soils LIMITED

Main Investigation Report

at
Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ

for
Eastleigh Borough Council

Reference: 22085/MIR Rev1.0
December 2025

Control Document

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

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Commission

This document comprises the Main Investigation Report (MIR) and incorporates the results, discussion, and conclusions to this intrusive works and supersedes the previous report undertaken by the client by Soils Limited (ref: 21876/MIR Rev1.0 Main Investigation Report, dated June 2025). General site data is recorded below:

Commission Record	
Client	Eastleigh Borough Council
Site Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ
Grid Reference	SU 49828 12021
Soils Limited Quotation Ref	Q30327, dated 12th August 2025
Clients Purchase Order	000070587, dated 13th August 2025

The record of revision to this document is presented below:

Record Of Revisions		
Revision	**Date**	**Reason**
Rev 1.0	December 2025	First issue to Client.

Documents associated with this development that must be referred to are given below.

Record Of Associated Documents			
Reference	**Type**	**Date**	**Creator**
21876/PIR Rev1.0	Desk study	June 2025	Soils Limited
22-148 KCA MHA ZZ XX DR A 0003 C01	Proposed Site Plan	June 2025	MH Architects

Soils Limited have been provided with a report undertaken on the site by Terra Firma in 2015; however, we note that it includes the following caveat:

The GI was conducted, and this report has been prepared for the sole internal reliance of Hampshire County Council and their design and construction teams. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Terra Firma (South). If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

Therefore, and regarding the age of the Terra Firma report, no reliance was placed on it during the present intrusive investigation.

Limitations and Disclaimers

The report was prepared solely for the brief described in our quotation and Section 1.1 of this report. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of our engagement.

We have exercised all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

This report is a snapshot of the site and conditions taken only at the time of our investigation works and described in our reporting. The ground is a product of continuing natural and artificial processes, and has variation by depth and location that cannot be determined absolutely. While a ground investigation will aim to understand and mitigate, risk cannot be eliminated.

Current regulations and good practice were used in the preparation of this report. Consideration of any subsequent changes to regulations or practice that may have occurred following issue of this report is the responsibility of the user.

If the term “competent person” is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Unless the site investigation works have been designed and specified in accordance with EC7, this report is not a Ground Investigation Report as defined by Eurocode 7.

Any reference to ground level relates to the site level at the time of the investigation, unless otherwise stated. Ground elevations and coordinates are only provided when this forms part of our engagement.

A survey of the possible presence or absence of invasive species including Japanese Knotweed is outside the scope of this investigation.

Copyright of all printed material including reports, survey data, drawings, laboratory test results, trial pit and borehole log sheets remains with Soils Limited.

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License for and reliance on this report is only valid once we have been paid in full for this engagement. In the event of non-payment, we reserve the right to notify parties other than the client of failure to pay and our cancellation of license and reliance.

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Section 1 Introduction

1.1 Objective of Investigation

The Client commissioned Soils Limited in April 2025 to undertake an intrusive ground investigation and to prepare a Main Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site. These works comprised Cable Percussion Boreholes, Windowless sampling and Dynamic Probing, Infiltration testing, DCP testing and Geotechnical and Contamination Testing. These works are referenced as Phase A in this report.

Following the conclusion of the Phase A works the Client commissioned Soils Limited in September 2025 to undertake additional intrusive ground investigation in the form of dynamic probes and Cone Penetration Testing across the site and to prepare an updated Main Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site. There was no additional laboratory testing as part of these works. These works are referenced Phase B in this report.

The following report has taken into consideration both Phases of work.

Soil samples were to be taken for chemical laboratory testing to enable recommendations for the safe redevelopment of the site and the protection of vulnerable receptors from any contamination identified as dictated by the Conceptual Site Model (During the Phase A works only) (CSM) in the Preliminary Investigation Report undertaken for the site by Soils Limited (report ref: 21876/PIR Rev1.0, June 2025) and the Revised Conceptual Site Model presented in Appendix F.1.

1.2 Site Description

The site of the proposed development comprised an irregularly shaped field with a gentle slope of <2° down to the north-east (Google Earth™ elevation data).

The study area was entirely covered in grass with large mature trees located on its boundaries. A spring was located on the northern portion of the site. The Hamble River was located approximately 930m south-east of the site.

The site was bounded by ‘Kings Copse Avenue’ to the north-west, housing with gardens to the north-east, open fields with tree lines and thickly vegetated areas including large shrubs to the east and south, and ‘Tanhouse Lane’ with school playing fields across to the west. A plant nursery was located to the south-west of the site. The general site topography of the area comprised of shallow slopes to the north-east/east.

The main access was provided via ‘Tanhouse Lane’ to the west.

The site location plan is given in

Figure 1. An aerial photograph of the site and its close environs has been included in figure 2.

1.3 Proposed Development

The proposed development was for a new housing estate comprising 200No. residential dwellings including a mixture of 2-storey houses and 4-storey blocks of residential flats. The proposal was to include hard landscaping in the form of car park spaces, access roads and pavements and soft landscaping in the form of residential gardens.

In compiling this report reliance was placed on the documents listed in Record Of Associated Documents. The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Development plans provided by the Client are presented in **Error! Reference source not found.**.

1.4 Anticipated Geology

The 1:50,000 BGS map showed the site to be located directly upon the bedrock London Clay Formation with no superficial deposits overlying.

The BGS maps suggested the presence of superficial deposits of Alluvium overlying the bedrock of the Whitecliff Sand Member to the adjacent north-east as well as the Wittering Formation bedrock at ~100m to the north-east and therefore these units might be present on site. The London Clay formation is anticipated to be located beneath the Whitecliff Sand Member and Wittering Formation.

1.4.1 Alluvium

Alluvium is the most recent river or estuarine deposit and generally comprises silty clays usually with an appreciable organic content. Lenses of sand and gravel are also commonly found, as are pockets of peat.

The BSI Code of Practice for Foundations, BS8004: 1986, Clause 2.2.2.3.4 Peat and organic soils, includes the caveat that 'all these soils are highly compressible, and even lightly loaded foundations will be subject to considerable settlements over a long period if placed on them. For this reason, these soils are not suitable for carrying the loads for important structures'.

1.4.2 Whitecliff Sand Member

Sedimentary bedrock comprising sand formed between 66 and 23.03 million years ago during the Palaeogene period. Its parent unit is London Clay Formation.

1.4.3 Wittering Formation

The Wittering Formation comprises greyish brown laminated clay; wavy- to lenticular-bedded sand interbedded with clay in equal proportions; and fine- to medium-grained sparsely glauconitic sand.

1.4.4 London Clay Formation

The London Clay Formation in the Hampshire region comprises silty and sandy clay, clayey and sandy silt, silty sand, sporadic claystones and thin beds of flint pebbles. The formation includes the Bognor Sand, Whitecliff Sand, Durley Sand, Portsmouth Sand and Nursling Sand Members. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

The lowest part of the London Clay Formation rests on the Reading Formation (Lambeth Group).

Section 2 Site Works

2.1 Proposed Project Works April 2025 (Phase A)

The proposed intrusive investigation was designed to provide information on the ground conditions and to aid the design of foundations for the proposed residential development. The intended investigation, as outlined within the Soils Limited quotation Q29697rev101, dated 13th March 2025 and subsequent Change Request Form, dated 14th April 2025, was to comprise the following items:

- Service clearance via EMF/GPR including marking out of Esso/SGN easement
- 8No. (up to) 5.00m deep windowless sampler boreholes
- 8No. (up to) 5.00m deep dynamic probes DPSH-B
- 2No. trial pit infiltration test locations in general accordance with BRE 365
- Additional trial pitting to provide coverage (and enable bulk sampling if earthworks testing is required)
- 4No. (up to) 30.00m deep cable percussive boreholes with (Phase A) SPT/U100 testing at 1.00m centres for the top 5.00m and at 1.50m thereafter
- CBR testing via hand-held DCP
- Geotechnical laboratory testing
- Contamination laboratory analysis including WAC testing

2.1.1 Actual Project Works April 2025 (Phase A)

The actual project works were undertaken between the 14th of April 2025 and 22nd of April 2025, with subsequent sample logging, laboratory testing and reporting. The actual works comprised:

- Service clearance via EMF/GPR including marking out of Esso/SGN easement
- 8No. windowless sampler boreholes up to 5.00m bgl (WS1 to WS8)
- 8No. dynamic probes DPSH-B up to 5.00m bgl (DP1 to DP8)
- 4No. cable percussive boreholes up to 30.00m bgl with alternate SPT/U100 testing at 1.00m centres for the top 5.00m and at 1.50m thereafter
- 2No. trial pit infiltration test locations in general accordance with BRE 365 (TPSK1 and TPSK2)
- 6No. trial pits to provide coverage and enable bulk sampling (TP3 to TP8)
- 11No. CBR tests via hand-held DCP
- Geotechnical laboratory testing
- Contamination laboratory analysis including 6No. WAC tests

The windowless sampler boreholes were backfilled with gravel upon completion. Following drilling and sampling, the cable percussive boreholes were backfilled with arisings and gravel. The trial pits were backfilled with arisings upon completion (and upon completion of the infiltration testing in TPSK1 and TPSK2) and mounded over to allow future settlement.

Following completion of site works, recovered soil cores and samples were logged and sub-sampled so that samples could be sent to the laboratory for both contamination and geotechnical testing.

2.2 Proposed Project Works September 2025 (Phase B)

The proposed intrusive investigation was designed to provide further information on the ground conditions and to aid the design of foundations for the proposed residential development. The intended investigation, as outlined within the Soils Limited quotation Q30327, dated 12th August 2025, was to comprise the following items:

- 2 Days of 5m deep dynamic probing DPSH
- 2 Days of CPT Testing
- Updated Report for entire site

2.2.1 Actual Project Works September 2025

The actual project works were undertaken on the 29th and 30th September 2025, with subsequent reporting. The actual works comprised:

- 14No. dynamic probes DPSH-B up to 4.00m bgl (DP101 to DP114)
- 48No. Cone Penetration Tests to depths of between 2.62-4.22m bgl

2.3 Ground Conditions

Phase A: On 14th April 2025, service clearance of proposed exploratory hole locations was undertaken using a cable avoidance tool (RD8000) to trace low and high voltage electricity cables, BT, security cabling and metal pipes. To detect non-metallic services such as fibre optic, clay drainage, plastic gas, and water services, Ground Penetration Radar (Leica DS2000) was used.

On 15th April 2025, eleven (11No.) dynamic cone penetrometer tests (DCP1 to DCP11) were conducted across the site to depths of up to 0.95m bgl.

Between 15th and 17th April 2025, four (4No.) cable percussive boreholes (BH1 to BH4) were drilled, using a Dando 4000 drilling rig, to depths ranging between 21.00m and 30.00m bgl.

On 16th April 2025, eight (8No.) trial pits (TPSK1, TPSK2 and TP3 to TP8) were machine excavated, using a JCB 3CX, to a depth of 2.00m bgl. Infiltration testing was undertaken within TPSK1 and TPSK2, as requested by the Client, in general accordance with BRE365, the results of which are presented in Section 3.4.

On 22nd April 2025, eight (8No.) windowless sampler boreholes (WS1 to WS8) were drilled, using a Premier drilling rig, to depths ranging between 4.60m and 5.00m bgl at locations selected by Soils Limited using a development plan and agreed with the Client. WS1 and WS6 were terminated early due to the density of the soils.

Eight (8No.) super heavy dynamic probes, (DP1 to DP8) were driven prior and adjacent

to their corresponding windowless sampler borehole to a depth of 5.00m bgl.

Phase B: On the 29th and 30th September 14No. super heavy dynamic probes, (DP101 to DP114) were driven to a depth of 5.00m bgl. 48No. CPT holes (CPT1-CPT48) were undertaken across the entire site to depths of between 2.62-4.22m bgl.

The maximum depths of exploratory holes have been included in Table 2.1.

Table 2.1 Final Depth of Exploratory Holes April 2025 (Phase A)

Exploratory Hole	Depth (m bgl)	Probe Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	4.70	DP1	5.00	TPSK1	2.00
WS2	5.00	DP2	5.00	TPSK2	2.00
WS3	5.00	DP3	5.00	TP3	2.00
WS4	5.00	DP4	5.00	TP4	2.00
WS5	5.00	DP5	5.00	TP5	2.00
WS6	4.60	DP6	5.00	TP6	2.00
WS7	5.00	DP7	5.00	TP7	2.00
WS8	5.00	DP8	5.00	TP8	2.00

Note(s): The depths given were taken from the ground level adjacent to the exploratory hole at the time of investigation.

Table 2.2 Final Depth of Exploratory Holes September 2025 (Phase B)

Probe Hole	Depth (m bgl)	Probe Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
DP101	4.00	CPT8	4.20	CPT29	4.20
DP102	4.00	CPT9	4.18	CPT30	4.20
DP103	4.00	CPT10	4.20	CPT31	4.20
DP104	4.00	CPT11	4.18	CPT32	4.20
DP105	4.00	CPT12	4.20	CPT33	4.20
DP106	4.00	CPT13	4.20	CPT34	2.62
DP107	4.00	CPT14	4.20	CPT35	4.20
DP108	4.00	CPT15	4.20	CPT36	3.76
DP109	4.00	CPT16	4.20	CPT37	4.20
DP110	4.00	CPT17	4.20	CPT38	4.22
DP111	4.00	CPT18	4.20	CPT39	4.20
DP112	4.00	CPT19	4.18	CPT40	4.20
DP113	4.00	CPT20	4.20	CPT41	4.20
DP114	4.00	CPT21	4.20	CPT42	4.20
CPT1	4.20	CPT22	4.20	CPT43	4.22
CPT2	4.20	CPT23	4.20	CPT44	4.20
CPT3	4.20	CPT24	4.20	CPT45	4.20
CPT4	4.20	CPT25	3.96	CPT46	4.20
CPT5	4.20	CPT26	4.18	CPT47	4.20
CPT6	4.20	CPT27	4.20	CPT48	4.20
CPT7	4.20	CPT28	4.20		

Note(s): The depths given were taken from the ground level adjacent to the exploratory hole at the time of investigation.

The approximate exploratory hole locations for the site works undertaken in April 2025 are shown on figure 3. The trial hole locations for the site works undertaken in September 2025 are shown in Figure 4.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the exploratory hole logs and quoted in this report were measured from ground level.

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

For more complete information about the soils encountered within the general area of the site reference must be made to the detailed records given within Appendix B, but for the purposes of discussion, the succession of conditions encountered in the exploratory holes in descending order can be summarised as:

Topsoil (TS)
Whitecliff Sand Member (WHI, in BH4 only)
London Clay Formation (LCF)

The ground conditions encountered in the exploratory holes are summarised in Table 2.3.

Table 2.3 Ground Conditions (Phase A)

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
TS	0.00	0.20 – 0.50	0.35	Firm, dark brown, slightly sandy, slightly gravelly, silty CLAY to very clayey SILT to greyish brown, slightly silty, slightly clayey, fine to medium SAND.
WHI	0.40	1.90	1.50	Greyish brown slightly clayey slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint. Occasional rootlets.
LCF	0.25 – 0.50	4.60[1] – 30.00[1]	Not proven[2]	Stiff to very stiff, dark brownish grey mottled grey, slightly sandy, slightly silty CLAY with occasional shell fragments. Sand was fine.

Note(s): [1] Final depth of exploratory hole. [2] Base of strata not encountered. The depths given in this table are taken from the ground level on-site at the time of investigation.

2.4 Ground Conditions Encountered in Exploratory Holes (Phase A)

The ground conditions encountered in exploratory holes have been described below in descending order. The engineering logs are presented in Appendix B.1.

2.4.1 Topsoil (Phase A)

Soils described as Topsoil were encountered in all exploratory holes from ground level to depths ranging between 0.20m and 0.50m bgl.

The Topsoil typically comprised firm, dark brown, slightly sandy, slightly gravelly, silty CLAY to very clayey SILT to greyish brown, slightly silty, slightly clayey, fine to medium SAND. Gravel was subangular to subrounded, fine to coarse flint. Abundant rootlets were noted.

The established depth of Topsoil found at each exploratory hole location has been included in Table 2.4.

Table 2.4 Established Depth of Topsoil (Phase A)

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1 [DP1]	0.20	BH3	0.30
WS2 [DP2]	0.25	BH4	0.40
WS3 [DP3]	0.30	TPSK1	0.35
WS4 [DP4]	0.30	TPSK2	0.50
WS5 [DP5]	0.30	TP3	0.35
WS6 [DP6]	0.30	TP4	0.35
WS7 [DP7]	0.30	TP5	0.40
WS8 [DP8]	0.30	TP6	0.50
BH1	0.30	TP7	0.50
BH2	0.40	TP8	0.40

2.4.2 Whitecliff Sand Member (Phase A)

Soils described as the Whitecliff Sand Member were only encountered within BH4 to a depth of 1.90m bgl located on the northern portion of the site.

The Whitecliff Sand Member stratum typically comprised of a greyish brown slightly clayey slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint with occasional rootlets.

The established depth of Whitecliff Sand Member found at each exploratory hole location has been included in Table 2.5.

Table 2.5 Established Depth of Whitecliff Sand Member

Exploratory Hole	Depth (m bgl)
BH4	1.90

2.4.3 London Clay Formation (Phase A)

Soils described as London Clay Formation were encountered within all the trial holes to below the Topsoil and where present the Whitecliff Sand Member to the base of the trial holes to a maximum depth of 30.00m bgl.

The London Clay Formation bedrock typically comprised stiff to very stiff, light brown and orange brown becoming dark brownish grey mottled grey, slightly sandy, slightly silty

CLAY with occasional shell fragments. Sand was fine. A band of light brownish grey mottled dark orangish brown slightly clayey fine to medium SAND was encountered in WS1 from 0.20m to 1.10m bgl. The established depth of London Clay Formation found at each exploratory hole location has been included in Table 2.6.

Table 2.6 Established Depth of London Clay Formation (Phase A)

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1 [DP1]	4.70[I]	BH3	30.00[I]
WS2 [DP2]	5.00[I]	BH4	21.00[I]
WS3 [DP3]	5.00[I]	TPSK1	2.00[I]
WS4 [DP4]	5.00[I]	TPSK2	2.00[I]
WS5 [DP5]	5.00[I]	TP3	2.00[I]
WS6 [DP6]	4.60[I]	TP4	2.00[I]
WS7 [DP7]	5.00[I]	TP5	2.00[I]
WS8 [DP8]	5.00[I]	TP6	2.00[I]
BH1	25.00[I]	TP7	2.00[I]
BH2	30.00[I]	TP8	2.00[I]

Note: [I] Final depth of exploratory hole.

2.5 Roots (Phase A)

Roots (incl. rootlets) were encountered in all twenty exploratory holes to depths ranging between 0.70m and 3.50m bgl, as detailed in Table 2.7. Note that roots were encountered to the final depth of TP6 to TP8, therefore, the final root depth could not be established at these locations.

Table 2.7 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS1	0.70	BH3	1.20
WS2	1.10	BH4	0.40
WS3	1.60	TPSK1	0.90
WS4	3.50	TPSK2	1.80
WS5	1.20	TP3	1.00
WS6	2.00	TP4	0.70
WS7	2.50	TP5	1.40
WS8	1.50	TP6	2.00[I]
BH1	1.00	TP7	1.80
BH2	0.40	TP8	2.00[I]

Note: [I] Final depth of exploratory hole. Great variation in root depth noted, potentially due to the size of the site and allocation of trial hole locations, together with different forms of vegetation including mature trees, shrubbery and grassed areas noted within the site and on its perimeter.

Roots may be found to greater depth at other locations on the site particularly close to trees and/or trees that have been removed both within the site and its close environs.

The study area was entirely covered in grass with large mature trees hedging its boundaries. Tree lines and thickly vegetated areas including large shrubs were present to the adjacent east and south of the site.

From the earliest viewable GoogleEarth™ aerial photographs of the site (1999), vegetation cover has continually increased on its boundaries and to the immediate south and east. No trees appear to have been removed from within the boundaries of the site.

It must be emphasised that the probability of determining the maximum depth of roots from a narrow diameter borehole is low.

2.6 Groundwater (Phase A)

Groundwater was encountered within five (5No.) out of the twenty (20No.) exploratory holes. However, this does not exclude the presence of groundwater from the remaining windowless sampler and cable percussive borehole locations as any potential groundwater strikes might have been masked by the rate of drilling.

Changes in groundwater level occur for reasons including seasonal effects and variations in drainage. The investigation was conducted in April (2025), when groundwater levels should typically be falling from their annual maximum (highest) elevation, which typically occurs around March.

The groundwater levels during site works are presented in Table 2.8.

Table 2.8 Groundwater Records (Phase A)

Exploratory Hole	Strike Depth (m bgl)	Standing (m bgl)	Exploratory Hole	Strike Depth (m bgl)
WS1	Not encountered		BH3	Not encountered
WS2	3.30	3.30 after 30mins	BH4	
WS3	Not encountered		TPSK1	
WS4			TPSK2	
WS5	4.00	3.50 after 30mins	TP3	
WS6	4.00	3.80 after 25mins	TP4	
WS7	4.00	3.20 after 25mins	TP5	
WS8	4.00	3.80 after 25mins	TP6	
BH1	Not encountered		TP7	
BH2			TP8	

Groundwater equilibrium conditions may only be conclusively established, if a series of observations are made via groundwater monitoring wells. Groundwater monitoring was not within the brief for the present investigation.

2.7 Ground Conditions Inferred from Cone Penetration Test (Phase B)

48No. CPT holes were undertaken across the entire site to depths of between 2.62-4.22m bgl.

The Soil Behaviour Type (SBT) was determined using the method proposed by Robertson (ref: Robertson, P.K., 1990. Soil classification using the cone penetration test. Canadian Geotechnical Journal, 27, pp. 151 – 158 and Robertson, P.K., 2010, “Soil

Behaviour type from the CPT: an update", 2nd International Symposium on Cone Penetration Testing, Huntington Beach, CA, Vol.2. pp575-583).

It must be noted that CPT results do not give a direct reference to soil types but do give a good indication of the soils properties. In consequence, the soil type names are not definitive, but the properties of the soils are.

The CPTu data plots and SBT charts are presented in Appendix C.2 and shows both the non-normalised SBT chart and the normalised SBTn chart. The non-normalised chart is based on cone resistance (q_c) and friction ratio (f_s) and the normalised chart takes about of the effective overburden pressure.

From interpretation of both SBT plots, the soils of the London Clay Formation were noted to be the dominant geology for the majority of the site from circa 0.3m-0.5m (assumed Topsoil) and for the full depth of the CPT investigation of circa 4m bgl, being described as clay to silty clay.

It must be mentioned however, that in 9no out of the 48no CPT locations, the soils up to 2.0-2.5m bgl included circa 0.5m thick bands of what was described as silty sands. The locations in question (CPT1-CPT2, CPT4-CPT5, CPT7, CPT11, CPT15 and CPT19) were situated within the north/north-eastern portion of the site, which was in broad alignment with the geological setting of the site, showing the north/north-eastern boundary of the site to coincide with the junction between the clayey soils of the London Clay Formation and the overlying sandy soils of the Whitecliff Sand Member.

The above was also in accordance with the findings Phase A investigation, where the sandy soils of the Whitecliff Sand Member were only recorded in BH4, drilled in close proximity to the north-eastern site boundary.

Section 3 Geotechnical In-Situ and Laboratory Testing

3.1 Standard Penetration Tests (Phase A)

Standard Penetration Tests (SPTs) were undertaken in BH1 to BH4. The results were interpreted based on the classifications outlined in Appendix C.1, Table C.1.1 to Table C.1.2.

Table 3.1 Hammer Efficiency

SPT Hammer Ref	Energy Ratio Er (%)
Dando 4000 – AR2847	77

Table 3.2 Standard Penetration Tests (SPT) Interpretation (Phase A)

Strata	Depth Range (m bgl)	Inferred N60 Range	Soil Classification	Inferred Cohesion (Cu kPa)
WHI	0.40-1.90	27	Medium Dense	N/A
LCF	0.30-30.00	7-64	Low to Extremely High	35 – >300

Note(s): SPT "N60" values presented have been corrected in accordance with BS EN 22476 Part 3.

A full interpretation of the SPT results, is outlined in Appendix C.2, Table C.2.1.

3.2 Dynamic Probe Tests (Phase A and B)

The results were converted to equivalent SPT "N60" values based on dynamic energy using commercial computer software (Geostru). Interpretation based on the classifications outlined in Appendix C.1,Table C.1.1 to Table C.1.2.

Table 3.3 Hammer Efficiency

Rig Reference	Energy Ratio Er (%)
Premier I	90.32
Premier II	84.32
Premier III	88.69

Table 3.4 Inferred SPT Interpretation (Phase A and B)

Strata	Depth Range (m bgl)	Inferred N60 Range	Soil Classification	Inferred Cohesion (Cu kPa)
WHI[1]	0.30 – 2.10	4 – 46	Very loose to Dense	n/a
LCF[2]	0.25/2.10 – 5.00	<4 – 129	Extremely Low to Very High[3]	<10 – 170

Note(s): SPT "N60" values presented have been corrected in accordance with BS EN 22476 Part 3.

[1] Inferred in DP110-DP113 only

[2] Inferred in DP1 only, a sandy band between 0.20-1.10m bgl was noted with soil classification being "Very loose to Medium dense"

[3] A band of "Extremely high" strength was recorded in DP1 between 4.9m and 5.0m bgl (full depth), which could be attributed to a claystone band

The sandy bands of the Whitecliff Sand Member were inferred within DP110 and DP112-DP113 only to depths of circa 2.0m bgl; equivalent SPT "N_{60}" values of between 4 and

46 were recorded classifying them as very loose to dense relative density and generally increasing with depth. It must be noted that DP110 and DP112-DP113 were located within the north/north-eastern site portion of the site, which as discussed in detail in Section 2.7, was in alignment with the geological setting of the site.

The recorded (Phase A) and inferred (Phase B) bands of the London Clay Formation were underlying the Topsoil apart from locations DP110-DP113 where they were overlain by the sandy bands of the Whitecliff Sand Member. Excluding DP1, where a sandy layer to a depth of 1.1m bgl was encountered, the London Clay Formation comprised cohesive bands possessing very low and occasionally extremely low to medium strength generally within the upper circa 2m - excluding DP4, DP7 and DP109 where they extended to 3m bgl; equivalent SPT "N_{60}" values between <4 and 8 were recorded with undrained cohesive strengths of locally between <10kPa and 40kPa, indicating possible weathering. Beyond these depths, the cohesive London Clay Formation recorded equivalent SPT "N_{60}" values generally between 8 and 34 classifying them as medium to very high strength with undrained cohesive strengths of between 40kPa and 170kPa, generally increasing with depth.

It must be noted at locations DP111-DP113 and along the north-eastern site boundary, the cohesive bands of London Clay Formation - either directly beneath the Topsoil or the sandy bands of the Whitecliff Sand Member at circa 2m bgl - were noted to possess very low and occasionally extremely low to medium strength with equivalent SPT "N_{60}" values between <4 and 8 and undrained cohesive strengths of between <10kPa and 40kPa; these bands were noted to extend for the full depth of the DPs to 4.0m bgl, therefore potentially extending deeper, which could result in poor engineering properties and thus have an adverse effect on shallow foundations – if adopted, as discussed in detail in Section 5.1.1.

A full interpretation of the DPSH tests, is outlined in Appendix C.2, Table C.2.2.

3.3 Dynamic Cone Penetrometer Tests (Phase A)

The Transport Research Laboratory (TRL), Dynamic Cone Penetrometer (DCP) was undertaken at eleven locations (DCP1 to DCP11). The results were interpreted based on the classification outlined in Appendix C.1.

The results from DCP testing indicated CBR values of between 2% and 12% for the soils encountered in the top 1.00m bgl.

The DCP results are presented in Appendix C.3.

3.4 Cone Penetration Testing (Phase B)

Cone Penetration testing was undertaken at 48No locations to depths of between 2.62m and 4.22m. At 1No. location early refusal was recorded (CPT-34).

Given the comparability of data with the dynamic probing, where equivalent SPT "N_{60}" values were derived, the SPT "N_{60}" values generated from the CPT tests (ref:

Lune at al 1997 and Robertson 2012) at each CPT location were used and evaluated to assist in the foundation design for the proposed development. It must be mentioned that the equivalent SPT "N_{60}" values from the dynamic probing and the SPT "N_{60}" values generated from the CPT tests were broadly consistent, showing similar trends across the site.

The CPT report can be found in Appendix D.

3.5 Infiltration Tests (Phase A)

Infiltration testing was attempted within two exploratory holes (TPSK1 and TPSK2) within the cohesive soils of the London Clay Formation. BRE DG365:2016 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test can only be ended once 75% of the water present has drained away. Testing comprised pouring clean water via a water tanker into the open trial hole, the drop-in water level over time was then recorded to give an indication of soakage potential.

A full test cycle was not completed in either TPSK1 nor TPSK2 due to insufficient head loss over time with both tests ending before 75% of the water drained away. As such, the tests did not fully comply with BRE Digest 365 "Soakaway Design".

Infiltration rates could not be calculated due to the poor drainage observed, as detailed in Table 3.5.

Table 3.5 Infiltration

Exploratory Hole	Test No.	Stratum	Pit Depth (m bgl)	Depth to Water		Duration (mins)	Infiltration Rate (m/s)
				Start	End		
TPSK1	1	LCF	1.80	0.81	0.81	1745	-[1]
TPSK2	1	LCF	2.00	1.13	1.22	1745	-[1]

Notes: [1]No infiltration rate calculated due to insufficient head loss over time within ground conditions encountered.

3.6 Quick Unconsolidated Undrained Triaxial Compression Tests (Phase A)

Quick Unconsolidated Undrained Triaxial Compression Tests (QUU) were performed on four samples from the London Clay Formation. The strength interpretation was based on the classification outlined in Table C.2.3.

Table 3.6 Undrained Cohesion Results Classification

Strata	Depth Range	Classification	
	(m bgl)	High to Very High	Undrained Cohesion Range (c_u)
LCF	6.50-15.50	High to Very High	86-203kPa

Details are given in Table C.2.3, Appendix C.2 and the laboratory report in Appendix C.3.

3.7 Atterberg Limit Tests (Phase A)

Atterberg Limit tests were performed on fourteen samples from the London Clay Formation. The results were classified in accordance with BRE Digest 240 and NHBC Standards Chapter 4.2.

Table 3.7 Atterberg Limit Results Classification

Strata	Depth Range (m bgl)	Volume Change Potential	
		NHBC	BRE 240
LCF	0.80-10.50	Medium to High	Medium to High

Details are in Table C.2.4, Appendix C.2 and the laboratory report in Appendix C.3.

3.8 Particle Size Distribution Testing (Phase A)

Particle Size Distribution (PSD) testing was performed on one sample from the granular beds of the Whitecliff Sand Member.

Table 3.8 Particle Size Distribution Classification

Strata	Depth (m bgl)	Volume Change Potential	
		NHBC	BRE 240
WHI (G)	0.80	No	No

Note: G=granular

A full interpretation of the PSD testing, is outlined in Table C.2.5, Appendix C.2 and the laboratory report in Appendix C.3.

3.9 Sulphate and pH Tests (Phase A)

Water soluble sulphate (2:1) and pH testing in accordance with Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground' was undertaken on 5No. samples from the London Clay Formation.

Table 3.9 Sulphate and pH Test Results

Strata	Depth (m bgl)	Sulphate Concentration (mg/l)	pH
LCF	1.00-12.00	<10-395	7.2-8.4

The significance of the sulphate and pH Test results are discussed in Section 5.3 and the laboratory report in Appendix C.3.

Section 4 Engineering Appraisal

4.1 Established Ground Conditions

An engineering appraisal of the soil types encountered during the site investigation and likely to be encountered during the redevelopment of this site is presented. Soil descriptions are based on analysis of disturbed samples taken from the exploratory holes.

4.1.1 Topsoil

Soils described as Topsoil were encountered in all exploratory holes from ground level to depths ranging between 0.20m and 0.50m bgl.

Foundations must not be placed on non-engineered fill unless such use can be justified on the basis of a thorough ground investigation and detailed design. Foundations must be taken through any Topsoil and/or Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

4.1.2 Whitecliff Sand Member

Soil described as the Whitecliff Sand Member was only encountered underlying the Topsoil within BH4 to depths of 1.90m bgl; the soils of the Whitecliff Sand Member were inferred:

- within DP110 and DP112-DP113 to depths of circa 2.0m bgl and;
- within CPT1-CPT2, CPT4-CPT5, CPT7, CPT11, CPT15 and CPT19 to 2.0-2.5m bgl.

All of the aforementioned locations were situated within the north/north-eastern portion of the site, which was in broad alignment with the geological setting of the site, showing the north/north-eastern boundary of the site to coincide with the junction between the clayey soils of the London Clay Formation and the overlying sandy soils of the Whitecliff Sand Member.

Soils of the Whitecliff Sand Member are expected to be granular soils as established in BH4 and inferred in the CPT (“silty sands”) and as such are expected to display moderate bearing capacities and settlement characteristics. However, as discussed in detail in Section 5.1.1, given the geological setting of the site, the thickness and composition of the soils of the Whitecliff Sand Member may vary, therefore its suitability as a bearing stratum for the proposed development should be assessed and confirmed at each DP/CPT location based on the locally derived bearing capacity and settlement characteristics.

4.1.3 London Clay Formation

Soils described as the London Clay Formation were encountered underlying the Topsoil and Whitecliff Sand Member from 0.20m to 1.90m bgl and persisted to the full investigatory depth of 30.00m bgl.

Soils of the London Clay Formation are overconsolidated, cohesive soils and as such are

expected to display to moderate bearing capacities with moderate settlement characteristics and would generally be a suitable bearing stratum for the proposed development, using shallow foundations for the proposed two-storey houses and piled foundations four-storey blocks of residential flats, as discussed in detail in Section 5.

It must be mentioned that as discussed in detail in Section 3.2 relatively low equivalent SPT "N_{60}" values were derived from the dynamic probing within the upper 2m and occasionally within the upper 3m bgl of the soils of the London Clay Formation, which was in alignment with the SPT "N_{60}" values derived from the CPT. The above coupled with the clay discolouration noted in the majority of trial holes (light brown to orange brown, as opposed to grey) to circa 3m bgl would indicate a near-surface zone of weathering typically found in London Clay Formation and linked with exposure to atmosphere (oxidisation), vegetation (roots fissures), freezing, rainfall and seasonal moisture changes (wetting-drying), resulting in disturbance of the clay structure, which could in turn significantly lower its bearing capacity.

Consequently, regarding the proposed 2-storey houses, the foundation depth within the soils of the London Clay Formation would need to be assessed and confirmed at each DP/CPT location based on the locally derived bearing capacity and settlement characteristics, as discussed in detail in Section 5.

4.1.4 Guidance on Shrinkable Soils

The ground conditions were established as Topsoil (thickness of 0.20m to 0.50m), overlying the Wittering Formation of a typical thickness of 1.65m (localised), over bedrock of the London Clay Formation (across the majority of the site).

The volume change potential for the natural strata is presented in Table 4.1.

Table 4.1 Established Volume Change Potential by Strata

Strata	Volume Change Potential		Established Lower Boundary (m bgl)
	BRE	NHBC	
WHI	No	No	1.90
LCF	High	High	30.00+

The granular soils for the Whitecliff Sand Member had no volume change potential. The cohesive soils of the London Clay Formation were classified as having a high volume change potential. However, given the limited thickness of the Whitecliff Sand Member, the VCP of the underlying London Clay Formation is likely to dictate foundation depths where the Whitecliff Sand Member is encountered in accordance with the NHBC Standards 2024, Chapter 4.2.9 – a) *Strip and trench fill foundations in non-shrinkable soils overlying shrinkable soil.*

4.1.5 Groundwater (Phase A)

Groundwater was encountered within WS2 and WS5-WS8, which were located on the north, eastern and south-eastern portions of the site. Groundwater strikes might have been masked by the rate of drilling, so groundwater may be present in other locations. It must be noted that on the CPT plots the groundwater level at circa 3.00m bgl has been assumed. The groundwater levels during site works are presented in Table 2.8.

Section 5 Foundation Scheme

5.1 Foundation Recommendations

The proposed development was for a new housing estate comprising 200No. residential dwellings including a mixture of 2-storey houses and 4-storey blocks of flats. The proposed was to include hard landscaping in the form of car park spaces, access roads and pavements and soft landscaping in the form of residential gardens.

Foundations **must not** be constructed within any Made Ground/Topsoil due to the likely variability and potential for large load induced settlements both total and differential.

Roots were encountered in all twenty exploratory holes at depths ranging between 0.40m and 3.50m bgl. If roots are encountered during the construction phase foundations **must not be placed within any live root penetrated** or desiccated **cohesive soils or those with a volume change potential**. Should the foundation excavations reveal such materials, the excavations **must** be extended to greater depth to bypass these unsuitable soils. Excavations must be checked by a suitable person prior to concrete being poured.

Considering the type of development, a shallow foundation solution could be adopted for the majority of the 2-storey houses and piled foundations must be used for the 4-storey flats due to the increased anticipated loads.

5.1.1 Shallow Foundations Feasibility Assessment

As outlined in Section 4.1.3, the strength - and therefore the bearing capacity - of the upper 2-3m of mostly the London Clay Formation was expected to be reduced due to weathering. Consequently, a feasibility assessment was carried out at each of the 22no dynamic probe locations and at each of the 48no CPT locations to establish minimum foundation depths and estimate bearing capacities and associated settlements for the proposed two-storey houses.

The density of in-situ test data of Phase A (DP1-DP8) and Phase B (DP111-DP114 and CPT1-CPT48) allowed the adoption of a minimum allowable bearing capacity of 50 kPa, which was deemed suitable for the relatively low loads associated with the proposed two-storey houses.

The equivalent SPT "N_{60}" values from the dynamic probing and the SPT "N_{60}" values generated from the CPT tests were broadly consistent and were therefore formed the basis of the foundation design at each of the 70no DP/CPT locations, assuming a 5.0m x 1.0m strip footing and using commercial design software.

The results of the feasibility assessment and foundation design at each DP/CPT location including allowable bearing capacities resulting in total (elastic and consolidation) settlements <25mm at various depths are tabulated on Table 5.1:

Table 5.1 Proposed Foundations Depth and Allowable BC – Per DP/CPT Location

Minimum Foundation Depth (m bgl)	DP	CPT	Allowable Bearing Capacity (kPa)	Inferred Bearing Stratum
1.0	1		60	LCF
	2		55	LCF
	4		55	LCF
	101-104		60	LCF
	106		60	LCF
	108		60	LCF
	110		100	WHI
		1	60	WHI
		2	110	WHI
		5	75	WHI
		6	90	WHI
		8	70	WHI
		9	60	LCF
		14	60	LCF
		31	60	LCF
		35	55	LCF
		36	80	LCF
		38-41	65	LCF
		44	65	LCF
		46	55	LCF
1.5	3		70	LCF
	5-6		70	LCF
	8		70	LCF
	114		60	LCF
		7	55	LCF
		23	50	LCF
		34	60	LCF
		42	50	LCF
		47-48	50	LCF
2.0	7		60	LCF
	105		50	LCF
	107		85	LCF
		17	50	LCF
		18-20	60	LCF
		21-22	70	LCF
		24-30	60	LCF
		32	60	LCF
		33	55	LCF
		37	80	LCF
		43	60	LCF
		45	60	LCF
2.5	109		70	LCF
		3	70	LCF
		10	70	LCF
		13	75	LCF
>2.5	111-113		Unsuitable for shallow foundations	
		4, 11-12, 15-16		

A distribution analysis of the proposed minimum foundation depths was carried out across all dynamic probing and CPT locations. The corresponding proportions were recorded, as presented on Table 5.2.

Table 5.2 Minimum Foundation Depth Distribution

No of DP/CPT Locations	Minimum Foundation Depth (m bgl)	Total Distribution
26	1.0	37%
11	1.5	16%
21	2.0	29%
4	2.5	6%
8	>2.5	12%

Figure 5 provides a visual representation of the minimum founding depths for the 2-storey residential properties across the site at each of the DP/CPT locations. It must be noted that at 8no DP/CPT locations the minimum foundation depth would be in excess of 2.5m bgl, given the markedly variable ground conditions, comprising a mixture of "potential soft spots" (London Clay Formation) extending to full depth of the DP/CPT locations and inferred sandy soils (Whitecliff Sand Member) of inconsistent thickness, which could result in low allowable bearing capacities of the order of <40kPa and potentially unacceptable differential settlements.

The 8no DP/CPT locations were situated near and along the north-eastern site boundary of the site coinciding with the junction between the clayey soils of the London Clay Formation and the overlying sandy soils of the Whitecliff Sand Member, where the stratigraphic contrast could result in sharp transitions between the two formations, creating planes of weakness and unpredictable lateral variability; thus the above findings were in alignment with the geological setting of the site. Therefore, as illustrated on Figure 5, the 8no DP/CPT locations would define an area within the north-eastern site portion where shallow foundations could be problematic, thus requiring either additional works to further refine the ground model within that area or the adoption of deep foundations.

5.1.2 Foundation Recommendations

Any soft spots identified during foundation trenches construction **must be removed** from the base of the excavations. Failure to do so could results in increased settlements.

The use of reinforced trench fill foundations **must be adopted** given the variable ground conditions established on site to reduce the potential for differential settlement affecting the foundations.

All foundation formations must be examined, recorded, and signed off by a competent person.

For the allowable bearing values given above, settlements should not exceed the adopted value of 25mm, provided that excavation bases are carefully bottomed out and blinded or concreted as soon after excavation as possible and kept dry.

Foundations must not be constructed over former structures and other hard spots. The foundations design must be suitable for the conditions present at the site.

The anticipated settlement includes both elastic settlement and long-term drained settlement (in the case of cohesive soils).

5.2 Piled Foundations

The foundations for the proposed residential flats must be piled. The piled foundations must be taken through any Topsoil/Made Ground into suitable strength soils of the London Clay Formation.

The construction of a piled foundation is a specialist job with the actual pile working load depending on the pile type and installation method. Prior to finalising the foundation design the advice from a reputable contractor who is familiar with the ground and groundwater conditions present at the site must be sought.

The vertical load capacities are provided for varying diameters and lengths of bored piles taken into the London Clay Formation, based on geotechnical laboratory testing and in-situ test and must only be used for preliminary design purposes.

A factor of safety of 3 was applied to the characteristic line derived from testing undertaken, for both the shaft and base load capacities. An Nc value of 9 and Alpha value of 0.45 has been used.

The bearing values given in Appendix E.1., are applicable to single vertically loaded piles. Where piles are to be constructed in groups the bearing value of each individual pile should be reduced by a factor of about 0.8 and a calculation made to check the factor of safety against block failure.

From ground level the upper 4m of the pile shaft has been ignored in the preliminary pile design given.

To prevent necking of the green concrete, temporary casing may be required where the pile passes through the Made Ground or London Clay Formation and below the groundwater table (if encountered). To achieve the full bearing value a pile should penetrate the bearing stratum by at least five times the pile diameter.

No allowance has been made for negative skin friction that could be generated where piles pass through very soft cohesive deposits underlying the site. The negative skin friction must be applied to the pile working load and must not be factored.

5.3 Subsurface Concrete

The sulphate and pH tests carried out in accordance with BRE Special Digest 1, 2005, ‘Concrete in Aggressive Ground’, established the site concrete classifications for each

stratum as presented in Table 5.3.

Table 5.3 Concrete Classification

Stratum	Design Sulphate Class	ACEC Class
LCF shallow Foundations	DS-1	AC-1
LCF Piled Foundations	DS-1	AC-1

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1 2005, *'Concrete in Aggressive Ground'* taking into account any possible exposure of potentially pyrite bearing natural ground and the pH of the soils.

5.4 Excavations

Shallow excavations in the Topsoil and Whitecliff Sand Member are likely to be marginally stable in the short term at best.

Deeper excavations taken into the London Clay Formation are likely to be unstable and require support. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions must therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose.

Excavations beneath the groundwater table are likely to be unstable and dewatering of foundation trenches may be necessary.

Section 6 Pavements

6.1 Pavements (Phase A)

The Transport Research Laboratory (TRL) Dynamic Cone Penetrometer (DCP) was undertaken at eleven locations on site (DCP1 – DCP11). The results from dynamic cone penetrometer tests indicated **CBR values of between 2% and 12%** for the soils encountered in the top 1.00m bgl.

When removing 400mm of Topsoil the worst case CBR value was 1% which was considered unsuitable for design purposes. Multiple soft spots were recorded across the site.

As CBR values were highly variable due to changes in moisture content and ground conditions, **in-situ testing must be undertaken** immediately prior to the installation of pavements/roads. Any soft spots at formation level, as identified across the site, must be dug out and replaced with a suitably compacted granular fill. Prior to construction the formation level must be proof rolled. It is recommended that further CBR testing, or plate load testing be undertaken across the site to confirm road/pavement design.

Granular soils of the Whitecliff Sand Member are regarded as non-frost-susceptible as the percentage material passing a 0.074 mm sieve is less than 10%.

Cohesive soils of the London Clay Formation may be regarded as non-frost-susceptible as their plasticity index was >20%.

Section 7 Site Drainage

7.1 Soakaways (Phase A)

Due to the impermeable nature of the London Clay Formation no infiltration rate could be calculated from the in-situ tests undertaken. Therefore, the use of soakaways on site would not be a viable option due to the poor drainage characteristics of the London Clay Formation.

It is recommended that the results of the testing are passed to a drainage engineer for confirmation.

Section 8 Determination of Chemical Analysis (Phase A)

8.1 Site Characterisation and Revised Conceptual Site Model

The Preliminary Investigation Report undertaken by Soils Limited (report ref: 21876/PIR dated June 2025) identified a low to moderate risk of ground contamination from previous usage of the site and offsite sources.

There were no anthropogenic materials and no visual or olfactory indicators of contamination noted during the investigation.

Deposits of the Whitecliff Sand Member and London Clay Formation were encountered underlying the Topsoil. Groundwater was encountered within the London Clay Formation at depths of between 3.30-3.80m bgl.

The conceptual site model was updated to take account of the above findings and is presented in Appendix F.1.

8.2 Soil Sampling

Exploratory hole locations were established to provide an overview of ground conditions across the site in relation to the proposed construction, together with enabling the collection of samples to enable chemical characterisation of the underlying strata.

Representative samples for potential environmental testing were obtained from the exploratory holes at depths of between 0.10m and 1.00m to allow appropriate representation of the materials encountered, with additional samples to be obtained, if necessary, where there was visual or olfactory evidence of contamination.

Unless otherwise stated, analytical testing was based initially on a screening suite of commonly identified inorganic and organic contaminants, taking into account the prevailing site conditions and the findings of the initial conceptual site model.

8.3 Determination of Chemical Analysis

The driver for determination of the analysis suite was the information obtained from the Preliminary Investigation Report and this intrusive investigation.

The chemical analyses were carried out on 4No. samples of Topsoil and 4 samples of the London Clay Formation. The nature of the analyses is detailed in Table 8.1.

Table 8.1 Chemical Analyses Suites - Soil

No. of Tests		Determinants
TS	LCF	
4	4	Metal suites: Arsenic, Boron (Water Soluble), Cadmium, Chromium (total & hexavalent), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc
4	4	Organic Matter
4	4	pH

No. of Tests		Determinants
TS	LCF	
4	4	Polycyclic aromatic hydrocarbons (PAH) – (EPA 16)
4	4	Phenols – total monohydric
4	4	Extractable petroleum hydrocarbons (EPH) – Texas banding
2	4	Waste acceptance criteria (WAC)
4	4	Asbestos screening

The soil testing was carried out in compliance with the MCERTS performance standard, and the results are shown in Appendix F.2, test reports 25-04477 and 25-09347.

Section 9 Qualitative Risk Assessment (Phase A)

9.1 Assessment Criteria

The assessment criteria used to determine risks to human health are derived and explained within Appendix F.3.

9.2 Representative Contamination Criteria - Soil

In compiling this report reliance was placed on drawing number AKSW-XX-XX-DR-C-9300_PO2, dated December 2024 and prepared by AKS Ward Construction Consultants. The recommendations provided within this report are made exclusively in relation to the scheme outlined above and must not be applied to any other scheme without further consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Based on the proposed development, the results of the chemical analysis have been compared against generic assessment criteria (GAC) for a '***Residential With home grown produce***' end use, as presented in SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014 (C4SL), derived for the protection of human health. Where this document has not published screening values for determinants, GACs derived for the same end use have been adopted from the following published guidance; DEFRA Soil Guideline Values (SGV) and LQM/CIEH/Suitable 4 Use Level (S4UL).

To assess the potential toxicity of organic determinants (Petroleum Hydrocarbons and Polyaromatic Hydrocarbons) to the human health, soils samples were analysed for Soil Organic Matter (SOM). The selected samples analysed recorded, SOM values of between 0.5% and 2.4%. For each soil sample tested, the resultant SOM allowed for the correct comparison to be made with the appropriate guideline value for each organic determinant analysed.

9.2.1 Risk Assessment – Topsoil and London Clay Formation

No exceedances were recorded within the four samples of the Topsoil and the four samples of the London Clay Formation tested when compared to GAC for a Residential with Home Grown Produce end use.

9.3 Asbestos

The test certificate for each sample submitted for contamination analysis during this investigation includes the results of an Asbestos Screen.

In each case 'Not detected' was reported.

This finding does not obviate the risk of asbestos being present on the site and the Client must seek advice from qualified and competent asbestos specialist during and prior to undertaking works to ensure compliance with appropriate legislation and guidance.

9.4 Risk to Controlled Waters

The site was predominantly located on an Unproductive Strata (Secondary A Aquifer in far northern portion of the site associated with the Whitecliff Sand Member), is not within a groundwater source protection zone and there are no groundwater abstractions within 1km of the site.

The nearest surface watercourse is a stream located along the northern portion of the site.

The Groundwater levels across the site were recorded at depths of around 3.00m bgl or in most instances were not recorded at all. The water within some of the windowless sampler boreholes may have been perched. Surface water maybe present during winter months especially on the northern portion of the site close to the spring. Based on the above the groundwater vulnerability is low to very low but surface water is moderate.

From the ground conditions encountered, low groundwater levels and the fact that the new drainage regime will control water flows the risk to controlled waters was considered to be low.

9.5 Risk from Ground Gas Ingression

The preliminary Risk Assessment (21876/May 2025) concluded that there was no Potential sources of ground gas within influencing distance of the site. In addition there was no Made Ground/Anthropogenic materials recorded within the soils on site. Therefore no ground gas monitoring wells were proposed and no gas monitoring has been undertaken.

9.5.1 Radon

According to the British Geological Survey, in conjunction with the Radiation Protection Division of the Health Protection Agency, the site is in an area where less than 1% of homes are estimated to be at or above the action level.

The site is not located in a radon affected area and no radon protective measures are necessary in the construction of new dwellings or extensions.

9.6 Generic Quantitative Risk Assessment

A quantitative risk assessment is undertaken for soil. The CSM has been updated to take account of the assessments below and presented in Appendix F.1. The full laboratory chemical report is presented in Appendix F.2.

9.6.1 Soils

None of the eight samples tested (Topsoil and London Clay Formation) recorded concentrations of determinants in excess of the relevant soil screening values for the proposed “Residential with Home Grown Produce” end use. Eight samples were tested within both the topsoil and London Clay Formation across the entire site area. Eight samples were considered to be enough given the site history (has been undeveloped land) and lack of Made Ground encountered.

9.6.2 Controlled Waters

The Groundwater Risk Assessment established that **there was no risk** to the groundwater receptor from the ground conditions encountered, low groundwater levels and the fact that the new drainage regime will control water flows the risk to controlled waters was considered to be low.

9.6.3 Ground Gas

The Preliminary Investigation Report identified a very low risk of ground gas sources that could potentially affect the site. In addition no Made Ground or anthropogenic materials were recorded within the boreholes undertaken on site.

9.7 Recommendations

Soil chemical analysis did not record any samples with substance levels over their representative guideline values and there was no evidence of Made Ground on site.

Therefore, there was no risk identified to vulnerable receptors of Human Health, Building Structures and Services or controlled waters.

Based on this investigation no further works are required, subject to agreement and approval of the local authority, which should be sought at the soonest opportunity.

A discovery strategy should be implemented to ensure that any unexpected contamination is suitably identified and addressed during the construction phase.

9.8 Protection of Services

Contamination of the ground may pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligations, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from contaminants specified in UKWIR Report 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010), or that the proposed remedial strategy will mitigate any existing risk.

9.9 Duty of Care

Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather.

9.10 Excavated Material

Excavated material as waste must be defined or classified prior to any disposal, transport, recycling or re-use at or by an appropriately licensed or exempt carrier and/or off-site disposal facility. The requirements inherent in both Duty of Care and Health and Safety must also be complied with. In order to determine what is to happen, what is suitable, appropriate and most effective in the disposal of wastes, especially those

subject to CDM waste management plan requirements, several factors must be considered, and competent advice must always be sought.

9.11 HazWasteOnline

The waste classification tool HazWasteOnline™ followed by WAC analysis was undertaken on six samples to provide a general indication for future waste removal.

The samples were all classified as Non-Hazardous, with the HazWasteOnline™ report presented in Appendix G. The WAC certificates are presented in Appendix F.2, within Test Report 25-09347.

9.12 Re-use of Excavated Material On-site

The re-use of on-site soils may be undertaken either under the Environmental Permitting Regulations 2007 (EPR), in which case soils other than uncontaminated soils are classed as waste, or under the CL:AIRE Voluntary Code of Practice (CoP) which was published in September 2008 and is accepted as an alternative regime to the EPR.

9.13 Imported Material

Any soil, which is to be imported onto the site, must undergo chemical analysis to permit classification prior to its importation and placement in order to ascertain its status with specific regard to contamination, i.e. to prove that it is suitable for the purpose for which it is intended.

9.14 Discovery Strategy

There may be areas of contamination not identified during the investigation. Such occurrences may also be discovered during the demolition and construction phases for the redevelopment of the site. A watching brief will need to be place for the duration of the construction works.

Should site staff or operatives identify any potential contamination during the construction phase then works must cease in that part of the site and Soils Limited and the Planning Authority and Contaminated Land Officer must be informed. The discovery must be quarantined and reported to the most senior member of site staff or the designated responsible person at the site for action.

Soils Limited will then arrange to attend site to inspect the area of concern and if appropriate undertaken logging, sampling, and further laboratory testing of the material. Further recommendations will be made following receipt and appraisal of such supplementary laboratory test results. The Local Authority will be copied in on any additional sampling and validation.

The discovery strategy must always remain on-site and must demonstrate a clear allocation of responsibility for reporting and dealing with contamination. A copy of the strategy must be placed on the health and safety notice board and /or displayed in a

prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.
Care must be taken during excavation works especially to investigate any soils, which appear by eye (e.g. such as fibrous materials, large amounts of ash and unusual discolouration), odour (e.g. fuel, oil and chemical type odours or unusual odours such as sweet odours or fishy odours) or wellbeing (e.g. light headedness and/or nausea, burning of nasal passages and blistering or reddening of skin due to contact with soil) to be contaminated or of unusual and/or different character to standard soils or those analysed. If any such sources are encountered, then Soils Limited must be informed.

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Figure 1 – Site Location Map



Job Number 22085	**Project** Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ
Client Eastleigh Borough Council	**Date** December 2025



Figure 2 – Aerial Photograph

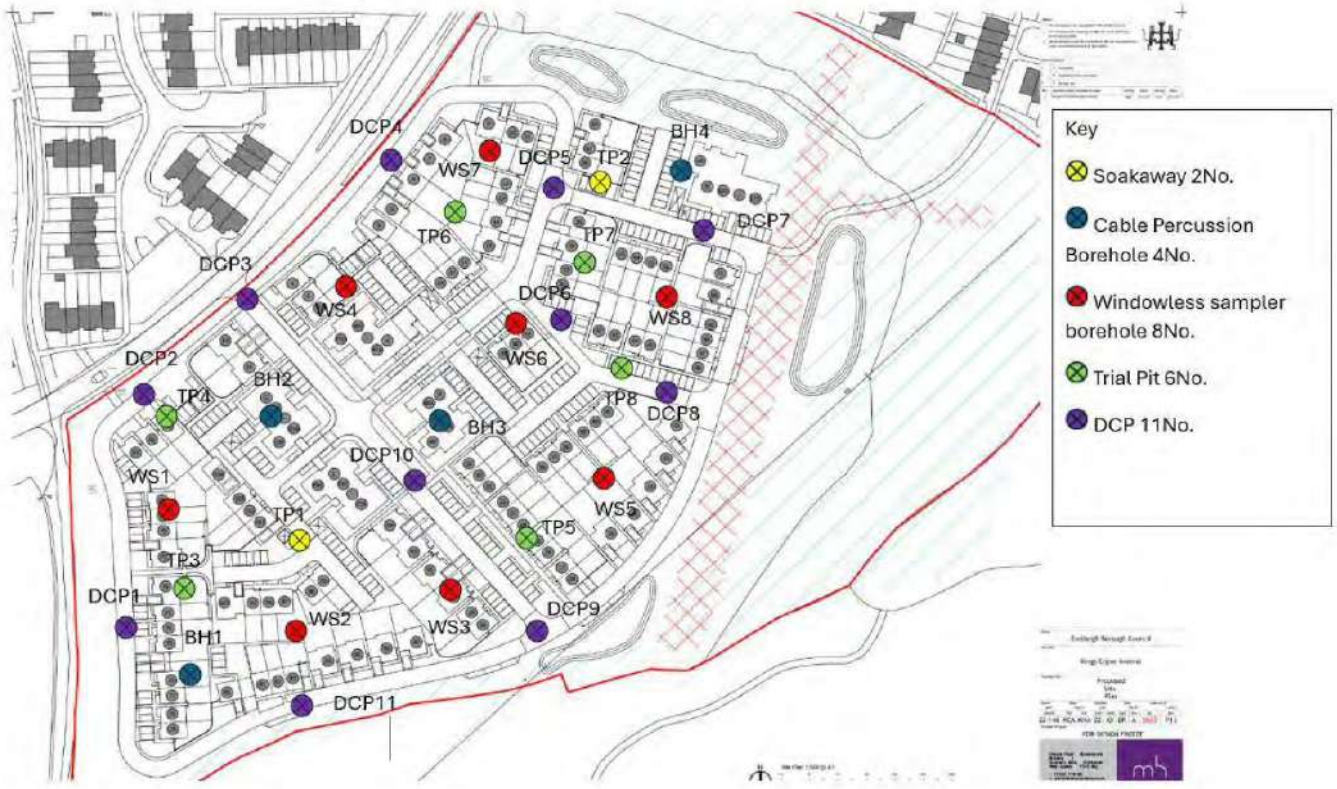


Figure 3 – Exploratory Hole Plan Phase A

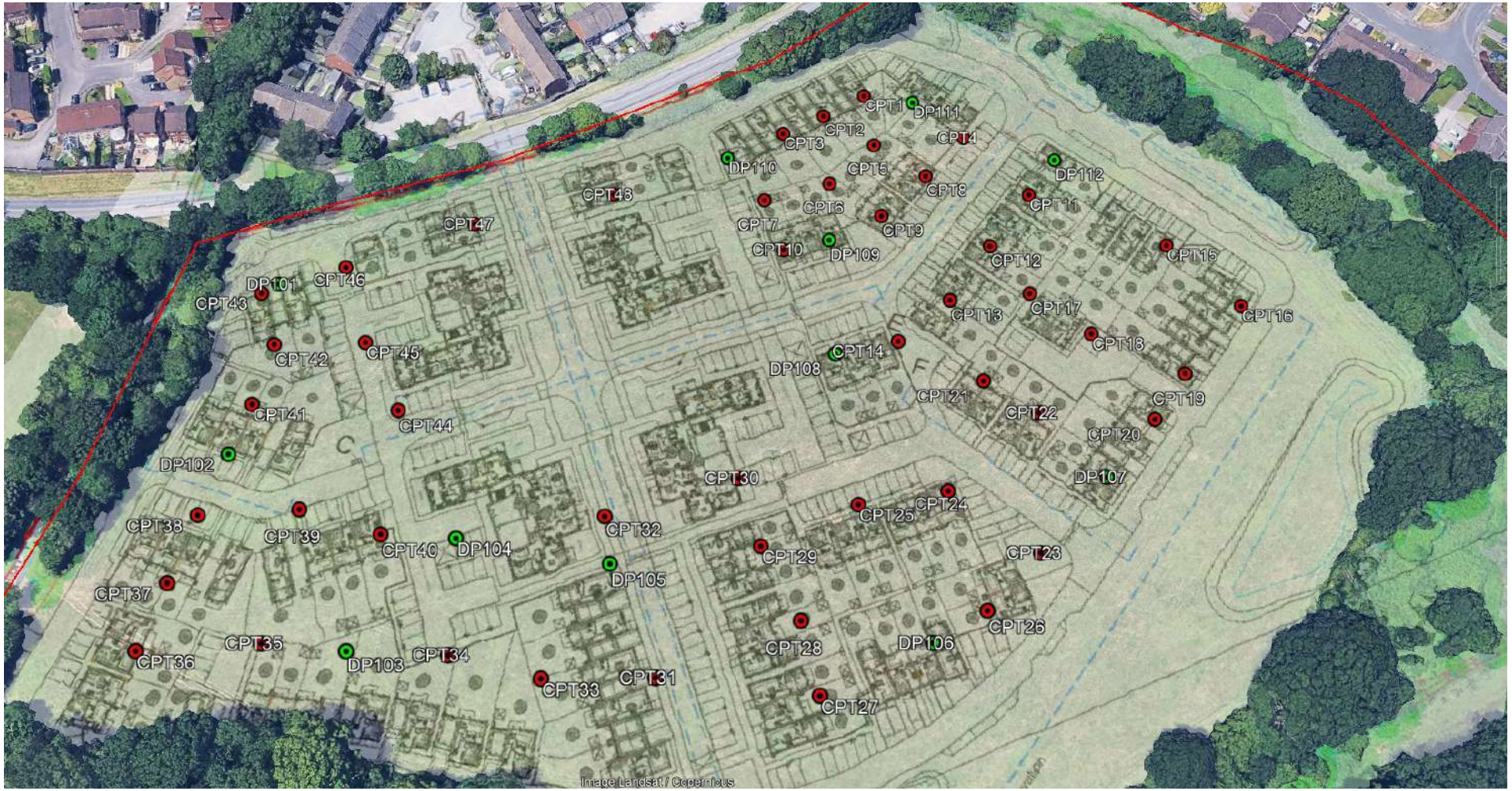


Figure 4 – Exploratory Hole Plan Phase B

Job Number 22085	**Project** Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ
Client Eastleigh Borough Council	**Date** December 2025

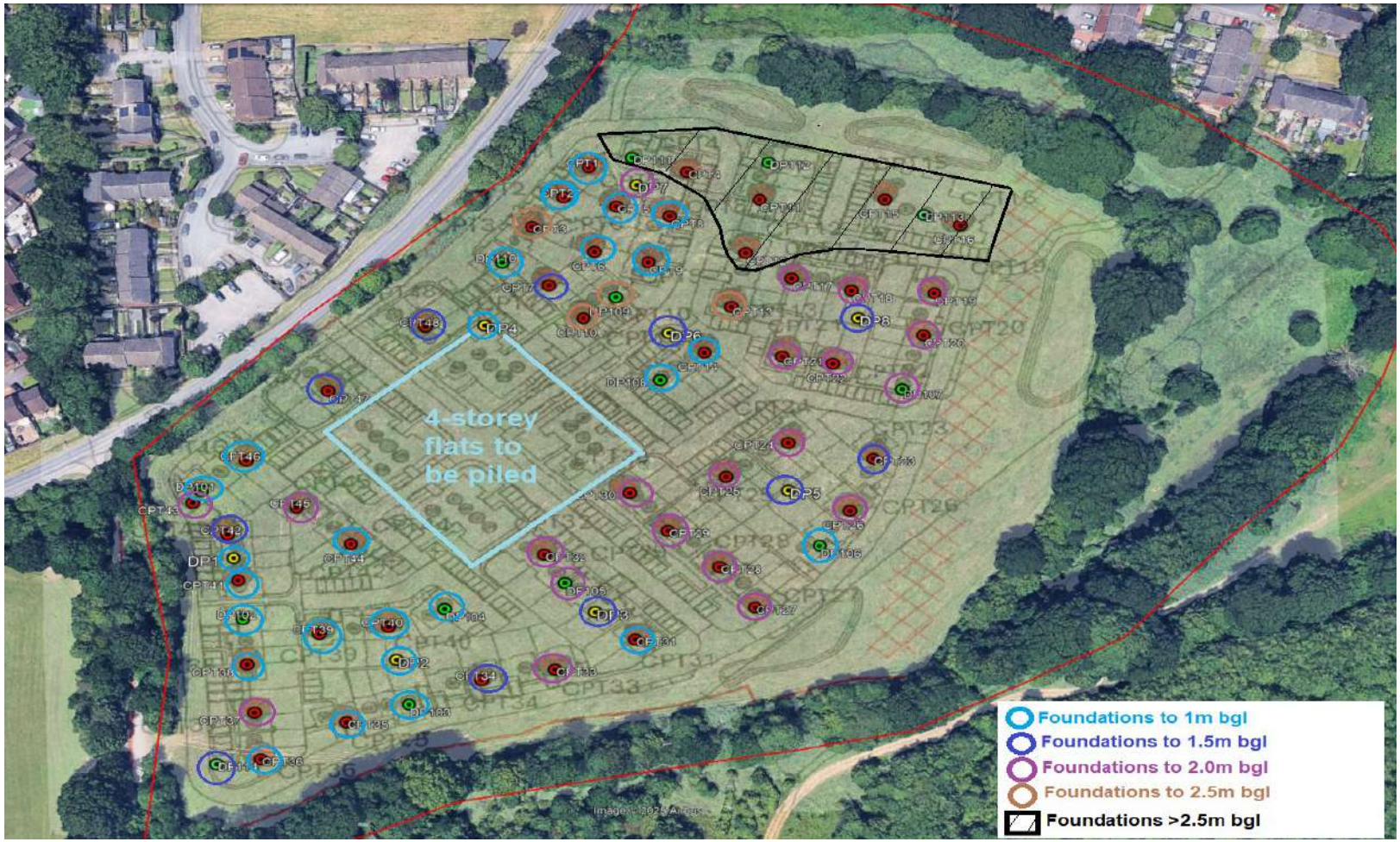


Figure 5 – Proposed Foundation Depths at each DP/CPT Location

Job Number 22085	**Project** Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ
Client Eastleigh Borough Council	**Date** December 2025

Appendix A Standards and Resources

The site works, soil descriptions and geotechnical testing was undertaken in accordance with the following standards were applicable:

- BS 5930:2015 and BS EN ISO 22476-2&3:2005+A1:2011
- BS EN 1997-1:2004+A1:2013
- BS EN ISO 14688-1:2018
- BS EN ISO 14688-2:2018
- BS 10175:2011+A2:2017
- LCRM 2021 Environment Agency
- BS 8004:2015 – Code of practice for foundations
- BS 1377:1990 Parts 1 to 8
- BRE Digest 241 “Low-rise buildings on shrinkable clay soils: Part 2
- BRE Special Digest 1, 2005, ‘Concrete in Aggressive Ground’
- Stroud, M. A. 1974, “The Standard Penetration Test – its application and interpretation”, Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.
- N.E. Simons, B.K. Menzies, “A Short Course in Foundation Engineering”
- NHBC Standards Chapter 4.2, January 2025
- SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014
- CIRIA C733, Asbestos in soil and made ground: a guide to understanding and managing risks and CAR2012 regulations.
- Google Earth (accessed April 2025)
- British Geological Survey Website & iGeology App (accessed April 2025)

Appendix B Field Work

Appendix B.1 Engineers Logs

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH1**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 1 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20 - 5.40	D	Ublow = 80		(0.30)		Soft greyish brown slightly silty, slightly sandy CLAY . Sand is fine . Rare rootlets. TOPSOIL		
0.40	B			0.30		Soft orangish brown slightly mottled light grey slightly sandy slightly silty CLAY. Sand is fine . Occasional rootlets. LONDON CLAY FORMATION.		
				(0.70)				
1.00	D			1.00		Firm brown slightly silty, slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
1.20 - 1.50	U	Ublow = 20						
1.60	B							
2.00	SPT D	N=12 (1,2/2,3,3,4)		(2.20)				
2.50	D							
3.00 - 3.45	U	Ublow = 45						
				3.20		Firm to stiff grey slightly silty, slightly sandy CLAY . Rare angular , fine to coarse cement stone gravel. LONDON CLAY FORMATION.		
3.45	D							
				(1.20)				
4.00	SPT D	N=50 (2,3/50 for 270mm)						
4.40	B			4.40		CLAYSTONE. LONDON CLAY FORMATION.		
				(0.40)				
				4.80		Firm to stiff grey slightly silty, slightly sandy CLAY . Rare angular , fine to coarse cement stone gravel. LONDON CLAY FORMATION.		
5.00	SPT D	N=23 (1,3/4,5,6,8)						
6.00	D							
6.50 - 6.95	U	Ublow = 75						
6.95	D			(4.20)				
7.50	D							
8.00	SPT D	N=27 (3,4/6,6,7,8)						
9.00	B			9.00		CLAYSTONE. LONDON CLAY FORMATION.		
				(0.40)				
				9.40		Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. LONDON CLAY FORMATION.		
9.50 - 9.95	U	Ublow = 80						
9.95	D							

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 1.00m bgl.

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH1**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 2 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. LONDON CLAY FORMATION.		
10.50	D							
11.00	SPT D	N=33 (4,4/6,8,9,10)						
12.00	D							
12.50 - 12.90	U	Ublow = 80						
12.90	D							
13.50	D							
14.00	SPT D	N=40 (4,5/7,10,11,12)		(8.60)				
15.00	D							
15.50 - 15.95	U	Ublow = 80						
15.95	D							
16.50	D							
17.00	SPT D	N=49 (4,6/9,12,13,15)						
18.00	D			18.00 (0.30) 18.30		CLAYSTONE. LONDON CLAY FORMATION.		
18.50 - 18.80	U	Ublow = 80				Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. Occasional shell fragments. LONDON CLAY FORMATION.		
18.80	D							
19.50	D							
20.00	SPT	N=50 (6,9/50 for 255mm)						

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 1.00m bgl.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH1**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 3 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
	D					Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. Occasional shell fragments. LONDON CLAY FORMATION.		
21.00	D							
21.50 - 21.90	U	Ublow = 80						
21.90	D							
22.50	D			(6.70)				
23.00 - 23.35	U	Ublow = 80						
23.50	D							
24.00	D							
24.50	SPT	N=43 (3,5/9,10,12,12)						
	D							
				25.00		End of Borehole at 25.00m		

21 22 23 24 25 26 27 28 29 30

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 1.00m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Kings Copse Avenue	Eastleigh Borough Council	**BH2**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25 - 17/04/25	AS	AS	FINAL	**CP**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 1 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.30	D			(0.40)		Soft dark brown slightly sandy, slightly gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular, fine to coarse flint . Occasional rootlets. TOPSOIL.		
0.50	B			0.40		Stiff orangish brown mottled light grey slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
1.20 - 1.65	U	Ublow = 40						
1.65	D							
2.00	SPT D	N=12 (2,2/2,3,3,4)		(3.00)				
2.50	D							
3.00 - 3.45	U	Ublow = 60						
3.45	D			3.40		Stiff grey slightly sandy, slightly silty CLAY. LONDON CLAY FORMATION.		
4.00	SPT D	N=17 (2,3/3,4,4,6)		(1.60)				
4.50	D							
5.00	B U			5.00		CLAYSTONE. LONDON CLAY FORMATION.		
5.50	SPT D	N=26 (4,3/5,6,7,8)		(0.30) 5.40		Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. Occasional shell fragments. LONDON CLAY FORMATION.		
6.00	D							
6.50 - 6.95	U	Ublow = 80						
6.95	D							
7.50	D							
8.00	SPT D	N=29 (3,4/5,7,8,9)						
9.00	D							
9.50 - 9.95	U	Ublow = 80						
9.95	D							

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH2**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25 - 17/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 2 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. Occasional shell fragments. LONDON CLAY FORMATION.		
10.50	D							
11.00	SPT D	N=36 (5,6/7,9,10,10)						
12.00	D							
12.50 - 12.95	U	Ublow = 80						
12.95	D							
13.50	D							
14.00	SPT D	N=40 (5,7/7,10,11,12)						
15.00	D			(21.60)				
15.50 - 15.95	U	Ublow = 80						
15.95	D							
16.50	D							
17.00	SPT D	N=50 (5,5/50 for 212mm)						
18.00	D							
18.50 - 18.95	U	Ublow = 80						
18.95	D							
19.50	D							
20.00	SPT	N=50 (5,6/50 for 275mm)						

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH2**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	16/04/25 - 17/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 3 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
	D					Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. Occasional shell fragments. LONDON CLAY FORMATION.		
21.00	D							
21.50 - 21.95	U	Ublow = 80						
22.00	D							
22.50	D							
23.00	SPT	N=50 (6,7/50 for 285mm)						
	D							
24.00	D							
24.50 - 24.80	U	Ublow = 80						
25.50	D							
26.00	SPT	N=50 (6,8/50 for 255mm)						
	D							
27.00	D			27.00		Stiff to very stiff grey slightly silty, slightly sandy CLAY . Sand is fine . Occasional sand lenses. shell fragments. LONDON CLAY FORMATION.		
27.50 - 27.85	U	Ublow = 80						
27.95	D							
28.50	D			(3.00)				
29.00 - 29.30	U	Ublow = 80						
29.30	D							
29.50	SPT	N=50 (6,8/50 for 280mm)						
	D							
				30.00		End of Borehole at 30.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH3**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	15/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 1 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.30) 0.30		Orange brown clayey gravelly SILT. Gravel is fine to medium flint. TOPSOIL.		
						Soft to firm brown, orange, grey slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
1.20	SPT D	N=6 (1,1/1,1,2,2)		(2.30)				
2.00 - 2.40	U	Ublow = 40						
2.60 - 3.00	B			2.60		Dark grey silty gravelly CLAY. Gravel is fine to medium sub-angular to sub-rounded flint. LONDON CLAY FORMATION.		
3.00	SPT	N=38 (13,12/20,8,5,5)		(0.40) 3.00		Soft to firm brown, orange, grey slightly sandy silty CLAY. LONDON CLAY FORMATION.		
3.10 - 3.40	B			(0.50) 3.50		Dark grey silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
4.00 - 4.35	U	Ublow = 60						
5.00	SPT	N=25 (3,4/25 for 225mm)		(3.30)				
6.00	D							
6.50	SPT	50 (4,4/50 for 200mm)						
6.80	D			6.80 (0.40) 7.20		CLAYSTONE. LONDON CLAY FORMATION.		
7.50	D					Stiff to very stiff dark grey silty slightly sandy CLAY. Shell fragments at 11.00m bgl. LONDON CLAY FORMATION.		
8.00	SPT	N=34 (4,5/8,8,9,9)						
9.00	D							
9.50	SPT	N=33 (4,5/6,8,9,10)						

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets observed to 1.20m bgl.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Kings Copse Avenue	Eastleigh Borough Council	**BH3**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	15/04/25	AS	AS	FINAL	**CP**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% |

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
10.50	D					Stiff to very stiff dark grey silty slightly sandy CLAY. Shell fragments at 11.00m bgl. LONDON CLAY FORMATION.		
11.00 - 11.30	U	Ublow = 70						
12.00	D							
12.50	SPT	N=37 (5,5/37 for 225mm)						
13.50	D							
14.00 - 14.35	U	Ublow = 90						
15.00	D			(13.10)				
15.50	SPT	N=47 (3,5/7,12,14,14)						
16.50	D							
17.00 - 17.30	U	Ublow = 100						
18.00	D							
18.50	SPT	N=43 (5,6/8,9,12,14)						
19.50	D							
20.00 - 20.30	U	Ublow = 100						

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets observed to 1.20m bgl.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Kings Copse Avenue	Eastleigh Borough Council	**BH3**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	15/04/25	AS	AS	FINAL	**CP**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 3 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				20.30		Stiff to very stiff dark grey silty slightly sandy CLAY. Shell fragments at 11.00m bgl. LONDON CLAY FORMATION.		
				(0.40)		CLAYSTONE. LONDON CLAY FORMATION.		
				20.70		Very Stiff dark grey silty CLAY. LONDON CLAY FORMATION.		
21.00	D							
21.50	SPT	N=50 (4,10/50 for 275mm)						
22.50	D							
23.00 - 23.20	U	Ublow = 100						
24.00	D							
24.50	SPT	N=48 (5,10/10,12,12,14)						
				(9.30)				
25.50	D							
26.00 - 26.20	U	Ublow = 100						
27.00	D							
27.50	SPT	N=48 (5,6/10,12,13,13)						
28.50	D							
29.00	SPT	50 (8,10/50 for 225mm)						
30.00	D			30.00		End of Borehole at 30.00m		

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets observed to 1.20m bgl.

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Kings Copse Avenue	Eastleigh Borough Council	**BH4**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	14/04/25 - 15/04/25	AS	AS	FINAL	**CP**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 1 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.25	D			(0.40)		Grass over brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint. and rare brick TOPSOIL.		
0.40	B			0.40		Firm orange, brown, sandy silty CLAY. WHITECLIFF SAND FORMATION.		
				(0.60)				
1.00	D			1.00		Orange, grey, brown silty clayey SAND. Sand is fine to medium. WHITECLIFF SAND FORMATION.		
1.20	SPT	N=21 (3,4/6,4,5,6)		(0.30)				
				1.30		Orange, brown silty SAND. WHITECLIFF SAND FORMATION.		
1.50	B			(0.60)				
				1.90		Soft to Firm orange, brown silty sandy CLAY. LONDON CLAY FORMATION.		
2.10 - 2.55	U	Ublow = 35		(0.70)				
2.55	D			2.60		Firm to stiff dark grey very silty CLAY. LONDON CLAY FORMATION.		
2.80	D							
3.00	SPT	N=8 (1,2/2,2,2,2)						
	D							
3.60	D							
4.00 - 4.40	U	Ublow = 35						
4.40	D							
				(4.30)				
5.00	SPT	N=24 (2,3/5,6,6,7)						
	D							
6.00	D							
6.50 - 6.95	U	Ublow = 80						
6.95	D			6.90		CLAYSTONE. LONDON CLAY FORMATION.		
				(0.40)				
7.50	D			7.30		Firm to stiff dark grey very silty CLAY. LONDON CLAY FORMATION.		
				(0.40)				
7.70	B			7.70		CLAYSTONE. LONDON CLAY FORMATION.		
				(0.30)				
8.00	SPT	N=40 (4,4/8,10,10,12)		8.00		Firm to stiff grey very silty sandy CLAY. LONDON CLAY FORMATION.		
	B							
9.00	D			(2.80)				
9.50	SPT	N=30 (4,4/6,6,8,10)						
	D							

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**BH4**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	14/04/25 - 15/04/25	AS	AS	FINAL	**CP**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 2 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Firm to stiff grey very silty sandy CLAY. LONDON CLAY FORMATION.		
10.50	D							
10.80	D			10.80		CLAYSTONE. LONDON CLAY FORMATION.		
11.00	SPT	N=39 (8,6/7,8,10,14)		11.00		Stiff grey very silty slightly sandy CLAY. LONDON CLAY FORMATION.		
	D							
				(1.80)				
12.00	D							
12.50 - 12.80	U	Ublow = 80						
12.80	B			12.80		CLAYSTONE. LONDON CLAY FORMATION.		
				(0.30)				
				13.10		Stiff to very stiff grey very silty slightly sandy CLAY. LONDON CLAY FORMATION		
13.50	D							
14.00	SPT	N=46 (4,5/7,11,12,16)						
	D							
15.00	D							
15.50 - 15.95	U	Ublow = 80						
15.95	D							
16.30	B							
				(7.90)				
17.00 - 17.40	U	Ublow = 70						
17.40	D							
18.00	D							
18.50	SPT	N=43 (5,8/8,10,12,13)						
	D							
19.00	B							
20.00	SPT	N=50 (6,8/50 for 280mm)						

11 12 13 14 15 16 17 18 19 20

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:	Client:	Hole ID:
Kings Copse Avenue	Eastleigh Borough Council	**BH4**

Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	14/04/25 - 15/04/25	AS	AS	FINAL	**CP**

Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Dando 4000	25/06/2025	1:50

Weather: | Termination: | SPT Hammer: AR2847 Energy Ratio: 77% | Sheet 3 of 3

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
	D					Stiff to very stiff grey very silty slightly sandy CLAY. LONDON CLAY FORMATION		
20.50	SPT	N=50 (5,9/50 for 275mm)						
	D			21.00		End of Borehole at 21.00m		

21 22 23 24 25 26 27 28 29 30

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
No groundwater encountered.
Rootlets recorded to 0.40m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS1**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 1	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.10	ES			0.20		Greyish brown slightly silty slightly clayey fine to medium SAND. Abundant rootlets. TOPSOIL		
0.30	WAC			(0.50)		Greyish brown slightly clayey slightly gravelly fine to medium SAND. Gravel is subangular to subrounded fine to medium flint. Rare fine gravel sized brick fragments. Occasional rootlets. LONDON CLAY FORMATION.		
0.80	D			0.70				
1.00	D			(0.40)		Light brownish grey mottled dark orangish brown slightly clayey fine to medium SAND. LONDON CLAY FORMATION.		
				1.10				
				(0.90)		Soft light brownish grey mottled orangish slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
				2.00				
				(1.30)		Firm greyish brown mottled orangish brown slightly silty slightly sandy CLAY. Sand is fine. Silt occasionally occurs in partings. LONDON CLAY FORMATION.		
				3.30				
				(1.40)		Stiff to very stiff dark brownish grey mottled grey slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
				4.70		End of Borehole at 4.70m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
Rootlets observed to 0.70m bgl.
No groundwater recorded.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS2**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 1	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	ES			0.25		Greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to medium flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
				(1.75)		Soft to firm light brownish grey mottled orangish brown slightly sandy CLAY. Sand is fine. Frequent roots and rootlets. LONDON CLAY FORMATION.		
1.50	D			2.00		Firm greyish brown mottled orangish brown slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
				(0.90)		*Mottled dark brown. Very weakly cemented nodules. Friable.*		
				2.90		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
				(2.10)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
Rootlets observed to 1.10m bgl.
Groundwater recorded at 3.30m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
3.30			0	0.00	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS3**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 1	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.10	WAC			(0.30)		Greyish brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to medium flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
0.50	ES			0.30		Soft greyish brown mottled orangish brown slightly sandy CLAY. Sand is fine to medium. Occasional rootlets becoming rare with depth observed to 1.60m bgl. LONDON CLAY FORMATION.		
				(1.60)				
2.00	D			1.90		Stiff greyish brown mottled orangish brown slightly sandy CLAY. Sand is fine to medium. Occasional lignite. LONDON CLAY FORMATION.		
				(0.80)				
						Very weakly cemented nodules.		
				2.70		Stiff greyish brown mottled orangish brown and reddish brown slightly silty slightly sandy CLAY. Sand is fine to medium. LONDON CLAY FORMATION.		
				(0.90)				
				3.60		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION.		
				(1.40)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
Rootlets observed to 1.60m bgl.
No groundwater recorded.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS4**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 1	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.30) 0.30		Greyish brown slightly sandy slightly gravelly very clayey SILT. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
0.50	WAC			(0.80)		Soft greyish brown mottled orangish brown and grey slightly sandy CLAY. Sand is fine. Frequent rootlets. LONDON CLAY FORMATION. *Sand is fine to coarse.*		
0.80	ES			1.10				
				(1.30)		Soft greyish brown mottled grey slightly sandy silty CLAY. Sand is fine. Occasional desiccated rootlets and rare rootlets. LONDON CLAY FORMATION.		
2.50	D			2.40				
				(0.60)		Firm greyish brown mottled grey slightly sandy silty CLAY. Sand is fine. Occasional desiccated rootlets and rare rootlets. LONDON CLAY FORMATION.		
				3.00				
				(1.00)		Stiff greyish brown mottled multicoloured slightly silty slightly sandy CLAY. Sand is fine to medium. Rare rootlets. LONDON CLAY FORMATION.		
				4.00				
				(1.00)		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Remarks:
Rootlets observed to 3.50m bgl.
No groundwater recorded.

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Water Strikes					
Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS5**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 2	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.10	ES			(0.30) 0.30		Firm dark brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
1.00	D			(1.30) 1.60		Soft brown mottled orangish brown slightly sandy CLAY. Sand is fine to medium. Frequent rootlets. LONDON CLAY FORMATION.		
				(1.60) 3.20		Stiff brown mottled light greyish brown and orangish brown slightly silty slightly sandy CLAY. Sand is fine to medium. LONDON CLAY FORMATION. *Subrounded medium gravel sized pyrite nodules.*		
				(1.55) 3.45		Greyish brown slightly clayey subangular to subrounded fine to coarse GRAVEL of septarian nodule fragments. LONDON CLAY FORMATION		
				5.00		Very stiff dark brownish grey slightly silty slightly sandy slightly gravelly CLAY. Gravel is subrounded pyrite nodules, terebridae and other shell fragments. Sand is fine. LONDON CLAY FORMATION. End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
Rootlets observed to 1.20m bgl.
Groundwater recorded at 4.00m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
4.00			30	3.50	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS6**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 2	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	ES			(0.30) 0.30		Firm dark brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
						Soft orangish brown mottled light greyish brown slightly sandy CLAY. Sand is fine to medium. Occasional rootlets. LONDON CLAY FORMATION.		
						Slightly sandy clayey GRAVEL of subangular fine to coarse flint.		
						Greenish grey fine to coarse sand.		
				(1.70)				
1.50	D					*Flint gravel.*		
				2.00		Stiff greyish brown mottled orangish brown and rarely reddish brown slightly silty slightly sandy CLAY. Sand is fine to medium. Occasional very weakly cemented nodules. LONDON CLAY FORMATION.		
				(0.90)				
				2.90		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
				(1.70)				
				4.60		End of Borehole at 4.60m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations

Date	Time	Depth (m)	Casing (m)	Water (m)

Borehole Diameter

Depth (m)	Dia (mm)

Casing Diameter

Depth (m)	Dia (mm)

Remarks:
Rootlets observed to 2.00m bgl.
Groundwater recorded at 4.00m bgl.

Chiselling

From (m)	To (m)	Duration	Remarks

Installation

Top (m)	Base (m)	Type	Dia (mm)

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
4.00			25	3.80	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS7**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 2	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.30)		Firm dark brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to medium. Abundant roots and rootlets. TOPSOIL		
				0.30				
0.50	ES					Soft light greyish brown mottled orangish brown very sandy CLAY. Sand is fine to medium. Frequent becoming rare with depth roots and rootlets. LONDON CLAY FORMATION.		
						Subrounded medium to coarse flint gravel.		
				(2.50)				
2.00	D					*Light brownish grey clayey fine to coarse SAND.*		
				2.80		Firm grey slightly silty slightly sandy CLAY. Sand is fine to medium. LONDON CLAY FORMATION.		
3.00	D			(0.70)				
				3.50		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION		
				(1.50)				
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
Rootlets observed to 2.50m bgl.
Groundwater recorded at 4.00m bgl.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
4.00			45	3.20	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

soils LIMITED

Contract Name:		Client:			Hole ID:
Kings Copse Avenue		Eastleigh Borough Council			**WS8**
Contract Number:	Start and End Date:	Logged By:	Checked By:	Status:	Hole Type:
21876	22/04/25	JM	AS	FINAL	**WS**
Easting:	Northing:	Ground Level:	Plant Used:	Print Date:	Scale:
			Premier 2	25/06/2025	1:50

Weather: | Termination: | Sheet 1 of 1

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
				(0.30) 0.30		Firm dark brown slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to medium. Abundant rootlets. TOPSOIL		
0.60	WAC			(0.60) 0.90		Soft brown mottled orangish brown slightly sandy CLAY. Sand is fine. Frequent roots and rootlets. LONDON CLAY FORMATION.		
0.80	D			(0.70) 1.60		Soft greyish brown mottled orangish brown and light brownish grey slightly silty slightly sandy CLAY. Sand is fine to medium. Rare rootlets and desiccated rootlets observed to 1.50m bgl. LONDON CLAY FORMATION.		
1.00	ES			(0.70) 2.30		Stiff greyish brown mottled orangish brown and light brownish grey slightly silty slightly sandy CLAY. Sand is fine to medium. LONDON CLAY FORMATION.		
				(0.60) 2.90		Stiff greyish brown mottled orangish brown and reddish brown slightly silty slightly sandy CLAY. Sand is fine. Occasional lignite partings. LONDON CLAY FORMATION.		
				(2.10)		Very stiff dark brownish grey slightly silty slightly sandy CLAY. Sand is fine. LONDON CLAY FORMATION. *Subangular to subrounded fine to coarse GRAVEL of septarian nodule fragments and shells.*		
				5.00		End of Borehole at 5.00m		

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter	
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)

Chiselling				Installation			
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)

Remarks:
Rootlets observed to 1.50m bgl.
Groundwater recorded at 4.00m bgl.

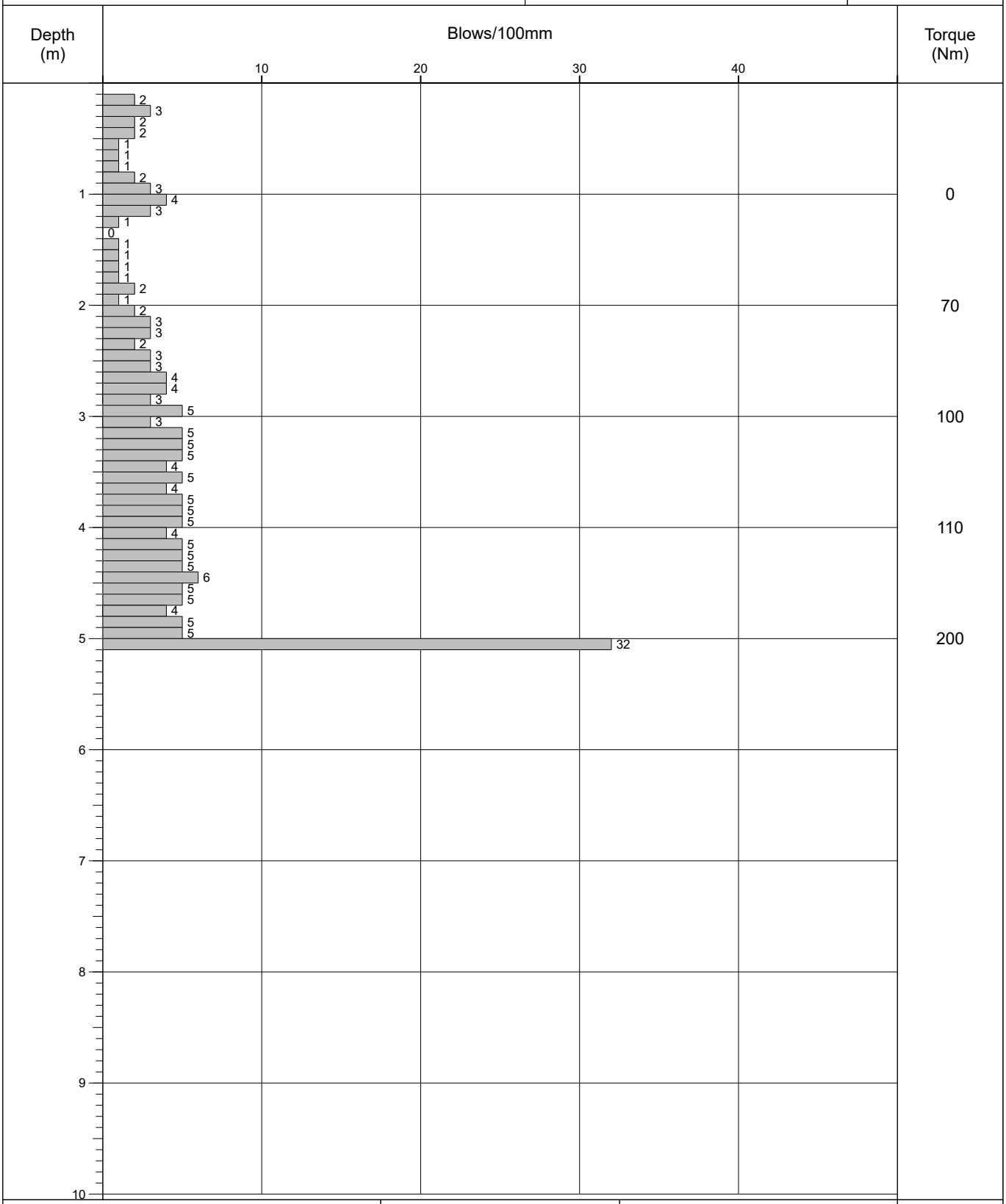
Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
4.00			25	3.80	

Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP1** Sheet 1 of 1	

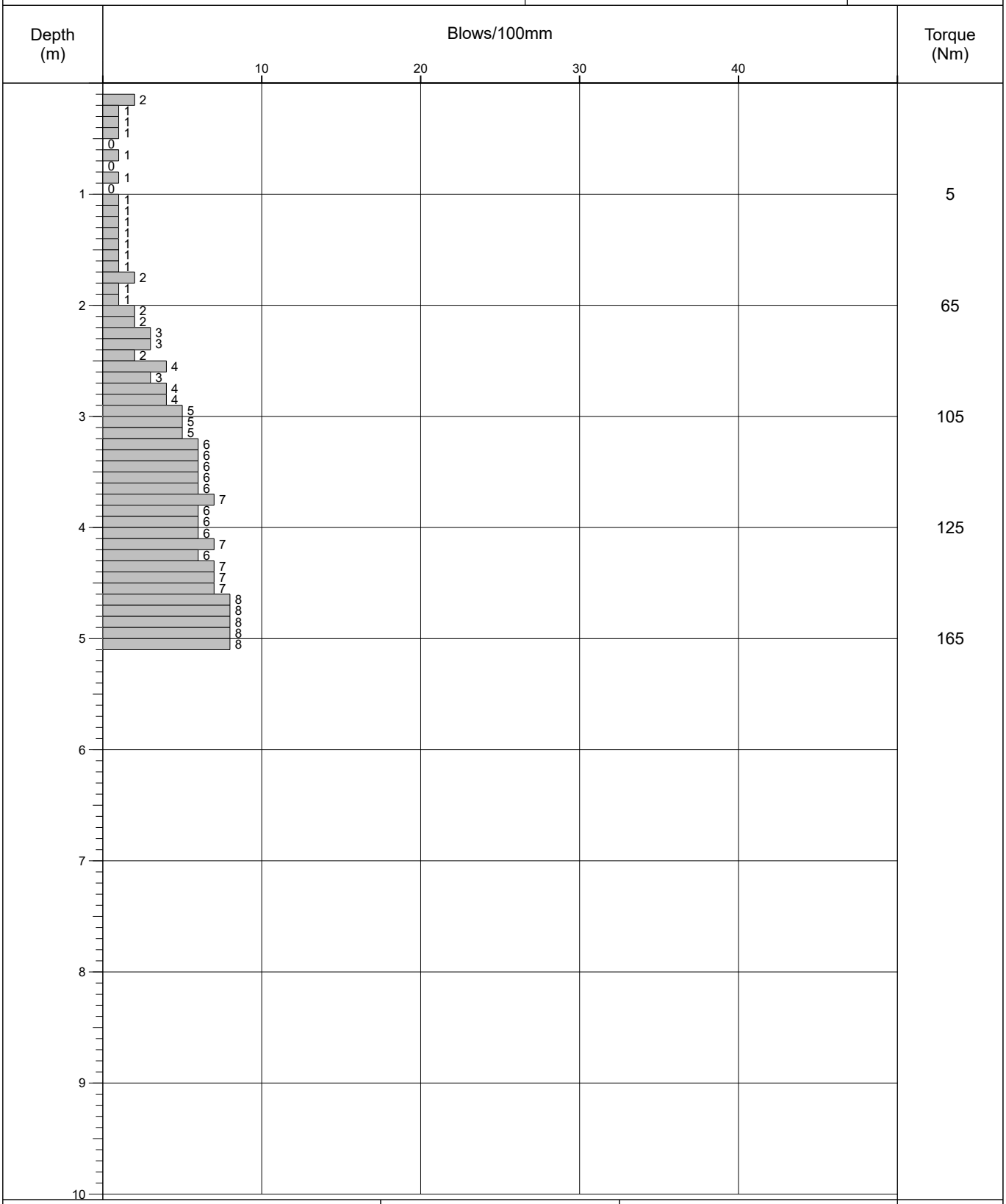
Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By SW



Remarks	Fall Height	760mm	Cone Base Diameter	50mm	AGS REGISTERED USER 2020
	Hammer Weight	63.5kg	Final Depth	5m	
	Probe Type	DPSH-B	Energy Ratio (Er)	90.32%	

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP2** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By SW

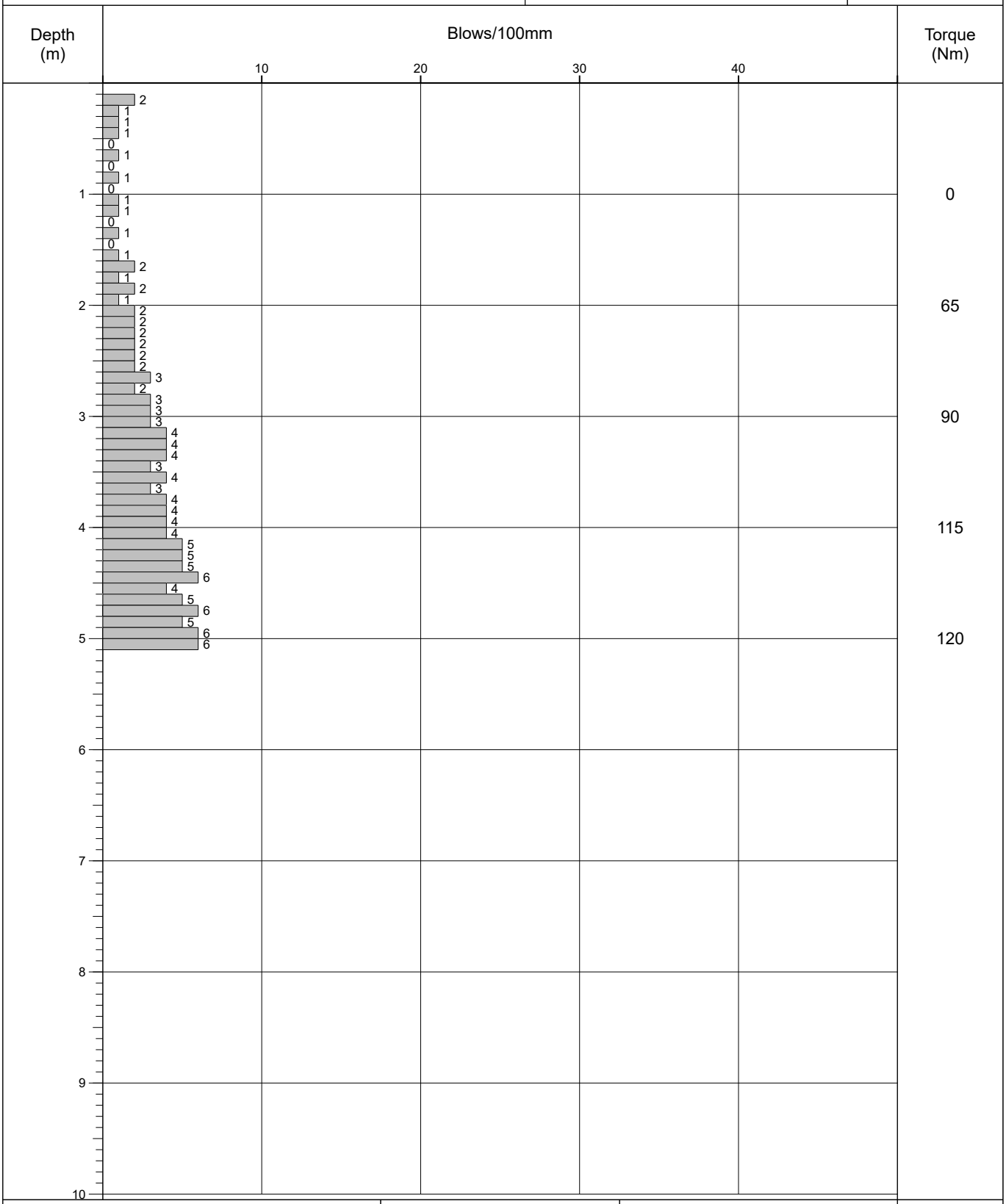


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	5m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.32%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP3** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By SW

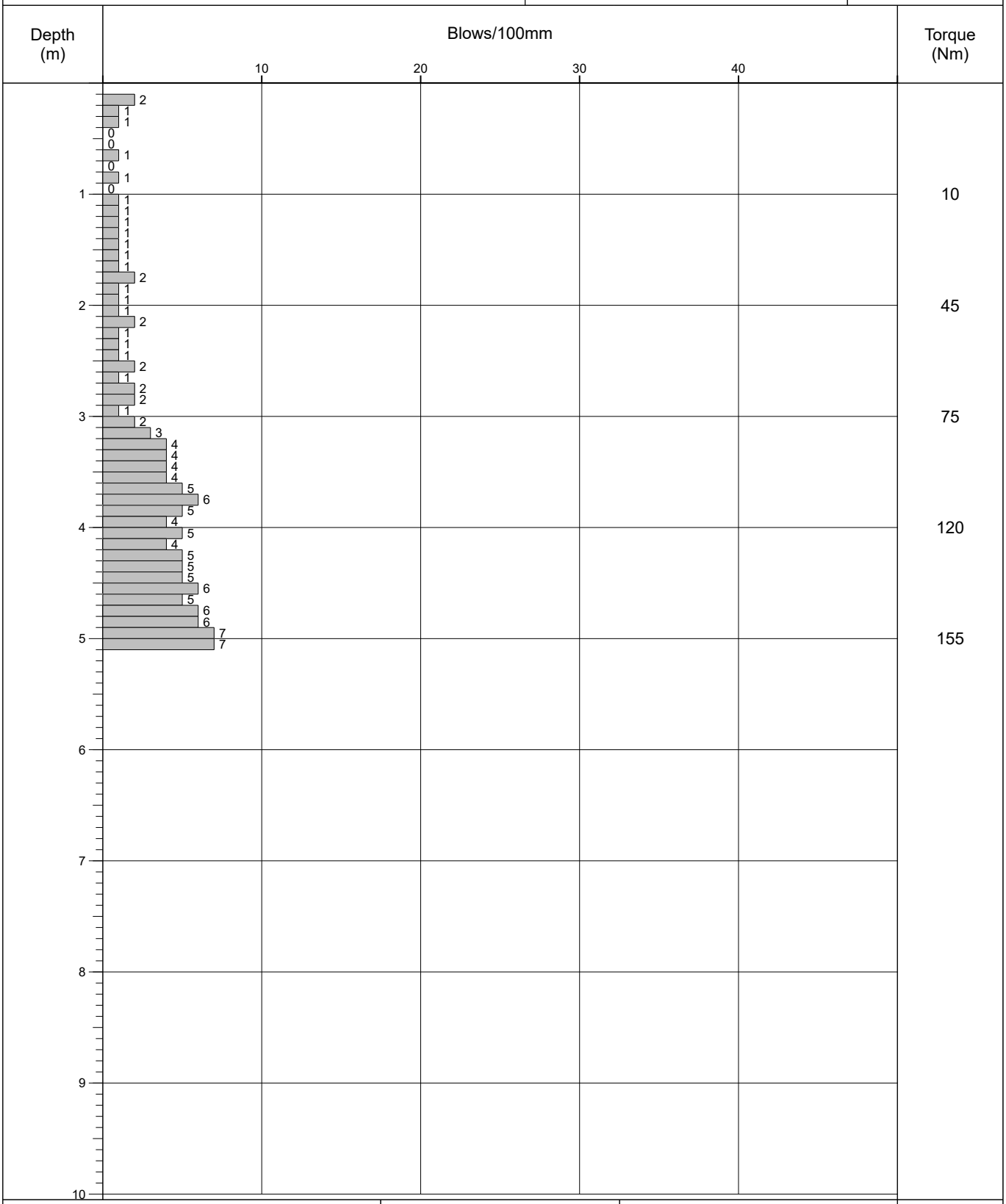


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	5m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.32%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP4** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By SW

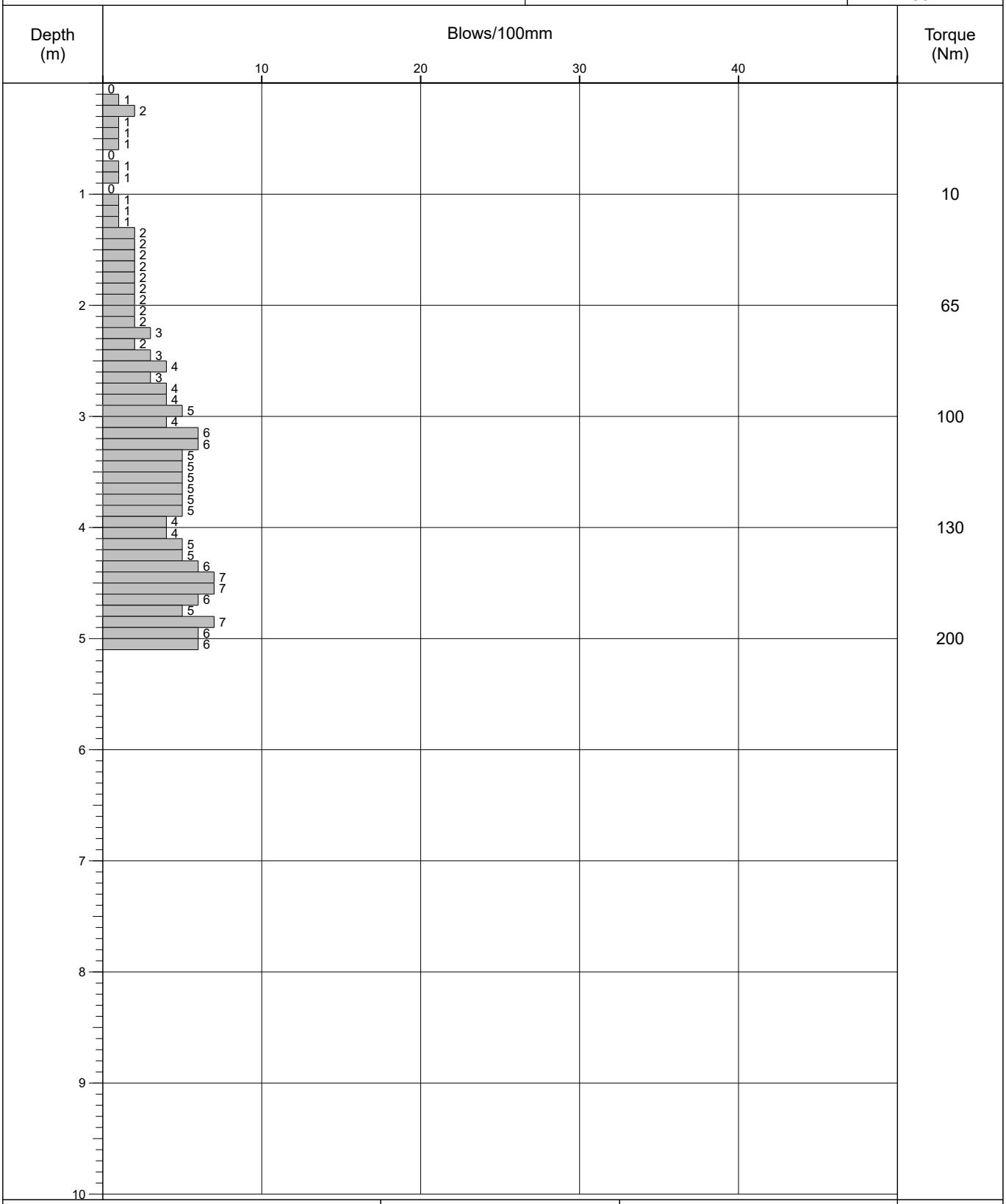


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	5m
	Probe Type	DPSH-B	Energy Ratio (Er)	90.32%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk		**Probe Log**	Probe No. **DP5** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By GJB

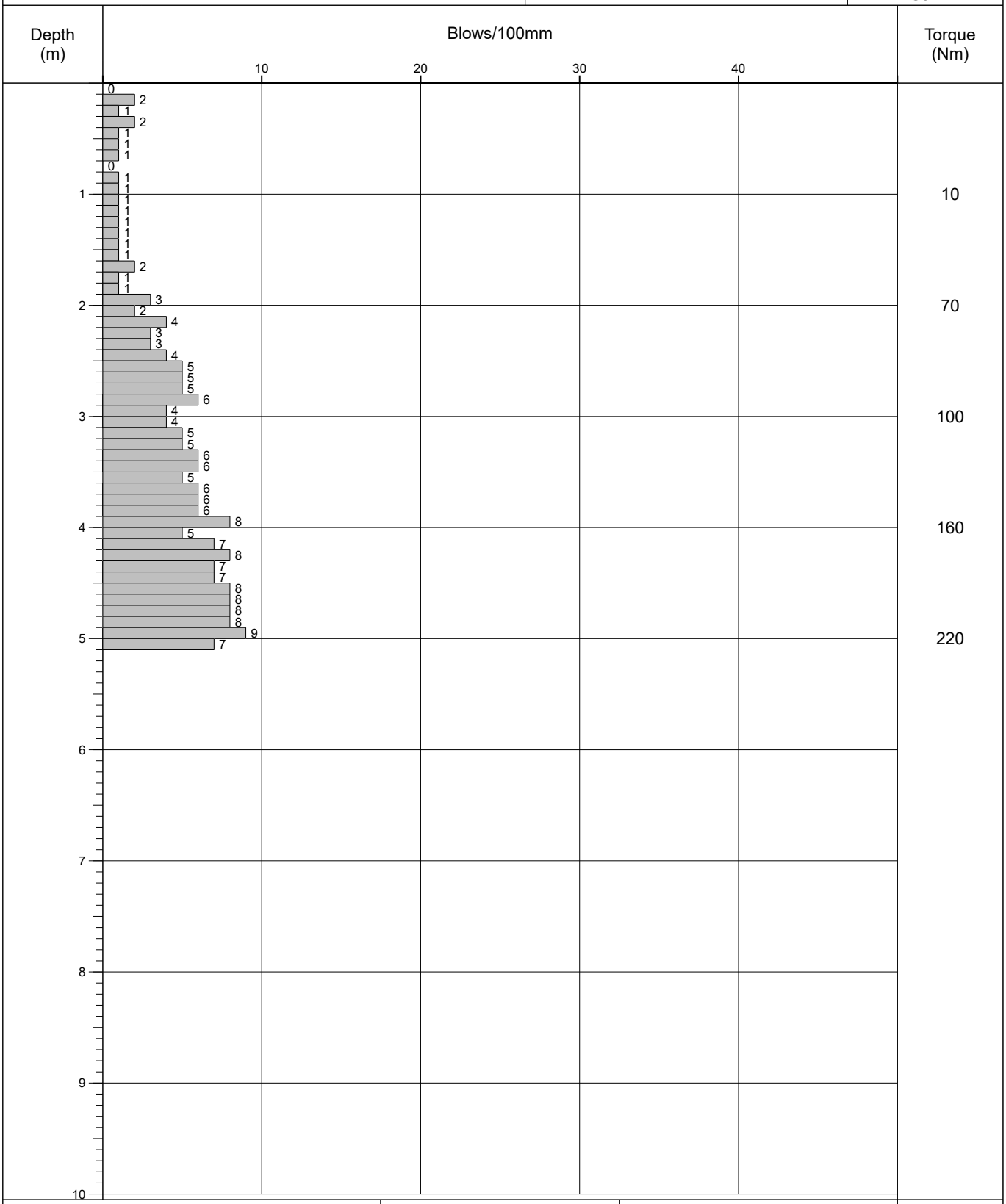


Remarks		Fall Height	760mm	Cone Base Diameter	50mm
		Hammer Weight	63.5kg	Final Depth	5m
		Probe Type	DPSH-B	Energy Ratio (Er)	84.32%

AGS REGISTERED USER 2020

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP6** Sheet 1 of 1

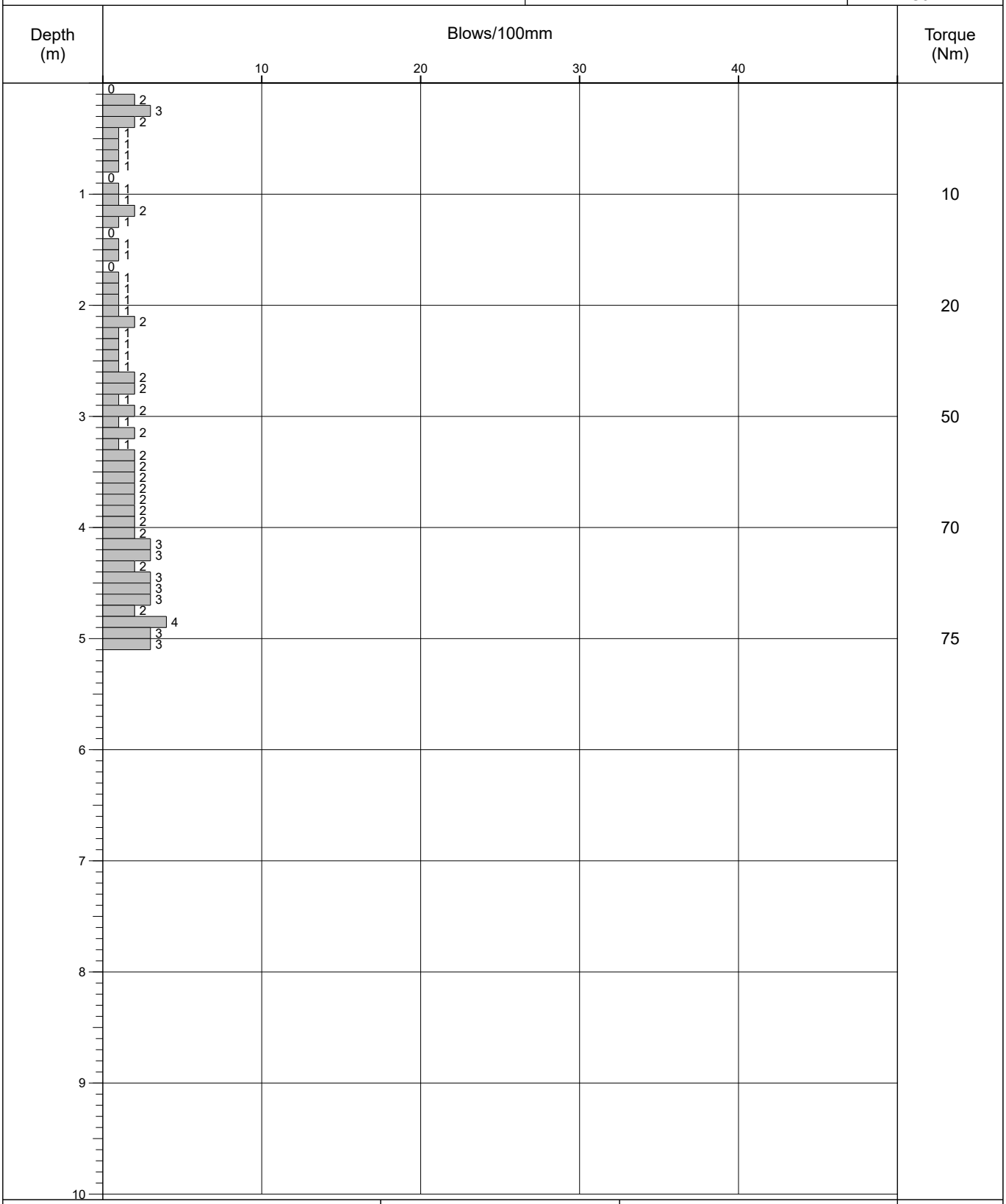
Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By GJB



Remarks	Fall Height	760mm	Cone Base Diameter	50mm	AGS REGISTERED USER 2020
	Hammer Weight	63.5kg	Final Depth	5m	
	Probe Type	DPSH-B	Energy Ratio (Er)	84.32%	

Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**	Probe No. **DP7** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By GJB

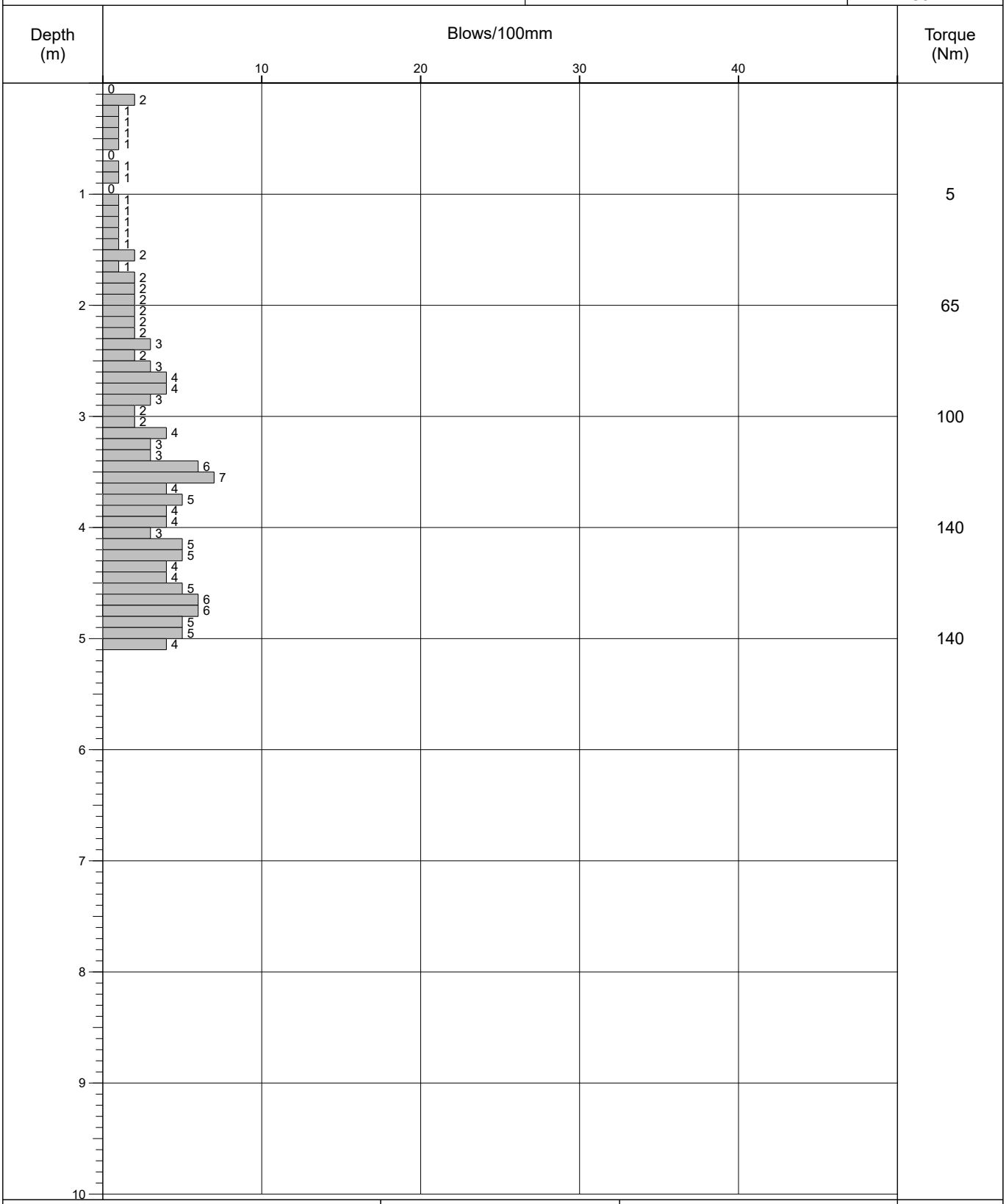


Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	5m
	Probe Type	DPSH-B	Energy Ratio (Er)	84.32%

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Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk	**Probe Log**		Probe No. **DP8** Sheet 1 of 1

Project Name:	Kings Copse Avenue	Project No. 21876	Co-ords:	Hole Type DP
Location:	Hedge End, SO30 2SZ		Level: m AOD	Scale 1:50
Client:	Eastleigh Borough Council		Dates: 22/04/2025	Logged By GJB



Remarks				
	Fall Height	760mm	Cone Base Diameter	50mm
	Hammer Weight	63.5kg	Final Depth	5m
	Probe Type	DPSH-B	Energy Ratio (Er)	84.32%

AGS REGISTERED USER 2020

Soils Limited
Newton House, Cross Road, Tadworth KT20 5SR
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Trial Pit Log

Trial Pit No.
TPSK1
Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.10m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.35			Grass over brown clayey slightly gravelly SILT. Gravel is angular fine to medium flint. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	1.80	D					
				2.00			End of Pit at 2.000m

General Remarks:
Rootlets observed to 0.90m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No.
TPSK2
Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Trial Pit Width: 0.50m	Support:
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.50			Brown clayey slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	1.80	D					
				2.00			End of Pit at 2.000m

General Remarks:
Rootlets observed to 1.80m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP3** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.35			Brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:

Rootlets observed to 1.00m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP4** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.35			Brown sandy slightly gravelly SILT. Gravel is angular fine to medium flint. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:

Rootlets observed to 0.70m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP5** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.40			Brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:

Rootlets observed to 1.40m bgl.
No roundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP6** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.50			Brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:
Rootlets observed to 2.00m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP7** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type: TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale: 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By: CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.50			Brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY with frequent fine sand pockets. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:
Rootlets observed to 1.80m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Trial Pit Log

Trial Pit No. **TP8** Sheet 1 of 1

Project Name: Kings Copse Avenue	Project No.: 21876	Method: Mechanical Excavator	Hole Type: TP
Location: Hedge End, SO30 2SZ		Plant: Mechanical Excavator	Scale: 1:25
Client: Eastleigh Borough Council	Trial Pit Length: 2.00m	Support: Trial Pit Width: 0.50m	
Dates: 16/04/2025	Level:	Co-ords:	Logged By: CF

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (mAOD)	Legend	Stratum Description
	0.30	D		0.40			Brown clayey, slightly gravelly SILT. Gravel is angular fine to medium flint and rare red brick. TOPSOIL
	0.60	D					Soft to firm orange brown and grey mottled CLAY. LONDON CLAY FORMATION.
	0.90	D					
	1.50	D					
	2.00	D		2.00			End of Pit at 2.000m

General Remarks:

Rootlets observed to 2.00m bgl.
No groundwater recorded.

