consider the following should be considered:

The conceptual model is based on the future use of the site (post development), in line with proposed development scheme.

Due to the minor consequence associated with the phytotoxic effect to flora (i.e., loss of plants in a landscaping scheme), the overall risk for most sites will be very low to low. here soils contain significant concentrations of heavy metals, in general there will other pollutant linkages (i.e., the risk to human health) that will trigger the requirement for remediation (e.g., a clean environmental cover system). As such the risk to flora associated with phytotoxic contaminants will not be considered further.

The risk to buildings associated with elevated sulphate will be considered as part of the geotechnical assessment and will not be included in the contamination risk assessment.

PL	Contaminants of Concern (source)	Pathway	Receptor	Probability	Consequence	Risk	Recommendation
1	PAHs, TPHs, Heavy Metals (ash, car park).	Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust. Windblown dust.	Future site users. Offsite receptors.	Likely	Medium	Moderate	Some elevated metals (lead), PAHs, and non-volatile TPH present. Further site investigation recommended. Remediation may be required in soft landscaping areas.
	Asbestos (Demolition material)			Unlikely	Medium	Low	
	SVOCs, VOCs			Unlikely	Medium	Low	
2	Naphthalene (made ground)	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users. Offsite receptors.	Likely	Medium	Moderate	Elevated naphthalene (based on old assessment criteria) in one location. recommended. Remediation may be required.
3	Hazardous / ground gas: methane, carbon dioxide (made ground, marl pit)	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate/Low	Gas monitoring required if putrescible material encountered during ground investigation.
4	Mobile contamination (made ground)	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater Surface water	Unlikely	Medium	Low	No mobile contamination encountered. No remediation recommended.
5	TPHs and PAHs (Ash, Made Ground)	Ingestion of tainted water supply.	Future site users. Water pipes.	Likely	Medium	Moderate	Elevated organic contamination encountered. Further site investigation recommended. Remediation may be required.

Table 2-2: Preliminary Contamination Conceptual Model.

3. Ground Investigation

3.1. Site Investigation Design and Methodology

The post demolition investigation was carried out on the 12th September 2024 and comprised the following:

- 5no. trial pits (using 10t tracked machine) excavated to 1.10-3.00mbgl (ref. TP101 to TP105).

The post enabling works investigation was carried out between 28th October – 3rd December 2024 and comprised the following:

- 6no. cable percussion boreholes drilled to 20.05-20.25mbgl (ref. CP101-CP106).
- 5no. window sample boreholes drilled to 3.33-5.45mbgl (ref. WS101-WS105).
- 7no. Cone Penetration Testing (CPT101-CPT107) drilled to depths of between 10.48m-15.00mbgl.

CPT101 and CPT107 had to be repositioned due to shallow refusals. The post enabling works site investigation was undertaken once finished remediation levels were in place.

All site investigation locations are shown in Figure 3.

The locations were chosen to allow adequate assessment of ground conditions across the site. Table 3-1 details the site investigation locations.

Site Investigation Locations	Rationale
TP101-TP105	General site coverage.
TP102-TP104, WS101-WS105	In previously inaccessible areas due to buildings.
CP101-CP106, CPT101-CPT107	In footprint of proposed buildings and specified by the client's structural engineer.

Table 3-1: Summary of Sampling Locations.

The investigation locations allow an adequate assessment of ground conditions across the site. The number of sampling points corresponds to one location per 25m square centres.

All profile logs are provided in Appendix B and are in line with BS14688-1[3] and BS5930[4].

3.2. Sampling Protocol

3.2.1. Soil Sampling (Contamination)

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation[5].

Soil was collected for onsite testing for total volatile organic compounds (TVOCs) using a photoionisation detector (PID) fitted with a 10.6eV lamp and moisture trap. A plastic zip bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested. Results of the PID readings are presented on the profile logs (Appendix B). The onsite monitoring was carried out in line CIRIA C665[6] to aid in screening samples for volatile analysis.

Soil samples of approximately 500g were recovered in amber jars and plastic tubs. All the samples were sent to DETS laboratory for chemical testing.

Many of the contamination tests are UKAS or MCERTS accredited and further details are given in the Certificate of Analysis presented in Appendix C. Table 3-2 shows the soil testing undertaken.

Testing	No. Samples	Justification
Metals / metalloids, pH, water soluble sulphate, speciated PAHs, SOM and asbestos screen.	7	A basic suite with a broad selection of contaminants where no significant evidence of contamination was identified.
Metals / metalloids, pH, water soluble sulphate, cyanide suite, phenol, TPHCWG, BTEX, MTBE, speciated PAHs, SOM and asbestos screen.	6	Although no evidence of contamination identified, detailed suite undertaken to confirm the absence of contamination and to support waste classification.
Waste Acceptance Criteria (WAC)	3	Samples of representative material which may be earmarked for disposal.

Table 3-2: Summary of Soil Testing.

Notes:

If asbestos present during screen identification and quantification will be undertaken.

Metal/metalloids=arsenic, cadmium, chromium, (total and hexavalent), copper, lead, mercury, nickel, selenium, vanadium, zinc, and boron; TPHCWG=carbon banded and aromatic/aliphatic split petroleum hydrocarbons; PAH=polycyclic aromatic hydrocarbons, BTEX=benzene, toluene, ethylbenzene, and xylenes; MTBE=Methyl tert-butyl ether, SOM=Soil Organic Matter.

3.2.2. Soil Sampling (Geotechnical)

Soil samples taken during the investigation were collected in tubs and bulk bags for and sent to Murray Rix Laboratories and DETS for geotechnical testing.

Further details are given in the laboratory report presented in Appendix D. Table 3-3 shows the geotechnical testing undertaken.

Testing	No. Samples
Moisture Condition Value	5
2.5kg Rammer	1
OMC/MDD Vibrating Hammer	4
Atterberg Limits (plasticity testing)	15
Moisture Content	11
Remoulded Single Stage Triaxial	2
Incremental Loading Oedometer Test	1
Particle Size Distribution (PSD)	18
Triaxial	9
BRE Suite Short	13

Table 3-3: Summary of Geotechnical Testing Undertaken.

3.2.3. Water Sampling

Groundwater sampling was not carried out as part of this investigation.

A low risk was identified in the preliminary contamination conceptual model for controlled waters (Pollutant Linkage 4) and further action was only recommended if significant soil contamination was identified on site. Based on the ground conditions encountered, LKC did not consider testing to be required. This is discussed further in Section 5.4.

3.3. In-situ Testing

3.3.1. Geotechnical Testing

In-situ geotechnical tests were performed in the boreholes to further characterise the sub-soil conditions. The following tests were undertaken:

- Standard Penetration Tests (SPTs) were performed in the window sample boreholes and cable percussion boreholes at approximately 1m intervals.
- Shear vane and pocket penetrometer tests (giving undrained shear strength) were performed within the window sample boreholes and trial pits within cohesive strata.
- The CPT recorded cone resistance (q_c), sleeve friction (f_s), porewater pressure (u_2), and inclination (I_x, I_y).

The results are provided within Appendix B.

3.4. Gas Monitoring

Gas monitoring was not carried out as part of this investigation. A moderate/low risk was identified and gas monitoring was only required should significant putrescible material be encountered.

CC Geotechnical Ltd has undertaken gas monitoring as part of their investigation and determined the site lies in CS2 conditions. This is discussed further in section 6.3.

4. Ground Conditions

4.1. Geology

The ground conditions beneath the site are summarised below. Logs are provided in Appendix B.

4.1.1. Made Ground – Post Demolition Works

The western portion of the site is surfaced with 0.05m of tarmacadam. The swimming pool base was still present in the centre of the site with demolition rubble surrounding the feature. The south of the site is surfaced with concrete of the former floor slab.

Made ground in the south eastern corner of the site (TP105) has been stripped and removed from site during the Japaneese Knotweed remediation.

Made ground was recorded in all trial pits to depths of between 0.60-2.50mbgl and comprised the following:

- Gravelly sand with brick fragments was encountered within TP102 and TP104 to depths of 2.50mbgl.
- Gravelly silty sand with ash, brick fragments, concrete fragments, tarmacadam and glass was encountered with TP101 to a depth of 1.00mbgl.

TP104 contained rare tarmac.

No made ground was encountered below the swimming pool (TP103).

4.1.2. Made Ground – Post Enabling Works

The made ground across all of the site comprised crushed demolition material from the former building to depths between 0.60-3.33mbgl depending on the height of rubble present to ground level, the eastern side of site had a lower elevation and less demolition material present leading to shallower made ground.

The material comprised gravelly silty SAND with generally frequent brick fragments and concrete fragments. Other anthropogenic material present within the made ground included clinker, ash, slate fragments, plastic fragments, coal fragments, textule fragments and timber fragments.

4.1.3. Natural Strata – Post Demolition Works

Two populations of superficial strata were encountered during the investigation.

- Slightly gravelly occasionally clayey sand was encountered within TP101-TP103 and TP105 from depths of between 0.30-1.00mbgl to an observed depth of 2.70mbgl.
- Firm to stiff consistency low to high strength sandy clay was encountered within TP104 and TP105 from depths of between ground level and 2.50mbgl to depths of greater than 3.00mbgl.

Bedrock was not encountered during this investigation.

4.1.4. *Natural Strata – Post Enabling Works*

Multiple superficial strata were encountered during the post enabling investigation:

- Loose to very dense gravelly sand was encountered below the made ground in all locations (except WS103) from depths of between 0.80-3.10mbgl.
- Firm to stiff consistency low to very high strength slightly gravelly sandy silty clay was encountered in all locations (except WS103) from depths of between 1.20-4.70mbgl to a maximum depth of 20.20mbgl.
- Very dense sand and gravel was encountered within CP101 and CP104 between the depths of 16.60m-18.70mbgl.
- Medium dense gravelly sand was encountered at the base of WS104 and WS105 at between 4.00-4.50mbgl down to the base of the boreholes.
- Within WS102 and WS104, a strata of medium dense sand and gravel was encountered below the sand at depths of between 1.80-2.70mbgl.
- Deeper bands of dense silty sand and very dense sand were present within CP103 and CP106 between 13.90-14.90mbgl and 19.5-20.05mbgl.

4.1.5. *Contamination*

Except for the anthropogenic material encountered in the made ground (as described above), no further contamination was identified.

There was no visual or olfactory evidence of hydrocarbons or volatile contaminants in any locations. The PID recorded a maximum of 0.5ppm TVOC in the samples.

4.1.6. *Obstructions*

The following obstructions were encountered prior to enabling works:

- TP104: Brick floor encountered between 1.80m to 1.90mbgl.
- CPT101-CPT101B and CPT107 refused within the placed demolition rubble.

The brick floor was not present within the post enabling works as site turnover had taken place.

4.2. Groundwater

4.2.1. *Groundwater Levels*

Groundwater strikes were recorded within all window sample boreholes, apart from WS103, at depths between 2.80-3.00mbgl. 2no. groundwater strikes were recorded in CP103 at 13.90mbgl and 19.60mbgl. 1no. groundwater strike as recorded in CP104 at 16.50mbgl.

No groundwater strikes were observed within any of the exploratory holes within the post demolition works.

CC Geotechnical Ltd did not record any groundwater strikes within the boreholes.

5. Geotechnical Assessment

5.1. Proposed Development

It is understood that the proposed development will comprise residential apartments with associated landscaping and infrastructure.

The depths of any underground engineering works (sewers etc.) are unknown and therefore have not been considered in the following assessment. Any such works should be designed so as not to influence, or compromise, proposed or existing foundations or ground stability.

Given the nature of the proposed development the structure meets the criteria of Geotechnical Category 2 of Eurocode 7[7].

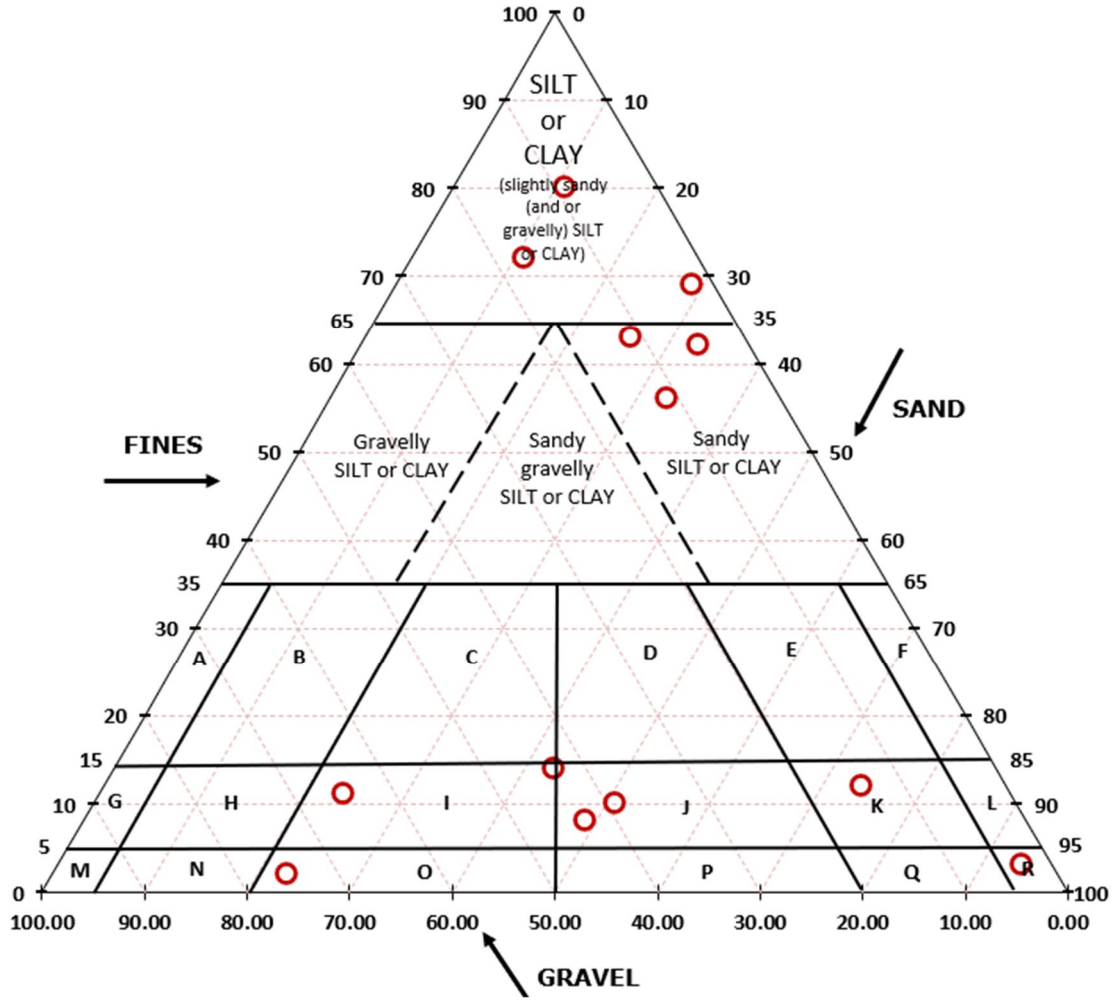
5.2. Summary of Ground Conditions

Ground conditions identified at the site are detailed in Section 4.1, and typically comprises made ground to depths of between 0.30 - 3.30mbgl over natural granular and cohesive superficial deposits of sand and clay to the completion depths investigated.

Groundwater strikes were recorded during the investigation between 13.90-19.60mbgl within bands of granular strata within the cable percussive boreholes. Shallow groundwater strikes were recorded between 2.80-3.00mbgl within the window samples boreholes.

18 no. samples were tested for Particle Size Distribution (PSD) with the results showing that the material is predominantly granular with fines fractions of between 2-12%.

Cohesive samples from the site works, logged as soft to very stiff slightly gravelly sandy clay, returned a clay fraction of 56-80%. The plots of the PSD tests are shown on the ternary plot reproduced in Graph 5-1.



Graph 5-1: Ternary plot of the PSD results.

Clay samples were subjected to Atterberg Limits (plasticity) and Moisture Content testing. Results are provided in Appendix D. The clay ranged from low to high plasticity.

The modified plasticity index as detailed in Chapter 4.2-D5 of the NHBC standards (modified plasticity index = plasticity index x % less than 425µm sieve / 100%) characterises the clay as having a low medium volume change potential, ranging between 7.92% and 27%. It is recommended that a medium volume change potential of the clay is assigned for this site

5.3. Site Preparation

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works[8]. This should include:

- Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.
- Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill; and,

- Buried structures and old foundations are likely to be present under the site. These should be excavated from below the proposed development footprint with the resulting void backfilled.

The near surface soils may potentially be disturbed by weathering and site traffic. Precautions should be taken to avoid this, as excessive disturbance may result in more onerous floor slab design, road cap thickness and increased amount of site disposal etc. Based on site observations the near surface soils may require at least some treatment or reinforcing to allow safe movement of construction plant and labour. A working platform will be required for piling plant.

Japanese Knotweed has been encountered in the south-east corner of the site. This has been treated by LK Remediate. Made ground in this area has been stripped and removed from site. A separate verification report will be provided.

5.4. Foundation Conditions and Bearing Capacity

5.4.1. General

The natural cohesive material has been assessed using in-situ testing by Hand Shear Vane (HV) to obtain the undrained shear strength (s_u) of the material. Pocket penetrometers (PP) were undertaken at regular intervals within the window samples and cable percussive boreholes to obtain undrained shear strength (s_u) of the material.

The clay encountered in the south of the site (TP104 and TP105) returned HV results of between 35kPa and 75kPa.

Clay encountered between 1.20-7.50m generally returned undrained shear strength values of between 12.30-61.30kPa. Between 7.50-20.00mbgl the PP returned readings of between 49.00-220.70kPa. The clay generally gets more competent with depth. Deeper bands of sand and gravel returned SPT results of >50 between 16.60-18.40mbgl in CP101 and CP104.

Nine sample was tested for undrained shear strength in triaxial compression. The results are provided in Appendix D.

5.4.2. Foundations Options

Due to the proposed development and the inherent variability of the made ground, traditional strip footings are not considered a viable option. Foundation options are therefore:

- Ground improvement by vibro stone columns; and,
- Deeper pile foundations.

5.4.3. Ground Improvement

The use of ground improvement techniques such as Vibro Stone Columns (VSC) will allow shallow foundations to be utilised with the Made Ground. The VSC should provide a bearing capacity of around 150kN/m² but will also remove variability within the Made Ground.

Specialist advice should be sought from a suitably experienced contractor with regard to whether the ground conditions are suitable, the allowable bearing capacity that can be achieved and settlements.

5.4.4. Piled Foundations

It is proposed to undertake a full site turnover which will remove and grub out any obstructions and historical foundations/infrastructure. Post site turnover works, driven pile foundations should be suitable however, due to the presence of infrastructure and historic buildings in the local area, consideration will need to be given to the effects vibrations may have on neighbouring properties should a driven pile solution be used. A bored pile solution may cause less disturbance on neighbouring properties.

Static load tests should be undertaken on the first few piles installed to confirm the pile design. Shaft friction in fine grained soils in generally take as no more than 100kN/m^2, unless higher values can be proven either using pile testing, or through experience in similar ground conditions[10]. Negative skin friction imposed on the piles by the made ground needs to be considered.

Dynamic load tests may also be recommended to ensure the concrete has cured well and that there is no bulging or thinning of the pile shaft once it has been drilled.

Should a bored pile solution be adopted then casing will be required while drilling the piles due to the presence of sands. This will help minimise ground disturbance and prevent collapse into the borehole causing areas of weakness. Arisings from bored piles will require off-site disposal unless they can be proven suitable for reuse on site.

Should a piled foundation solution be the preferred option, then warranty providers such as the NHBC or LABC, may require further information on ground conditions to a minimum of 5m below the base of the pile.

5.5. Ground Floor Slabs

Due to the presence of substantial thickness of made ground across the site ground bearing floor slabs, whilst viable, will require detailed design to accommodate variability of the formation and account for differential settlement.

Following suitable preparation of the sub-grade, by a combination of excavation and re-compaction, a ground bearing floor slab should be suitable for the proposed structure. Floor slabs should be designed by a suitably experienced structural engineer.

Where suspended floor slabs are employed ventilation of the under-floor void will be required to address condensation issues. This would also assist in the mitigation of potential gas ingress issues.

5.6. Pavement Construction

It is understood that a site turnover is to be undertaken which will remove obstructions in the ground and that the material will not be replaced to a compaction specification. Based on this it is considered that a design CBR of less than 1% may be required to account for the disturbance from the turnover works. It is recommended that the CBR value of the strata is assessed post turn-over using on site plate tests of the formation.

Following excavation, the sub formation should be proof rolled and any soft material inspected and removed.

5.7. Drainage

The presence of substantial depths of made ground in the south of the site may result in settlement. It is therefore recommended that drain runs, in this area, are designed using steeper gradients and flexible joints to allow for some differential settlement.

5.8. Concrete Durability

Based upon the results of the chemical analyses (Appendix D), subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1 across majority of the site in accordance with the recommendations provided in BRE Special Digest 1 (2005). DS-3 AC-2 may be required in the vicinity of TP04, WS105 and CP104 located in the south of the site.

5.9. Excavations

Some of the exploratory holes were observed to be unstable during the excavation. The short- and long-term stability of near vertically sided excavations can therefore not be guaranteed and random and sudden instability within these soils should be anticipated.

Due to the variability of the made ground all excavations should be supported or battered back in accordance with guidance contained in CIRIA R97[11].

5.10. Construction Activity and Inspection

The following activities and inspections should be incorporated in to the site works:

- Due to the variability of the soils at the site it is recommended that sufficient allowance is made for the inspection of formation and sub formations to foundations and pavement construction;
- Excavations where access is required should be subject to a risk assessment from a competent person and where appropriate mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 utilised;
- It is considered that de-watering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to provision of space for settling tanks or an attenuation pond;
- Where access to confined spaces is required appropriate mitigation measures should be addressed within the Construction Stage Health and Safety Plan. Particular account should be taken of the gas results;
- The presence of potential contamination and mitigation measures should be addressed as part of the Construction Stage Health and Safety Plan and should include measures to design out the risks, reduce their impact and finally the use of Personnel Protective Equipment (PPE).

6. Generic Risk Assessment

6.1. Introduction

Current good practice requires that the findings from a site investigation should be evaluated on a site-specific basis, using a risk-based approach. Risk assessment involves identification and evaluation of the hazards presented by the concentrations of contaminants measured followed by an evaluation of the risks which are associated with these hazards (LCRM[13]). Information gathered from the risk assessment has been collated in the revised contamination conceptual model in Section 6.6.

6.2. Soil Risk Assessment

6.2.1. Methodology

With regards to the soil risk assessment LKC will use the following hierarchy:

- Category 4 Screening Levels (C4SLs) [14, 15].
- LQM Suitable 4 Use Levels (S4ULs) [16, 17, 18, 19].

The proposed development is for residential apartments with limited shared soft landscaping, therefore the assessment criteria for residential without plant uptake has been used.

All criteria have been generated using the CLEA V1.06 model[20] based either on 1%, 2.5% and 6% Soil Organic matter (SOM). Results will be compared to the nearest appropriate SOM.

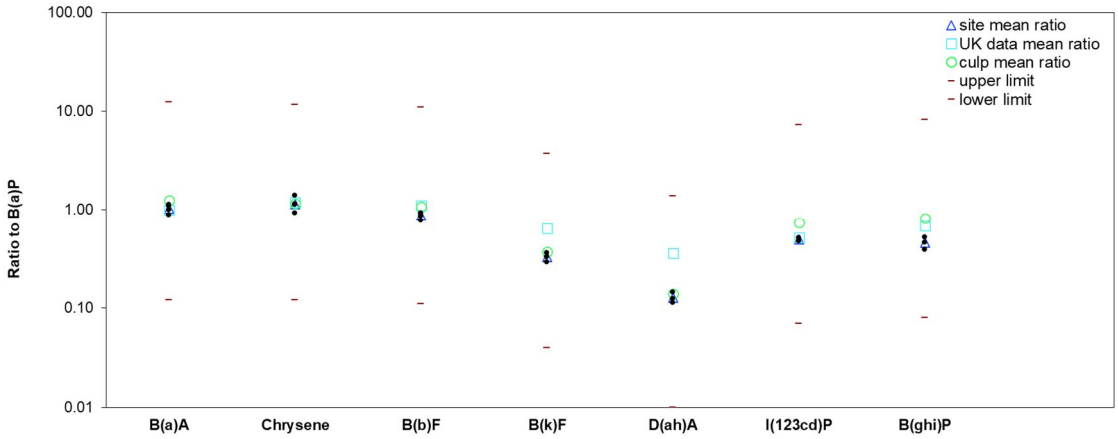
A summary of the generic assessment criteria used in this assessment is provided in Appendix E.

B(a)P as Surrogate Marker

LKC consider the main risk drivers for PAHs are benzo(a)pyrene (B(a)P) and naphthalene. This is due to B(a)P possibly being a carcinogen and most toxic of the PAHs[21,22] and naphthalene the most volatile and soluble[23]. The C4SLs indicate B(a)P as a surrogate marker for carcinogenic PAHs, if it falls within appropriate limits, since the risk from other non-carcinogenic PAHs are considered negligible[24]. For B(a)P to be used as a surrogate marker it should follow the profile described by the HPA (2008)[25] and CL:AIRE (2013). Naphthalene will be treated separately using the LQM S4ULs.

LKC undertook an assessment of the PAH data for the site with regards to using B(a)P as a surrogate marker for carcinogenic PAHs as per HPA and CL:AIRE guidelines. The primary toxicological study related to Culp *et.al*[26], which was based on coal tar mixtures (>80,000mg/kg of total PAHs) fed in food to mice over a two-year carcinogenicity study.

Graph 6-1 summarises the study site data with respect to how the ratios of carcinogenic PAHs relate to B(a)P, within the confidence limits provided in the HPA document.



Graph 6-1: The ratio of PAH to B(a)P in soil for all available data at the site based on 4 samples (where values were >LOD to allow the calculation of a ratio).

Notes:

B(a)P=Benzo(a)pyrene; D(ah)A=Dibenzo(ah)anthracene; B(a)A=Benzo(a)anthracene; B(b)F=Benzo(b)fluoranthene; B(k)F=Benzo(k)fluoranthene; I(123cd)P=Indeno(123cd)pyrene; B(ghi)P=Benzo(ghi)perylene.

All the data points that could be used to calculate ratios fall inside the upper or lower limits.

Based on this distribution of data LKC considers B(a)P can be used as a surrogate marker for carcinogenic PAHs and the C4SL criteria is suitable for this dataset.

6.2.2. Soil Results Comparison against Assessment Criteria

All analysis sheets are presented in Appendix C . All the data has been compared to relevant assessment criteria and is presented in Appendix E. Elevated results are presented in Table 6-1.

Sample Location / Depth (mbgl)	Contaminant	Criteria, 6%	Total No. of Samples Tested	Sample Result > Criteria
TP101	Benzo(a)pyrene	5.30	4	17.50

Table 6-1: Summary of Elevated Results.

Notes:

All units in mg/kg.

Only results that exceeded assessment criteria have been shown and results from all depths are noted.

Results have been compared to the nearest appropriate SOM for the assessment criteria hierarchy described in Section 6.2.

No asbestos was identified in any soil samples analysed.

6.2.3. Direct Contact Risk – Pollutant Linkage 1

Elevated PAHs have been identified on site as part of this investigation. The source of the contamination is expected to the ash noted in the made ground.

CC Geotechnical Ltd encountered elevated PAHs and non-volatile TPHs within TP01, WS02, BH01 and BH02 located in the north of the site. The source is expected to be ash, coal and 'cinders' noted in made ground.

At the concentrations identified, the contaminants are considered to pose a potential risk to future site users (residents) in soft landscaped areas, where made ground may be exposed. The principal pathways are the ingestion pathways (soil, dust) and dermal contact.

The probability of PAH contamination affecting site users is likely. With a medium consequence, the risk is considered to be moderate, and remediation is recommended.

No asbestos was identified in any of the samples; therefore, the probability of asbestos affected site users is considered to be unlikely. With a severe consequence, the risk is moderate / low. At this stage, a low risk is assumed (as no asbestos identified) and remediation is not required. However, as a precaution, construction workers should be and vigilant for any suspected ACM during groundworks.

No elevated hydrocarbons were identified by The LK Group. CC Geotechnical identified elevated heavy end hydrocarbons within TP01 in the north. Therefore, the probability of these contaminants posing a risk to site users in considered likely. With a medium consequence, the risk is considered to be medium, and remediation is recommended.

No elevated SVOCs or VOCs were identified by The LK Group. Therefore the probability of these contaminants posing a risk to site users in considered unlikely. With a medium consequence, the risk is considered to be low, and no remediation is recommended.

6.2.4. Risk from Inhalation of Vapours – Pollutant Linkage 2

LKC encountered no elevations of volatile contaminants within any of the samples tested. CC Geotechnical Ltd encountered elevation of naphthalene (38mg/kg) within TP01 in the north of the site. However, the assessment criteria for naphthalene has been revised since the CC Geotechnical Ltd assessment and the result is no longer considered to be elevated based on the SOM content of the sample.

No visual or olfactory evidence of volatile contaminants was identified during the investigation. The PID did not detect any significant TVOCs.

LKC consider the probability of volatile contaminants affecting site users as unlikely. The consequence is expected to be medium, giving a low risk and remediation is required.

6.3. Gas Risk Assessment

Gas monitoring was not carried out as part of this assessment. The PRA identified a moderate/ low risk.

Gas monitoring was undertaken in one borehole by CC Geotechnical Ltd. No methane or flow was recorded and a maximum CO2 reading of 7.25 was reported. Gas screening Values of 0.00072l/hr for carbon dioxide and <0.00001l/hr for methane were calculated. Characteristic Situation 2 was recommended. Although no discussion as to the rationale is provided within the report it is assumed that this is a function of the CO2, which ranged between 4.2-7.2% across the six visits.

The desk study did not identify any significant sources of ground contamination on the site. The LKC conceptual model recommended gas monitoring only if significant putrescible material was encountered. BS8587[27] Figure 6 describes *"made ground with low degradable organic content (e.g. up to 5% organic material such as pieces of wood, pieces of paper, rags, etc. with a high proportion of ash and no food or other easily degradable waste) and natural soil strata with a low degradable organic content, e.g. alluvium, peat"* as *"very low generation potential"*.

No such material has been encountered during any of the site investigation phases or during enabling works (which included a full turnover of made ground).

The CCG gas monitoring data does not report any flow readings above limits of detection and CO2 marginally above 5%v/v. In accordance with CIRIA C665[28], if carbon dioxide and methane are recorded above 5%v/v and 1%v/v respectively, you should consider upgrading the characteristic situation from CS1 to CS2, although upgrading the CS is not mandatory.

Wilson *et al*[29] suggests there is no need to increase the classification if the carbon dioxide is caused by biological respiration of small quantities of organic material. Plate 6-2 summarises the gas monitoring data using the methodology described by Wilson *et al*.

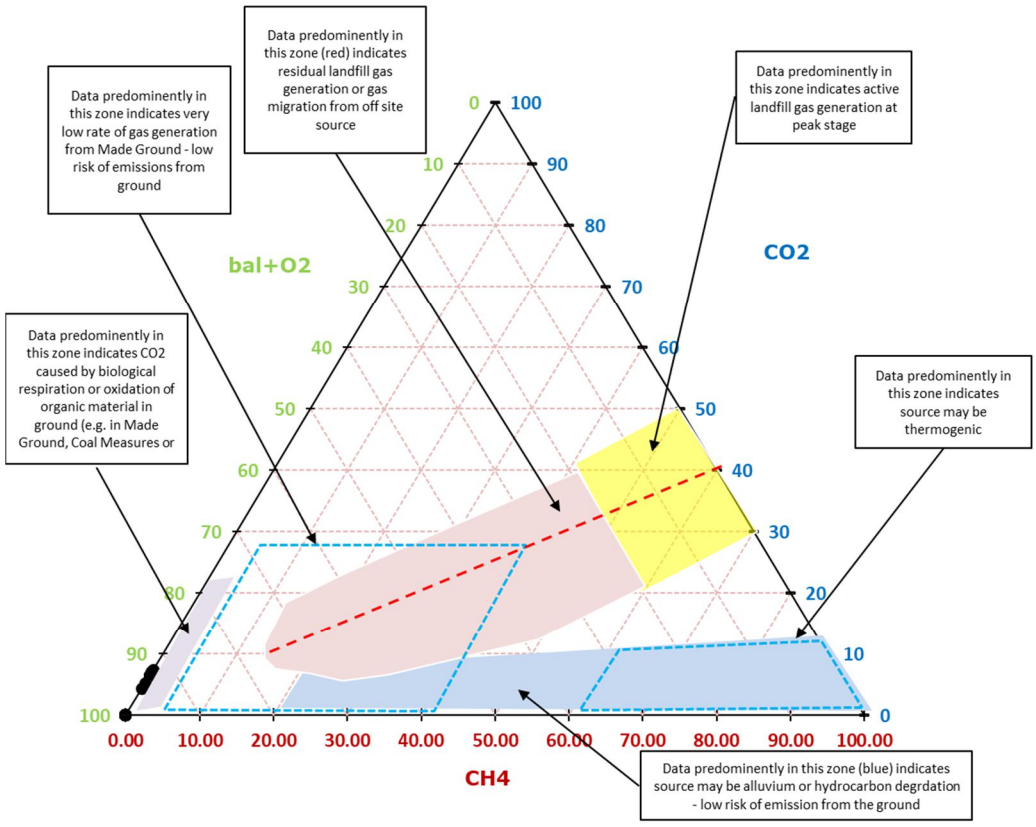


Plate 6-1: Gas Ternary Plot based on CCG data.

Wilson *et al* goes on to say:

"where gas monitoring results plot within the zone shown…for microbial respiration there is no requirement to increase the Characteristic Situation simply because CO2 concentrations exceed 5%"

All the data from the CCG gas monitoring (plotted above) falls within the area of the ternary plot which is indicative of microbial respiration. This indicates the CO2 is likely to be from microbial degradation of organic material and it does not warrant upgrading of the classification.

Gas can potentially migrate into buildings, accumulate in confined spaces, and cause explosions (methane) and asphyxiation. LKC consider the probability of carbon dioxide and / or methane gas affecting site users and buildings as unlikely. Assuming a severe consequence, there is a moderate / low risk and no remediation is required.

6.4. Controlled Water Assessment

The PRA conducted by Carley Daines and Partners Ltd identified a moderate to high risk with respect to controlled waters due to the Principal Aquifer underlying the site. No abstractions have been identified within influencing distance and the site is not located in a Source Protection Zone. Surface water is not considered to be a significant receptor.

CC Geotechnical undertook leachate testing and no leachable contaminant was above guideline criteria.

No evidence of significant mobile contamination was identified on the site by The LK Group. Although elevated PAHs (compared to human health criteria) were identified within the soils, the source is anticipated to be ash noted within the made ground. Contamination associated with ash and clinker is not anticipated to be mobile due to the residual crystalline nature of the matrix.

The site investigation did not identify any significant sources of likely mobile contamination within the soils. This confirms an unlikely probability of onsite contamination affecting controlled waters. With a medium consequence the risk is anticipated to be low, and no remediation is required.

6.5. Potable Water Supply (Pollutant Linkage 5)

Soil results were compared to United Utilities (UU) guidelines for the selection of potable water pipes in land potentially affected by contamination. Only contaminants of concern, based on the preliminary conceptual model and ground conditions encountered, were analysed.

Elevated TPH EC10-16 and EC16-44 and VOCs (naphthalene) have been identified within the made ground of TP101 and TP104.

The probability of organic contaminants affecting potable water pipes is a likely probability. Given the consequence is considered to be medium, the risk (Pollutant Linkage 5) is anticipated to be moderate and remediation may be required.

Once details of the pipeline location and depths are known a UU Water Pipe Risk Assessment in line with the utility provider should be undertaken to confirm the most appropriate pipework for potable water.

6.6. Revised Contamination Conceptual Model

The preliminary contamination conceptual model (Table 2-3) has been revised following the risk assessments undertaken in Sections 6.1-6.4. The revised contamination conceptual model follows the same methodology and guidance used in the preliminary contamination conceptual model. The risk matrix is provided in Appendix A.

The revised contamination conceptual model is presented in Table 6 2.

Where a very low risk or low risk is identified no specific remediation is required.

Where there is a moderate / low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

PL	Contaminants of Concern	Pathway	Receptor	Probability	Consequence	Risk	Recommendations
1	PAHs, Non-volatile TPHs, Heavy Metals.	Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust. Windblown dust.	Future site users. Offsite receptors.	Likely	Medium	Moderate	Elevated concentrations identified. Remediation in soft landscaping.
	Asbestos			Unlikely		Low	No asbestos identified. Further site investigation recommended. No remediation recommended.
	SVOCs, VOCs			Unlikely		Low	No evidence encountered during site investigation. No elevated concentration identified. No remediation recommended.
2	Naphthalene	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users. Offsite receptors.	Unlikely	Medium	Low	No elevated concentrations based on updated assessment criteria and SOM. No remediation recommended.
3	Hazardous / ground gas: methane, carbon dioxide	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate/low	No significant putrescible material encountered. Previous monitoring did not identify significant concentrations of gas or flow. No remediation recommended.
4	Mobile contamination	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater Surface water	Unlikely	Medium	Low	No significant elevated concentrations of likely mobile contamination encountered. No remediation recommended.
5	TPHs and PAHs	Ingestion of tainted water supply.	Future site users. Water pipes.	Likely	Medium	Moderate	Some elevated concentrations identified. UU risk assessment will be required. Remediation (barrier pipe) likely

Table 6-22: Revised Contamination Conceptual Model.

7. Waste Disposal Assessment

7.1. HazWaste Assessment

The soil contamination results as presented in Appendix C have been used to help determine the waste classification of material for off-site disposal. Hazwaste online certificates are included in Appendix F.

As an initial screen the soil results were inputted into HazWasteOnline™. This is a web-based facility that allows an assessment waste as either hazardous or non-hazardous waste based on relevant guidance and legislation.

HazWasteOnline™. has been designed to cover, amongst other waste types, the List of Waste (LoW) code number 17 "Construction and Demolition Waste (Including Excavated Soil from Contaminated Sites)".

Where less than limits of detection (LOD) were recorded, the value of the LOD was inputted.

Where applicable, contaminants were selected based on observations during sampling, site history, ground conditions and likely species present in soils (e.g., metal oxides relating to an ash-based source).

The following samples summarised in Table 7-1 are classified as hazardous.

Location and Depth	Contaminant	Hazard Property
TP104 0.2-1m	TPH	HP3 Flammable HP7 Carcinogenic HP11 Mutagenic

Table 7-1: Summary of Hazard Properties Based on HazWasteOnline™ Findings.

7.2. Waste Acceptance Criteria (WAC) Testing

Waste Acceptance Criteria (WAC) testing was also undertaken on 2no. samples representative of material which may be earmarked for off-site disposal. WAC test results are included in Appendix C.

CC Geotechnical undertook WAC on 2 no. samples.

The WAC limits cannot be used to assess whether a waste is non-hazardous or hazardous. It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

8. Summary Conclusions

8.1. Ground Conditions

Ground conditions are summarised in Table 8-1 below.

Made Ground	Gravelly sand with frequent brick and concrete encountered to depths between 0.60-3.33mbgl. Rare ash, clinker, plastic fragments, slate fragments, coal fragments, textile fragments and timber fragments noted within the made ground.
Superficial	Gravelly sand from depths of between 0.30-3.10mbgl. Firm consistency gravelly sandy silty clay encountered site wide from depths of between 3.00-4.70mbgl. Deeper boreholes encountered stiff to very stiff gravelly sandy silty clay to base of boreholes with bands of gravelly sand and sand and gravel present.
Bedrock	Not encountered.
Groundwater	Groundwater strikes were recorded at depths between 2.80-3.00mbgl within the window sample boreholes. 2no. groundwater strikes were recorded in CP103 at 13.90mbgl and 19.60mbgl. 1no. groundwater strike as recorded in CP104 at 16.50mbgl.
Obstructions	Brick floor at 1.80mbgl within TP104. Has been removed during site turnover.
Other Observations	No visual and olfactory evidence of contamination encountered.

Table 8-1: Summary of Ground Conditions.

8.2. Geotechnical

Geotechnical observations and conclusions are contained in Table 8-2 below, more detailed discussions are contained within Section 5.

Anticipated Foundation Type	Piled foundations or Vibro Stone Columns supporting traditional shallow foundations.
Shallow Groundwater	Groundwater strikes were recorded at depths between 2.80-3.00mbgl within the window sample boreholes.
Concrete Requirements	Based on BRE Digest 2005[32] – DS-1 AC-1 across most of the site. DS-3 AC-2 may be required in the vicinity of WS105, CP104 and TP04.
Services	Services – consideration to the presence of services running through the site. Services may need to be re-routed.
Temporary support of excavation	Trial pits recorded as unstable in natural sand. Open excavations likely to require support.
Plasticity	Consideration will need to be given to the shrink / swell of the clay strata if it is to be used as founding strata, particularly where trees/hedges are present. Foundations may need to be deepened. The clay is classed as having a medium volume change potential.
Road / Pavement Design	A design CBR value of <1% should be adopted for the ground post turnover of the site.
Slope Stability	No significant slopes on site. No further consideration required.

Table 8-2: Geotechnical Conclusions Table.

8.3. Contamination Assessment

A revised contamination conceptual model has been produced by LKC which is summarised in Table 8-3 below (more detailed model provided in Section 6).

PL	Contaminant	Risk	Recommendations
1	PAHs, Non-volatile TPHs, Heavy metals.	Moderate	Remediation recommended in soft landscaping.
	Asbestos	Low	No remediation recommended.
	SVOCs and VOCs	Low	No remediation recommended.
2	Naphthalene and other volatile contaminants	Low	No remediation recommended.
3	Carbon dioxide, methane	Moderate/Low	No remediation recommended.
4	Groundwater (mobile contaminants)	Low	No remediation recommended.
	Surface Water: (mobile contaminants)	Low	No remediation recommended.
5	Organic contaminants.	Moderate	Utility provider risk assessment to be completed. The site will likely require barrier piping.

Table 8-3: Summary Risk Table.
PL=Pollutant Linkage, see Table 6-2 for details.

8.4. Waste Assessment

The following samples summarised in Table 8-4 are classified as hazardous.

Location and Depth	Contaminant	Hazard Property
TP104 0.2-1m	TPH	HP3 Flammable HP7 Carcinogenic HP11 Mutagenic

Table 8-4: Summary of Hazard Properties Based on HazWasteOnline™ Findings.

Waste Acceptance Criteria (WAC) testing was also undertaken on 2no. samples The WAC limits cannot be used to assess whether a waste is non-hazardous or hazardous. It is recommended that waste assessment and WAC data is forwarded to a licensed waste disposal operator.

9. Recommendations and Remediation Strategy

The recommendations/requirements provided below are considered appropriate for the site based on the site investigation work undertaken. LKC should stress that no remediation, enabling works or designing works should take place until Regulatory approval has been obtained.

A summary of remediation requirements is included in Table 9-1.

PL	Recommendation
1	Environmental cover system required in soft landscaping areas.
2	No specific remediation required.
3	No remediation required.
4	No remediation required.
5	Potable water pipe assessment required. Barrier pipe likely.

Table 9-1: Remediation Summary.

The local authority may require a standalone Build-Phase Remediation Strategy and Verification Plan in accordance with LCRM Stage 3 remediation and verification[33]. This should be produced once details of design, contractors and installation are known.

All the remediation and validation work should be documented in a Site Completion Report. The Completion Report will be provided to satisfy the outstanding contaminated land planning condition.

9.1. Remediation and Validation Recommendations

9.1.1. Environmental Cover System (PL1)

In gardens and soft landscaping areas, an environmental cover system will be required and should comprise 600mm depth in private back gardens and 450mm in private front gardens / soft landscaping (including community garden). The environmental cover system should constructed be as shown in Plate 9-1.

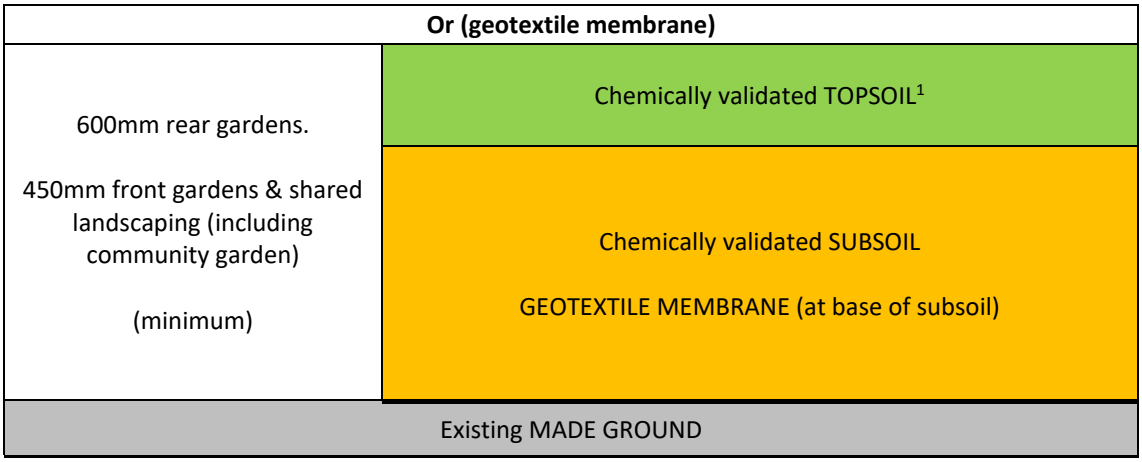


Plate 9-1: Typical Environmental Cover System Construction.

Notes:

Hardstood Areas – No Remediation Required.

[1]NHBC recommend 100mm minimum topsoil depth.

Where there are TPO's in influencing distance of environmental cover systems it is likely the arboriculture officer may only allow a 100mm clean cover system over a geotextile membrane.

Validation of environmental cover soils will be required and should include measuring depth using a staff and providing photographic evidence. Photographic evidence of the granular physical break or geotextile layer should also be collected.

Chemical validation of imported soils is required, details are included in Section 9.3.

9.1.2. Potable Water Pipe Remediation (PL5)

It is recommended that a Water Pipeline Assessment[39] is undertaken once the location and depth of potable water pipes are known. Barrier pipe maybe required.

Validation of pipeline installation should include delivery notes of pipe materials, photographs of installed pipe and confirmation of connections.

9.2. Other Considerations

9.2.1. Unexpected Contamination

The relevant contractors should be briefed that during development works at the site should any unusual ground conditions and / or visual or olfactory evidence of contamination (including asbestos containing material) be encountered at the site, LKC and the Local Authority should be informed, and further assessment of the material may be required.

Impacted soils should be placed on an impermeable surface to await further assessment, treatment, or removal from site (this may be subject to chemical testing to confirm suitable waste facility). The work should be done under the supervision and instruction of an environmental consultant.

To determine that significantly impacted soils have been removed, verification samples will be collected from the base and sides of the excavation. If all impacted ground cannot be removed and contamination remains on the ground, further remediation may need to be considered.

Validation requirements should include a log of work undertaken, including photographs and details of any sampling undertaken and validation of any potential additional remedial work.

9.2.2. Stockpile Management

Stockpiled material should be suitably managed. Material should be segregated by type and source. For example, construction / demolition arisings, site won subsoil. Stockpiles may also require covering to minimise the generation of vapours, fibres, dust, and possible nuisance to adjacent receptors, and to prevent rainwater ingress. The source of each stockpile should be recorded and appropriate validation testing for re-use or potential offsite disposal should be undertaken as required.

9.2.3. Disposal

Material required to be removed from site should be undertaken under an appropriate duty of care and the results of chemical analysis should be provided to a licensed landfill for confirmation of waste classification.

Waste records such as disposal tickets and waste carrier licences should be provided in the Site Completion Report. Photographic evidence of removal and waste removal tickets should be retained and included in the validation report.

9.2.4. Health and Safety Considerations

In working with, removing, or treating any contaminating material it is important that any potential risks associated with the actual site works are mitigated by good environmental management of the site during the remedial phases. Standard health and safety precautions (as per HSE guidance[40]) should be adopted by all workers involved with site enabling and construction works.

9.2.5. Piling in Contaminated Land

If a piled foundation is being considered this may provide a preferential pathway for contaminants to the underlying aquifer. A piling risk assessment may be required. Good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency[41].

9.3. Validation of Imported / Site Won Soils

Chemical validation of all imported and site-won soils to be used on site in gardens and soft landscaping areas should be undertaken. Imported soils should be accompanied by a certificate of analysis and source details.

A summary of the required imported material sampling requirements is presented in Table 9-2, based on MCC 'Guidelines to Developer' (2021) [42]. LKC consider no testing, but proof of provenance is sufficient for natural, virgin, quarried material.

Ideally, the material should be sampled at source to prevent double handling if soil fails, with confirmatory sampling undertaken on importation to site. Where this is not possible then material imported should be segregated based on source and soil type. Validation samples should be taken prior to placement in gardens / soft landscaping to ensure suitability for use.

Material Type	**Source**	**Suite of Analysis**	**Sampling Rate (min. 3 per source)**		
			Garden	**Landscape**	**Other ***
Topsoil / subsoil / Fill material	Greenfield	Suite A	200m^3	200m^3	200m^3
	Remediated / Site-won	Suite A / B dependent upon original SI	100m^3	150m^3	200m^3
	Brownfield / Unknown	Suite B	50m^3	150m^3	200m^3
Quarried Fill	First Generation i.e., quarried sand (subsoil)	No testing is required.	Certification of material provenance is required.		

Table 9-2: Sampling Requirements for Imported and Site Won Soils.

Notes:

Suite A - Heavy metals, pH, water soluble sulphate, speciated PAH, soil organic matter and asbestos screen.

Suite B - Heavy metals, pH, water soluble sulphate, speciated PAH, phenol, total and free cyanide, soil organic matter, asbestos screen, banded petroleum hydrocarbons (TPH CWG), BTEX, MTBE.

*Other assumed to be stone / 6F2 / mass fill etc.

Any soil with visual or olfactory evidence of hydrocarbons should be rejected.

In addition, it should be ensured that the matrix of the topsoil is suitable as a growing medium and no undesirable material is present (in line with BS3882[43]). Topsoil soil shall be free of weeds, roots or perennial weeds, pests, diseases, debris, tree roots, sticks, subsoil and foreign matter and shall be capable of being broken down to a fine tilth. LKC advise this information is provided by the supplier before material is imported onto site.

Imported material to be used in gardens will be compared against residential without plant uptake criteria (as used in the contamination risk assessment in Section 6).

9.4. Site Completion Report

All remediation and validation work should be documented in a Site Completion Report. The Site Completion Report will allow discharge of relevant planning conditions.

Figures





Client: Caddick Construction Ltd				Title: Site Location & Boundary Plan	
Site: Chorlton Baths, Manchester				Scale (see scale bar): 1:25,000 & 1:1,250 @ A4	Figure: 1
Job No.: LKC241317	Drawn By: MB	Checked By: PD	Drawn: Nov 2024		Revision:

LK CONSULT



Extract From: Buttress
Drawing Ref: Proposed Site Plan, No.04100, Rev:P04 (07/08/2023)

KEY

- Site Boundary
- Root Protection Area
- Approx retained tree canopy line
- Existing tree removed where hatched in red
- Works to crown
- Proposed tree
- Refer to Tree Survey and reports by Lally Tree Management
- Application Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

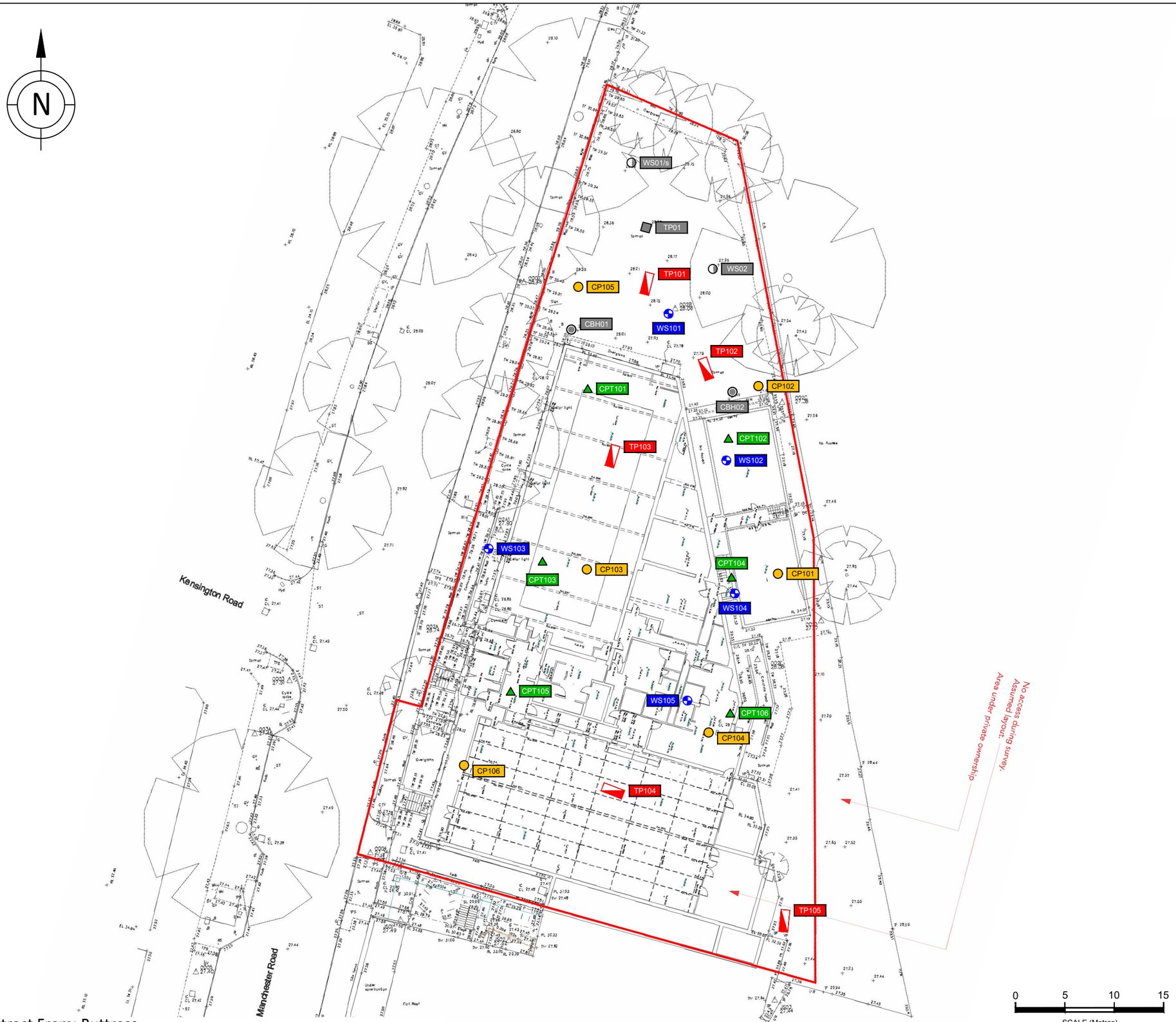
Client: Caddick Construction (NW) Ltd

Site: Chorlton Baths, Manchester

Title: Proposed Development Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC241317	See Scale Bar	2	

Drawn By:	Checked By:	Drawn:
AC	MB	Oct 2024



Extract From: Buttress
Drawing Ref: Topographical Plan, No.01104, Rev:P01 (31/03/2023)

KEY

Site Boundary

LKC Site Investigations:

- Cable Percussion Borehole Location (CP)
- Window Sample Borehole (WS)
- Cone Penetrometer Test (CPT)
- Trial Pit (TP)

CCG Site Investigation Locations:

- Window Sample Borehole (WS)
- Trial Pit (TP)
- Cable Percussive Borehole (CBH)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

Client: Caddick Construction Ltd

Site: Chorlton Baths, Manchester

Title: Site Investigation Location Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC241317	See Scale Bar	3	A

Drawn By:	Checked By:	Drawn:
CC	MB	Dec 2024



Extract From: Buttress
Drawing Ref: Topographical Plan, No.01104, Rev:P01 (31/03/2023)

KEY

- Site Boundary
- Trial Pit (TP)

CCG Site Investigation Locations, April 2024:

- Window Sample Borehole (WS)
- Trial Pit (TP)
- Cable Percussive Borehole (CBH)

CONTAMINANTS:

- Pb — Lead (Pb) (>200mg/kg)
- B(a)P — Benzo(a)Pyrene (BaP) (>5.3mg/kg)

ADDITIONAL MAPPING:

Extract From: Buttress
Drawing Ref: Proposed Site Plan, No.04100, Rev:P04 (07/08/2023)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

LK CONSULT LIMITED

Client: Caddick Construction (NW) Ltd

Site: Chorlton Baths, Manchester

Title: Exceedances Location Plan

Job No.:	Scale (See Scale Bar):	Figure:	Revision:
LKC241317	See Scale Bar	4	

Drawn By:	Checked By:	Drawn:
AC	MB	Oct 2024

Appendix A – Risk Matrix

RISK EVALUATION

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552[44]. It involves the classification of the:

- Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- Magnitude if the probability (likelihood) of the risk occurring (Table B).

Consequence (Severity)		
Classification	**Definition**	**Example**
Severe	Short term (acute) risk to human health likely to results in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/properties. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High Concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled waters. Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary). Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services ('significant harm' as defined in DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g., foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

Table A. Classification of Consequence

Probability (Likelihood)	
Classification	**Definition**
High Likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term.

Table B. Classification of Probability.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	**Very High Risk**	**High Risk**	Moderate Risk	Moderate / Low Risk
	Likely	**High Risk**	Moderate Risk	Moderate / Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate / Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate / Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table C. Comparison of Consequence against Probability

Once the risk has been determined the corresponding action can be assessed (Table D).

Risk	Action Required
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR there is evidence that sever harm to a designated receptor is currently happening. This risk, if realised, is likely to results in a substantial liability. Urgent investigation (if not already undertaken) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table D. Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk is identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Appendix B – Profile Logs

Window Sample Borehole Log

Location Number: **WS101**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 01/11/2024
Project No. : LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Window Sample Rig: Premier Compact 110 Series	Level	Logged By: CK
	Scale: 1:40	Page Number: Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.40 - 1.40	ES			MADE GROUND: Medium dense dark brown gravelly silty SAND with frequent brick fragments, concrete fragments, occasional clinker, rare ash, slate fragments and whole bricks. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
0.40 - 1.40	PID=0.3ppm					
1.20	N=14 (5,6/3,3,4,4)					
1.40 - 1.80	ES	1.40		Very dense light brownish grey gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
1.40 - 1.80	PID=0.0ppm					
1.80 - 3.00	D					
2.00	N=50 (8,8/50 for 275mm)					
3.00	N=19 (4,4/4,5,5,5)	3.00		No Recovery		
3.50 - 4.00	D	3.50		Firm consistency medium strength brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
3.75	PP=58.9kPa					
4.00	N=16 (3,3/3,4,4,5)					
4.50 - 5.00	D					
4.75	PP=49.0kPa					
5.00	N=16 (3,4/4,4,4,4)					
		5.45		End of Borehole at 5.45m		

1 2 3 4 5 6 7 8

Remarks:

Borehole stable.

Groundwater strike at 2.80mbgl.

Window Sample Borehole Log

Location Number: **WS102**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 01/11/2024
Project No. : LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Window Sample Rig: Premier Compact 110 Series	Level	Logged By: CK; Scale: 1:40; Page Number: Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.50 - 1.20 0.50 - 1.20	ES PID=0.1ppm	0.50		MADE GROUND: Brown gravelly silty SAND with frequent brick fragments and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
				MADE GROUND: Orangish brown and grey gravelly silty SAND with occasional concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
1.20 - 2.00 1.20	D N=18 (2,2/3,5,5,5)	1.20		Medum dense to dense greyish brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
2.00 - 2.70 2.00	D N=37 (6,6/7,10,10,10)			2.00m to 2.70mbgl - Sand is dense.		
2.70 - 3.30 3.00	D N=10 (2,2/2,2,3,3)	2.70		Medium dense brown SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		▼
3.30 - 4.00 3.80 4.00	D PP=61.3kPa N=50 (8,8/50 for 275mm)	3.30		Firm consistency medium strength brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
		4.43		End of Borehole at 4.43m		

1 2 3 4 5 6 7 8

Remarks:

Borehole terminated at 4.43mbgl due to SPT refusal.

Borehole stable.

Groundwater strike at 3.00mbgl.

Window Sample Borehole Log

Location Number: **WS103**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 01/11/2024
Project No. : LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Window Sample Rig: Premier Compact 110 Series	Level	Logged By: CK
	Scale: 1:40	Page Number: Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
1.20	N=12 (4,3/3,3,3,3)			MADE GROUND: Loose to dense dark brown gravelly silty SAND with frequent brick fragments, concrete fragments, rare ash, coal fragments, plastic fragments and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	
2.00 - 3.00	ES				
2.00 - 3.00	PID=0.3ppm				
2.00	N=6 (3,3/3,1,1,1)				
3.00	N=50 (8,8/50 for 275mm)				
		3.33		End of Borehole at 3.33m	

1 2 3 4 5 6 7 8

Remarks:

Borehole terminated at 3.33mbgl due to SPT refusal on dense made ground.

Borehole undertaken 2.00m above normal ground level on stockpile of demolition rubble.

Window Sample Borehole Log

Location Number: **WS104**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 01/11/2024
Project No. : LKC241317	Contractor:	
Equipment:	Level	Logged By: CK
	Scale: 1:40	Page Number: Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.00 - 0.50 0.00 - 0.50	ES PID=0.5ppm			MADE GROUND: Brown gravelly silty SAND with frequent brick fragments, rare ash, concrete fragments and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
0.50 - 0.60 0.50 - 0.60 0.60 - 1.20 0.60	ES PID=0.0ppm D PP=61.3kPa	0.50 0.60		Firm consistency medium strength brown slightly gravelly sandy SILT with rare brick fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
1.20 - 1.80 1.20	D N=19 (3,4/4,5,5,5)	1.20		Orangish brown slightly gravelly silty SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	1	
		1.80		Medium dense grey gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
2.00 - 3.00 2.00	D N=20 (3,4/5,5,5,5)			Medium dense brown SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	2	
3.00 3.20	N=18 (3,3/4,4,5,5) PP=49.0kPa	3.00		Firm consistency medium strength pinkish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	3	
3.50 - 4.00 3.80	D PP=49.0kPa					
4.00 - 4.50 4.00	D N=19 (3,4/4,5,5,5)				4	
4.50 - 5.00 5.00	D N=15 (3,3/3,4,4,4)	4.50		Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	5	
		5.45		End of Borehole at 5.45m	6 7 8	

Remarks:

Borehole stable.

Groundwater strike at 2.90mbgl.

Window Sample Borehole Log

Location Number: **WS105**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 01/11/2024
Project No. : LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Window Sample Rig: Premier Compact 110 Series	Level	Logged By: CK; Scale: 1:40; Page Number: Sheet 1 of 1

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
0.00 - 0.80 0.00 - 0.80	ES PID=0.2ppm			MADE GROUND: Brown gravelly silty SAND with frequent brick fragments, concrete fragments, rare ash, clinker, textile fragments and timber fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	
0.80 - 1.20 0.80 - 1.20	ES PID=0.0ppm	0.80		Loose to medium dense greyish brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	
1.20 - 2.00 1.20	D N=22 (4,5/5,6,6,5)				
2.00 - 3.00 2.00	D N=8 (2,2/2,2,2,2)				
3.00	N=15 (2,2/2,3,5,5)	3.10		Firm consistency medium strength brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	
3.50 - 4.00 3.75	D PP=61.3kPa				
4.00 - 5.00 4.00	N=18 (2,3/3,5,5,5)	4.00		Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.	
5.00	N=11 (2,2/2,3,3,3)				
		5.45		End of Borehole at 5.45m	

Remarks:

Borehole stable.

Groundwater strike at 2.80mbgl.

Cable Percussion Drilling Log

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Location Number: **CP101**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 19/11/2024 - 20/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB
Scale: 1:100	Page Number: Sheet 1 of 2	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.20 - 1.00	D			MADE GROUND: Reddish brown sandy GRAVEL with frequent brick fragments, concrete fragments, occasional metal fragments and rare ash. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular comprising sandstone. (Demolition rubble)		
1.00 - 1.20	D	0.90				
1.20 - 1.65	D	1.20		Brown slightly gravelly clayey SAND. Sand is fine to coarse. Gravel is fine to coarse, subrounded comprising quartzite and sandstone.		
1.20 - 1.65	N=14 (2,2/3,3,4,4)					
1.70 - 2.00	B			Firm to very stiff consistency low to very high strength brownish grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite, sandstone and mudstone.		
1.70	PP=36.8kPa					
2.20 - 2.65	D					
2.20 - 2.65	N=12 (3,3/3,3,3,3)					
2.50	PP=49.0kPa					
3.00	PP=49.0kPa					
3.40 - 3.70	B					
3.40 - 3.85	D					
3.40 - 3.85	N=22 (4,5/5,5,5,7)					
3.50	PP=61.3kPa					
4.00	PP=61.3kPa					
4.30 - 4.75	D					
4.30	N=19 (3,4/4,5,5,5)					
4.50	PP=98.1kPa					
5.00	PP=73.6kPa					
5.50 - 5.95	D					
5.50	PP=49.0kPa					
5.50	N=19 (4,4/4,5,5,5)					
6.00	PP=98.1kPa					
7.00 - 7.45	D					
7.00	PP=36.8kPa					
7.00	N=16 (3,3/4,4,4,4)					
7.50	PP=49.0kPa					
8.50 - 8.95	U					
9.00 - 9.65	D					
9.00	PP=171.7kPa					
9.00	N=34 (5,5/7,7,8,12)					
9.70 - 10.00	B					
10.50	PP=98.1kPa					
10.60 - 11.05	U					
11.00	PP=220.7kPa					
11.10 - 11.50	D					
11.50	PP=196.2kPa					
12.00	PP=220.7kPa					
12.20 - 12.60	D					
12.20	50 (7,10/50 for 285mm)					
13.50	PP=147.2kPa					
13.80 - 14.20	D					
13.80	50 (8,11/50 for 275mm)					
15.00	PP=24.5kPa					
15.20 - 15.60	D					
15.20	N=50 (7,9/50 for 245mm)					
17.00 - 17.40	D	17.00		Very dense brownish grey SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subrounded comprising quartzite and sandstone.		
17.00	50 (6,9/50 for 245mm)					
17.50 - 17.80	B					
18.50 - 18.90	D	18.70		Very stiff consistency high strength brown slightly gravelly sandy silty CLAY. Sand id fine to coarse. Gravel is fine to coarse, subangular comprising quartzite, sandstone and mudstone.		
18.50	N=50 (8,10/50 for 255mm)					
19.80 - 20.20	D					
	50 (10,14/50 for 265mm)					

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.20	200	20.00	200	20	7.20			

Remarks:

Groundwater encountered at 17.00mbgl rising to 7.2mbgl after 20 minutes.
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP101**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 19/11/2024 - 20/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 2 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
19.80 20.00	PP=122.6kPa	20.20		Very stiff consistency high strength brown slightly gravelly sandy silty CLAY. Sand id fine to coarse. Gravel is fine to coarse, subangular comprising quartzite, sandstone and mudstone. End of Borehole at 20.20m		

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.20	200	20.00	200	20	7.20			

Remarks:
Groundwater encountered at 17.00mbgl rising to 7.2mbgl after 20 minutes.
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP102**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 18/11/2024 - 19/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 1 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
0.20 - 1.00	D			MADE GROUND: Reddish brown sandy GRAVEL with frequent brick fragments, concrete fragments, occasional metal fragments and rare ash. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular comprising sandstone. (Demolition rubble)	
1.00 - 1.20	D	1.20			
1.20 - 1.65	N=12 (2,2/3,3,3,3)			Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite and sandstone.	
1.70 - 2.00	B				
2.30 - 2.75	D				
2.30 - 2.75	N=17 (3,3/4,4,4,5)				
3.40 - 3.85	D	3.40			
3.40 - 3.85	N=20 (3,3/4,5,5,6)			Firm to stiff consistency very low to very high strength brownish grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded comprising quartzite, sandstone and mudstone.	
3.50	PP=49.0kPa				
4.00 - 4.30	B				
4.50 - 4.95	U				
4.50	PP=12.3kPa				
5.00 - 5.50	D				
5.00	PP=49.0kPa				
5.50 - 5.95	D				
5.50	PP=49.0kPa				
5.50 - 5.95	N=19 (3,4/4,5,5,5)				
7.10 - 7.55	D				
7.10 - 7.55	N=18 (4,4/4,5,4,5)				
7.50	PP=12.3kPa				
8.50 - 8.95	D				
8.50	PP=122.6kPa				
8.50 - 8.95	N=39 (6,7/8,9,10,12)				
9.00 - 9.30	B				
10.00	PP=171.7kPa				
10.10 - 10.55	U				
10.55	PP=171.7kPa				
10.50	D				
10.60 - 11.00	PP=196.2kPa				
11.50	D				
11.60 - 11.90	50 (6,8/50 for 170mm)				
11.60					
13.00 - 13.30	D				
13.30	PP=220.7kPa				
13.00 - 13.00	50 (7,10/50 for 170mm)				
13.00	PP=147.2kPa				
14.00					
14.70 - 15.00	D				
14.70	50 (25 for 70mm/50 for 210mm)				
16.50 - 16.90	D				
16.50	PP=49.0kPa				
16.50 - 17.50	50 (8,10/50 for 220mm)				
16.50	PP=73.6kPa				
18.00	PP=49.0kPa				
18.20 - 18.60	D				
18.20 - 18.60	N=50 (7,9/50 for 255mm)				
19.70 - 20.10	D				

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.00	200					

Remarks:
Borehole dry and stable

Cable Percussion Drilling Log

Location Number: **CP102**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 18/11/2024 - 19/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 2 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
19.70 - 20.08 20.00	N=50 (10,10/50 for 235mm) PP=122.6kPa	20.10		Firm to stiff consistency very low to very high strength brownish grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded comprising quartzite, sandstone and mudstone. End of Borehole at 20.10m	

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.00	200					

Remarks:
Borehole dry and stable

Cable Percussion Drilling Log

Location Number: **CP103**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 28/10/2024 - 29/10/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: CK
Scale: 1:100	Page Number: Sheet 1 of 2	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.20	D			MADE GROUND: Medium dense reddish brown sandy GRAVEL with frequent brick fragments, concrete fragments, occasional metal fragments and rare glass fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. (Demolition Rubble)		
1.00	D					
1.20 - 1.65	SPT					
1.20 - 1.65	N=12 (2,2/3,3,3,3)					
2.20 - 2.65	SPT					
2.20	N=17 (3,3/7,3,3,4)					
		3.10				
3.20 - 3.65	SPT			Medium dense greyish brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
3.20	N=16 (3,3/4,4,4,4)					
3.70	D					
4.10 - 4.55	SPT					
4.10	N=15 (3,3/3,4,4,4)					
		4.70				
4.90 - 5.35	SPT			Firm to stiff consistency brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
4.90	N=21 (4,4/5,5,5,6)					
5.40 - 5.70	B					
6.10 - 6.55	SPT					
6.10	N=19 (3,4/4,5,5,5)					
7.60 - 8.05	SPT					
7.60	N=15 (3,3/3,4,4,4)					
8.00 - 8.30	B					
9.00 - 9.45	SPT					
9.00	N=15 (3,3/3,4,4,4)					
10.40 - 10.85	SPT					
	N=24 (3,4/5,5,6,8)					
10.40	B					
10.90 - 11.20	SPT					
11.50 - 11.90	50 (5,7/50 for 190mm)					
11.50	B					
12.00 - 12.30	SPT					
13.00 - 13.35	50 (5,10/50 for 180mm)					
		13.90				
13.00	SPT			Dense brown silty SAND. Sand is fine to coarse.		
14.00 - 14.45	N=32 (6,7/8,8,8,8)					
14.00	B					
		14.90				
14.50 - 14.80	SPT			Stiff to very stiff consistency brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
15.00 - 15.40	N=47 (10,10/47 for 275mm)					
15.00	B					
15.70 - 16.00	SPT					
16.60 - 17.00	N=50 (8,12/50 for 245mm)					
16.60						
18.10 - 18.50	SPT					
18.10	N=50 (7,10/50 for 255mm)					
		19.60				
19.70 - 20.10	SPT			Very dense orangish brown SAND. Sand is fine to coarse.		
	N=50 (8,8/50 for 255mm)					

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.10	200	20	10.00	11.50	14.00	01:00
				20	13.10	15.00	19.70	02:00

Remarks:
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP103**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 28/10/2024 - 29/10/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: CK; Scale: 1:100; Page Number: Sheet 2 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
19.70		20.10		Very dense orangish brown SAND. Sand is fine to coarse. End of Borehole at 20.10m		

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.10	200	20 20	10.00 13.10	11.50 15.00	14.00 19.70	01:00 02:00

Remarks:
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP104**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 29/10/2024 - 31/10/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: CK; Scale: 1:100; Page Number: Sheet 1 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
0.20	D			MADE GROUND: Reddish brown gravelly SAND with frequent brick fragments and concrete fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. (Demolition Rubble).		
		0.60				
1.00	D					
1.20 - 1.65	SPT	1.20		MADE GROUND: Dark brown gravelly silty SAND with frequent brick fragments, occasional concrete fragments, rare coal fragments, ash and clinker. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone.		
1.20	N=16 (2,2/3,3,4,6)					
1.70 - 2.00	B					
2.20 - 2.65	SPT			Medium dense greyish brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
2.20	N=19 (3,3/4,4,5,6)					
		3.20				
3.30 - 3.75	SPT			Firm to stiff consistency reddish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
3.30	N=19 (2,3/4,4,5,6)					
3.80 - 4.10	B					
4.30 - 4.75	U			3.20 to 7.45mbgl - Clay is firm consistency		
4.80	D					
5.40 - 5.85	SPT					
5.40	N=15 (2,3/3,3,4,5)					
6.00 - 6.30	B					
7.00 - 7.45	SPT					
7.00	N=12 (2,2/2,3,3,4)			7.45 to 16.60mbgl - Clay is stiff consistency.		
8.50 - 8.95	SPT					
8.50	N=22 (3,4/5,5,5,7)					
9.00 - 9.30	B					
10.00 - 10.40	SPT N=50 (6,10/50 for 295mm)					
10.00	B					
10.50 - 10.80						
11.60 - 12.00	SPT N=50 (7,11/50 for 275mm)					
11.60						
13.10 - 13.50	SPT N=50 (8,10/50 for 265mm)					
13.10						
14.50 - 14.95	SPT N=43 (6,8/10,10,11,12)					
14.50						
16.10 - 16.50	SPT N=50 (7,8/50 for 265mm)					
		16.60				
16.10	SPT			Very dense brown SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
16.60 - 16.90	N=50 (3,4/50 for 285mm)					
16.60	B					
17.00 - 17.30	SPT					
		18.40				
18.30 - 18.50	50 (25 for 115mm/50 for 105mm)			Very stiff consistency brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone.		
18.30						
19.80 - 20.10	SPT 50 (12,13/50 for 145mm)					

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.10	200	20	6.10	10.60	19.80	03:30

Remarks:
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP104**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 29/10/2024 - 31/10/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: CK
Scale: 1:100	Page Number: Sheet 2 of 2	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
19.80		20.10		Very stiff consistency brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. End of Borehole at 20.10m		

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.10	200	20.10	200	20	6.10	10.60	19.80	03:30

Remarks:
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP105**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 21/11/2024 - 22/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 1 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
0.50 - 1.00	D			MADE GROUND: Reddish brown gravelly SAND with frequent brick fragments, concrete fragments, occasional metal fragments and rare ash. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular comprising sandstone. (Demolition rubble)	
1.20 - 1.65 1.20	D N=14 (2,3/3,3,4,4)	1.20		Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite and sandstone.	
1.70 - 2.00	B				
2.20 - 2.65 2.20	D N=16 (3,3/4,4,4,4)				
3.30 - 3.75 3.30	D N=23 (3,3/5,5,6,7)	3.20		Firm to stiff consistency brownish grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded comprising quartzite, sandstone and mudstone.	
3.70 - 4.00	B				
4.40 - 4.85 4.40	D N=22 (3,4/5,5,6,6)				
5.50 - 5.95	U				
6.00 - 6.50	D				
7.20 - 7.65 7.20	D N=17 (3,3/3,4,5,5)				
8.70 - 9.10 8.70	D N=50 (5,5/50 for 285mm)				
9.00 - 9.30	B				
10.50 - 10.95	U				
12.20 - 12.65 12.20	D N=41 (5,6/8,10,11,12)				
13.60 - 14.00 13.60	D 50 (8,10/50 for 255mm)				
15.10 - 15.50 15.10	D 50 (9,11/50 for 265mm)				
16.60 - 17.00 16.60	D N=50 (5,7/50 for 275mm)				
18.20 - 18.65 18.20	D N=32 (5,6/6,7,9,10)				
19.80 - 20.25	D N=35 (6,6/7,8,10,10)				

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.25	200							

Remarks:
Borehole dry and stable.