Groundwater Remarks:

Sample Type
D: Disturbed
B: Bulk
J: Jar
W: Water

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Dynamic Probe

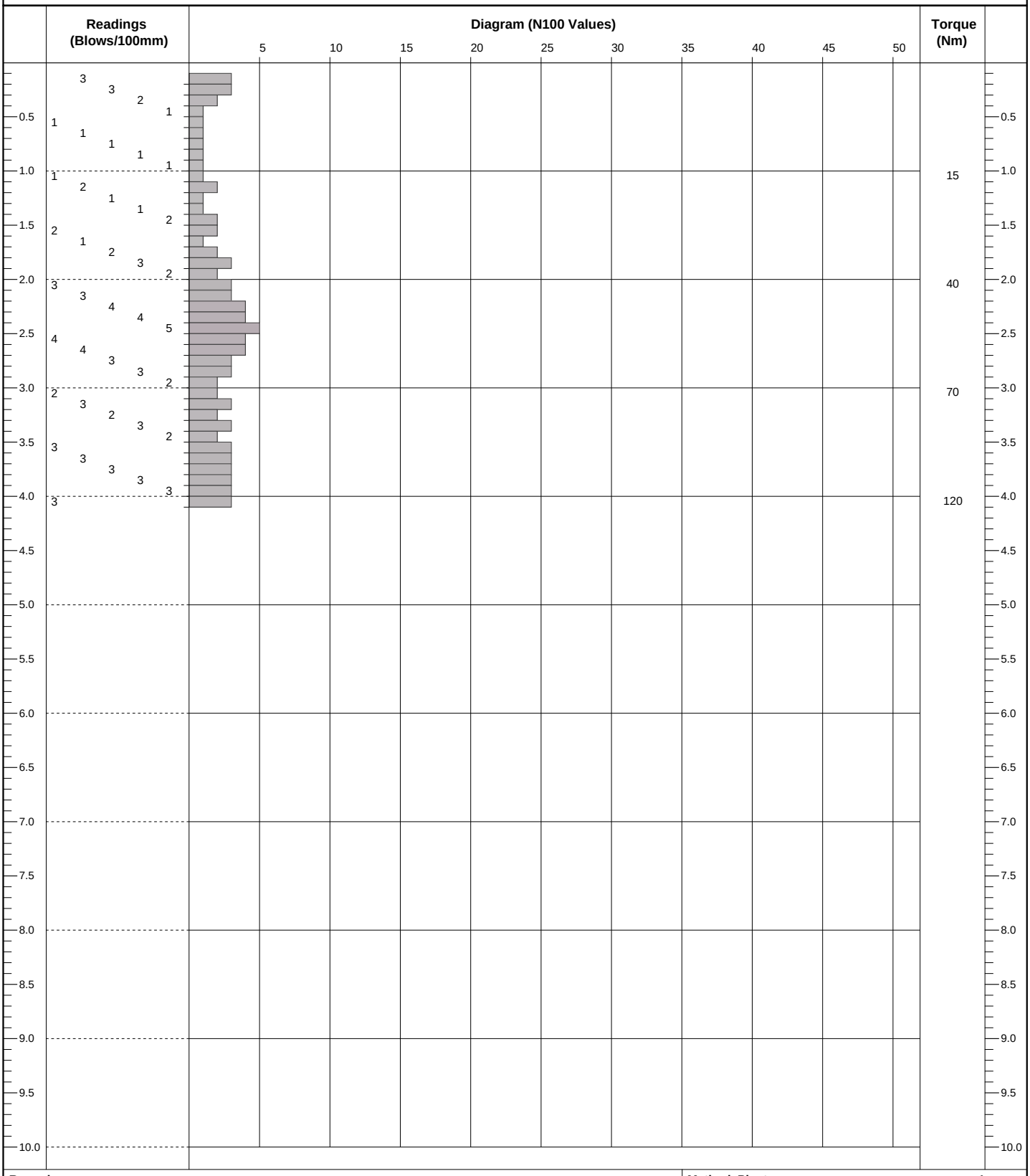
DP101

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

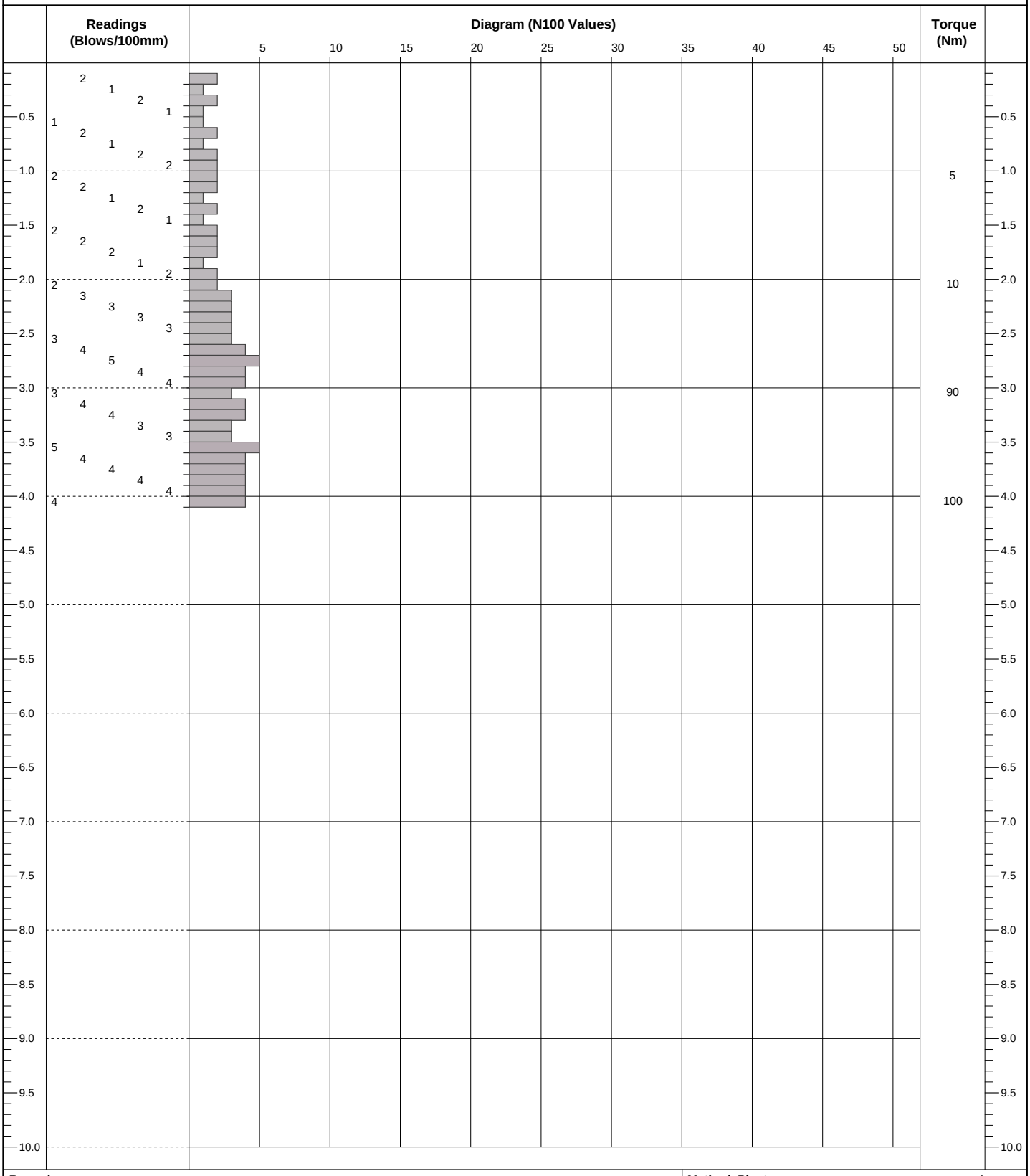
DP102

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

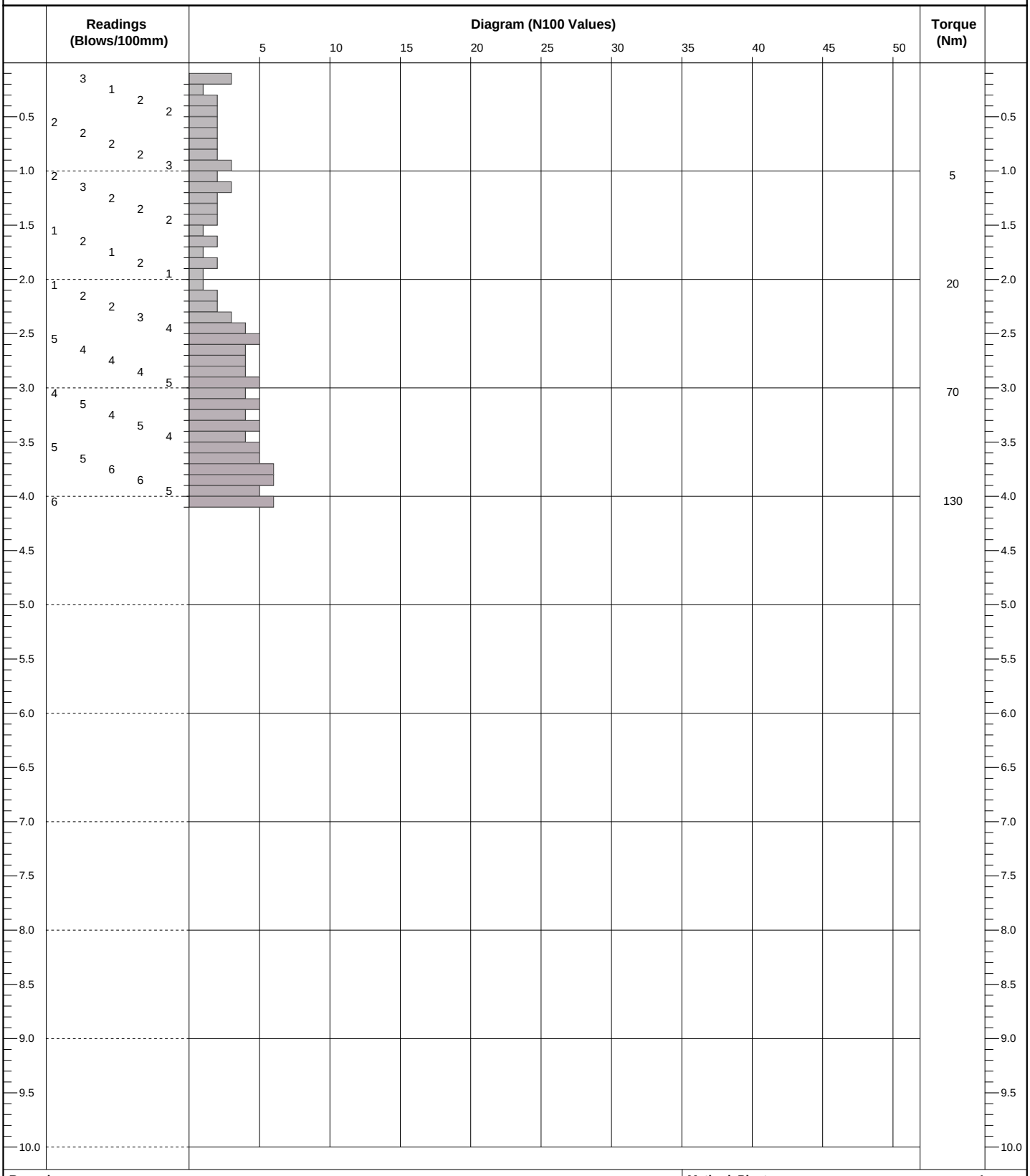
DP103

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

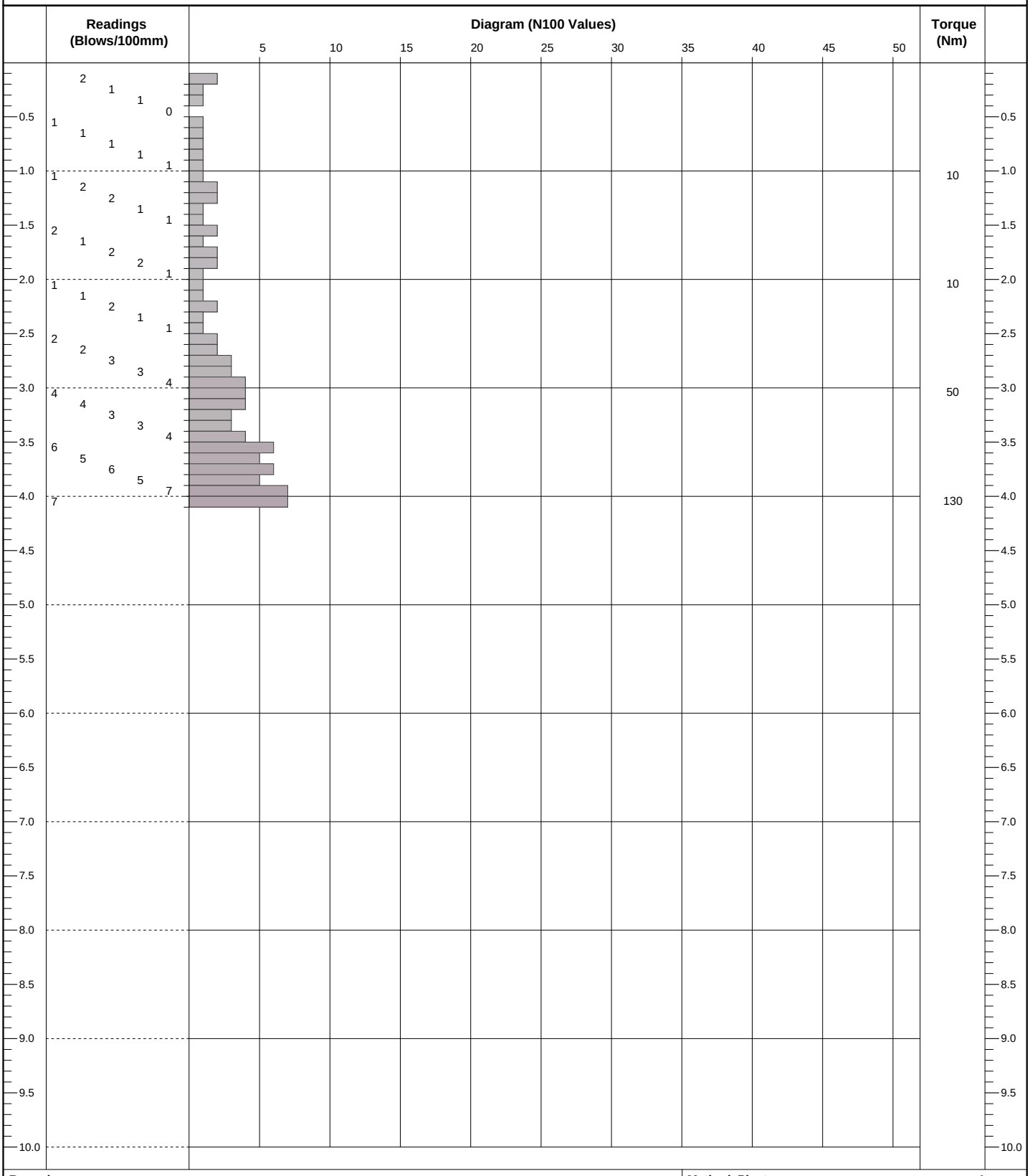
DP104

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

Created using Pebble Geo

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Dynamic Probe

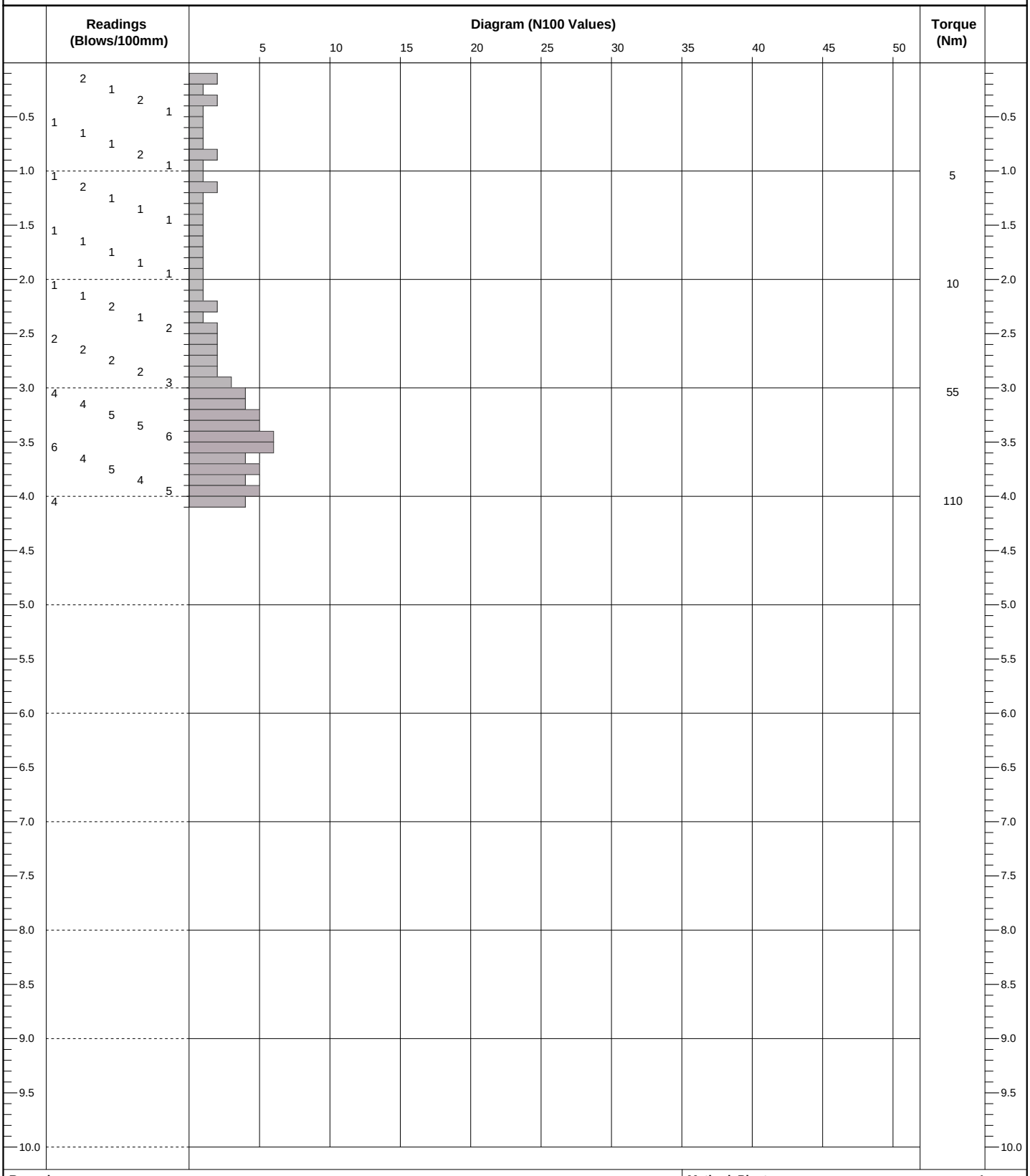
DP105

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

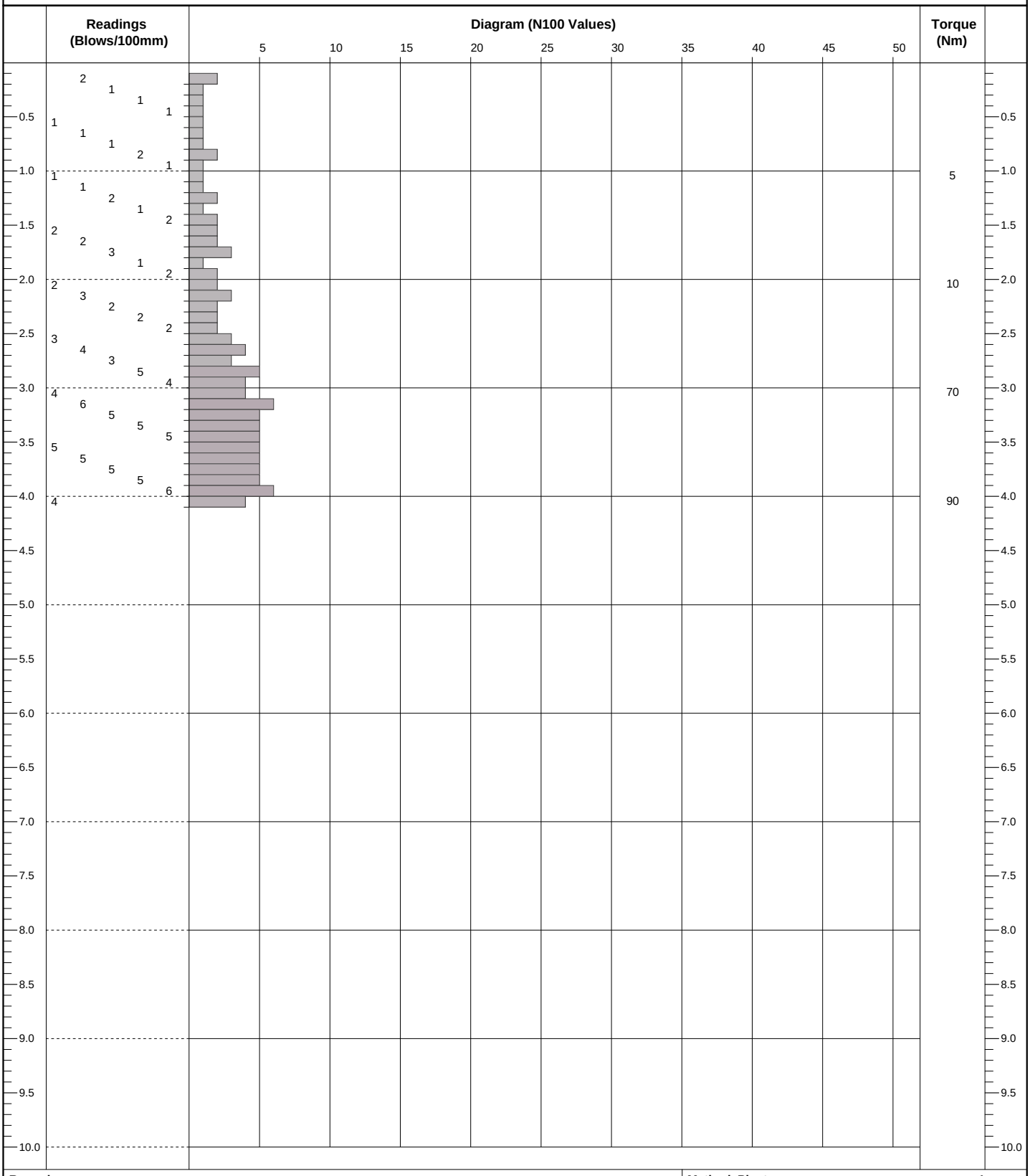
DP106

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

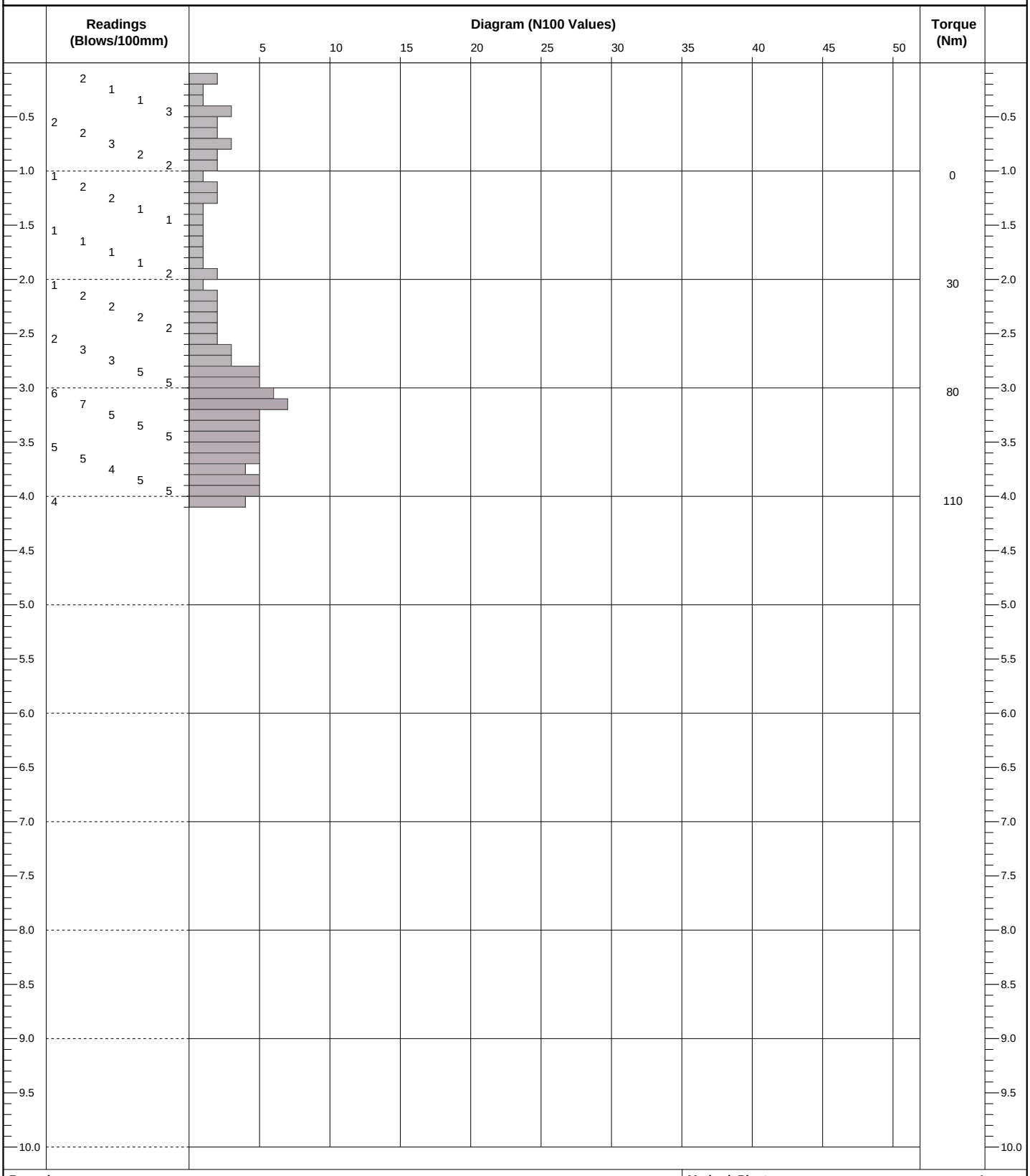
DP107

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

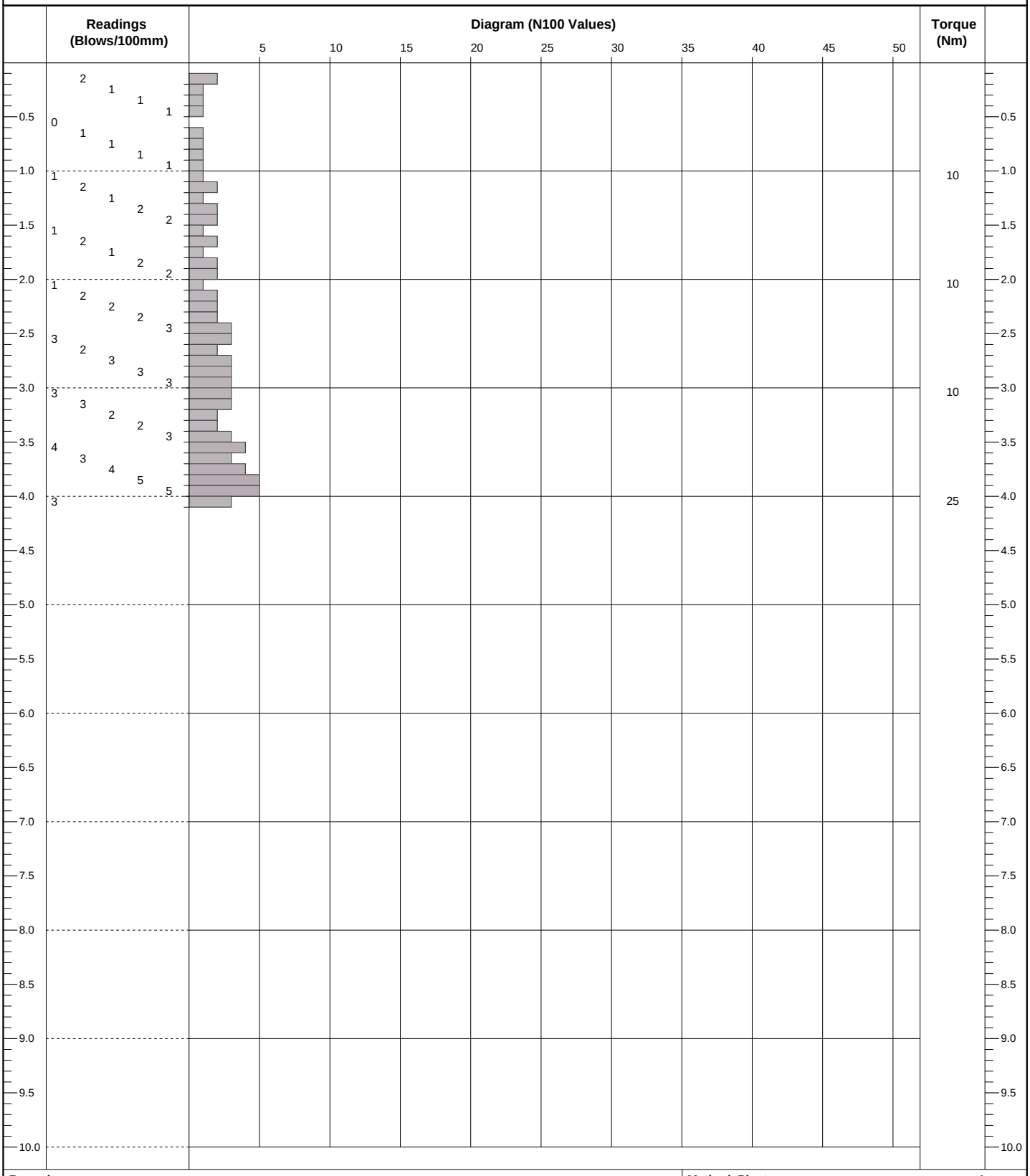
DP108

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

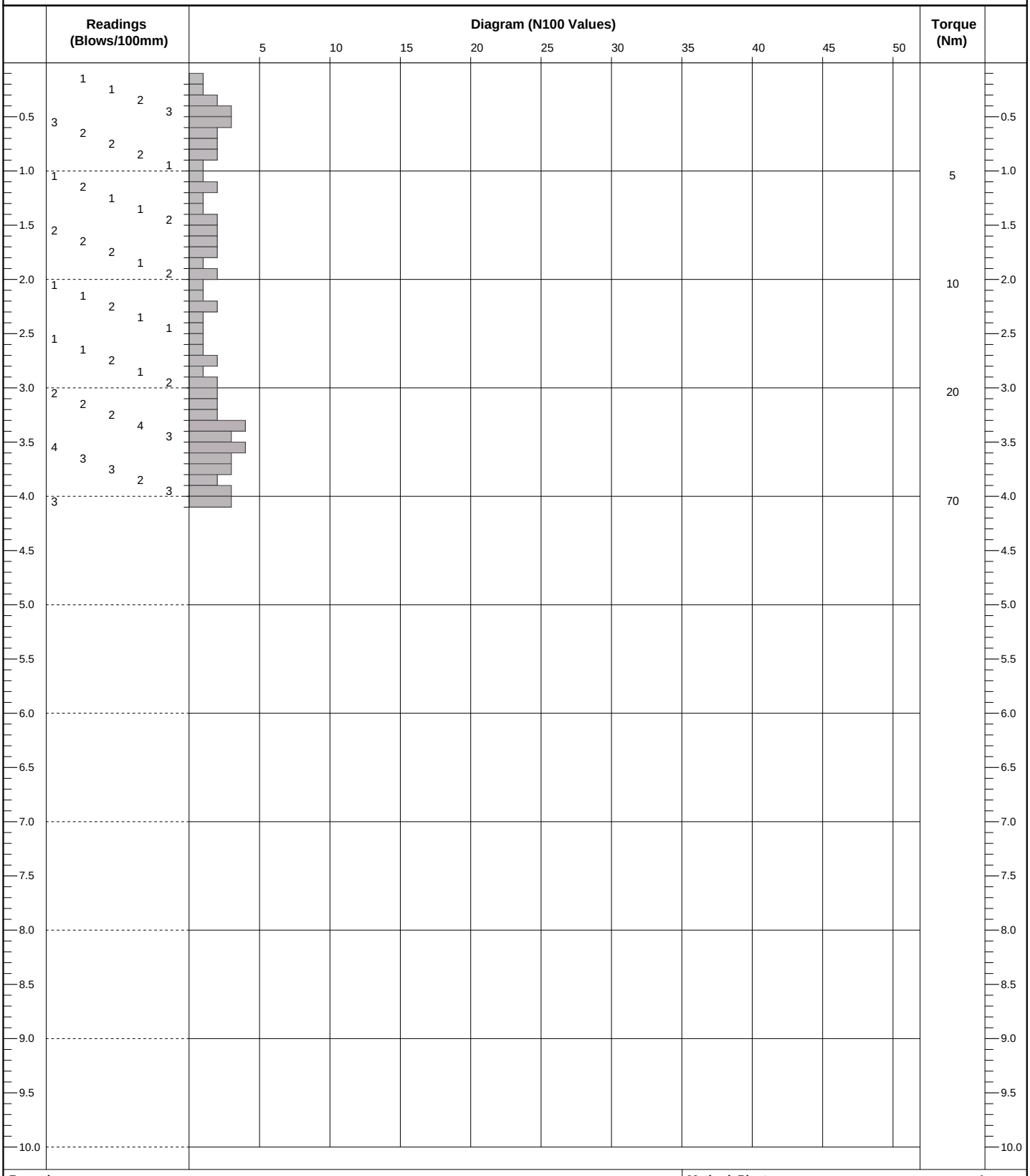
DP109

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

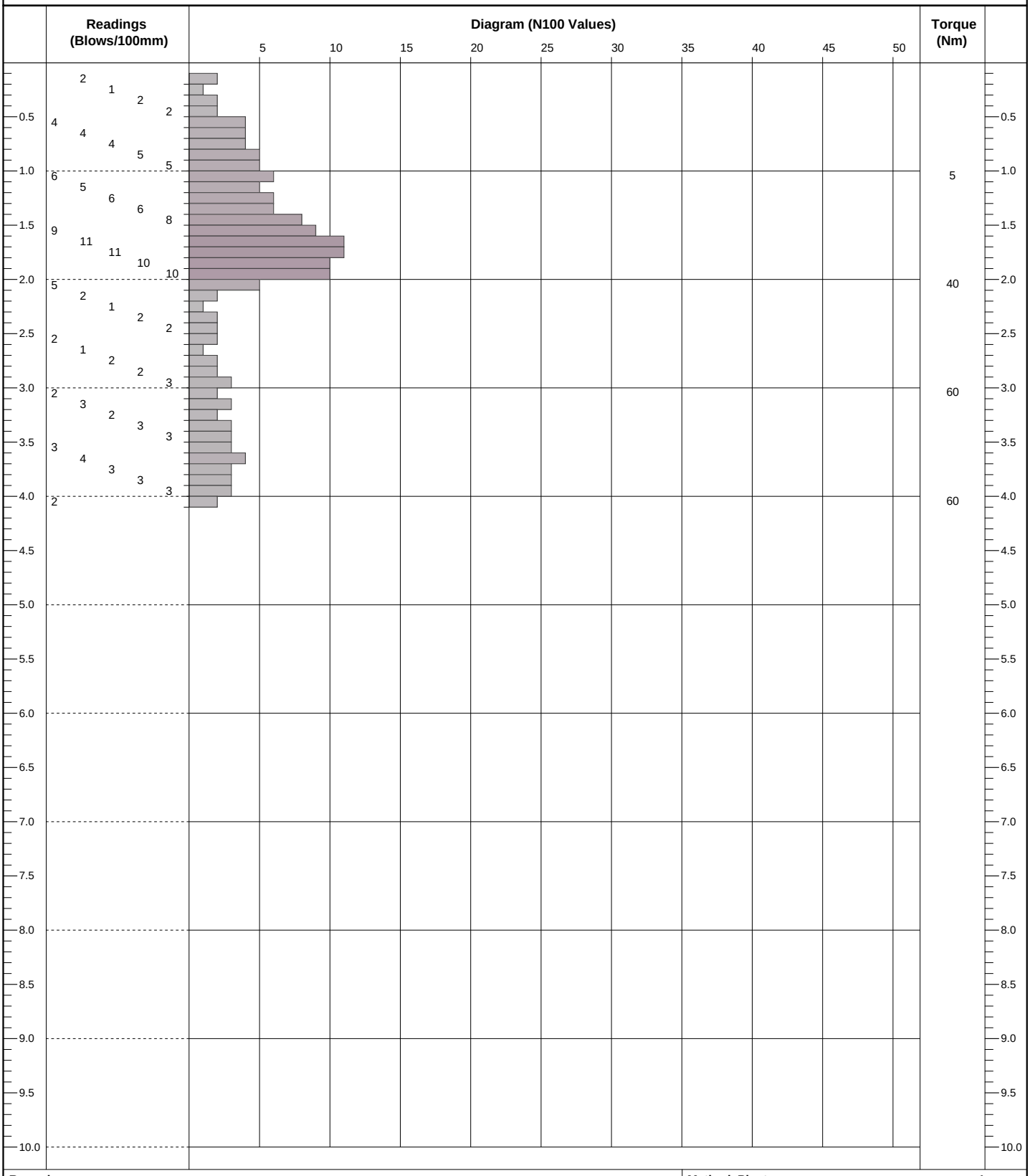
DP110

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

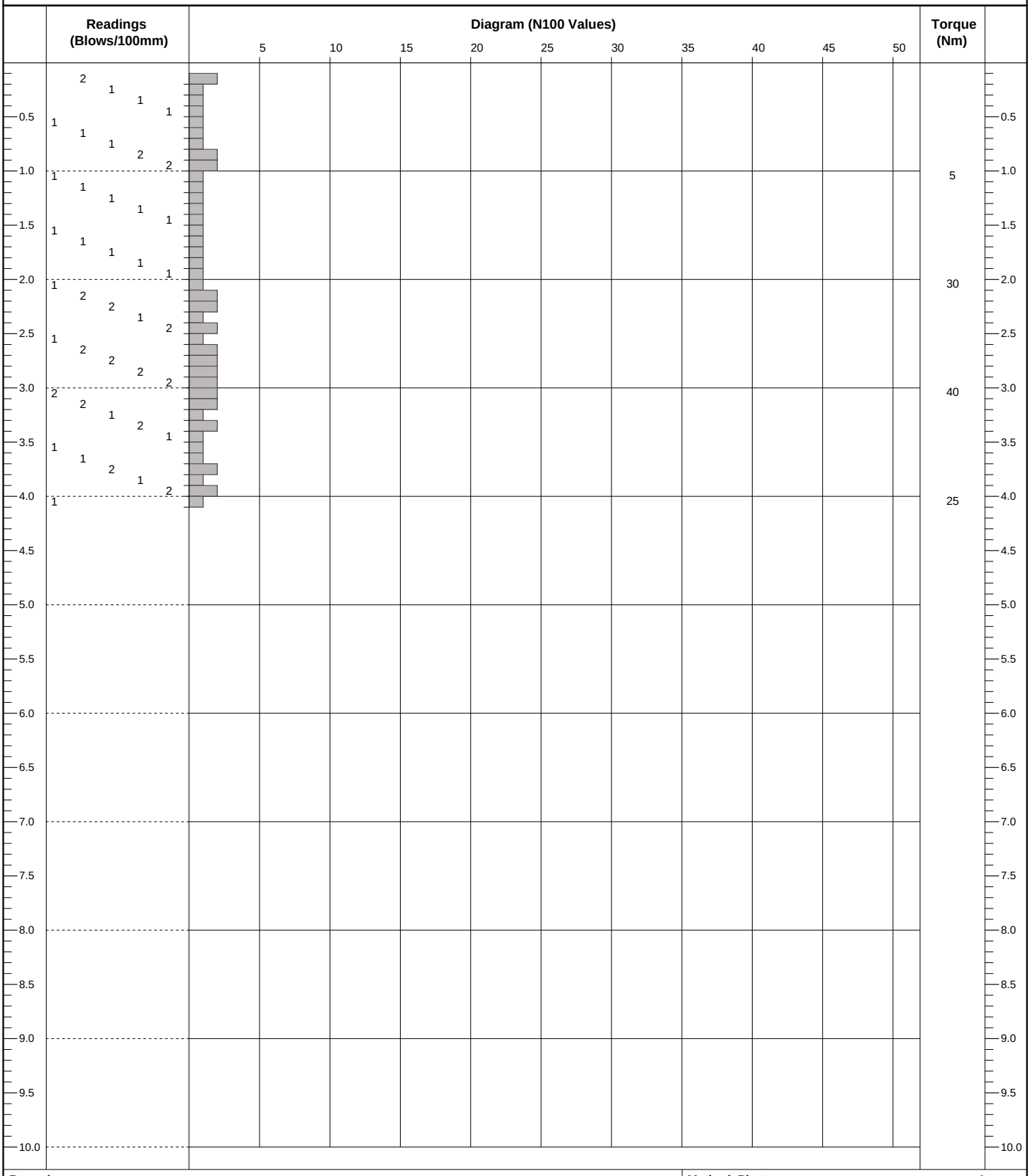
DP111

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

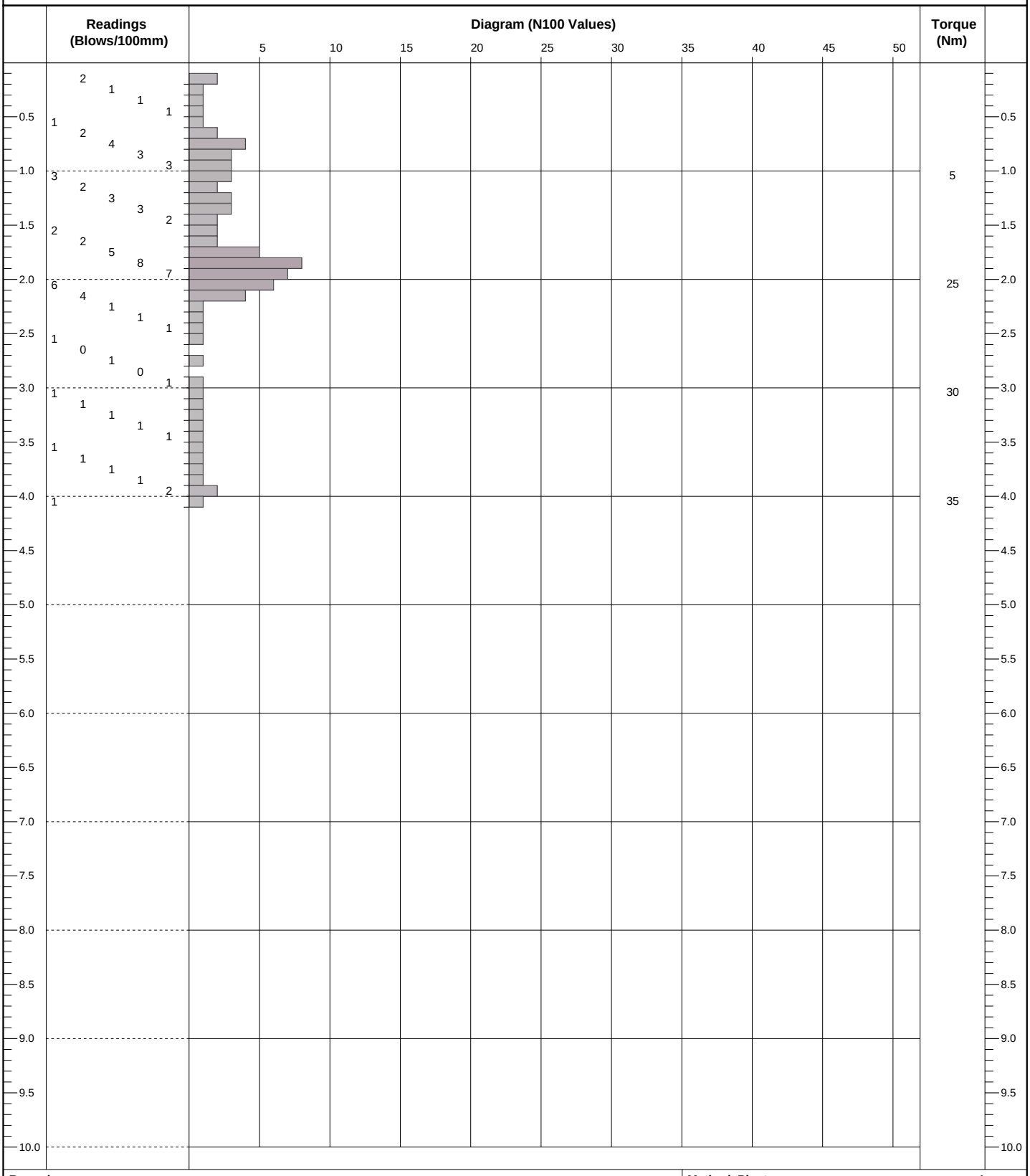
DP112

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

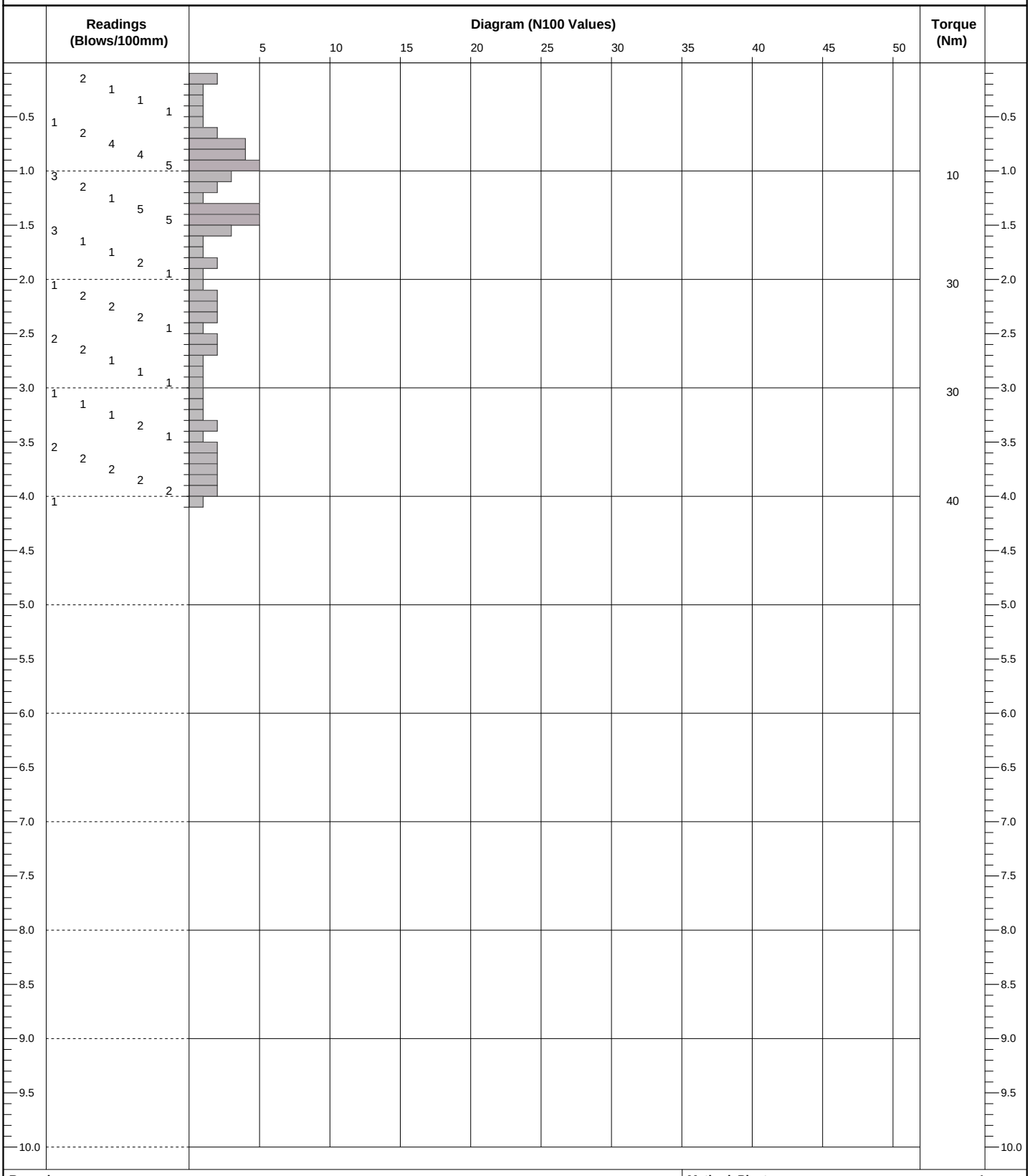
DP113

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

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Dynamic Probe

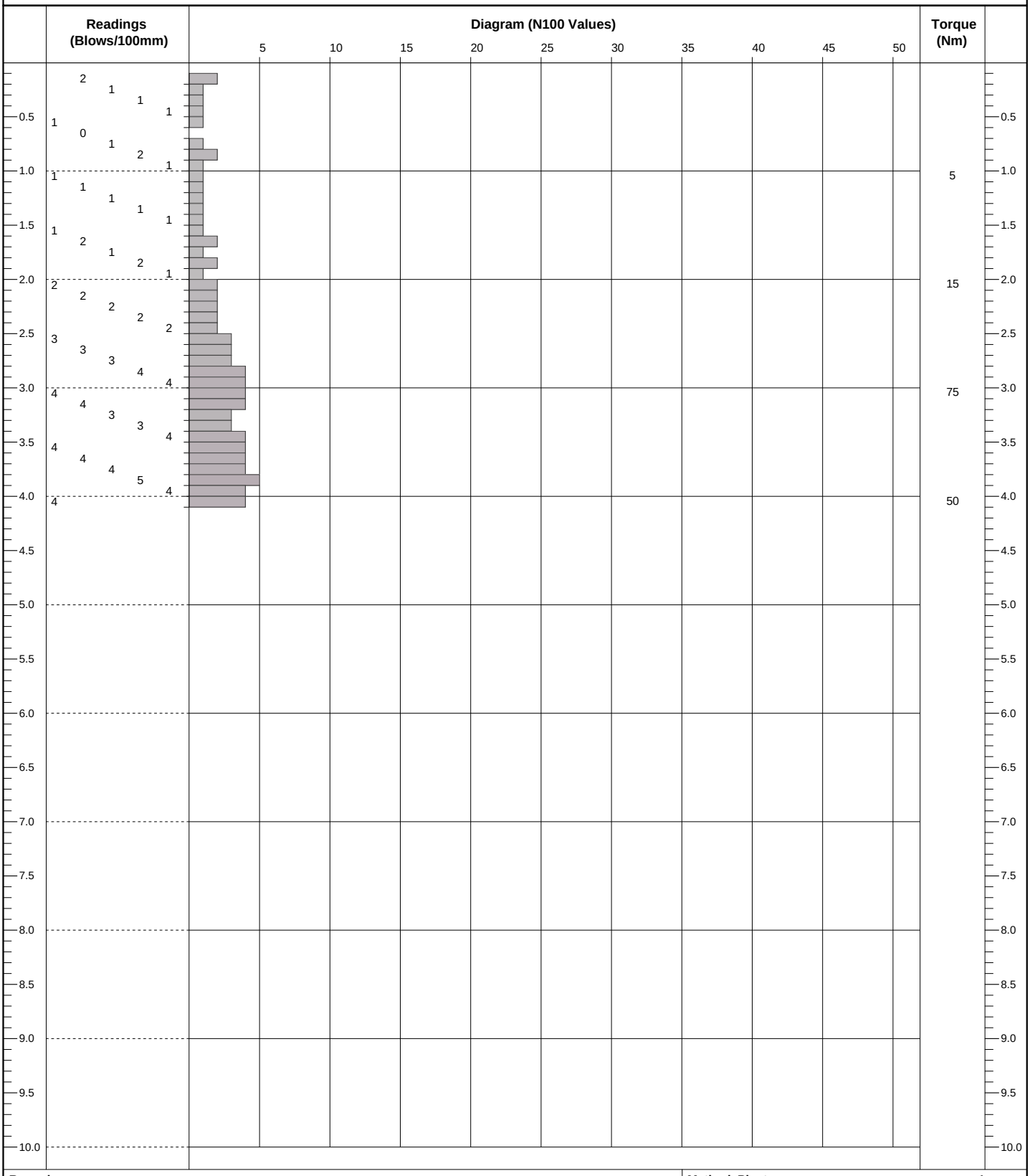
DP114

Sheet 1 of 1

Probe Type	Easting	Northing	Ground Level (m)	Scale
DPSH-B				1:50

Project Name	Project No.	Start Date	End Date
	22085		

Client	Consultant	Contractor
	AS	



Remarks

Method, Plant

Logger

Hammer Weight (kg)	65.5
Hammer Drop (mm)	760
Cone Diameter (mm)	50
Cone Angle	90
Rod Diameter (mm)	35
Damper	

Appendix C Geotechnical In-Situ and Laboratory Testing

Appendix C.1 Classification

Classification based on SPT "N" values:
The inferred undrained strength of the cohesive soils was based on the SPT "N" blow counts, derived from the relationship suggested by Stroud (1974) and classified using Table C.1.1. (Ref: Stroud, M. A. 1974, "The Standard Penetration Test – its application and interpretation", Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.).

Table C.1.1 SPT "N" Blow Count Cohesive Classification

Classification	Undrained Cohesive Strength C_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

Note(s): (Ref: BS EN ISO 14688-2:2004+A1:2013 Clause 5.3.)

The relative density of granular soils was classified based of the relationship given in Table C.1.2.

The *UK National Annex to Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing, NA 3.7 SPT test, BS EN 1997-2:2007, Annex F* states "Relative density descriptions on borehole records should also be based on uncorrected SPT N values, unless significantly disturbed, using the density classification in BS 5930:2015, Table 7.

Table C.1.2 SPT "N" Blow Count Granular Classification

Classification	SPT "N" blow count (blows/300mm)
Very loose	0 to 4
Loose	4 to 10
Medium dense	10 to 30
Dense	30 to 50
Very dense	Greater than 50

Note(s): (Ref: The Standard Penetration Test (SPT): Methods and Use, CIRIA Report 143, 1995)

Classification of DCP results to CBR:

The DCP consists of a cone fixed to the bottom of a 575mm vertical rod. An 8kg weight is repeatedly lifted and dropped onto an anvil at the mid-height of the rod to deliver a 'blow'. A vertical scale alongside the rod is used to measure the depth of penetration of the cone. These measurements are then converted to CBR values using the following equation derived from the DTP Interim Advice Note 73/06 – Design Guidance for Road Pavement Foundations:

$$Log_{10}(CBR) = 2.48 - 1.057 \times Log_{10}(mm/blow)$$

Appendix C.2 Interpretation

Table C.2.1 Interpretation of SPT Tests

BH	Strata	SPT N60 Blow Counts	Inferred Cohesive Strength
BH1	LC 0.30 – 25.00[1] CLAY	15-64	Medium to Extremely High (Cu = 75->300kPa)
BH2	LC 0.40 – 30.00[1] CLAY	15-64	Medium to Extremely High (Cu = 75->300kPa)
BH3	LC 0.30 – 30.00[1] CLAY	7-64	High to Extremely High (Cu = 35->300kPa)
BH4	WHI 0.40 – 1.90 SAND	27	Medium Dense
	LC 1.90 – 21.00[1] CLAY	10-64	Medium to Extremely High (Cu = 50->300kPa)

Note(s): [1] Base of Borehole

Table C.2.2 Interpretation of DPSH Blow Counts

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP1	LCF (granular) 0.20 – 1.10 SAND	4 - 16	Very loose to Medium dense
	LCF[1] (cohesive) 1.10 – 5.00 CLAY	<4 - 129	Extremely low to Extremely High[2] (C_u = <10 – >300kPa)
DP2	LCF 0.25 – 5.00 CLAY	<4 - 32	Extremely low to Very High (C_u = <10 – 160kPa)
DP3	LCF 0.30 – 5.00 CLAY	<4 -24	Extremely low to High (C_u = <10 – 120kPa)
DP4	LCF 0.30 – 5.00 CLAY	<4 - 28	Extremely low to High (C_u = <10 – 140kPa)
DP5	LCF 0.30 – 3.20 CLAY	<4 - 19	Extremely low to High (C_u = <10 – 95kPa)
	LCF 3.20 – 3.45 GRAVEL	19 - 23	Medium Dense
	LCF 3.45 – 5.00 CLAY	15 - 27	High (C_u = 75 – 135kPa)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP6	LCF 0.30 – 5.00 CLAY	<2 - 34	Extremely low to Very High (C_u = <10 – 170kPa)
DP7	LCF 0.30 – 5.00 CLAY	<4 - 15	Extremely low to Medium (C_u = <10 – 75kPa)
DP8	LCF 0.30 – 5.00 CLAY	<4 - 27	Extremely low to High (C_u = <10 – 135kPa)
DP101	LCF 0.30 – 4.00 CLAY	4 - 21	Low to High (C_u = 20 – 105kPa)
DP102	LCF 0.30 – 4.00 CLAY	4 - 21	Low to High (C_u = 20 – 105kPa)
DP103	LCF 0.30 – 4.00 CLAY	4 - 25	Low to High (C_u = 20 – 125kPa)
DP104	LCF 0.30 – 4.00 CLAY	<4 - 30	Extremely to High (C_u = <10 – 150kPa)
DP105	LCF 0.30 – 4.00 CLAY	4 - 25	Low to High (C_u = 20 – 125kPa)
DP106	LCF 0.30 – 4.00 CLAY	4 - 25	Low to High (C_u = 20 – 125kPa)
DP107	LCF 0.30 – 4.00 CLAY	4 - 30	Low to High (C_u = 20 – 150kPa)
DP108	LCF 0.30 – 4.00 CLAY	<4 - 21	Extremely to High (C_u = <10 – 105kPa)
DP109	LCF 0.30 – 4.00 CLAY	4 - 17	Low to High (C_u = 20 – 85kPa)
DP110	WHI 0.30 – 2.00 SAND	8 - 46	Loose to dense
	LCF 2.00 – 4.00 CLAY	4 - 17	Low to High (C_u = 20 – 85kPa)
DP111	LCF 0.30 – 4.00 CLAY	4 - 8	Low to Medium (C_u = 20 – 40kPa)
DP112	WHI 0.30 – 2.10 SAND	8 - 34	Loose to dense
	LCF 2.10 – 4.00 CLAY	<4 - 30	Extremely low to High (C_u = <10 – 150kPa)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP113	WHI 0.30 – 1.60 SAND	4 - 21	Very loose to medium dense
	LCF 1.60 – 4.00 CLAY	4 - 8	Low to Medium (C_u = 20 – 40kPa)
DP114	LCF 0.30 – 4.00 CLAY	<4 - 21	Extremely low to High (C_u = <10 – 105kPa)

Note(s): [1] Ground conditions inferred past the base of windowless sampler boreholes. [2] Possible claystone band

Table C.2.3 Interpretation of QUU Tests

Location	Stratum	Sample Depth (m bgl)	Moisture Content (%)	Soil Strength	Shear Strength (kPa)
BH1	LCF	6.50	22	High	86
BH2	LCF	9.50	20	High	119
BH3	LCF	11.00	20	High	99
BH4	LCF	15.50	23	Very high	203

Table C.2.4 Interpretation of Atterberg Limit Tests

Stratum	M/C (%)	PI (%)	>425µm (%)	Mod PI (%)	Class	VCP	
						BRE	NHBC
LCF	20.6-50.4	27-50	100	27-50	CI-CH	Medium to High	Medium to High

Note(s): BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results). VCP=Volume Change Potential
NHBC Volume Change Potential refers to NHBC Standards Chapter 4.2
Soils Classification based on British Soil Classification System
The Atterberg Limit Tests were undertaken in accordance with BS 1377: Part 2:1990 Clauses 3.2, 4.3 and 5th

Table C.2.5 Interpretation of PSD Tests

Location	Depth (m bgl)	Soil Description	VCP		>63µm Sieve (%)
			BRE	NHBC	
WS1	0.80	Brown slightly silty/clayey fine to coarse SAND	No	No	6

Note(s): (The Particle Size Distribution Tests were undertaken in accordance with BS 1377: Part 2: 1990 Clause 9).
VCP=Volume Change Potential

Appendix C.3 Geotechnical In-Situ and Laboratory Results

Laboratory Report

Contract Number: 78459

Client Ref: **21876**
Client PO: **21876/AS**

Date Received: **29-04-2025**
Date Completed: **13-05-2025**
Report Date: **13-05-2025**

Client: **Soils Limited**

This report has been checked and approved by:

Contract Title: **Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ**
For the attention of: **Alex Stratford**

Richard John
Quality/Technical Manager

Description	Qty
Determination of water content BS EN ISO 17892-1:2014 - @ Non Accredited Test	7
1 point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	7
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	4

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	78459	
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	
Date Tested	09/05/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH1		D	4.00	-		Brown silty CLAY
BH1		D	9.95	-		Brown silty CLAY
BH2		D	2.00	-		Brown silty CLAY
BH2		D	6.00	-		Brown silty CLAY
BH3		D	5.00	-		Brown silty CLAY
BH3		D	10.50	-		Brown silty CLAY
BH4		D	7.50	-		Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
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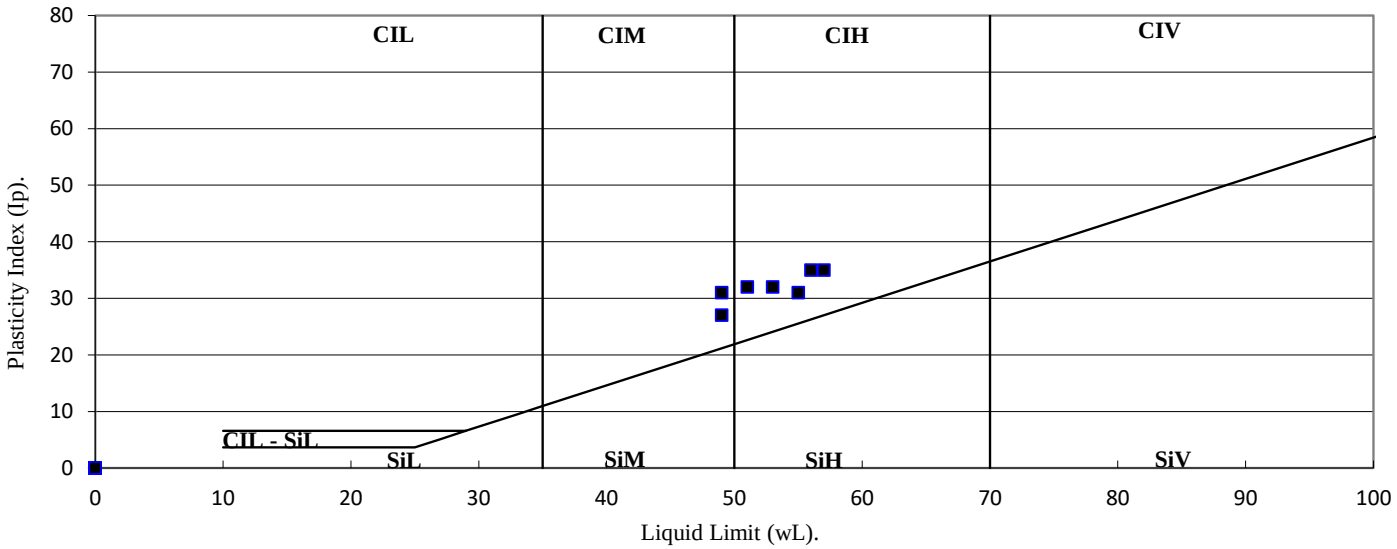
Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	78459	
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	
Date Tested	09/05/2025	
Test Comments	80g/30° Fall cone used	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Factor Applied	Remarks
BH1		D	4.00	-		21.2	49	22	27	100	0.997	CI Intermediate Plasticity
BH1		D	9.95	-		23.0	56	21	35	100	0.991	CH High Plasticity
BH2		D	2.00	-		25.6	55	24	31	100	1.010	CH High Plasticity
BH2		D	6.00	-		20.6	57	22	35	100	0.991	CH High Plasticity
BH3		D	5.00	-		21.7	51	19	32	100	0.998	CH High Plasticity
BH3		D	10.50	-		20.9	49	18	31	100	0.991	CI Intermediate Plasticity
BH4		D	7.50	-		25.3	53	21	32	100	0.988	CH High Plasticity
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SYMBOLS : NP = Non Plastic **NB: All liquid limits are 4 point and wet sieved**

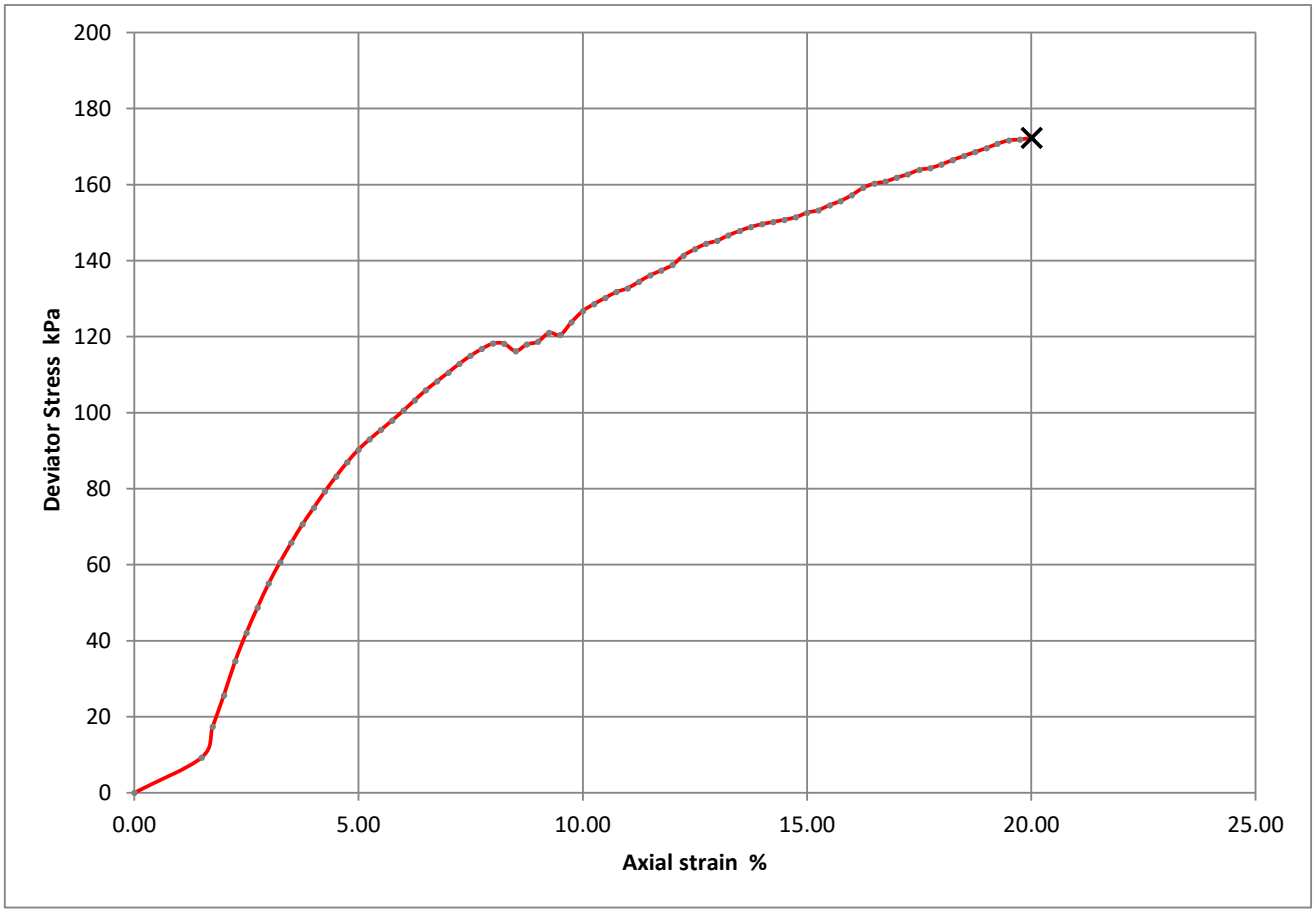
PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

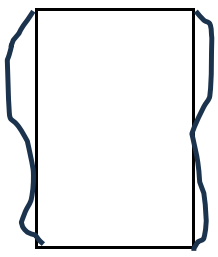
Operator
Clayton. J

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78459
		Borehole/Pit No.	BH1
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	Sample No.	
Soil Description	Brown sandy silty CLAY	Depth Top (m)	6.50
		Depth Base (m)	
Date Tested	07/05/2025	Sample Type	D
		Operator	David. E



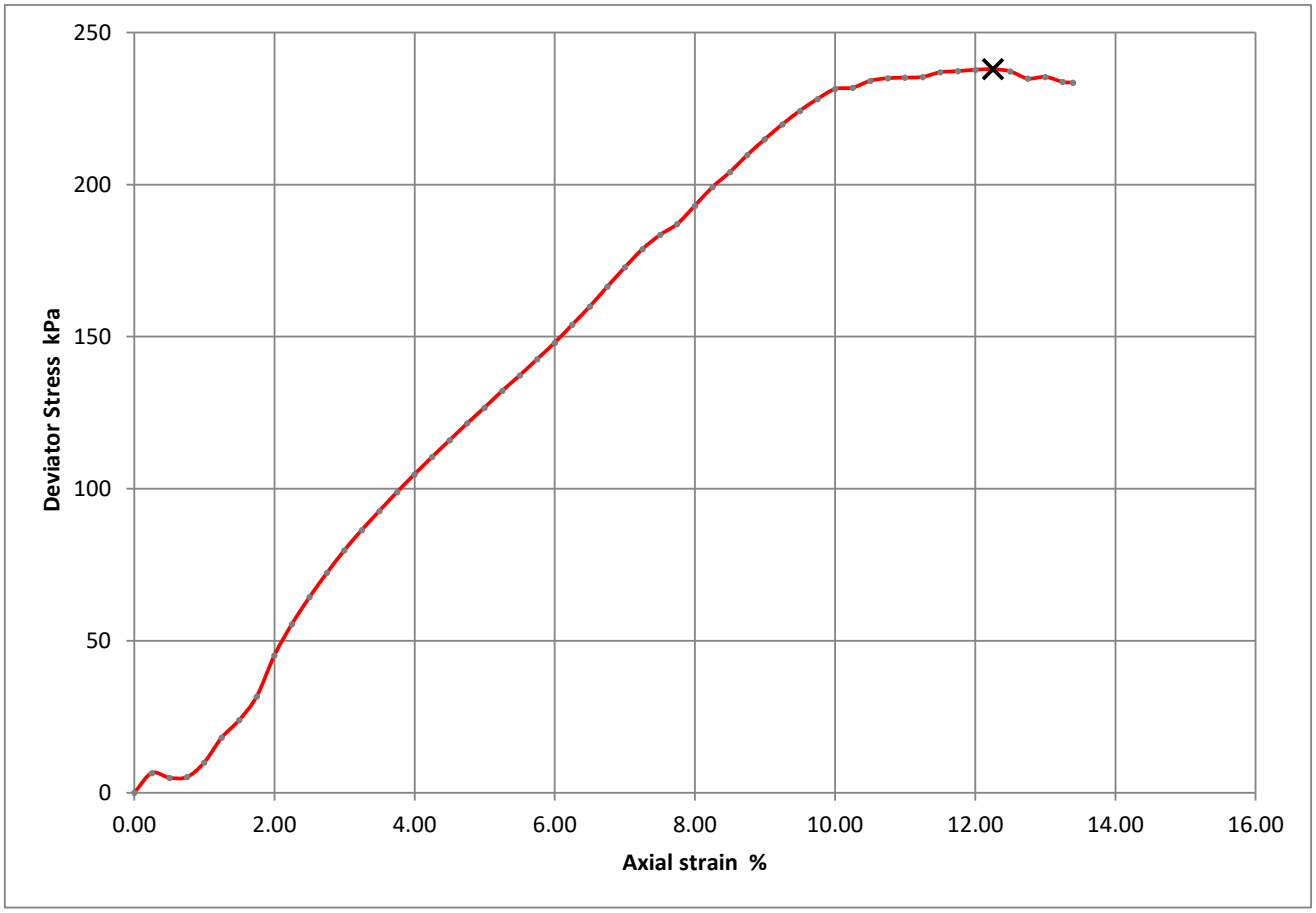
Moisture Content (%)	22
Bulk Density (Mg/m^3)	2.02
Dry Density (Mg/m^3)	1.66
Specimen Length (mm)	180.4
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	120
Deviator Stress (kPa)	172
Undrained Shear Strength (kPa)	86
Failure Strain (%)	20
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.52

Notes.



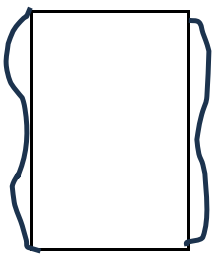
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78459
		Borehole/Pit No.	BH2
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	Sample No.	
Soil Description	Brown sandy silty CLAY	Depth Top (m)	9.50
		Depth Base (m)	
Date Tested	07/05/2025	Sample Type	D
		Operator	David. E



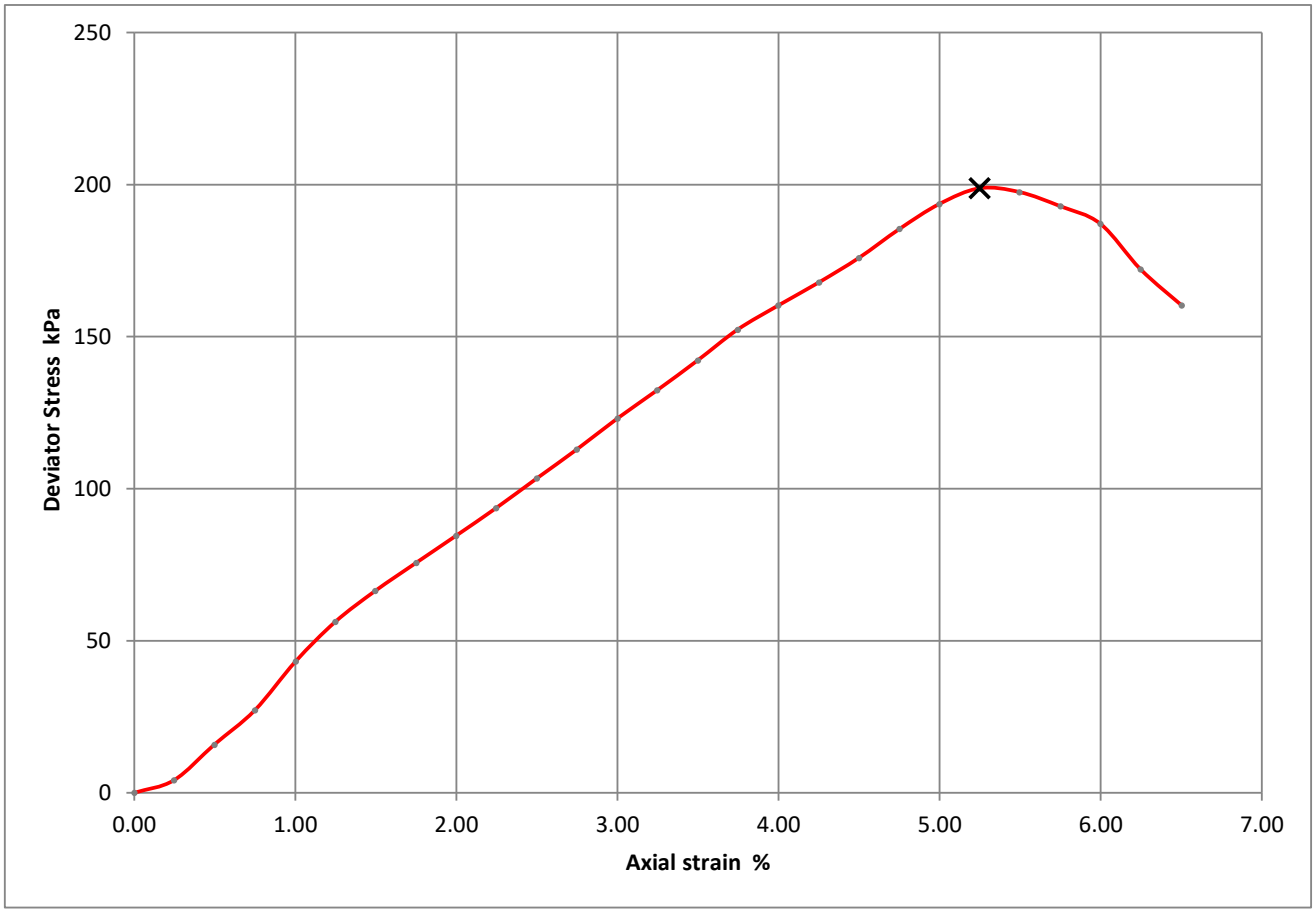
Moisture Content (%)	20
Bulk Density (Mg/m^3)	1.98
Dry Density (Mg/m^3)	1.64
Specimen Length (mm)	189.2
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	80
Deviator Stress (kPa)	238
Undrained Shear Strength (kPa)	119
Failure Strain (%)	12
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.45

Notes.



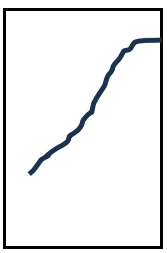
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78459
		Borehole/Pit No.	BH3
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	Sample No.	
Soil Description	Brown sandy silty CLAY	Depth Top (m)	11.00
		Depth Base (m)	
Date Tested	07/05/2025	Sample Type	D
		Operator	David. E



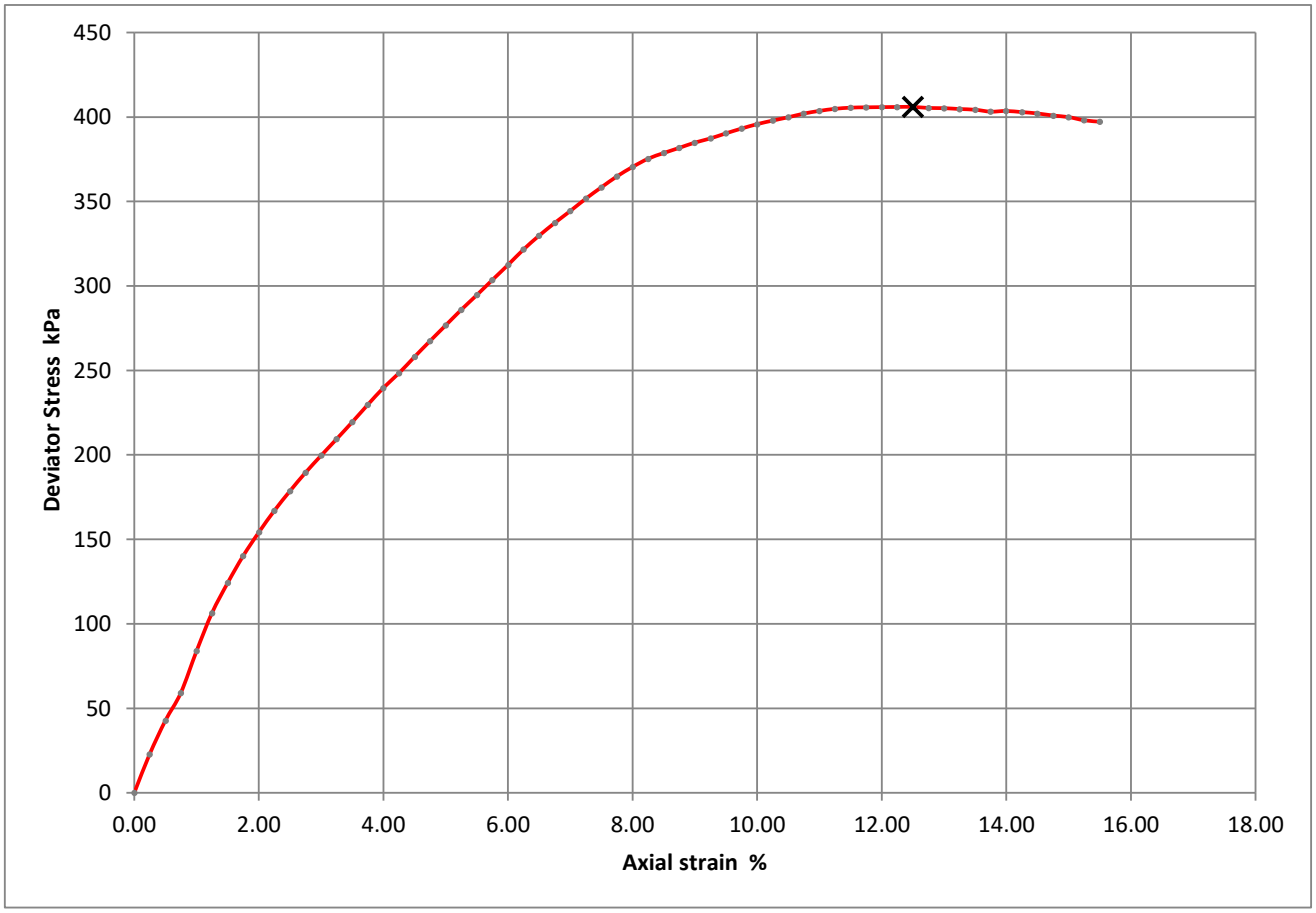
Moisture Content (%)	20
Bulk Density (Mg/m^3)	1.92
Dry Density (Mg/m^3)	1.59
Specimen Length (mm)	208.4
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	160
Deviator Stress (kPa)	199
Undrained Shear Strength (kPa)	99
Failure Strain (%)	5
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



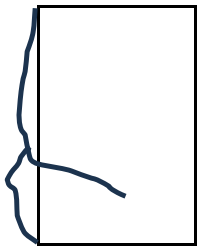
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78459
		Borehole/Pit No.	BH4
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	Sample No.	
Soil Description	Brown sandy silty CLAY	Depth Top (m)	15.50
		Depth Base (m)	
Date Tested	07/05/2025	Sample Type	D
		Operator	David. E



Moisture Content (%)	23
Bulk Density (Mg/m^3)	1.99
Dry Density (Mg/m^3)	1.63
Specimen Length (mm)	208.1
Specimen Diameter (mm)	104.2
Cell Pressure (kPa)	240
Deviator Stress (kPa)	406
Undrained Shear Strength (kPa)	203
Failure Strain (%)	13
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



Failure Sketch.

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 78501

Client Ref: **21876**
Client PO: **21876/AS**

Date Received: **30-04-2025**
Date Completed: **07-05-2025**
Report Date: **07-05-2025**

Client: **Soils Limited**

This report has been checked and approved by:

Contract Title: **Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ**
For the attention of: **Alex Stratford**

Shaun Jones
Laboratory manager

Description	Qty
Determination of water content BS EN ISO 17892-1:2014 - @ Non Accredited Test	7
1 point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	7
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	78501	
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	
Date Tested	03/05/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
WS2		D	1.50	-		Brown sandy silty CLAY
WS3		D	2.00	-		Brown sandy silty CLAY
WS4		D	2.50	-		Brown silty CLAY
WS5		D	1.00	-		Brown sandy silty CLAY
WS6		D	1.50	-		Brown sandy silty CLAY
WS7		D	3.00	-		Grey/ brown sandy silty CLAY
WS8		D	0.80	-		Brown sandy silty CLAY
				-		
				-		
				-		
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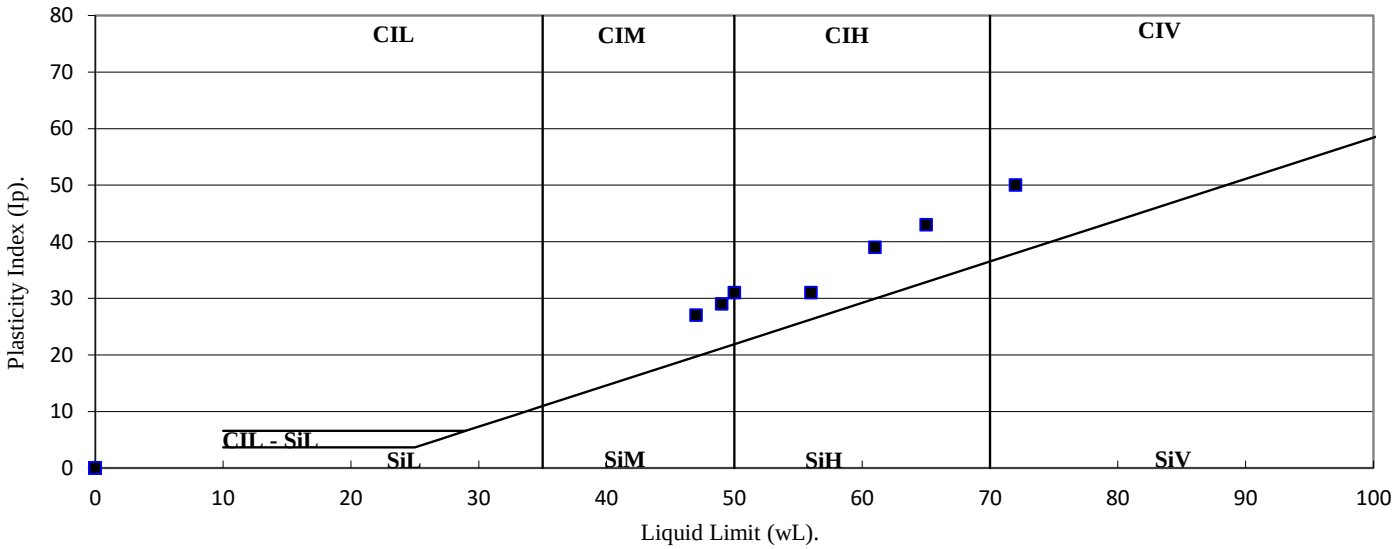
Operator
Dean

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 1 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	78501	
Project Name	Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ	
Date Tested	03/05/2025	
Test Comments	80g/30° Fall cone used	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Factor Applied	Remarks
WS2		D	1.50	-		27.5	47	20	27	100	0.995	CI Intermediate Plasticity
WS3		D	2.00	-		26.7	61	22	39	100	0.992	CH High Plasticity
WS4		D	2.50	-		29.9	72	22	50	100	0.995	CV Very High Plasticity
WS5		D	1.00	-		50.4	50	19	31	100	0.992	CI/H Inter/High Plasticity
WS6		D	1.50	-		27.7	49	20	29	100	0.992	CI Intermediate Plasticity
WS7		D	3.00	-		34.2	56	25	31	100	0.992	CH High Plasticity
WS8		D	0.80	-		28.4	65	22	43	100	0.994	CH High Plasticity
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SYMBOLS : NP = Non Plastic **NB: All liquid limits are 4 point and wet sieved**

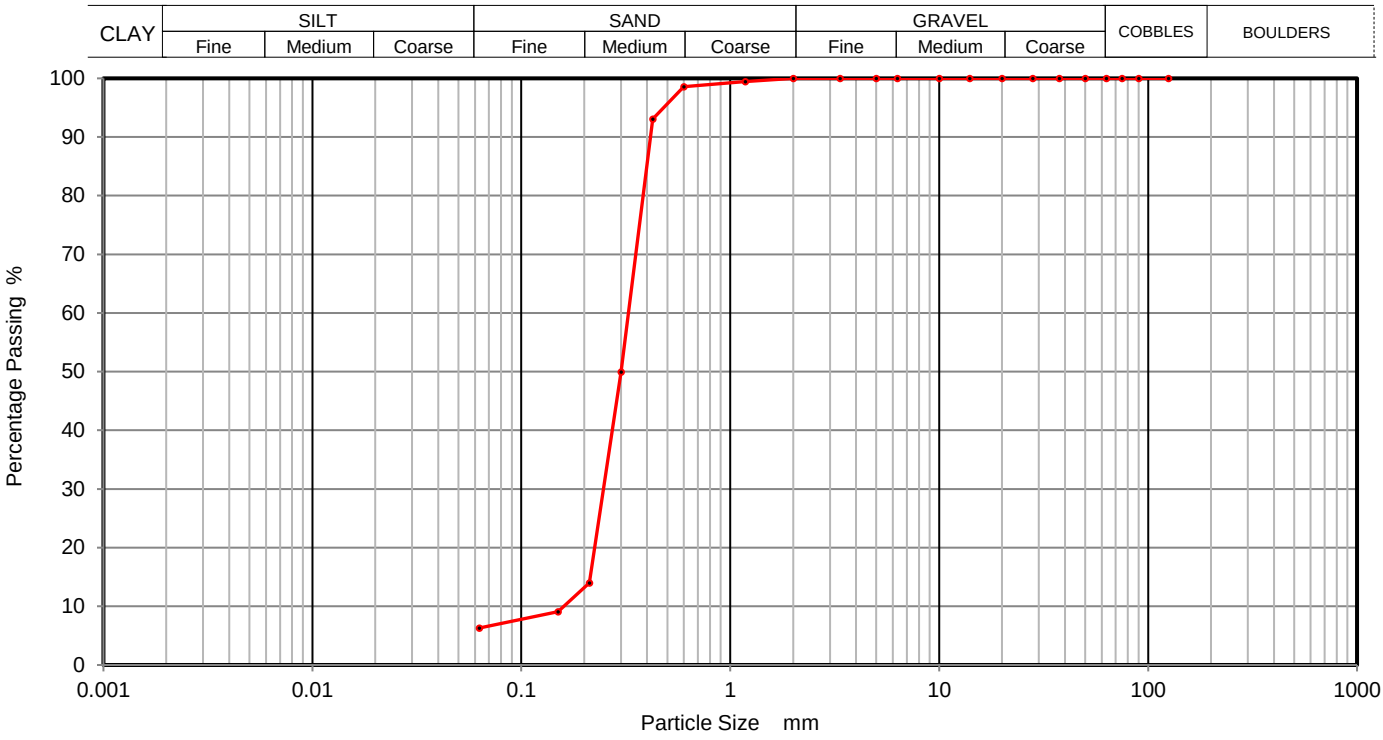
PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

Operator
Dean

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION** **BS EN ISO 17892-4:2016** **Wet Sieve, Clause 5.2**	Contract Number	**78501**
		Borehole/Pit No.	**WS1**
Project Name	**Kings Copse Avenue, Hedge End, Hampshire SO30 2SZ**	Sample No.	
Sample Description	Brown slightly silty/ clayey fine to coarse SAND	Depth Top	**0.80**
		Depth Base	
Date Tested	03/05/2025	Sample Type	**D**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.63	99		
0.425	93		
0.30	50		
0.20	14		
0.15	9		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	94
Silt and Clay	6

Remarks

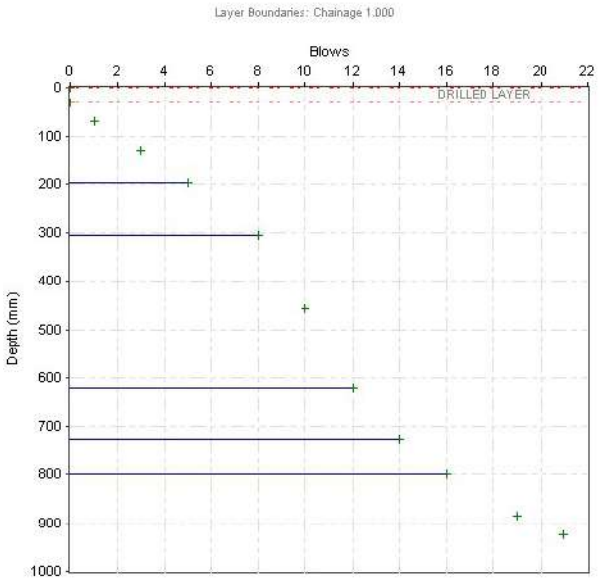
Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron. T

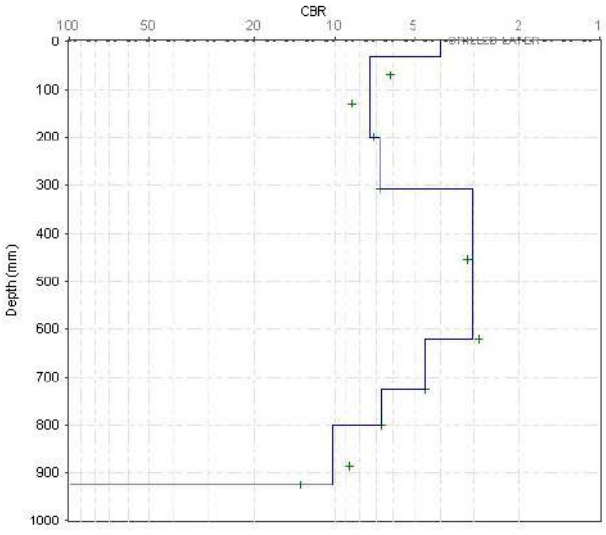
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	1.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	4	31	31	Base	0.01	0.01	0.01	0.01
3	33.40	7	167	198	Base	0.02	0.13	0.13	0.13
4	36.33	7	109	307	Base	0.02	0.08	0.08	0.08
5	78.25	3	313	620	Base	0.01	0.11	0.11	0.11
6	53.00	5	106	726	Base	0.01	0.05	0.05	0.05
7	37.00	7	74	800	Base	0.02	0.05	0.05	0.05
8	24.80	10	124	924	Base	0.03	0.13	0.13	0.13

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.58	0.58	0.58
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.58	0.58	0.58

CBR Relationship:

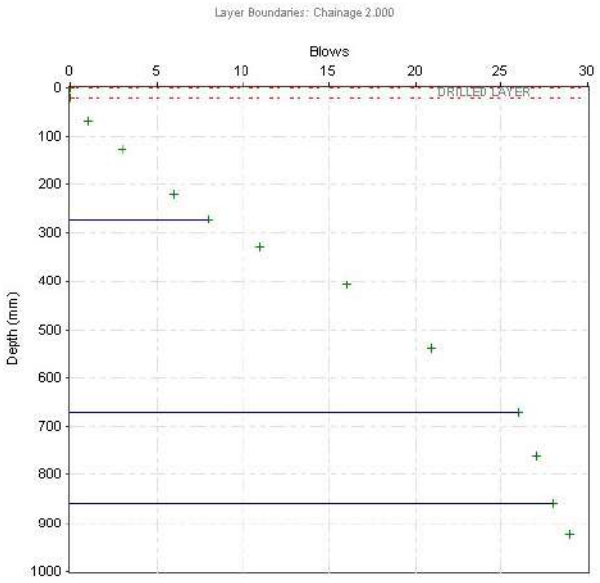
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

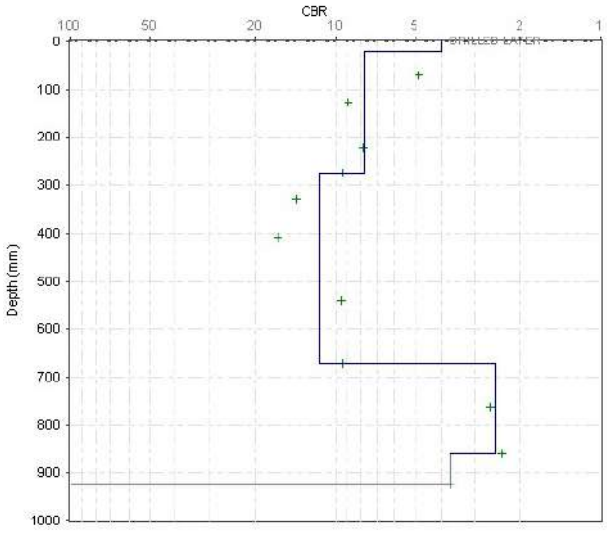
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	2.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	4	20	20	Base	0.01	0.01	0.01	0.01
3	31.75	8	254	274	Base	0.02	0.22	0.22	0.22
4	22.11	11	398	672	Base	0.03	0.48	0.48	0.48
5	94.00	2	188	860	Base	0.01	0.05	0.05	0.05
6	64.00	4	64	924	Base	0.01	0.03	0.03	0.03

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.79	0.79	0.79
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.79	0.79	0.79

CBR Relationship:

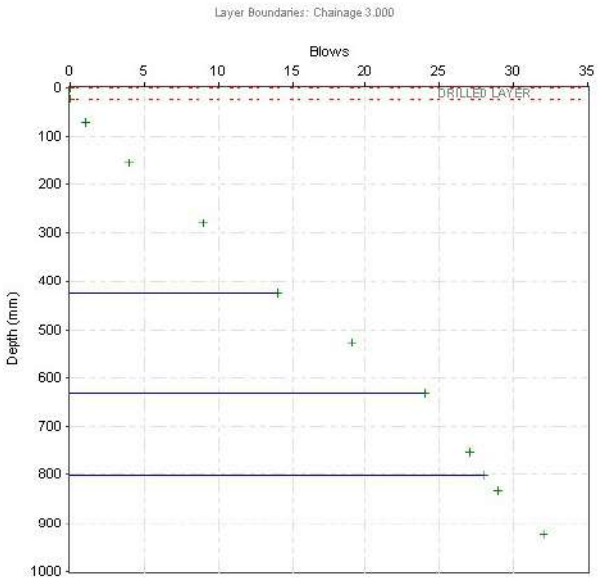
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

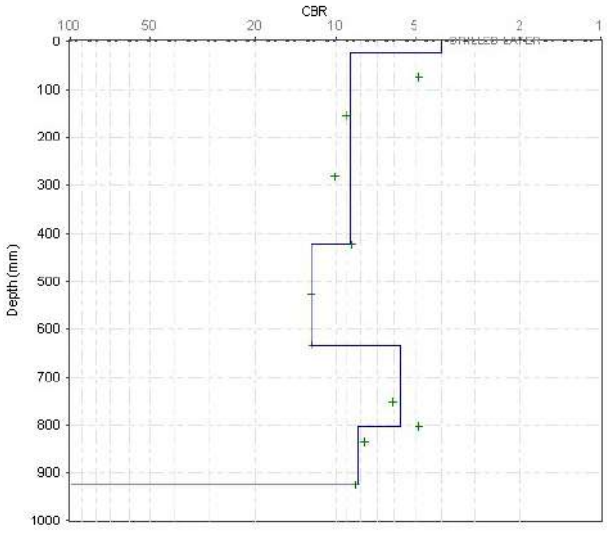
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	3.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	4	24	24	Base	0.01	0.01	0.01	0.01
3	28.64	9	401	425	Base	0.02	0.38	0.38	0.38
4	20.70	12	207	632	Base	0.03	0.27	0.27	0.27
5	42.75	6	171	803	Base	0.02	0.11	0.11	0.11
6	30.25	8	121	924	Base	0.02	0.11	0.11	0.11

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.87	0.87	0.87
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.87	0.87	0.87

CBR Relationship:

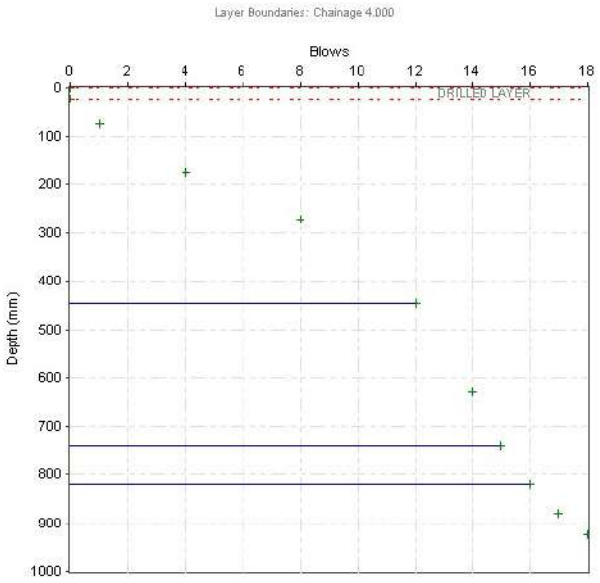
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

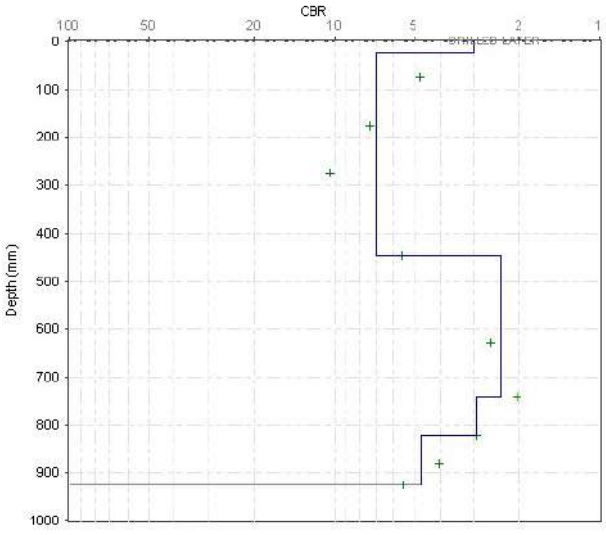
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	4.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	3	24	24	Base	0.01	0.01	0.01	0.01
3	35.25	7	423	447	Base	0.02	0.32	0.32	0.32
4	98.00	2	294	741	Base	0.01	0.08	0.08	0.08
5	80.00	3	80	821	Base	0.01	0.03	0.03	0.03
6	51.50	5	103	924	Base	0.01	0.05	0.05	0.05

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.49	0.49	0.49
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.49	0.49	0.49

CBR Relationship:

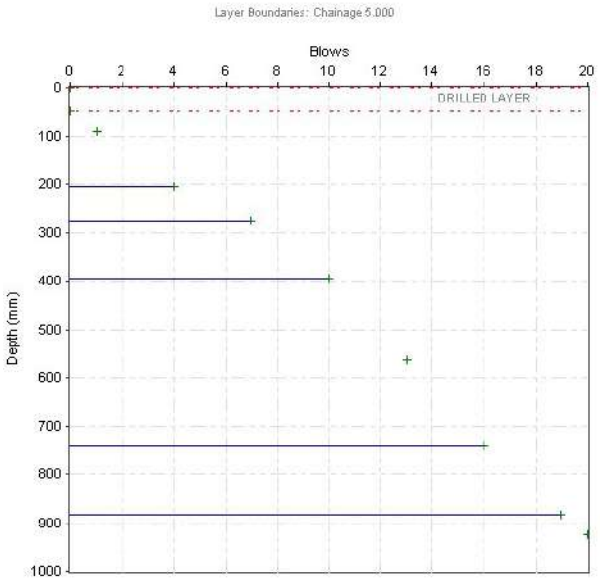
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

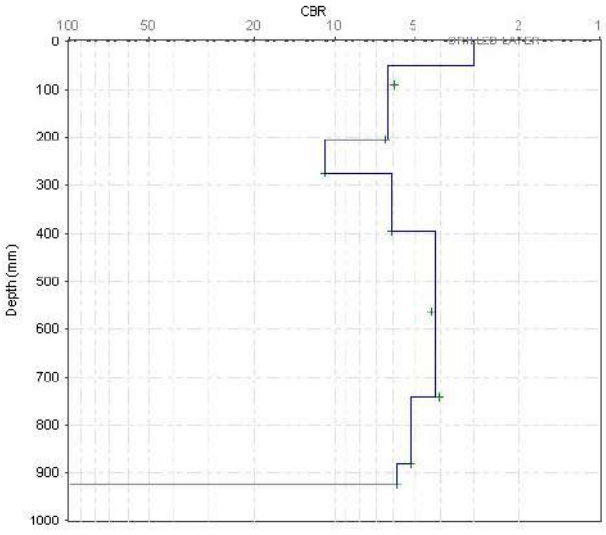
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	5.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	3	49	49	Base	0.01	0.02	0.02	0.02
3	39.00	6	156	205	Base	0.02	0.11	0.11	0.11
4	23.33	11	70	275	Base	0.03	0.08	0.08	0.08
5	40.33	6	121	396	Base	0.02	0.08	0.08	0.08
6	57.50	4	345	741	Base	0.01	0.16	0.16	0.16
7	47.00	5	141	882	Base	0.01	0.08	0.08	0.08
8	42.00	6	42	924	Base	0.02	0.03	0.03	0.03

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.56	0.56	0.56
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.56	0.56	0.56

CBR Relationship:

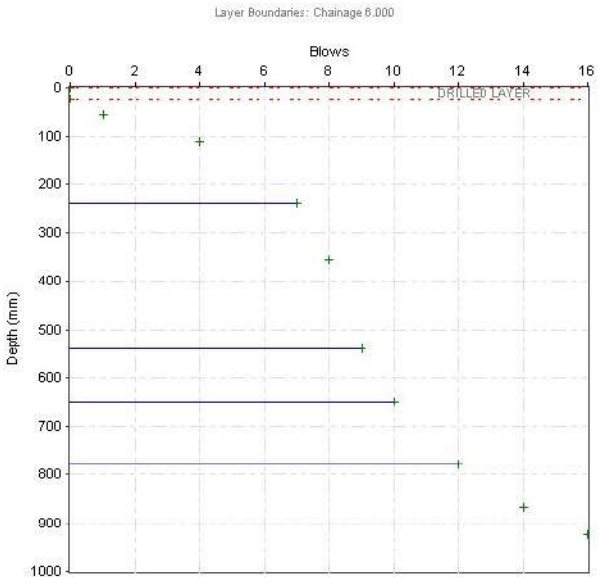
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

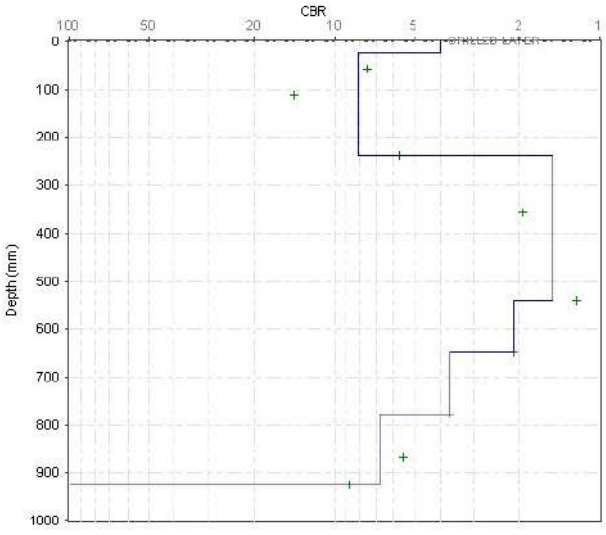
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	6.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	4	24	24	Base	0.01	0.01	0.01	0.01
3	30.71	8	215	239	Base	0.02	0.19	0.19	0.19
4	150.50	2	301	540	Base	0.00	0.05	0.05	0.05
5	109.00	2	109	649	Base	0.01	0.03	0.03	0.03
6	65.00	4	130	779	Base	0.01	0.05	0.05	0.05
7	36.25	7	145	924	Base	0.02	0.11	0.11	0.11

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.44	0.44	0.44
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.44	0.44	0.44

CBR Relationship:

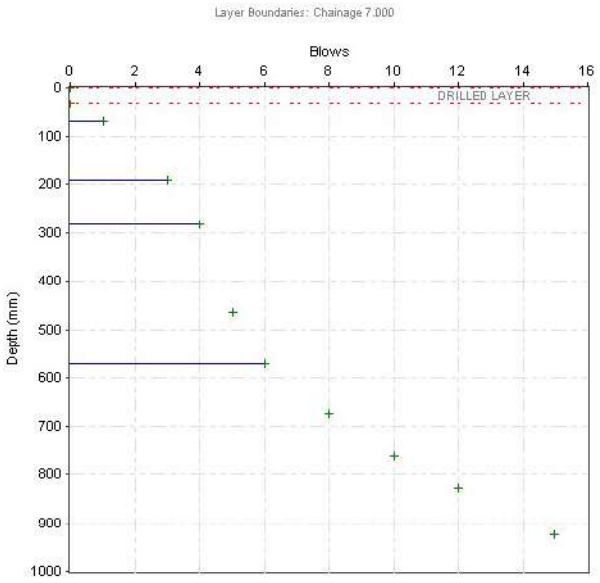
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

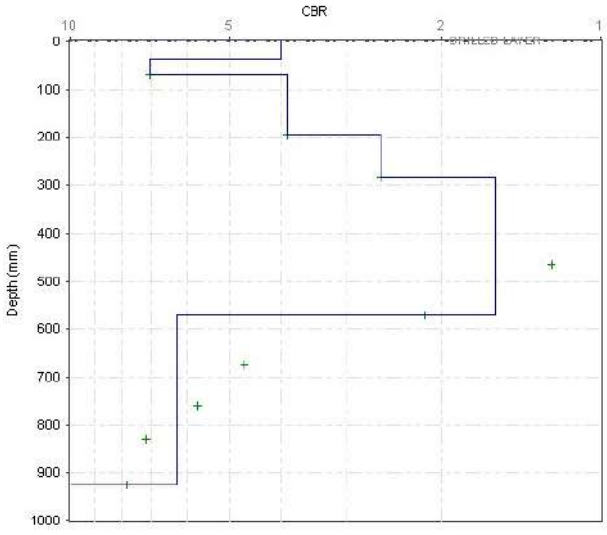
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	7.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	4	35	35	Base	0.01	0.01	0.01	0.01
3	35.00	7	35	70	Base	0.02	0.03	0.03	0.03
4	61.50	4	123	193	Base	0.01	0.05	0.05	0.05
5	90.00	3	90	283	Base	0.01	0.03	0.03	0.03
6	144.50	2	289	572	Base	0.00	0.05	0.05	0.05
7	39.11	6	352	924	Base	0.02	0.24	0.24	0.24

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.41	0.41	0.41
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.41	0.41	0.41

CBR Relationship:

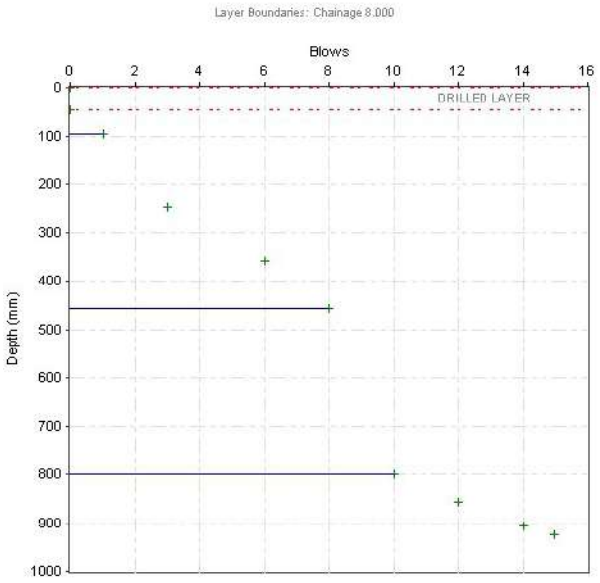
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

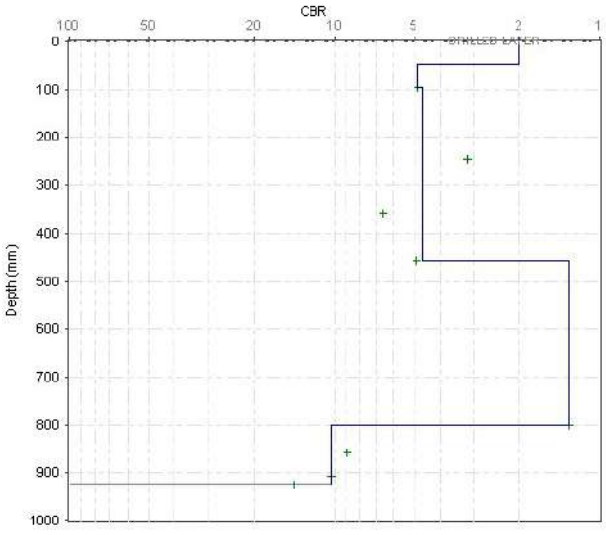
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	8.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	2	46	46	Base	0.01	0.02	0.02	0.02
3	50.00	5	50	96	Base	0.01	0.03	0.03	0.03
4	51.71	5	362	458	Base	0.01	0.19	0.19	0.19
5	171.50	1	343	801	Base	0.00	0.05	0.05	0.05
6	24.60	10	123	924	Base	0.03	0.13	0.13	0.13

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.42	0.42	0.42
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.42	0.42	0.42

CBR Relationship:

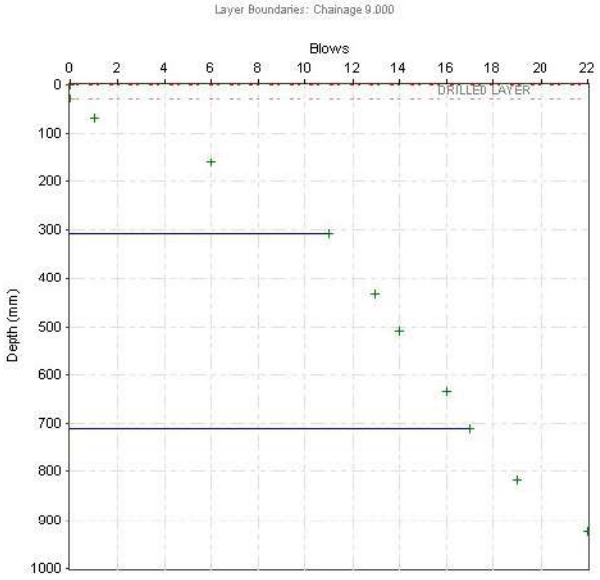
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

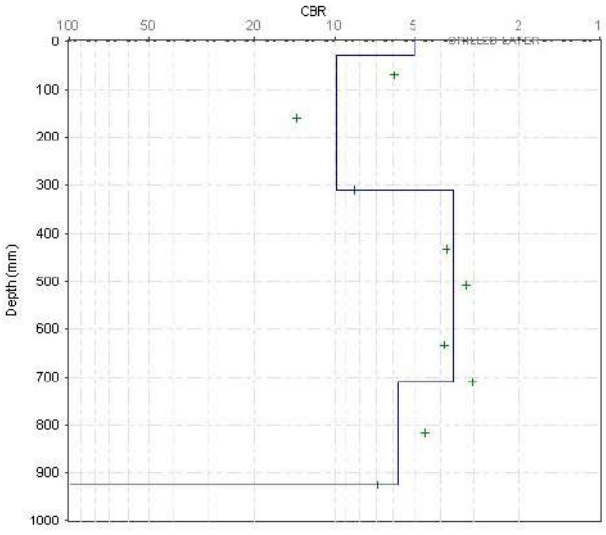
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	9.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	5	28	28	Base	0.01	0.01	0.01	0.01
3	25.55	10	281	309	Base	0.03	0.30	0.30	0.30
4	67.00	4	402	711	Base	0.01	0.16	0.16	0.16
5	42.60	6	213	924	Base	0.02	0.13	0.13	0.13

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.60	0.60	0.60
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.60	0.60	0.60

CBR Relationship:

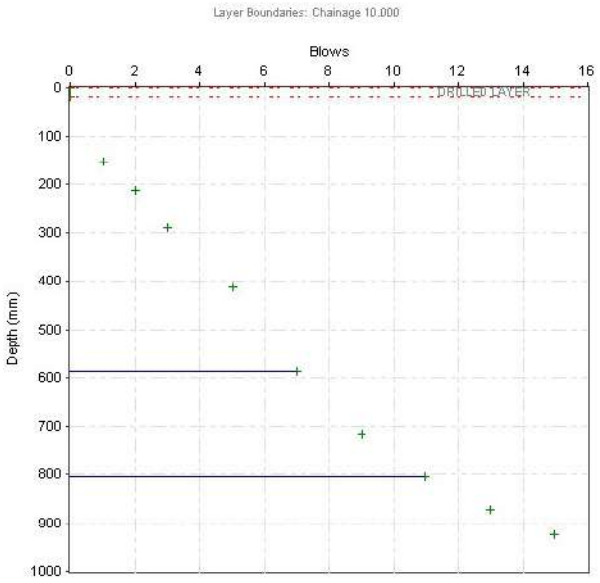
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

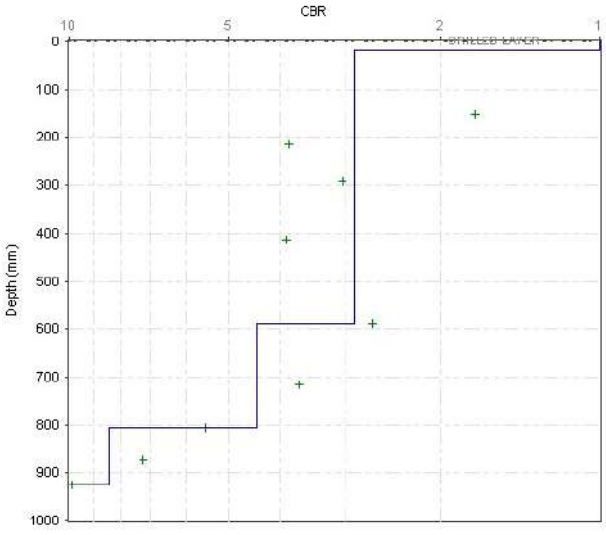
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	10.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	1	19	19	Base	0.00	0.00	0.00	0.00
3	81.29	3	569	588	Base	0.01	0.19	0.19	0.19
4	54.25	4	217	805	Base	0.01	0.11	0.11	0.11
5	29.75	8	119	924	Base	0.02	0.11	0.11	0.11

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.40	0.40	0.40
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.40	0.40	0.40

CBR Relationship:

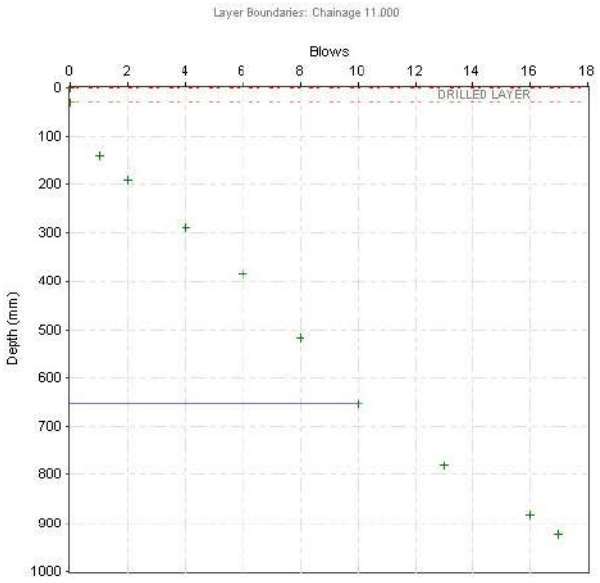
TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

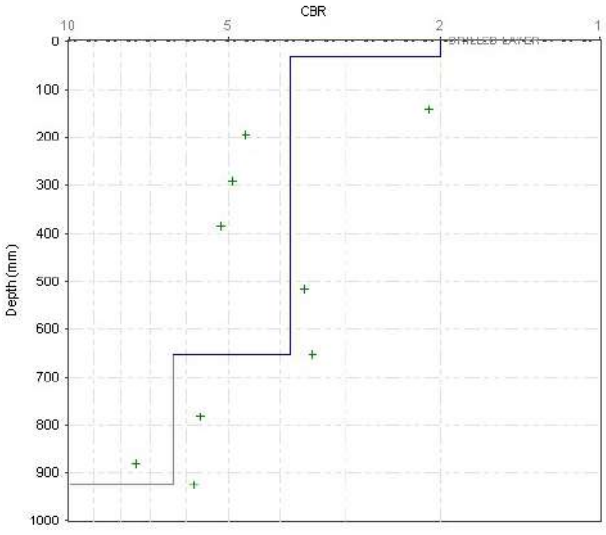
DCP Layer Strength Analysis Report

Project Name: 21876 DCP

Chainage (km):	11.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Lay-by / other	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	26	Surface Moisture:	Unknown
Test Date:	15/04/2025	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	0.00	0	0	0	Base	0.00	0.00	0.00	0.00
2	0.00	2	31	31	Base	0.01	0.01	0.01	0.01
3	62.30	4	623	654	Base	0.01	0.27	0.27	0.27
4	38.57	6	270	924	Base	0.02	0.19	0.19	0.19

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	0.47	0.47	0.47
Sub-Base	--	--	--
Subgrade	--	--	--
Pavement Strength	0.47	0.47	0.47

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

Normec DETS

UKAS TESTING 4480

Alex Stratford
Soils Ltd
Thomas Telford House - Unit 11
Sun Valley Business Park
Winnall Close
Winchester
SO23 0LB

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

DETS Report No: 25-04479

Site Reference:	Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ
Project / Job Ref:	21876
Order No:	21876/AS
Sample Receipt Date:	28/04/2025
Sample Scheduled Date:	28/04/2025
Report Issue Number:	1
Reporting Date:	02/05/2025

Authorised by:

Steve Knight
Customer Support Manager

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

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

Soil Analysis Certificate						
DETS Report No: 25-04479	**~Date Sampled**	22/04/25	22/04/25	22/04/25	22/04/25	22/04/25
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ	**~TP / BH No**	WS1	WS7	BH1	BH2	BH3
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: 21876/AS	**~Depth (m)**	1.00	2.00	6.00	4.00	8.00
Reporting Date: 02/05/2025	**DETS Sample No**	774314	774315	774316	774317	774318

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.7	7.2	8.2	7.8	8.4
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	867	778	732	439	778
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.09	0.08	0.07	0.04	0.08
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	< 10	< 10	248	88	264
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	< 0.01	< 0.01	0.25	0.09	0.26
Total Sulphur	%	< 0.02	NONE	0.04	0.05	0.30	5.42	0.35
Ammonium as NH_4	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	3.4	< 0.5	3.6
Ammonium as NH_4	mg/l	< 0.05	MCERTS	< 0.05	< 0.05	0.34	< 0.05	0.36
W/S Chloride (2:1)	mg/kg	< 1	MCERTS	8	10	8	11	14
W/S Chloride (2:1)	mg/l	< 0.5	MCERTS	4	4.9	4	5.7	7.2
Water Soluble Nitrate (2:1) as NO_3	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Water Soluble Nitrate (2:1) as NO_3	mg/l	< 1.5	MCERTS	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
W/S Magnesium	mg/l	< 0.1	NONE	0.2	0.5	13	5.7	12

Normec DETS Limited
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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 25-04479	**~Date Sampled**	22/04/25				
Soils Ltd	**~Time Sampled**	None Supplied				
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ	**~TP / BH No**	BH4				
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied				
~Order No: 21876/AS	**~Depth (m)**	12.00				
Reporting Date: 02/05/2025	**DETS Sample No**	774319				

Determinand	**Unit**	**RL**	**Accreditation**					
pH	pH Units	N/a	**MCERTS**	8.1				
Total Sulphate as SO_4	mg/kg	< 200	**MCERTS**	1190				
Total Sulphate as SO_4	%	< 0.02	**MCERTS**	0.12				
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	395				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.40				
Total Sulphur	%	< 0.02	NONE	0.39				
Ammonium as NH_4	mg/kg	< 0.5	**MCERTS**	5.4				
Ammonium as NH_4	mg/l	< 0.05	**MCERTS**	0.54				
W/S Chloride (2:1)	mg/kg	< 1	**MCERTS**	14				
W/S Chloride (2:1)	mg/l	< 0.5	**MCERTS**	7.2				
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				
W/S Magnesium	mg/l	< 0.1	NONE	19				

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

Soil Analysis Certificate - Sample Descriptions
DETS Report No: 25-04479
Soils Ltd
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ
~Project / Job Ref: 21876
~Order No: 21876/AS
Reporting Date: 02/05/2025

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
774314	WS1	None Supplied	1.00	14.3	Light brown sand
774315	WS7	None Supplied	2.00	18.7	Light brown sandy clay
774316	BH1	None Supplied	6.00	14	Brown sandy clay
774317	BH2	None Supplied	4.00	16.9	Brown clay
774318	BH3	None Supplied	8.00	12.9	Brown sandy clay
774319	BH4	None Supplied	12.00	14.6	Brown clay

Moisture content is part of procedure E003 & is not an accredited test

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

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 25-04479
Soils Ltd
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ
~Project / Job Ref: 21876
~Order No: 21876/AS
Reporting Date: 02/05/2025

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

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List of HWOL Acronyms and Operators
DETS Report No: 25-04479
Soils Ltd
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire, SO30 2SZ
~Project / Job Ref: 21876
~Order No: 21876/AS
Reporting Date: 02/05/2025

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

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Certificate Key

Symbol	Description
F	Filtered sample
UF	Unfiltered sample
D	Dried sample
AR	As received sample
RL	Reporting limit
~	Sample details provided by customer and can affect the validity of results
M/S	Missing Sample
M	MCERTS accredited test
U	UKAS accredited test

Appendix D CPT Testing Report

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SOUTHAMPTON

SOIL INVESTIGATION

CPT REPORT

Cone penetration testing
Parameter derivation

Project Reference.: 25-32-30218-1

Report Issue No.: 01 30218_01

PROJECT:	Southampton

CLIENT:	Soils Ltd.

FIELDWORK

CPT rig(s)	17.9-tonne track-truck mounted CPT unit (UK20)
Date fieldwork started	29th September 2025
Date fieldwork completed	30th September 2025
Lankelma's representative	Paul Dimelow
Client's representative	Alex Stratford

DOCUMENT CHECKING

Action	Date	Name
Completed	07/10/2025	Christopher Player
Checked	10/10/2025	Joseph Hobbs
Approved	10/10/2025	Joseph Hobbs

Issue	Date	Status
01_01	10/10/2025	Final

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1 INTRODUCTION

At the request of Soils Ltd., a soils investigation was carried out on project *Southampton*.

Site location:

(In the general region of)

Heath House Lane
Southampton
SO30 0LE

2 DISCLAIMER

The information contained in this report and all other associated reporting deliverables supplied in digital data files and AGS format data files referenced within this report (collectively "Report") are for the sole benefit of Lankelma's client ("Client") identified at the front of this report.

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3 GLOSSARY OF SYMBOLS, TERMS AND ABBREIATIONS

SYMBOLS (excluding base units)

B_q	Pore pressure ratio. The net pore pressure normalized with respect to the net cone resistance: $B_q = (u_2 - u_0)/(q_t - \sigma_v)$
c_{vh}	Coefficient of consolidation. Subscript vh indicates some combination of horizontal and vertical flow when assessed from CPTu dissipation tests.
E	Young's modulus (generic, E' and E_u apply to drained and undrained deformation conditions respectively)
F_r	Normalised friction sleeve resistance: $F_r = f_s / (q_c - \sigma_v)$
f_s	Friction sleeve resistance: The total frictional force acting on the friction sleeve, F_s, divided by its surface area A_s: $f_s = F_s / A_s$
g	Gravitational field strength: g = 9.81 N kg^{-1}
G	Shear modulus (generic, G_0 applies to small strain conditions, G_u applies to undrained shear (G at existing effective stress) and $G_{\%}$ applies to stress at variable % mobilised yield stress (e.g. G_{50}))

s	Specific gravity of solids
I_c & I_{SBT}	Soil Behaviour Type Index: Continuous numerical representations of Robertson soil behaviour type classification charts. I_c and I_{SBT} apply to the Robertson (1990) and Robertson and Cabal (2010) classification charts respectively.
	Soil Behaviour Type Index: Continuous numerical representation of Robertson & Cabal (2010) soil behaviour type classification chart based on dimensionless parameters.
I_R	Rigidity Index: Ratio of shear modulus to undrained shear strength, $I_R = G_u/s_u$
k	Coefficient of permeability with units of velocity
m_v	Coefficient of compressibility: $m_v = 1/M'$
m'	Pre-consolidation (yield) stress exponent (section 0).
M'	Constrained modulus
q_c	Cone resistance: The total force, Q_c, acting on the cone, divided by the projected area of the cone, A_c: $q_c = Q_c/A_c$
Q_t	Normalised cone resistance (method 1): $Q_t = (q_c - \sigma_v)/\sigma'v$
Q_{tn}	Normalised cone resistance where normalisation varies with soil type. See section 6.4.
q_t	Corrected tip resistance: The cone tip resistance q_c corrected for pore water pressure effects on the cone shoulder
$q_{t\text{-}net}$	Net cone resistance: $q_{t\text{-}net} = q_t - \sigma_v$. Where q_t is unavailable q_c is applied
q_{t1}	Normalised cone resistance (method 2): $q_{t1} = (q_t)/(\sigma'_v)^{0.5}$
Dr	Relative density (percentage)
R_f	Friction ratio: The ratio, expressed as a percentage, of the sleeve friction, f_s, to the cone resistance, q_c: $R_f = (f_s/q_c) \cdot 100$
r	Radius
s_u	Undrained shear strength (generic)
t	Time
u_0	Equilibrium pore pressure
u_2	Measured pore pressure: Dynamic pore pressure measured at the shoulder position (u_2) during penetration and dissipation tests. $u_2 = \Delta u_2 + u_0$
Δu_2	Excess (or differential) pore pressure: $\Delta u_2 = u_2 - u_0$
V_s, V_p	Shear wave velocity, V_s, and pressure wave velocity, V_p. Measured with use of a seismic receiver

Greek

γ	Unit weight of soil
γ_w	Unit weight of water
ρ	Volumetric mass density (or specific mass) of soil: $\rho = \gamma/g$
σ_v	Total overburden stress
σ'_v	Effective overburden stress
σ_{atm}, P_a	Reference atmospheric stress: σ_{atm} = 101.3 kPa

TERMS AND ABBREVIATIONS

Cone or 'tip': The conical tip of the cone penetrometer. This is sometimes referred to as the 'point' in other literature

CPT: Cone penetration test

CPTu: Cone penetration test using a penetrometer with pore pressure measurement (piezocone).

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

HOC: Heavily overconsolidated

LOC: Lightly overconsolidated

mBGL: Meters below ground level

NC: Normally consolidated

OC: Overconsolidated

Penetration length: CPT test length without correction for inclination

Piezocone: A cone penetrometer with a pore pressure sensor (u_2 or u_1 position).

Seismic cone: A cone penetrometer with a seismic receiver incorporated.

Dynamic pore pressure: The pore pressure measured during penetration (u_2 or u_1)

Soil behaviour type, or 'SBT': A classified soil type according to a classification system based on CPT or CPTu measurements.

Rod string: The series of hollow tube push rods that transmit thrust force to the penetrometer.

Zero value(s) or baseline value(s): The analogue or digital output of a sensor (or set of sensors) with no load applied.

4 COMPLETED WORKS

- 49 nr. cone penetration tests without pore pressure measurement (CPT)
- Factual report including point data interpretation of selected parameters

Appendix A contains tabulated details of the works completed together with analysis results where applicable.

5 FIELDWORK GENERAL

Fieldwork was performed with a 17.9-tonne track-truck mounted CPT unit (UK20) equipped with a 17.5-tonne capacity hydraulic ram set.

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

The target depth for the investigation was 4 m below ground level. Table 3 details the final test depths and reasons for test termination (*refusal factor).* Where required, each penetration refusal decision was verbally confirmed with the Client's on-site representative.

6 CONE PENETRATION TESTS

Cone penetration testing was carried out in general accordance with BS ISO 22476-1:2022.

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

Penetrometers were calibrated in accordance with BS ISO 22476-1:2022 and ISO 376:2011 within 6 months of the fieldwork completion. Copies of all calibration certificates for the cones used are provided in Appendix B.

The penetrometer used was a 150 kN axial capacity model with digital output (down-hole digitisation) and internal measurement of load cell temperature. The temperature data was used for QA during the test and QC during processing. The test operative aimed to keep the rate of temperature change to less than 0.5°/min in low strength soils to maintain acceptable measurement error. The temperature data can be used to assess ground temperature at depths where the cone has paused for more than 20-50 minutes with an accuracy of +- 0.5°, depending on the thermal properties of the soil.

At intervals during the fieldwork, the penetrometer was temperature stabilised in a water bath to obtain stabilised zero load baseline values (after extraction from the water). This was done prior to each test, or approximately every 30 m of testing where the final depths were relatively shallow, when larger zero drifts were observed, or when changing penetrometer. The purpose of this procedure is to prevent transient temperature effects from influencing the strain gauge sensors, so that representative baseline values may be subtracted from the data collected during penetration - where temperature is controlled, and temperature effects are corrected for based on the magnitude and rate of change in temperature. Additionally, it enables more reliable assessment of long-term shift in the baseline output of the sensors.

Penetrometer dimensional measurements and tolerance checks were obtained prior to each test, or following each 20-60 m of testing, depending on aggressiveness of ground conditions and closeness of prior measurements to tolerance limits. The tip measurement was based on the largest diameter portion of the tip (comprising the conical part, u_2 pore pressure filter and 'equal end area piece' adjacent to the friction sleeve), while the sleeve measurement was obtained at both ends of the sleeve and averaged for the purpose of determining the surface area.

6.1 CPT DATA REDUCTION AND PRESENTATION

Presentation

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

Derivation of pressure

The cone tip and sleeve force measurements were converted to pressure using the measured tip and sleeve diameters.

Zero load reference values

Zero load reference values were recorded before and after each test, and periodically these were obtained after temperature stabilisation in a water bath to remove the influence of transient temperature effects. When selecting the most representative baseline values (for subtraction from the raw data), priority was given to values obtained following temperature stabilisation. Depending on the frequency of baseline output stabilisation, the stabilised values applied to the raw data may be obtained prior to a previous test, or, following a subsequent test when the average of pre & post stabilised baseline values is applied to the data.

Temperature correction (post-processing algorithmic)

For standard high capacity cones the correction and/or control of temperature effects is critical to the production of results suitable for design purposes, particularly in lower strength fine soils where temperature error can become a large proportion of the measured values.

Tests performed with magnetometer measurements ('magcone' tests) lack load cell temperature measurements and it is therefore not possible to correct the data for temperature effects (apparent pressure due to temperature change) during post processing. To mitigate this, test without temperature measurement are performed with additional temperature stabilisation pauses in lower strength soils. These pauses are evidenced with dissipation tests and appear on the data plots as 'QC dissipation test' symbols.

For tests with load cell temperature measurements the tip and pore pressure measurements are corrected for static and transient temperature effects using parameters obtained from temperature response tests. For each recorded value, the static and transient temperature error component (apparent sensor output due to change in temperature) were subtracted from the reading.

For subtraction type cones incorporating traditional temperature compensation wiring in the strain gauge circuit, the apparent cone tip resistance ($q_{c:a}$) and apparent pore pressure (u_a) due to static and transient temperature effects can be approximated by

$q_{c:a} = a(\Delta T/\Delta t) + b(\Delta T)$,

$u_a = b(\Delta T)$

Where $q_{c:a}$ is the apparent tip resistance, a is the apparent resistance due to unit transient temperature change, and b is the change in apparent resistance per unit static temperature change relative to the temperature of the penetrometer at the time of zero load output measurement.

The temperature corrected tip ($q_{c:c}$), and pore pressure ($u_{:c}$) are then found from

$q_{c:c} = q_{c:m} - q_{c:a}$,

$u_{:c} = u_{:m} - u_{:a}$

Where subscript '$_{:m}$', denotes the field measured resistance/pressure as recorded in the raw data files.

Notes:

1. Temperature correction of the sleeve data is possible but is often unwarranted as it does not substantially improve accuracy. This is because for subtraction type cones the errors in the sleeve force largely cancel with errors in the tip force when they have the same sign, which is expected when temperature change is the primary source of sensor drift.

The effectiveness of the correction parameters is verified by the ISO 22476:2022 temperature verification procedure presented in the calibration certificate.

Correction for pore pressure effects

For tests without u_2 pore pressure measurement it is not possible to derive the total cone resistance (or 'corrected cone resistance') expressed as

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

Where a is the 'net area ratio' of projected shaft area divided by projected face area, and 1- a is the proportion of cross-sectional area between the cone tip and penetrometer body where pore pressures (positive or negative) can act to add or subtract from the total external axial force on the tip. The difference between measured and corrected values is largest in low strength collapsible soils with large excess pore pressures. The percentage adjustment is described by the curves on the chart below for a = 0.8:

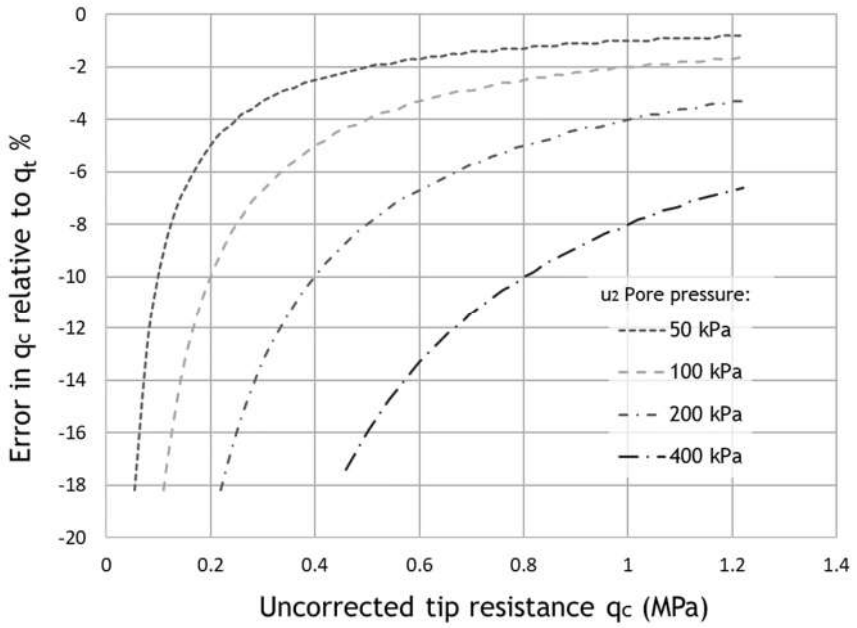


Figure 6-1 Uncorrected tip with % error for various pore pressure values

All penetrometers had equal sleeve end areas and no correction for pore pressure effects has been applied to the sleeve readings.

Depth corrections

Penetration length readings were corrected for inclination according to the procedure described in ISO-22476-1:2022. Sleeve readings were depth corrected for the dimensional offset between cone tip and sleeve and an additional 'effective' offset between the sleeve and focal point of bearing resistance within the soil below the conical tip.

Spike/ artefact removal and resampling

Rod spikes (artefacts of the pause for push rod addition) have been filtered from the cone tip and sleeve data and replaced with an interpolated value.

The data was re-sampled from 10 mm resolution to 20 mm to reduce the size of the data set to a more manageable size for end users. A 20 mm resolution is within the intrinsic influence zone of the cone tip measurement, and the loss of meaningful resolution is negligible.

Parameter derivation and data deliverables

Raw data plots are presented in Appendix C and include the intermediate interpretation parameters friction ratio, R_f, and pore pressure ratio B_q. For piezocone tests q_t is reported on all logs, and q_c only appears in the digital AGS data.

Geotechnical parameters appropriate for drained and undrained cone penetration conditions are derived for corresponding drained and undrained derived soil behaviour types (SBTs) respectively, however, to account for uncertainty in the SBT correlation with drainage behaviour, all parameters are derived over a range of transitional soils within the range $2.4 < I_c < 2.7$ (see section 6.5). Geotechnical parameter plots are presented in Appendix D onwards.

All raw and derived data are provided in the AGS 4.0 data file delivered alongside this report.

6.2 IN-SITU STRESS CONDITIONS

An estimate of the equilibrium pore pressure and total and effective vertical stress states is required for derivation of net and normalised readings required for interpretation of most soil parameters obtained from the CPT and dissipation test.

The total vertical stress with depth is calculated as the sum of the derived soil unit weight above a given depth:

$$\sigma_{v0} = \sum_{i=1}^{n} \gamma_i \, h_i$$

Where γ_i is the soil unit weight (kN/m^3) assigned to the depth increment i, h_i is the depth increment (m) and n is the total number of increments above the considered depth.

See section 6.3 for information on the applied empirical estimate of soil unit weight.

An arbitrary phreatic surface of 3.00 mBGL was applied in the calculation of effective stress.

Note: The term phreatic surface is used here, and it is assumed that the piezometric level measured by the piezometer, under hydrostatic conditions, coincides with the phreatic surface. The phreatic surface reported is intended to provide information about pore pressure distribution assumed for calculation purposes and may not represent the true position of the groundwater table or perched water bodies. Complex groundwater pressure distributions will be applied if they are observed from the measurements and are sufficiently well defined.

6.3 SOIL UNIT WEIGHT

The soil unit weight is estimated using the following method proposed by Robertson (2010b).

$$\frac{y}{y_w} = 0.27\,Log(R_f) + 0.36\,(Log(q_t/R_f)) + 1.236$$

Throughout pre-drilled zones (inspection pits or drill-out) the soil was assigned a nominal unit weight of 17 kN/m^3.

For depths where the friction sleeve resistance measurement was less than zero due to measurement limitations, the friction sleeve resistance input parameter was substituted with a nominal 1.0 kPa resistance for the purpose of obtaining an approximate soil unit weight necessary for estimation of total vertical stress over the entire test profile.

6.4 SOIL BEHAVIOUR TYPE (SBT)

The data is interpreted using 4 soil behaviour type schemes: Robertson (1990, 2010, 2016) and Schneider et al, 2008. The Robertson (1990) scheme is very widely used and forms the bases of the layer analysis whereby the profile is split into approximate zones of common classification or classification variance. The Robertson (2010 & 2016) and Schneider at al methods are less widely used in general practice but can provide classification that is more relevant to the design problem in many instances, and the reader is directed to the relevant references for additional information.

For all SBT classification systems discussed in this report, it should be noted that:

- The systems provide a general soil type that tends to show biased towards the soil fraction that dominates the mechanical behaviour in relation to the CPT parameters on which the system is based.
- Significant bonding/microstructure will influence derived soil type (Robertson 2022).
- If cohesive soils are dry and/or heavily overconsolidated, the classification tends to shift towards a coarser soil type (or lower I_c index).
- Strictly, all SBT systems are applicable to saturated or near saturated soils. If applicable, performance of SBT systems in dryer soils should receive due scrutiny.
- While the repeatability and behavioural bias of the SBT is often of practical benefit, the classification may not be an appropriate substitute for classification based on particle size grading and/or consistency (Atterberg indices).

A dedicated SBT comparison log is provided in Appendix D.

<u>Robertson (1990, 2010)</u>

The Robertson 1990 and 2010 SBT classification systems, based on the same chart shown in Figure 6-3, provides 9 classification zones as a function of q_t (or q_c) and f_s.

The 1990 system is based on dimensionless stress normalised parameters of cone resistance (Q_t) and friction ratio (F_r). Where:

$$Q_t = \left(\frac{q_t - \sigma_{v0}}{\sigma'_{v0}}\right)$$

$$F_r = \left(\frac{f_s}{q_t - \sigma_{v0}}\right)$$

Robertson (2009) recommended use of an improved stress normalisation method for tip resistance (Q_{tn}) that uses a stress exponent *n* that varies with the derived soil type and is found iteratively (starting with Q_t) from:

$$Q_{tn} = \left(\frac{q_t - \sigma_{v0}}{p_a}\right) \cdot \left(\frac{p_a}{\sigma'_{v0}}\right)^n$$

and

$$n = 0.318(I_c) + 0.05\left(\frac{\sigma'_{v0}}{p_a}\right) - 0.15$$

where I_c is the SBT index discussed in section 6.5, and is continuous function of Q_{tn} and F_r.

Three iterations of Q_{tn} were performed during data processing, with the initial calculation based on an average of the non-normalised and normalised values of I_c for the upper 6 m to limit the effects of overconsolidation at shallow depth.

While the classification based on normalised parameters is more accurate, particularly for NC soils exceeding ~15 m depth, the classification is often significantly in error (artificially granular/drained) at shallow depth (< ~1-3 m). The error at shallow depth is largely associated with the potentially large difference between the estimated vertical effective stress (applied in normalisation of q_t and f_s) and the unknown horizontal stress influencing penetration resistance, especially at high OCR state.

Robertson (2010) proposed a non-normalised version of the 1990 chart which uses dimensionless cone resistance (q_c/Pa) and friction ratio (Rf). SBT classification according to this chart is generally more reliable at shallow depth in Lankelma's experience.

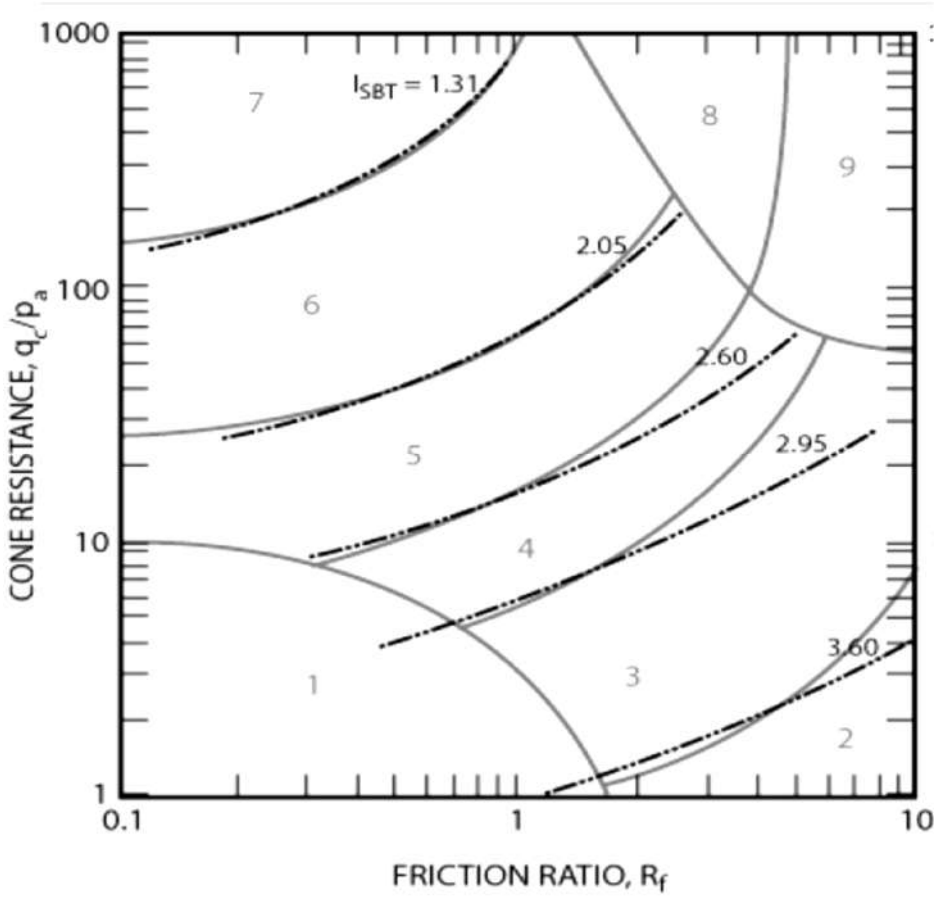


Figure 6-2 Non-normalised SBT chart by Robertson et al. (2010) based on dimensionless cone resistance (qc/Pa) and friction ration, Rf, showing contours of SBT index I_{SBT} (denoted I_c on the test plots). The chart is equally applicable to normalised tip resistance (Q_t, Q_{tn}) and normalised friction ratio (F_r) values using the same dimensionless scales.

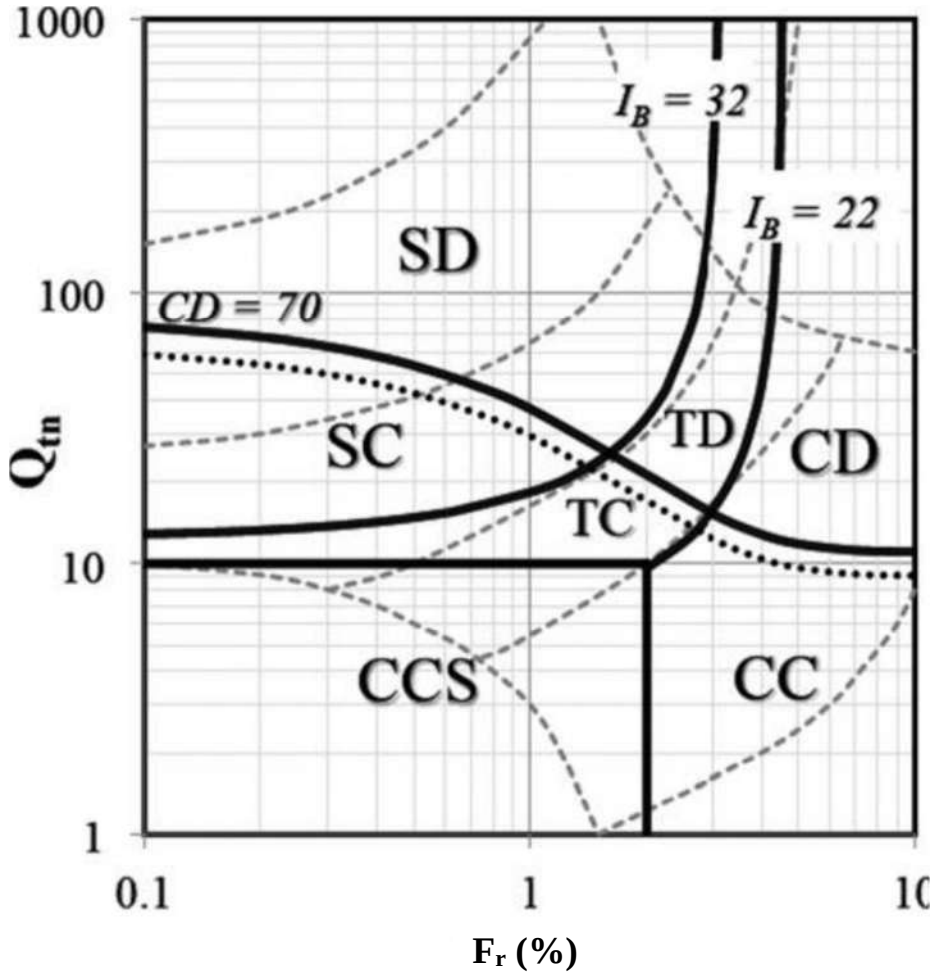
Table 1 Robertson (1990, 2010) soil behaviour type zone descriptions

Zone	**Soil Behaviour Type (SBT)**		
1	Sensitive fine-grained	6	Sands - clean sand to silty sand
2	Organic soils	7	Gravelly sand to sand
3	Clays – clay to silty clay	8*	Very stiff/dense sand to clayey sand[1]
4	Silt mixtures - clayey silt to silty clay	9*	Very stiff fine grained[1]
5	Sand mixtures – silty sand to sandy silt	**Heavily overconsolidated or cemented*	

[1]Note zones 8 and 9 appear as *'Very stiff/dense sand to clayey sand – HOC or cemented'* and *'Very stiff fine grained – HOC or cemented'* within the soil unit descriptions of plots in Appendix D.

Robertson 2016

Using the same Q_{tn} - F_r space as the 1990 and 2010 charts, Robertson (2016) proposed an alternative purely behavioural classification system that places less emphasis on classification according to composition/textural properties and more emphasis on mechanical behaviour – namely the tendency of the soil to dilate or collapse during large strain shear, and sensitivity.



Zone	Soil Behaviour Type (SBT)
CCS	Clay-like – contractive - sensitive
CC	Clay-like – Contractive
CD	Clay-like – Dilative
TC	Transitional - Contractive
TD	Transitional - Dilative
SC	Sand-like - Contractive
SD	Sand-like - Dilative

Figure 6-3 Robertson 2016 soil behaviour type classification chart and zone descriptions

Layer Analysis

The layer boundaries are manually interpreted based on broad changes in Robertson's (1990) SBT classification or variance with depth. Once the layer boundaries are defined, the SBT zones within each layer are listed along with the corresponding percentage of data points, excluding null/filtered data. The modal classification is reported in full, while secondary zones are provided with abbreviated descriptions. For example: *'Clays – clay to silty clay [74%];* Silt mixtures [20%]', where the asterisk indicates an abbreviation of the full description 'Silt mixtures – clayey silt to silty clay'.

It is important to note that classification zone boundaries do not exist naturally, and minor variations in cone response can result in multiple classifications within layers of relatively uniform behaviour. This is particularly true when the data plot is near a zone boundary, contains spurious spikes, or includes very thin layers. Therefore, a system is necessary to limit the number of classified zones

within each layer description. The following logic has been applied to retain only the most significant classifications:

For LT >= 1, C = 85
For 0.5 <= LT < 1, C = 75
For LT < 0.5, C = 65

Where
C = Minimum % SBT zone classification coverage within the layer description text
LT = Layer thickness (m)

For layers having a thickness of less than 1 m, 8% of data at the top and bottom of the layer (16% total) are excluded to limit the effect of transition zone data (measured resistance influenced by overlying or underlying strata of different stiffness) being included in the classification.

The continuous SBT index I_c can be used to assess the classification distribution and variation not accounted for by the layer description.

6.5 SOIL BEHAVIOUR TYPE INDEX – I_C

The principal trend in soil behaviour type (SBT) variation can be expressed by a continuous index, I_C, as proposed by Robertson and Wride (1998) based on a similar index proposed by Jefferies and Davies (1993). The index provides a continuous profile of SBT variation with depth for end-user analysis of soil units and variation within units. The equivalent non-normalised version proposed by Robertson (2010) is provided for comparison.

The basis of I_c and its approximation of the original chart classification zones may be seen from Figure 6-2. The method does not identify zones 1 (*sensitive fine grained)* or zones 8 & 9 (*heavily overconsolidated or cemented*).

Normalised SBT index I_C (Robertson and Wride, 1998), as updated by Robertson (2009) to use Q_{tn}*:*

$$I_c = [(3.47 - \log Q_{tn})^2 + (\log F_r + 1.22)^2]^{0.5}$$

Non-normalised SBT index I_C (Robertson, 2010)*:*

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

The normalised version of I_c is generally more accurate, while the non-normalised version is intended for compatibility with the non-normalised Robertson's (2010) SBT chart and may be more accurate at shallow depths in overconsolidated soils.

I_c results are presented in Appendix D and are repeated alongside derived parameters on all plot sheets to provide SBT context.

6.6 RELATIVE DENSITY

The relative density of sands is calculated based on an empirical relationship proposed by Jamiolkowski *et al.* (2001) based on a large database of undisturbed frozen samples and calibration chamber tests on clean sands.

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

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

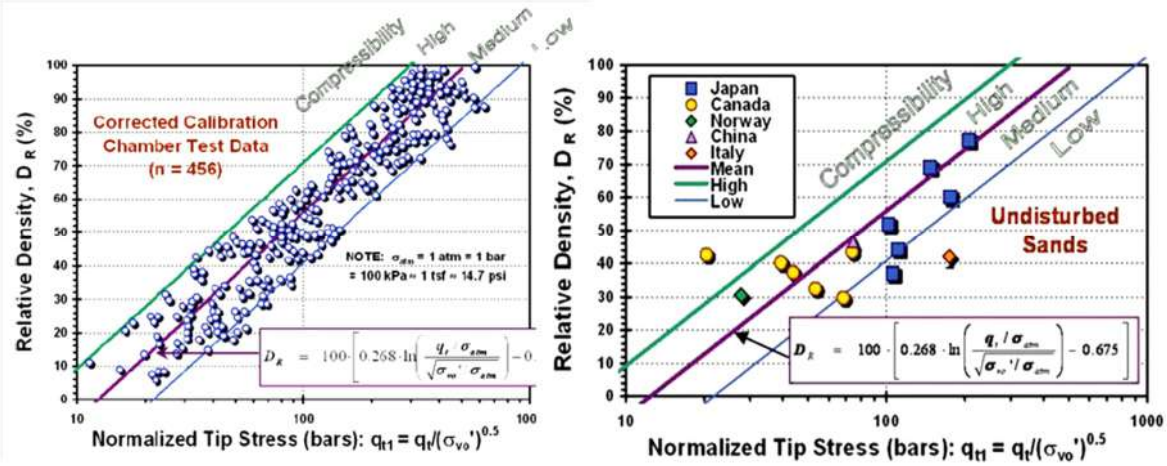


Figure 6-4 Relative density with normalised tip stress and sand compressibility from calibration chamber tests (left) and undisturbed frozen samples (right). Jamiolkowski *et al.* (2001). Reproduced from Mayne (2007).

The results are presented in Appendix F.

6.7 UNDRAINED SHEAR STRENGTH

The undrained shear strength s_u is usually estimated by dividing the net tip resistance by an empirical cone factor N_k (Lunne *et al*, 1997):

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

Mayne and Peuchen (2018) performed an evaluation of 407 high-quality undrained anisotropically consolidated triaxial compression tests (CAUC) with net tip resistance data pairs, resulting in N_{kt} factors with regression analysis details for five categories of clays shown in Table 2.

Table 2 Summary of CAUC s_u versus q_{net} for various clays. Reproduced from Mayne and Peuchen (2018).

Clay Group	Number of sites	Nr Data	Correlation Coefficient r^2	Factor N_{kt}	Mean Pore Pressure Parameter B_q
1) Offshore NC-LOC	17	115	0.98	12.32	0.51
2) Onshore NC-LOC	30	191	0.867	12.00	0.53
3) Sensitive NC-LOC	5	43	0.507	10.33	0.84

Clay Group	Number of sites	Nr Data	Correlation Coefficient r^2	Factor N_{kt}	Mean Pore Pressure Parameter B_q
4) OC Intact	5	36	0.862	13.57	0.49
5) OC Fissured	5	22	0.393	22.47	-0.01
All clays	62	407	0.923	13.33	0.55

The test plots of Appendix E provide profiles of s_u corresponding to the N_{kt} factors of groups 2, 4 and 5, with the applicable N_{kt} value and soil group name indicated in the header legend. *'s_u3…reference'* on the logs corresponding to N_{kt} = 15 and has been included for comparison to data interpreted using the commonly adopted N_{kt} value of 15 for 'normal' clays.

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

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

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

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

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

When calculated, the s_u estimate based on B_q is presented as 's_u5 – Dynamic N_{kt} from Bq (CAUC)' on the plots and is only suitable for tests that have a high-quality pore pressure data, often indicated by a positive, repeatable, and dynamic response.

Note: N_{kt} (with subscript 'kt') indicates a N_k factor that has been established using the corrected (total) tip resistance q_t. N_{kt} can be applied to the uncorrected tip resistance q_c but results in a slightly lower estimate of s_u depending on the correction magnitude (q_c - q_t) in lower strength soils.

s_u results are presented in Appendix E.

6.8 OVERCONSOLIDATION RATIO

The preconsolidation stress $\sigma_p^{'}$ is calculated based on the method proposed by Mayne et al (2009):

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

$$OCR = \sigma_p{}'/\sigma'_{v0}{}'$$

Mayne *et al* found that the trend with mean grain size followed a power law through the addition of exponent m' and that its value can be estimated by relation to soil behaviour type index I_c:

$$m^{'} = 1 - \frac{0.28}{1 + (I_c/2.65)^{25}}$$

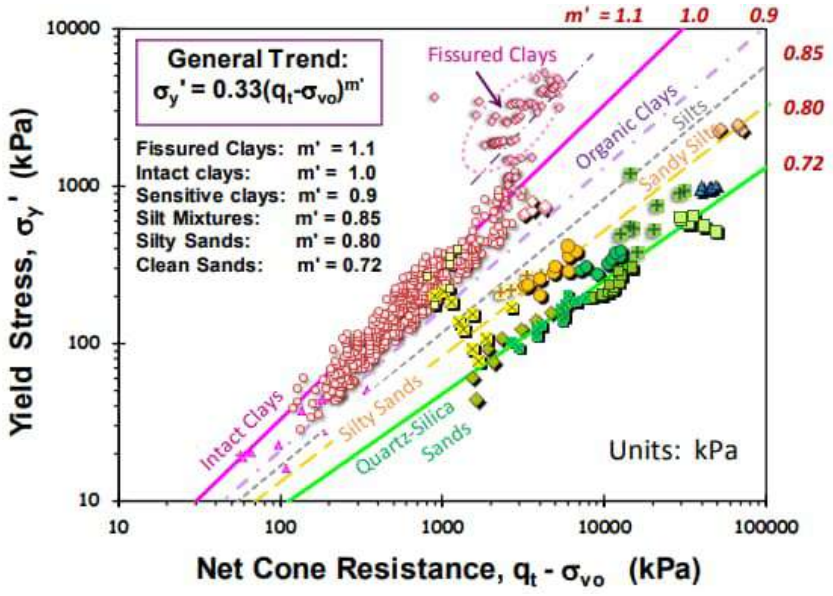


Figure 6-5 Preconsolidation stress with net cone resistance power law, reproduced from Mayne (2014).

An additional set of $\sigma_p^{'}$ and OCR values were calculated for $m^{'}$ = 1.1 to reflect the upper trend for over consolidated fissured clays not captured by the correlation with Ic.

The results are presented in Appendix E.

6.9 SPT N60 VALUES

Equivalent SPT N_{60} values, defined as the non-normalised SPT blow count over a 30 cm interval, with a reference hammer efficiency (energy transfer ratio, 'ETR' or 'ER') of 60%, is derived according to two correlations:

Method 1 - Jefferies and Davies (1993) cited in, and modified by, Lunne *et al.* (1997) to use I_c according to normalised Robertson 1990 SBT chart:

$$N_{60} = \frac{q_t}{8.5 \cdot \sigma_{atm} \cdot (1 - I_c/4.6)}$$

Method 2 - Robertson (2012):

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

The correlations are intended for clays, silts and sands and not for carbonates or cemented geo-materials.

Conversion of N_{60} values for comparison to other hammer efficiency values, or vice-versa, can be performed using the relationship:

$$N_{60} \cdot \frac{60}{ETR} = N_{ETR}$$

Where ETR is entered as a percentage.

The results are presented in Appendix F.

6.10 FRICTION ANGLE

Sands

The peak friction angle of granular materials is calculated using the Kulhawy and Mayne (1990) method. The relationship is based on a calibration chamber database from 24 sands (mainly sampled by freezing) of varying mineralogy and is found from:

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

Where:

ϕ' = Peak friction angle (degrees)

q_{t1} = stress normalised cone resistance:

$$q_{t1} = \left(\frac{q_t}{\sigma_{atm}}\right) / \left(\frac{\sigma_{v0'}}{\sigma_{atm}}\right)^{0.5}$$

The presence of compressible minerals or fines tends to reduce tip resistance resulting in lower estimate of friction angle, while very coarse (sand) or larger grain size tends to increase tip resistance resulting in higher estimate. Increased penetration resistance due to high k_0 conditions also results in an overestimate of friction angle.

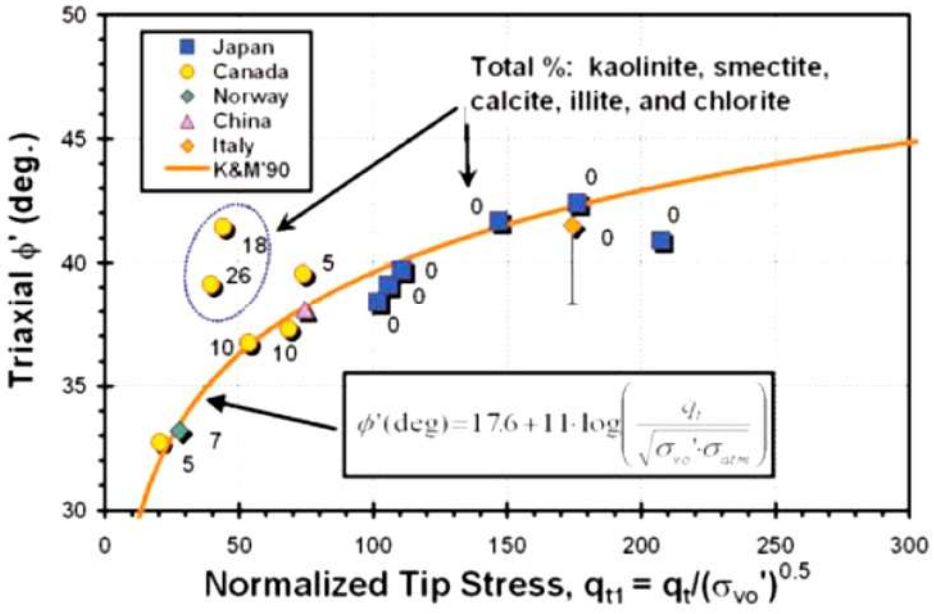


Figure 6-6 Peak triaxial friction angle from undisturbed sands with normalised cone resistance.

Fine grained soils

The effective friction angle for fine grained soils is calculated based on the Senneset *et al.* (1988, 1989) method, referred to as 'NTH' (Norwegian Institute of Technology) solution, using the modified and approximate closed form solution by Mayne & Campanella (2005) as a direct function of the pore pressure parameter Bq and normalised tip resistance Q_{tn} (referred to as Q in figure Figure 6-7 Triaxial ϕ' versus CPTu-evaluated value (NTH method) for 105 soft-firm clays with OCRs < 2.5 (Ouyang and Mayne 2018, cited in Mayne *et al* 2022). The method is generally applicable where $0.1 < B_q < 1.0$ and $20° < \phi' < 45°$and is appropriate for non-cemented normally consolidated to lightly overconsolidated soils.

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

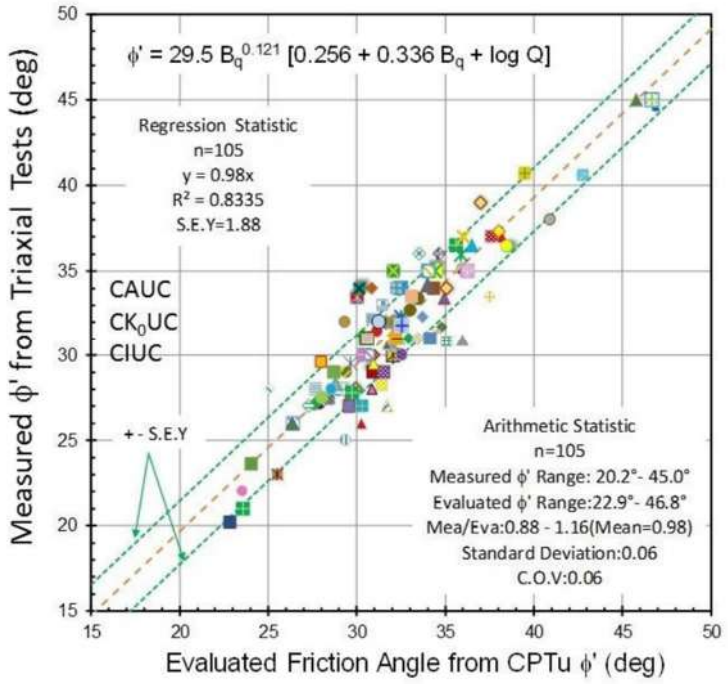


Figure 6-7 Triaxial ϕ' versus CPTu-evaluated value (NTH method) for 105 soft-firm clays with OCRs < 2.5 (Ouyang and Mayne 2018, cited in Mayne *et al* 2022).

The results are presented in Appendix F.

6.11 COEFFICIENT OF VOLUME CHANGE

Coefficient of volume change m_v defined as the inverse of the constrained modulus M, is evaluated for all soil types using the constrained modulus method proposed by Mayne (2006) cited in Mayne (2007). The value may be used to predict settlement at the end of primary consolidation and is applicable to the present state of vertical effective stress up to the pre-consolidation stress for overconsolidated soils.

$$m_v = 1/M'$$

Where:

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

$$\alpha = 5$$

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

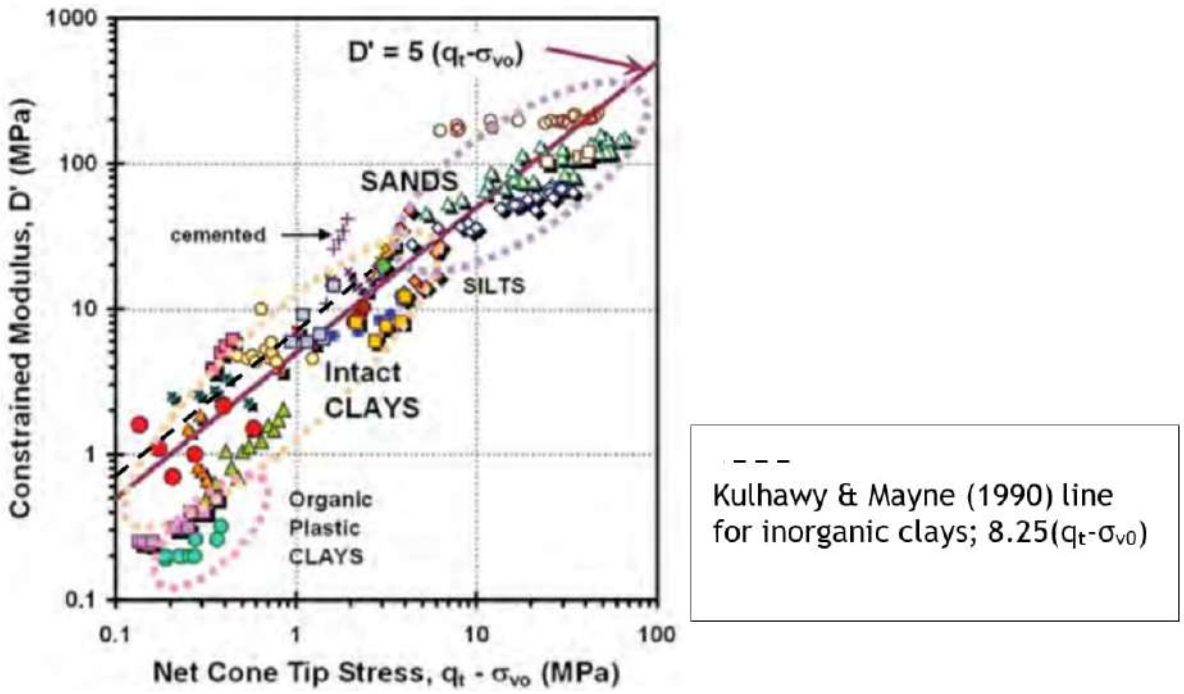


Figure 6-8 Constrained modulus of Mayne (2006). Annotated/redrawn from NCHRP Synthesis 368 (2007).

The results are presented in Appendix E.

6.12 YOUNG'S MODULUS

The secant Young's modulus E' at 25% mobilised shear strength (FOS = 4) is calculated according to the method proposed by Robertson (2009):

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

Where:

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

The method described by Robertson may be adapted to estimate E' for loading at different percentages of mobilised shear strength.

The results are presented in Appendix F.

7 GENERAL INTERPRETATION NOTES

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

DRAINED AND UNDRAINED SOIL BEHAVIOUR

Geotechnical parameters appropriate for drained and undrained cone penetration conditions are derived for drained and undrained soil behaviour types (SBTs) respectively, however, to help mitigate the uncertainty in the SBT correlation with drainage behaviour, all parameters are derived over the Soil Behaviour Type range $2.4 < I_c < 2.7$. For partially drained conditions, error will be introduced within derived parameters.

Piezocone dynamic pore pressure and dissipation tests may be used to identify drainage conditions. Dissipation t_{50} values exceeding 50 seconds indicate undrained penetration behaviour based on the findings of Kim *et al.* (2008).

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

DYNAMIC PORE PRESSURE u_2 (CPTu)

While the piezo system is saturated before use, testing through unsaturated soils may result in some degree of desaturation leading to a less accurate and more 'sluggish' pore pressure response. Desaturation can also occur during penetration due to suction pressure causing cavitation during dilative shear at the cone shoulder. Dissipation tests that are undertaken following desaturation are likely to have a more pronounced initial rise and the results of analysis may have some degree of error.

If the piezometer system becomes desaturated it may re-saturate at higher excess pressures later in the test as gas dissolves under pressure. The pore pressure response in saturated contractive soils should normally have a dynamic 'peaky' appearance.

The tip resistance in lower strength contractive soils without pore pressure measurement in the u_2 position is likely to be significantly lower (up to 20%, typically ~10%) than the equivalent corrected tip resistance depending on the magnitude of excess pore pressure generated during penetration.

CONICAL TIP AND FRICTION SLEEVE OFFSET

The accuracy of the friction ratio (and derived SBT) over thin layers and at layer boundaries is sensitive to the offset between the focal point of shear in front of the conical tip and the centre of the friction sleeve, and the difference in the vertical extent of soil influencing the sensors. This often results in sharp peaks or troughs at boundaries when the sleeve rises or falls out of unison with tip resistance. More broadly, this error will be seen in any circumstances where the spacing between inclusions or discontinuities causes the cone tip and sleeve to experience heterogeneity, for example in disturbed fill or landslip material with a 'blocky' macro fabric or large inclusions. The figure below provides an example of the tip-sleeve offset and resulting (erroneous) friction ratio spike.

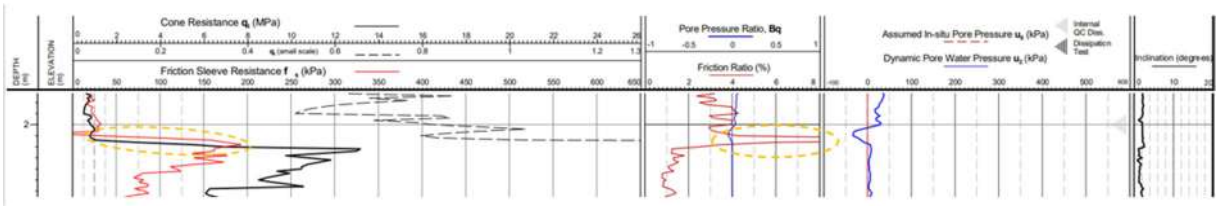


Figure 7-1 example of offset in tip and sleeve response at a strata boundary.

Note that the cone-sleeve offset results in the absence of friction ratio over the last ~14 cm of each test location, and therefore the SBT material description does not extend over this range.

FRICTION SLEEVE DATA

There are three common causes of friction sleeve measurement error; 1) unequal pore pressure acting on the sleeve end areas as the sleeve passes though materials of different permeability and hence excess pore pressure Δu_2, often resulting in a negative/positive spike, 2) Accuracy limitations and temperature effects in very low strength or sensitive soils, and 3) error associated with bending strain that occurs while the cone inclination deviates rapidly. Temperature effects are generally mitigated by temperature stabilisation during the test and at the time of zero output measurement.

In sand, particularly loose to medium dense, the sleeve data may show a sudden drop following a penetration pause, followed by a much more gradual recovery over 15-30 cm. This is believed to be associated with relaxation of stress on the sleeve due to creep as stresses are redistributed further from the cone. The effect of this on SBT classification is generally very small.

CONE TYPE

The reference cone type has a 10 cm^2 projected cone tip area and 150 cm^2 friction sleeve area, however it is common to use a larger 15 cm^2 cone with a 225 cm^2 friction sleeve area for improved sensitivity, temperature stability, damage prevention and penetration depth potential due to the higher bending strength. Use of a 15 cm^2 cone does however require higher penetration force (reaction force) for a given penetration pressure and produces more pronounced transitions zones and thin layer effects due to the larger influence zone.

TRANSITION ZONES AND THIN LAYER EFFECTS

During penetration at the boundary between soils of contrasting stiffness, a transition zone is often evident prior to mobilisation of the true soil stiffness. These should be cautiously ignored in assessment of soil behaviour type and parameter evaluation. Where the stiff layer is thin (<~1 m) mobilised resistance may be significantly less than that of an equivalent thick layer. The effect for thin low stiffness layers is less significant. Procedures for thin-layer effect correction are provided by Robertson and Wride (1998) and Boulanger & DeJong (2018).

GRAVELS

The presence of gravel or larger clasts in a soil is often characterised by short peaks in the CPT tip and sleeve readings, possibly with associate inclinometer ‘shake’ and/or short sharp reductions in pore water readings due to dilation effects. Frequent gravels in soft or loose soils may generate localised erroneous friction ratio values.

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APPENDICES

Appendix A SUMMARY TABLES

Appendix B GENERAL INFORMATION

Appendix C CONE PENETRATION TEST RESULTS

Appendix D SOIL BEHAVIOUR TYPE RESULTS

Appendix E PARAMETER RESULTS 1 – s_u, m_v, OCR, SBT, I_c

Appendix F PARAMETER RESULTS 2 – SPT N60, Phi, D_r, E, I_c

Appendix G PENETROMETER TEMPERATURE RESULTS

APPENDIX A SUMMARY TABLES

Table 3 CPT summary

Location ID	Stroke number	Final depth (m)	Cone ID	Piezocone test	Pre-drilled (m)	Pre-drilling details	Rig	Primary refusal factor	Applied zero values	Tip zero drift (kPa)	Sleeve zero drift (subtraction) (kPa)	Piezo. zero drift (kPa)	Nr dissipation tests	Raw file name	X Coordinate	Y Coordinate	Z Coordinate	Date	Remarks
CPT-01	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-24.00	1.00	-		30218-V1-290925-UK20-LP100.L03				29/09/2025	
CPT-02	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-24.00	1.00	-		30218-V1-290925-UK20-LP100.L02				29/09/2025	
CPT-03	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-20.60	0.30	-		30218-V1-290925-UK20-LP100.L01				29/09/2025	
CPT-04	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-24.00	1.00	-		30218-V1-290925-UK20-LP100.L04				29/09/2025	
CPT-05	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	1.80	-1.30	-		30218-V1-290925-UK20-LP100.L14				29/09/2025	
CPT-06	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-39.20	0.50	-		30218-V1-290925-UK20-LP100.L15				29/09/2025	
CPT-07	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L31				30/09/2025	
CPT-08	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	1.80	-1.30	-		30218-V1-290925-UK20-LP100.L13				29/09/2025	
CPT-09	1	4.18	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-39.20	0.50	-		30218-V1-290925-UK20-LP100.L16				29/09/2025	
CPT-10	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L32				30/09/2025	
CPT-11	1	4.18	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-24.00	1.00	-		30218-V1-290925-UK20-LP100.L05				29/09/2025	
CPT-12	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	1.80	-1.30	-		30218-V1-290925-UK20-LP100.L12				29/09/2025	
CPT-13	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-39.20	0.50	-		30218-V1-290925-UK20-LP100.L17				29/09/2025	
CPT-14	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	6.60	0.60	-		30218-V1-290925-UK20-LP100.L20				29/09/2025	
CPT-15	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-24.00	1.00	-		30218-V1-290925-UK20-LP100.L06				29/09/2025	
CPT-16	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-35.40	2.20	-		30218-V1-290925-UK20-LP100.L07				29/09/2025	
CPT-17	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	1.80	-1.30	-		30218-V1-290925-UK20-LP100.L11				29/09/2025	
CPT-18	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-35.40	2.20	-		30218-V1-290925-UK20-LP100.L10				29/09/2025	
CPT-19	1	4.18	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-35.40	2.20	-		30218-V1-290925-UK20-LP100.L08				29/09/2025	
CPT-20	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-35.40	2.20	-		30218-V1-290925-UK20-LP100.L09				29/09/2025	
CPT-21	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-39.20	0.50	-		30218-V1-290925-UK20-LP100.L18				29/09/2025	
CPT-22	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	6.60	0.60	-		30218-V1-290925-UK20-LP100.L19				29/09/2025	
CPT-23	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L35				30/09/2025	
CPT-24	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L34				30/09/2025	
CPT-25	1	3.96	S15-CFIPTT.2477	NO			UK22	Total reaction force	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L37				30/09/2025	
CPT-26	1	4.18	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L36				30/09/2025	
CPT-27	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L41				30/09/2025	
CPT-28	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L40				30/09/2025	
CPT-29	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L39				30/09/2025	
CPT-30	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L38				30/09/2025	

Location ID	Stroke number	Final depth (m)	Cone ID	Piezocone test	Pre-drilled (m)	Pre-drilling details	Rig	Primary refusal factor	Applied zero values	Tip zero drift (kPa)	Sleeve zero drift (subtraction) (kPa)	Piezo. zero drift (kPa)	Nr dissipation tests	Raw file name	X Coordinate	Y Coordinate	Z Coordinate	Date	Remarks
CPT-31	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L42				30/09/2025	
CPT-32	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	8.80	-1.50	-		30218-V1-300925-UK20-LP100.L49				30/09/2025	
CPT-33	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L43				30/09/2025	
CPT-34	1	2.62	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	1.20	-		30218-V1-300925-UK20-LP100.L44				30/09/2025	
CPT-35	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	8.80	-1.50	-		30218-V1-300925-UK20-LP100.L45				30/09/2025	
CPT-36	1	3.76	S15-CFIPTT.2074	NO			UK22	Total reaction force	pre	-19.60	-0.80	-		30218-V1-300925-UK20-LP100.L21				30/09/2025	
CPT-37	1	4.20	S15-CFIPTT.2074	NO			UK22	Target depth	pre	-26.40	2.30	-		30218-V1-300925-UK20-LP100.L22				30/09/2025	
CPT-38	1	4.22	S15-CFIPTT.2477	NO			UK22	Target depth	pre	34.20	-1.80	-		30218-V1-300925-UK20-LP100.L23				30/09/2025	
CPT-39	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	8.80	-1.50	-		30218-V1-300925-UK20-LP100.L46				30/09/2025	
CPT-40	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	8.80	-1.50	-		30218-V1-300925-UK20-LP100.L48				30/09/2025	
CPT-41	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	0.10	-		30218-V1-300925-UK20-LP100.L24				30/09/2025	
CPT-42	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	0.10	-		30218-V1-300925-UK20-LP100.L25				30/09/2025	
CPT-43	1	4.22	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	0.10	-		30218-V1-300925-UK20-LP100.L26				30/09/2025	
CPT-44	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	8.80	-1.50	-		30218-V1-300925-UK20-LP100.L47				30/09/2025	
CPT-45	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	3.00	0.10	-		30218-V1-300925-UK20-LP100.L27				30/09/2025	
CPT-46	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L28				30/09/2025	
CPT-47	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L29				30/09/2025	
CPT-48	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L30				30/09/2025	
SPT-14	1	4.20	S15-CFIPTT.2477	NO			UK22	Target depth	pre	-19.00	0.70	-		30218-V1-300925-UK20-LP100.L33				30/09/2025	

CPT test plots are presented in Appendix C.

APPENDIX B GENERAL INFORMATION

LIST OF FIGURES

Cone calibration certificate: S15-CFIIP.2074

Cone calibration certificate: S15-CFIIP.2477

Data sheet: 17.9-tonne track-truck mounted CPT unit (UK20)

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Test Setup

Calibrated Instrument

Instrument type:	**Subtraction**	**Number of sensors:**	**5**
Serial number:	**DS15-CFIIPTT.2074**	**Manufacturer:**	**Eijkelkamp Geopoint**
Nominal cone area:	**15 cm²**	**Nominal sleeve area:**	**227 cm²**
Calibration standard:	**BS EN ISO 22476-1:2023**	**Location:**	**Lankelma Calibration Laboratory**
Calibration date:	**02 September 2025**	**Calibration expiry:**	**02 March 2026**

Sensor measurand	Calibration range	Maximum rating	Momentary overload	Sensor stability (60 sec)	Max drift before re-calibration
Cone resistance (qc)	66.67 MPa	100 MPa	100 MPa	± 0.45 kPa	4 bar
Sleeve friction (fs)	4.41 MPa	1.00 MPa*	1.00 MPa	± 0.07 kPa	0.04 bar
Pore pressure (u)	4 MPa	5 MPa	6.75 MPa	± 0.04 kPa	0.14 bar
Inclination (i)	20 °	90 °		± 0.05 °	
Temperature (t)	30 °C	90 °C		± 0.027 °C	
Magnetic field (m)					

** The maximum usable sleeve friction stress is limited by the physical strength of the sleeve.*

ISO 22476-22 Cone Penetrometer Classification

Sensor measurand	Measurement uncertainty $U_{qc:class}$, $U_{fs:class}$, $U_{u:class}$	Ambient temperature stability		Transient temperature stability		Bending influence Δb_{qc}, Δb_{fs}, Δb_u	Overall classification *(highest number represents penetrometer class)*
		Uncorrected Δa_{qc}, Δa_{fs}, Δa_u	Corrected Δa_{qcc}, Δa_{fsc}, Δa_{uc}	Uncorrected Δt_{qc}, Δt_{fs}, Δt_u	Corrected Δt_{qcc}, Δt_{fsc}, Δt_{uc}		
Cone resistance	0	2	0	2	1	0	1
Sleeve friction	0	2	0	2	0	0	0
Pore pressure	1	N/A	0	3	0	0	1

Calibration signed by:

P Metcalf

Calibration checked by:

A Harman

Cone penetrometer, serial number: DS15-CFIIPTT.2074 was found to comply with the requirements of BS EN ISO 22476-1:2023 for the following classifications:
Cone Resistance - Class 1 Sleeve Friction - Class 0 Pore Pressure - Class 1

Reference Instruments

Device	Serial number	Uncertainty of recorded value	Calibration date
AM DSCCHA-100 kN	66914	0.02 ±%	01/07/2025
AM DSCCHA-5 kN	61065	0.05 ±%	01/07/2025
Keithley 7.5 Digit DMM	4496826	12.00 PPM	10/06/2025
MMG1.0KV	563542	0.02 ±%	09/04/2025
ETI Ref Thermometer	D24276054	0.04 °C	17/09/2024
Lankelma HV6 Rotary Table	INC-JIG 01	0.10 °	17/07/2023
10 kg Calibration Weight	H1-S1 10kg	0.001 %	02/08/2024
Mitutoyo 200mm Caliper	A23044194	0.02 ±mm	14/06/2025

Calibration Standard

The calibration was performed according to BS EN ISO 22476-1:2023 & BS EN ISO 17025:2017 for the calibration of cone penetrometers.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation for each of the calibrated sensors has been carried out in accordance with BS EN ISO 22476-1:2023 requirements.

The report provides traceability of measurement to national standards and the SI system of units.

Clause 5.1.2 of BS EN ISO 22476-1:2023, states that the maximum period of validity of the calibration of the cone penetrometer shall not exceed 12 months. The cone penetrometer shall be recalibrated if the readings before a test show a zero baseline drift of over 2% of full scale output compared to the calibration zero load readings.

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Cone Dimension Verification

Cone Tip

Cone shoulder diameter

Rotational position	d_c
0 °	43.75 mm
120 °	43.76 mm
240 °	43.78 mm

Height of the cylindrical extension of the cone

Rotational position	h_e
0 °	11.33 mm
120 °	11.33 mm
240 °	11.33 mm

Height of the conical section of the cone

Rotational position	h_c
0 °	34.72 mm
120 °	34.72 mm
240 °	34.70 mm

Filter element diameter

Rotational position	d_{fil}
0 °	43.54 mm
120 °	43.54 mm
240 °	43.54 mm

Friction Sleeve

Friction sleeve diameter

Rotational position	Upper section d_{2u}	Middle section d_{2m}	Lower section d_{2l}
0 °	43.97 mm	43.99 mm	44.02 mm
120 °	43.97 mm	43.99 mm	44.03 mm
240 °	43.98 mm	44.00 mm	44.03 mm

Friction sleeve length

Rotational position	l_s
0 °	164.91 mm
120 °	164.91 mm
240 °	164.91 mm

Gap between the cone and the lower end of the friction sleeve

Rotational position	l_{gl}
0 °	2.80 mm
120 °	2.80 mm
240 °	2.80 mm

Gap above the upper end of the friction sleeve

Rotational position	l_{gu}
0 °	2.80 mm
120 °	2.80 mm
240 °	2.80 mm

Cone Tip Dimension Uncertainty

Reference device uncertainty u_r	0.015 mm
Average diameter d_c	43.763 mm
Relative error b_c	0.038 %
Area A_c	1504.218 mm^2
Dimension uncertainty U_{dc}	0.018 mm
Area uncertainty u_{AC}	1.225 mm^2
Expanded area uncertainty U_{AC}	2.450 mm^2

Friction Sleeve Dimension Uncertainty

Reference device uncertainty u_r	0.015 mm
Average diameter d_2	43.998 mm
Relative error b_{c2}	0.073 %
Average length l_s	164.910 mm
Relative error b_{ls}	0.000 %
Area A_s	22794.371 mm^2
Dimension uncertainty diameter u_{d2}	0.024 mm
Dimension uncertainty length u_{ls}	0.015 mm
Area uncertainty u_{as}	12.553 mm^2
Expanded area uncertainty U_{as}	25.106 mm^2
Sleeve length to diameter ratio	3.748
Diameter difference, sleeve - tip	0.234 mm

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Cone Resistance Calibration

Calibration method

1. The cone was loaded to full range 3 times for no less than 1 minute before calibration.
2. The cone was calibrated with 4 sets of increasing forces and 2 sets of decreasing forces, with rotation before set 3 and 5.
3. The coefficients of a linear and third order equation relating the the estimate of applied force as a function of the deflection were calculated and are shown in Table 1.
4. The forces applied, and the resulting deflections are given in Tables 2. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Ucqc and Uqc_class for each force is shown as a percentage of the recorded value and in units of pressure (kPa) as shown in Table 3.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

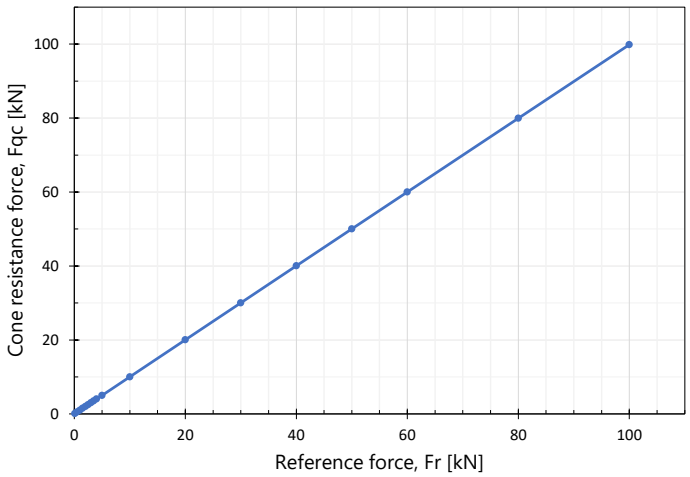
Cone Penetrometer	
Cone penetrometer type	Subtraction
Cone resistance capacity	150 kN
Calibration range	100 kN
Cone resistance effective resolution	0.0005 kN
Cone area	1,504 mm^2
Measured alpha factor cone area ratio	0.78
Historic drift between cone calibrations (u_{drift})	0.05774 %
Apparent pore pressure (u_a) at full range	2.06 kPa
Cone resistance max zero drift	3.32 kPa
Reference load cell max zero drift	2.27 kPa

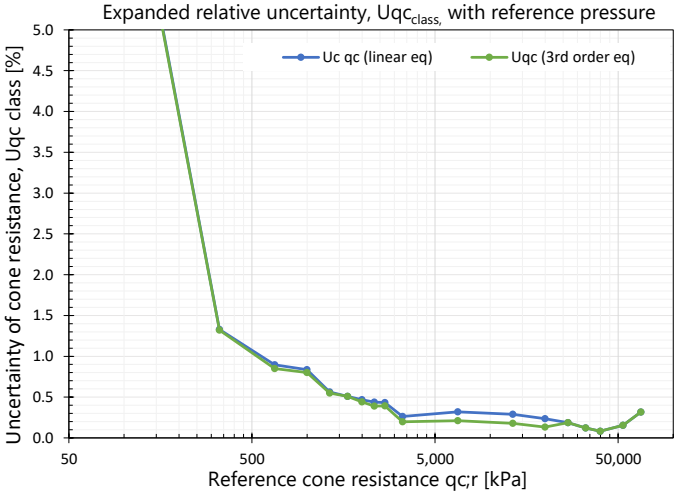
Calibration Conditions	
Ambient temperature	25.6 °C
Ambient temperature variation	0.26 °C
Instrument temperature variation	0.32 °C

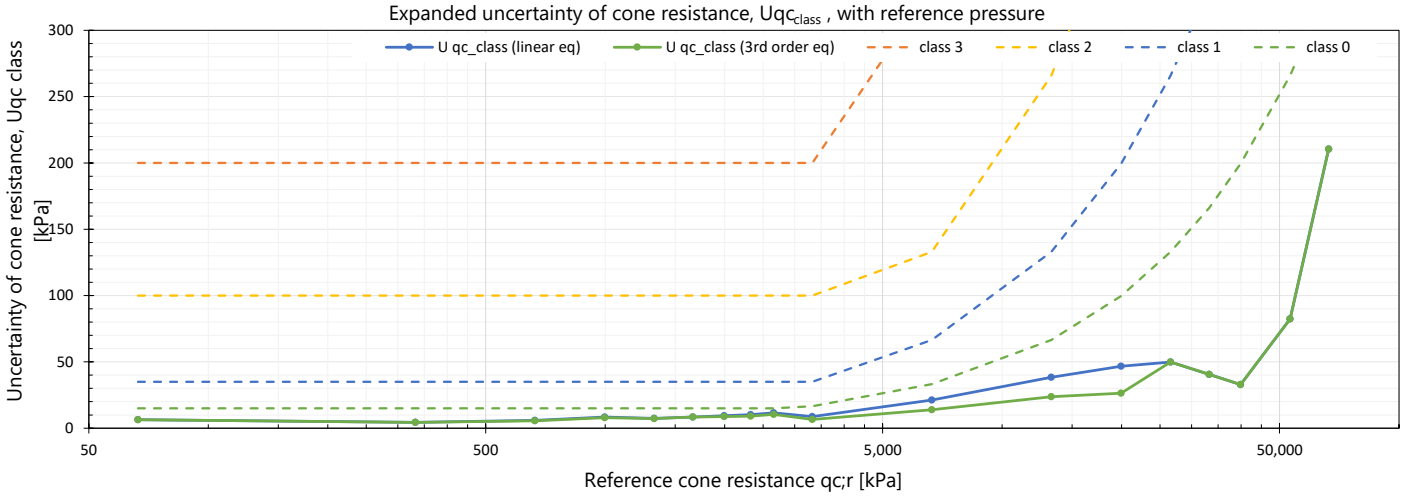
Reference Load Cell Uncertainty	
AM DSCCHA-100 kN	0.02 ±%
AM DSCCHA-5 kN	0.05 ±%

Reference Indicator Uncertainty	
Keithley 7.5 Digit DMM	12 PPM

Cone Resistance Calibration - Graphical Results







Interpolation

Table - 1

Linear Equation	*The cone output in force units of D (0.1 N) is derived using a linear factor from the raw cone output. D = Factor x RAW_Output*	0.1 N Factor = 0.00911
Polynomial Equation	*3rd order polynomial equation. For a given cone indicated output of D (in 0.1 N units), the corrected applied force, F (in 0.1 N units) is calculated from :*	a0 = 0 a1 = 0.999401292 a2 = -8.10774E-09 a3 = 2.04665E-14 *Polynomial calc. is only to be used when the cone load is under 30 kN*

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Cone Resistance Calibration - Tabular Results

Table - 2a **Low range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
0	0.0026	0.0044	0.0013		0.0050	
0.1	0.1021	0.0996	0.1040		0.0982	
0.5	0.5004	0.4994	0.5007		0.4989	
1	1.0036	1.0050	1.0006		0.9988	
1.5	1.5046	1.5058	1.5013		1.4966	
2	2.0012	2.0037	2.0010		1.9973	
2.5	2.4997	2.5071	2.5002		2.4981	
3	3.0018	3.0086	3.0025		2.9979	
3.5	3.5032	3.5091	3.5030		3.4990	
4	4.0040	4.0106	4.0019		3.9982	
5	5.0041	5.0089	5.0001		5.0001	
4				3.9991		3.9927
3.5				3.5010		3.4959
3				3.0004		2.9912
2.5				2.4993		2.4917
2				1.9994		1.9883
1.5				1.4986		1.4897
1				0.9985		0.9877
0.5				0.4983		0.4905
0.1				0.0988		0.0895

Table -2b **High range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
10	10.0157	10.0116	10.0073		10.0022	
20	20.0237	20.0169	20.0118		20.0098	
30	30.0220	30.0218	30.0129		30.0094	
40	40.0444	40.0397	40.0304		40.0279	
50	50.0322	50.0333	50.0226		50.0182	
60	60.0243	60.0165	60.0000		59.9950	
80	79.9576	79.9524	79.9407		79.9338	
100	99.8597	99.8554	99.8413		99.8333	
80				79.9563		79.9497
60				60.0213		60.0142
50				50.0375		50.0281
40				40.0418		40.0346
30				30.0244		30.0177
20				20.0189		20.0096
10				10.0133		9.9998

Table - 3 **Uncertainty assessment**

Reference force	Reference tip resistance	Standard uncertainty u1 - u8								Combined standard calibration uncertainty		Expanded calibration uncertainty [k=2]				BS EN ISO 22476:2023 class	Tip calibration drift
kN	kPa	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kPa	%	kPa	%		kPa
Fr	qc;r	u1*	u2	u3	u4	u5	u6	u7	u8	uc	uc;dim	Uc qc		Uqc class		Cone Class **	u_{drift}***
0	0	0.0000	0.0011	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0011	0.0011	1.5		1.5		0	0.0
0.1	66	0.0004	0.0017	0.0015	0.0002	0.0000	0.0014	0.0040	0.0000	0.0048	0.0048	6.4	9.62	6.4	9.62	0	0.0
0.5	332	0.0006	0.0005	0.0006	0.0002	0.0000	0.0000	0.0031	0.0000	0.0033	0.0033	4.4	1.33	4.4	1.32	0	0.2
1	665	0.0007	0.0012	0.0008	0.0002	0.0001	0.0010	0.0038	0.0000	0.0043	0.0043	5.8	0.87	5.7	0.85	0	0.4
1.5	997	0.0048	0.0021	0.0007	0.0002	0.0001	0.0008	0.0028	0.0000	0.0060	0.0061	8.2	0.82	8.0	0.80	0	0.6
2	1,330	0.0041	0.0011	0.0015	0.0002	0.0001	0.0002	0.0031	0.0000	0.0055	0.0057	7.6	0.57	7.3	0.55	0	0.8
2.5	1,662	0.0041	0.0008	0.0043	0.0002	0.0001	0.0007	0.0021	0.0000	0.0064	0.0067	8.9	0.54	8.5	0.51	0	1.0
3	1,994	0.0044	0.0014	0.0039	0.0002	0.0002	0.0007	0.0026	0.0000	0.0066	0.0070	9.4	0.47	8.8	0.44	0	1.2
3.5	2,327	0.0053	0.0013	0.0034	0.0002	0.0002	0.0017	0.0015	0.0000	0.0068	0.0074	9.8	0.42	9.1	0.39	0	1.3
4	2,659	0.0061	0.0013	0.0038	0.0002	0.0002	0.0014	0.0024	0.0000	0.0078	0.0085	11.3	0.42	10.4	0.39	0	1.5
5	3,324	0.0023	0.0008	0.0028	0.0002	0.0003	0.0014	0.0029	0.0000	0.0049	0.0064	8.5	0.25	6.5	0.20	0	1.9
10	6,648	0.0046	0.0026	0.0024	0.0002	0.0005	0.0084	0.0024	0.0000	0.0105	0.0133	17.7	0.27	14.0	0.21	0	3.8
20	13,296	0.0079	0.0029	0.0039	0.0002	0.0010	0.0151	0.0021	0.0000	0.0178	0.0242	32.1	0.24	23.7	0.18	0	7.7
30	19,944	0.0108	0.0050	0.0001	0.0002	0.0015	0.0148	0.0057	0.0000	0.0198	0.0315	41.8	0.21	26.4	0.13	0	11.5
40	26,592	0.0133	0.0052	0.0027	0.0002	0.0020	0.0342	0.0052	0.0000	0.0376	0.0497	66.1	0.25	50.0	0.19	0	15.4
50	33,240	0.0163	0.0041	0.0006	0.0002	0.0025	0.0243	0.0072	0.0000	0.0305	0.0509	67.7	0.20	40.6	0.12	0	19.2
60	39,888	0.0179	0.0091	0.0045	0.0002	0.0030	0.0064	0.0117	0.0000	0.0247	0.0548	72.8	0.18	32.9	0.08	0	23.0
80	53,184	0.0232	0.0071	0.0030	0.0002	0.0040	0.0560	0.0091	0.0000	0.0619	0.0899	119.5	0.22	82.3	0.15	0	30.7
100	66,480	0.0281	0.0078	0.0025	0.0002	0.0050	0.1555	0.0000	0.0000	0.1583	0.1780	236.7	0.36	210.4	0.32	0	38.4

The class of the penetrometer is determined from the measurement uncertainty at any deflection
At each given deflection the expanded measurement uncertainty Uqc_class is calculated from the readings obtained during calibration.

$$Uqc_{class} = \frac{2}{S} \times \sqrt{\sum_{i=1}^{8} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration force.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the repeatability of the calibration results.
u4 is the standard uncertainty associated with the resolution and noise of the system.
u5 is the standard uncertainty associated with the drift in zero output.
u6 is the standard uncertainty associated with interpolation.
u7 is the standard uncertainty associated with reversibility.
u8 is the standard uncertainty associated with apparent load transfer from other sensor.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Uqc_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Sleeve Friction Calibration

Calibration method

1. The sleeve was loaded to full range 3 times for no less than 1 minute before calibration.
2. The sleeve was calibrated with 4 sets of increasing forces and 2 sets of decreasing forces, with rotation before set 3 and 5.
3. The coefficients of a linear and third order equation relating the estimate of applied force as a function of the deflection were calculated and are shown in Table 4.
4. The forces applied, and the resulting deflections are given in Tables 5. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Ucfs and Ufs_class for each force is shown as a percentage of the recorded value and in units of pressure (kPa) as shown in Table 6.

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

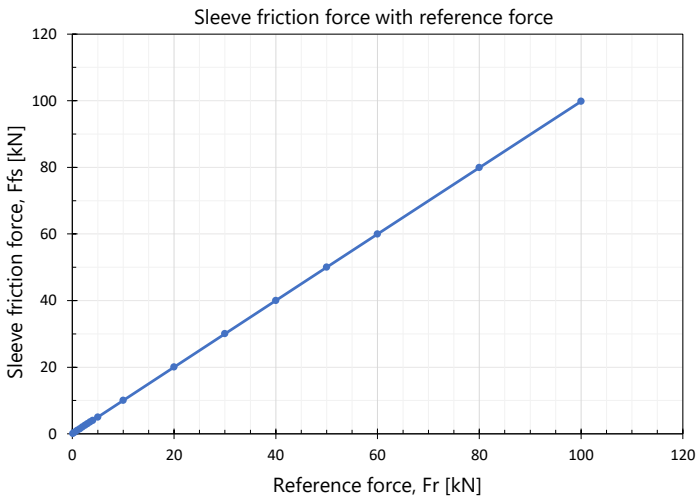
Cone Penetrometer	
Cone penetrometer type	Subtraction
Sleeve friction capacity	150 kN
Calibration range	100 kN
Sleeve friction effective resolution	0.005 kN
Sleeve area	22,794 mm^2
Measured beta factor sleeve area ratio	0.000
Historic drift between sleeve calibrations (u_{drift})	0.0262 %
Apparent pore pressure (u_a) at full range	2.06 kPa
Sleeve friction max zero drift	0.56 kPa
Reference load cell max zero drift	0.15 kPa

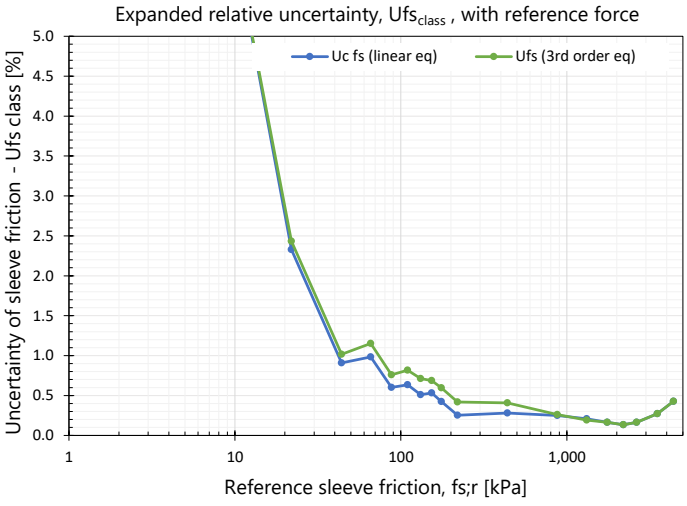
Calibration Conditions	
Ambient temperature	25.6 °C
Ambient temperature variation	0.26 °C
Instrument temperature variation	0.38 °C

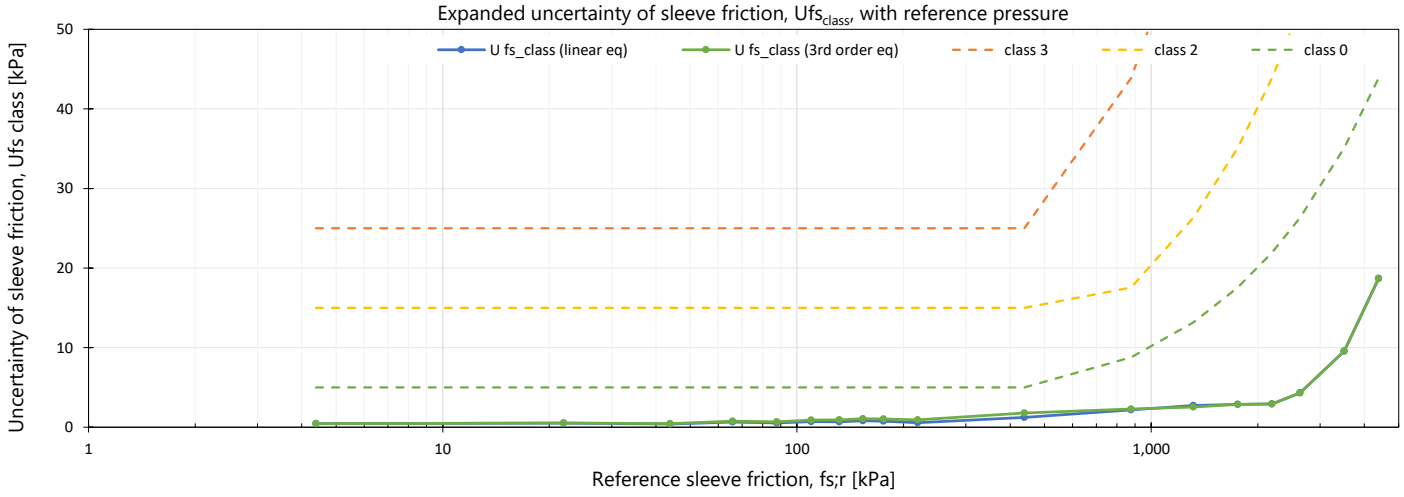
Reference Load Cell Uncertainty	
AM DSCCHA-100 kN	0.02 ±%
AM DSCCHA-5 kN	0.05 ±%

Reference Indicator Uncertainty	
Keithley 7.5 Digit DMM	12 PPM

Sleeve Friction Calibration - Graphical Results







Interpolation

Table - 4

Linear Equation	*The sleeve output in force units D (0.1 N) is derived using a linear factor from the raw sleeve output. D = Factor x RAW_Output*	0.1 N Factor = 0.008809
Polynomial Equation	*3rd order polynomial equation. For a given cone indicated output of D (0.1 N units), the corrected applied force, F (in 0.1 N units) is calculated from :*	a0 = 0 a1 = 0.998174028 a2 = 2.45123E-09 a3 = 1.43887E-15 *Polynomial calc. is only to be used when the sleeve load is under 30 kN*

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Sleeve Friction Calibration - Tabular Results

Table - 6a **Low range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
0	0.0128	0.0092	0.0040		0.0017	
0.1	0.0997	0.1072	0.1019		0.1022	
0.5	0.4959	0.5047	0.5005		0.4994	
1	0.9975	1.0033	0.9988		0.9999	
1.5	1.4961	1.5042	1.4974		1.4971	
2	1.9962	2.0024	1.9980		1.9956	
2.5	2.4940	2.5038	2.4970		2.4941	
3	2.9953	3.0038	2.9946		2.9946	
3.5	3.4929	3.5038	3.4974		3.4954	
4	3.9950	4.0026	3.9958		3.9928	
5	4.9938	5.0013	4.9956		4.9938	
4				3.9973		3.9965
3.5				3.4999		3.5006
3				3.0011		2.9958
2.5				2.5017		2.4982
2				1.9992		1.9979
1.5				1.4990		1.4985
1				1.0004		0.9958
0.5				0.5022		0.4983
0.1				0.1052		0.1020

Table - 6b **High range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
10	9.9928	10.0009	9.9935		9.9902	
20	19.9965	20.0006	19.9941		19.9910	
30	30.0195	30.0327	30.0219		30.0181	
40	40.0194	40.0285	40.0180		40.0126	
50	50.0031	50.0162	50.0060		49.9995	
60	59.9865	59.9948	59.9747		59.9674	
80	79.9112	79.9187	79.9048		79.8950	
100	99.8044	99.8127	99.7954		99.7871	
80				79.9288		79.9214
60				60.0101		60.0086
50				50.0340		50.0293
40				40.0434		40.0412
30				30.0449		30.0467
20				20.0115		20.0093
10				10.0071		9.9989

Table - 6 **Uncertainty assessment**

Reference force	**Reference sleeve friction**	**Standard uncertainty u1 - u8**								**Combined standard calibration uncertainty**		**Expanded calibration uncertainty [k=2]**				**BS EN ISO 22476:2023 Class**	**Sleeve calibration drift**
kN	kPa	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kPa	%	kPa	%		kPa
Fr	fs;r	u1*	u2	u3	u4	u5	u6	u7	u8	uc	uc;dim	Uc_{fs}		Ufs_{class}		Cone Class **	u_{drift}***
0	0	0.0000	0.0034	0.0000	0.0020	0.0000	0.0000	0.0000	0.0000	0.0040	0.0040	0.35		0.35		0	0.00
0.1	4	0.0004	0.0008	0.0042	0.0020	0.0000	0.0013	0.0010	-0.0002	0.0050	0.0050	0.44	10.05	0.44	10.05	0	0.00
0.5	22	0.0006	0.0014	0.0051	0.0020	0.0001	0.0014	0.0008	-0.0014	0.0061	0.0061	0.53	2.43	0.53	2.43	0	0.01
1	44	0.0007	0.0007	0.0034	0.0020	0.0001	0.0013	0.0016	-0.0022	0.0051	0.0051	0.45	1.02	0.45	1.02	0	0.01
1.5	66	0.0048	0.0004	0.0047	0.0020	0.0002	0.0031	0.0009	-0.0039	0.0086	0.0087	0.76	1.16	0.76	1.16	0	0.02
2	88	0.0041	0.0007	0.0035	0.0020	0.0003	0.0034	0.0010	-0.0032	0.0076	0.0077	0.67	0.77	0.67	0.77	0	0.02
2.5	110	0.0041	0.0010	0.0057	0.0020	0.0003	0.0050	0.0026	-0.0043	0.0102	0.0103	0.90	0.82	0.90	0.82	0	0.03
3	132	0.0044	0.0002	0.0049	0.0020	0.0004	0.0052	0.0022	-0.0059	0.0107	0.0108	0.95	0.72	0.94	0.72	0	0.03
3.5	154	0.0053	0.0013	0.0063	0.0020	0.0004	0.0048	0.0023	-0.0065	0.0120	0.0122	1.07	0.70	1.05	0.70	0	0.04
4	175	0.0061	0.0009	0.0044	0.0020	0.0005	0.0055	0.0015	-0.0069	0.0119	0.0121	1.06	0.61	1.05	0.61	0	0.05
5	219	0.0023	0.0006	0.0043	0.0020	0.0006	0.0056	0.0011	-0.0070	0.0105	0.0109	0.95	0.43	0.92	0.43	0	0.06
10	439	0.0046	0.0010	0.0047	0.0020	0.0013	0.0078	0.0064	-0.0162	0.0203	0.0211	1.85	0.42	1.78	0.42	0	0.11
20	877	0.0079	0.0016	0.0024	0.0020	0.0026	0.0062	0.0103	-0.0212	0.0260	0.0282	2.48	0.28	2.28	0.28	0	0.23
30	1,316	0.0108	0.0011	0.0076	0.0020	0.0038	0.0198	0.0149	0.0051	0.0289	0.0333	2.92	0.22	2.53	0.22	0	0.34
40	1,755	0.0133	0.0021	0.0053	0.0020	0.0051	0.0166	0.0156	-0.0176	0.0327	0.0394	3.46	0.20	2.87	0.20	0	0.46
50	2,194	0.0163	0.0019	0.0076	0.0020	0.0064	0.0029	0.0167	-0.0215	0.0335	0.0433	3.80	0.17	2.94	0.17	0	0.57
60	2,632	0.0179	0.0056	0.0048	0.0020	0.0077	0.0238	0.0221	-0.0303	0.0491	0.0592	5.19	0.20	4.31	0.20	0	0.69
80	3,510	0.0232	0.0047	0.0043	0.0020	0.0103	0.0965	0.0146	-0.0404	0.1088	0.1174	10.30	0.29	9.55	0.29	0	0.92
100	4,387	0.0281	0.0050	0.0048	0.0020	0.0128	0.2048	0.0000	-0.0492	0.2130	0.2200	19.30	0.44	18.69	0.44	0	1.15

The class of the penetrometer is determined from the measurement uncertainty at any deflection.
At each given deflection the expanded measurement uncertainty Ufs_class is calculated from the readings obtained during calibration.

$$Ufs_{class} = \frac{2}{S} \times \sqrt{\sum_{i=1}^{8} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration force.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the repeatability of the calibration results.
u4 is the standard uncertainty associated with the resolution and noise of the system.
u5 is the standard uncertainty associated with the drift in zero output.
u6 is the standard uncertainty associated with interpolation.
u7 is the standard uncertainty associated with reversibility.
u8 is the standard uncertainty associated with apparent load transfer from other sensor. Includes subtraction error where: Fr;qc = Fr;fs.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Ufs_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

Sleeve Friction Calibration - Subtraction Error

In use, the forces acting on the sleeve load cell element are a combination of tip resistance and sleeve friction, with the tip resistance force value from the tip load cell element being subtracted to give the sleeve friction value. The resultant error values for differing tip and sleeve values are shown in Table 7.

The highlighted cell results in Table 7, show a direct reading of the subtraction error from the calibration results.

The non-highlighted cells in Table 7, show an interpolated subtraction error from the calibration results.

Sleeve friction - tip subtraction combined standard uncertainty uc_sub, where friction ratio is between 0.1% and 10%.

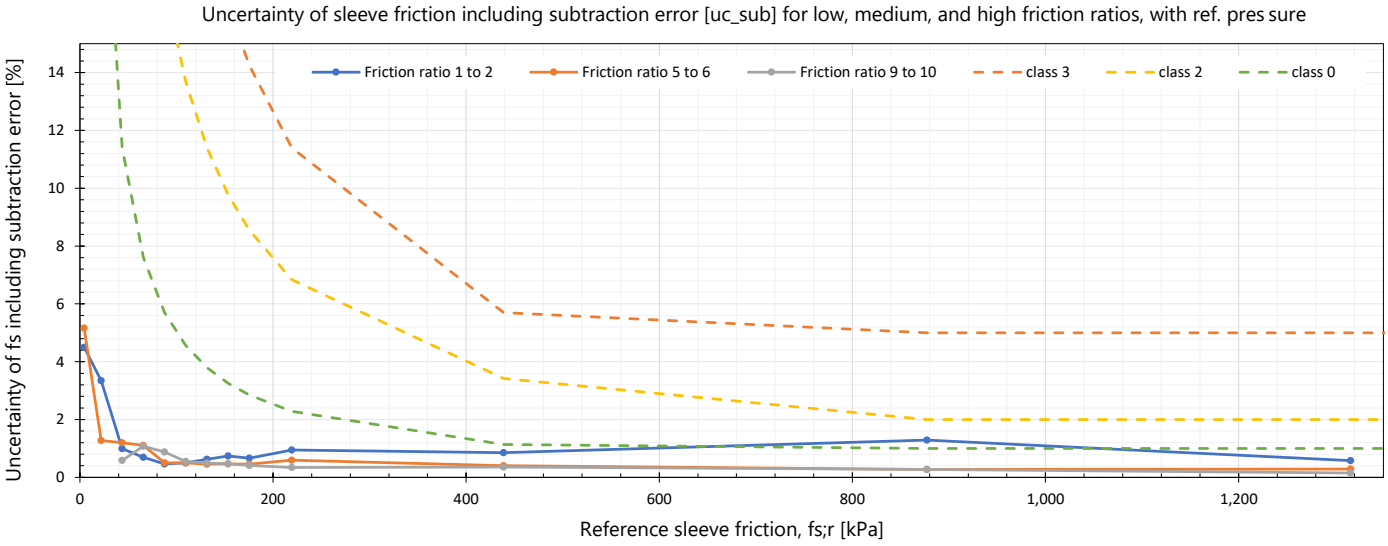
Table - 7

Sleeve friction combined standard uncertainty including subtraction error (%)

Tip resistance kPa ↓ / Sleeve friction kPa →	4	22	44	66	88	110	132	154	175	219	439	877	1,316
66	5.16	-	-	-	-	-	-	-	-	-	-	-	-
332	4.50	***1.27***	-	-	-	-	-	-	-	-	-	-	-
665	4.42	***2.55***	***1.20***	***1.08***	-	-	-	-	-	-	-	-	-
997	3.48	***2.36***	***1.60***	***1.11***	***0.88***	-	-	-	-	-	-	-	-
1,330	4.92	***3.01***	***1.57***	***1.11***	***0.86***	0.55	0.50	-	-	-	-	-	-
1,662	4.60	***3.03***	***1.61***	0.69	0.50	0.53	0.49	0.48	-	-	-	-	-
1,994	3.75	***3.51***	***1.82***	0.63	***0.84***	0.50	0.46	0.45	0.41	-	-	-	-
2,327	3.86	***3.83***	0.53	0.64	0.46	0.50	0.46	0.45	0.41	0.33	-	-	-
2,659	4.27	1.19	***1.75***	0.67	0.48	0.52	0.47	0.47	0.42	0.34	-	-	-
3,324	5.60	1.45	0.70	0.75	0.55	0.57	0.52	0.50	0.46	***0.59***	-	-	-
6,648	-	1.11	0.53	0.64	0.46	0.51	0.46	0.46	0.42	0.33	***0.41***	-	-
13,296	-	3.08	1.51	1.30	0.96	0.90	0.79	0.74	0.66	0.53	***0.34***	***0.20***	0.15
19,944	-	11.32	5.63	4.04	3.02	2.55	2.16	1.91	1.69	1.35	***0.35***	***0.17***	***0.29***
26,592	-	-	4.86	3.53	2.63	2.24	1.91	1.69	1.50	1.20	***0.65***	***0.23***	0.39
33,240	-	-	5.96	4.26	3.18	2.68	2.27	2.01	1.77	1.42	***0.97***	0.54	***0.76***
39,888	-	-	6.57	4.67	3.49	2.92	2.48	2.18	1.93	1.54	0.94	***1.06***	0.44
53,184	-	-	-	5.98	4.47	3.71	3.13	2.75	2.42	1.94	1.14	***1.81***	0.51
66,480	-	-	-	-	5.52	4.55	3.83	3.35	2.94	2.36	1.35	0.78	0.58

Friction ratio (for a given row) →

Friction ratio (for a given column) ↑



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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Pore Pressure Calibration

Calibration method

1. The cone penetrometer was placed in a pressure vessel and was pressurised to full range 3 times for no less than 1 minute before calibration.
2. The pore pressure was calibrated with 2 sets of increasing pressures and 2 sets of decreasing pressures.
3. The coefficients of a linear and third order equation relating the estimate of applied pressure as a function of deflection were calculated and are shown in Table 8.
4. The pressures applied, and the resulting deflections are given in Tables 9. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Uu and Uu_class for each force is shown as a percentage of the recorded value and in units of pressure kPa as shown in Table 10.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

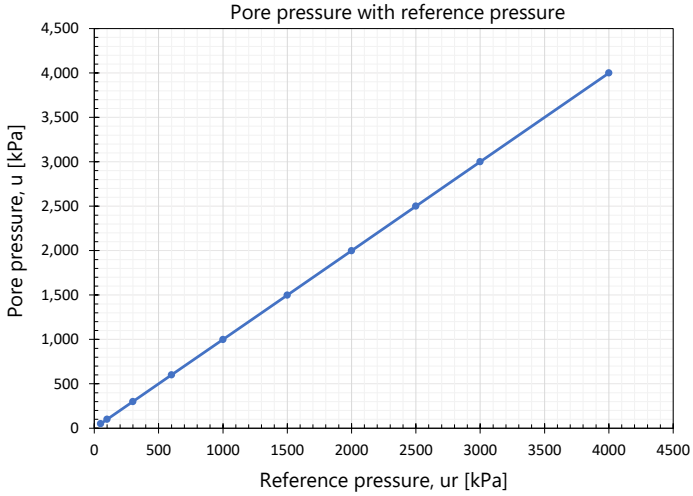
Cone Penetrometer		
Pore pressure sensor capacity	5	MPa
Calibration range	4	MPa
Pore pressure resolution	0.005	kPa
Historic drift between pore calibrations (u_{drift})	0.05774	%
Pore pressure sensor max zero drift	1.94	kPa
Reference pressure sensor max zero drift	0.18	kPa

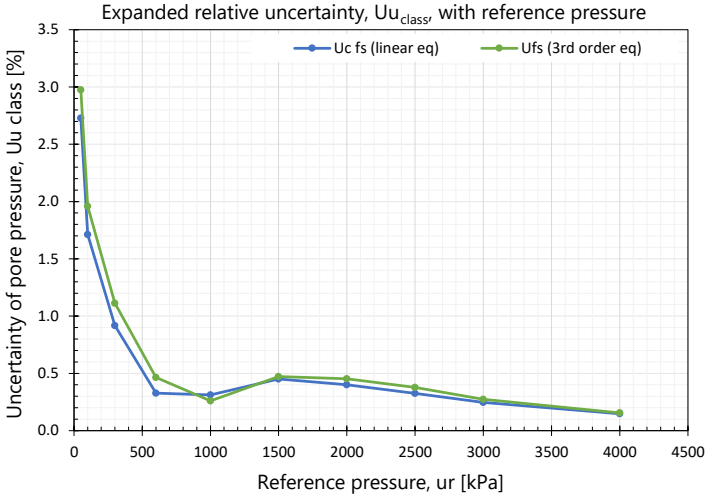
Calibration Conditions		
Ambient temperature	24.2	°C
Pressure chamber temperature variation	0.32	°C
Instrument temperature variation	0.11	°C

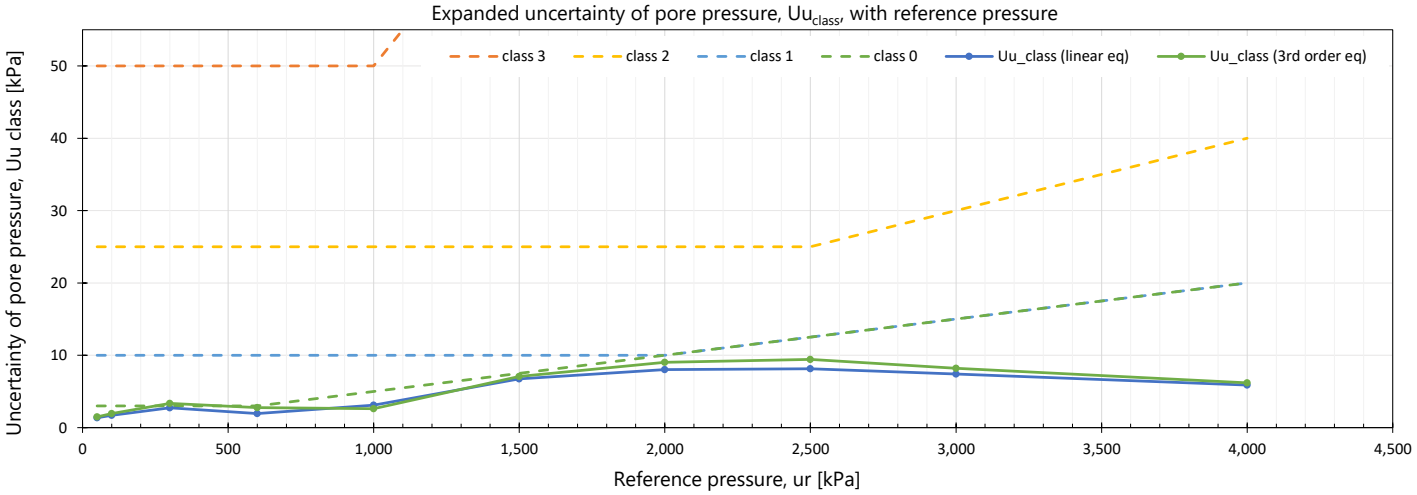
Reference Pressure Sensor Uncertainty		
MMG1.0KV	0.02	±%

Reference Indicator Uncertainty		
Keithley 7.5 Digit DMM	12	PPM

Pore Pressure Calibration - Graphical Results







Interpolation

Table - 8

Linear Equation	*The pore pressure output in pressure units D (0.1 Pa) is derived using a linear factor from the raw pore pressure output. D = Factor x RAW_Output*	0.1 Pa Factor = 0.045187
Polynomial Equation	*3rd order polynomial equation. For a given cone indicated output of D (0.1 Pa units), the corrected applied pressure, P (in 0.1 Pa units) is calculated from :* $P = (a3 \times D^3) + (a2 \times D^2) + (a1 \times D) + a0$	a0 = -488.0191932 a1 = 1.002921874 a2 = -2.94475E-10 a3 = 5.83415E-18

Pore Pressure Calibration - Tabular Results

Table - 9 **Calibration results**

kPa ur	kPa X1	kPa X2'	kPa X3	kPa X4'
0	1.94		1.01	
50	50.49		50.59	
100	100.57		100.71	
300	301.06		301.08	
600	600.83		601.20	
1000	999.14		999.95	
1500	1497.45		1498.59	
2000	1997.01		1998.36	
2500	2497.00		2498.17	
3000	2997.88		2998.55	
4000	4000.42		4001.94	
3000		3002.94		3004.07
2500		2503.32		2504.36
2000		2003.16		2004.49
1500		1502.01		1503.28
1000		1000.48		1001.71
600		599.07		600.09
300		298.22		299.52
100		99.01		99.69
50		49.52		49.77

Table - 10 **Uncertainty assessment**

Reference pressure	**Standard uncertainty u1 to u6**						**Combined standard calibration uncertainty**		**Expanded calibration uncertainty [k=2]**				**BS EN ISO 22476:2023 class**	**Pore calibration drift**
kPa ur	kPa u1*	kPa u2	kPa u3	kPa u4	kPa u5	kPa u6	kPa u_i	%	kPa U_u	%	kPa Uu_{class}	%	Cone Class **	kPa u_{drift}***
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0	0.00
50	0.02	0.06	0.00	0.02	0.54	0.51	0.74	1.49	1.49	2.98	1.49	2.98	0	0.03
100	0.05	0.08	0.00	0.05	0.64	0.74	0.98	0.98	1.96	1.96	1.96	1.96	0	0.06
300	0.14	0.01	0.00	0.15	1.07	1.27	1.67	0.56	3.34	1.11	3.34	1.11	1	0.17
600	0.29	0.21	0.00	0.29	1.02	0.83	1.39	0.23	2.78	0.46	2.78	0.46	0	0.35
1000	0.48	0.47	0.00	0.48	0.46	0.90	1.30	0.13	2.60	0.26	2.60	0.26	0	0.58
1500	0.72	0.66	0.00	0.73	1.98	2.67	3.54	0.24	7.08	0.47	7.08	0.47	0	0.87
2000	0.96	0.78	0.00	0.97	2.32	3.55	4.52	0.23	9.04	0.45	9.04	0.45	0	1.15
2500	1.20	0.68	0.00	1.21	2.41	3.61	4.72	0.19	9.43	0.38	9.43	0.38	0	1.44
3000	1.44	0.39	0.00	1.45	1.79	3.06	4.11	0.14	8.22	0.27	8.22	0.27	0	1.73
4000	1.92	0.88	0.00	1.94	1.18	0.00	3.10	0.08	6.20	0.16	6.20	0.16	0	2.31

The class of the penetrometer is determined from the measurement uncertainty at any deflection

At each given deflection the expanded measurement uncertainty Uu_class is calculated from the readings obtained during calibration.

$$Uu_{class} = 2 \times \sqrt{\sum_{i=1}^{6} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration pressure.
u2 is the standard uncertainty associated with the repeatability of the calibration results.
u3 is the standard uncertainty associated with the resolution and noise of the system.
u4 is the standard uncertainty associated with the drift in zero output.
u5 is the standard uncertainty associated with interpolation.
u6 is the standard uncertainty associated with reversibility.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Uu_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

Pore Pressure Calibration - Measured Area Ratios

Calibration method

1. The apparent cone resistance qc;a and apparent sleeve friction fs;a are recorded for all pore pressure calibration intervals, and shown in Table 11a and 11b.
2. The resulting net area ratios of the cone *a* and net area ratios of the sleeve *b* are computed and shown in Table 11a and 11b.
3. The final recorded cone net area ratio *a* and sleeve net area ration *b* are shown in Table 12, where reference pressure ur = 2000kPa

Table - 11a **Cone net area ratio assessment**

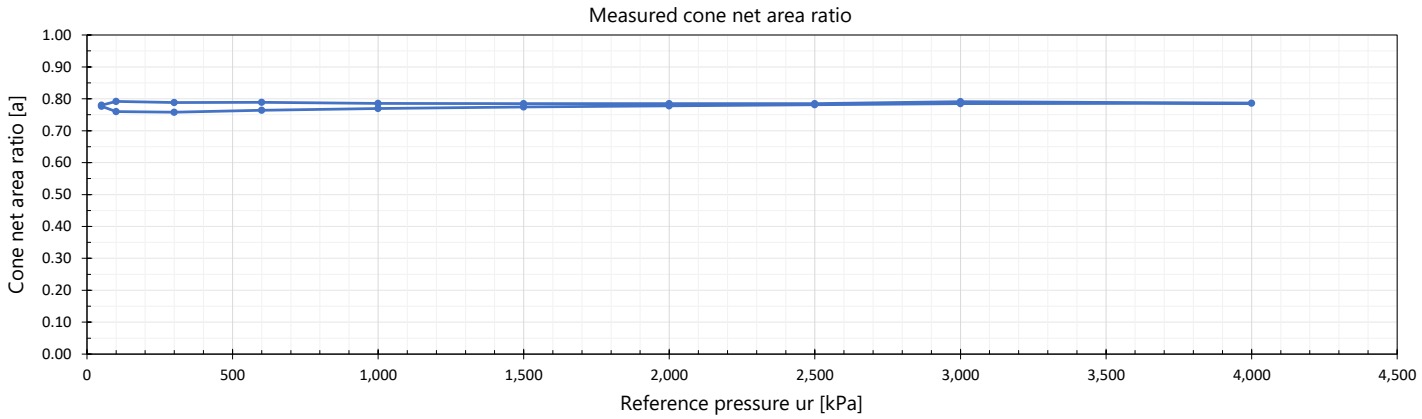
	Apparent cone resistance [qc;a]					
kPa ur	kPa X1	kPa X2'	kPa X3	kPa X4'	kPa Mean	Alpha factor
50	39.3		38.4		38.8	0.78
100	76.9		75.1		76.0	0.76
300	228.1		226.8		227.4	0.76
600	460.1		457.2		458.7	0.76
1000	771.8		767.6		769.7	0.77
1500	1163.8		1159.5		1161.7	0.77
2000	1557.7		1555.4		1556.5	0.78
2500	1954.2		1953.9		1954.1	0.78
3000	2356.0		2351.8		2353.9	0.78
4000	3160.5		3131.1		3145.8	0.79
3000		2373.8		2373.1	2373.4	0.79
2500		1963.01		1962.91	1963.0	0.79
2000		1570.53		1568.37	1569.4	0.78
1500		1176.8		1177.69	1177.2	0.78
1000		785.752		785.324	785.5	0.79
600		473.456		473.18	473.3	0.79
300		236.879		235.934	236.4	0.79
100		79.3271		79.0373	79.2	0.79
50		39.348		38.6377	39.0	0.78

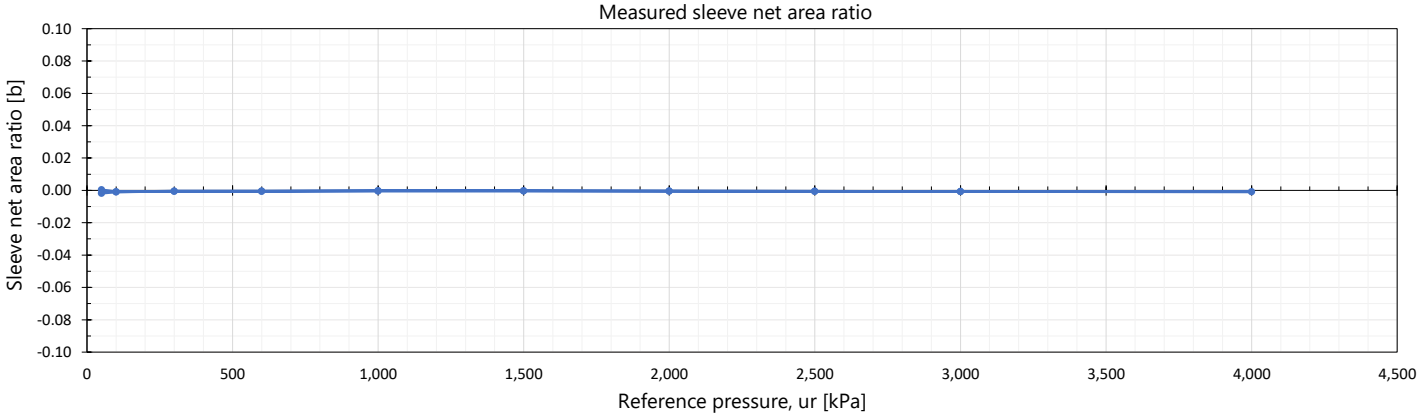
Table - 11b **Sleeve friction net area ratio assessment**

	Apparent sleeve friction [fs;a]					
kPa ur	kPa X1	kPa X2'	kPa X3	kPa X4'	kPa Mean	Beta factor
50	-0.15		-0.02		-0.09	-0.002
100	-0.16		-0.04		-0.10	-0.001
300	-0.20		-0.10		-0.15	0.000
600	-0.27		-0.21		-0.24	0.000
1000	-0.30		-0.11		-0.20	0.000
1500	-0.65		-0.32		-0.48	0.000
2000	-1.02		-0.66		-0.84	0.000
2500	-1.44		-1.22		-1.33	-0.001
3000	-2.13		-1.91		-2.02	-0.001
4000	-3.64		-3.57		-3.60	-0.001
3000		-2.22		-2.10	-2.16	-0.001
2500		-1.61		-1.56	-1.59	-0.001
2000		-1.03		-0.95	-0.99	0.000
1500		-0.48		-0.51	-0.50	0.000
1000		-0.37		-0.43	-0.40	0.000
600		-0.30		-0.32	-0.31	-0.001
300		-0.17		-0.16	-0.16	-0.001
100		-0.04		-0.13	-0.09	-0.001
50		0.00		0.03	0.02	0.000

Table - 12

Cone net area ratio [a]	0.78
Sleeve friction net area ratio [b]	0.000





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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Inclination Calibration

Calibration method

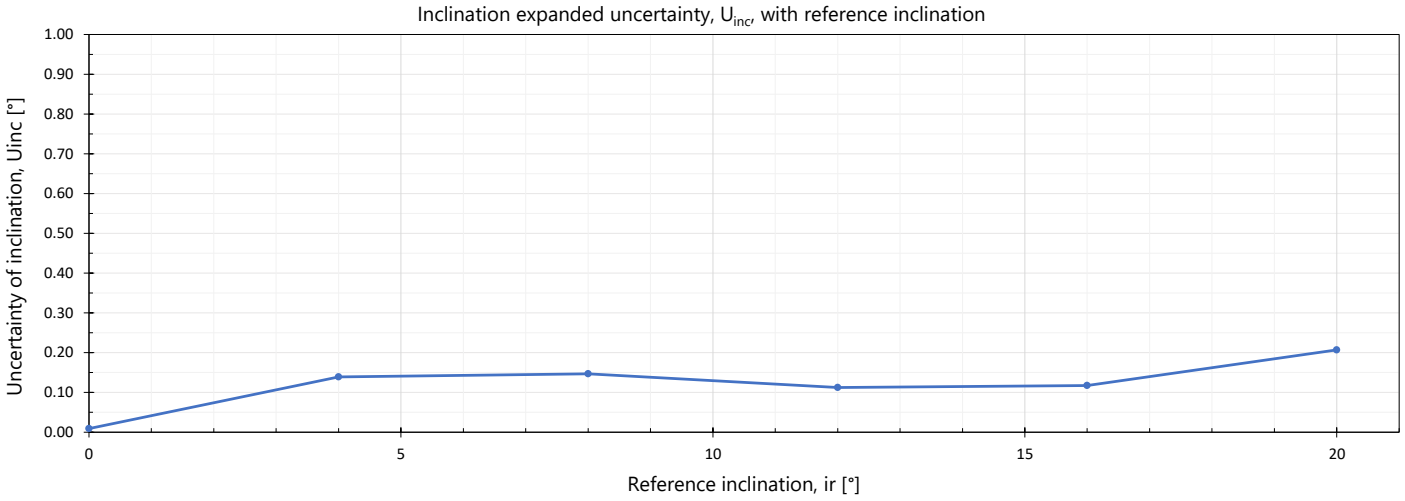
1. The cone penetrometer was placed in the inclination calibration frame and set to a vertical reference inclination of ir = 0°.
2. The inclination was calibrated from ir = 0° to ir = 20°. This was conducted twice, once with the cone at 0° rotation and once with the cone at 90° rotation.
3. The coefficients of a linear equation relating the estimate of the inclination as a function of raw sensor deflection were calculated and are shown in Table 13.
4. The inclination angle applied, and the resulting measurements are given in Table 14.
5. The combined expanded uncertainty* of measurement Uinc for each inclination angle is shown as a percentage of the recorded value and in units of arc degrees °, as shown in Table 15.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Cone Penetrometer	
Inclination sensor range	90 °
Calibration range	20 °
Inclination resolution	0.005 °
Inclinometer number of axis	2

Reference Inclination Rotary Table Uncertainty	
Lankelma HV6 Rotary Table	0.10 °

Inclination - Graphical Results



Interpolation

Table - 13

Linear Equation	*The Inclination output in angular units (0.1° x 10^{-3}) is derived using a linear factor from the raw inclination output.*	X axis Factor =	9.767193
		Y axis Factor =	9.790029

Inclination Calibration - Tabular Results

Table - 14

Inclination calibration

° ir	° θ0	° θ90
0	0.00	0.00
4	4.00	4.11
8	7.91	7.95
12	11.94	11.96
16	16.02	15.91
20	20.08	20.13

Table - 15

Uncertainty assessment

Reference Inclination	Standard calibration uncertainty u1 to u4				Combined standard calibration uncertainty ui		Expanded calibration uncertainty Uinc [k=2]	
° ir	° u1	° u2	° u3	° u4	°	% u_i	°	% U_{inc}
0	0.00	0.00	0.00	0.00	0.00		0.01	
4	0.01	0.04	0.00	0.06	0.07	1.74	0.14	3.47
8	0.02	0.01	0.00	-0.07	0.07	0.92	0.15	1.84
12	0.02	0.01	0.00	-0.05	0.06	0.47	0.11	0.94
16	0.02	0.04	0.00	-0.04	0.06	0.37	0.12	0.73
20	0.02	0.02	0.00	0.10	0.10	0.52	0.21	1.03

At each given deflection the expanded measurement uncertainty Uinc is calculated from the readings obtained during calibration.

$$U_{inc} = 2 \times \sqrt{\sum_{i=1}^{4} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration inclination.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the resolution and noise of the system.
u4 is the standard uncertainty associated with interpolation.

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CERTIFICATE OF CALIBRATION

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Cone Penetrometer Serial No.
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Temperature Calibration

Calibration method

1. The cone penetrometer was placed in the thermostatic temperature calibration bath with the temperature set to 0°C.
2. The temperature was calibrated from Tr = 0°C to Tr = 30°C.
3. The coefficients of a linear equation relating the estimate of temperature as a function of raw temperature sensor deflection were calculated and are shown in Table 16.
4. The applied temperature, and the resulting measurements are given in Table 17.
5. The combined expanded uncertainty* of measurement Utemp for each temperature is shown as a percentage of the recorded value and in units of Celsius °C, as shown in Table 18.

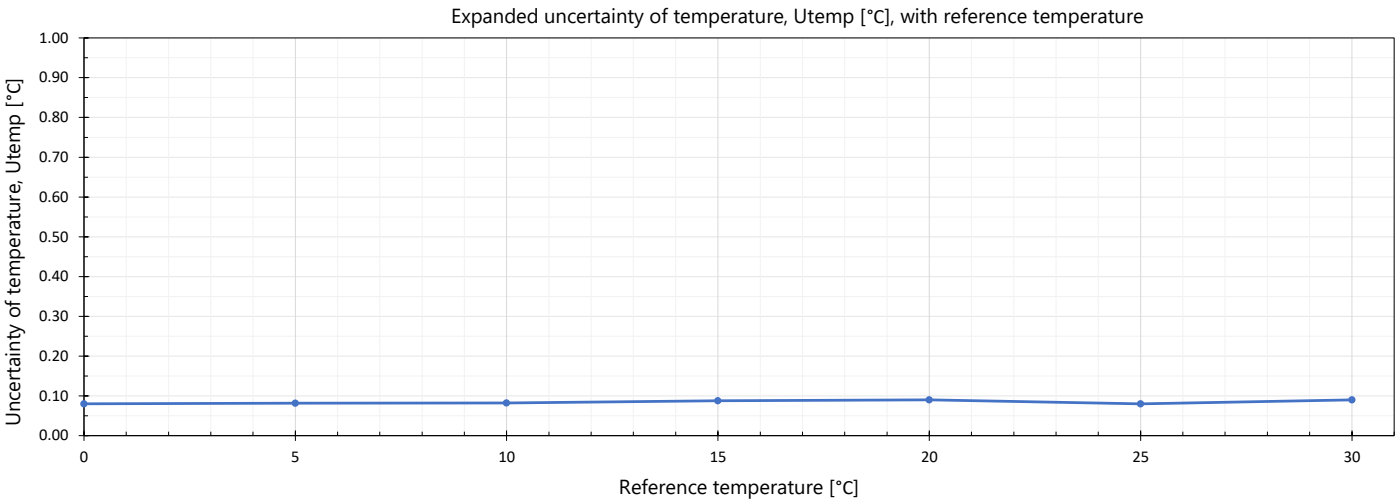
* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Cone Penetrometer	
Temperature sensor range	90 °
Calibration range	30 °
Temperature resolution	0.005 °
Temperature number of axis	2

Reference Thermometer Uncertainty	
ETI Ref Thermometer	0.04 °

Temperature Datalogger Uncertainty	
ETI ThermaData	0.4 °

Temperature Calibration - Graphical Results



Interpolation

Table - 16

Linear Equation	*The temperature sensor output in temperature units (0.1°C x 10^{-3}) is derived using a linear factor from the raw temperature output.*	Temperature sensor [qc] factor =	0.383314
		Temperature sensor [fs] factor =	0.383489

Temperature Calibration - Tabular Results

Table - 17
Temperature calibration

°C T_r	°C T_a
0	0.00
5	5.01
10	9.99
15	15.02
20	20.02
25	25.00
30	29.98

Table - 18 **Uncertainty assessment**

Reference temp	Standard calibration uncertainty u1 to u3			Combined standard calibration uncertainty u_t		Expanded calibration uncertainty U_{temp} [k=2]	
°C T_r	°C u1	°C u2	°C u3	°C	% u_t	°C	% U_{temp}
0	0.04	0.00	0.00	0.04		0.08	
5	0.04	0.00	0.01	0.04	0.81	0.08	1.63
10	0.04	0.00	-0.01	0.04	0.41	0.08	0.82
15	0.04	0.00	0.02	0.04	0.29	0.09	0.59
20	0.04	0.00	0.02	0.05	0.23	0.09	0.45
25	0.04	0.00	0.00	0.04	0.16	0.08	0.32
30	0.04	0.00	-0.02	0.04	0.15	0.09	0.30

At each given deflection the expanded measurement uncertainty Utemp is calculated from the readings obtained during calibration.

$$U_{temp} = 2 \times \sqrt{\sum_{i=1}^{3} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration temperature.
u2 is the standard uncertainty associated with the resolution and noise of the system.
u3 is the standard uncertainty associated with interpolation.

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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
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Temperature Influence Verification

Verification method

1. The cone penetrometer was placed in the thermostatic temperature calibration bath with the temperature set to 30°C, the second bath temperature was set to 0°C.
2. The test method for verification of a cone penetrometer for temperature influence was followed as set out in BS EN ISO 22476-1:2023, clause B.2.7.2.
3. The bath temperatures, apparent cone resistance, apparent sleeve friction, apparent pore pressure, and apparent cone temperature were recorded for the duration of the test.
4. The correction factors for; corrected apparent cone resistance, corrected sleeve friction, and corrected pore pressure were applied in post processing.
5. The start and end apparent readings are shown in Table 19. The maximum and minimum apparent readings are shown in Table 20.
6. The ambient stability, transient stability, and resulting penetrometer class were calculated and are shown in Table 21.

Table - 19 **Start and end apparent readings**

	°C	°C	kPa	kPa	kPa	kPa	kPa	kPa
	Ta_{qc}	Ta_{fs}	qc;a	qc;ac	fs;a	fs;ac	u;a	u;ac
T30	30.0	30.0	-0.4	-0.3	0.0	0.0	0.1	0.1
T0	0.1	0.1	193.6	14.3	-11.0	-0.2	87.0	-5.4

Table - 20 **Maximum / minimum apparent readings**

	kPa	kPa	kPa	kPa	kPa	kPa
	qc;a	qc;ac	fs;a	fs;ac	u;a	u;ac
max	553.5	147.9	6.6	6.8	87.1	0.3
min	-325.8	-133.3	-17.9	-7.1	-3.0	-7.9

Maximum rate of change

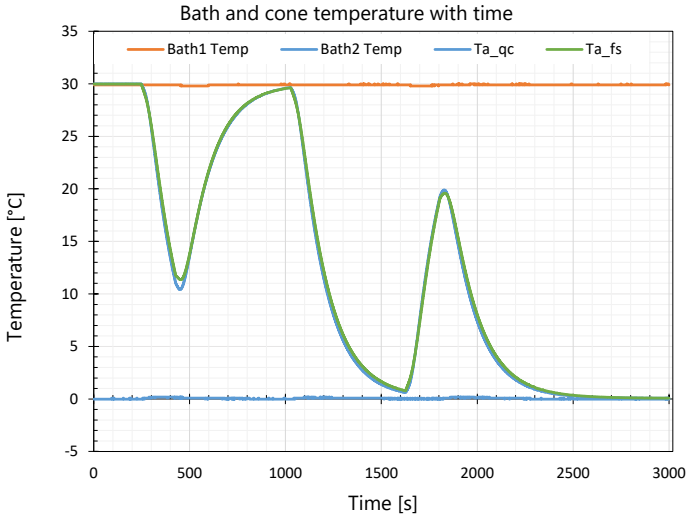
kPa/s	kPa/s	kPa/s	kPa/s	kPa/s	kPa/s
Δfgqc	Δfgqcc	Δfgfs	Δfgfsc	Δfgu	Δfguc
13.47	8.16	0.38	0.33	0.43	0.27

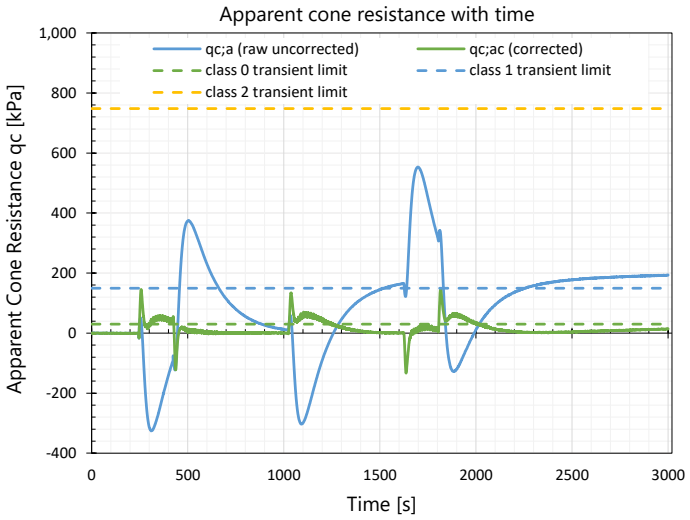
Table - 21a **Ambient temperature stability and classification**

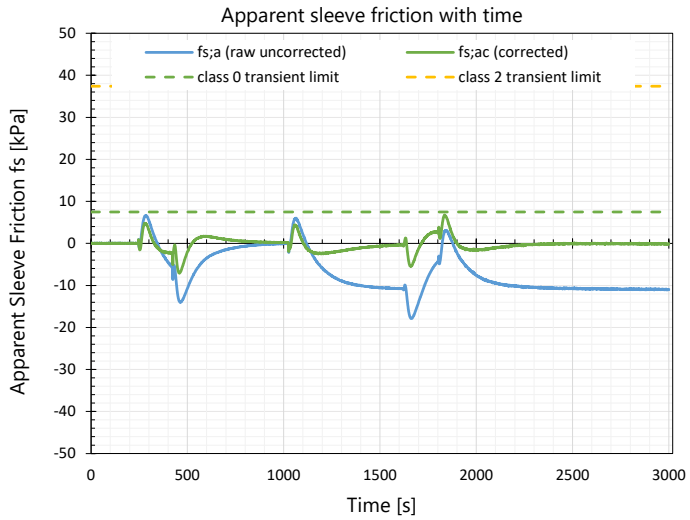
Ambient temperature stability		kPa/°C	Class
Uncorrected	Δaqc	-6.48	2
	Δafs	0.37	2
	Δau	-2.91	N/A
Corrected	Δaqcc	-0.49	0
	Δafsc	0.01	0
	Δauc	0.18	0

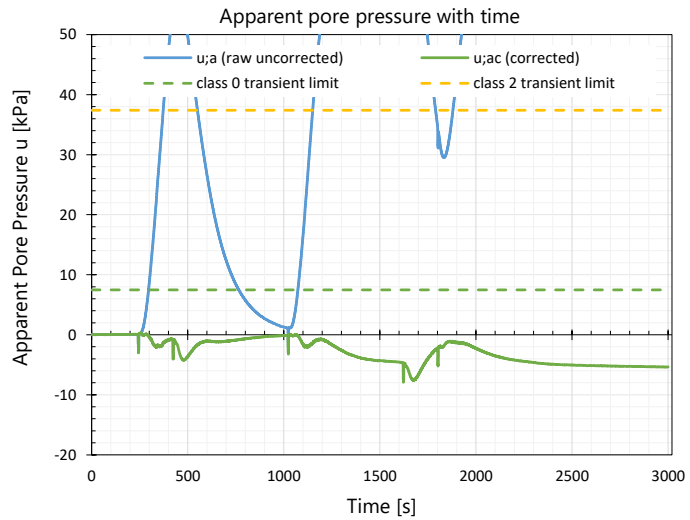
Table - 21b **Transient temperature stability and classification**

Transient temperature stability		kPa/°C	Class
Uncorrected	Δtqc	29.39	2
	Δtfs	0.82	2
	Δtu	3.01	3
Corrected	Δtqcc	9.40	1
	Δtfsc	0.46	0
	Δtuc	0.28	0









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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Bending Influence Verification

Verification Method

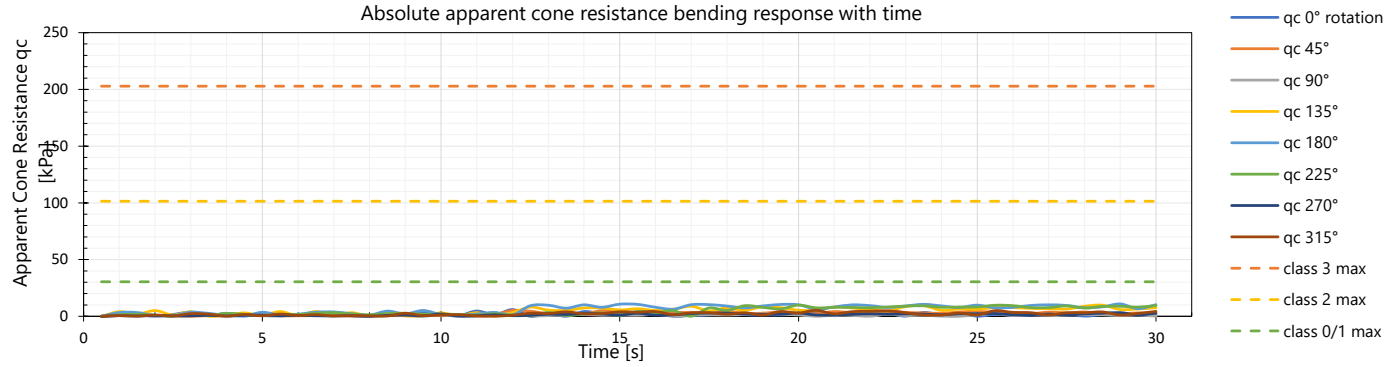
1. The cone penetrometer was placed in the bending influence frame, clamping the cone horizontally.
2. The test method for verification of a cone penetrometer for bending influence was followed as set out in BS EN ISO 22476-1:2023, clause B.2.8.2.
3. The air temperature, apparent cone resistance, apparent sleeve friction, and apparent pore pressure were recorded for the duration of each test. In total 8 tests were performed from 0° rotation to 315° rotation, evenly spaced with 45° rotation between tests.
4. The bending influence results and resulting cone penetrometer classification was calculated and are shown in Table 22.

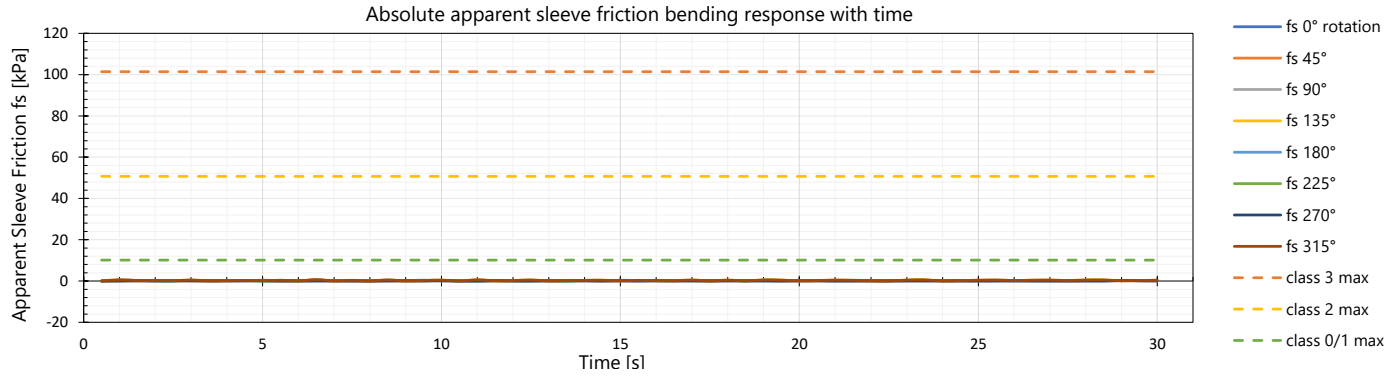
Table - 22 **Bending Influence results**

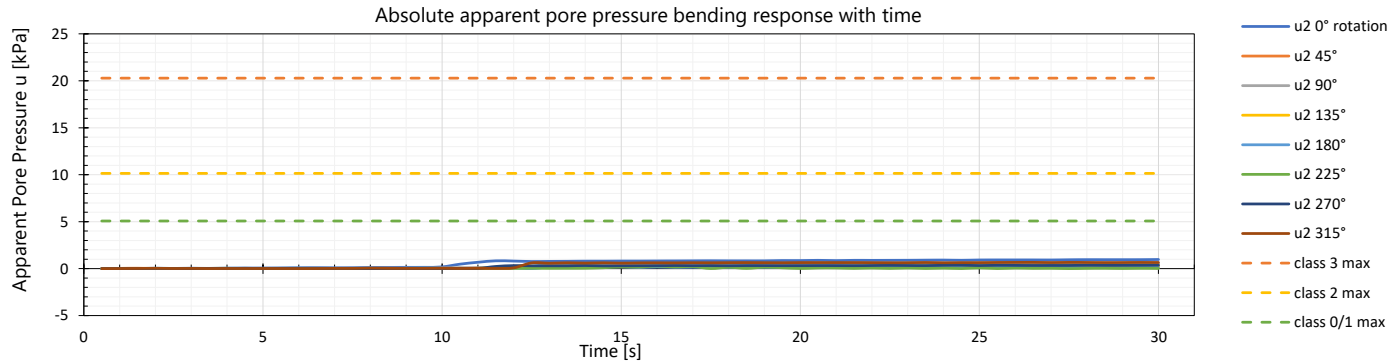
	qc;a [kPa/N]	fs;a [kPa/N]	u2;a [kPa/N]	Ambient Temp [°C]
max	0.033	0.007	0.000	25.7
min	-0.097	-0.001	-0.010	25.6
max test Δb, Δt	0.130	0.008	0.010	0.1
class	0	0	0	

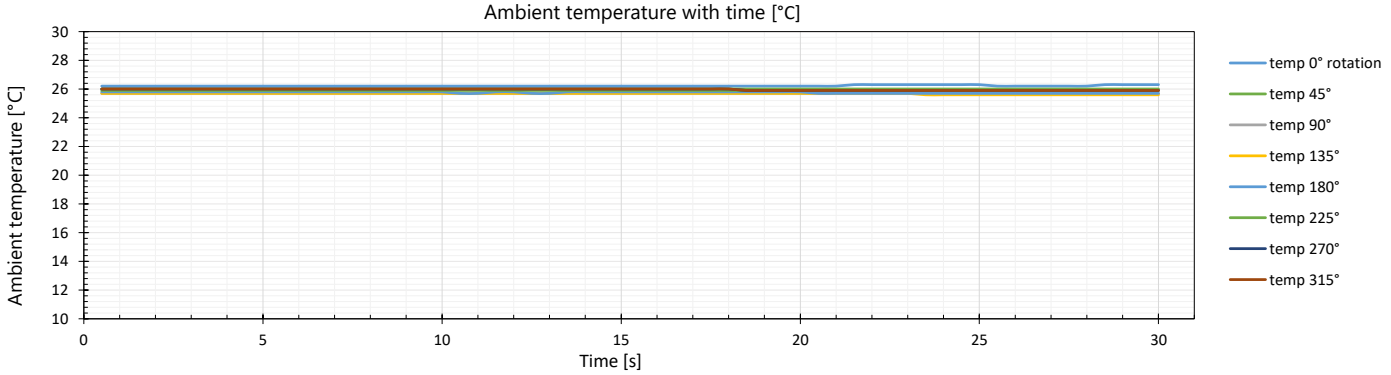
10 kg Calibration Weight Uncertainty	
10 kg Calibration Weight	0.001 %

10 kg Calibration Weight	
Reference weight	10.341 kg
Reference force	101.411 N









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CERTIFICATE OF CALIBRATION

Certificate Number: 1762

Cone Penetrometer Serial No.
DS15-CFIIPTT.2074

Sensor Stability Verification

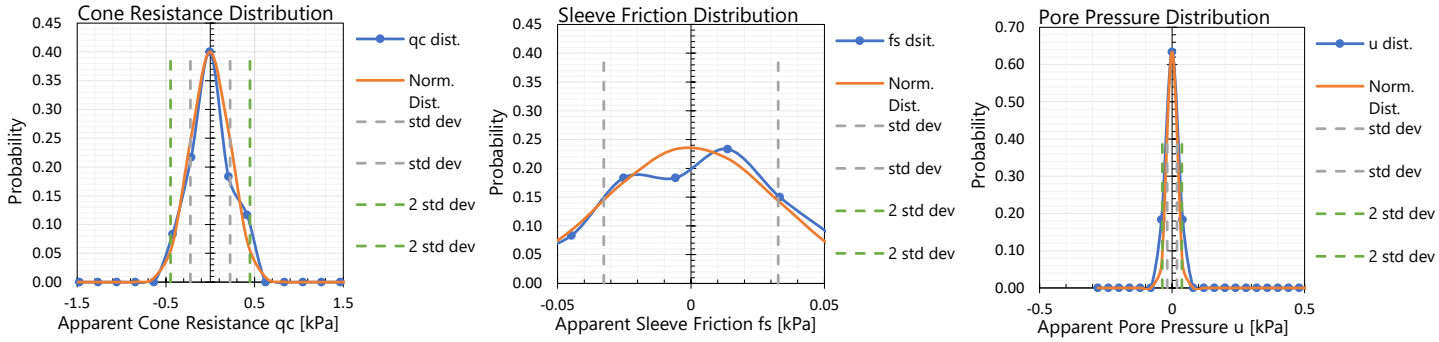
The purpose of this section is to quantify the stability of the geotechnical sensors (qc, fs, u) and demonstrate validity of applying a normal distribution, described by standard deviation and mean, when assessing probability of noise magnitude. The sampling duration has been limited to 60 seconds to allow direct comparison to the field verification data required under BS EN ISO 22476-1: 2023.

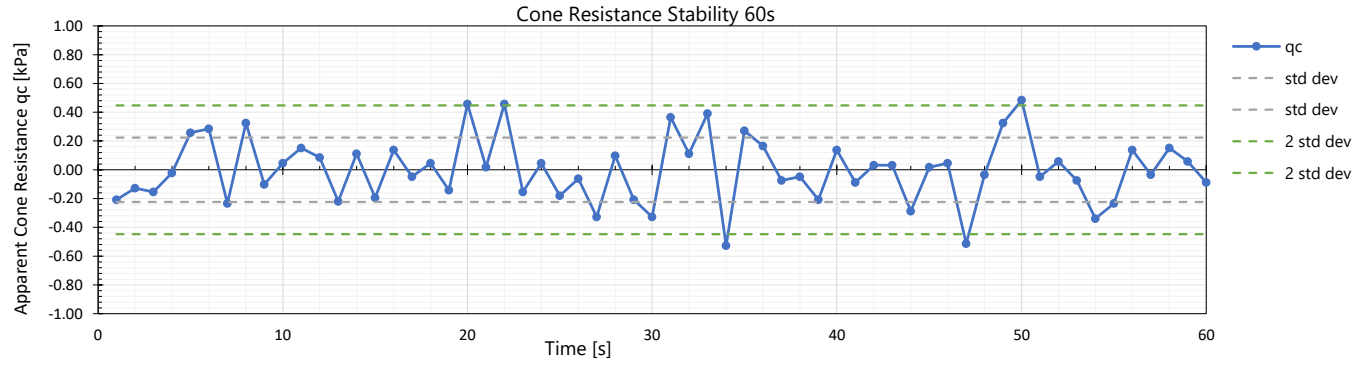
Verification method

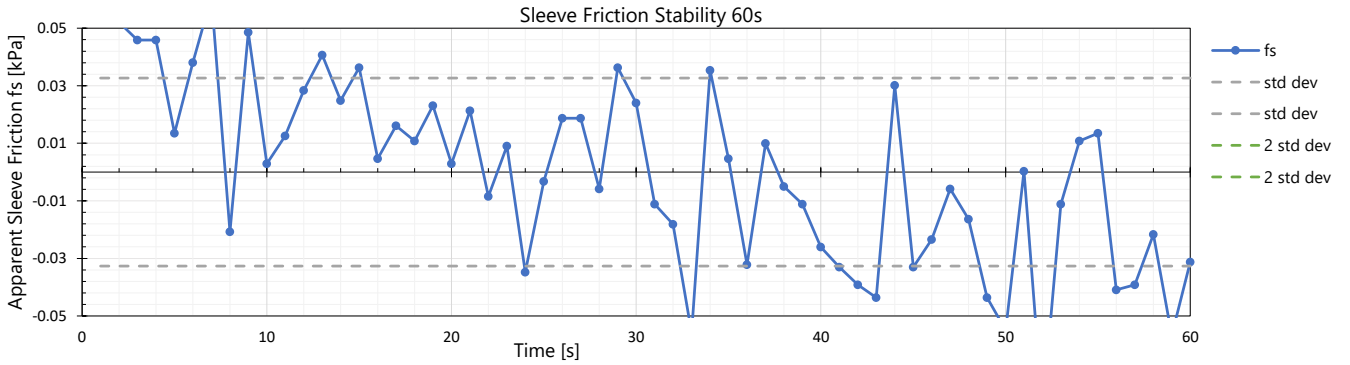
1. The cone penetrometer was placed in the thermostatic temperature calibration bath at ambient temperature.
2. The cone penetrometer was left for no less than 30 minuets or until the output was stable.
3. The output was recorded for 60 seconds at a frequency of 1Hz. The maximum change and standard deviation are shown in Table 23.

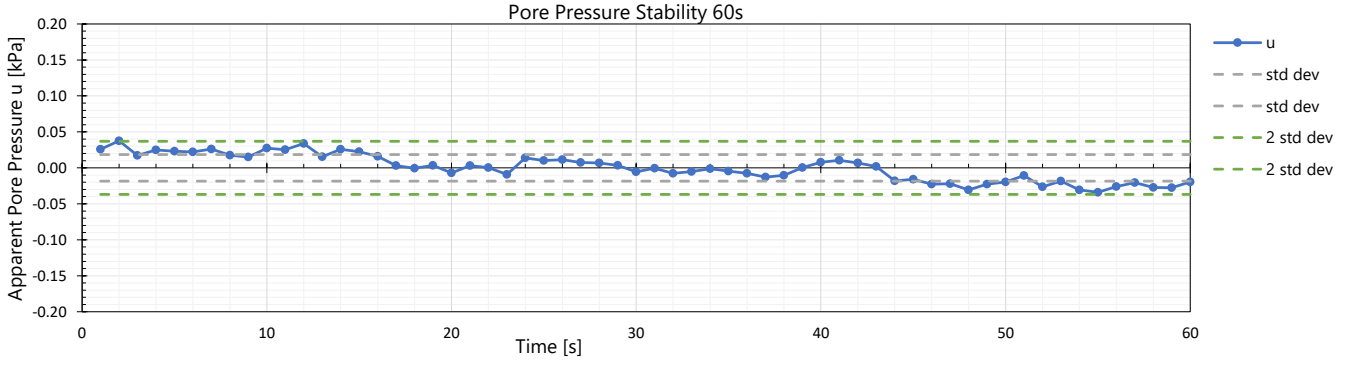
Table - 23 **Sensor stability results**

	qc (kPa)	fs (kPa)	u (kPa)	Inc (°)	Temp (°C)
Max	0.484	0.069	0.038	0.049	0.022
Min	-0.527	-0.083	-0.034	-0.061	-0.023
Δ (Max - Min)	1.010	0.152	0.072	0.111	0.083
Standard deviation (68% coverage)	± 0.224	± 0.033	± 0.018	± 0.025	± 0.013
2 standard deviations (95% coverage)	± 0.448	± 0.065	± 0.037	± 0.050	± 0.027









CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Test Setup

Calibrated Instrument

Instrument type:	**Subtraction**	**Number of sensors:**	**5**
Serial number:	**DS15-CFIIPTT.2477**	**Manufacturer:**	**Eijkelkamp Geopoint**
Nominal cone area:	**15 cm²**	**Nominal sleeve area:**	**227 cm²**
Calibration standard:	**BS EN ISO 22476-1:2023**	**Location:**	**Lankelma Calibration Laboratory**
Calibration date:	**15 April 2025**	**Calibration expiry:**	**15 October 2025**

Sensor measurand	Calibration range	Maximum rating	Momentary overload	Sensor stability (60 sec)	Max drift before re-calibration
Cone resistance (qc)	66.67 MPa	100 MPa	100 MPa	± 0.37 kPa	20,000 0.1N
Sleeve friction (fs)	4.41 MPa	1.30 MPa*	1.30 MPa	± 0.05 kPa	20,000 0.1N
Pore pressure (u)	4 MPa	5 MPa	6.75 MPa	± 0.05 kPa	800,000 0.1Pa
Inclination (i)	20 °	90 °		± 0.04 °	
Temperature (t)	30 °C	90 °C		± 0.031 °C	
Magnetic field (m)					

** The maximum usable sleeve friction stress is limited by the physical strength of the sleeve.*

ISO 22476-22 Cone Penetrometer Classification

Sensor measurand	Measurement uncertainty $U_{qc:class}$, $U_{fs:class}$, $U_{u:class}$	Ambient temperature stability		Transient temperature stability		Bending influence Δb_{qc}, Δb_{fs}, Δb_u	Overall classification *(highest number represents penetrometer class)*
		Uncorrected Δa_{qc}, Δa_{fs}, Δa_u	Corrected Δa_{qcc}, Δa_{fsc}, Δa_{uc}	Uncorrected Δt_{qc}, Δt_{fs}, Δt_u	Corrected Δt_{qcc}, Δt_{fsc}, Δt_{uc}		
Cone resistance	0	1	0	2	1	0	1
Sleeve friction	0	0	0	2	2	0	2
Pore pressure	0	N/A	0	3	0	0	0

Calibration signed by:

P Metcalf

Calibration checked by:

A Harman

Cone penetrometer, serial number: DS15-CFIIPTT.2477 was found to comply with the requirements of BS EN ISO 22476-1:2023 for the following classifications:
Cone Resistance - Class 1 Sleeve Friction - Class 2 Pore Pressure - Class 0

Reference Instruments

Device	Serial number	Uncertainty of recorded value	Calibration date
AM DSCCHA-100 kN	66914	0.02 ±%	19/06/2023
AM DSCCHA-5 kN	61065	0.05 ±%	19/06/2023
Keithley 7.5 Digit DMM	4496826	12.00 PPM	02/07/2024
MMG750V1P1MC0T3A6CE	502273	0.02 ±%	15/03/2024
ETI Ref Thermometer	D24276054	0.04 °C	17/09/2024
Lankelma HV6 Rotary Table	INC-JIG 01	0.10 °	17/07/2023
10 kg Calibration Weight	H1-S1 10kg	0.001 %	02/08/2024
Mitutoyo 200mm Caliper	A23044194	0.02 ±mm	20/06/2024

Calibration Standard

The calibration was performed according to BS EN ISO 22476-1:2023 & BS EN ISO 17025:2017 for the calibration of cone penetrometers.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation for each of the calibrated sensors has been carried out in accordance with BS EN ISO 22476-1:2023 requirements.

The report provides traceability of measurement to national standards and the SI system of units.

Clause 5.1.2 of BS EN ISO 22476-1:2023, states that the maximum period of validity of the calibration of the cone penetrometer shall not exceed 12 months. The cone penetrometer shall be recalibrated if the readings before a test show a zero baseline drift of over 2% of full scale output compared to the calibration zero load readings.