Cable Percussion Drilling Log

Location Number: **CP105**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 21/11/2024 - 22/11/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 2 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)
19.80		20.25		Firm to stiff consistency brownish grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded comprising quartzite, sandstone and mudstone.	
				End of Borehole at 20.25m	

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.25	200							

Remarks:
Borehole dry and stable.

Cable Percussion Drilling Log

Location Number: **CP106**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 02/12/2024 - 03/12/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB
Scale: 1:100	Page Number: Sheet 1 of 2	

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
1.20 - 1.65 1.20	D N=12 (2,3/3,3,3,3)			MADE GROUND: Medium dense reddish brown sandy GRAVEL with frequent brick fragments, concrete fragments, occasional metal fragments and rare glass fragments. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded comprising sandstone and mudstone. (Demolition Rubble)		
2.20 - 2.65 2.20 2.70 - 3.00	D N=18 (6,5/4,4,5,5) B	2.00		Medium dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite and sandstone.		
3.30 - 3.75 3.30	D N=19 (3,4/4,5,5,5)					
4.20 - 4.65 4.20 4.50 4.70 - 5.00 5.30 - 5.75 5.30 5.50	D N=15 (3,3/3,4,4,4) PP=73.6kPa B D N=17 (3,3/4,4,4,5) PP=73.6kPa	4.00		Firm to stiff consistency medium to very high strength brownish grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded comprising quartzite, sandstone and mudstone.		
7.00 - 7.45 7.00 7.50 - 7.70 7.50 8.50 8.60 - 9.05 8.60 9.00 - 9.30	U PP=73.6kPa D PP=98.1kPa PP=73.6kPa D N=37 (5,7/7,10,10,10) B					
10.00 - 10.55 10.00 10.60 - 11.00 11.50 - 11.90 11.50 11.50	U PP=49.0kPa D D PP=122.6kPa 50 (7,8/50 for 295mm)					
13.00 13.10 - 13.50 13.10	PP=171.7kPa D 50 (6,10/50 for 285mm)					
14.50 14.80 - 15.20 14.80	PP=73.6kPa D N=50 (7,9/50 for 235mm)					
16.50 - 16.90 16.50 16.50	D PP=196.2kPa N=50 (6,10/50 for 235mm)					
18.00 18.10 - 18.50 18.10	PP=171.7kPa D 50 (7,11/50 for 295mm)					
19.60 - 20.05 19.60	D N=45 (7,8/10,10,12,13)	19.50		Very dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite and sandstone.		

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.05	150	20.05	150	20 20	12.50 10.00			

Remarks:
Groundwater encountered at 13.00mbgl and 19.50mbgl rising to 10.00mbgl and 12.50mbgl respectively after 20 minutes.
Borehole stable.

Cable Percussion Drilling Log

Location Number: **CP106**

Project Name: Chorlton Baths	Client: Caddick Construction (NW) Ltd	Date: 02/12/2024 - 03/12/2024
Project ID:LKC241317	Contractor: D & I Drilling Ltd	
Equipment: Cable Percussive Drilling Rig / Shell and Auger Rig	Level	Logged By: MB; Scale: 1:100; Page Number: Sheet 2 of 2

Depth (m)	Samples / Tests	Depth (m)	Legend	Stratum Description	Level (m)	Water Strikes
		20.05		Very dense brown gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse, subangular comprising quartzite and sandstone.		
				End of Borehole at 20.05m		

21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Hole Diameter		Casing Diameter		Water Strike Details		Chiselling		
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	Time Elapsed (mins)	Depth Water (m)	Depth Top (m)	Depth Base (m)	Duration (hh:mm)
20.05	150	20.05	150	20	12.50			
				20	10.00			

Remarks:
Groundwater encountered at 13.00mbgl and 19.50mbgl rising to 10.00mbgl and 12.50mbgl respectively after 20 minutes.
Borehole stable.

IN SITU
SITE INVESTIGATION



STATIC CONE PENETRATION TEST

FACTUAL REPORT

CLIENT: LK Consult Ltd

PROJECT: Chorlton Baths

Project	**Chorlton Baths**
Project No.	**1240458**
Client	**LK Consult Ltd**
Address	**Eton Hill Business Park, Eton Hill Road, Manchester, M26 2ZS**

Attention: Peter Dunn

Dear Peter,

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

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

Yours faithfully,

In Situ Site Investigation Limited



Darren Ward

Director

Report Issue

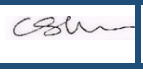
Issue	Date	Prepared	Sign	Checked	Sign	Approved	Sign
01	28/10/2024	Chloe Donovan		Darren Ward		Darren Ward	

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1.0 INTRODUCTION

In Situ Site Investigation Limited (In Situ) was engaged in a geotechnical site investigation at Chorlton Baths at the request of LK Consult Ltd. The site investigation consisted of completing 11 Static Piezocone Penetration Tests (CPTU), to provide information on the soil conditions and derived geotechnical parameters at:

Former Chorlton Leisure Centre at Manchester Rd,
Chorlton-cum-Hardy,
Manchester
M21 9PG

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

The fieldwork was carried out on 24th October 2024 as per the client's request.

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

2.0 FIELDWORK

2.1 CONE PENETRATION TESTS

The fieldwork activity is summarised in Table 2.1.

Table 2.1 Fieldwork Summary	
CPT Operator/s	Dave Roberts
Date Started	24th October 2024
Date Finished	24th October 2024
In Situ S.I. Project Manager	Darren Ward
Main Contractor's Site Manager	Aaron Astley

2.1.1 Rig Information

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

Table 2.2 Rig Summary	
Rig Name	**Rig Description**
CPT017	20 Tonne Track Mounted CPT Rig

2.1.2 CPTU Cone

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

Table 2.3 Cone Summary		
Number	**Cross-section area**	**Filter position**
S15-CFIP.2136	15cm^2	u_2

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

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

Table 2.4 Completed Fieldwork Summary
11 CPTU to a maximum depth of 15.00m. Each test measured Cone Resistance, q_c, Sleeve Friction, f_s, Porewater Pressure in the shoulder position, u_2, Inclination in X and Y axes.
Provision of factual report with estimated soil type, derived geotechnical parameters & AGS data file.

2.1.3 CPTU Cone Calibration

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

2.1.4 CPTU Cone Saturation

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

2.1.5 Test Procedure

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

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

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

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

2.1.6 In Situ Pore Pressure (u_0)

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

2.2 POSITIONING

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

3.0 CONE PENETRATION MEASURED PARAMETERS

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

3.1 DATA PROCESSING

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

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

3.1.1 Zero Measurements

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

3.2 MEASURED PARAMETERS

3.2.1 Cone Resistance (q_c)

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

3.2.2 Sleeve Friction (f_s)

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

3.2.3 Porewater pressure (u_2)

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

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

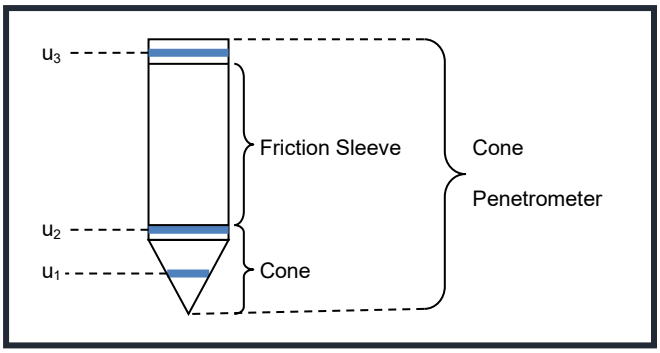


Figure 3.1: *Diagram showing pore pressure filter locations (after Lunne et al., 1997)*

3.2.4 Inclination (I_x, I_y)

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

3.3 ESTIMATED SOIL BEHAVIOUR TYPE

3.3.1 Friction Ratio (R_f)

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

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

3.3.2 Estimated Soil Behaviour Type (SBT)

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

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

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

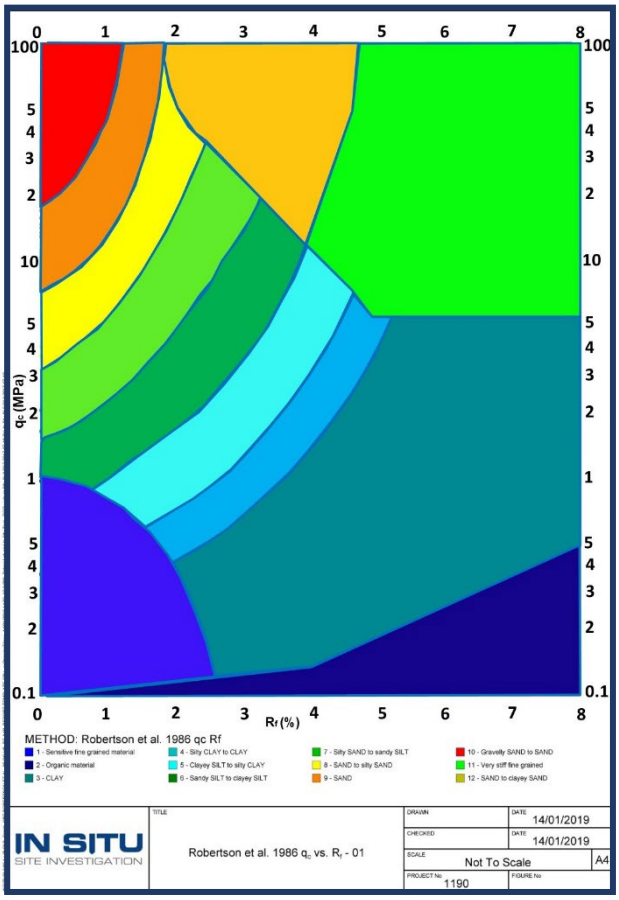


Figure 3.2: *Robertson et al., 1986 soil behaviour type chart.*

3.3.3 Pore Pressure Ratio (B_q)

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

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

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

where

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

3.4 APPLIED CORRECTIONS

3.4.1 Corrected Cone Resistance (q_t)

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

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

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

where

α is the cone area ratio

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

3.4.2 Depth Correction

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

To calculate the corrected depth the following formula is used:

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

where

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

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

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

where

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

4.0 GEOTECHNICAL DERIVED PARAMETERS

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

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

4.1 SOIL BEHAVIOUR TYPE INDEX (I_c)

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

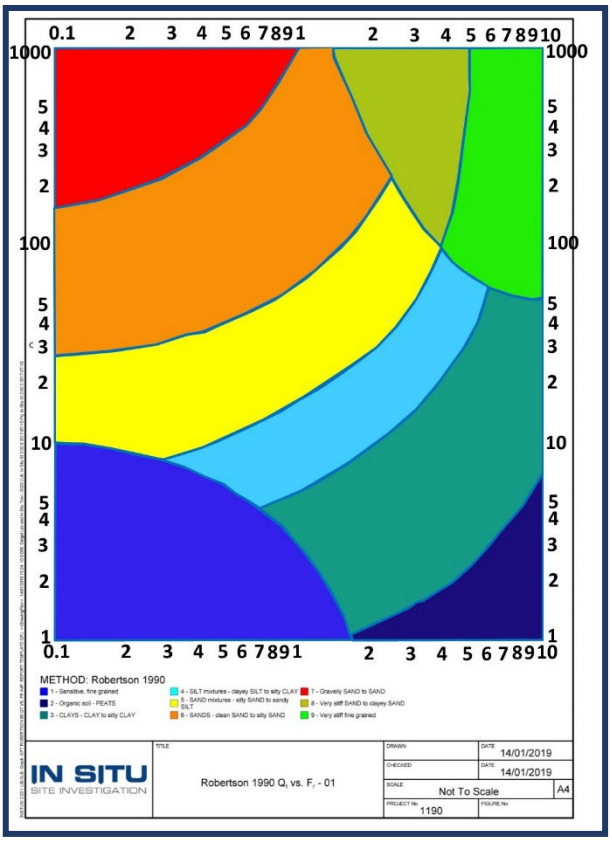


Figure 4.1: *Robertson 1990 soil behaviour type chart.*

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

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

where

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

F_R is the normalized friction ratio, in *%*

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

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

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

** Heavily over consolidated or cemented*

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

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

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

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

1) *Robertson & Wride (1998)*

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

2) *Jefferies and Davies (1993)*

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

3) *Robertson (2012)*

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

where

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

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

4.3 RELATIVE DENSITY (D_r)

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

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

1) Baldi et al., (1986)

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

where

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

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

Wehr is a correction coefficient for calcareous soils

2) Jamiolkowski et al., (2001)

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

where

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

q_t is corrected cone resistance

σ_{atm} is the atmospheric pressure

3) Kulhawy and Mayne, (1990)

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

where

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

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

where

q_c is the cone resistance in *kPa*

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

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

t is time in years

4.4 FRICTION ANGLE (φ')

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

1) Mayne and Campanella, (2005)

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

where

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

Q_t is the normalized cone resistance

2) Robertson and Campanella, (1983)

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

where

q_c is the cone resistance in *kPa*

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

3) Kulhawy and Mayne, (1990)

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

where

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

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

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

4.5 FINES CONTENT (*FC*)

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

1) Robertson and Wride (1998)

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

2) Suzuki et al. (1998)

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

where

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

4.6 UNDRAINED SHEAR STRENGTH (s_u)

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

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

where

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

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

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

4.7 SENSITIVITY (S_t)

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

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

1) Schmertmann (1978)

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

where

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

2) Mayne (2007)

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

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

4.8 SOIL UNIT WEIGHT (γ)

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

Dry unit weight for sands:

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

Saturated unit weight for clays method 1

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

Saturated unit for clays method 2

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

where

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

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

z is the depth

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

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

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APPENDIX A

APPENDIX A1 – Project Summary Sheet

Piezocone Tests Summary Sheet

HOLE ID	Final Depth (m)	Date of Test	Cone Used	Test Remarks
CPT101	0.17	24/10/2024	S15-CFIP.2136	Test refused on inclination.
CPT101A	0.24	24/10/2024	S15-CFIP.2136	Test refused on inclination.
CPT101B	1.62	24/10/2024	S15-CFIP.2136	Test refused on total pressure.
CPT101C	10.48	24/10/2024	S15-CFIP.2136	Test refused on inclination.
CPT102	14.98	24/10/2024	S15-CFIP.2136	Test completed at target depth.
CPT103	14.99	24/10/2024	S15-CFIP.2136	Test completed at target depth.
CPT104	15.00	24/10/2024	S15-CFIP.2136	Test completed at target depth.
CPT105	13.33	24/10/2024	S15-CFIP.2136	Test refused on total pressure.
CPT106	12.58	24/10/2024	S15-CFIP.2136	Test refused on total pressure.
CPT107	1.10	24/10/2024	S15-CFIP.2136	Test refused on inclination.
CPT107A	13.11	24/10/2024	S15-CFIP.2136	Test refused on total pressure.

APPENDIX A2 – CPT Rig Datasheet

RIGS

20 TONNE CPT TRACK MOUNTED RIG (CPT017)

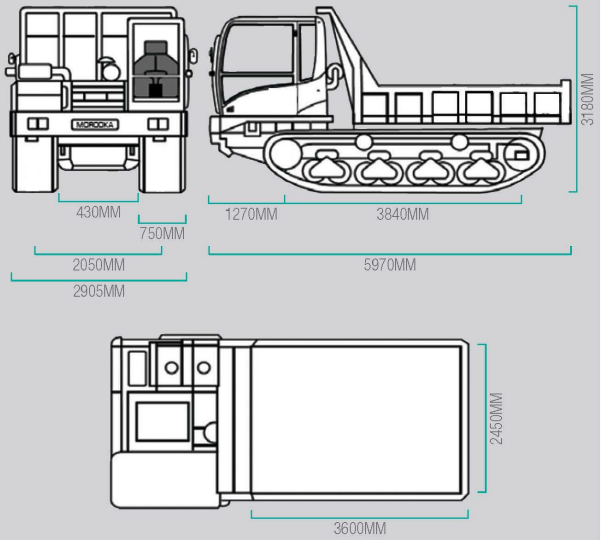
We have a variety of rigs giving us the capacity to meet our clients' needs and specifications for each individual project.

This rubber tracked rig weighs 20 tonnes and is able to push up to a depth of 40 metres, depending on the ground conditions. It has low ground bearing pressure and is ideal for soft, boggy sites which are inaccessible for our wheeled rigs.

CPT RIG DETAILS

DRIVE SYSTEM	RUBBER TRACKED
TOTAL WEIGHT	20 TONNES
GROUND BEARING PRESSURE	35kPA
CPT RAM THRUST CAPACITY	20 TONNES
MAXIMUM PENETRATION	30-40M DEPENDING ON THE GROUND CONDITIONS.
PERFORMANCE RATES	100-150M OF TESTING A DAY, DEPENDING ON ACCESS TO POSITIONS.
TYPICAL SITES FOR THIS RIG	SOFT, BOGGY SITES. THE RIG HAS LOW GROUND BEARING PRESSURE.

CPT RIG DIMENSIONS




Shrewsbury



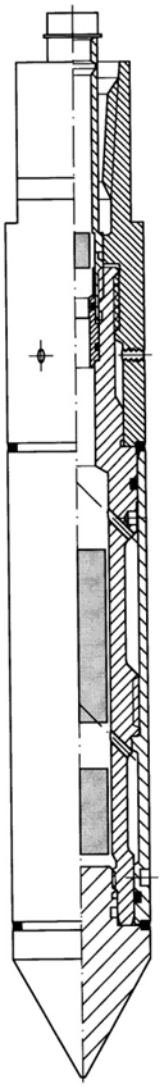
Heading North on our low loader


Falkirk, Scotland

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APPENDIX A3 – Cone Datasheet

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



SPECIFICATIONS S15 SERIES ELECTRICAL CONES

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

GENERAL SPECIFICATIONS

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

TIP RESISTANCE

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

LOCAL SLEEVE FRICTION

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

PORE PRESSURE

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

INCLINATION

Range	25 ˚ (biaxial)
Accuracy	< 2 ˚

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

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

APPENDIX A4 – Cone Calibration Certificate

Gouda Geo-Equipment B.V.
Satellietbaan 8
2181 MH Hillegom
The Netherlands

Tel. + 31 (0)715.318.475
E-mail: info@gouda-geo.com

WWW.GOUDA-GEO.COM
Down to Earth

Certificate of Calibration

Certificate No. CMI 24.05.6608

Instrument

Instrument Type:	Electrical Subtraction Cone	Calibration Result:	Certified
Manufacturer:	GP calibrated by Gouda Geo-Equipment BV		
Model No.:	S15-CFIIP	Date Calibrated:	2-5-2024
Serial No.:	2136	Next Due Date:	2-5-2025
Cone area factor:	0,86		
Used Calibration Procedure: GGECP008, ISO 22476-1:2012		Location: Hillegom (The Netherlands)	

Customer

In Situ Site Investigation Ltd.

Calibration Instruments

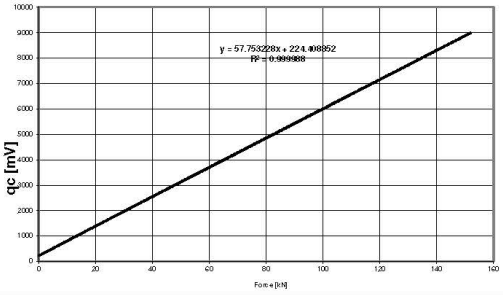
Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 1016780 + 1013883
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 8 February, 2024	Date Calibrated: 8 February, 2024	Date Calibrated: 19 September, 2023
Next Due Date: 8 February, 2025	Next Due Date: 8 February, 2025	Next Due Date: 19 September, 2024
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 24.02.6313	Traceability: CMI 24.02.6314	Traceability: 2309200019

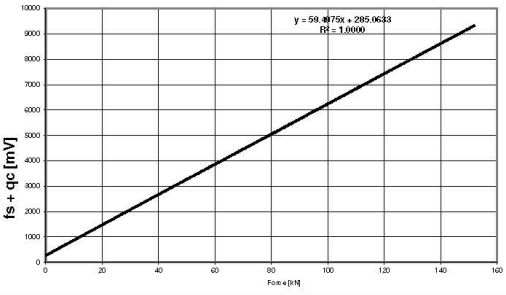
Calibration Conditions

Environmental conditions whilst performing the calibration:		Ambient Temperat	21.4 °C
		Relative Humidity:	44.2 %
Condition of Calibrated Apparatus when Received: Fair			

Measurement Parameters

zero value	221 mV	zero value	281 mV
Full scale	8663 @ 150 kN	Full scale	8925 @ 150 kN





Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Nederlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO 22476-1:2012.
The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature, humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

This report shall not be reproduced or duplicated by any means, except in full, without the written approval of Gouda Geo-Equipment B.V.

APPENDIX A5 – Symbol List

English

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

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

Greek

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

APPENDIX A6 – Abbreviations

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

APPENDIX A7 – Glossary

CPT
Cone Penetration Test.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX A8 – Soils Description Tables

GRANULAR SOILS (Sands and Gravels)

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

COHESIVE SOILS (Clays and Silts)

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

APPENDIX B

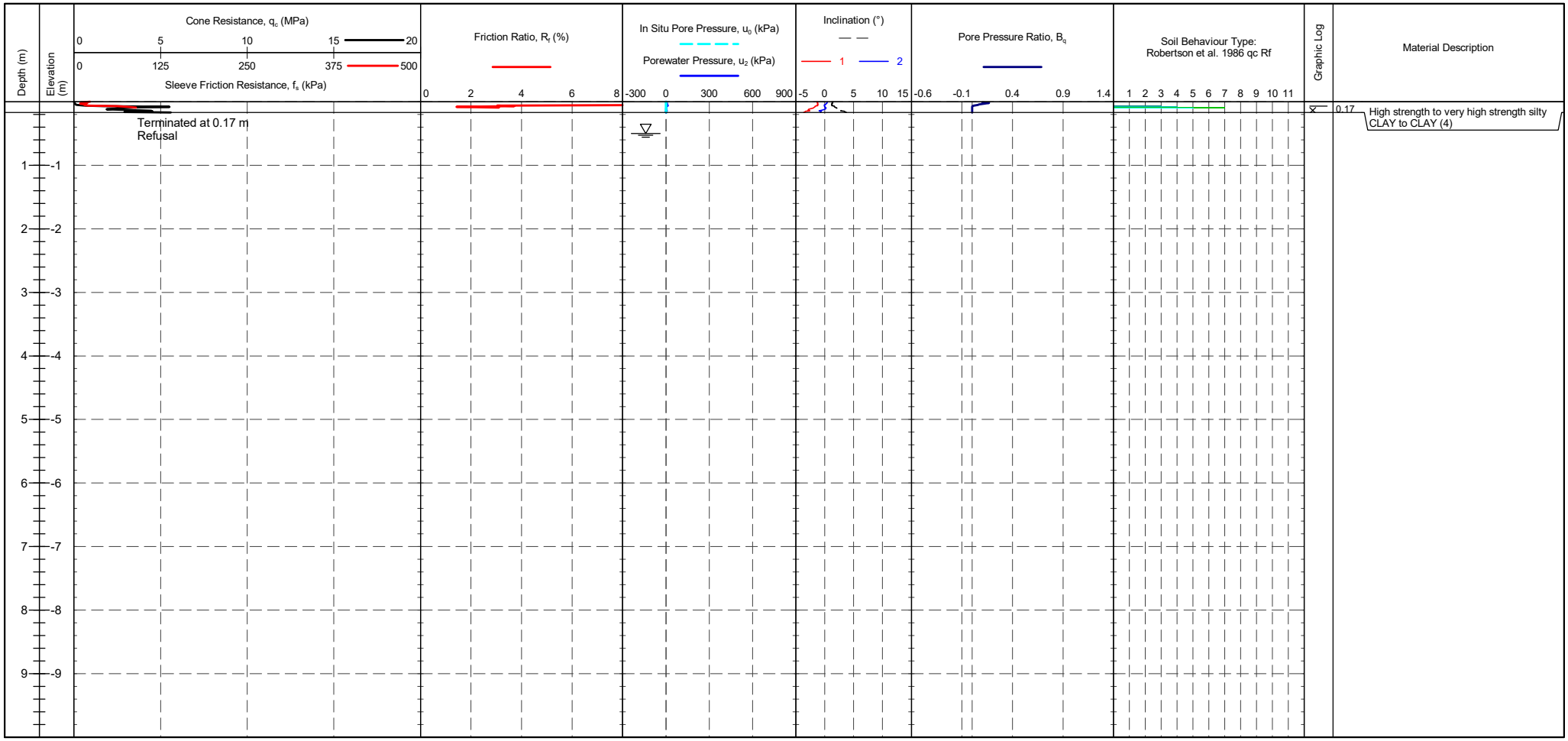
Cone Penetration Measured Parameters and Geotechnical Derived Parameters

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT101**

CLIENT : LK Group PROJECT : Chorlton Baths LOCATION : Manchester PROJECT No. : 1240458	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Refusal	Remark: Test refused on inclination.	SHEET : 1 OF 1 STATUS : Final TEST DATE : 24/10/2024 PLOT DATE : 25/10/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	256 mV	269 mV	0.003 kPa
X-Y Inclinometer	2424 mV	2412 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

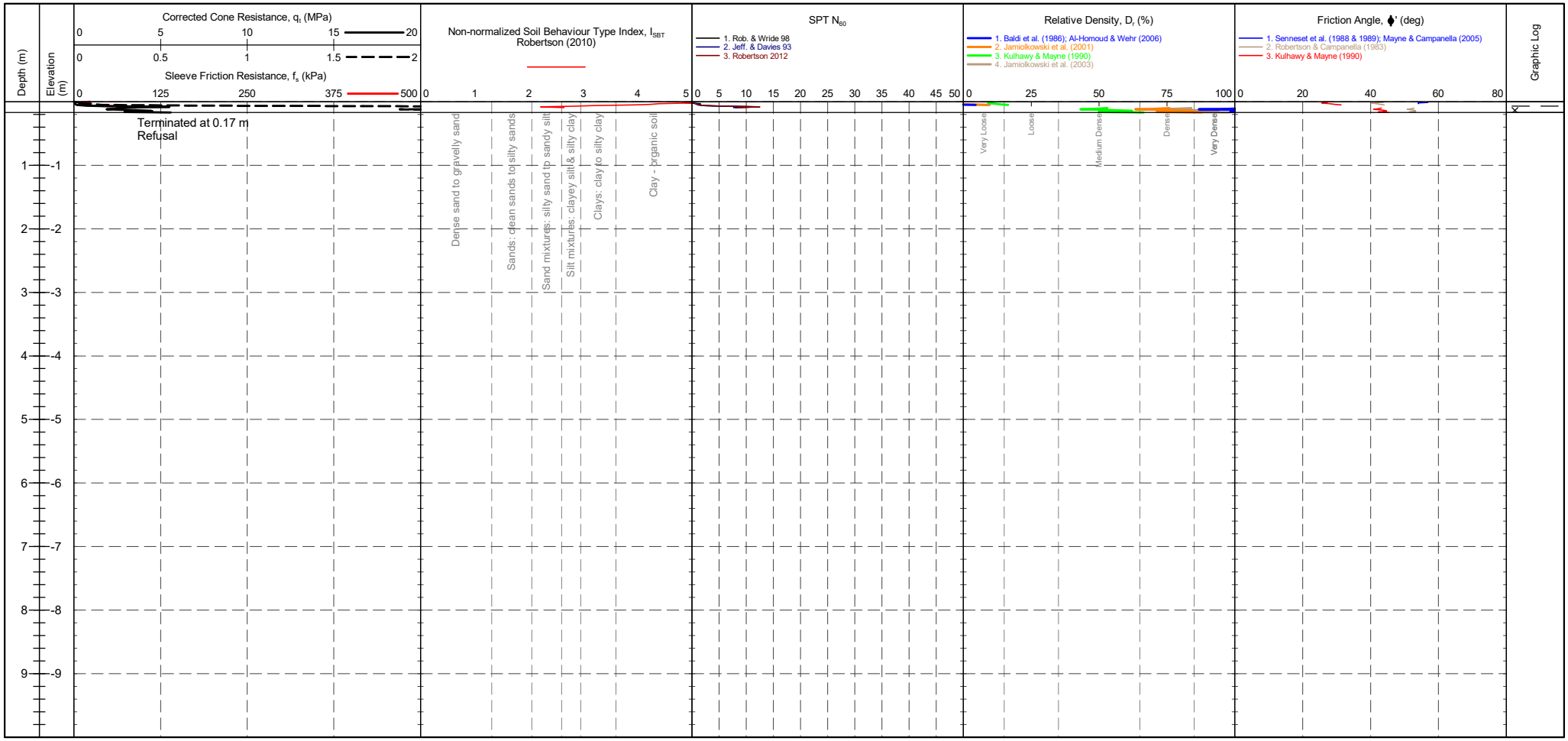
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT101**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	256 mV	269 mV	0.003 kPa
X-Y Inclinometer	2424 mV	2412 mV	

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

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

Groundwater Level

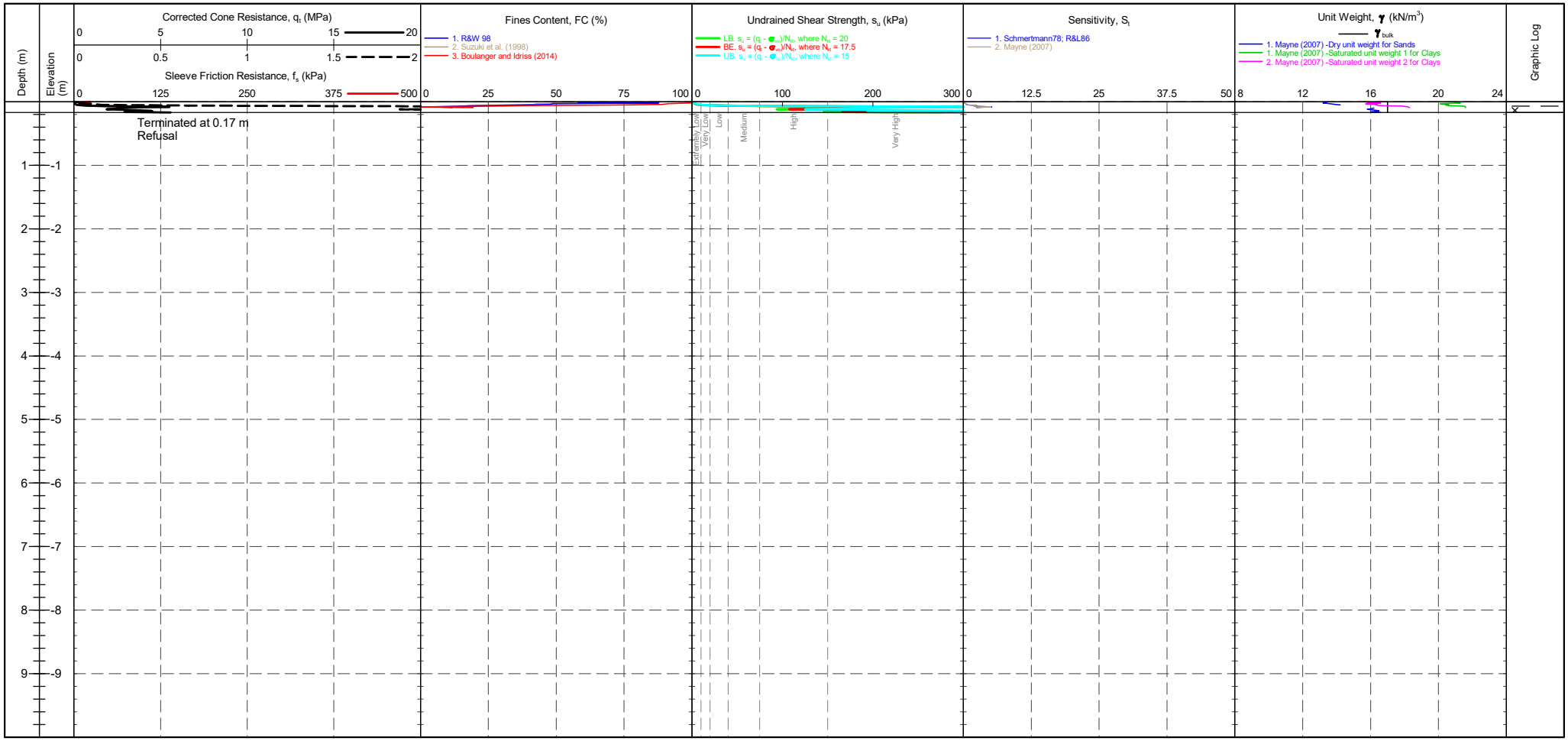
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT101**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



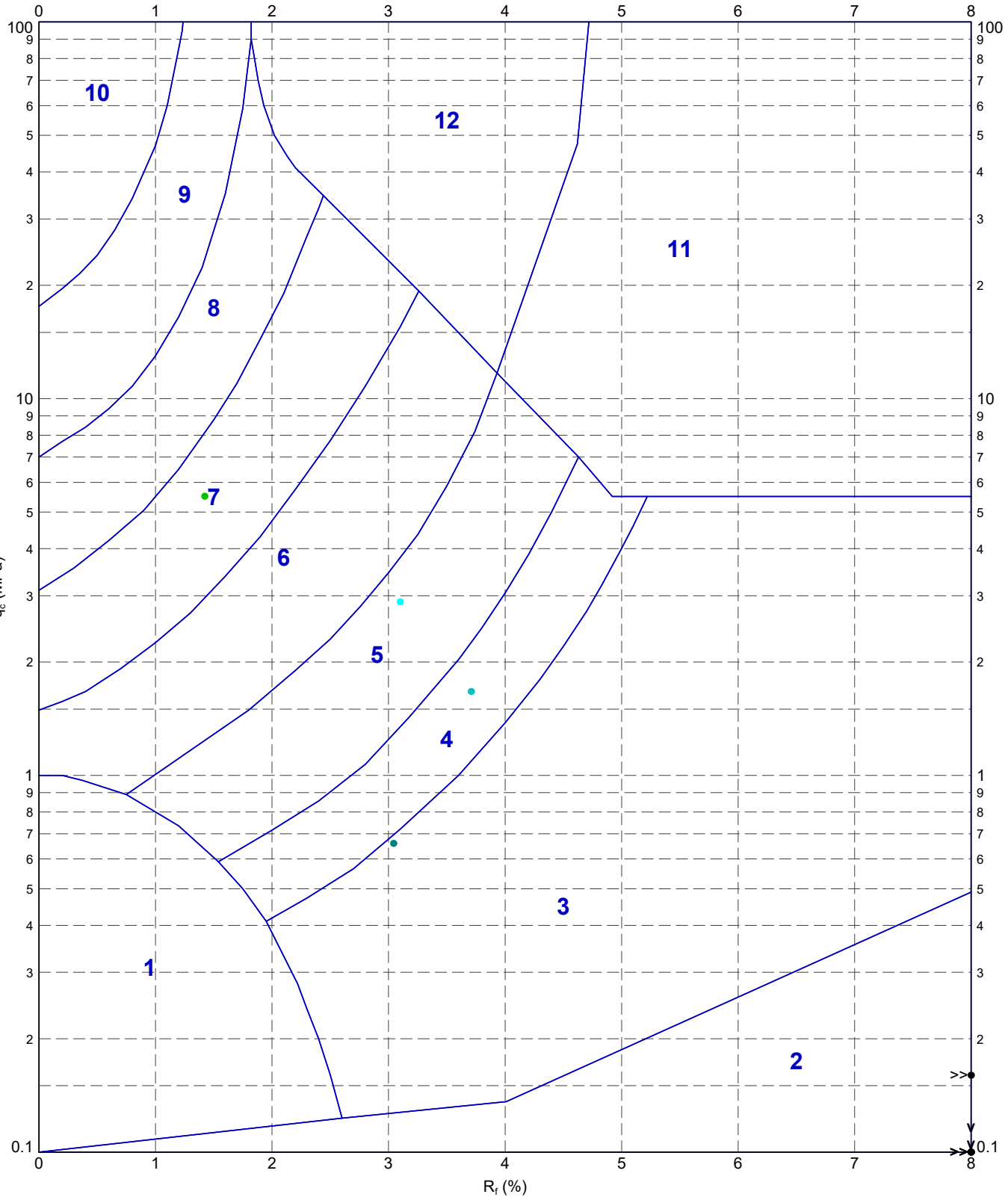
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	264 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	338 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	256 mV	269 mV	0.003 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2424 mV	2412 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT101

DRAWN		DATE	25/10/2024
CHECKED		DATE	25/10/2024
SCALE	Not To Scale		A4
PROJECT No	1240458	FIGURE No	

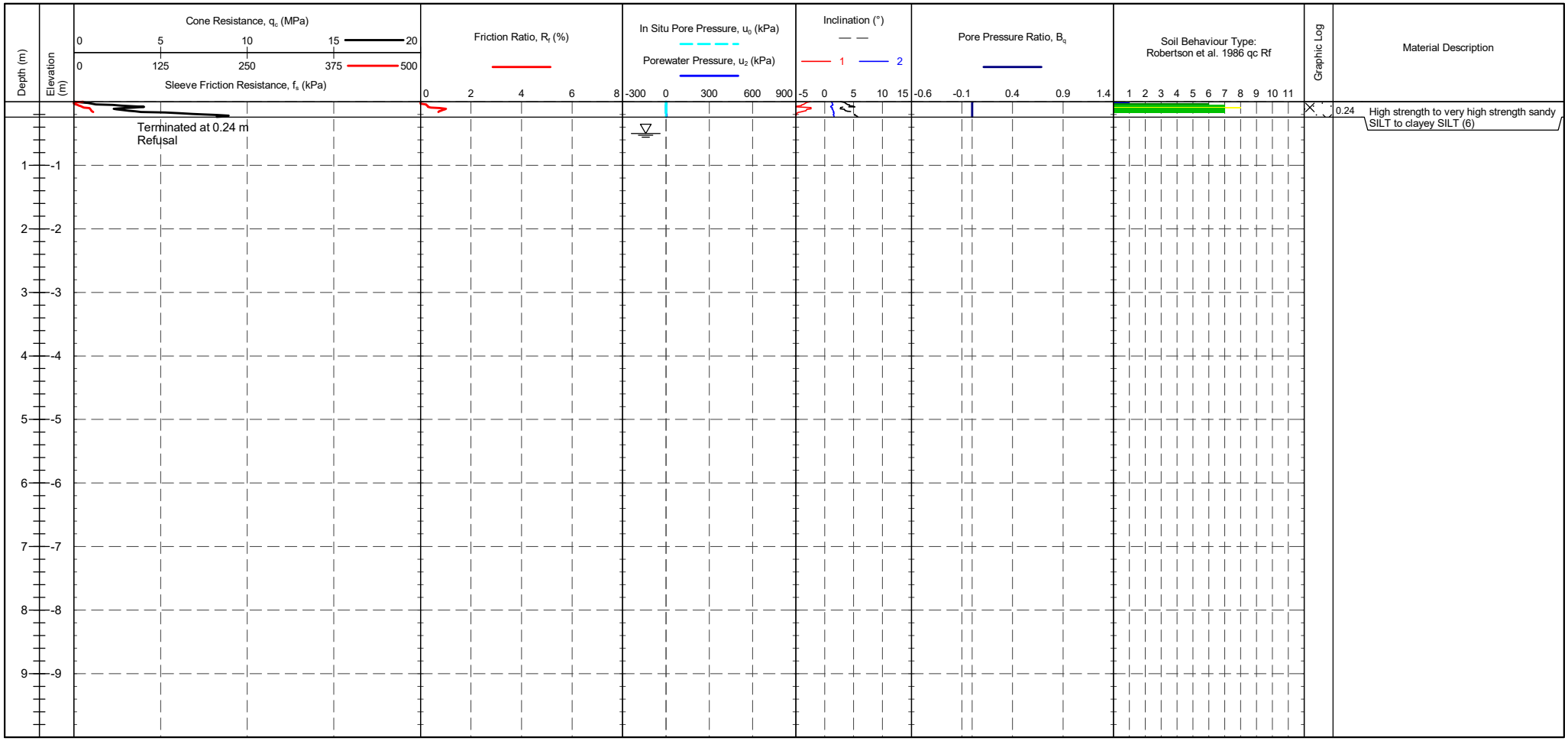
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:25 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT101A**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	263 mV	-0.012 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	269 mV	272 mV	0.001 kPa
X-Y Inclinometer	2293 mV	2305 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

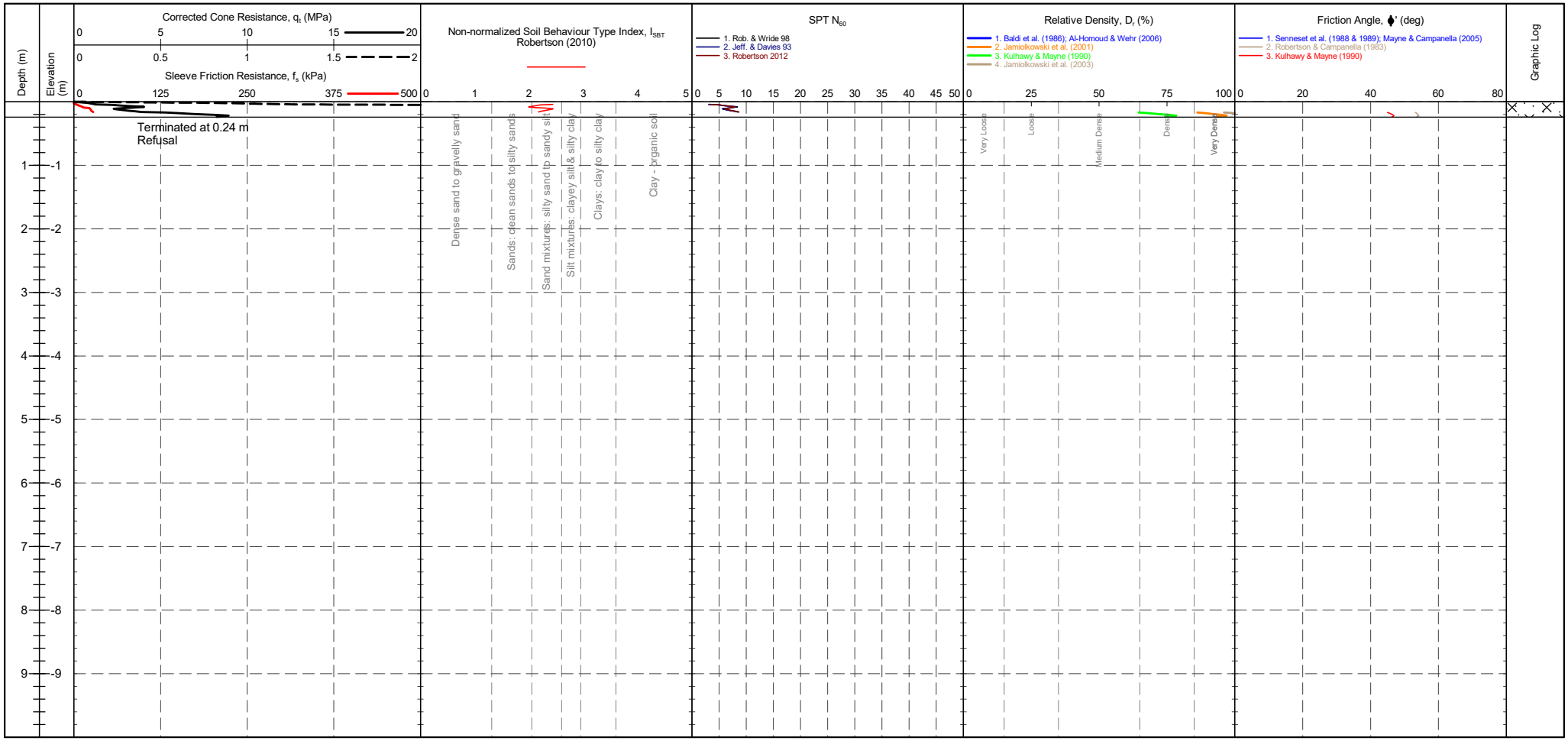
PointID: **CPT101A**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on inclination.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	263 mV	-0.012 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	269 mV	272 mV	0.001 kPa
X-Y Inclinometer	2293 mV	2305 mV	

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

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

Groundwater Level

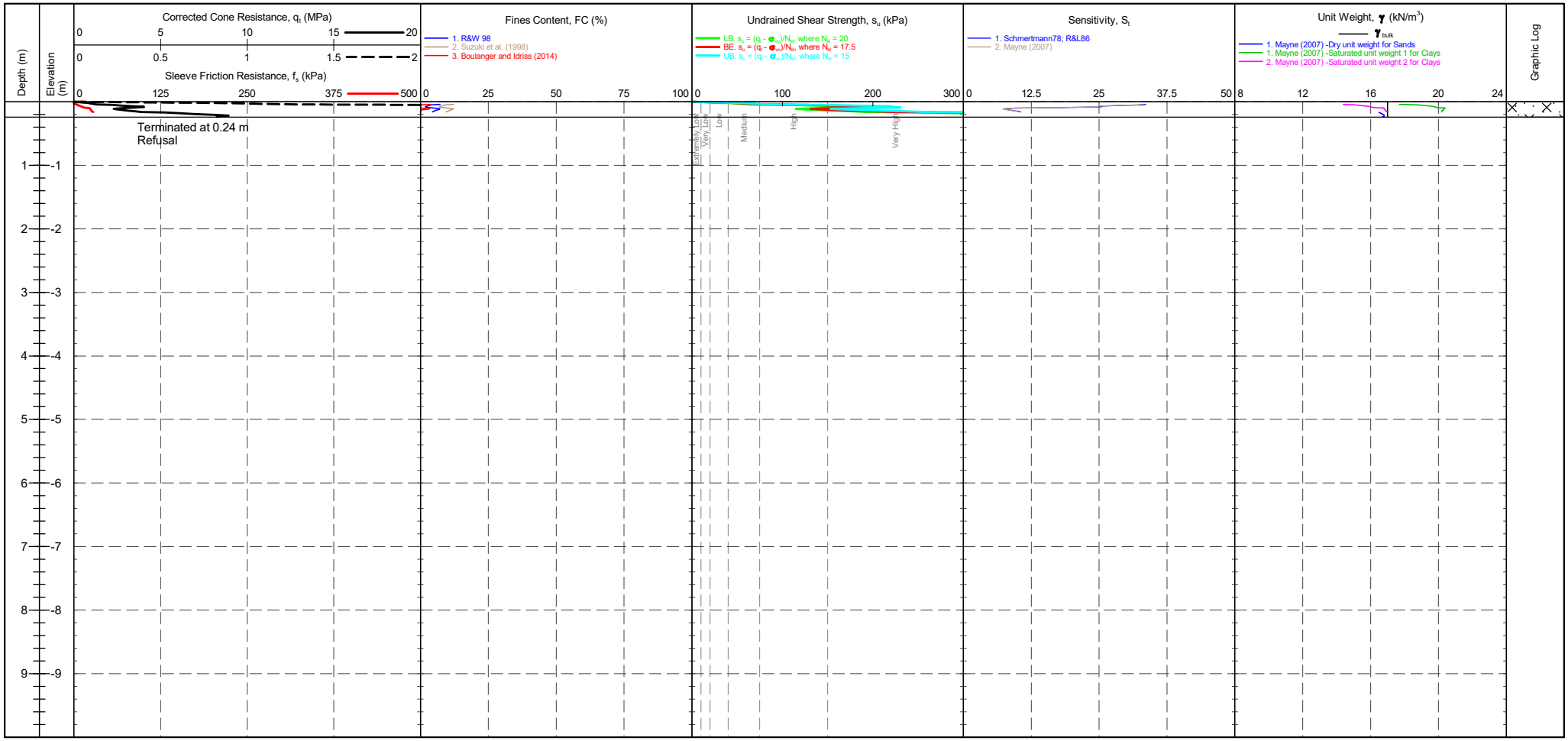
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT101A**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



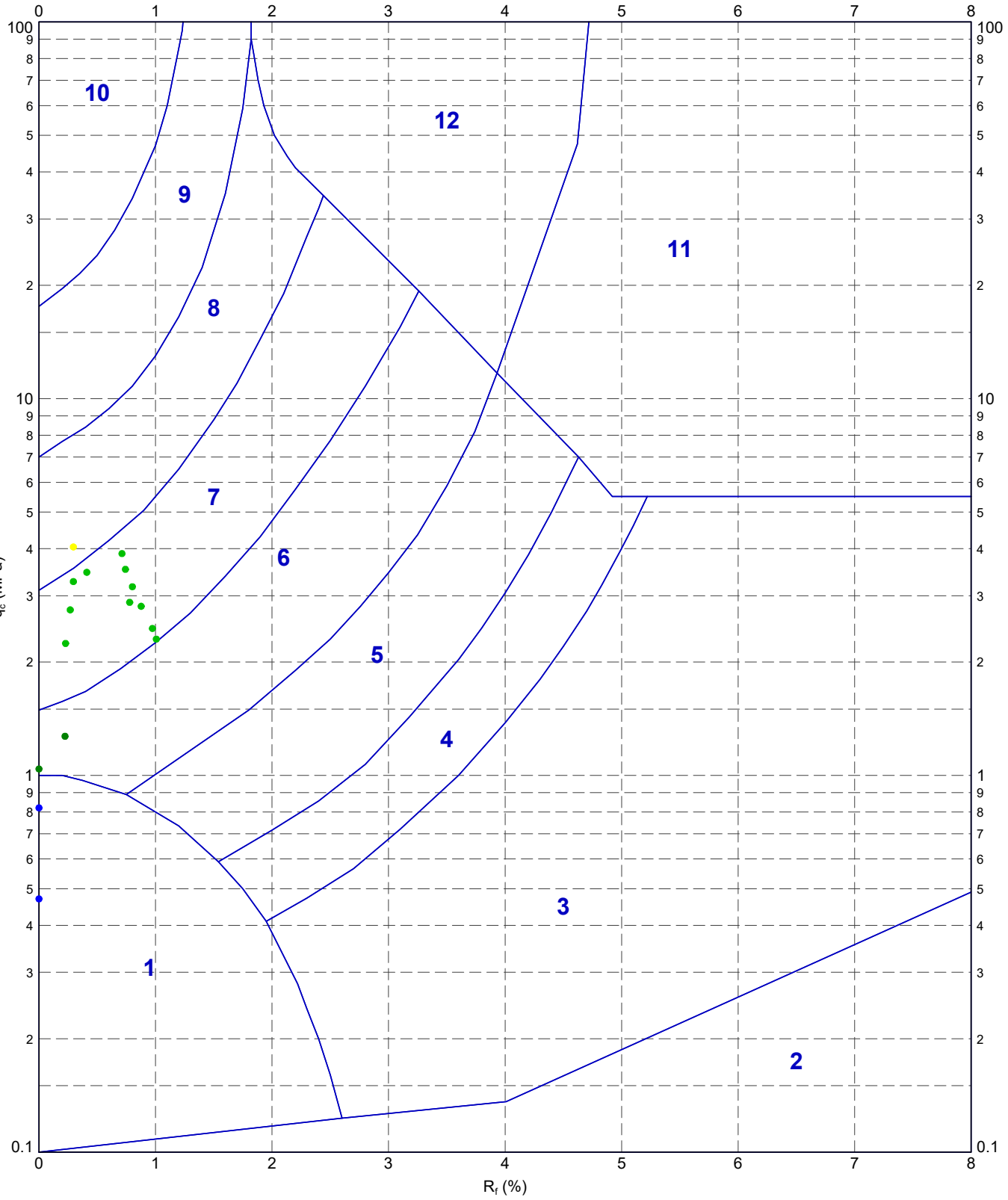
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	263 mV	-0.012 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	338 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	269 mV	272 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2293 mV	2305 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT101A

DRAWN	DATE 25/10/2024	
CHECKED	DATE 25/10/2024	
SCALE Not To Scale		A4
PROJECT No 1240458	FIGURE No	

220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:26 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

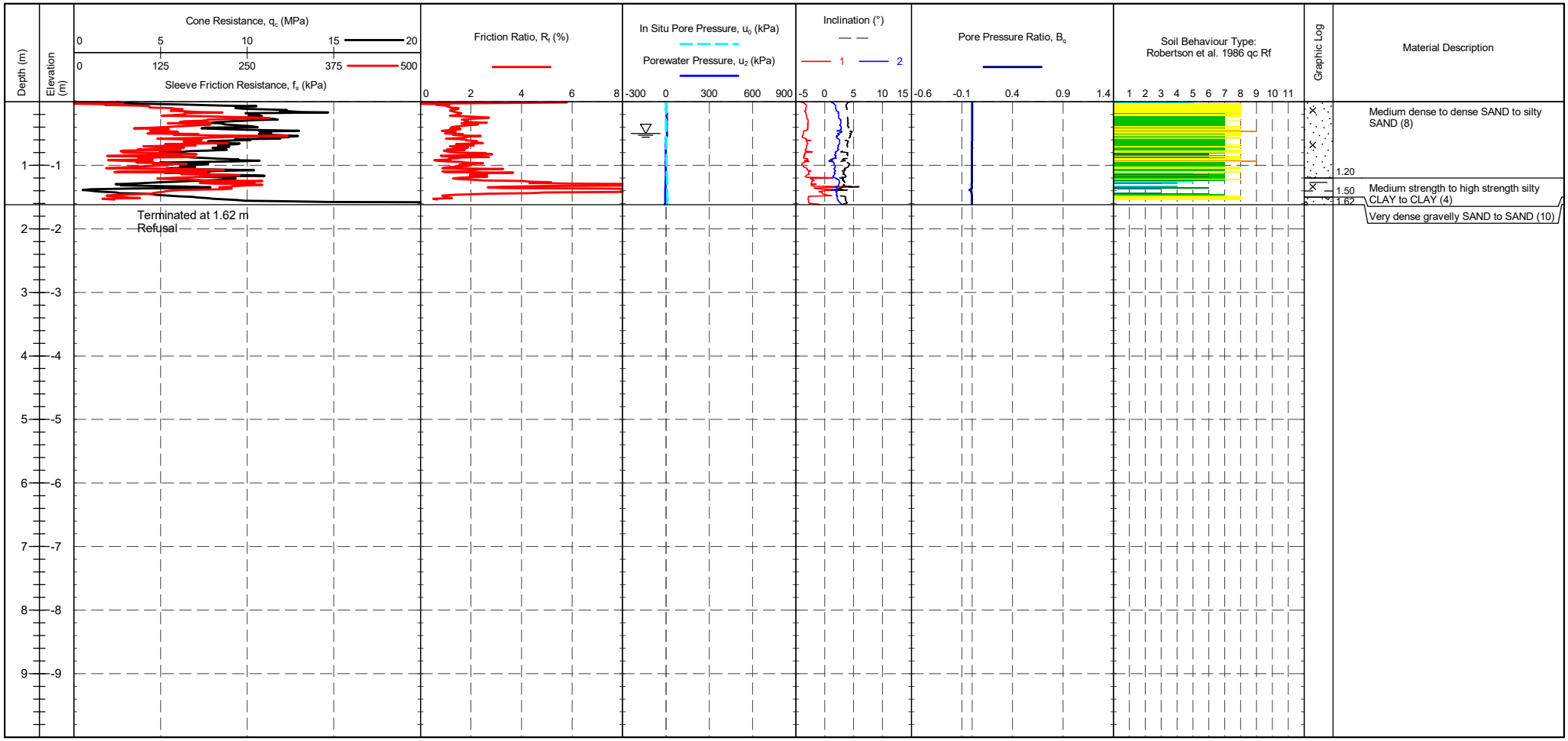
PointID: **CPT101B**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	274 mV	249 mV	-0.006 kPa
X-Y Inclinometer	2110 mV	2125 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

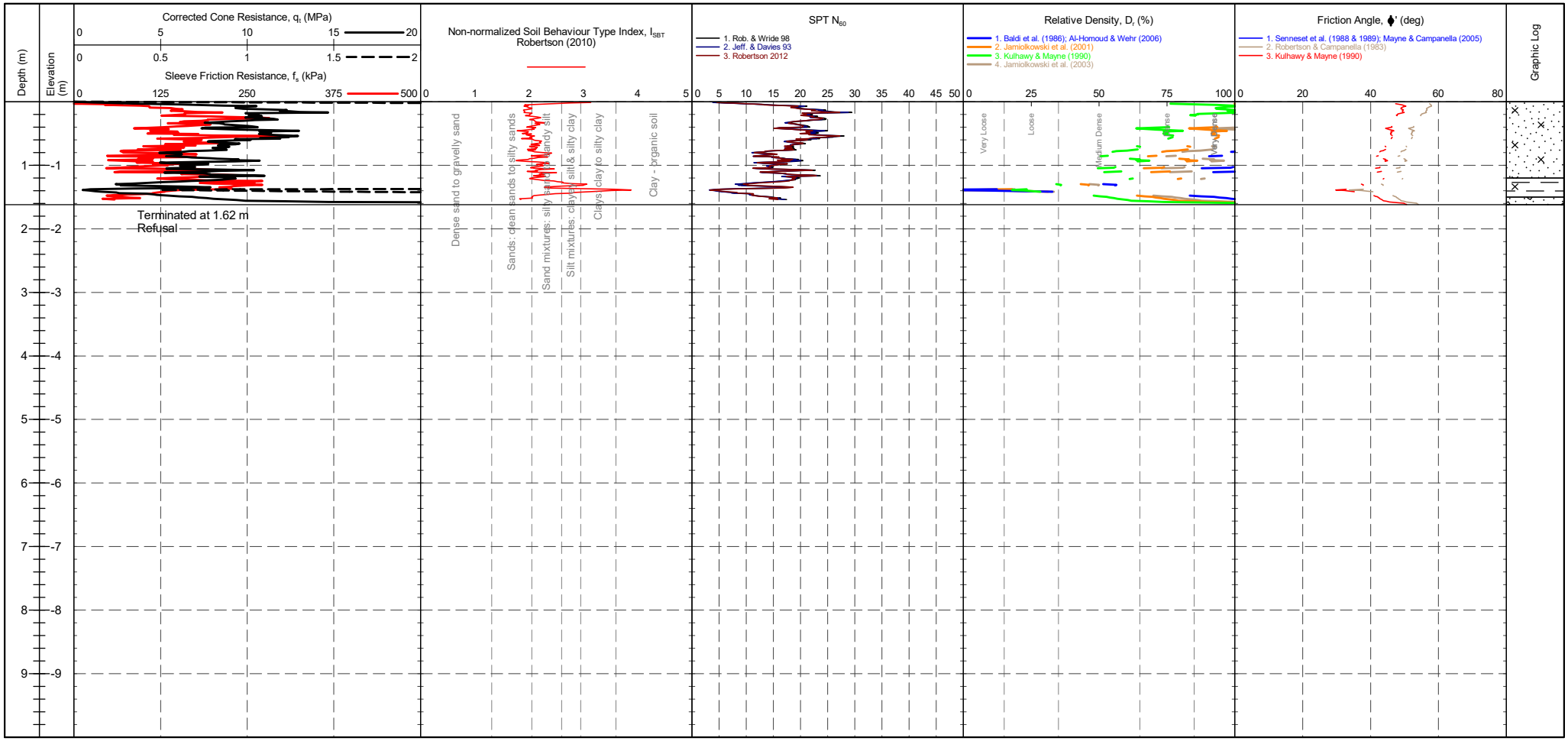
PointID: **CPT101B**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	274 mV	249 mV	-0.006 kPa
X-Y Inclinometer	2110 mV	2125 mV	

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

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

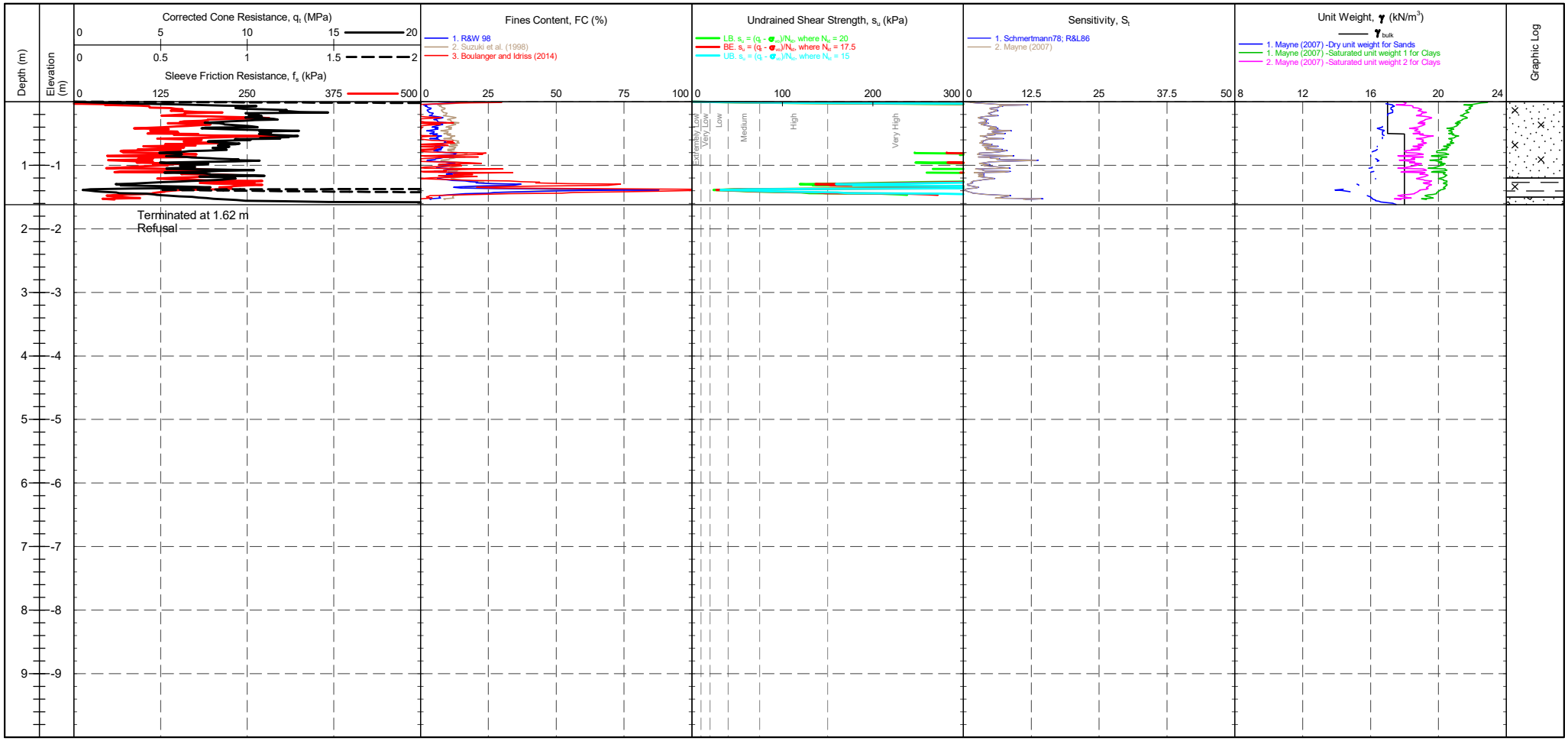
PointID: **CPT101B**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 1
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

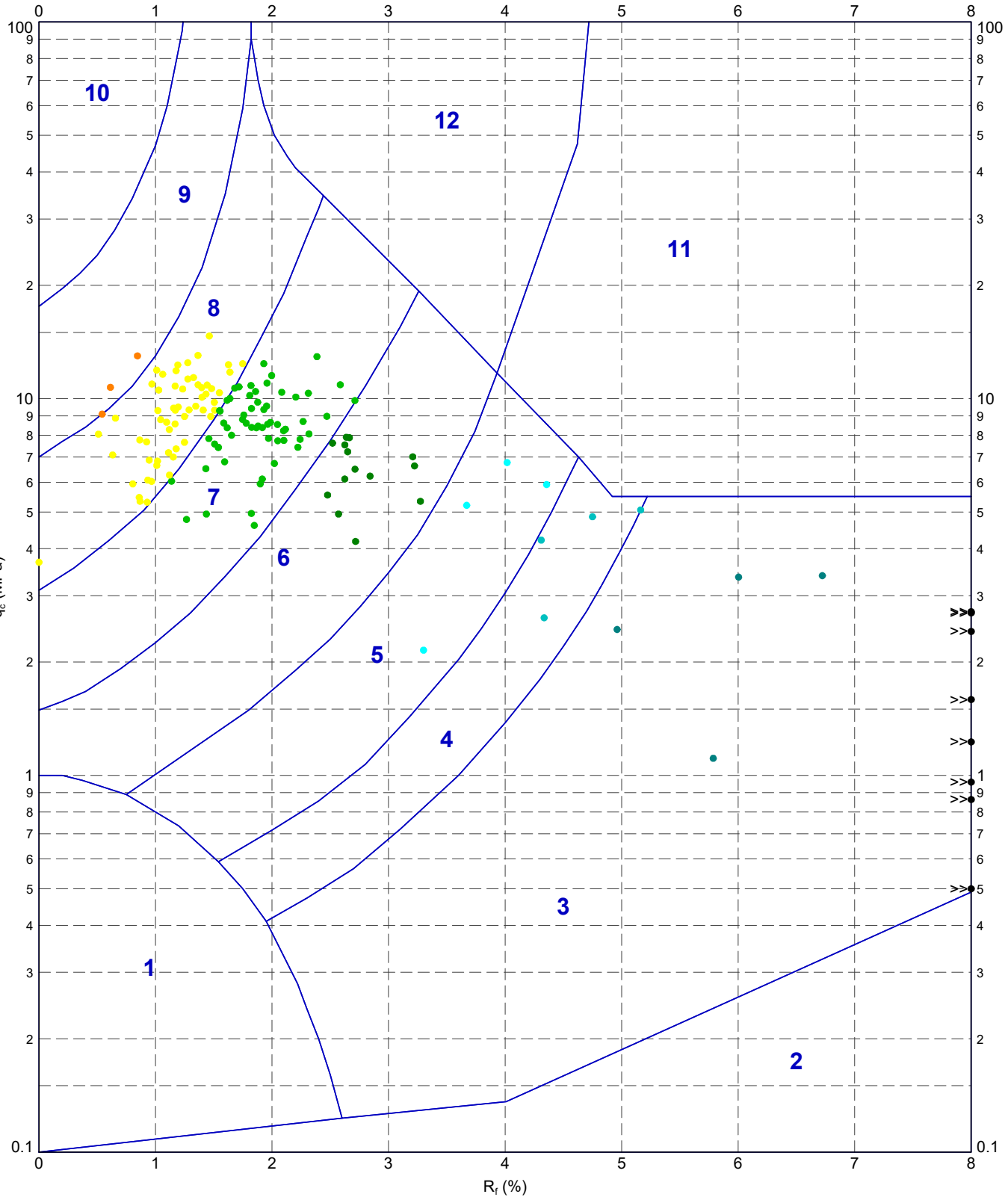
Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	338 mV	0 kPa
Pore Pressure 2	274 mV	249 mV	-0.006 kPa
X-Y Inclinometer	2110 mV	2125 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT101B

DRAWN	DATE	25/10/2024
CHECKED	DATE	25/10/2024
SCALE	Not To Scale	A4
PROJECT No	1240458	FIGURE No

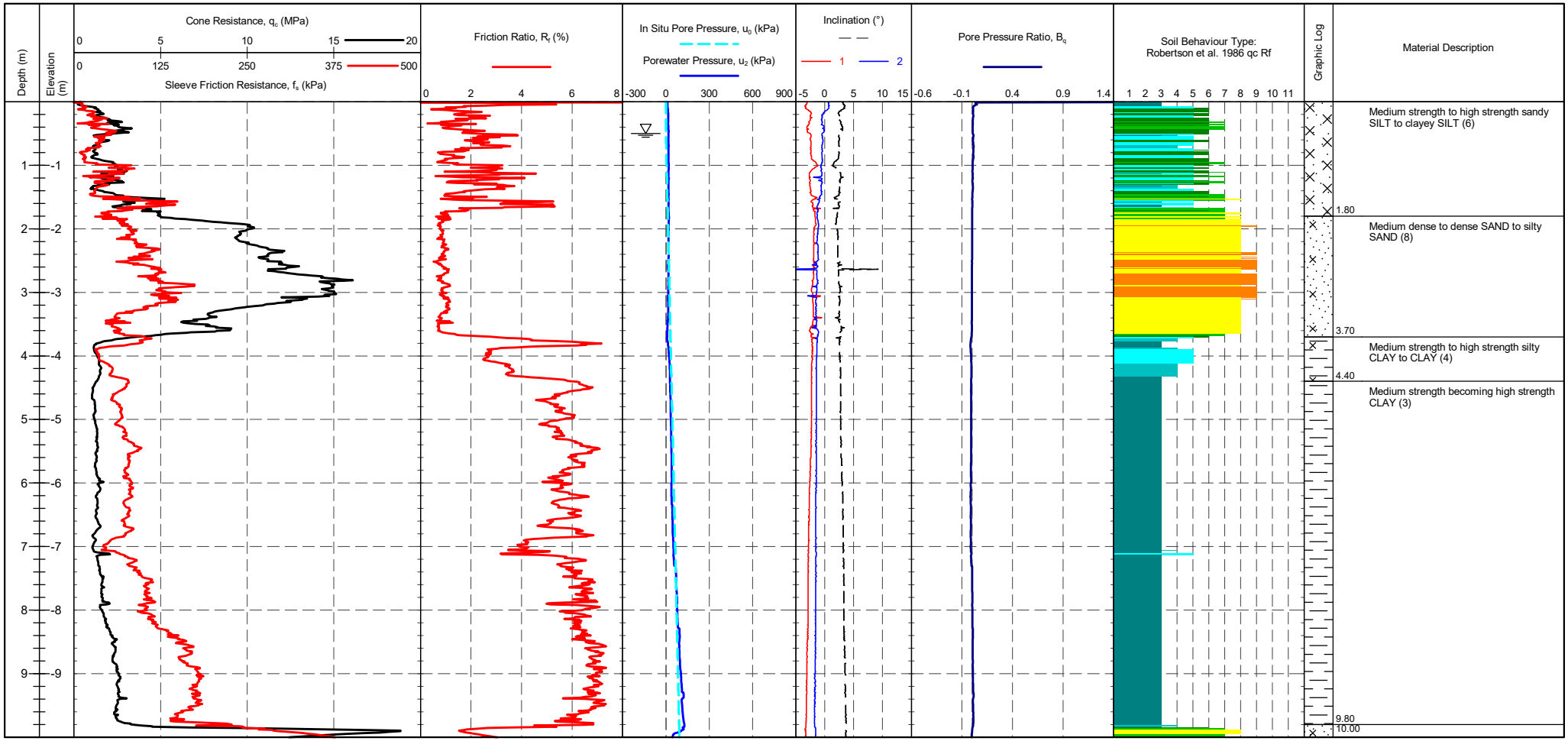
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:27 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT101C**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm²	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	262 mV	262 mV	0 MPa
Sleeve	337 mV	335 mV	-0.001 kPa
Pore Pressure 2	193 mV	249 mV	0.015 kPa
X-Y Inclinometer	2246 mV	2269 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

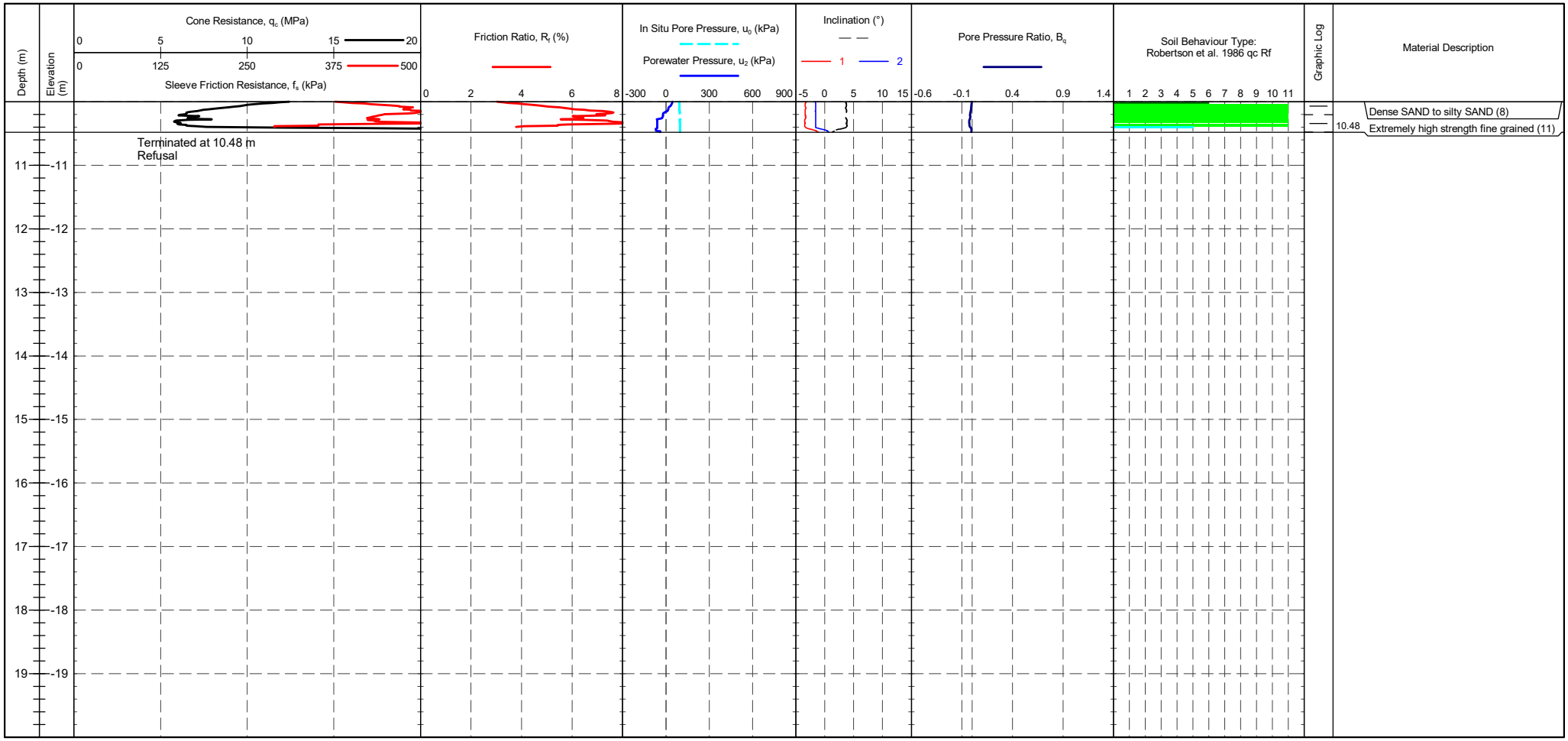
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT101C**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	262 mV	262 mV	0 MPa
Sleeve	337 mV	335 mV	-0.001 kPa
Pore Pressure 2	193 mV	249 mV	0.015 kPa
X-Y Inclinometer	2246 mV	2269 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