LANKELMA

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Cone Dimension Verification

Cone Tip

Cone shoulder diameter

Rotational position	d_c
0 °	44.00 mm
120 °	44.00 mm
240 °	44.00 mm

Height of the cylindrical extension of the cone

Rotational position	h_e
0 °	0.00 mm
120 °	0.00 mm
240 °	0.00 mm

Height of the conical section of the cone

Rotational position	h_c
0 °	0.00 mm
120 °	0.00 mm
240 °	0.00 mm

Filter element diameter

Rotational position	d_{fil}
0 °	0.00 mm
120 °	0.00 mm
240 °	0.00 mm

Friction Sleeve

Friction sleeve diameter

Rotational position	Upper section d_{2u}	Middle section d_{2m}	Lower section d_{2l}
0 °	44.00 mm	44.00 mm	44.00 mm
120 °	44.00 mm	44.00 mm	44.00 mm
240 °	44.00 mm	44.00 mm	44.00 mm

Friction sleeve length

Rotational position	l_s
0 °	165.00 mm
120 °	165.00 mm
240 °	165.00 mm

Gap between the cone and the lower end of the friction sleeve

Rotational position	l_{gl}
0 °	0.00 mm
120 °	0.00 mm
240 °	0.00 mm

Gap above the upper end of the friction sleeve

Rotational position	l_{gu}
0 °	0.00 mm
120 °	0.00 mm
240 °	0.00 mm

Cone Tip Dimension Uncertainty

Reference device uncertainty u_r	0.015 mm
Average diameter d_c	44.000 mm
Relative error b_c	0.000 %
Area A_c	1520.531 mm^2
Dimension uncertainty U_{dc}	0.015 mm
Area uncertainty u_{AC}	1.037 mm^2
Expanded area uncertainty U_{AC}	2.073 mm^2

Friction Sleeve Dimension Uncertainty

Reference device uncertainty u_r	0.015 mm
Average diameter d_2	44.000 mm
Relative error b_{c2}	0.000 %
Average length l_s	165.000 mm
Relative error b_{ls}	0.000 %
Area A_s	22807.963 mm^2
Dimension uncertainty diameter u_{d2}	0.015 mm
Dimension uncertainty length u_{ls}	0.015 mm
Area uncertainty u_{as}	8.047 mm^2
Expanded area uncertainty U_{as}	16.094 mm^2
Sleeve length to diameter ratio	3.750
Diameter difference, sleeve - tip	0.000 mm

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Cone Resistance Calibration

Calibration method

1. The cone was loaded to full range 3 times for no less than 1 minute before calibration.
2. The cone was calibrated with 4 sets of increasing forces and 2 sets of decreasing forces, with rotation before set 3 and 5.
3. The coefficients of a linear and third order equation relating the the estimate of applied force as a function of the deflection were calculated and are shown in Table 1.
4. The forces applied, and the resulting deflections are given in Tables 2. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Ucqc and Uqc_class for each force is shown as a percentage of the recorded value and in units of pressure (kPa) as shown in Table 3.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

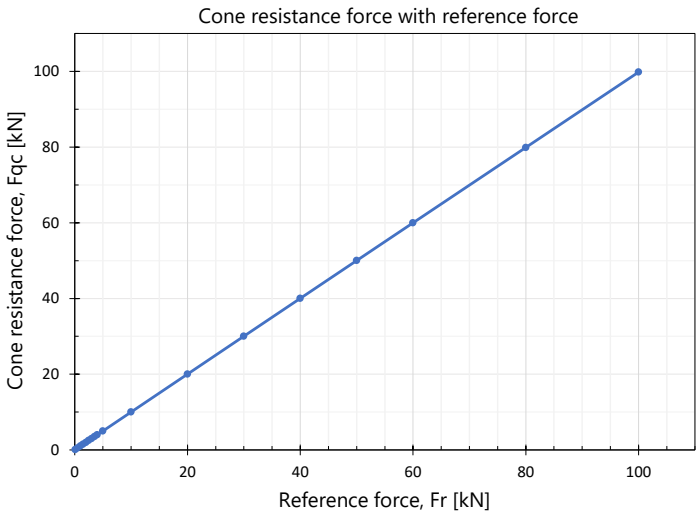
Cone Penetrometer	
Cone penetrometer type	Subtraction
Cone resistance capacity	150 kN
Calibration range	100 kN
Cone resistance effective resolution	0.0005 kN
Cone area	1,521 mm^2
Measured alpha factor cone area ratio	0.76
Historic drift between cone calibrations (u_{drift})	0 %
Apparent pore pressure (u_a) at full range	0.29 kPa
Cone resistance max zero drift	2.90 kPa
Reference load cell max zero drift	1.11 kPa

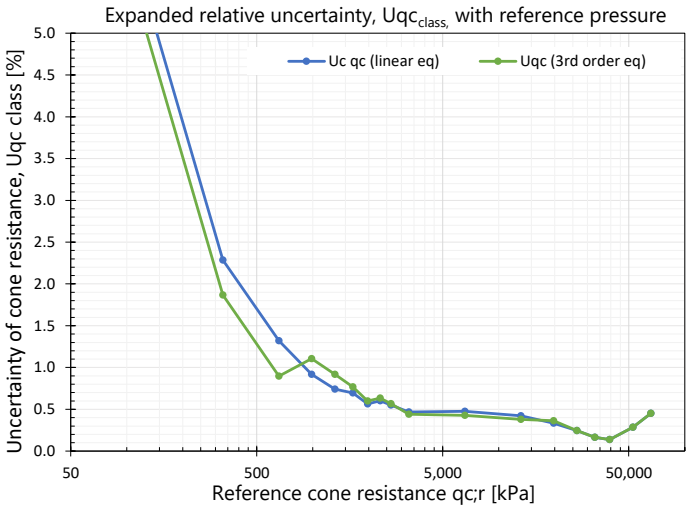
Calibration Conditions	
Ambient temperature	23.1 °C
Ambient temperature variation	0.58 °C
Instrument temperature variation	0.54 °C

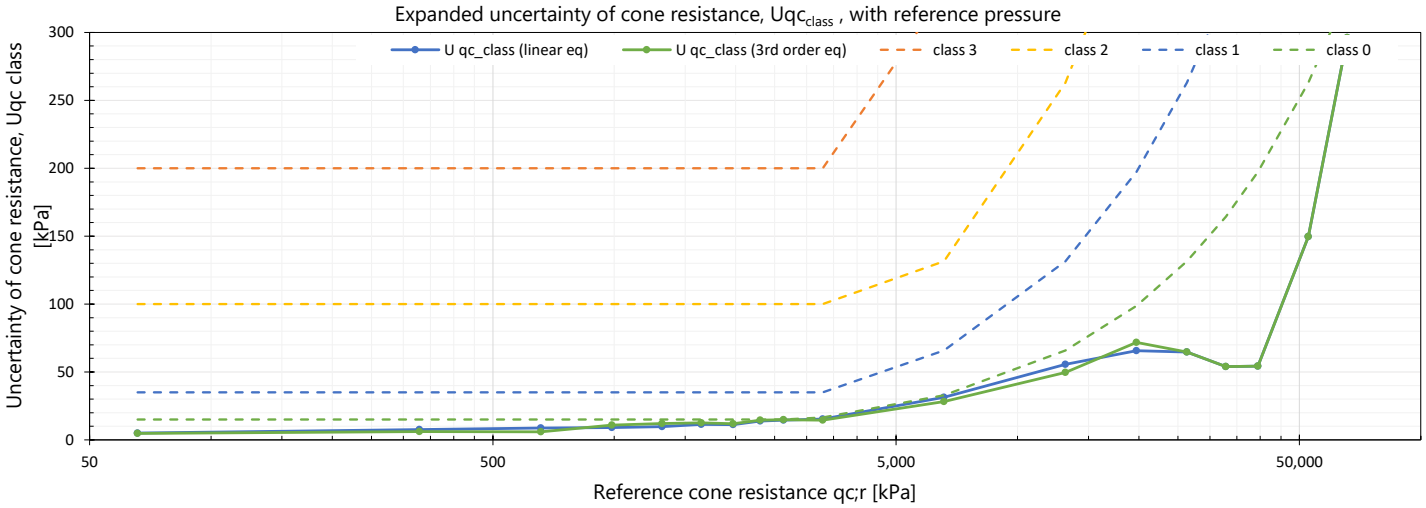
Reference Load Cell Uncertainty	
AM DSCCHA-100 kN	0.02 ±%
AM DSCCHA-5 kN	0.05 ±%

Reference Indicator Uncertainty	
Keithley 7.5 Digit DMM	12 PPM

Cone Resistance Calibration - Graphical Results







Interpolation

Table - 1

Linear Equation	*The cone output in force units of D (0.1 N) is derived using a linear factor from the raw cone output. D = Factor x RAW_Output*	0.1 N Factor = 0.009047
Polynomial Equation	*3rd order polynomial equation. For a given cone indicated output of D (in 0.1 N units), the corrected applied force, F (in 0.1 N units) is calculated from :*	a0 = 0 a1 = 0.997809333 a2 = -5.9986E-09 a3 = 2.15354E-14 *Polynomial calc. is only to be used when the cone load is under 30 kN*

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Cone Resistance Calibration - Tabular Results

Table - 2a **Low range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
0	0.0012	0.0009	0.0044		0.0016	
0.1	0.1055	0.1052	0.1036		0.1006	
0.5	0.5075	0.5072	0.5046		0.4997	
1	1.0073	1.0062	1.0044		0.9999	
1.5	1.4970	1.4983	1.4971		1.4912	
2	1.9976	2.0002	1.9956		1.9897	
2.5	2.4997	2.5003	2.4976		2.4895	
3	2.9992	2.9997	3.0010		2.9881	
3.5	3.4990	3.4993	3.5003		3.4869	
4	3.9989	4.0004	3.9993		3.9878	
5	4.9997	5.0007	4.9999		4.9865	
4				4.0098		4.0020
3.5				3.5111		3.5017
3				3.0066		3.0011
2.5				2.5077		2.5033
2				2.0040		1.9996
1.5				1.5043		1.4984
1				1.0037		0.9988
0.5				0.5008		0.4996
0.1				0.1016		0.0999

Table -2b **High range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
10	9.9961	9.9967	9.9999		9.9825	
20	19.9843	19.9846	19.9945		19.9794	
30	29.9628	29.9690	29.9807		29.9671	
40	40.0214	40.0243	40.0416		40.0290	
50	49.9973	50.0019	50.0239		50.0181	
60	59.9630	59.9672	59.9930		59.9947	
80	79.8630	79.8695	79.8950		79.9168	
100	99.7404	99.7455	99.7943		99.8130	
80				79.9310		79.9405
60				60.0488		60.0482
50				50.0828		50.0795
40				40.1004		40.0932
30				30.0342		30.0252
20				20.0404		20.0321
10				10.0263		10.0160

Table - 3 **Uncertainty assessment**

Reference force	Reference tip resistance	Standard uncertainty u1 - u8								Combined standard calibration uncertainty		Expanded calibration uncertainty [k=2]				BS EN ISO 22476:2023 class	Tip calibration drift
kN	kPa	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kPa	%	kPa	%		kPa
Fr	qc;r	u1*	u2	u3	u4	u5	u6	u7	u8	uc	uc;dim	Uc qc		Uqc class		Cone Class **	u_{drift}***
0	0	0.0000	0.0010	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0010	0.0010	1.4		1.4		0	0.0
0.1	66	0.0007	0.0014	-0.0002	0.0002	0.0000	0.0031	-0.0008	0.0000	0.0036	0.0036	4.7	7.21	4.7	7.21	0	0.0
0.5	329	0.0011	0.0020	-0.0001	0.0002	0.0000	0.0039	-0.0011	0.0000	0.0047	0.0047	6.2	1.87	6.1	1.87	0	0.0
1	658	0.0012	0.0017	-0.0007	0.0002	0.0000	0.0039	-0.0005	0.0000	0.0045	0.0045	6.0	0.91	5.9	0.90	0	0.0
1.5	986	0.0048	0.0019	0.0008	0.0002	0.0001	-0.0049	0.0042	0.0000	0.0083	0.0084	11.0	1.11	10.9	1.11	0	0.0
2	1,315	0.0041	0.0020	0.0015	0.0002	0.0001	-0.0057	0.0053	0.0000	0.0092	0.0093	12.2	0.93	12.1	0.92	0	0.0
2.5	1,644	0.0041	0.0027	0.0004	0.0002	0.0001	-0.0044	0.0069	0.0000	0.0096	0.0097	12.8	0.78	12.6	0.77	0	0.0
3	1,973	0.0044	0.0041	0.0003	0.0002	0.0001	-0.0039	0.0054	0.0000	0.0090	0.0092	12.1	0.62	11.8	0.60	0	0.0
3.5	2,302	0.0053	0.0043	0.0001	0.0002	0.0002	-0.0046	0.0074	0.0000	0.0111	0.0113	14.9	0.65	14.6	0.63	0	0.0
4	2,631	0.0061	0.0041	0.0009	0.0002	0.0002	-0.0047	0.0072	0.0000	0.0113	0.0117	15.3	0.58	14.9	0.57	0	0.0
5	3,288	0.0020	0.0049	0.0005	0.0002	0.0002	-0.0046	0.0085	0.0000	0.0110	0.0115	15.2	0.46	14.5	0.44	0	0.0
10	6,577	0.0048	0.0092	0.0004	0.0002	0.0004	-0.0072	0.0173	0.0000	0.0214	0.0225	29.6	0.45	28.2	0.43	0	0.0
20	13,153	0.0074	0.0192	0.0001	0.0002	0.0009	-0.0139	0.0285	0.0000	0.0378	0.0402	52.9	0.40	49.7	0.38	0	0.0
30	19,730	0.0107	0.0303	0.0036	0.0002	0.0013	-0.0299	0.0323	0.0000	0.0546	0.0583	76.7	0.39	71.8	0.36	0	0.0
40	26,307	0.0135	0.0059	0.0017	0.0002	0.0018	0.0306	0.0355	0.0000	0.0492	0.0563	74.0	0.28	64.7	0.25	0	0.0
50	32,883	0.0153	0.0081	0.0027	0.0002	0.0022	0.0131	0.0347	0.0000	0.0411	0.0534	70.2	0.21	54.0	0.16	0	0.0
60	39,460	0.0179	0.0103	0.0024	0.0002	0.0027	-0.0164	0.0316	0.0000	0.0413	0.0581	76.4	0.19	54.3	0.14	0	0.0
80	52,613	0.0244	0.0157	0.0038	0.0002	0.0035	-0.1085	0.0172	0.0000	0.1138	0.1262	165.9	0.32	149.6	0.28	0	0.0
100	65,767	0.0521	0.0218	0.0029	0.0002	0.0044	-0.2179	0.0000	0.0000	0.2252	0.2353	309.5	0.47	296.2	0.45	0	0.0

The class of the penetrometer is determined from the measurement uncertainty at any deflection
At each given deflection the expanded measurement uncertainty Uqc_class is calculated from the readings obtained during calibration.

$$Uqc_{class} = \frac{2}{S} \times \sqrt{\sum_{i=1}^{8} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration force.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the repeatability of the calibration results.
u4 is the standard uncertainty associated with the resolution and noise of the system.
u5 is the standard uncertainty associated with the drift in zero output.
u6 is the standard uncertainty associated with interpolation.
u7 is the standard uncertainty associated with reversibility.
u8 is the standard uncertainty associated with apparent load transfer from other sensor.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Uqc_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Sleeve Friction Calibration

Calibration method

1. The sleeve was loaded to full range 3 times for no less than 1 minute before calibration.
2. The sleeve was calibrated with 4 sets of increasing forces and 2 sets of decreasing forces, with rotation before set 3 and 5.
3. The coefficients of a linear and third order equation relating the estimate of applied force as a function of the deflection were calculated and are shown in Table 4.
4. The forces applied, and the resulting deflections are given in Tables 5. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Ucfs and Ufs_class for each force is shown as a percentage of the recorded value and in units of pressure (kPa) as shown in Table 6.

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

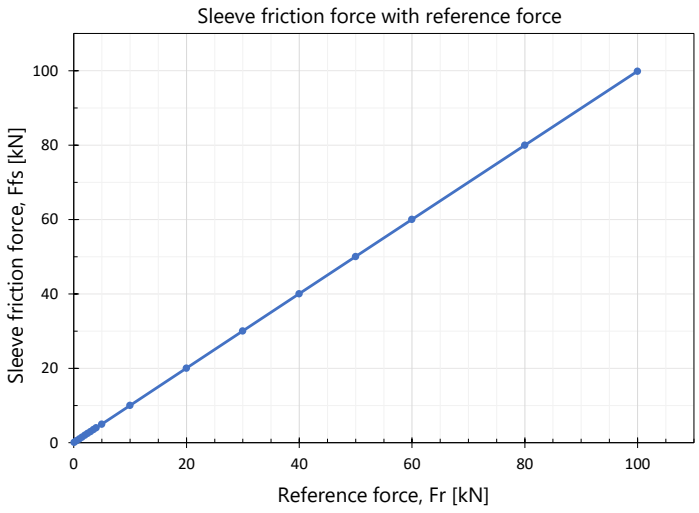
Cone Penetrometer	
Cone penetrometer type	Subtraction
Sleeve friction capacity	150 kN
Calibration range	100 kN
Sleeve friction effective resolution	0.0005 kN
Sleeve area	22,808 mm^2
Measured beta factor sleeve area ratio	0.000
Historic drift between sleeve calibrations (u_{drift})	0 %
Apparent pore pressure (u_a) at full range	0.29 kPa
Sleeve friction max zero drift	0.28 kPa
Reference load cell max zero drift	0.07 kPa

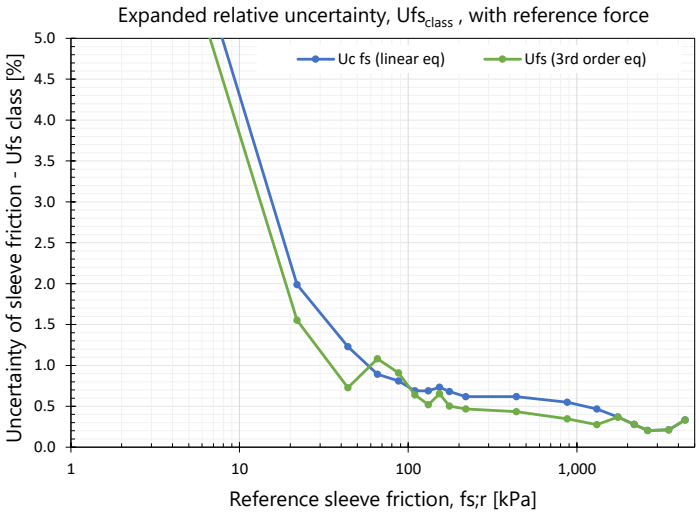
Calibration Conditions	
Ambient temperature	23.1 °C
Ambient temperature variation	0.58 °C
Instrument temperature variation	0.58 °C

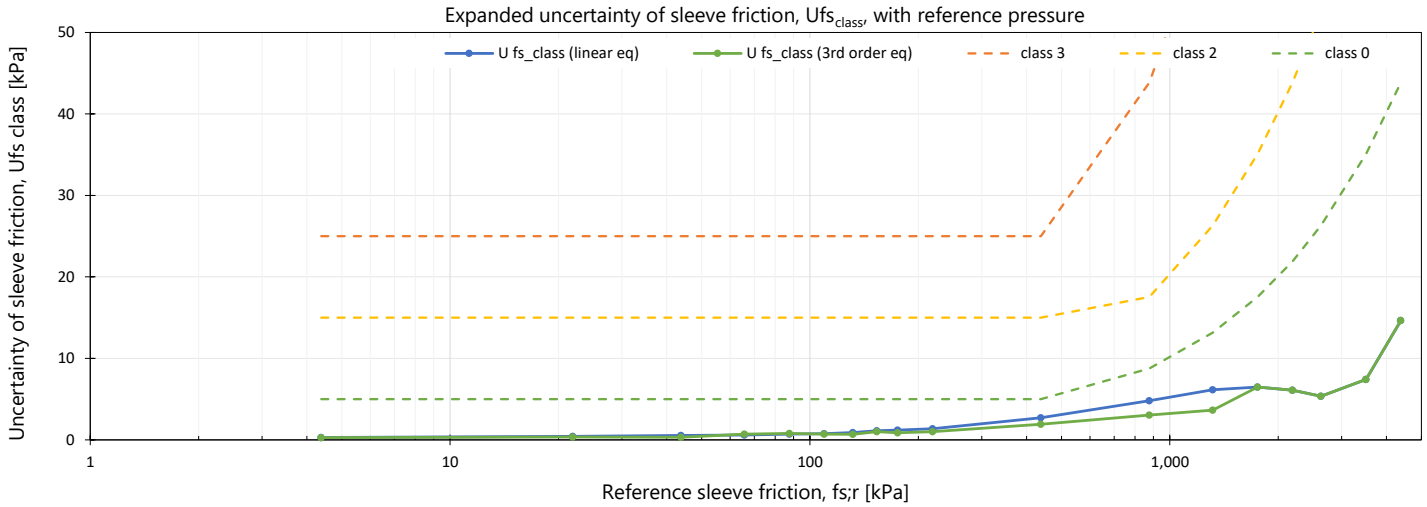
Reference Load Cell Uncertainty	
AM DSCCHA-100 kN	0.02 ±%
AM DSCCHA-5 kN	0.05 ±%

Reference Indicator Uncertainty	
Keithley 7.5 Digit DMM	12 PPM

Sleeve Friction Calibration - Graphical Results







Interpolation

Table - 4

Linear Equation	*The sleeve output in force units D (0.1 N) is derived using a linear factor from the raw sleeve output. D = Factor x RAW_Output*	0.1 N Factor = 0.008775
Polynomial Equation	*3rd order polynomial equation. For a given cone indicated output of D (0.1 N units), the corrected applied force, F (in 0.1 N units) is calculated from :*	a0 = 0 a1 = 0.996825697 a2 = -2.19205E-09 a3 = 1.43739E-14 *Polynomial calc. is only to be used when the sleeve load is under 30 kN*

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Sleeve Friction Calibration - Tabular Results

Table - 6a **Low range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
0	0.0013	0.0007	0.0064		0.0033	
0.1	0.1034	0.1050	0.1038		0.1010	
0.5	0.5037	0.5074	0.5030		0.5011	
1	1.0031	1.0059	1.0037		1.0009	
1.5	1.4967	1.4988	1.4973		1.4915	
2	1.9962	1.9981	1.9971		1.9916	
2.5	2.4968	2.4966	2.4993		2.4920	
3	2.9966	2.9978	2.9998		2.9939	
3.5	3.4960	3.4951	3.5003		3.4895	
4	3.9954	3.9960	4.0003		3.9919	
5	4.9950	4.9958	5.0004		4.9880	
4				4.0103		4.0039
3.5				3.5132		3.5055
3				3.0083		3.0035
2.5				2.5070		2.5021
2				2.0069		2.0022
1.5				1.5037		1.4983
1				1.0026		1.0010
0.5				0.5019		0.5008
0.1				0.1005		0.1027

Table - 6b **High range calibration results**

	0°	0°	120°	120°	240°	240°
kN	kN	kN	kN	kN	kN	kN
Fr	X1	X2	X3	X4'	X5	X6'
10	9.9887	9.9906	9.9964		9.9856	
20	19.9746	19.9759	19.9912		19.9833	
30	29.9649	29.9677	29.9922		29.9855	
40	40.0358	40.0395	40.0683		40.0675	
50	50.0203	50.0247	50.0571		50.0609	
60	59.9960	60.0004	60.0352		60.0419	
80	79.9202	79.9272	79.9605		79.9805	
100	99.8264	99.8332	99.8808		99.9032	
80				79.9847		80.0067
60				60.0844		60.0976
50				50.1150		50.1233
40				40.1249		40.1301
30				30.0455		30.0445
20				20.0388		20.0352
10				10.0256		10.0198

Table - 6 **Uncertainty assessment**

Reference force	Reference sleeve friction	Standard uncertainty u1 - u8								Combined standard calibration uncertainty		Expanded calibration uncertainty [k=2]				BS EN ISO 22476:2023 Class	Sleeve calibration drift
kN	kPa	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kPa	%	kPa	%		kPa
Fr	fs;r	u1*	u2	u3	u4	u5	u6	u7	u8	uc	uc;dim	Uc_{fs}		Ufs_{class}		Cone Class **	u_{drift}***
0	0	0.0000	0.0015	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.0015	0.0015	0.13		0.13		0	0.00
0.1	4	0.0007	0.0009	0.0009	0.0002	0.0000	0.0027	-0.0004	-0.0005	0.0031	0.0031	0.27	6.22	0.27	6.22	0	0.00
0.5	22	0.0011	0.0008	0.0021	0.0002	0.0000	0.0026	-0.0004	-0.0013	0.0039	0.0039	0.34	1.55	0.34	1.55	0	0.00
1	44	0.0012	0.0009	0.0016	0.0002	0.0001	0.0025	-0.0003	-0.0014	0.0036	0.0037	0.32	0.73	0.32	0.73	0	0.00
1.5	66	0.0048	0.0018	0.0012	0.0002	0.0001	-0.0049	0.0038	0.0001	0.0081	0.0081	0.71	1.08	0.71	1.08	0	0.00
2	88	0.0041	0.0017	0.0011	0.0002	0.0001	-0.0051	0.0059	0.0006	0.0091	0.0091	0.80	0.91	0.80	0.91	0	0.00
2.5	110	0.0041	0.0021	-0.0001	0.0002	0.0002	-0.0040	0.0052	0.0005	0.0080	0.0080	0.71	0.64	0.70	0.64	0	0.00
3	132	0.0044	0.0017	0.0007	0.0002	0.0002	-0.0032	0.0052	0.0007	0.0078	0.0079	0.69	0.53	0.68	0.53	0	0.00
3.5	153	0.0053	0.0031	-0.0006	0.0002	0.0002	-0.0047	0.0084	-0.0001	0.0114	0.0115	1.01	0.66	1.00	0.66	0	0.00
4	175	0.0061	0.0024	0.0003	0.0002	0.0003	-0.0041	0.0063	0.0006	0.0101	0.0102	0.89	0.51	0.88	0.51	0	0.00
5	219	0.0020	0.0036	0.0005	0.0002	0.0003	-0.0055	0.0093	-0.0009	0.0117	0.0118	1.03	0.47	1.02	0.47	0	0.00
10	438	0.0048	0.0032	0.0011	0.0002	0.0006	-0.0098	0.0183	-0.0026	0.0217	0.0220	1.93	0.44	1.91	0.44	0	0.00
20	877	0.0074	0.0048	0.0008	0.0002	0.0013	-0.0170	0.0287	-0.0031	0.0347	0.0354	3.11	0.35	3.04	0.35	0	0.00
30	1,315	0.0107	0.0082	0.0016	0.0002	0.0019	-0.0192	0.0324	0.0107	0.0415	0.0428	3.75	0.29	3.64	0.29	0	0.00
40	1,754	0.0135	0.0107	0.0021	0.0002	0.0026	0.0571	0.0343	0.0266	0.0739	0.0752	6.60	0.38	6.48	0.38	0	0.00
50	2,192	0.0153	0.0130	0.0026	0.0002	0.0032	0.0460	0.0347	0.0330	0.0695	0.0717	6.29	0.29	6.09	0.29	0	0.00
60	2,631	0.0179	0.0143	0.0025	0.0002	0.0038	0.0244	0.0302	0.0408	0.0610	0.0646	5.66	0.22	5.35	0.22	0	0.00
80	3,508	0.0244	0.0178	0.0041	0.0002	0.0051	-0.0463	0.0146	0.0621	0.0846	0.0892	7.82	0.22	7.42	0.22	0	0.00
100	4,384	0.0521	0.0228	0.0039	0.0002	0.0064	-0.1300	0.0000	0.0876	0.1669	0.1706	14.96	0.34	14.64	0.34	0	0.00

The class of the penetrometer is determined from the measurement uncertainty at any deflection.
At each given deflection the expanded measurement uncertainty Ufs_class is calculated from the readings obtained during calibration.

$$Ufs_{class} = \frac{2}{S} \times \sqrt{\sum_{i=1}^{8} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration force.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the repeatability of the calibration results.
u4 is the standard uncertainty associated with the resolution and noise of the system.
u5 is the standard uncertainty associated with the drift in zero output.
u6 is the standard uncertainty associated with interpolation.
u7 is the standard uncertainty associated with reversibility.
u8 is the standard uncertainty associated with apparent load transfer from other sensor. Includes subtraction error where: Fr;qc = Fr;fs.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Ufs_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

Sleeve Friction Calibration - Subtraction Error

In use, the forces acting on the sleeve load cell element are a combination of tip resistance and sleeve friction, with the tip resistance force value from the tip load cell element being subtracted to give the sleeve friction value. The resultant error values for differing tip and sleeve values are shown in Table 7.

The highlighted cell results in Table 7, show a direct reading of the subtraction error from the calibration results.

The non-highlighted cells in Table 7, show an interpolated subtraction error from the calibration results.

Sleeve friction - tip subtraction combined standard uncertainty uc_sub, where friction ratio is between 0.1% and 10%.

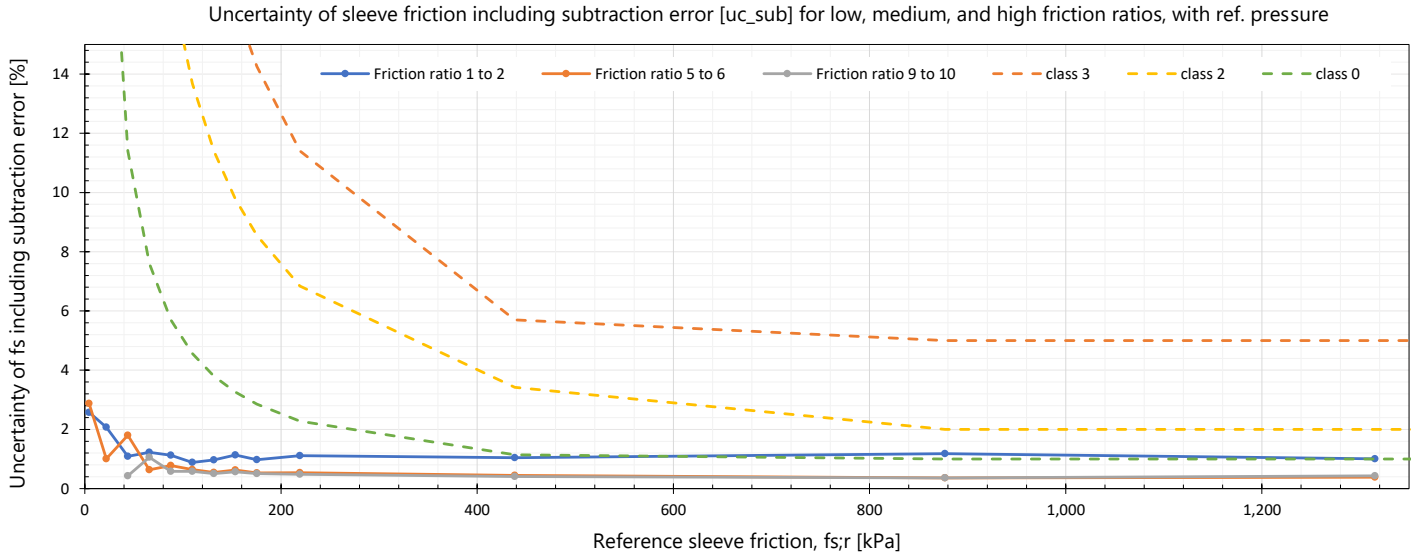
Table - 7

Sleeve friction combined standard uncertainty including subtraction error (%)

Tip resistance kPa ↓	Sleeve friction kPa → 4	22	44	66	88	110	132	153	175	219	438	877	1,315
66	2.87	-	-	-	-	-	-	-	-	-	-	-	-
329	2.58	1.01	-	-	-	-	-	-	-	-	-	-	-
658	3.22	3.37	1.80	1.06	-	-	-	-	-	-	-	-	-
986	5.32	1.84	0.89	0.63	0.58	-	-	-	-	-	-	-	-
1,315	6.56	1.94	1.03	0.83	0.58	0.59	0.50	-	-	-	-	-	-
1,644	7.04	1.80	1.17	0.93	0.78	0.60	0.52	0.57	-	-	-	-	-
1,973	7.96	2.44	1.03	0.99	0.66	0.64	0.55	0.59	0.50	-	-	-	-
2,302	7.77	2.11	0.95	0.98	0.81	0.63	0.54	0.59	0.50	0.46	-	-	-
2,631	9.14	2.09	1.25	1.07	0.88	0.69	0.59	0.63	0.53	0.48	-	-	-
3,288	9.00	2.06	1.07	1.06	0.87	0.68	0.59	0.62	0.53	0.54	-	-	-
6,577	-	3.06	1.57	1.39	1.13	0.88	0.75	0.77	0.65	0.58	0.45	-	-
13,153	-	5.63	2.86	2.25	1.77	1.40	1.18	1.13	0.98	0.84	0.47	0.27	0.43
19,730	-	11.05	5.57	4.05	3.12	2.48	2.08	1.91	1.65	1.38	1.61	0.73	0.38
26,307	-	-	8.49	6.00	4.58	3.65	3.06	2.74	2.38	1.96	0.85	0.73	0.54
32,883	-	-	10.46	7.32	5.57	4.44	3.72	3.31	2.88	2.36	0.72	0.81	0.48
39,460	-	-	12.58	8.73	6.63	5.29	4.42	3.91	3.41	2.78	1.56	0.57	0.67
52,613	-	-	-	11.92	9.02	7.20	6.02	5.28	4.60	3.74	2.04	0.94	0.83
65,767	-	-	-	15.40	11.63	9.29	7.76	6.77	5.91	4.78	2.56	1.41	1.01

Friction ratio (for a given row) →

Friction ratio (for a given column) ↑



CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Pore Pressure Calibration

Calibration method

1. The cone penetrometer was placed in a pressure vessel and was pressurised to full range 3 times for no less than 1 minute before calibration.
2. The pore pressure was calibrated with 2 sets of increasing pressures and 2 sets of decreasing pressures.
3. The coefficients of a linear and third order equation relating the estimate of applied pressure as a function of deflection were calculated and are shown in Table 8.
4. The pressures applied, and the resulting deflections are given in Tables 9. No corrections for temperature have been applied to these results.
5. The combined expanded uncertainty* of deflection Uu and Uu_class for each force is shown as a percentage of the recorded value and in units of pressure kPa as shown in Table 10.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

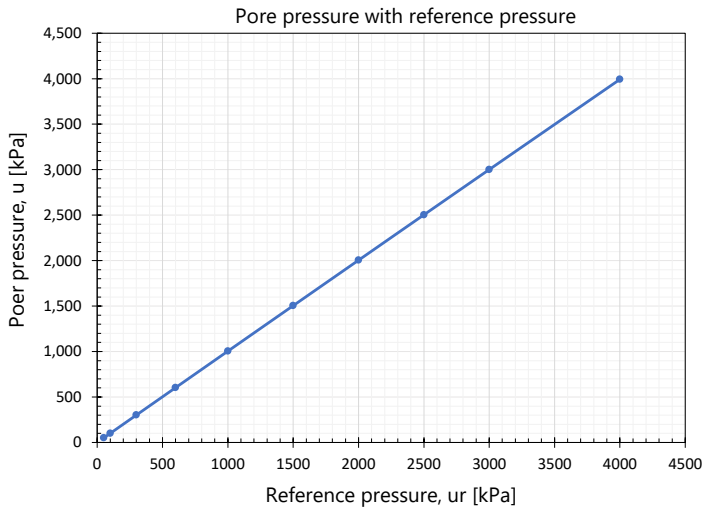
Cone Penetrometer	
Pore pressure sensor capacity	5 MPa
Calibration range	4 MPa
Pore pressure resolution	0.005 kPa
Historic drift between pore calibrations (u_{drift})	0 %
Pore pressure sensor max zero drift	0.23 kPa
Reference pressure sensor max zero drift	0.02 kPa

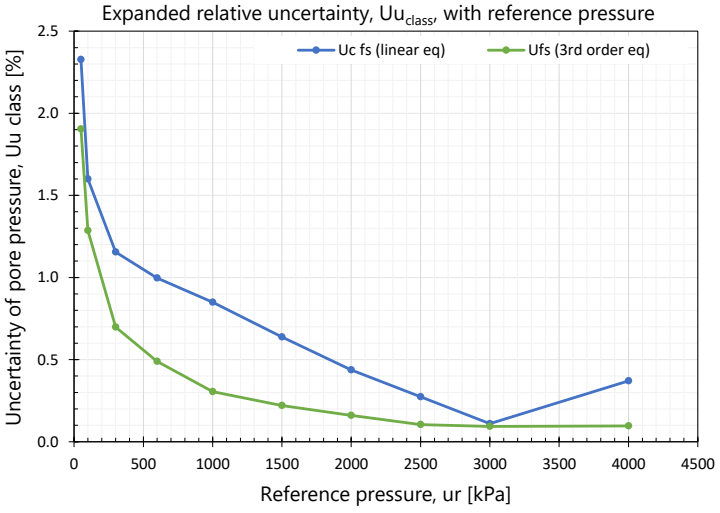
Calibration Conditions	
Ambient temperature	23.5 °C
Pressure chamber temperature variation	0.19 °C
Instrument temperature variation	0.02 °C

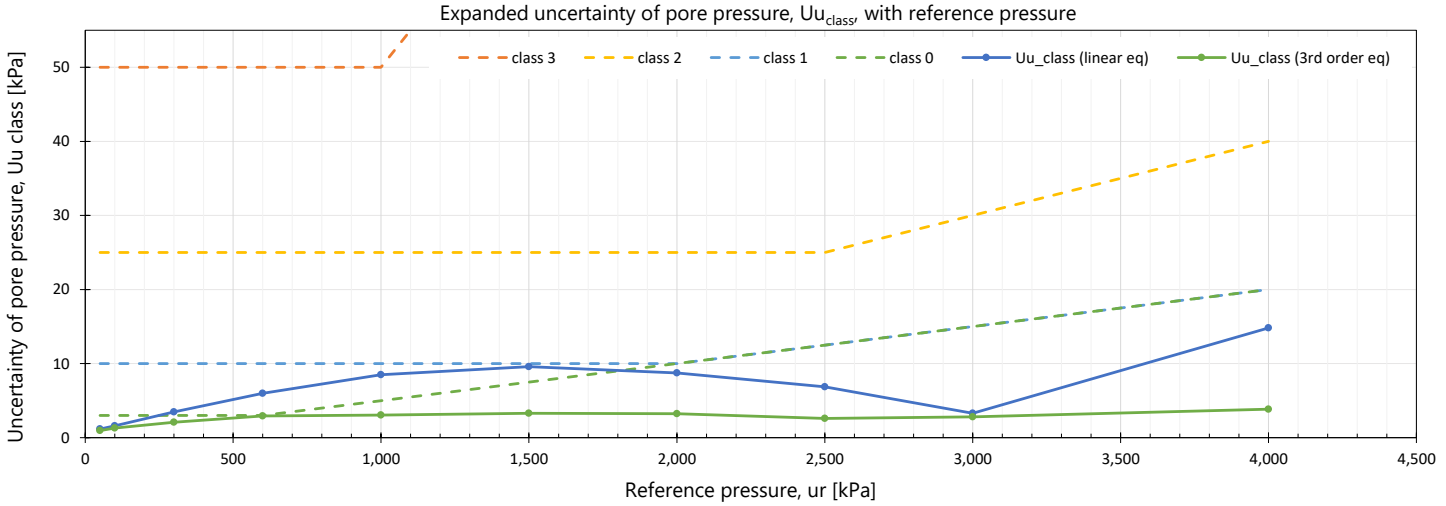
Reference Pressure Sensor Uncertainty	
MMG750V1P1MC0T3A6CE	0.02 ±%

Reference Indicator Uncertainty	
Keithley 7.5 Digit DMM	12 PPM

Pore Pressure Calibration - Graphical Results







Interpolation

Table - 8

Linear Equation	*The pore pressure output in pressure units D (0.1 Pa) is derived using a linear factor from the raw pore pressure output. D = Factor x RAW_Output*	0.1 Pa Factor = 0.049915
Polynomial Equation	*3rd order polynomial equation.* *For a given cone indicated output of D (0.1 Pa units), the corrected applied pressure, P (in 0.1 Pa units) is calculated from :* $P = (a3 \times D^3) + (a2 \times D^2) + (a1 \times D) + a0$	a0 = 0 a1 = 0.992272401 a2 = 2.7359E-10 a3 = -1.03411E-18

Pore Pressure Calibration - Tabular Results

Table - 9 **Calibration results**

kPa ur	kPa X1	kPa X2'	kPa X3	kPa X4'
0	-0.23		-0.11	
50	49.94		49.97	
100	99.71		99.85	
300	299.46		299.38	
600	599.22		598.96	
1000	998.98		999.01	
1500	1498.97		1498.76	
2000	1999.07		1998.72	
2500	2499.43		2499.39	
3000	2999.42		2999.80	
4000	3998.94		3998.99	
3000		2999.18		2999.37
2500		2499.39		2499.68
2000		1999.91		1999.83
1500		1500.37		1500.26
1000		1000.43		1000.73
600		600.71		600.87
300		300.71		300.64
100		100.56		100.45
50		50.46		50.29

Table - 10 **Uncertainty assessment**

Reference pressure	**Standard uncertainty u1 to u6**						**Combined standard calibration uncertainty**		**Expanded calibration uncertainty [k=2]**				**BS EN ISO 22476:2023 class**	**Pore calibration drift**
kPa ur	kPa u1*	kPa u2	kPa u3	kPa u4	kPa u5	kPa u6	kPa u_i	%	kPa U_u	%	kPa Uu_{class}	%	Cone Class **	kPa u_{drift}***
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0	0.00
50	0.41	0.02	0.00	0.00	-0.04	0.24	0.48	0.95	0.95	1.90	0.95	1.90	0	0.00
100	0.42	0.08	0.00	0.01	-0.22	0.42	0.64	0.64	1.29	1.29	1.29	1.29	0	0.00
300	0.48	-0.04	0.00	0.02	-0.58	0.72	1.05	0.35	2.09	0.70	2.09	0.70	0	0.00
600	0.57	-0.15	0.00	0.03	-0.91	0.98	1.47	0.24	2.94	0.49	2.94	0.49	0	0.00
1000	0.70	0.02	0.00	0.06	-1.00	0.92	1.53	0.15	3.06	0.31	3.06	0.31	0	0.00
1500	0.85	-0.12	0.00	0.09	-1.14	0.84	1.65	0.11	3.30	0.22	3.30	0.22	0	0.00
2000	1.00	-0.21	0.00	0.12	-1.11	0.56	1.61	0.08	3.22	0.16	3.22	0.16	0	0.00
2500	1.15	-0.02	0.00	0.14	-0.59	0.07	1.30	0.05	2.61	0.10	2.61	0.10	0	0.00
3000	1.30	0.22	0.00	0.17	-0.39	-0.20	1.40	0.05	2.80	0.09	2.80	0.09	0	0.00
4000	1.60	0.03	0.00	0.23	-1.03	0.00	1.92	0.05	3.84	0.10	3.84	0.10	0	0.00

The class of the penetrometer is determined from the measurement uncertainty at any deflection

At each given deflection the expanded measurement uncertainty Uu_class is calculated from the readings obtained during calibration.

$$Uu_{class} = 2 \times \sqrt{\sum_{i=1}^{6} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration pressure.
u2 is the standard uncertainty associated with the repeatability of the calibration results.
u3 is the standard uncertainty associated with the resolution and noise of the system.
u4 is the standard uncertainty associated with the drift in zero output.
u5 is the standard uncertainty associated with interpolation.
u6 is the standard uncertainty associated with reversibility.

** u1 is not a requirement for BS EN ISO 22476-1:2023 class uncertainty Uu_class. We have included u1 for clarity and confidence in the result.*
*** If the classification is altered with the inclusion u1, then the lower classification will be given alongside a # symbol as identification.*
**** udrift is the standard uncertainty associated with the drift in sensitivity between calibrations. This is an uncertainty associated with subsequent use and not a calibration uncertainty.*

Pore Pressure Calibration - Measured Area Ratios

Calibration method

1. The apparent cone resistance qc;a and apparent sleeve friction fs;a are recorded for all pore pressure calibration intervals, and shown in Table 11a and 11b.
2. The resulting net area ratios of the cone *a* and net area ratios of the sleeve *b* are computed and shown in Table 11a and 11b.
3. The final recorded cone net area ratio *a* and sleeve net area ration *b* are shown in Table 12, where reference pressure ur = 2000kPa

Table - 11a **Cone net area ratio assessment**

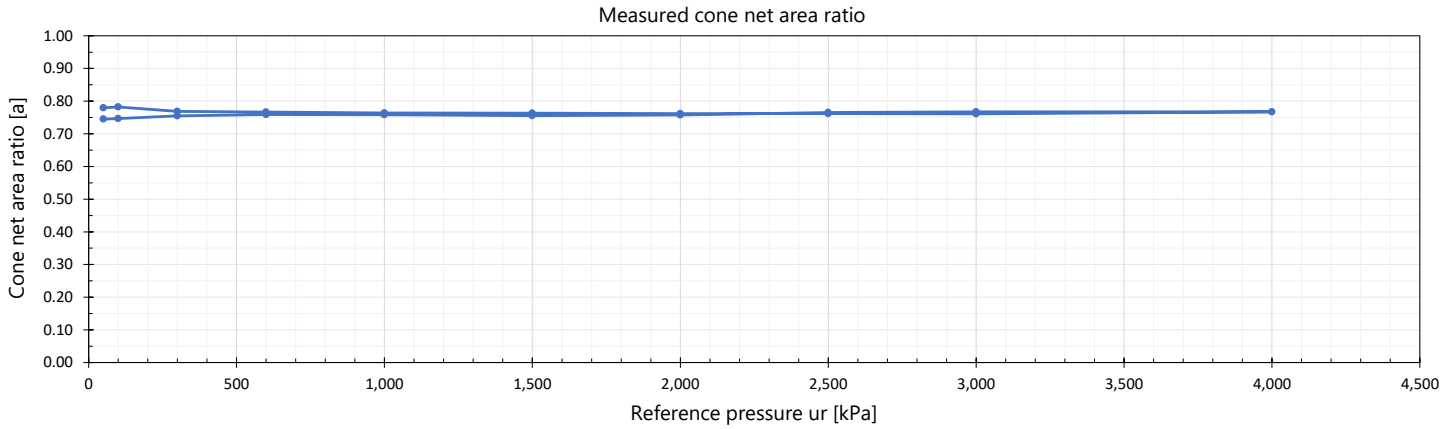
	Apparent cone resistance [qc;a]					
kPa	kPa	kPa	kPa	kPa	kPa	Alpha
ur	X1	X2'	X3	X4'	Mean	factor
50	39.6		38.3		39.0	0.78
100	78.7		77.7		78.2	0.78
300	231.4		230.0		230.7	0.77
600	460.2		459.4		459.8	0.77
1000	764.1		763.4		763.8	0.76
1500	1143.9		1144.6		1144.3	0.76
2000	1522.5		1523.2		1522.9	0.76
2500	1904.8		1903.2		1904.0	0.76
3000	2284.8		2283.5		2284.1	0.76
4000	3074.4		3064.5		3069.4	0.77
3000		2301.4		2303.8	2302.6	0.77
2500		1912.63		1913.94	1913.3	0.77
2000		1514.04		1516.48	1515.3	0.76
1500		1132.82		1134.35	1133.6	0.76
1000		758.127		758.915	758.5	0.76
600		454.93		455.542	455.2	0.76
300		225.588		227.314	226.5	0.75
100		74.8578		74.416	74.6	0.75
50		37.1471		37.35	37.2	0.74

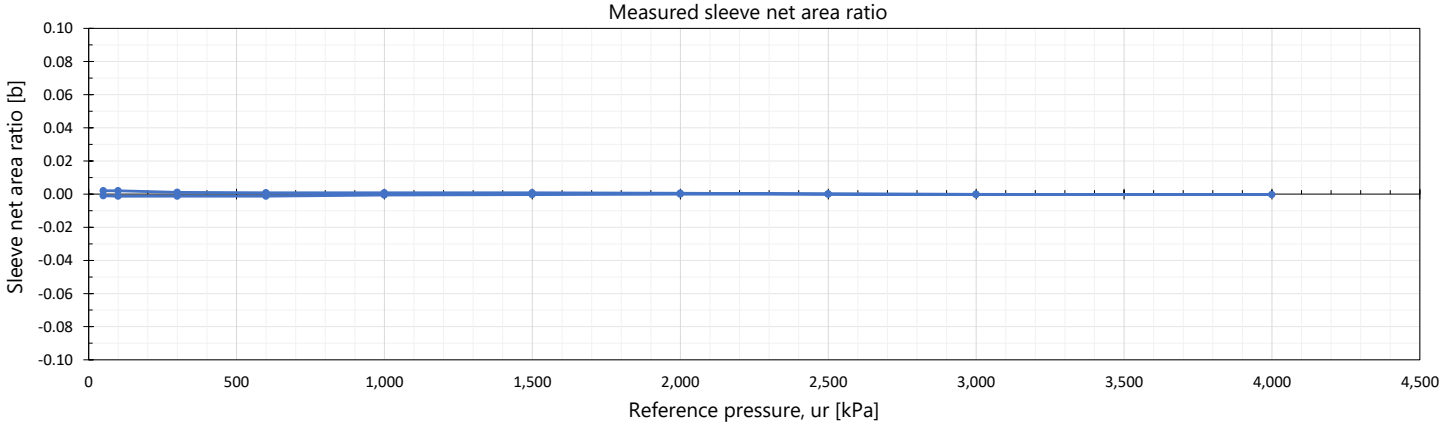
Table - 11b **Sleeve friction net area ratio assessment**

	Apparent sleeve friction [fs;a]					
kPa	kPa	kPa	kPa	kPa	kPa	Beta
ur	X1	X2'	X3	X4'	Mean	factor
50	-0.08		-0.01		-0.05	-0.001
100	-0.18		-0.07		-0.13	-0.001
300	-0.39		-0.34		-0.37	-0.001
600	-0.75		-0.72		-0.74	-0.001
1000	-0.59		-0.58		-0.59	-0.001
1500	-0.42		-0.39		-0.40	0.000
2000	-0.12		-0.10		-0.11	0.000
2500	0.00		0.11		0.05	0.000
3000	-0.45		-0.40		-0.42	0.000
4000	-1.42		-1.42		-1.42	0.000
3000		-0.26		-0.40	-0.33	0.000
2500		0.27		0.24	0.25	0.000
2000		1.04		0.92	0.98	0.000
1500		1.15		1.10	1.13	0.001
1000		0.85		0.74	0.80	0.001
600		0.50		0.51	0.50	0.001
300		0.40		0.25	0.33	0.001
100		0.20		0.19	0.20	0.002
50		0.09		0.11	0.10	0.002

Table - 12

Cone net area ration [a]	0.76
Sleeve friction net area ratio [b]	0.000





CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Inclination Calibration

Calibration method

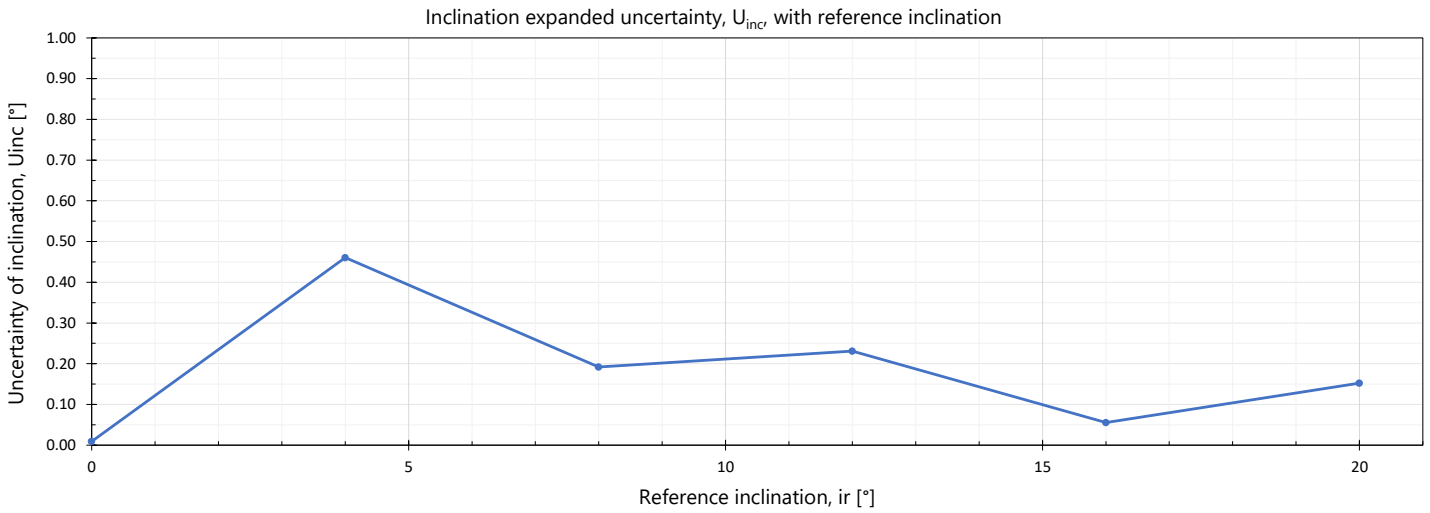
1. The cone penetrometer was placed in the inclination calibration frame and set to a vertical reference inclination of ir = 0°.
2. The inclination was calibrated from ir = 0° to ir = 20°. This was conducted twice, once with the cone at 0° rotation and once with the cone at 90° rotation.
3. The coefficients of a linear equation relating the estimate of the inclination as a function of raw sensor deflection were calculated and are shown in Table 13.
4. The inclination angle applied, and the resulting measurements are given in Table 14.
5. The combined expanded uncertainty* of measurement Uinc for each inclination angle is shown as a percentage of the recorded value and in units of arc degrees °, as shown in Table 15.

* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Cone Penetrometer	
Inclination sensor range	90 °
Calibration range	20 °
Inclination resolution	0.005 °
Inclinometer number of axis	2

Reference Inclination Rotary Table Uncertainty	
Lankelma HV6 Rotary Table	0.10 °

Inclination - Graphical Results



Interpolation

Table - 13

Linear Equation	*The Inclination output in angular units (0.1° x 10^{-3}) is derived using a linear factor from the raw inclination output.*	X axis Factor =	9.537168
		Y axis Factor =	9.625149

Inclination Calibration - Tabular Results

Table - 14

Inclination calibration

° ir	° θ0	° θ90
0	0.00	0.00
4	4.23	4.26
8	8.13	8.04
12	12.12	12.11
16	15.99	15.97
20	19.91	19.94

Table - 15

Uncertainty assessment

Reference Inclination	Standard calibration uncertainty u1 to u4				Combined standard calibration uncertainty ui		Expanded calibration uncertainty Uinc [k=2]	
° ir	° u1	° u2	° u3	° u4	°	% u_i	°	% U_{inc}
0	0.00	0.00	0.00	0.00	0.00		0.01	
4	0.01	0.01	0.00	0.23	0.23	5.76	0.46	11.52
8	0.02	0.03	0.00	0.09	0.10	1.20	0.19	2.40
12	0.02	0.01	0.00	0.11	0.12	0.96	0.23	1.92
16	0.02	0.01	0.00	-0.02	0.03	0.17	0.06	0.35
20	0.02	0.01	0.00	-0.07	0.08	0.38	0.15	0.76

At each given deflection the expanded measurement uncertainty Uinc is calculated from the readings obtained during calibration.

$$U_{inc} = 2 \times \sqrt{\sum_{i=1}^{4} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration inclination.
u2 is the standard uncertainty associated with the reproducibility of the calibration results.
u3 is the standard uncertainty associated with the resolution and noise of the system.
u4 is the standard uncertainty associated with interpolation.

CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Temperature Calibration

Calibration method

1. The cone penetrometer was placed in the thermostatic temperature calibration bath with the temperature set to 0°C.
2. The temperature was calibrated from Tr = 0°C to Tr = 30°C.
3. The coefficients of a linear equation relating the estimate of temperature as a function of raw temperature sensor deflection were calculated and are shown in Table 16.
4. The applied temperature, and the resulting measurements are given in Table 17.
5. The combined expanded uncertainty* of measurement Utemp for each temperature is shown as a percentage of the recorded value and in units of Celsius °C, as shown in Table 18.

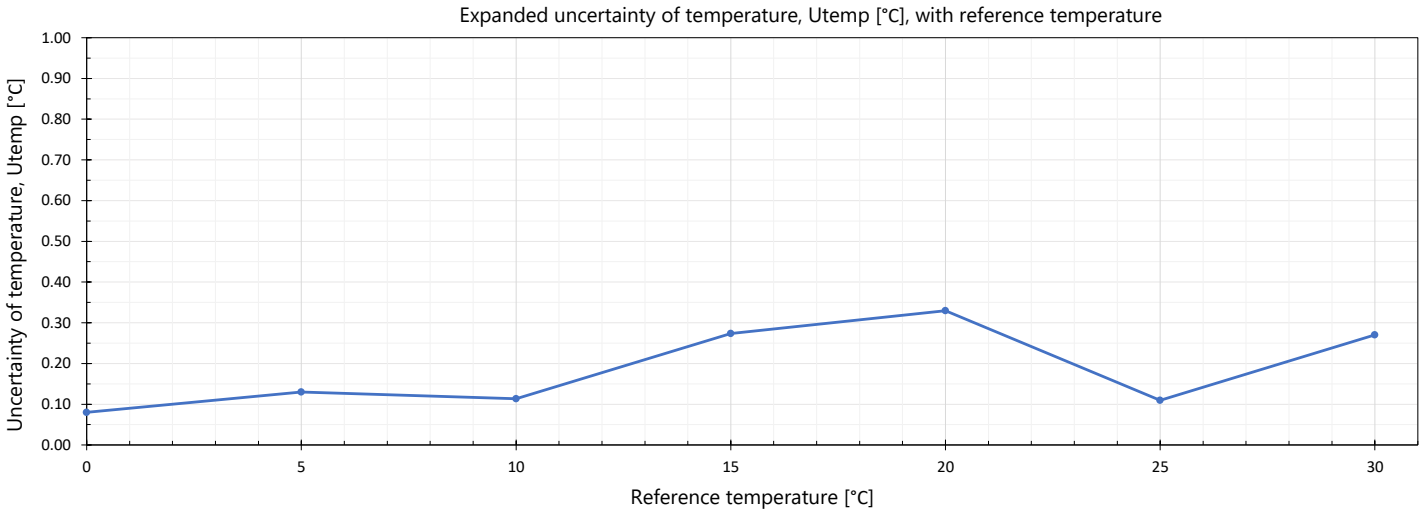
* The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Cone Penetrometer	
Temperature sensor range	90 °
Calibration range	30 °
Temperature resolution	0.005 °
Temperature number of axis	2

Reference Thermometer Uncertainty	
ETI Ref Thermometer	0.04 °

Temperature Datalogger Uncertainty	
ETI ThermaData	0.4 °

Temperature Calibration - Graphical Results



Interpolation

Table - 16

Linear Equation	*The temperature sensor output in temperature units (0.1°C x 10⁻³) is derived using a linear factor from the raw temperature output.*	Temperature sensor [qc] factor =	0.570200
		Temperature sensor [fs] factor =	0.578100

Temperature Calibration - Tabular Results

Table - 17

Temperature calibration

°C T_r	°C T_a
0	0.00
5	5.05
10	9.96
15	14.87
20	19.84
25	25.04
30	30.13

Table - 18

Uncertainty assessment

Reference temp	Standard calibration uncertainty u1 to u3			Combined standard calibration uncertainty u_t		Expanded calibration uncertainty U_{temp} [k=2]	
°C T_r	°C u1	°C u2	°C u3	°C	% u_t	°C	% U_{temp}
0	0.04	0.00	0.00	0.04		0.08	
5	0.04	0.00	0.05	0.07	1.30	0.13	2.60
10	0.04	0.00	-0.04	0.06	0.57	0.11	1.13
15	0.04	0.00	-0.13	0.14	0.91	0.27	1.82
20	0.04	0.00	-0.16	0.16	0.82	0.33	1.65
25	0.04	0.00	0.04	0.05	0.22	0.11	0.44
30	0.04	0.00	0.13	0.14	0.45	0.27	0.90

At each given deflection the expanded measurement uncertainty Utemp is calculated from the readings obtained during calibration.

$$U_{temp} = 2 \times \sqrt{\sum_{i=1}^{3} u_i^2}$$

where,
u1 is the standard uncertainty associated with the applied calibration temperature.
u2 is the standard uncertainty associated with the resolution and noise of the system.
u3 is the standard uncertainty associated with interpolation.

Temperature Influence Verification

Verification method

1. The cone penetrometer was placed in the thermostatic temperature calibration bath with the temperature set to 30°C, the second bath temperature was set to 0°C.
2. The test method for verification of a cone penetrometer for temperature influence was followed as set out in BS EN ISO 22476-1:2023, clause B.2.7.2.
3. The bath temperatures, apparent cone resistance, apparent sleeve friction, apparent pore pressure, and apparent cone temperature were recorded for the duration of the test.
4. The correction factors for; corrected apparent cone resistance, corrected sleeve friction, and corrected pore pressure were applied in post processing.
5. The start and end apparent readings are shown in Table 19. The maximum and minimum apparent readings are shown in Table 20.

Table - 19 **Start and end apparent readings**

	°C	°C	kPa	kPa	kPa	kPa	kPa	kPa
	Ta_{qc}	Ta_{fs}	qc;a	qc;ac	fs;a	fs;ac	u;a	u;ac
T30	30.2	30.3	-2.3	-2.2	-0.1	-0.1	-0.1	-0.1
T0	0.3	0.1	-53.6	-3.4	0.5	1.0	-99.8	0.4

Table - 20 **Maximum / minimum apparent readings**

	kPa	kPa	kPa	kPa	kPa	kPa
	qc;a	qc;ac	fs;a	fs;ac	u;a	u;ac
max	373.8	79.6	13.1	9.3	0.3	3.7
min	-428.3	-90.1	-12.1	-8.5	-100.8	-6.7

Maximum rate of change

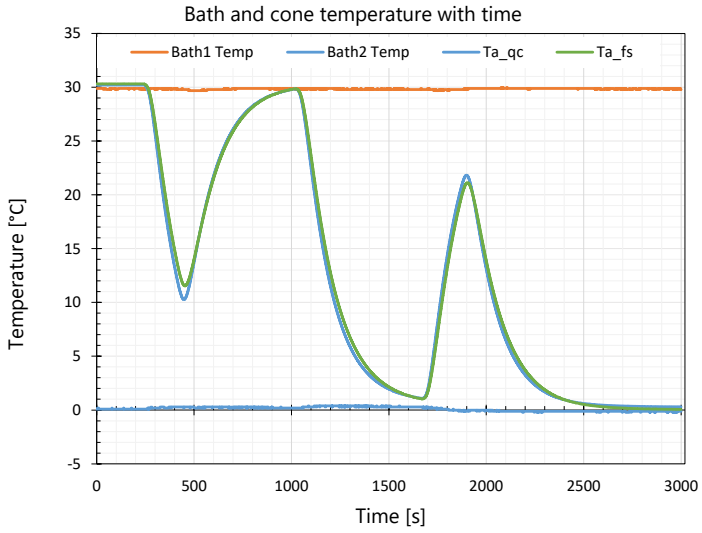
kPa/s	kPa/s	kPa/s	kPa/s	kPa/s	kPa/s
Δfgqc	Δfgqcc	Δfgfs	Δfgfsc	Δfgu	Δfguc
14.50	6.27	0.53	0.44	0.65	0.20

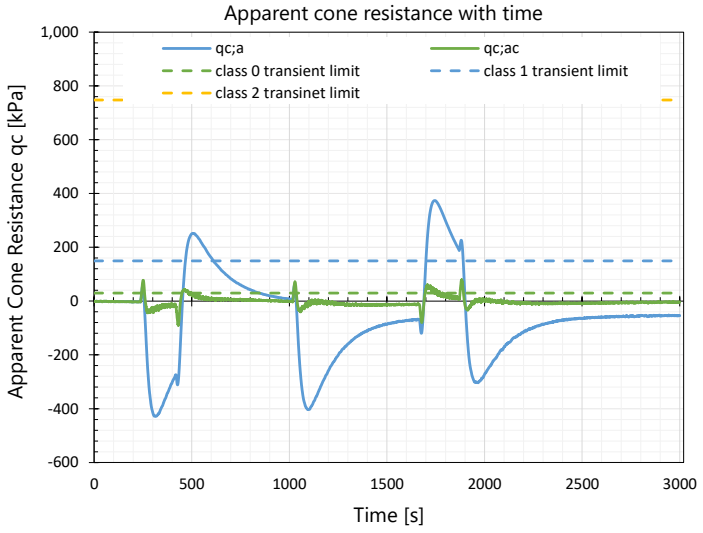
Table - 21a **Ambient temperature stability and classification**

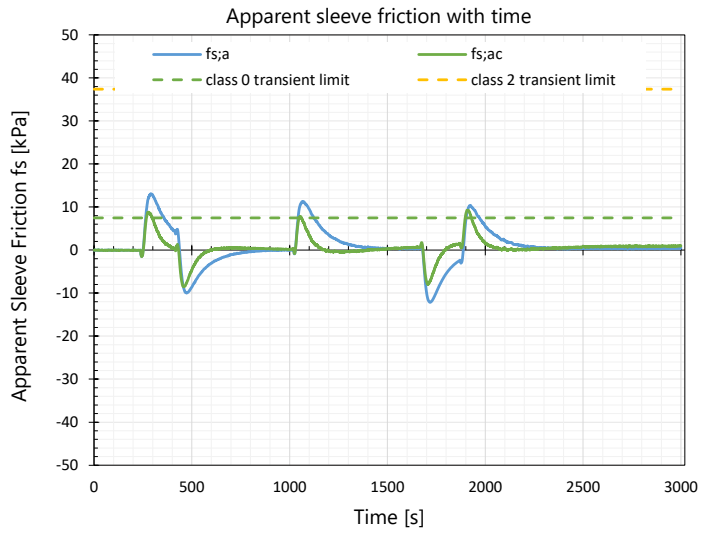
Ambient temperature stability		kPa/°C	Class
Uncorrected	Δaqc	1.72	1
	Δafs	-0.02	0
	Δau	3.33	N/A
Corrected	Δaqcc	0.04	0
	Δafsc	-0.03	0
	Δauc	-0.02	0

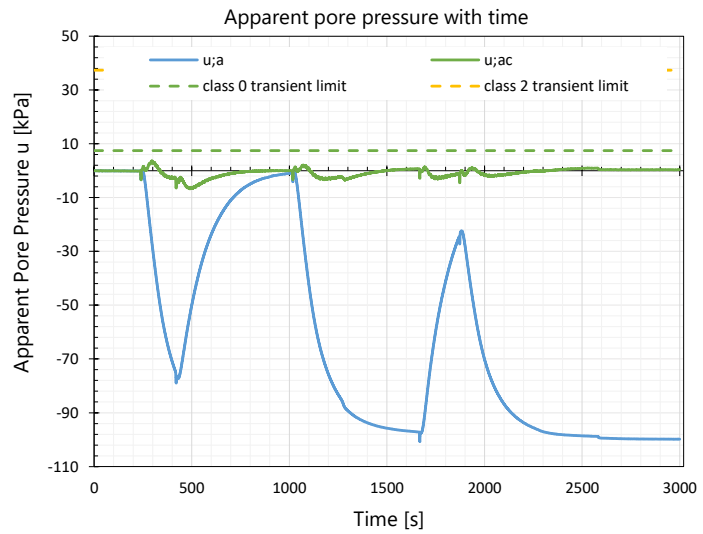
Table - 21b **Transient temperature stability and classification**

Transient temperature stability		kPa/°C	Class
Uncorrected	Δtqc	26.81	2
	Δtfs	0.83	2
	Δtu	3.38	3
Corrected	Δtqcc	5.67	1
	Δtfsc	0.59	2
	Δtuc	0.35	0









CERTIFICATE OF CALIBRATION

Certificate Number: 1722

Cone Penetrometer Serial No.
DS15-CFIIPTT.2477

Bending Influence Verification

Verification Method

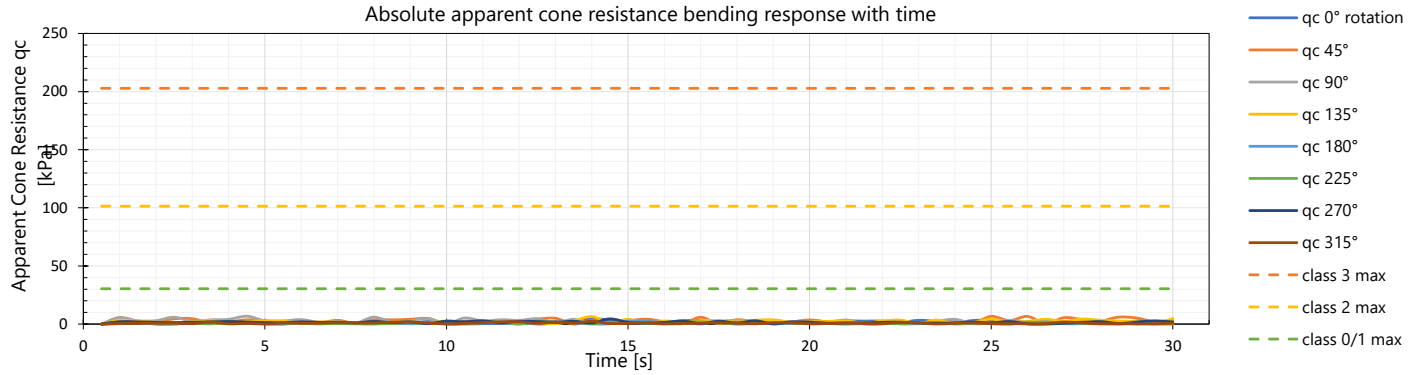
1. The cone penetrometer was placed in the bending influence frame, clamping the cone horizontally.
2. The test method for verification of a cone penetrometer for bending influence was followed as set out in BS EN ISO 22476-1:2023, clause B.2.8.2.
3. The air temperature, apparent cone resistance, apparent sleeve friction, and apparent pore pressure were recorded for the duration of each test. In total 8 tests were performed from 0° rotation to 315° rotation, evenly spaced with 45° rotation between tests.
4. The bending influence results and resulting cone penetrometer classification was calculated and are shown in Table 22.

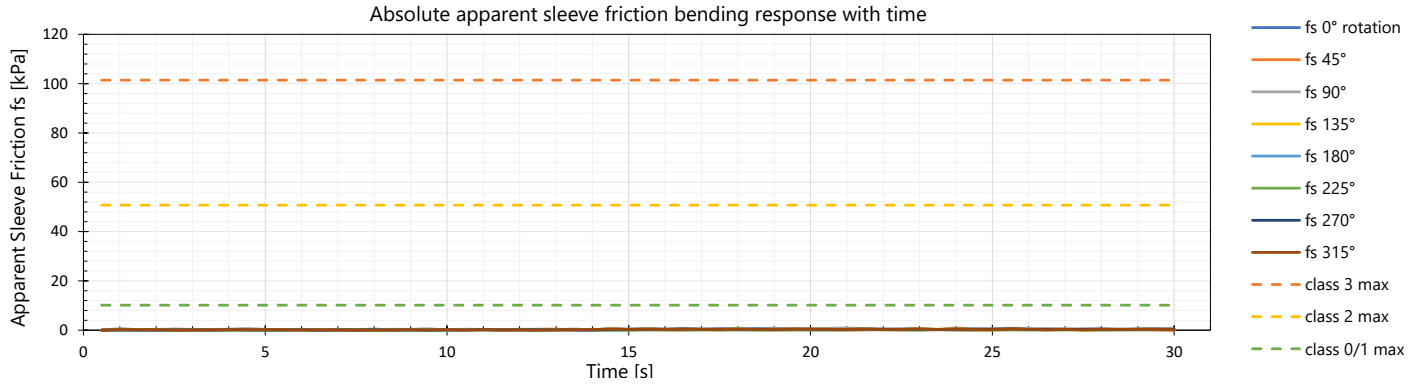
Table - 22 **Bending Influence results**

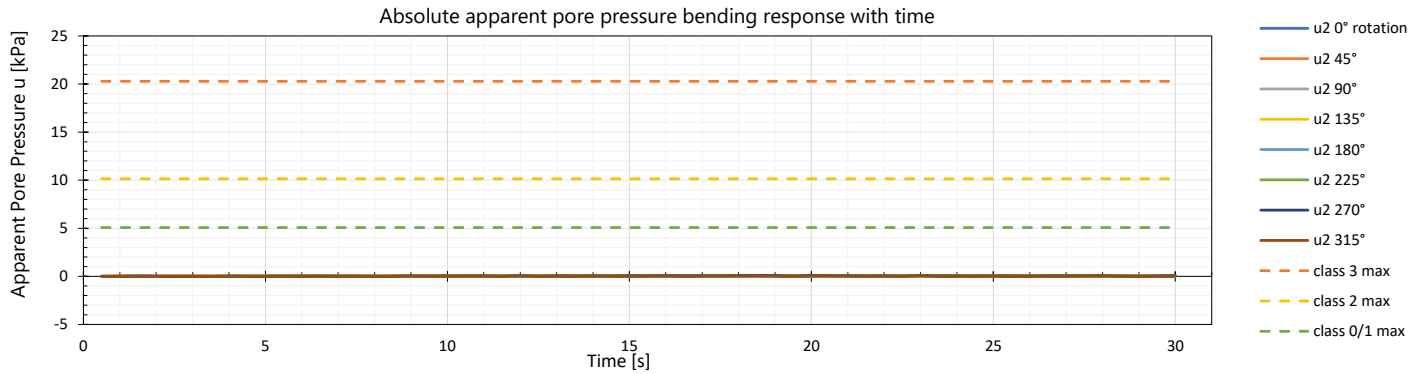
	qc;a [kPa/N]	fs;a [kPa/N]	u2;a [kPa/N]	Ambient Temp [°C]
max	0.067	0.001	0.000	26.6
min	-0.030	-0.009	-0.001	26.4
max test Δb, Δt	0.097	0.009	0.001	0.2
class	0	0	0	

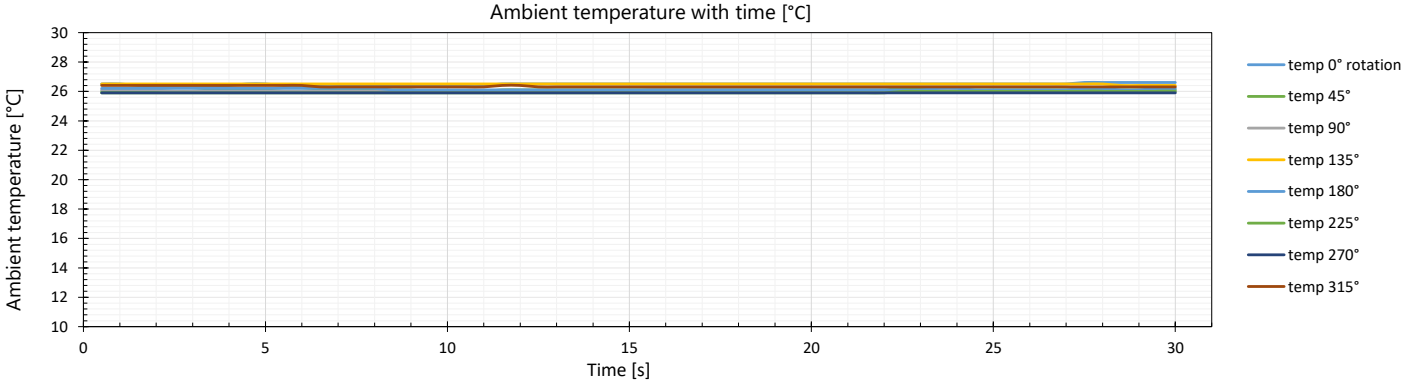
10 kg Calibration Weight Uncertainty	
10 kg Calibration Weight	0.001 %

10 kg Calibration Weight	
Reference weight	10.341 kg
Reference force	101.411 N









Sensor Stability Verification

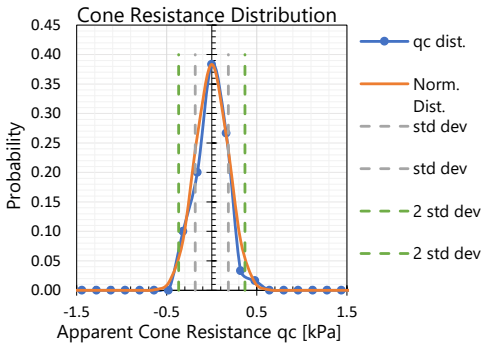
The purpose of this section is to quantify the stability of the geotechnical sensors (qc, fs, u) and demonstrate validity of applying a normal distribution, described by standard deviation and mean, when assessing probability of noise magnitude. The sampling duration has been limited to 60 seconds to allow direct comparison to the field verification data required under BS EN ISO 22476-1: 2023.

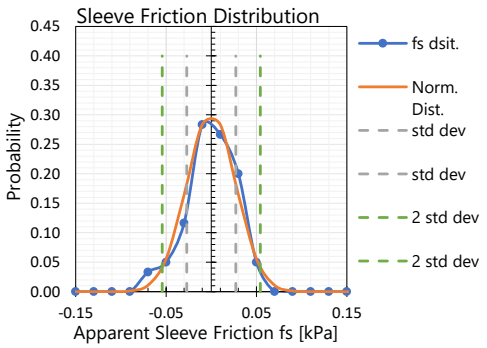
Verification method

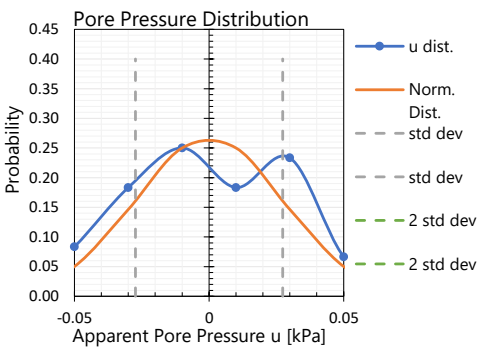
1. The cone penetrometer was placed in the thermostatic temperature calibration bath at ambient temperature.
2. The cone penetrometer was left for no less than 30 minuets or until the output was stable.
3. The output was recorded for 60 seconds at a frequency of 1Hz. The maximum change and standard deviation are shown in Table 23.

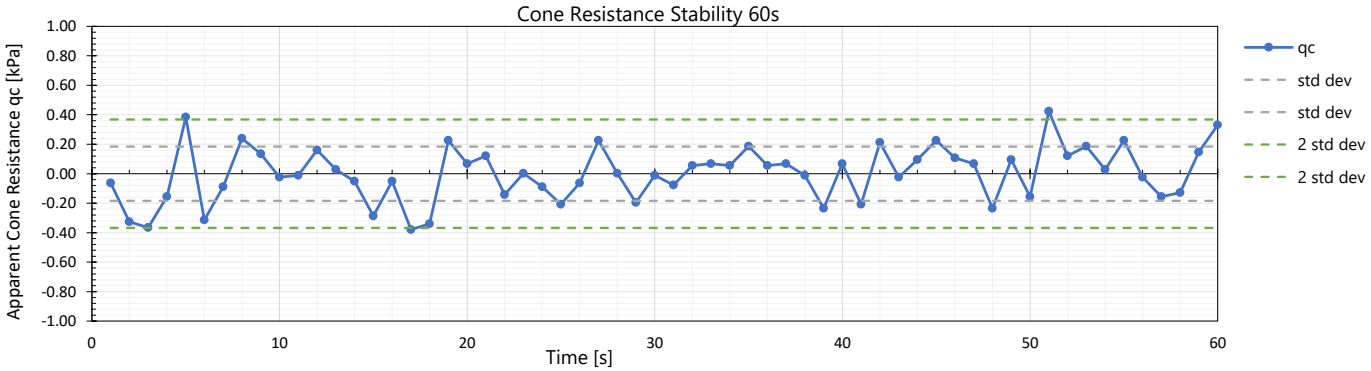
Table - 23 **Sensor stability results**

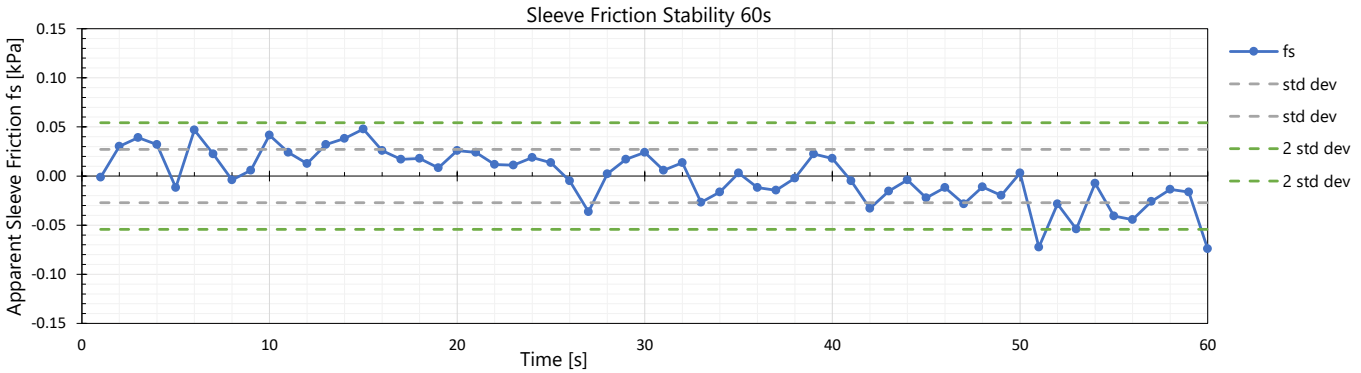
	qc (kPa)	fs (kPa)	u (kPa)	Inc (°)	Temp (°C)
Max	0.423	0.048	0.050	0.045	0.027
Min	-0.379	-0.074	-0.053	-0.040	-0.026
Δ (Max - Min)	0.802	0.122	0.103	0.086	0.096
Standard deviation (68% coverage)	± 0.184	± 0.027	± 0.027	± 0.020	± 0.015
2 standard deviations (95% coverage)	± 0.368	± 0.054	± 0.055	± 0.039	± 0.031

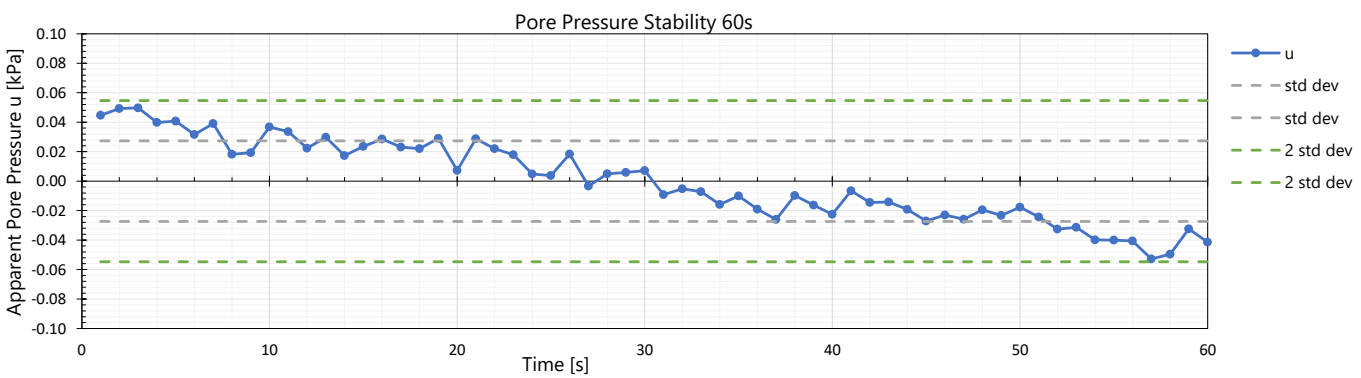














UK20
Track-truck

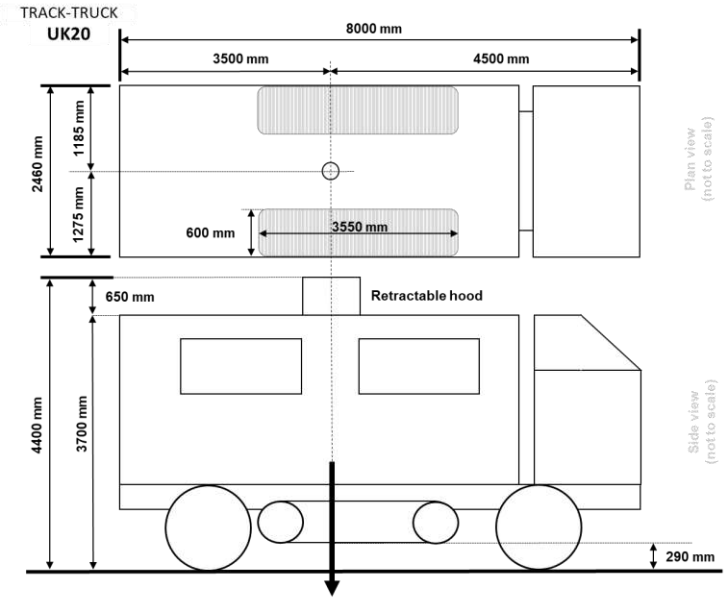
LANKELMA
01797 280050 – www.lankelma.com

The versatile track-truck is suitable for most geotechnical sites. The rig is driven to site as a self-contained HGV with tracks that can be deployed to cope with soft or uneven terrain.

Fitted with a chalwyn valve and spark arrestor.

Remote-controlled tracking to assist with manoeuvring onto location.

Complies with Euro 6 emission standards for use in London's low emissions zones (LEZ).



Rig weight	19. T
Max. operating ram capacity	20. T
Max. travelling speed	86 km/h
Track material	Steel
Track length	3550 mm
Track width	600 mm
Jack plate dimensions	Tracks act as jacks
Jack arrangements	1nr. on each side
Max. ground clearance on jacks	290 mm
Max. ground bearing pressure	Wheels – 300 kPa Tracks – 48 kPa
Max. testing gradient	10 degrees
Max. traversing gradient	20 degrees (operator assessed)
Noise output at 2 m	Testing - 69.5 dBA Driving – 78.7 dBA
Clamp arrangement	Hydraulic catching – semi automatic
Ram stroke	1.2 m
Max. casing size	55 mm
Typical production	100 m+ of standard CPTu testing per day (depending on conditions and access)

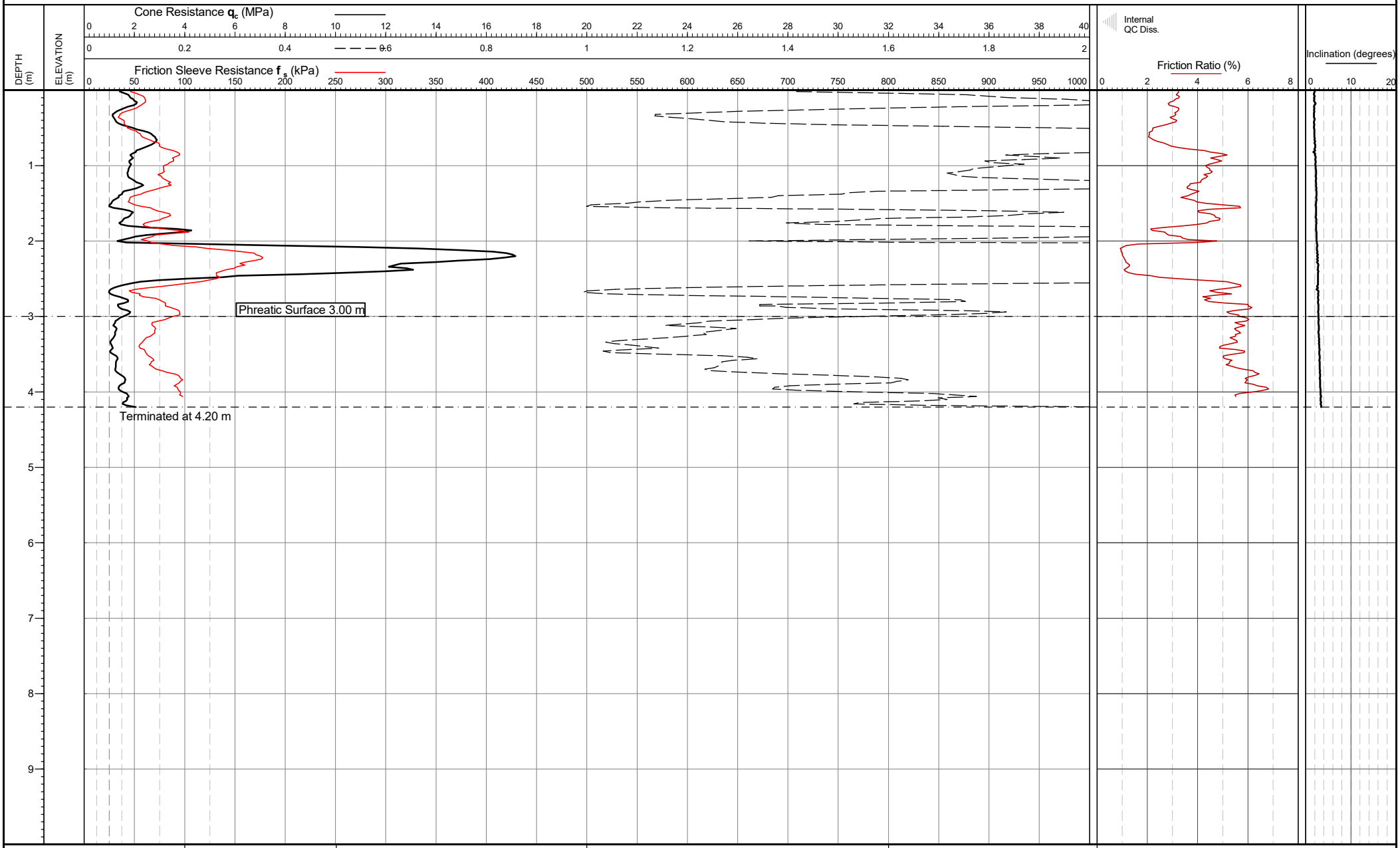
APPENDIX C CONE PENETRATION TEST RESULTS

Measured CPT parameters

intermediate parameters R_f and B_q

Project: SOUTHAMPTON

Client: SOILS LTD.

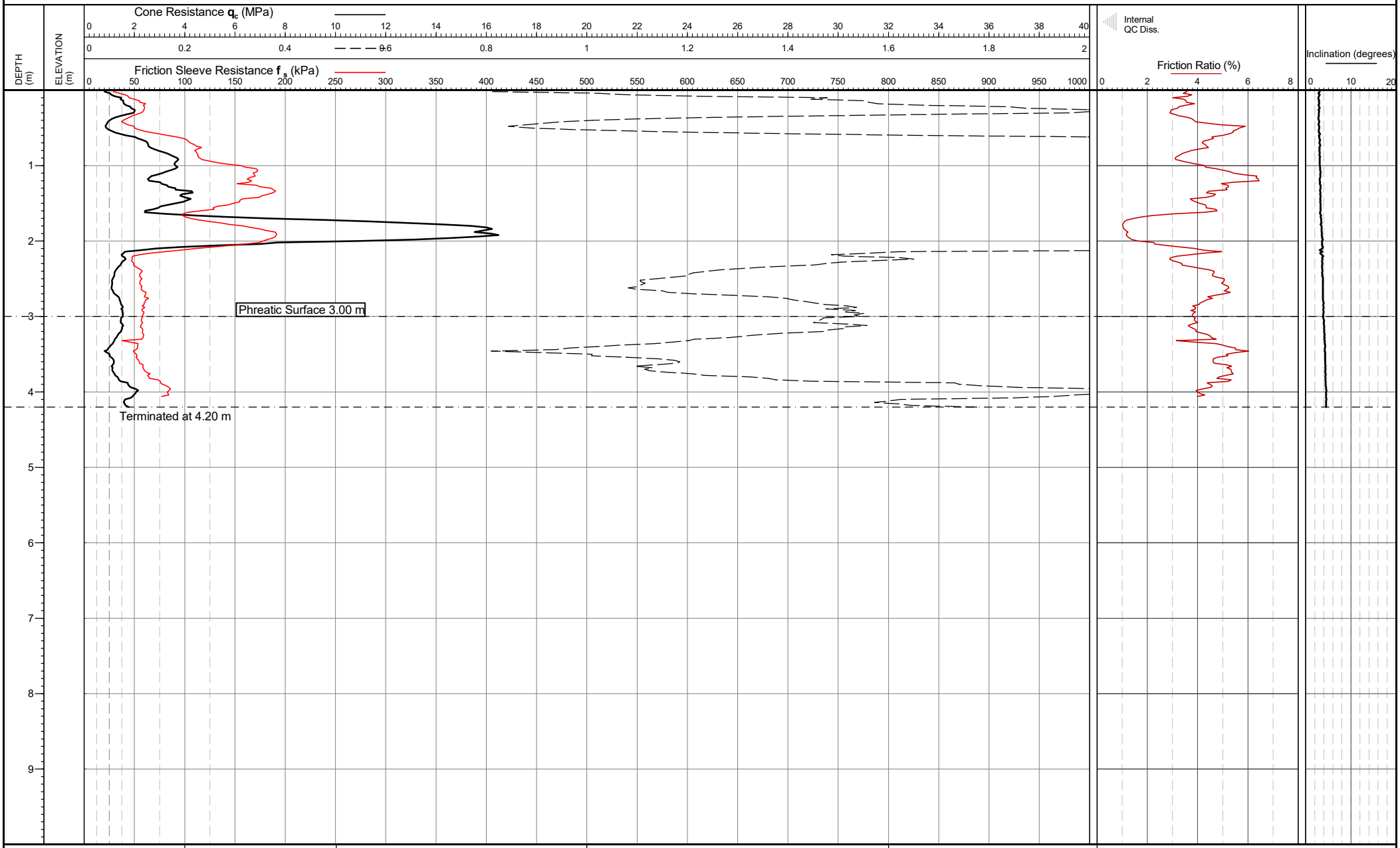


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:10:55	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-01

Project: SOUTHAMPTON

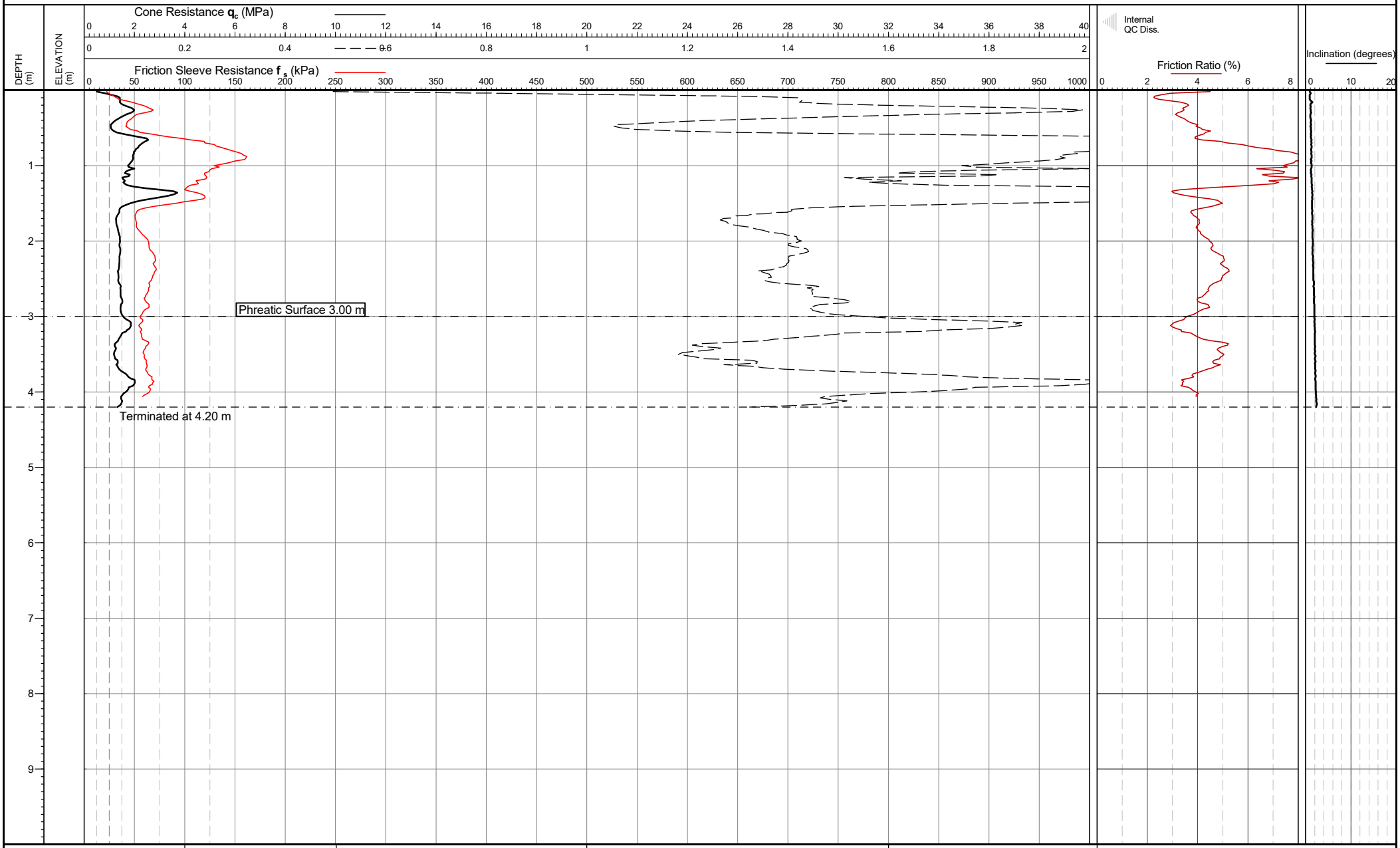
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 11:30:59	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-02** Page 1 of 1

Project: SOUTHAMPTON

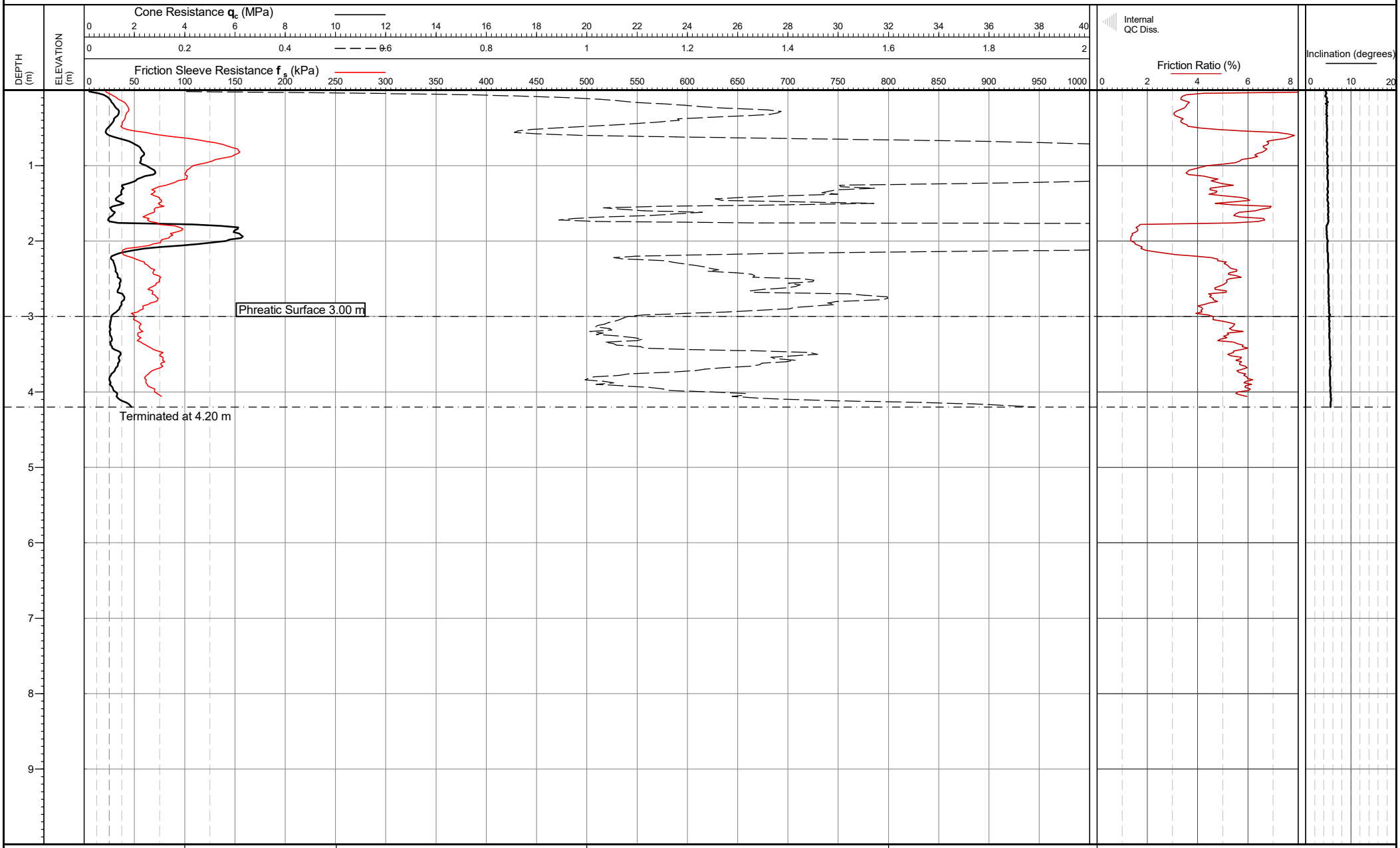
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 10:41:56	Zero drift (Pre/post test) q_c (kPa): -20.6 f_s (kPa): 0.3 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-03** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

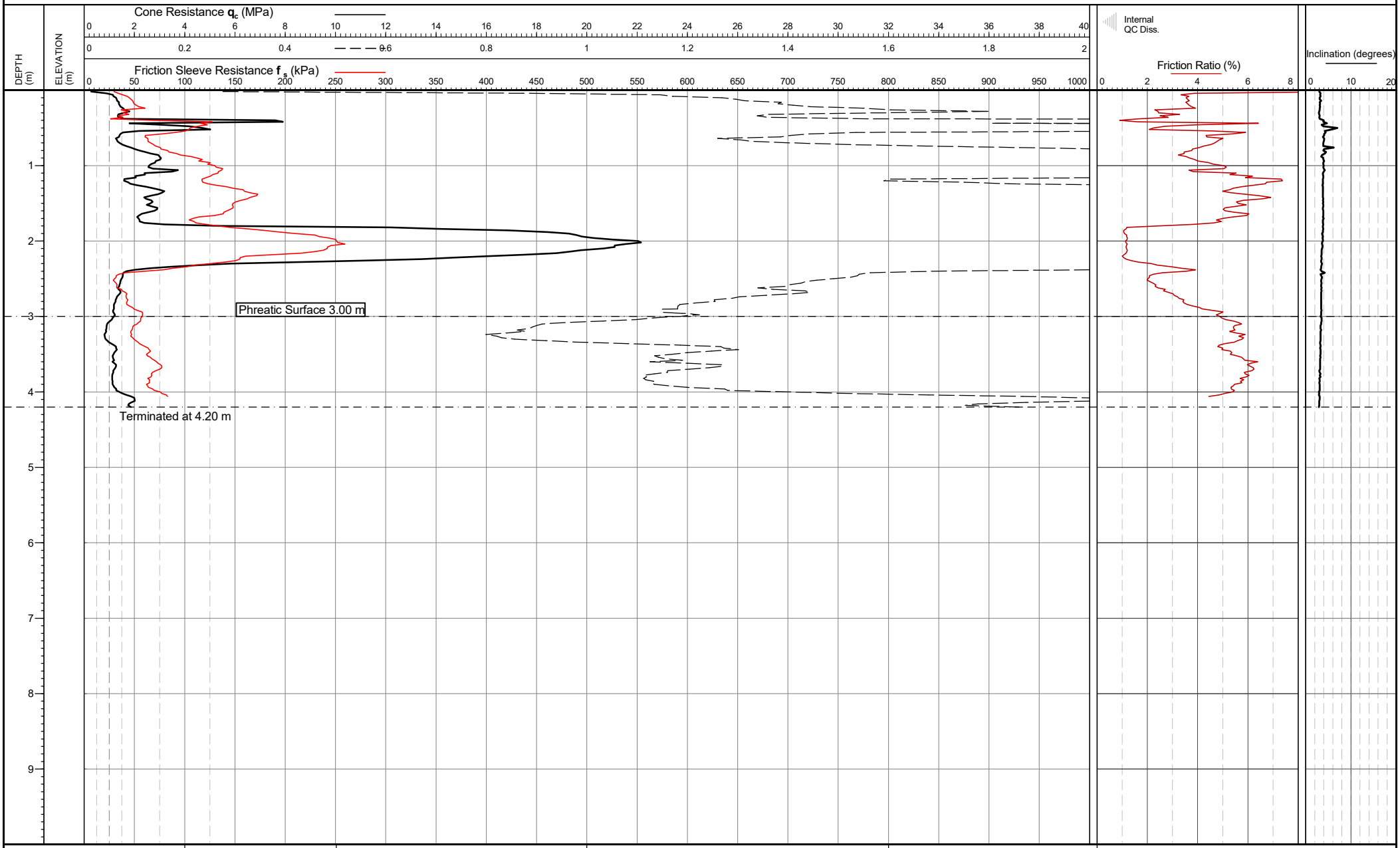


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:24:30	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-04

Project: SOUTHAMPTON

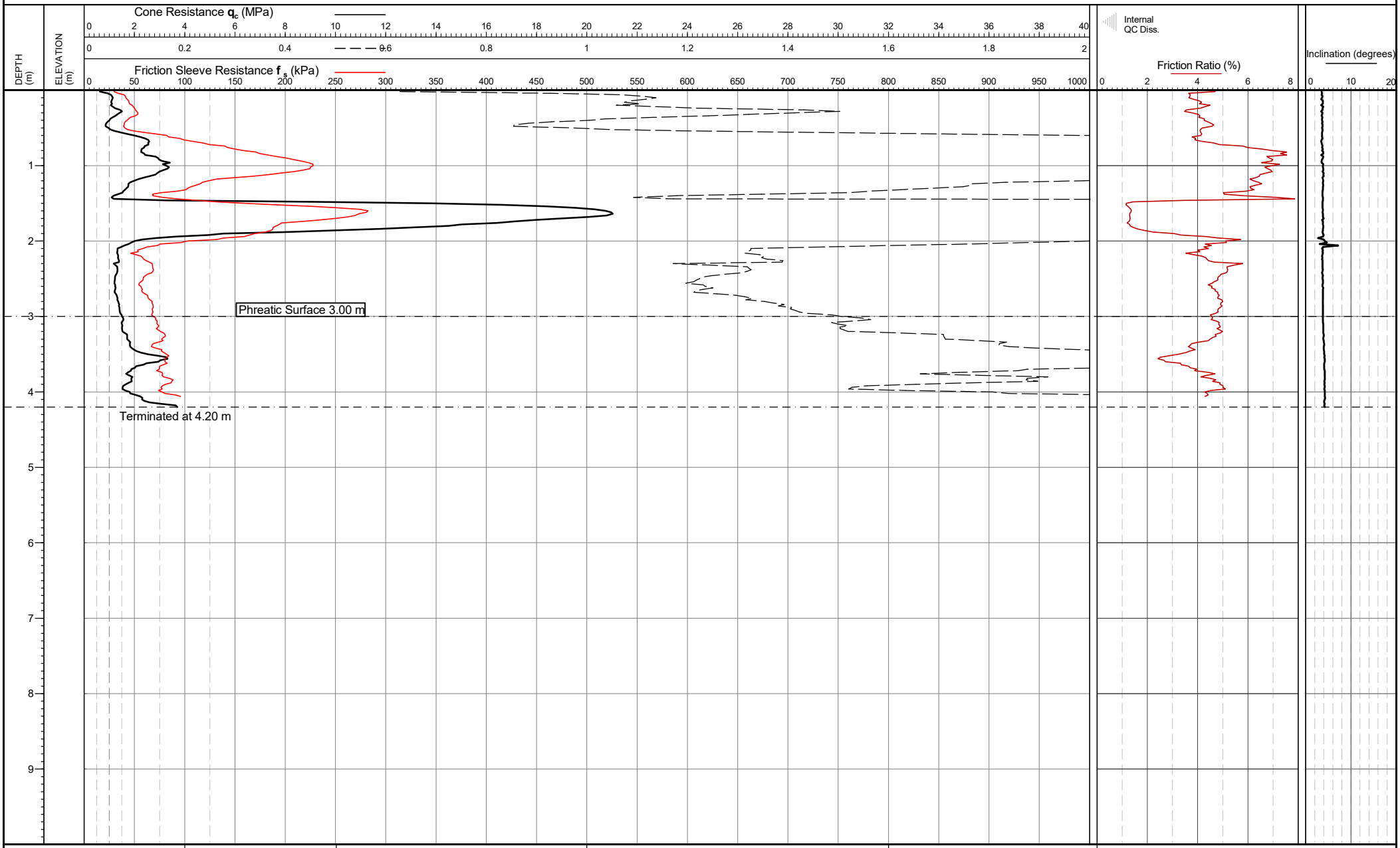
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 15:12:32	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-05** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.



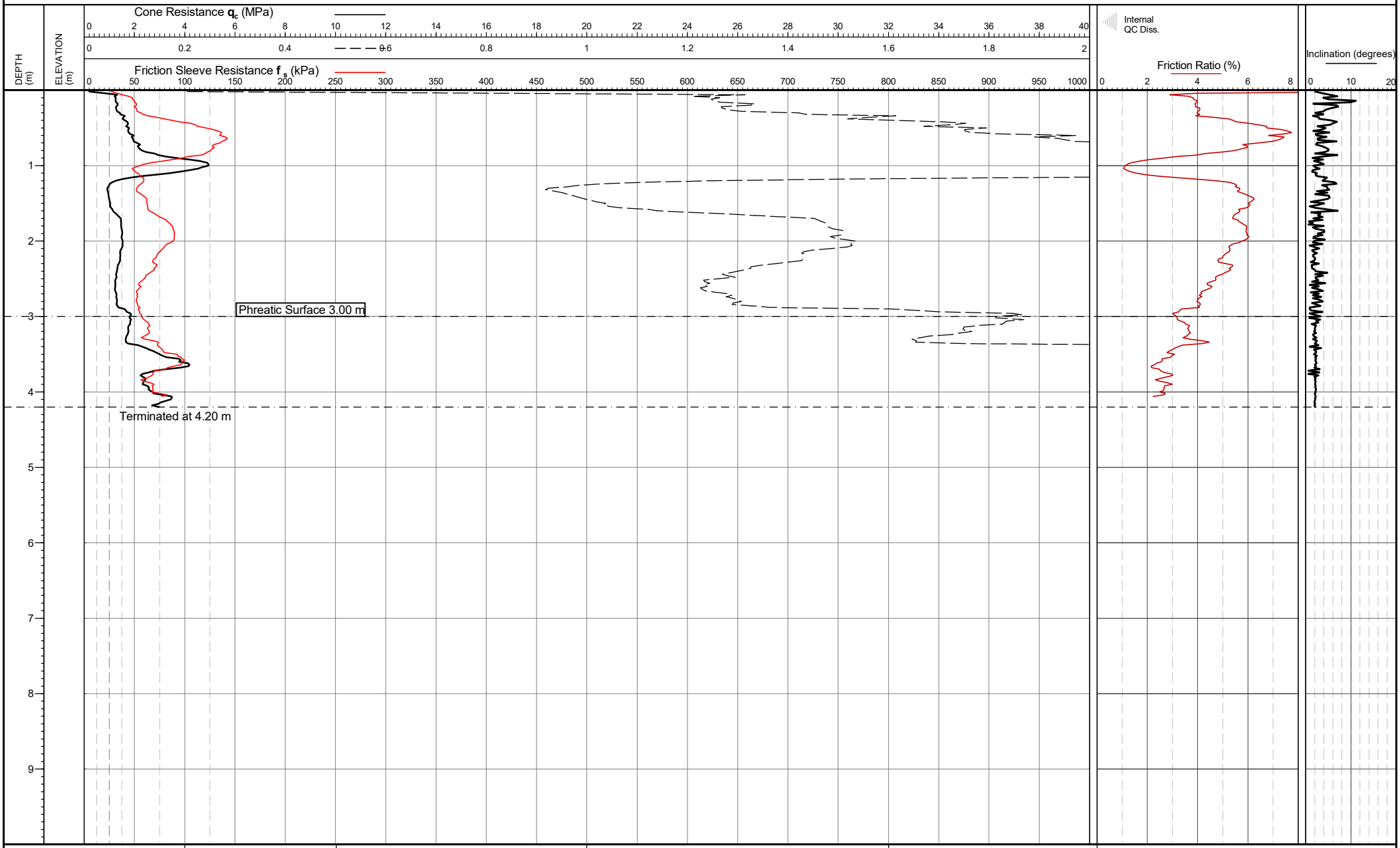
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 15:46:10	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-06

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

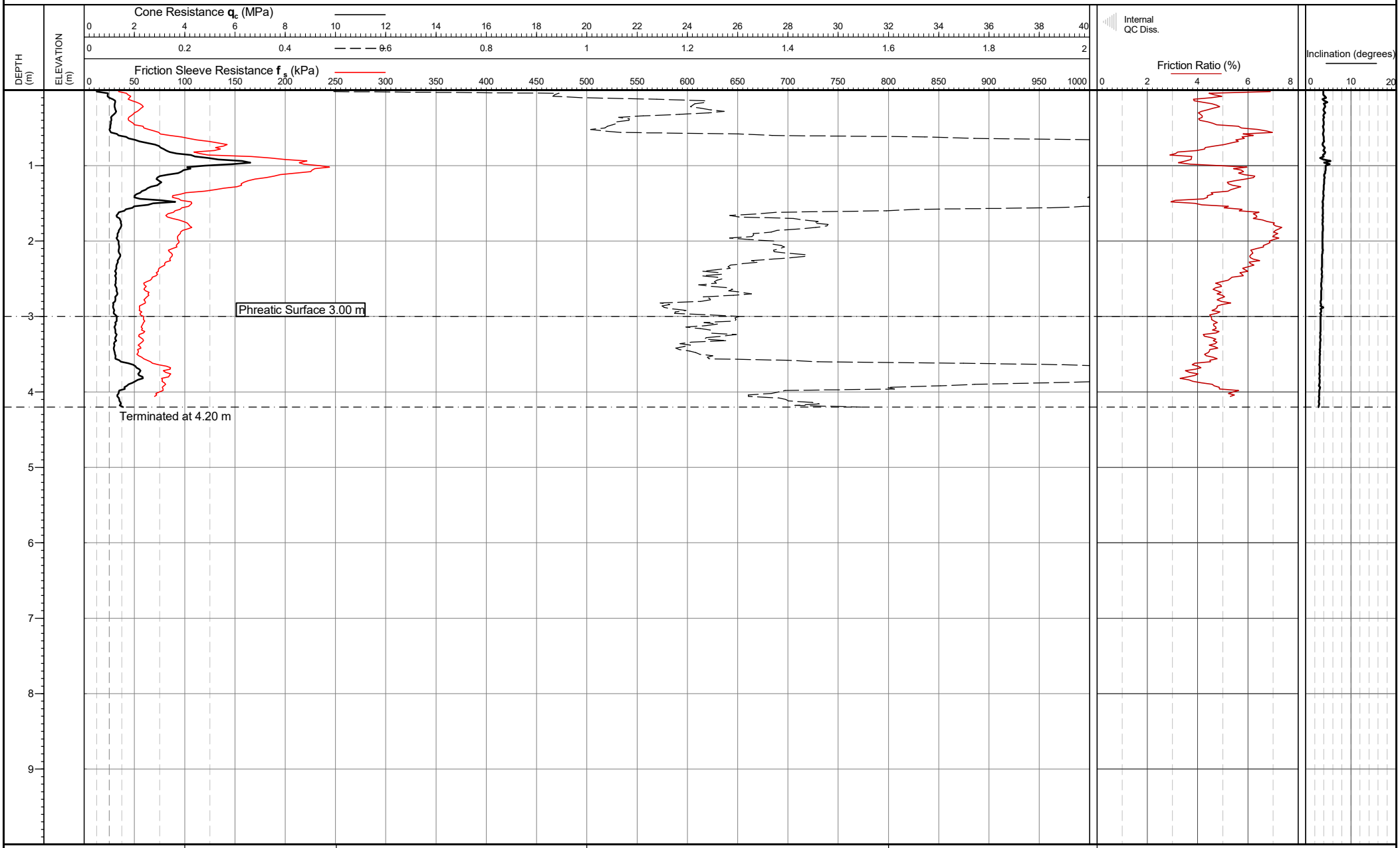


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:01:27	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-07

Project: SOUTHAMPTON

Client: SOILS LTD.

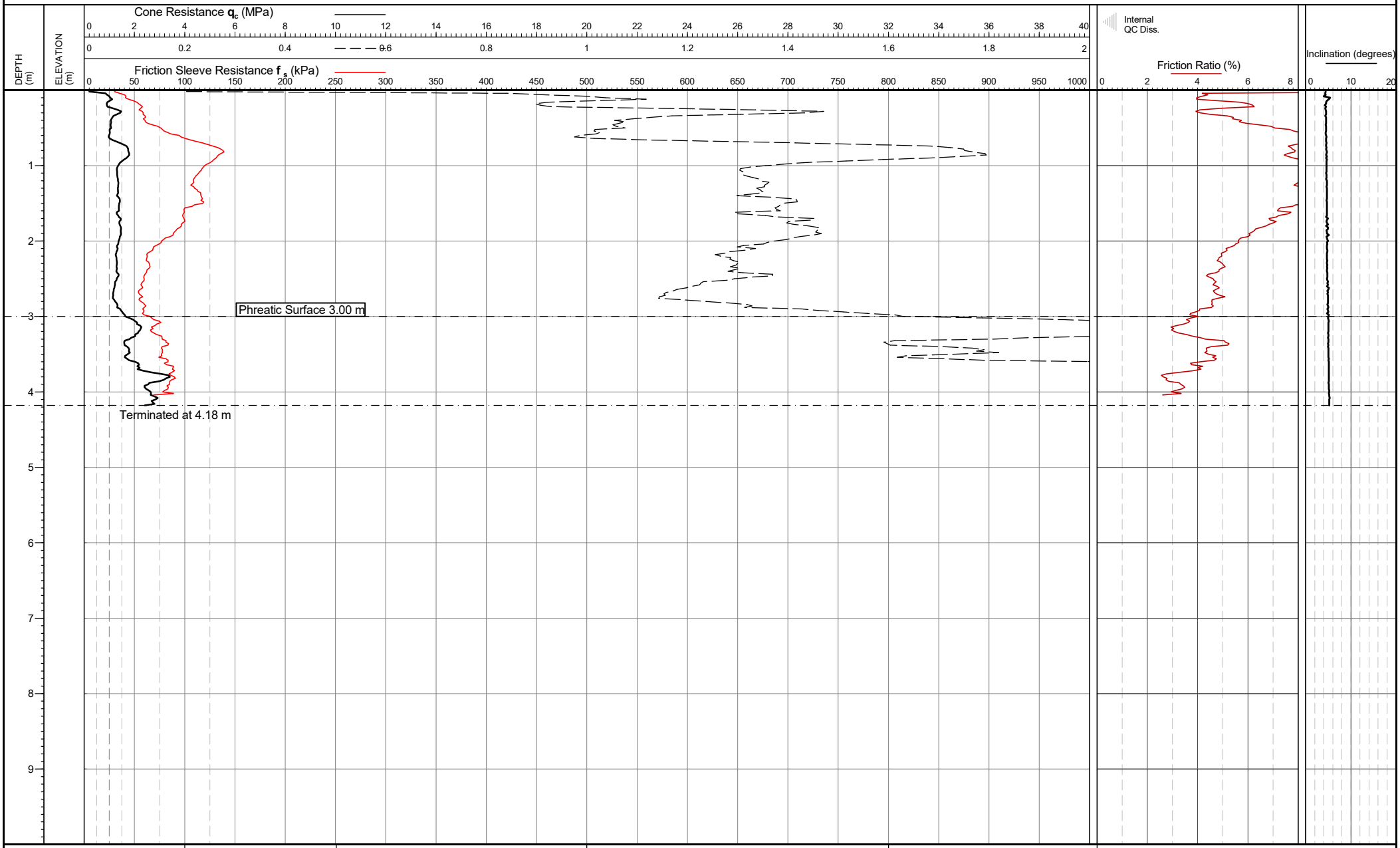


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:57:03	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-08

Project: SOUTHAMPTON

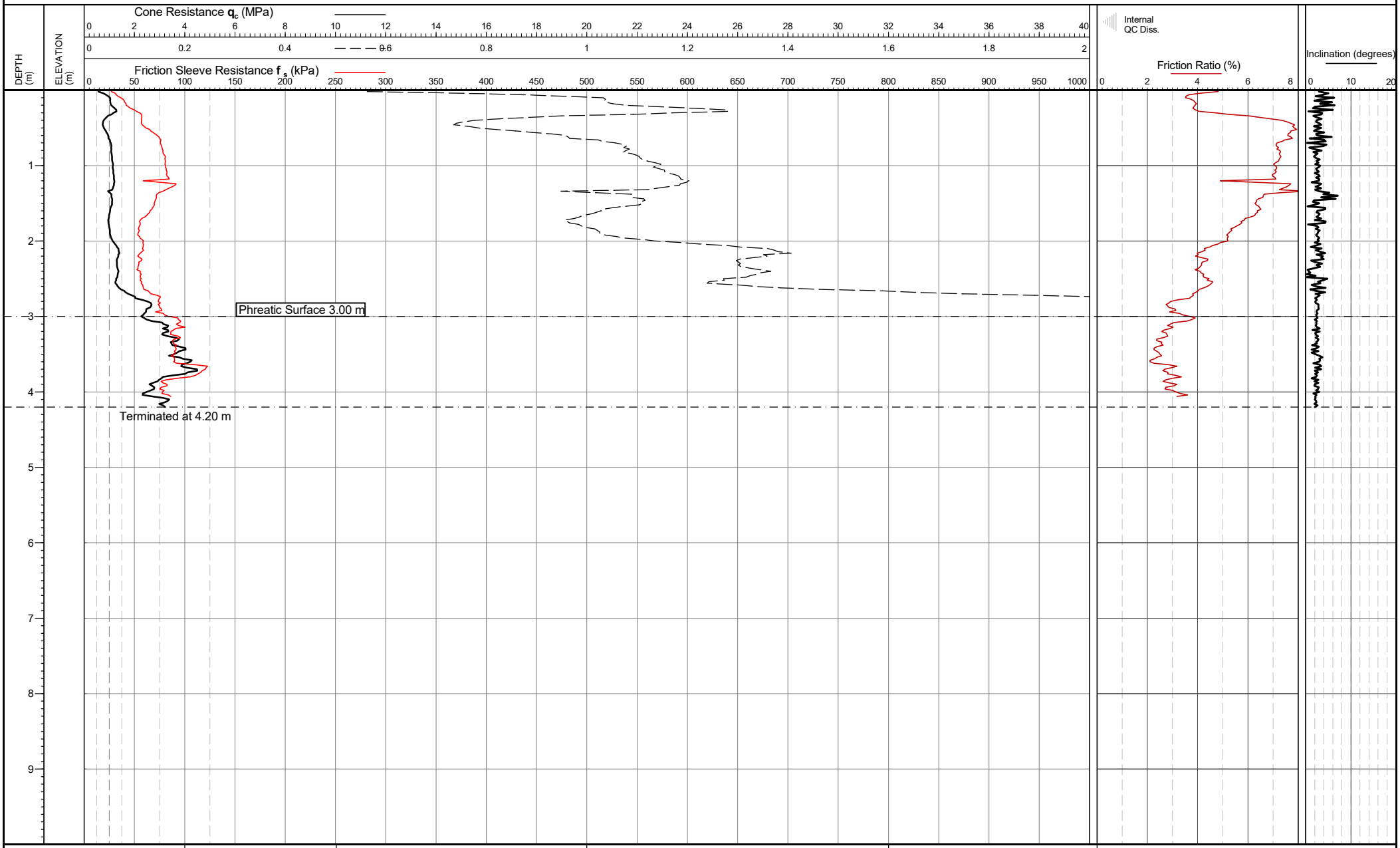
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:12:56	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-09** Page 1 of 1

Project: SOUTHAMPTON

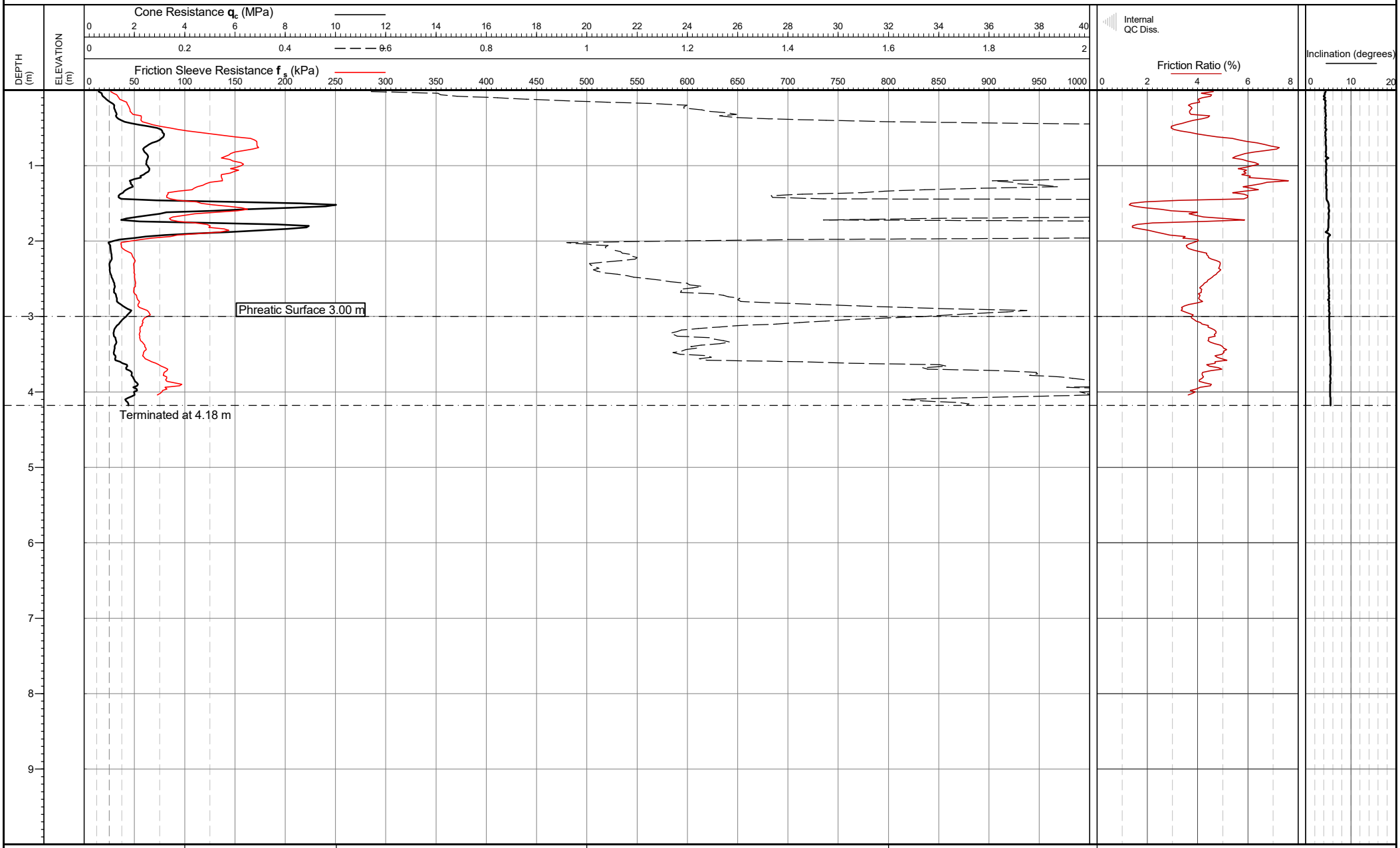
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:14:45	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-10** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

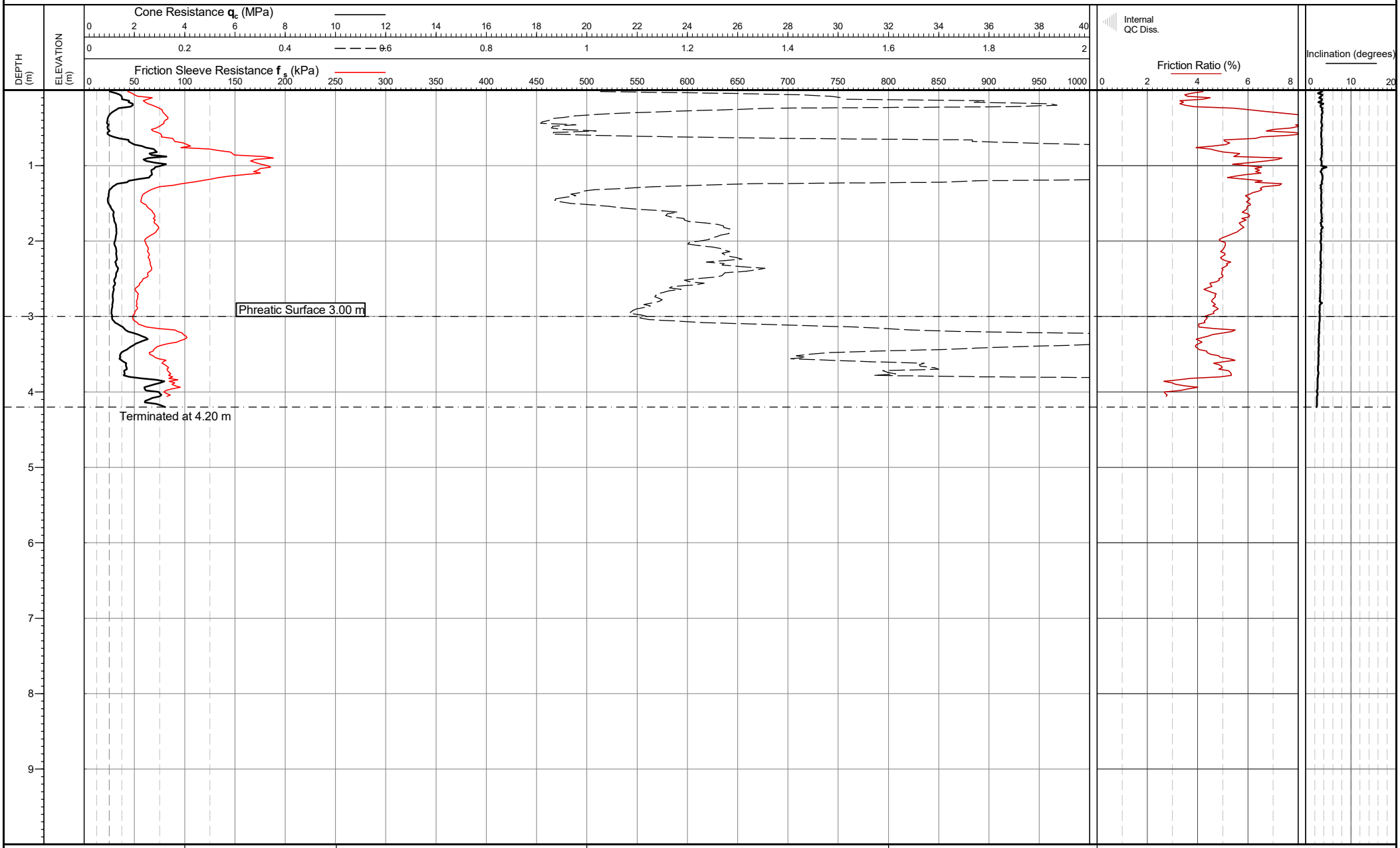


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:40:31	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-11

Project: SOUTHAMPTON

Client: SOILS LTD.

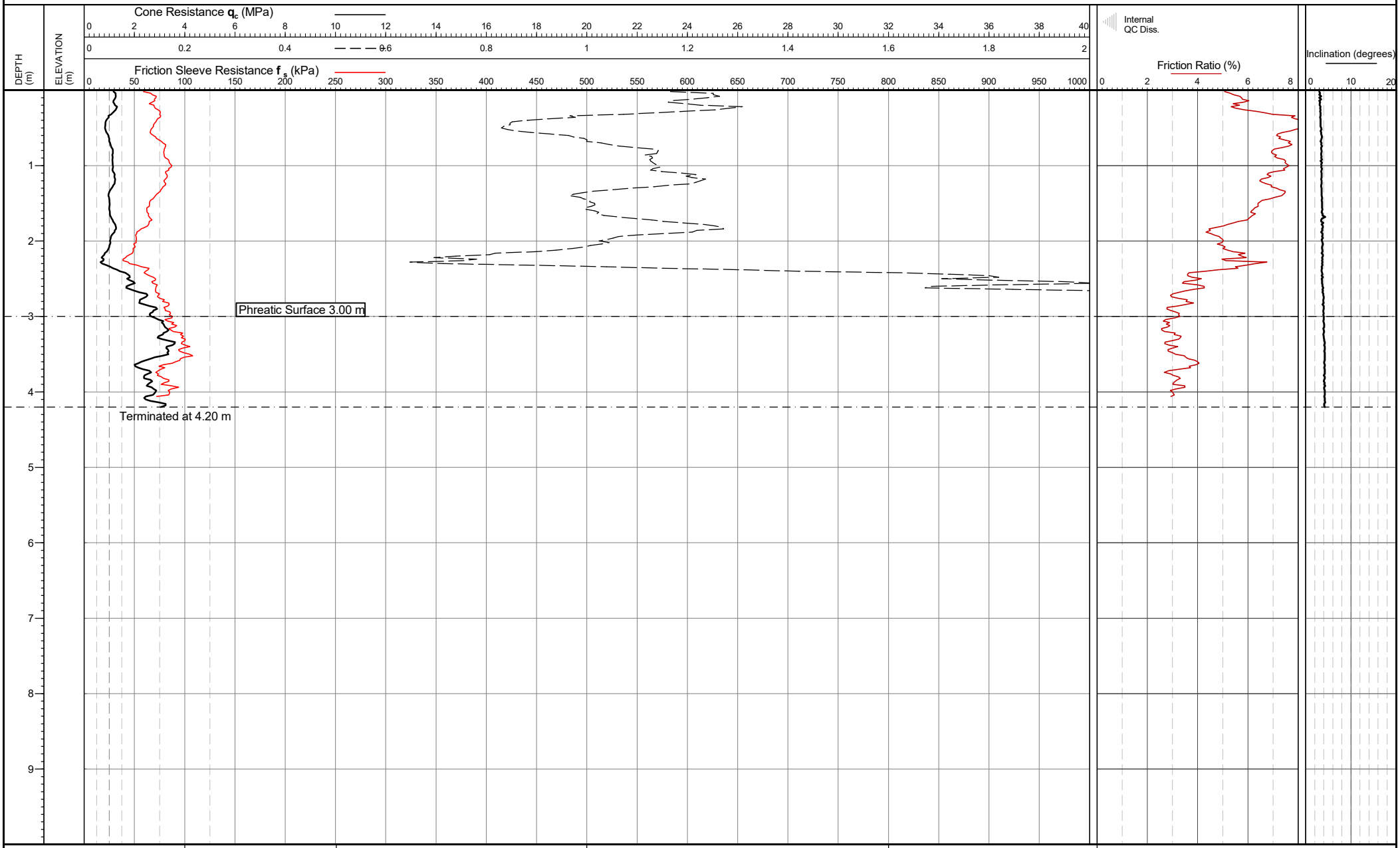


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:44:47	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-12

Project: SOUTHAMPTON

Client: SOILS LTD.

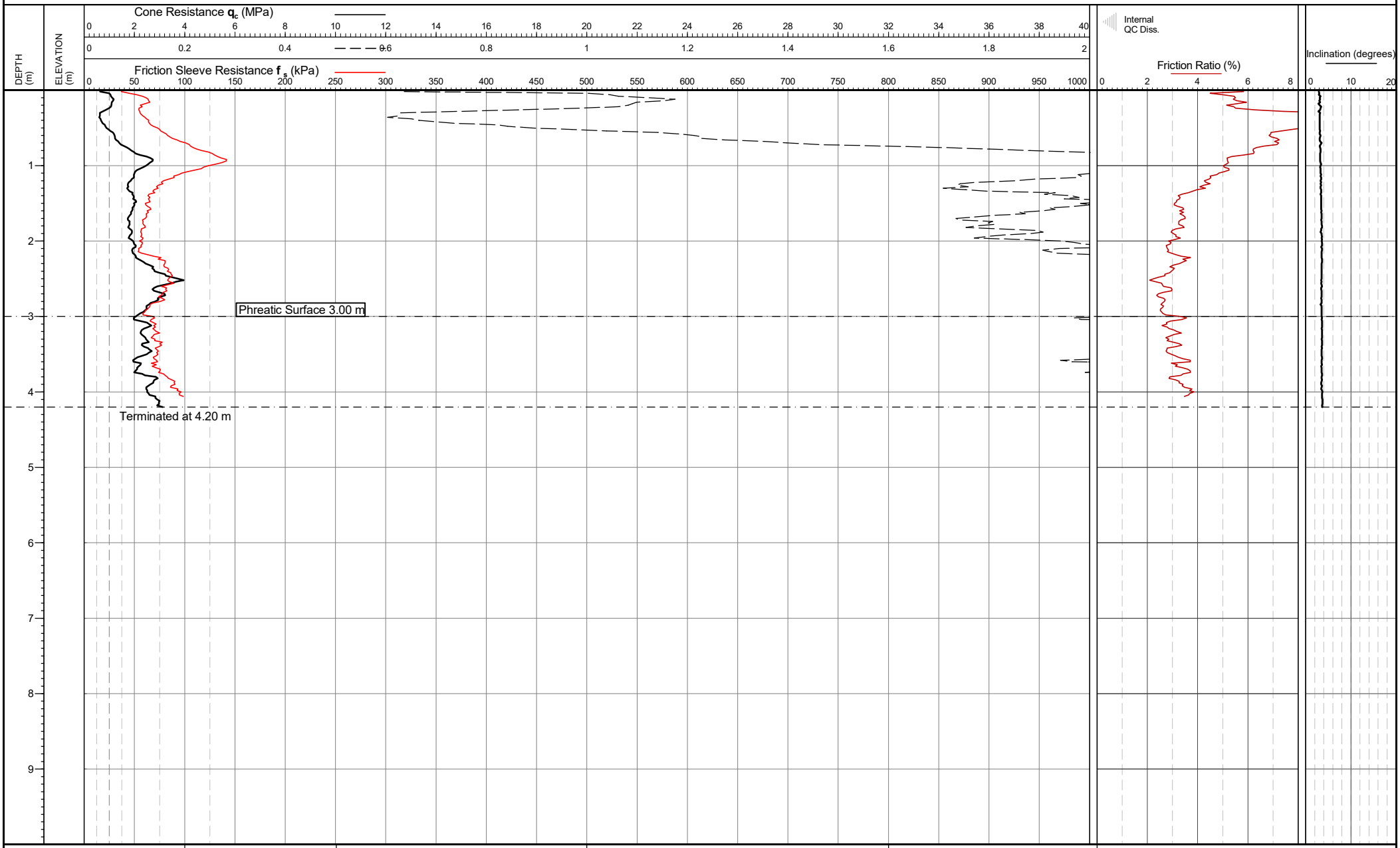


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:26:17	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-13

Project: SOUTHAMPTON

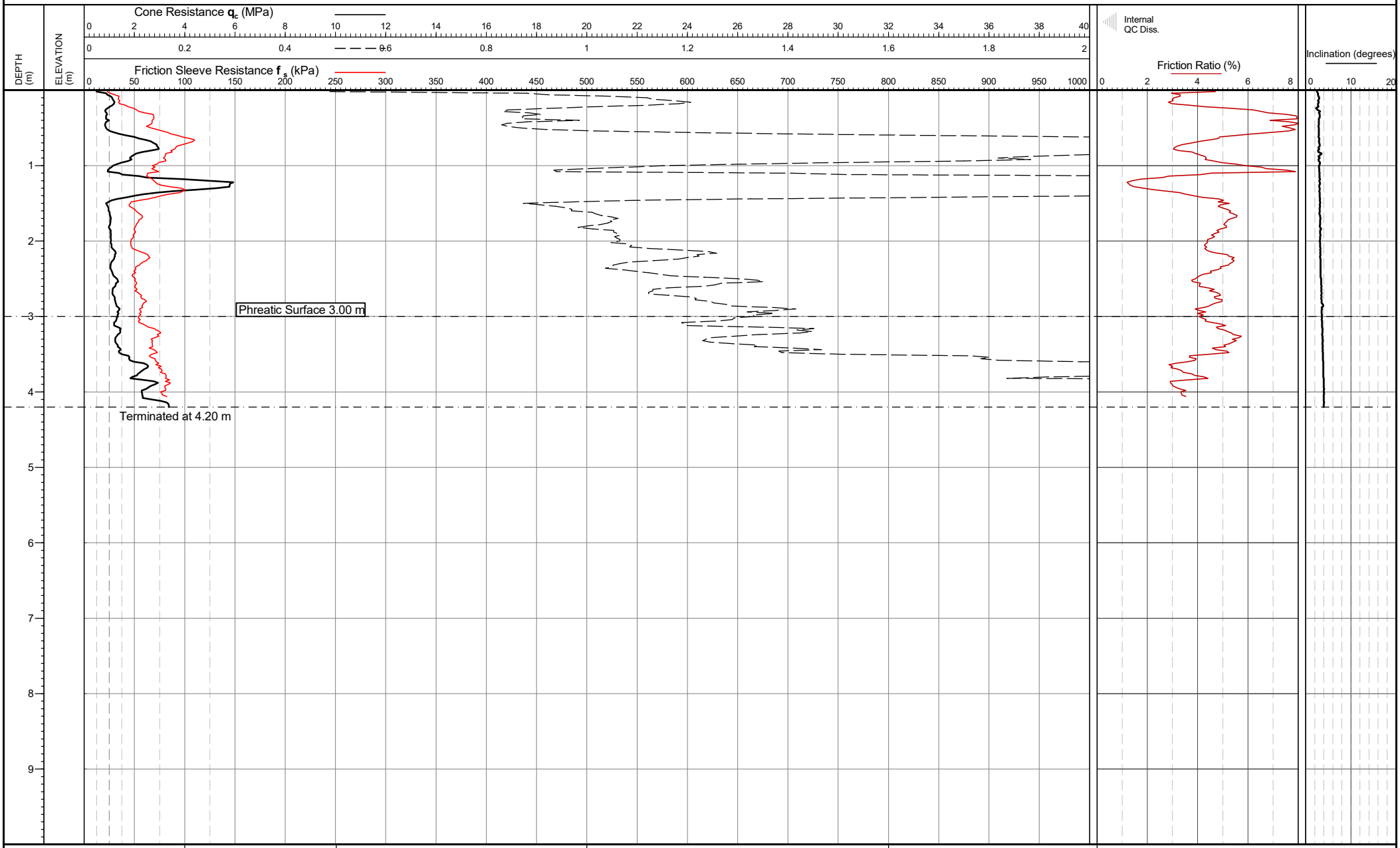
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 17:16:57	Zero drift (Pre/post test) q_c (kPa): 6.6 f_s (kPa): 0.6 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-14** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

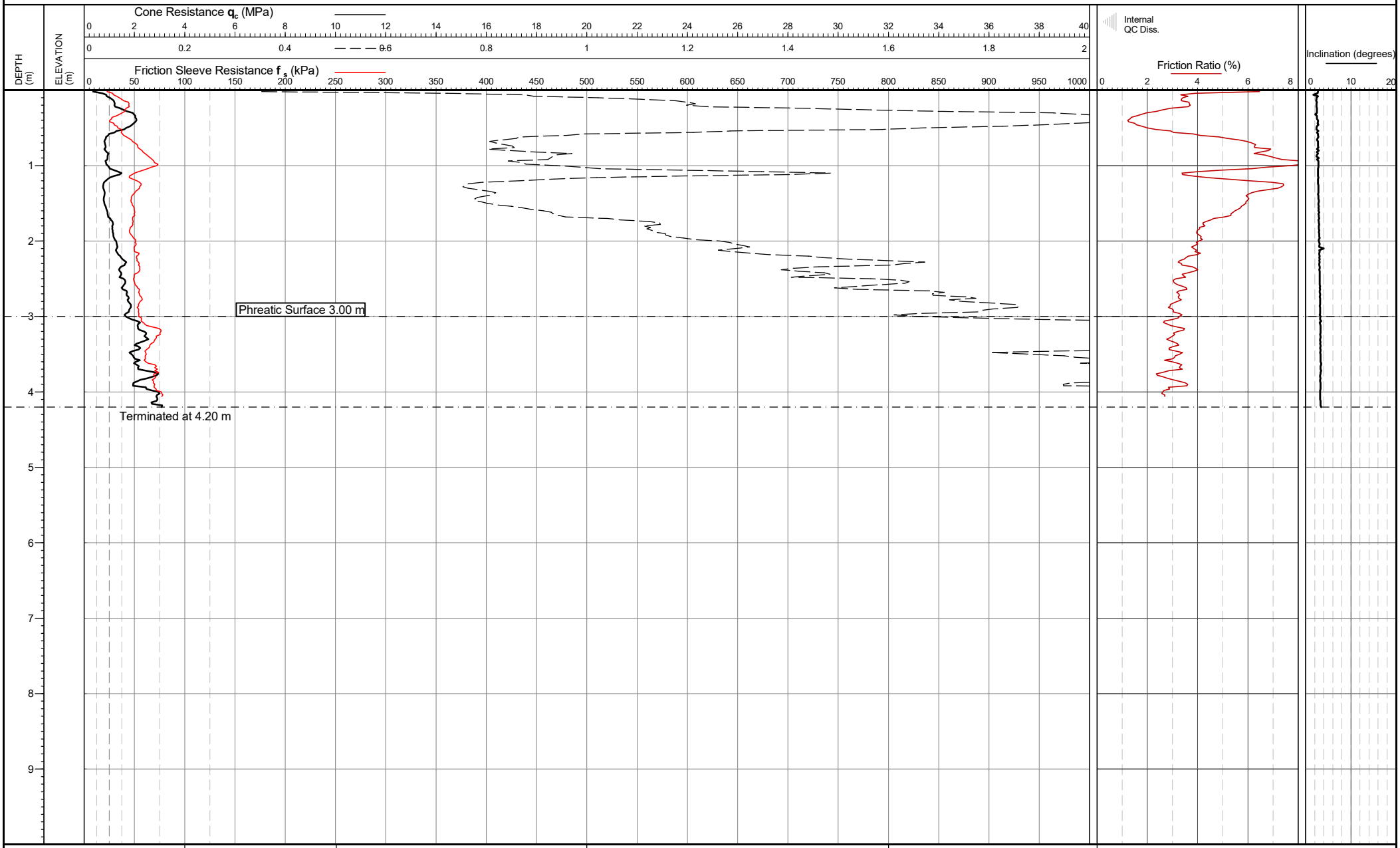


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:59:12	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-15

Project: SOUTHAMPTON

Client: SOILS LTD.

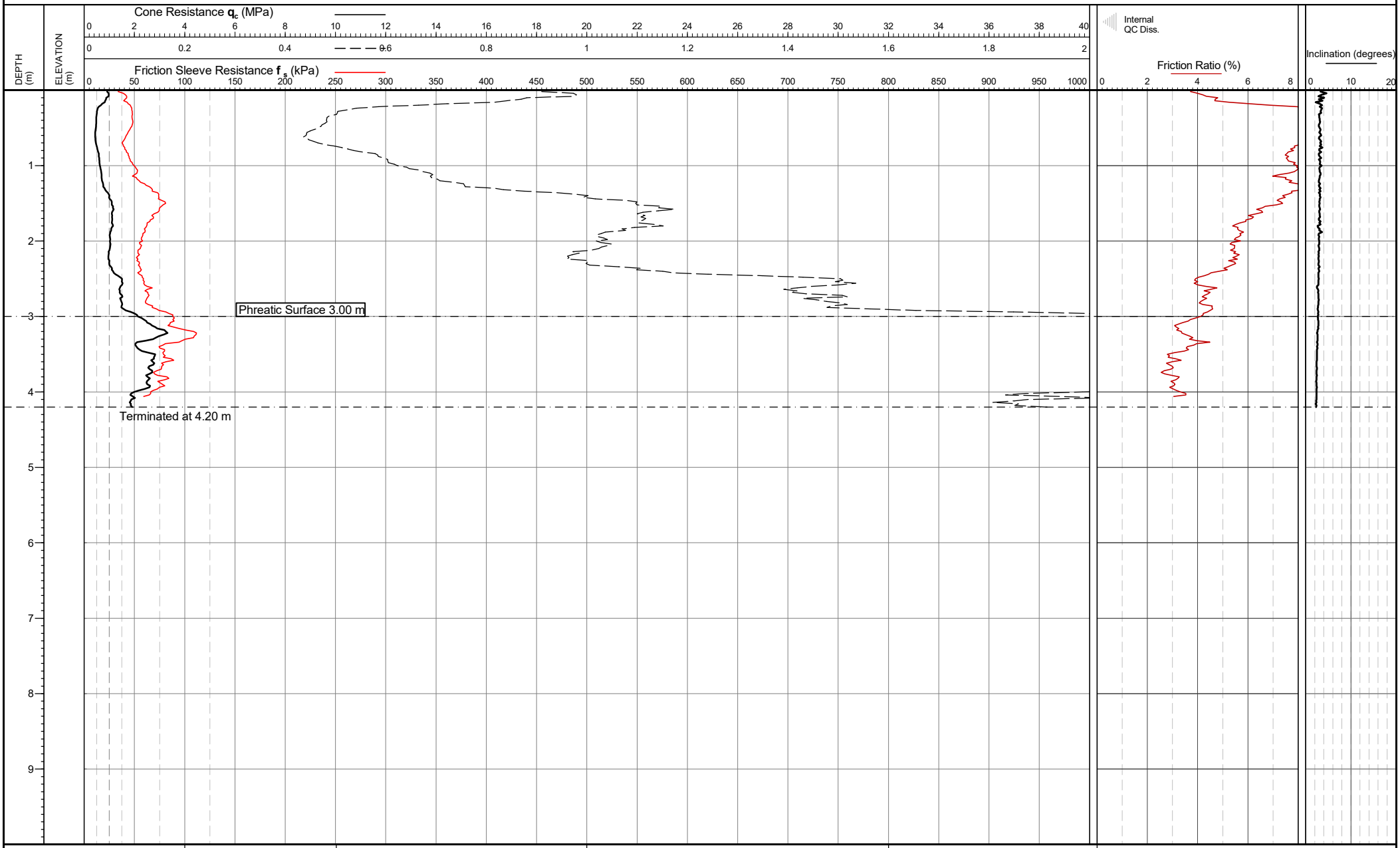


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:24:55	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-16

Project: SOUTHAMPTON

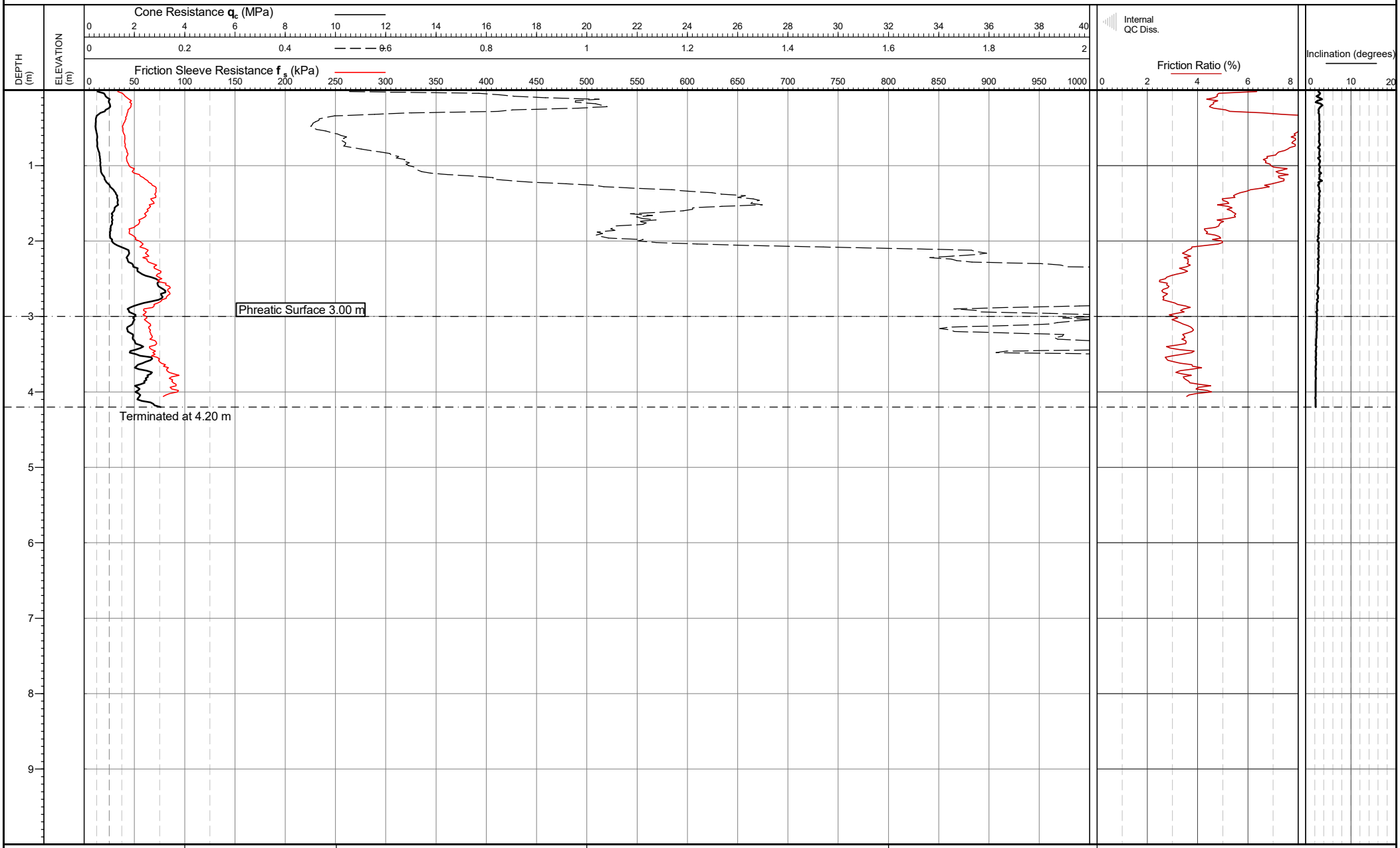
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:33:18	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-17** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

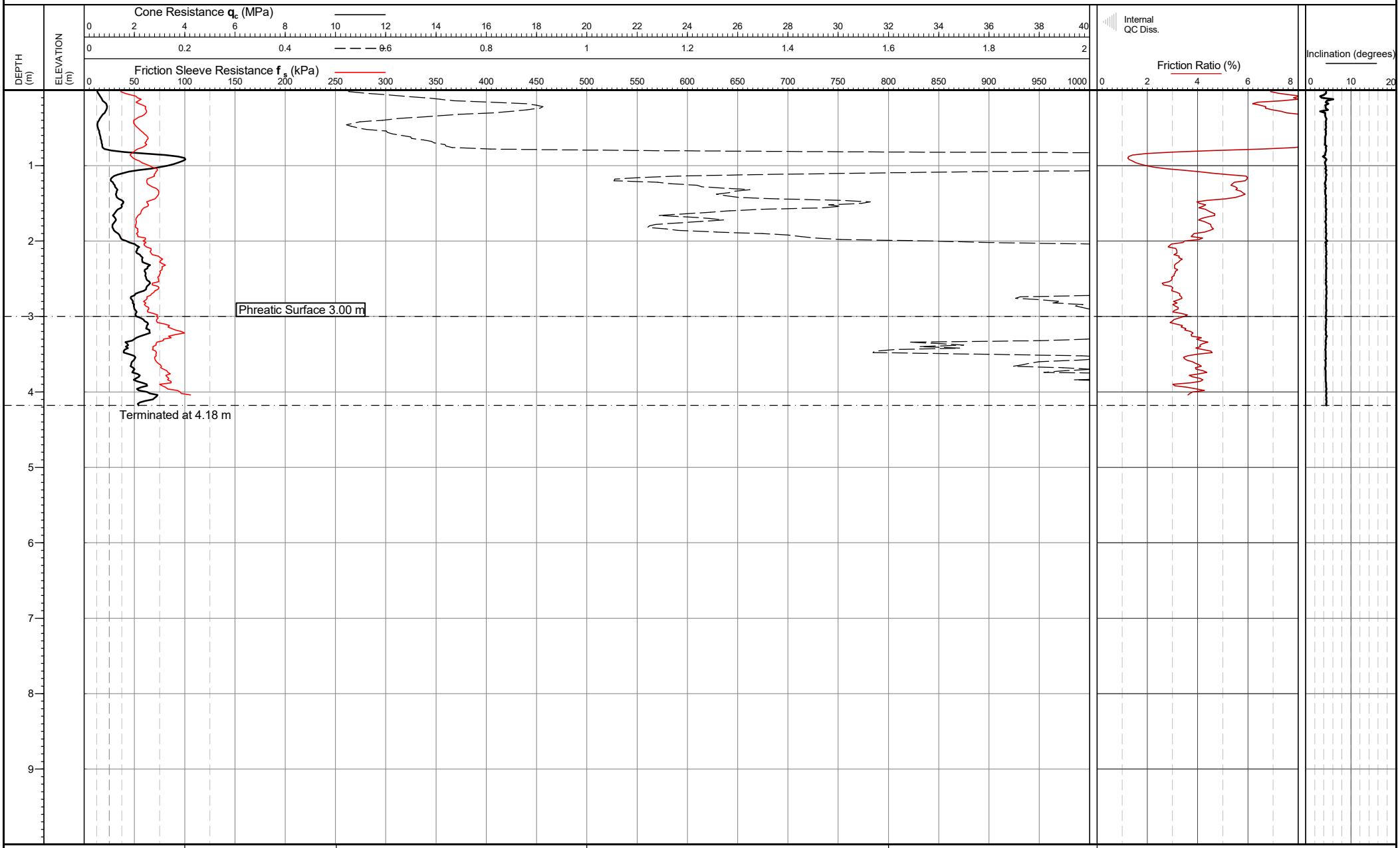


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:04:07	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-18

Project: SOUTHAMPTON

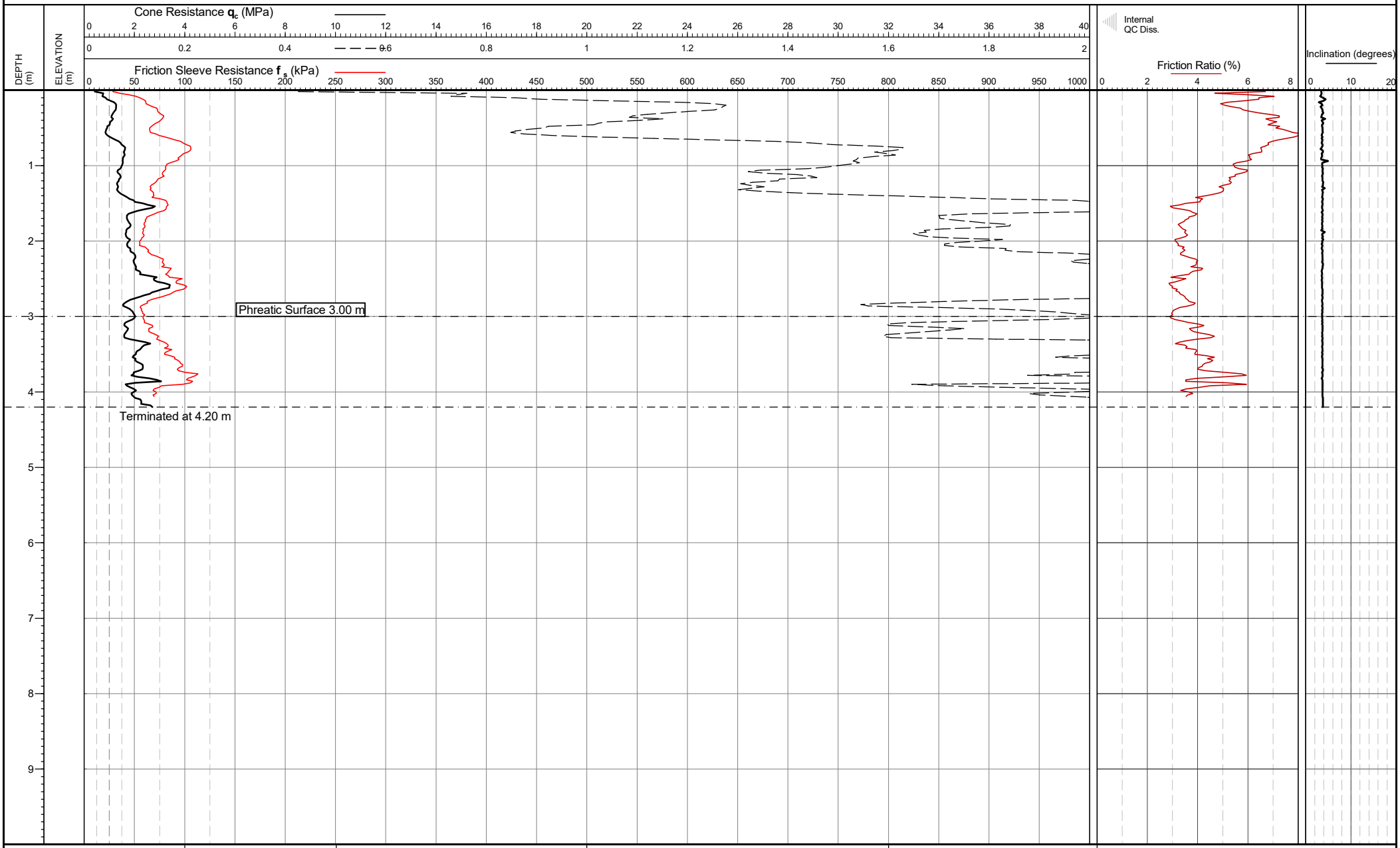
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:36:46	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-19** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

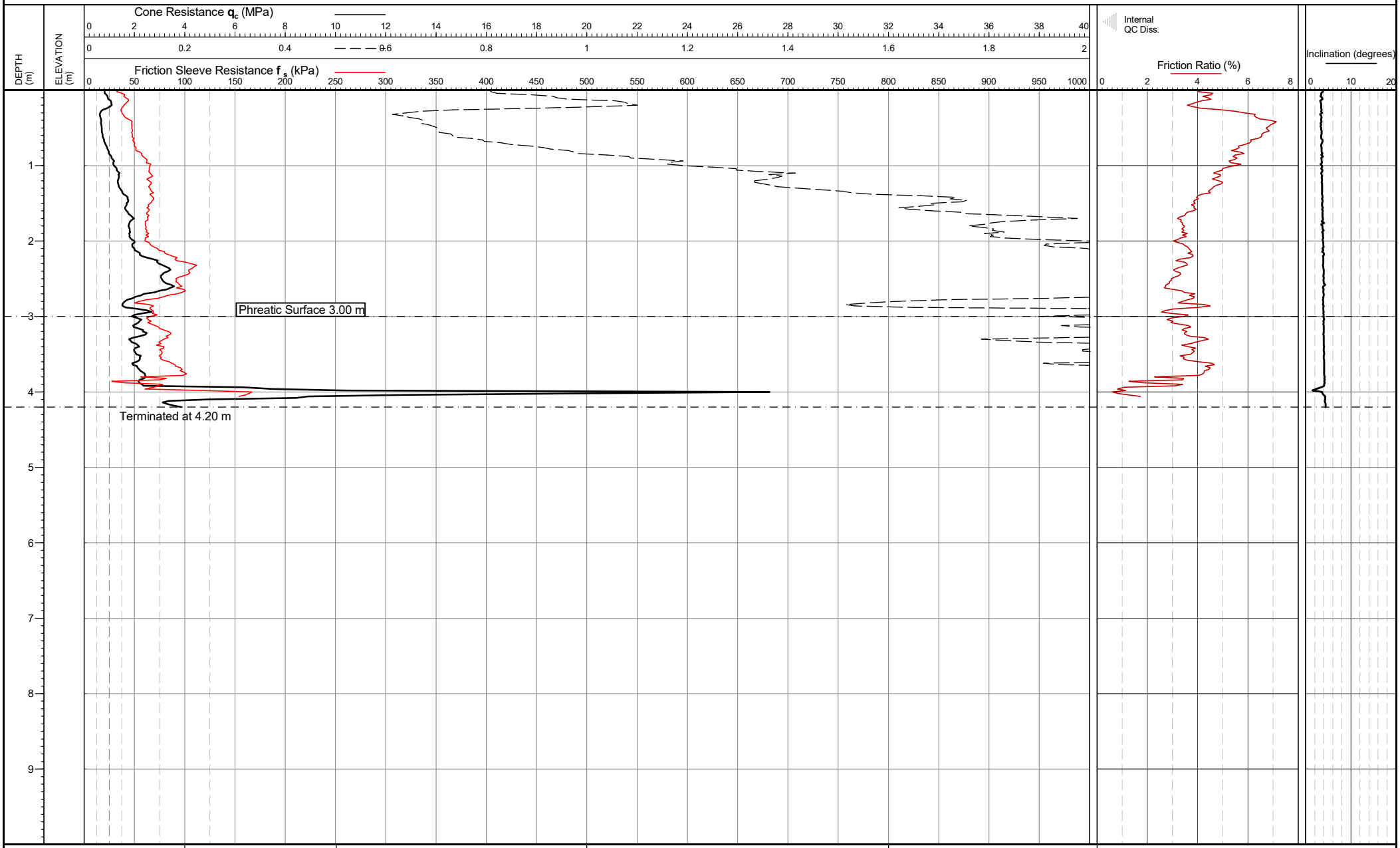


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:50:58	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-20** Page 1 of 1

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

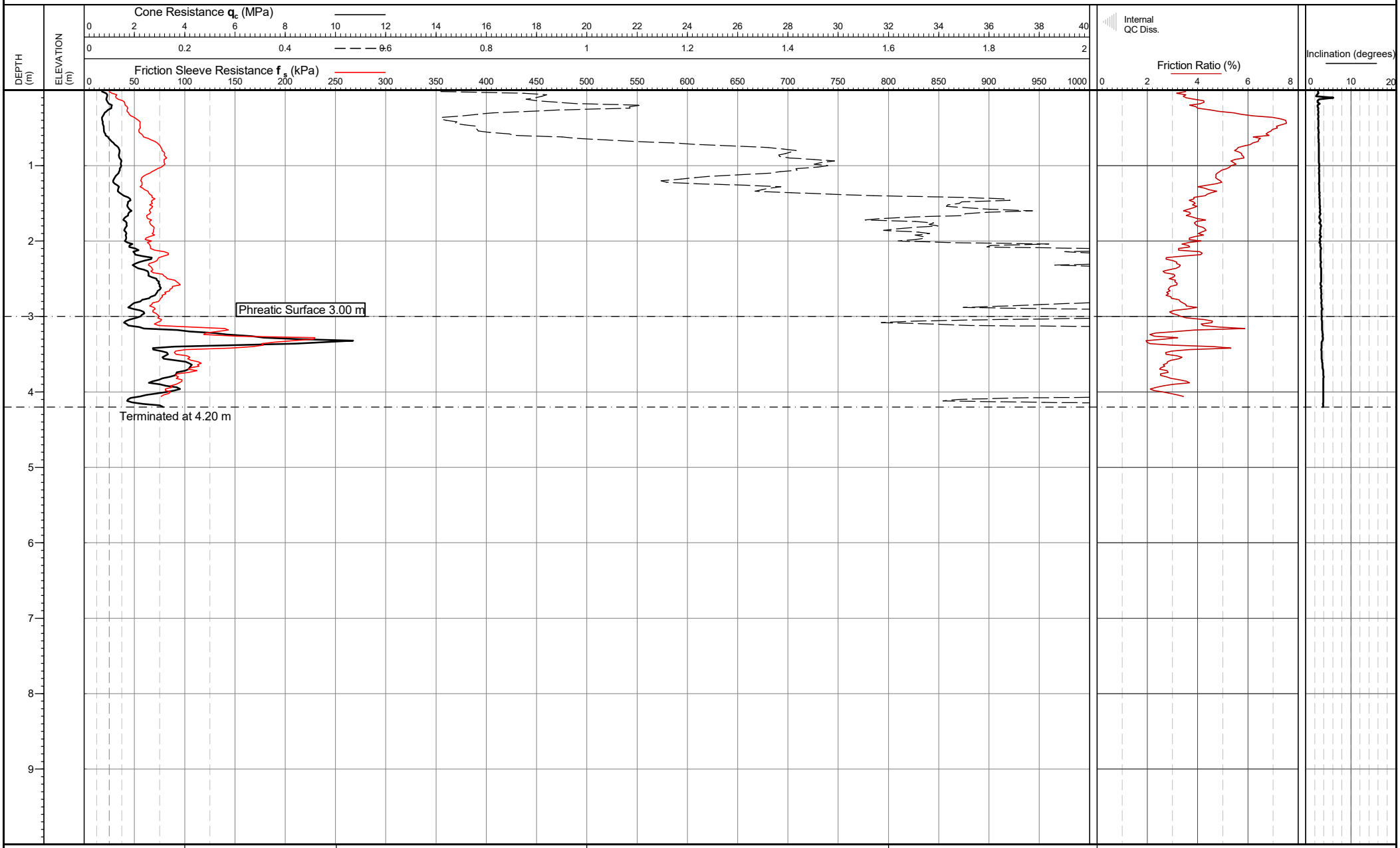


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:37:37	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-21

Project: SOUTHAMPTON

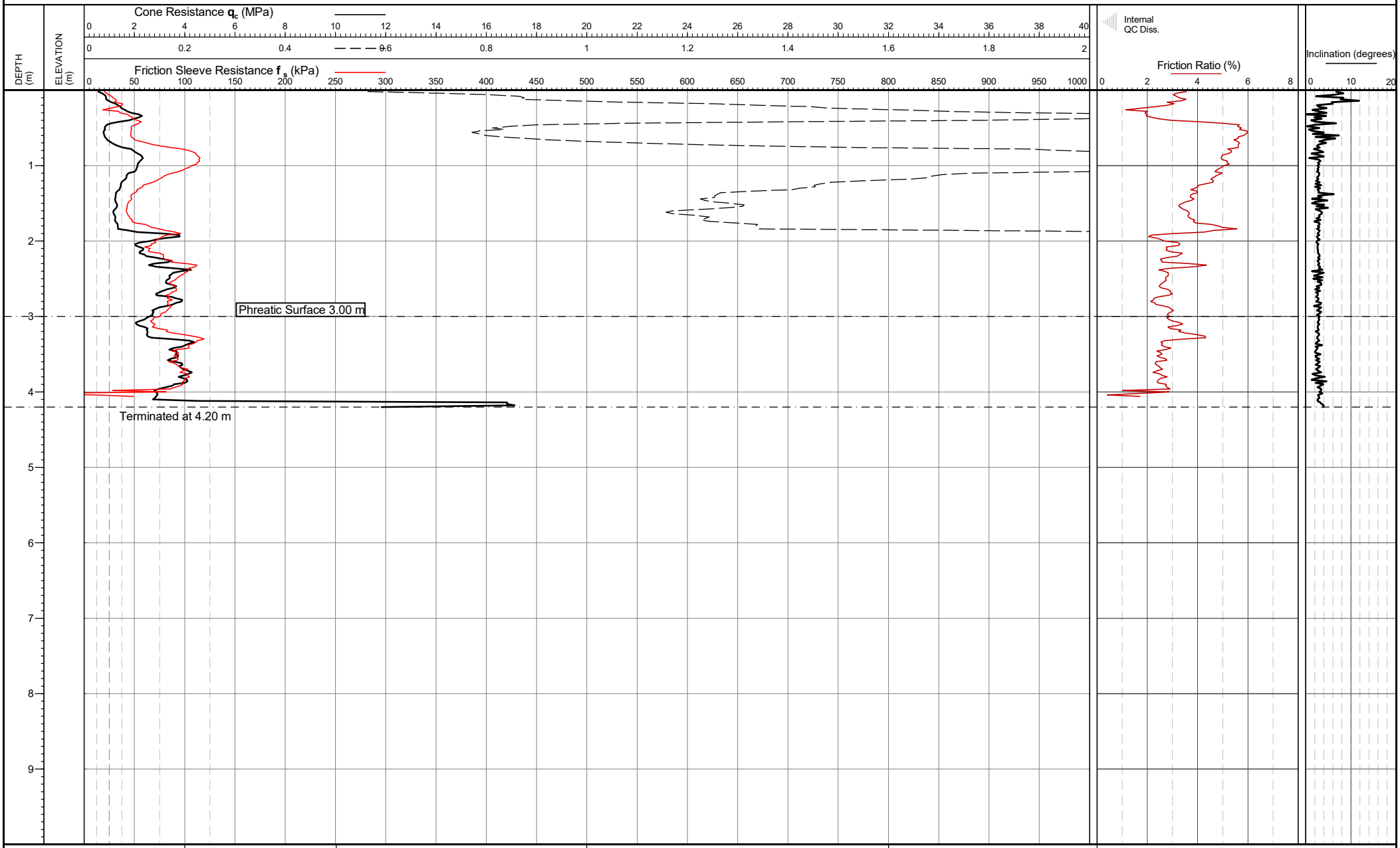
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:58:55	Zero drift (Pre/post test) q_c (kPa): 6.6 f_s (kPa): 0.6 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-22** Page 1 of 1

Project: SOUTHAMPTON

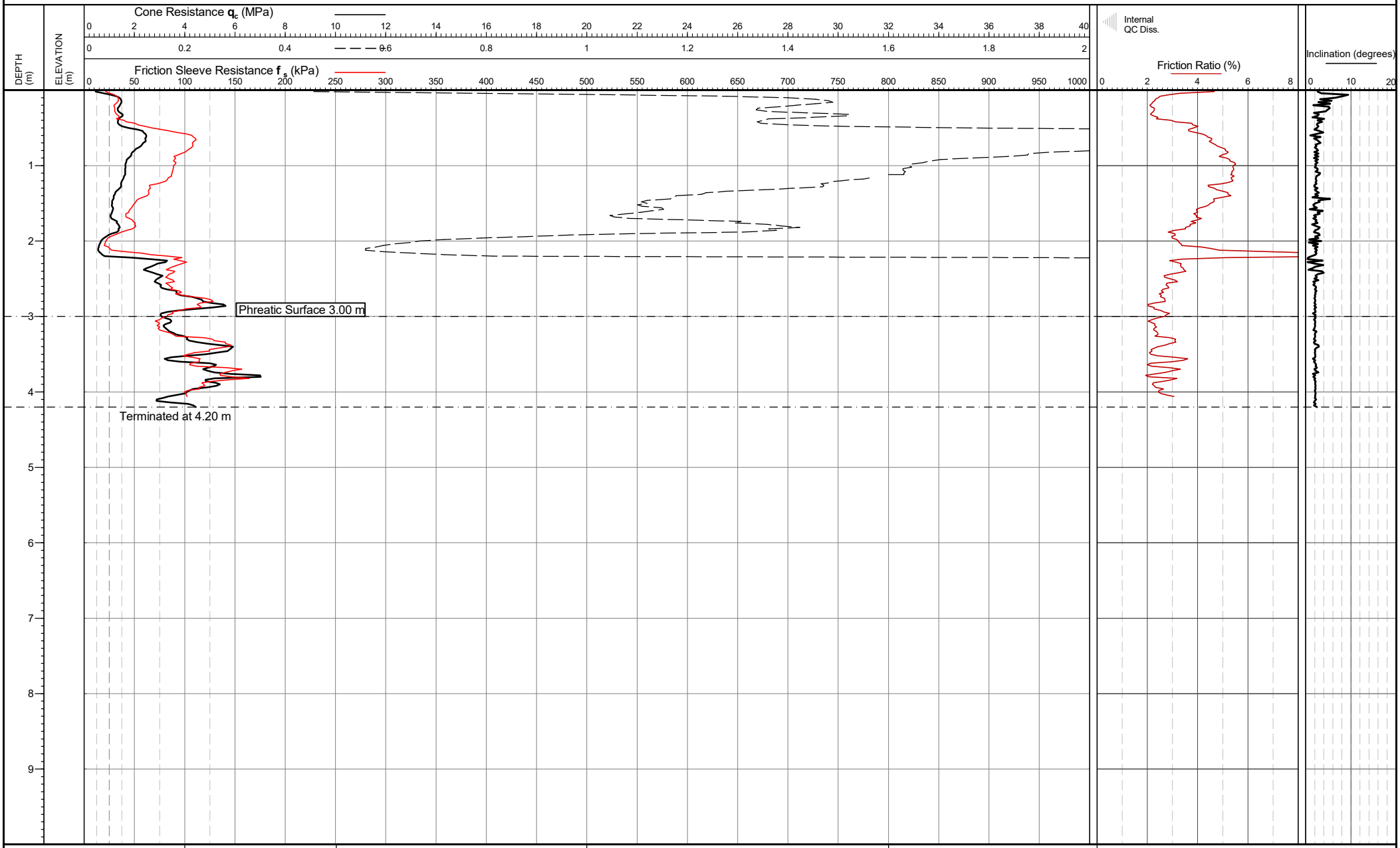
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:57:31	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-23** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

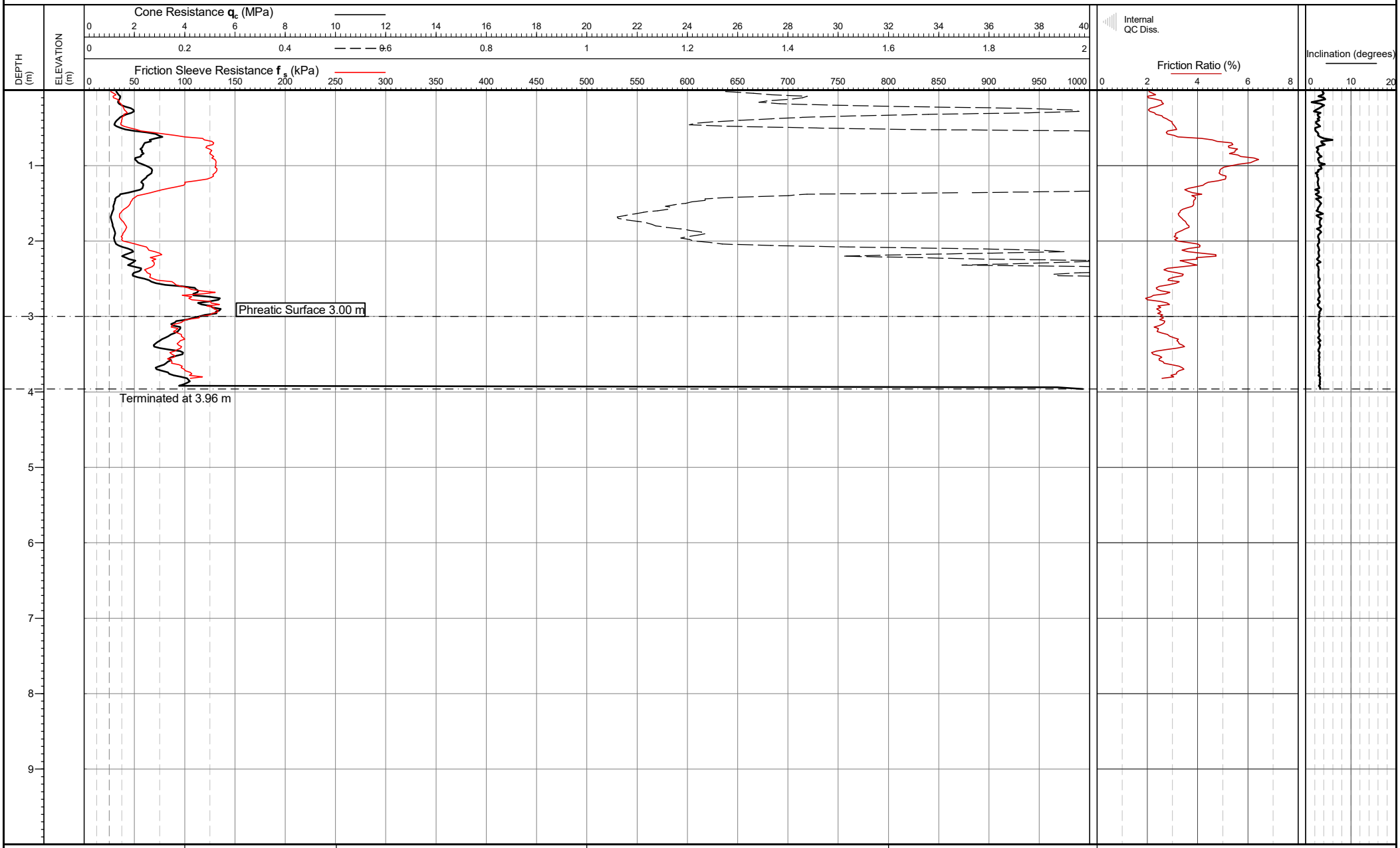


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:37:40	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-24

Project: SOUTHAMPTON

Client: SOILS LTD.

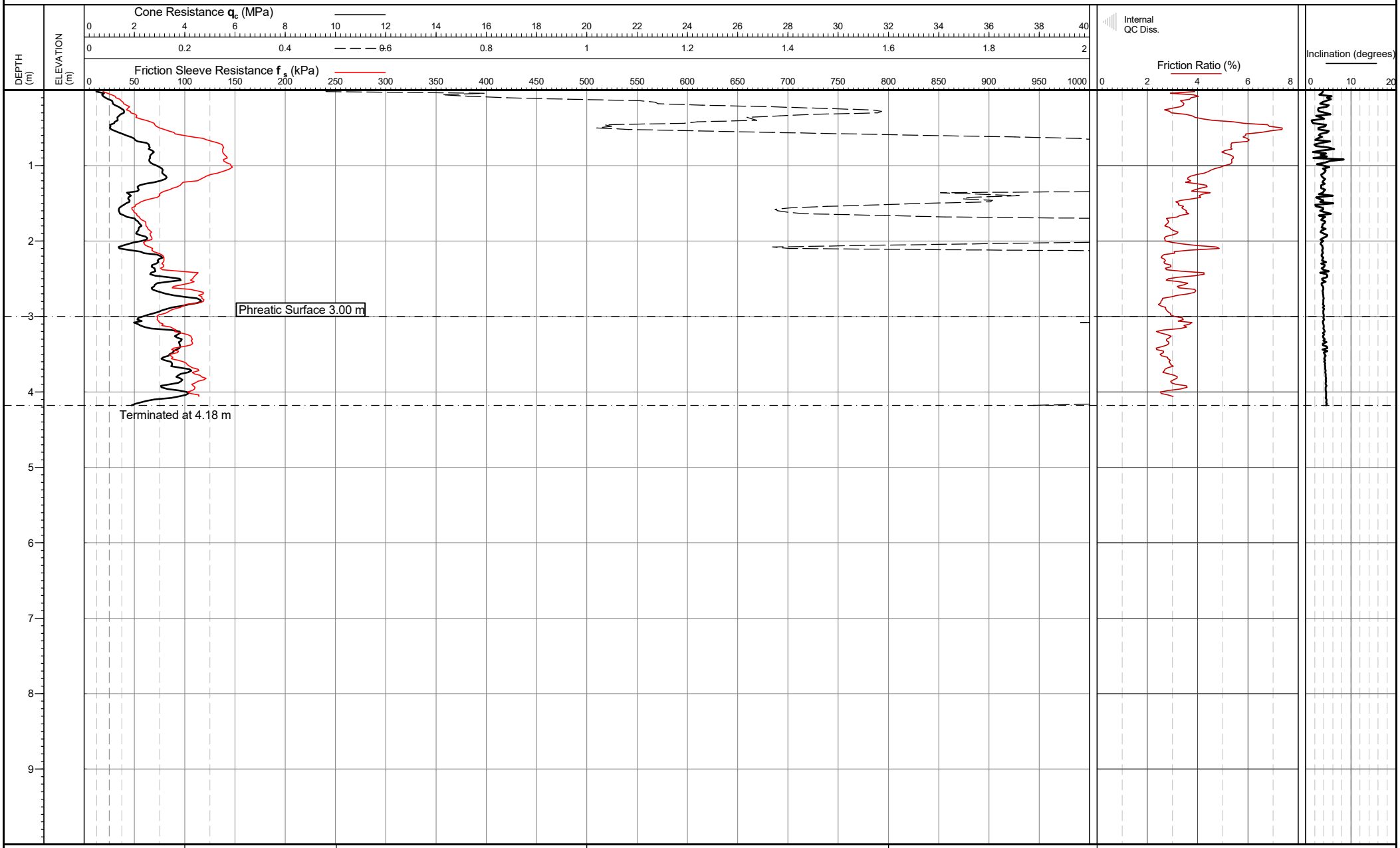


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:35:44	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Total reaction force	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-25

Project: SOUTHAMPTON

Client: SOILS LTD.

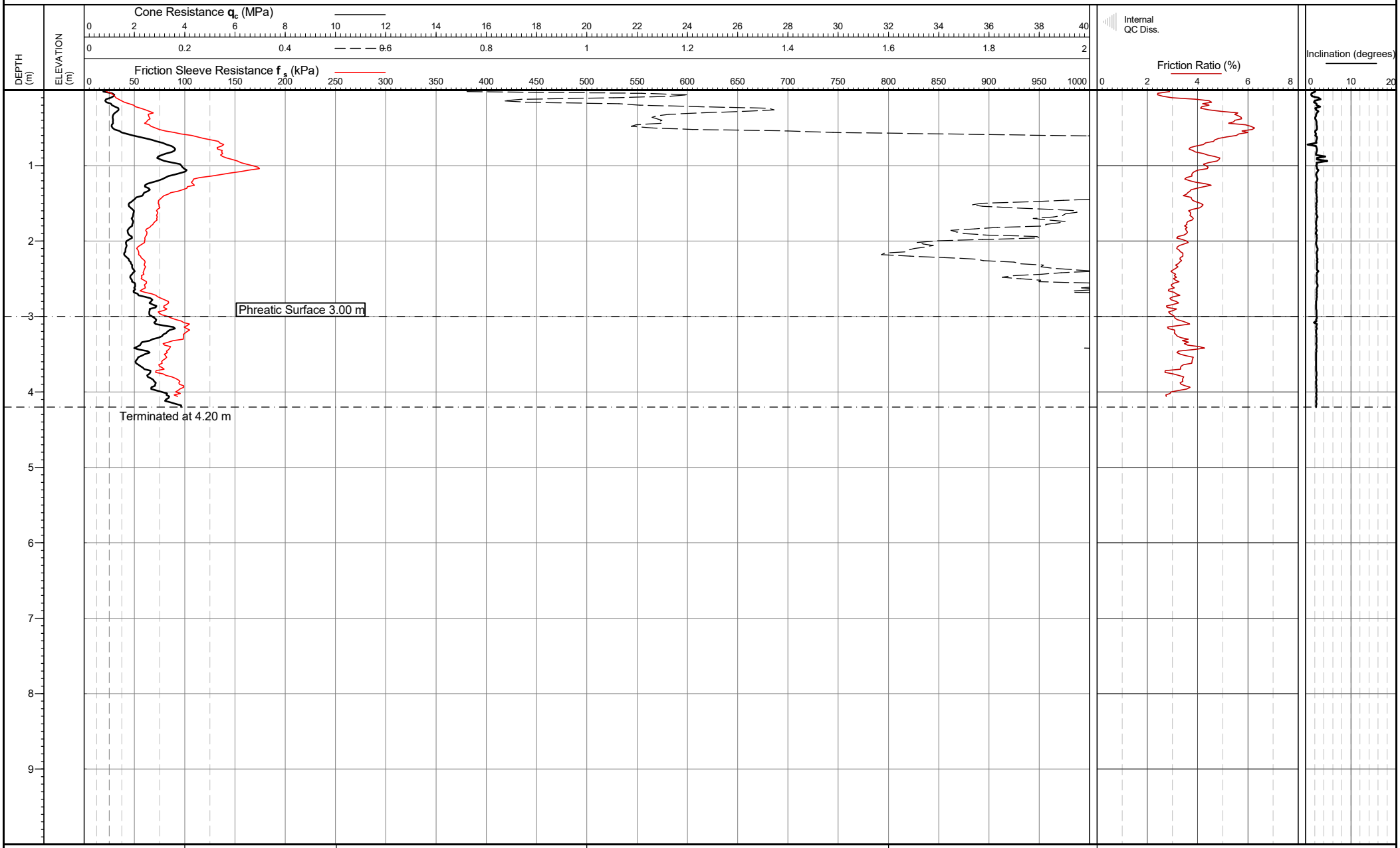


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:22:10	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-26

Project: SOUTHAMPTON

Client: SOILS LTD.

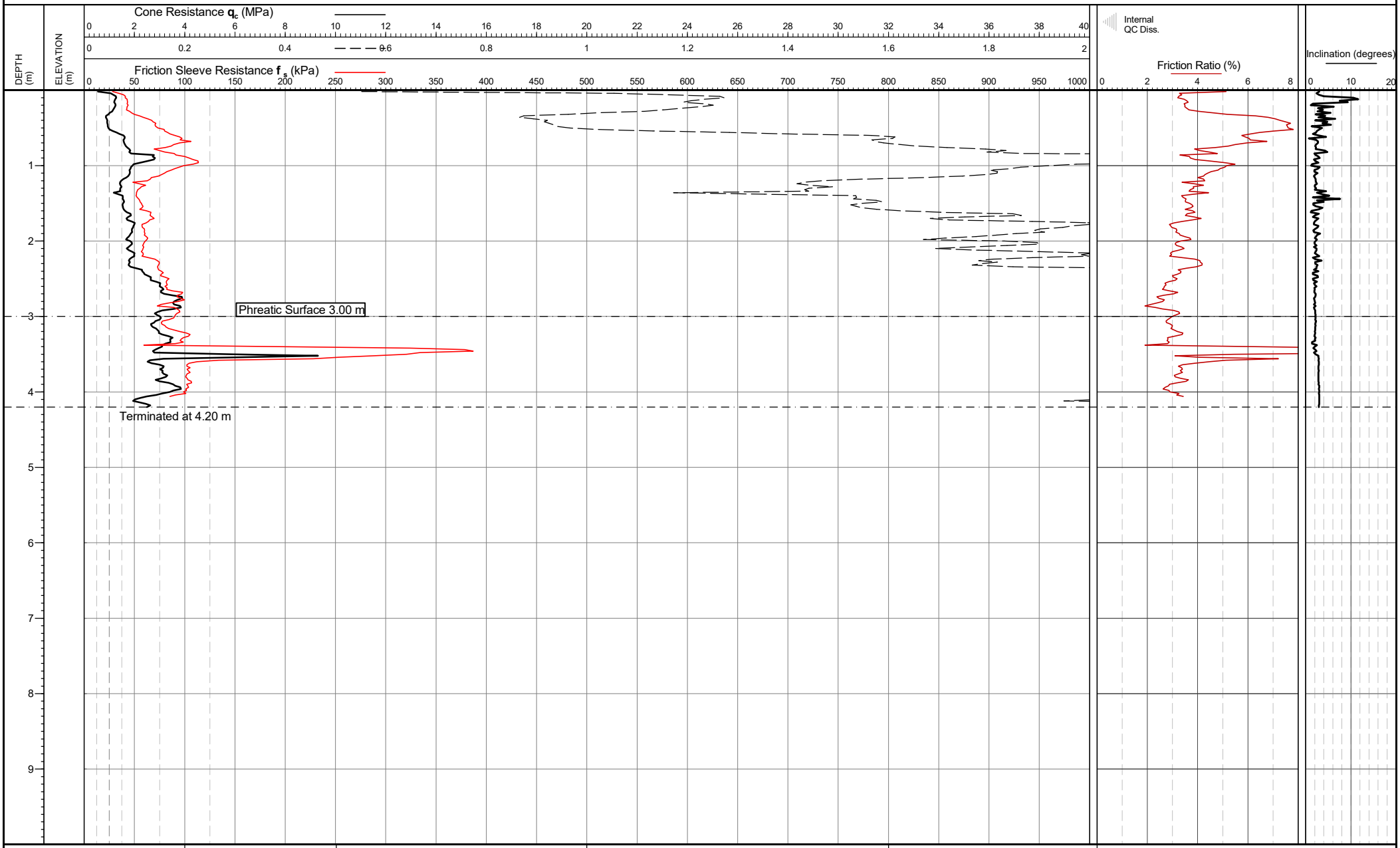


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:50:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-27

Project: SOUTHAMPTON

Client: SOILS LTD.

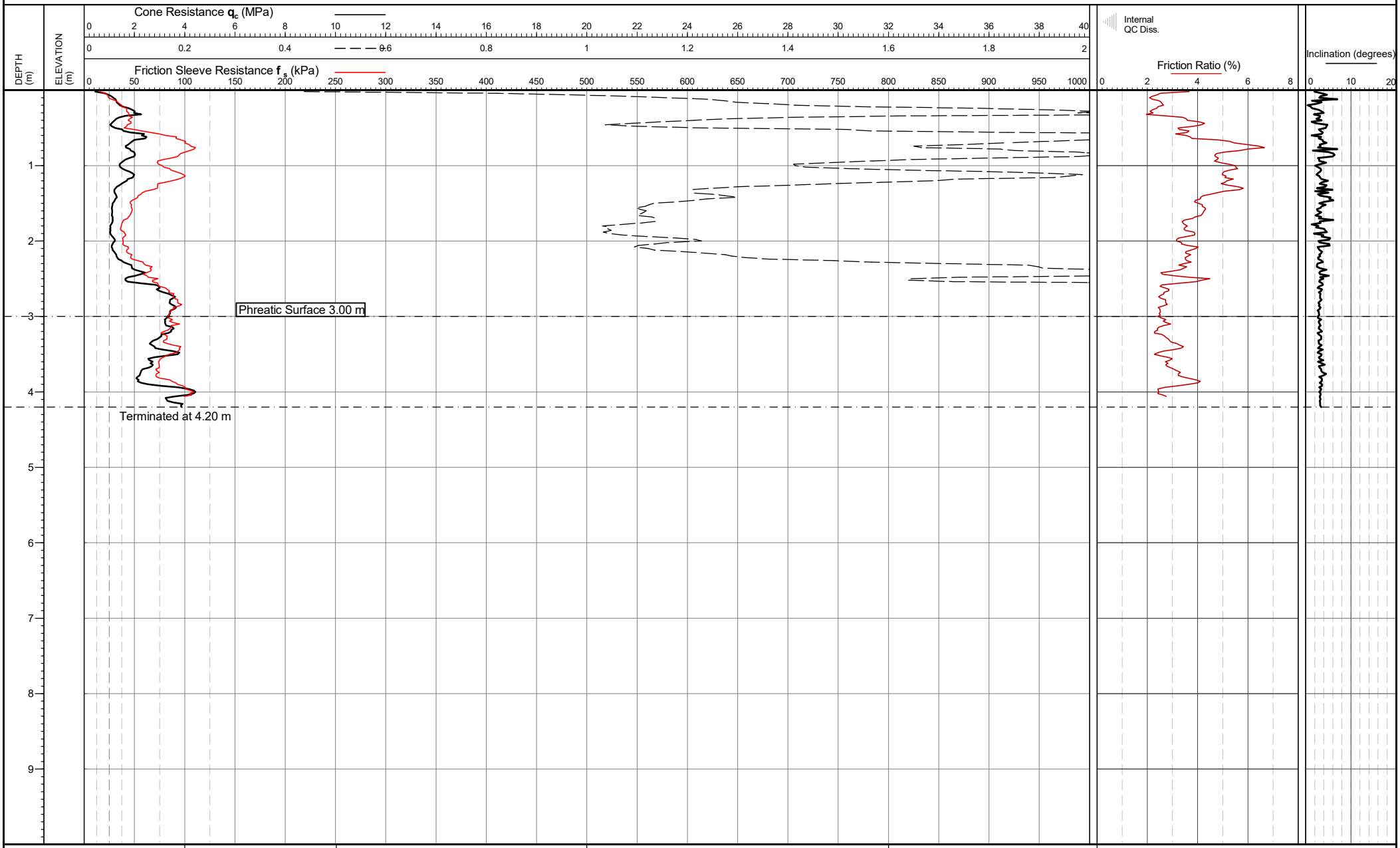


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:19:55	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-28

Project: SOUTHAMPTON

Client: SOILS LTD.

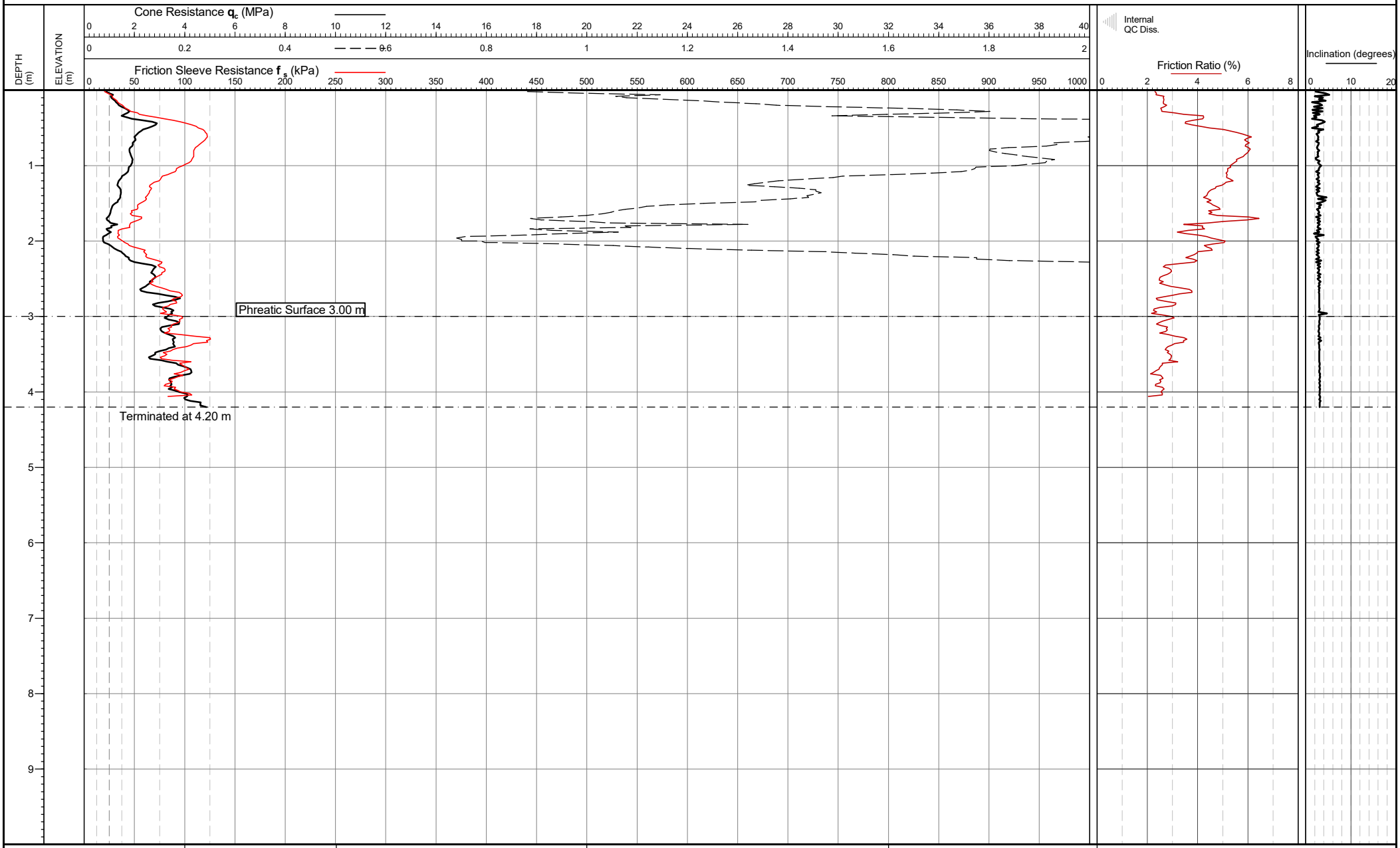


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:05:28	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-29

Project: SOUTHAMPTON

Client: SOILS LTD.

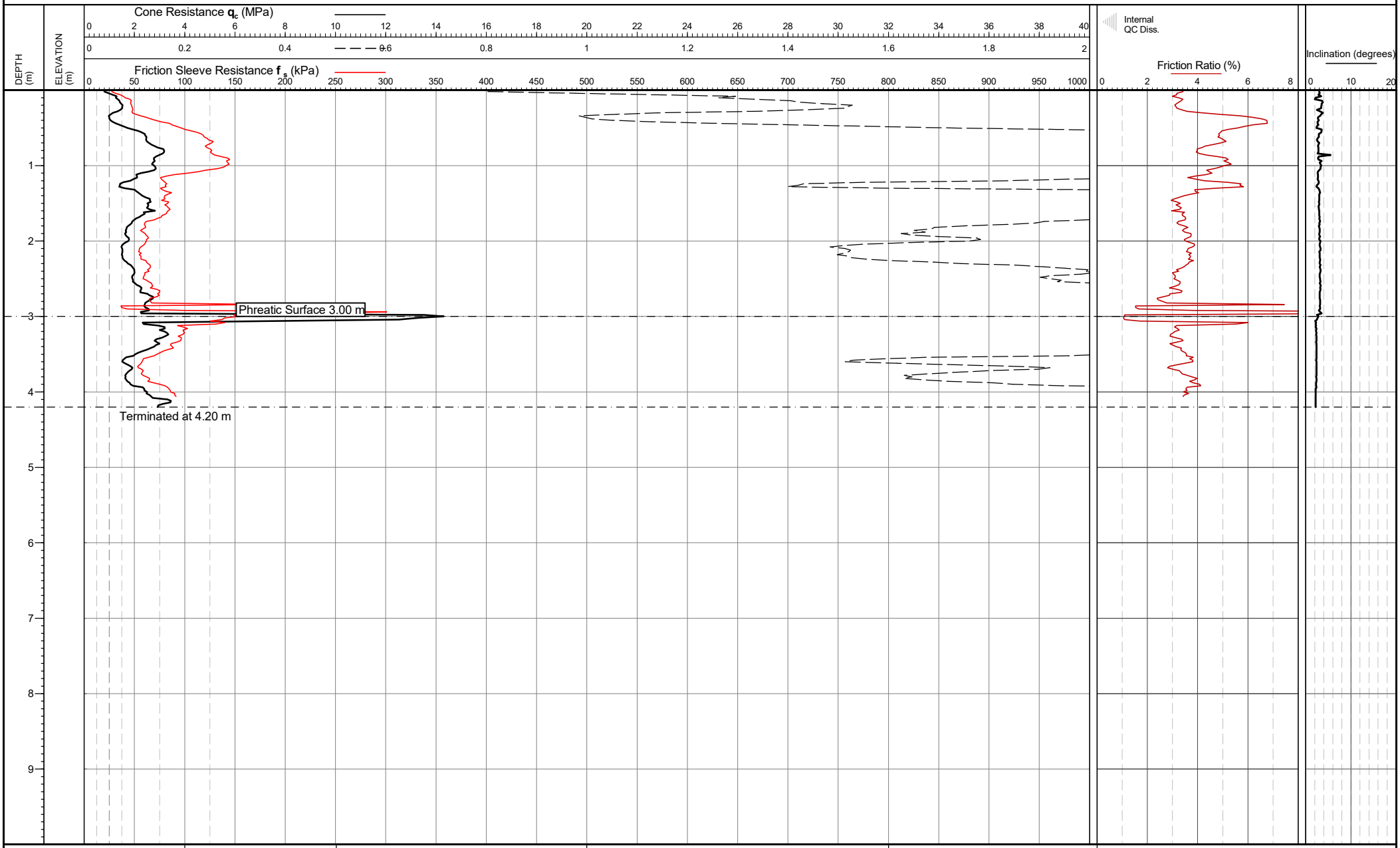


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:45:44	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-30

Project: SOUTHAMPTON

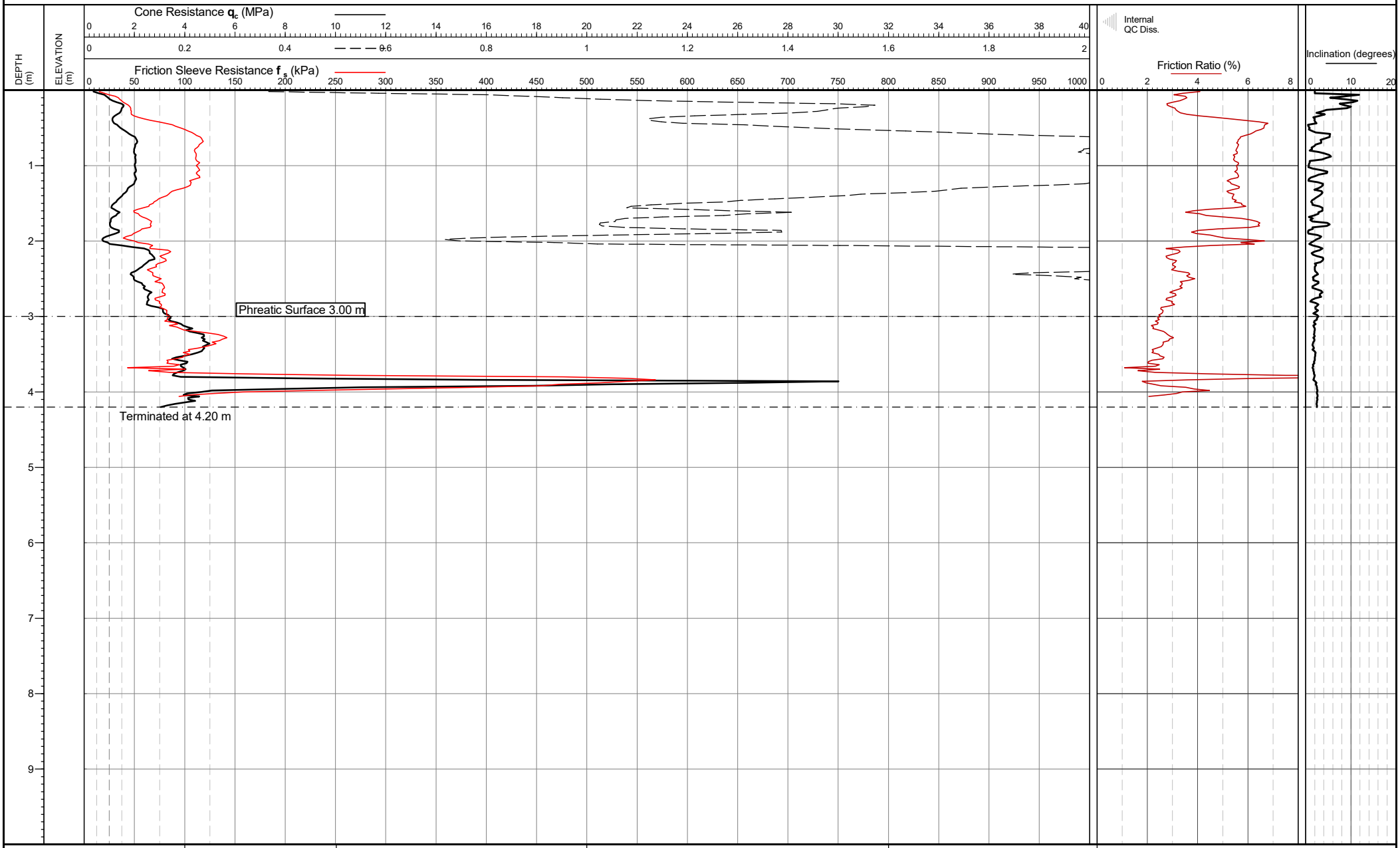
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:05:51	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-31** Page 1 of 1

Project: SOUTHAMPTON

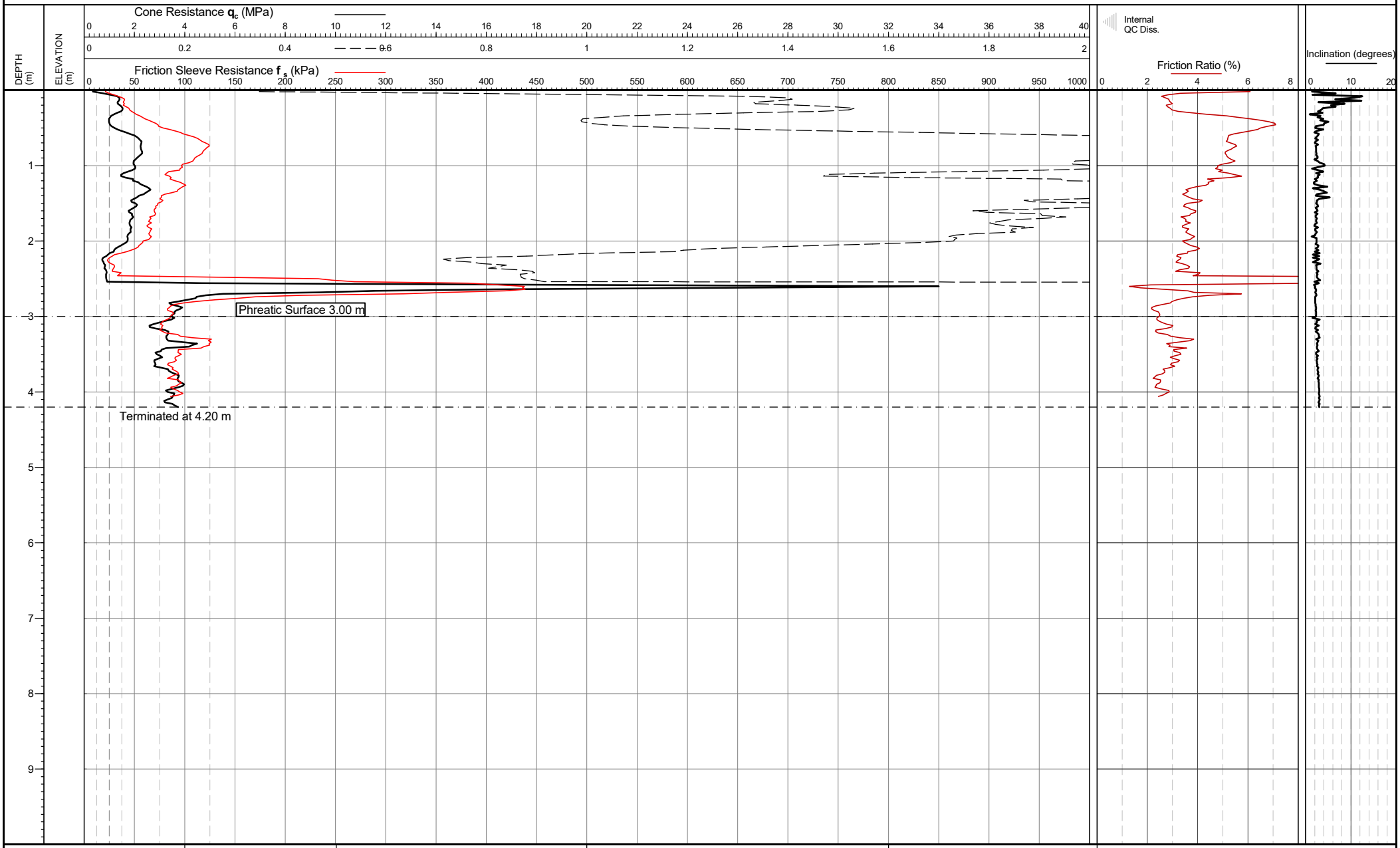
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:51:01	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-32** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

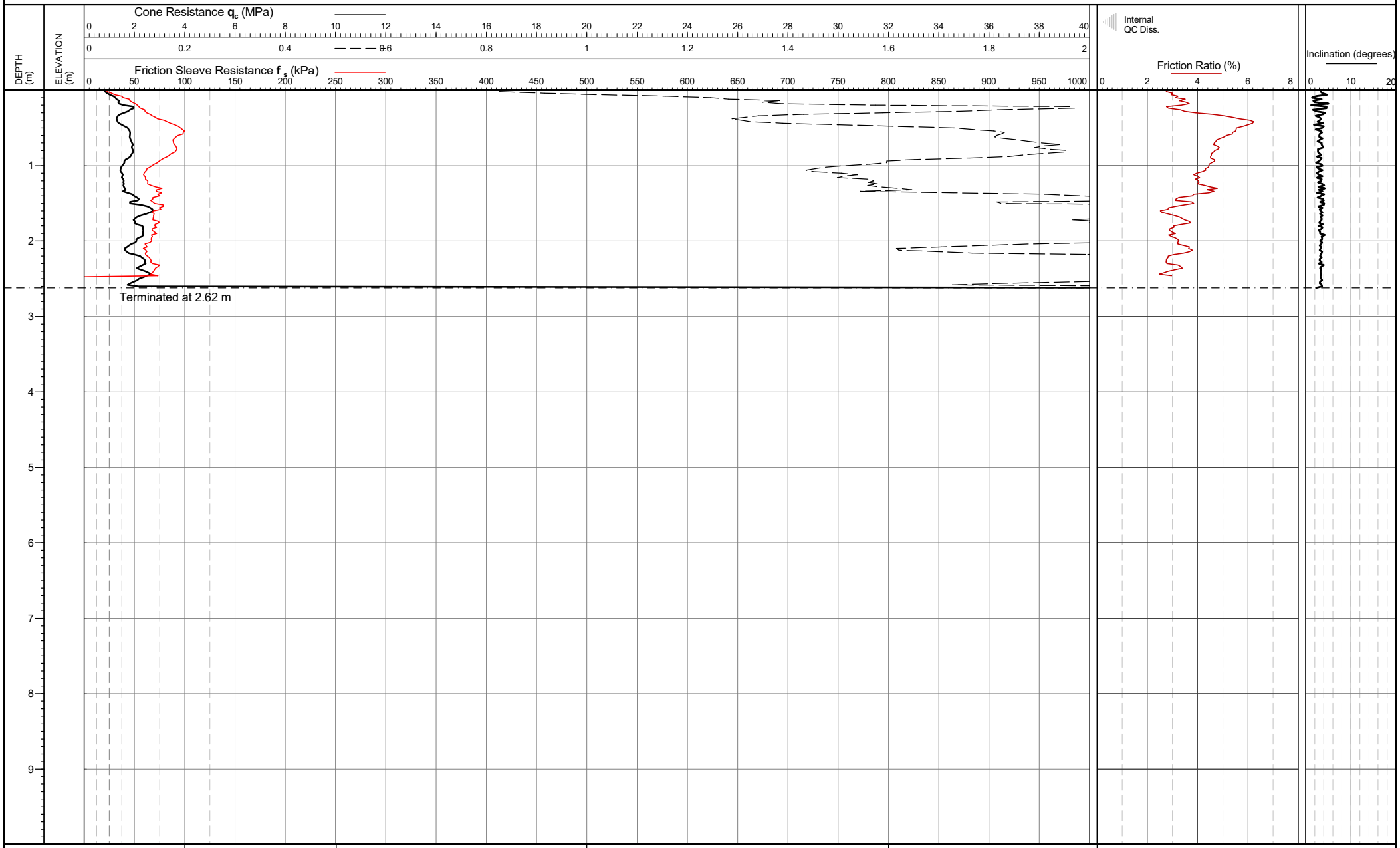


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:14:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-33

Project: SOUTHAMPTON

Client: SOILS LTD.

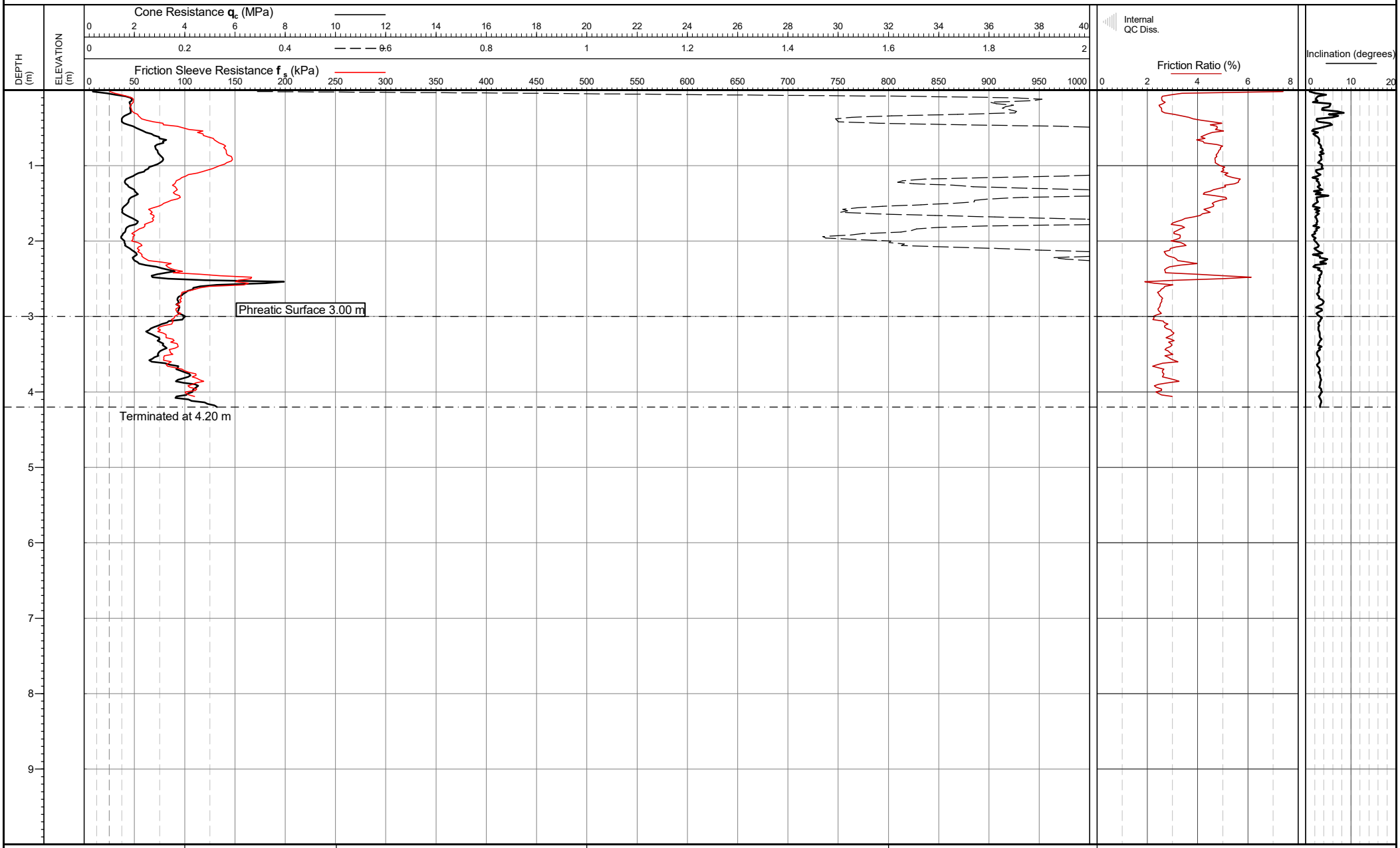


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:29:32	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-34

Project: SOUTHAMPTON

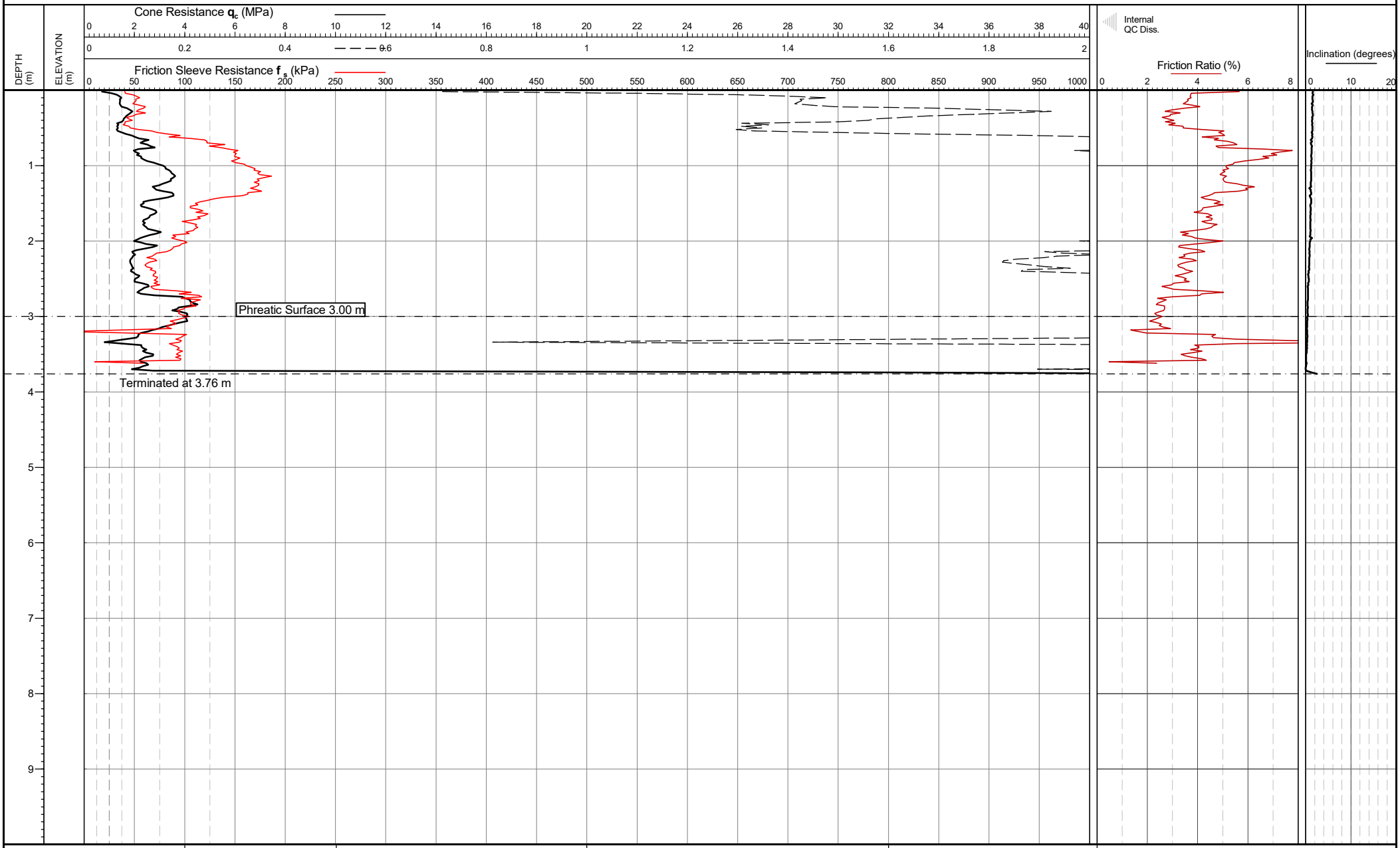
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:58:03	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-35** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

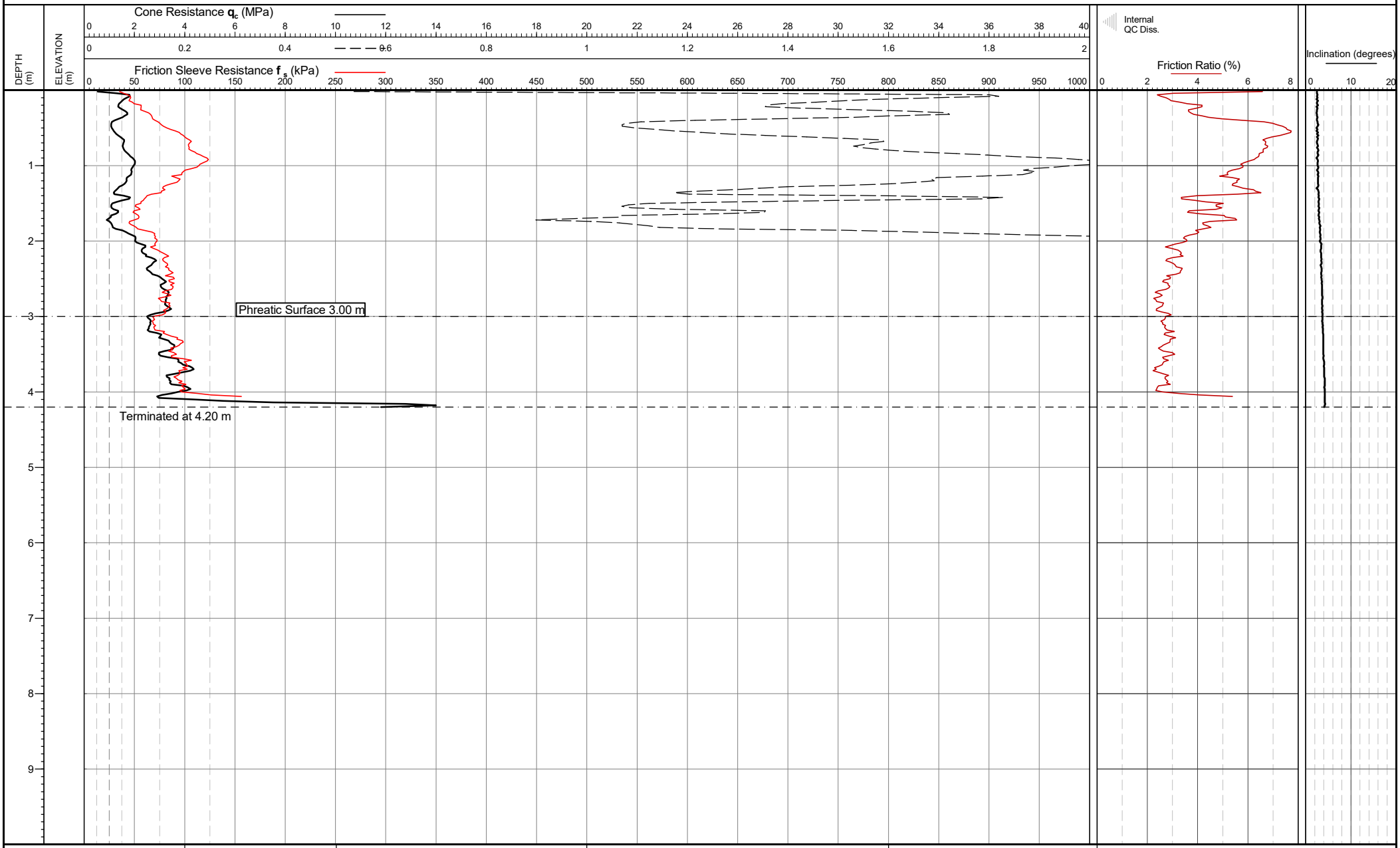


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:08:51	Zero drift (Pre/post test) q_c (kPa): -19.6 f_s (kPa): -0.8 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Total reaction force	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-36

Project: SOUTHAMPTON

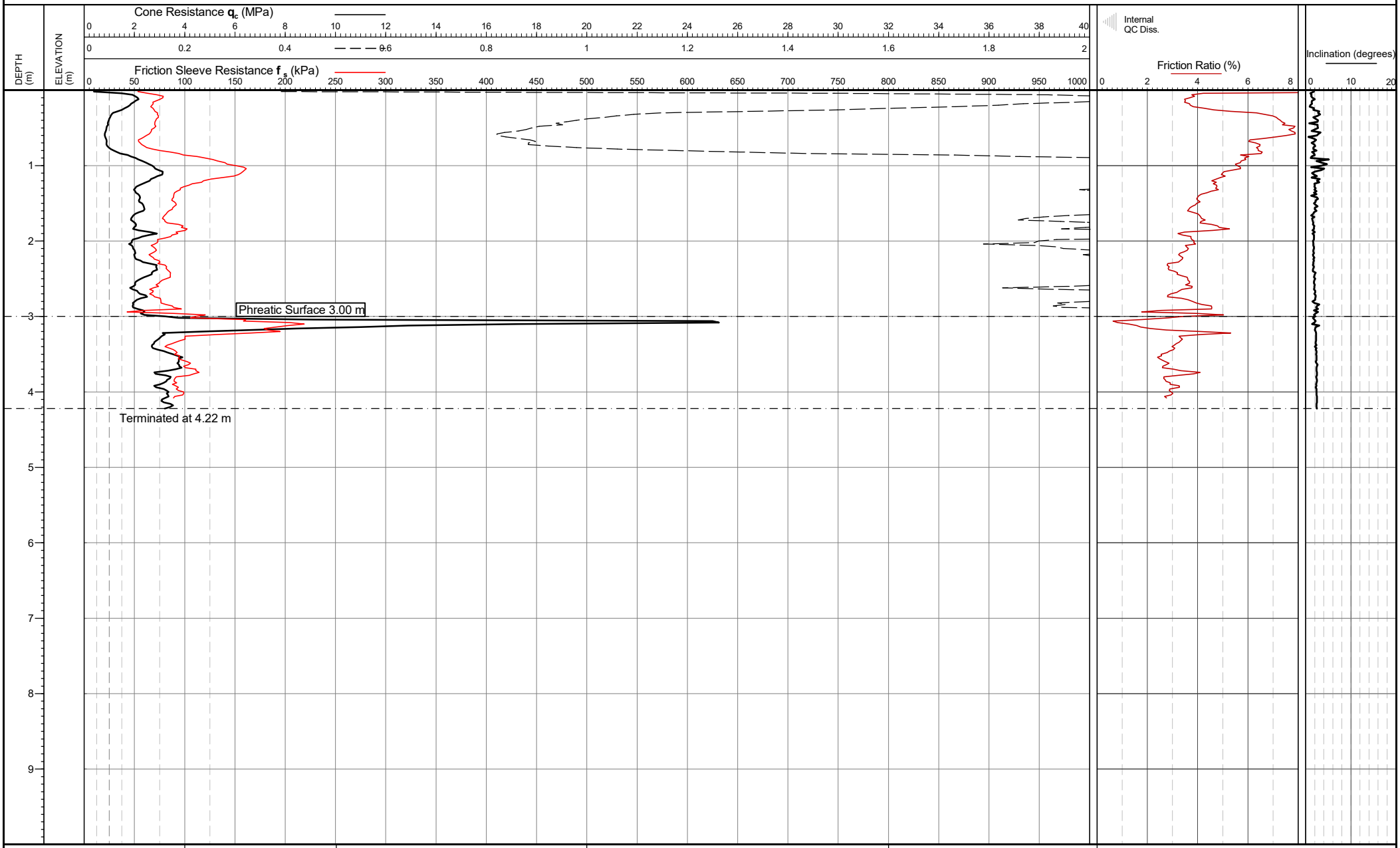
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:33:54	Zero drift (Pre/post test) q_c (kPa): -26.4 f_s (kPa): 2.3 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-37** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

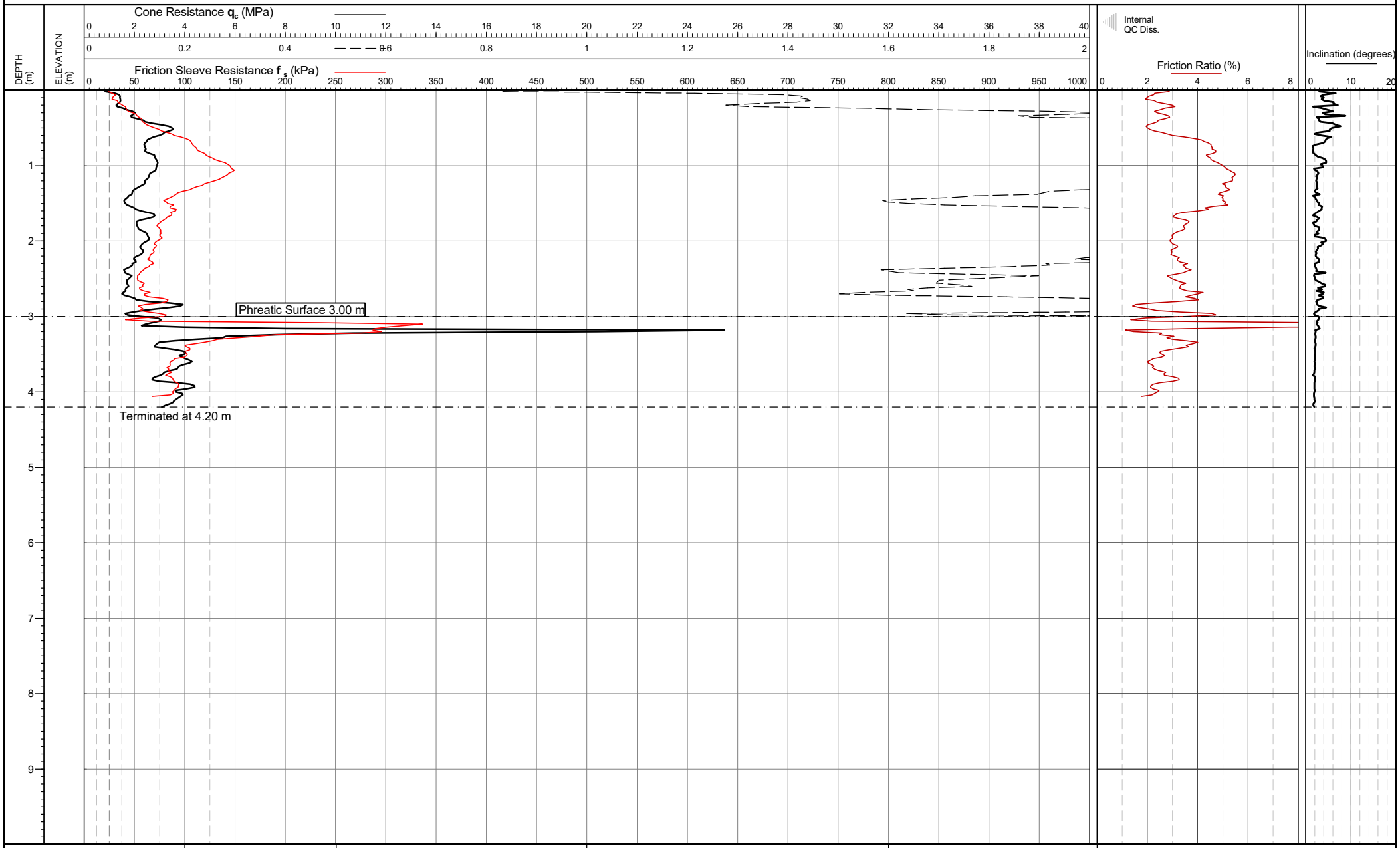


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:58:34	Zero drift (Pre/post test) q_c (kPa): 34.2 f_s (kPa): -1.8 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-38

Project: SOUTHAMPTON

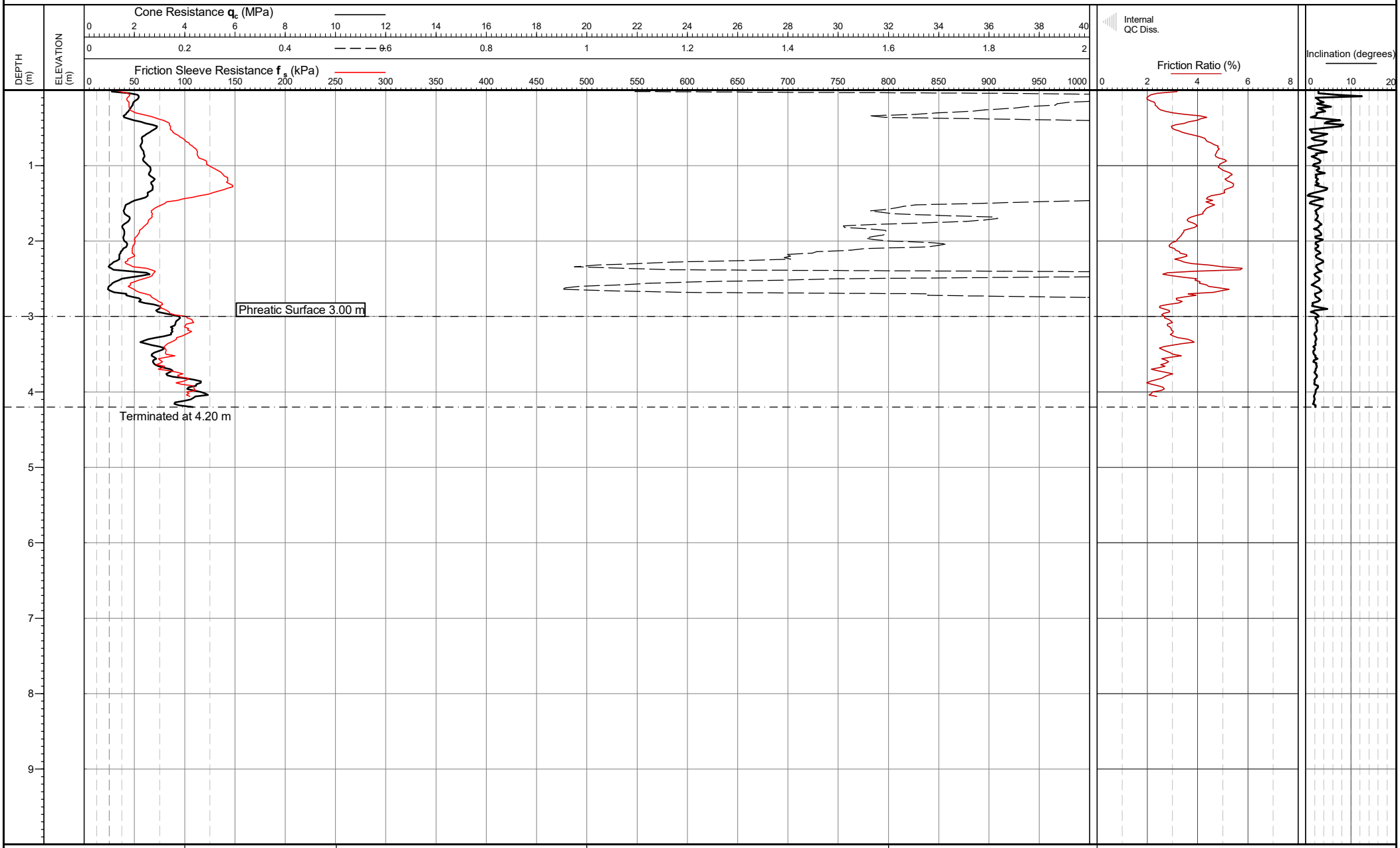
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:12:42	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-39** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

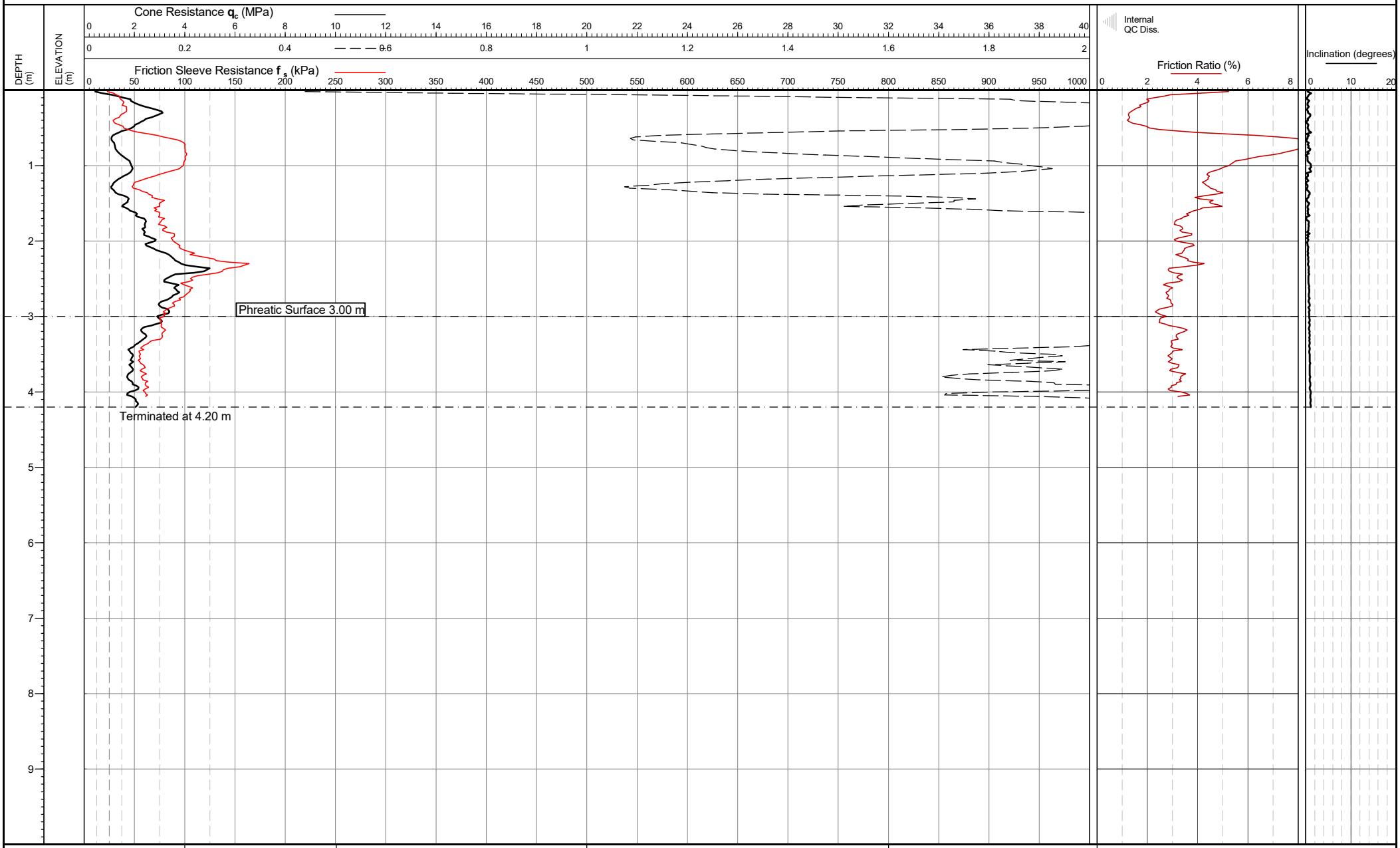


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:33:05	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-40

Project: SOUTHAMPTON

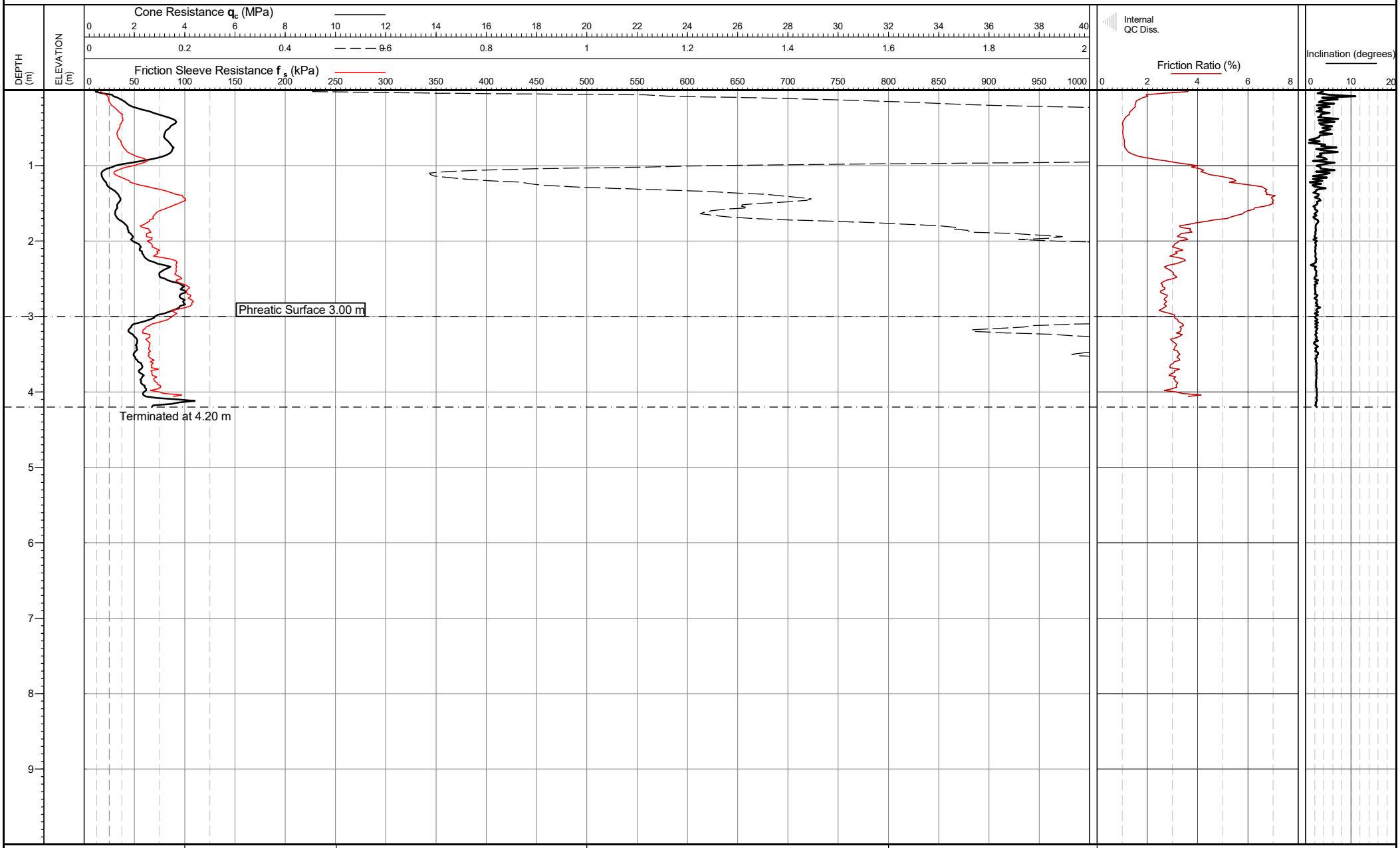
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:29:08	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-41** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

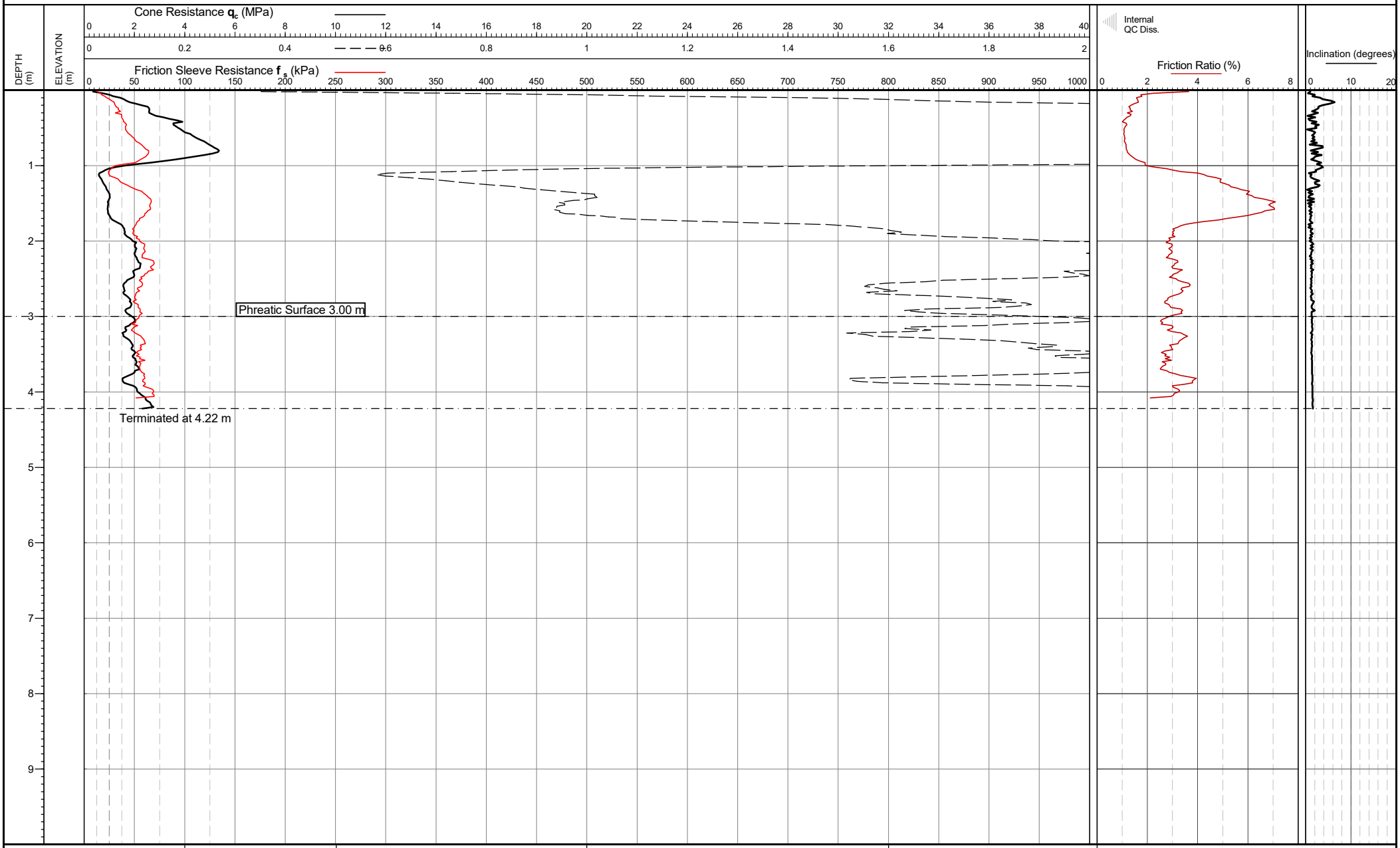


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:39:35	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-42

Project: SOUTHAMPTON

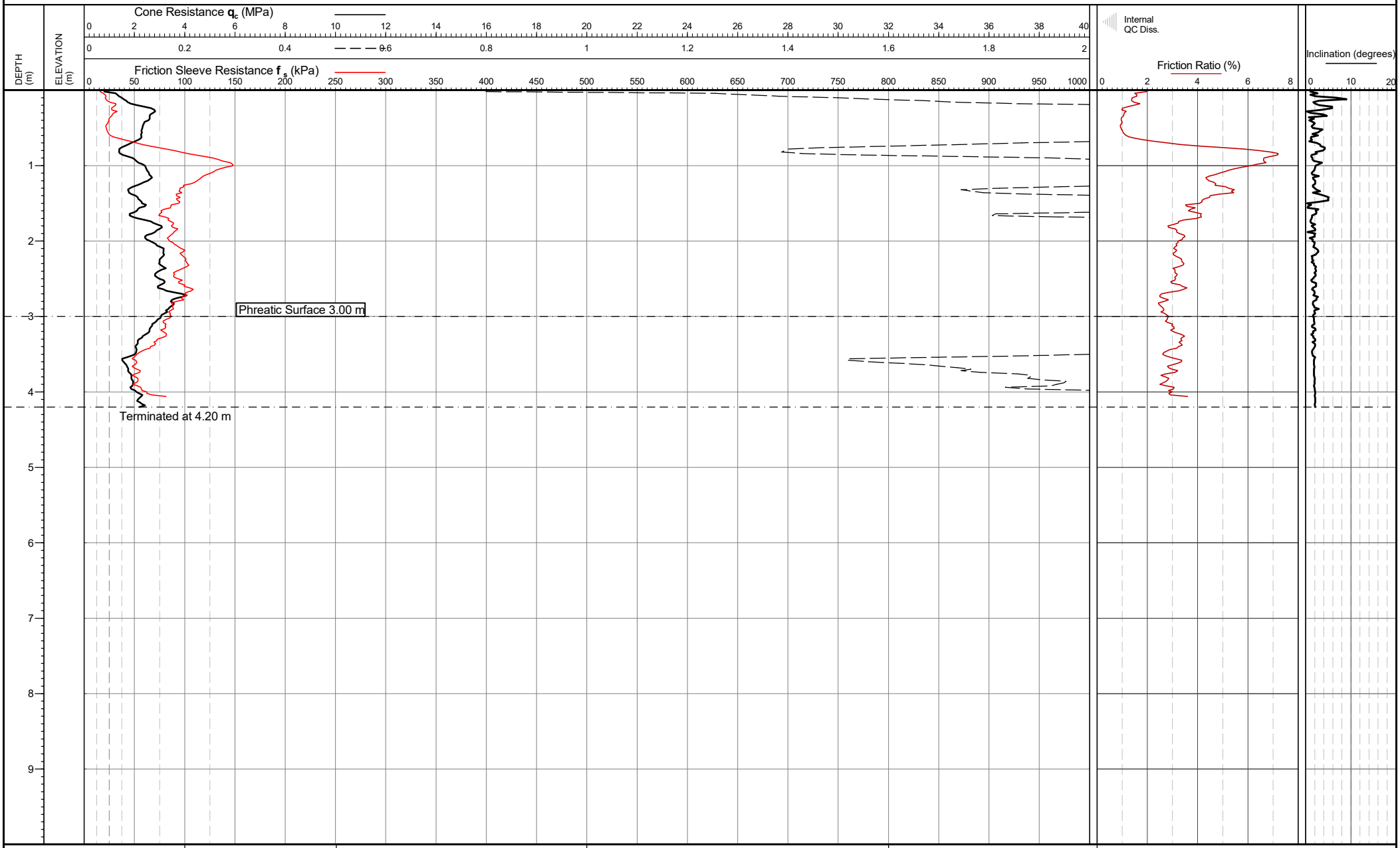
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:52:18	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-43** Page 1 of 1

Project: SOUTHAMPTON

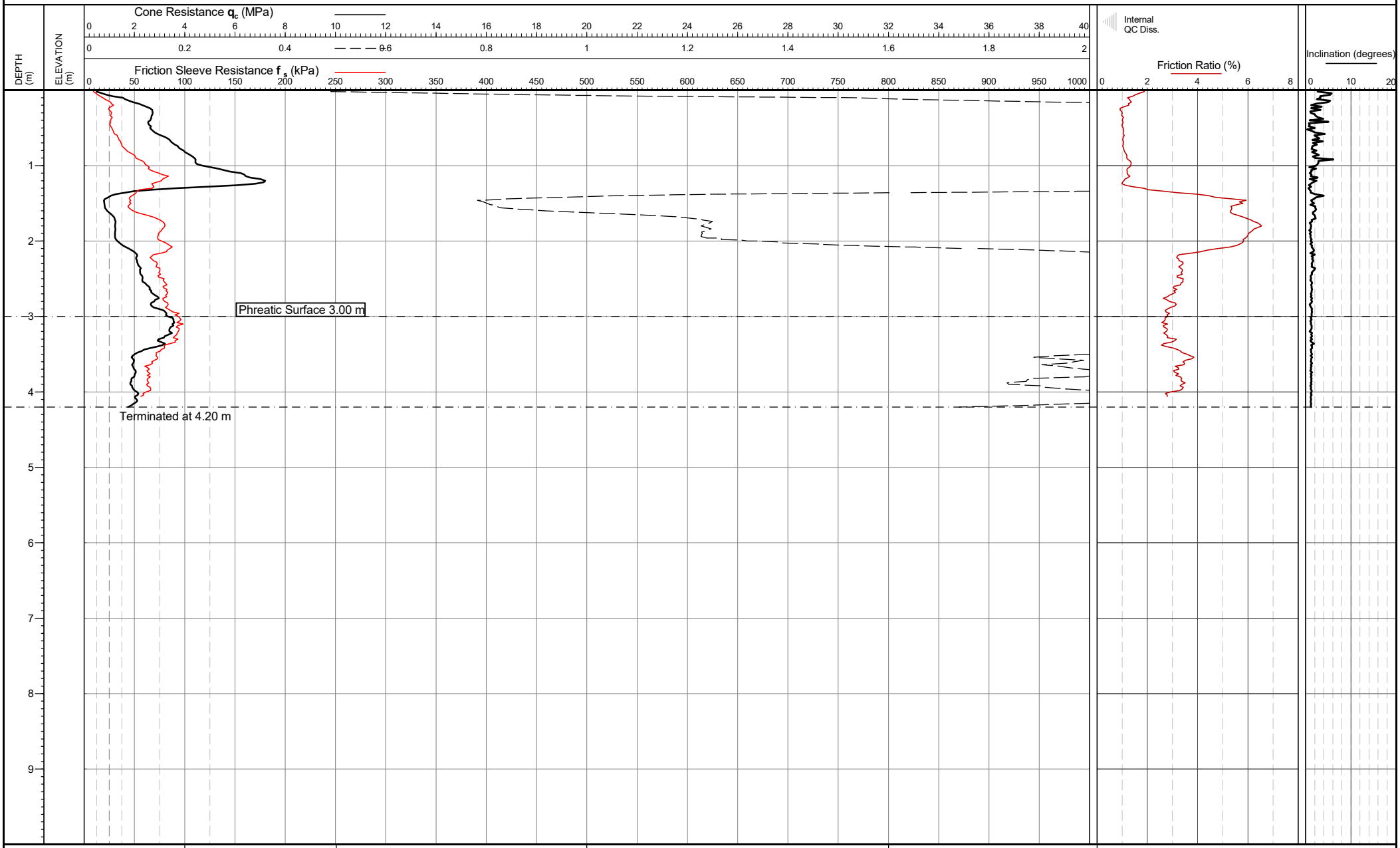
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:21:14	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 ($f_{s\ drift}$ - $q_{c\ drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-44** Page 1 of 1

Project: SOUTHAMPTON

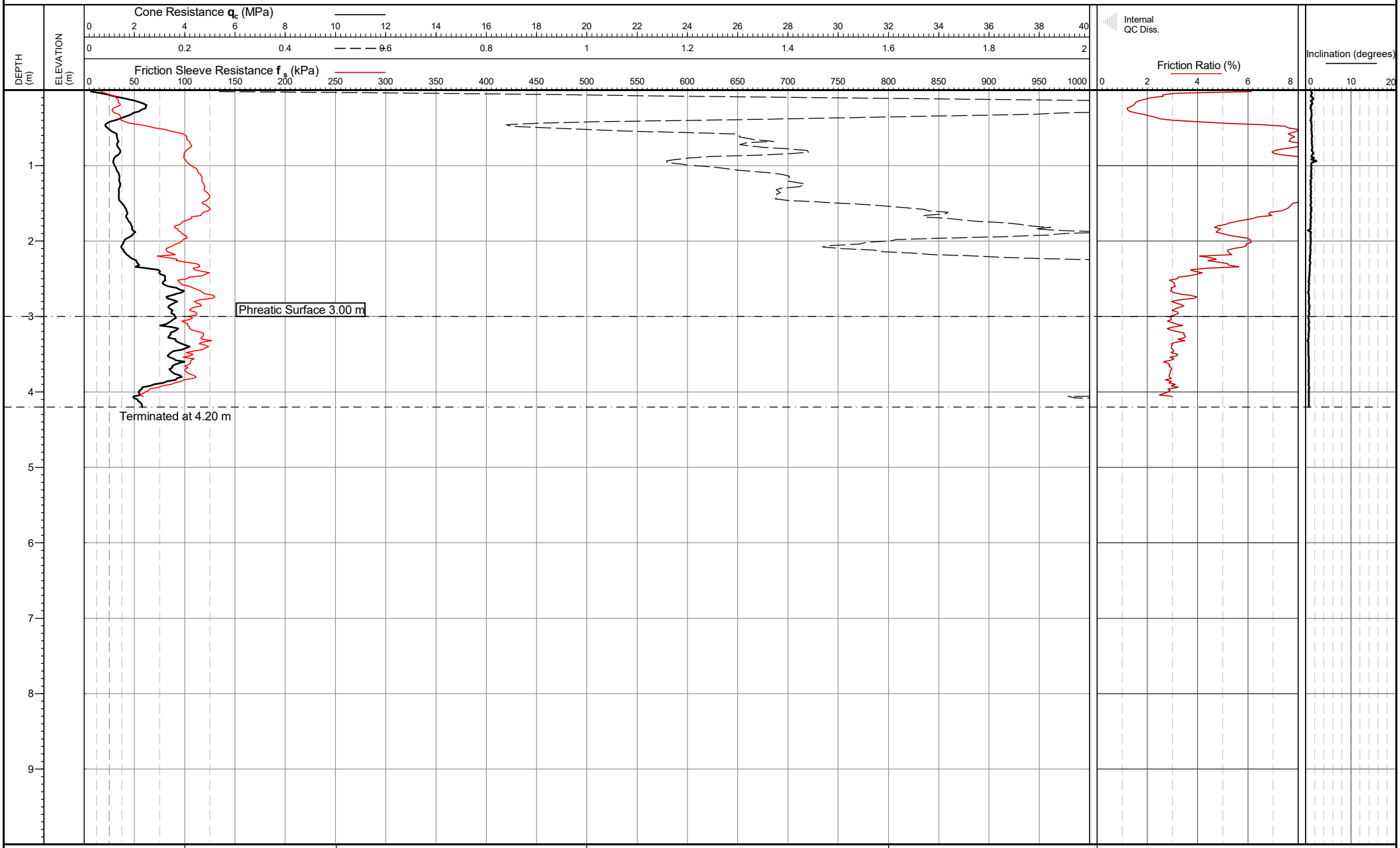
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:01:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-45** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.