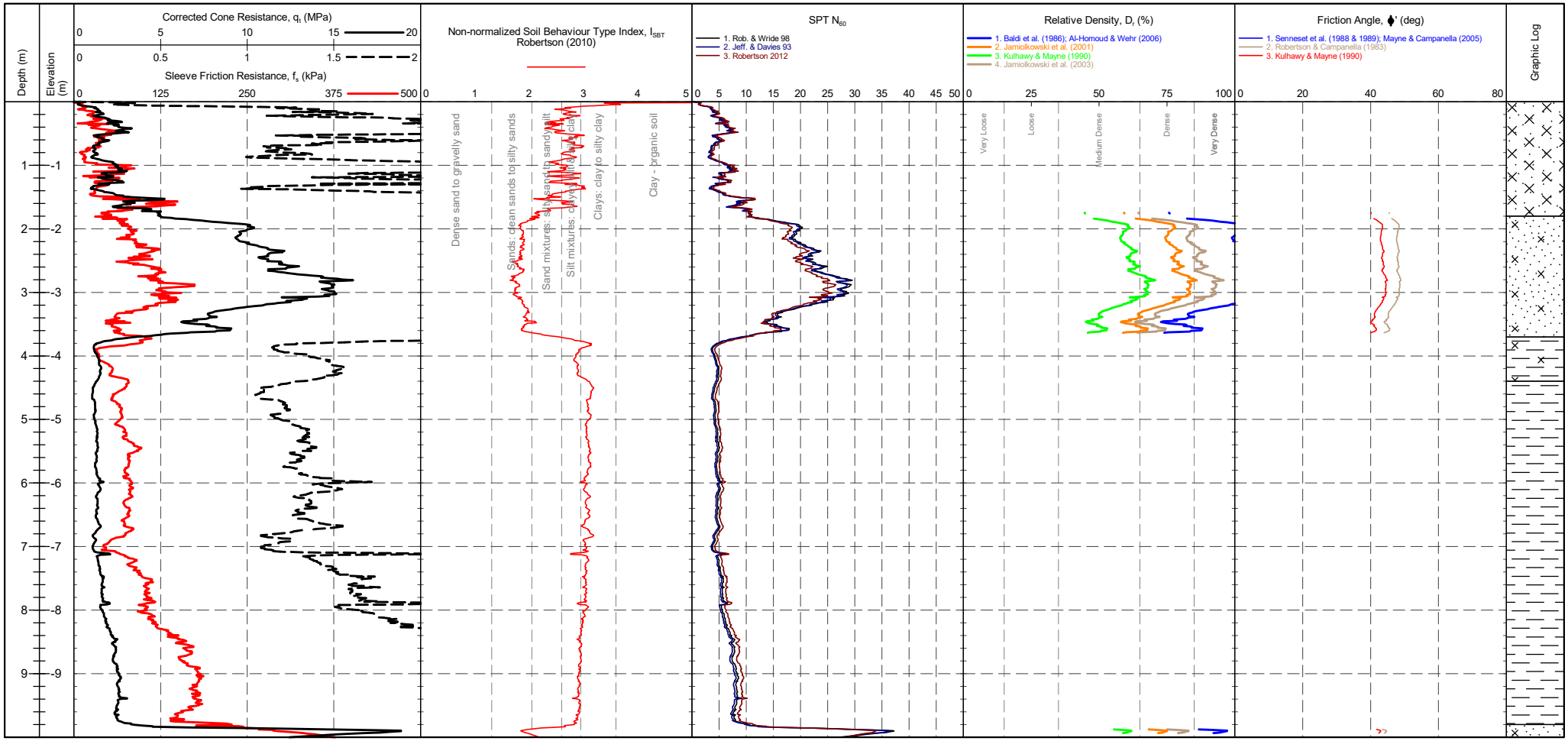
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT101C**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	262 mV	262 mV	0 MPa
Sleeve	337 mV	335 mV	-0.001 kPa
Pore Pressure 2	193 mV	249 mV	0.015 kPa
X-Y Inclinometer	2246 mV	2269 mV	

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

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

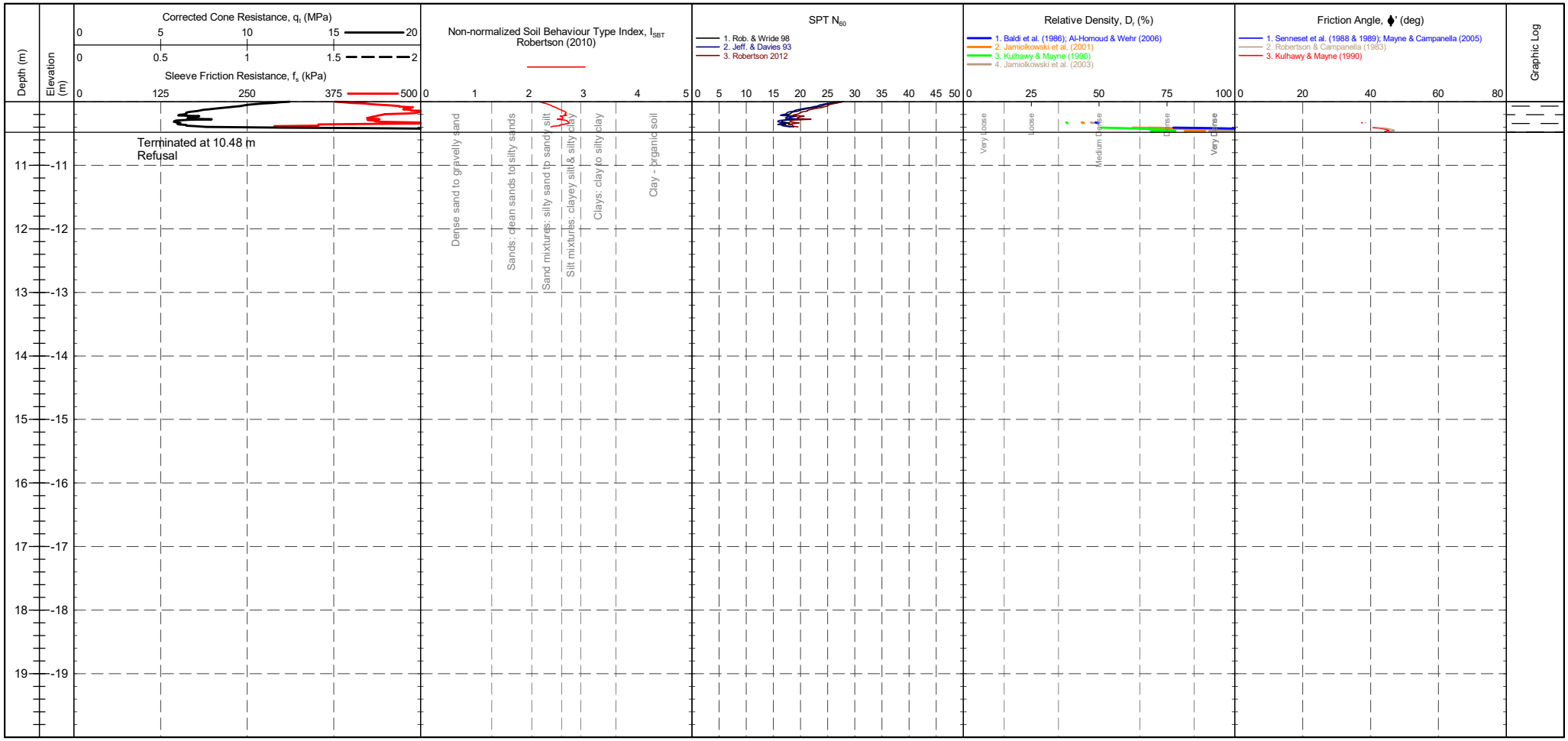
PointID: **CPT101C**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on inclination.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Transducer			
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Tip	262 mV	262 mV	0 MPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Sleeve	337 mV	335 mV	-0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	Pore Pressure 2	193 mV	249 mV	0.015 kPa
				X-Y Inclinometer	2246 mV	2269 mV	

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

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

Groundwater Level

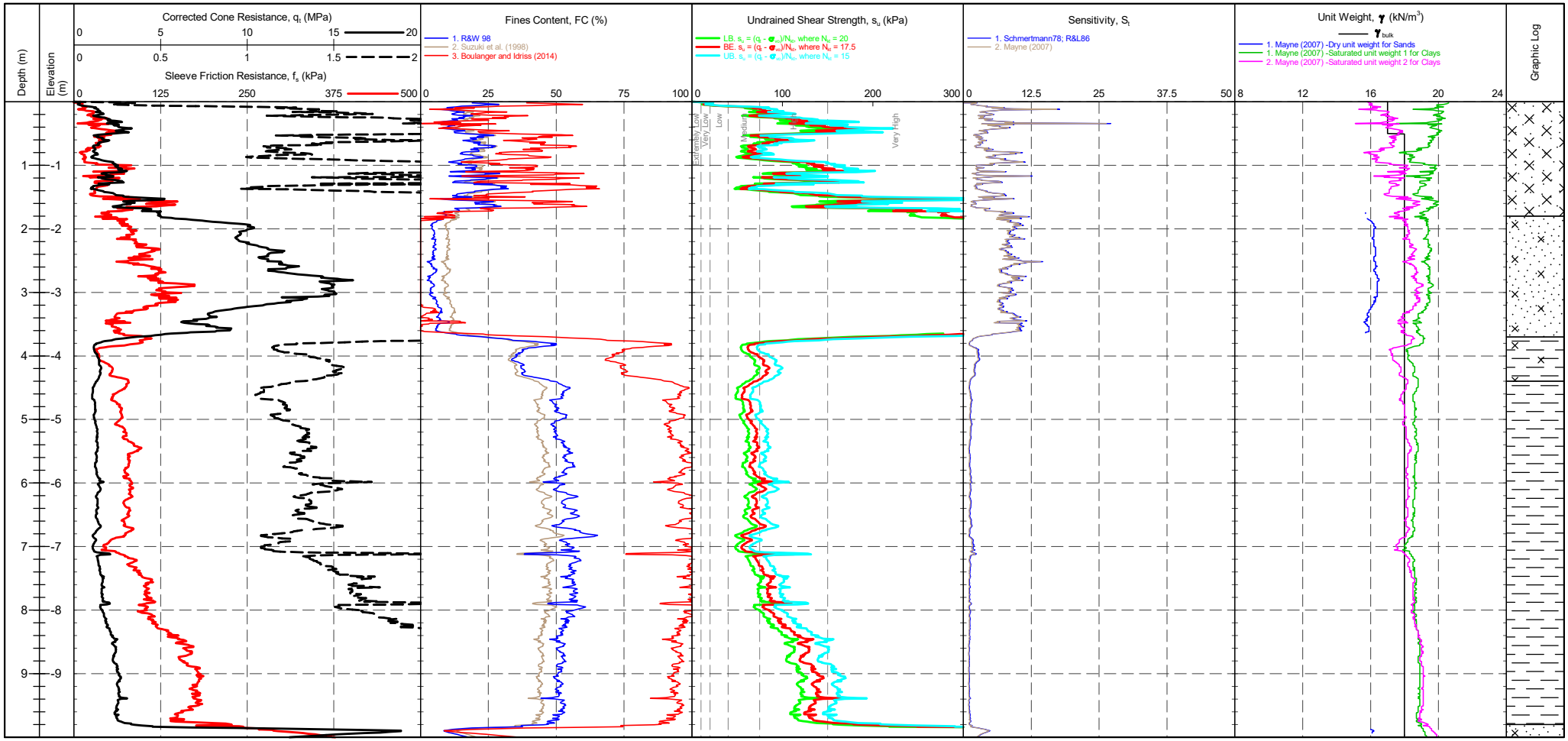
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID **CPT101C**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer	262 mV	262 mV	0 MPa
Tip	337 mV	335 mV	-0.001 kPa
Sleeve	193 mV	249 mV	0.015 kPa
Pore Pressure 2	2246 mV	2269 mV	
X-Y Inclinometer			

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

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

Groundwater Level

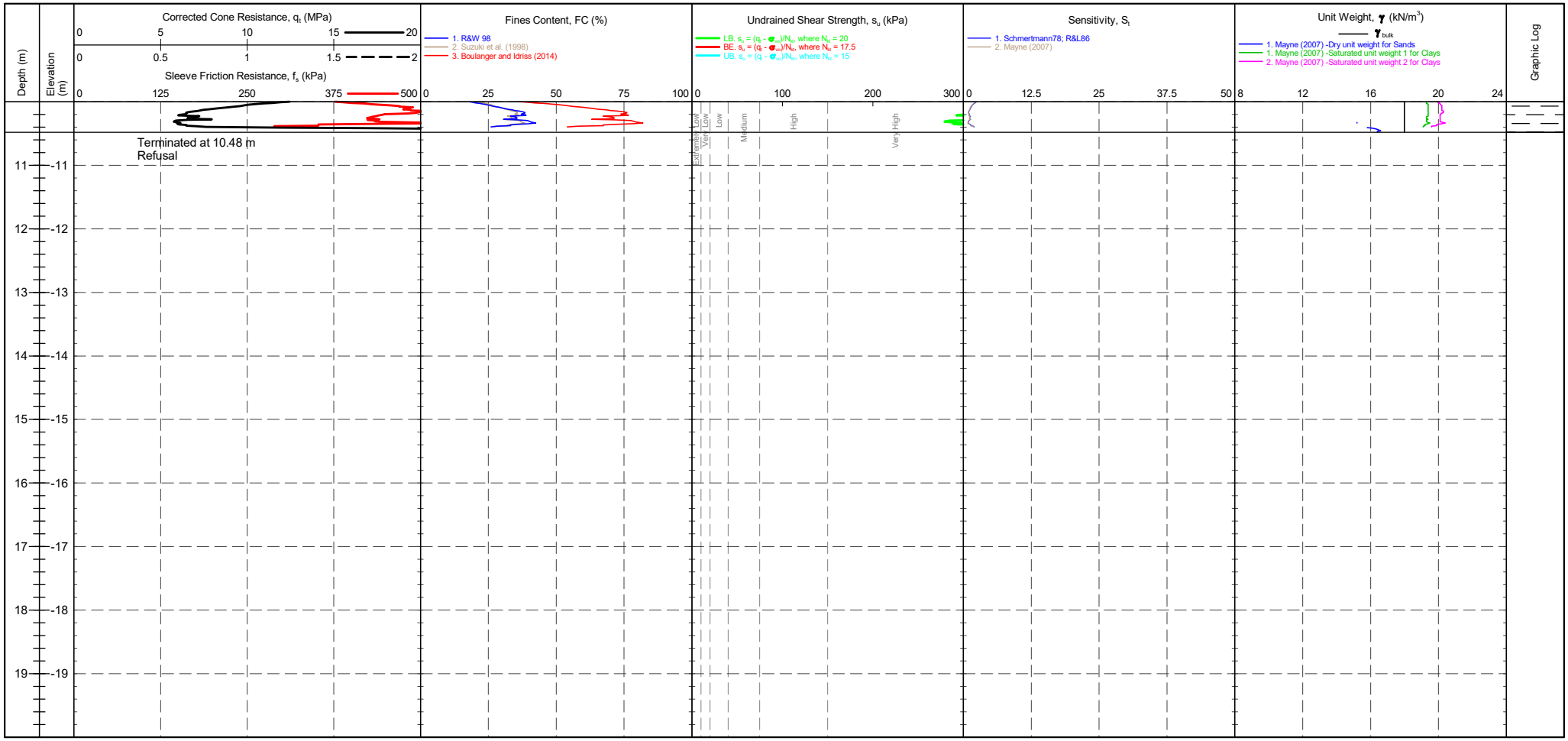
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT101C**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



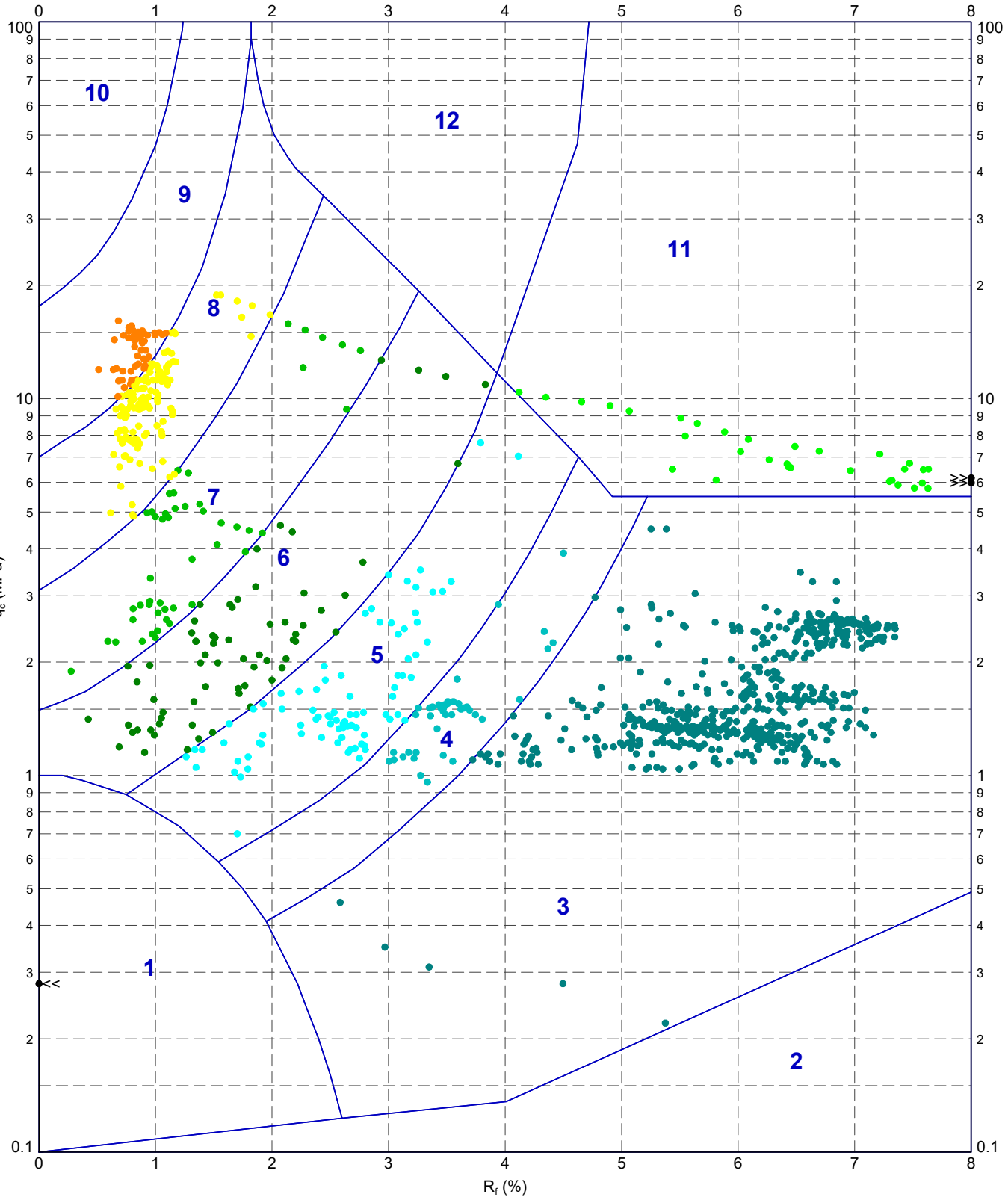
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	262 mV	262 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	337 mV	335 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	193 mV	249 mV	0.015 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2246 mV	2269 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT101C

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:28 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

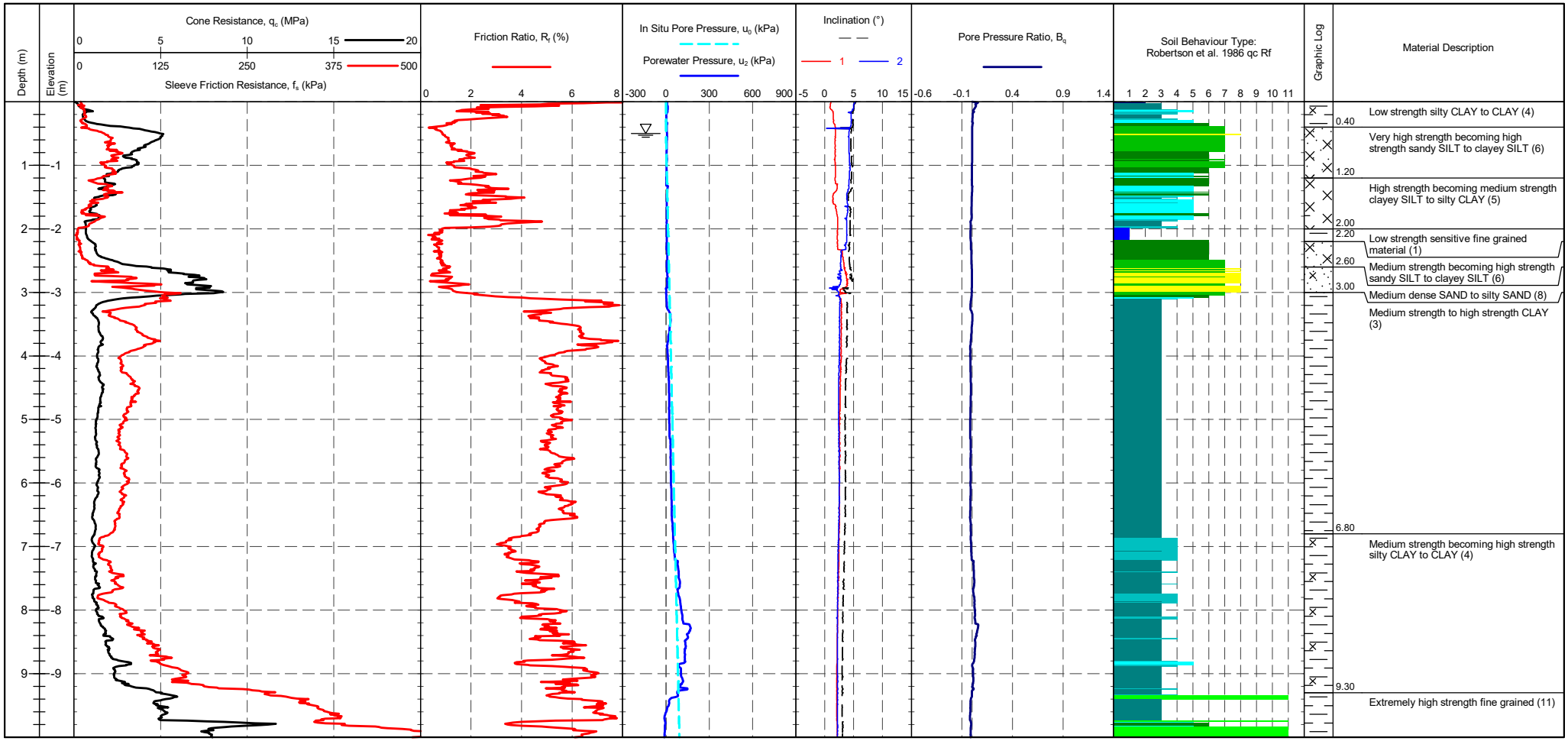
PointID: **CPT102**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	263 mV	264 mV	0.012 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	259 mV	256 mV	-0.001 kPa
X-Y Inclinometer	2661 mV	2838 mV	

METHOD: Robertson et al. 1986 qc Rf

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

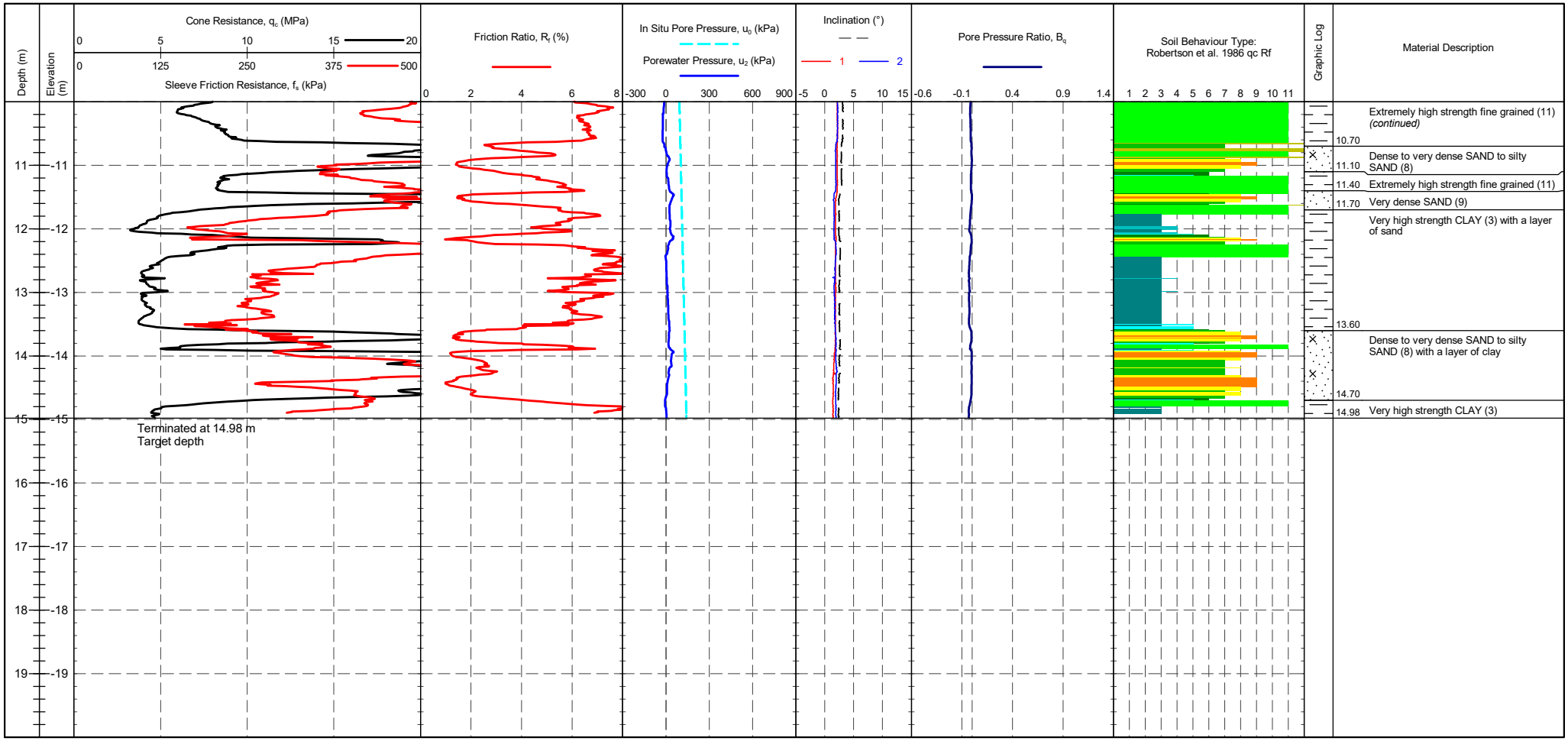
Groundwater Level
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT102**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	263 mV	264 mV	0.012 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	259 mV	256 mV	-0.001 kPa
X-Y Inclinometer	2661 mV	2838 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

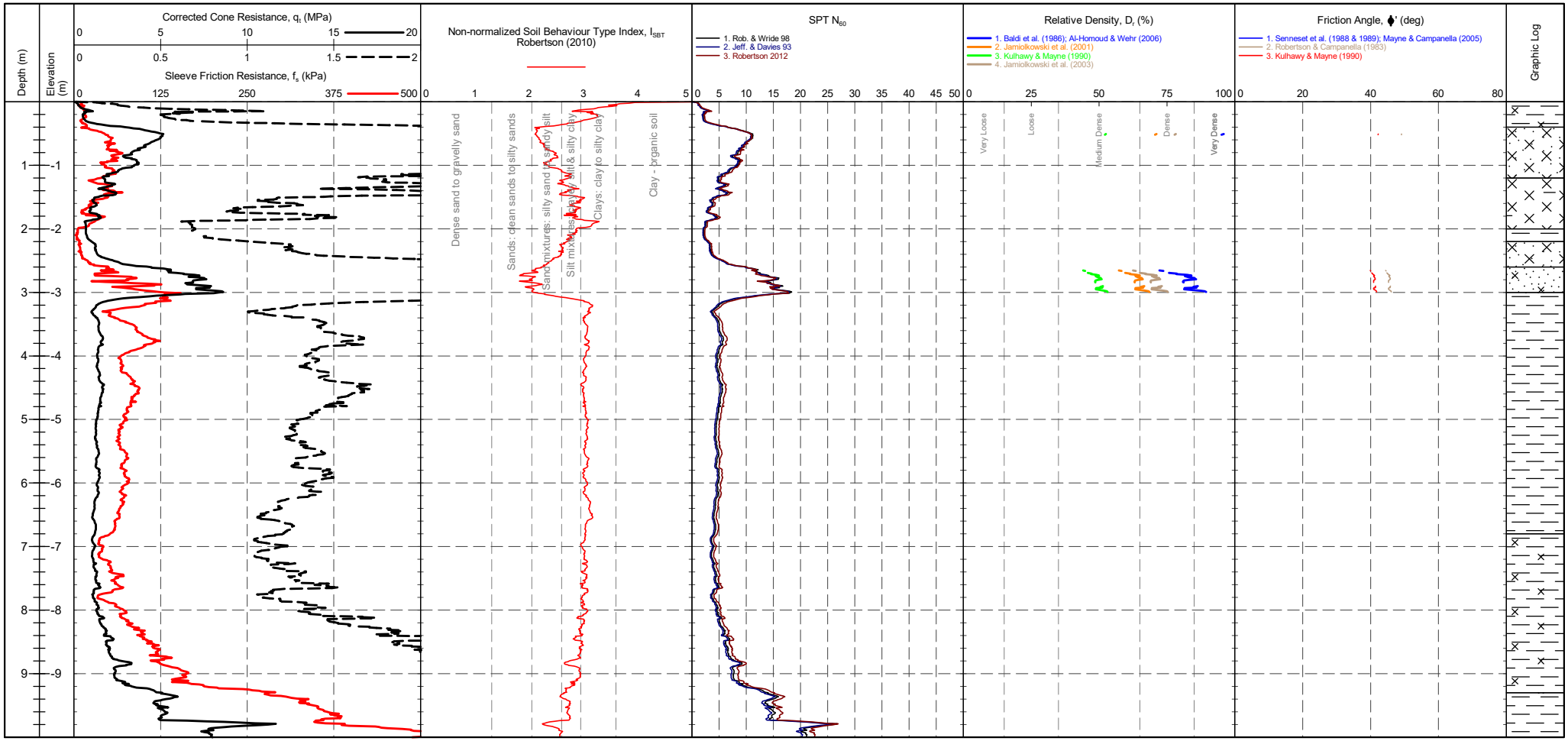
PointID **CPT102**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Target depth

Remark:
Test completed at target depth.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136
CONE MODEL	: Subtraction
CONE AREA	: 15cm²
CONE AREA RATIO	: 0.79
FILTER POSITION	: u2
FILTER TYPE	: HDPE

TEST TYPE	: TE2
APPLICATION CLASS	: 2
RIG	: CPT 017 - Griffen
OPERATOR	: DR
FRICTION REDUCER	: None
WEATHER	: Sunny & Cold

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	263 mV	264 mV	0.012 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	259 mV	256 mV	-0.001 kPa
X-Y Inclinometer	2661 mV	2838 mV	

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

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

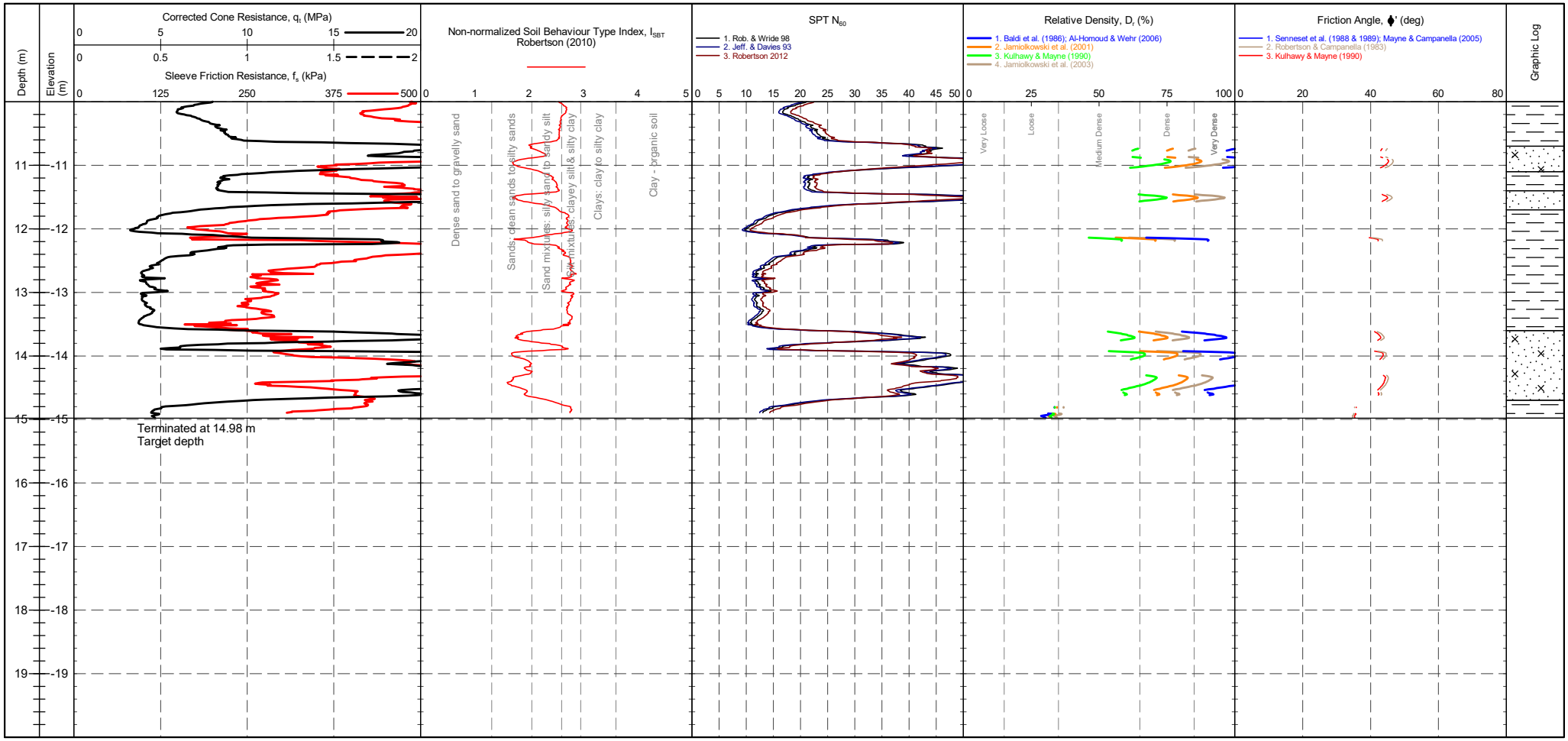
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT102**

CLIENT : LK Group PROJECT : Chorlton Baths LOCATION : Manchester PROJECT No. : 1240458	EASTING : 0.000 m NORTHING : 0.000 m ELEVATION : 0.000 m OD CHECKED BY : DW TERMINATION REASON : Target depth	Remark: Test completed at target depth.	SHEET : 2 OF 2 STATUS : Final TEST DATE : 24/10/2024 PLOT DATE : 25/10/2024 METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post / Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Tip	263 mV	264 mV / 0.012 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV / 0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	259 mV	256 mV / -0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2661 mV	2838 mV

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

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

Groundwater Level

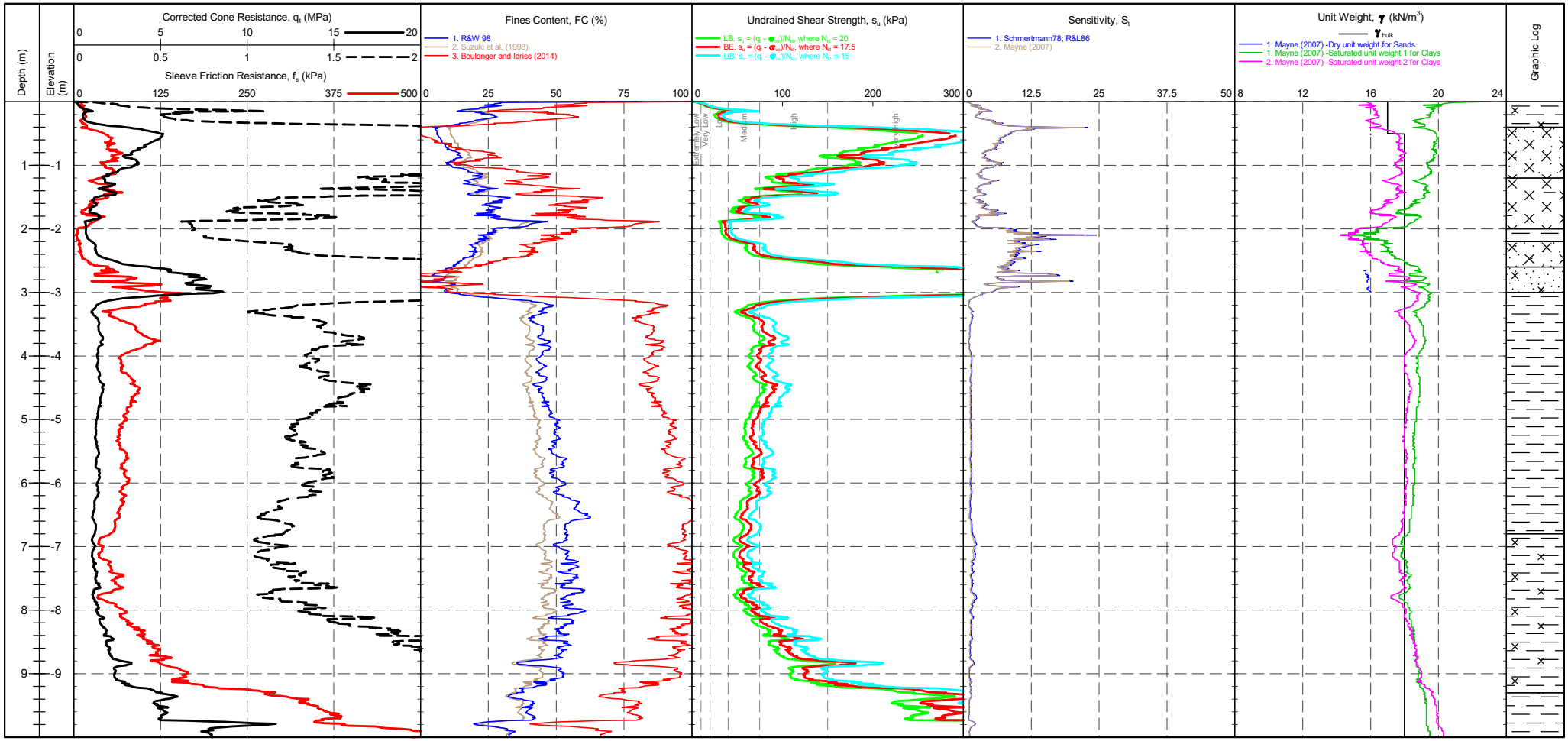
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT102**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	263 mV	264 mV	0.012 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	259 mV	256 mV	-0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2661 mV	2838 mV	

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

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

Groundwater Level

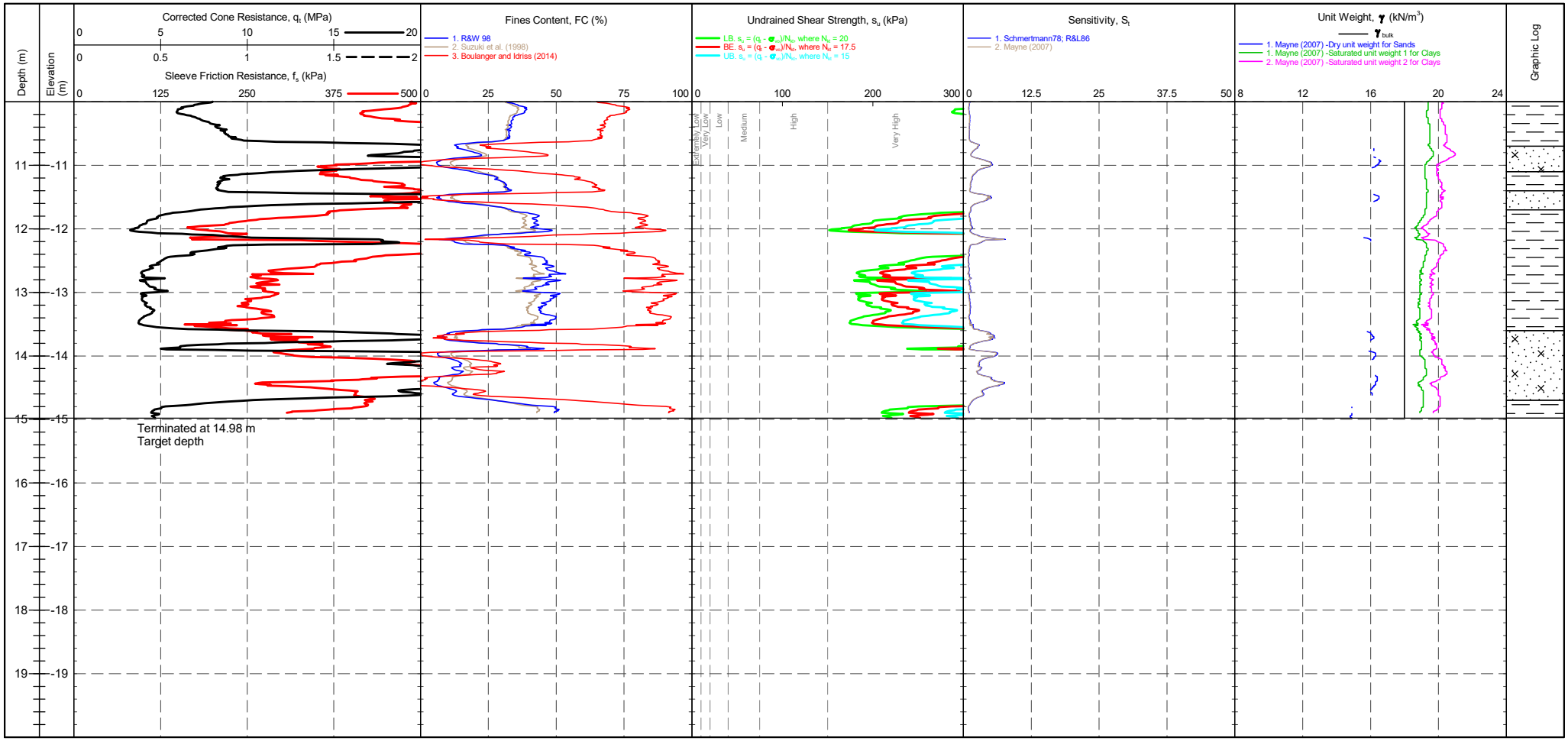
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID **CPT102**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



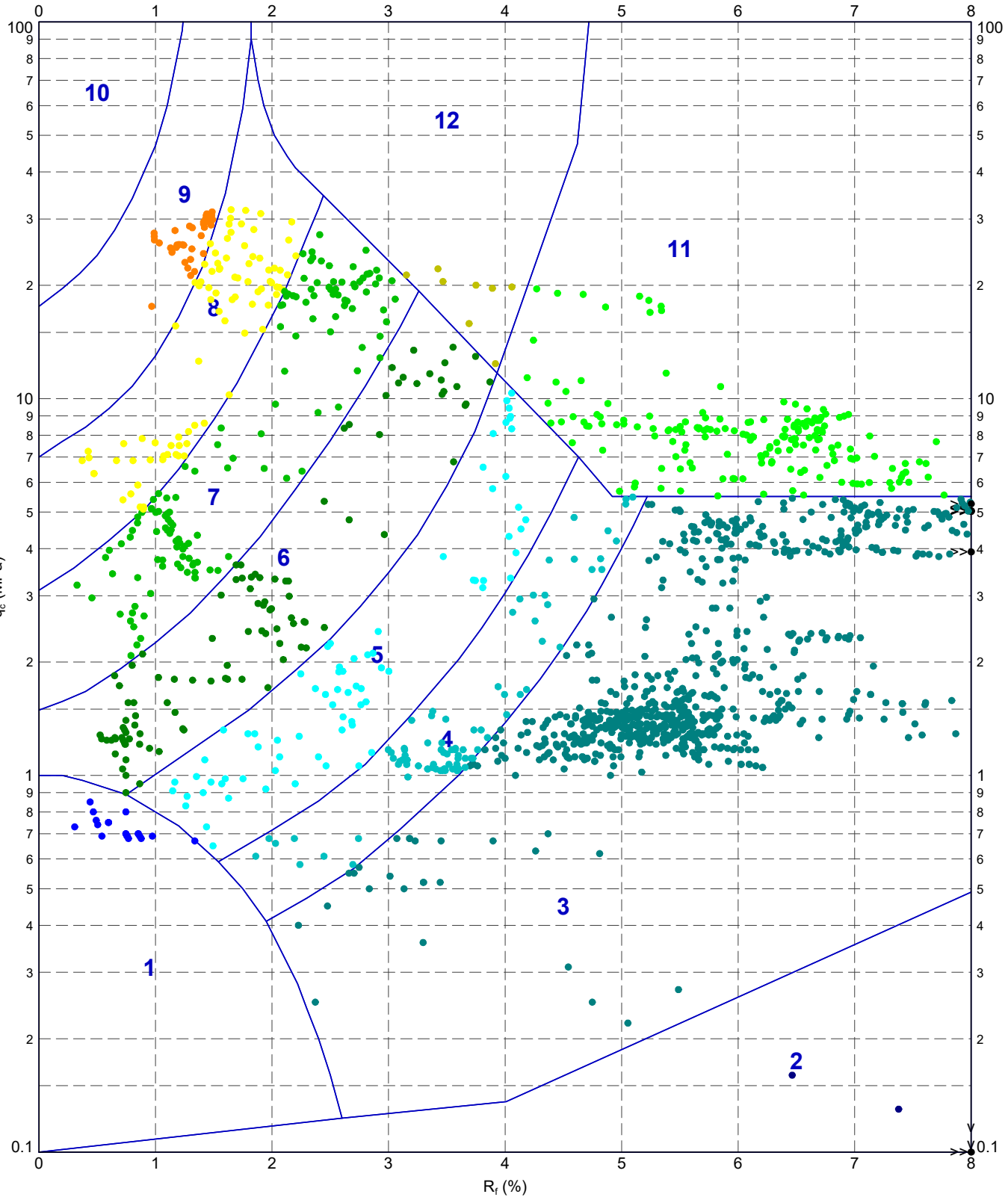
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	263 mV	264 mV	0.012 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	259 mV	256 mV	-0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2661 mV	2838 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU
SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT102

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

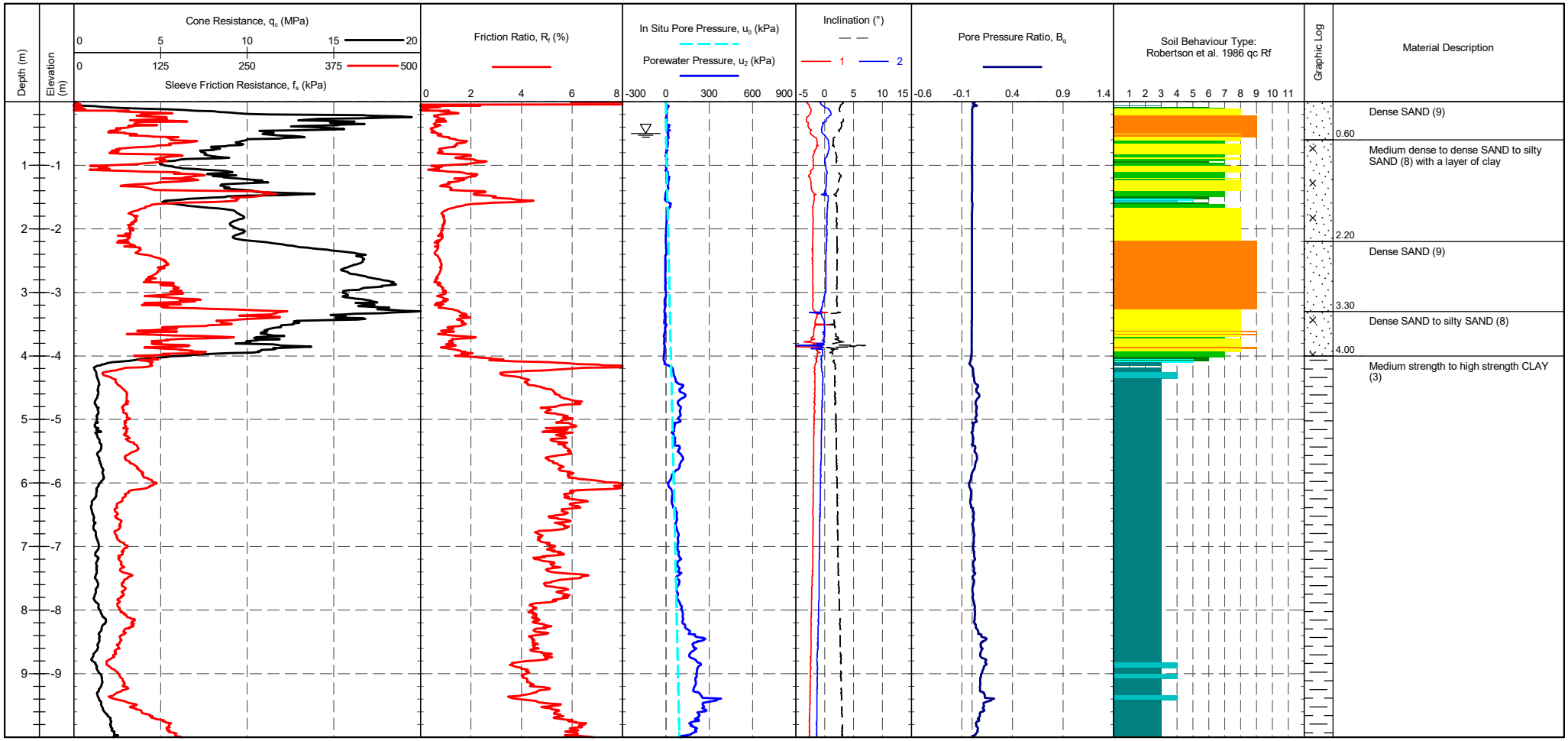
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:30 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen		
CONE AREA	: 15cm²	OPERATOR	: DR		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Cold		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	267 mV	0.035 MPa
Sleeve	338 mV	340 mV	0.001 kPa
Pore Pressure 2	287 mV	261 mV	-0.007 kPa
X-Y Inclinometer	2246 mV	2257 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

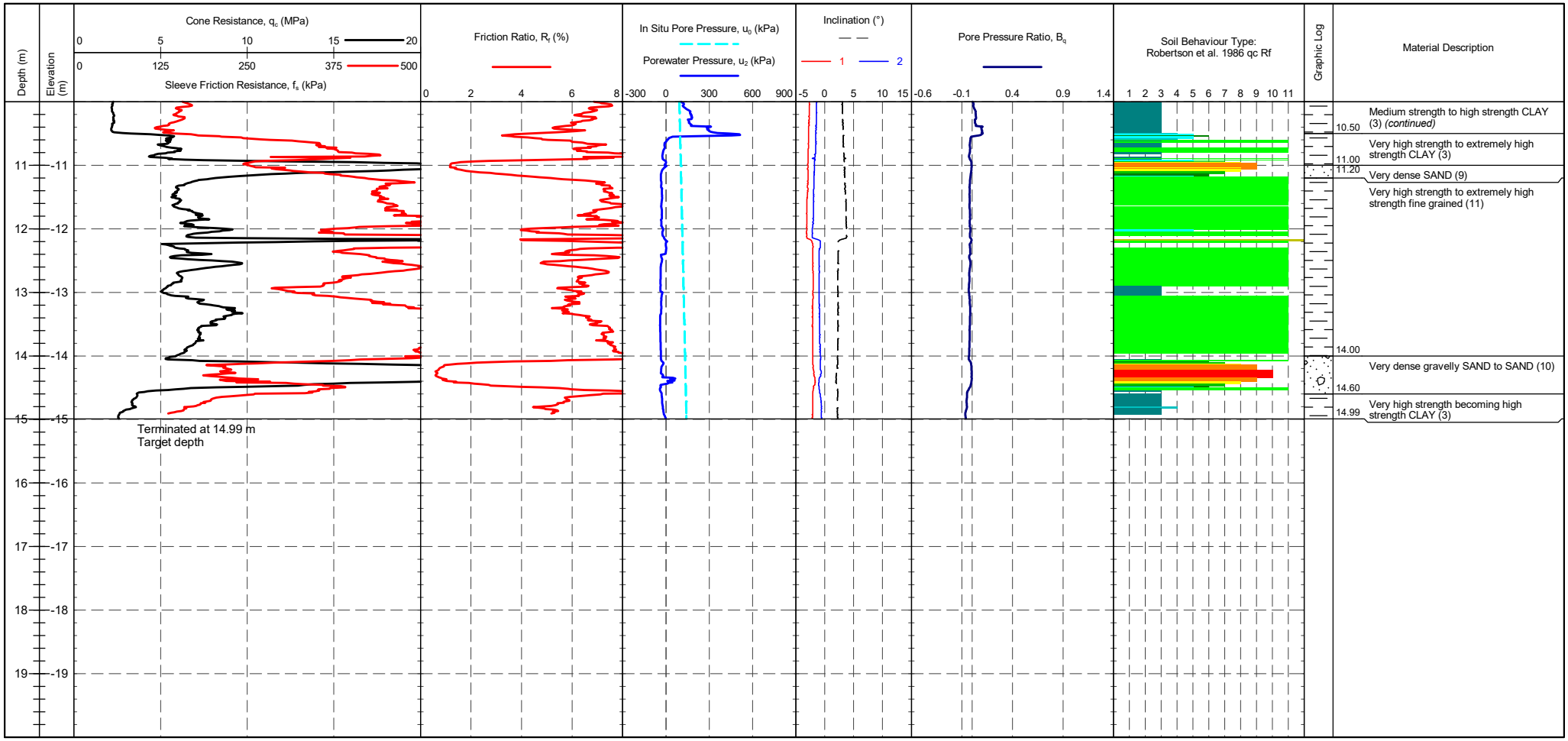
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen		
CONE AREA	: 15cm^2	OPERATOR	: DR		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Cold		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	267 mV	0.035 MPa
Sleeve	338 mV	340 mV	0.001 kPa
Pore Pressure 2	287 mV	261 mV	-0.007 kPa
X-Y Inclinometer	2246 mV	2257 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

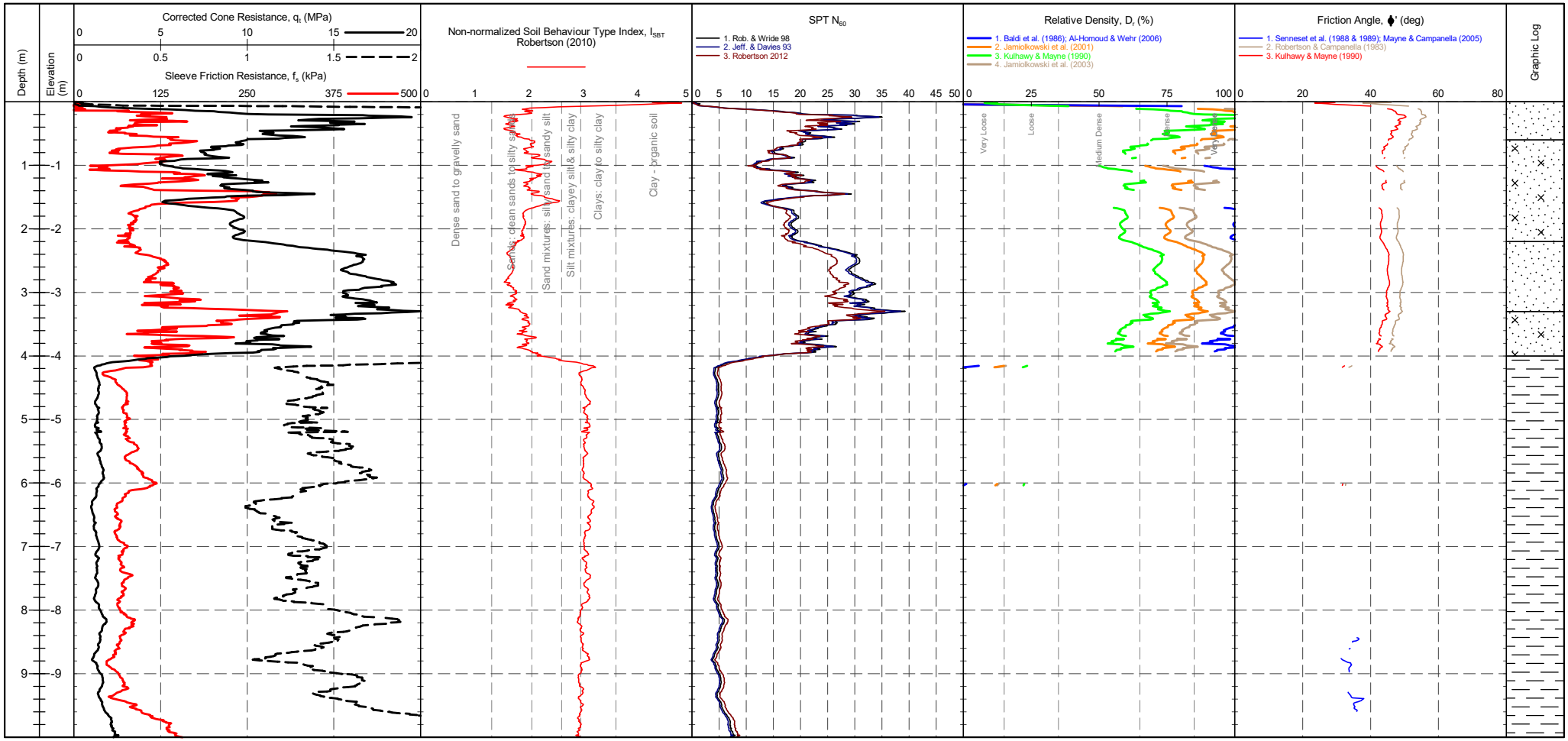
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	267 mV	0.035 MPa
Sleeve	338 mV	340 mV	0.001 kPa
Pore Pressure 2	287 mV	261 mV	-0.007 kPa
X-Y Inclinometer	2246 mV	2257 mV	

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

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

Groundwater Level

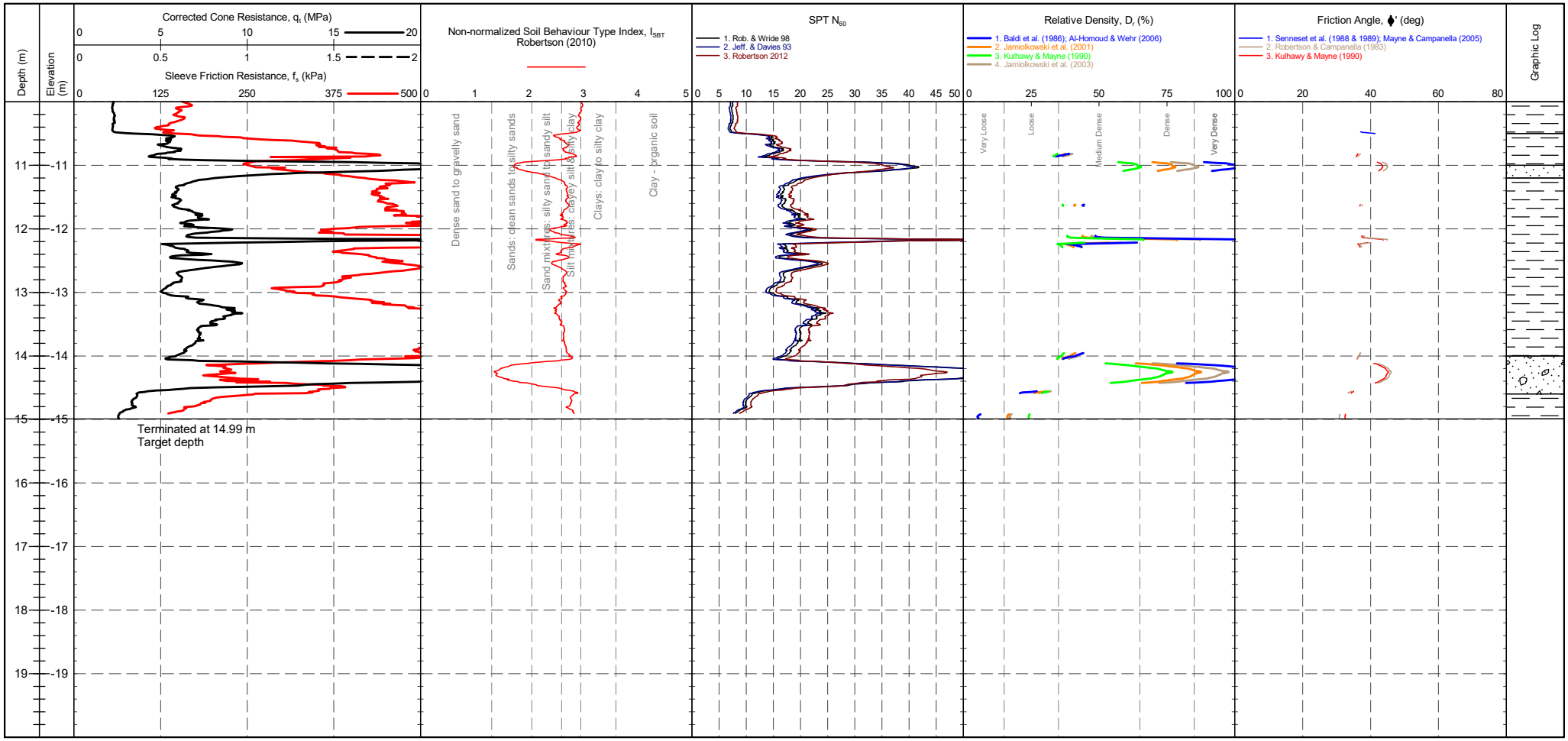
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post / Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Tip	264 mV	267 mV / 0.035 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	340 mV / 0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	287 mV	261 mV / -0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2246 mV	2257 mV

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

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

Groundwater Level

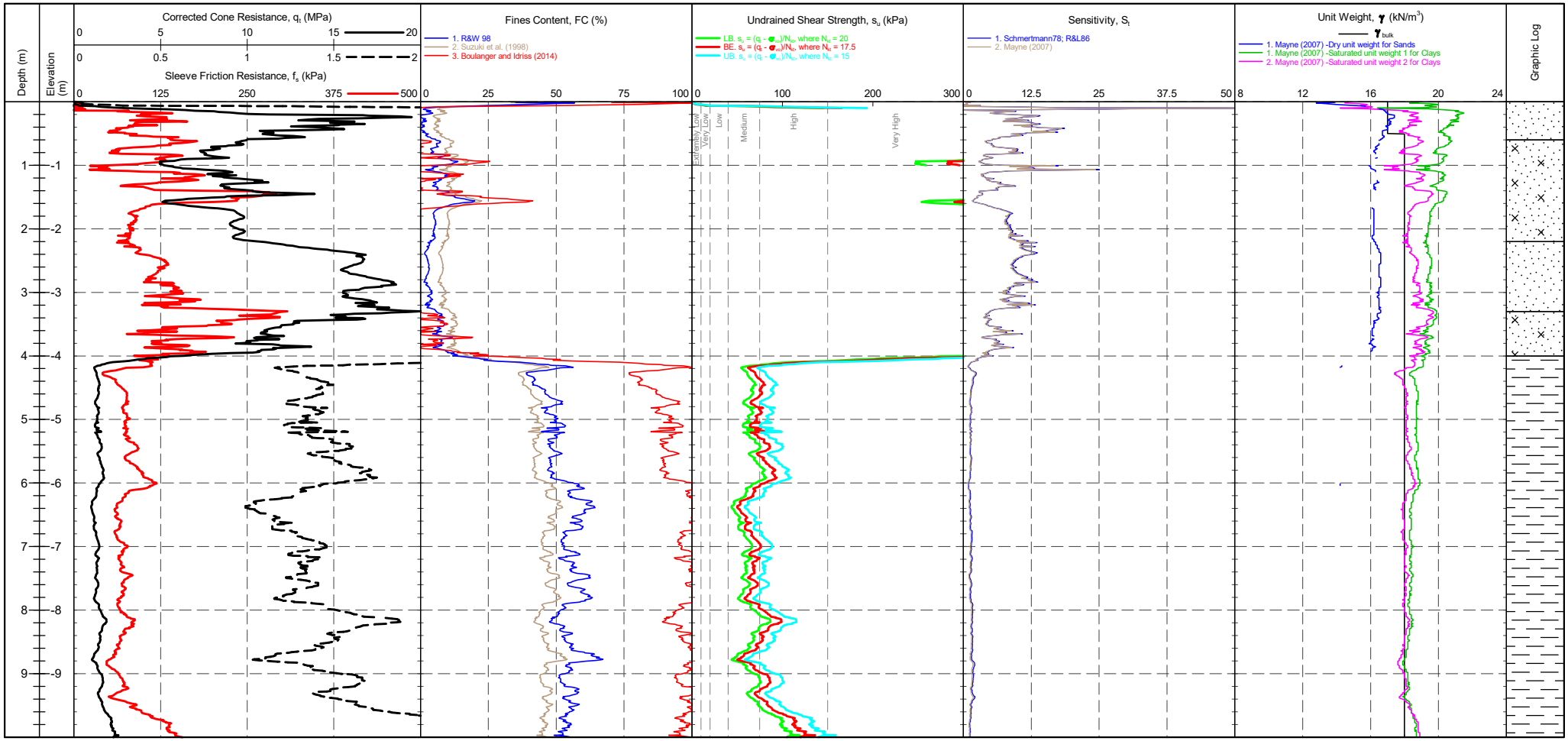
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	267 mV	0.035 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	340 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	287 mV	261 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2246 mV	2257 mV	

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

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

Groundwater Level

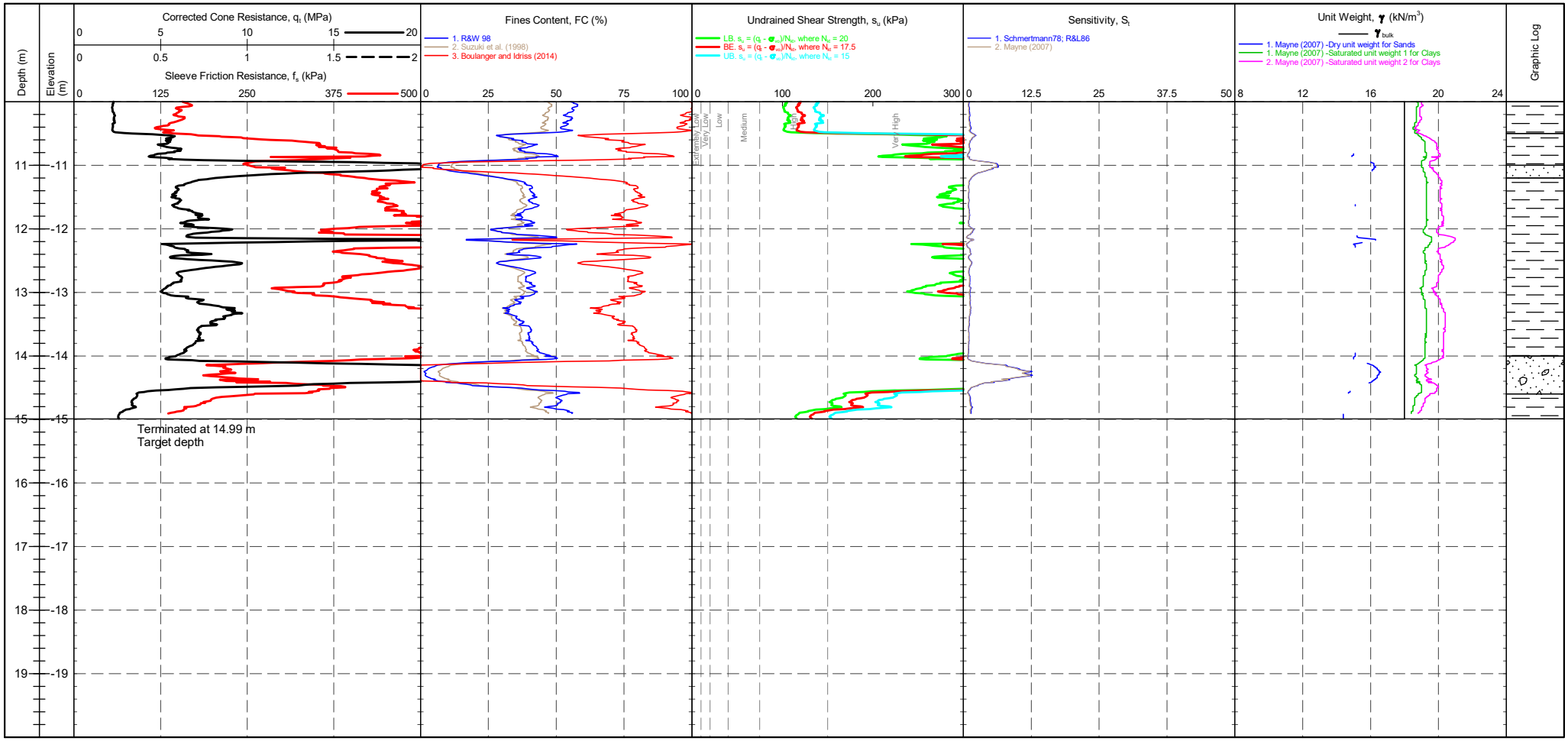
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT103**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



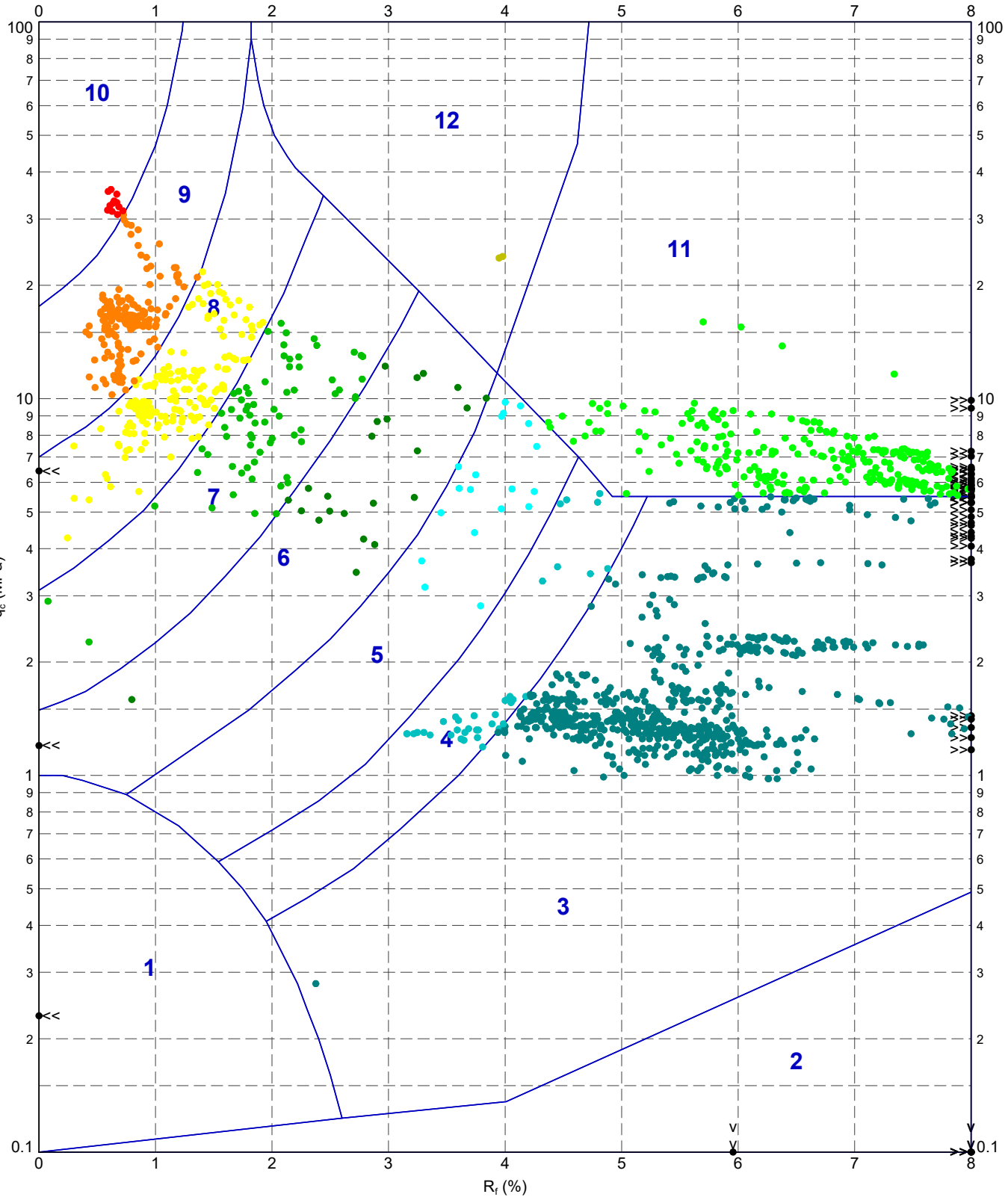
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	267 mV	0.035 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	340 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	287 mV	261 mV	-0.007 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2246 mV	2257 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT103

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

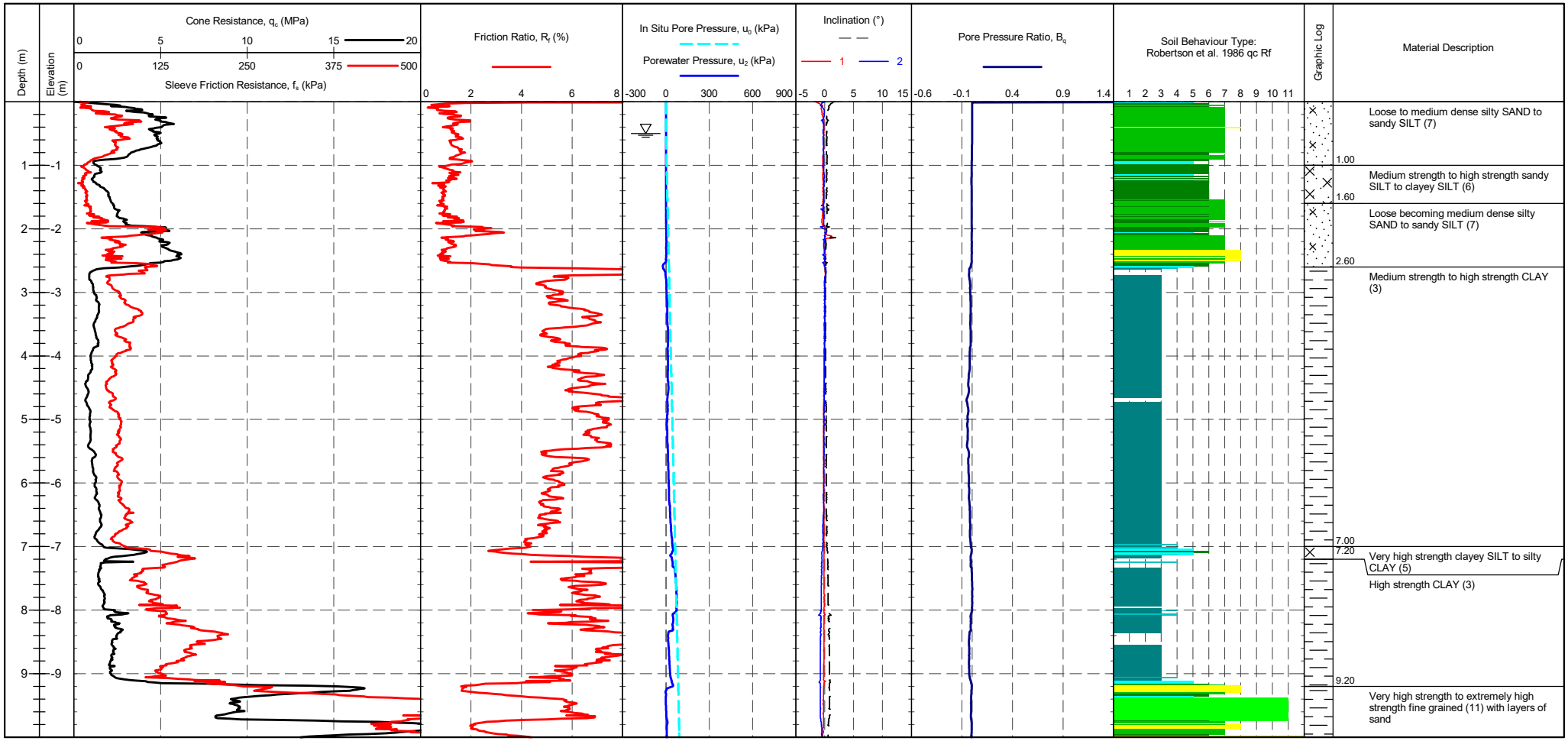
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:32 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	253 mV	271 mV	0.005 kPa
X-Y Inclinometer	2385 mV	2383 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

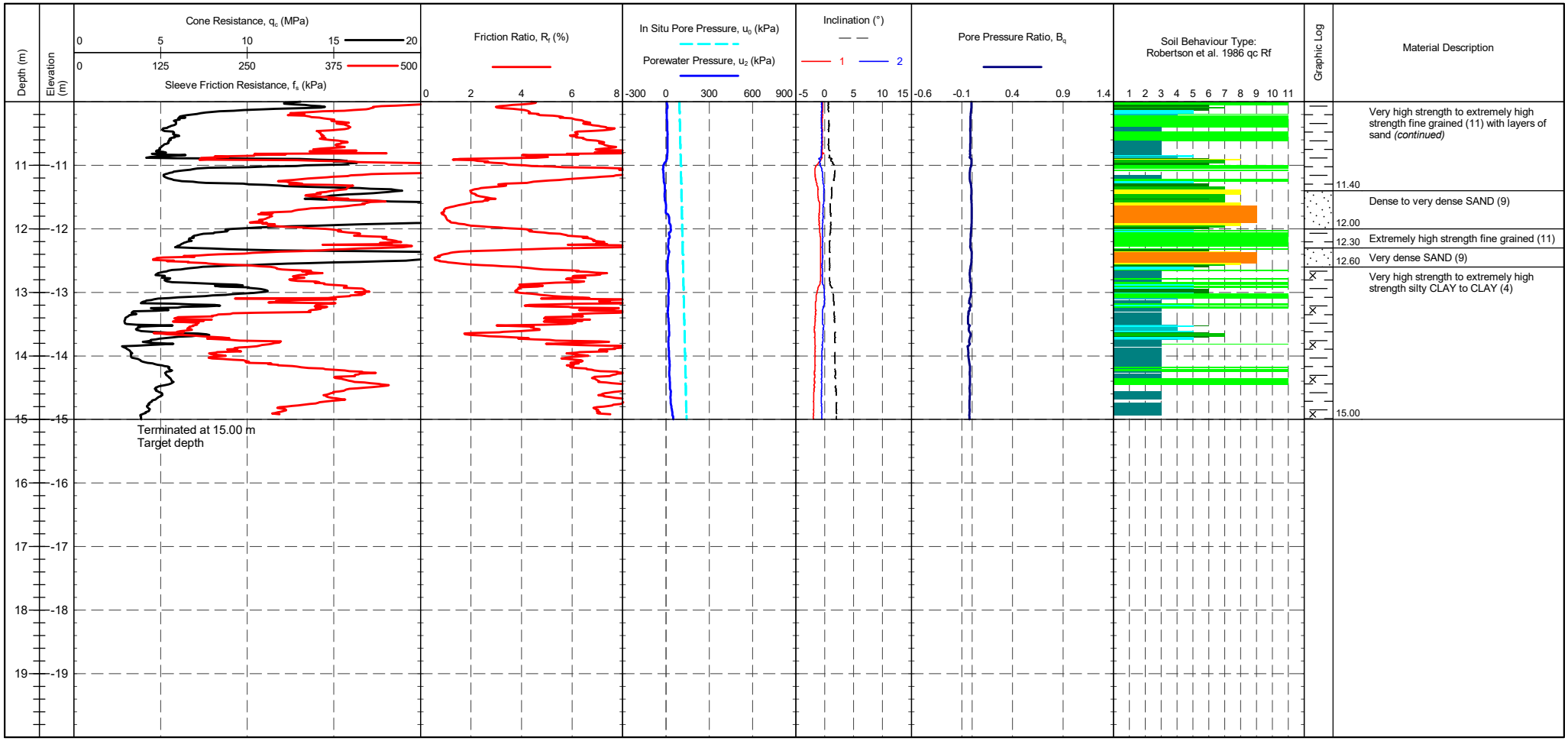
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm²	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	253 mV	271 mV	0.005 kPa
X-Y Inclinometer	2385 mV	2383 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

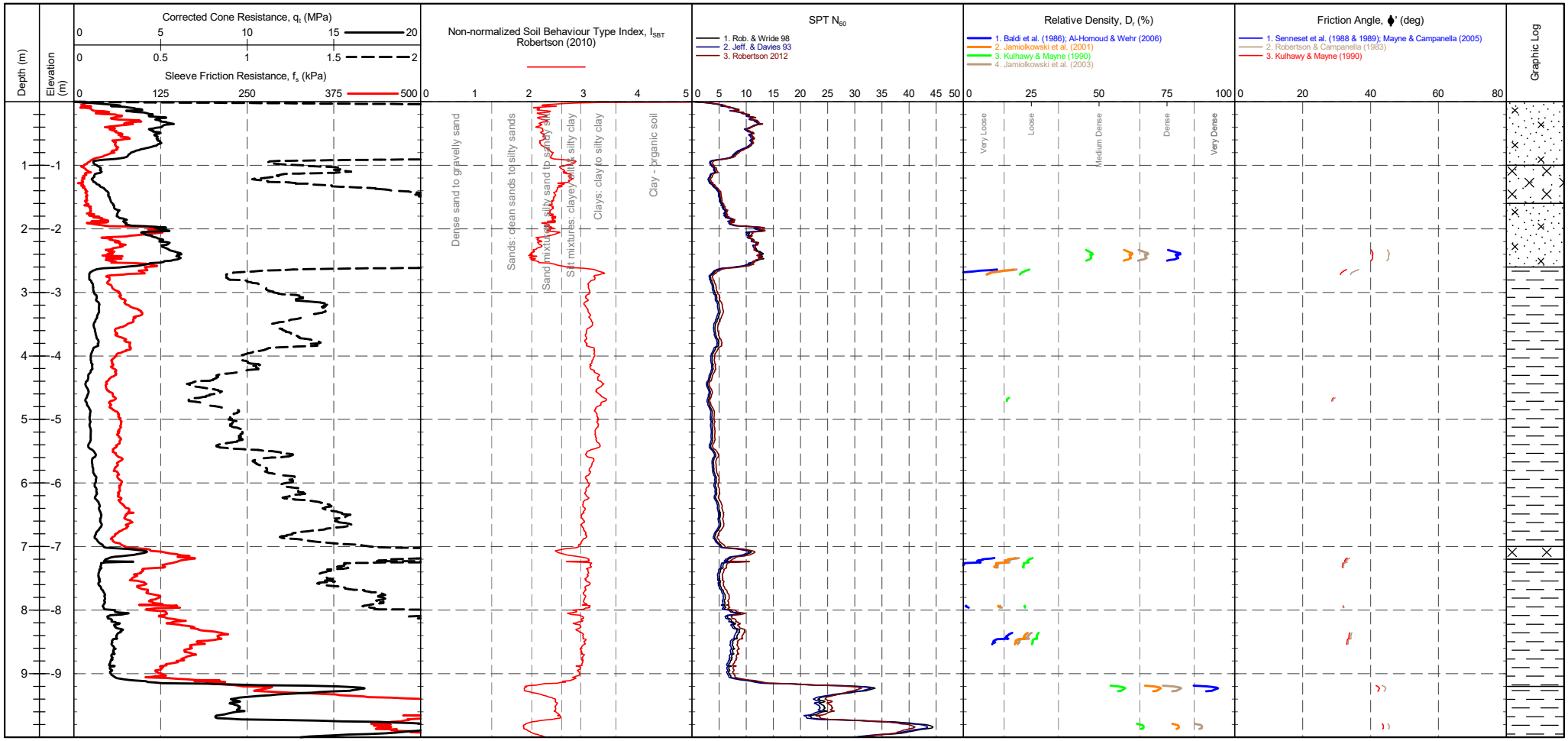
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	
CONE AREA RATIO	: 0.79	OPERATOR	: DR	
FILTER POSITION	: u2	FRICTION REDUCER	: None	
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	264 mV	0 MPa
Sleeve	338 mV	339 mV	0.001 kPa
Pore Pressure 2	253 mV	271 mV	0.005 kPa
X-Y Inclinometer	2385 mV	2383 mV	

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

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

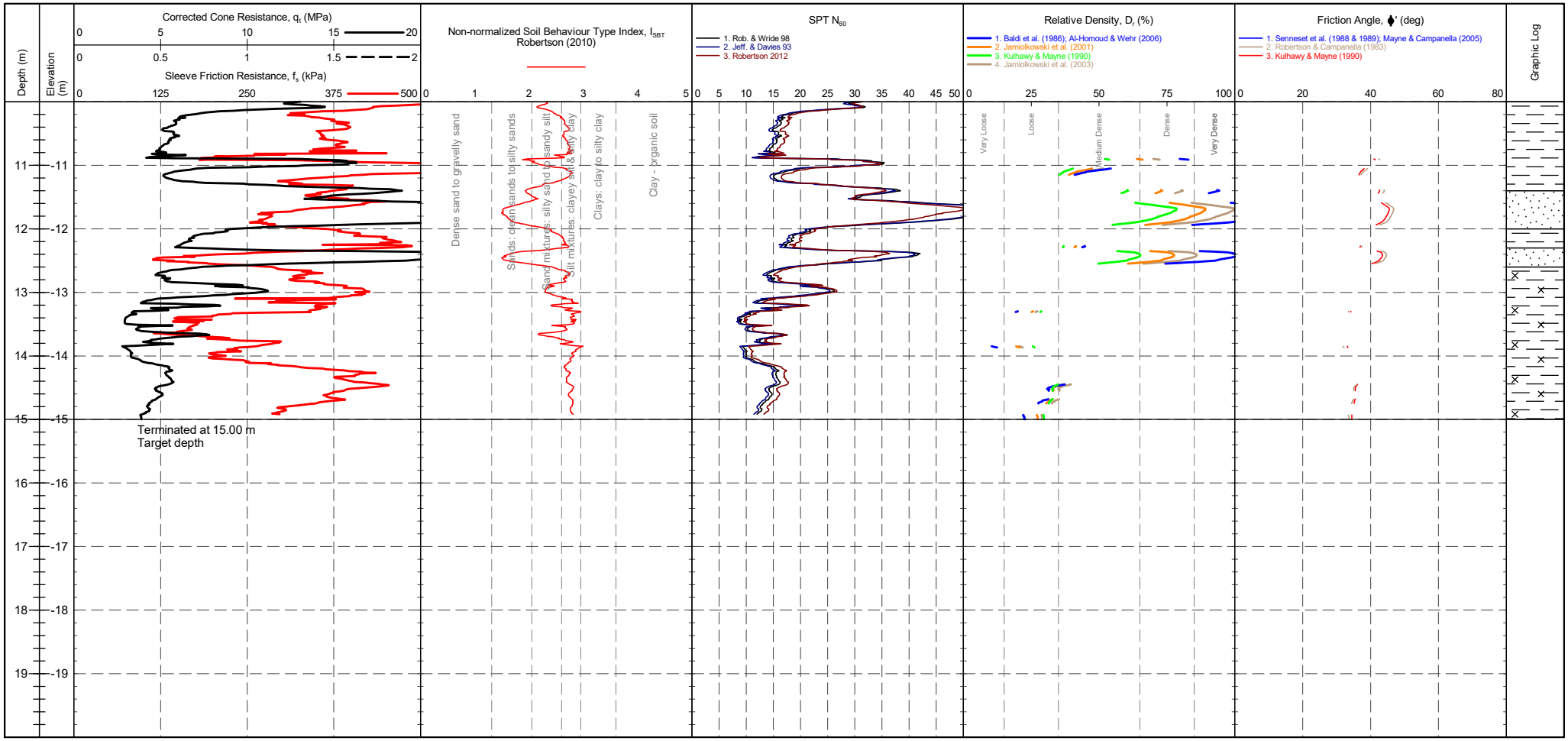
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Tip	264 mV	264 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	253 mV	271 mV	0.005 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2385 mV	2383 mV	

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

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

Groundwater Level

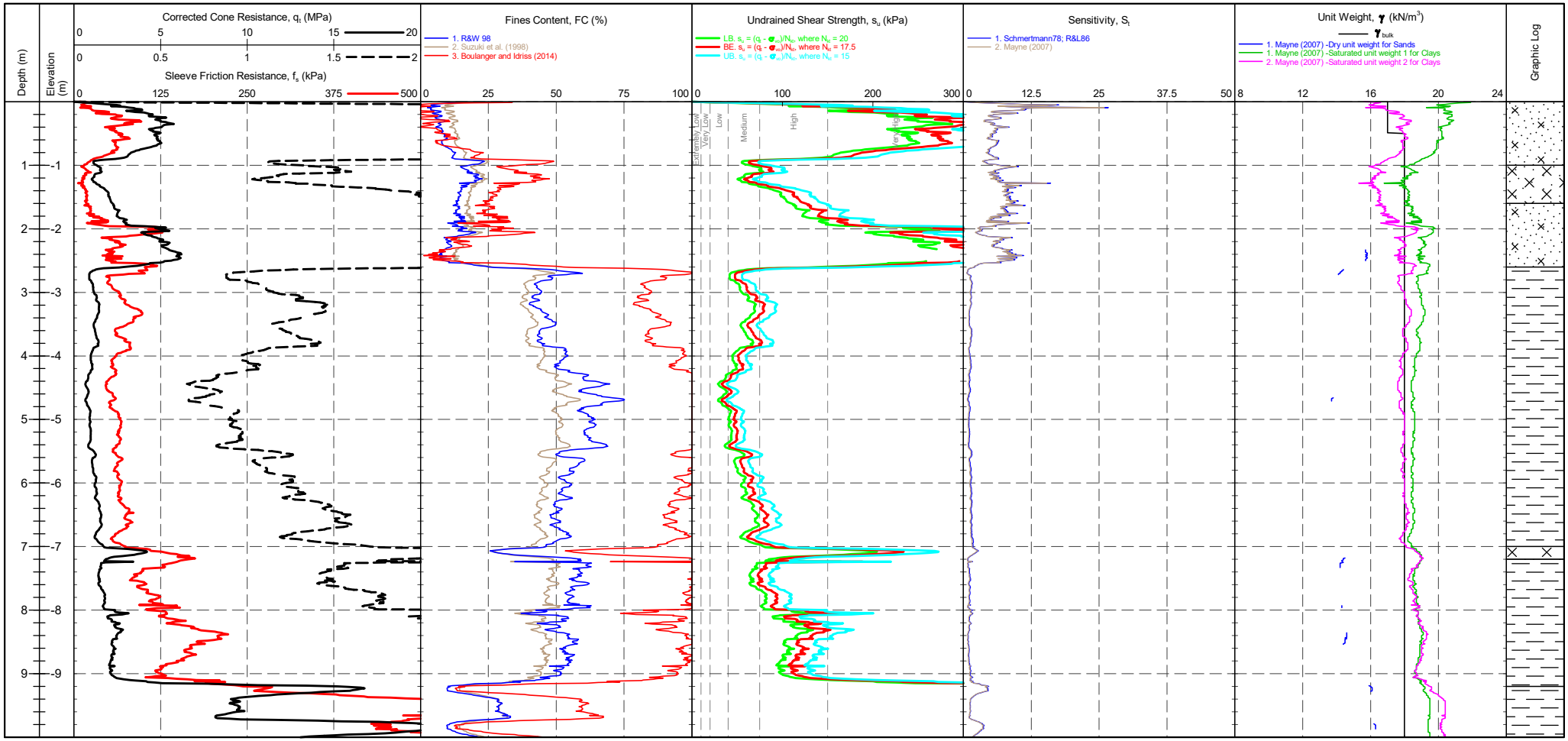
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	264 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	253 mV	271 mV	0.005 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2385 mV	2383 mV	

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

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

Groundwater Level

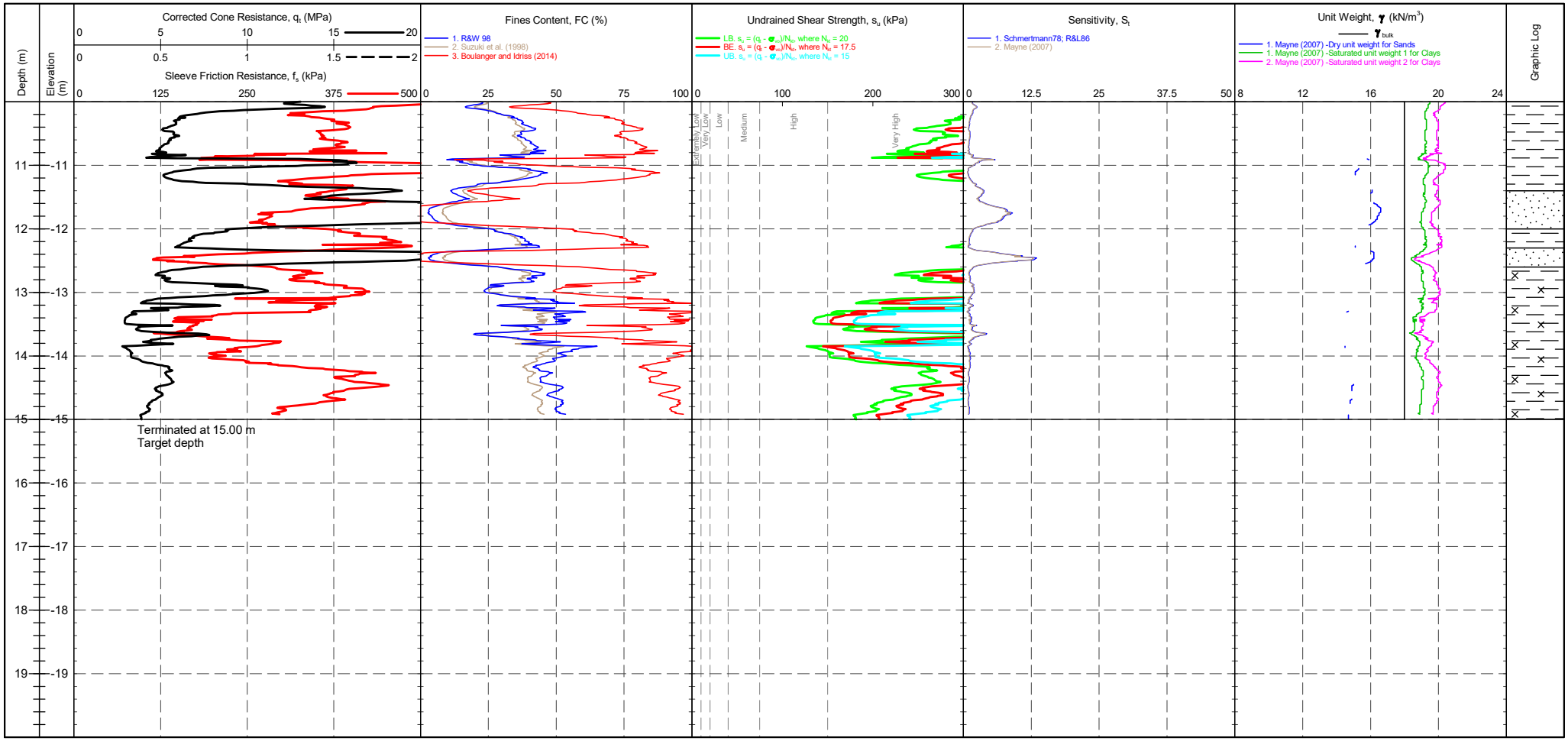
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT104**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test completed at target depth.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Target depth		METHOD : ISO 22476-1:2022



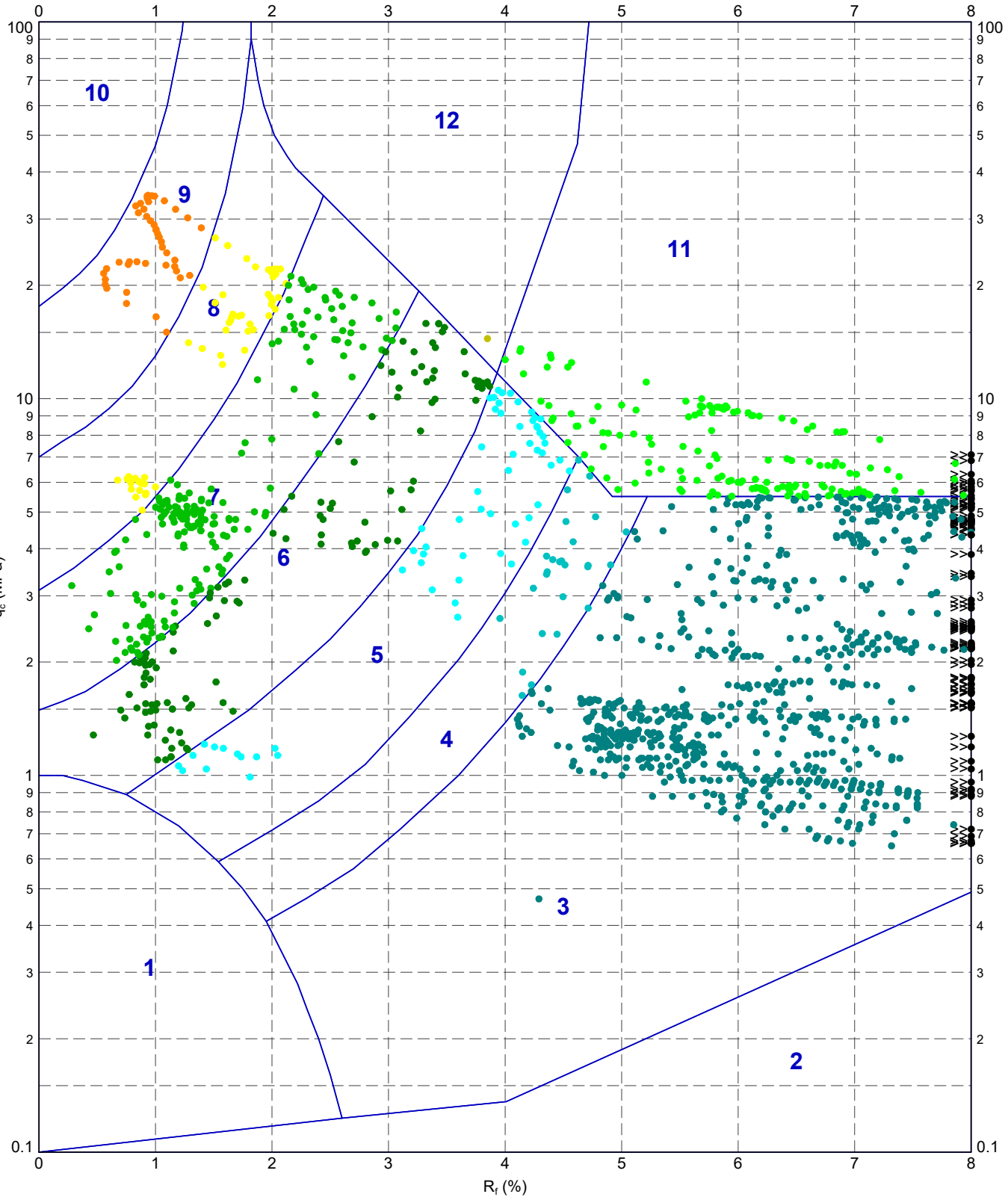
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	264 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	339 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	253 mV	271 mV	0.005 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2385 mV	2383 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT104

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

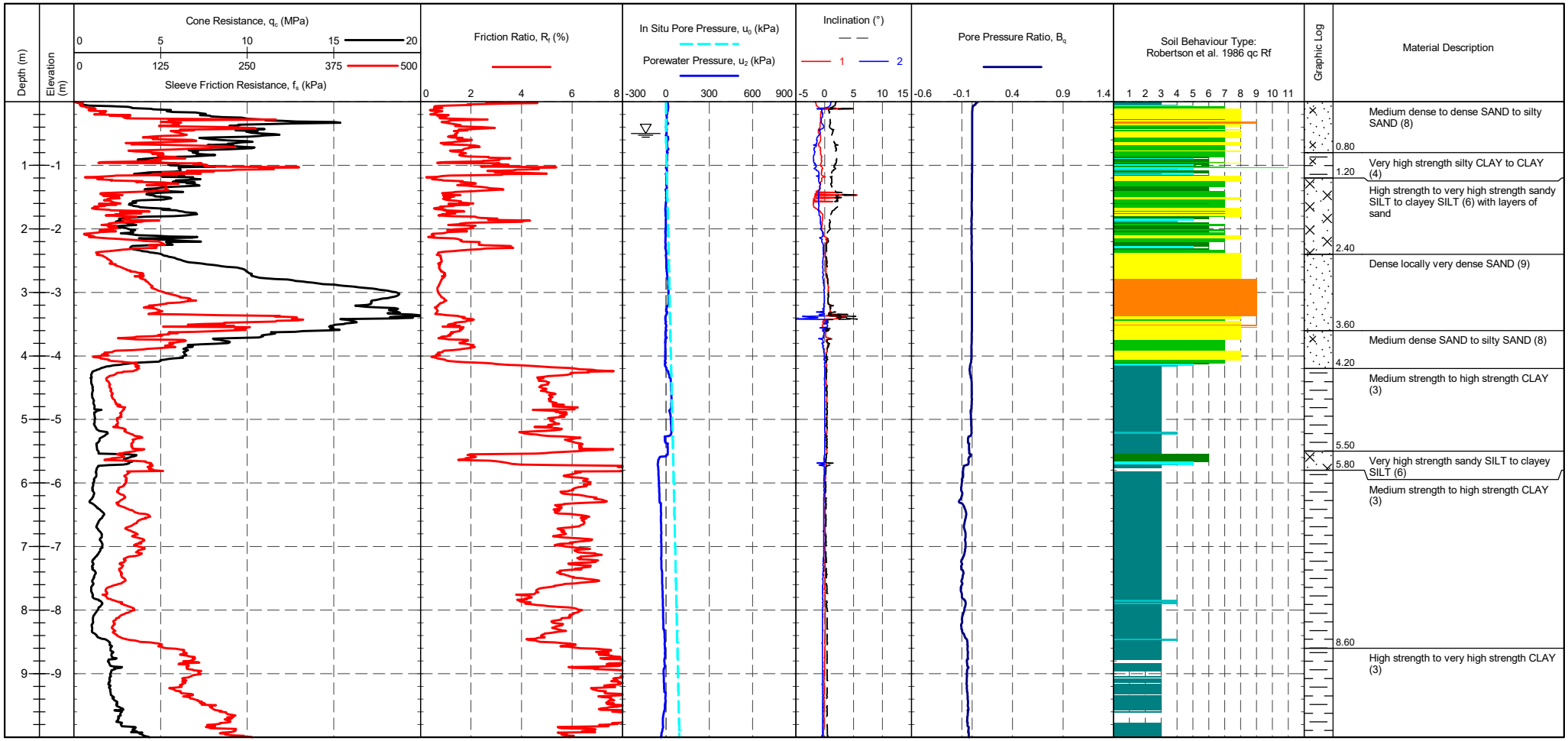
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:33 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT105**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	265 mV	267 mV	0.023 MPa
Sleeve	339 mV	341 mV	0.001 kPa
Pore Pressure 2	261 mV	265 mV	0.001 kPa
X-Y Inclinometer	2381 mV	2345 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

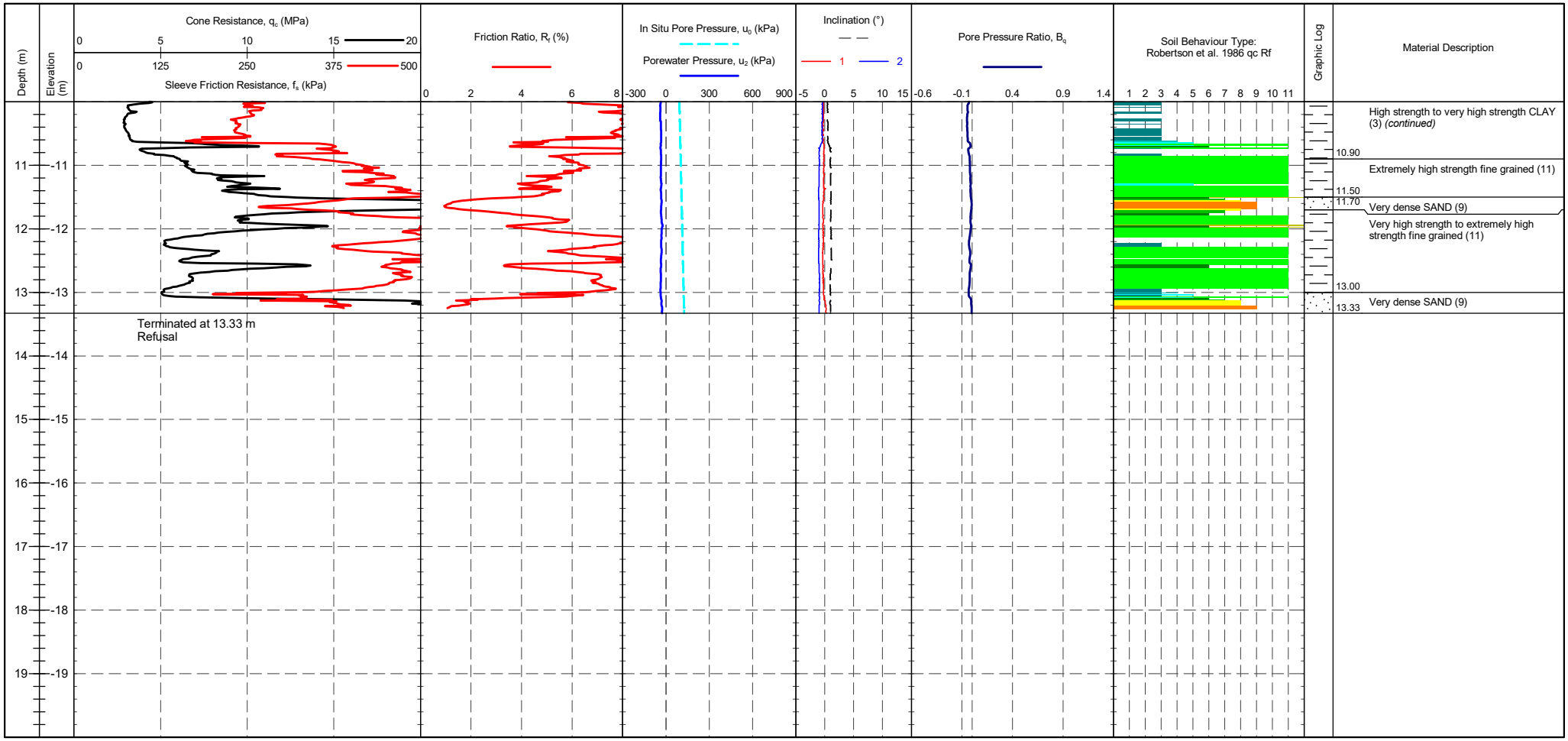
PointID: **CPT105**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	265 mV	267 mV	0.023 MPa
Sleeve	339 mV	341 mV	0.001 kPa
Pore Pressure 2	261 mV	265 mV	0.001 kPa
X-Y Inclinometer	2381 mV	2345 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

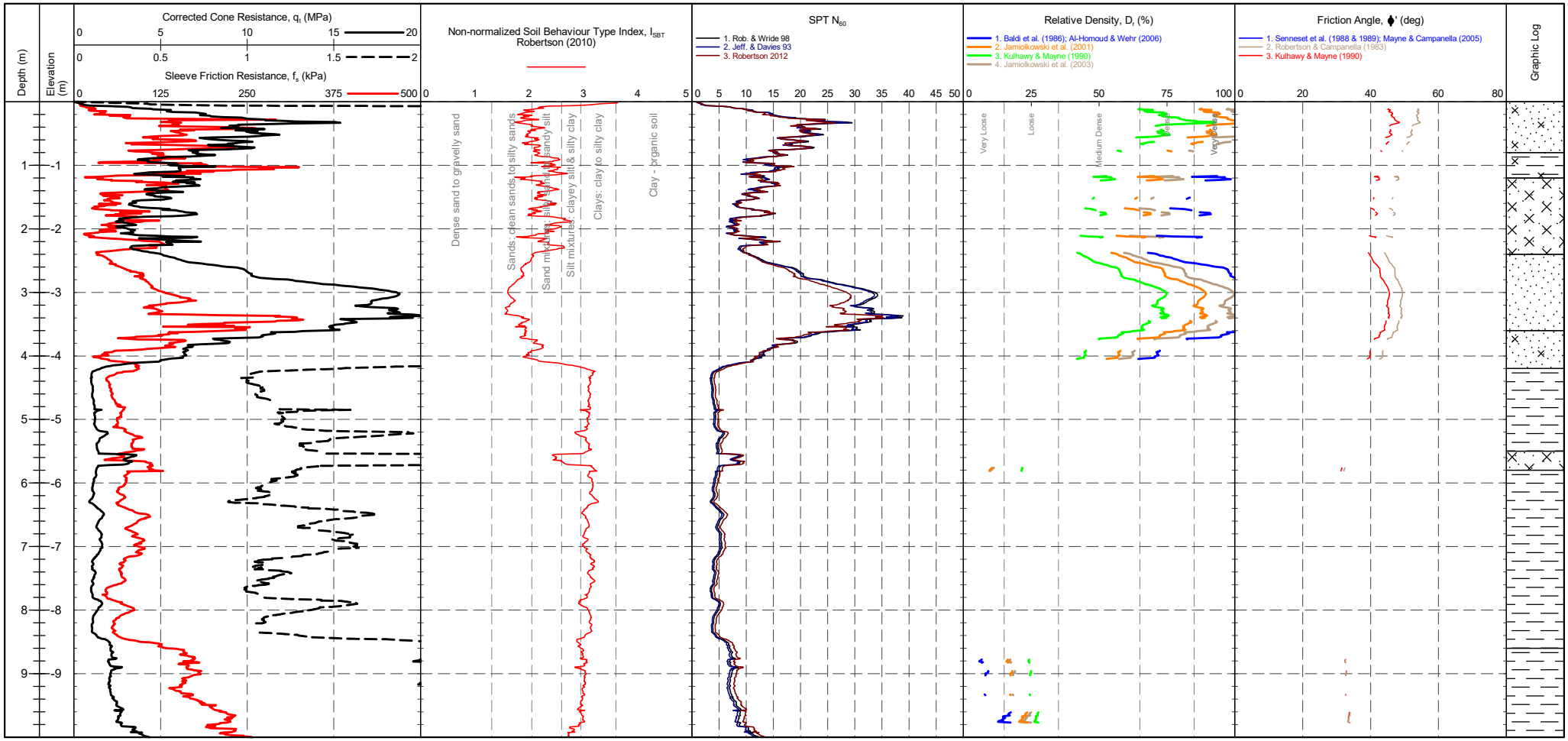
PointID **CPT105**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136
CONE MODEL	: Subtraction
CONE AREA	: 15cm²
CONE AREA RATIO	: 0.79
FILTER POSITION	: u2
FILTER TYPE	: HDPE

TEST TYPE	: TE2
APPLICATION CLASS	: 2
RIG	: CPT 017 - Griffen
OPERATOR	: DR
FRICTION REDUCER	: None
WEATHER	: Sunny & Cold

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	265 mV	267 mV	0.023 MPa
Sleeve	339 mV	341 mV	0.001 kPa
Pore Pressure 2	261 mV	265 mV	0.001 kPa
X-Y Inclinometer	2381 mV	2345 mV	

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

Description	SBT Index, Ic
Clays	2.95-3.60
Silt mixtures	2.60-2.95
Sand mixtures	2.05-2.60
Sands	1.31-2.05
Gravelly sand	<1.31

Description	SPT N value, NSPT
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Description	Relative Density Dr (%)
Very Loose	0 - 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	>85

Groundwater Level

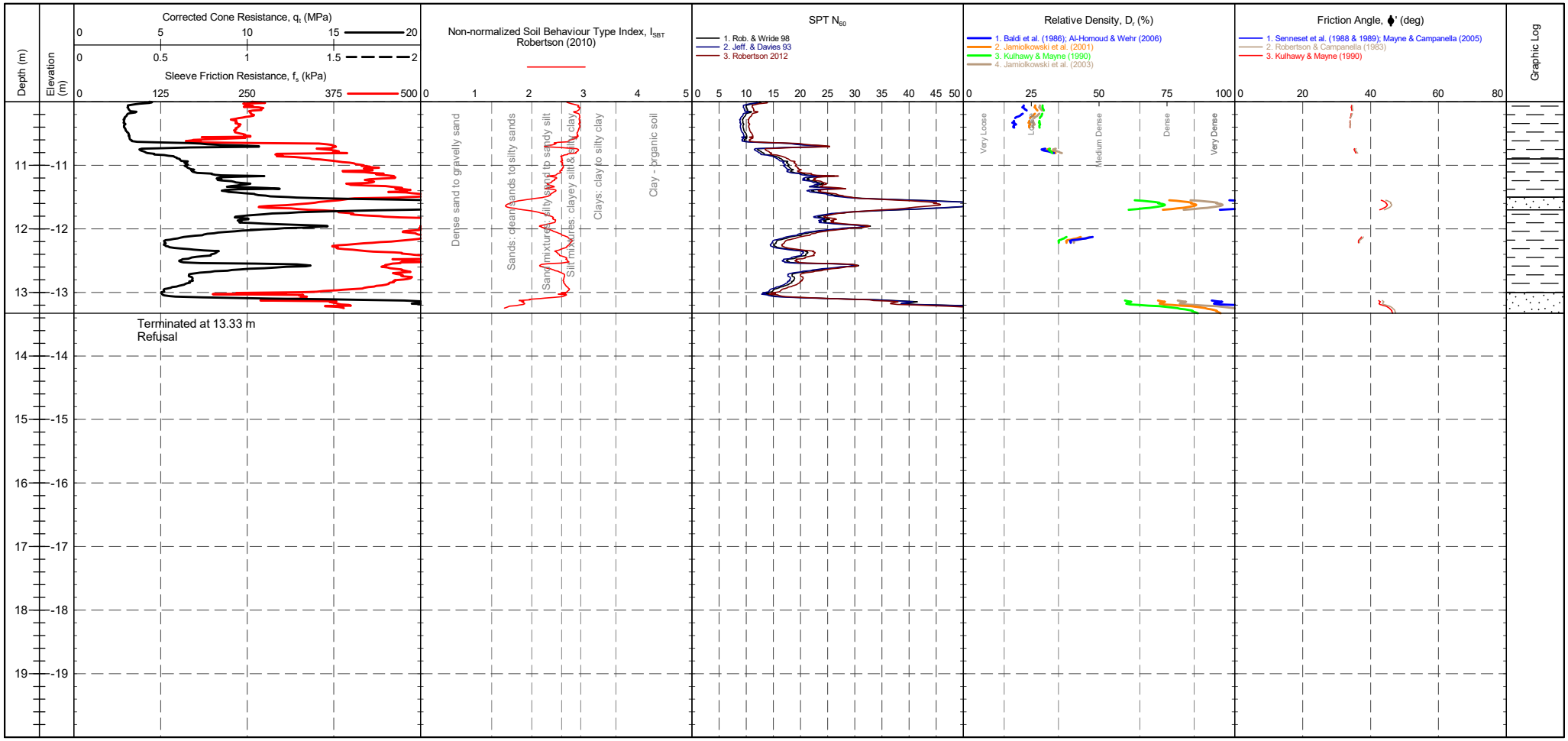
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT105**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Tip	265 mV	267 mV	0.023 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	339 mV	341 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	261 mV	265 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2381 mV	2345 mV	

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

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

Groundwater Level

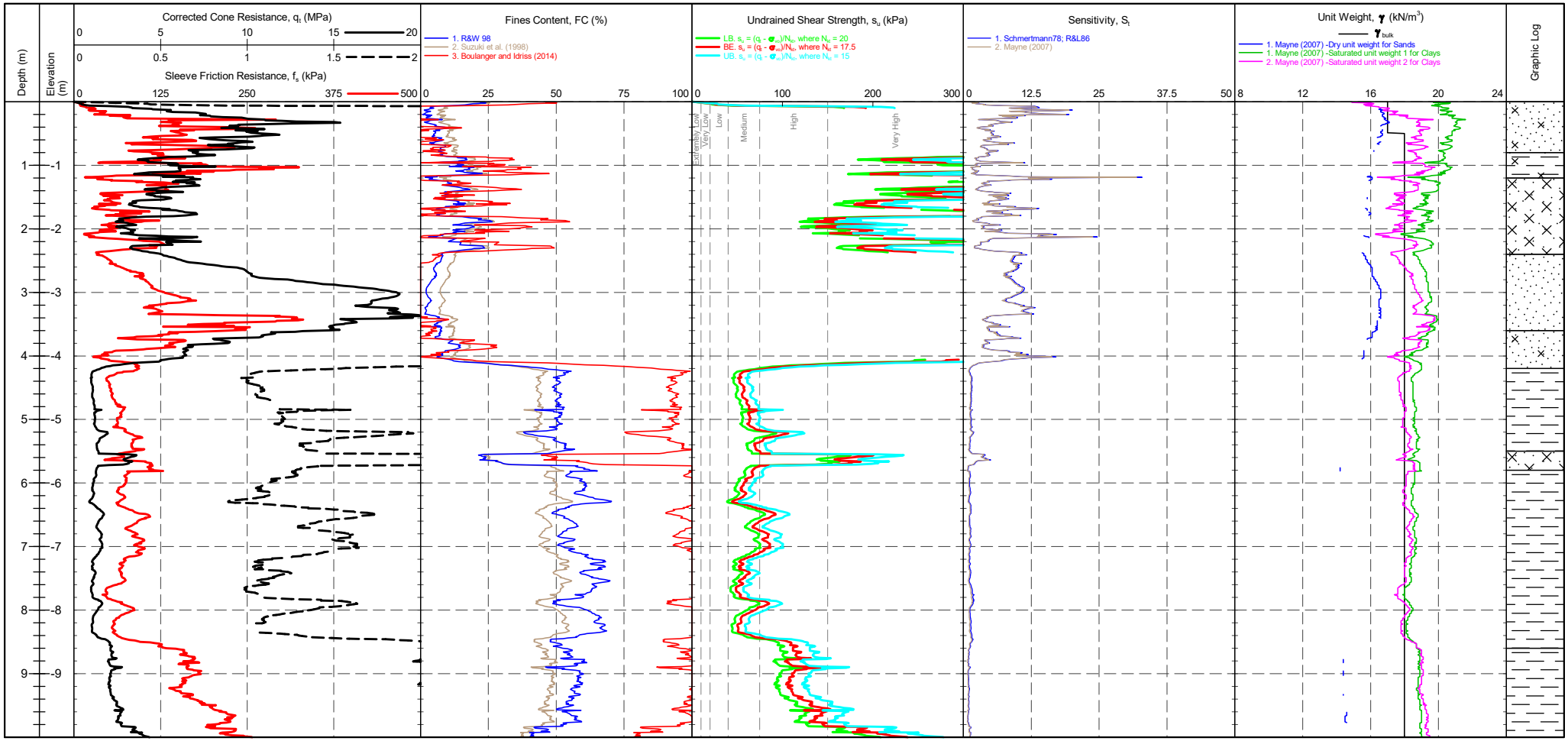
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT105**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	265 mV	267 mV	0.023 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	339 mV	341 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	261 mV	265 mV	0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2381 mV	2345 mV	

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

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

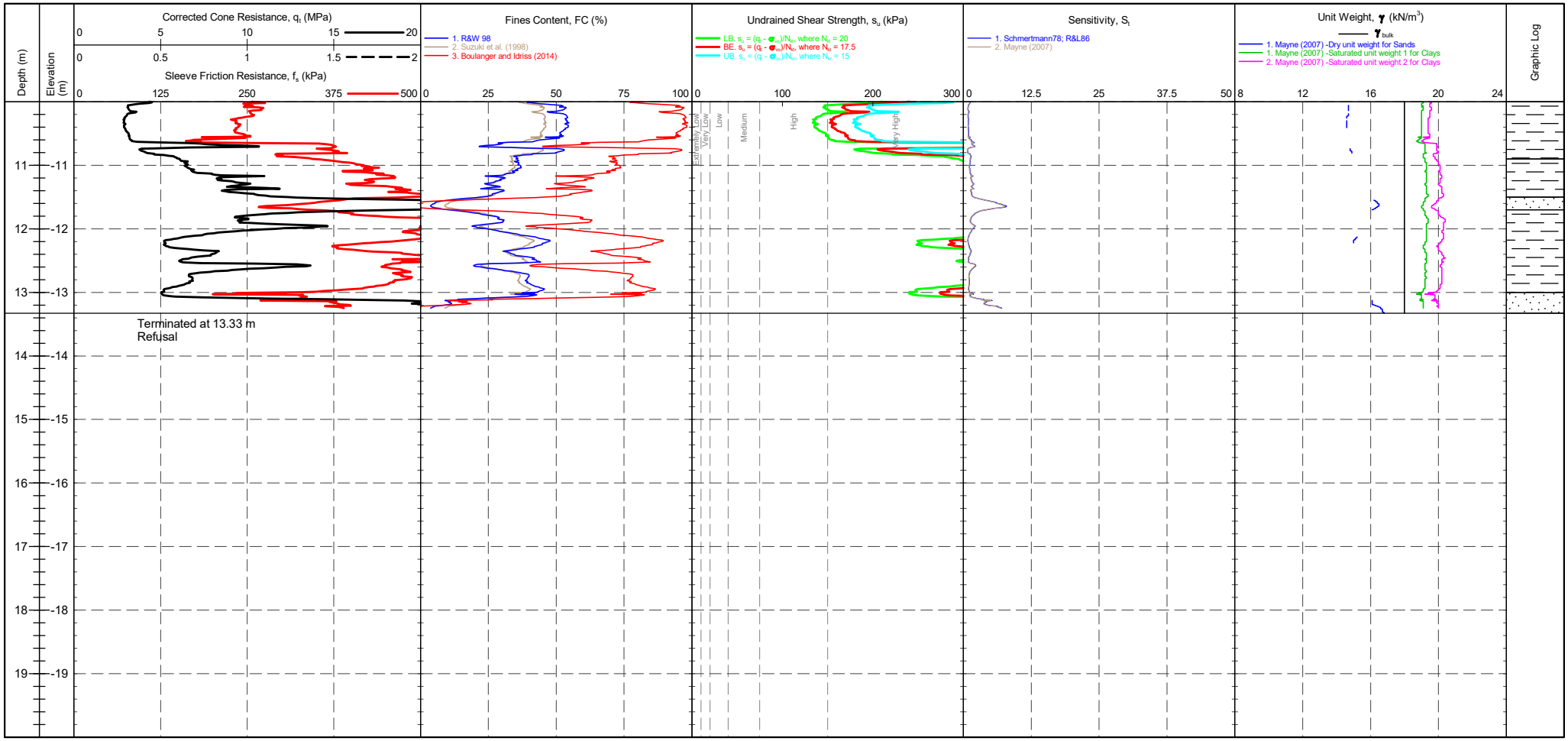
PointID: **CPT105**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

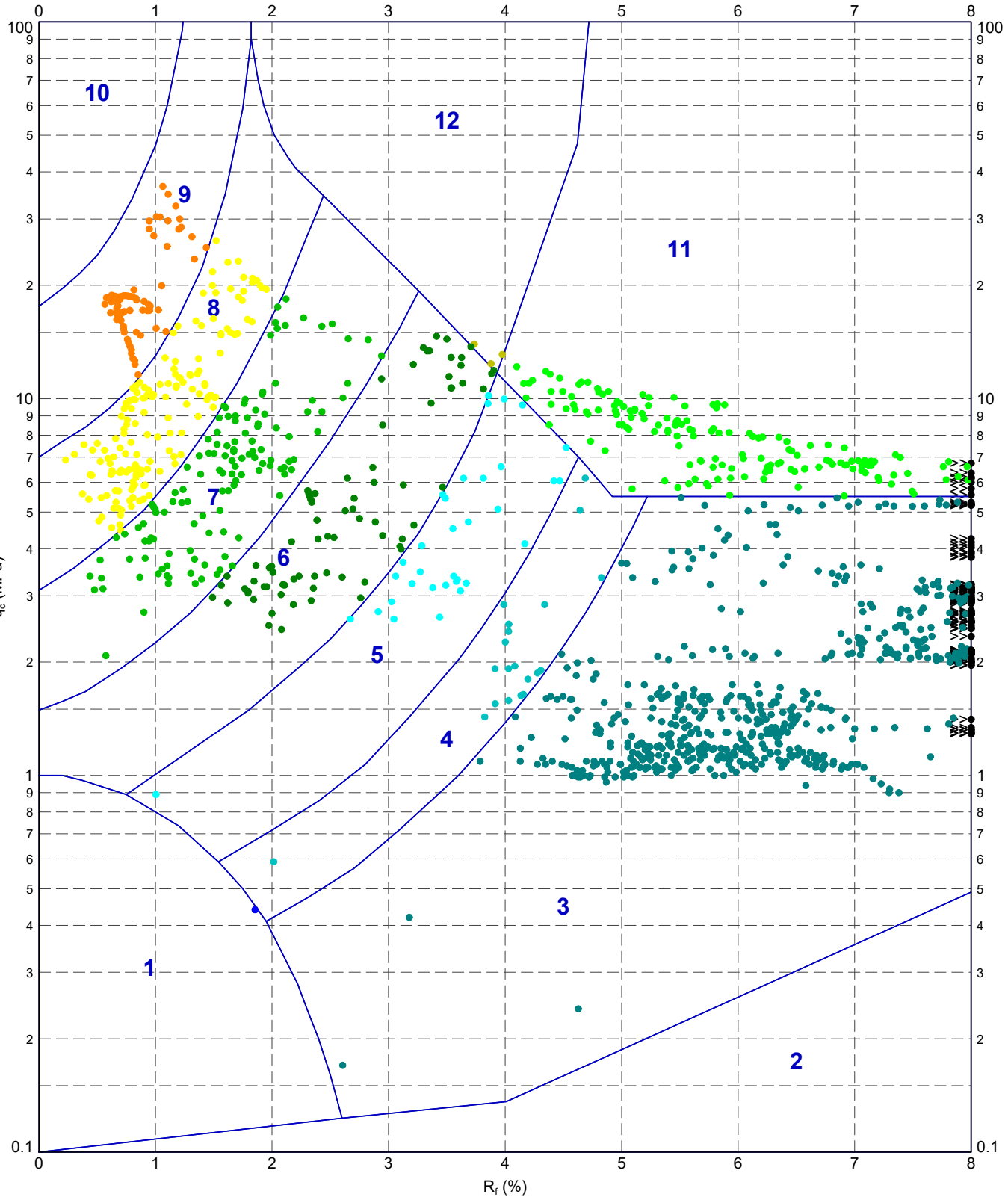
	Pre	Post	Difference
Transducer			
Tip	265 mV	267 mV	0.023 MPa
Sleeve	339 mV	341 mV	0.001 kPa
Pore Pressure 2	261 mV	265 mV	0.001 kPa
X-Y Inclinometer	2381 mV	2345 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU
SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT105

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

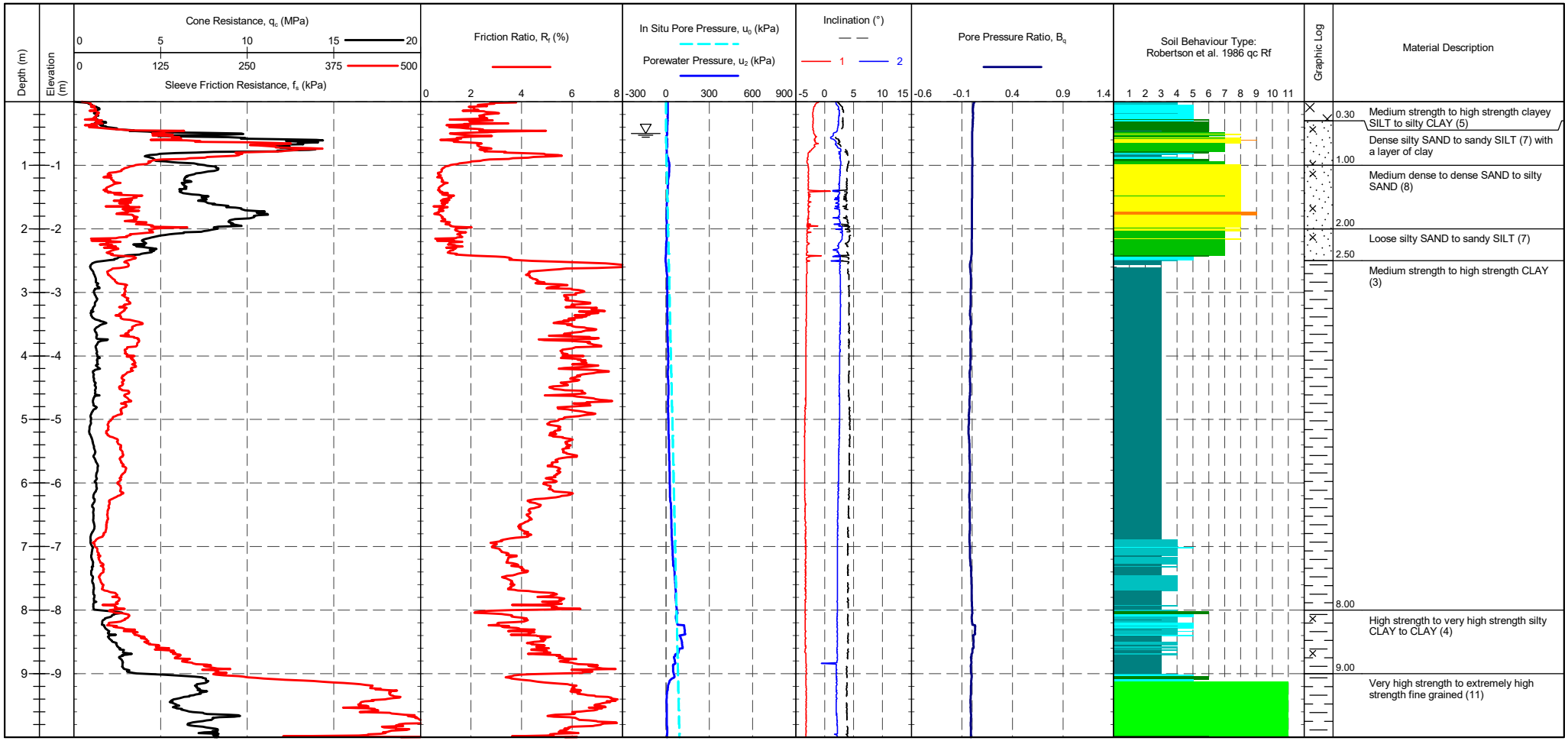
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:35 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	263 mV	263 mV	0 MPa
Sleeve	338 mV	337 mV	-0.001 kPa
Pore Pressure 2	268 mV	118 mV	-0.039 kPa
X-Y Inclinometer	2449 mV	2468 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

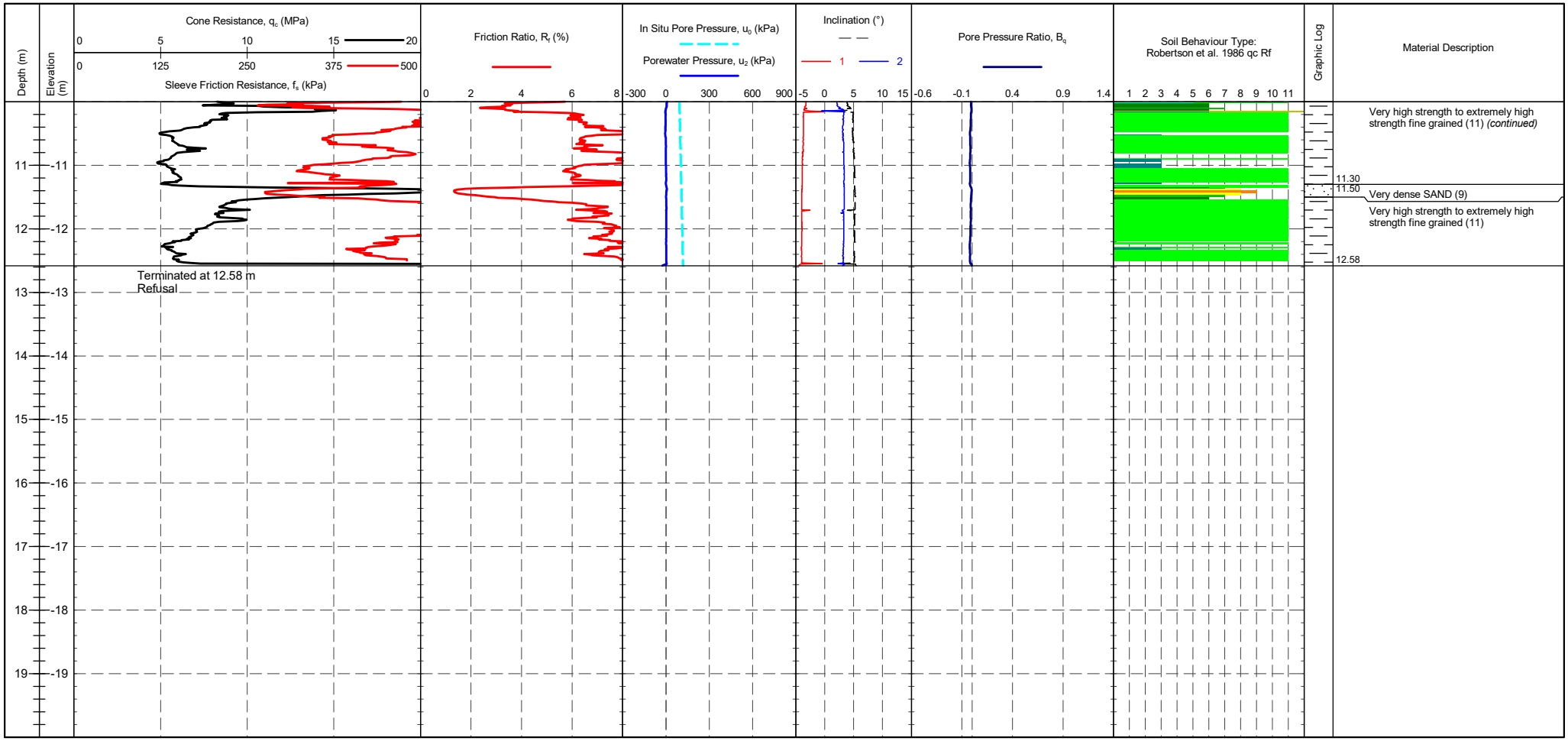
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2		
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen		
CONE AREA	: 15cm²	OPERATOR	: DR		
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None		
FILTER POSITION	: u2	WEATHER	: Sunny & Cold		
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	263 mV	263 mV	0 MPa
Sleeve	338 mV	337 mV	-0.001 kPa
Pore Pressure 2	268 mV	118 mV	-0.039 kPa
X-Y Inclinometer	2449 mV	2468 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

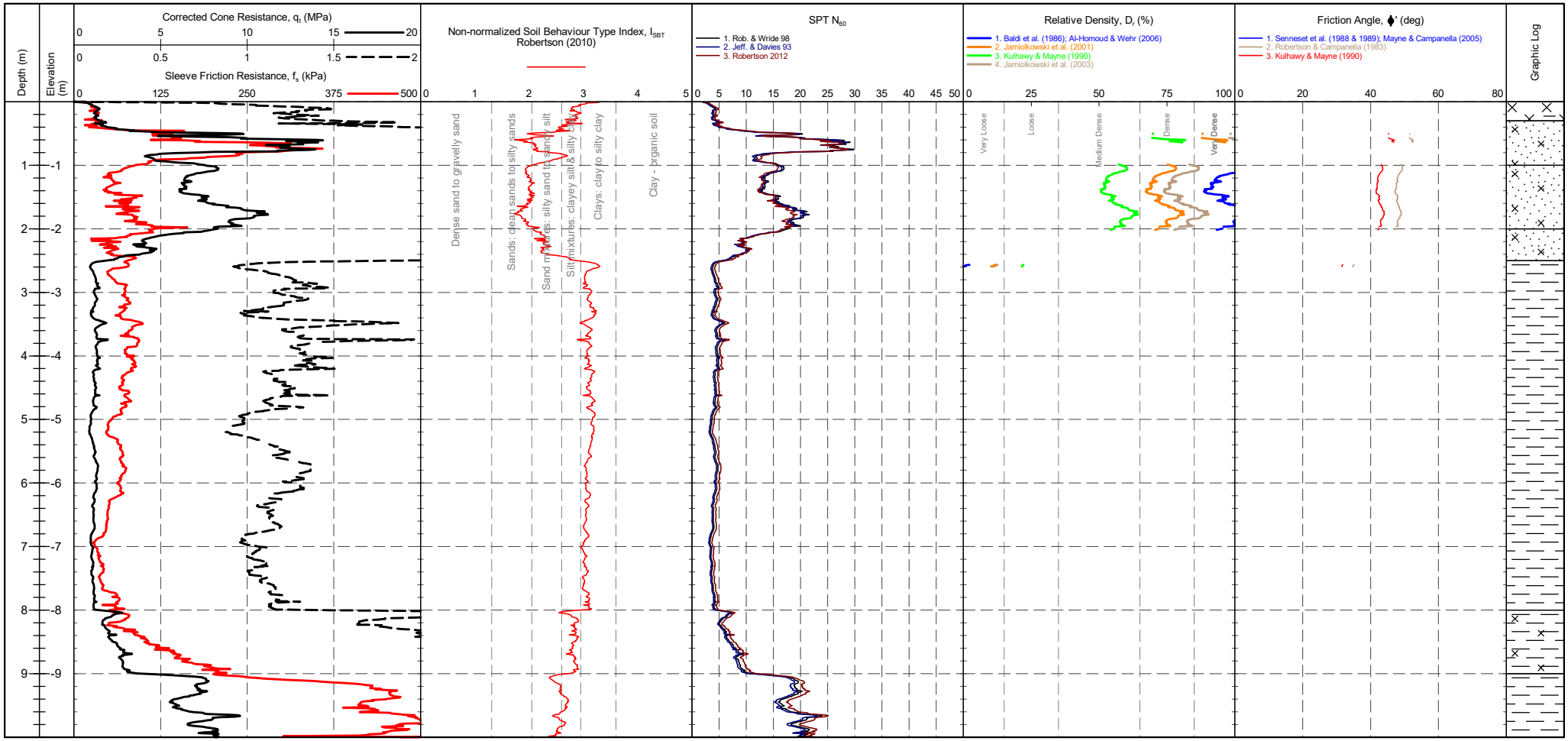
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	
CONE AREA RATIO	: 0.79	OPERATOR	: DR	
FILTER POSITION	: u2	FRICTION REDUCER	: None	
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	263 mV	263 mV	0 MPa
Sleeve	338 mV	337 mV	-0.001 kPa
Pore Pressure 2	268 mV	118 mV	-0.039 kPa
X-Y Inclinometer	2449 mV	2468 mV	

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

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

Groundwater Level

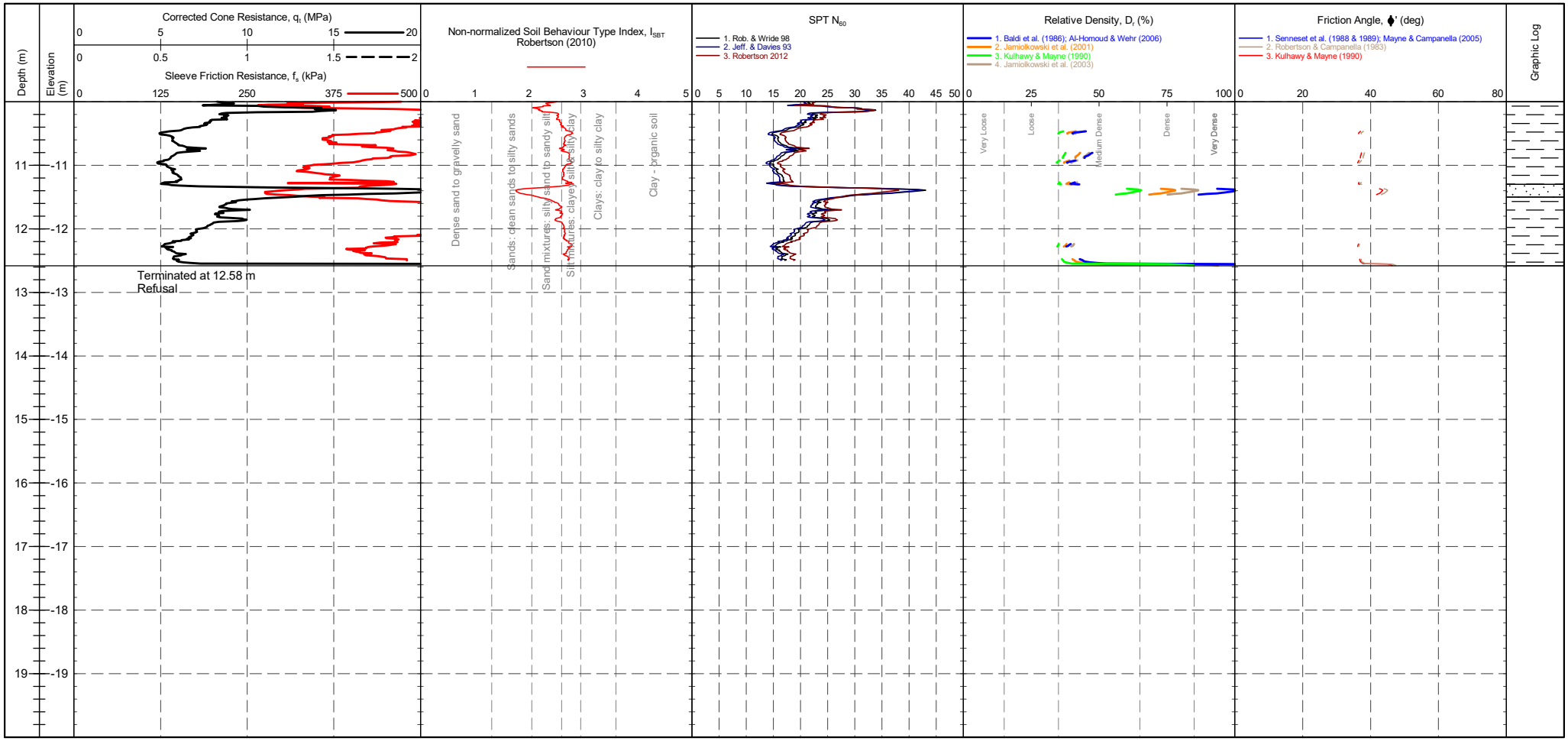
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen	Tip	263 mV	263 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	337 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	268 mV	118 mV	-0.039 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2449 mV	2468 mV	

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

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

Groundwater Level

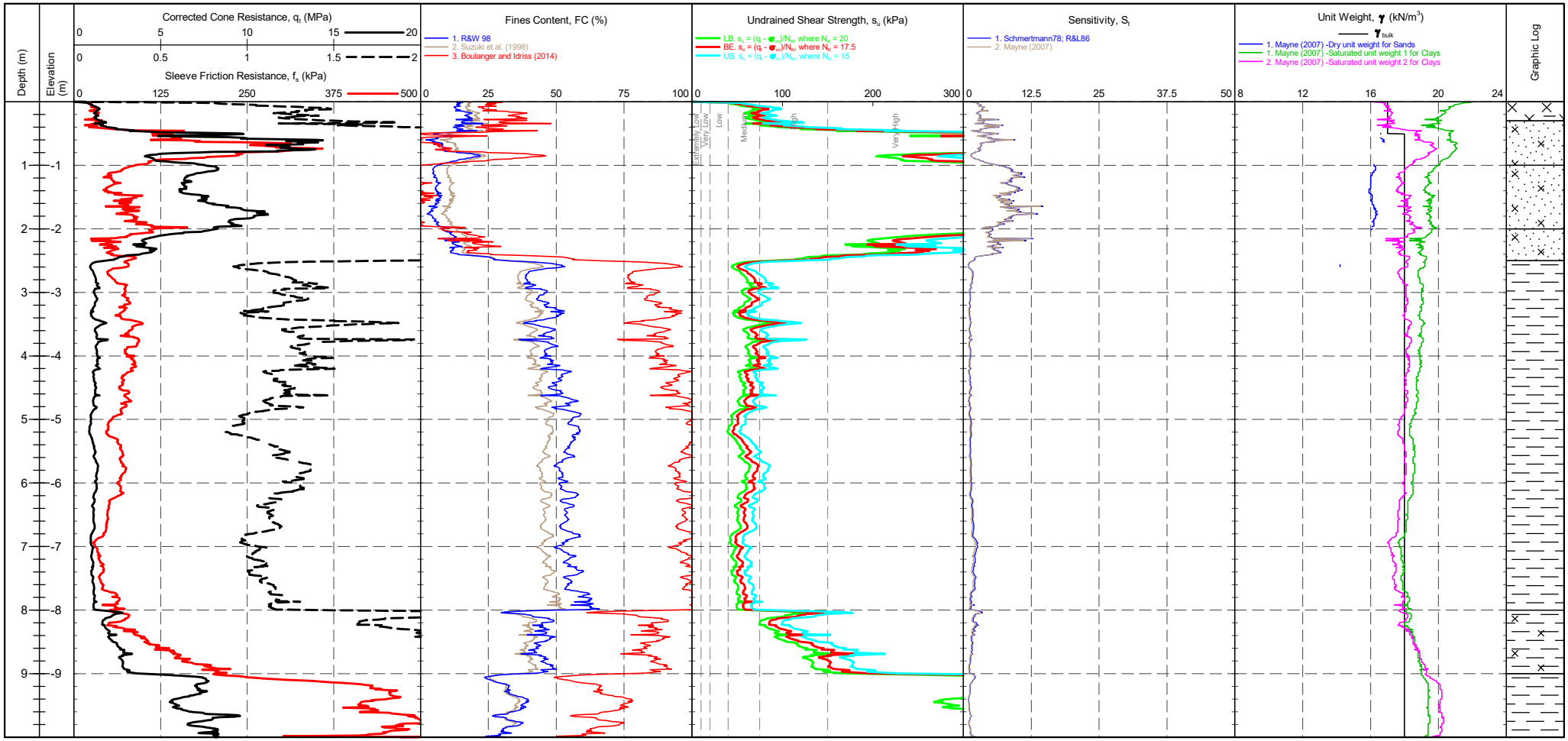
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	263 mV	263 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	337 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	268 mV	118 mV	-0.039 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2449 mV	2468 mV	

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

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

Groundwater Level

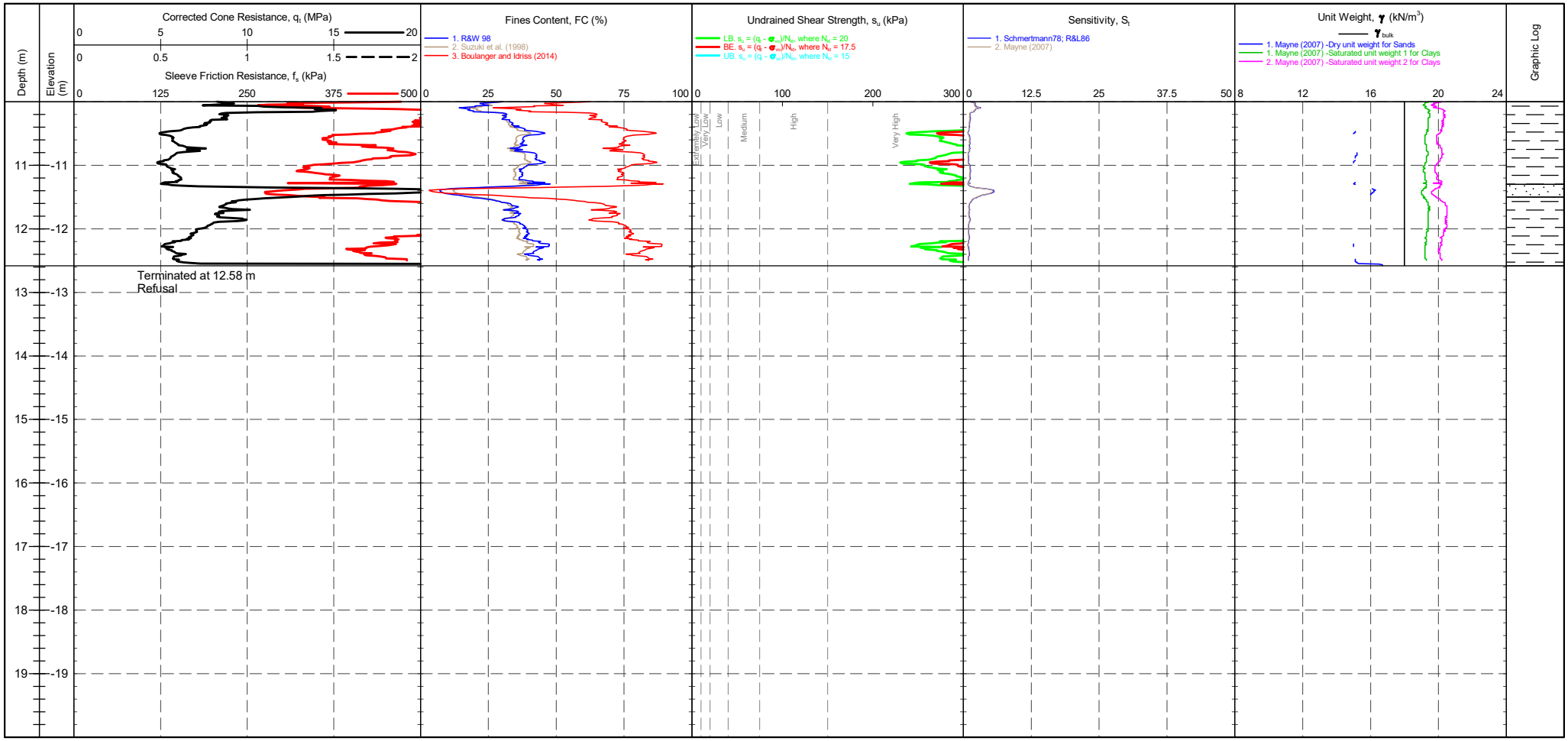
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT106**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