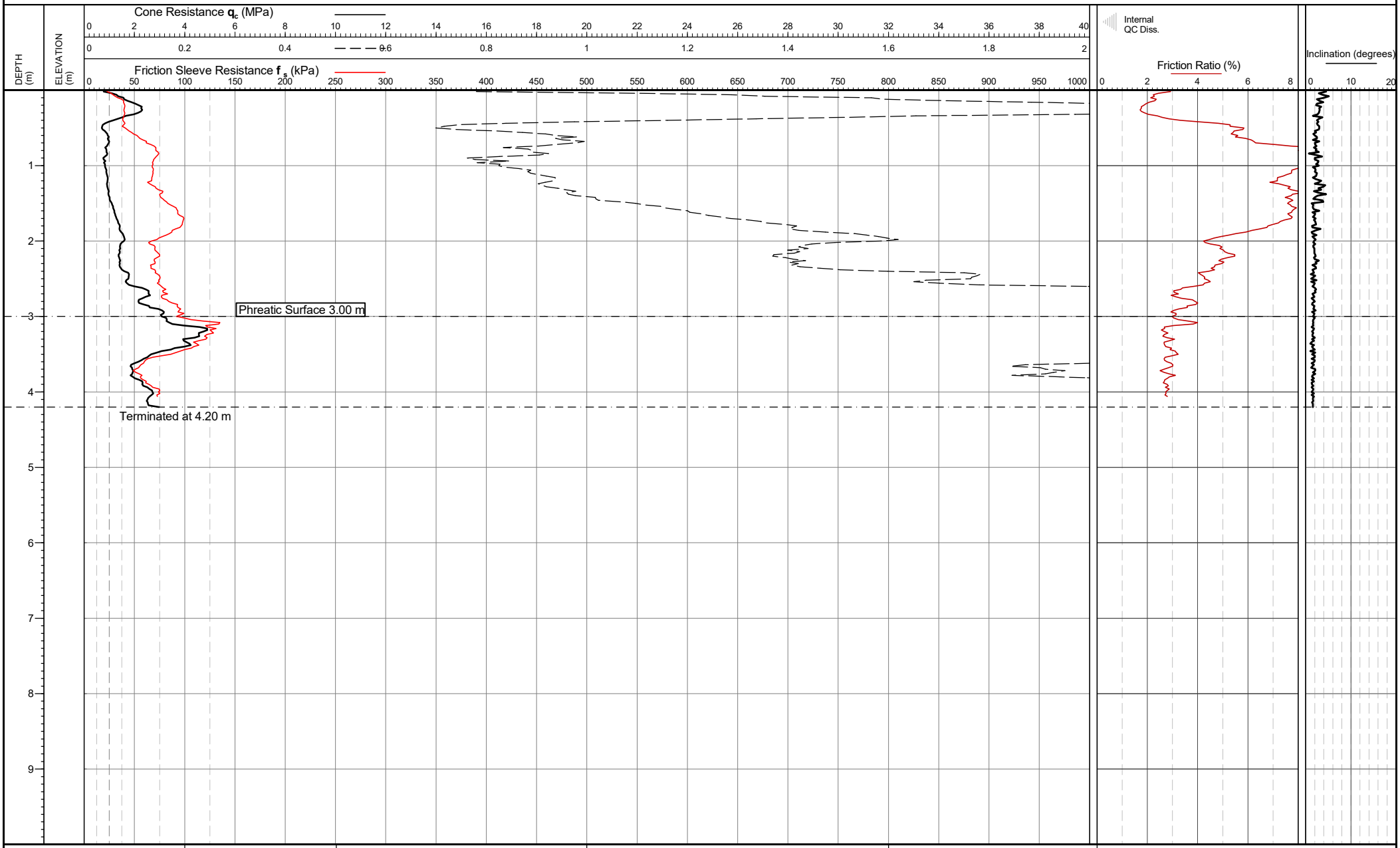


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:26:03	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-46

Project: SOUTHAMPTON

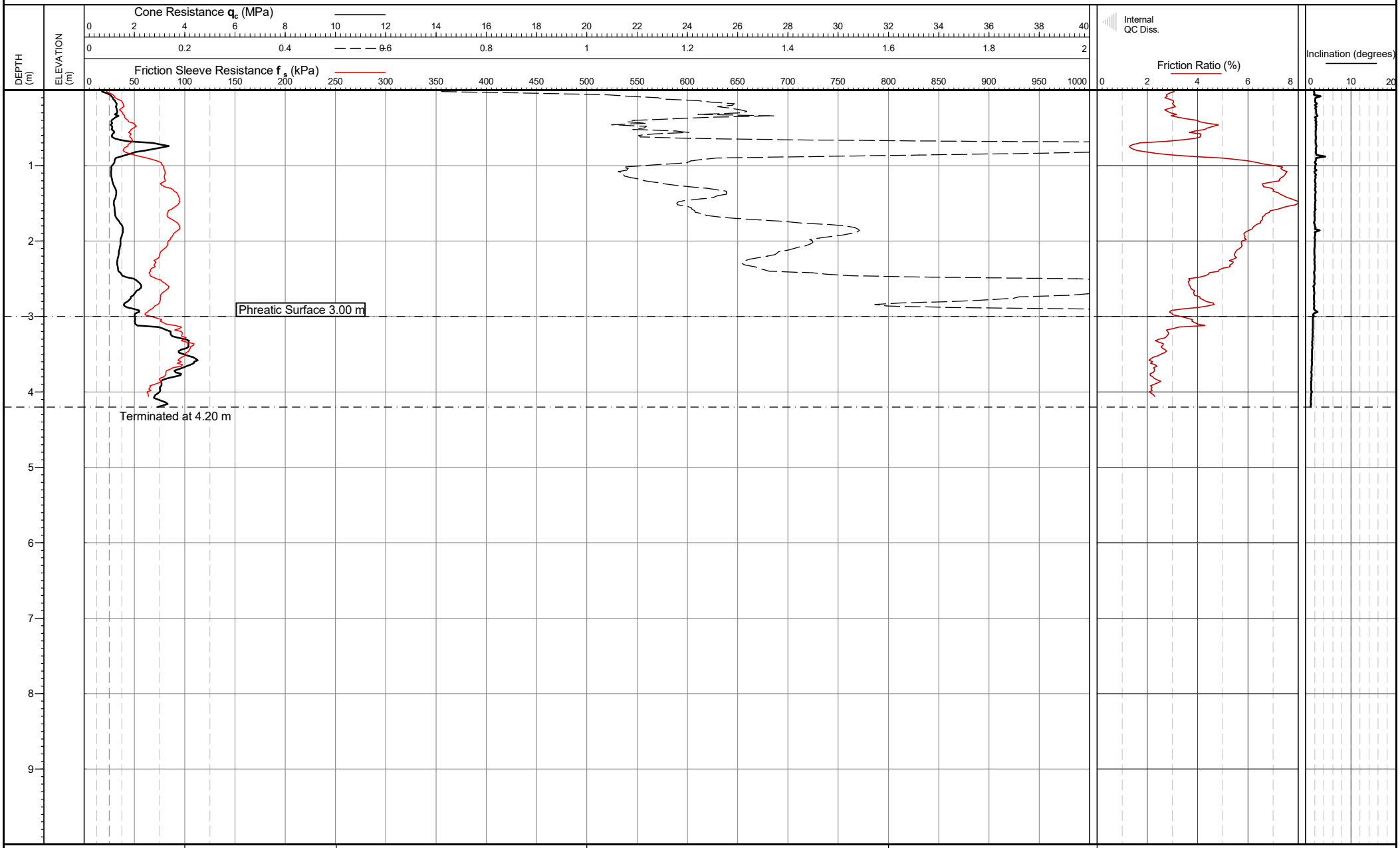
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:36:17	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-47** Page 1 of 1

Project: SOUTHAMPTON

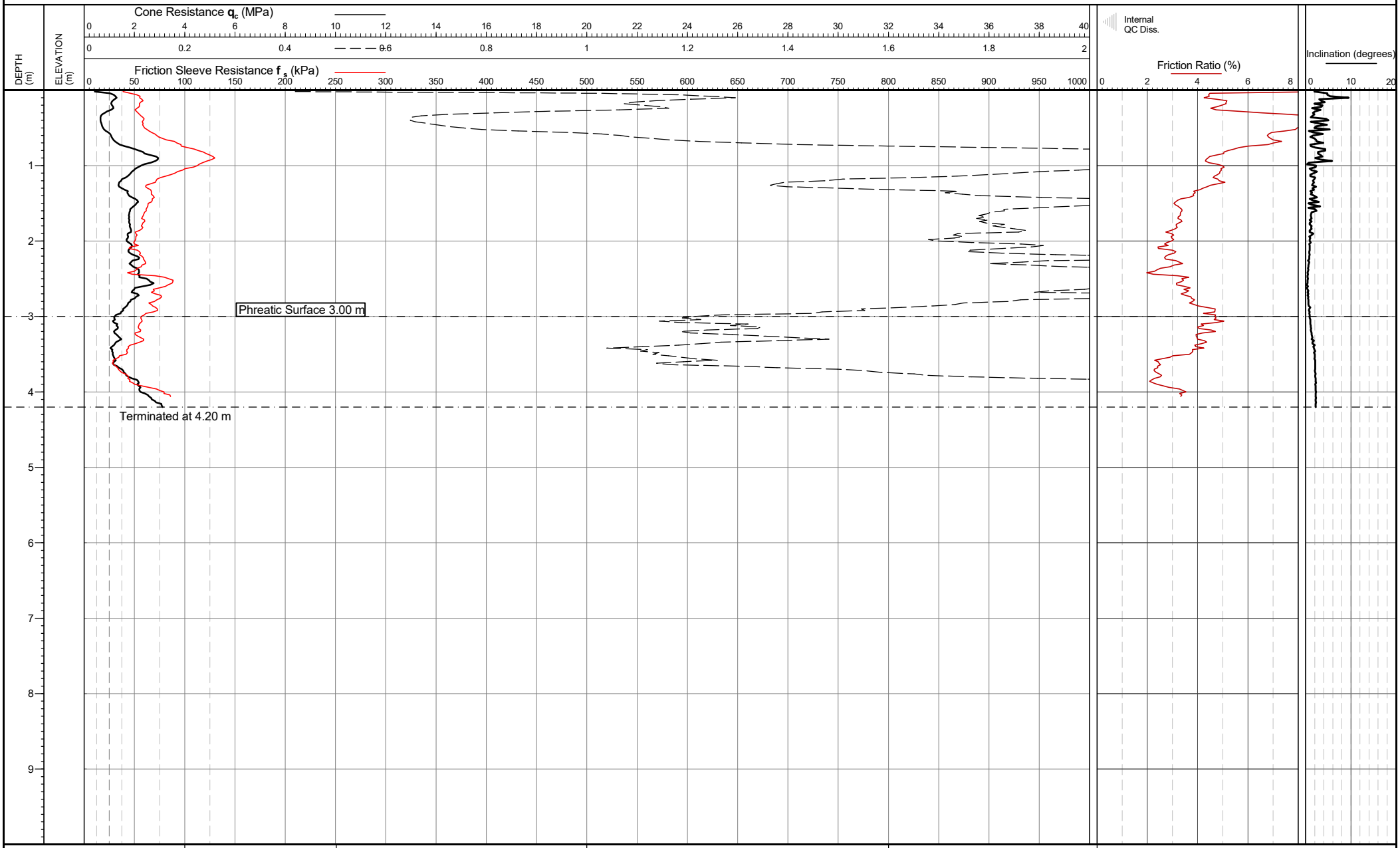
Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:50:04	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: CPT-48** Page 1 of 1

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:25:23	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 ($f_{s\,drift}$ - $q_{c\,drift}$)	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Refusal criteria: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1	**TEST ID: SPT-14** Page 1 of 1

APPENDIX D SOIL BEHAVIOUR TYPE RESULTS

Soil behaviour type (SBT) point data evaluation according to:

Schneider et al (2008)

Robertson (2016)

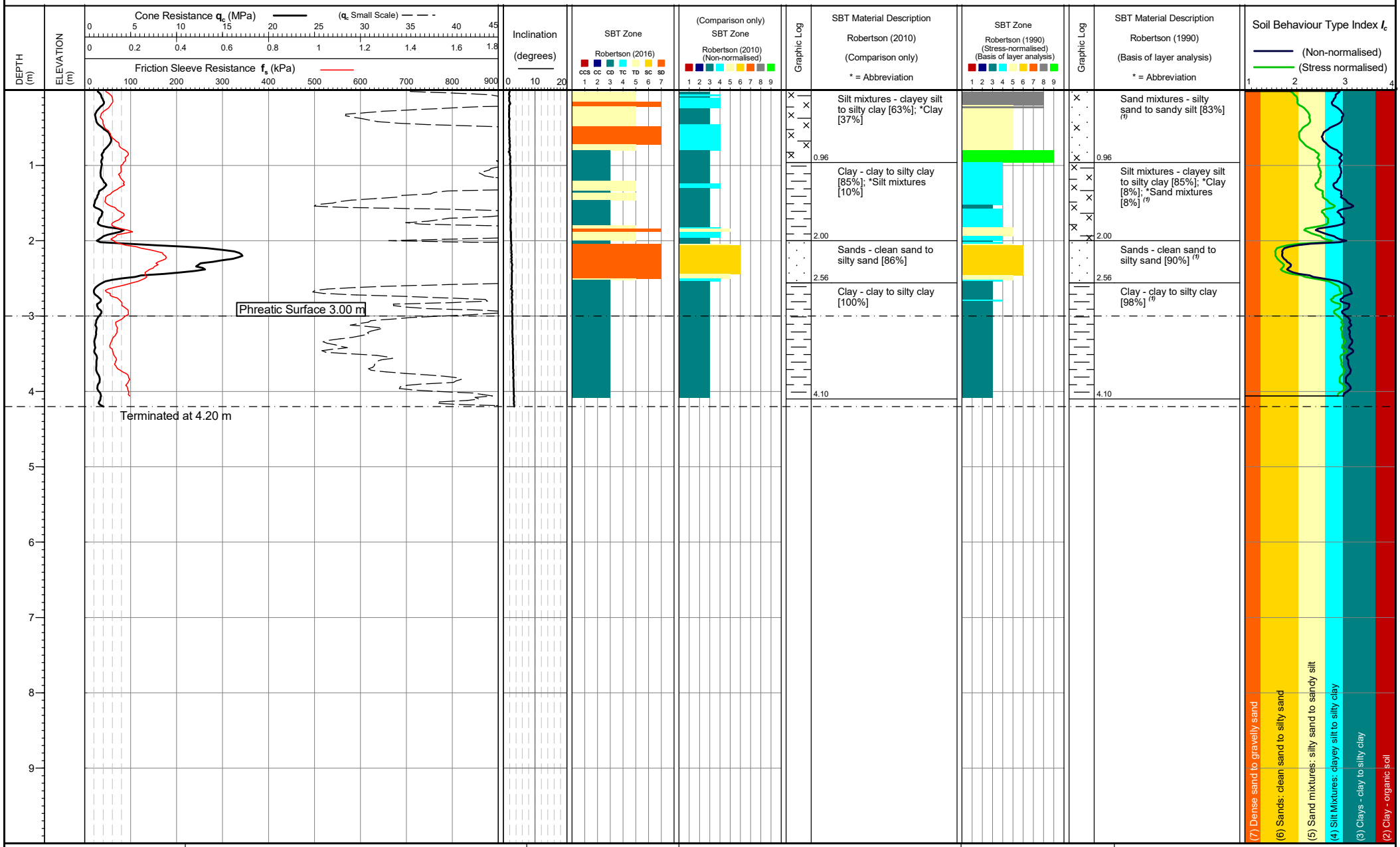
Robertson (2010) with aggregate layer descriptions