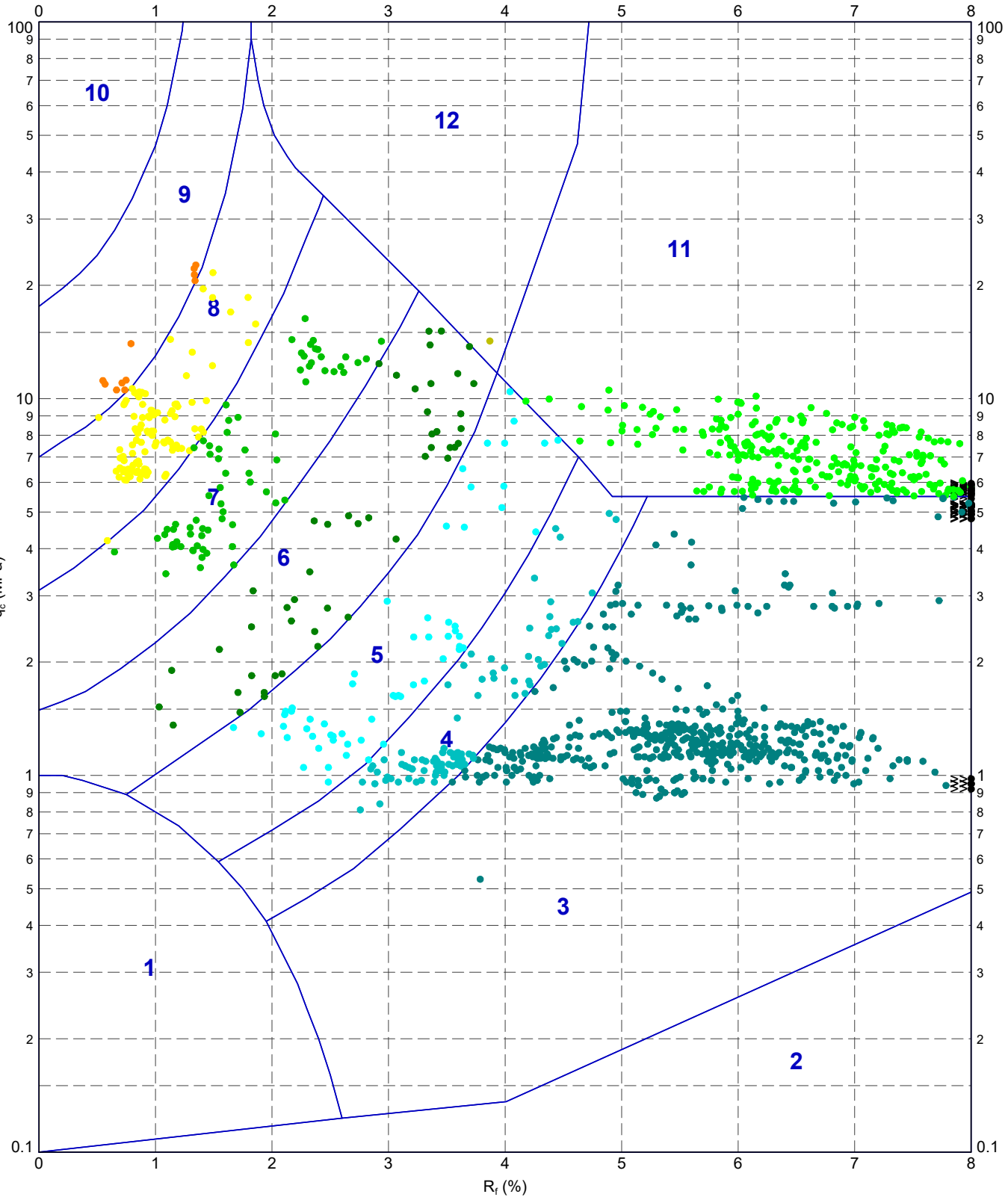
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	263 mV	263 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	338 mV	337 mV	-0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	268 mV	118 mV	-0.039 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2449 mV	2468 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU
SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT106

DRAWN	DATE 25/10/2024
CHECKED	DATE 25/10/2024
SCALE Not To Scale	A4
PROJECT No 1240458	FIGURE No

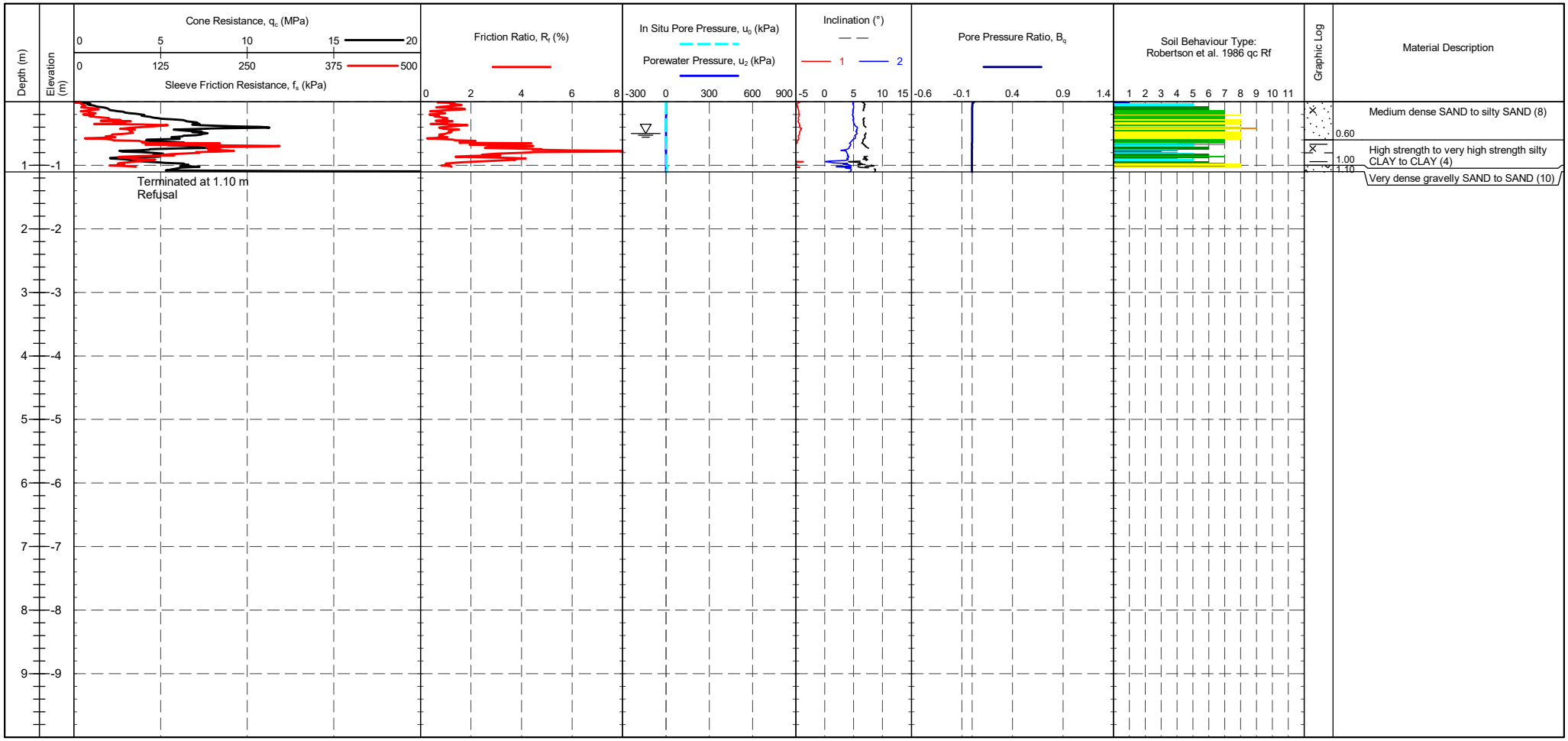
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:36 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT107**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen	Tip	264 mV	267 mV	0.035 MPa
CONE AREA	: 15cm^2	OPERATOR	: DR	Sleeve	339 mV	340 mV	0.001 kPa
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None	Pore Pressure 2	265 mV	259 mV	-0.002 kPa
FILTER POSITION	: u2	WEATHER	: Sunny & Cold	X-Y Inclinometer	2146 mV	2160 mV	
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes				

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

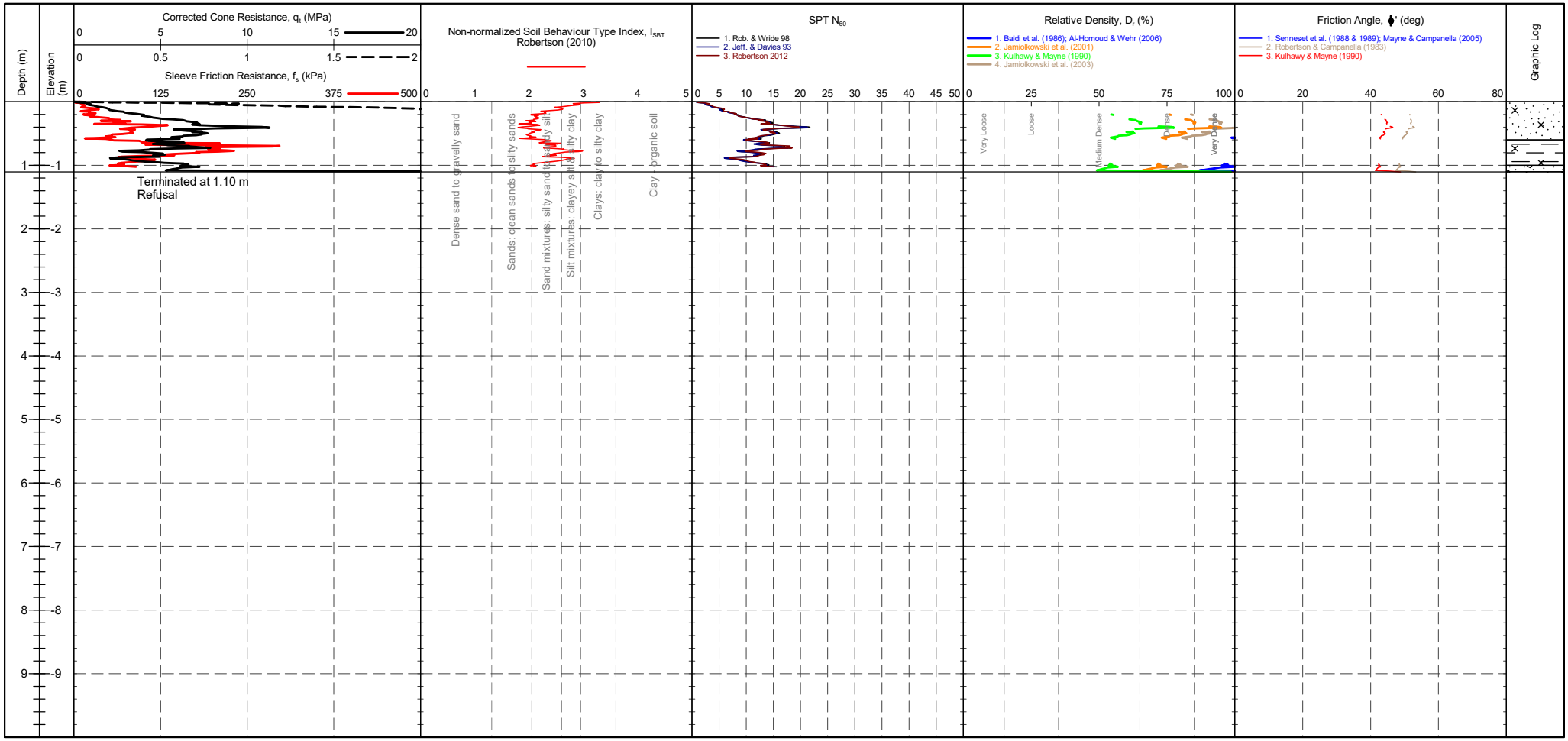
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

PointID: **CPT107**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	264 mV	267 mV	0.035 MPa
Sleeve	339 mV	340 mV	0.001 kPa
Pore Pressure 2	265 mV	259 mV	-0.002 kPa
X-Y Inclinometer	2146 mV	2160 mV	

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

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

Groundwater Level

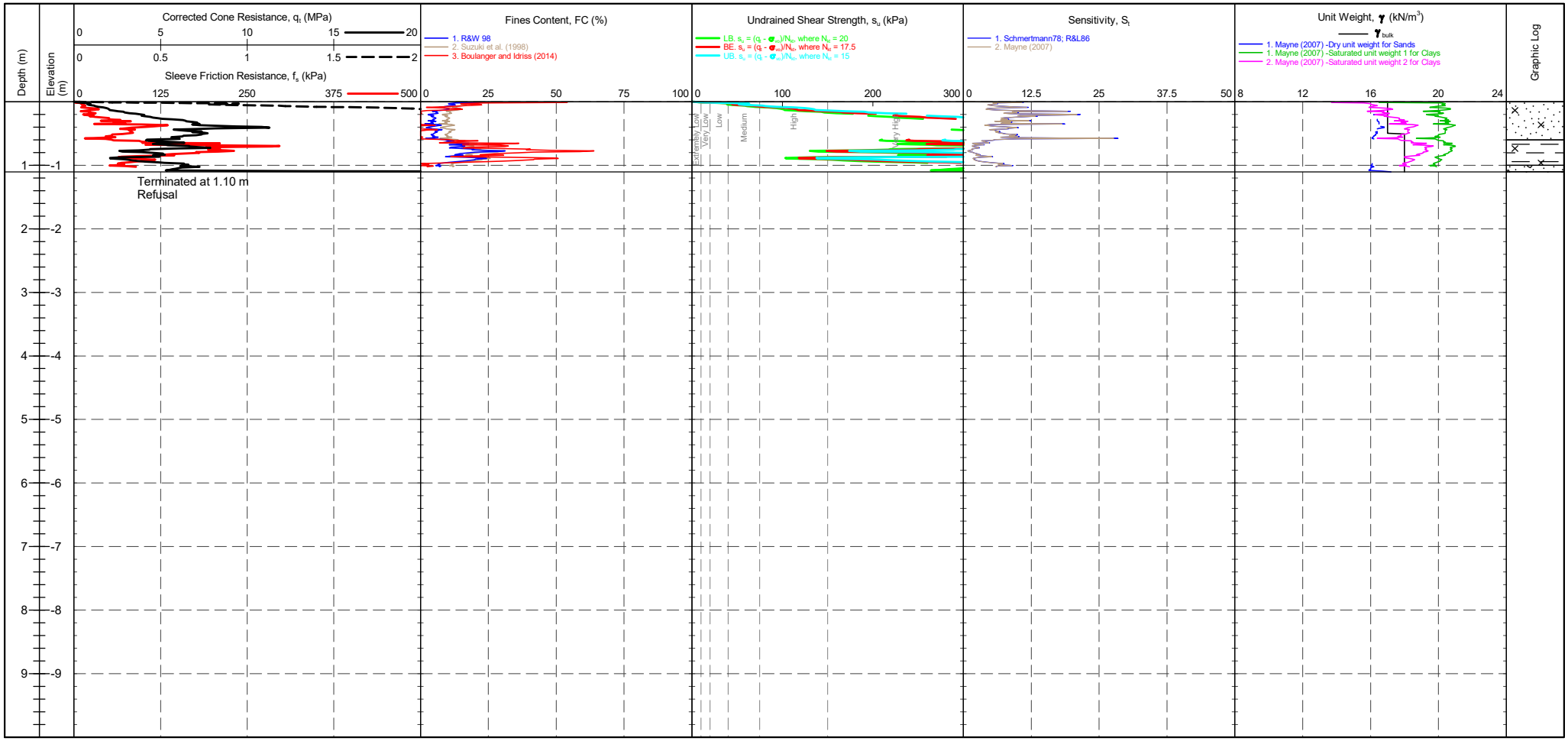
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT107**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 1
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on inclination.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



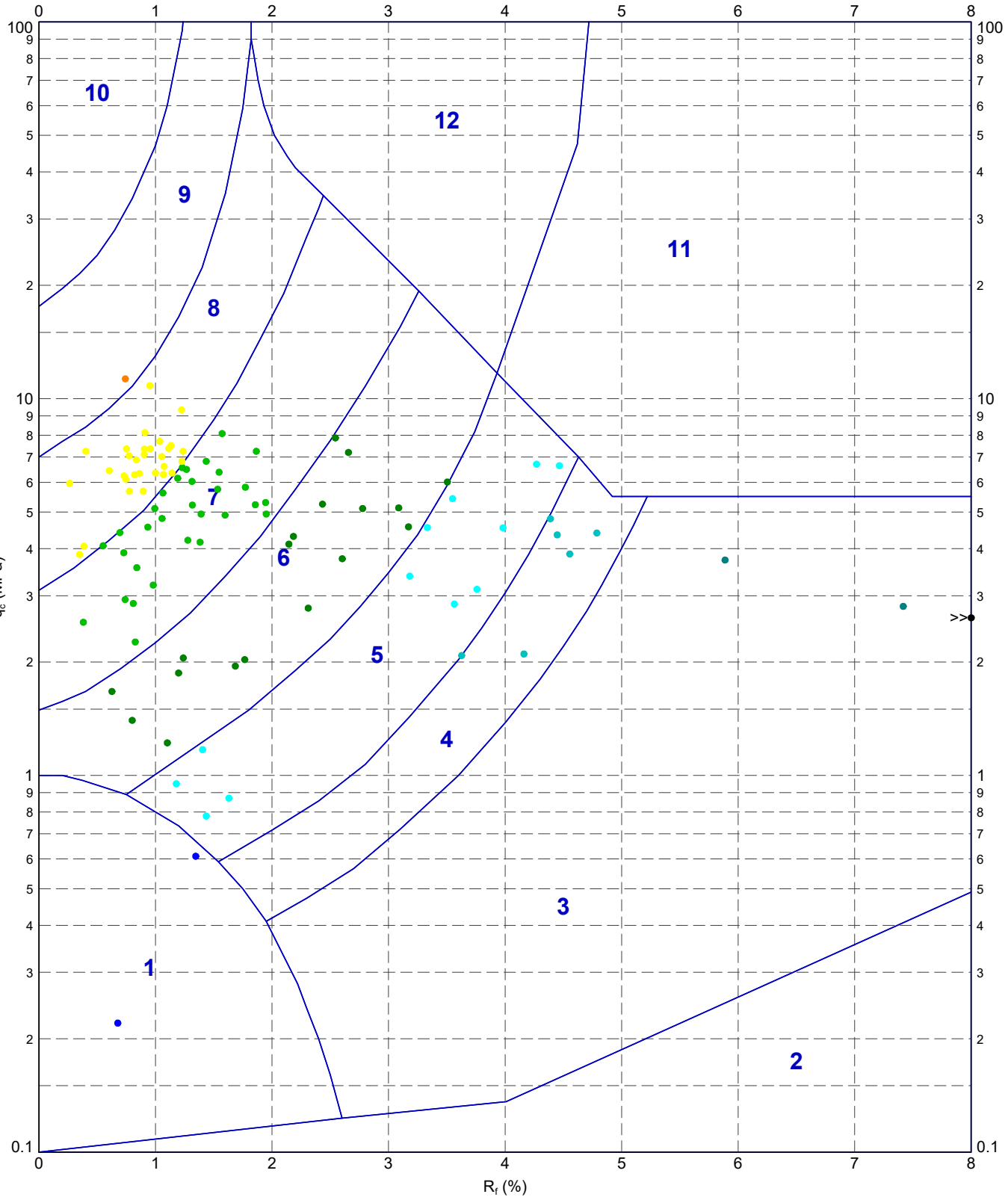
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	264 mV	267 mV	0.035 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	339 mV	340 mV	0.001 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	265 mV	259 mV	-0.002 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2146 mV	2160 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT107

DRAWN	DATE 25/10/2024	
CHECKED	DATE 25/10/2024	
SCALE Not To Scale		A4
PROJECT No 1240458	FIGURE No	

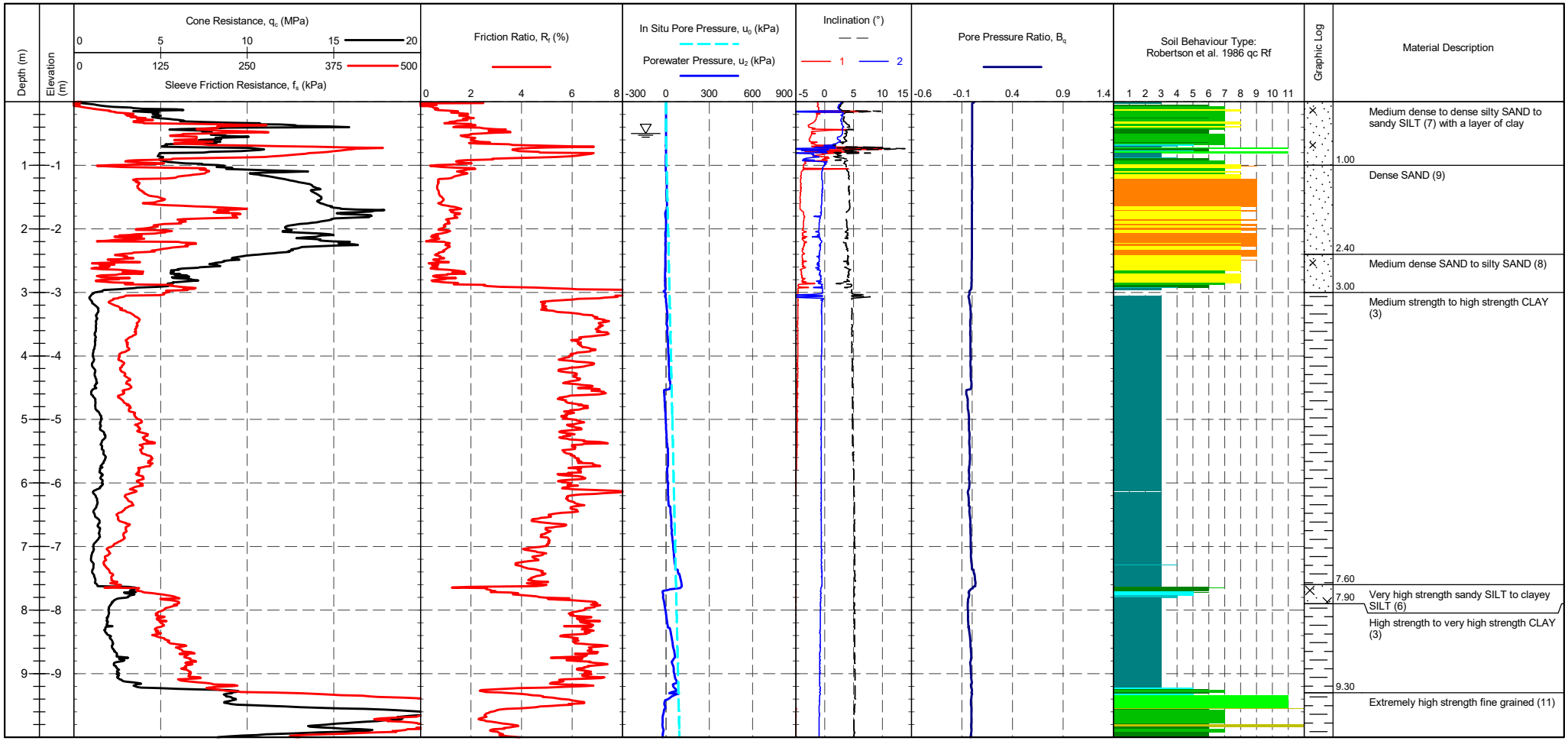
220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:37 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

PointID: **CPT107A**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm²	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	266 mV	266 mV	0 MPa
Sleeve	339 mV	339 mV	0 kPa
Pore Pressure 2	257 mV	255 mV	-0.001 kPa
X-Y Inclinometer	2435 mV	2483 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 01

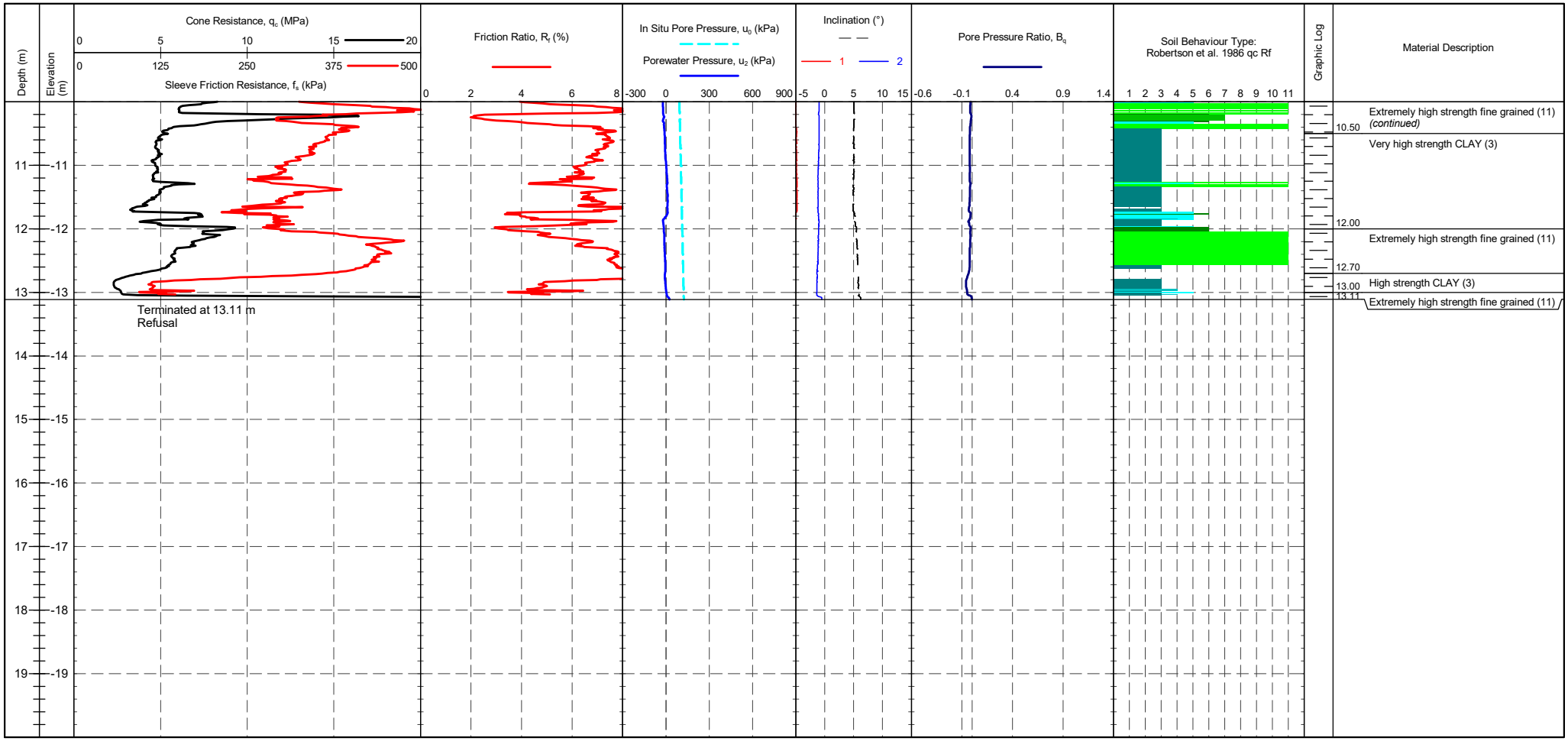
PointID: **CPT107A**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2
CALIBRATION DATE	: 20/06/2023	APPLICATION CLASS	: 2
CONE MODEL	: Subtraction	RIG	: CPT 017 - Griffen
CONE AREA	: 15cm^2	OPERATOR	: DR
CONE AREA RATIO	: 0.79	FRICTION REDUCER	: None
FILTER POSITION	: u2	WEATHER	: Sunny & Cold
FILTER TYPE	: HDPE	GROUNDWATER DEPTH	: Assumed for calculation purposes

CPTU ZERO VALUES

Transducer	Pre	Post	Difference
Tip	266 mV	266 mV	0 MPa
Sleeve	339 mV	339 mV	0 kPa
Pore Pressure 2	257 mV	255 mV	-0.001 kPa
X-Y Inclinometer	2435 mV	2483 mV	

METHOD: Robertson et al. 1986 qc Rf

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

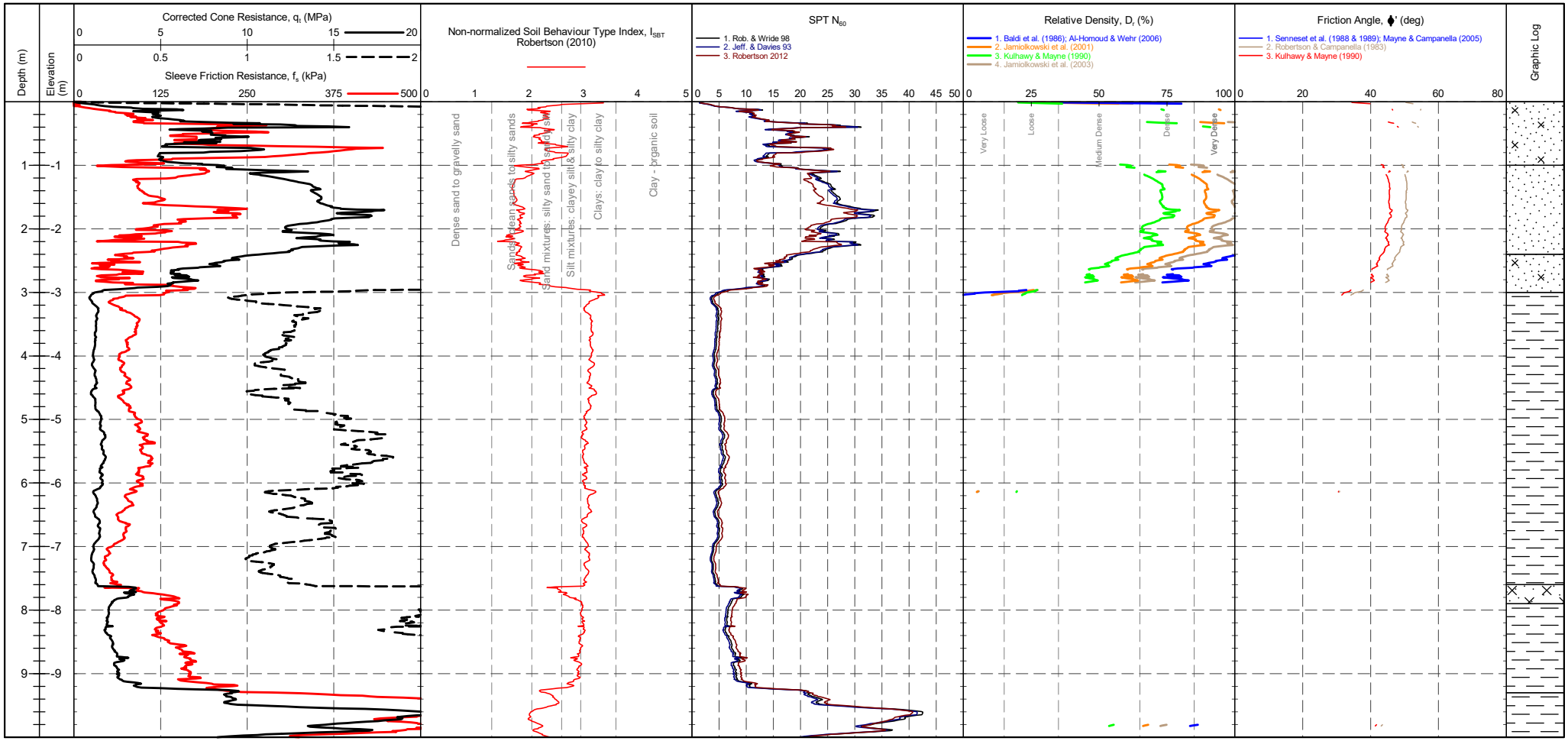
PointID **CPT107A**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 1 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2		
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

CPTU ZERO VALUES

	Pre	Post	Difference
Transducer			
Tip	266 mV	266 mV	0 MPa
Sleeve	339 mV	339 mV	0 kPa
Pore Pressure 2	257 mV	255 mV	-0.001 kPa
X-Y Inclinometer	2435 mV	2483 mV	

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

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

Groundwater Level

Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 02

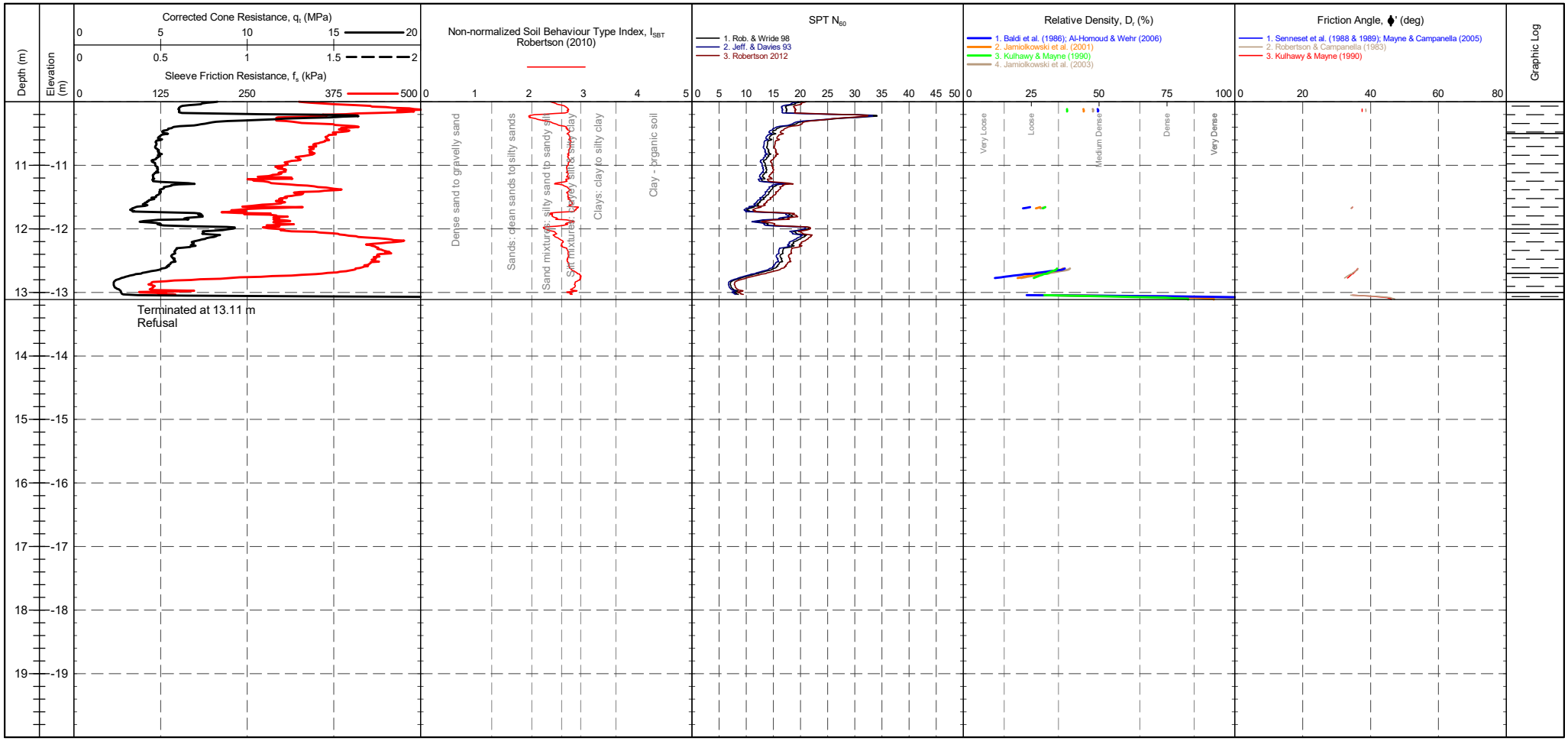
PointID **CPT107A**

CLIENT : LK Group
PROJECT : Chorlton Baths
LOCATION : Manchester
PROJECT No. : 1240458

EASTING : 0.000 m
NORTHING : 0.000 m
ELEVATION : 0.000 m OD
CHECKED BY : DW
TERMINATION REASON : Refusal

Remark:
Test refused on total pressure.

SHEET : 2 OF 2
STATUS : Final
TEST DATE : 24/10/2024
PLOT DATE : 25/10/2024
METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES	
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2		
CONE AREA	: 15cm²	RIG	: CPT 017 - Griffen		
CONE AREA RATIO	: 0.79	OPERATOR	: DR		
FILTER POSITION	: u2	FRICTION REDUCER	: None		
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold		

Transducer	Pre	Post	Difference
Tip	266 mV	266 mV	0 MPa
Sleeve	339 mV	339 mV	0 kPa
Pore Pressure 2	257 mV	255 mV	-0.001 kPa
X-Y Inclinometer	2435 mV	2483 mV	

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

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

Groundwater Level

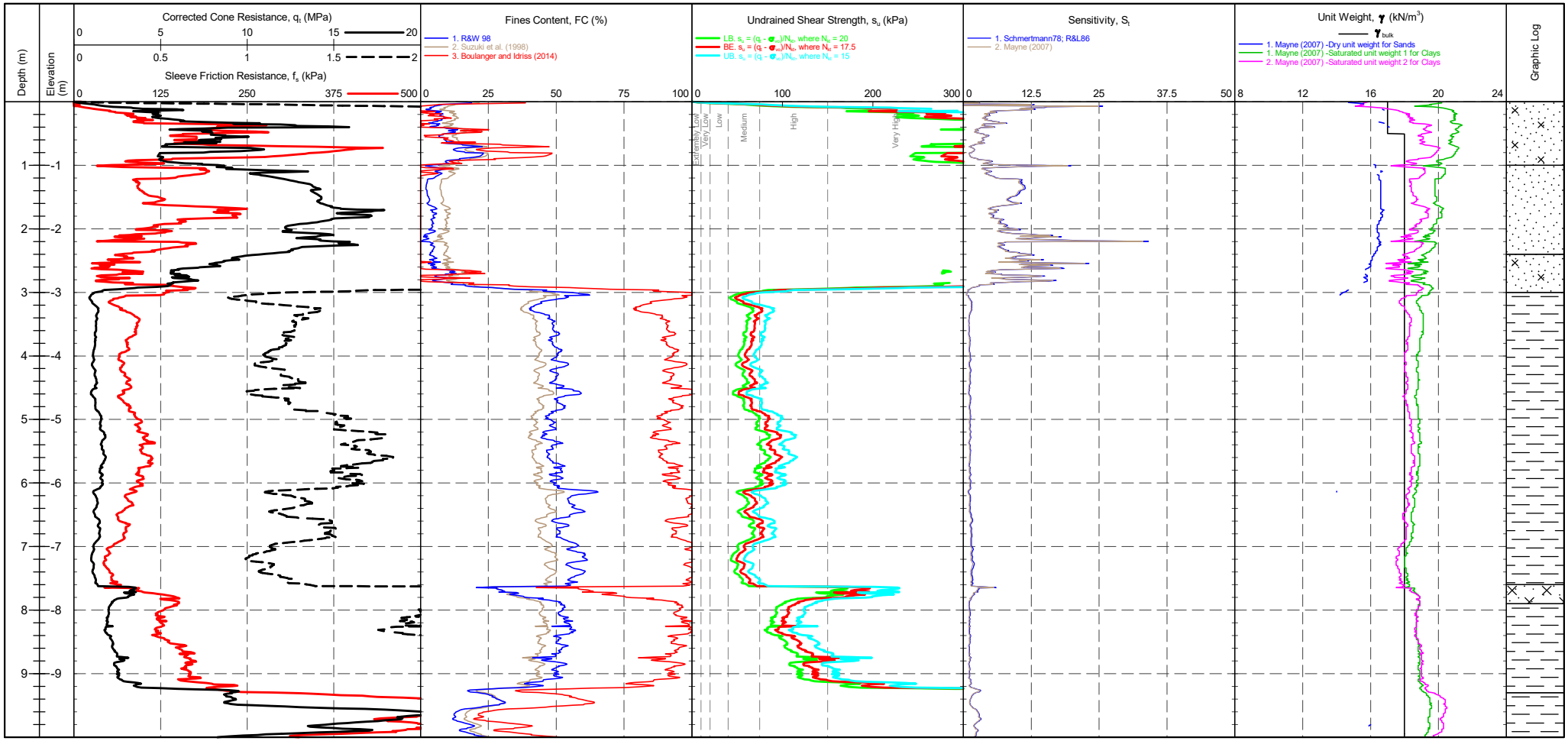
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID **CPT107A**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 1 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	266 mV	266 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	339 mV	339 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	257 mV	255 mV	-0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2435 mV	2483 mV	

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

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

Groundwater Level

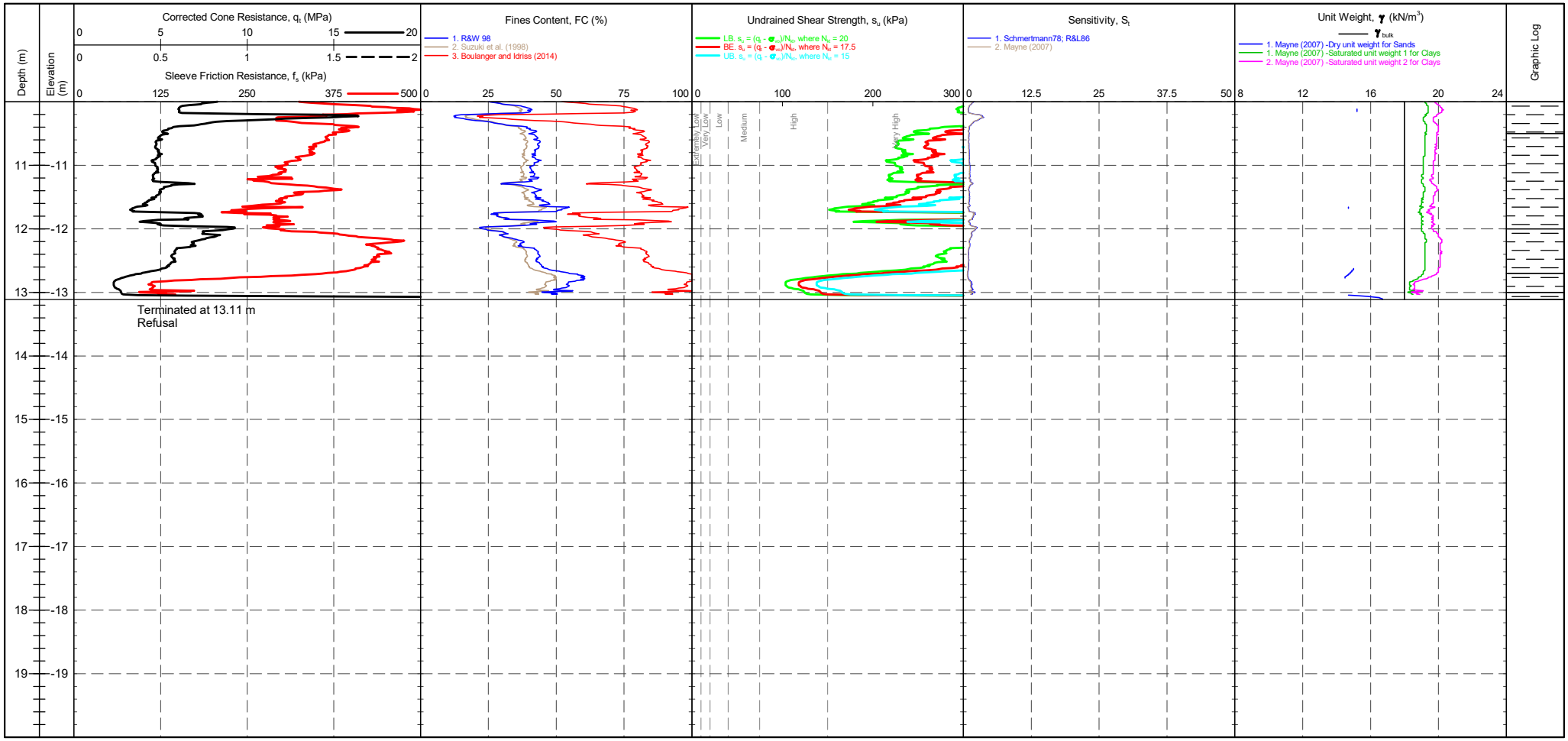
Dissipation Test

IN SITU SITE INVESTIGATION Working with: LK GROUP

CPT LOG 03

PointID: **CPT107A**

CLIENT : LK Group	EASTING : 0.000 m	Remark:	SHEET : 2 OF 2
PROJECT : Chorlton Baths	NORTHING : 0.000 m	Test refused on total pressure.	STATUS : Final
LOCATION : Manchester	ELEVATION : 0.000 m OD		TEST DATE : 24/10/2024
PROJECT No. : 1240458	CHECKED BY : DW		PLOT DATE : 25/10/2024
	TERMINATION REASON : Refusal		METHOD : ISO 22476-1:2022



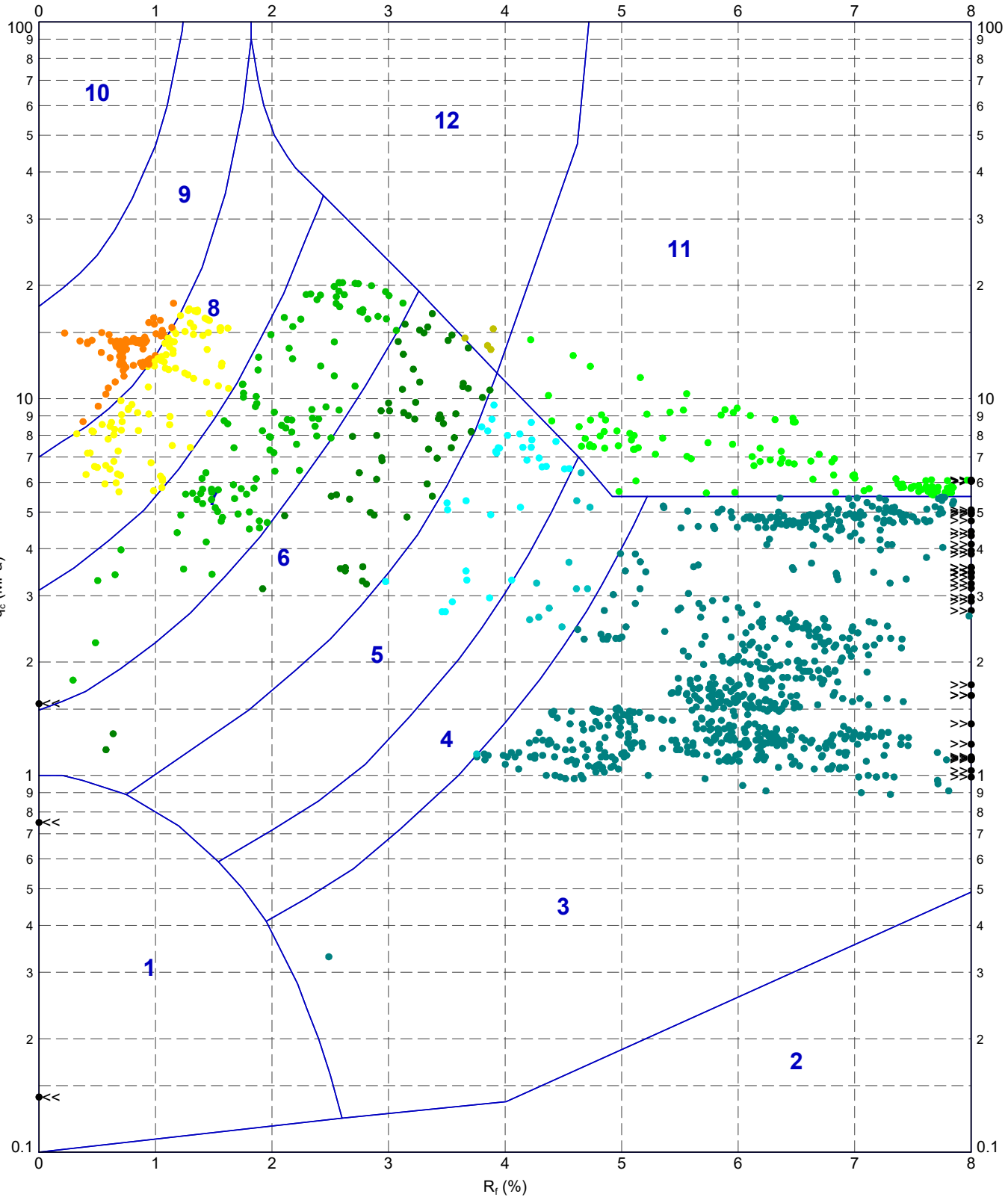
CONE ID	: S15-CFIP.2136	TEST TYPE	: TE2	CPTU ZERO VALUES			
CONE MODEL	: Subtraction	APPLICATION CLASS	: 2	Transducer	Pre	Post	Difference
CONE AREA	: 15cm^2	RIG	: CPT 017 - Griffen	Tip	266 mV	266 mV	0 MPa
CONE AREA RATIO	: 0.79	OPERATOR	: DR	Sleeve	339 mV	339 mV	0 kPa
FILTER POSITION	: u2	FRICTION REDUCER	: None	Pore Pressure 2	257 mV	255 mV	-0.001 kPa
FILTER TYPE	: HDPE	WEATHER	: Sunny & Cold	X-Y Inclinometer	2435 mV	2483 mV	

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

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

Groundwater Level

Dissipation Test



METHOD: Robertson et al. 1986 qc Rf

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

IN SITU
SITE INVESTIGATION

TITLE

LK Group
Manchester
Chorlton Baths
Robertson et al. 1986 q_c vs. R_f - CPT107A

DRAWN	DATE 25/10/2024	
CHECKED	DATE 25/10/2024	
SCALE Not To Scale		A4
PROJECT No 1240458	FIGURE No	

220629-ADVANCED REPORT INSITUSI 2.02.1 LIB - CHLOE.GLB Graph CPT ROBERTSON ET AL. 86 QC VS. RF A4P 1240458 CHORLTON BATHS LK GROUP.GPJ <<DrawingFile>> 25/10/2024 16:39 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: In Situ SI 2.02.0 2017-07-10 Prj: In Situ SI 2.02.0 2017-07-10



IN SITU SITE INVESTIGATION

Unit 23 Hastings Innovation
Centre,
Highfield Drive
St. Leonards on Sea, East Sussex,
TN38 9UH, U.K.

Company No.: 6339499
VAT No.: 922 3561 41

Appendix C – Certificates of Analysis (Soil)

Peter Dunn
LK Consult Limited
Unit 29 Eton Business Park
Eton Hill Road
Manchester
M26 2ZS

Normec DETS Limited
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 24-13219

Site Reference:	Chorlton Baths
Project / Job Ref:	LKC241317
Order No:	PO-C000521
Sample Receipt Date:	05/11/2024
Sample Scheduled Date:	05/11/2024
Report Issue Number:	1
Reporting Date:	11/11/2024

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

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.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24	01/11/24	01/11/24	01/11/24
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Chorlton Baths	**~TP / BH No**	WS101	WS101	WS102	WS103	WS104
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	ES
~Order No: PO-C000521	**~Depth (m)**	0.40 - 1.40	1.40 - 1.80	0.50 - 1.20	2.00 - 3.00	0.00 - 0.50
Reporting Date: 11/11/2024	**DETS Sample No**	748153	748154	748155	748156	748157

Determinand	**Unit**	**RL**	**Accreditation**	(n)				
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	**MCERTS**	10.1	9.1	8.3	8.9	9.5
Total Cyanide	mg/kg	< 1	NONE		< 1			
Free Cyanide	mg/kg	< 1	NONE		< 1			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	554	60	41	210	1650
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.55	0.06	0.04	0.21	1.65
Organic Matter (SOM)	%	< 0.1	**MCERTS**	3.2	0.7	1.3	2.2	4.8
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**					
W/S Chloride (2:1)	mg/l	< 0.5	**MCERTS**					
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**					
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	**MCERTS**					
Arsenic (As)	mg/kg	< 2	**MCERTS**	6	< 2	5	5	10
W/S Boron	mg/kg	< 1	NONE		< 1			
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	**MCERTS**	9	4	6	6	11
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	**MCERTS**	24	9	13	19	35
Lead (Pb)	mg/kg	< 3	**MCERTS**	59	56	42	51	197
W/S Magnesium	mg/l	< 0.1	NONE					
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	**MCERTS**	9	6	5	7	11
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	**MCERTS**	18	4	13	12	22
Zinc (Zn)	mg/kg	< 3	**MCERTS**	68	31	23	34	119
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results
(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24	01/11/24	01/11/24	01/11/24
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Chorlton Baths	**~TP / BH No**	WS104	WS105	WS105	WS102	WS104
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	ES
~Order No: PO-C000521	**~Depth (m)**	0.50 - 0.60	0.00 - 0.80	0.80 - 1.20	2.70 - 3.30	4.50 - 5.00
Reporting Date: 11/11/2024	**DETS Sample No**	748158	748159	748160	748161	748162

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**		Not Detected	Not Detected		
pH	pH Units	N/a	**MCERTS**	7.6	10.5	8.4	7.8	7.9
Total Cyanide	mg/kg	< 1	NONE		< 1			
Free Cyanide	mg/kg	< 1	NONE		< 1			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	121	1760	860	55	17
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.12	1.76	0.86	0.05	0.02
Organic Matter (SOM)	%	< 0.1	**MCERTS**		5	1.2		
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**	11			7	5
W/S Chloride (2:1)	mg/l	< 0.5	**MCERTS**	5.7			3.4	2.7
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**	24			6	< 3
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	**MCERTS**	12			2.8	< 1.5
Arsenic (As)	mg/kg	< 2	**MCERTS**		9	3		
W/S Boron	mg/kg	< 1	NONE		< 1			
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**		0.2	< 0.2		
Chromium (Cr)	mg/kg	< 2	**MCERTS**		11	7		
Chromium (hexavalent)	mg/kg	< 2	NONE		< 2	< 2		
Copper (Cu)	mg/kg	< 4	**MCERTS**		31	6		
Lead (Pb)	mg/kg	< 3	**MCERTS**		96	37		
W/S Magnesium	mg/l	< 0.1	NONE	1.1			0.9	0.8
Mercury (Hg)	mg/kg	< 1	**MCERTS**		< 1	< 1		
Nickel (Ni)	mg/kg	< 3	**MCERTS**		10	7		
Selenium (Se)	mg/kg	< 2	**MCERTS**		< 2	< 2		
Vanadium (V)	mg/kg	< 1	**MCERTS**		24	11		
Zinc (Zn)	mg/kg	< 3	**MCERTS**		116	31		
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	WS105	CP104			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO-C000521	**~Depth (m)**	3.50 - 4.00	8.50 - 8.95			
Reporting Date: 11/11/2024	**DETS Sample No**	748163	748164			

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**					
pH	pH Units	N/a	**MCERTS**	8.2	8.3			
Total Cyanide	mg/kg	< 1	NONE					
Free Cyanide	mg/kg	< 1	NONE					
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	38	24			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.04	0.02			
Organic Matter (SOM)	%	< 0.1	**MCERTS**					
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**	19	6			
W/S Chloride (2:1)	mg/l	< 0.5	**MCERTS**	9.5	3.2			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**	4	< 3			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	**MCERTS**	1.9	< 1.5			
Arsenic (As)	mg/kg	< 2	**MCERTS**					
W/S Boron	mg/kg	< 1	NONE					
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**					
Chromium (Cr)	mg/kg	< 2	**MCERTS**					
Chromium (hexavalent)	mg/kg	< 2	NONE					
Copper (Cu)	mg/kg	< 4	**MCERTS**					
Lead (Pb)	mg/kg	< 3	**MCERTS**					
W/S Magnesium	mg/l	< 0.1	NONE	1.6	1.8			
Mercury (Hg)	mg/kg	< 1	**MCERTS**					
Nickel (Ni)	mg/kg	< 3	**MCERTS**					
Selenium (Se)	mg/kg	< 2	**MCERTS**					
Vanadium (V)	mg/kg	< 1	**MCERTS**					
Zinc (Zn)	mg/kg	< 3	**MCERTS**					
Total Phenols (monohydric)	mg/kg	< 2	NONE					

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24	01/11/24	01/11/24	01/11/24
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Chorlton Baths	**~TP / BH No**	WS101	WS101	WS102	WS103	WS104
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	ES
~Order No: PO-C000521	**~Depth (m)**	0.40 - 1.40	1.40 - 1.80	0.50 - 1.20	2.00 - 3.00	0.00 - 0.50
Reporting Date: 11/11/2024	**DETS Sample No**	748153	748154	748155	748156	748157

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.48	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	0.22	< 0.1	0.36	0.32	0.14
Fluorene	mg/kg	< 0.1	MCERTS	0.12	< 0.1	0.29	0.17	0.13
Phenanthrene	mg/kg	< 0.1	MCERTS	1.92	0.10	3.91	2.65	1.11
Anthracene	mg/kg	< 0.1	MCERTS	0.37	< 0.1	0.82	0.47	0.25
Fluoranthene	mg/kg	< 0.1	MCERTS	2.43	< 0.1	6	4.41	1.30
Pyrene	mg/kg	< 0.1	MCERTS	2.31	< 0.1	6.16	5.92	1.20
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	1.19	< 0.1	2.93	3.15	0.61
Chrysene	mg/kg	< 0.1	MCERTS	1.29	< 0.1	2.88	3.51	0.69
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.36	< 0.1	3.22	3.17	0.64
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.52	< 0.1	0.88	0.73	0.26
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1.09	< 0.1	2.58	2.98	0.55
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.63	< 0.1	1.43	1.22	0.30
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.12	< 0.1	0.35	0.33	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.59	< 0.1	1.46	1.32	0.32
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	14.1	< 1.6	33.8	30.4	7.5

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(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	WS105	WS105			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO-C000521	**~Depth (m)**	0.00 - 0.80	0.80 - 1.20			
Reporting Date: 11/11/2024	**DETS Sample No**	748159	748160			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	0.13	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	0.15	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	4.64	0.12			
Anthracene	mg/kg	< 0.1	MCERTS	0.45	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	1.23	0.13			
Pyrene	mg/kg	< 0.1	MCERTS	1.04	0.13			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.45	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	0.55	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.57	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.21	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.43	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.29	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.25	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	10.4	< 1.6			

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	WS101	WS105			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO-C000521	**~Depth (m)**	1.40 - 1.80	0.00 - 0.80			
Reporting Date: 11/11/2024	**DETS Sample No**	748154	748159			

Determinand	**Unit**	**RL**	**Accreditation**	(n)				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	**MCERTS**	< 2	< 2			
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	**MCERTS**	< 2	< 2			
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	**MCERTS**	< 3	< 3			
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	**MCERTS**	< 3	< 3			
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	**MCERTS**	< 10	19			
Aliphatic >C34 - C44 : EH_CU_1D_AL	mg/kg	< 10	NONE	< 10	< 10			
Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	< 21			
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	< 2	< 2			
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	< 2	< 2			
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	< 2	2			
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	**MCERTS**	< 3	14			
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	**MCERTS**	< 10	< 10			
Aromatic >C35 - C44 : EH_CU_1D_AR	mg/kg	< 10	NONE	< 10	< 10			
Aromatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21			
Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42			

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-13219	**~Date Sampled**	01/11/24	01/11/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	WS101	WS105			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO-C000521	**~Depth (m)**	1.40 - 1.80	0.00 - 0.80			
Reporting Date: 11/11/2024	**DETS Sample No**	748154	748159			

Determinand	Unit	RL	Accreditation	(n)				
Benzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2			
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2			
o-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2			
MTBE : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5			

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Waste Acceptance Criteria Analytical Certificate

DETS Report No: 24-13219	**~Date Sampled**	01/11/24	
LK Consult Limited	**~Time Sampled**	None Supplied	
~Site Reference: Chorlton Baths	**~TP / BH No**	WS101	
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	
~Order No: PO-C000521	**~Depth (m)**	1.40 - 1.80	
Reporting Date: 11/11/2024	**DETS Sample No**	748154	

Determinand	**Unit**	**MDL**		**Landfill Waste Acceptance Criteria Limits**		
				Inert Waste Landfill	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
TOC[MU]	%	< 0.1	0.4	3%	5%	6%
Loss on Ignition[MU]	%	< 0.01	1.40	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10	500	--	--
Total PAH[MU]	mg/kg	< 1.7	< 1.7	100	--	--
pH[MU]	pH Units	N/a	9.1	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1	--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 * mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	0.0068	0.0042		0.082	0.5	2	25
Barium[U]	0.0140	0.0094		0.178	20	100	300
Cadmium[U]	< 0.0002	< 0.0002		< 0.002	0.04	1	5
Chromium[U]	0.0045	0.0017		0.036	0.5	10	70
Copper[U]	0.0104	0.0112		0.201	2	50	100
Mercury[U]	< 0.00004	< 0.00004		< 0.0004	0.01	0.2	2
Molybdenum[U]	0.0041	0.0009		0.022	0.5	10	30
Nickel[U]	0.0006	0.0005		0.0089	0.4	10	40
Lead[U]	0.0129	0.0346		0.585	**0.5**	10	50
Antimony[U]	< 0.0002	< 0.0002		< 0.002	0.06	0.7	5
Selenium[U]	0.0029	0.0011		0.0226	0.1	0.5	7
Zinc[U]	0.007	0.010		0.18	4	50	200
Chloride[U]	11	2		48	800	15000	25000
Fluoride[U]	< 0.5	< 0.5		< 1	10	150	500
Sulphate[U]	57	7		227	1000	20000	50000
TDS	159	57		1223	4000	60000	100000
Phenol Index[U]	< 0.01	< 0.01		< 0.5	1	-	-
DOC[U]	11.5	9.5		175	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.09						
Dry Matter (%)	95.6						
Moisture (%)	4.6						
Stage 1							
Volume Eluate L2 (litres)	0.17						
Filtered Eluate VE1 (litres)	0.16						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and Normec DETS Limited cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test
~Sample details provided by customer and can affect the validity of results
* DETS are accredited for the testing of leachate and not the leachate preparation stage which is unaccredited

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-13219	
LK Consult Limited	
~Site Reference: Chorlton Baths	
~Project / Job Ref: LKC241317	
~Order No: PO-C000521	
Reporting Date: 11/11/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
748153	WS101	ES	0.40 - 1.40	9.8	Brown sandy clay with stones and brick
748154	WS101	ES	1.40 - 1.80	3.9	Brown sand with stones
748155	WS102	ES	0.50 - 1.20	11.2	Brown sandy clay with stones
748156	WS103	ES	2.00 - 3.00	9.8	Brown sandy clay with stones and brick
748157	WS104	ES	0.00 - 0.50	14.3	Brown sandy clay with stones and vegetation
748158	WS104	ES	0.50 - 0.60	16.5	Brown sandy clay
748159	WS105	ES	0.00 - 0.80	9.5	Brown clayey sand with stones and brick
748160	WS105	ES	0.80 - 1.20	9.6	Brown sandy clay with stones
748161	WS102	ES	2.70 - 3.30	6.9	Brown clayey sand with stones
748162	WS104	ES	4.50 - 5.00	11.4	Brown clayey sand with stones
748163	WS105	ES	3.50 - 4.00	16.3	Brown clay
748164	CP104	ES	8.50 - 8.95	9.7	Brown clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-13219

LK Consult Limited

~Site Reference: Chorlton Baths

~Project / Job Ref: LKC241317

~Order No: PO-C000521

Reporting Date: 11/11/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received
~Sample details provided by customer and can affect the validity of results

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UKAS TESTING
4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 24-13219
LK Consult Limited
~Site Reference: Chorlton Baths
~Project / Job Ref: LKC241317
~Order No: PO-C000521
Reporting Date: 11/11/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	F	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	UF	Biological Oxygen Demand (BOD)	Determination using BOD sensors measuring the change of pressure	E133
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered
~Sample details provided by customer and can affect the validity of results

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List of HWOL Acronyms and Operators
DETS Report No: 24-13219
LK Consult Limited
~Site Reference: Chorlton Baths
~Project / Job Ref: LKC241317
~Order No: PO-C000521
Reporting Date: 11/11/2024

Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total
~	Sample details provided by customer and can affect the validity of results

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
Mineral Oil (C10 - C40) (BS EN 12457-3) - EH_CU_1D_AL
TPH - Aliphatic >C34 - C44 - raw data - EH_CU_1D_AL
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C34 - C44 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C35 - C44 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
Total BTEX (BS EN 12457-3) - HS_1D_MS_Total
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Parameter	Matrix Type	Expanded Uncertainity Measurement	Unit
TOC	Soil	12.2	%
Loss on Ignition	Soil	22.9	%
BTEX	Soil	11.2	%
Sum of PCBs	Soil	43.4	%
Mineral Oil	Soil	9.0	%
Total PAH	Soil	18.5	%
pH	Soil	0.335	Units
Acid Neutralisation Capacity	Soil	18.0	%
Clay Content	Soil	15.0	%
Silt Content	Soil	14.0	%
Sand Content	Soil	13.0	%
Loss on Ignition	Soil	22.9	%
pH	Soil	0.335	Units
Carbonate	Soil	12.0	%
Total Nitrogen	Soil	12.0	%
Phosphorus (Extractable)	Soil	24.0	%
Potassium (Extractable)	Soil	20.0	%
Magnesium (Extractable)	Soil	26.0	%
Zinc	Soil	21.6	%
Copper	Soil	18.2	%
Nickel	Soil	24.3	%
Available Sodium	Soil	23.0	%
Available Calcium	Soil	23.0	%
Electrical Conductivity	Soil	10.0	%

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DETS Report No: 24-13235

Site Reference:	Chorlton Baths
Project / Job Ref:	LKC241317
Order No:	PO-C000521
Sample Receipt Date:	31/10/2024
Sample Scheduled Date:	05/11/2024
Report Issue Number:	1
Reporting Date:	11/11/2024

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

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.

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Soil Analysis Certificate						
DETS Report No: 24-13235	**~Date Sampled**	29/10/24	29/10/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	CP104	CP104			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO-C000521	**~Depth (m)**	1.00 - 1.20	1.20 - 1.50			
Reporting Date: 11/11/2024	**DETS Sample No**	748253	748254			

Determinand	**Unit**	**RL**	**Accreditation**					
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected				
pH	pH Units	N/a	**MCERTS**	9.5	8.9			
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	1650	190			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	1.65	0.19			
Organic Matter (SOM)	%	< 0.1	**MCERTS**	2.5				
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**		19			
W/S Chloride (2:1)	mg/l	< 0.5	**MCERTS**		9.6			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	**MCERTS**		< 3			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	**MCERTS**		< 1.5			
Arsenic (As)	mg/kg	< 2	**MCERTS**	8				
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	< 0.2				
Chromium (Cr)	mg/kg	< 2	**MCERTS**	11				
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	**MCERTS**	23				
Lead (Pb)	mg/kg	< 3	**MCERTS**	94				
W/S Magnesium	mg/l	< 0.1	NONE		1.4			
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1				
Nickel (Ni)	mg/kg	< 3	**MCERTS**	9				
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2				
Vanadium (V)	mg/kg	< 1	**MCERTS**	18				
Zinc (Zn)	mg/kg	< 3	**MCERTS**	106				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

Normec DETS Limited
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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-13235	**~Date Sampled**	29/10/24				
LK Consult Limited	**~Time Sampled**	None Supplied				
~Site Reference: Chorlton Baths	**~TP / BH No**	CP104				
~Project / Job Ref: LKC241317	**~Additional Refs**	ES				
~Order No: PO-C000521	**~Depth (m)**	1.00 - 1.20				
Reporting Date: 11/11/2024	**DETS Sample No**	748253				

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1				
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1				
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1				
Phenanthrene	mg/kg	< 0.1	MCERTS	0.48				
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1				
Fluoranthene	mg/kg	< 0.1	MCERTS	0.46				
Pyrene	mg/kg	< 0.1	MCERTS	0.42				
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.15				
Chrysene	mg/kg	< 0.1	MCERTS	0.21				
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.14				
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1				
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.15				
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1				
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1				
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1				
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	2				

~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-13235	
LK Consult Limited	
~Site Reference: Chorlton Baths	
~Project / Job Ref: LKC241317	
~Order No: PO-C000521	
Reporting Date: 11/11/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
748253	CP104	ES	1.00 - 1.20	11.2	Brown clayey sand with stones and brick
748254	CP104	ES	1.20 - 1.50	17	Brown clayey sand with stones

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-13235

LK Consult Limited

~Site Reference: Chorlton Baths

~Project / Job Ref: LKC241317

~Order No: PO-C000521

Reporting Date: 11/11/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

~Sample details provided by customer and can affect the validity of results

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List of HWOL Acronyms and Operators
DETS Report No: 24-13235
LK Consult Limited
~Site Reference: Chorlton Baths
~Project / Job Ref: LKC241317
~Order No: PO-C000521
Reporting Date: 11/11/2024

Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total
~	Sample details provided by customer and can affect the validity of results

Det - Acronym

4480

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DETS Report No: 24-10916

Site Reference:	Chorlton Baths
Project / Job Ref:	LKC241317
Order No:	PO000360
Sample Receipt Date:	17/09/2024
Sample Scheduled Date:	17/09/2024
Report Issue Number:	1
Reporting Date:	24/09/2024

Authorised by:

Steve Knight
Customer Support Manager

Dates of laboratory activities for each tested analyte are available upon request.

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.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

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Soil Analysis Certificate						
DETS Report No: 24-10916	**~Date Sampled**	12/09/24	12/09/24	12/09/24	12/09/24	12/09/24
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Chorlton Baths	**~TP / BH No**	TP101	TP101	TP102	TP102	TP103
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	ES
~Order No: PO000360	**~Depth (m)**	0.05 - 1.00	1.00 - 2.00	0.00 - 0.60	0.60 - 1.50	0.30 - 1.00
Reporting Date: 24/09/2024	**DETS Sample No**	738523	738524	738525	738526	738527

Determinand	Unit	RL	Accreditation					(n)
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected		Not Detected		Not Detected
pH	pH Units	N/a	MCERTS	7.8	8.4	7.8	8.1	7.7
Total Cyanide	mg/kg	< 1	NONE	< 1		< 1		< 1
Free Cyanide	mg/kg	< 1	NONE	< 1		< 1		< 1
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	169	< 10	61	< 10	< 10
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.17	< 0.01	0.06	< 0.01	< 0.01
Organic Matter (SOM)	%	< 0.1	MCERTS	7.3		5.6		0.6
W/S Chloride (2:1)	mg/kg	< 1	MCERTS		11		4	6
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS		5.7		2.1	2.8
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS		< 3		< 3	< 3
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS		< 1.5		< 1.5	< 1.5
Arsenic (As)	mg/kg	< 2	MCERTS	23		20		3
W/S Boron	mg/kg	< 1	NONE	1.1		< 1		< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.5		< 0.2		< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	14		12		7
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2		< 2
Copper (Cu)	mg/kg	< 4	MCERTS	105		59		7
Lead (Pb)	mg/kg	< 3	MCERTS	212		141		6
W/S Magnesium	mg/l	< 0.1	NONE		0.3		0.6	0.8
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	30		14		9
Selenium (Se)	mg/kg	< 2	MCERTS	< 2		< 2		< 2
Vanadium (V)	mg/kg	< 1	MCERTS	44		23		8
Zinc (Zn)	mg/kg	< 3	MCERTS	148		78		27
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2		< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results
(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate						
DETS Report No: 24-10916	**~Date Sampled**	12/09/24	12/09/24			
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied			
~Site Reference: Chorlton Baths	**~TP / BH No**	TP104	TP104			
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES			
~Order No: PO000360	**~Depth (m)**	0.20 - 1.00	2.50 - 3.00			
Reporting Date: 24/09/2024	**DETS Sample No**	738528	738529			

Determinand	Unit	RL	Accreditation	(n)				
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected				
pH	pH Units	N/a	MCERTS	9.8	5.3			
Total Cyanide	mg/kg	< 1	NONE	< 1				
Free Cyanide	mg/kg	< 1	NONE	< 1				
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	487	835			
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.49	0.84			
Organic Matter (SOM)	%	< 0.1	MCERTS	5				
W/S Chloride (2:1)	mg/kg	< 1	MCERTS		53			
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS		26.4			
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS		1330			
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS		666			
Arsenic (As)	mg/kg	< 2	MCERTS	5				
W/S Boron	mg/kg	< 1	NONE	< 1				
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3				
Chromium (Cr)	mg/kg	< 2	MCERTS	9				
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2				
Copper (Cu)	mg/kg	< 4	MCERTS	9				
Lead (Pb)	mg/kg	< 3	MCERTS	26				
W/S Magnesium	mg/l	< 0.1	NONE		28			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1				
Nickel (Ni)	mg/kg	< 3	MCERTS	8				
Selenium (Se)	mg/kg	< 2	MCERTS	< 2				
Vanadium (V)	mg/kg	< 1	MCERTS	14				
Zinc (Zn)	mg/kg	< 3	MCERTS	36				
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
~Sample details provided by customer and can affect the validity of results

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-10916	**~Date Sampled**	12/09/24	12/09/24	12/09/24	12/09/24	
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Chorlton Baths	**~TP / BH No**	TP101	TP102	TP103	TP104	
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	
~Order No: PO000360	**~Depth (m)**	0.05 - 1.00	0.00 - 0.60	0.30 - 1.00	0.20 - 1.00	
Reporting Date: 24/09/2024	**DETS Sample No**	738523	738525	738527	738528	

Determinand	**Unit**	**RL**	**Accreditation**			(n)	(n)	
Naphthalene	mg/kg	< 0.1	MCERTS	0.83	0.28	< 0.1	< 0.1	
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	< 0.1	< 0.1	
Acenaphthene	mg/kg	< 0.1	MCERTS	6.68	0.58	< 0.1	0.16	
Fluorene	mg/kg	< 0.1	MCERTS	4.19	0.54	< 0.1	< 0.1	
Phenanthrene	mg/kg	< 0.1	MCERTS	37.30	4.91	< 0.1	3.79	
Anthracene	mg/kg	< 0.1	MCERTS	7.65	0.91	< 0.1	0.57	
Fluoranthene	mg/kg	< 0.1	MCERTS	46.30	7.73	< 0.1	5.21	
Pyrene	mg/kg	< 0.1	MCERTS	42.40	9.32	< 0.1	4.50	
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	19.30	4.15	< 0.1	3.36	
Chrysene	mg/kg	< 0.1	MCERTS	19.70	5.32	< 0.1	2.74	
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	16.10	3.61	< 0.1	2.56	
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	5.75	1.36	< 0.1	1.08	
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	17.50	4.66	< 0.1	2.97	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	8.42	2.40	< 0.1	1.42	
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	1.99	0.58	< 0.1	0.43	
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	6.83	2.14	< 0.1	1.55	
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	241	48.6	< 1.6	30.3	

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 24-10916	**~Date Sampled**	12/09/24	12/09/24	12/09/24	12/09/24	
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Chorlton Baths	**~TP / BH No**	TP101	TP102	TP103	TP104	
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	
~Order No: PO000360	**~Depth (m)**	0.05 - 1.00	0.00 - 0.60	0.30 - 1.00	0.20 - 1.00	
Reporting Date: 24/09/2024	**DETS Sample No**	738523	738525	738527	738528	

Determinand	**Unit**	**RL**	**Accreditation**			(n)	(n)	
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	**MCERTS**	4	< 3	< 3	5	
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	**MCERTS**	4	8	< 3	60	
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	**MCERTS**	12	73	< 10	647	
Aliphatic >C34 - C44 : EH_CU_1D_AL	mg/kg	< 10	NONE	< 10	< 10	< 10	177	
Aliphatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	< 21	81	< 21	888	
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	**MCERTS**	41	6	< 2	2	
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	**MCERTS**	254	58	< 3	61	
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	**MCERTS**	276	200	< 10	639	
Aromatic >C35 - C44 : EH_CU_1D_AR	mg/kg	< 10	NONE	13	34	< 10	168	
Aromatic (C5 - C44) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	584	299	< 21	870	
Total >C5 - C44 : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	604	380	< 42	1759	

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 24-10916	**~Date Sampled**	12/09/24	12/09/24	12/09/24	12/09/24	
LK Consult Limited	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	
~Site Reference: Chorlton Baths	**~TP / BH No**	TP101	TP102	TP103	TP104	
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	ES	ES	ES	
~Order No: PO000360	**~Depth (m)**	0.05 - 1.00	0.00 - 0.60	0.30 - 1.00	0.20 - 1.00	
Reporting Date: 24/09/2024	**DETS Sample No**	738523	738525	738527	738528	

Determinand	Unit	RL	Accreditation					
						(n)	(n)	
Benzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
Toluene : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
o-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	
MTBE : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	

~Sample details provided by customer and can affect the validity of results
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Waste Acceptance Criteria Analytical Certificate

DETS Report No: 24-10916	**~Date Sampled**	12/09/24	
LK Consult Limited	**~Time Sampled**	None Supplied	
~Site Reference: Chorlton Baths	**~TP / BH No**	TP101	
~Project / Job Ref: LKC241317	**~Additional Refs**	ES	
~Order No: PO000360	**~Depth (m)**	0.05 - 1.00	
Reporting Date: 24/09/2024	**DETS Sample No**	738523	

Determinand	**Unit**	**MDL**		**Landfill Waste Acceptance Criteria Limits**		
				Inert Waste Landfill	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
TOC[MU]	%	< 0.1	4.3	**3%**	5%	6%
Loss on Ignition[MU]	%	< 0.01	6.60	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	21	500	--	--
Total PAH[MU]	mg/kg	< 1.7	242	**100**	--	--
pH[MU]	pH Units	N/a	7.8	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1	--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 * mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	0.0046	0.0039		0.071	0.5	2	25
Barium[U]	0.0456	0.0310		0.573	20	100	300
Cadmium[U]	< 0.0002	< 0.0002		< 0.002	0.04	1	5
Chromium[U]	0.0004	0.0005		0.009	0.5	10	70
Copper[U]	0.0139	0.0056		0.107	2	50	100
Mercury[U]	< 0.00004	< 0.00004		< 0.0004	0.01	0.2	2
Molybdenum[U]	0.0428	0.0152		0.298	0.5	10	30
Nickel[U]	0.0013	0.0008		0.0153	0.4	10	40
Lead[U]	0.0011	0.0031		0.054	0.5	10	50
Antimony[U]	0.0147	0.0084		0.157	**0.06**	0.7	5
Selenium[U]	0.0006	0.0004		0.0076	0.1	0.5	7
Zinc[U]	0.020	0.006		0.12	4	50	200
Chloride[U]	3	< 1		16	800	15000	25000
Fluoride[U]	1	0.9		15.6	**10**	150	500
Sulphate[U]	75	20		405	1000	20000	50000
TDS	212	99		1881	4000	60000	100000
Phenol Index[U]	< 0.01	< 0.01		< 0.5	1	-	-
DOC[U]	21.7	11.5		217	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.10						
Dry Matter (%)	88.4						
Moisture (%)	13.2						
Stage 1							
Volume Eluate L2 (litres)	0.16						
Filtered Eluate VE1 (litres)	0.07						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and Normec DETS Limited cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test
~Sample details provided by customer and can affect the validity of results
* DETS are accredited for the testing of leachate and not the leachate preparation stage which is unaccredited

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Waste Acceptance Criteria Analytical Certificate

DETS Report No: 24-10916		**~Date Sampled**	12/09/24		**Landfill Waste Acceptance Criteria Limits**	
LK Consult Limited		**~Time Sampled**	None Supplied		**Inert Waste Landfill**	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
~Site Reference: Chorlton Baths		**~TP / BH No**	TP104				
~Project / Job Ref: LKC241317		**~Additional Refs**	ES				
~Order No: PO000360		**~Depth (m)**	0.20 - 1.00				
Reporting Date: 24/09/2024		**DETS Sample No**	738528				
Determinand	**Unit**	**MDL**					
TOC[MU]	%	< 0.1	2.9		3%	5%	6%
Loss on Ignition[MU]	%	< 0.01	3.60		--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05		6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1		1	--	--
Mineral Oil[MU]	mg/kg	< 10	866		**500**	--	--
Total PAH[MU]	mg/kg	< 1.7	30.3		100	--	--
pH[MU]	pH Units	N/a	9.8		--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	1.4		--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 * mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	0.0028	0.0038		0.068	0.5	2	25
Barium[U]	0.0388	0.0149		0.289	20	100	300
Cadmium[U]	< 0.0002	< 0.0002		< 0.002	0.04	1	5
Chromium[U]	0.0166	0.0027		0.060	0.5	10	70
Copper[U]	0.0171	0.0043		0.089	2	50	100
Mercury[U]	< 0.00004	< 0.00004		< 0.0004	0.01	0.2	2
Molybdenum[U]	0.0117	0.0012		0.030	0.5	10	30
Nickel[U]	0.0020	0.0005		0.0108	0.4	10	40
Lead[U]	< 0.0002	0.0005		0.008	0.5	10	50
Antimony[U]	< 0.0002	< 0.0002		< 0.002	0.06	0.7	5
Selenium[U]	0.0015	0.0003		0.0058	0.1	0.5	7
Zinc[U]	0.018	0.003		0.06	4	50	200
Chloride[U]	33	2		65	800	15000	25000
Fluoride[U]	< 0.5	< 0.5		< 1	10	150	500
Sulphate[U]	155	27		599	1000	20000	50000
TDS	296	48		1072	4000	60000	100000
Phenol Index[U]	< 0.01	< 0.01		< 0.5	1	-	-
DOC[U]	35	12		237	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.09						
Dry Matter (%)	92.9						
Moisture (%)	7.6						
Stage 1							
Volume Eluate L2 (litres)	0.17						
Filtered Eluate VE1 (litres)	0.07						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and Normec DETS Limited cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test
~Sample details provided by customer and can affect the validity of results
* DETS are accredited for the testing of leachate and not the leachate preparation stage which is unaccredited

Normec DETS Limited
Unit 1, Rose Lane Industrial Estate
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Tel : 01622 850410

Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-10916	
LK Consult Limited	
~Site Reference: Chorlton Baths	
~Project / Job Ref: LKC241317	
~Order No: PO000360	
Reporting Date: 24/09/2024	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
738523	TP101	ES	0.05 - 1.00	11.1	Black loamy sand with stones and concrete
738524	TP101	ES	1.00 - 2.00	8.8	Brown sandy clay with stones
738525	TP102	ES	0.00 - 0.60	11	Black loamy sand with stones
738526	TP102	ES	0.60 - 1.50	5.7	Light brown sandy clay with stones
738527	TP103	ES	0.30 - 1.00	5.4	Light brown sand with stones
738528	TP104	ES	0.20 - 1.00	6.5	Brown sandy gravel with stones and concrete
738529	TP104	ES	2.50 - 3.00	31.8	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S
~Sample details provided by customer and can affect the validity of results

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Maidstone
Kent ME17 2JN
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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-10916

LK Consult Limited

~Site Reference: Chorlton Baths

~Project / Job Ref: LKC241317

~Order No: PO000360

Reporting Date: 24/09/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received
~Sample details provided by customer and can affect the validity of results

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UKAS TESTING
4480

Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 24-10916
LK Consult Limited
~Site Reference: Chorlton Baths
~Project / Job Ref: LKC241317
~Order No: PO000360
Reporting Date: 24/09/2024

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	F	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	UF	Biological Oxygen Demand (BOD)	Determination using BOD sensors measuring the change of pressure	E133
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by c	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detec	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethan	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered
~Sample details provided by customer and can affect the validity of results

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List of HWOL Acronyms and Operators
DETS Report No: 24-10916
LK Consult Limited
~Site Reference: Chorlton Baths
~Project / Job Ref: LKC241317
~Order No: PO000360
Reporting Date: 24/09/2024

Acronym	**Description**
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total
~	Sample details provided by customer and can affect the validity of results

Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
Mineral Oil (C10 - C40) (BS EN 12457-3) - EH_CU_1D_AL
TPH - Aliphatic >C34 - C44 - raw data - EH_CU_1D_AL
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C34 - C44 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C35 - C44 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C44 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C44 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
Total BTEX (BS EN 12457-3) - HS_1D_MS_Total
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Parameter	Matrix Type	Expanded Uncertainity Measurement	Unit
TOC	Soil	12.2	%
Loss on Ignition	Soil	22.9	%
BTEX	Soil	11.2	%
Sum of PCBs	Soil	43.4	%
Mineral Oil	Soil	9.0	%
Total PAH	Soil	18.5	%
pH	Soil	0.335	Units
Acid Neutralisation Capacity	Soil	18.0	%
Clay Content	Soil	15.0	%
Silt Content	Soil	14.0	%
Sand Content	Soil	13.0	%
Loss on Ignition	Soil	22.9	%
pH	Soil	0.335	Units
Carbonate	Soil	12.0	%
Total Nitrogen	Soil	12.0	%
Phosphorus (Extractable)	Soil	24.0	%
Potassium (Extractable)	Soil	20.0	%
Magnesium (Extractable)	Soil	26.0	%
Zinc	Soil	21.6	%
Copper	Soil	18.2	%
Nickel	Soil	24.3	%
Available Sodium	Soil	23.0	%
Available Calcium	Soil	23.0	%
Electrical Conductivity	Soil	10.0	%

Appendix D – Certificates of Analysis (Geotechnical)

LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

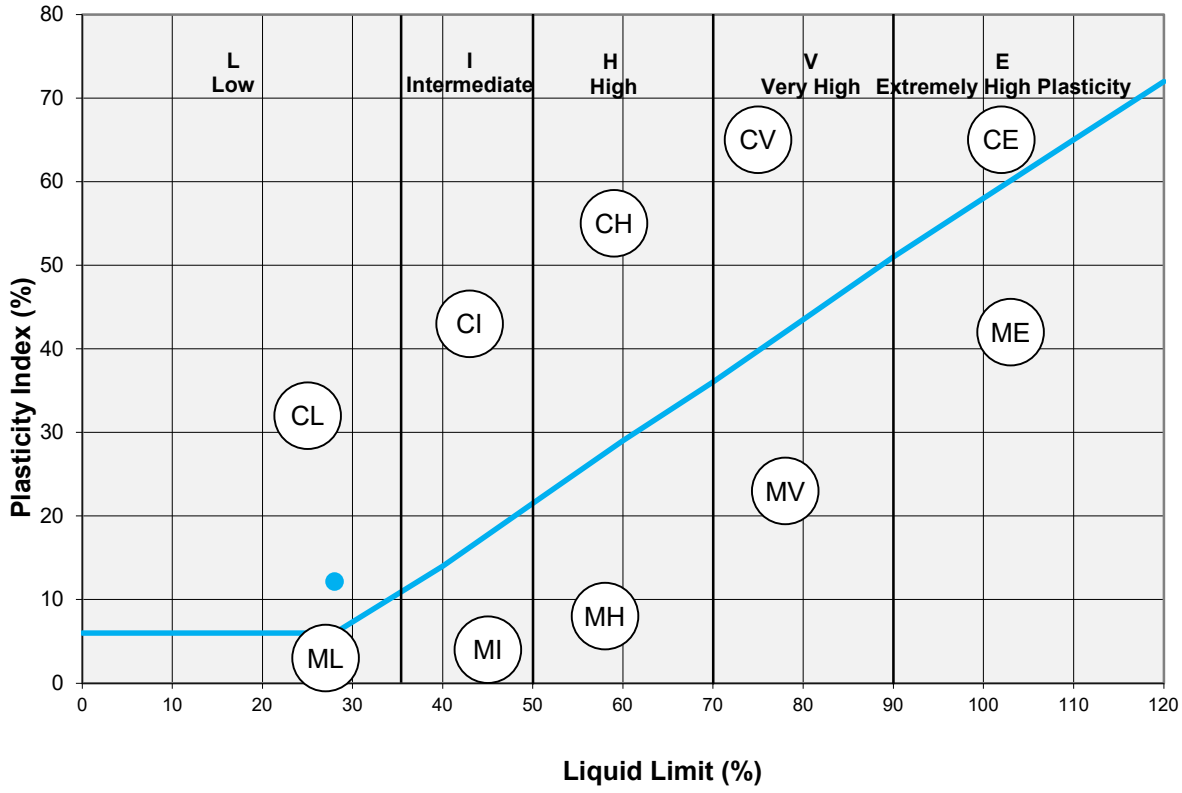
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** CP103 10.90-11.20m

Contract No. LKC241317

Sample Description	Brown gravelly sandy CLAY

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
13.7	28	16	12	CL	93



Tested By: HW **Checked By:** CW

Date: 08/11/2024 **Date:** 08/11/2024

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Eton Hill Road, Radcliffe
Manchester, M26 2ZS

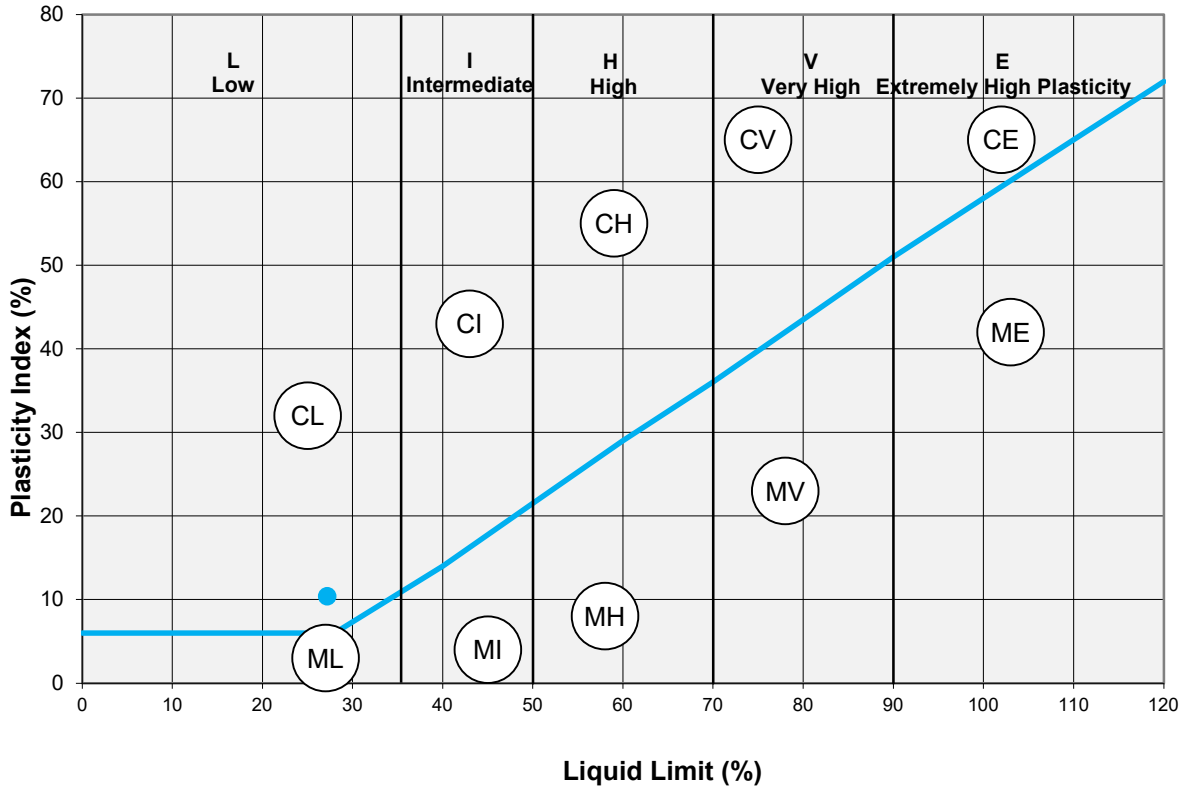
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** CP104 9.00-9.30m

Contract No. LKC241317

Sample Description	Brown gravelly sandy CLAY.

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
12.9	27	17	10	CL	90



Tested By: EH / HW **Checked By:** CW

Date: 12/11/2024 **Date:** 13/11/2024

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Eton Hill Road, Radcliffe
Manchester, M26 2ZS

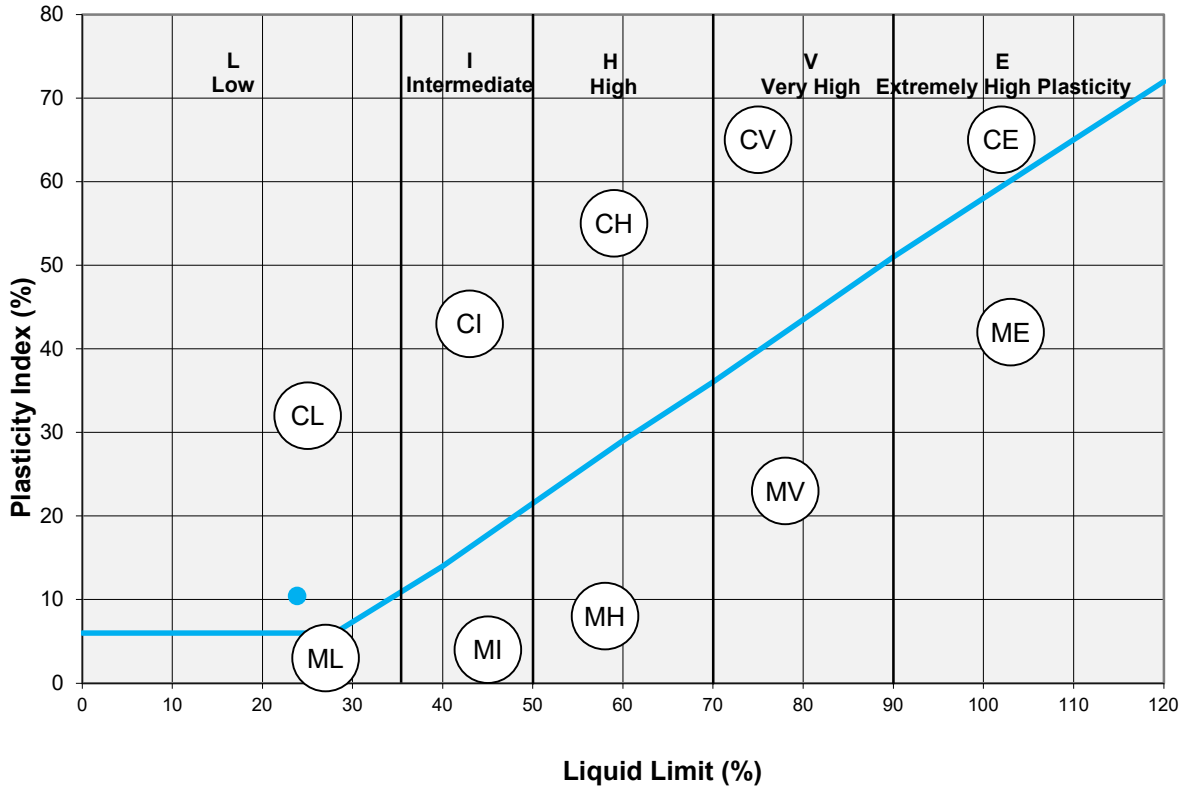
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** CP104 13.10-13.50m

Contract No. LKC241317

Sample Description	Brown gravelly very sandy CLAY.

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
11.0	24	13	10	CL	93



Tested By: HW/EH **Checked By:** CW

Date: 20/11/2024 **Date:** 09/12/2024

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Manchester, M26 2ZS

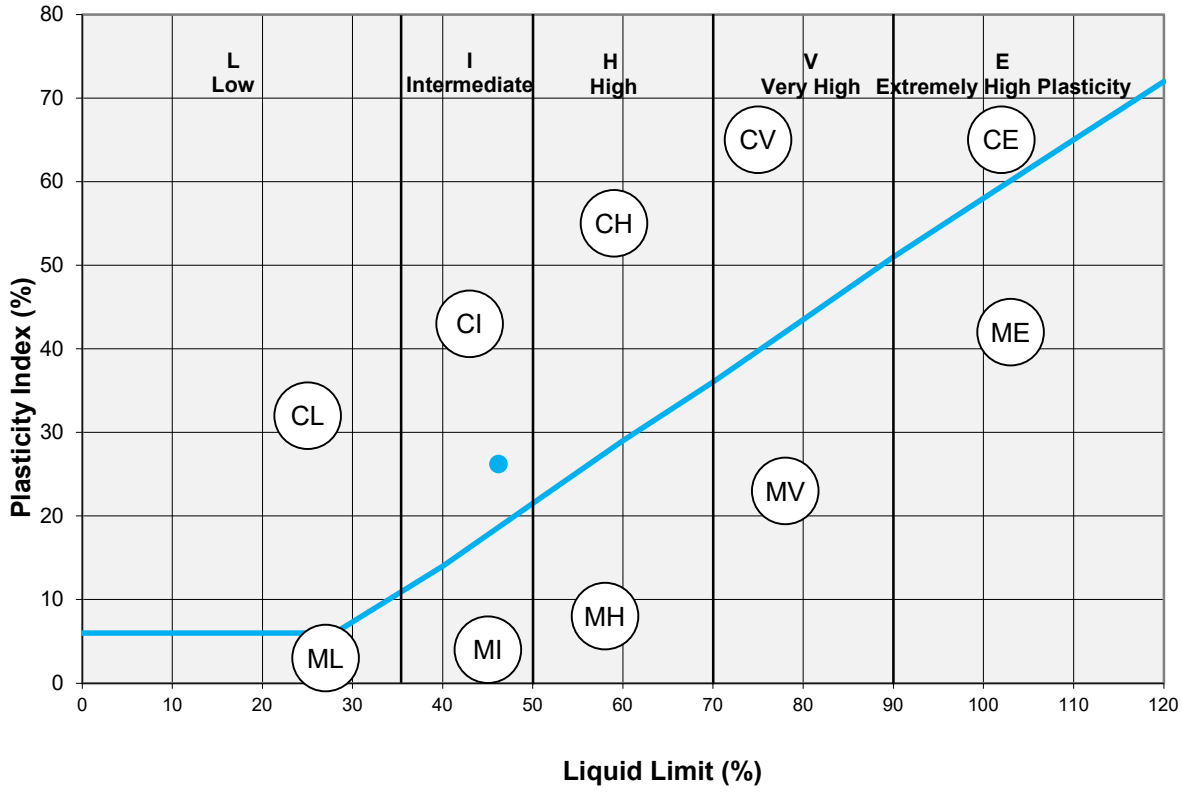
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** WS101 3.50-4.00m

Contract No. LKC241317

Sample Description	Brown gravelly sandy silty CLAY.

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
21.9	46	20	26	CI	98



Tested By: EH / HW **Checked By:** CW

Date: 15/11/2024 **Date:** 18/11/2024

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Eton Hill Road, Radcliffe
Manchester, M26 2ZS

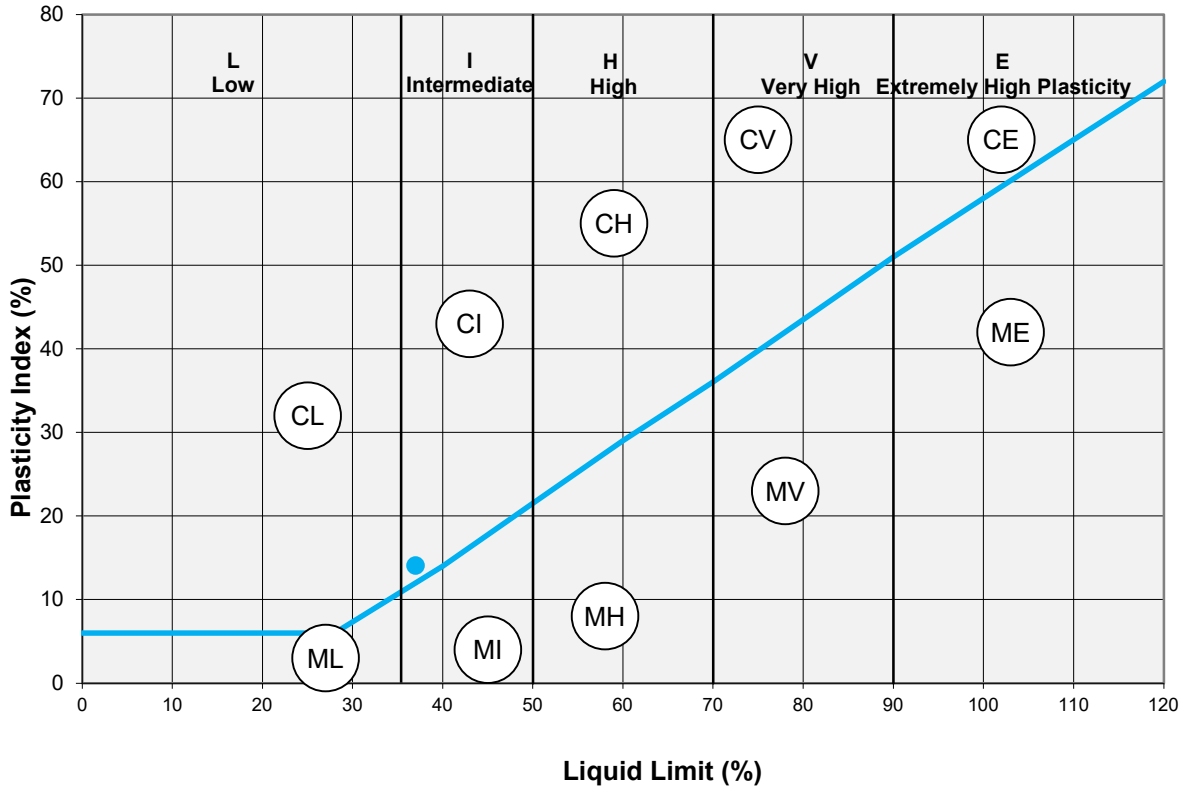
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** WS104 3.50-4.00m

Contract No. LKC241317

Sample Description	Brown gravelly sandy CLAY.

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
16.6	37	23	14	CI	83



Tested By: EH / HW **Checked By:** CW

Date: 15/11/2024 **Date:** 18/11/20024

LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

Site:	Chorlton Baths, Chorlton	**Job Number:**	LKC241317
Sample:	CP104	**Depth:**	1.70-2.00m

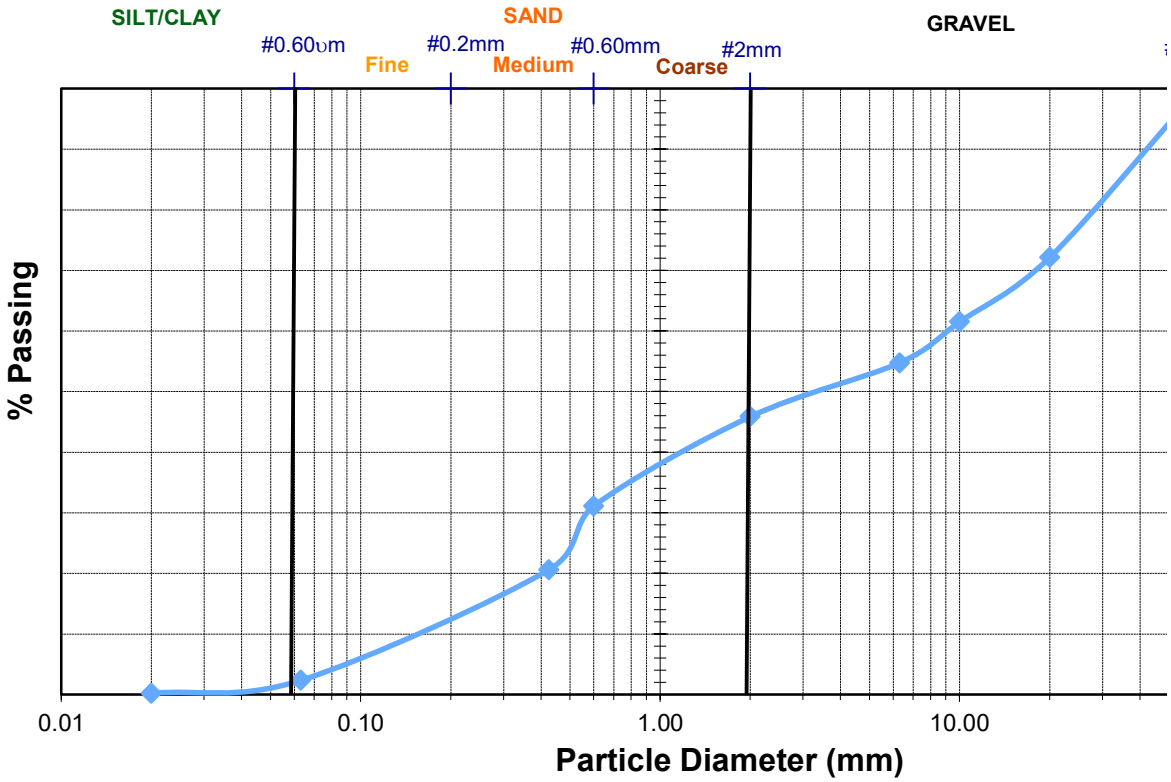
Sample Description:	**Light brown silty very sandy GRAVEL.**

Weight of Container (g): 1249.0 **Weight of Container & Soil (g):**

Weight of Dry Container and Sample (g): 7184.0 **Weight of dry sample (g):**

As received moisture content:

Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)
63.00	0.0	0.0	0.0	0.0
20.00	1370.0	3023.0	1653.0	27.9
10.00	1191.0	1822.0	631.0	10.6
6.30	1008.0	1410.0	402.0	6.8
2.00	529.0	1054.0	525.0	8.8
0.60	535.0	1412.0	877.0	14.8
0.43	459.0	1082.0	623.0	10.5
0.06	481.0	1565.0	1084.0	18.3
0.020	450.0	577.0	127.0	2.1
Pan	363.0	369.0	6.0	0.1
		TOTAL:	**5928**	**99.9**



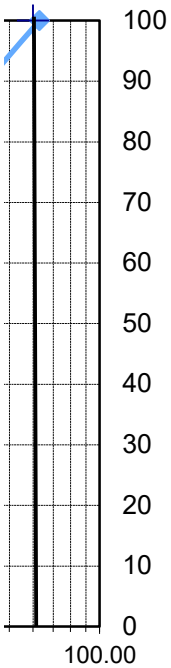
Tested By:	**HW**	**Checked By:**	**CW**
Date:	**02/12/2024**	**Date:**	**02/12/2(**

NSULT LIMITED

7994.0
5935.0
14%

Soil Passing (%)
100.0
72.1
61.5
54.7
45.9
31.1
20.6
2.4
0.2
0.1

#60mm



)24

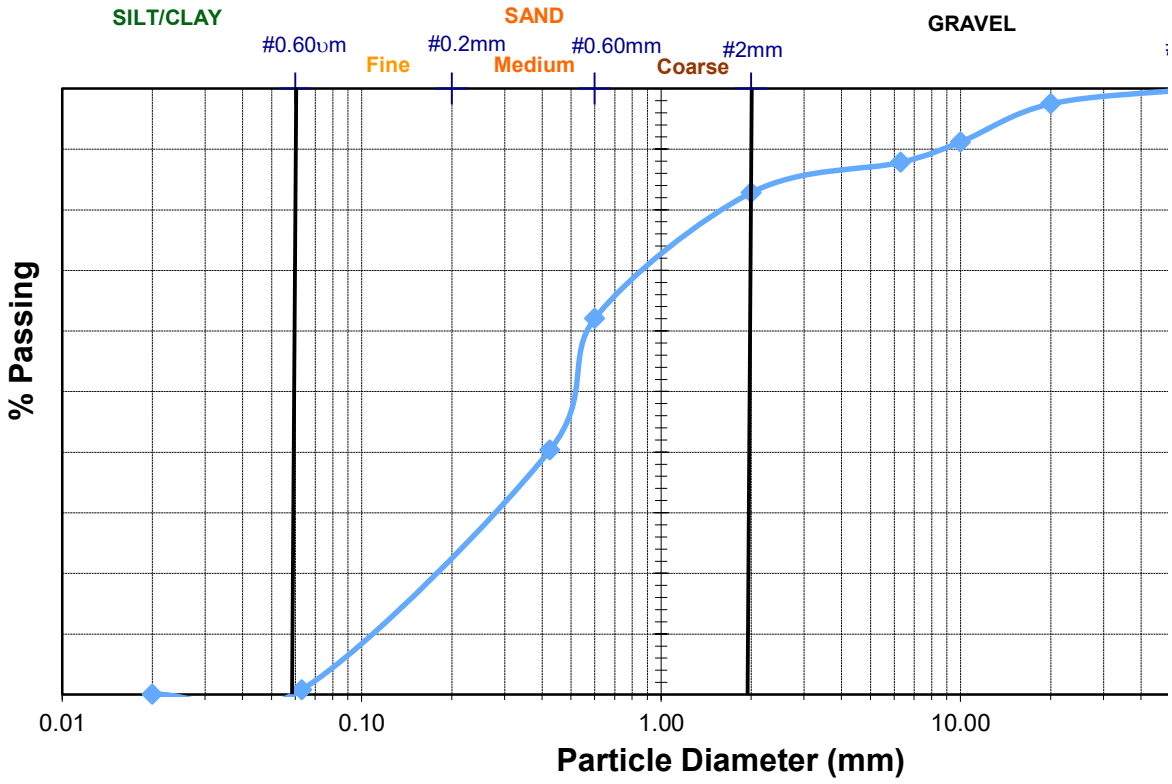
LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

Site:	Chorlton Baths, Chorlton	**Job Number:**	LKC241317
Sample:	WS101	**Depth:**	1.80-3.00m

Sample Description:	**light brown gravelly SAND**

Weight of Container (g): 1240.0
Weight of Container & Soil (g):
Weight of Dry Container and Sample (g): 6739.0
Weight of dry sample (g):
As received moisture content:

Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)
63.00	0.0	0.0	0.0	0.0
20.00	1370.0	1507.0	137.0	2.5
10.00	1191.0	1538.0	347.0	6.3
6.30	1008.0	1193.0	185.0	3.4
2.00	529.0	803.0	274.0	5.0
0.60	535.0	1677.0	1142.0	20.8
0.43	459.0	1653.0	1194.0	21.7
0.06	481.0	2657.0	2176.0	39.6
0.020	450.0	490.0	40.0	0.7
Pan	363.0	367.0	4.0	0.1
		TOTAL:	**5499**	**100.0**



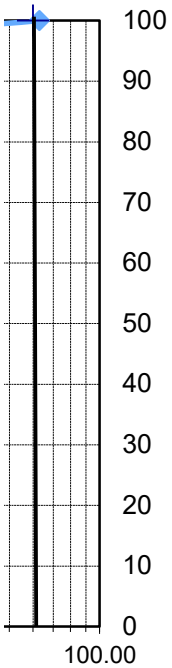
Tested By:	**HW**	**Checked By:**	**CW**
Date:	**06/12/2024**	**Date:**	**06/12/2(**

NSULT LIMITED

7004.0
5499.0
5%

Soil Passing (%)
100.0
97.5
91.2
87.8
82.9
62.1
40.4
0.8
0.1
0.0

#60mm



)24

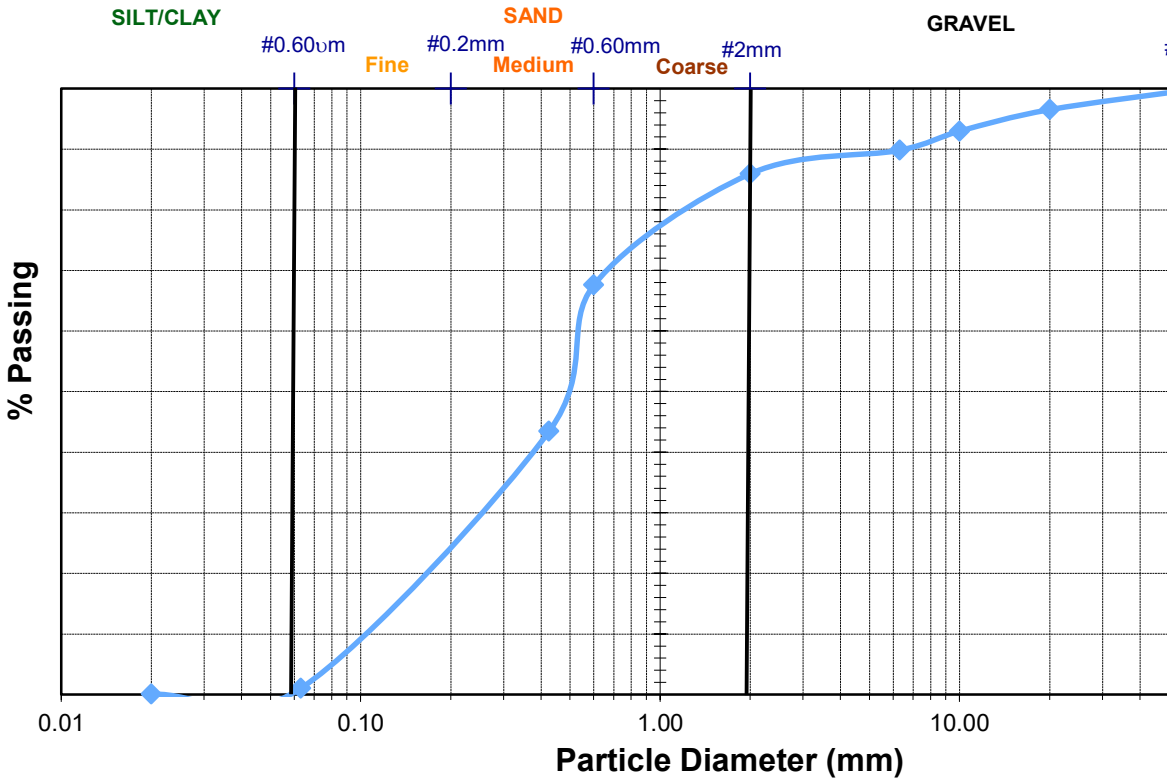
LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

Site:	Chorlton Baths, Chorlton	**Job Number:**	LKC241317
Sample:	WS102	**Depth:**	1.20-2.70m

Sample Description:	**Light brown gravelly SAND**

Weight of Container (g): 1354.0
Weight of Container & Soil (g):
Weight of Dry Container and Sample (g): 5850.0
Weight of dry sample (g):
As received moisture content:

Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)
63.00	0.0	0.0	0.0	0.0
20.00	1370.0	1525.0	155.0	3.4
10.00	1191.0	1351.0	160.0	3.6
6.30	1008.0	1150.0	142.0	3.2
2.00	529.0	704.0	175.0	3.9
0.60	535.0	1360.0	825.0	18.3
0.43	459.0	1544.0	1085.0	24.1
0.06	481.0	2388.0	1907.0	42.4
0.020	450.0	493.0	43.0	1.0
Pan	363.0	367.0	4.0	0.1
		TOTAL:	**4496**	**100.0**



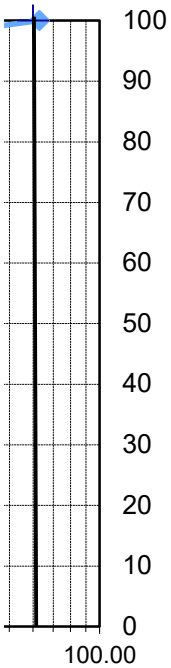
Tested By:	**HW**	**Checked By:**	**CW**
Date:	**04/12/2024**	**Date:**	**05/12/2(**

NSULT LIMITED

6094.0
4496.0
5%

Soil Passing (%)
100.0
96.6
93.0
89.8
85.9
67.6
43.5
1.0
0.1
0.0

#60mm



)24

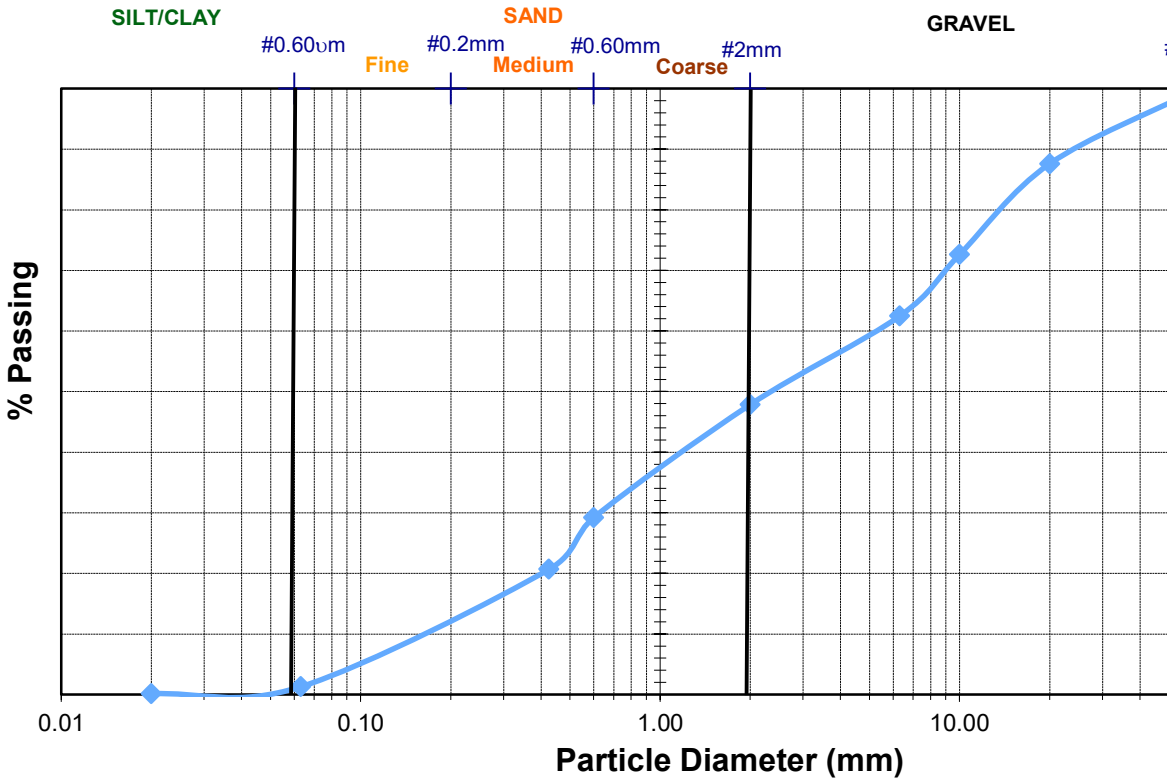
LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

Site:	Chorlton Baths, Chorlton	**Job Number:**	LKC241317
Sample:	WS104	**Depth:**	2.00-3.00m

Sample Description:	**Dark brown slightly silty very sandy GRAVEL**

Weight of Container (g): 1237.0
Weight of Container & Soil (g):
Weight of Dry Container and Sample (g): 4706.0
Weight of dry sample (g):
As received moisture content:

Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)
63.00	0.0	0.0	0.0	0.0
20.00	1370.0	1800.0	430.0	12.4
10.00	1191.0	1710.0	519.0	15.0
6.30	1008.0	1361.0	353.0	10.2
2.00	529.0	1035.0	506.0	14.6
0.60	535.0	1182.0	647.0	18.7
0.43	459.0	755.0	296.0	8.5
0.06	481.0	1154.0	673.0	19.4
0.020	450.0	490.0	40.0	1.2
Pan	363.0	368.0	5.0	0.1
		TOTAL:	**3469**	**100.0**



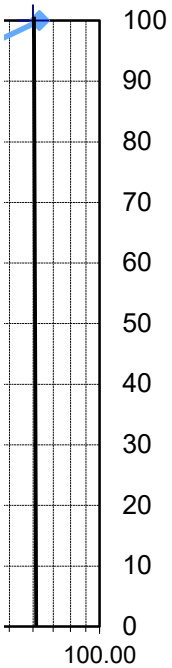
Tested By:	**HW**	**Checked By:**	**CW**
Date:	**04/12/2024**	**Date:**	**05/12/2(**

NSULT LIMITED

5057.0
3469.0
10%

Soil Passing (%)
100.0
87.6
72.6
62.5
47.9
29.2
20.7
1.3
0.1
0.0

#60mm



)24

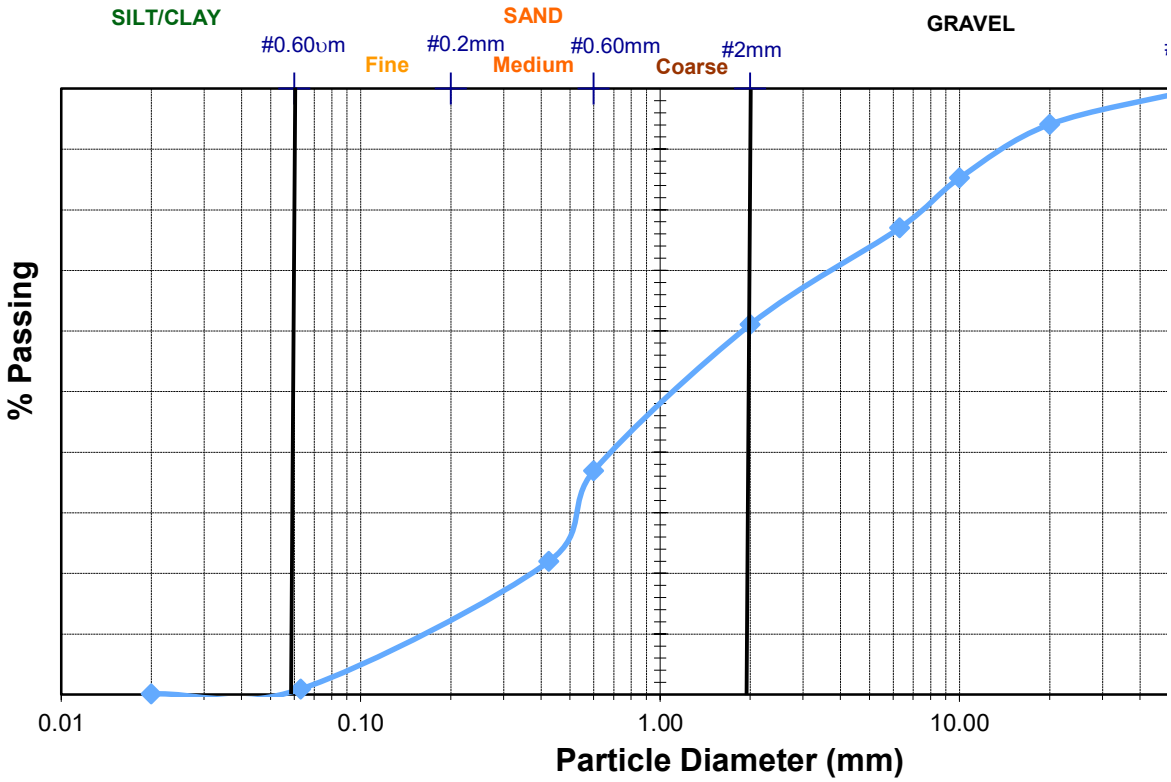
LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

Site:	Chorlton Baths, Chorlton	**Job Number:**	LKC241317
Sample:	WS105	**Depth:**	2.00-3.00m

Sample Description:	**Orangy brown gravelly SAND**

Weight of Container (g): 1249.0
Weight of Container & Soil (g):
Weight of Dry Container and Sample (g): 4627.0
Weight of dry sample (g):
As received moisture content:

Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)
63.00	0.0	0.0	0.0	0.0
20.00	1370.0	1570.0	200.0	5.9
10.00	1191.0	1489.0	298.0	8.8
6.30	1008.0	1287.0	279.0	8.3
2.00	529.0	1067.0	538.0	15.9
0.60	535.0	1350.0	815.0	24.1
0.43	459.0	964.0	505.0	14.9
0.06	481.0	1193.0	712.0	21.1
0.020	450.0	477.0	27.0	0.8
Pan	363.0	367.0	4.0	0.1
		TOTAL:	**3378**	**100.0**



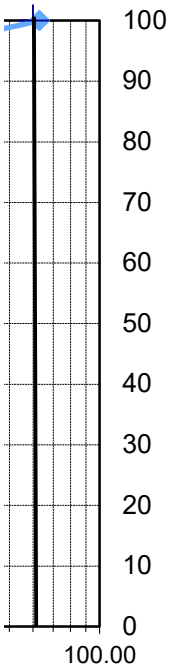
Tested By:	**HW**	**Checked By:**	**CW**
Date:	**06/12/2024**	**Date:**	**06/12/2(**

NSULT LIMITED

4913.0
3378.0
8%

Soil Passing (%)
100.0
94.1
85.3
77.0
61.1
36.9
22.0
0.9
0.1
0.0

#60mm



)24

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client LK Consult Ltd

Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Contract LKC 24 1317 -
Chorlton Baths

Job Number MRN 24076/96
Date of Issue 01 October 2024

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

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ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

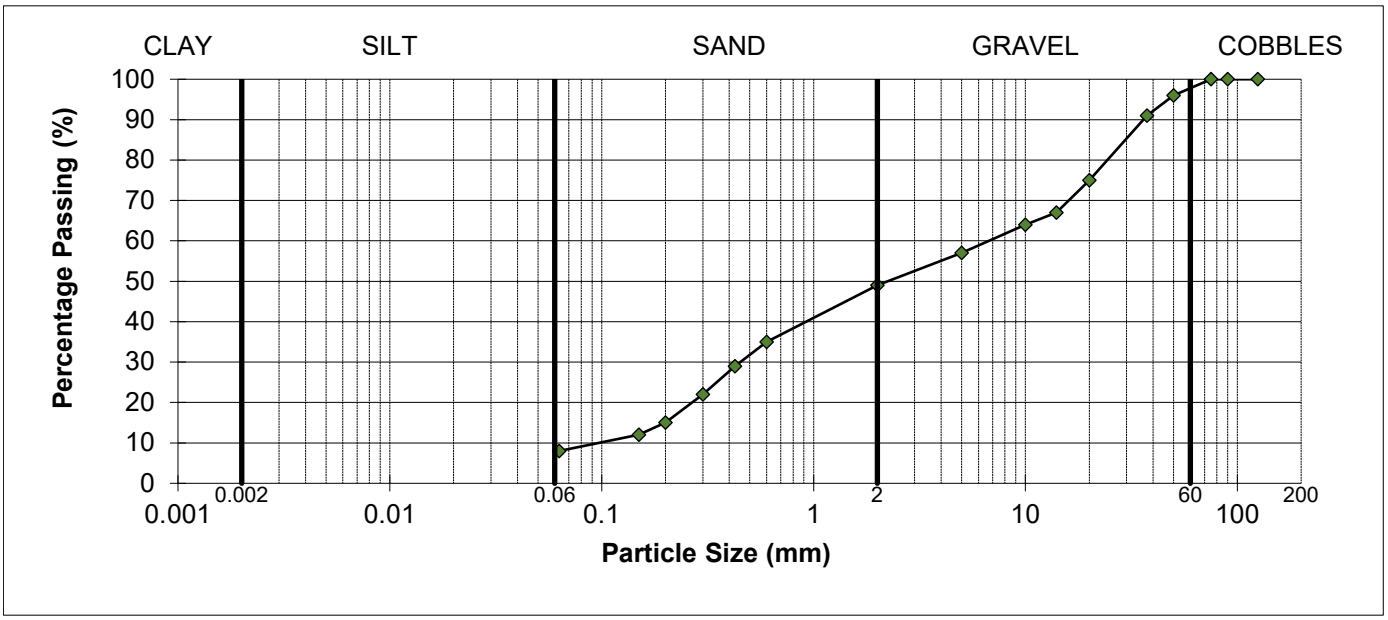
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP101 0.1-1 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554901	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	57	
90	100		2	49	
75	100		0.6	35	
50	96		0.425	29	
37.5	91		0.3	22	
20	75		0.2	15	
14	67		0.15	12	
10	64		0.063	8	



REMARKS
As received water content = 11.1%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

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DUKINFIELD, CHESHIRE SK16 4QX
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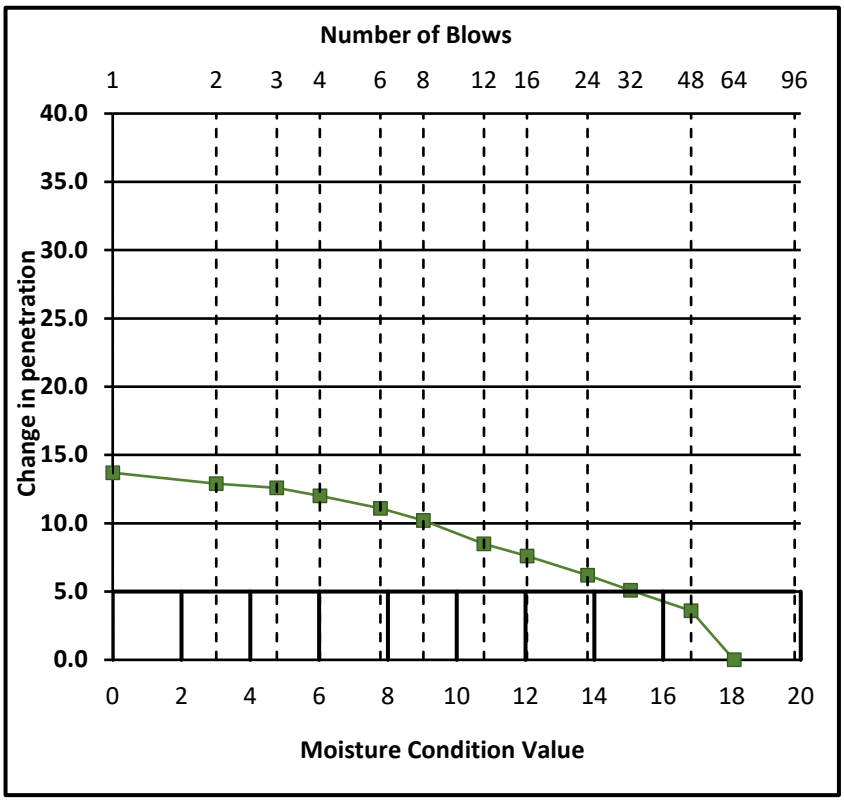
MOISTURE CONDITION VALUE
BS 1377-2:2022 Cl. 13
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014+A1:2022

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP101 0.1-1 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554901	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
INTERPRETATION OF TEST CURVE	Straight line through 5mm change in penetration
PROPORTION LARGER THAN 20mm	25%

Total number of blows (n)	Penetration (mm)	Change in penetration n to 4 n (mm)
1	99.2	13.7
2	92.2	12.9
3	88.3	12.6
4	85.5	12.0
6	81.8	11.1
8	79.3	10.2
12	75.7	8.5
16	73.5	7.6
24	70.7	6.2
32	69.1	5.1
48	67.2	3.6
64	65.9	
96	64.5	
128	64.0	
192	63.6	
256		



MOISTURE CONDITION VALUE	**15.0**
WATER CONTENT	**14.2** %

REMARKS

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) SIGNED DATE 01-Oct-24

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DRY DENSITY/WATER CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

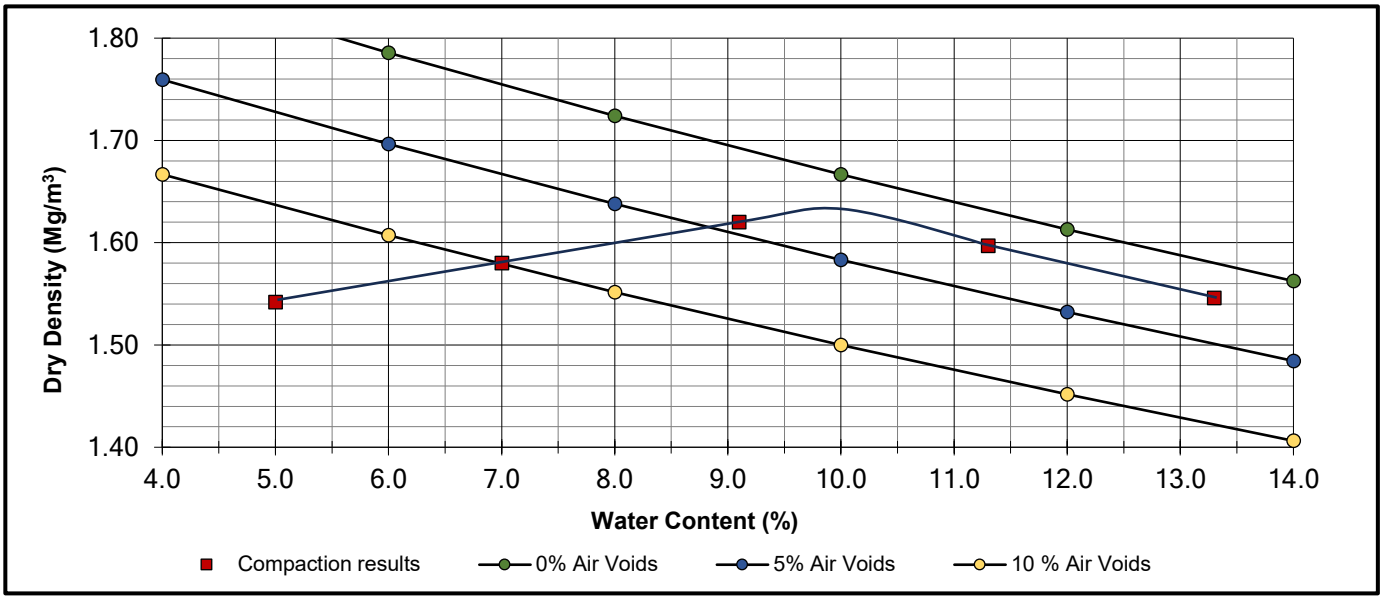
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP101 0.1-1 B	DATE SAMPLED	12-Sep-24
SAMPLE NUMBER	554901	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	9 %	GRADING ZONE	Zone 5
RETAINED 20mm	25 %	PARTICLE DENSITY	2.00 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	5.0	1.542
2	7.0	1.580
3	9.1	1.620
4	11.3	1.597
5	13.3	1.546



OPTIMUM WATER CONTENT	**9.9**	(%)
MAXIMUM DRY DENSITY	**1.63**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) SIGNED DATE 01-Oct-24
(Director / Head of Laboratory)

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

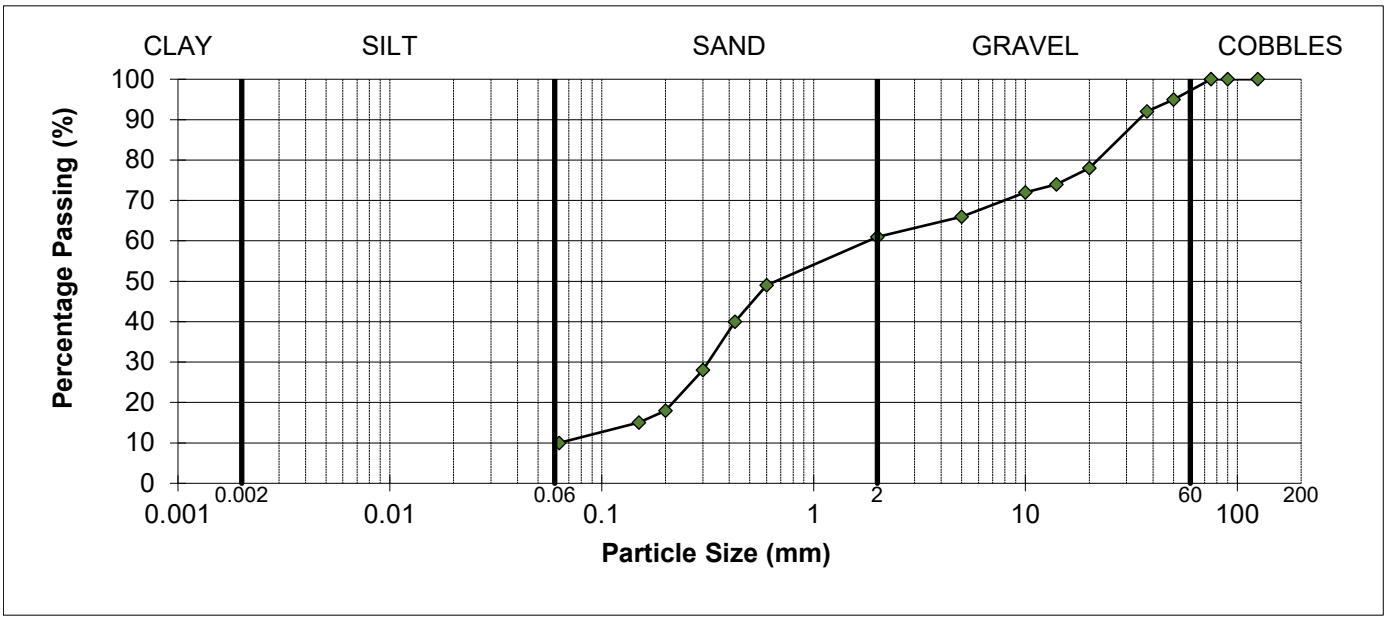
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP102 0-0.6 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554903	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	66	
90	100		2	61	
75	100		0.6	49	
50	95		0.425	40	
37.5	92		0.3	28	
20	78		0.2	18	
14	74		0.15	15	
10	72		0.063	10	



REMARKS
As received water content = 12.1%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

MURRAY RIX

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TEL 0161 475 0870

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TEST CERTIFICATE

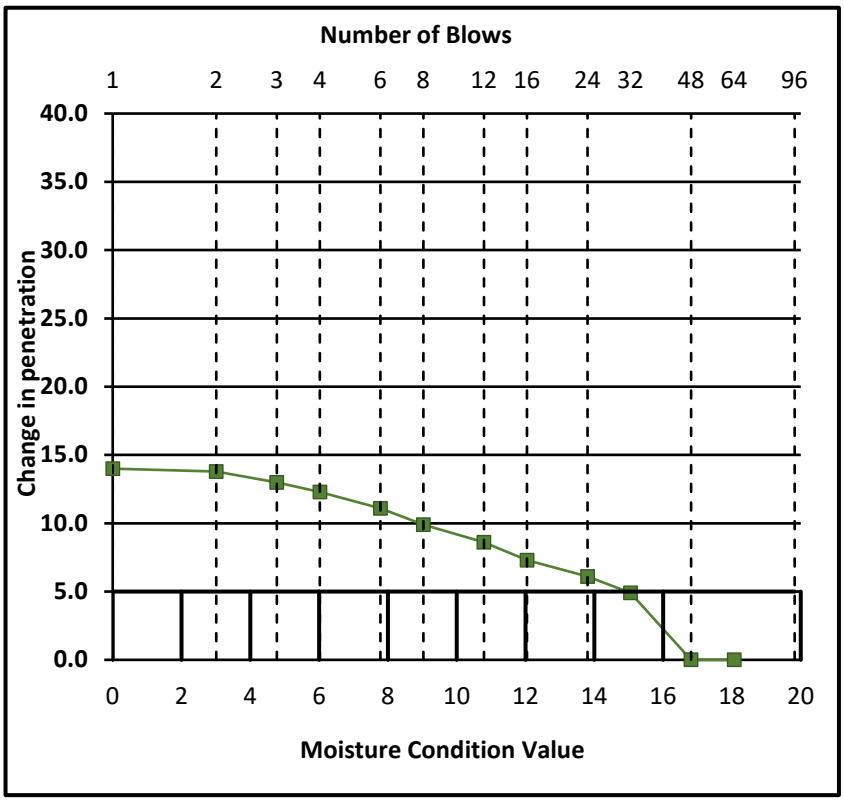
MOISTURE CONDITION VALUE
BS 1377-2:2022 Cl. 13
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014+A1:2022

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP102 0-0.6 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554903	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
INTERPRETATION OF TEST CURVE	Straight line through 5mm change in penetration
PROPORTION LARGER THAN 20mm	22%

Total number of blows (n)	Penetration (mm)	Change in penetration n to 4 n (mm)
1	98.9	14.0
2	92.0	13.8
3	87.9	13.0
4	84.9	12.3
6	81.1	11.1
8	78.2	9.9
12	74.9	8.6
16	72.6	7.3
24	70.0	6.1
32	68.3	4.9
48	66.3	
64	65.3	
96	63.9	
128	63.4	
192		
256		



MOISTURE CONDITION VALUE	**15.0**
WATER CONTENT	**12.7** %

REMARKS

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) SIGNED DATE 01-Oct-24

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UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

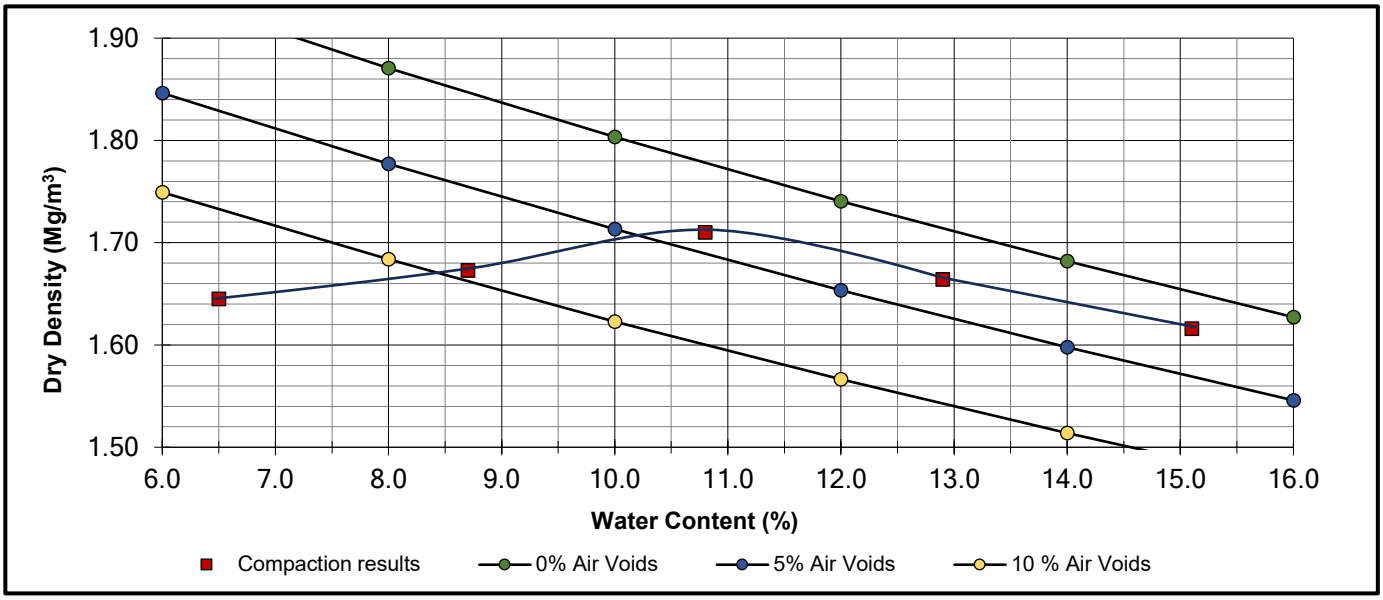
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP102 0-0.6 B	DATE SAMPLED	12-Sep-24
SAMPLE NUMBER	554903	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	8 %	GRADING ZONE	Zone 5
RETAINED 20mm	22 %	PARTICLE DENSITY	2.20 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	6.5	1.645
2	8.7	1.673
3	10.8	1.710
4	12.9	1.664
5	15.1	1.616



OPTIMUM WATER CONTENT	**11**	(%)
MAXIMUM DRY DENSITY	**1.71**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) SIGNED DATE 01-Oct-24
(Director / Head of Laboratory)

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

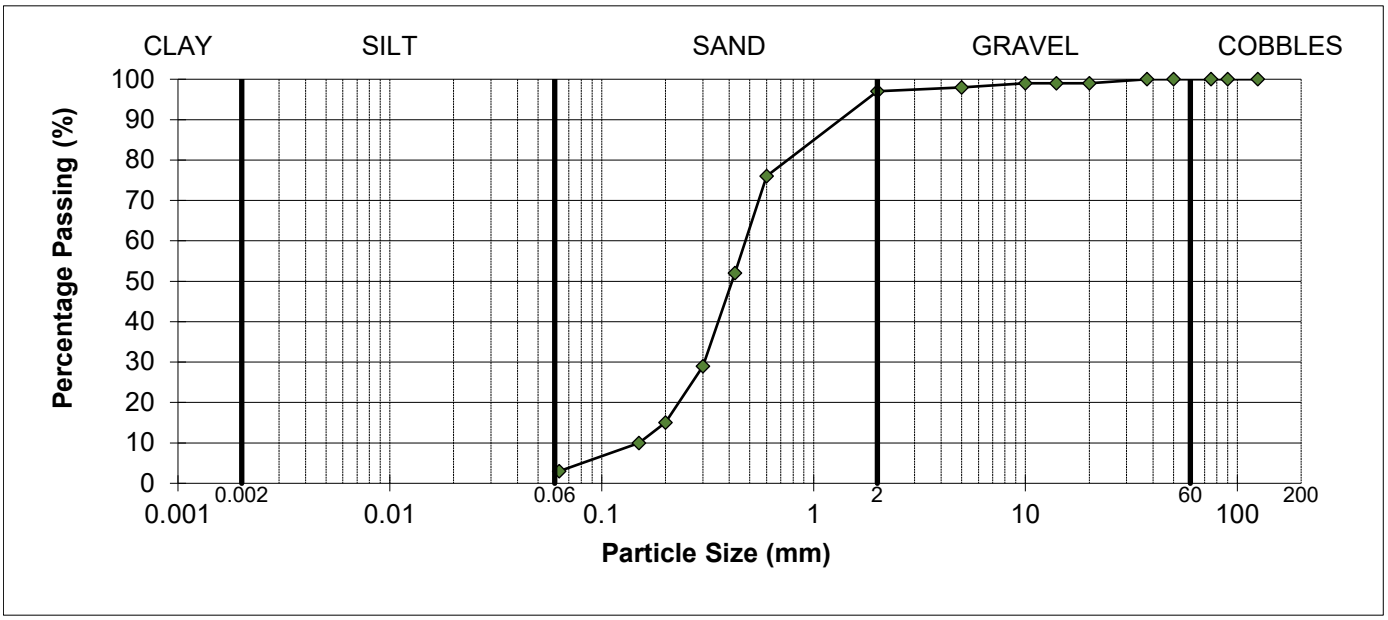
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP103 1-2 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554907	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Brown slightly gravelly SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	98	
90	100		2	97	
75	100		0.6	76	
50	100		0.425	52	
37.5	100		0.3	29	
20	99		0.2	15	
14	99		0.15	10	
10	99		0.063	3	



REMARKS
As received water content = 4.0%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

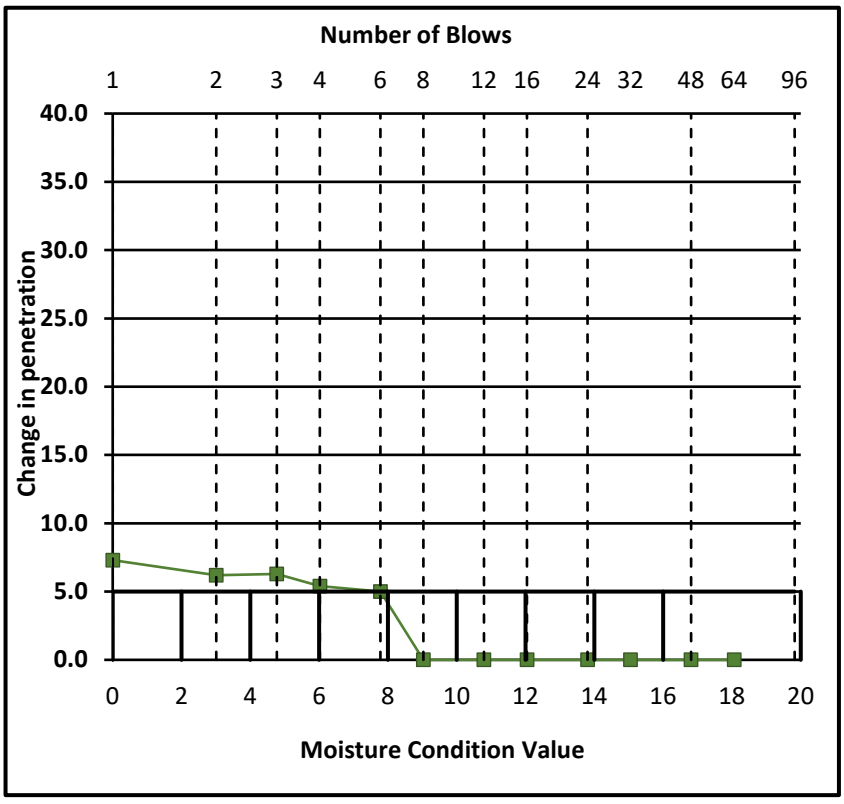
MOISTURE CONDITION VALUE
BS 1377-2:2022 Cl. 13
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014+A1:2022

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP103 1-2 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554907	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Brown slightly gravelly SAND
ADVISED SOURCE	Site Investigation Sample
INTERPRETATION OF TEST CURVE	Straight line through 5mm change in penetration
PROPORTION LARGER THAN 20mm	1%

Total number of blows (n)	Penetration (mm)	Change in penetration n to 4 n (mm)
1	93.9	7.3
2	90.6	6.2
3	88.9	6.3
4	86.6	5.4
6	85.7	5.0
8	84.4	
12	82.6	
16	81.2	
24	80.7	
32		
48		
64		
96		
128		
192		
256		



MOISTURE CONDITION VALUE	**7.8**
WATER CONTENT	**4.2** %

REMARKS

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) SIGNED DATE 01-Oct-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

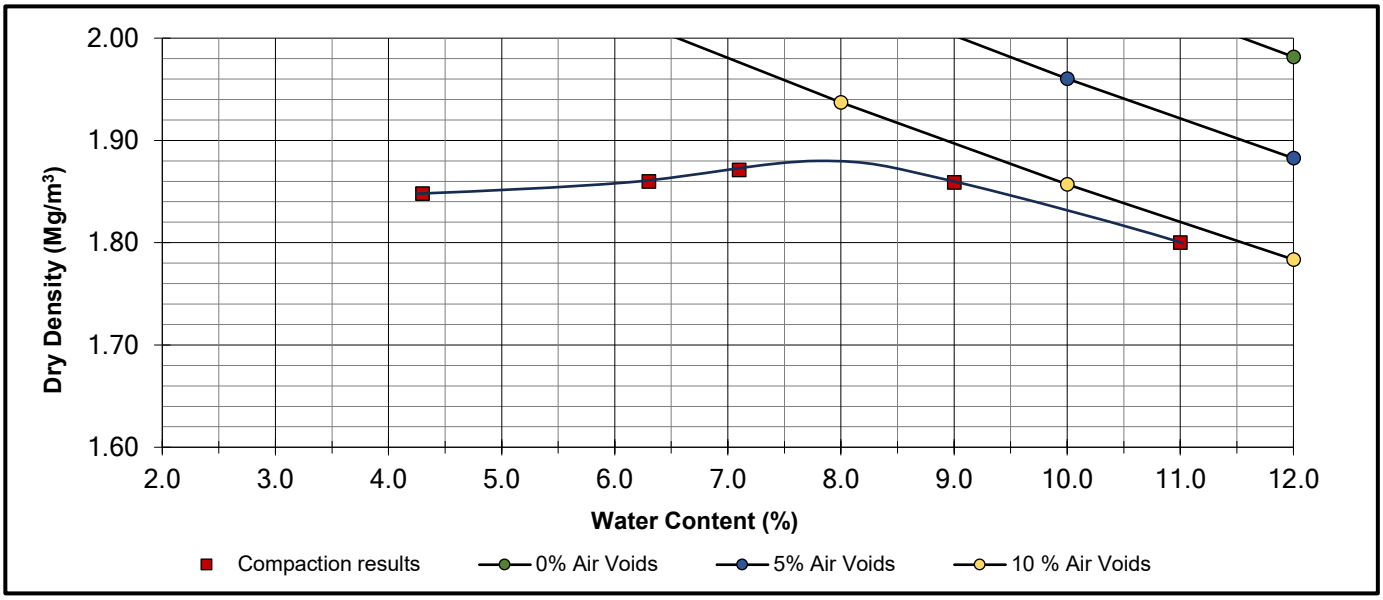
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP103 1-2 B	DATE SAMPLED	12-Sep-24
SAMPLE NUMBER	554907	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Brown slightly gravelly SAND
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	1 %	PARTICLE DENSITY	2.60 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	4.3	1.848
2	6.3	1.860
3	7.1	1.871
4	9.0	1.859
5	11.0	1.800



OPTIMUM WATER CONTENT	**7.9**	(%)
MAXIMUM DRY DENSITY	**1.88**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) SIGNED DATE 01-Oct-24
(Director / Head of Laboratory)