Robertson (1990) with aggregate layer descriptions

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 12:10:55

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

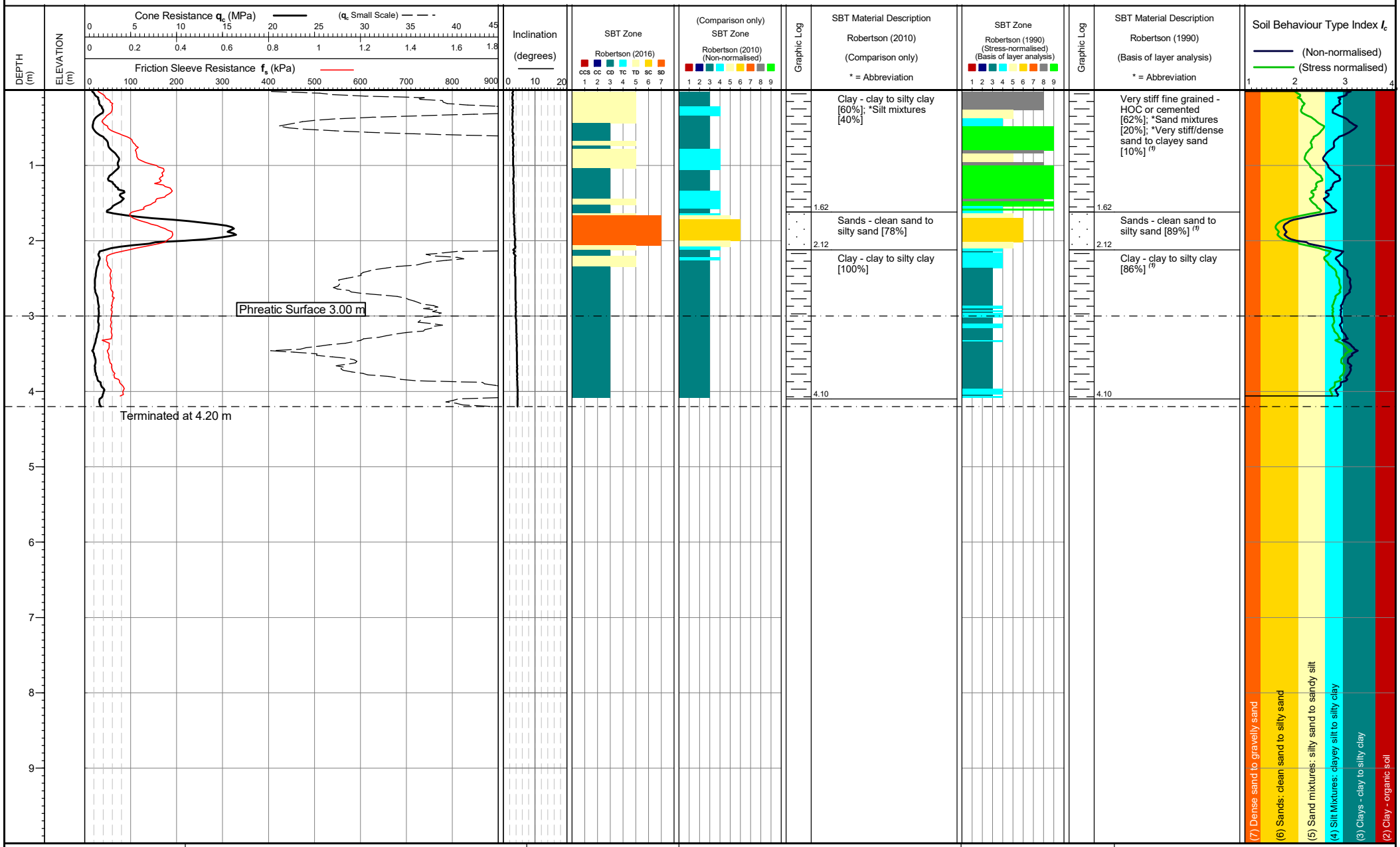
Internal QA Diss.
Dissipation Test

TEST ID: CPT-01

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 11:30:59

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

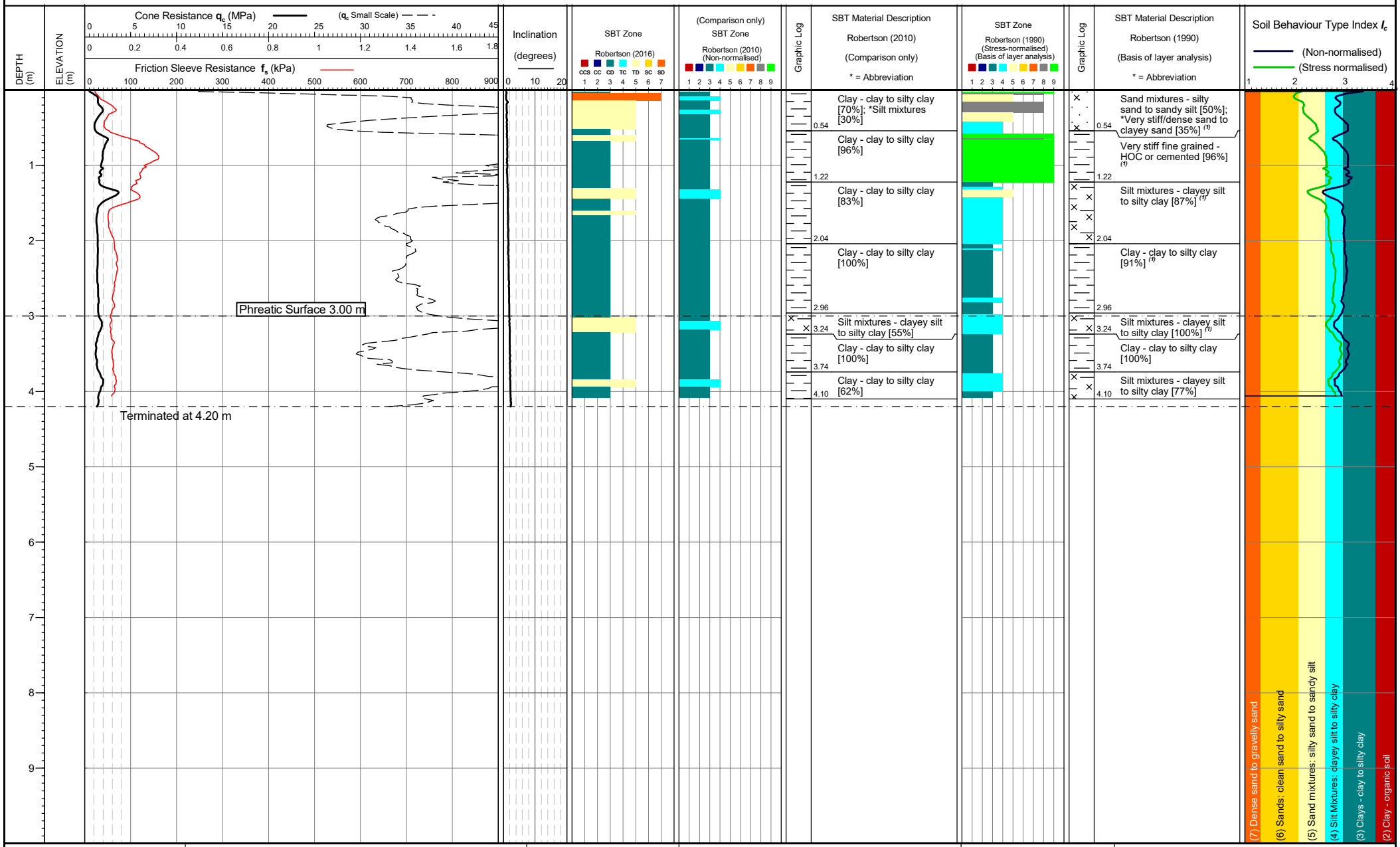
Internal QA Diss.
Dissipation Test

TEST ID: CPT-02

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 10:41:56

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

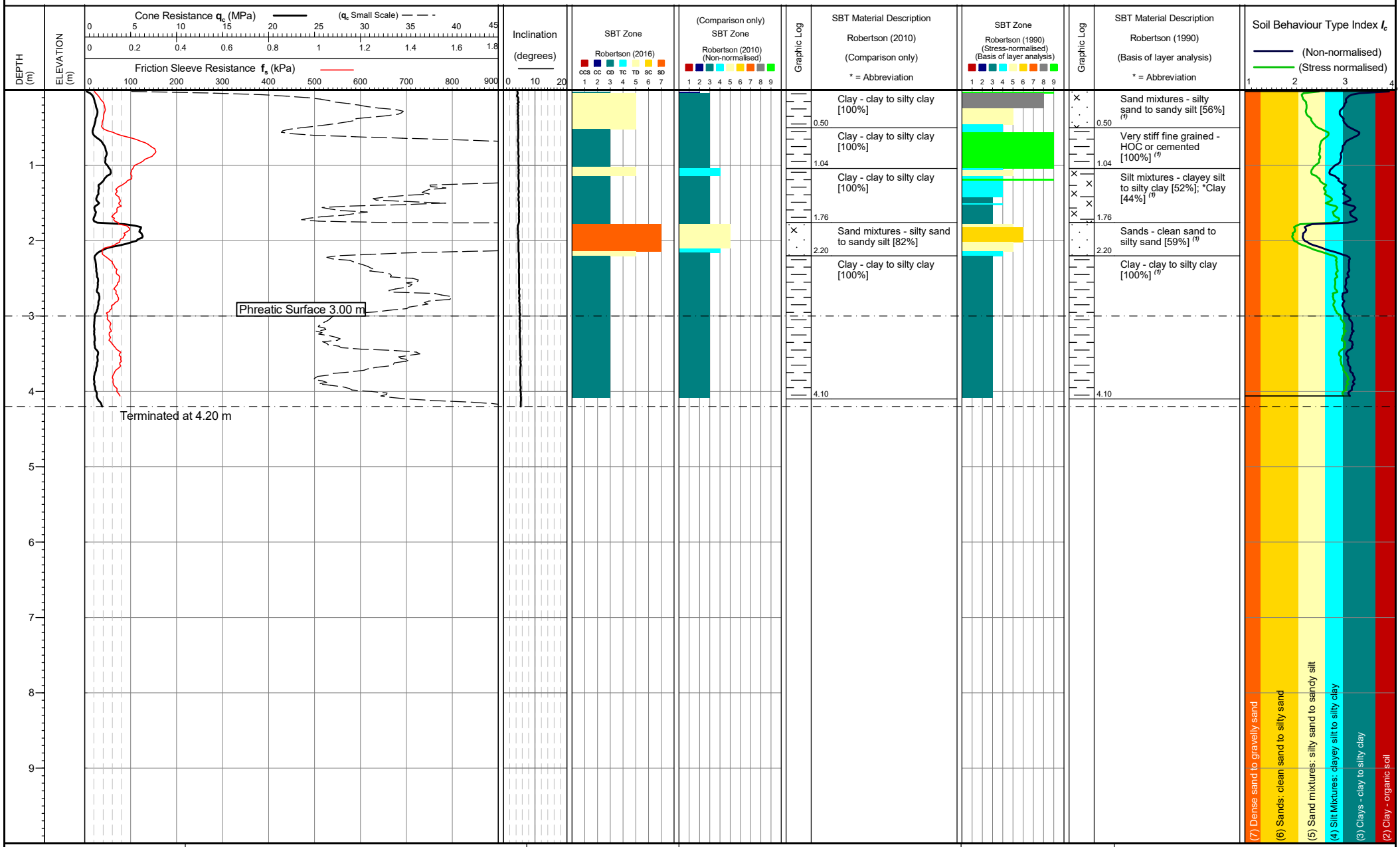
Internal QA Diss. Dissipation Test

TEST ID: CPT-03

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 12:24:30

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

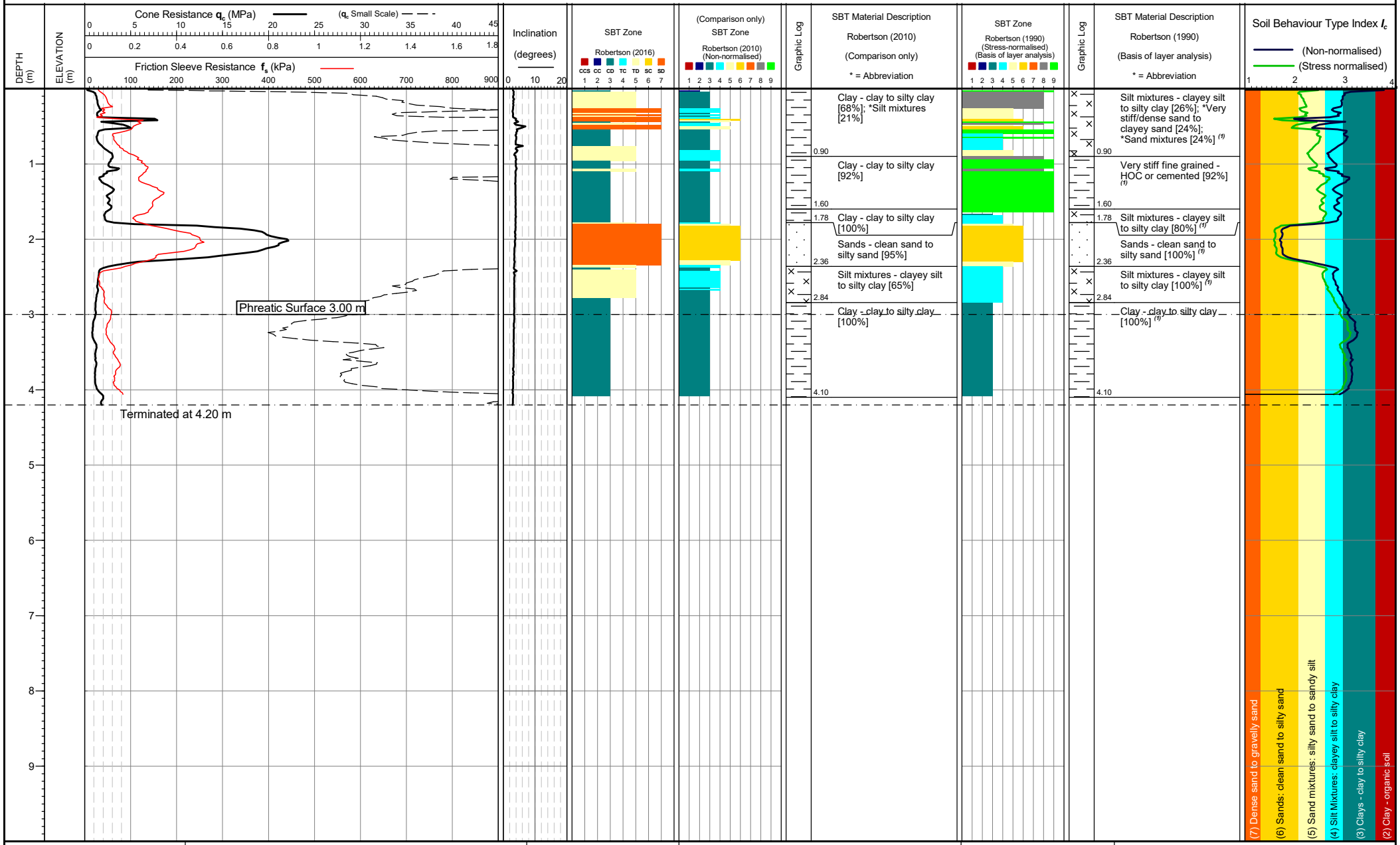
Internal QA Diss.
Dissipation Test

TEST ID: CPT-04

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 15:12:32

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

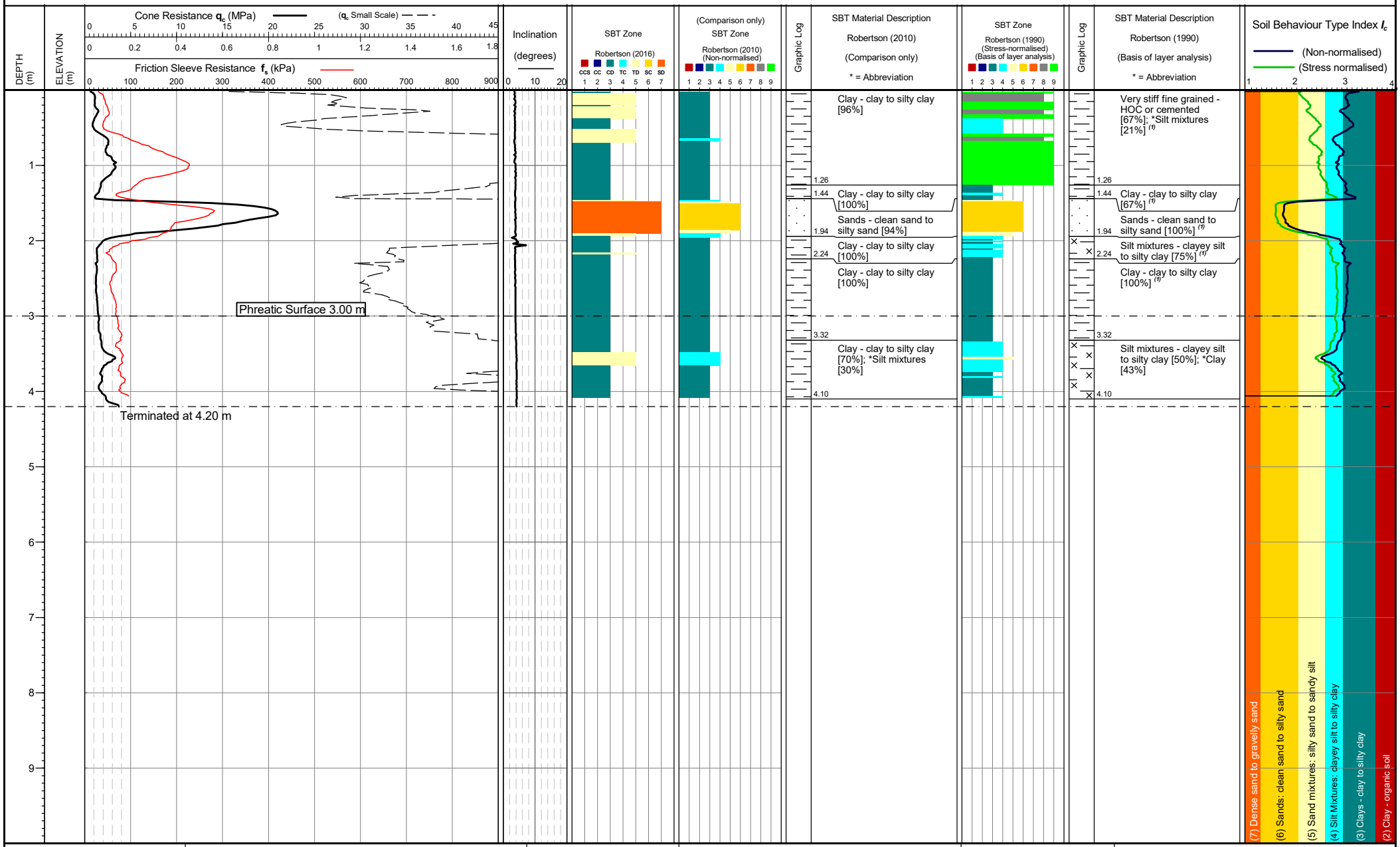
Internal QA Diss.
Dissipation Test

TEST ID: CPT-05

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 15:46:10

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

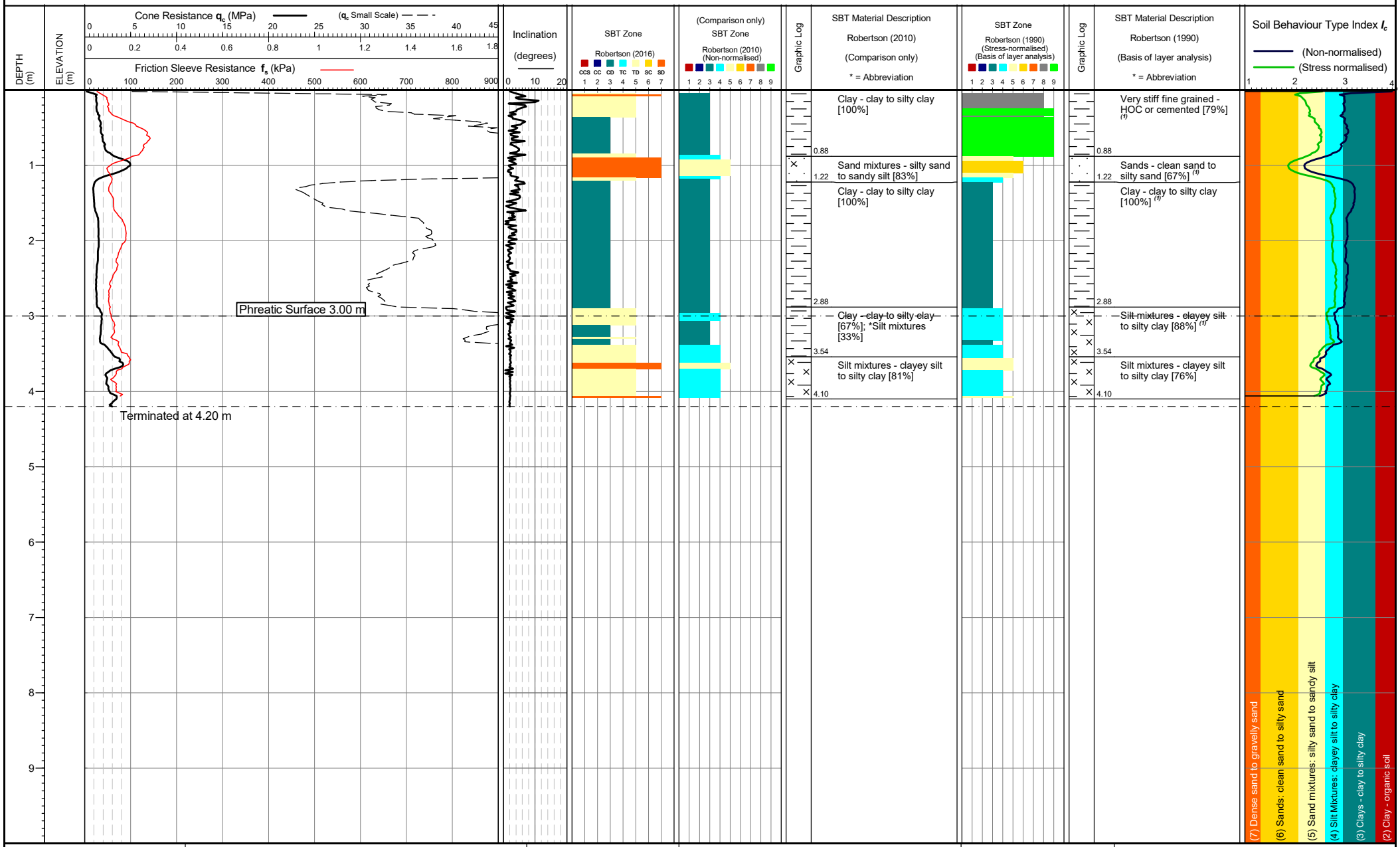
Internal QA Diss.
Dissipation Test

TEST ID: CPT-06

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 11:01:27

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

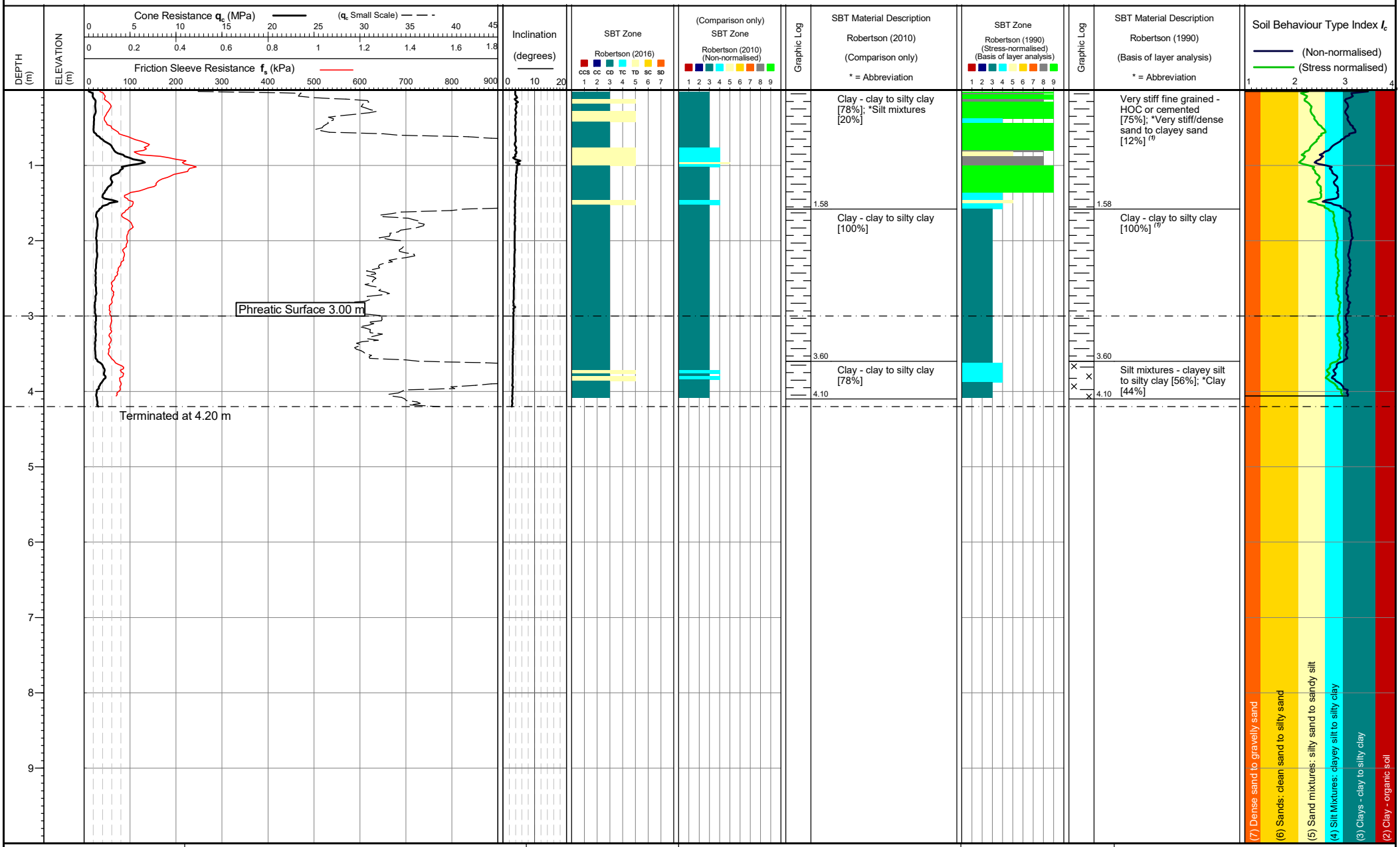
Internal QA Diss. Dissipation Test

TEST ID: CPT-07

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 14:57:03

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

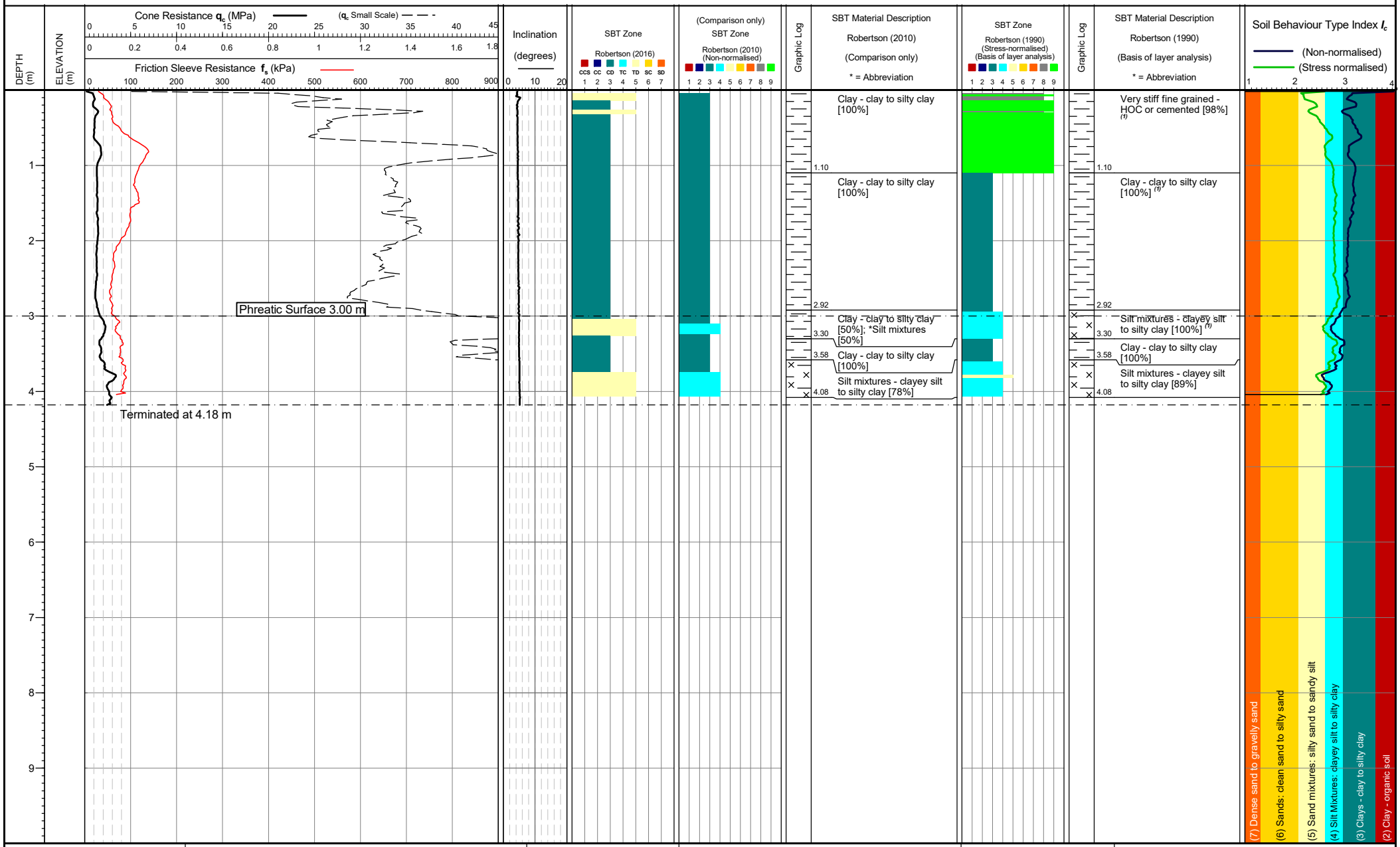
Internal QA Diss.
Dissipation Test

TEST ID: CPT-08

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 16:12:56

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss. Dissipation Test

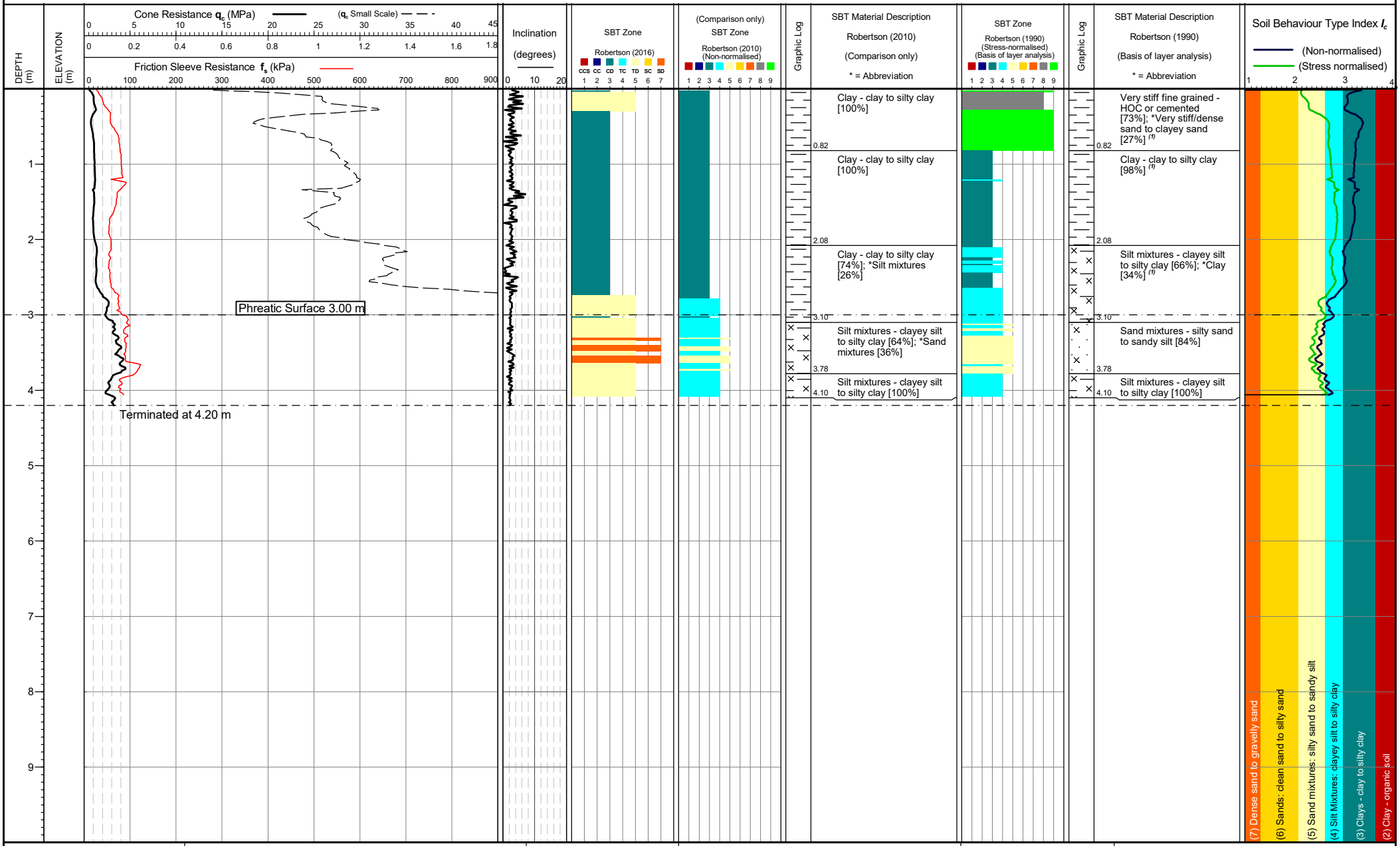
TEST ID: CPT-09

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 11:14:45

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

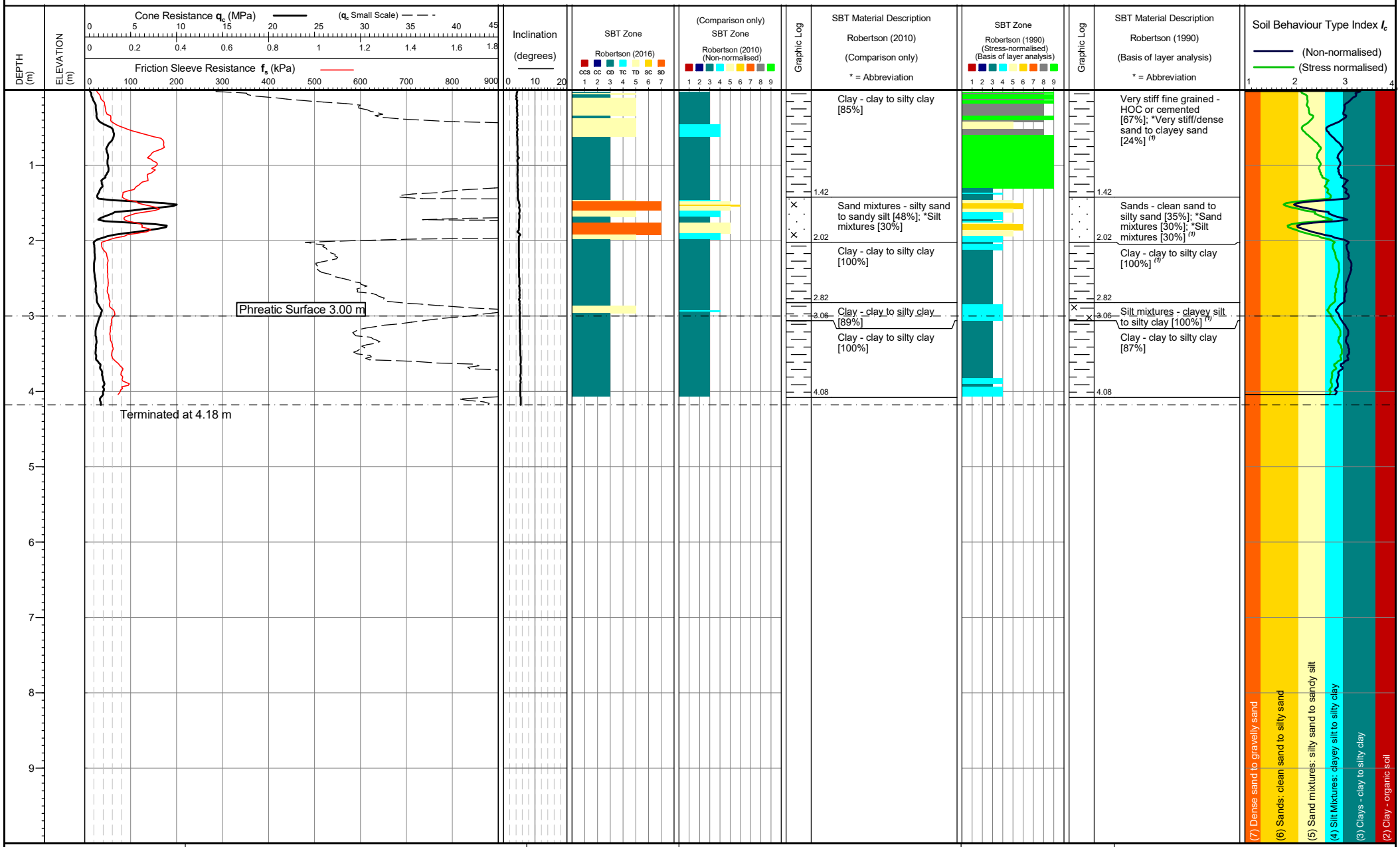
Internal QA Diss.
Dissipation Test

TEST ID: CPT-10

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 12:40:31

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

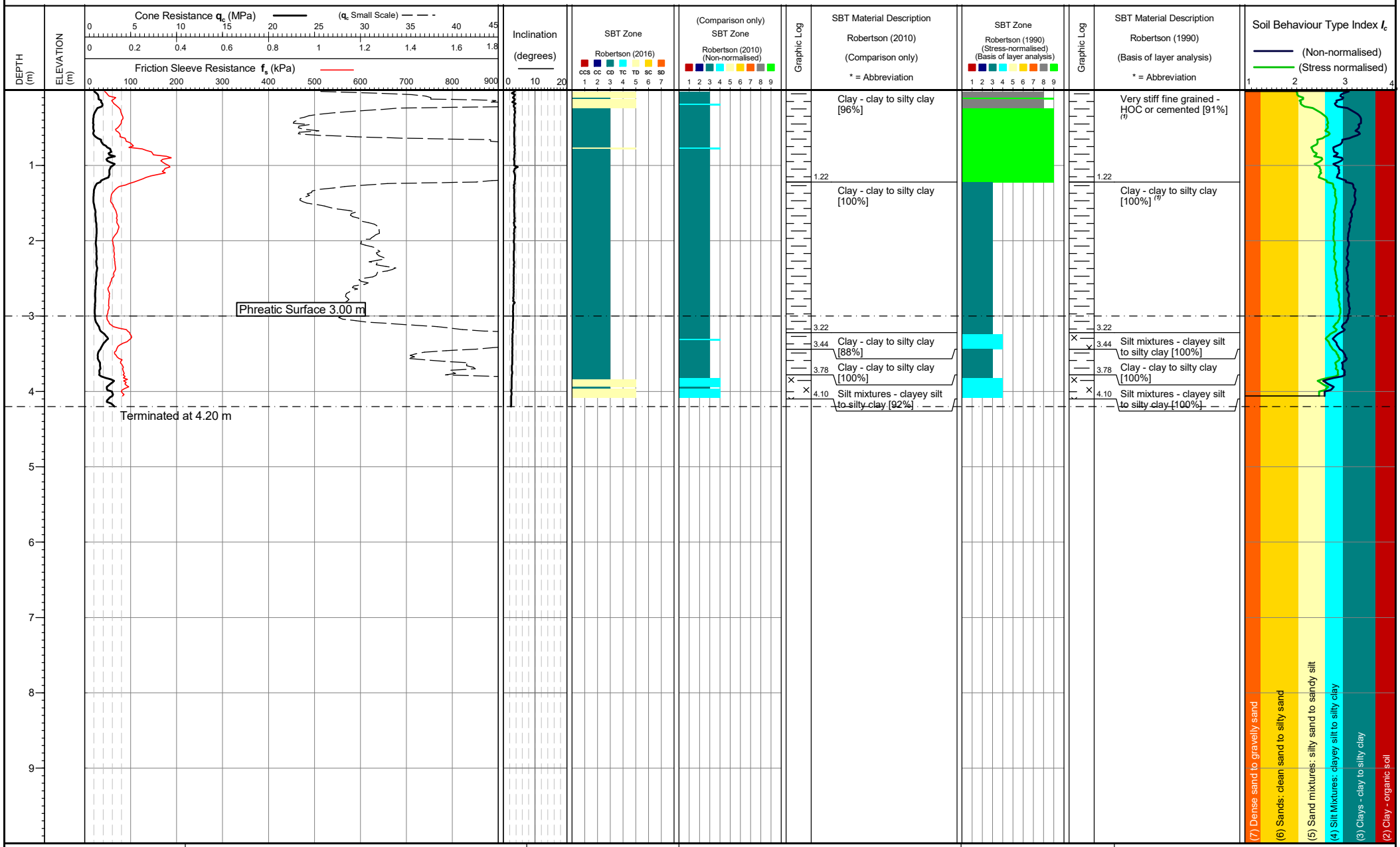
Internal QA Diss.
Dissipation Test

TEST ID: CPT-11

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 14:44:47

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss. Dissipation Test

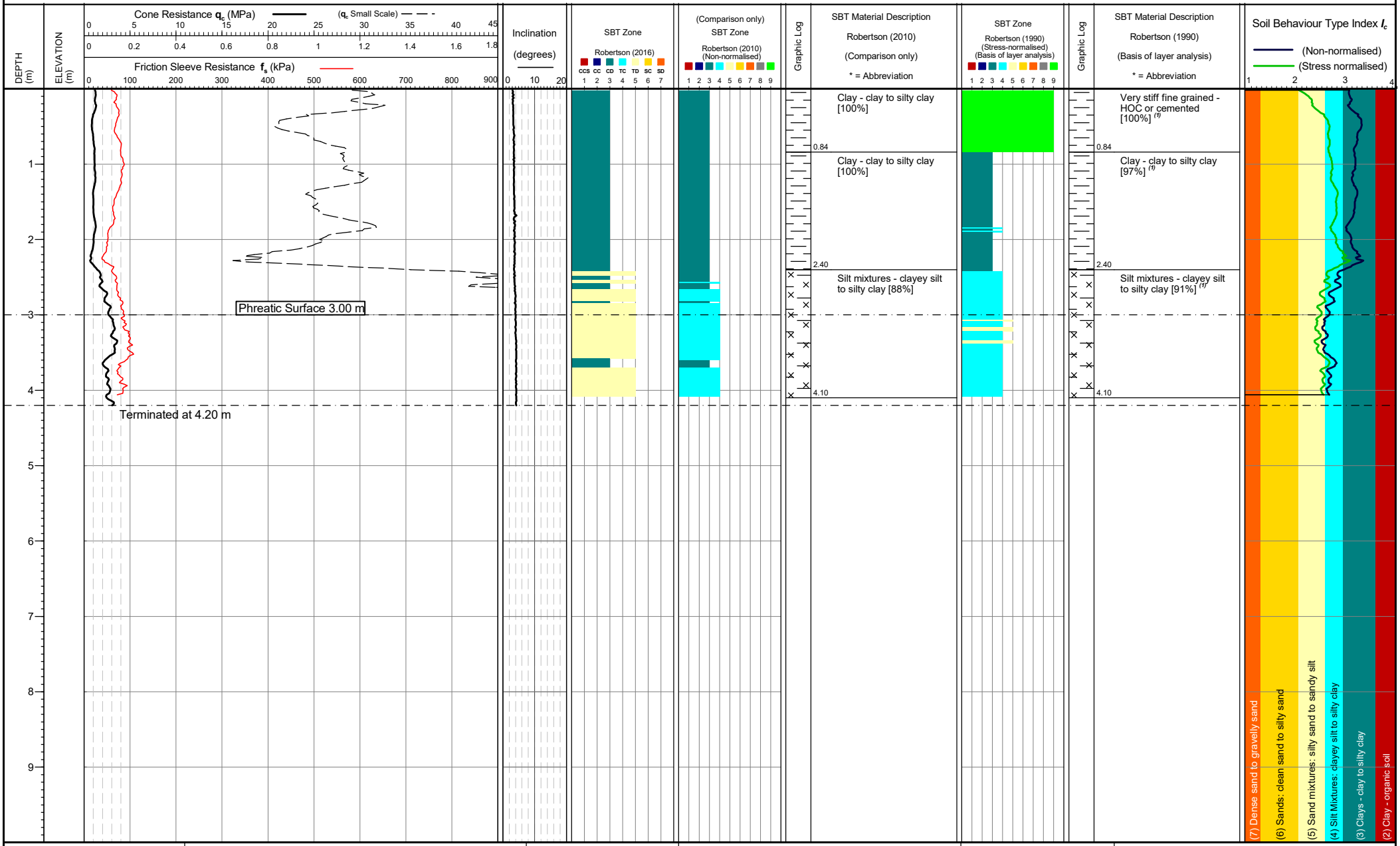
TEST ID: CPT-12

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 16:26:17

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

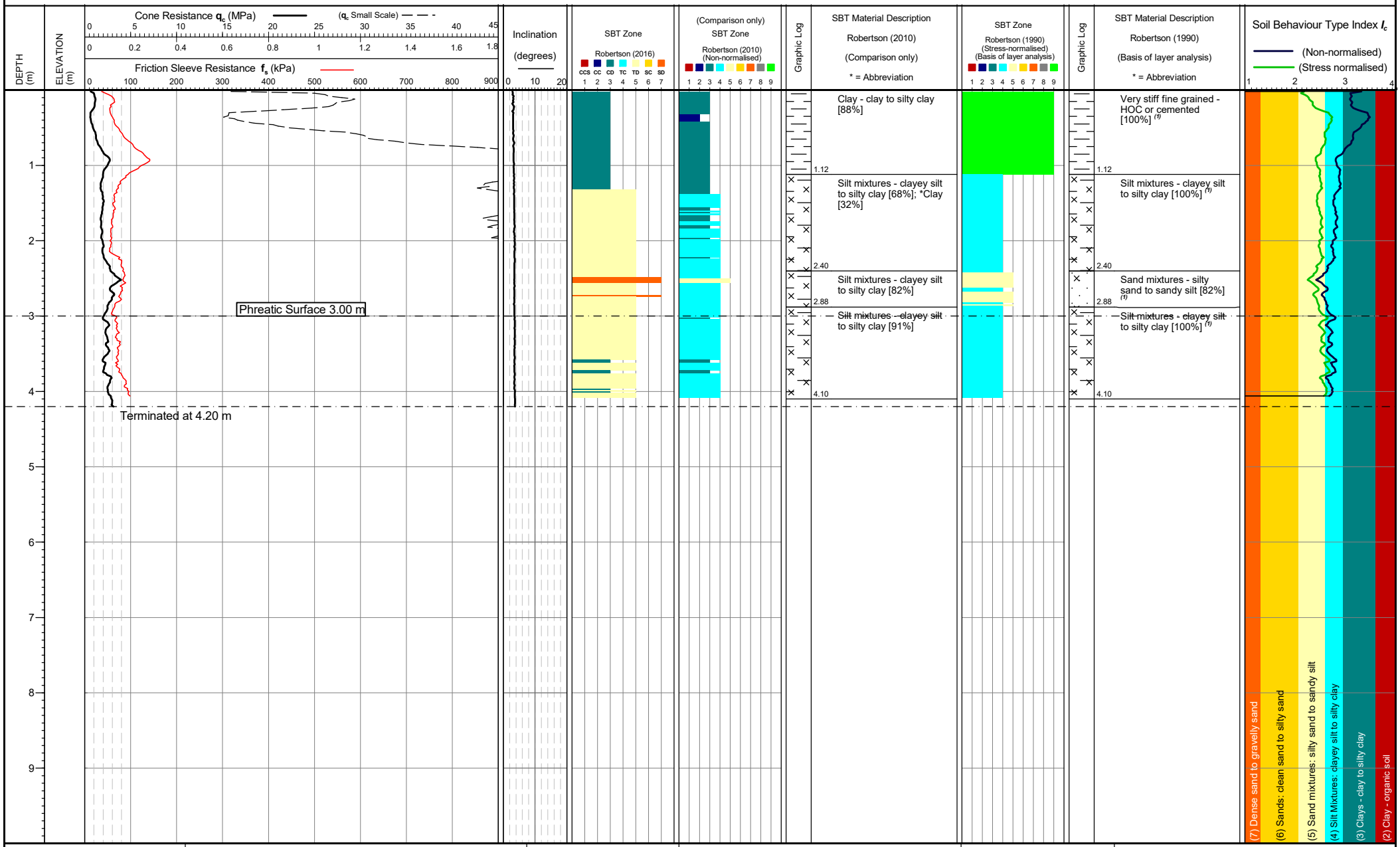
Internal QA Diss.
Dissipation Test

TEST ID: CPT-13

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 17:16:57

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

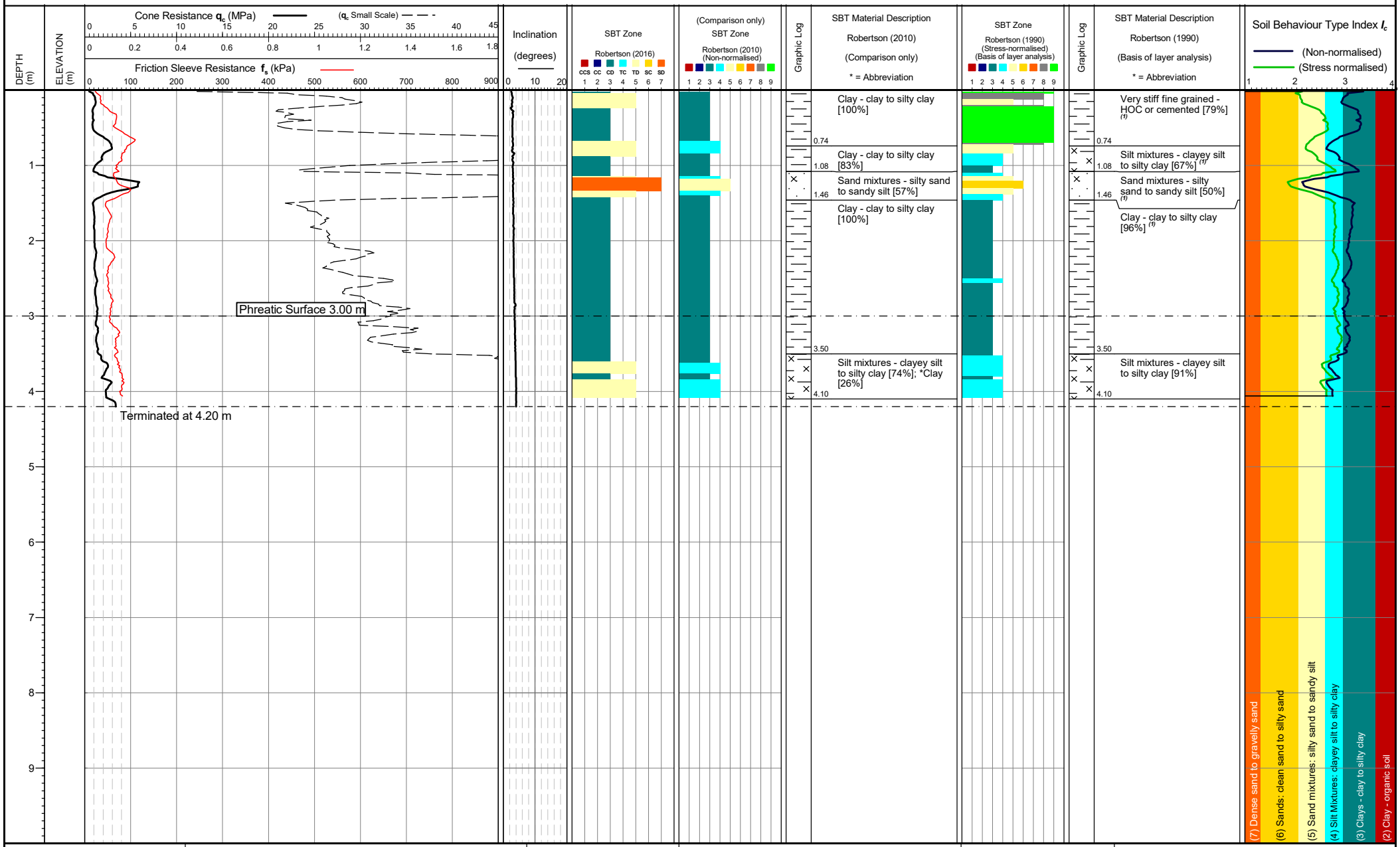
Internal QA Diss. Dissipation Test

TEST ID: CPT-14

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 12:59:12

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

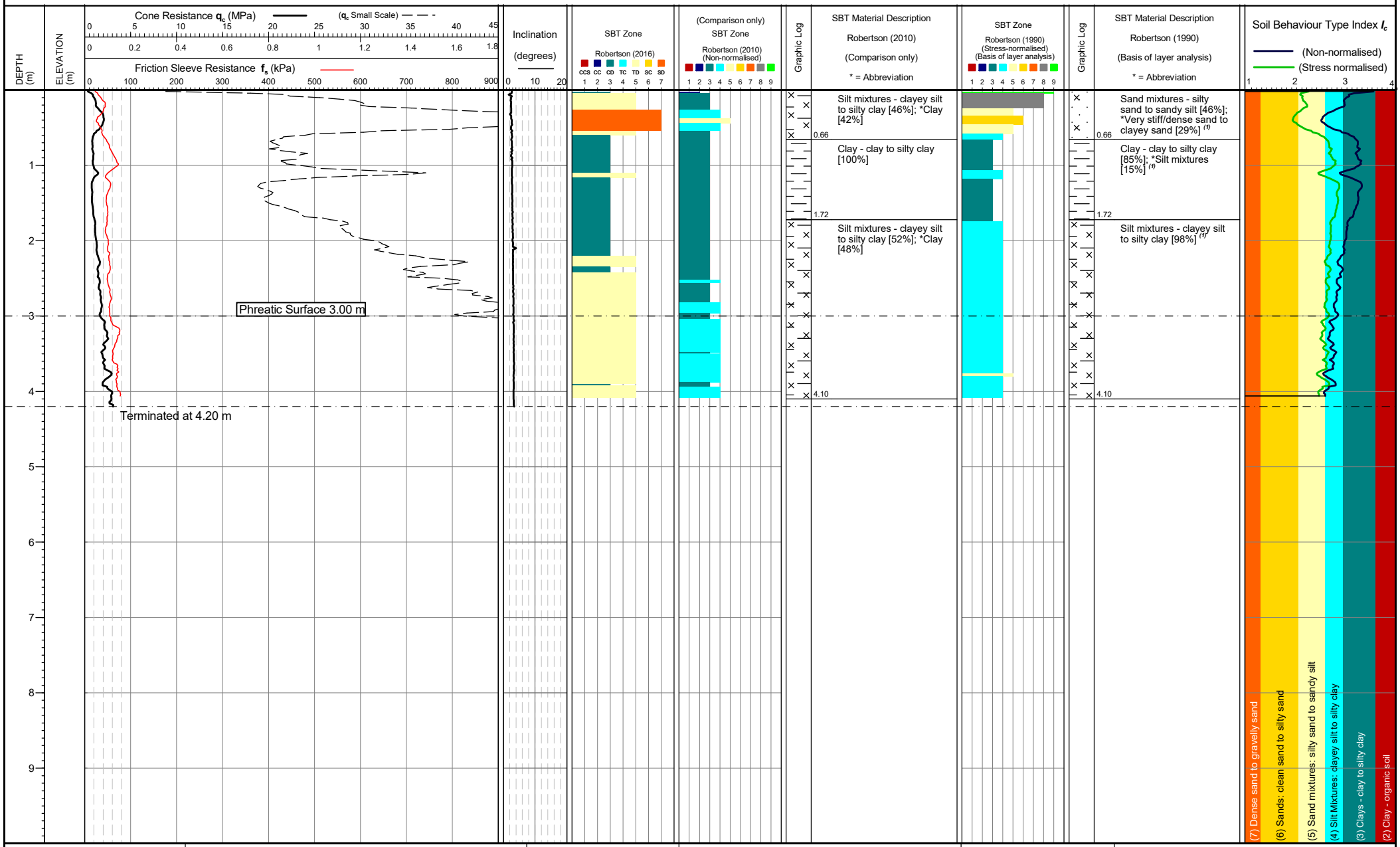
Internal QA Diss.
Dissipation Test

TEST ID: CPT-15

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 13:24:55

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

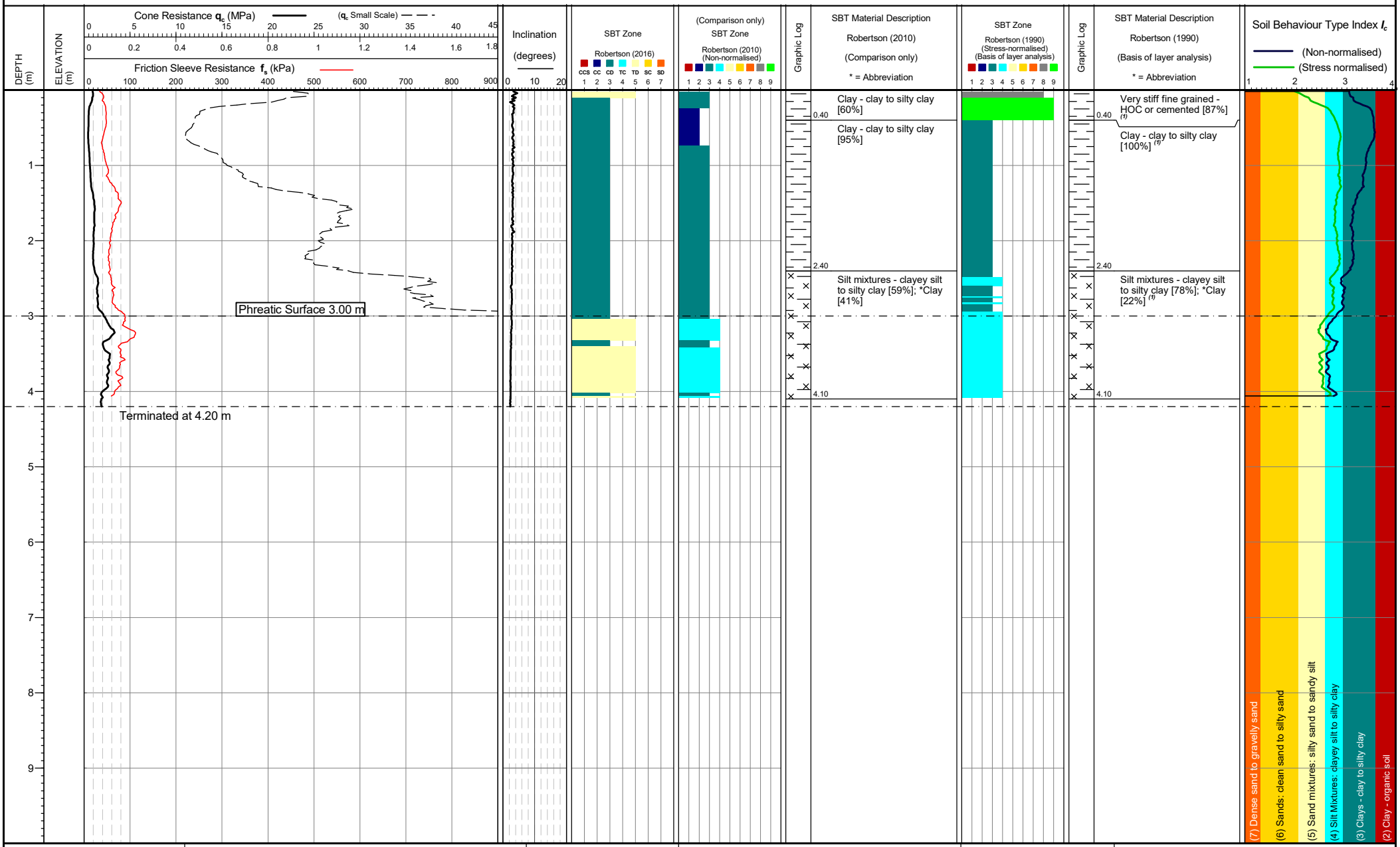
Internal QA Diss.
Dissipation Test

TEST ID: CPT-16

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 14:33:18

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

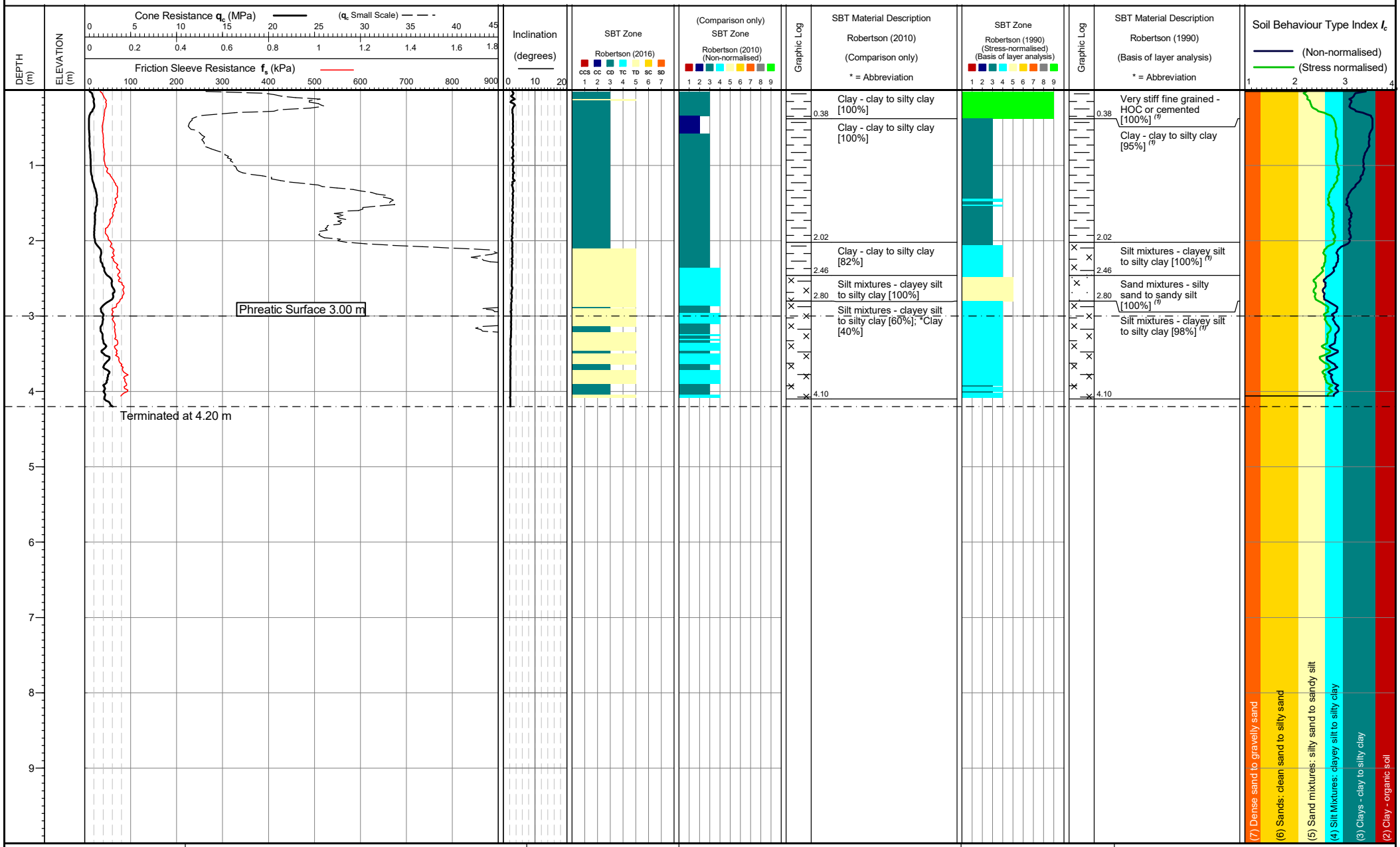
Internal QA Diss.
Dissipation Test

TEST ID: CPT-17

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 14:04:07

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

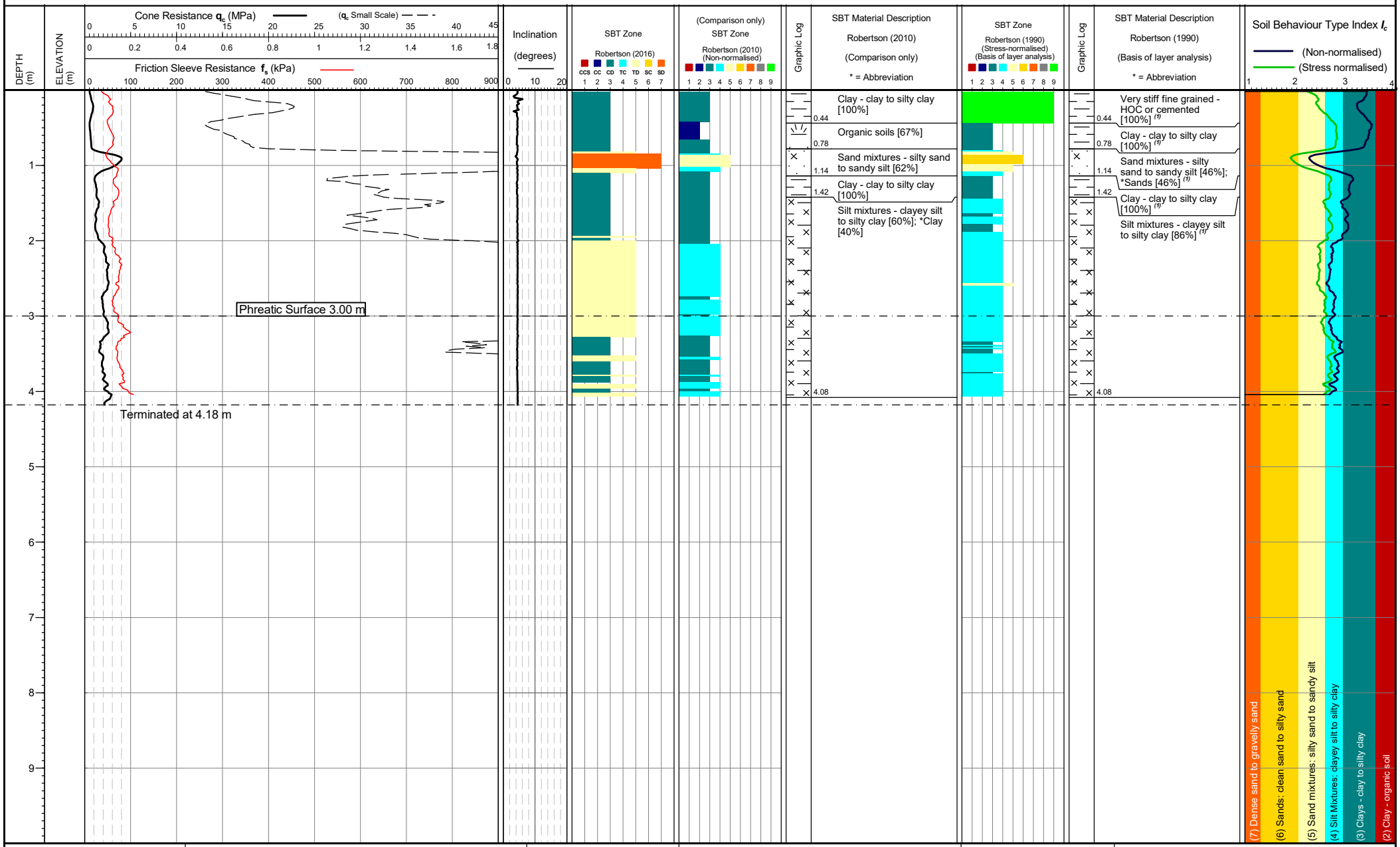
Internal QA Diss.
Dissipation Test

TEST ID: CPT-18

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 13:36:46

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

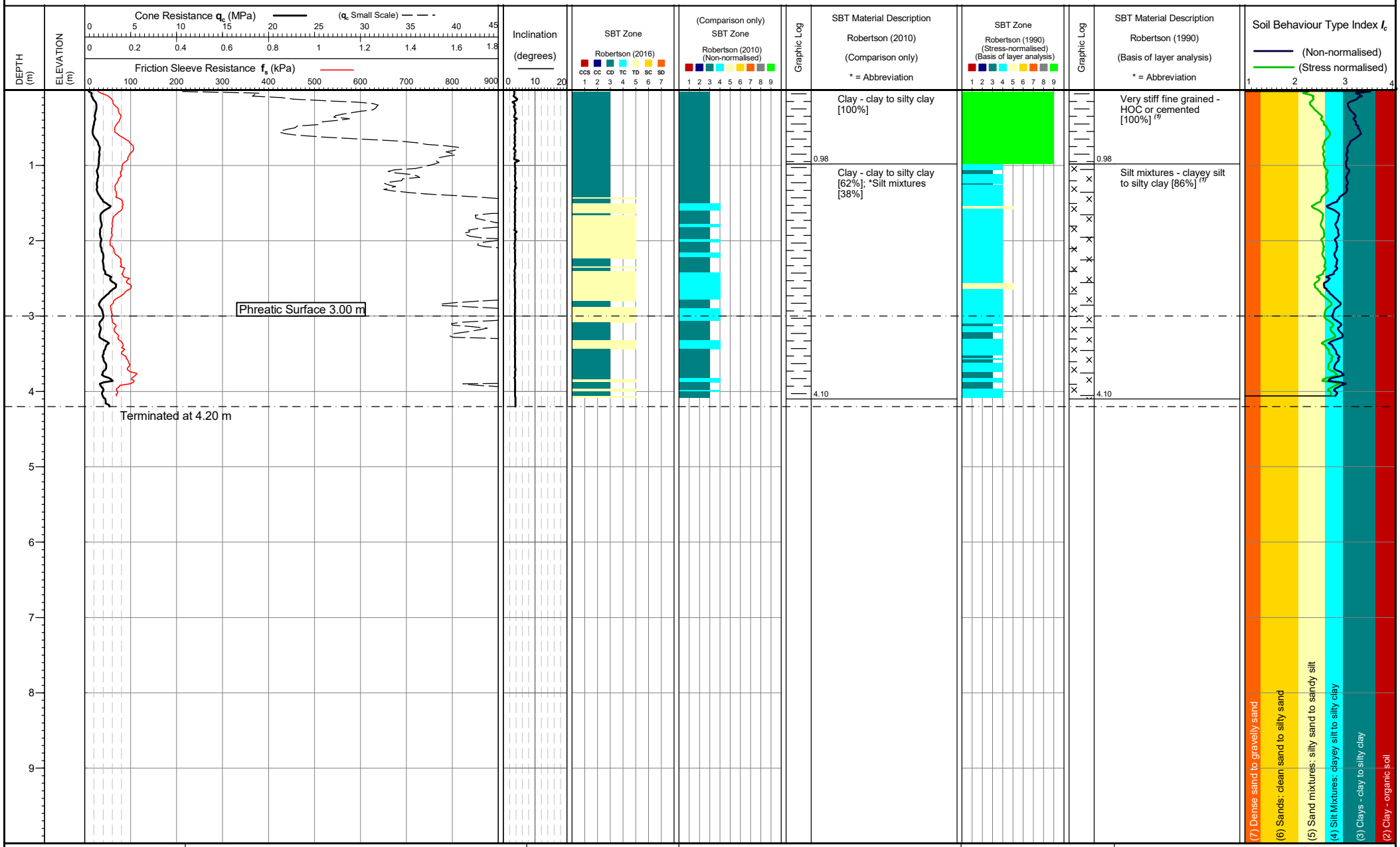
Internal QA Diss.
Dissipation Test

TEST ID: CPT-19

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 13:50:58

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

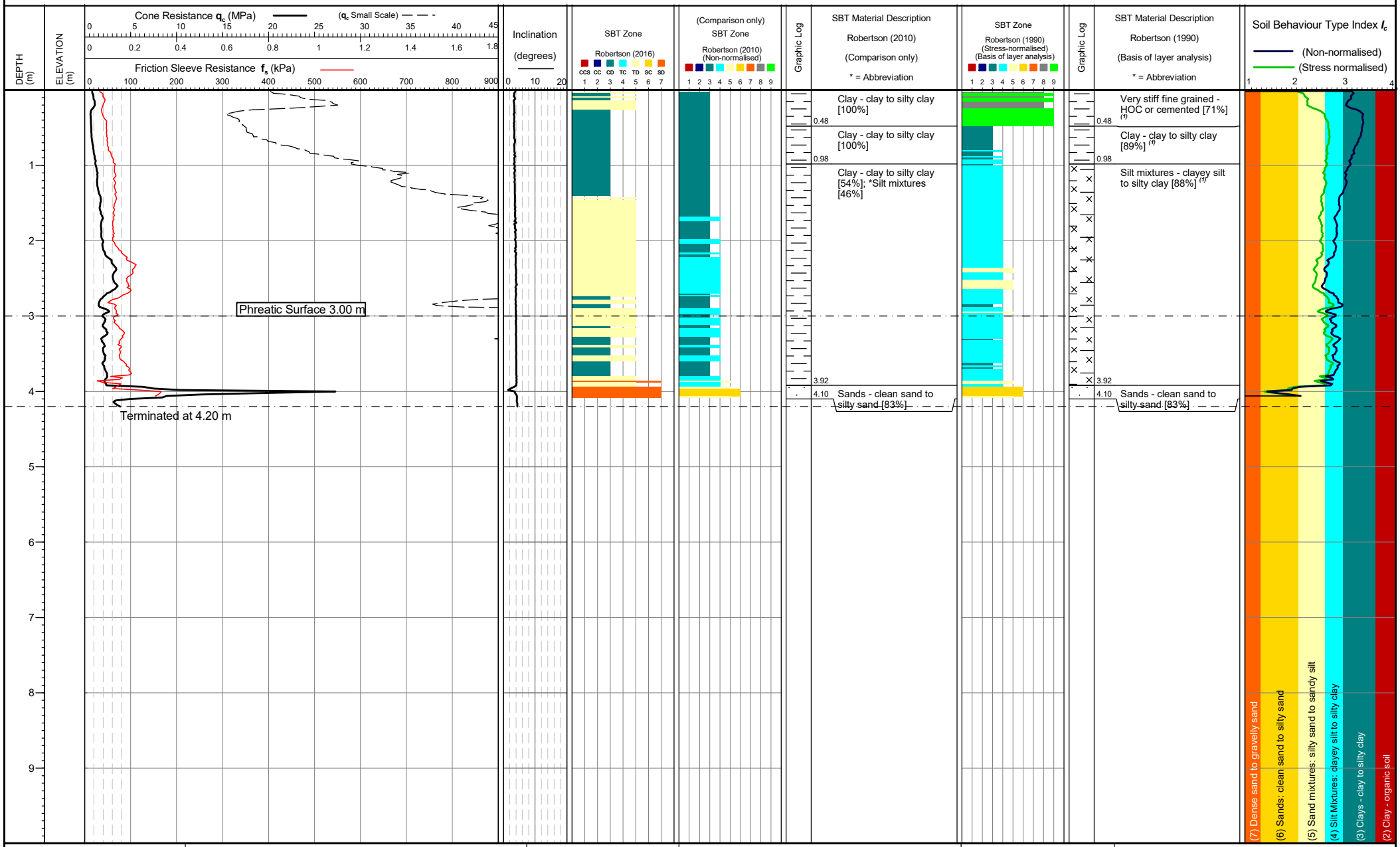
Internal QA Diss. | Dissipation Test

TEST ID: CPT-20

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 16:37:37

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss.
Dissipation Test

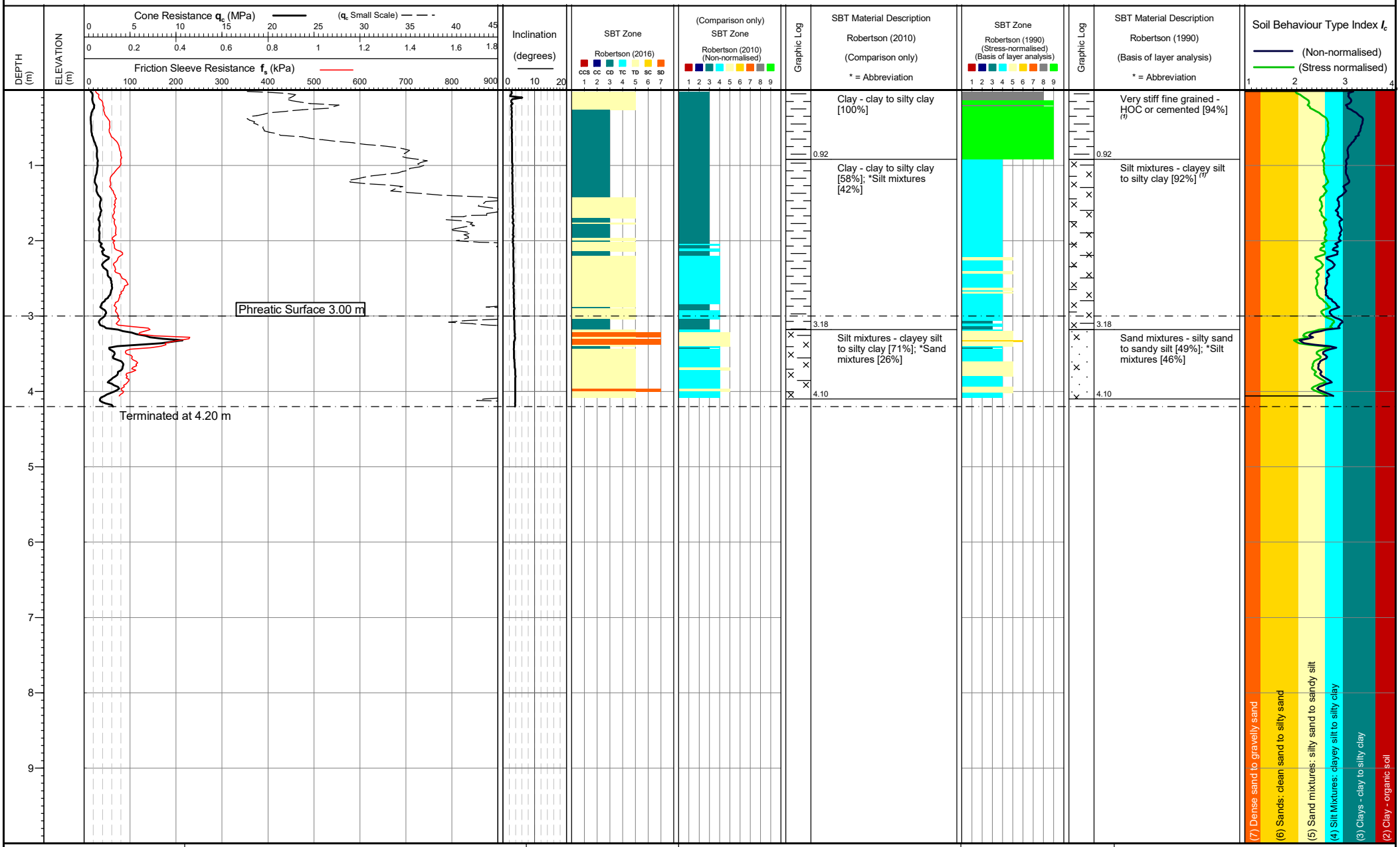
TEST ID: CPT-21

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 29/09/2025 16:58:55

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

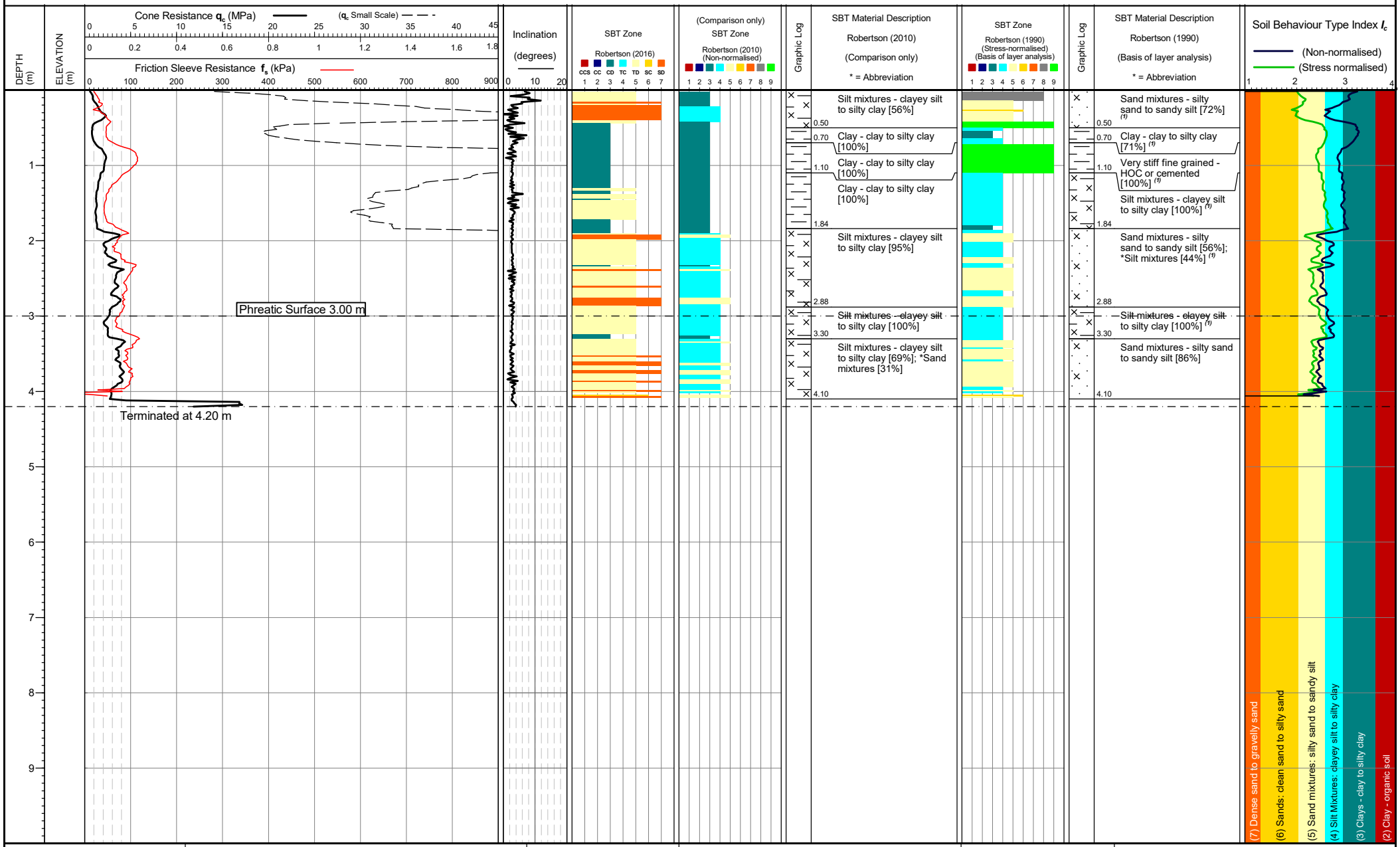
Internal QA Diss.
Dissipation Test

TEST ID: CPT-22

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 11:57:31

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

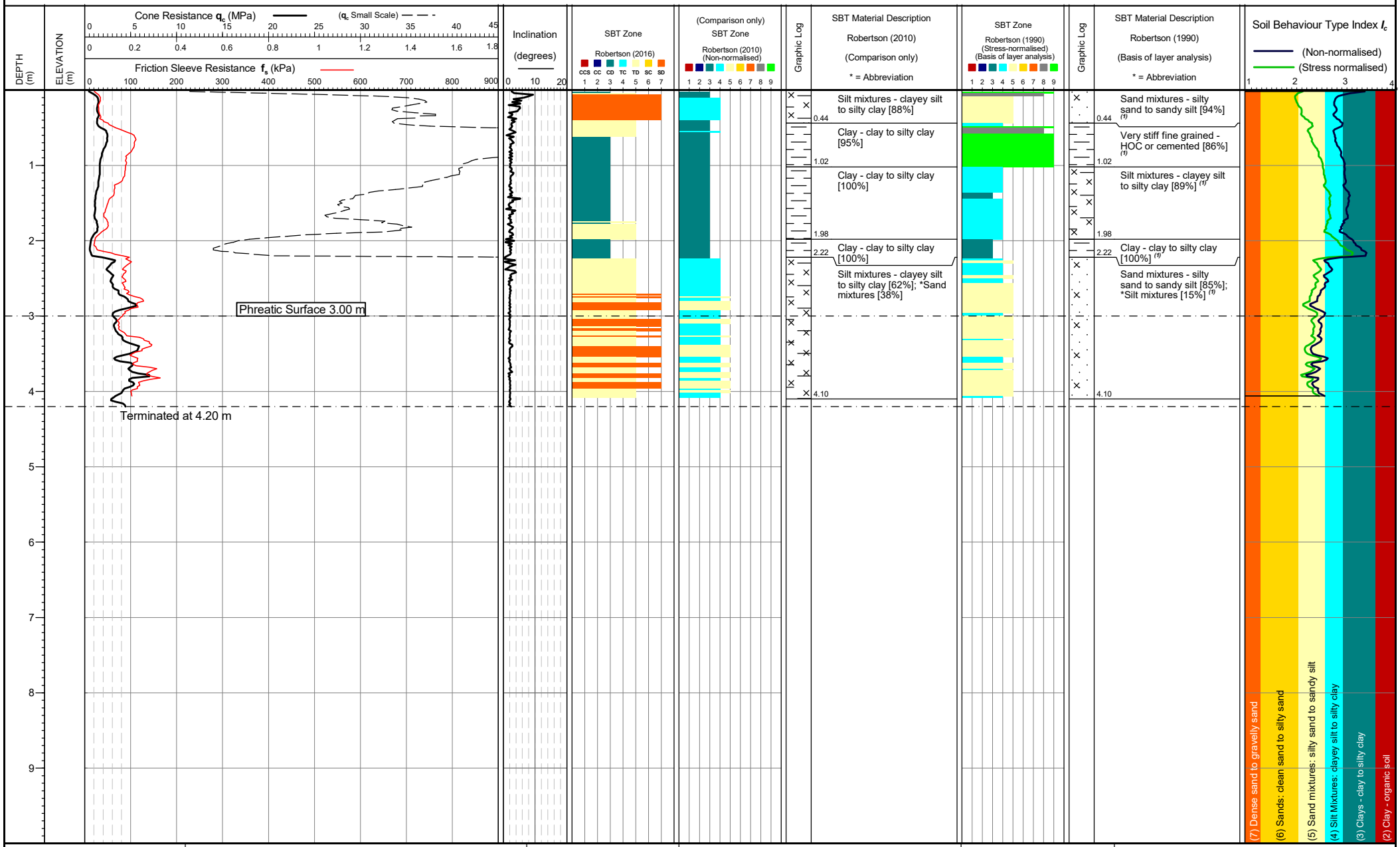
Internal QA Diss.
Dissipation Test

TEST ID: CPT-23

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 11:37:40

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

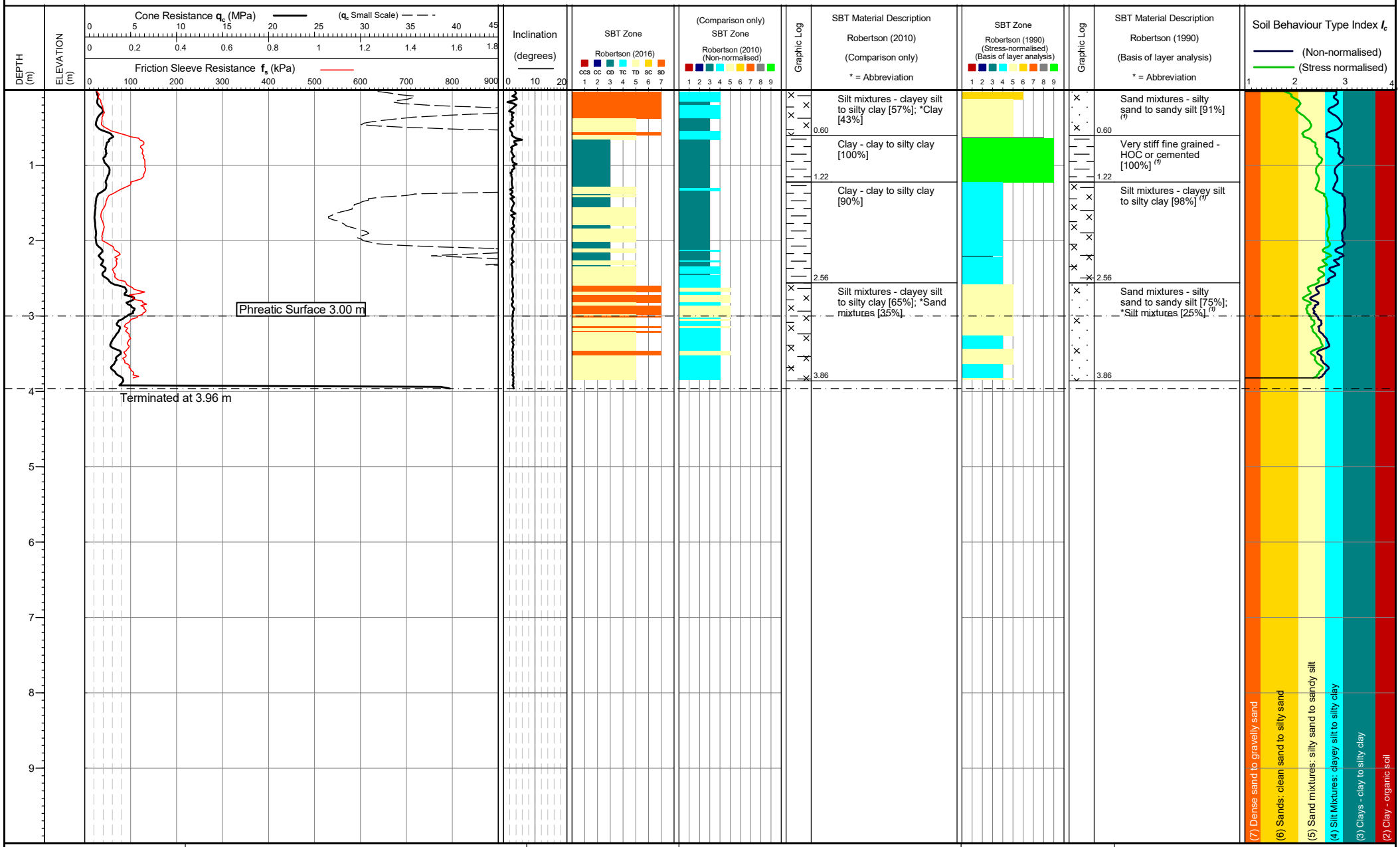
Internal QA Diss.
Dissipation Test

TEST ID: CPT-24

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 12:35:44

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

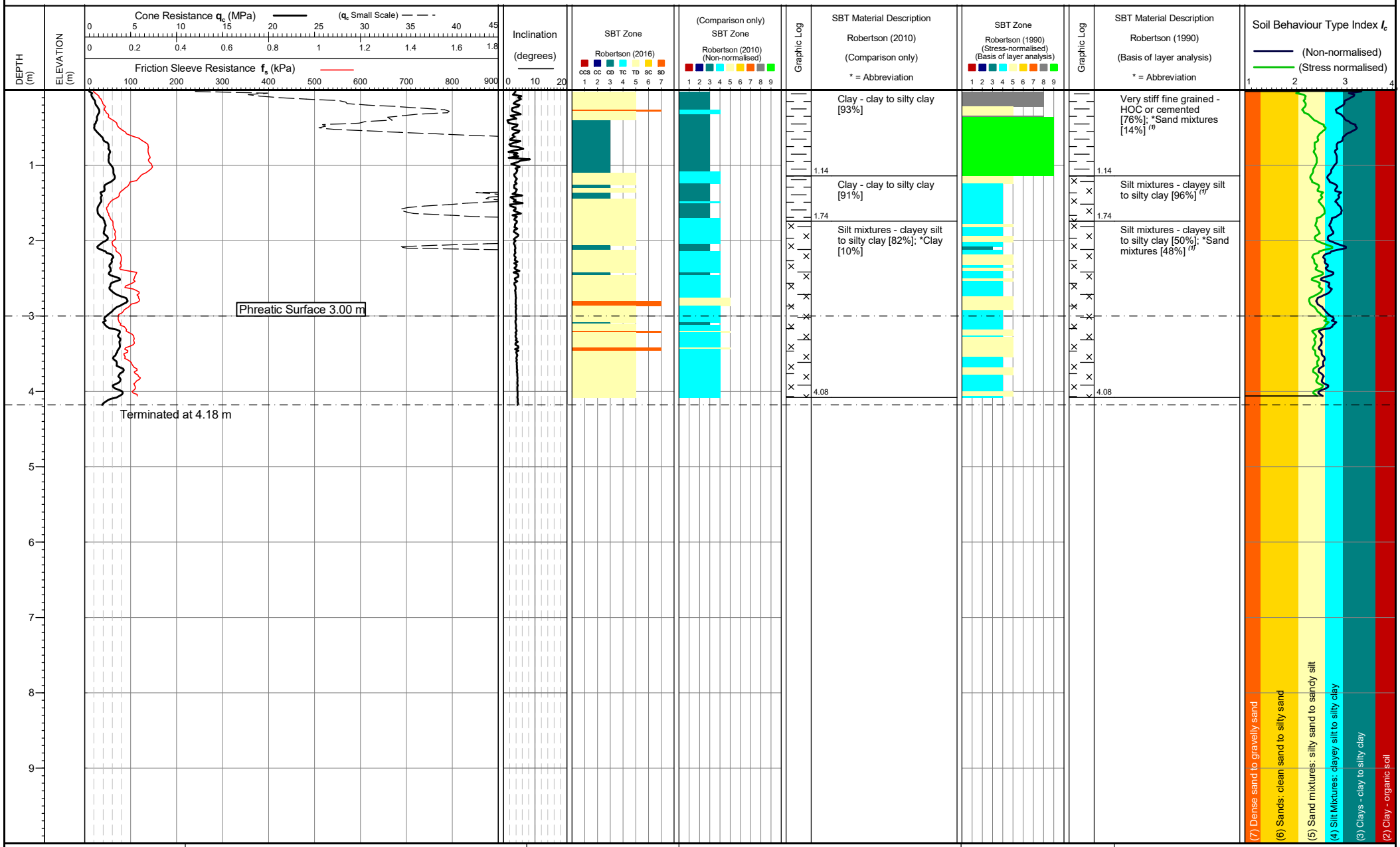
Internal QA Diss.
Dissipation Test

TEST ID: CPT-25

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 12:22:10

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

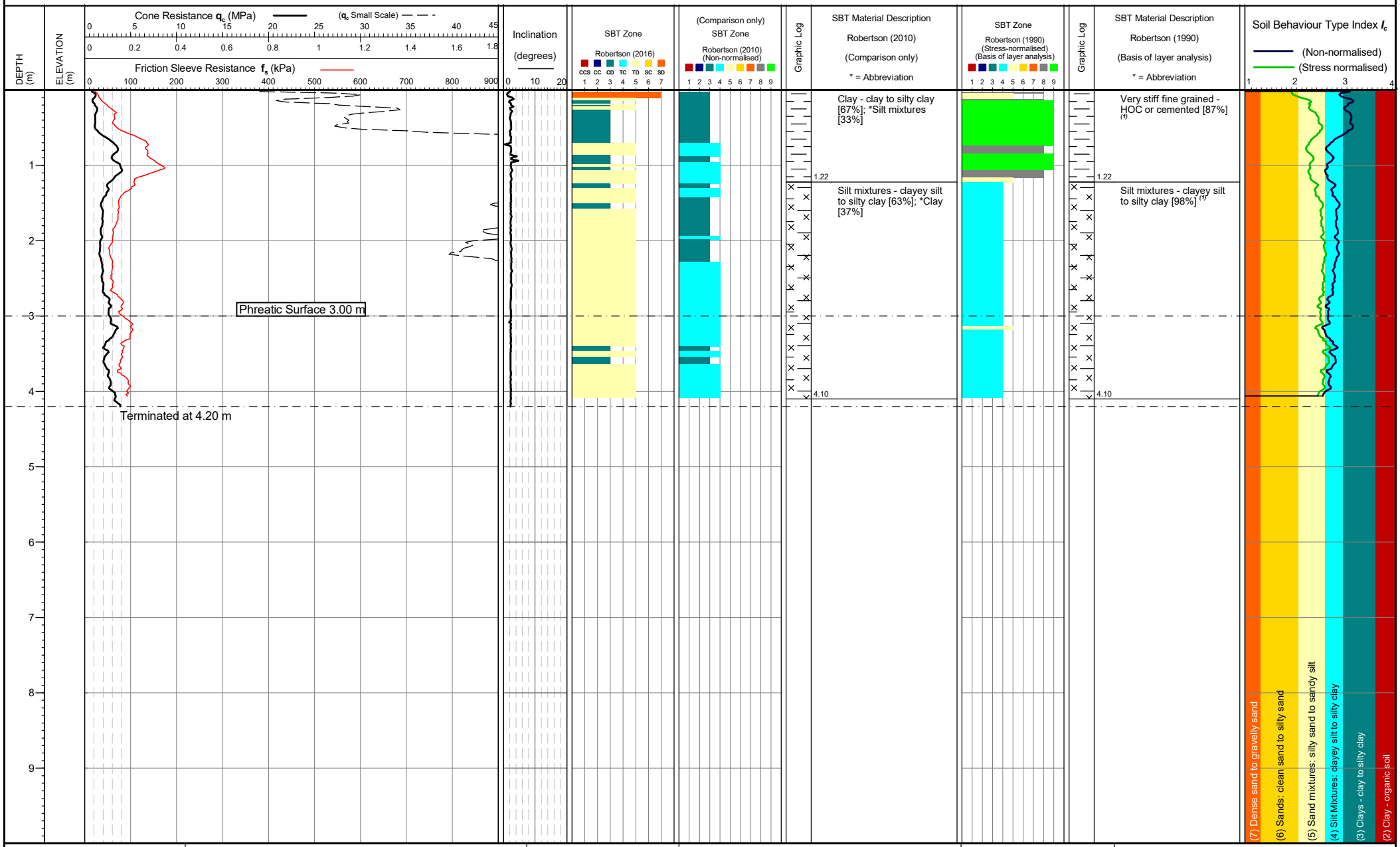
Internal QA Diss.
Dissipation Test

TEST ID: CPT-26

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 13:50:52

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss. Dissipation Test

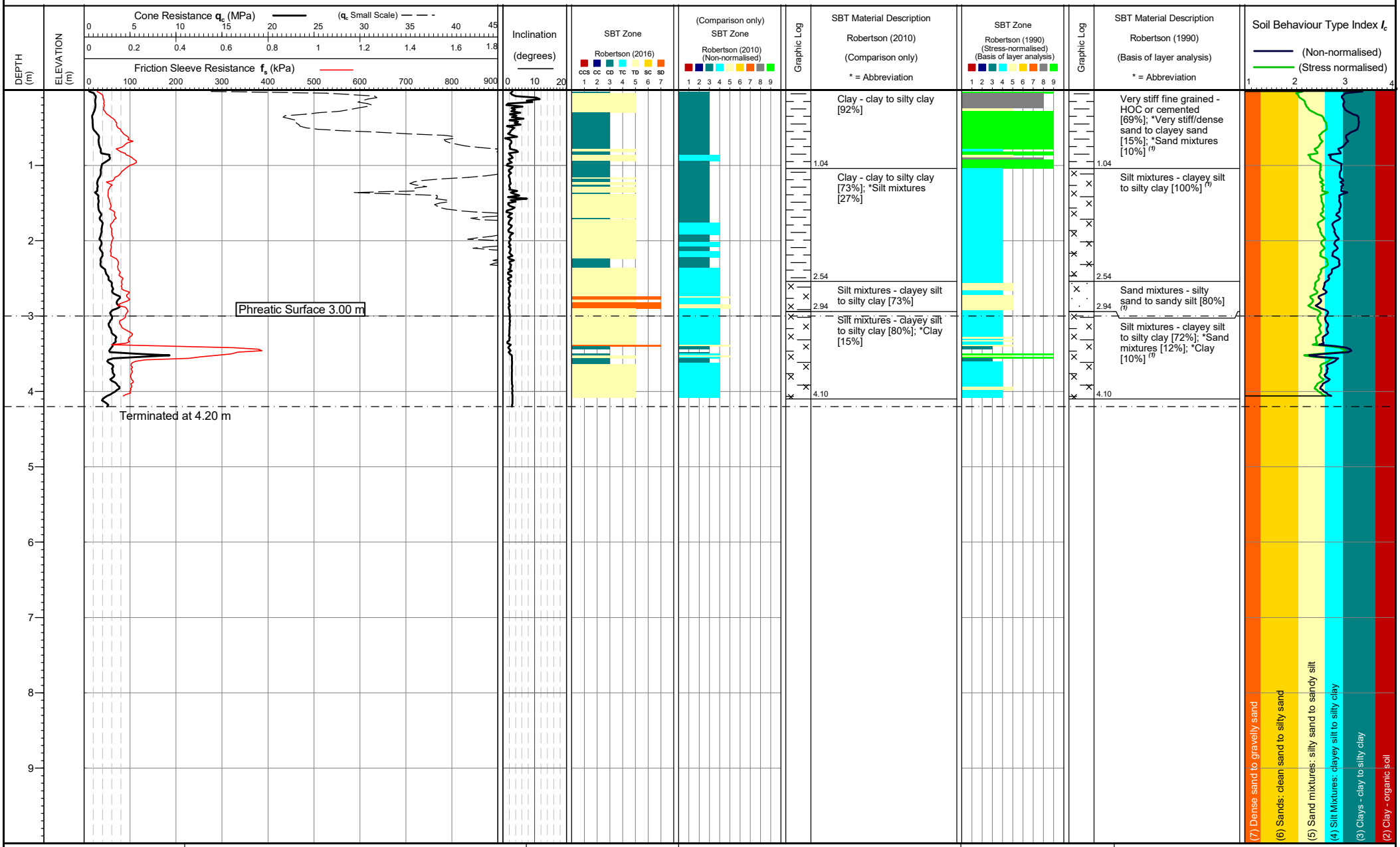
TEST ID: CPT-27

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 13:19:55

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

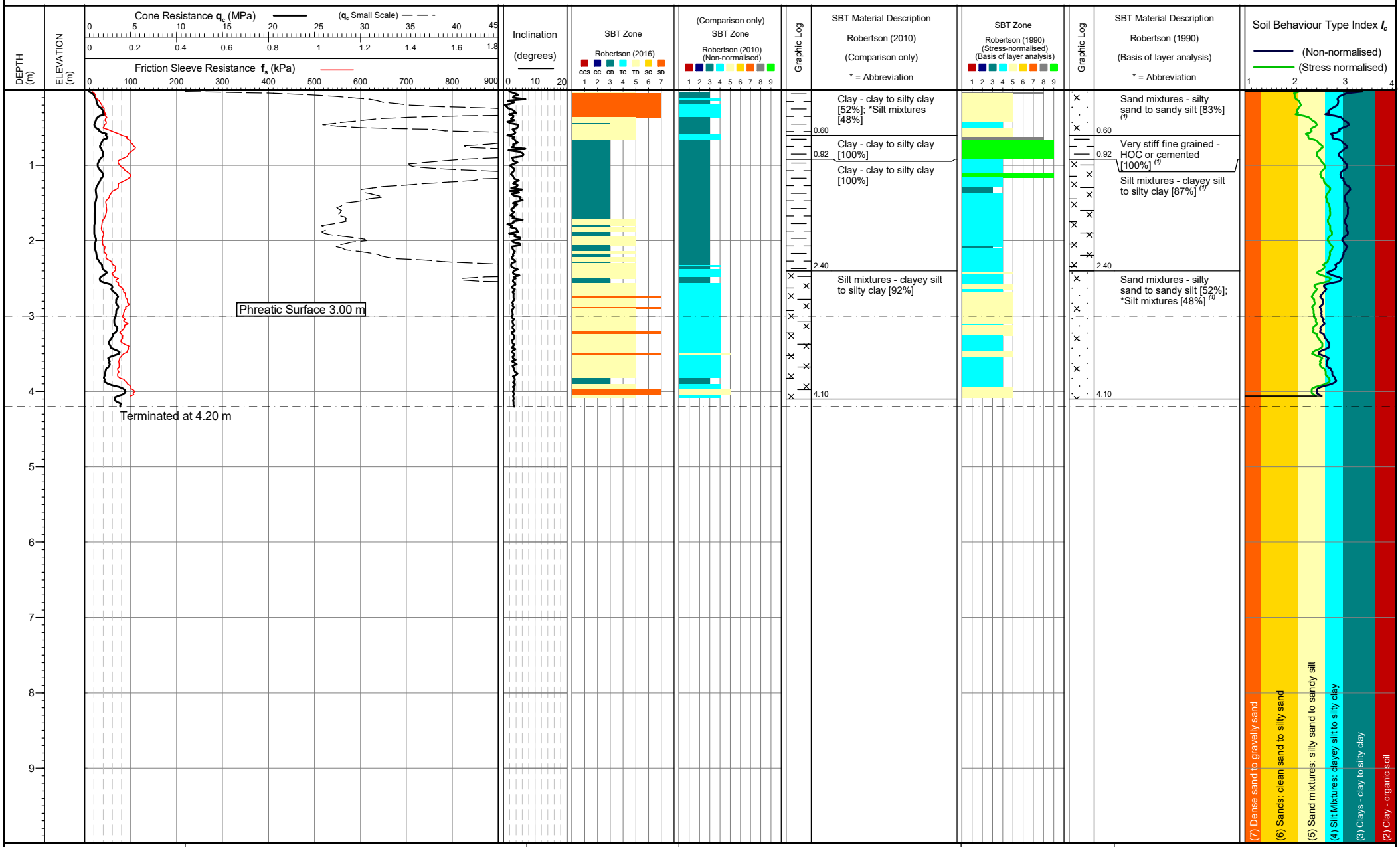
Internal QA Diss.
Dissipation Test

TEST ID: CPT-28

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 13:05:28

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

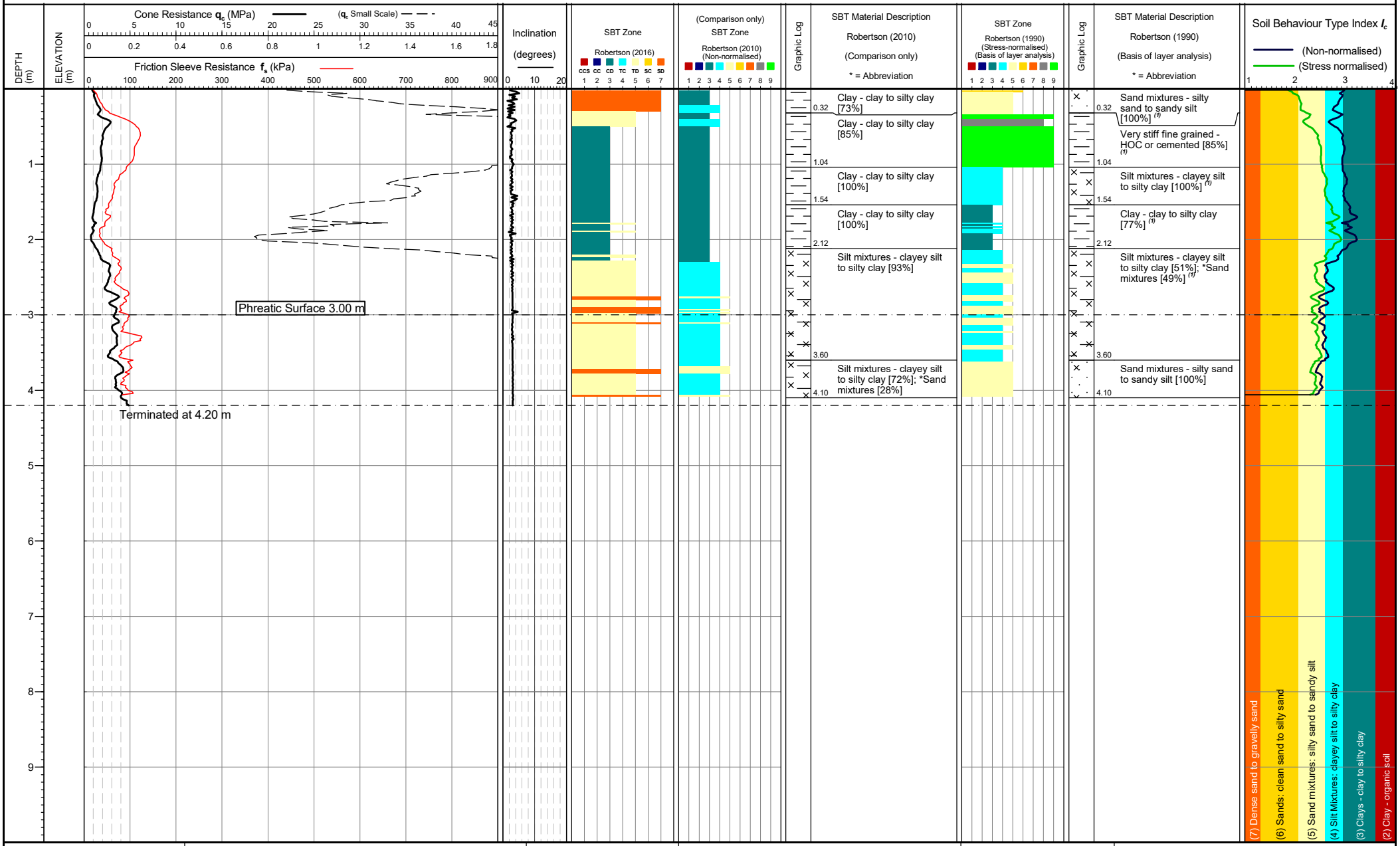
Internal QA Diss.
Dissipation Test

TEST ID: CPT-29

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 12:45:44

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

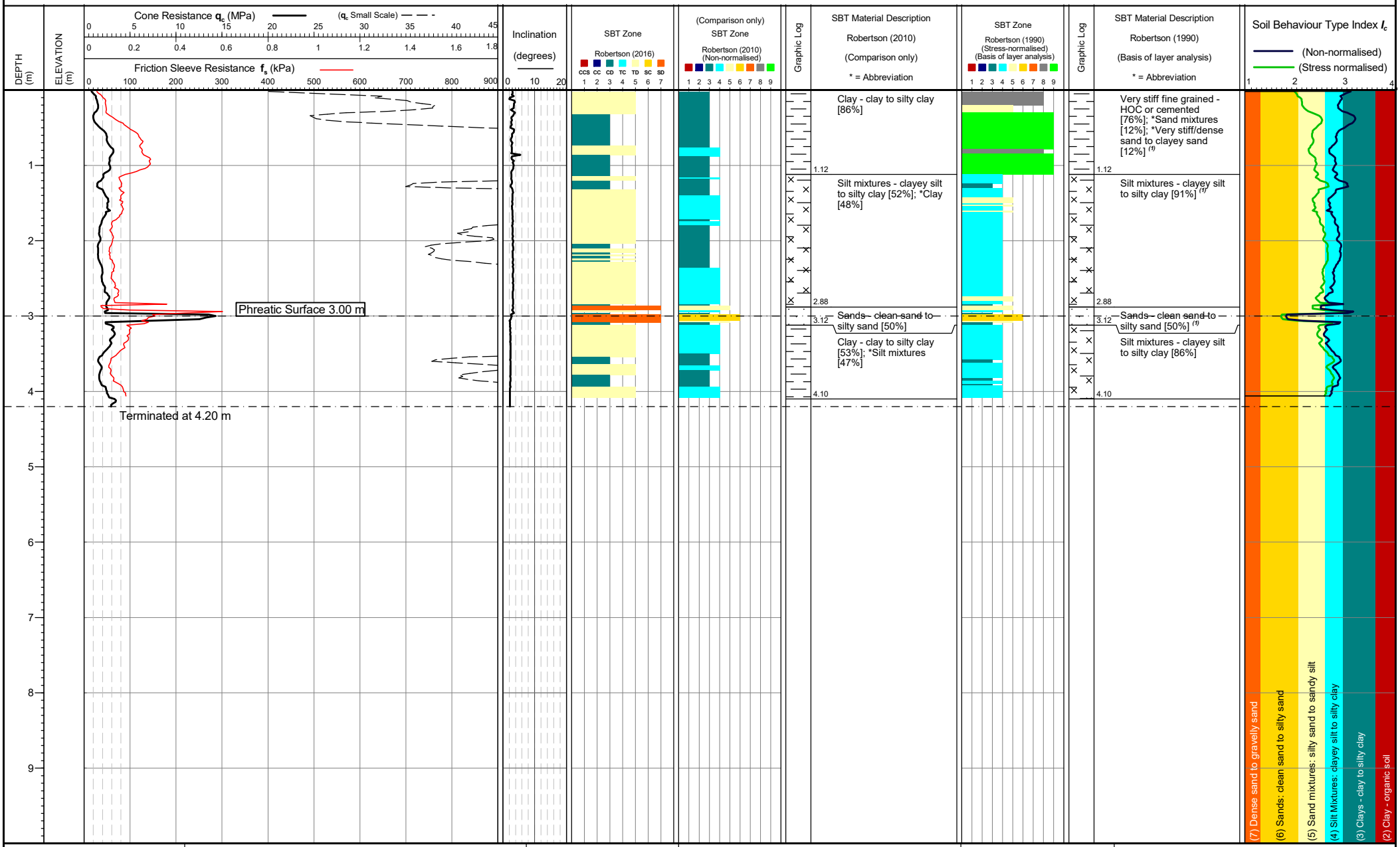
Internal QA Diss.
Dissipation Test

TEST ID: CPT-30

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 14:05:51

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

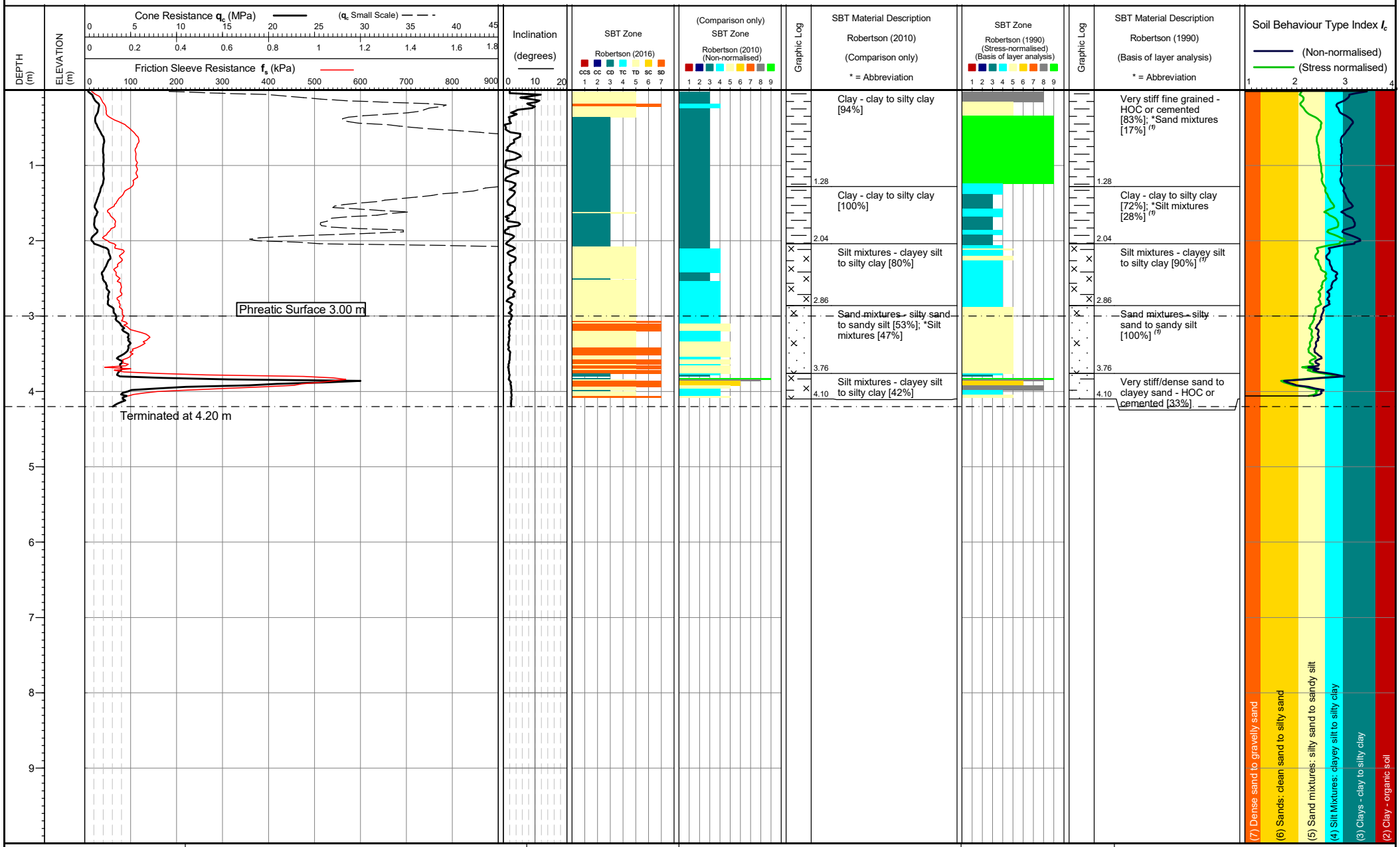
Internal QA Diss.
Dissipation Test

TEST ID: CPT-31

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 15:51:01

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss. Dissipation Test

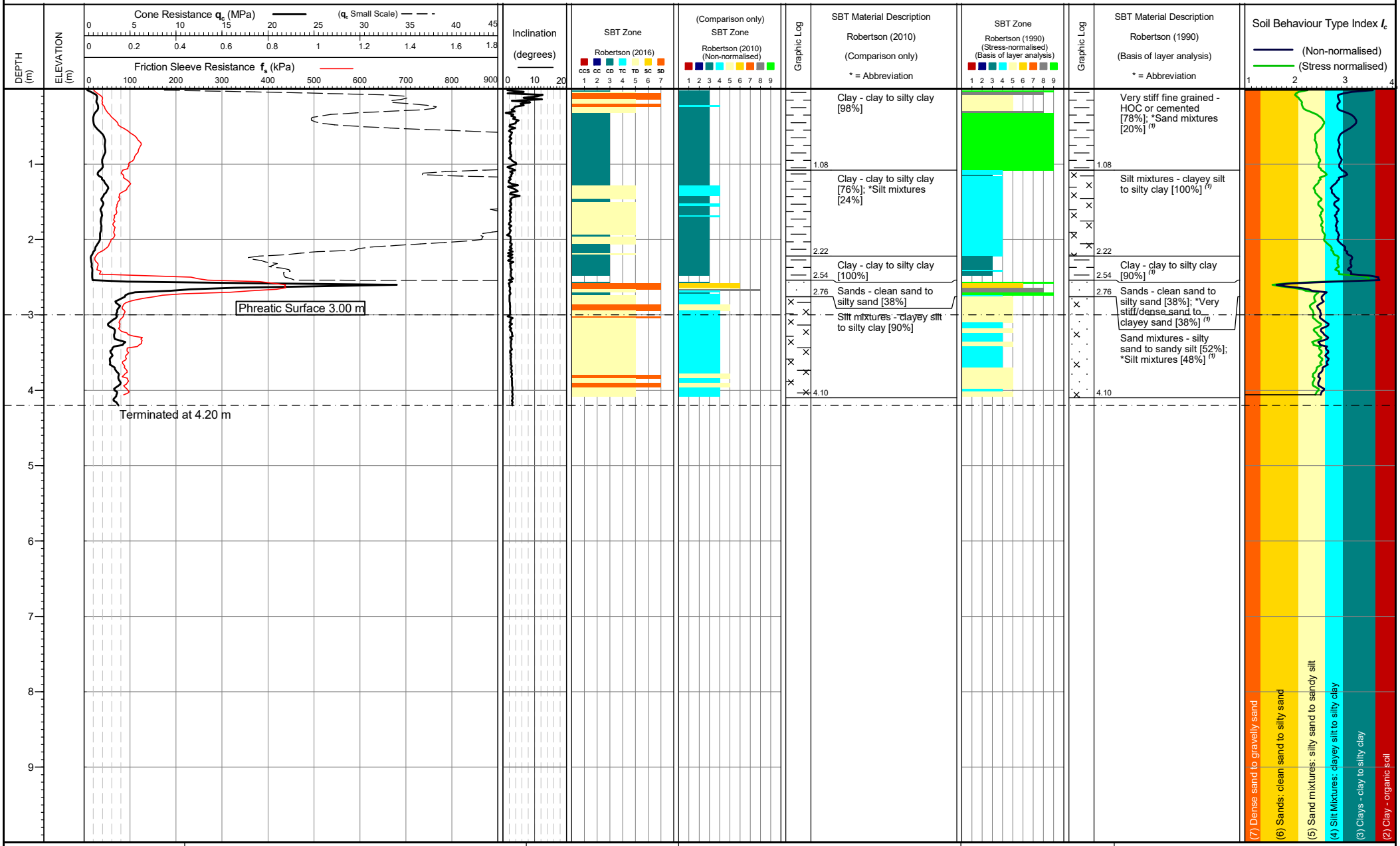
TEST ID: CPT-32

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 14:14:52

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

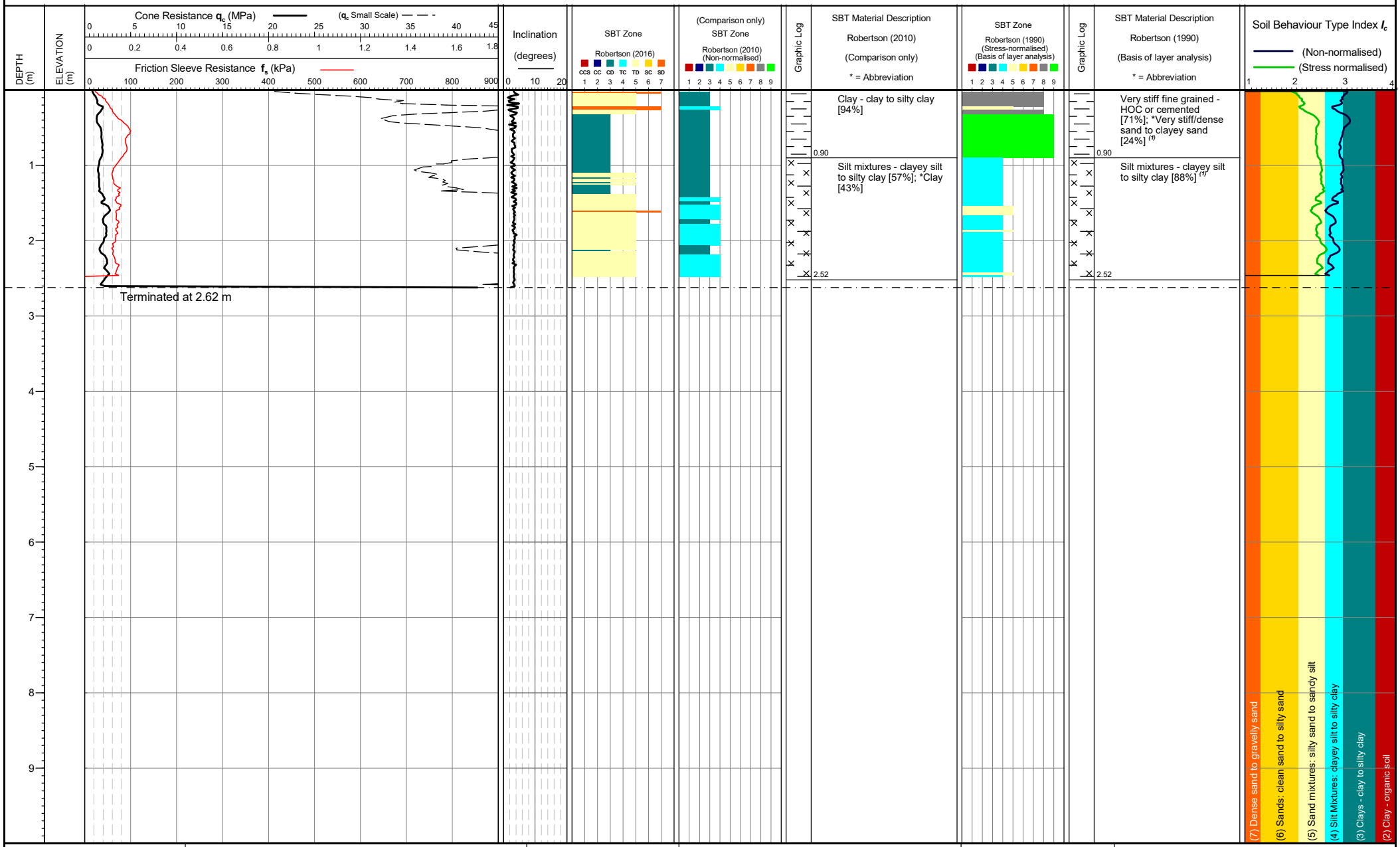
Internal QA Diss.
Dissipation Test

TEST ID: CPT-33

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 14:29:32

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

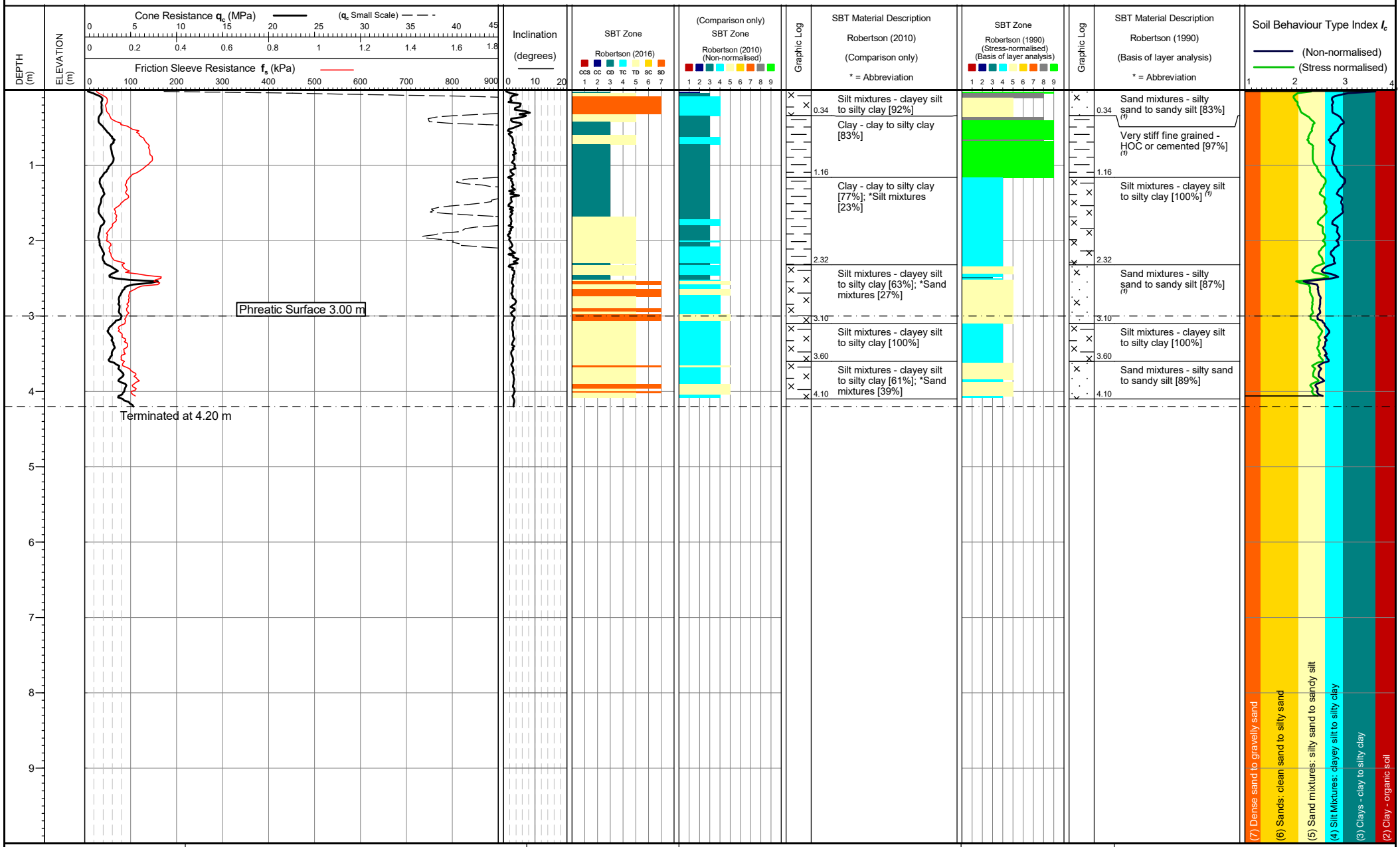
Internal QA Diss.
Dissipation Test

TEST ID: CPT-34

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 14:58:03

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

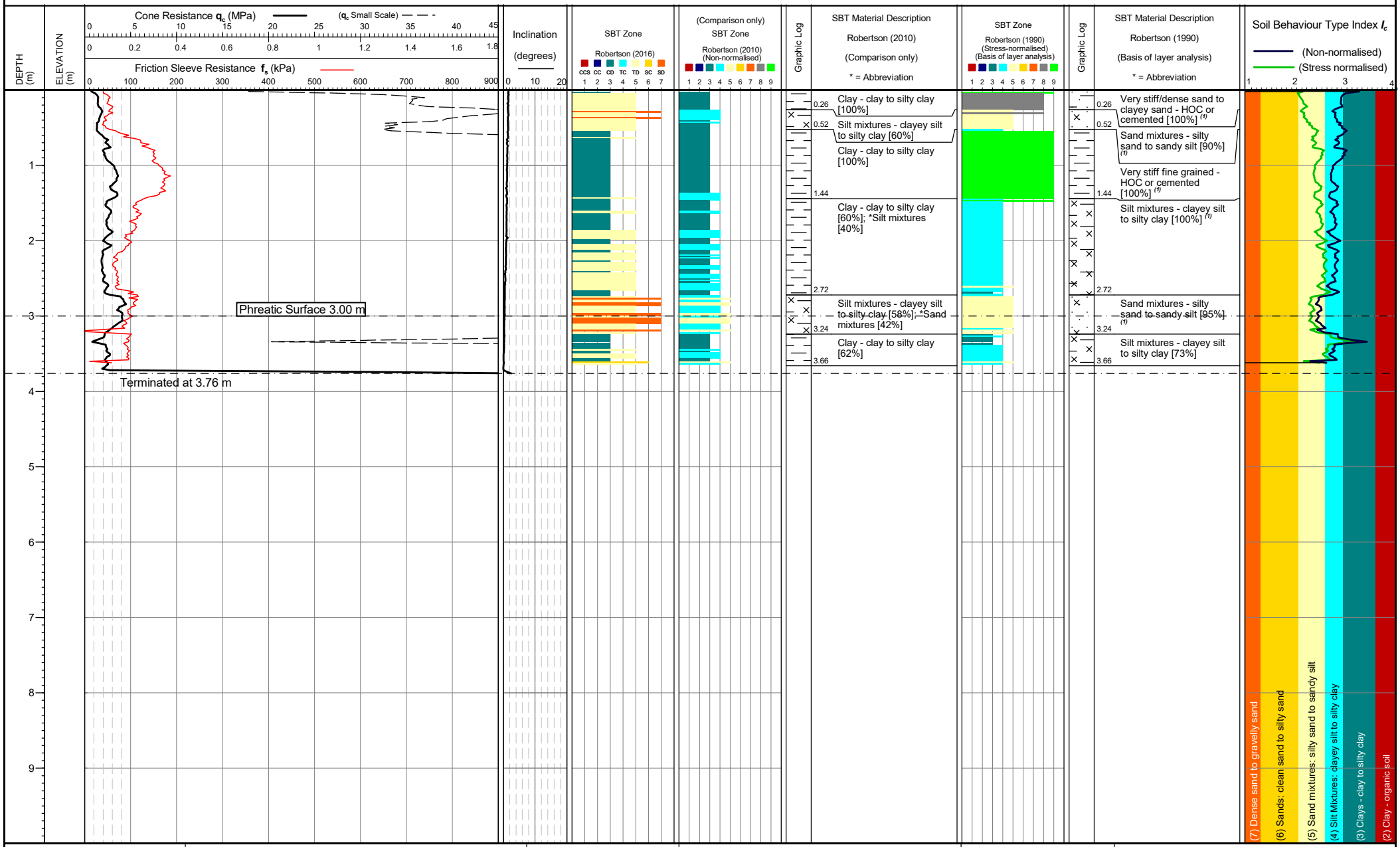
Internal QA Diss. Dissipation Test

TEST ID: CPT-35

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 08:08:51

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

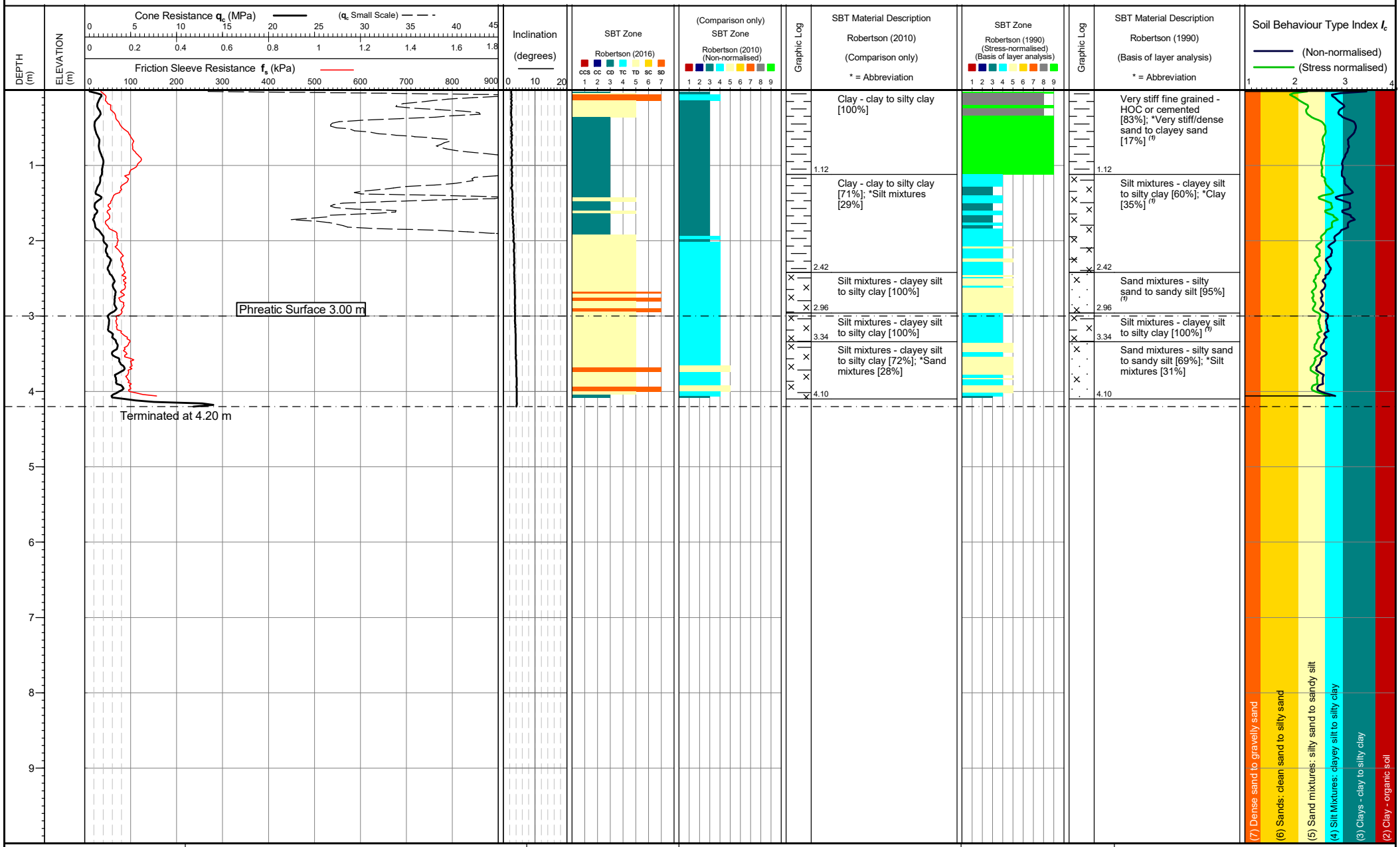
Internal QA Diss. Dissipation Test

TEST ID: CPT-36

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 08:33:54

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

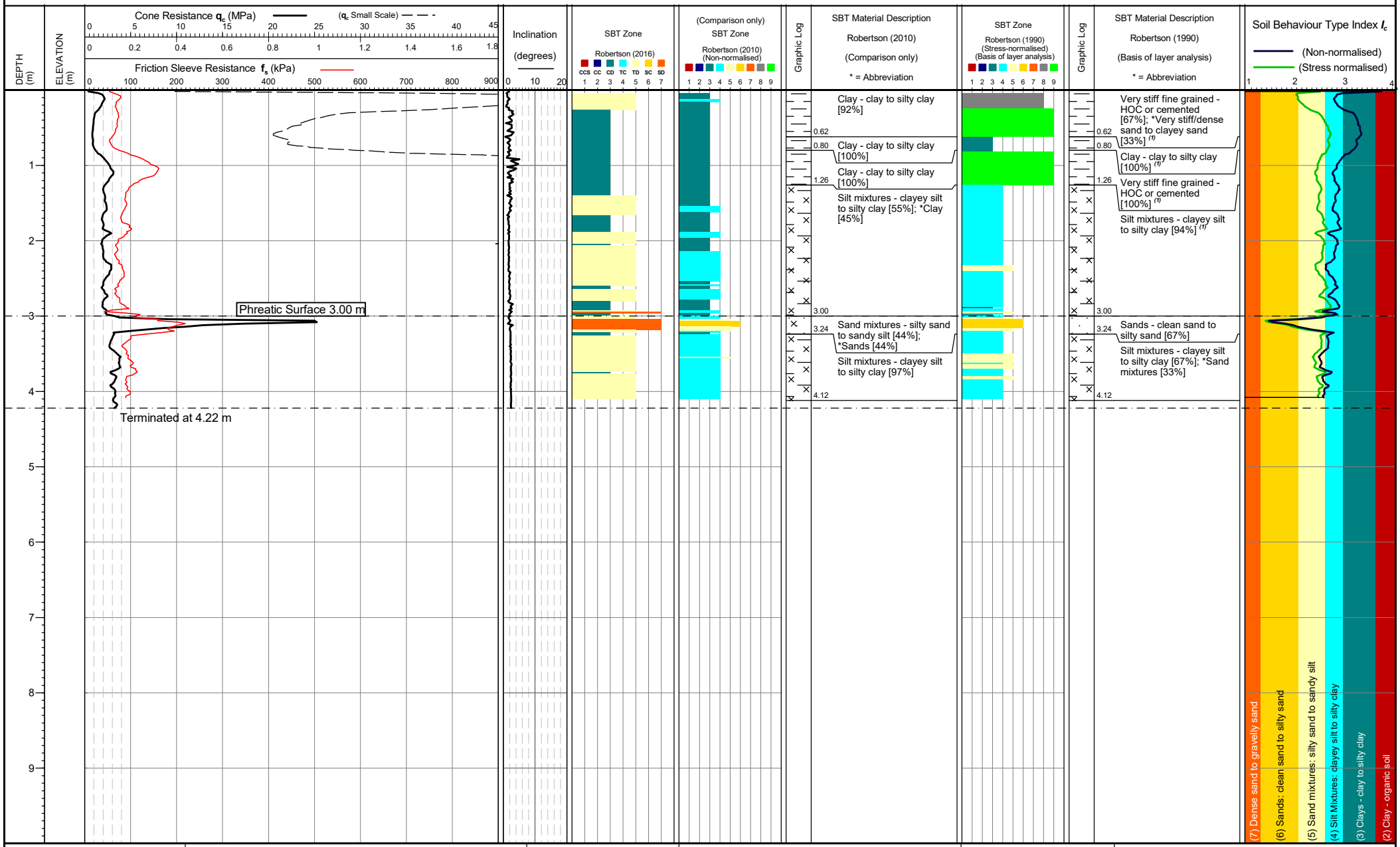
Internal QA Diss. Dissipation Test

TEST ID: CPT-37

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 08:58:34

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

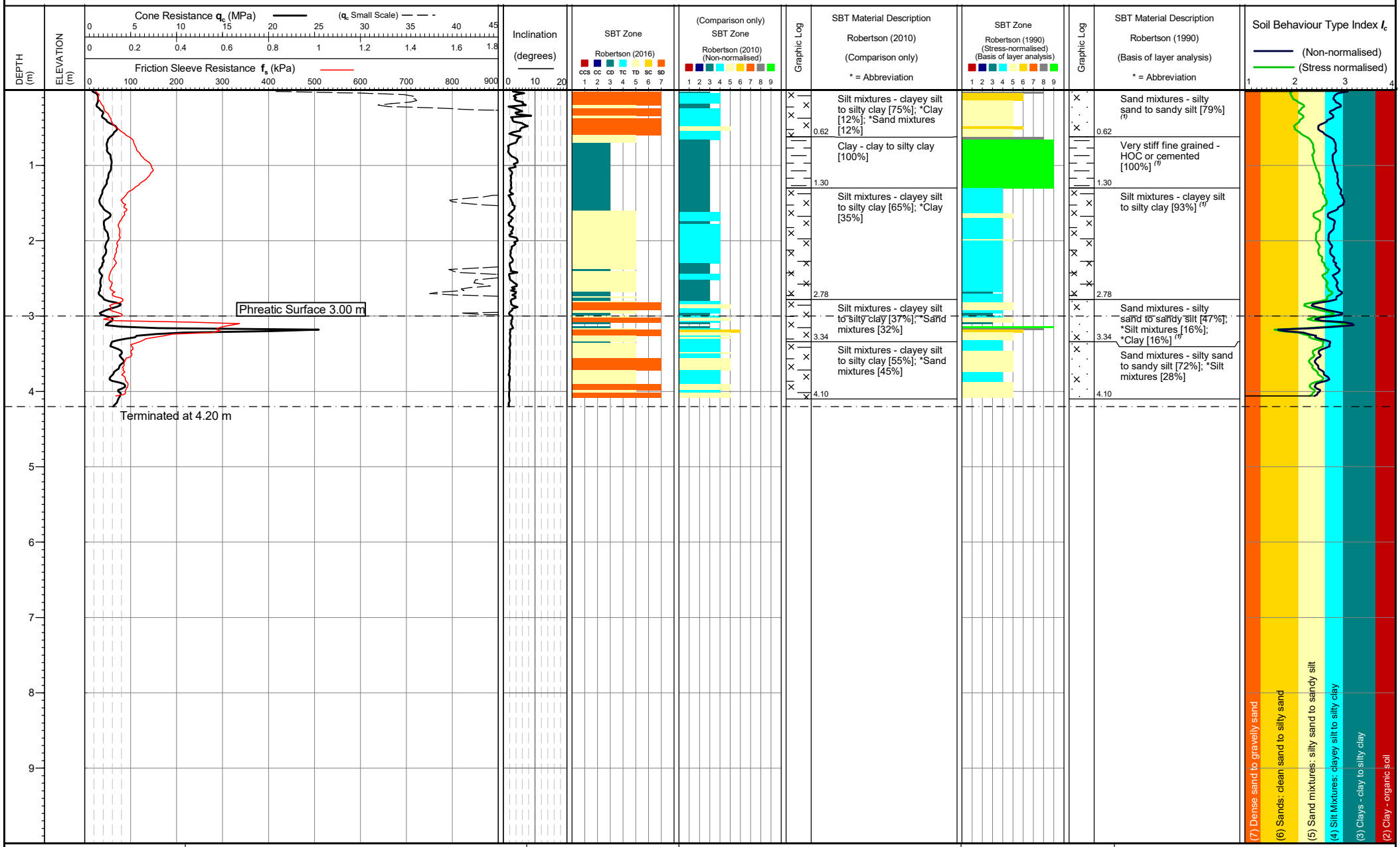
Internal QA Diss.
Dissipation Test

TEST ID: CPT-38

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 15:12:42

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

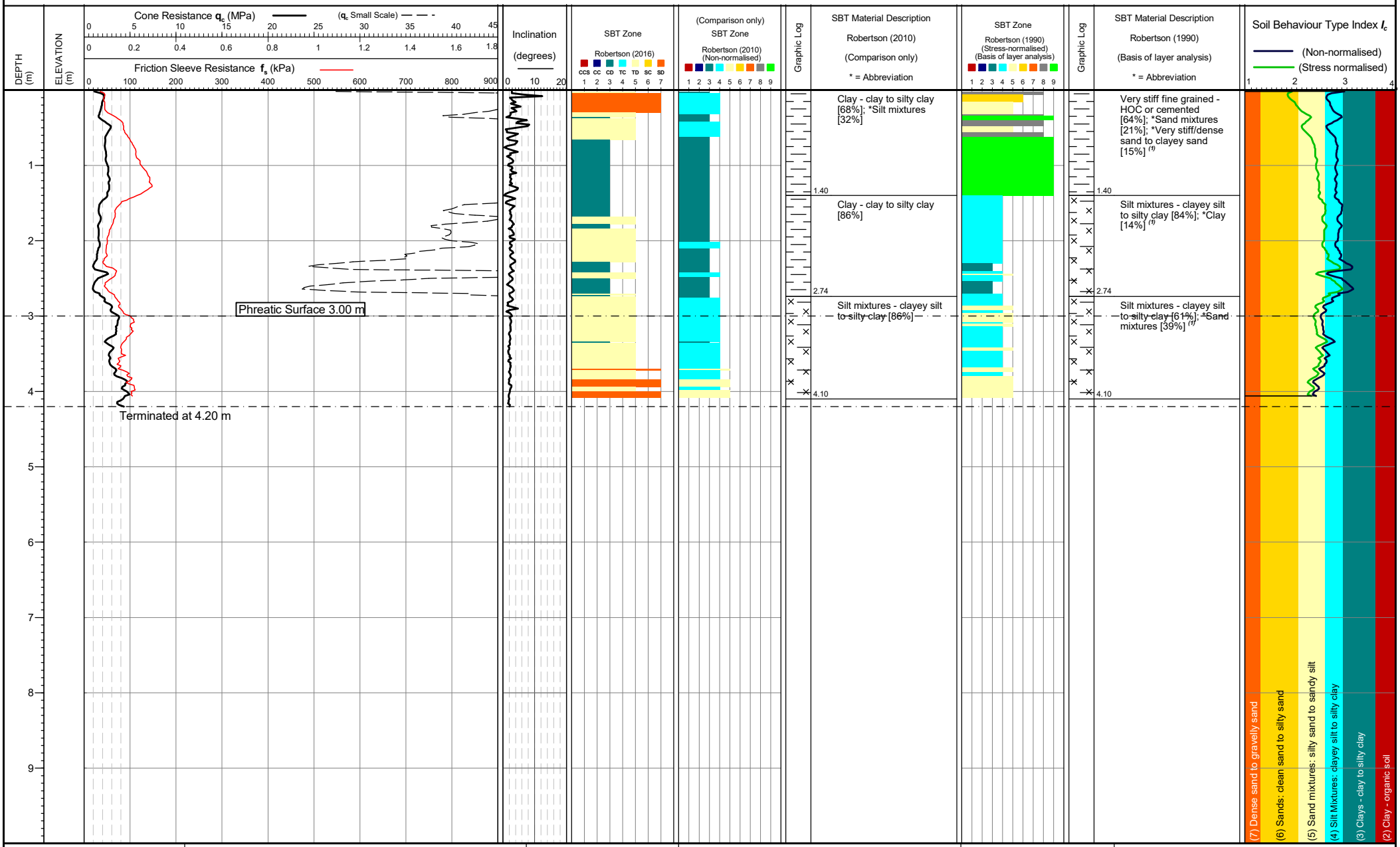
Internal QA Diss.
Dissipation Test

TEST ID: CPT-39

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 15:33:05

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss.
Dissipation Test

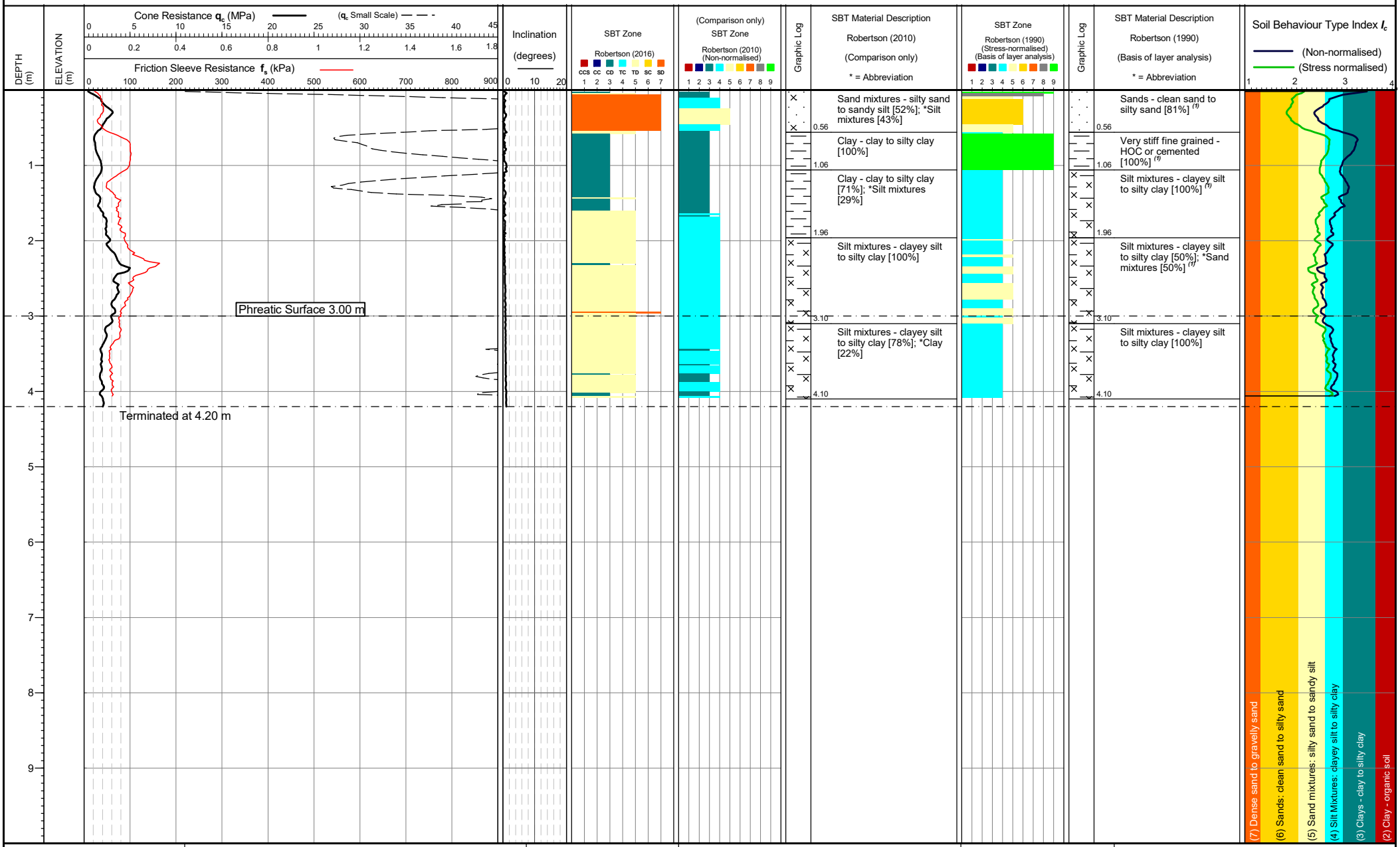
TEST ID: CPT-40

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 09:29:08

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

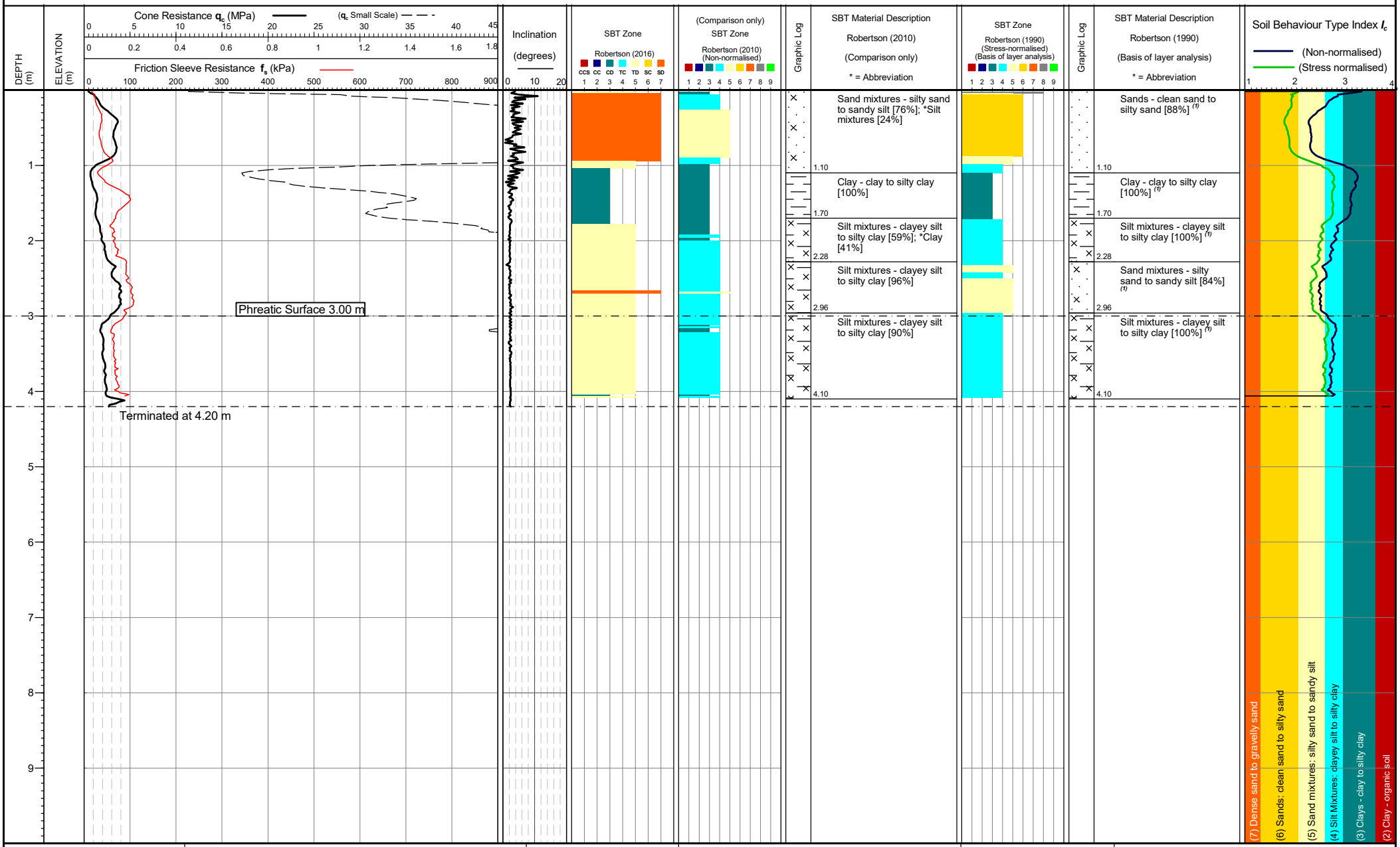
Internal QA Diss. Dissipation Test

TEST ID: CPT-41

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 09:39:35

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

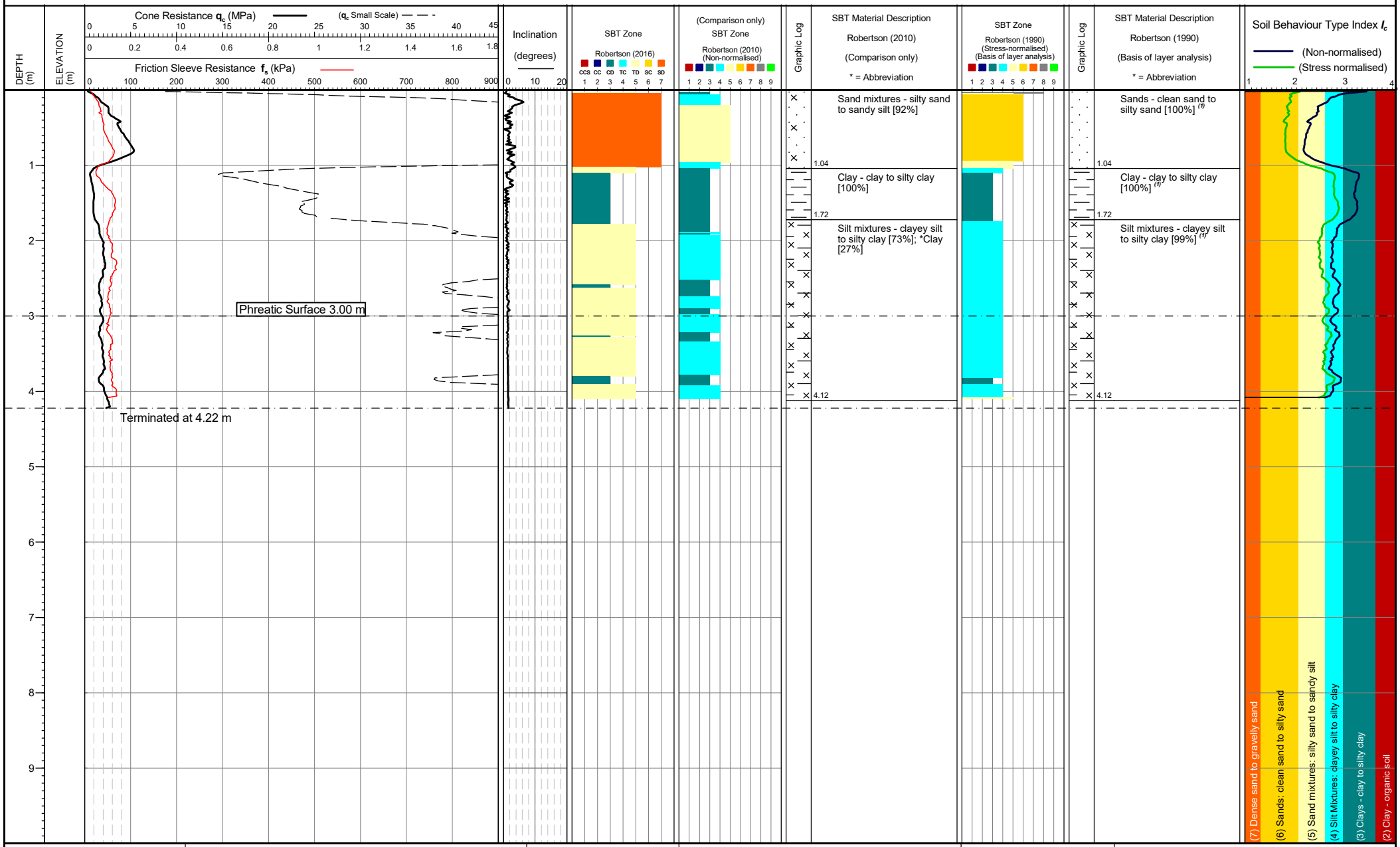
Internal QA Diss.
Dissipation Test

TEST ID: CPT-42

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 09:52:18

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss.
Dissipation Test

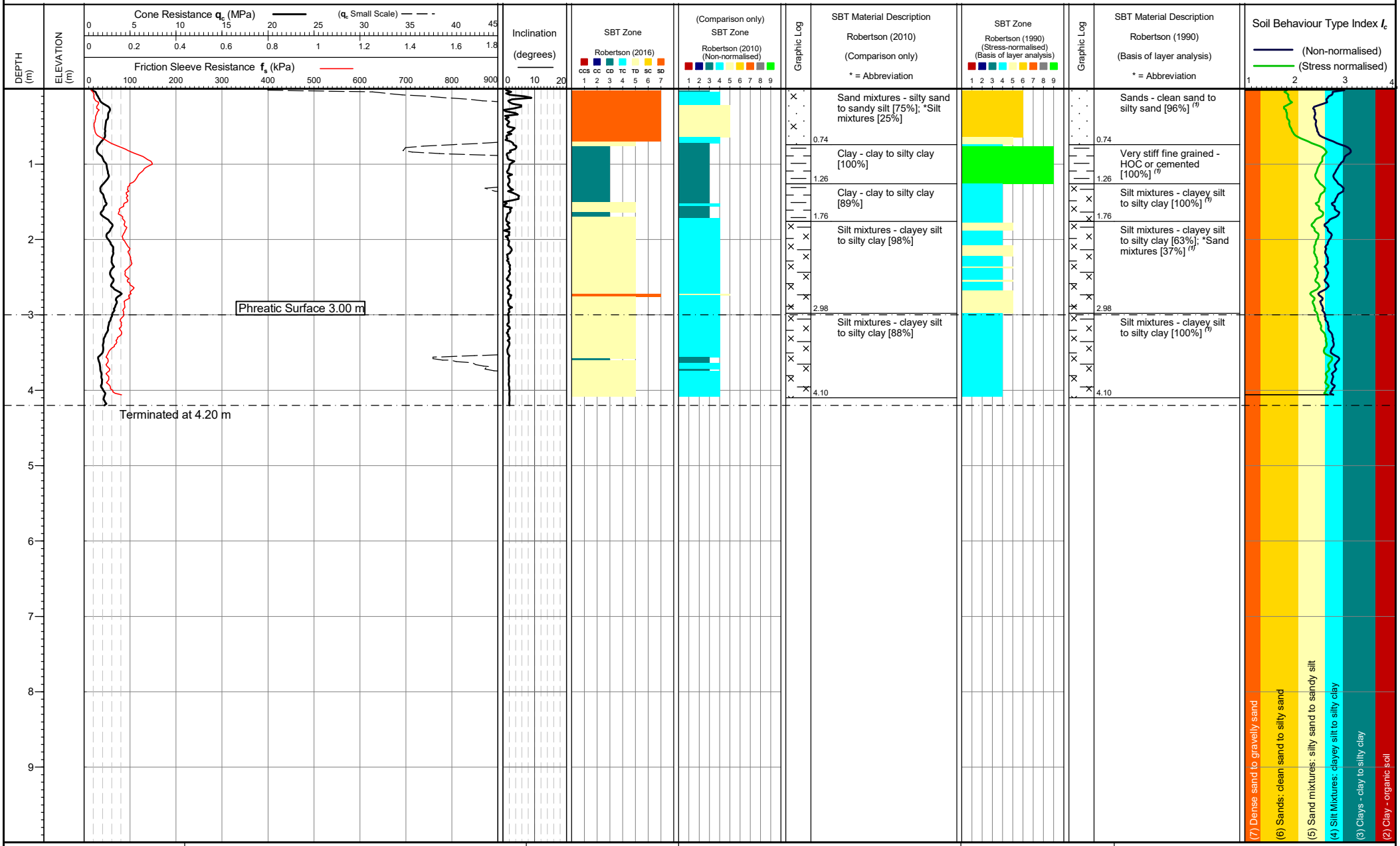
TEST ID: CPT-43

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 15:21:14

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

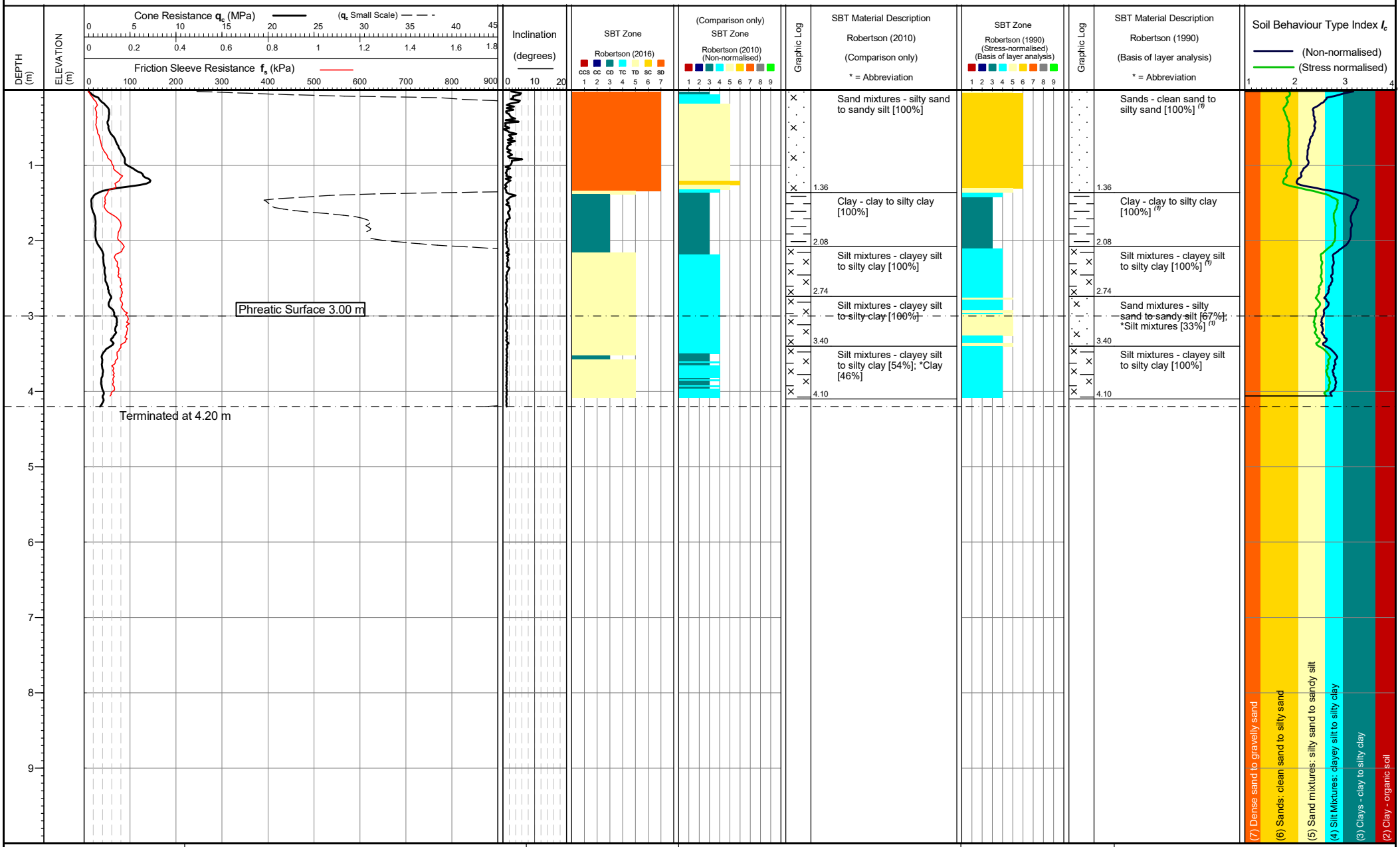
Internal QA Diss. Dissipation Test

TEST ID: CPT-44

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 10:01:52

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

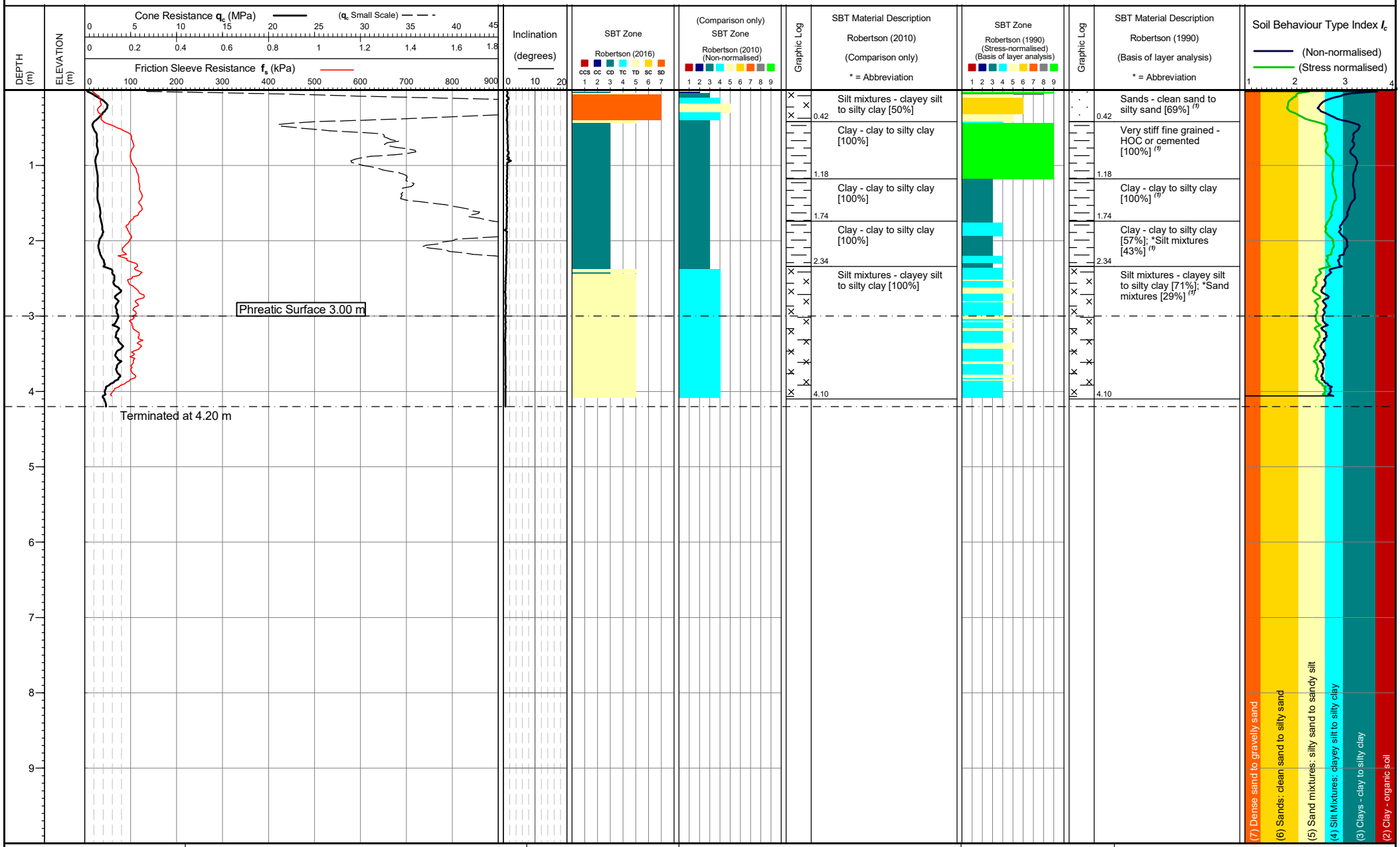
Internal QA Diss. Dissipation Test

TEST ID: CPT-45

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 10:26:03

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

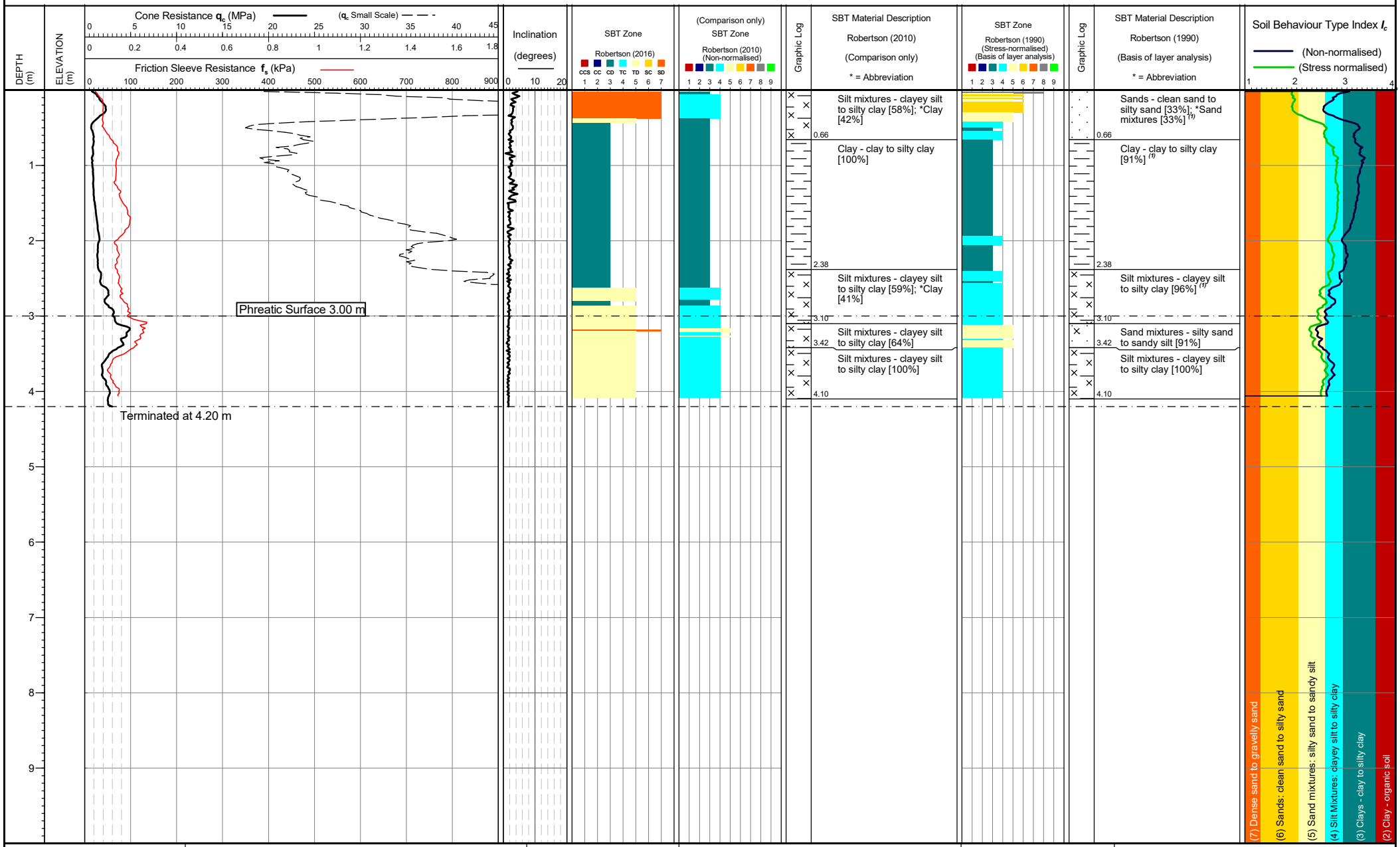
Internal QA Diss.
Dissipation Test

TEST ID: CPT-46

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 10:36:17

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

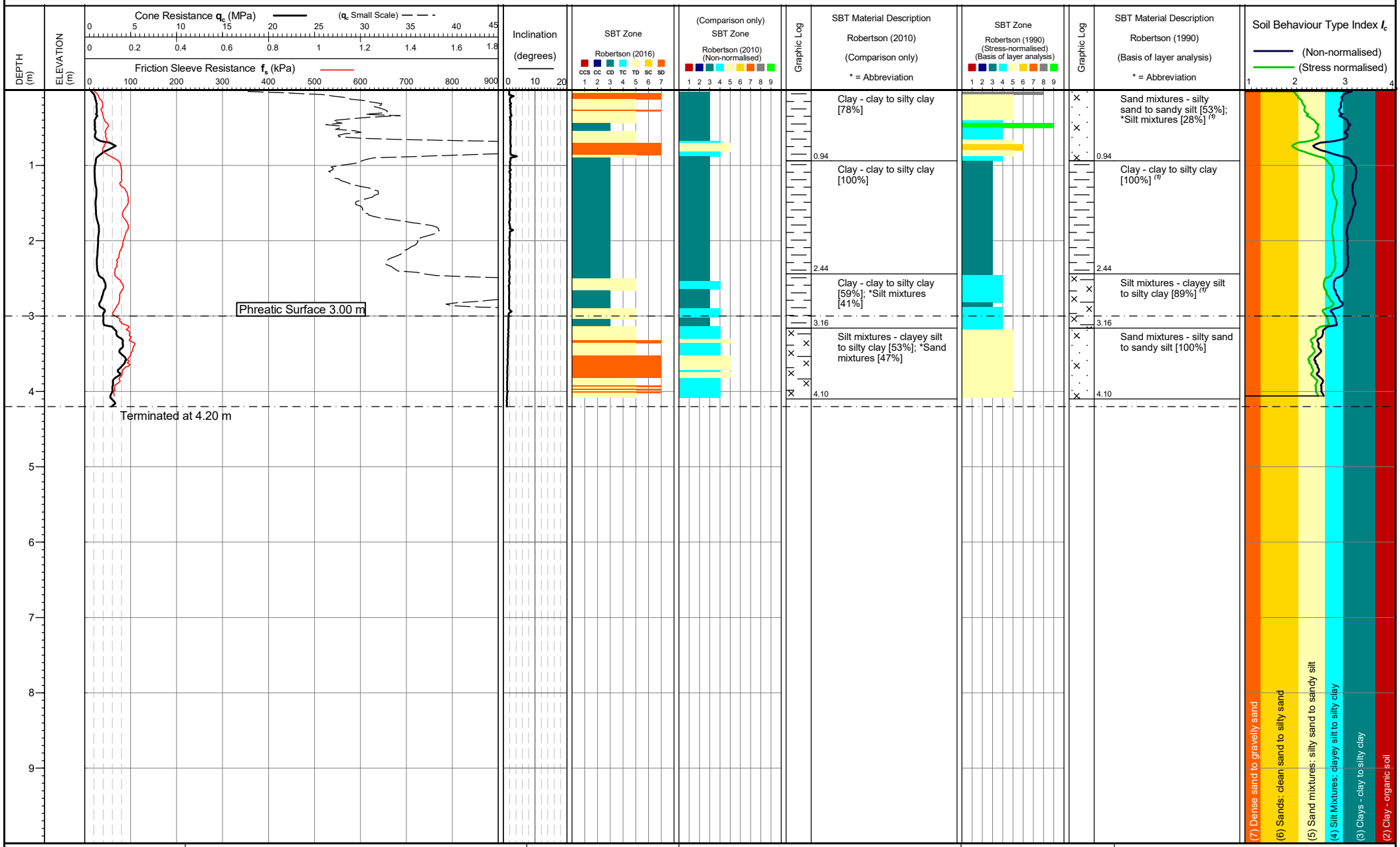
Internal QA Diss.
Dissipation Test

TEST ID: CPT-47

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 10:50:04

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

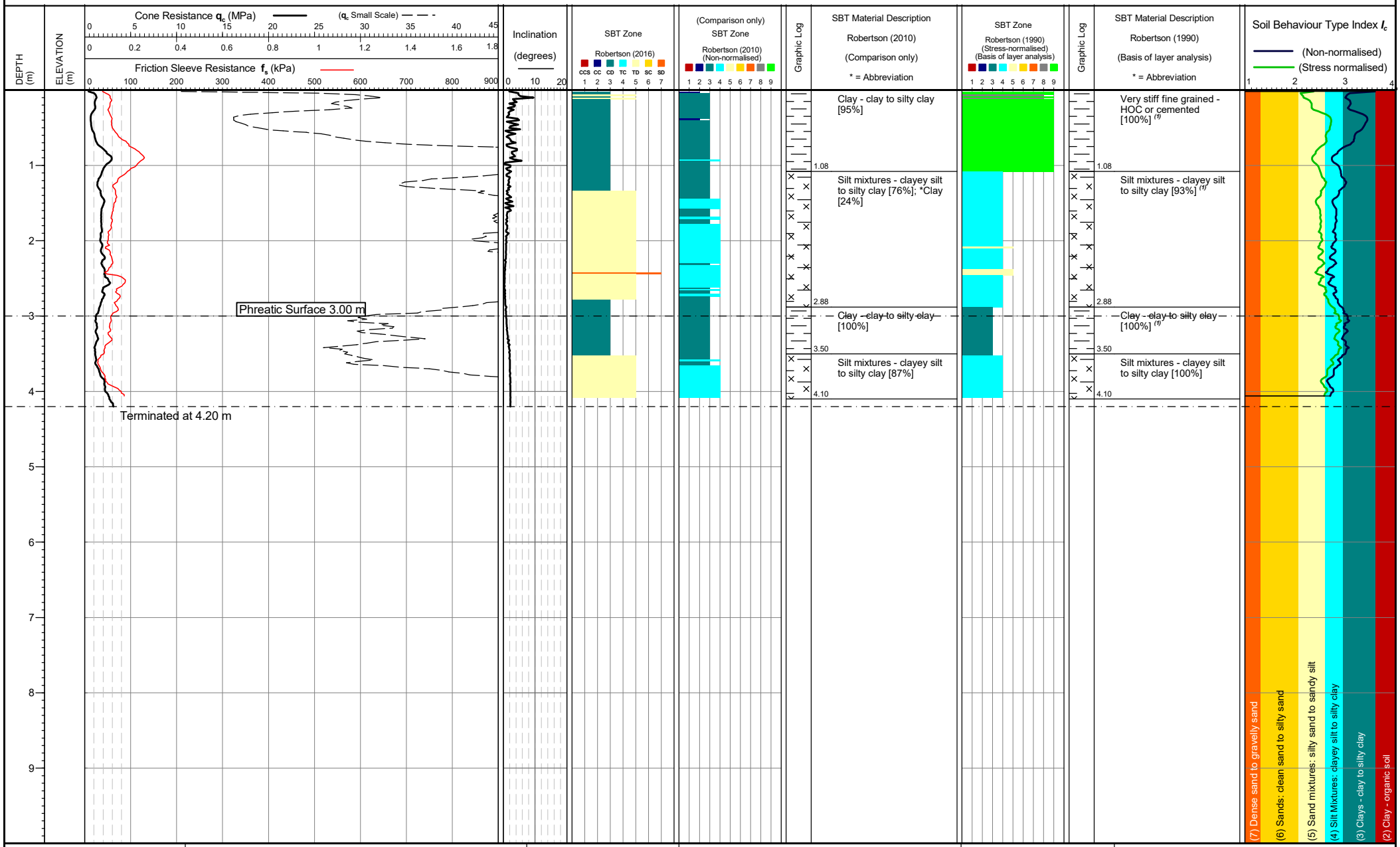
Internal QA Diss.
Dissipation Test

TEST ID: CPT-48

Project: SOUTHAMPTON

Client: SOILS LTD.

Lankelma Project Ref: 25-32-30218-1



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Location: Hampshire, UK
Rig Used: UK22
Date of test: 30/09/2025 11:25:23

Remarks: *Phreatic surface origin: Arbitrary value

Coordinates: ,
Elevation:

Robertson (2016) Material Type
1 - **CCS** - Clay-like - Contractive - Sensitive
2 - **CC** - Clay-like - Contractive
3 - **CD** - Clay-like - Dilative
4 - **TC** - Transitional - Contractive
5 - **TD** - Transitional - Dilative
6 - **SC** - Sand-like - Contractive
7 - **SD** - Sand-like - Dilative

Robertson (1990 & 2010) Material Type
1 - Sensitive fine-grained
2 - Organic soils
3 - Clays - clay to silty clay
4 - Silt mixtures - clayey silt to silty clay
5 - Sand mixtures - silty sand to sandy silt
6 - Sands - clean sand to silty sand
7 - Gravelly sand to sand
8 - Very stiff/dense sand to clayey sand
9 - Very stiff fine grained

(1) 0-3 m: Normalised SBT often artificially coarse/stiff at very low in-situ stresses

Internal QA Diss.
Dissipation Test

TEST ID: SPT-14

APPENDIX E PARAMETER RESULTS 1 – S_U, M_V, OCR, SBT, I_C

Undrained shear strength

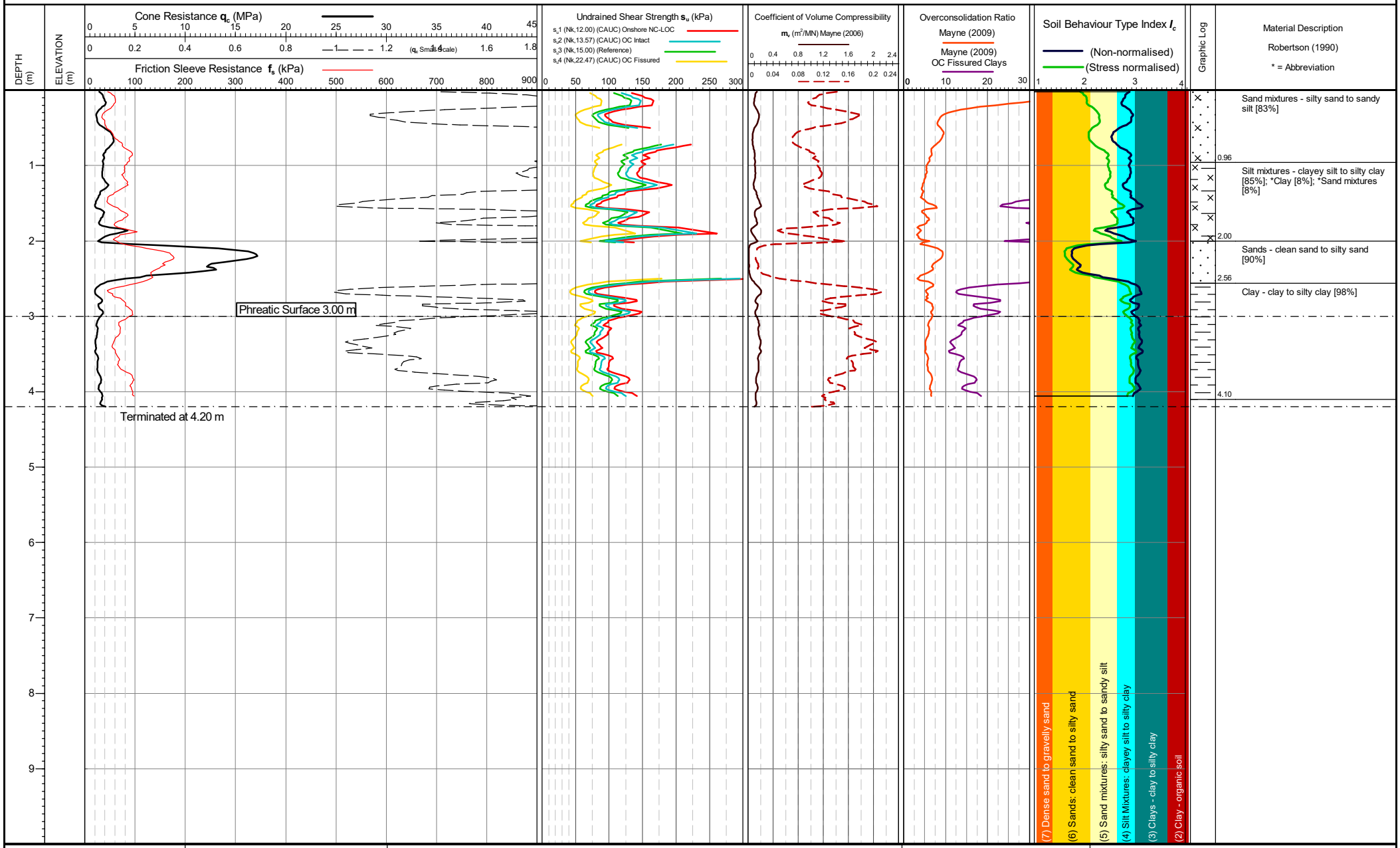
Coefficient of volume change

Overconsolidation ratio

Robertson 1990 SBT descriptions & SBT index I_c

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 12:10:55

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

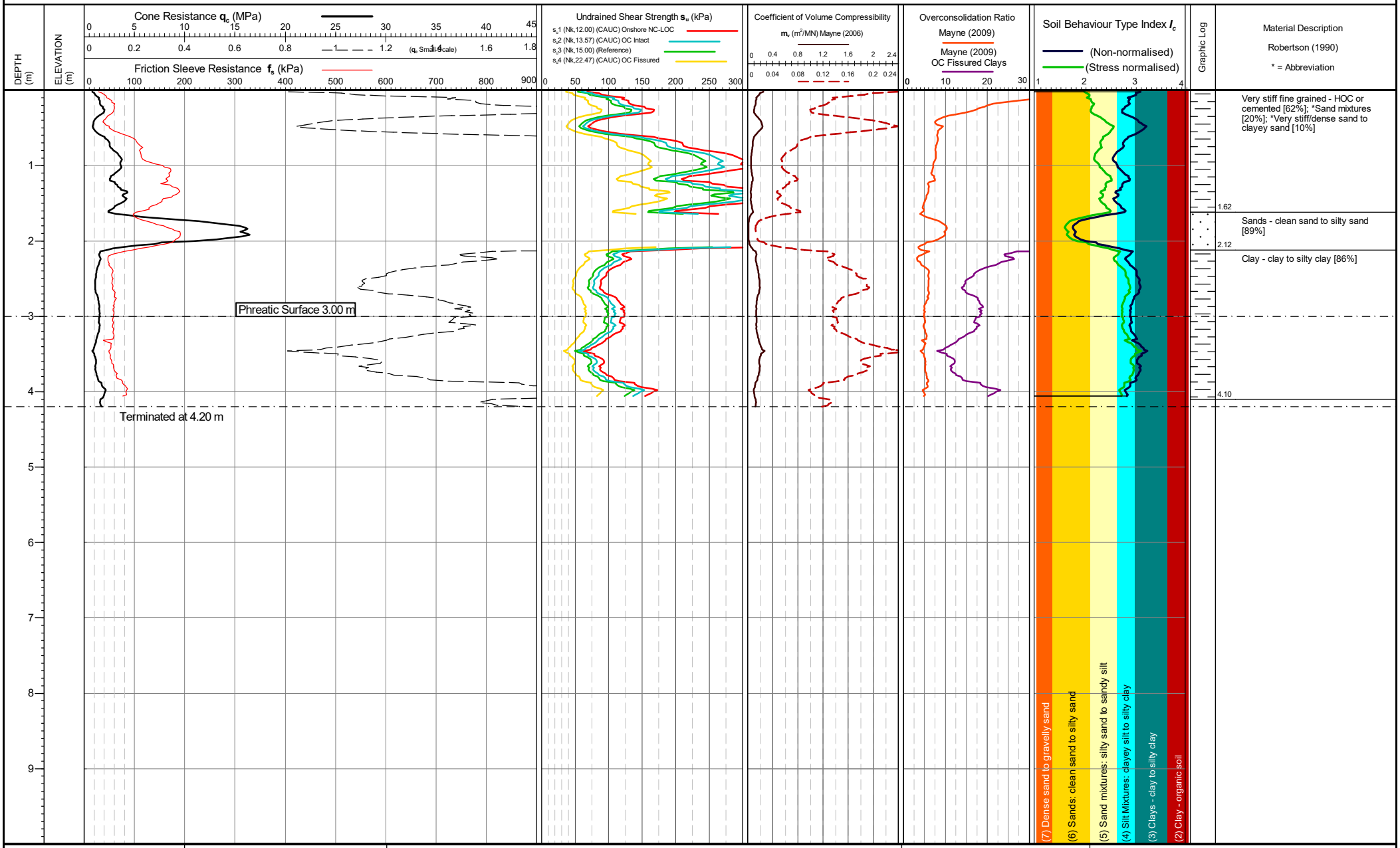
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-01

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 11:30:59

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

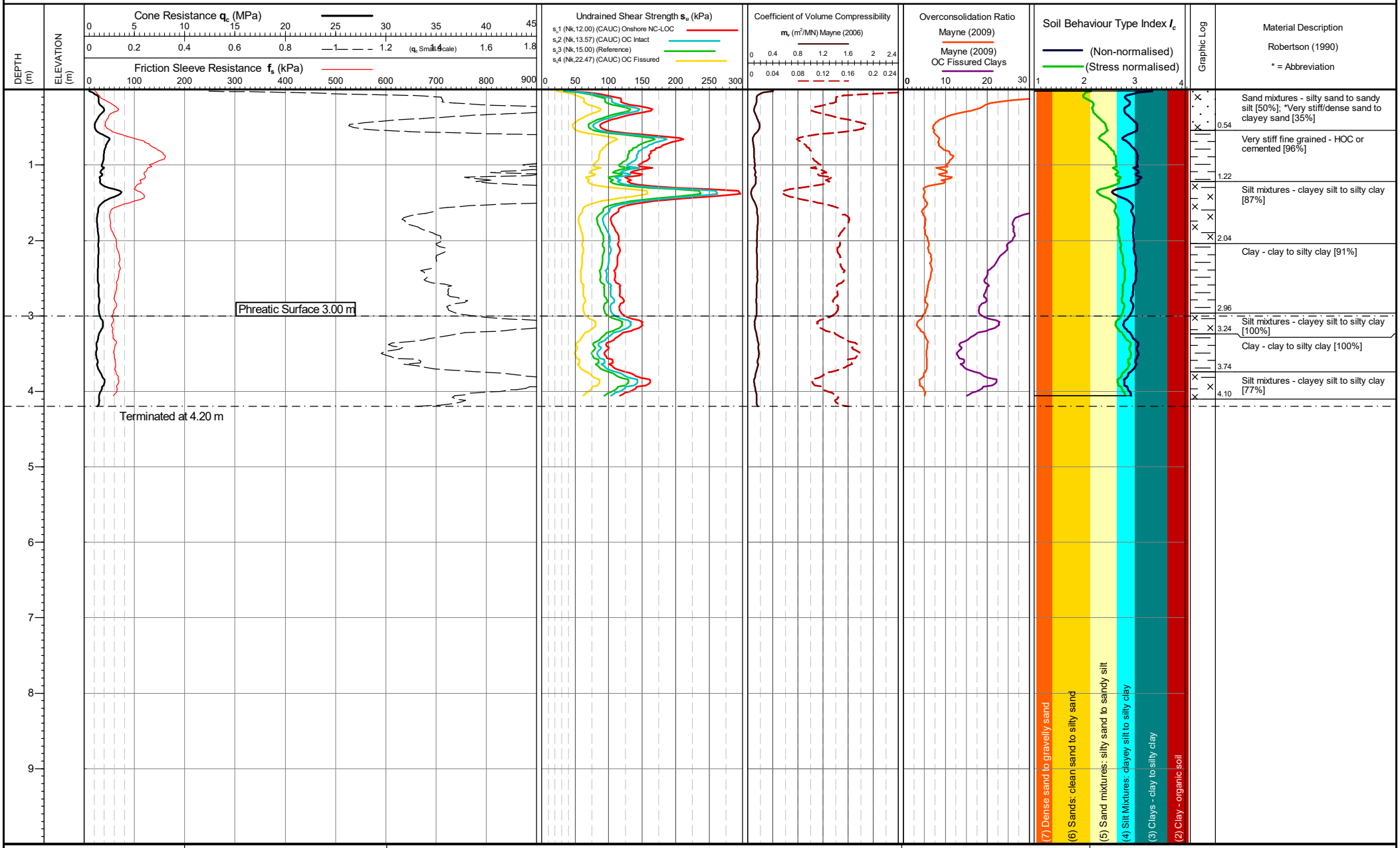
Checked by: Chris Player

TEST ID: CPT-02

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 10:41:56

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

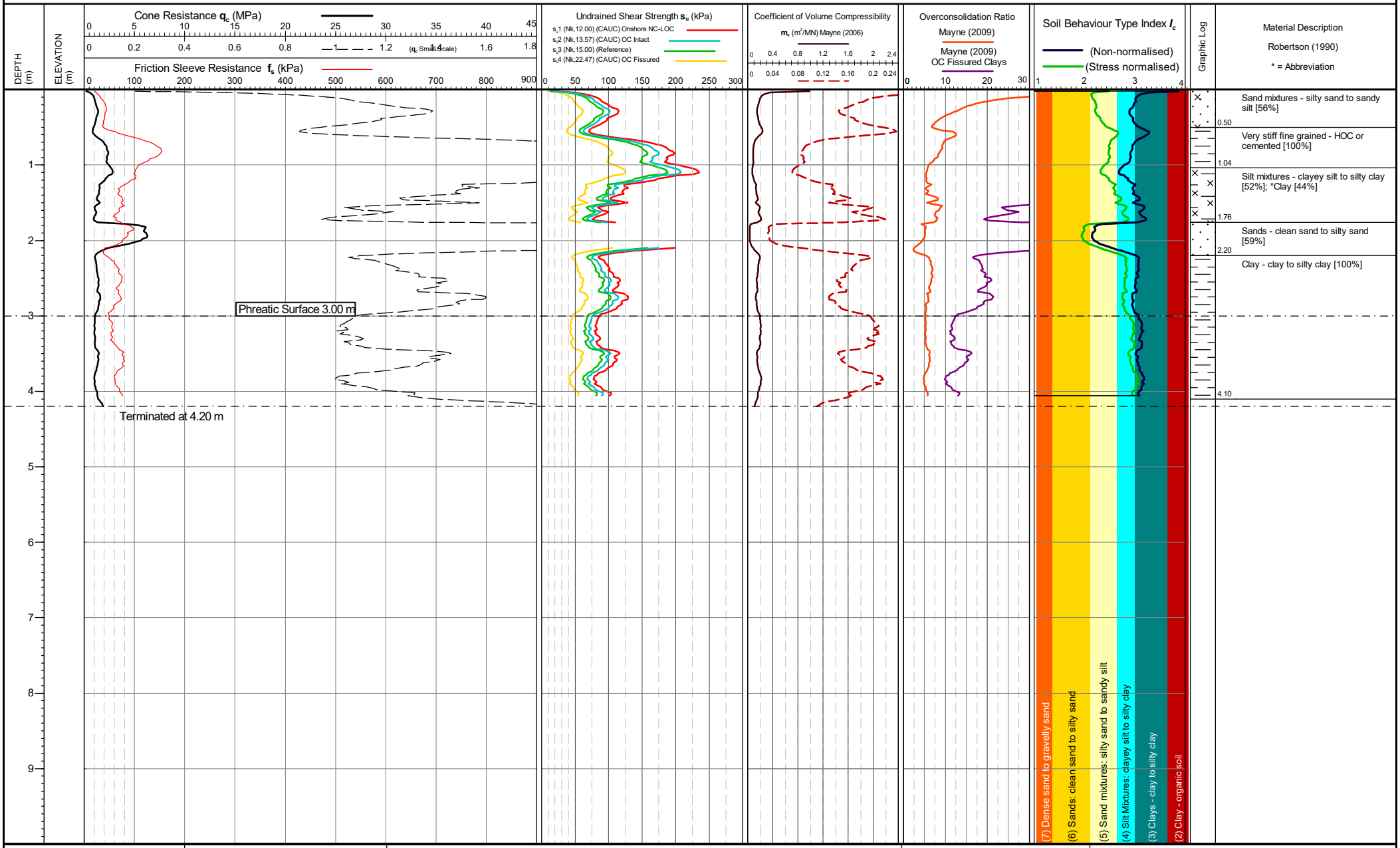
Checked by: Chris Player

TEST ID: CPT-03

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 12:24:30

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

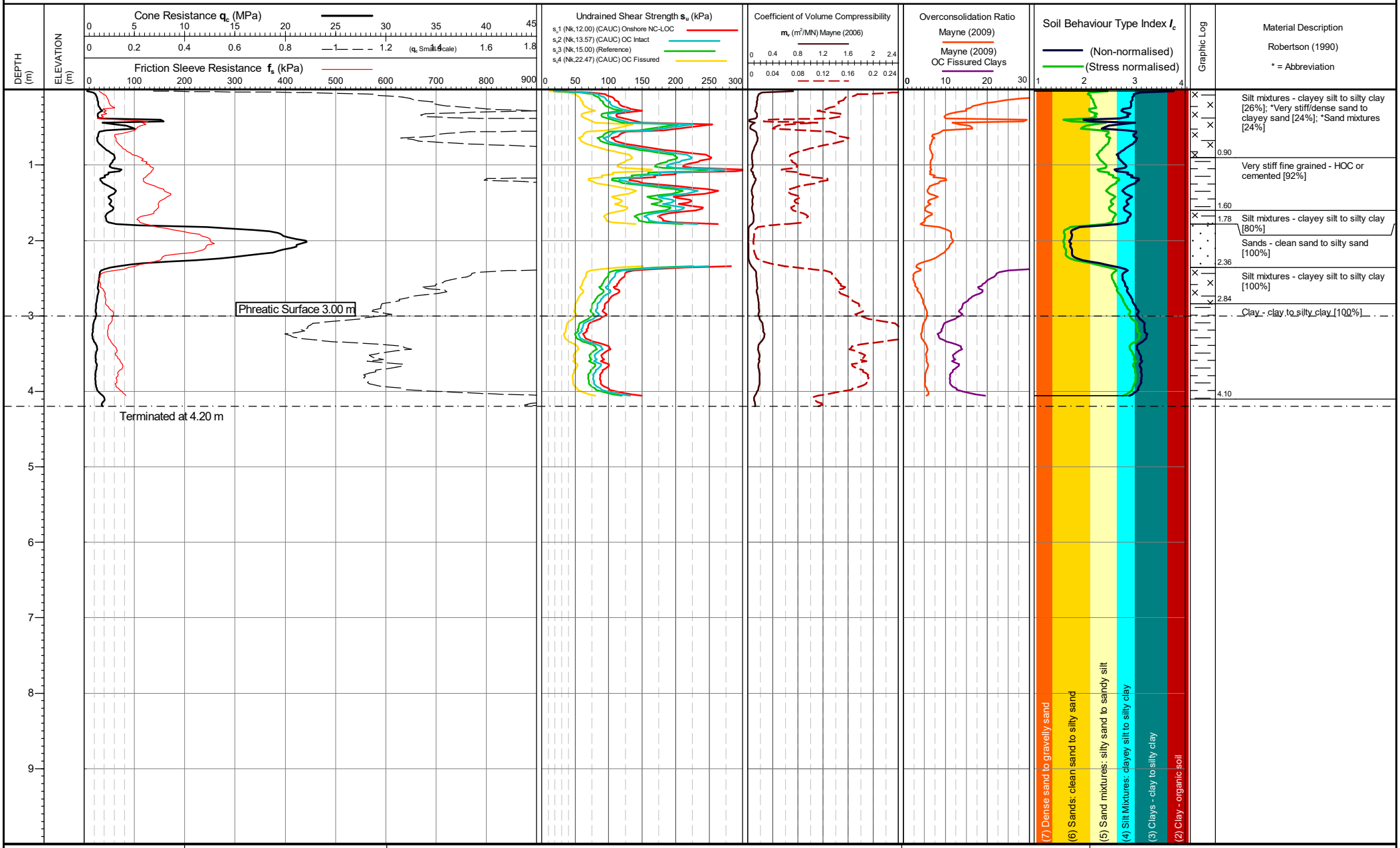
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-04

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 15:12:32

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

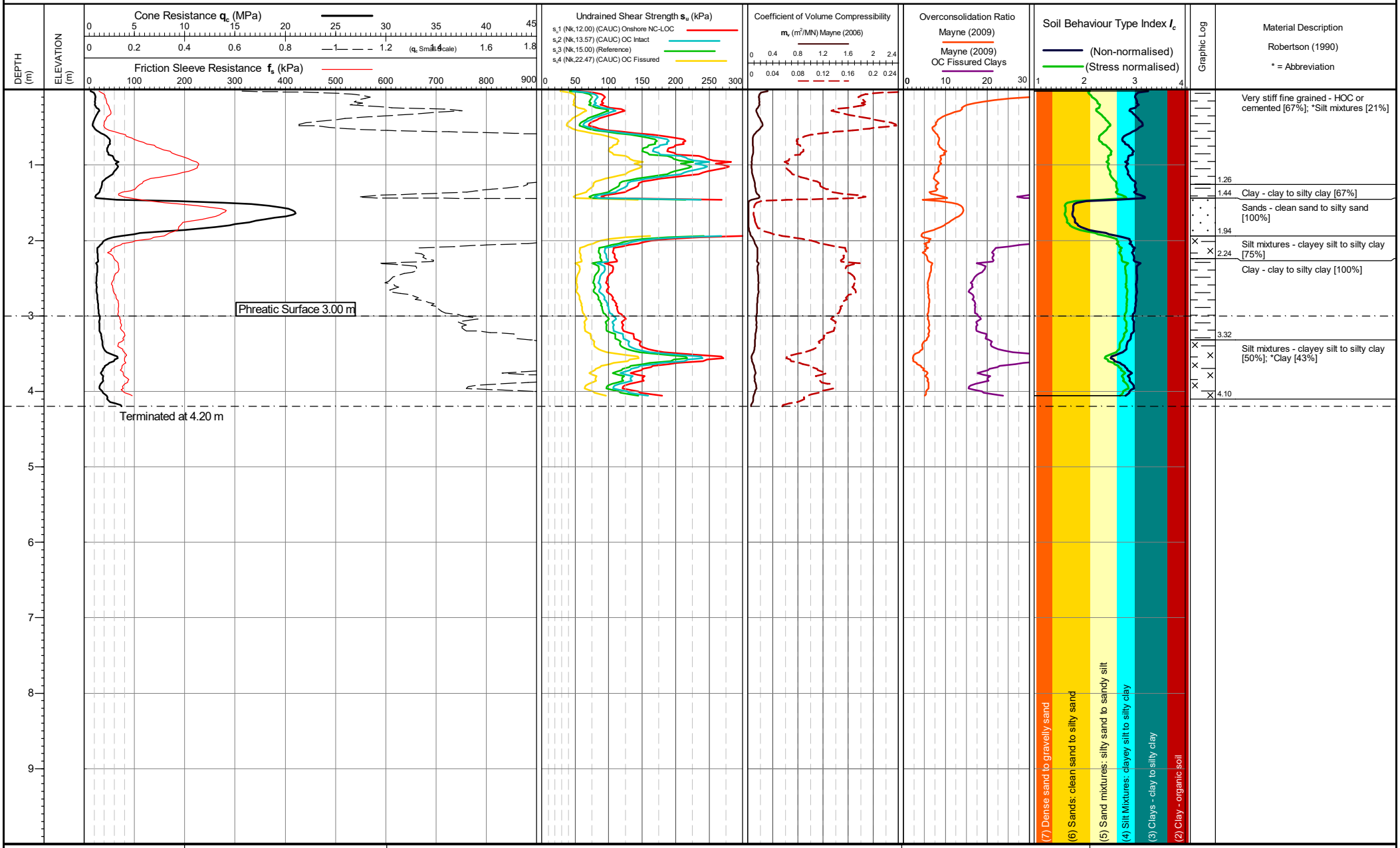
Checked by: Chris Player

TEST ID: CPT-05

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 15:46:10

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

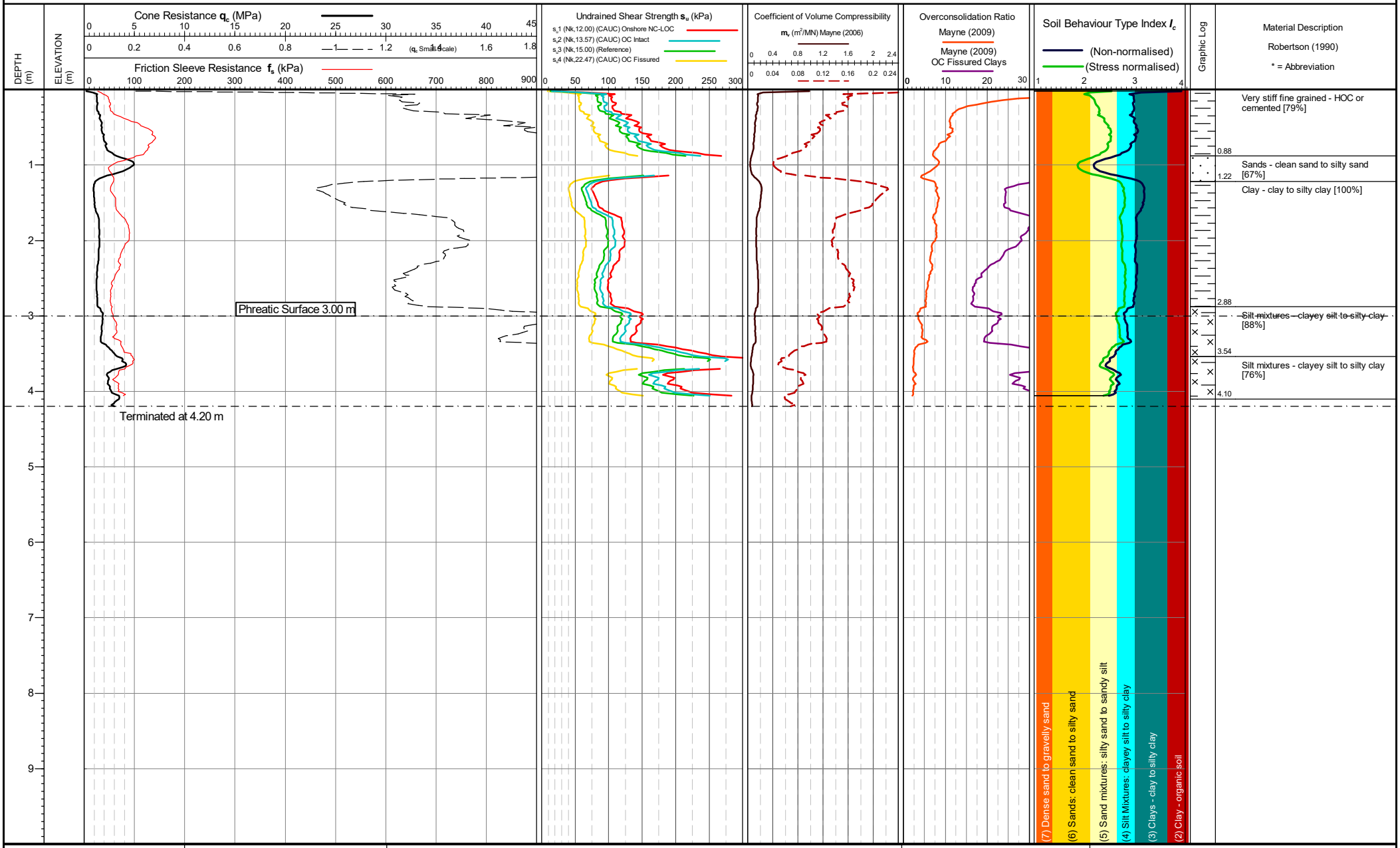
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-06

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 11:01:27

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

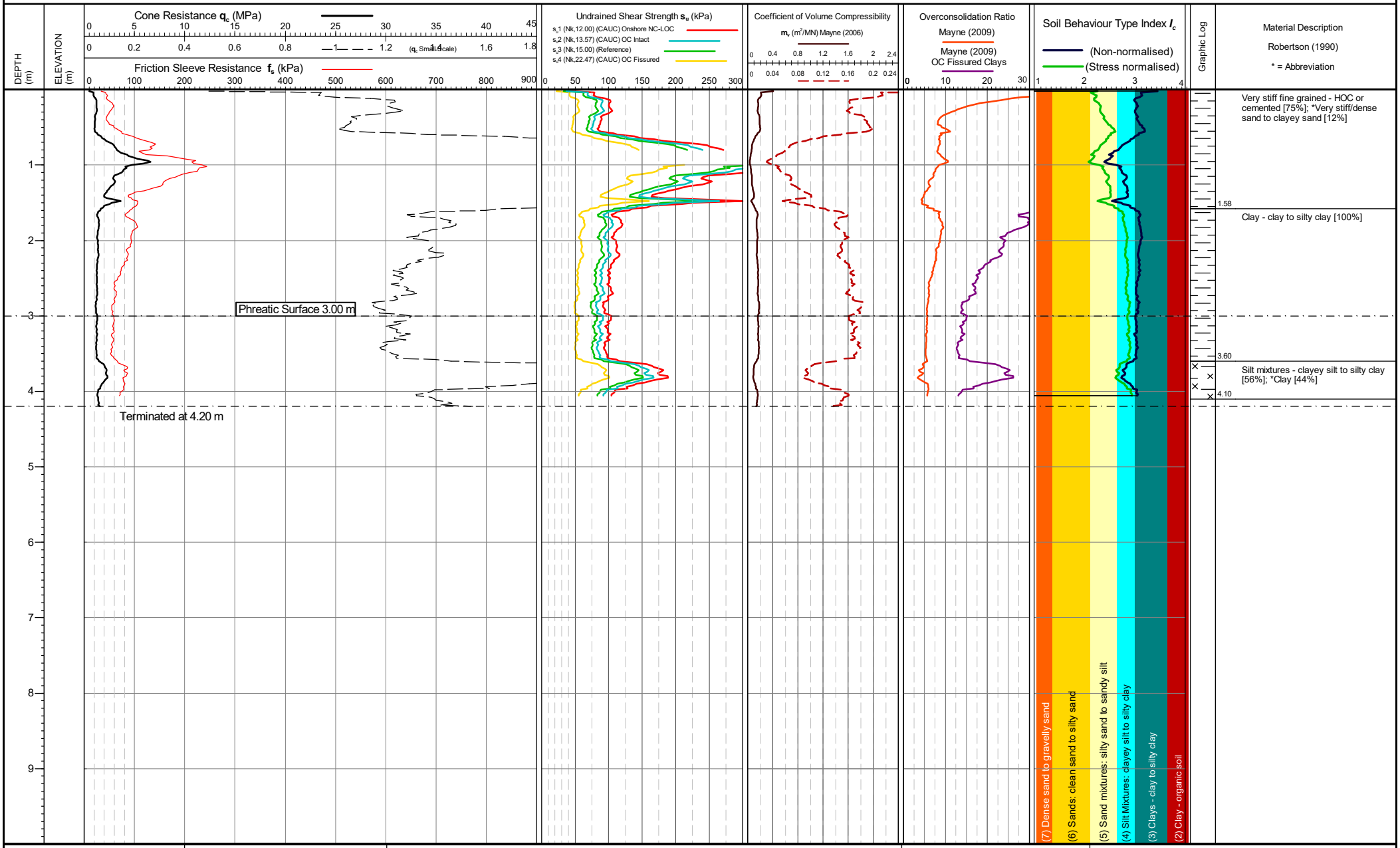
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-07

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 14:57:03

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

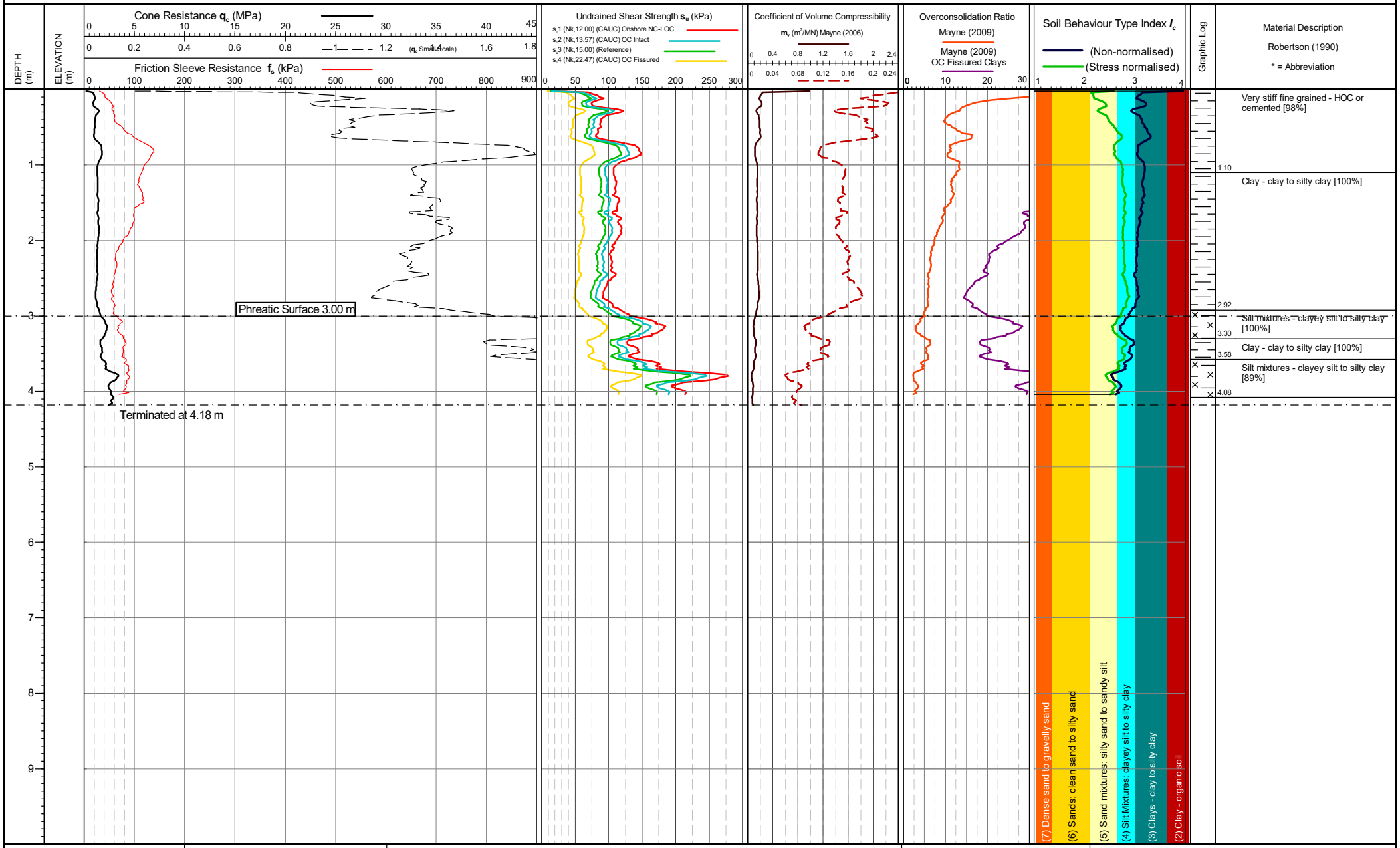
Checked by: Chris Player

TEST ID: CPT-08

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 16:12:56

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

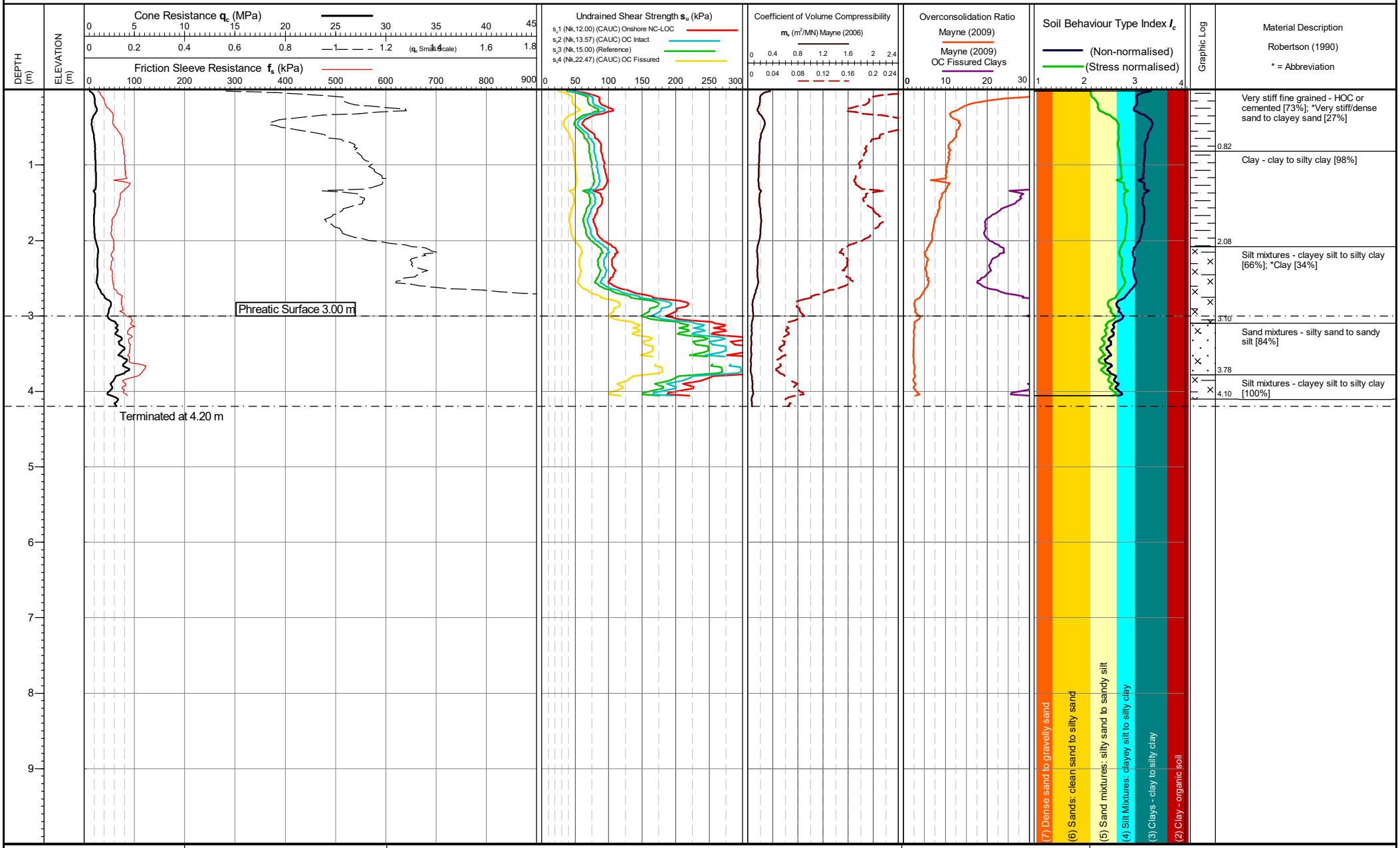
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-09

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 11:14:45

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

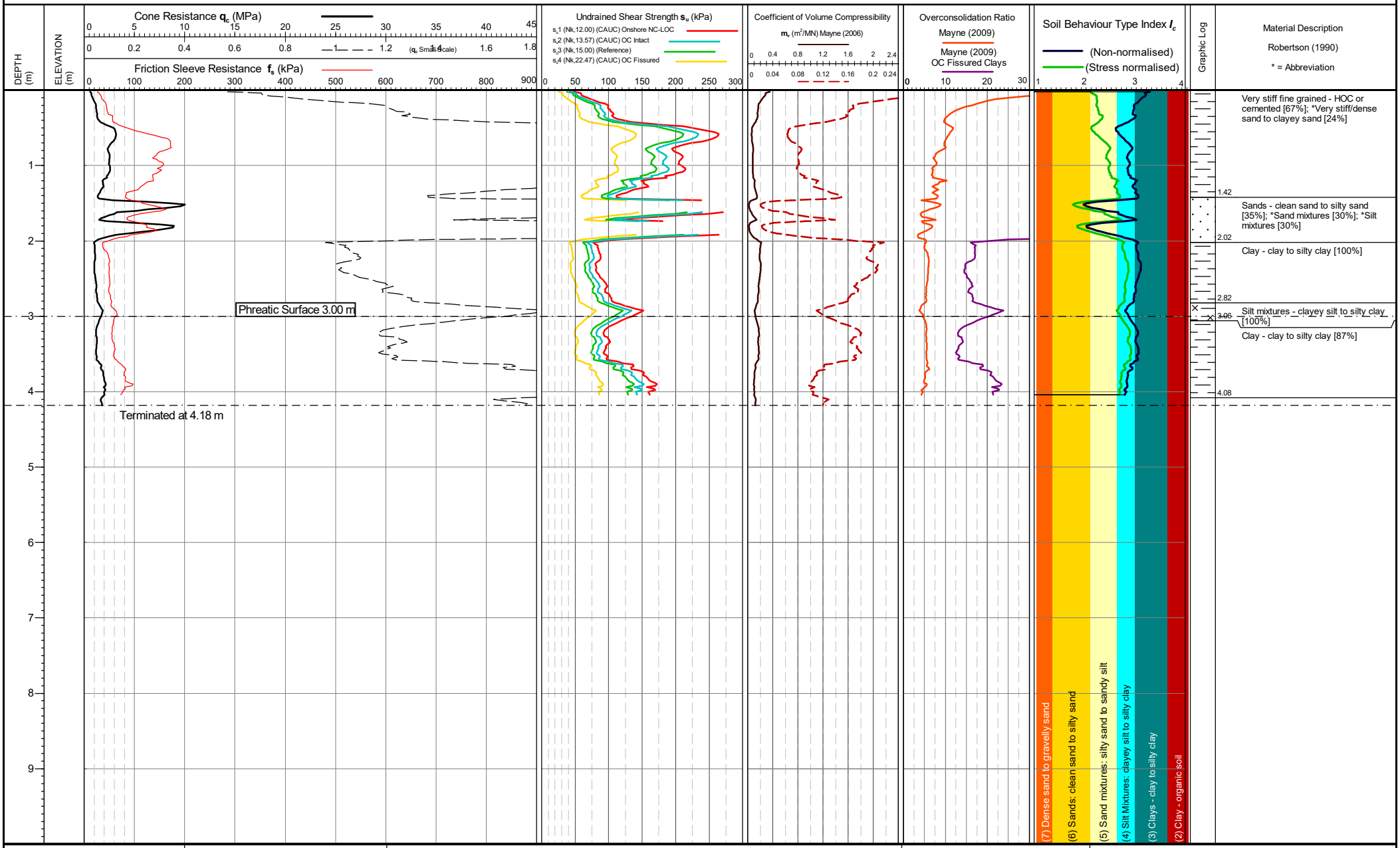
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-10

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 12:40:31

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

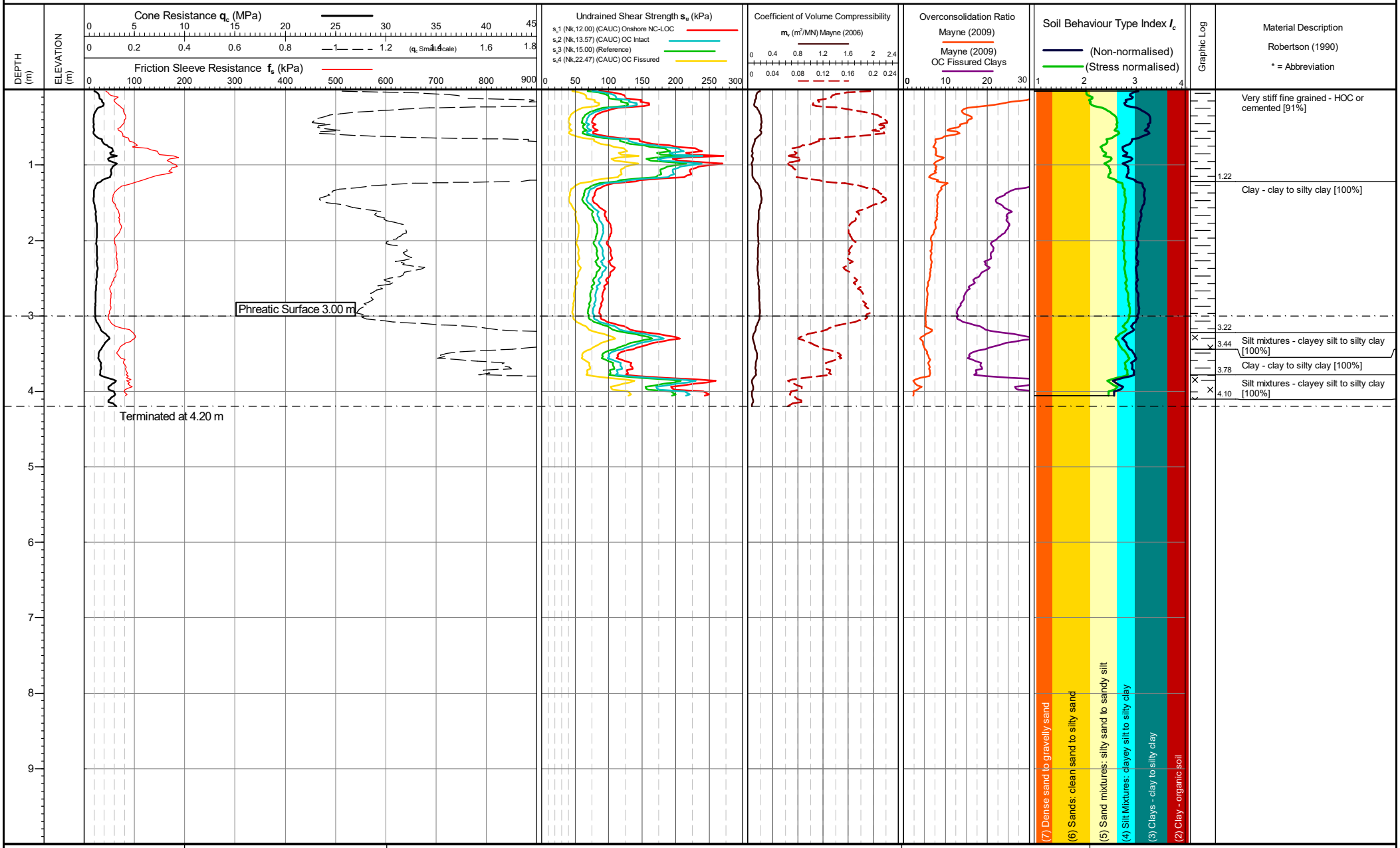
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-11

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 14:44:47

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

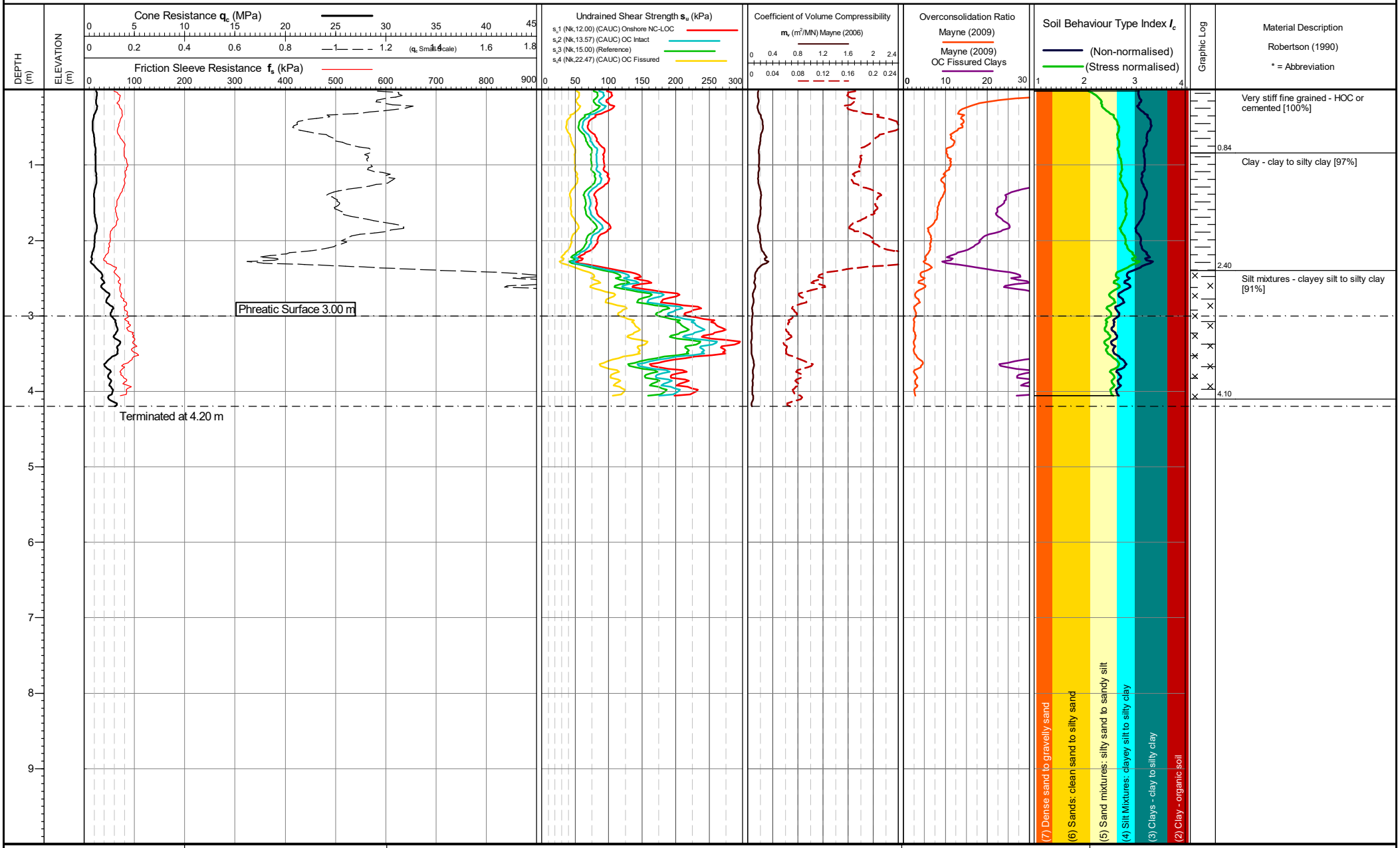
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-12

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 16:26:17

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

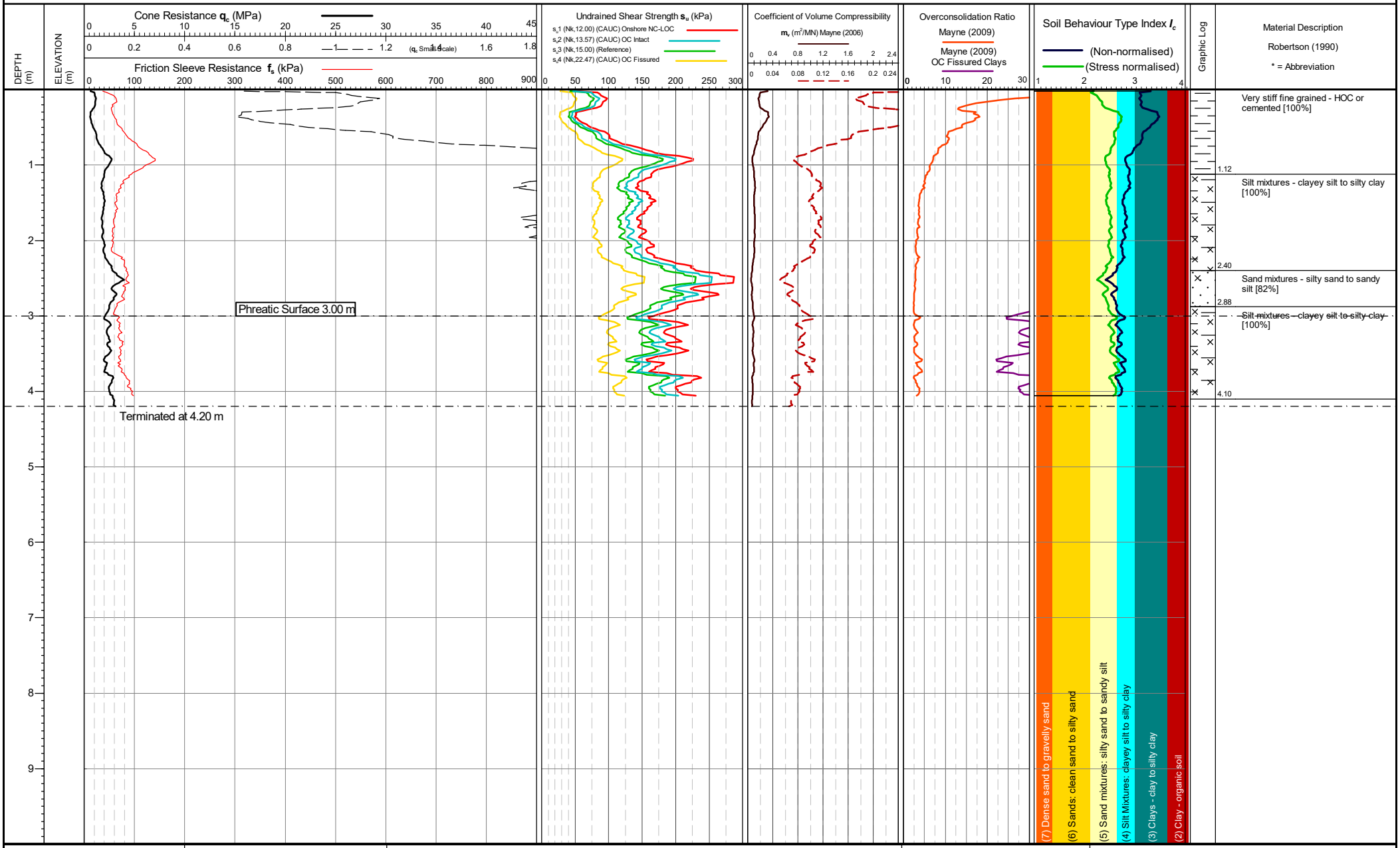
Checked by: Chris Player

TEST ID: CPT-13

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 17:16:57

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

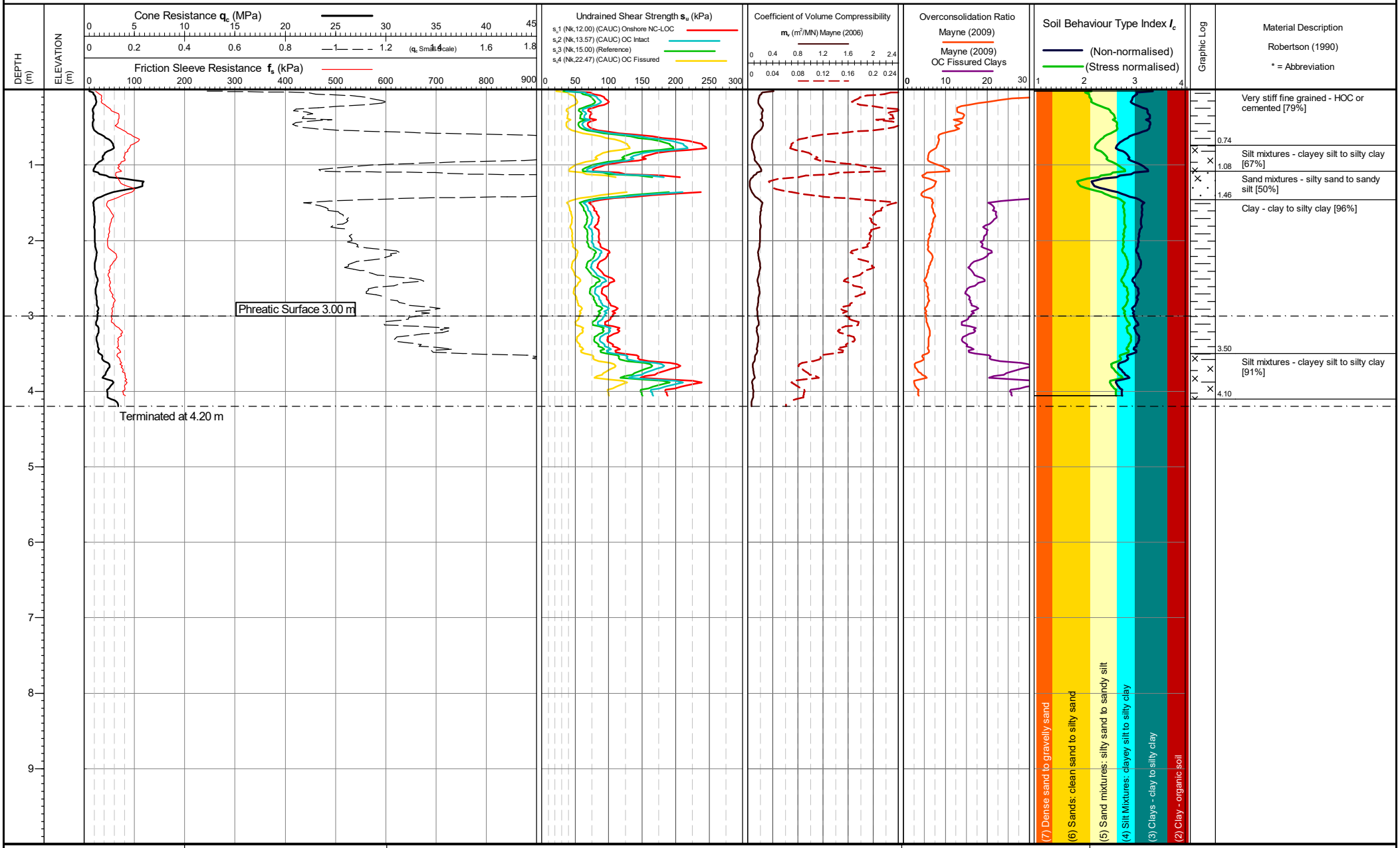
Checked by: Chris Player

TEST ID: CPT-14

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 12:59:12

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

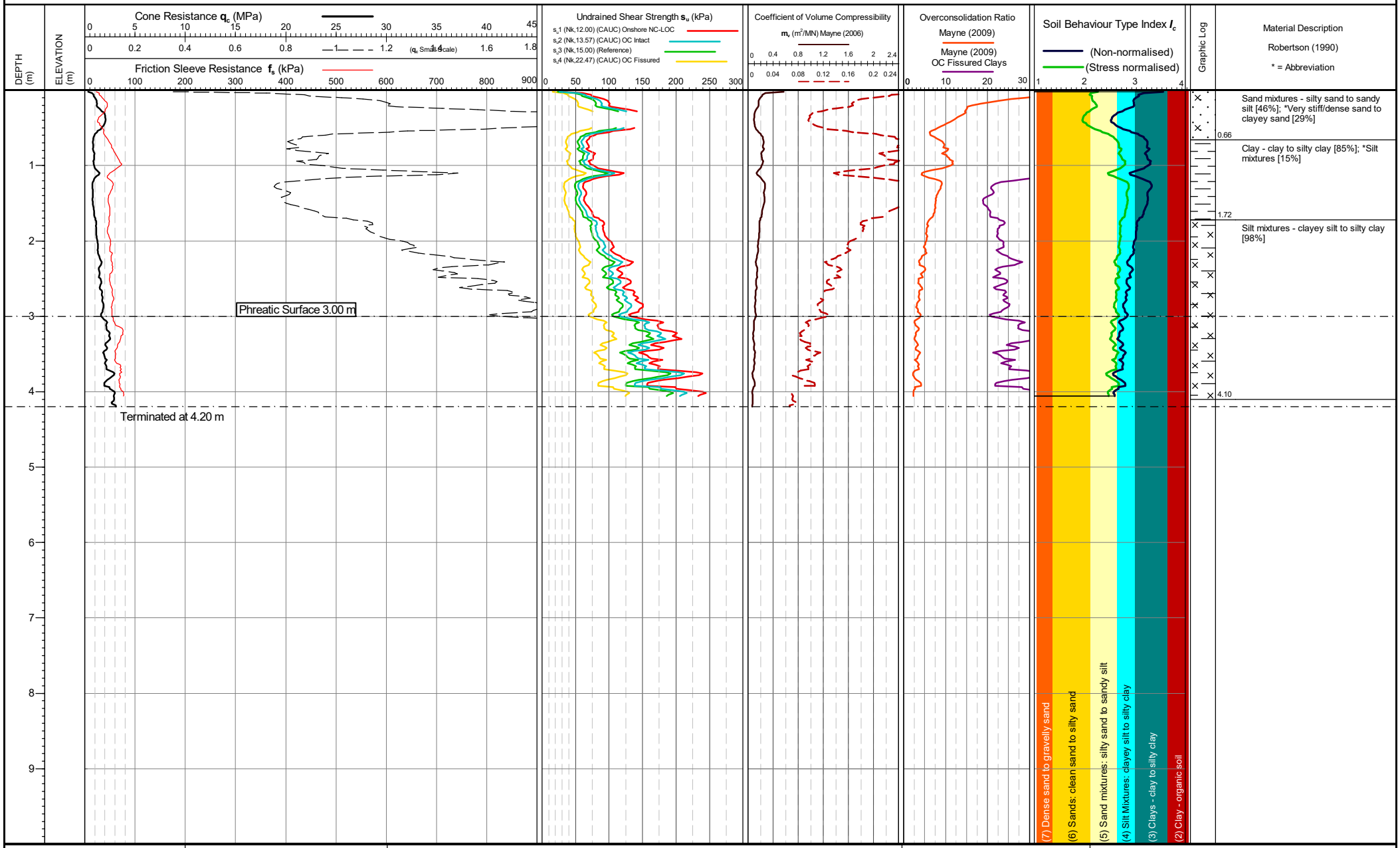
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-15

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 13:24:55

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

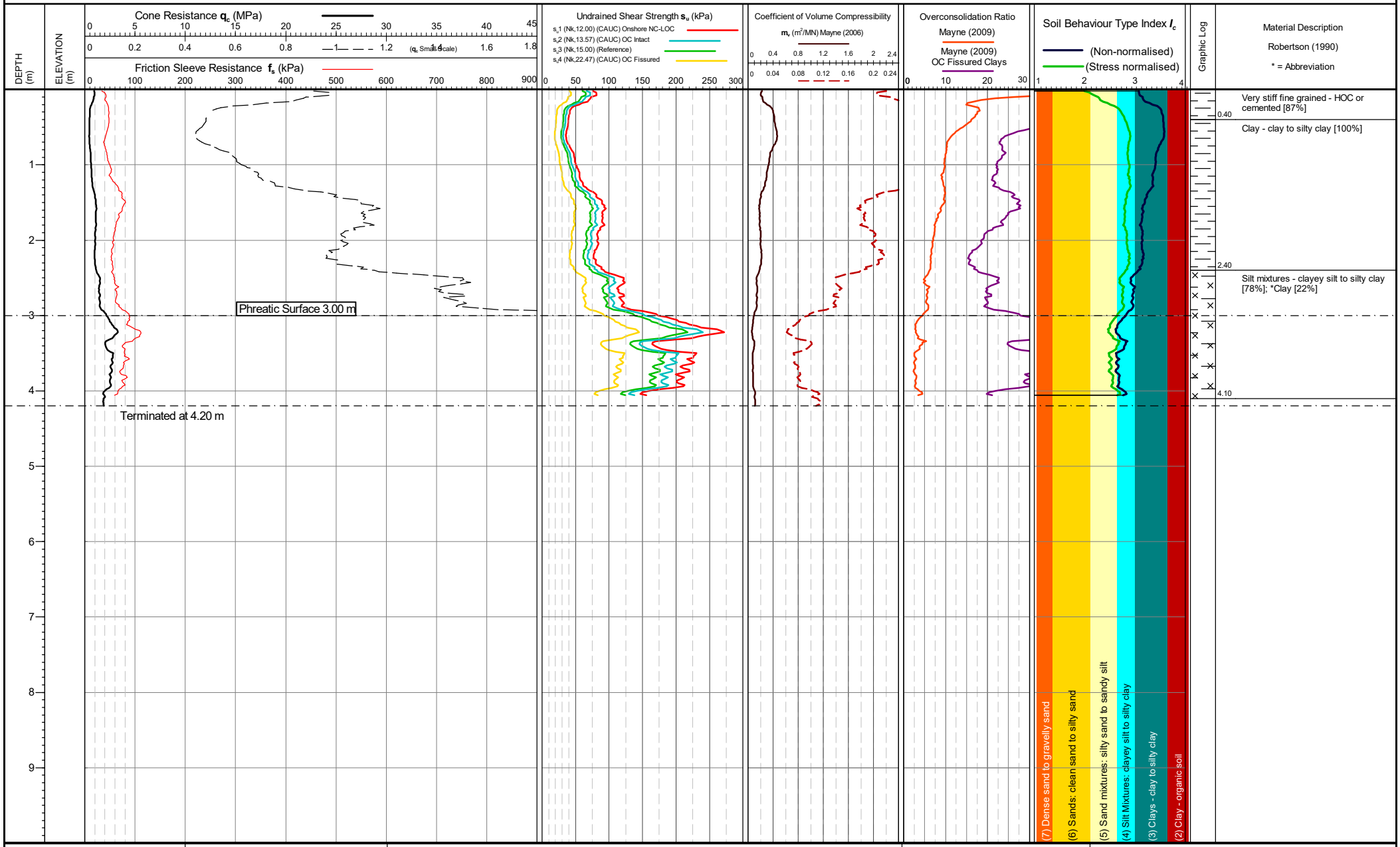
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-16

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 14:33:18

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

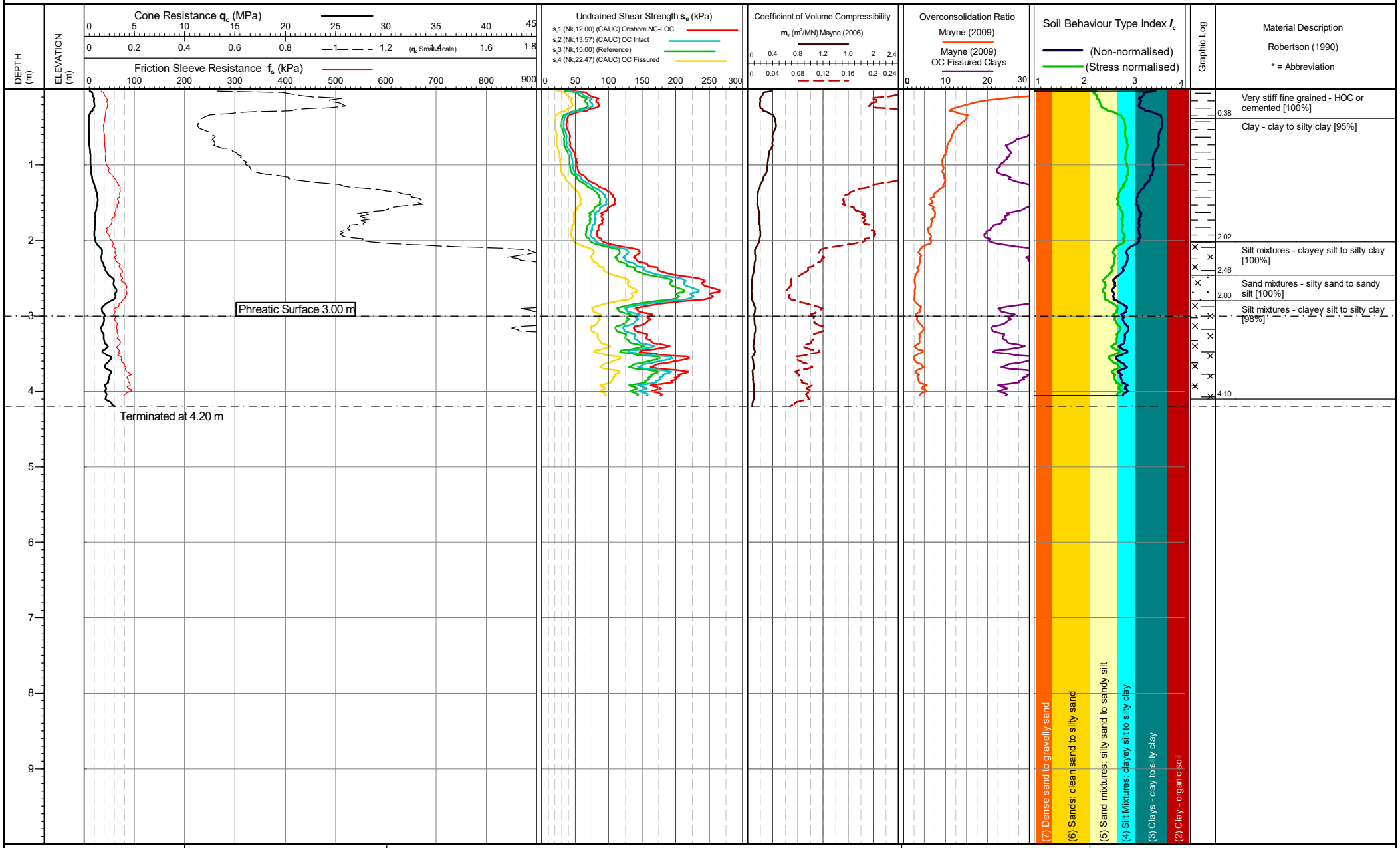
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-17

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 14:04:07

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

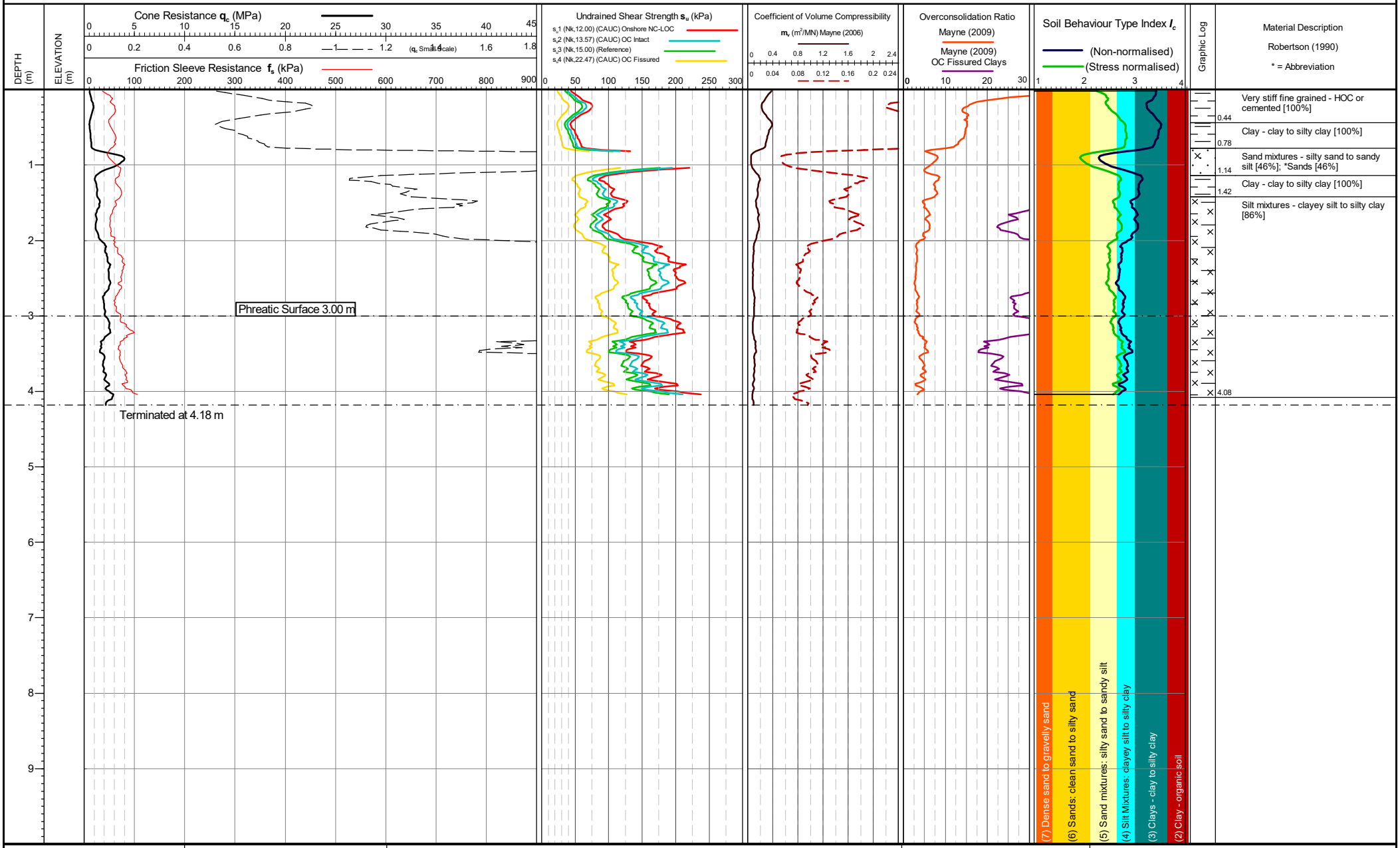
Checked by: Chris Player

TEST ID: CPT-18

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 13:36:46

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

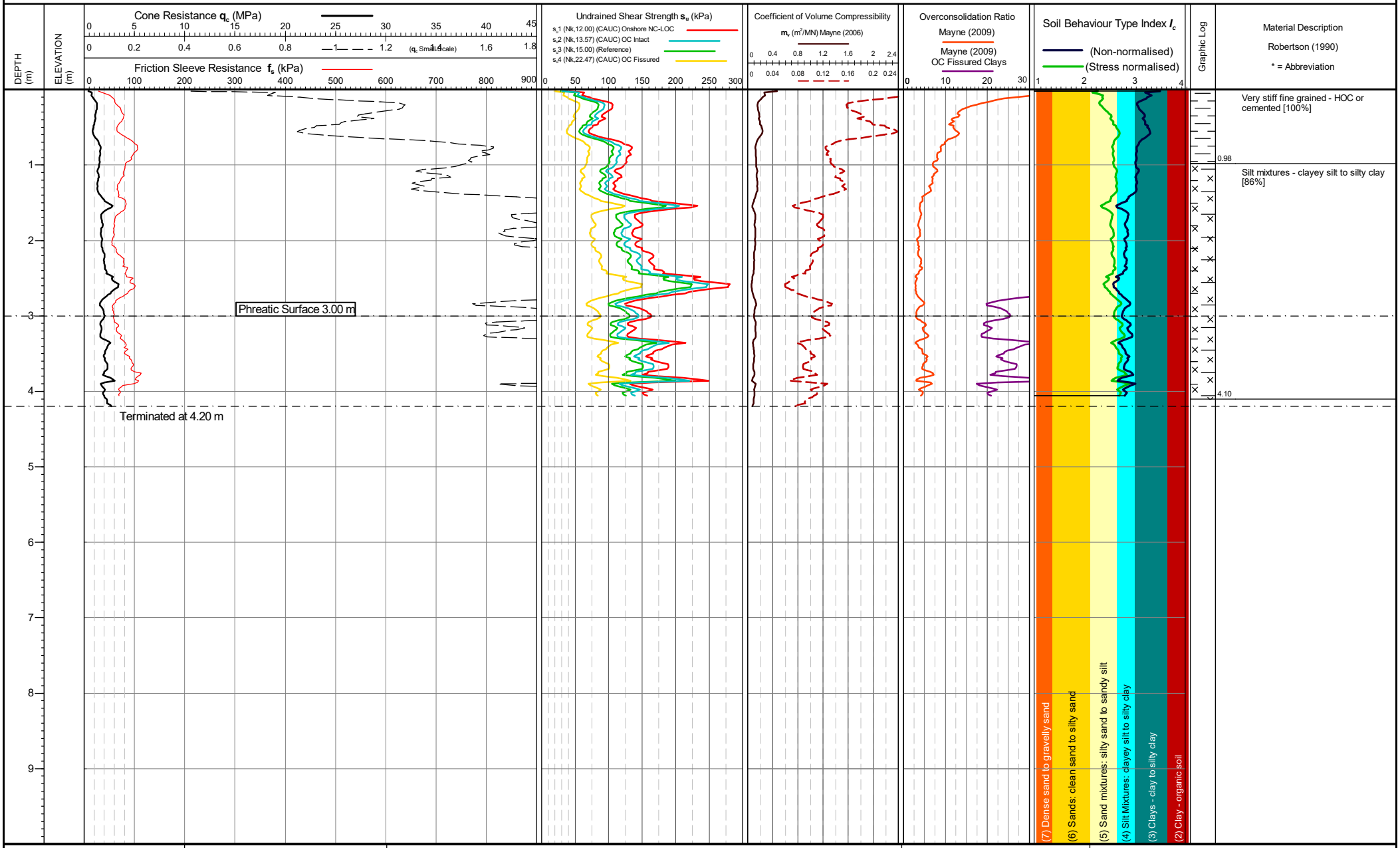
Checked by: Chris Player

TEST ID: CPT-19

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 13:50:58

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

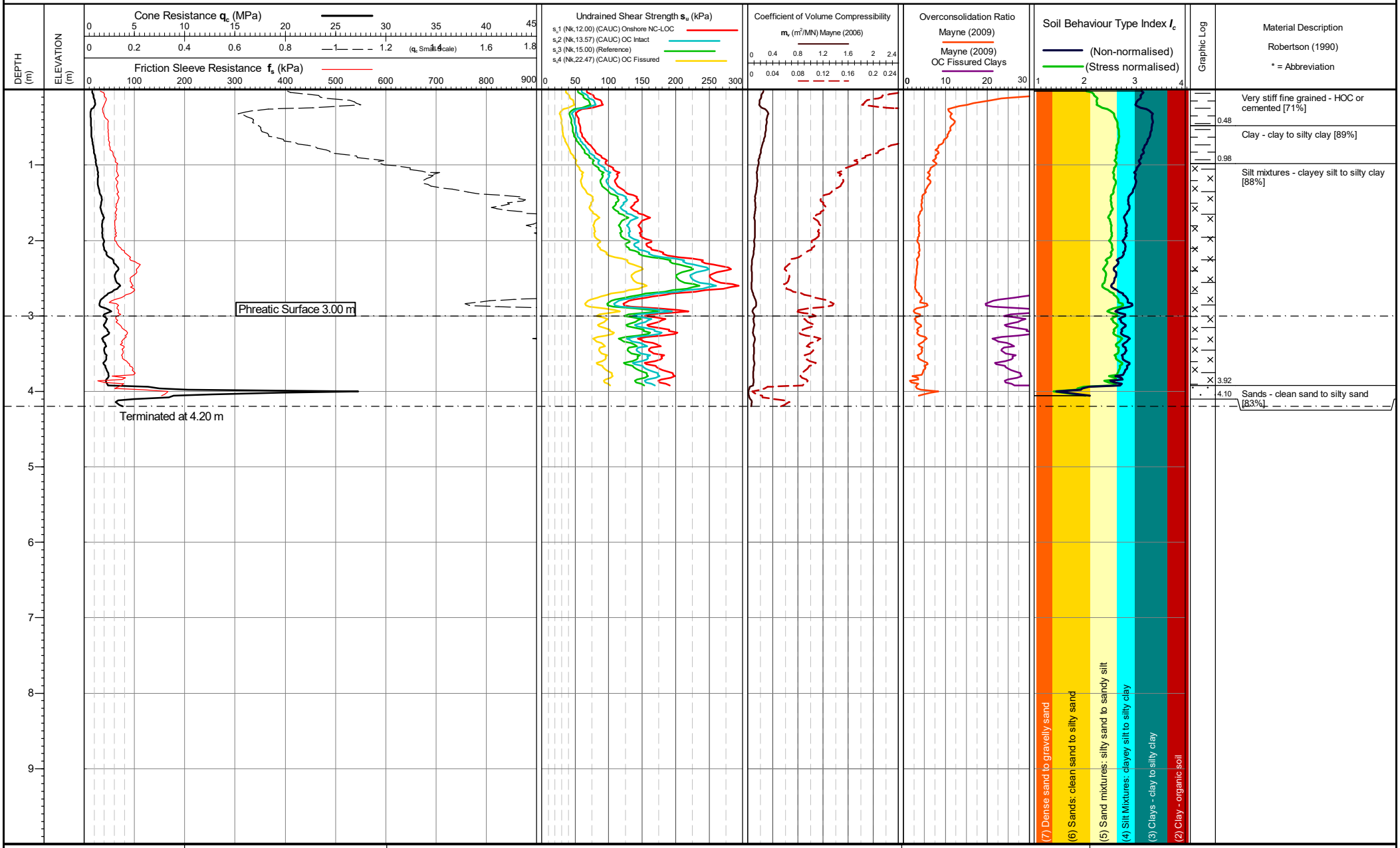
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-20