M U R R A Y R I X
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

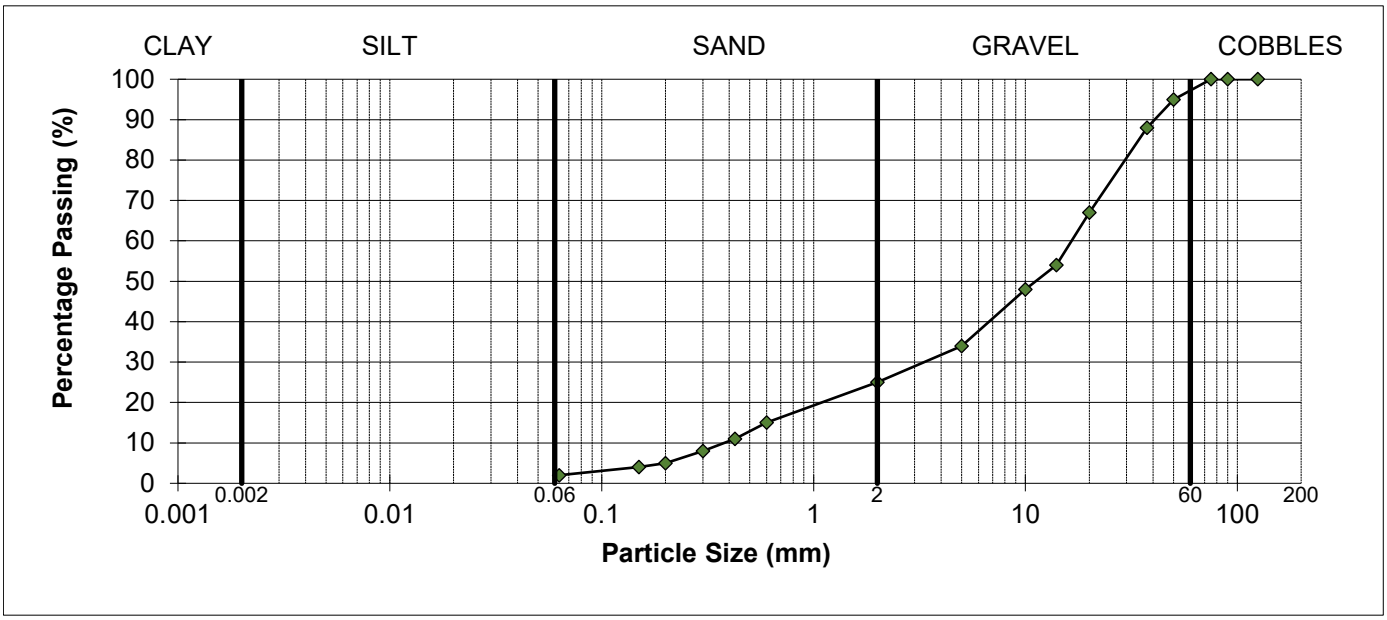
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 B 0.2-1 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554908	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black slightly silty sandy GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	34	
90	100		2	25	
75	100		0.6	15	
50	95		0.425	11	
37.5	88		0.3	8	
20	67		0.2	5	
14	54		0.15	4	
10	48		0.063	2	



REMARKS
As received water content = 5.3%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

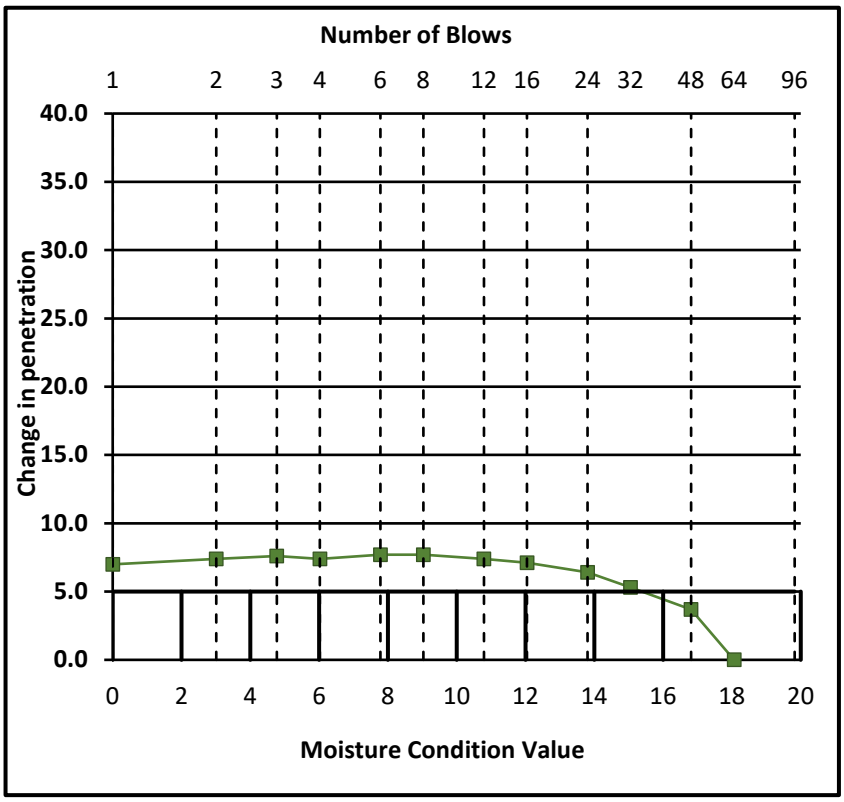
MOISTURE CONDITION VALUE
BS 1377-2:2022 Cl. 13
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014+A1:2022

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 B 0.2-1 B	DATE SAMPLED	12-Sep-24
LAB SAMPLE No	554908	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black slightly silty sandy GRAVEL
ADVISED SOURCE	Site Investigation Sample
INTERPRETATION OF TEST CURVE	Straight line through 5mm change in penetration
PROPORTION LARGER THAN 20mm	33%

Total number of blows (n)	Penetration (mm)	Change in penetration n to 4 n (mm)
1	81.9	7.0
2	78.7	7.4
3	76.6	7.6
4	74.9	7.4
6	72.8	7.7
8	71.3	7.7
12	69.0	7.4
16	67.5	7.1
24	65.1	6.4
32	63.6	5.3
48	61.6	3.7
64	60.4	
96	58.7	
128	58.3	
192	57.9	
256		



MOISTURE CONDITION VALUE	**7.8**
WATER CONTENT	**8.9** %

REMARKS

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) SIGNED DATE 01-Oct-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP VIBRATING HAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

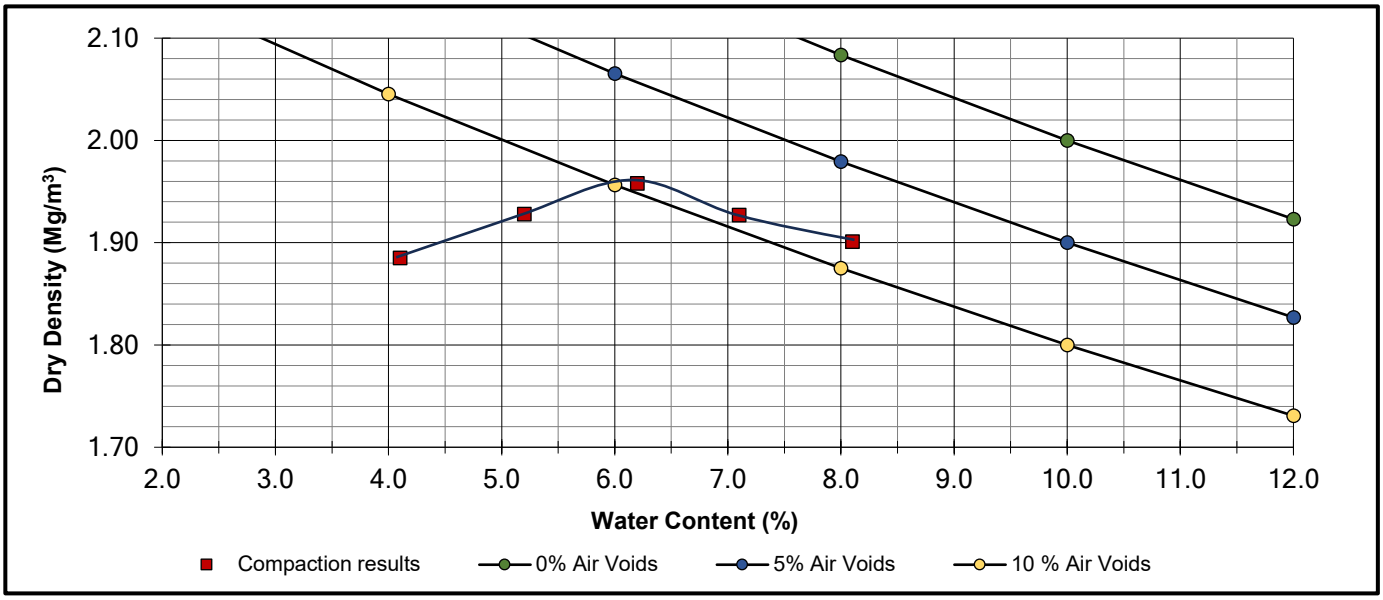
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 B 0.2-1 B	DATE SAMPLED	12-Sep-24
SAMPLE NUMBER	554908	DATE RECEIVED	12-Sep-24
DATE TESTED	19-Sep-24	SAMPLED BY	Client

MATERIAL	Black slightly silty sandy GRAVEL
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	12	%	GRADING ZONE	Zone X	
RETAINED 20mm	33	%	PARTICLE DENSITY	2.50 Mg/m3	(Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	4.1	1.885
2	5.2	1.928
3	6.2	1.958
4	7.1	1.927
5	8.1	1.901



OPTIMUM WATER CONTENT	**6.1**	(%)
MAXIMUM DRY DENSITY	**1.94**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) SIGNED DATE 01-Oct-24
(Director / Head of Laboratory)

M U R R A Y R I X

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UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

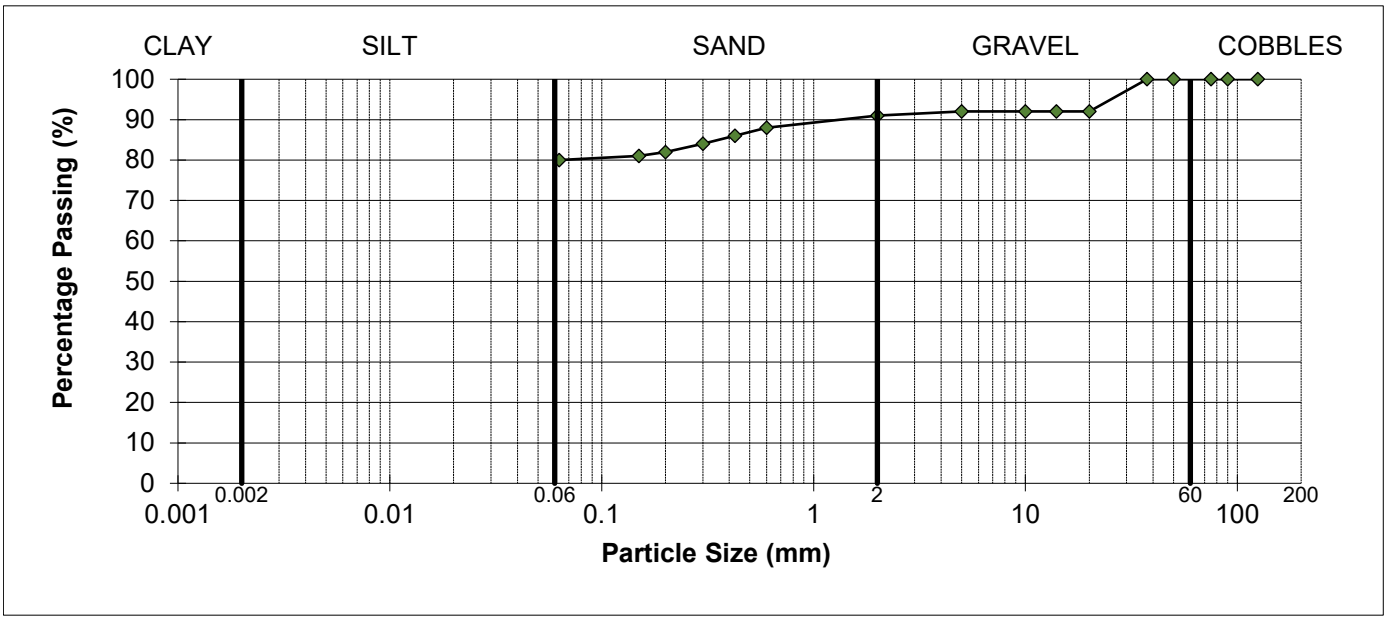
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 2.5-3 B	DATE SAMPLED	29-Aug-24
LAB SAMPLE No	554909	DATE RECEIVED	04-Sep-24
DATE TESTED	05-Sep-24	SAMPLED BY	Client

MATERIAL	Light grey brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	92	
90	100		2	91	
75	100		0.6	88	
50	100		0.425	86	
37.5	100		0.3	84	
20	92		0.2	82	
14	92		0.15	81	
10	92		0.063	80	



REMARKS
As received water content = 41.3%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1580

TEST CERTIFICATE

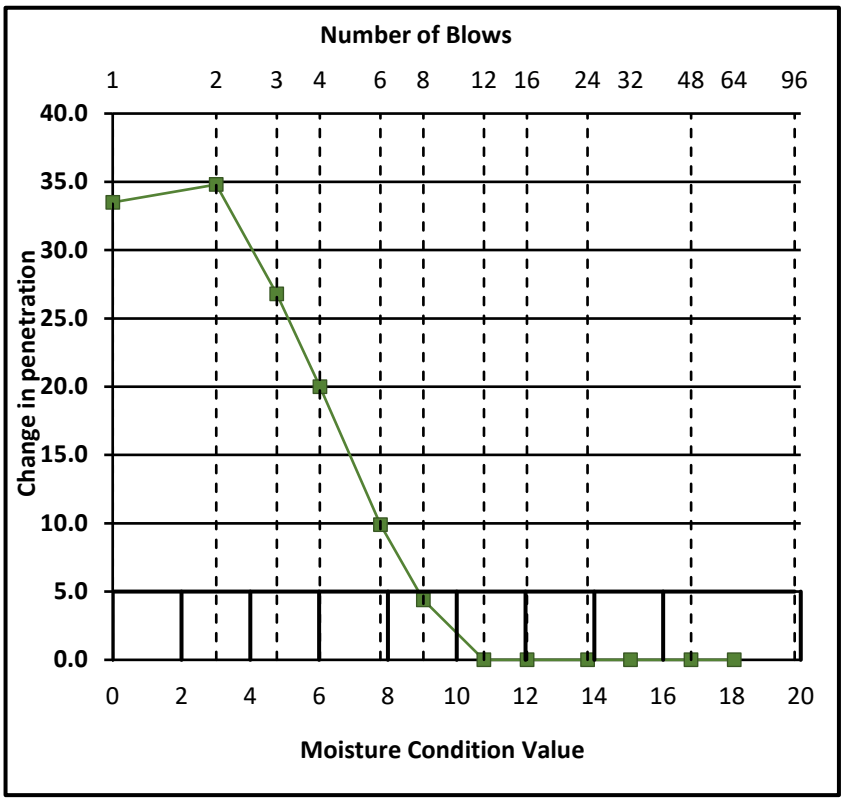
MOISTURE CONDITION VALUE
BS 1377-2:2022 Cl. 13
DETERMINATION OF WATER CONTENT - BS EN ISO 17892-1:2014+A1:2022

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 2.5-3 B	DATE SAMPLED	29-Aug-24
LAB SAMPLE No	554909	DATE RECEIVED	04-Sep-24
DATE TESTED	05-Sep-24	SAMPLED BY	Client

MATERIAL	Light grey brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
INTERPRETATION OF TEST CURVE	Straight line through 5mm change in penetration
PROPORTION LARGER THAN 20mm	8%

Total number of blows (n)	Penetration (mm)	Change in penetration n to 4 n (mm)
1	133.3	33.5
2	117.4	34.8
3	106.9	26.8
4	99.8	20.0
6	88.9	9.9
8	82.6	4.4
12	80.1	
16	79.8	
24	79.0	
32	78.2	
48		
64		
96		
128		
192		
256		



MOISTURE CONDITION VALUE	**8.8**
WATER CONTENT	**41.3** %

REMARKS

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) SIGNED DATE 01-Oct-24

MURRAY RIX

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

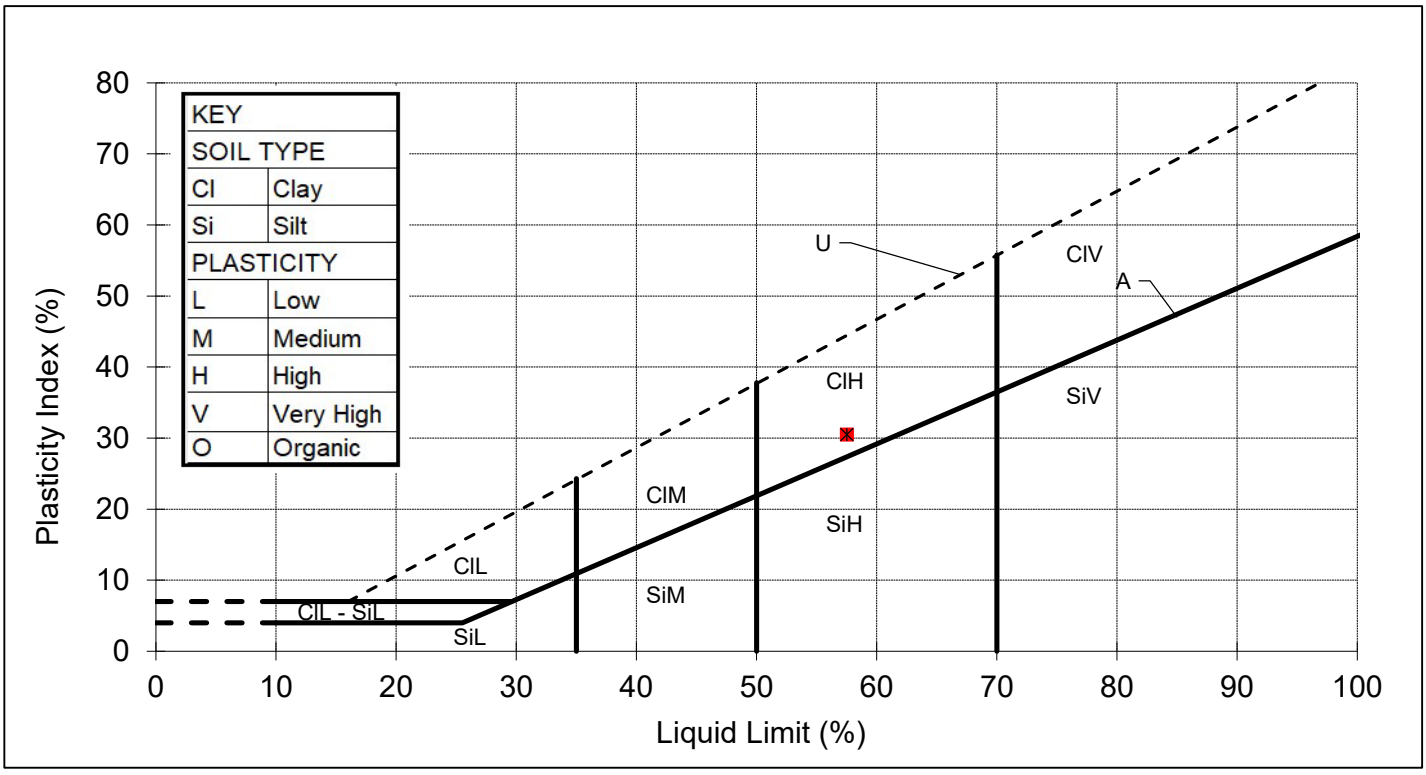
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 2.5-3 B	DATE SAMPLED	29-Aug-24
SAMPLE No.	554909	DATE RECEIVED	04-Sep-24
DATE TESTED	05-Sep-24	SAMPLED BY	Client

MATERIAL	Light grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	57.5	1.003	
Determination 2 (avg)	19.7	57.2		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
41.3	58	27	31	86



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 01-Oct-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

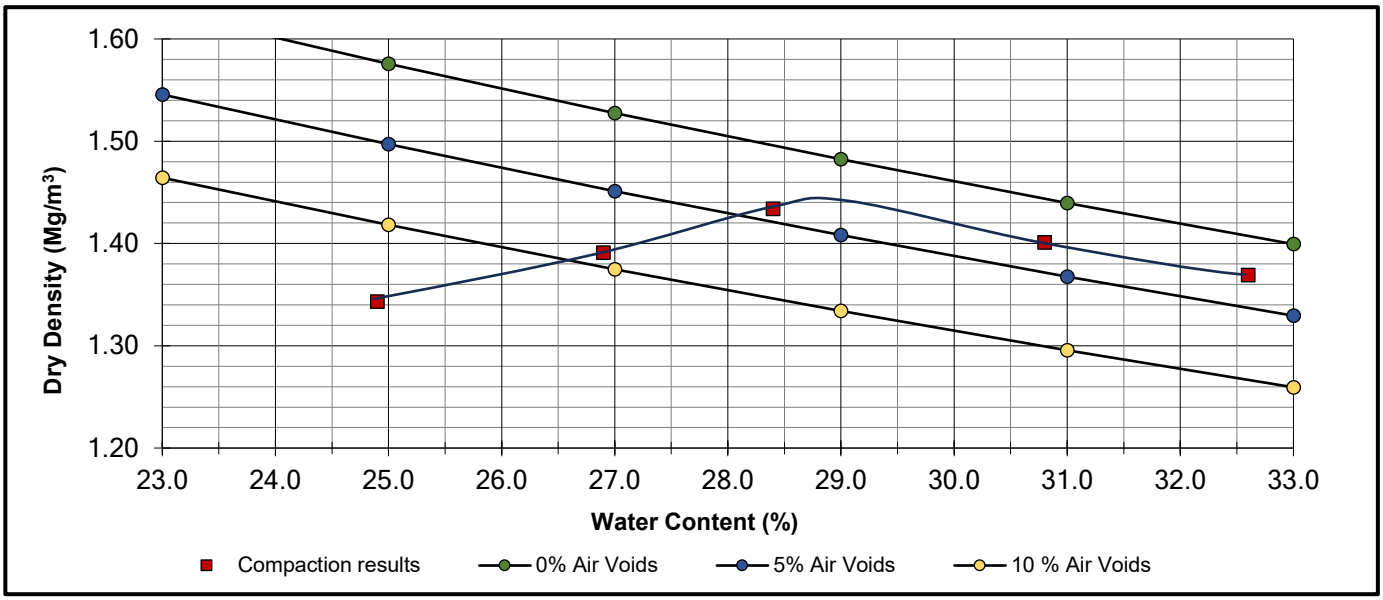
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 2.5-3 B	DATE SAMPLED	29-Aug-24
SAMPLE NUMBER	554909	DATE RECEIVED	04-Sep-24
DATE TESTED	05-Sep-24	SAMPLED BY	Client

MATERIAL	Light grey brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Separate Batches

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 3
RETAINED 20mm	8 %	PARTICLE DENSITY	2.60 Mg/m3 (Assumed)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	24.9	1.343
2	26.9	1.391
3	28.4	1.434
4	30.8	1.401
5	32.6	1.369



OPTIMUM WATER CONTENT	**29**	(%)
MAXIMUM DRY DENSITY	**1.44**	(Mg/m^3)

REMARKS

NAME O.P. Davies BA (Hons) SIGNED DATE 01-Oct-24
(Director / Head of Laboratory)

MURRAY RIX
ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1580

TEST CERTIFICATE

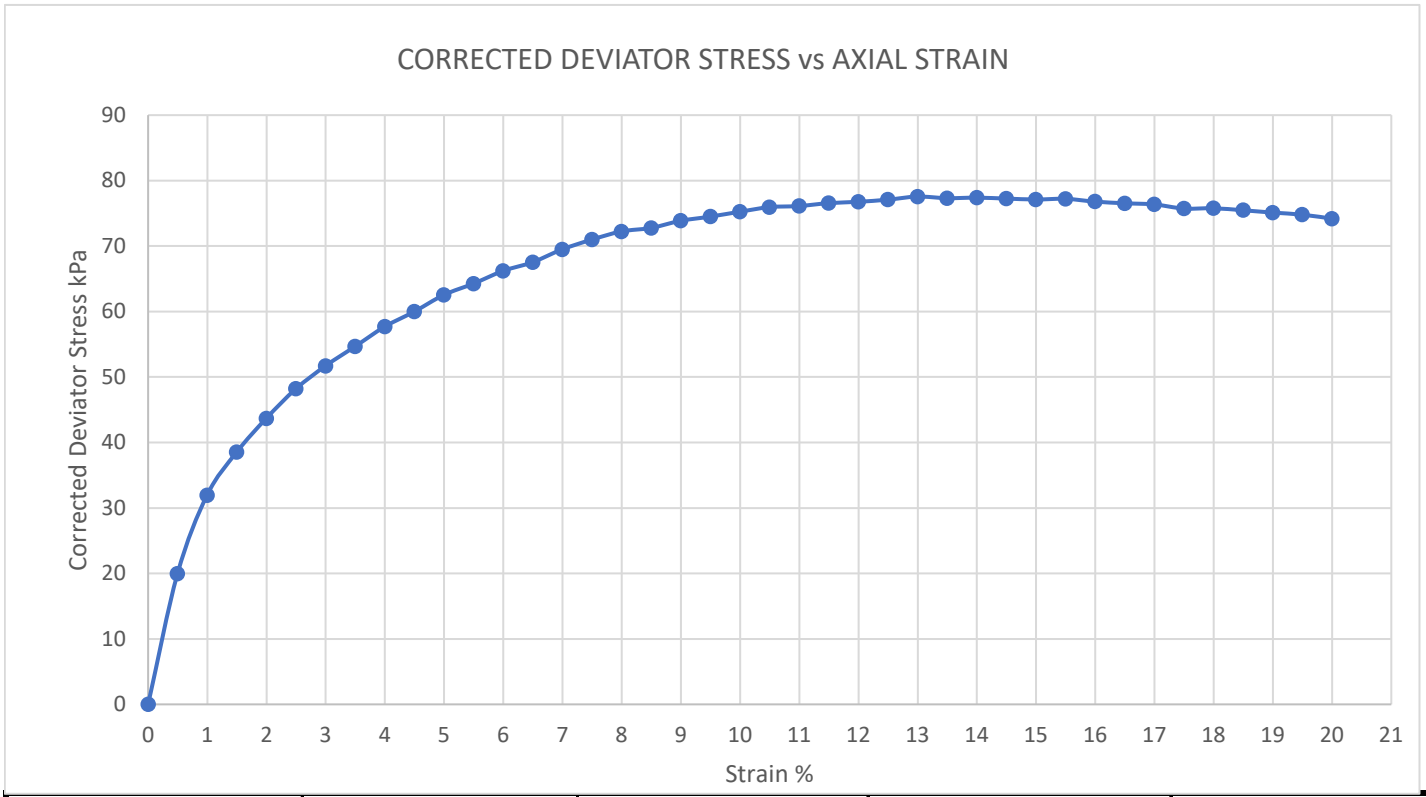
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377-7:1990 & Specification For Highway Works Clause 633

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/96

SAMPLE LABEL	TP104 2.5-3 B	**DATE SAMPLED**	29-Aug-24
LAB SAMPLE No.	554909	**DATE RECEIVED**	04-Sep-24
DATE TESTED	05-Sep-24	**SAMPLED BY**	Client
MATERIAL	Light grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	As client & site above		

INITIAL CONDITIONS

Specimen Location	Sample Preparation	2.5kg Rammer	Sample Moisture Content at Preparation	As received
	Retained 20mm (%)	8	Specimen Condition	Recompacted
	Specimen Length (mm)	200	Specimen Moisture Content (%)	22.4
	Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	1.62
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.32
	Membrane Correction	4.53		



Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
200	13.0	1.0	78	39

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 01 October 2024

TEST REPORT

Client LK Consult Ltd

Address Unit 29 Eton Business Park
Eton Hill Road
Radcliffe
Greater Manchester
M26 2ZS

Contract LKC 24 1317 -
Chorlton Baths

Job Number MRN 24076/117
Date of Issue 20 December 2024

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

5 The results included within the report are representative of the samples submitted for analysis.

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

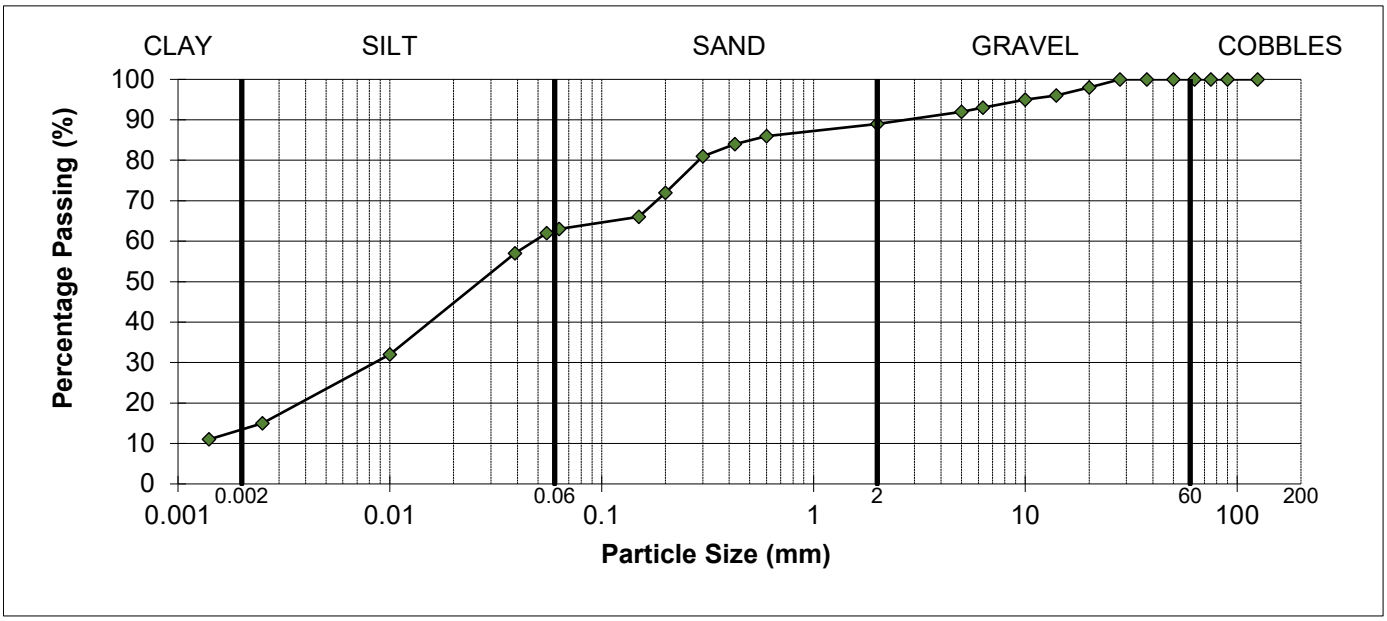
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP101 3.4-3.7 B	DATE SAMPLED	19-Nov-24
LAB SAMPLE No	610701	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	89	
90	100		0.6	86	
75	100		0.425	84	
63	100		0.3	81	
50	100		0.2	72	
37.5	100		0.15	66	
28	100		0.063	63	
20	98		0.055	62	
14	96		0.039	57	
10	95		0.01	32	
6.3	93		0.0025	15	
5	92		0.0014	11	



REMARKS
As received water content = 18.8%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

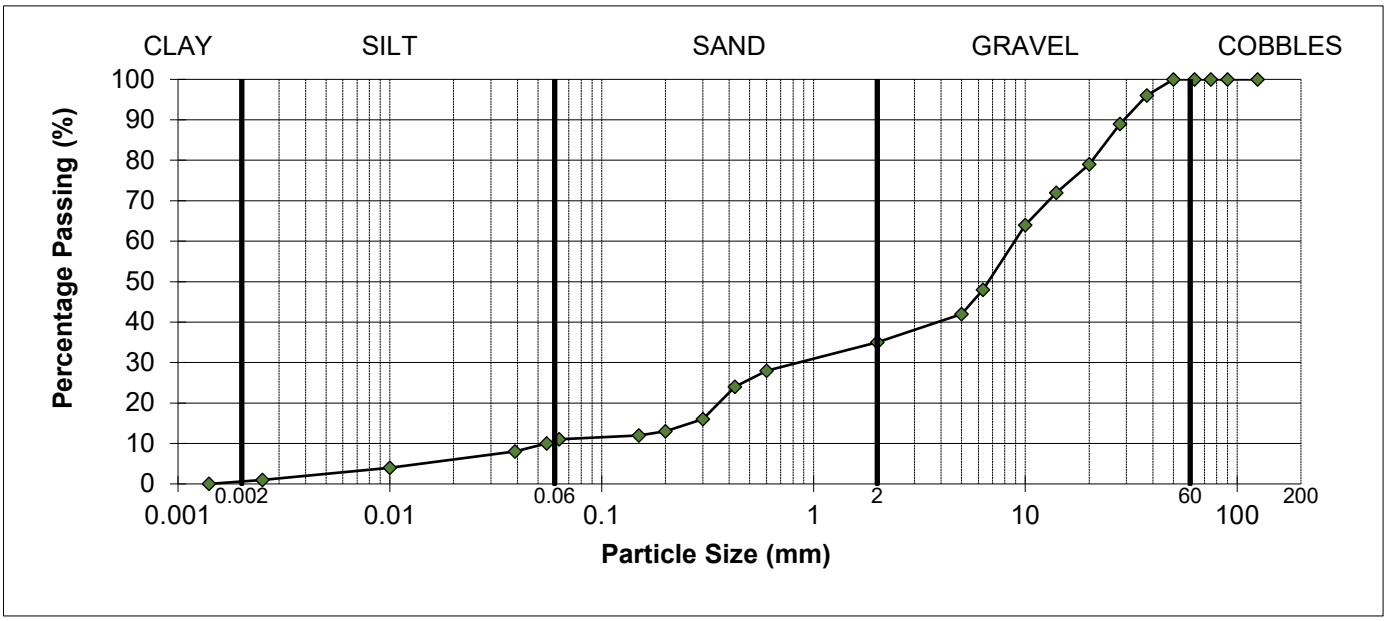
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP101 17.5-17.8 B	DATE SAMPLED	19-Nov-24
LAB SAMPLE No	610703	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Grey brown silty very sandy GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	35	
90	100		0.6	28	
75	100		0.425	24	
63	100		0.3	16	
50	100		0.2	13	
37.5	96		0.15	12	
28	89		0.063	11	
20	79		0.055	10	
14	72		0.039	8	
10	64		0.01	4	
6.3	48		0.0025	1	
5	42		0.0014	0	



REMARKS
As received water content = 8.3%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

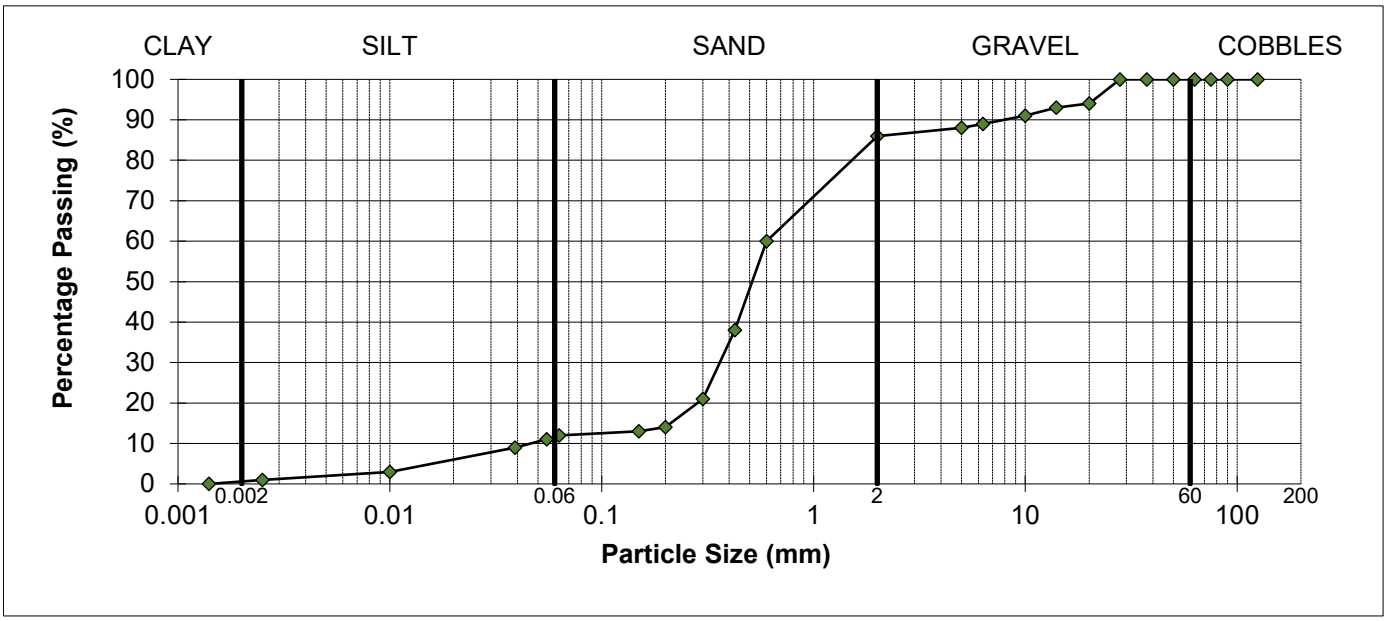
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP102 1.7-2 B	DATE SAMPLED	18-Nov-24
LAB SAMPLE No	610704	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Grey brown silty gravelly SAND
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	86	
90	100		0.6	60	
75	100		0.425	38	
63	100		0.3	21	
50	100		0.2	14	
37.5	100		0.15	13	
28	100		0.063	12	
20	94		0.055	11	
14	93		0.039	9	
10	91		0.01	3	
6.3	89		0.0025	1	
5	88		0.0014	0	



REMARKS
As received water content = 15.8%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

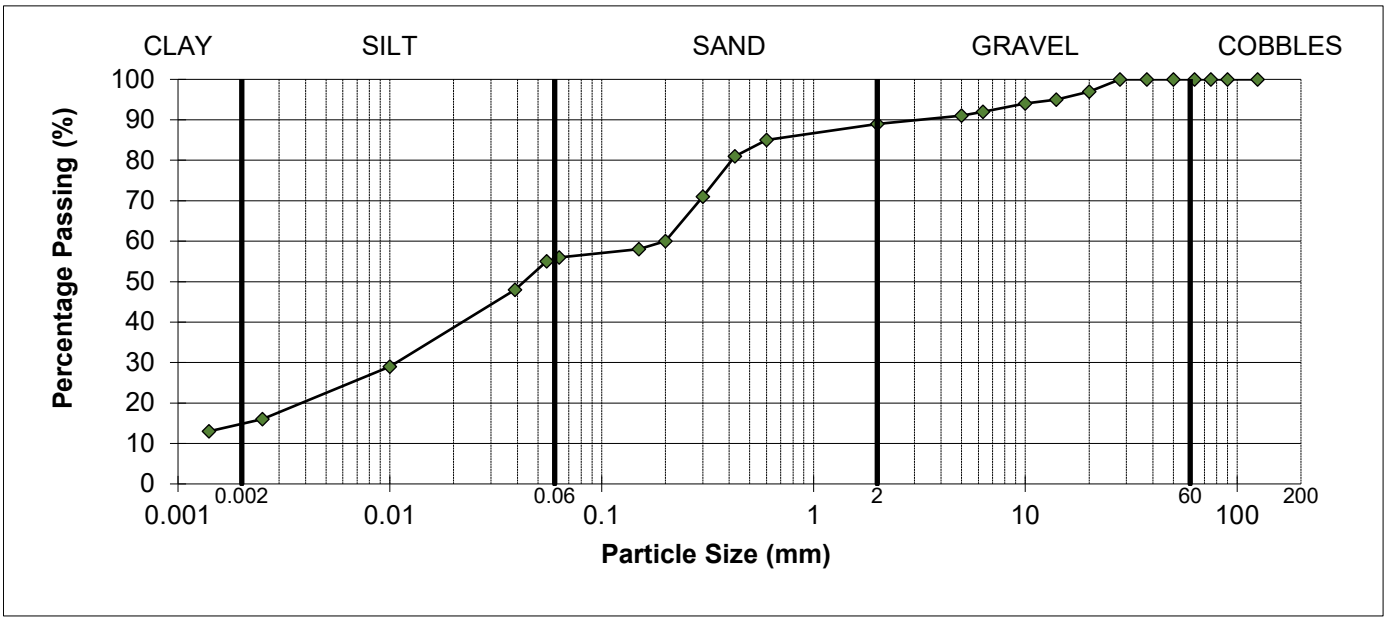
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP102 9-9.3 B	DATE SAMPLED	18-Nov-24
LAB SAMPLE No	610706	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	89	
90	100		0.6	85	
75	100		0.425	81	
63	100		0.3	71	
50	100		0.2	60	
37.5	100		0.15	58	
28	100		0.063	56	
20	97		0.055	55	
14	95		0.039	48	
10	94		0.01	29	
6.3	92		0.0025	16	
5	91		0.0014	13	



REMARKS

As received water content = 11.3%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

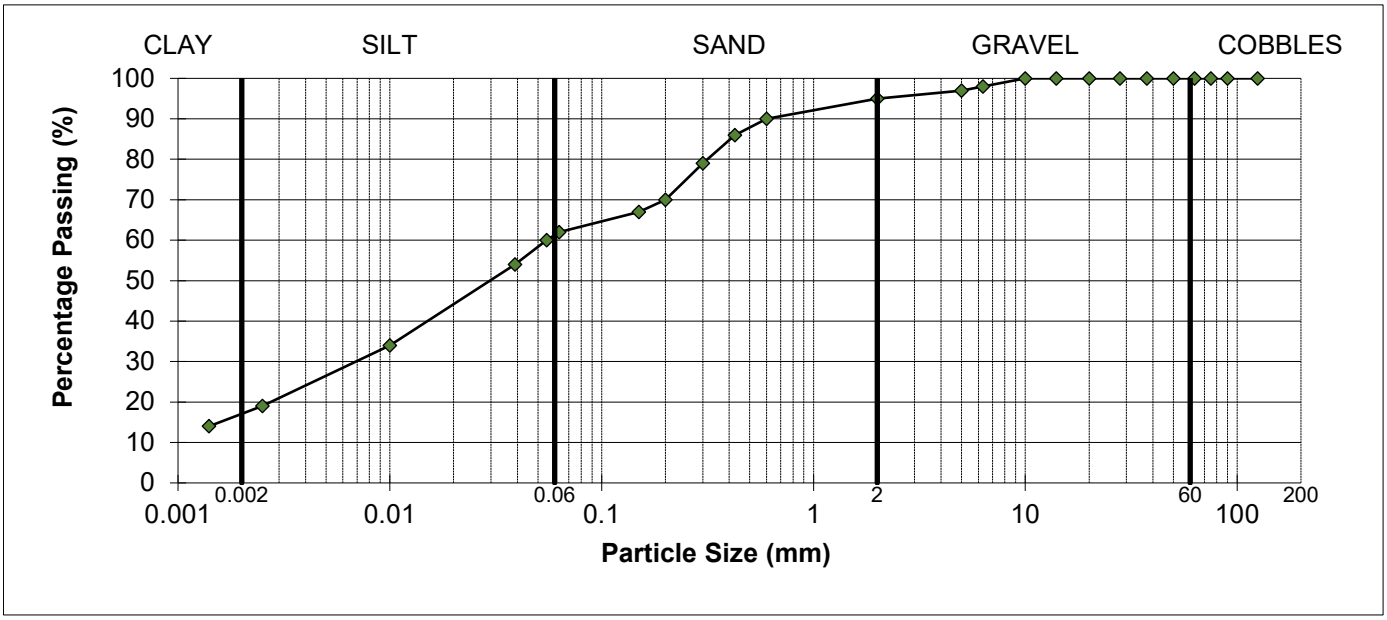
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 1.7-2 B	DATE SAMPLED	21-Nov-24
LAB SAMPLE No	616015	DATE RECEIVED	13-Dec-24
DATE TESTED	16-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	95	
90	100		0.6	90	
75	100		0.425	86	
63	100		0.3	79	
50	100		0.2	70	
37.5	100		0.15	67	
28	100		0.063	62	
20	100		0.055	60	
14	100		0.039	54	
10	100		0.01	34	
6.3	98		0.0025	19	
5	97		0.0014	14	



REMARKS

As received water content = 14.1%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

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ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

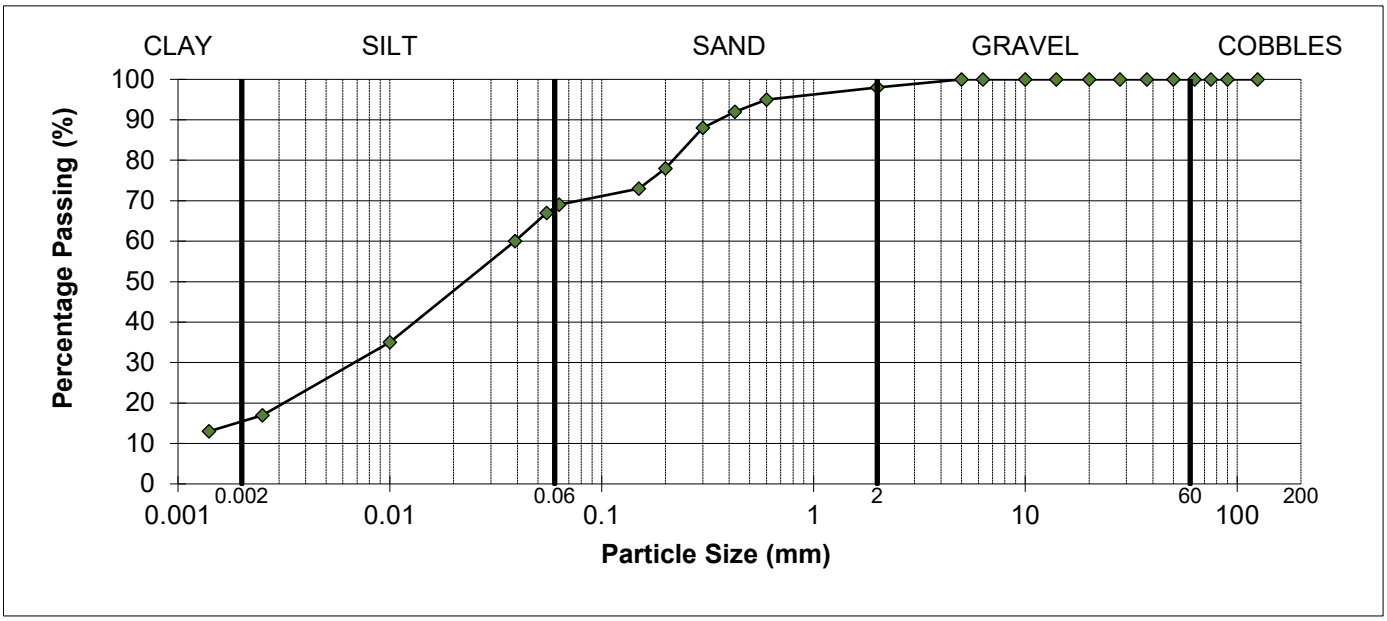
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 9-9.3 B	DATE SAMPLED	21-Nov-24
LAB SAMPLE No	616017	DATE RECEIVED	13-Dec-24
DATE TESTED	16-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	98	
90	100		0.6	95	
75	100		0.425	92	
63	100		0.3	88	
50	100		0.2	78	
37.5	100		0.15	73	
28	100		0.063	69	
20	100		0.055	67	
14	100		0.039	60	
10	100		0.01	35	
6.3	100		0.0025	17	
5	100		0.0014	13	



REMARKS

As received water content = 17.6%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

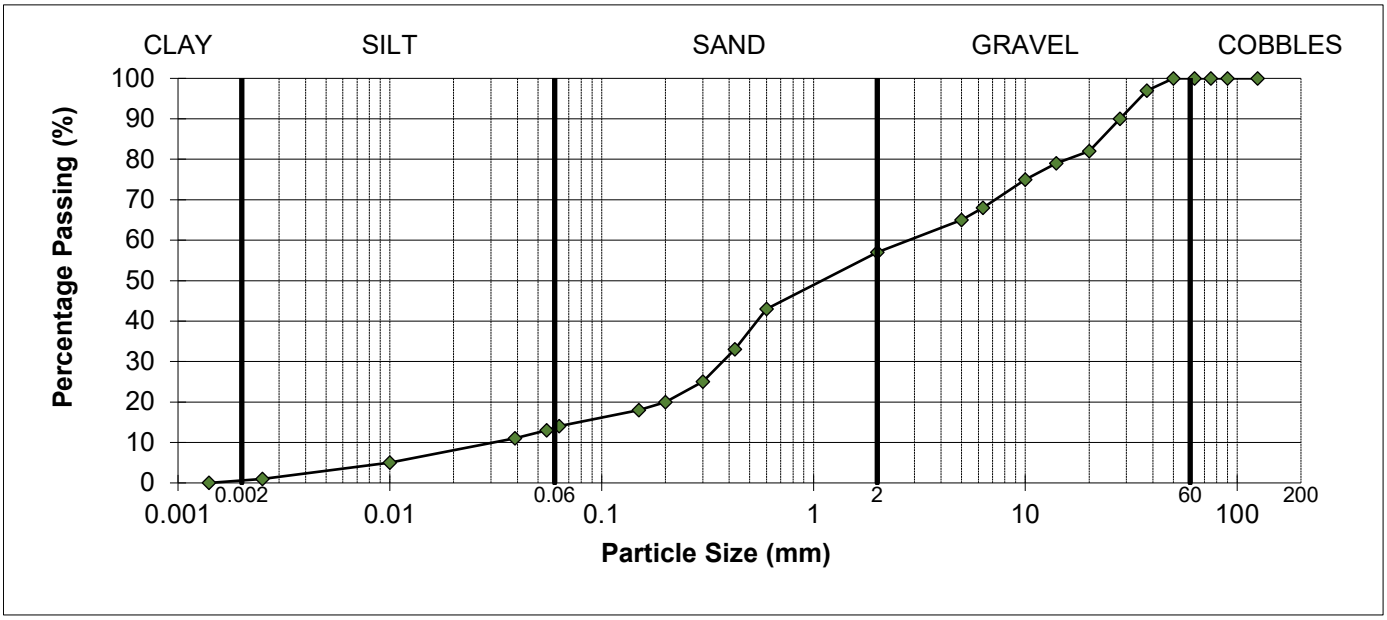
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP106 2.7-3 B	DATE SAMPLED	02-Dec-24
LAB SAMPLE No	610710	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	57	
90	100		0.6	43	
75	100		0.425	33	
63	100		0.3	25	
50	100		0.2	20	
37.5	97		0.15	18	
28	90		0.063	14	
20	82		0.055	13	
14	79		0.039	11	
10	75		0.01	5	
6.3	68		0.0025	1	
5	65		0.0014	0	



REMARKS
As received water content = 7.1%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

M U R R A Y R I X

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

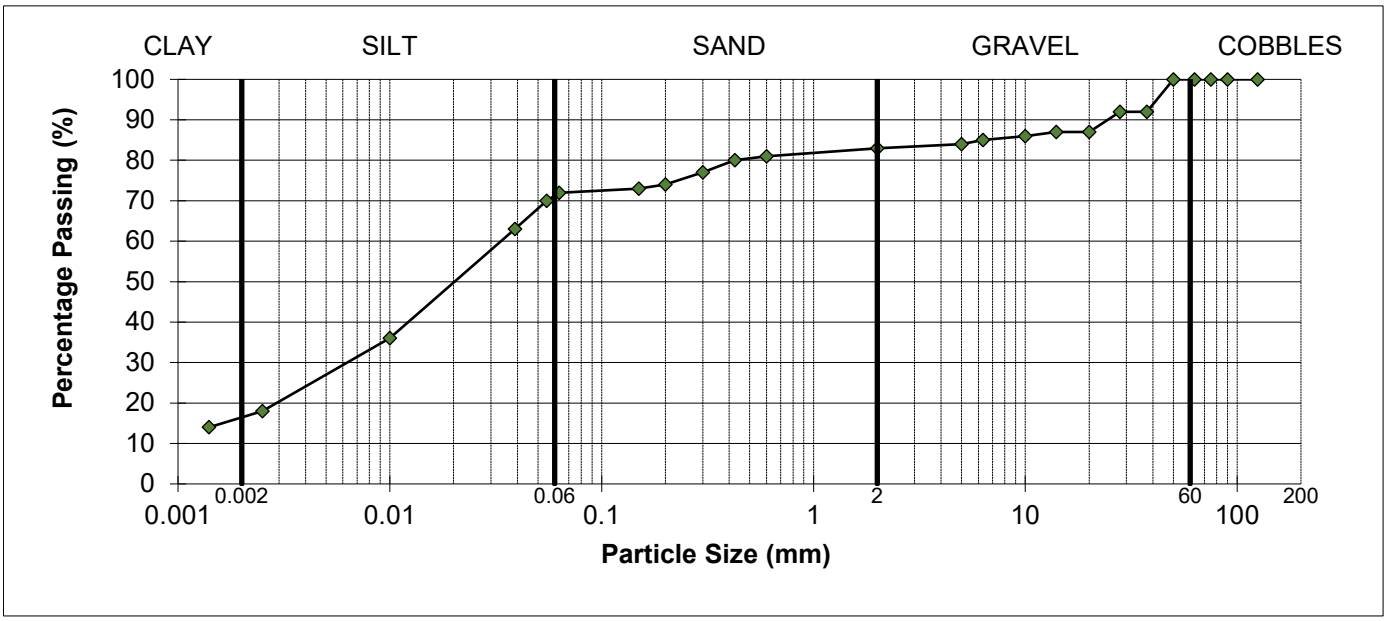
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP106 4.7-5 B	DATE SAMPLED	02-Dec-24
LAB SAMPLE No	610711	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		2	83	
90	100		0.6	81	
75	100		0.425	80	
63	100		0.3	77	
50	100		0.2	74	
37.5	92		0.15	73	
28	92		0.063	72	
20	87		0.055	70	
14	87		0.039	63	
10	86		0.01	36	
6.3	85		0.0025	18	
5	84		0.0014	14	



REMARKS

As received water content = 19.2%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

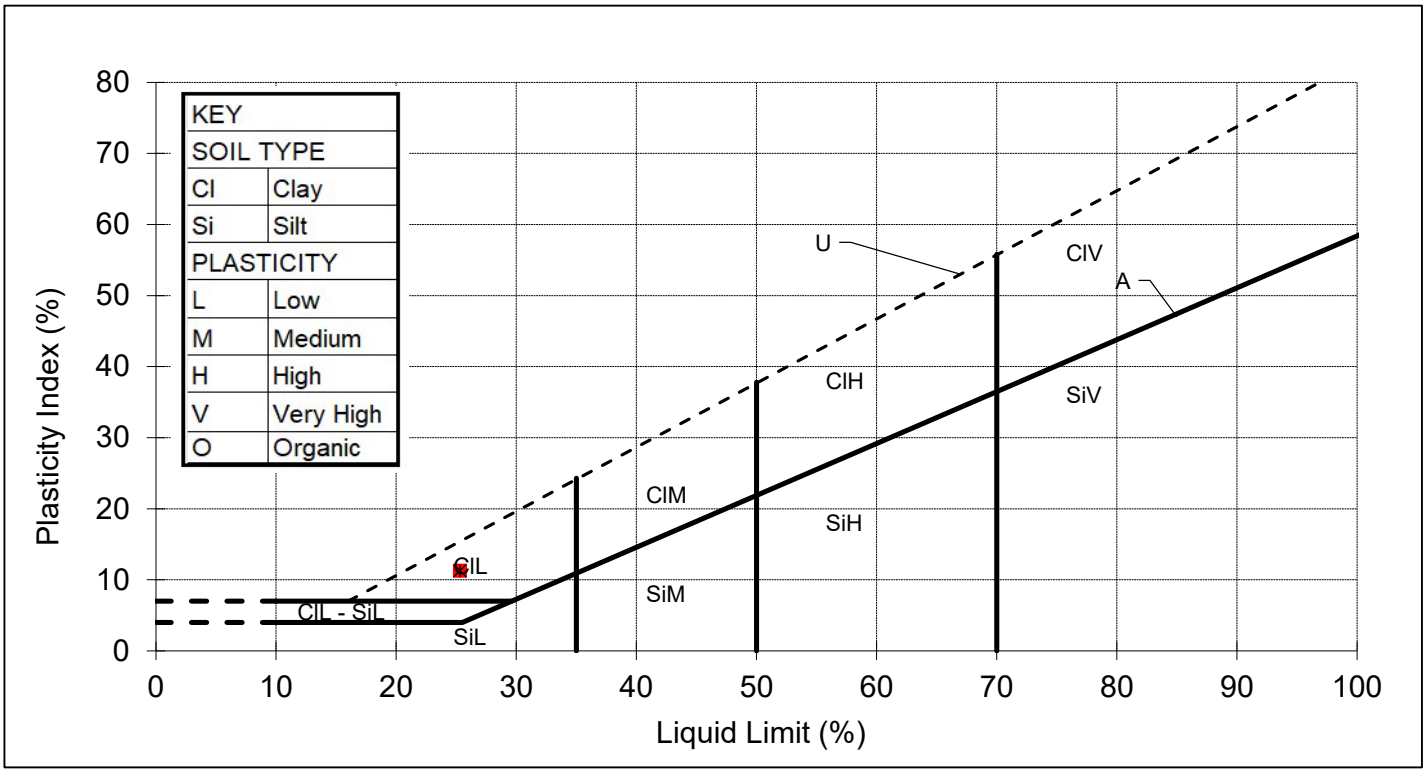
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP101 3.4-3.7 B	DATE SAMPLED	19-Nov-24
SAMPLE No.	610701	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.7	25.2	1.006	
Determination 2 (avg)	19.5	25.1		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18.8	25	14	11	84



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

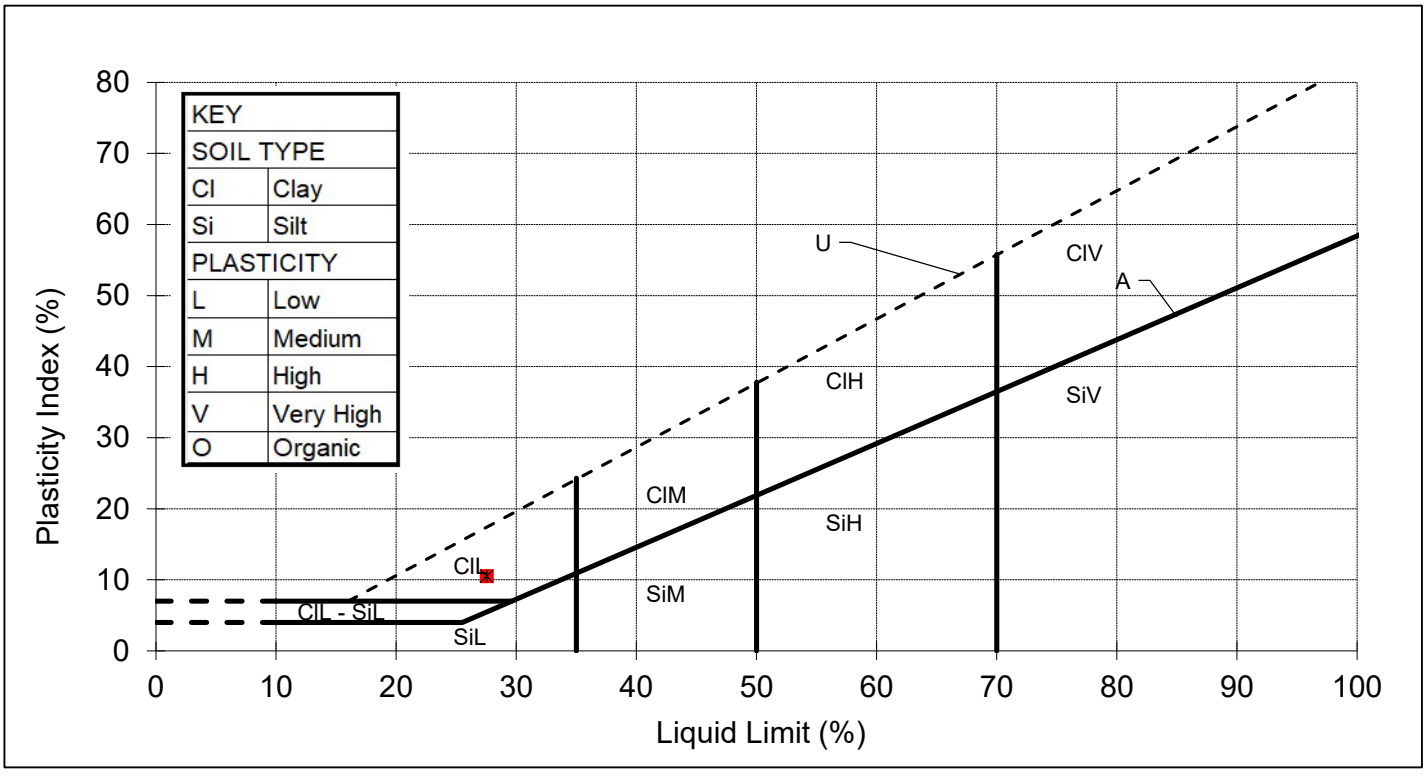
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP101 9.7-10 B	DATE SAMPLED	19-Nov-24
SAMPLE No.	610702	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	24.8	28.9	0.954	
Determination 2 (avg)	24.4	28.8		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.7	28	17	11	72



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

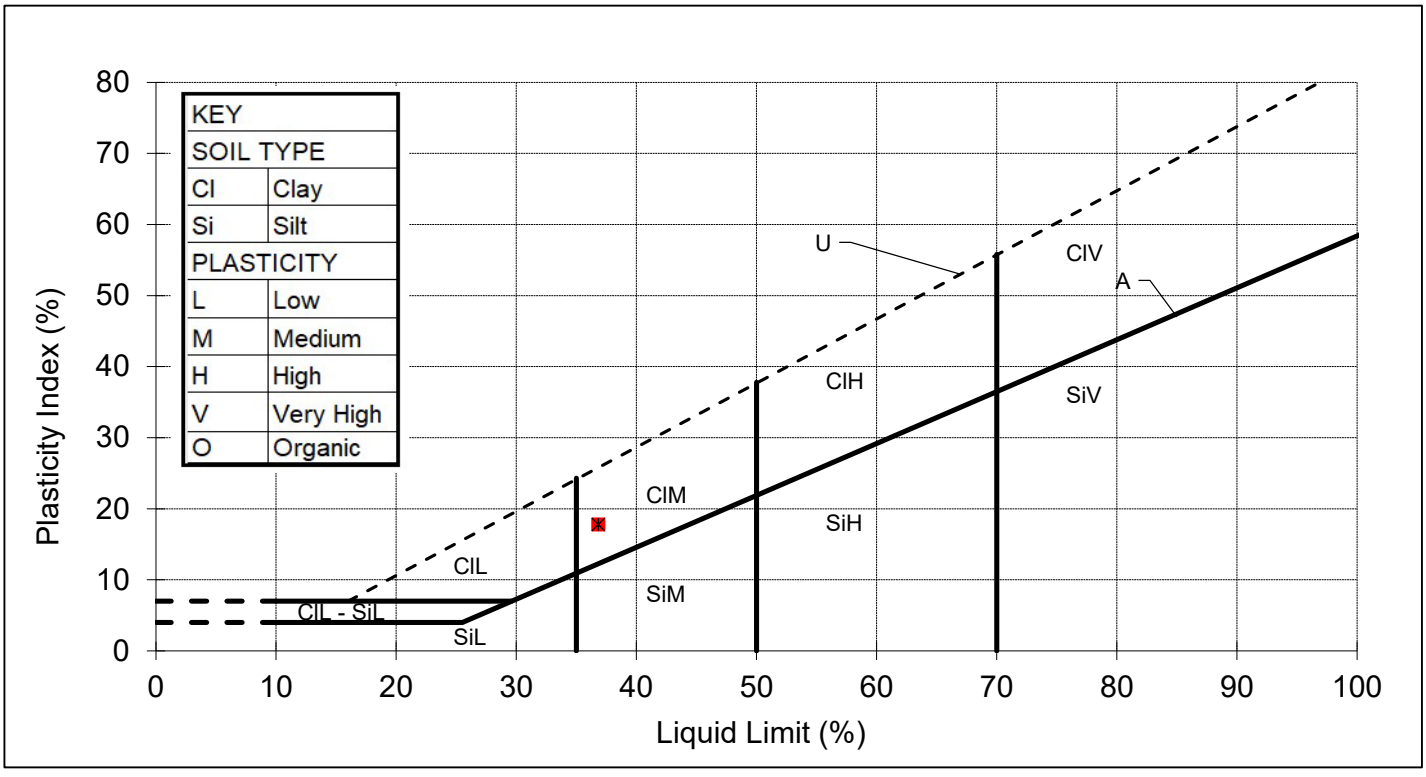
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP102 4-4.3 B	DATE SAMPLED	18-Nov-24
SAMPLE No.	610705	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.1	35.9	1.031	
Determination 2 (avg)	17.8	35.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
21.7	37	19	18	98



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

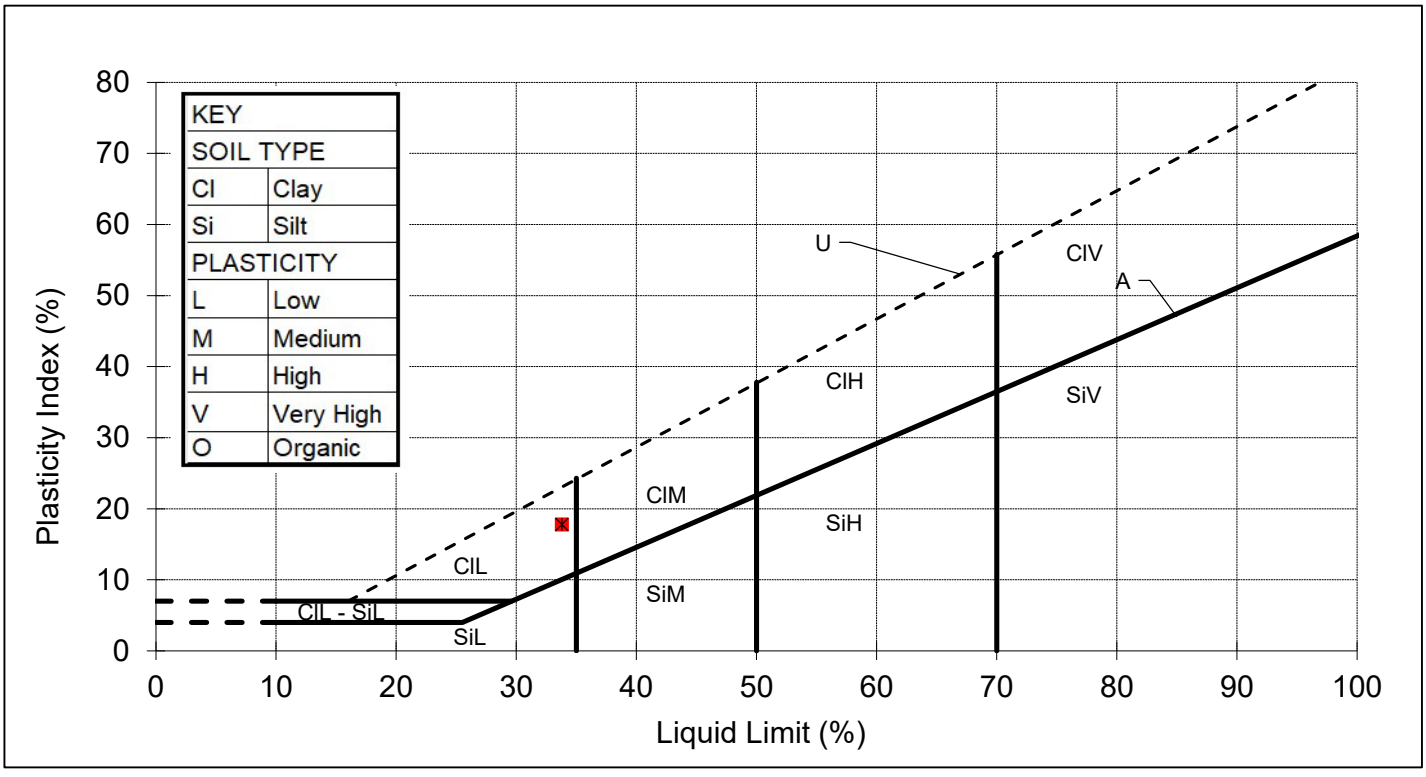
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 3.7-4 B	DATE SAMPLED	21-Nov-24
SAMPLE No.	616016	DATE RECEIVED	13-Dec-24
DATE TESTED	13-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.4	33.5	1.011	
Determination 2 (avg)	19.2	33.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18.9	34	16	18	92



REMARKS

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NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

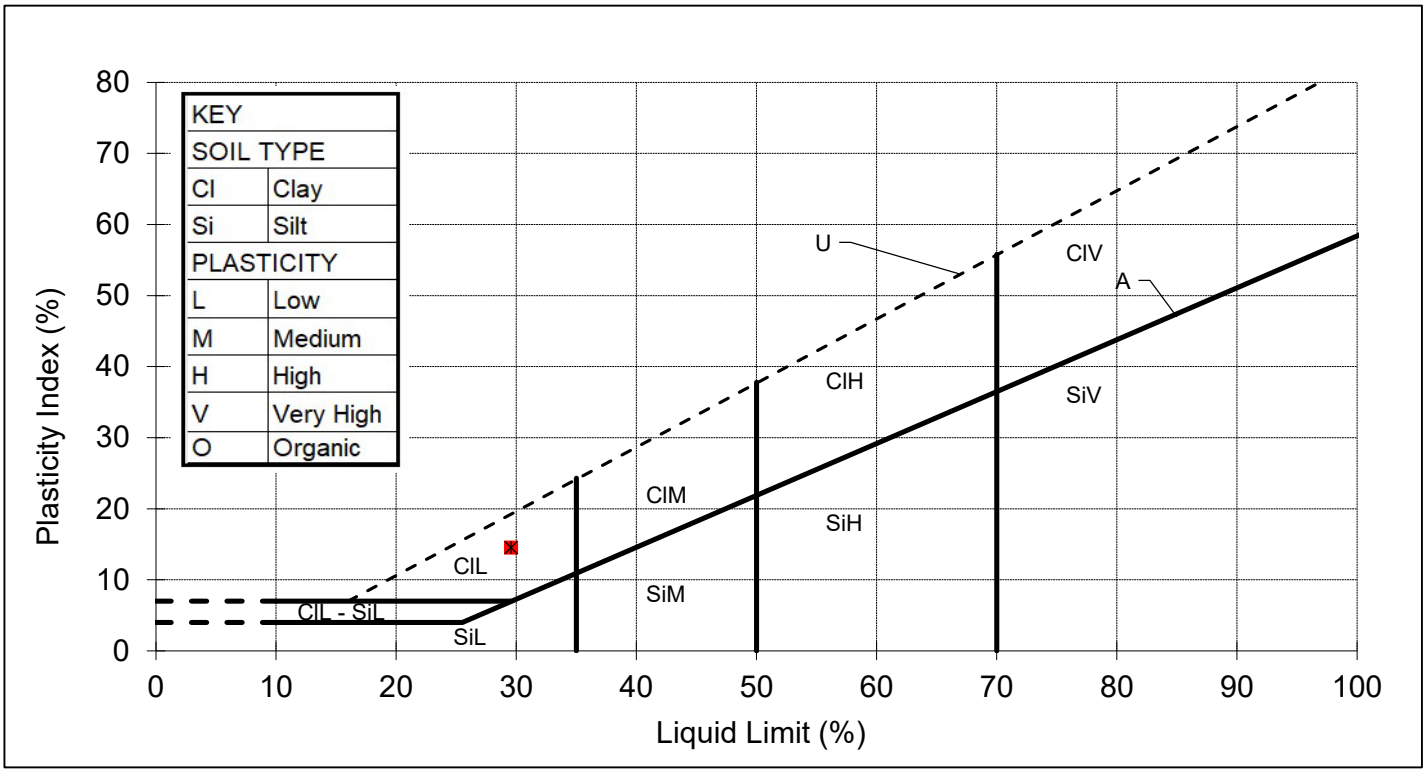
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 9-9.3 B	DATE SAMPLED	21-Nov-24
SAMPLE No.	616017	DATE RECEIVED	13-Dec-24
DATE TESTED	16-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	29.6	1.000	
Determination 2 (avg)	20.0	29.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17.6	30	15	15	92



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

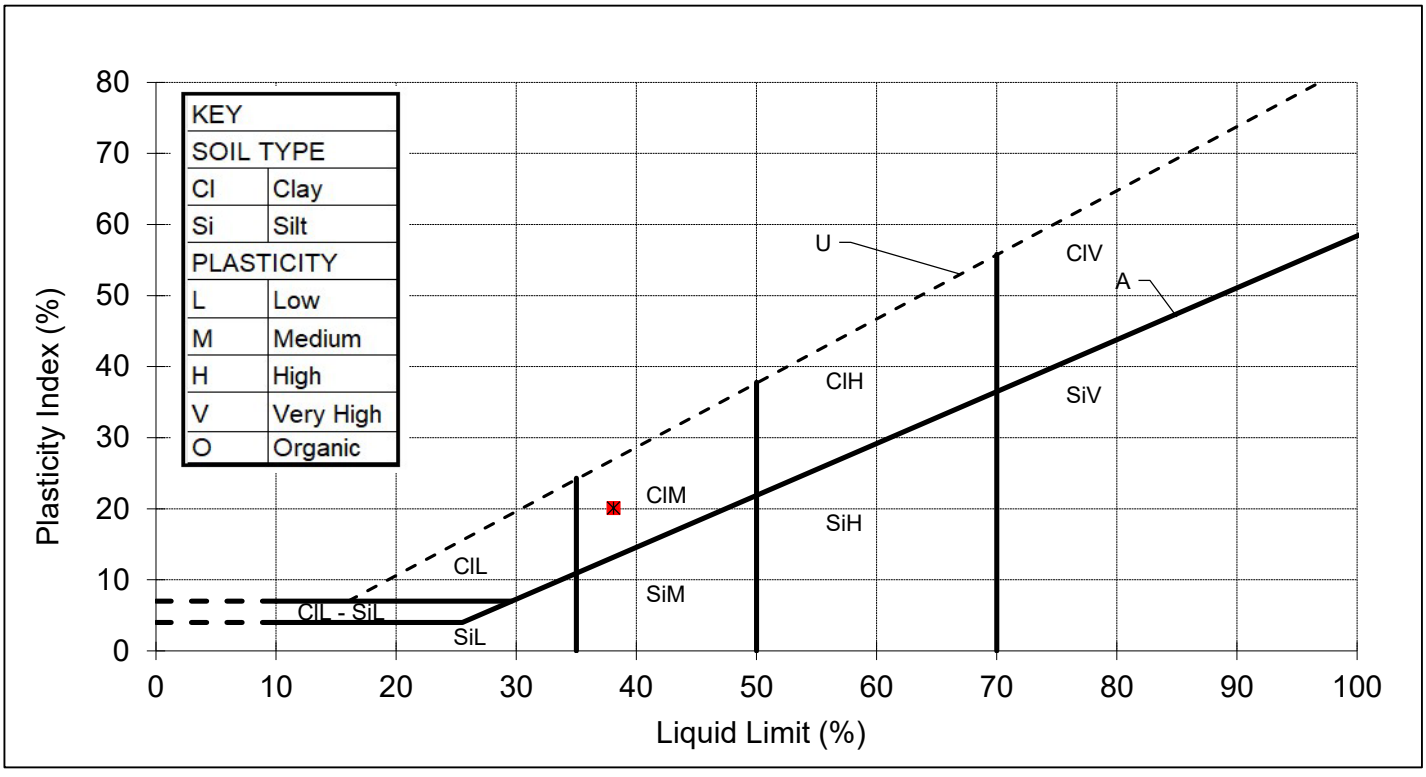
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP106 4.7-5 B	DATE SAMPLED	02-Dec-24
SAMPLE No.	610711	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.9	37.5	1.019	
Determination 2 (avg)	18.8	37.3		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19.2	38	18	20	80



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

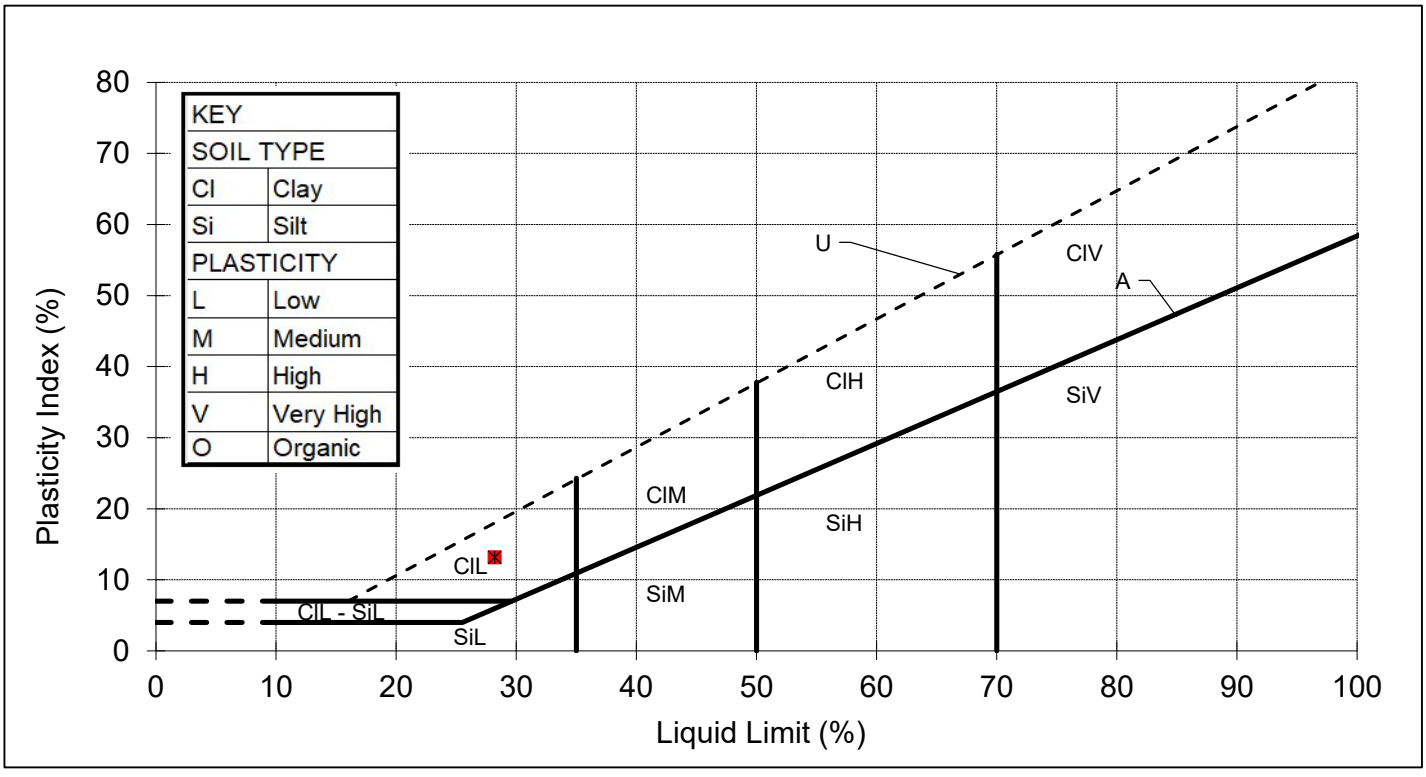
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP106 9-9.3 B	DATE SAMPLED	02-Dec-24
SAMPLE No.	610712	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	23.2	29.5	0.960	
Determination 2 (avg)	23.0	29.2		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
12.7	28	15	13	67



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

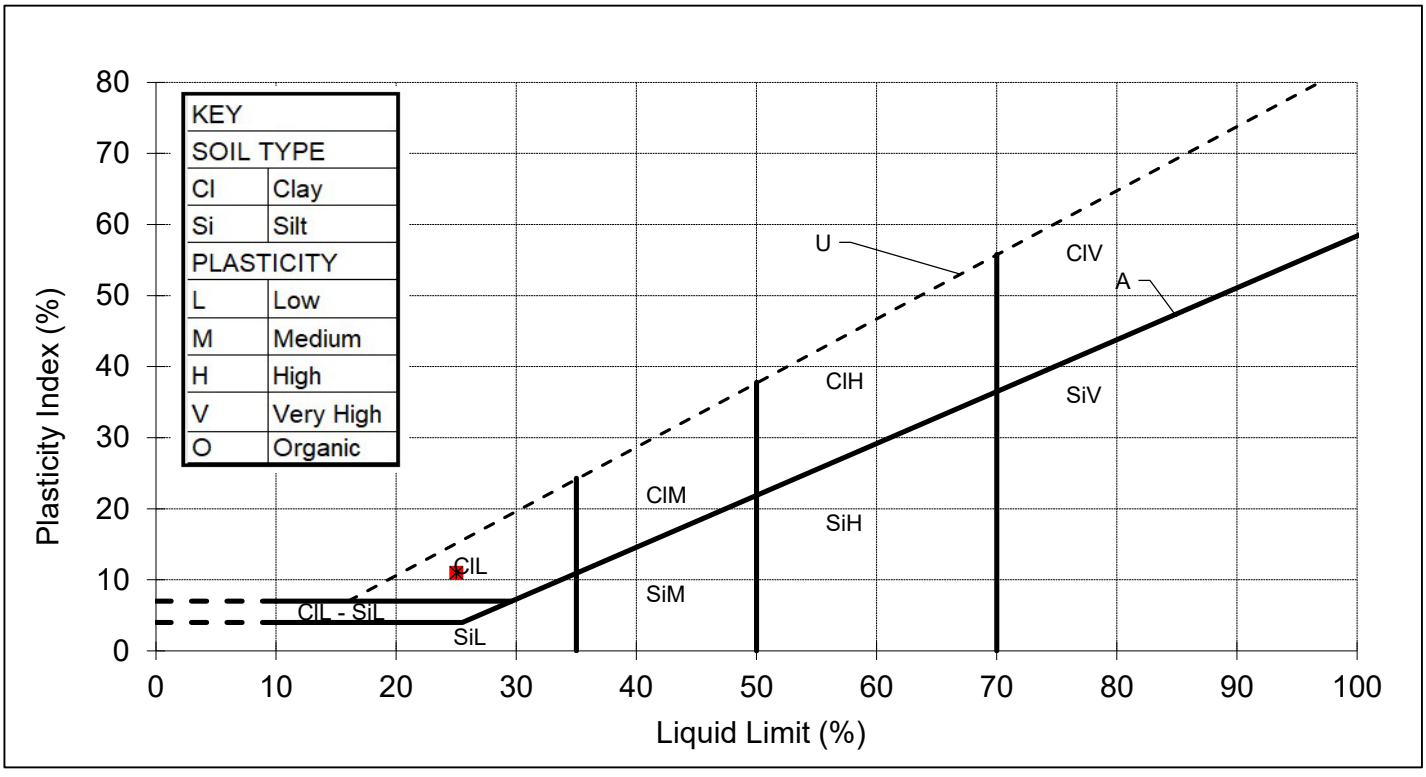
CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP102 16.50-16.9 D	DATE SAMPLED	18-Nov-24
SAMPLE No.	610720	DATE RECEIVED	05-Dec-24
DATE TESTED	09-Dec-24	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	16.5	23.9	1.048	
Determination 2 (avg)	16.3	23.8		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
11.2	25	14	11	78



REMARKS

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Dec-24

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

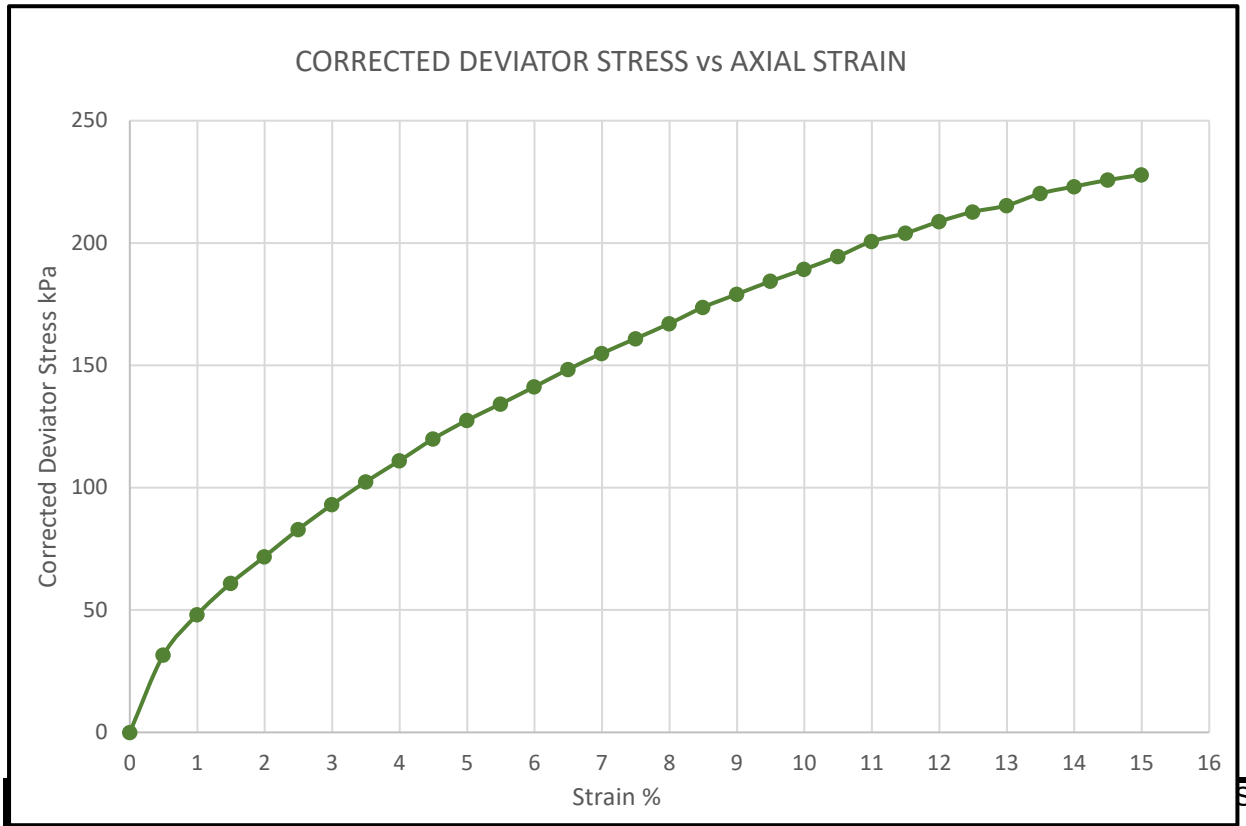
BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP101 10.6-11.05 U	**DATE SAMPLED**	19-Nov-24
LAB SAMPLE No.	610713	**DATE RECEIVED**	05-Dec-24
DATE TESTED	12-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

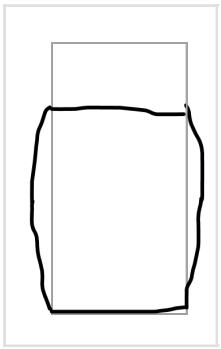
INITIAL CONDITIONS

Specimen Location 	Sample Length (mm)	280	Specimen depth from top of Sample (mm)	10
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	201	Specimen Water Content (%)	10.7
	Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.16
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.95
	Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Strain at Failure (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
220	15.0	2.0	228	114

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed 

Date 20 December 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

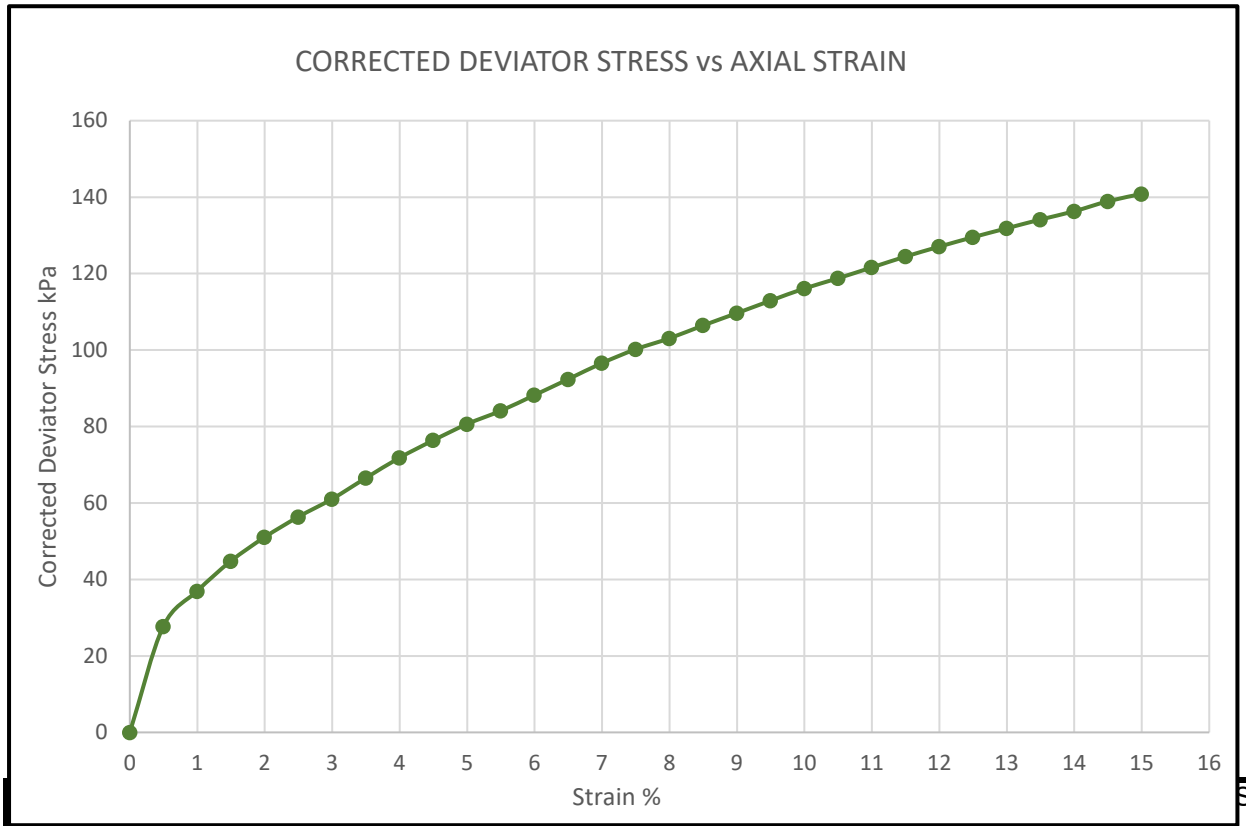
SAMPLE LABEL	CP102 4.5-4.95 U	**DATE SAMPLED**	18-Nov-24
LAB SAMPLE No.	610714	**DATE RECEIVED**	05-Dec-24
DATE TESTED	12-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

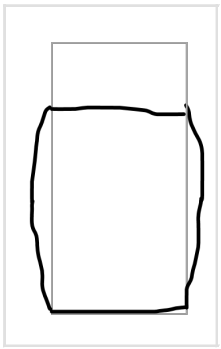


Sample Length (mm)	445	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Water Content (%)	13.5
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.23
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.96
Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Strain at failure (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
90	15.0	2.0	141	70

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 20 December 2024

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

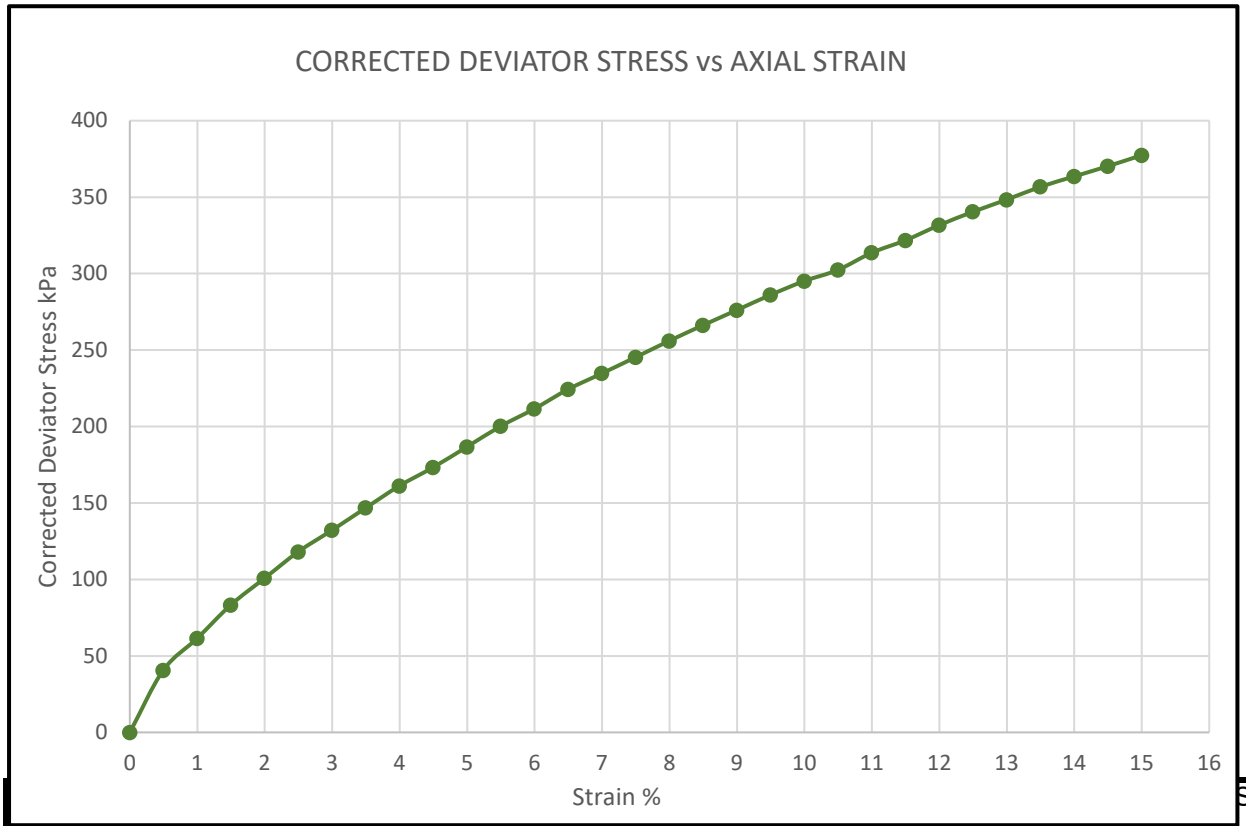
SAMPLE LABEL	CP102 10.1-10.55 U	**DATE SAMPLED**	18-Nov-24
LAB SAMPLE No.	610715	**DATE RECEIVED**	05-Dec-24
DATE TESTED	12-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

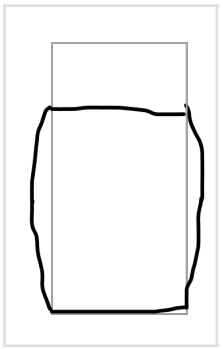


Sample Length (mm)	235	Specimen depth from top of Sample (mm)	15
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Water Content (%)	9.9
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.12
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.93
Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Strain at Failure (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
200	15.0	2.0	377	189

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 20 December 2024

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

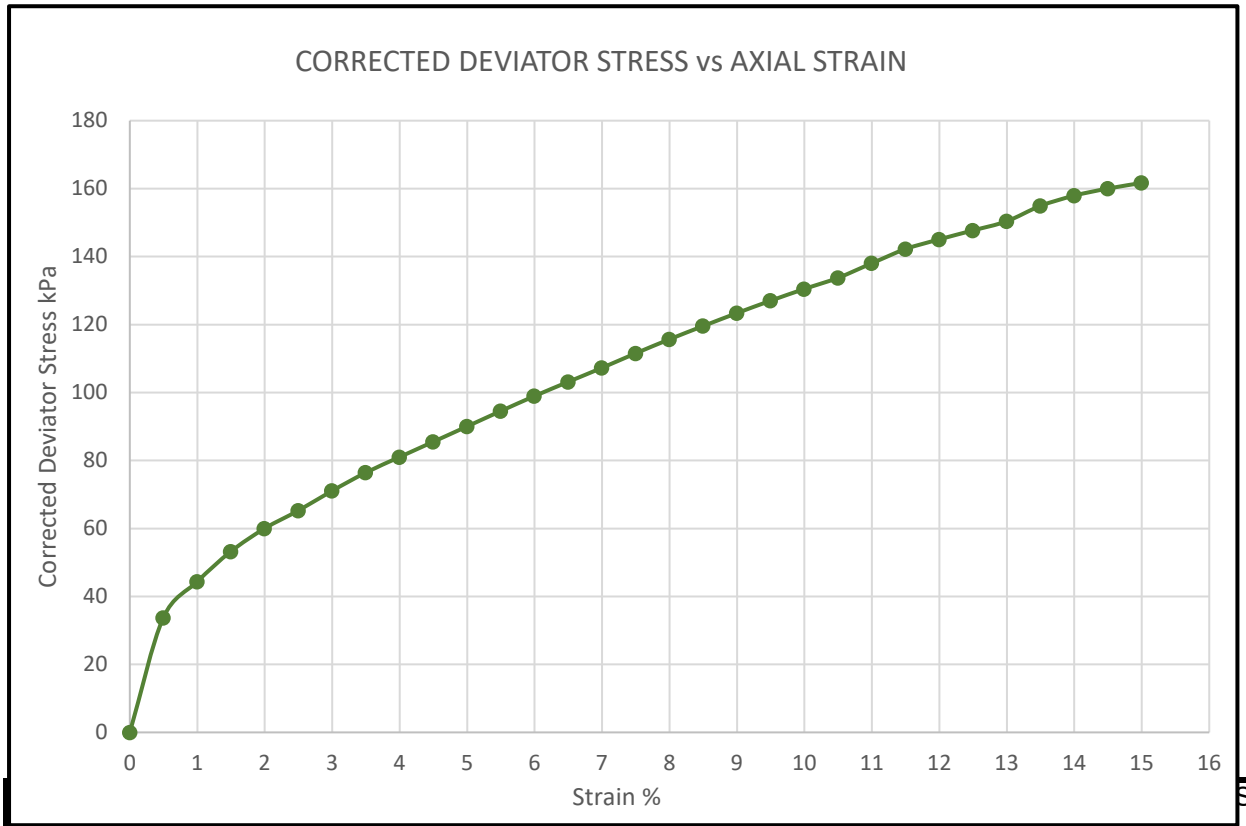
BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 5.5-5.95 U	**DATE SAMPLED**	21-Nov-24
LAB SAMPLE No.	616007	**DATE RECEIVED**	13-Dec-24
DATE TESTED	16-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

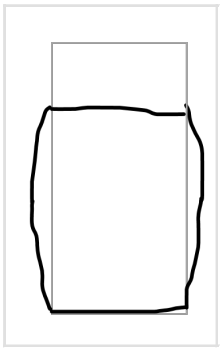
INITIAL CONDITIONS

Specimen Location 	Sample Length (mm)	400	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Water Content (%)	14.6
	Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.13
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.86
	Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Strain at failure (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
110	15.0	2.0	162	81

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed 

Date 20 December 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

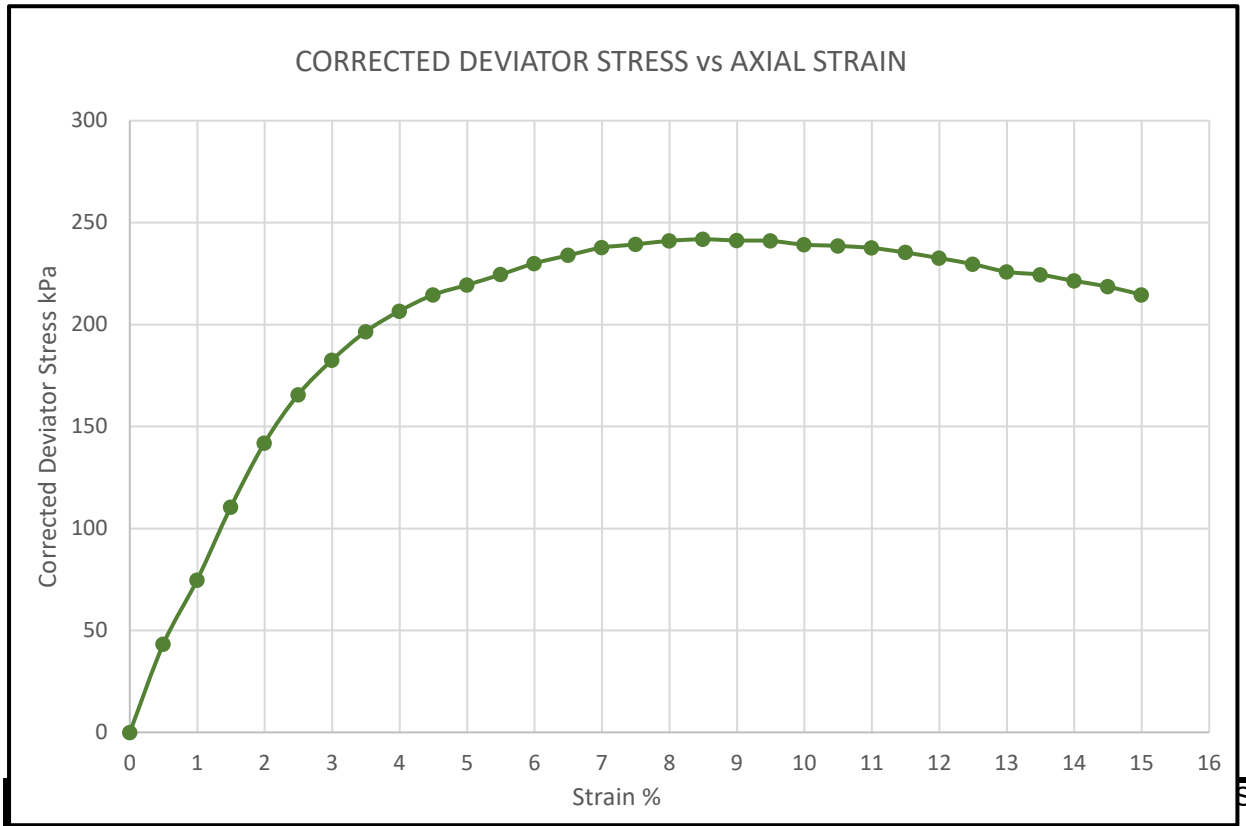
BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP105 10.5-10.95 U	**DATE SAMPLED**	21-Nov-24
LAB SAMPLE No.	616019	**DATE RECEIVED**	13-Dec-24
DATE TESTED	16-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

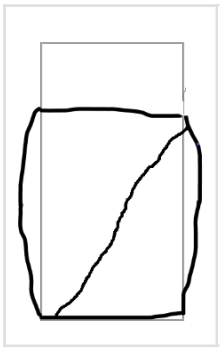
INITIAL CONDITIONS

Specimen Location 	Sample Length (mm)	300	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Water Content (%)	10.7
	Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.18
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.97
	Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Shear Strength (kPa)	Strain (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
220	8.5	2.0	242	121

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed 

Date 20 December 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

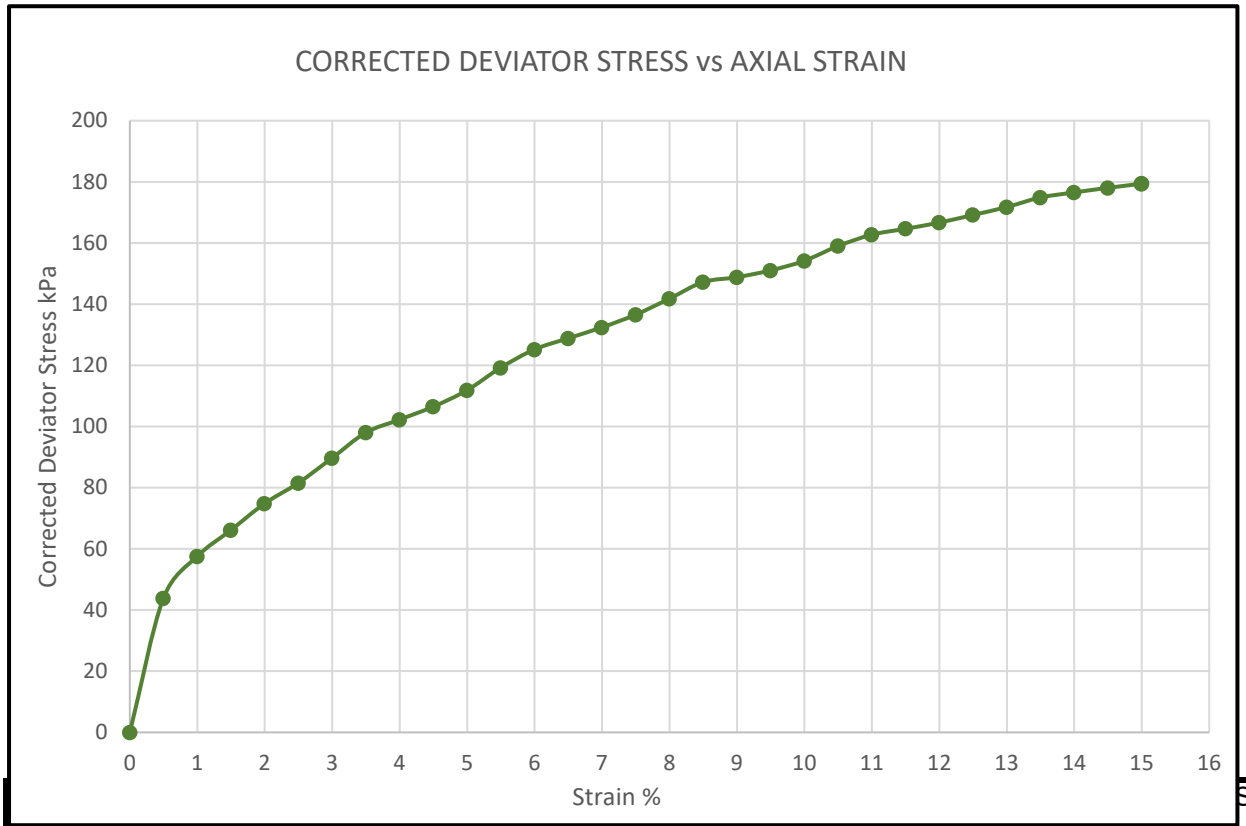
SAMPLE LABEL	CP106 7-7.45 U	**DATE SAMPLED**	02-Dec-24
LAB SAMPLE No.	610718	**DATE RECEIVED**	05-Dec-24
DATE TESTED	12-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

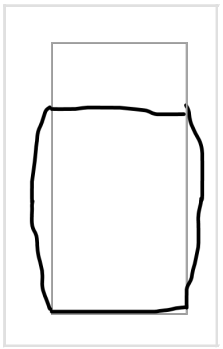


Sample Length (mm)	400	Specimen depth from top of Sample (mm)	40
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Water Content (%)	19.0
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.16
Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.82
Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Shear Strength Cu (kPa)	Strain (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Shear Strength Cu (kPa)
140	15.0	2.0	179	90

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 20 December 2024

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

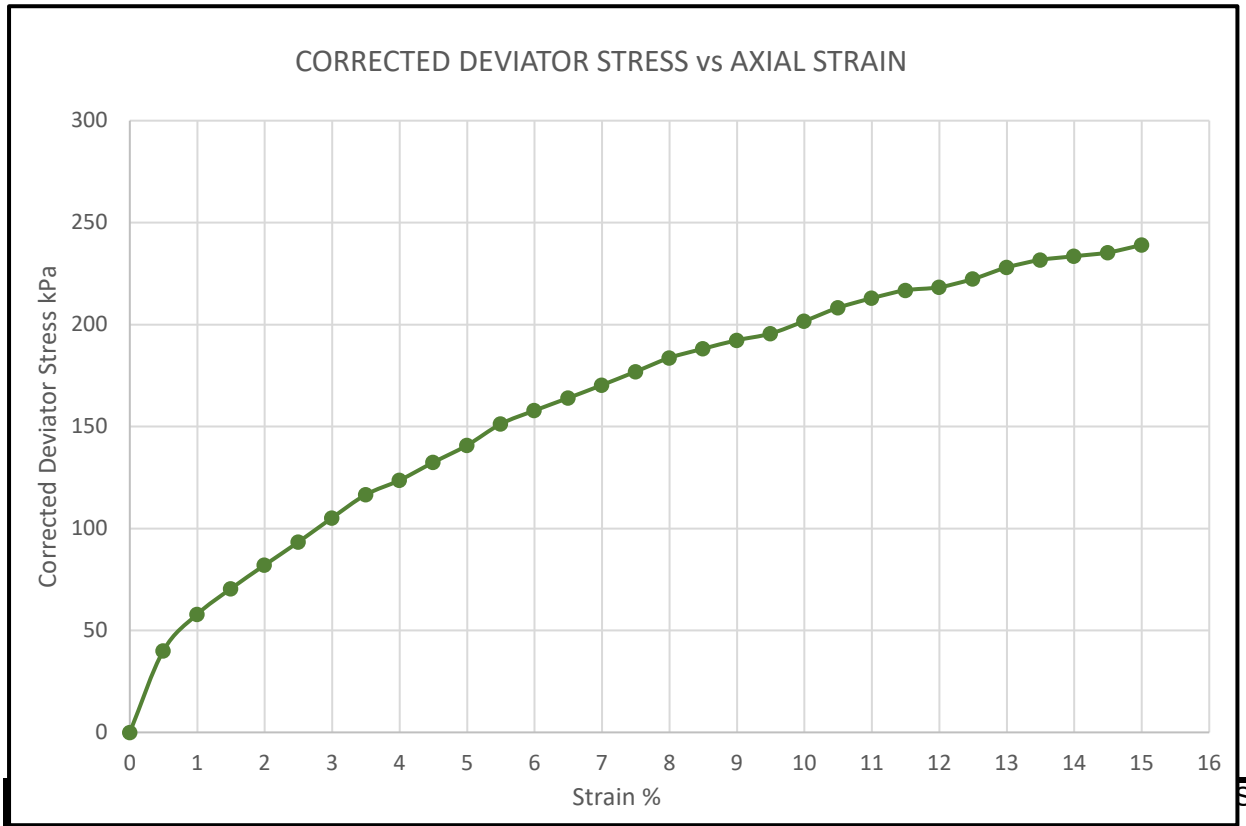
BS EN ISO 17892-8:2018

CLIENT	LK Consult Ltd
SITE	LKC 24 1317 - Chorlton Baths
JOB NUMBER	MRN 24076/117

SAMPLE LABEL	CP106 10-10.55 U	**DATE SAMPLED**	02-Dec-24
LAB SAMPLE No.	610719	**DATE RECEIVED**	05-Dec-24
DATE TESTED	12-Dec-24	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

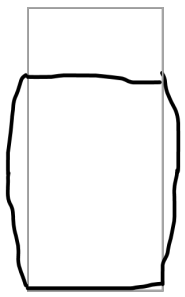
INITIAL CONDITIONS

Specimen Location 	Sample Length (mm)	400	Specimen depth from top of Sample (mm)	40
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Water Content (%)	10.4
	Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.15
	Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	1.95
	Membrane Correction	3.39		



TEST TYPE
SINGLE STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Strain at Failure (%)	Strain Rate (%/min)	Deviator Stress (kPa)	Undrained Shear Strength Cu (kPa)
200	15.0	2.0	239	120

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed 

Date 20 December 2024

LK GROUP
Unit 29 Eton Business Park
Eton Hill Road, Radcliffe
Manchester, M26 2ZS

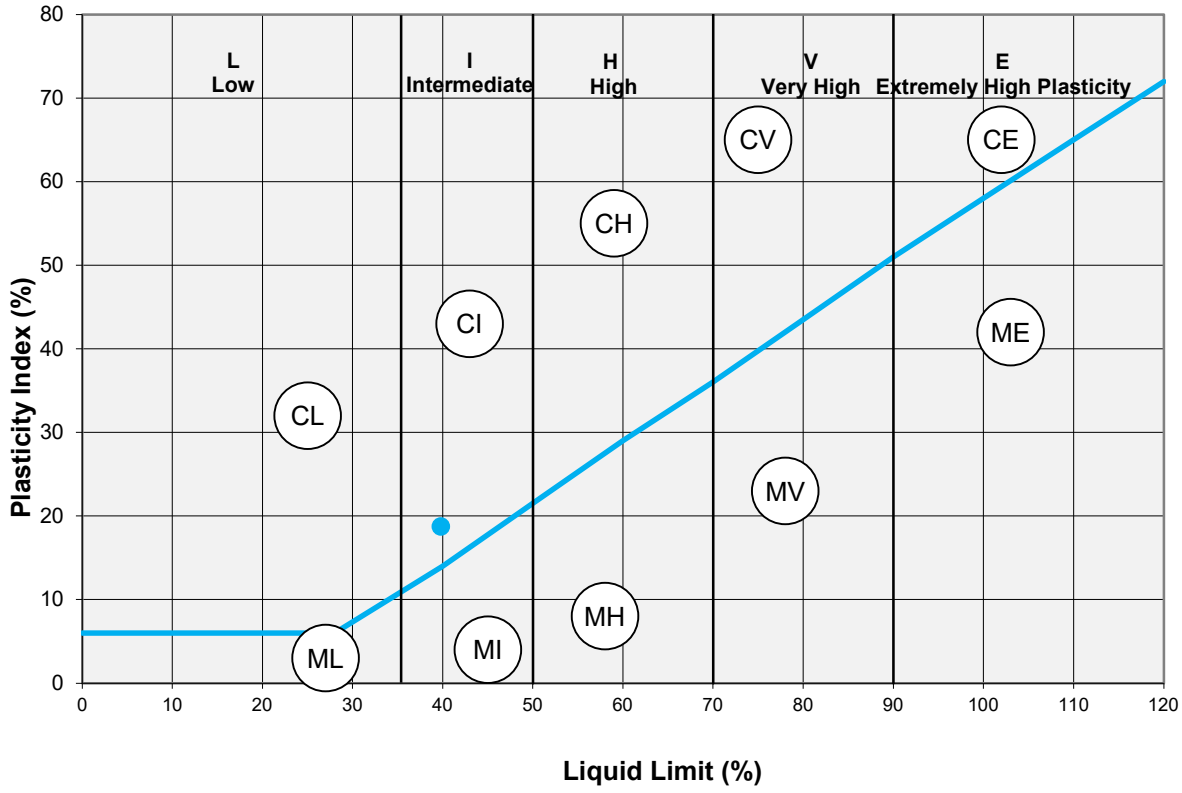
LK CONSULT LIMITED

Location: Chorlton Baths, Chorlton **Sample :** CP103 5.40-5.70m

Contract No. LKC241317

Sample Description	Brown gravelly sandy silty CLAY.

Moisture Content (Natural) (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Class	Passing 425 micron (%)
18.6	40	21	19	CI	98



Tested By: EH / HW **Checked By:** CW

Date: 12/11/2024 **Date:** 13/11/2024

Appendix E – Generic Assessment Criteria Values

Generic Assessment Criteria Values

	Contaminant	SOM	Res +	Res -	Allot.	Comm.	POSresi	POSpark	Source
Metals	Inorganic Arsenic	N/A	37	40	49	640	79	168	DEFRA C4SL
	Beryllium	N/A	1.7	1.7	35	12	2.2	63	LQM S4UL
	Boron	N/A	290	11,000	45	240,000	21,000	46,000	LQM S4UL
	Cadmium	N/A	26	149	4.9	410	220	880	DEFRA C4SL
	Chromium (III)	N/A	910	910	18,000	8,600	1,500	33,000	LQM S4UL
	Chromium (VI)	N/A	21.0	21.0	170.0	49	23.0	250	DEFRA C4SL
	Copper	N/A	2,400	7,100	520	68,000	12,000	44,000	LQM S4UL
	Lead	N/A	200	310	80	2,330	630	1,300	DEFRA C4SL
	Elemental Mercury	N/A	1.2	1.2	21	58 (25.8) vap	16	30 (25.8) vap	LQM S4UL
	Inorganic Mercury	N/A	40	56	19	1,100	120	240	LQM S4UL
	Methylmercury	N/A	11	15	6.0	320	40	68	LQM S4UL
	Nickel (2015 update)	N/A	130	180	53	980	230	800	LQM S4UL
	Selenium	N/A	250	430	88	12,000	1,100	1,800	LQM S4UL
	Vanadium	N/A	410	1,200	91	9,000	2,000	5,000	LQM S4UL
	Zinc	N/A	3,700	40,000	620	730,000	81,000	170,000	LQM S4UL
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	1%	210	3,000 (57.1) sol	34	84,000 (57.0) sol	15,000	29,000	LQM S4UL
		2.5%	510	4,700 (141) sol	85	97,000 (141) sol	15,000	30,000	LQM S4UL
		6%	1,100	6,000 (336) sol	200	100,000	15,000	30,000	LQM S4UL
	Acenaphthylene	1%	170	2,900 (86.1) sol	28	83,000 (86.1) sol	15,000	29,000	LQM S4UL
		2.5%	420	4,600 (212) sol	69	97,000 (212) sol	15,000	30,000	LQM S4UL
		6%	920	6,000 (506) sol	160	100,000	15,000	30,000	LQM S4UL
	Anthracene	1%	2,400	31,000 (1.17) vap	380	520,000	74,000	150,000	LQM S4UL
		2.5%	5,400	35,000	950	540,000	74,000	150,000	LQM S4UL
		6%	11,000	37,000	2,200	540,000	74,000	150,000	LQM S4UL
	Benz(a)anthracene	1%	7.2	11	2.9	170	29	49	LQM S4UL
		2.5%	11	14	6.5	170	29	56	LQM S4UL
		6%	13	15	13	180	29	62	LQM S4UL
	Benzo(a)pyrene (only)	1%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		2.5%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
		6%	5.0	5.3	5.70	77	10.0	21	DEFRA C4SL
	Benzo(a)pyrene (surrogate marker Coal Tar)	1%	0.8	1.2	0.32	15	2.2	4	LQM S4UL
		2.5%	1.0	1.2	0.67	15	2.2	5	LQM S4UL
		6%	1.1	1.2	1.20	15	2.2	5	LQM S4UL
	Benzo(b)fluoranthene	1%	2.6	3.9	0.99	44	7.1	13	LQM S4UL
		2.5%	3.3	4.0	2.1	44	7.2	15	LQM S4UL
		6%	3.7	4.0	3.9	45	7.2	16	LQM S4UL
	Benzo(ghi)perylene	1%	320	360	290	3,900	640	1,400	LQM S4UL
		2.5%	340	360	470	4,000	640	1,500	LQM S4UL
		6%	350	360	640	4,000	640	1,600	LQM S4UL
	Benzo(k)fluoranthene	1%	77	110	37	1,200	190	370	LQM S4UL
		2.5%	93	110	75	1,200	190	410	LQM S4UL
		6%	100	110	130	1,200	190	440	LQM S4UL
	Chrysene	1%	15	30	4.1	350	57	93	LQM S4UL
		2.5%	22	31	9.4	350	57	110	LQM S4UL
		6%	27	32	19	350	57	120	LQM S4UL
	Dibenzo(ah)anthracene	1%	0.24	0.31	0.14	3.5	0.57	1.1	LQM S4UL
		2.5%	0.28	0.32	0.27	3.6	0.58	1.3	LQM S4UL
		6%	0.3	0.32	0.43	3.6	0.58	1.4	LQM S4UL
	Fluoranthene	1%	280	1,500	52	23,000	3,100	6,300	LQM S4UL
		2.5%	560	1,600	130	23,000	3,100	6,300	LQM S4UL
		6%	890	1,600	290	23,000	3,100	6,400	LQM S4UL
	Fluorene	1%	170	2,800 (36.0) sol	27	63,000 (30.9) sol	9,900	20,000	LQM S4UL
		2.5%	400	3,800 (76.5) sol	67	68,000	9,900	20,000	LQM S4UL
		6%	860	4,500 (183) sol	160	71,000	9,900	20,000	LQM S4UL
	Indeno(123-cd)pyrene	1%	27	45	9.5	500	82	150	LQM S4UL
		2.5%	36	46	21	510	82	170	LQM S4UL
		6%	41	46	39	510	82	180	LQM S4UL
	Naphthalene	1%	15	15	65	1,600*	11,000*	8,400*	DEFRA C4SL
		2.5%	36	36	130	3,700*	15,000*	17,00*	DEFRA C4SL
		6%	85	85	200	8,400*	1,200*	1,900*	DEFRA C4SL
	Phenanthrene	1%	95	1,300 (36.0) sol	15	22,000	3,100	6,200	LQM S4UL
		2.5%	220	1,500	38	22,000	3,100	6,200	LQM S4UL
		6%	440	1,500	90	22,000	3,100	6,300	LQM S4UL
	Pyrene	1%	620	3,700	110	54,000	7,400	15,000	LQM S4UL
		2.5%	1,200	3,800	270	54,000	7,400	15,000	LQM S4UL
		6%	2,000	3,800	620	54,000	7,400	15,000	LQM S4UL
	Coal Tar (B(a)P as surrogate marker)	1%	0.79	1.2	0.32	15	2.2	4.4	LQM S4UL
		2.5%	0.98	1.2	0.67	15	2.2	4.7	LQM S4UL
		6%	1.1	1.2	1.2	15	2.2	4.8	LQM S4UL

Generic Assessment Criteria Values

	Contaminant	SOM	Res +	Res -	Allot.	Comm.	POSresi	POSpark	Source
BTEX Compounds	Benzene	1%	0.87	0.38	0.017	27	72	90	LQM S4UL
		2.5%	0.17	0.70	0.034	47	72	100	LQM S4UL
		6%	0.37	1.4	0.075	90	73	110	LQM S4UL
	Toluene	1%	130	880 (869) vap	22	56,000 (869) vap	56,000	87,000 (869) vap	LQM S4UL
		2.5%	290	1,900	51	110,000 (1,920) vap	56,000	95,000 (1,920) vap	LQM S4UL
		6%	660	3,900	120	180,000 (4,360) vap	56,000	100,000 (4,360)	LQM S4UL
	Ethylbenzene	1%	47	83	16	5,700 (518) vap	24,000	17,000 (518) vap	LQM S4UL
		2.5%	110	190	39	13,000 (1,220) vap	24,000	22,000 (1,220) vap	LQM S4UL
		6%	260	440	91	27,000 (2,840) vap	25,000	27,000 (2,840) vap	LQM S4UL
	o-xylene	1%	60	88	28	6,600 (478) sol	41,000	17,000 (478) sol	LQM S4UL
		2.5%	140	210	67	15,000 (1,120) sol	42,000	24,000 (1,120) sol	LQM S4UL
		6%	330	480	160	33,000 (2,620) sol	43,000	33,000 (2,620) sol	LQM S4UL
	m-xylene	1%	59	82	31	6,200 (625) vap	41,000	17,000 (625) vap	LQM S4UL
		2.5%	140	190	74	14,000 (1,470) vap	42,000	24,000 (1,470) vap	LQM S4UL
		6%	320	450	170	31,000 (3,460) vap	43,000	32,000 (3,460) vap	LQM S4UL
	p-xylene	1%	56	79	29	5,900 (576) sol	41,000	17,000 (576) sol	LQM S4UL
		2.5%	130	180	69	14,000 (1,350) sol	42,000	23,000 (1,350) sol	LQM S4UL
		6%	310	430	160	30,000 (3,170) sol	43,000	31,000 (3,170) sol	LQM S4UL
Petroleum Hydroc	**Aliphatic**								
	EC 5-6	1%	42	42	730	3,200 (304) sol	570,000(304)sol	95,000 (304) sol	LQM S4UL
	EC>6-8	1%	100	100	2,300	7,800 (144) sol	600,000	150,000 (144) sol	LQM S4UL
	EC>8-10	1%	27	27	320	2,000 (78) sol	13,000	14,000 (78) vap	LQM S4UL
	EC>10-12	1%	130 (48) vap	130 (48) vap	2,200	9,700 (48) sol	13,000	21,000 (48) vap	LQM S4UL
	EC>12-16	1%	1,100 (24) sol	1,100 (24) sol	11,000	59,000 (24) sol	13,000	25,000 (24) sol	LQM S4UL
	EC>16-35	1%	65,000 (8.48)	65,000 (8.48) f ,sol	260,000 f	160,000 f	250,000 f	450,000 f	LQM S4UL
	EC>35-44	1%	65,000 (8.48)	65,000 (8.48) f ,sol	260,000 f	160,000 f	250,000 f	450,000 f	LQM S4UL
	Aliphatic								
	EC 5-6	2.5%	78	78	1,700	5,900 (558) sol	590,000	130,000 (558) sol	LQM S4UL
	EC>6-8	2.5%	230	230	5,600	17,000 (322) sol	610,000	220,000 (322) sol	LQM S4UL
	EC>8-10	2.5%	65	65	770	4,800 (190) vap	13,000	18,000 (190) vap	LQM S4UL
	EC>10-12	2.5%	330 (118) vap	330 (118) vap	4,400	23,000 (118) vap	13,000	23,000 (118) vap	LQM S4UL
	EC>12-16	2.5%	2,400 (59) sol	2,400 (59) sol	13,000	82,000 (59) sol	13,000	25,000 (59) sol	LQM S4UL
	EC>16-35	2.5%	92,000 (21)	92,000 (21) f ,sol	270,000 f	1,700,000 f	250,000 f	480,000 f	LQM S4UL
	EC>35-44	2.5%	92,000 (21)	92,000 (21) f ,sol	270,000 f	1,700,000 f	250,000 f	480,000 f	LQM S4UL
	Aliphatic								
	EC 5-6	6%	160	160	3,900	12,000 (1,150) sol	600,000	180,000 (1,150)	LQM S4UL
	EC>6-8	6%	530	530	13,000	40,000 (736) sol	620,000	320,000 (736) sol	LQM S4UL
	EC>8-10	6%	150	150	1,700	11,000 (451) vap	13,000	21,000 (451) vap	LQM S4UL
	EC>10-12	6%	760 (283) vap	760 (283) vap	7,300	47,000 (283) vap	13,000	24,000 (283) vap	LQM S4UL
	EC>12-16	6%	4,300 (142) sol	4,400 (142) sol	13,000	90,000 (142) sol	13,000	26,000 (142) sol	LQM S4UL
	EC>16-35	6%	110,000f	110,000f	270,000 f	1,800,000f	250,000 f	490,000 f	LQM S4UL
	EC>35-44	6%	110,000f	110,000f	270,000 f	1,800,000f	250,000 f	490,000 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	1%	70	370	13	26,000 (1,220) sol	56,000	76,000 (1,220) sol	LQM S4UL
	EC>7-8(toluene)	1%	130	860	22	56,000 (869) vap	56,000	87,000 (869) vap	LQM S4UL
	EC>8-10	1%	34	47	8.6	3,500 (613) vap	5,000	7,200 (613) vap	LQM S4UL
	EC>10-12	1%	74	250	13	16,000 (364) sol	5,000	9,200 (364) sol	LQM S4UL
	EC>12-16	1%	140	1,800	23	36,000 (169)sol	5,100	10,000	LQM S4UL
	EC>16-21	1%	260 f	1,900 f	46 f	28,000 f	3,800 f	7,600 f	LQM S4UL
	EC>21-35	1%	1,100 f	1,900 f	370 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>35-44	1%	1,100 f	1,900 f	370f	28,000 f	3,800 f	7,800 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	2.5%	140	690	27	46,000 (2,260) sol	56,000	84,000 (2,260) sol	LQM S4UL
	EC>7-8(toluene)	2.5%	290	1,800	51	110,000 (1,920) sol	56,000	95,000 (1,920) sol	LQM S4UL
	EC>8-10	2.5%	83	110	21	8,100 (1,500) vap	5,000	8,500 (1,500) vap	LQM S4UL
	EC>10-12	2.5%	180	590	31	28,000 (899) sol	5,000	9,700 (899) sol	LQM S4UL
	EC>12-16	2.5%	330	2,300 (419) sol	57	37,000	5,100	10,000	LQM S4UL
	EC>16-21	2.5%	540 f	1,900 f	110 f	28,000 f	3,800 f	7,700 f	LQM S4UL
	EC>21-35	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>35-44	2.5%	1,500 f	1,900 f	820 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	Aromatic								
	EC5-7(benzene as non-	6%	300	1,400	57	86,000 (4,710) sol	56,000	92,000 (4,710) sol	LQM S4UL
	EC>7-8(toluene)	6%	660	3,900	120	180,000 (4,360)vap	56,000	100,000 (4,360)	LQM S4UL
	EC>8-10	6%	190	270	51	17,000 (3,580) vap	5,000	9,300 (3,580) vap	LQM S4UL
	EC>10-12	6%	380	1,200	4	34,000 (2,150) sol	5,000	10,000	LQM S4UL
	EC>12-16	6%	660	2,500	130	38,000	5,100	10,000	LQM S4UL
	EC>16-21	6%	930f	1,900 f	260 f	28,000 f	3,800 f	7,800 f	LQM S4UL
	EC>21-35	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f	LQM S4UL
	EC>35-44	6%	1,700 f	1,900 f	1,600 f	28,000 f	3,800 f	7,900 f	LQM S4UL
	Aliphatic +Aromatic >EC44	1%	1,600 f	1,900 f	1,200 f	28,000 f	3,800 f	7,800 f	LQM S4UL
		2.5%	1,800 f	1,900 f	2,100 f	28,000 f	3,800 f	7,800 f	LQM S4UL
		6%	1,900 f	1,900 f	3,000 f	28,000 f	3,800 f	7,900 f	LQM S4UL

	Contaminant	SOM	Res +	Res -	Allot.	Comm.	POSresi	POSpark	Source
Chloalkanes and Alkenes & Explosives	1,2 Dichloroethane (DCA)	1%	0.0071	0.0092	0.0046	0.67	29	21	LQM S4UL
		2.5%	0.0110	0.0130	0.0083	0.97	29	24	LQM S4UL
		6%	0.0190	0.0230	0.0160	1.7	29	28	LQM S4UL
	1,1,1 Trichloroethane (TCA)	1%	8.8	9.0	48	660	140,000	57,000 (1,425) vap	LQM S4UL
		2.5%	18	18	110	1,300	140,000	76,000 (2,915) vap	LQM S4UL
		6%	39	40	240	3,000	140,000	100,000 (6,392)	LQM S4UL
	1,1,2,2-Tetrachloroethanes (PCA)	1%	1.6	3.9	0.41	270	1,400	1,800	LQM S4UL
		2.5%	3.4	8.0	0.89	550	1,400	2,100	LQM S4UL
		6%	7.5	17	2.0	1,100	1,400	2,300	LQM S4UL
	1,1,1,2-Tetrachloroethanes (PCA)	1%	1.2	1.5	0.79	110	1,400	1,500	LQM S4UL
		2.5%	2.8	3.5	1.9	250	1,400	1,800	LQM S4UL
		6%	6.4	8.2	4.4	560	1,400	2,100	LQM S4UL
	Tetrachloroethene (PCE)	1%	0.31	0.32	2.00	24	3,200	1400	DEFRA C4SL
		2.5%	0.70	0.71	4.8	55	3,300	1900	DEFRA C4SL
		6%	1.60	1.60	11.0	130	3,400	2,500	DEFRA C4SL
	Tetrachloromethane (carbon tetrachloride)	1%	0.03	0.03	0.45	2.9	890	190	LQM S4UL
		2.5%	0.06	0.06	1.0	6.3	920	270	LQM S4UL
		6%	0.13	0.13	2.4	14	950	400	LQM S4UL
	Trichloroethene (TCE)	1%	0.009	0.010	0.032	0.7	76.0	41.0	DEFRA C4SL
		2.5%	0.020	0.020	0.072	1.5	78.0	51.0	DEFRA C4SL
		6%	0.043	0.045	0.160	3.4	79.0	69.0	DEFRA C4SL
	cis 1,2-dichloroethene	1%	0.46	0.50	0.890	38	3,800	2,000	DEFRA C4SL
		2.5%	0.78	0.84	1.70	64	3,800	2,400	DEFRA C4SL
		6%	1.50	1.60	3.60	120	3,900	3,100	DEFRA C4SL
	Trichloromethane (chloroform)	1%	0.91	1.2	0.42	99	2,500	2,600	LQM S4UL
		2.5%	1.7	2.1	0.83	170	2,500	2,800	LQM S4UL
		6%	3.4	4.2	1.7	350	2,500	3,100	LQM S4UL
	Trans-1,2 Dichloroethene	1%	0.9	0.9	3.7	69	13,000	5,600	DEFRA C4SL
		2.5%	1.6	1.7	7.5	120	13,000	7,000	DEFRA C4SL
		6%	3.3	3.4	16.0	260	13,000	9,100	DEFRA C4SL
	Chloroethene (vinyl chloride)	1%	0.006	0.015	0.0017	1.1E+00	7.8	18.0	DEFRA C4SL
		2.5%	0.010	0.019	0.0031	1.4E+00	7.8	19.0	DEFRA C4SL
		6%	0.017	0.029	0.0058	2.20	7.8	19.0	DEFRA C4SL
	2,4,6-Trinitritoluene (TNT)	1%	1.6	65	0.24	1,000	130	260	LQM S4UL
		2.5%	3.7	66	0.58	1,000	130	270	LQM S4UL
		6%	8.1	66	1.4	1,000	130	270	LQM S4UL
	RDX	1%	120	13,000	17	210,000	26,000	49,000 (18.7) sol	LQM S4UL
		2.5%	250	13,000	38	210,000	26,000	51,000	LQM S4UL
		6%	540	13,000	85	210,000	27,000	53,000	LQM S4UL
	HMX	1%	5.7	6,700	0.86	110,000	13,000	23,000 (0.35) vap	LQM S4UL
		2.5%	13	6,700	1.9	110,000	13,000	23,000 (0.39) vap	LQM S4UL
		6%	26	6,700	3.9	110,000	13,000	24,000 (0.48) vap	LQM S4UL
Pesticides	Aldrin	1%	5.7	7.3	3.2	170	18	30	LQM S4UL
		2.5%	6.6	7.4	6.1	170	18	31	LQM S4UL
		6%	7.1	7.5	9.8	170	18	31	LQM S4UL
	Dieldrin	1%	0.97	7.0	0.17	170	18	30	LQM S4UL
		2.5%	2.0	7.3	0.41	170	18	30	LQM S4UL
		6%	3.5	7.4	0.96	170	18	31	LQM S4UL
	Atrazine	1%	3.3	610	0.5	9,300	1,200	2,300	LQM S4UL
		2.5%	7.8	620	1.2	9,400	1,200	2,400	LQM S4UL
		6%	17.4	620	2.7	9,400	1,200	2,400	LQM S4UL
	Dichlorvos	1%	3.2E-02	6.4	4.9E-03	140	16	26	LQM S4UL
		2.5%	6.6E-02	6.5	1.0E-02	140	16	26	LQM S4UL
		6%	0.14	6.6	2.2E-02	140	16	27	LQM S4UL
	Endosulfanns (2 isomers)	1%	7.4	160 (3.0E-03) vap	1.2	5,600 (3.0E-03) vap	1,200	2,300	LQM S4UL
		2.5%	18	280 (7.0E-03) vap	2.9	7,400 (7.0E-03) vap	1,200	2,400	LQM S4UL
		6%	41	410 (1.6E-02) vap	6.8	8,400 (1.6E-02) vap	1,200	2,500	LQM S4UL
	Hexachlorocyclohexane (3 isomers), inc Lindane	1%	8.5E-02	3.7	1.3E-02	65	8.1	15	LQM S4UL
		2.5%	0.2	3.8	3.2E-02	65	8.1	15	LQM S4UL
		6%	0.46	3.8	7.7E-02	65	8.1	16	LQM S4UL
Chlorobenzenes	Chlorobenzene	1%	0.46	0.46	5.9	56	11,000	1,300 (675) sol	LQM S4UL
		2.5%	1.0	1.0	14	130	13,000	2,000 (1,520) sol	LQM S4UL
		6%	2.4	2.4	32	290	14,000	2,900	LQM S4UL
	Dichlorobenzenes (3 isomers)	1%	23	24	94	2,000 (571) sol	90,000	24,000 (571) sol	LQM S4UL
		2.5%	55	57	230	4,800 (1,370) sol	95,000	36,000 (1,370) sol	LQM S4UL
		6%	130	130	540	11,000 (3,240) sol	98,000	51,000 (3,270) sol	LQM S4UL
	Trichlorobenzenes (3 isomers)	1%	2.6	2.6	55	220	15,000	1,700 (318) vap	LQM S4UL
		2.5%	6.4	6.4	140	530	17,000	2,600 (786) vap	LQM S4UL
		6%	15	15	320	1,300	19,000	4,000 (1,880) vap	LQM S4UL
	Tetrachlorobenzenes (3 isomers)	1%	0.66	0.75	0.38	49 (39.4) vap	78	110 (39) vap	LQM S4UL
		2.5%	1.6	1.9	0.90	120 (98.1) vap	79	120	LQM S4UL
		6%	3.7	4.3	2.2	240 (235) vap	79	130	LQM S4UL
	Pentachlorobenzene	1%	5.8	19	1.2	640 (43.0) sol	100	190	LQM S4UL
		2.5%	12	30	3.1	770 (107) sol	100	190	LQM S4UL
		6%	22	38	7.0	830	100	190	LQM S4UL
	Hexachlorobenzene	1%	1.8 (0.20) vap	4.1 (0.20) vap	0.47	110 (0.20) vap	16	30	LQM S4UL
		2.5%	3.3 (0.50) vap	5.7 (0.50) vap	1.1	120	16	30	LQM S4UL
		6%	4.9	6.7 (1.2) vap	2.5	120	16	30	LQM S4UL

Generic Assessment Criteria Values

	Contaminant	SOM	Res +	Res -	Allot.	Comm.	POSresi	POSpark	Source
Chlorophenol	Chlorophenols (4 congeners)	1%	0.87 [g]	94	0.13 [g]	3,500	620	1,100	LQM S4UL
		2.5%	2.0	150	0.30	4,000	620	1,100	LQM S4UL
		6%	4.5	210	0.70	4,300	620	1,100	LQM S4UL
	Pentachlorophenol	1%	0.22	27 (16.4) [vap]	3.0E-02	400	60	110	LQM S4UL
		2.5%	0.52	29	8.0E-02	400	60	120	LQM S4UL
		6%	1.2	31	0.19	400	60	120	LQM S4UL
Others	Carbon Disulphide	1%	0.14	0.14	4.8	11	11,000	1,300	LQM S4UL
		2.5%	0.29	0.29	10	22	11,000	1,900	LQM S4UL
		6%	0.62	0.62	23	47	11,000	2,700	LQM S4UL
	Hexachlorobutadiene	1%	0.29	0.32	0.25	31	25	48	LQM S4UL
		2.5%	0.7	0.78	0.61	66	25	50	LQM S4UL
		6%	1.6	1.8	1.4	120	25	51	LQM S4UL
	Phenol	1%	120	440 (460)	23	440 [dir] (26,000)	440 [dir] (10,000)	440 [dir] (7,600)	LQM S4UL
		2.5%	200	690	42	690 [dir] (30,000)	690 [dir] (10,000)	690 [dir] (8,300)	LQM S4UL
		6%	380	1,200	83	1,300 [dir] (34,000)	1,300 [dir] (10,000)	1,300 [dir] (9,300)	LQM S4UL

sol/vap = solubility/vapour limit (potenitally use if free product identified, although highly conservative)
*=naphthalene C4SL exceeds the CLEA calculated soil saturation concentration (76 mg kg-1 for 1% SOM,
183 mg kg-1 for 2.5% SOM and 432 mg kg-1 for 6% SOM)
f = oral, dermal and inhalation exposures compared to oral HCV
dir = S4ULs based on threshold protective of direct skin contact with phenol)brackets long term exposure for illustration purposes)
g = derived based on 2,3,4-tetrachlorophenol

Appendix F – Hazwaste Online Certificates

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

RWAPQ-QWGVM-S13LD

Job name

LKC241317

Description/Comments

Project

LKC241317

Site

Chorlton Baths

Classified by

Name:
Peter Dunn
Company:
LK Group
Date:
03 Oct 2024 14:58 GMT
Telephone:
0161 763 7200

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	26 Mar 2015 *
Most recent 3 year Refresher	02 Aug 2022

Next 3 year Refresher due by Aug 2025
* training course booked

Purpose of classification

2 - Material Characterisation

Address of the waste

3 Cavendish Terrace, Chorlton-cum-Hardy, Manchester **Post Code** M21 0UA

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Development of brownfield land

Description of the specific process, sub-process and/or activity that created the waste

Construction

Description of the waste

Soil

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP101-0.05 - 1.00-12/09/2024	0.05 - 1.00	Non Hazardous		3
2	TP102-0.00 - 0.60-12/09/2024	0.00 - 0.60	Non Hazardous		6
3	TP103-0.30 - 1.00-12/09/2024	0.30 - 1.00	Non Hazardous		9
4	TP104-0.20 - 1.00-12/09/2024	0.20 - 1.00	Hazardous	HP 3(i), HP 7, HP 11	12

Related documents

#	Name	Description
1	24-10916.1.hwol	DETS South .hwol file used to populate the Job
2	LK SUITE 1 - 5	waste stream template used to create this Job

Report

Created by: Peter Dunn

Created date: 03 Oct 2024 14:58 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	15
Appendix B: Rationale for selection of metal species	16
Appendix C: Version	17

Classification of sample: TP101-0.05 - 1.00-12/09/2024

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP101-0.05 - 1.00-12/09/2024
Sample Depth:
0.05 - 1.00 m
Moisture content:
11.1%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11.1% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	26.997	mg/kg	0.0027 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.508	mg/kg	0.0000508 %	✓	
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14	mg/kg	1.462	18.191	mg/kg	0.00182 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		105	mg/kg	1.126	105.096	mg/kg	0.0105 %	✓	
5		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<**LOD**
6		nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		30	mg/kg	1.273	33.94	mg/kg	0.00339 %	✓	
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	212	mg/kg		188.468	mg/kg	0.0188 %	✓	
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<**LOD**
9		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		44	mg/kg	1.785	69.829	mg/kg	0.00698 %	✓	
10		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		148	mg/kg	1.245	163.77	mg/kg	0.0164 %	✓	
11		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<**LOD**
12		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		1.1	mg/kg	3.22	3.149	mg/kg	0.000315 %	✓	
13		TPH (C6 to C40) petroleum group			TPH		604	mg/kg		536.956	mg/kg	0.0537 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
20		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
21		naphthalene				0.83	mg/kg		0.738	mg/kg	0.0000738 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				6.68	mg/kg		5.939	mg/kg	0.000594 %	✓	
			201-469-6	83-32-9									
24		fluorene				4.19	mg/kg		3.725	mg/kg	0.000372 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				37.3	mg/kg		33.16	mg/kg	0.00332 %	✓	
			201-581-5	85-01-8									
26		anthracene				7.65	mg/kg		6.801	mg/kg	0.00068 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				46.3	mg/kg		41.161	mg/kg	0.00412 %	✓	
			205-912-4	206-44-0									
28		pyrene				42.4	mg/kg		37.694	mg/kg	0.00377 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				19.3	mg/kg		17.158	mg/kg	0.00172 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				19.7	mg/kg		17.513	mg/kg	0.00175 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				16.1	mg/kg		14.313	mg/kg	0.00143 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				5.75	mg/kg		5.112	mg/kg	0.000511 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				17.5	mg/kg		15.558	mg/kg	0.00156 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				8.42	mg/kg		7.485	mg/kg	0.000749 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				1.99	mg/kg		1.769	mg/kg	0.000177 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				6.83	mg/kg		6.072	mg/kg	0.000607 %	✓	
			205-883-8	191-24-2									
37		polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
38		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.137 %		

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"
Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0537%)

Classification of sample: TP102-0.00 - 0.60-12/09/2024

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP102-0.00 - 0.60-12/09/2024
Sample Depth:
0.00 - 0.60 m
Moisture content:
11%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	23.502 mg/kg	0.00235 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		12 mg/kg	1.462	15.609 mg/kg	0.00156 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		59 mg/kg	1.126	59.12 mg/kg	0.00591 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
6	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		14 mg/kg	1.273	15.857 mg/kg	0.00159 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	141 mg/kg		125.49 mg/kg	0.0125 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<LOD
9	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		23 mg/kg	1.785	36.543 mg/kg	0.00365 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		78 mg/kg	1.245	86.408 mg/kg	0.00864 %	✓	
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
12	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
13	TPH (C6 to C40) petroleum group			TPH		380 mg/kg		338.2 mg/kg	0.0338 %	✓	

#		Determinand	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number											
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
20		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
21		naphthalene				0.28	mg/kg		0.249	mg/kg	0.0000249 %	✓	
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				0.12	mg/kg		0.107	mg/kg	0.0000107 %	✓	
			205-917-1	208-96-8									
23		acenaphthene				0.58	mg/kg		0.516	mg/kg	0.0000516 %	✓	
			201-469-6	83-32-9									
24		fluorene				0.54	mg/kg		0.481	mg/kg	0.0000481 %	✓	
			201-695-5	86-73-7									
25		phenanthrene				4.91	mg/kg		4.37	mg/kg	0.000437 %	✓	
			201-581-5	85-01-8									
26		anthracene				0.91	mg/kg		0.81	mg/kg	0.000081 %	✓	
			204-371-1	120-12-7									
27		fluoranthene				7.73	mg/kg		6.88	mg/kg	0.000688 %	✓	
			205-912-4	206-44-0									
28		pyrene				9.32	mg/kg		8.295	mg/kg	0.000829 %	✓	
			204-927-3	129-00-0									
29		benzo[a]anthracene				4.15	mg/kg		3.694	mg/kg	0.000369 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				5.32	mg/kg		4.735	mg/kg	0.000473 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				3.61	mg/kg		3.213	mg/kg	0.000321 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				1.36	mg/kg		1.21	mg/kg	0.000121 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				4.66	mg/kg		4.147	mg/kg	0.000415 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34		indeno[123-cd]pyrene				2.4	mg/kg		2.136	mg/kg	0.000214 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.58	mg/kg		0.516	mg/kg	0.0000516 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36		benzo[ghi]perylene				2.14	mg/kg		1.905	mg/kg	0.00019 %	✓	
			205-883-8	191-24-2									
37		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0759 %		

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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"
Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0338%)

Classification of sample: TP103-0.30 - 1.00-12/09/2024

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP103-0.30 - 1.00-12/09/2024
Sample Depth:
0.30 - 1.00 m
Moisture content:
5.4%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 5.4% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3 mg/kg	1.32	3.747 mg/kg	0.000375 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7 mg/kg	1.462	9.678 mg/kg	0.000968 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		7 mg/kg	1.126	7.456 mg/kg	0.000746 %	✓	
5	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<**LOD**
6	nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		9 mg/kg	1.273	10.835 mg/kg	0.00108 %	✓	
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	6 mg/kg		5.676 mg/kg	0.000568 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<2 mg/kg	1.405	<2.81 mg/kg	<0.000281 %		<**LOD**
9	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		8 mg/kg	1.785	13.51 mg/kg	0.00135 %	✓	
10	zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		27 mg/kg	1.245	31.792 mg/kg	0.00318 %	✓	
11	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<**LOD**
12	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<**LOD**
13	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
15		benzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
17		ethylbenzene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
20		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
21		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
22		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
23		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
24		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
25		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
26		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
27		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
28		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
29		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
33		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									
34		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
35		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									
36		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
37		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0142 %		

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: TP104-0.20 - 1.00-12/09/2024

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP104-0.20 - 1.00-12/09/2024
Sample Depth:
0.20 - 1.00 m
Moisture content:
6.5%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.164%)

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.164%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.164%)

Determinands

Moisture content: 6.5% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5 mg/kg	1.32	6.173 mg/kg	0.000617 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.32 mg/kg	0.000032 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		9 mg/kg	1.462	12.299 mg/kg	0.00123 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9 mg/kg	1.126	9.474 mg/kg	0.000947 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
5		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1	mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
6		nickel { nickel(II) oxide (nickel monoxide) }	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]		8	mg/kg	1.273	9.519	mg/kg	0.000952 %	✓	
7		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	26	mg/kg		24.31	mg/kg	0.00243 %	✓	
8		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<2	mg/kg	1.405	<2.81	mg/kg	<0.000281 %		<LOD
9		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		14	mg/kg	1.785	23.368	mg/kg	0.00234 %	✓	
10		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		36	mg/kg	1.245	41.897	mg/kg	0.00419 %	✓	
11		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD
12		boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
13		TPH (C6 to C40) petroleum group			TPH		1759	mg/kg		1644.665	mg/kg	0.164 %	✓	
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
19		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
20		pH			PH		9.8	pH		9.8	pH	9.8 pH		
21		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
22		acenaphthylene		205-917-1	208-96-8		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
23		acenaphthene		201-469-6	83-32-9		0.16	mg/kg		0.15	mg/kg	0.000015 %	✓	
24		fluorene		201-695-5	86-73-7		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
25		phenanthrene		201-581-5	85-01-8		3.79	mg/kg		3.544	mg/kg	0.000354 %	✓	
26		anthracene		204-371-1	120-12-7		0.57	mg/kg		0.533	mg/kg	0.0000533 %	✓	
27		fluoranthene		205-912-4	206-44-0		5.21	mg/kg		4.871	mg/kg	0.000487 %	✓	
28		pyrene		204-927-3	129-00-0		4.5	mg/kg		4.208	mg/kg	0.000421 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
29		benzo[a]anthracene				3.36	mg/kg		3.142	mg/kg	0.000314 %	✓	
		601-033-00-9	200-280-6	56-55-3									
30		chrysene				2.74	mg/kg		2.562	mg/kg	0.000256 %	✓	
		601-048-00-0	205-923-4	218-01-9									
31		benzo[b]fluoranthene				2.56	mg/kg		2.394	mg/kg	0.000239 %	✓	
		601-034-00-4	205-911-9	205-99-2									
32		benzo[k]fluoranthene				1.08	mg/kg		1.01	mg/kg	0.000101 %	✓	
		601-036-00-5	205-916-6	207-08-9									
33		benzo[a]pyrene; benzo[def]chrysene				2.97	mg/kg		2.777	mg/kg	0.000278 %	✓	
		601-032-00-3	200-028-5	50-32-8									
34	●	indeno[123-cd]pyrene				1.42	mg/kg		1.328	mg/kg	0.000133 %	✓	
			205-893-2	193-39-5									
35		dibenz[a,h]anthracene				0.43	mg/kg		0.402	mg/kg	0.0000402 %	✓	
		601-041-00-2	200-181-8	53-70-3									
36	●	benzo[ghi]perylene				1.55	mg/kg		1.449	mg/kg	0.000145 %	✓	
			205-883-8	191-24-2									
37	●	polychlorobiphenyls; PCB				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
38	●	monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.182 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
●	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

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Concentrations at less than 1.0% are "unlikely to be flammable". Flammability of soils is unlikely to result in a hazardous classification in soils (AGS Waste Classification – A Practitioner's Guide).

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.164%)

Appendix A: Classifier defined and non GB MCL determinands

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **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 Acute 1; H400 , Aquatic Chronic 1; H410

- **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds

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 (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

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. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

nickel {nickel(II) oxide (nickel monoxide)}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

lead {lead compounds with the exception of those specified elsewhere in this Annex}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

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.

vanadium {divanadium pentaoxide; vanadium pentoxide}

Most conservative species.

zinc {zinc oxide}

Worst case compound based on absence of CrVI and assumed metal oxides from a combustion, ash based source.

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

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass.

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 v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2024.271.6257.11459 (29 Sep 2024)
HazWasteOnline Database: 2024.271.6257.11459 (29 Sep 2024)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023
GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024
GB MCL List v5.0 - version 5.0 of 26th June 2024

Appendix G – References

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