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 16:37:37

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

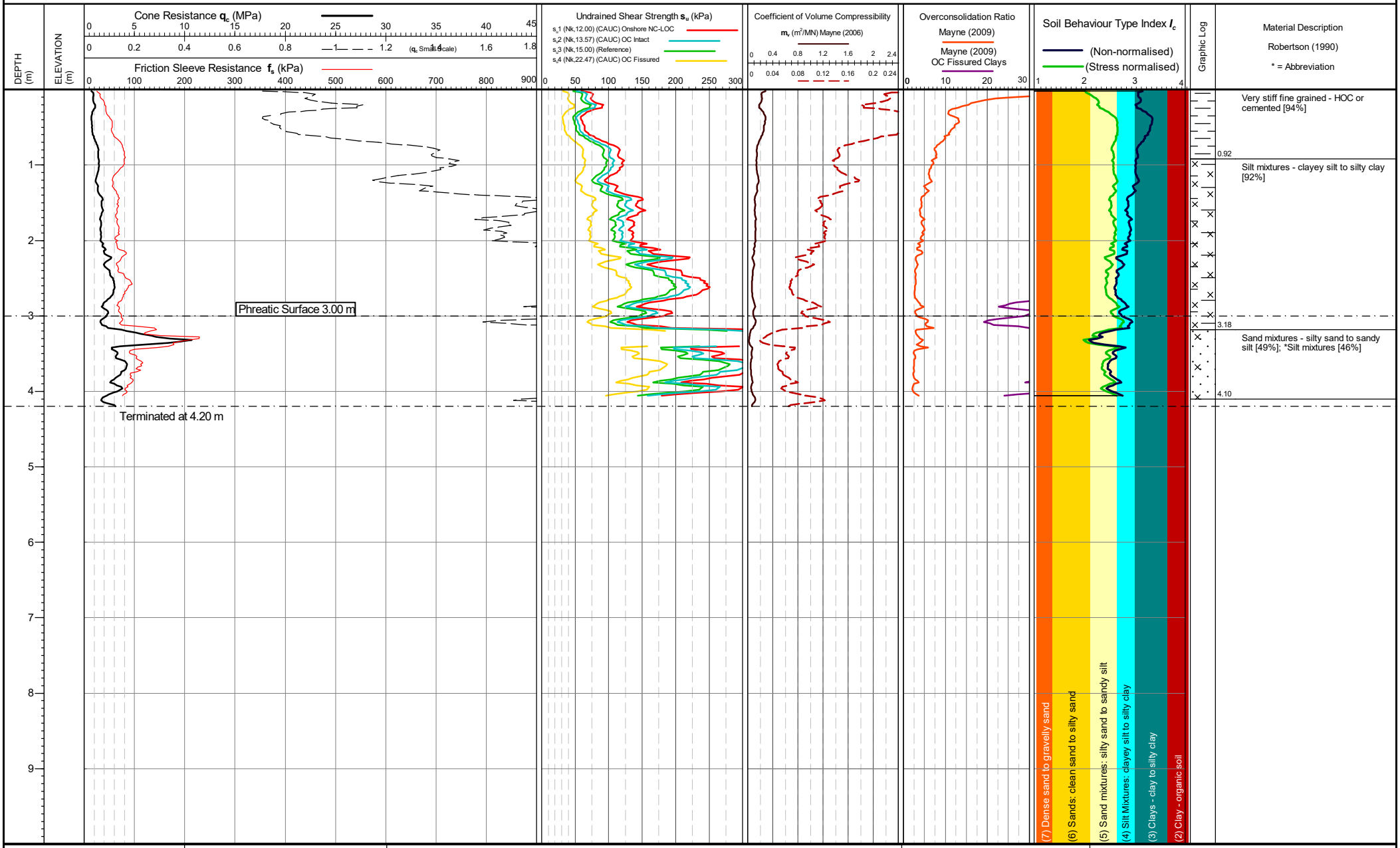
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-21

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 29/09/2025 16:58:55

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

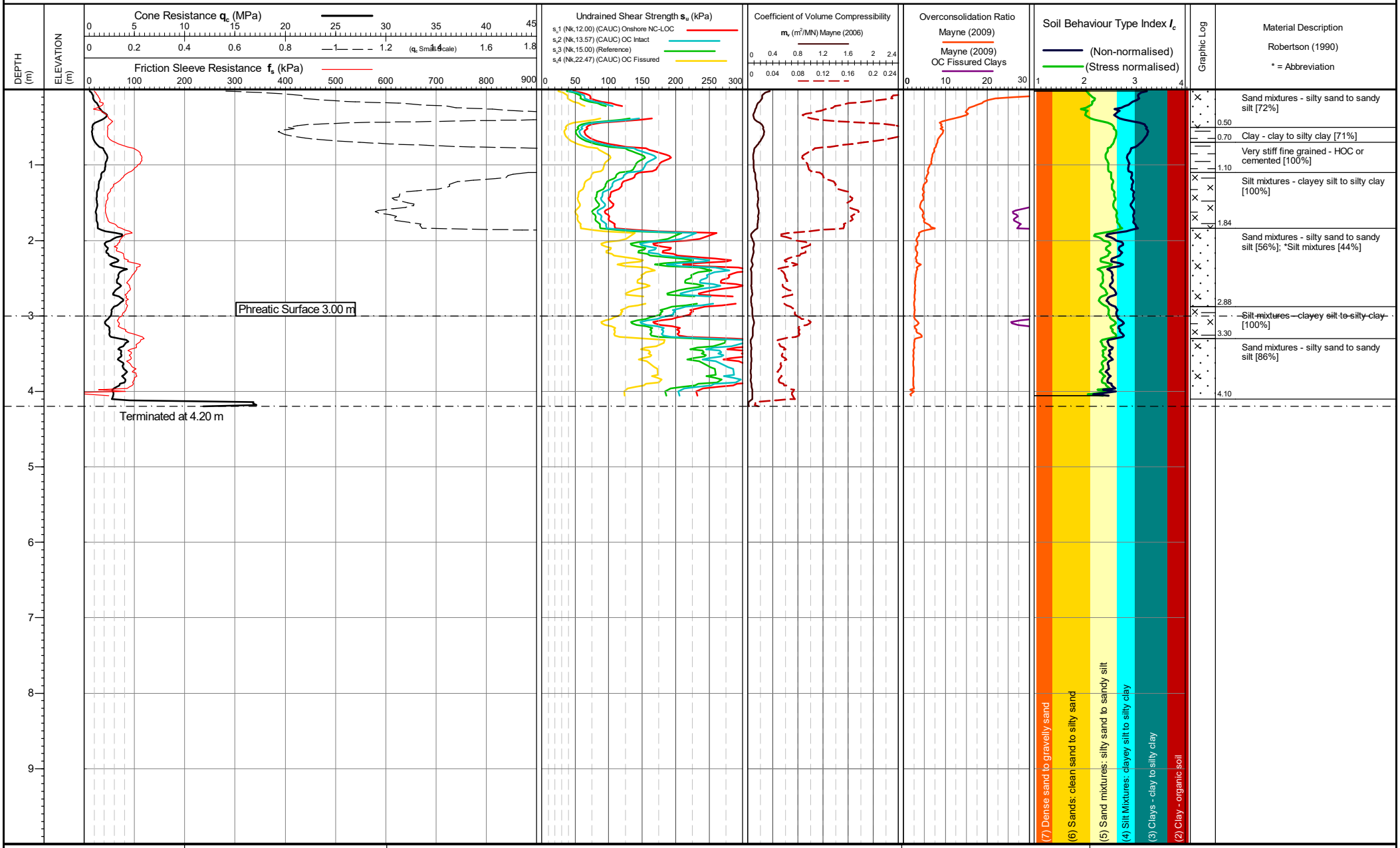
Checked by: Chris Player

TEST ID: CPT-22

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 11:57:31

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

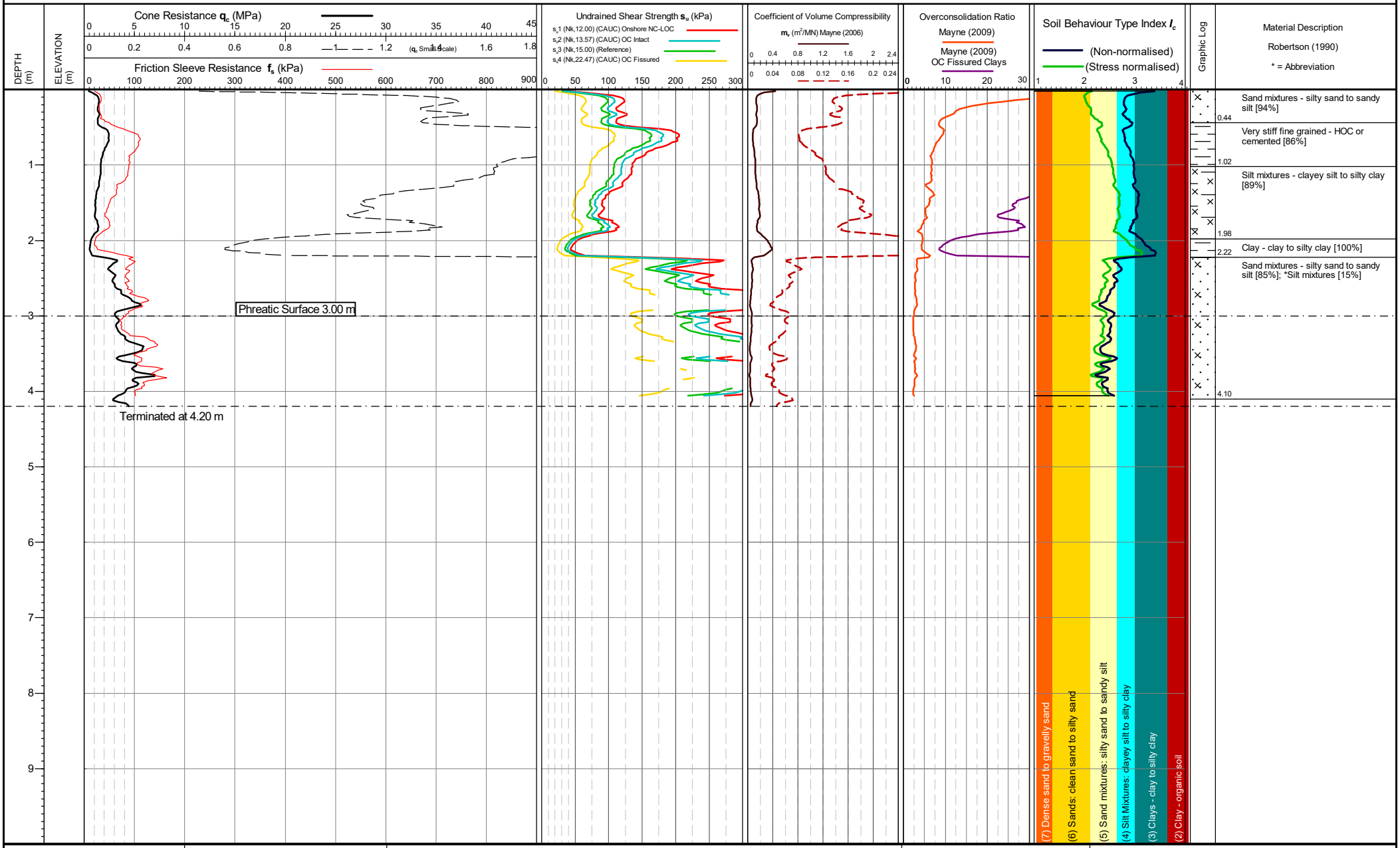
Checked by: Chris Player

TEST ID: CPT-23

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 11:37:40

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

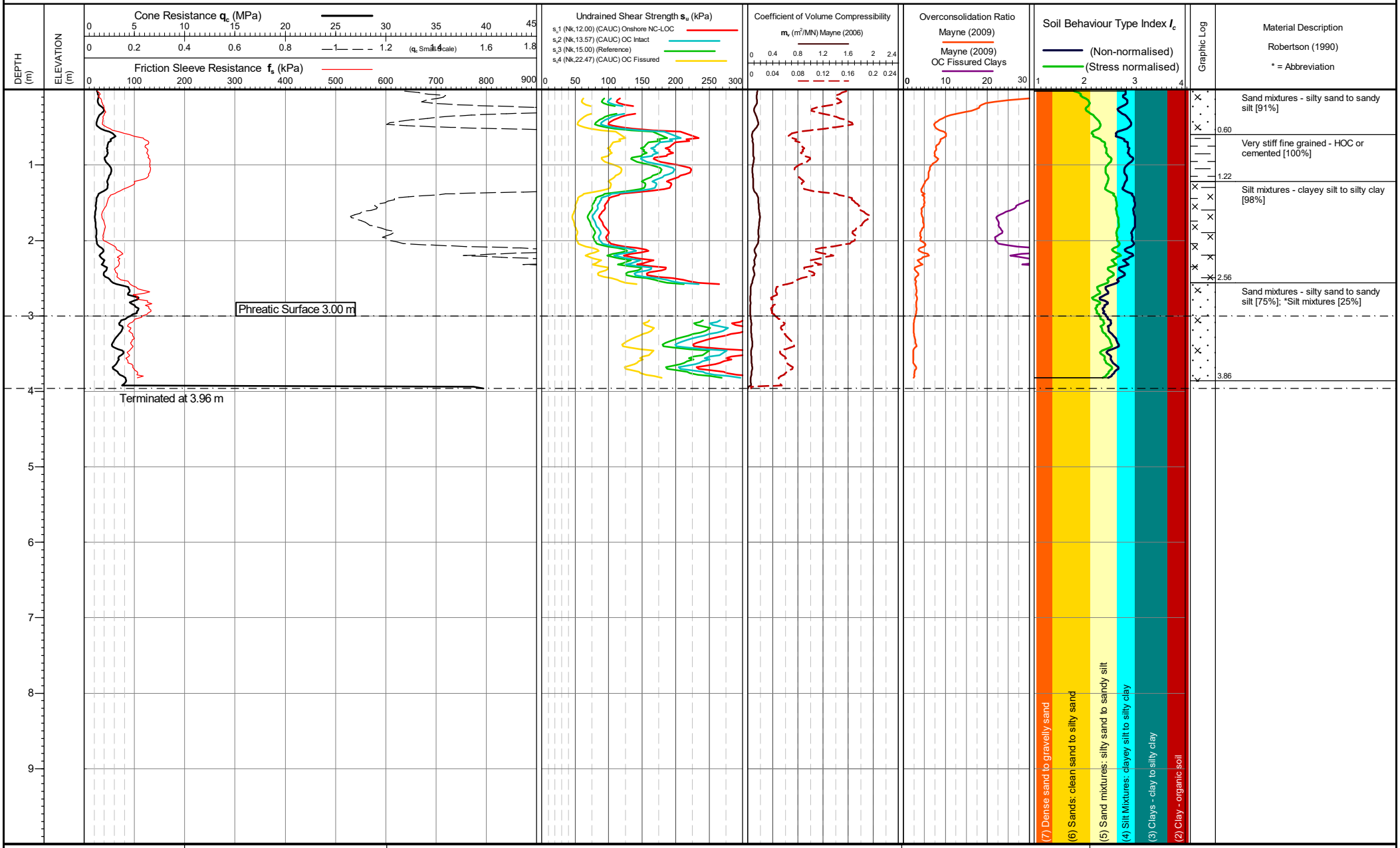
Checked by: Chris Player

TEST ID: CPT-24

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 12:35:44

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Total reaction force

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

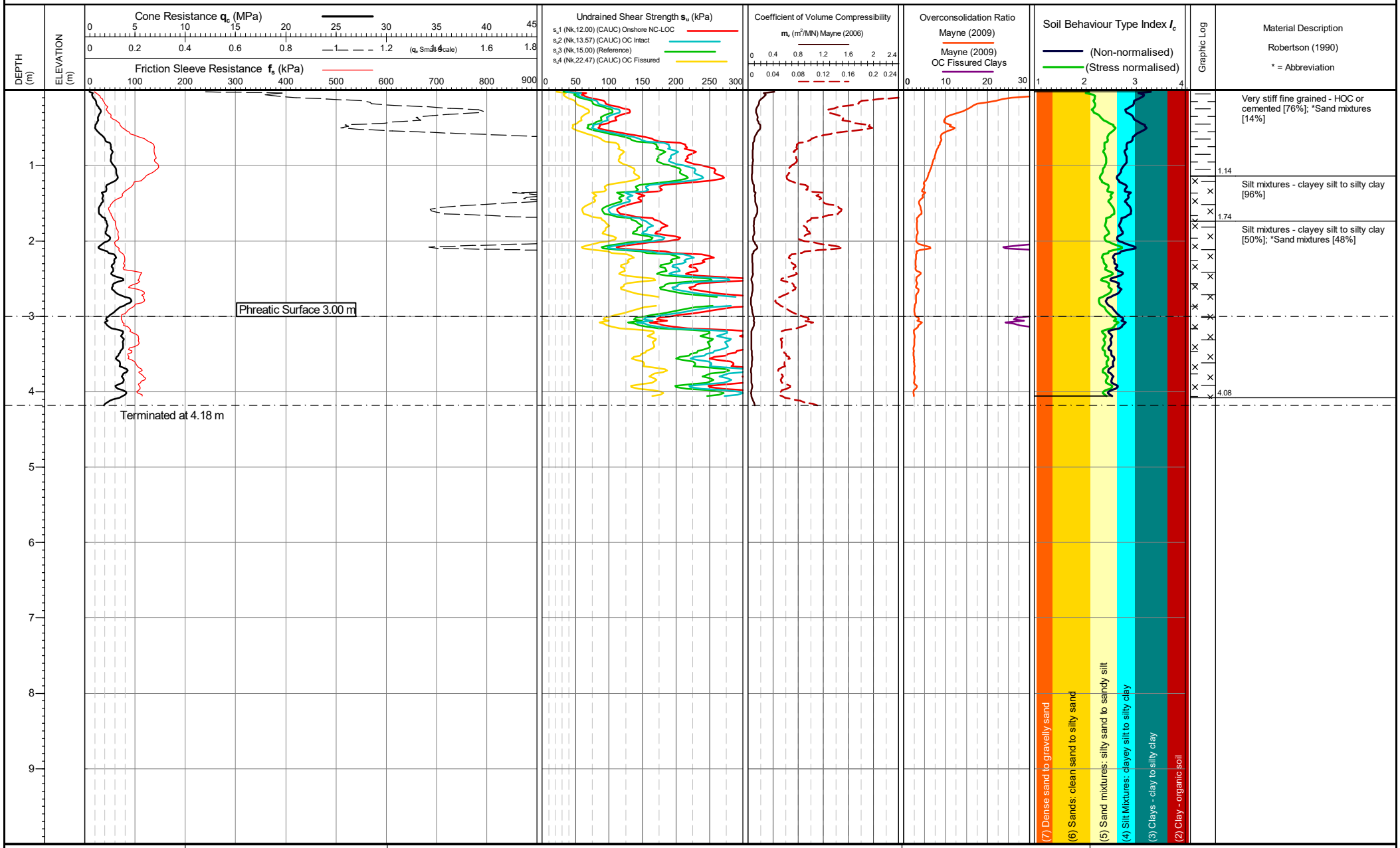
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-25

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 12:22:10

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

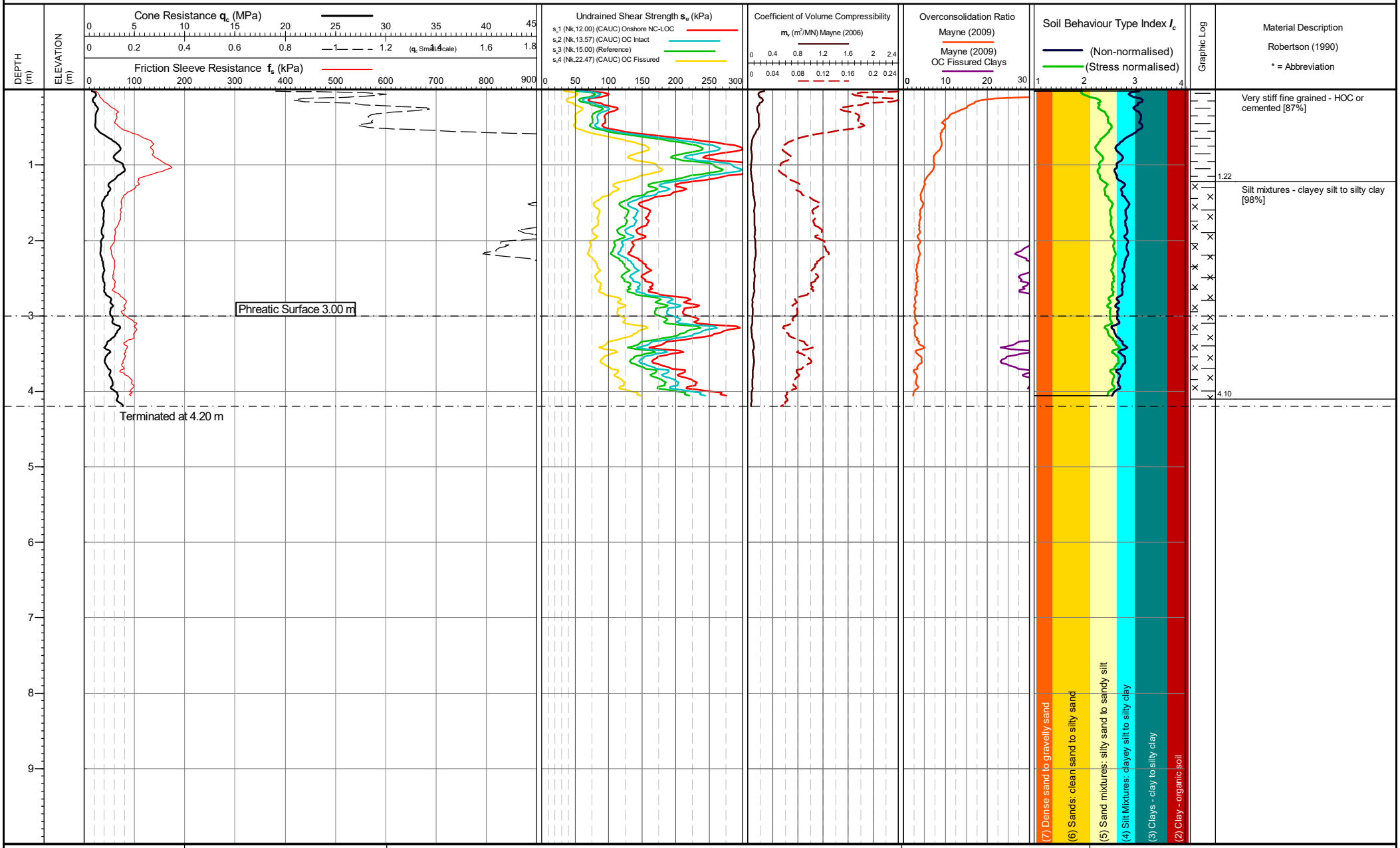
Checked by: Chris Player

TEST ID: CPT-26

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 13:50:52

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

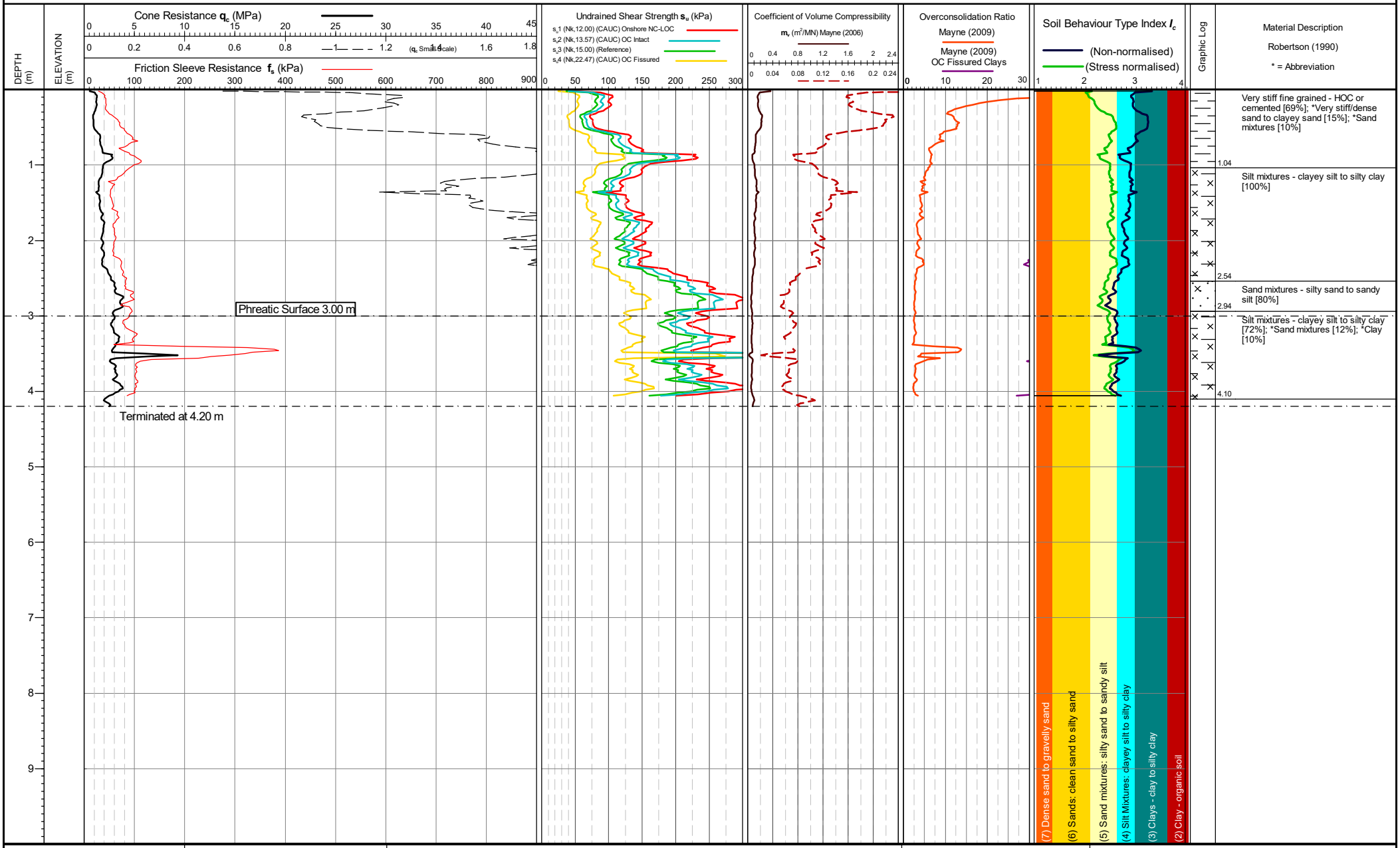
Checked by: Chris Player

TEST ID: CPT-27

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 13:19:55

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

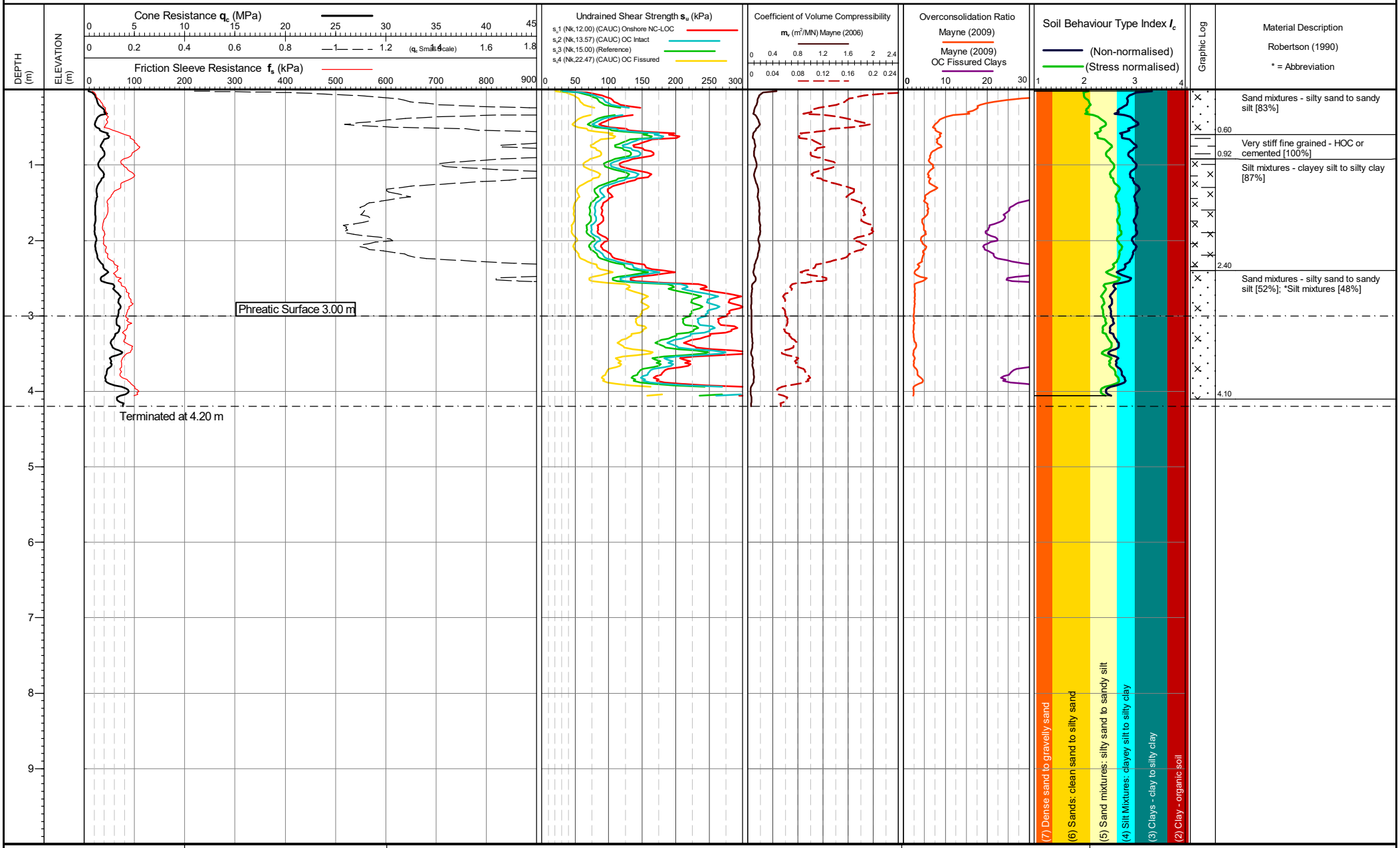
Checked by: Chris Player

TEST ID: CPT-28

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 13:05:28

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

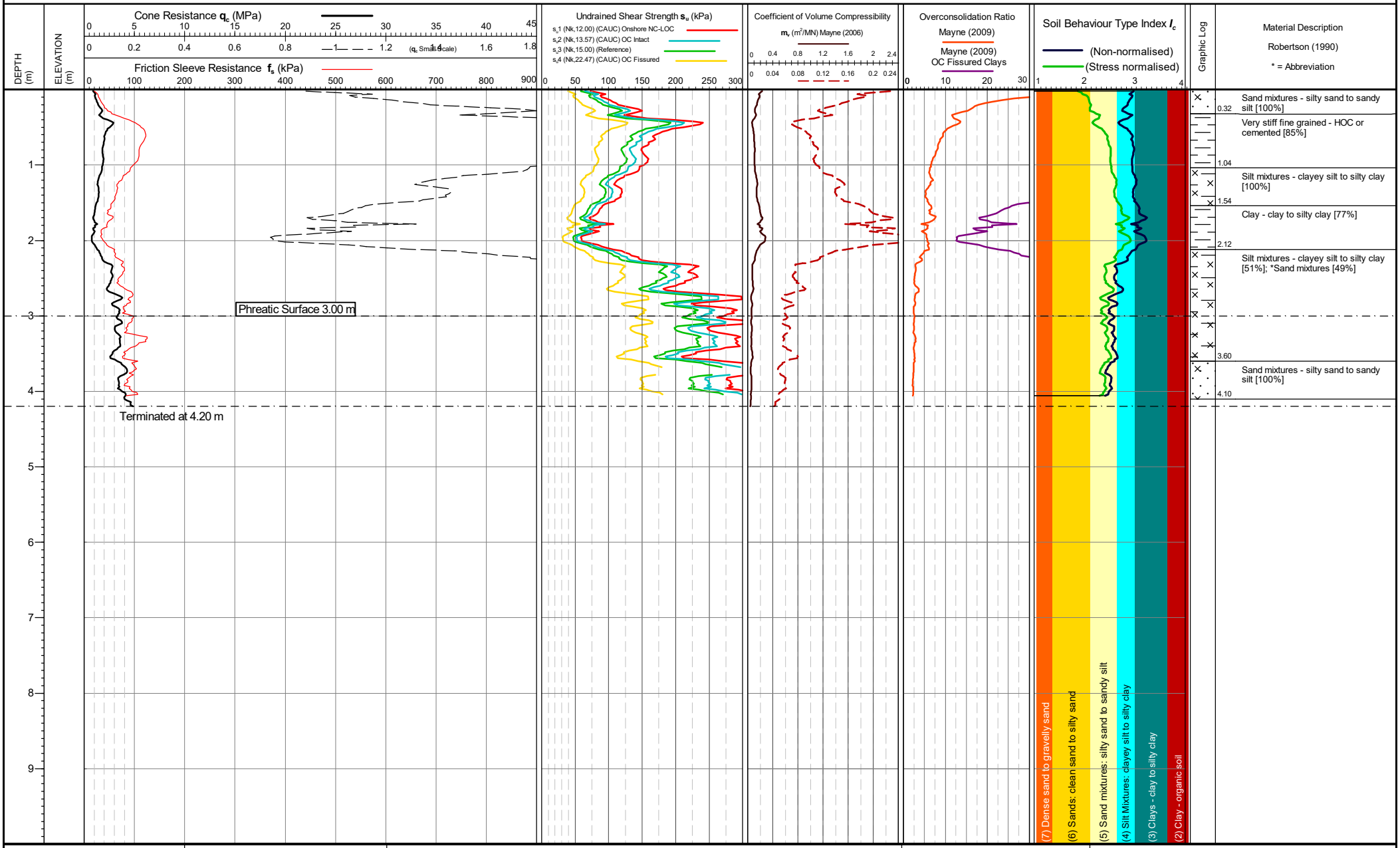
Checked by: Chris Player

TEST ID: CPT-29

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 12:45:44

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

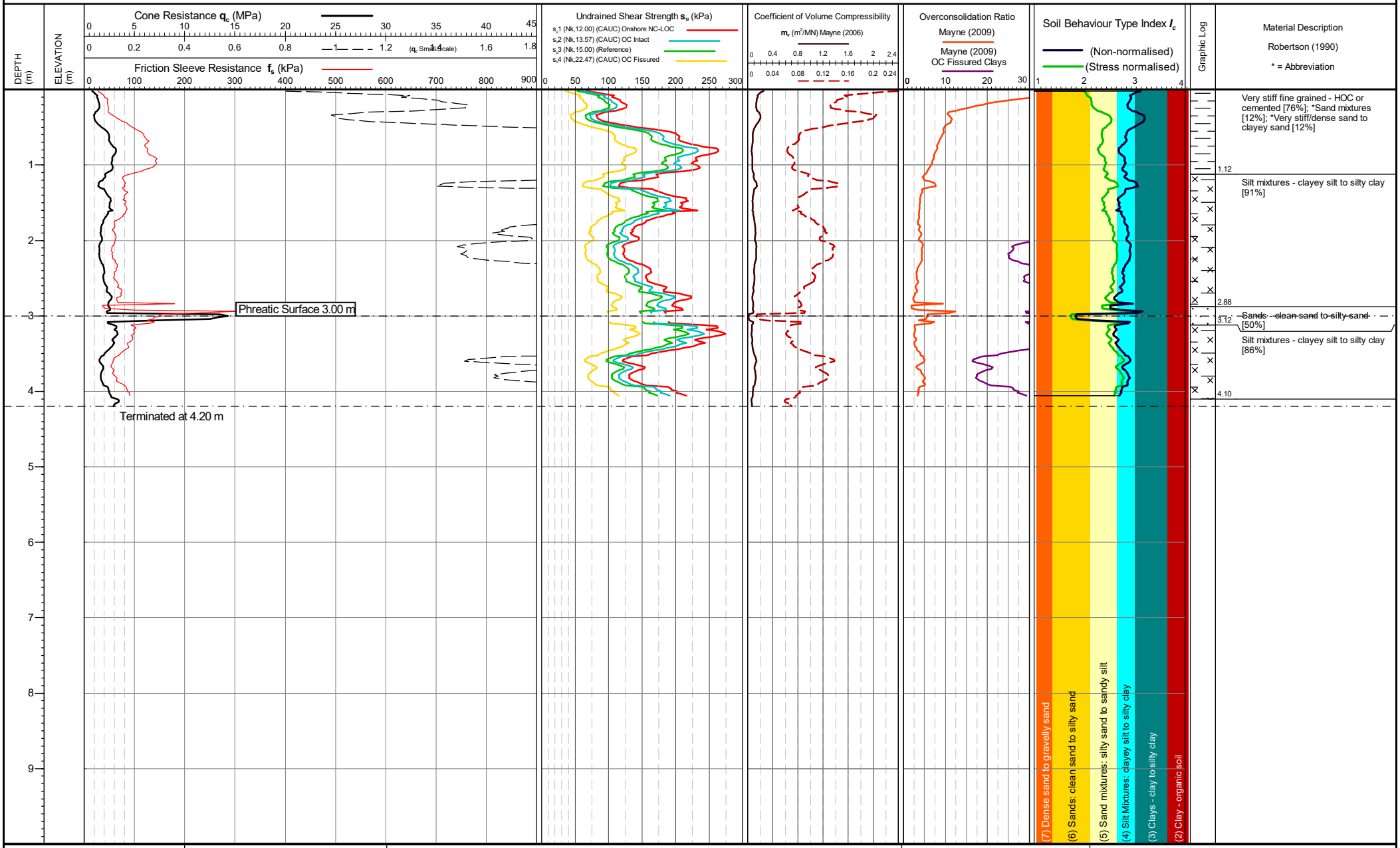
Checked by: Chris Player

TEST ID: CPT-30

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 14:05:51

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

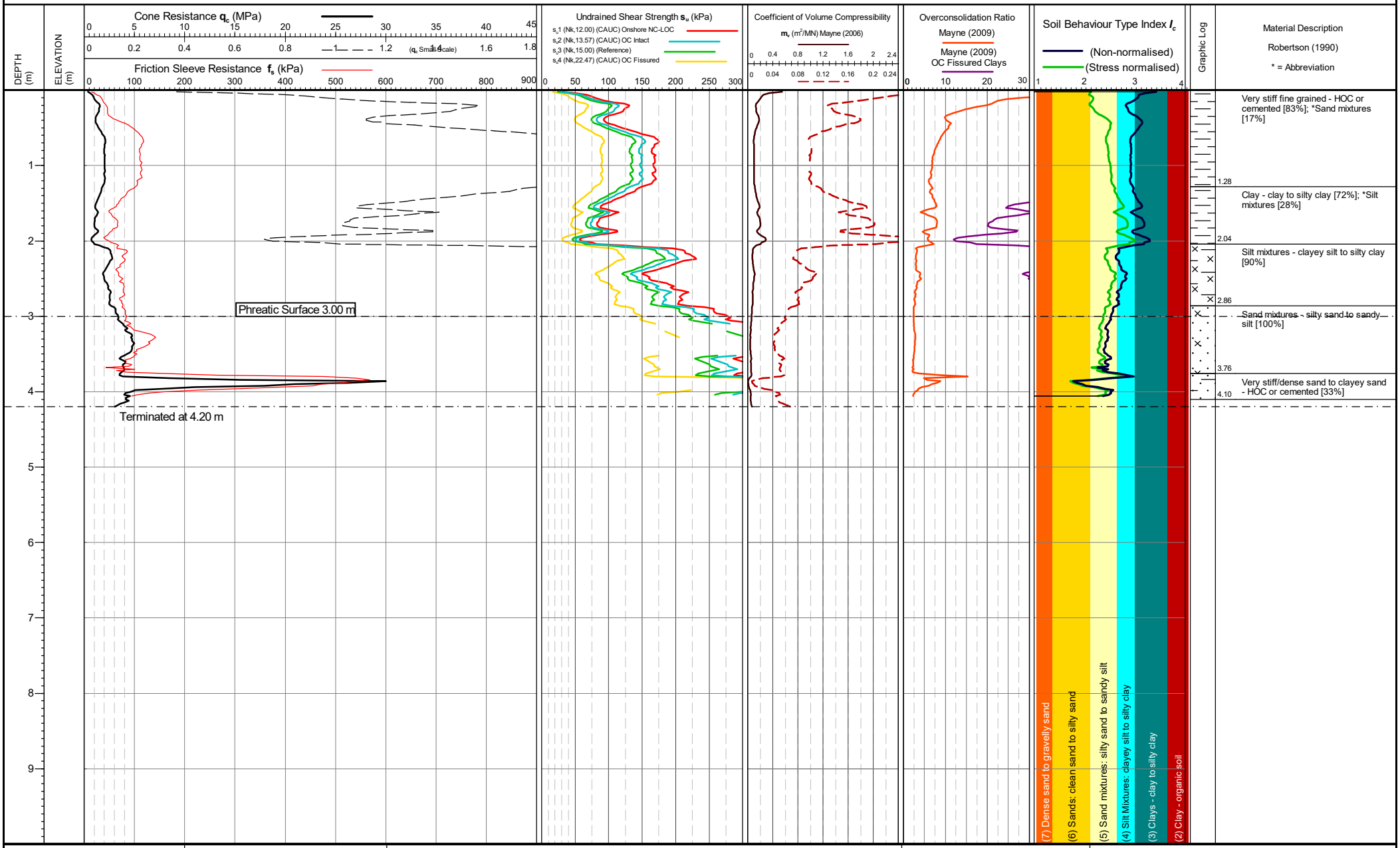
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-31

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 15:51:01

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

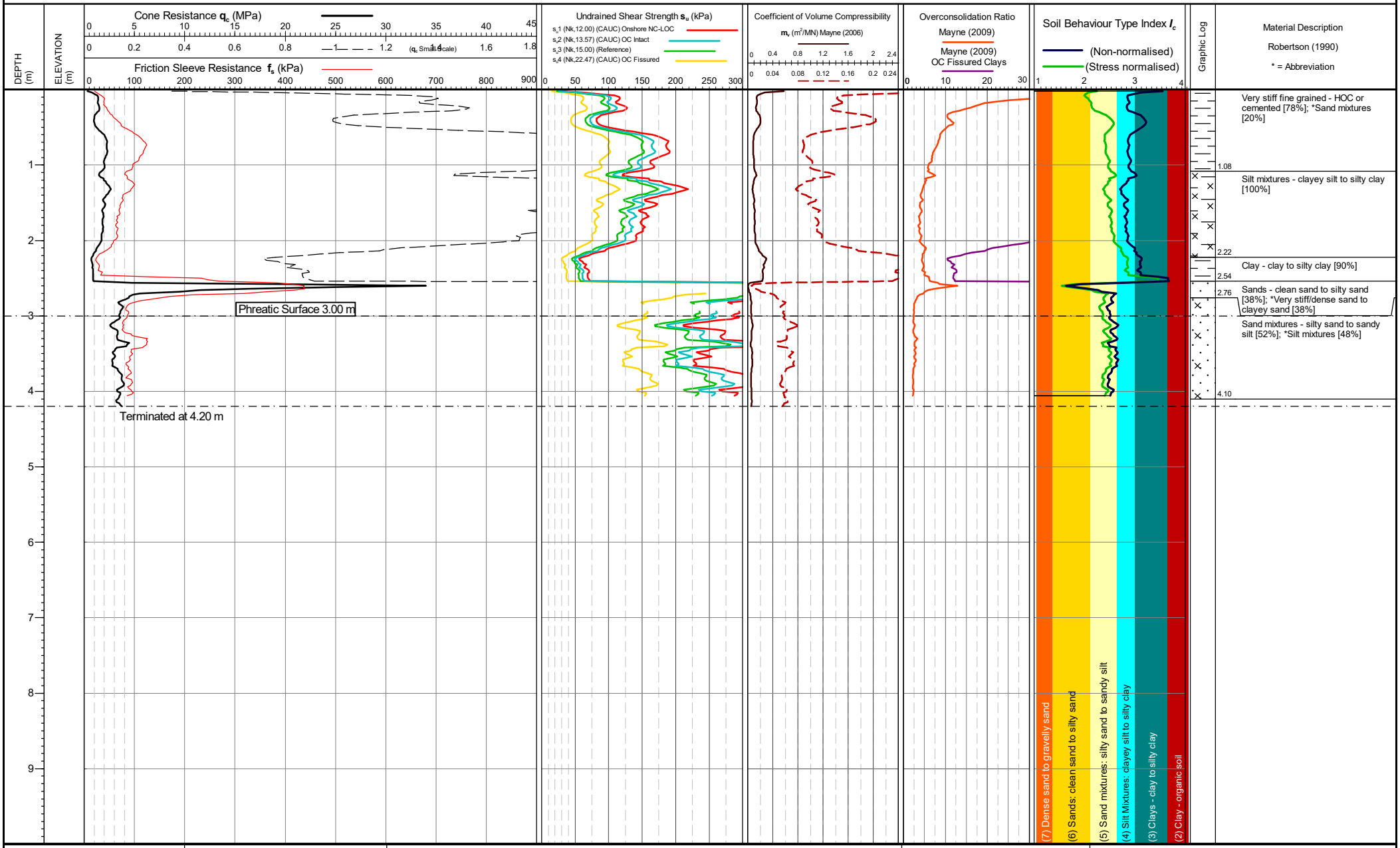
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-32

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 14:14:52

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

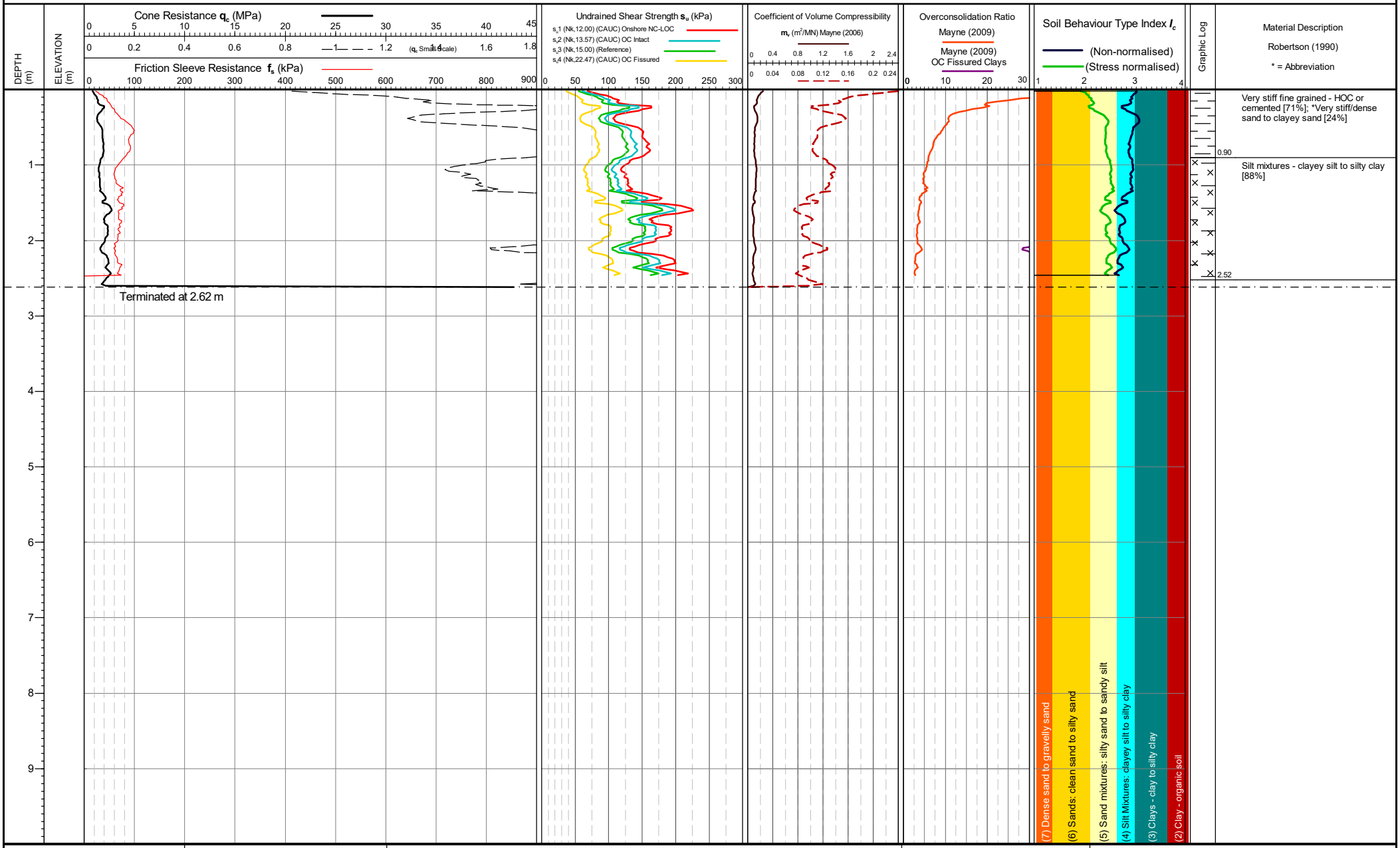
Checked by: Chris Player

TEST ID: CPT-33

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 14:29:32

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

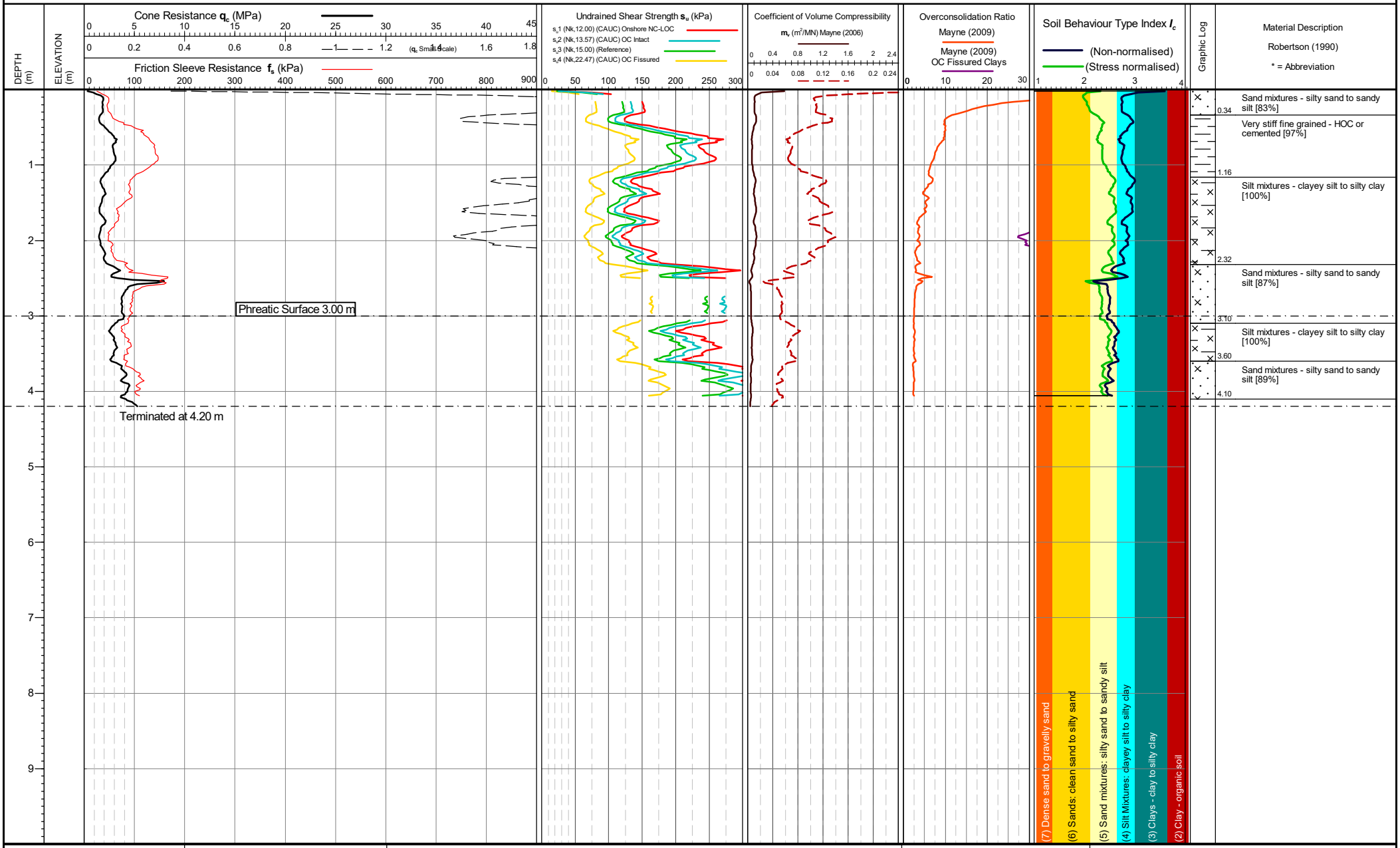
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-34

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 14:58:03

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

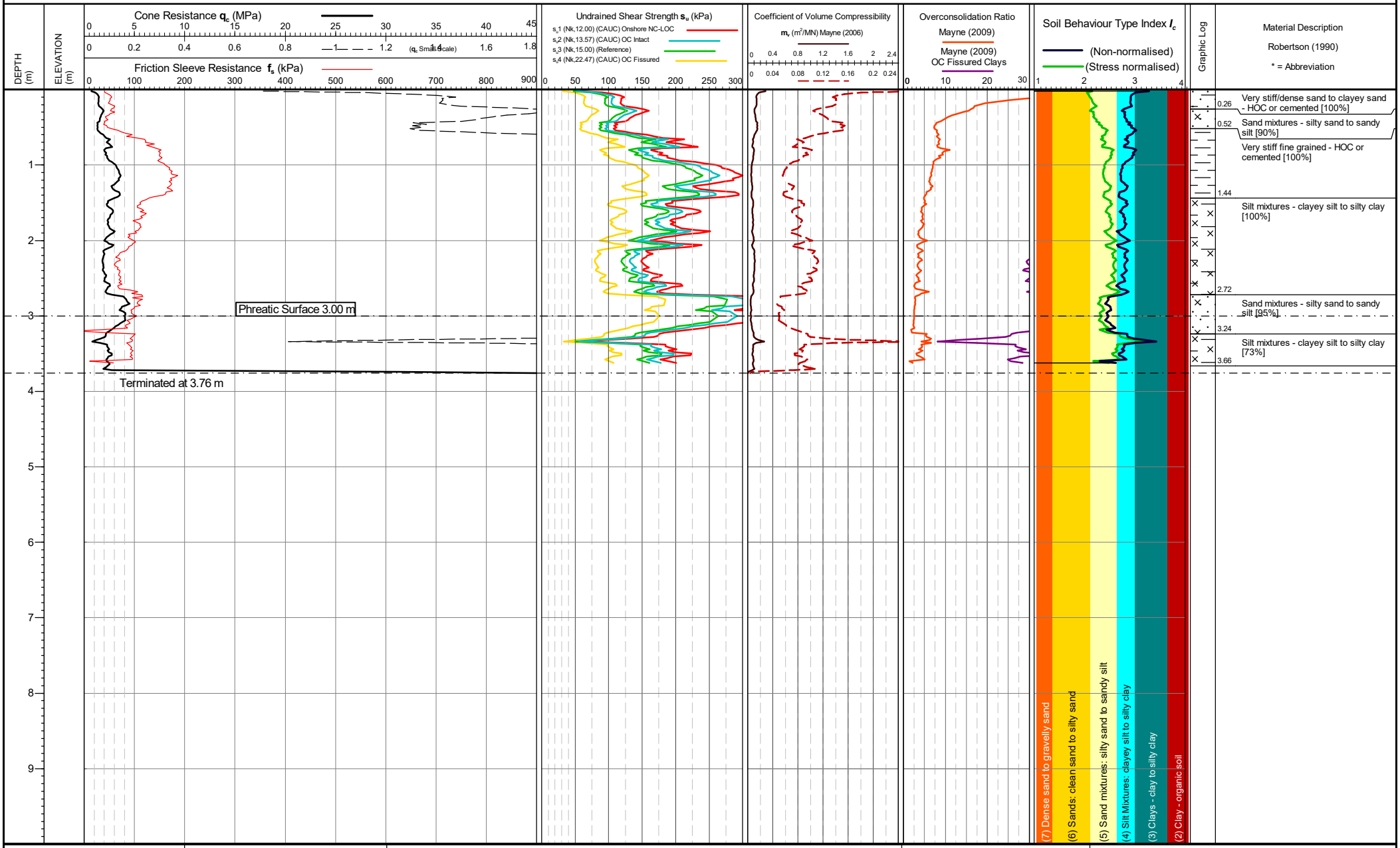
Checked by: Chris Player

TEST ID: CPT-35

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 08:08:51

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Total reaction force

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

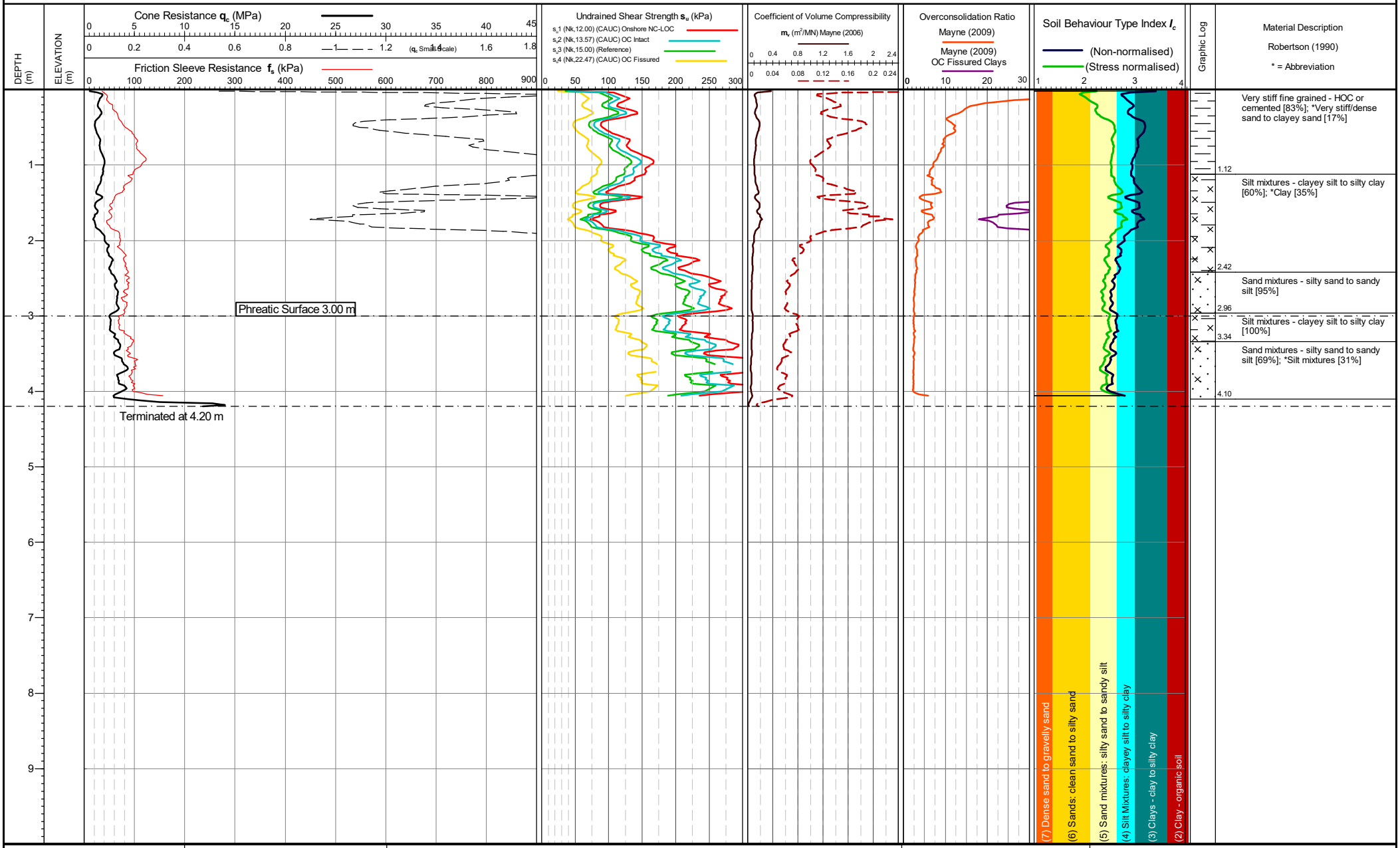
Checked by: Chris Player

TEST ID: CPT-36

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2074
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 08:33:54

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

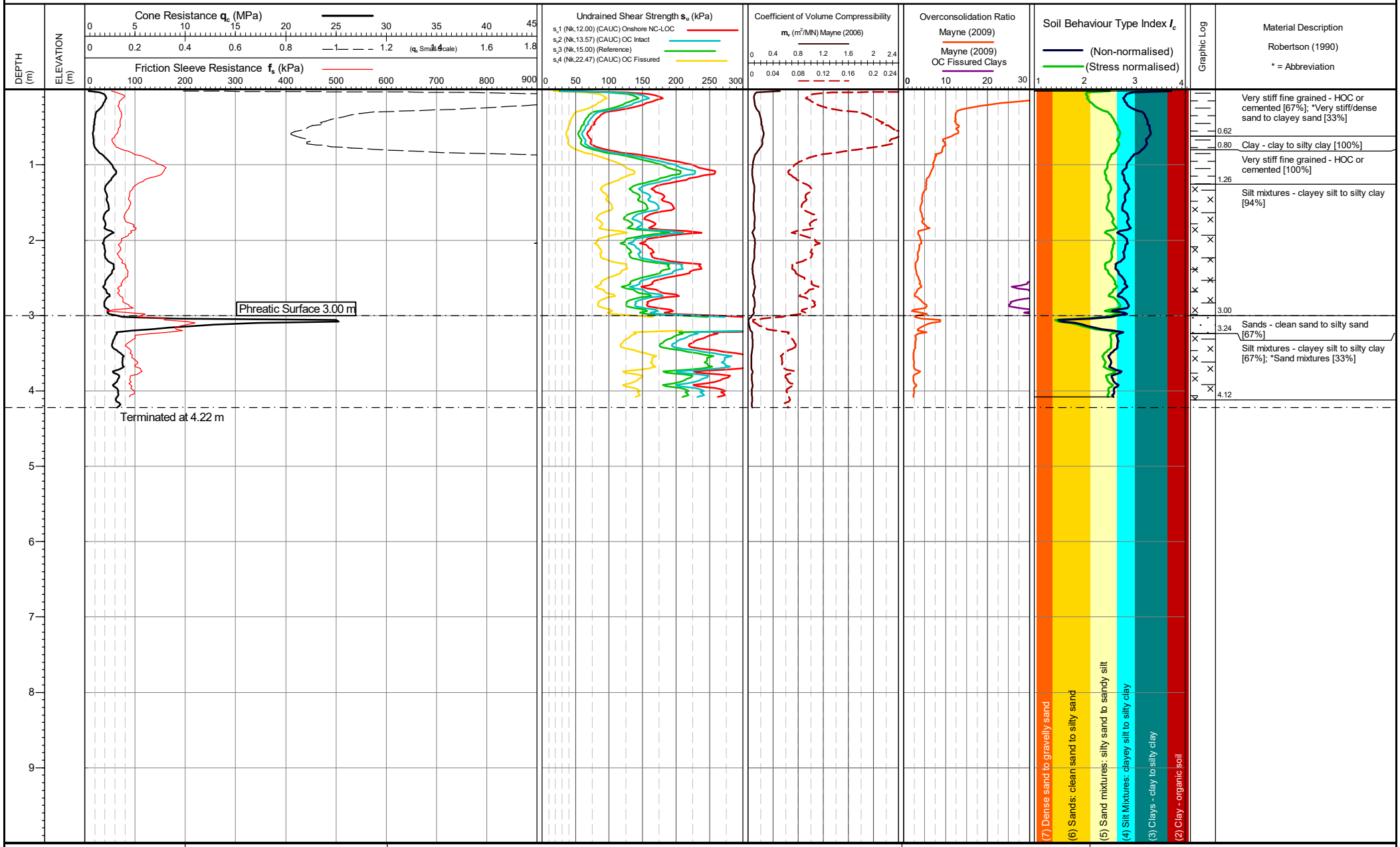
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-37

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 08:58:34

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

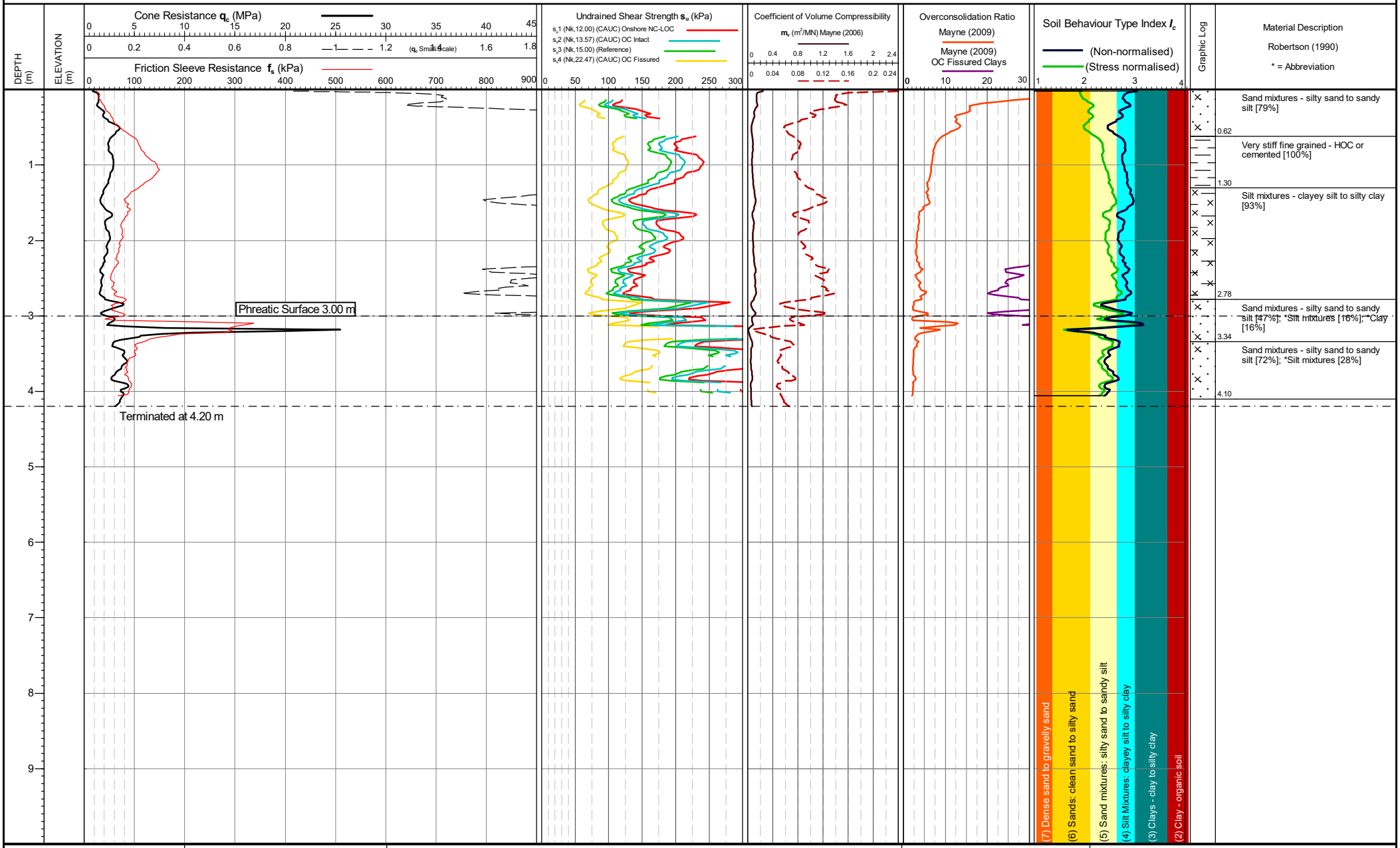
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-38

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 15:12:42

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

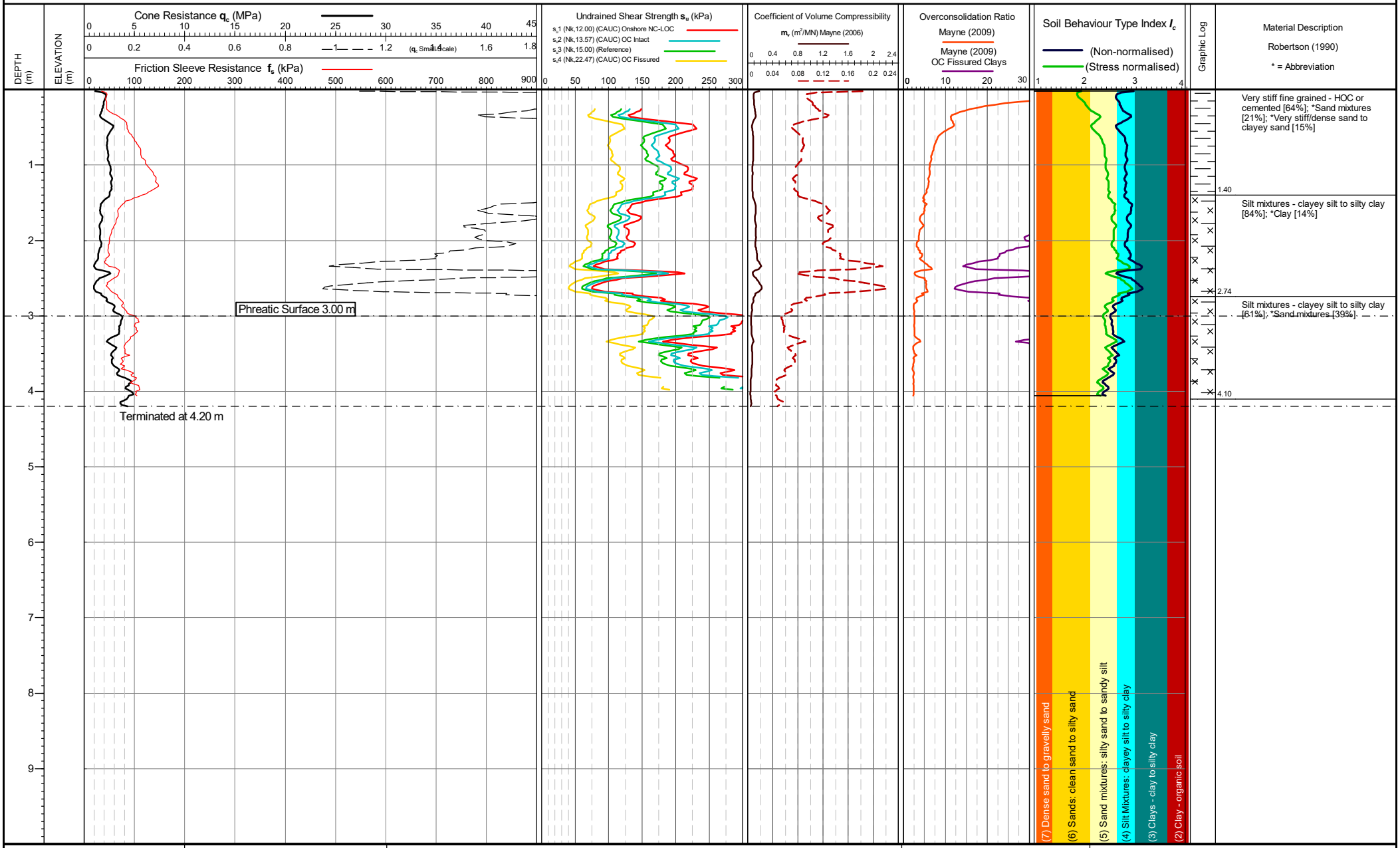
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-39

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 15:33:05

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

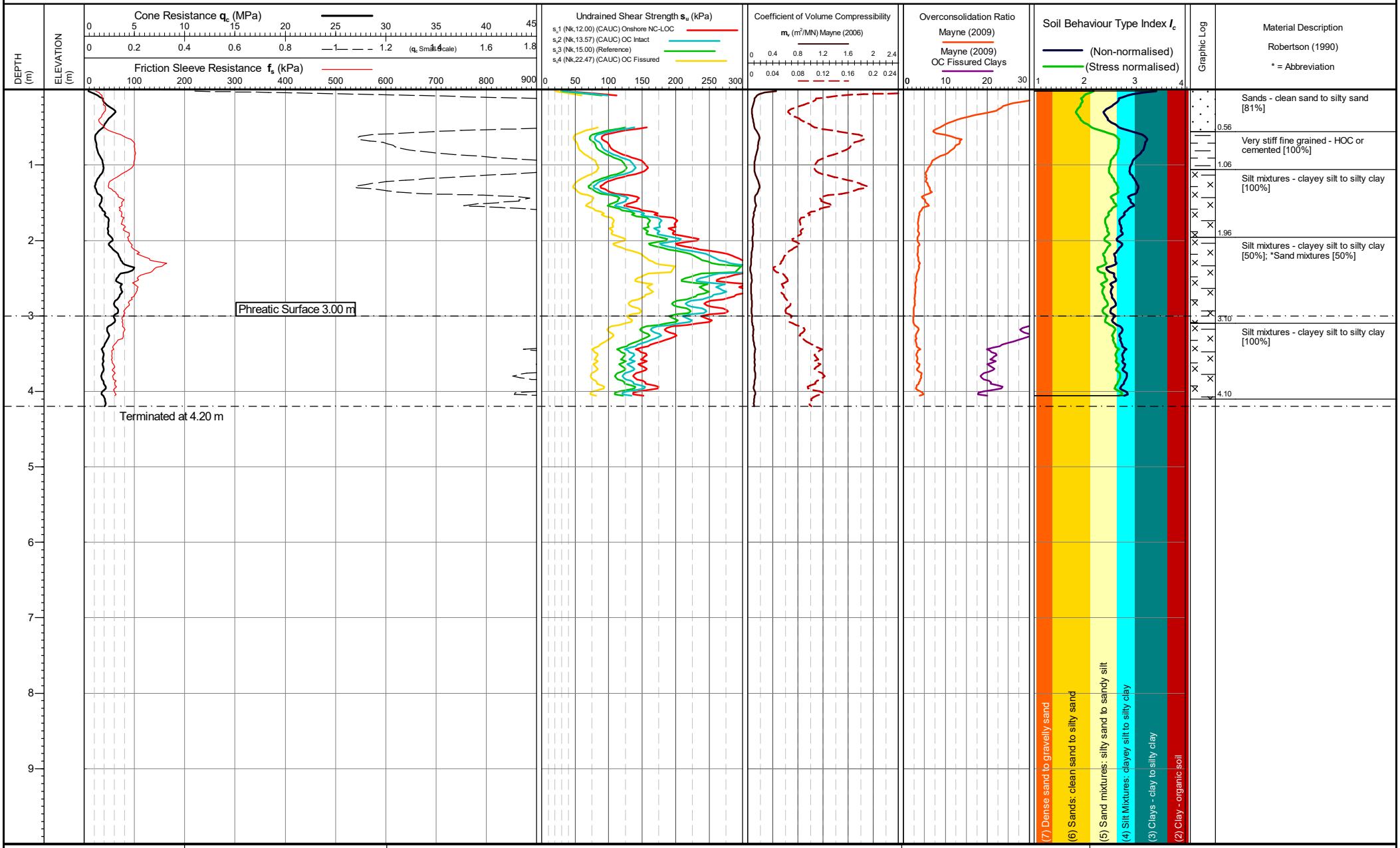
Checked by: Chris Player

TEST ID: CPT-40

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 09:29:08

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

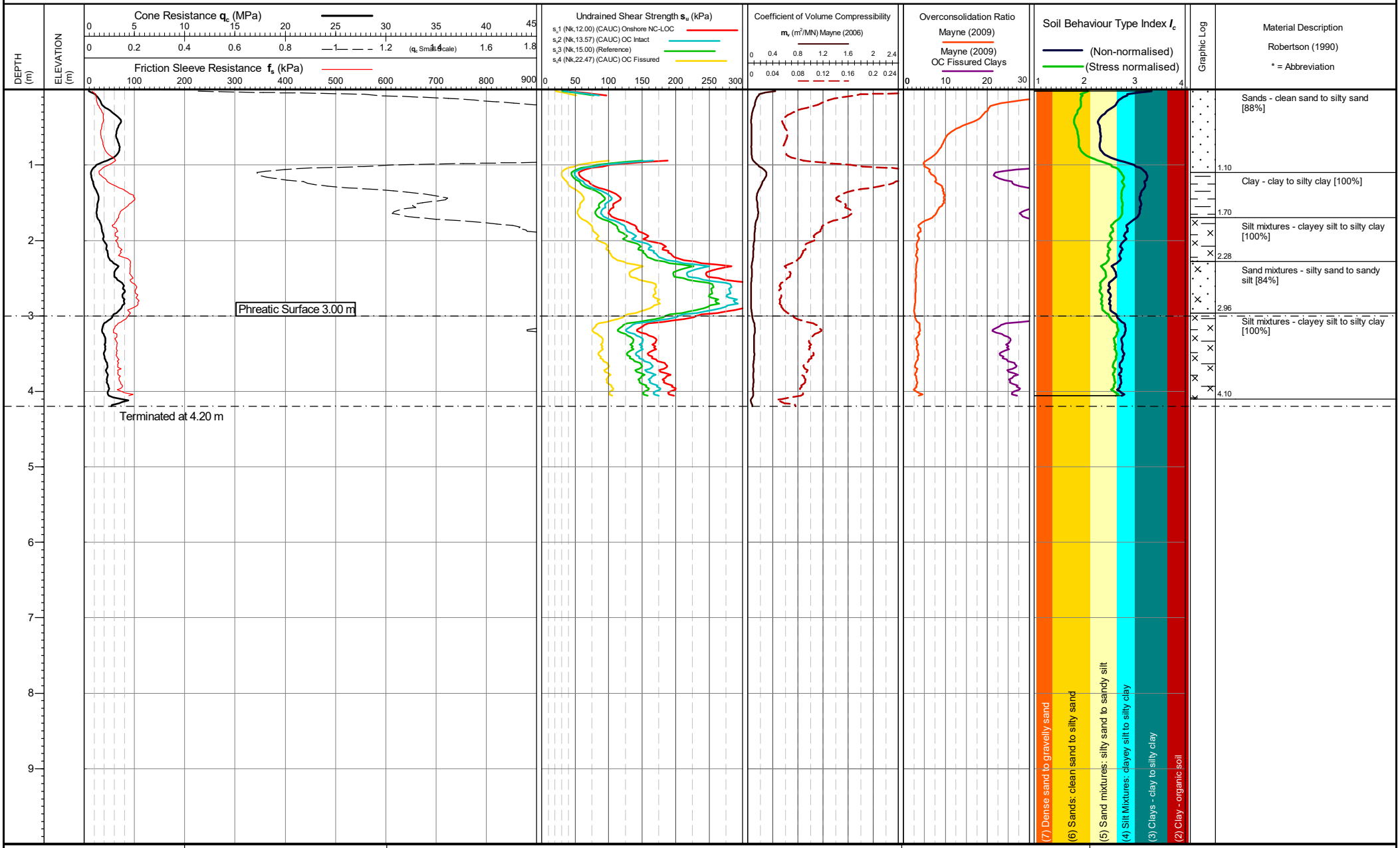
Checked by: Chris Player

TEST ID: CPT-41

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 09:39:35

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

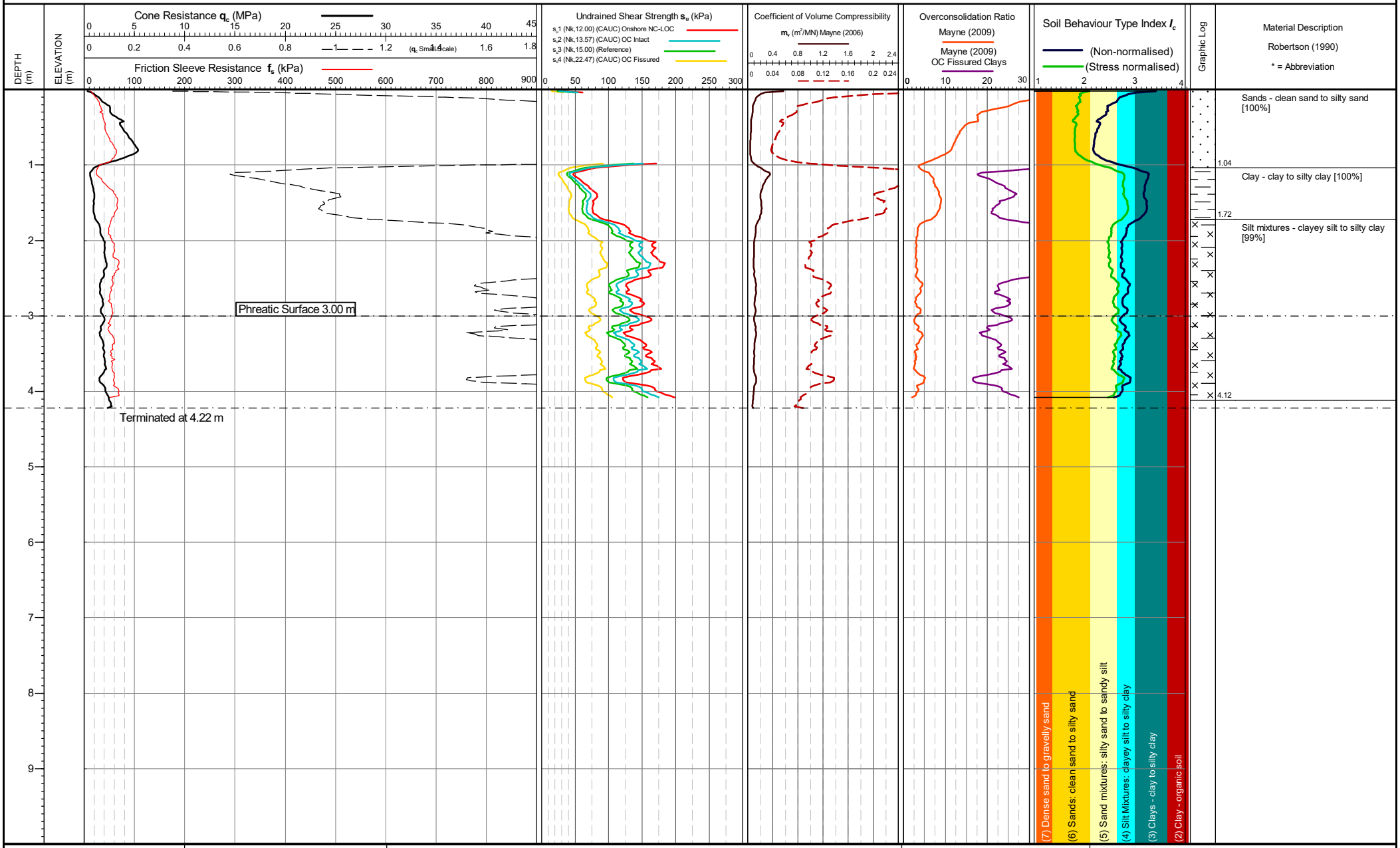
Checked by: Chris Player

TEST ID: CPT-42

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 09:52:18

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

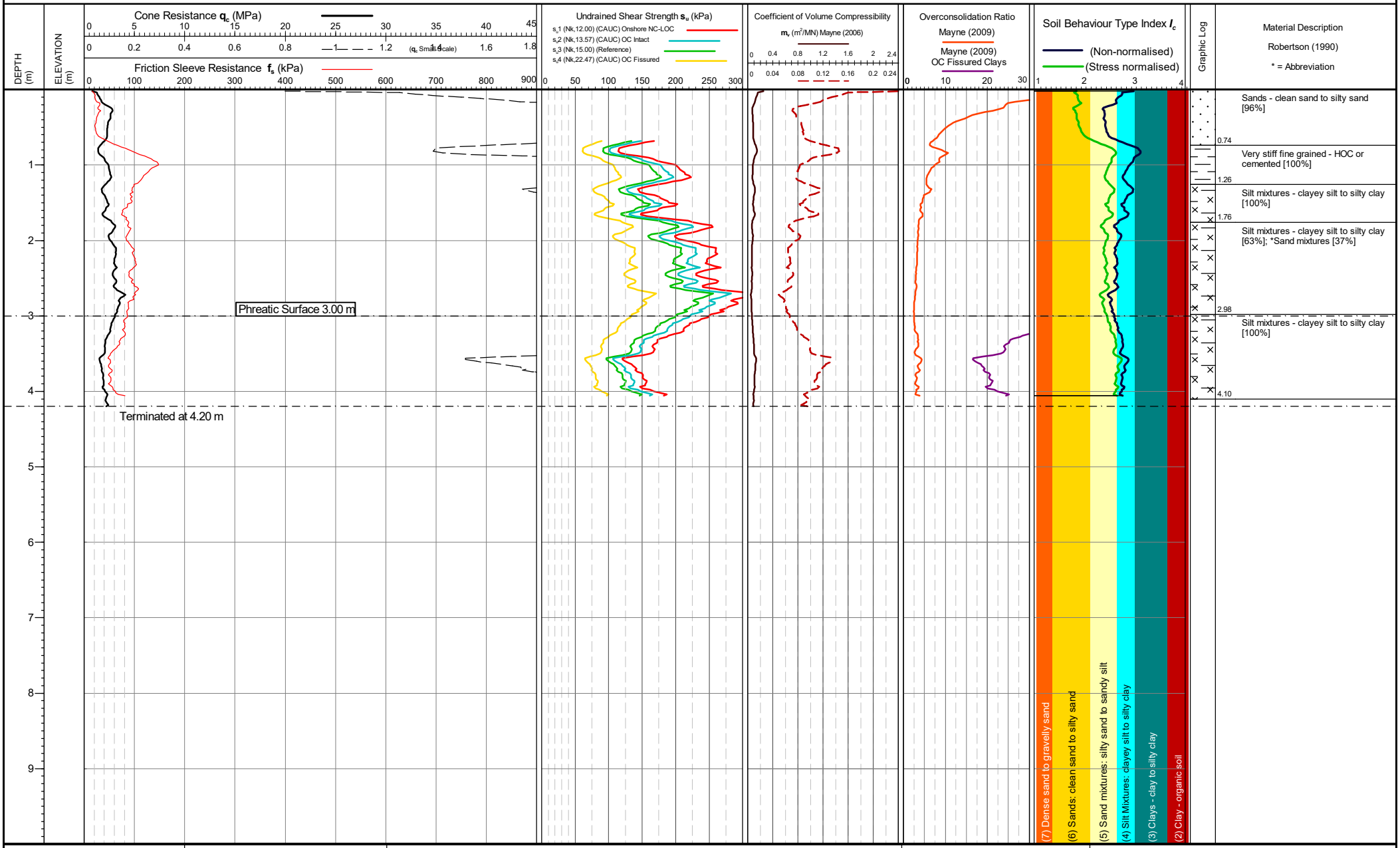
Checked by: Chris Player

TEST ID: CPT-43

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 15:21:14

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

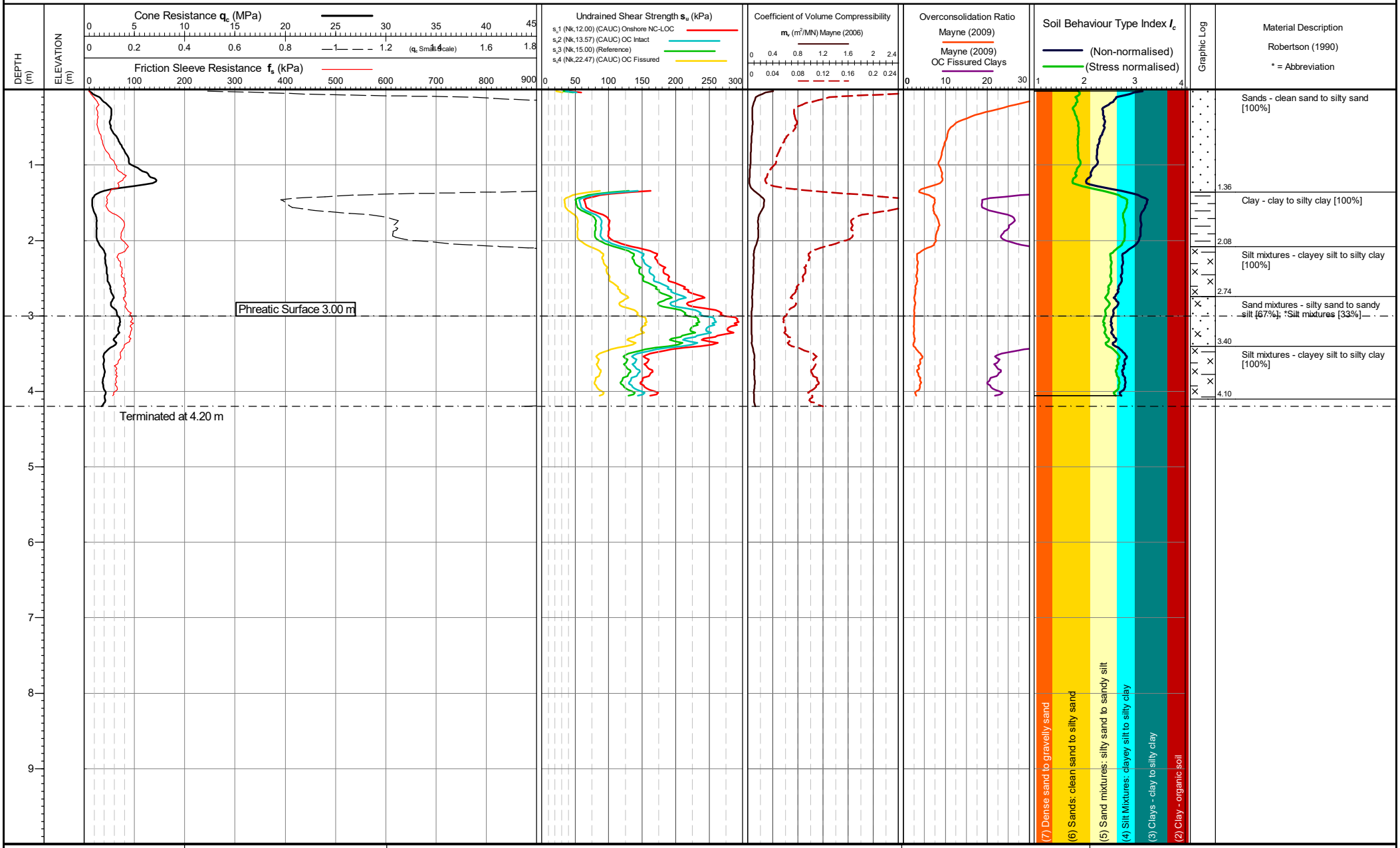
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-44

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 10:01:52

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

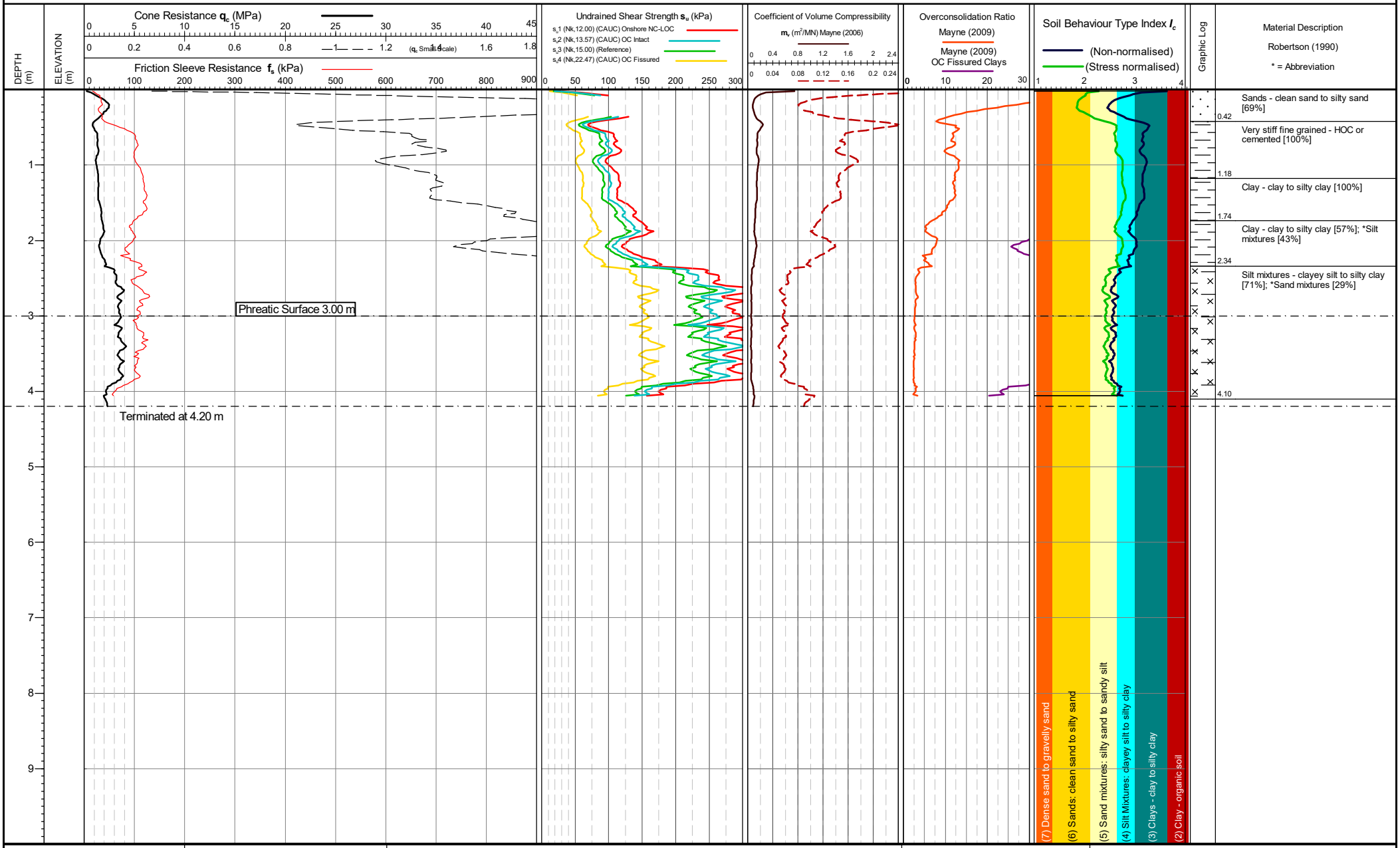
Checked by: Chris Player

TEST ID: CPT-45

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 10:26:03

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

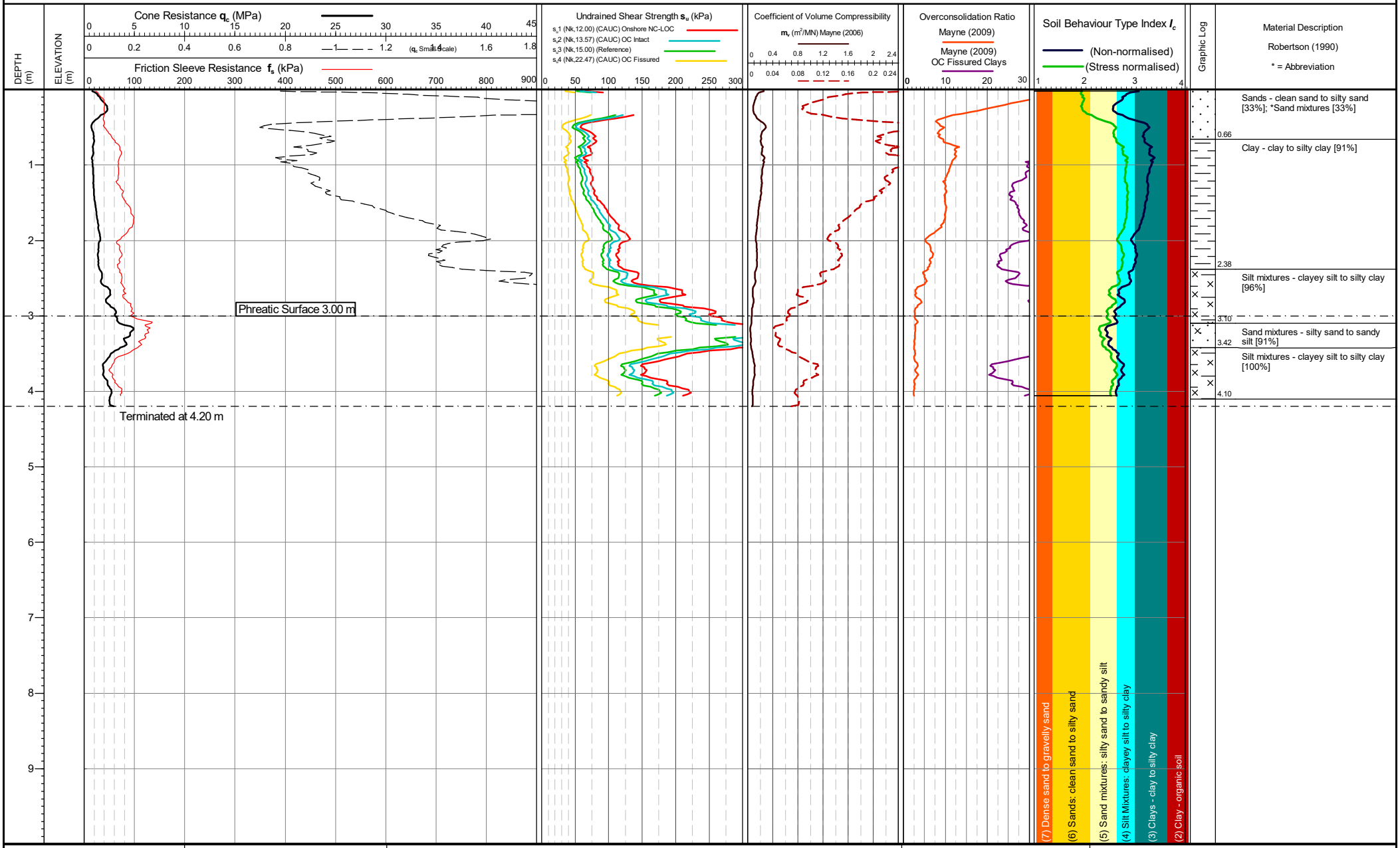
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-46

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 10:36:17

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

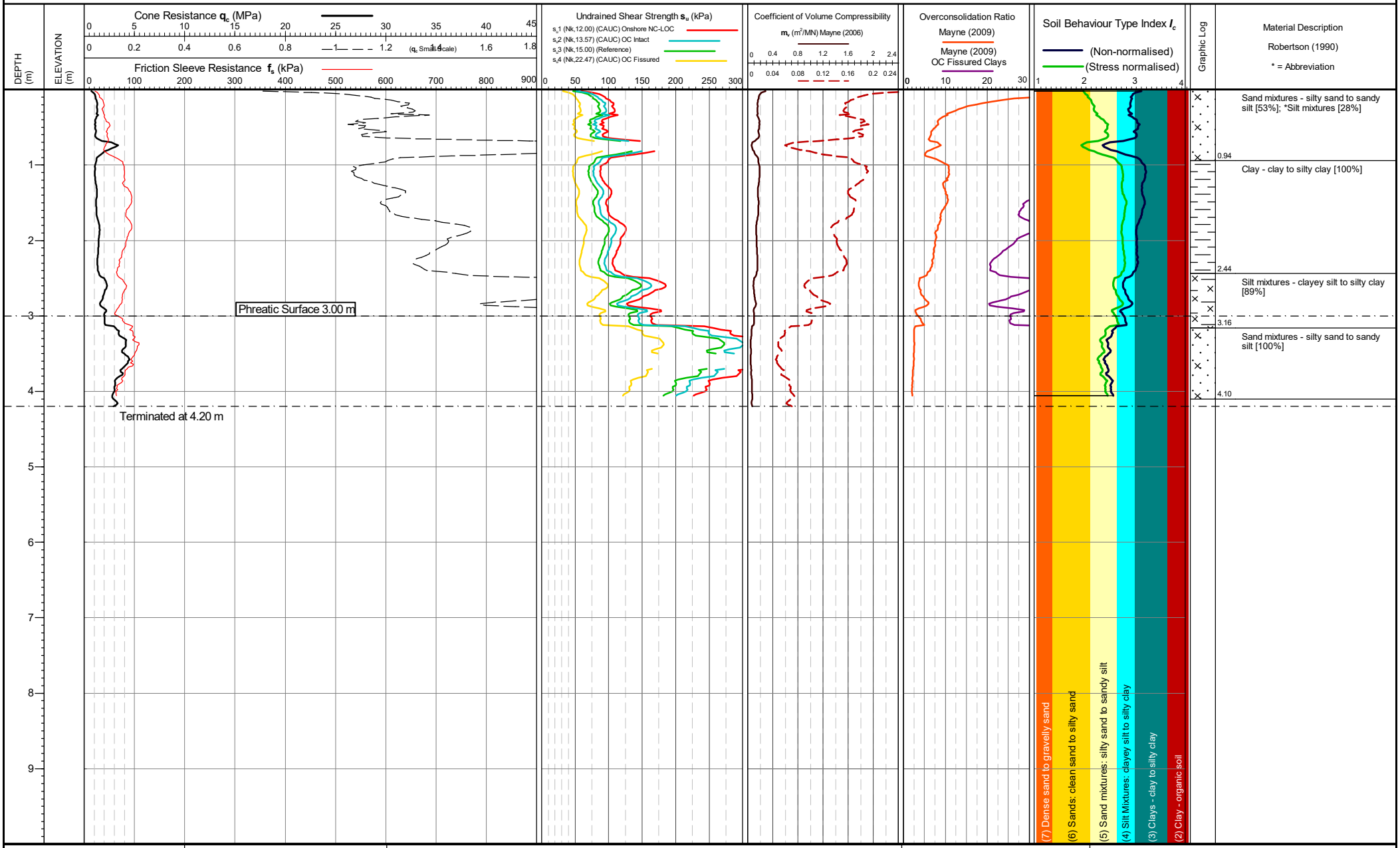
Checked by: Chris Player

TEST ID: CPT-47

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 10:50:04

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

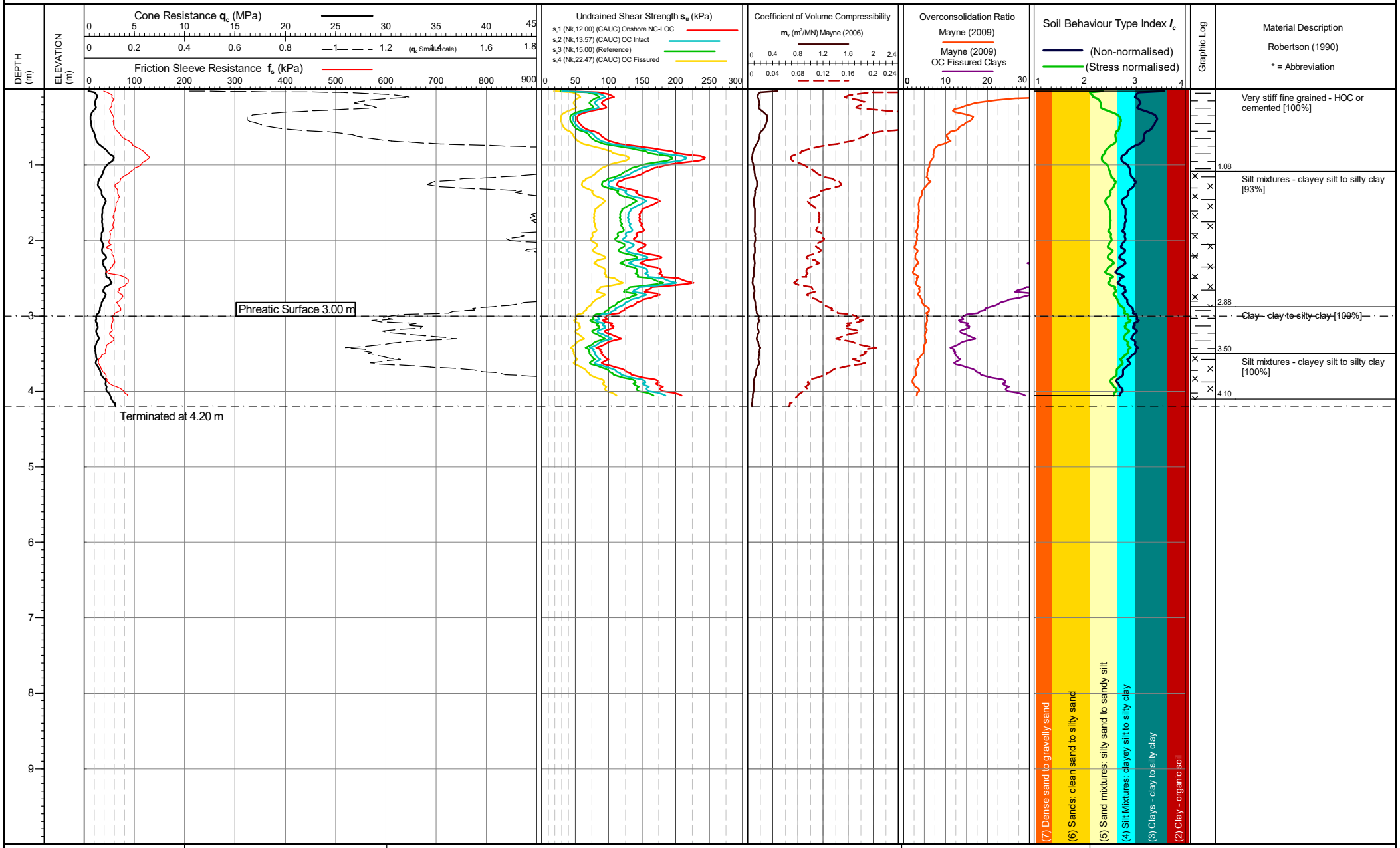
Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: CPT-48

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
ConeID: S15-CFIPTT.2477
Operator: Owen Treharne
Rig Used: UK22
Date of test: 30/09/2025 11:25:23

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

Remarks: *Phreatic surface origin: Arbitrary value

Termination Remark: Target depth

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Lankelma Project Ref: 25-32-30218-1

Checked by: Chris Player

TEST ID: SPT-14

APPENDIX F PARAMETER RESULTS 2 – SPT N60, PHI, D_R, E, I_C

Equivalent SPT N60

Peak friction angle

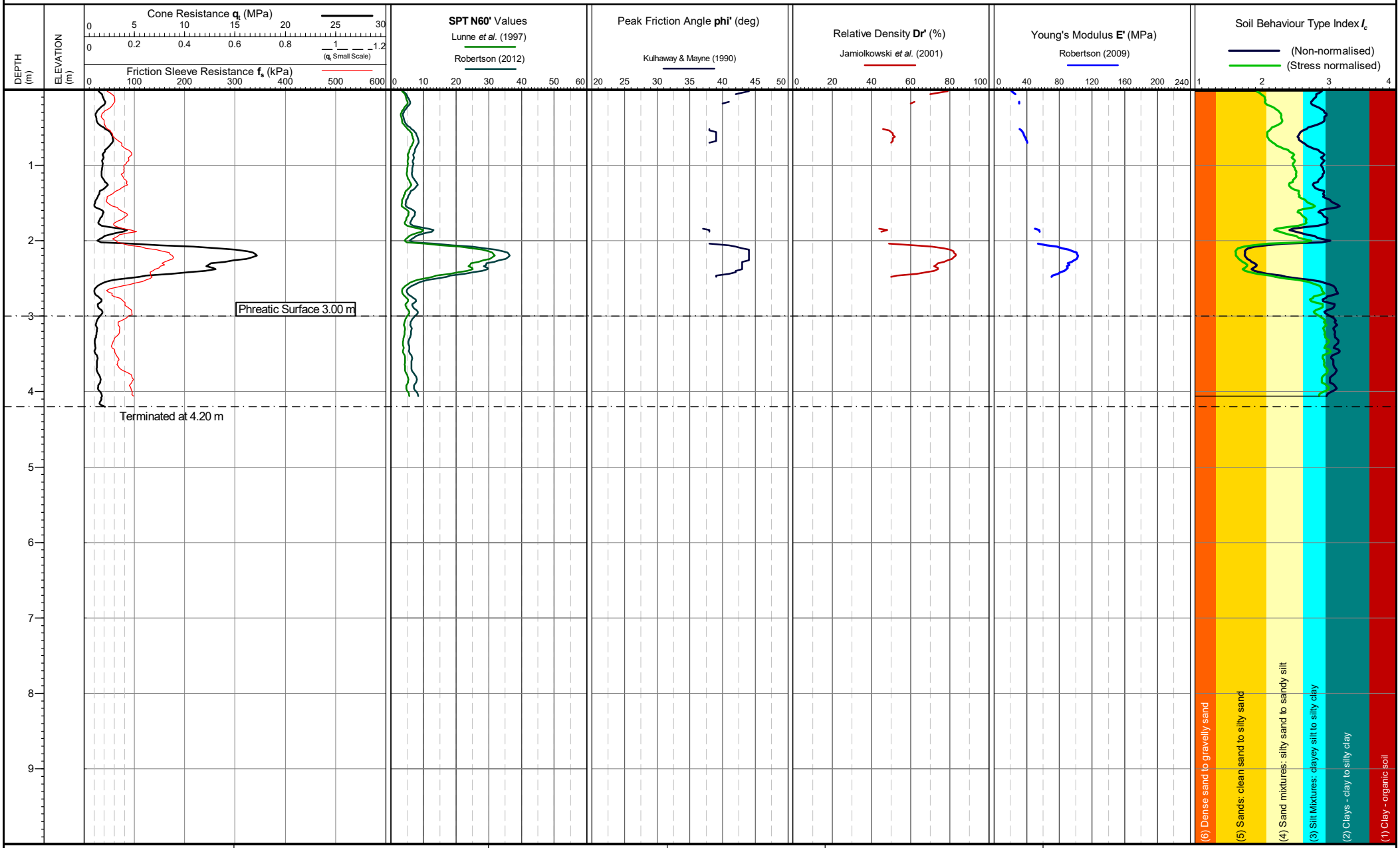
Relative density

Young's modulus

SBT index I_c

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 12:10:55

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

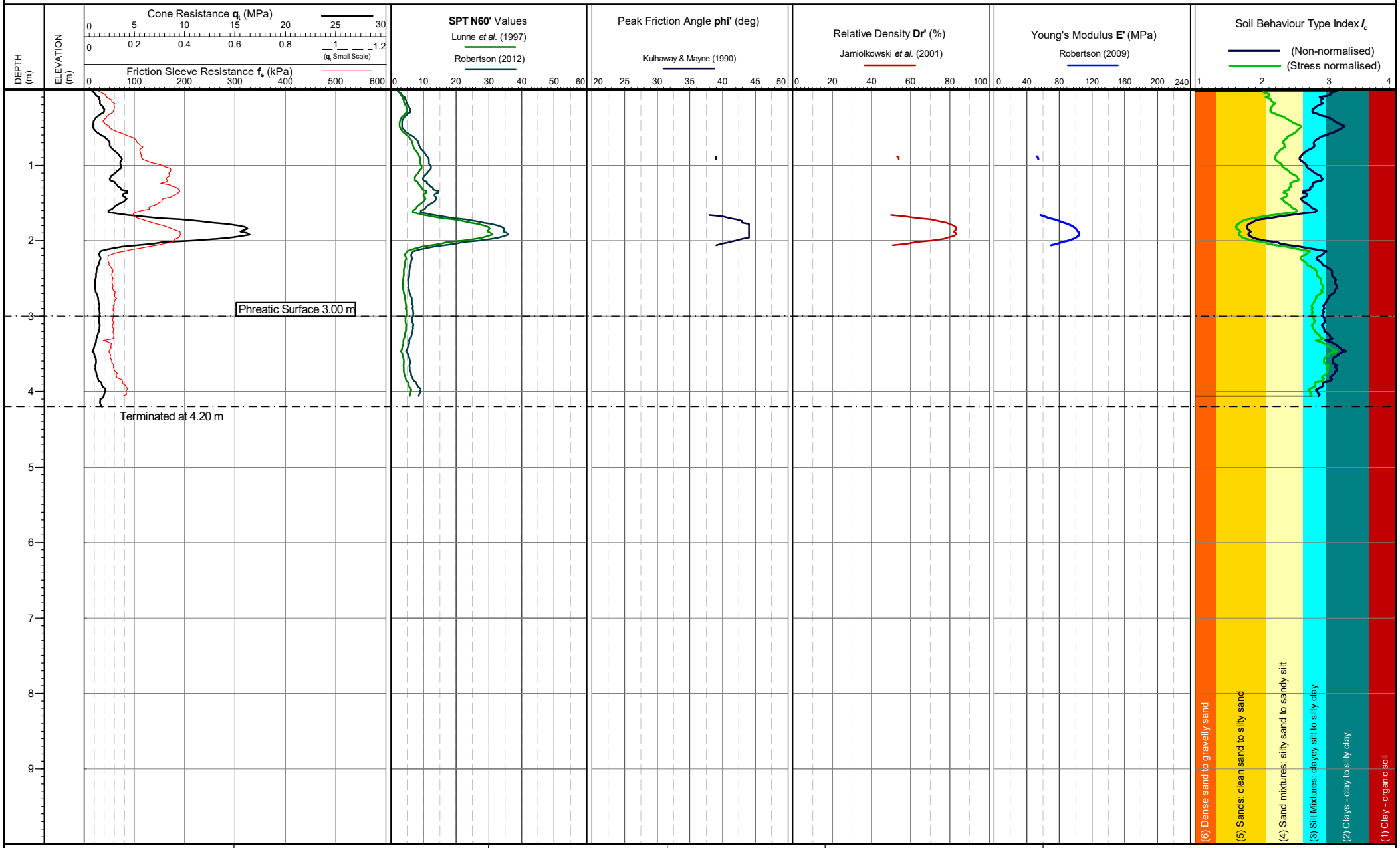
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-01

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 11:30:59

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

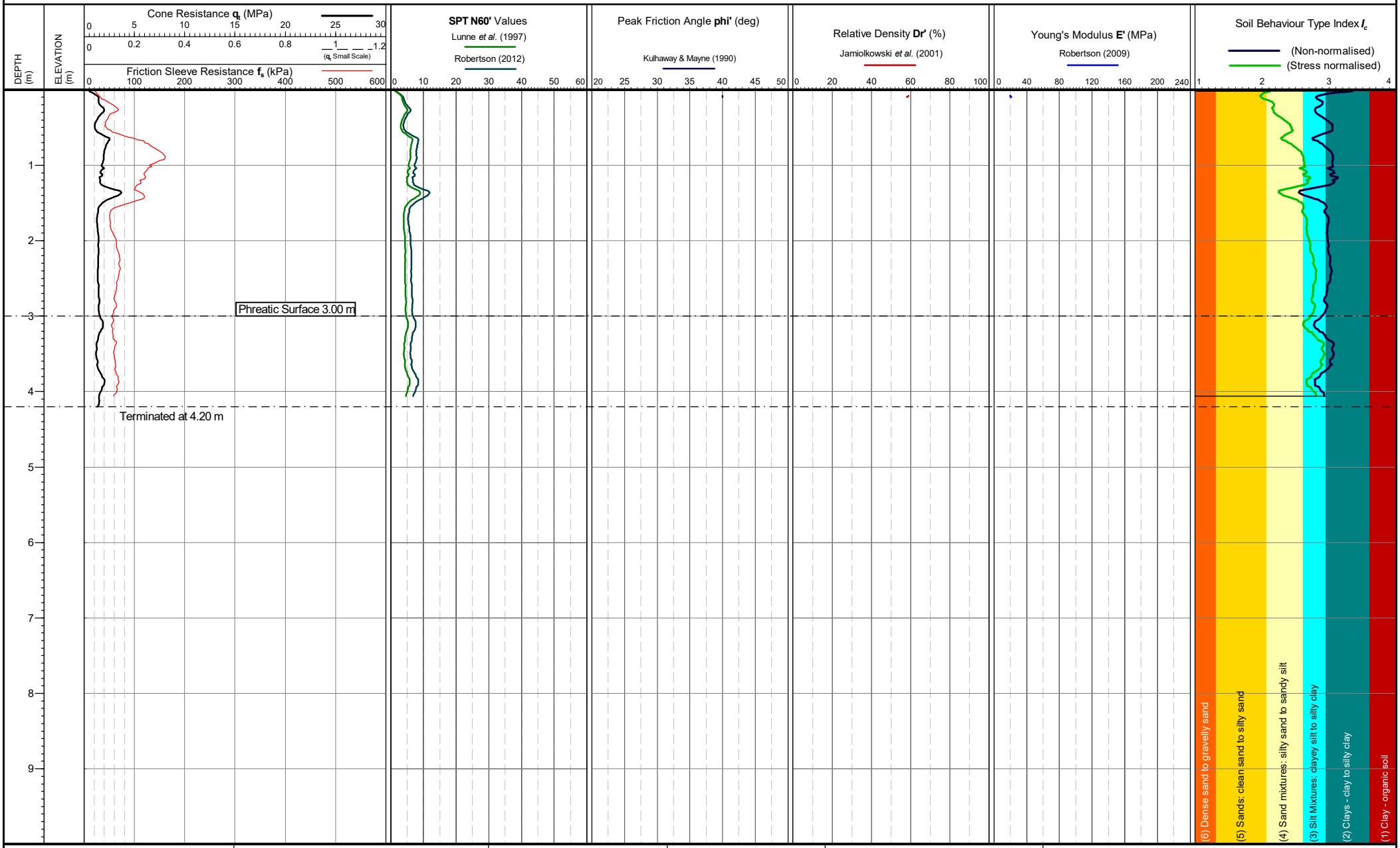
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-02

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 10:41:56

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

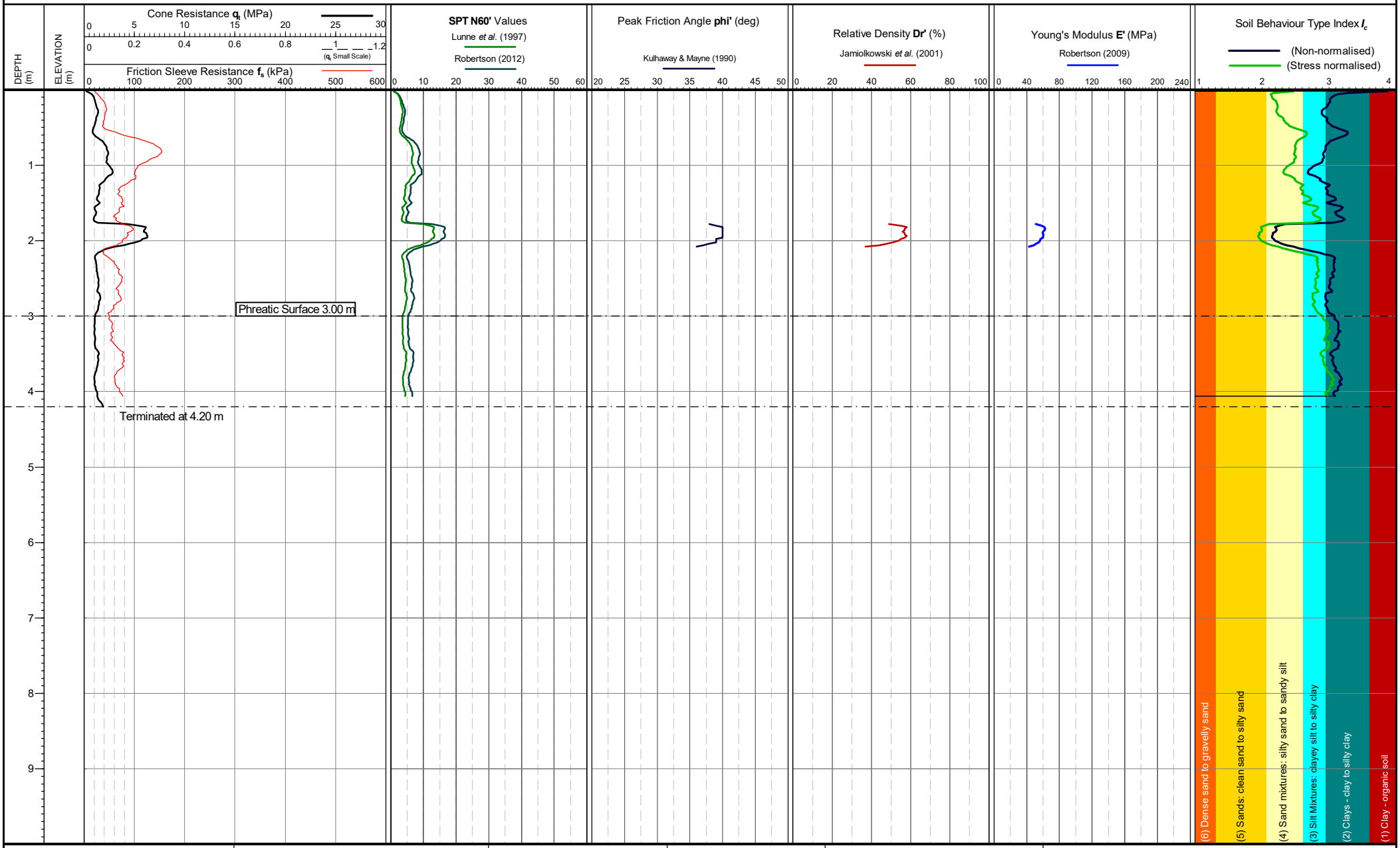
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-03

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 12:24:30

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

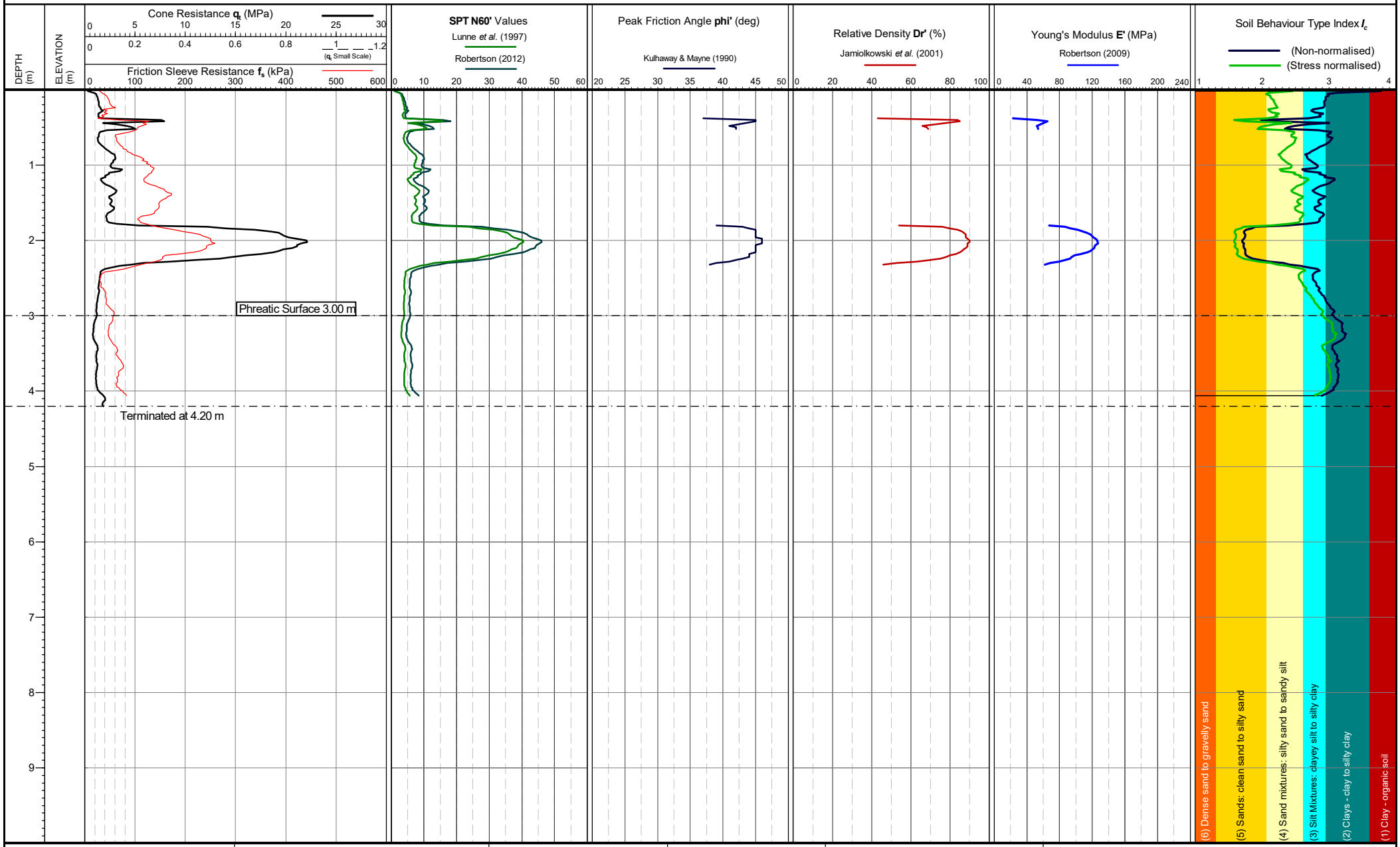
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-04

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 15:12:32

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

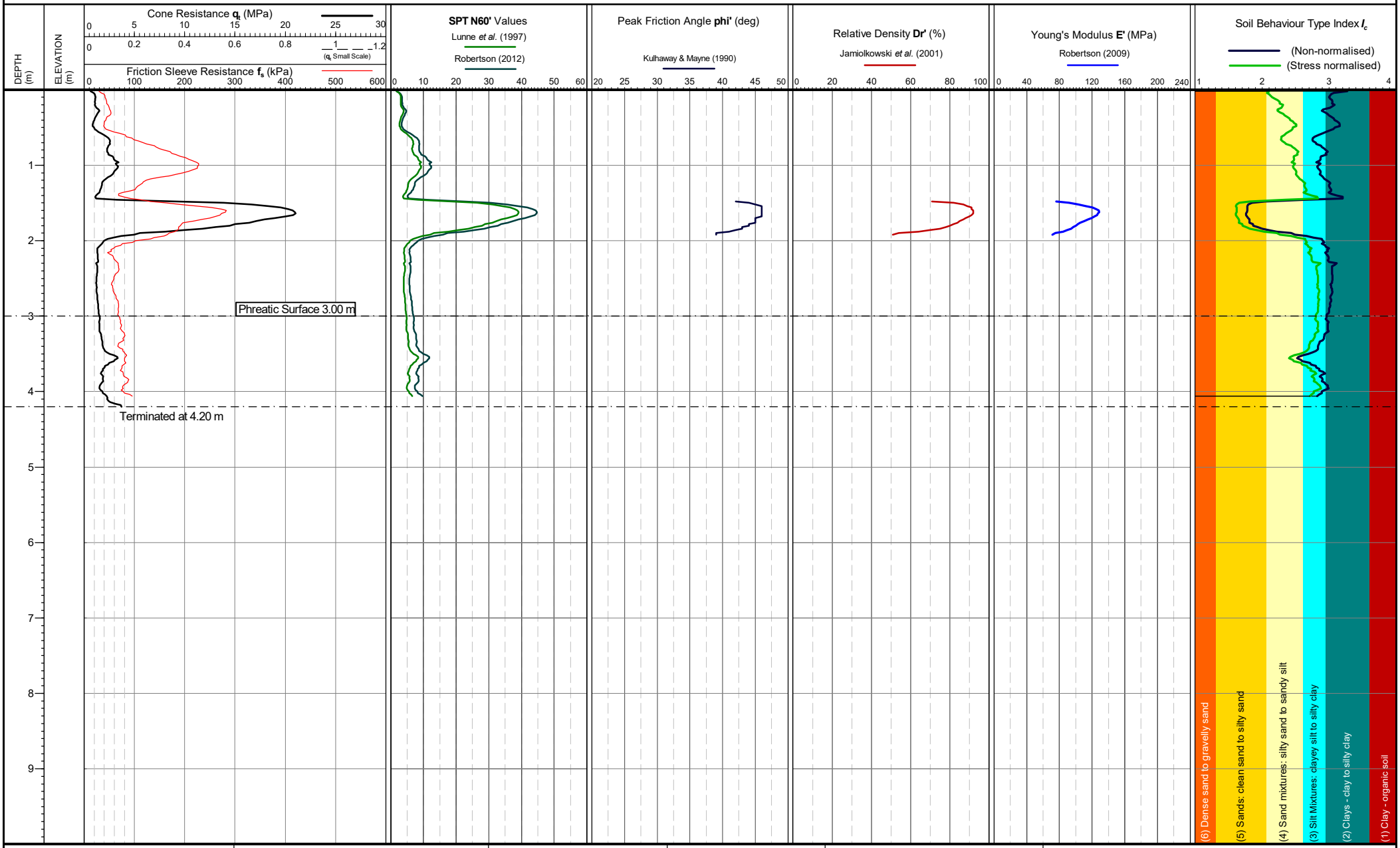
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-05

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 15:46:10

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

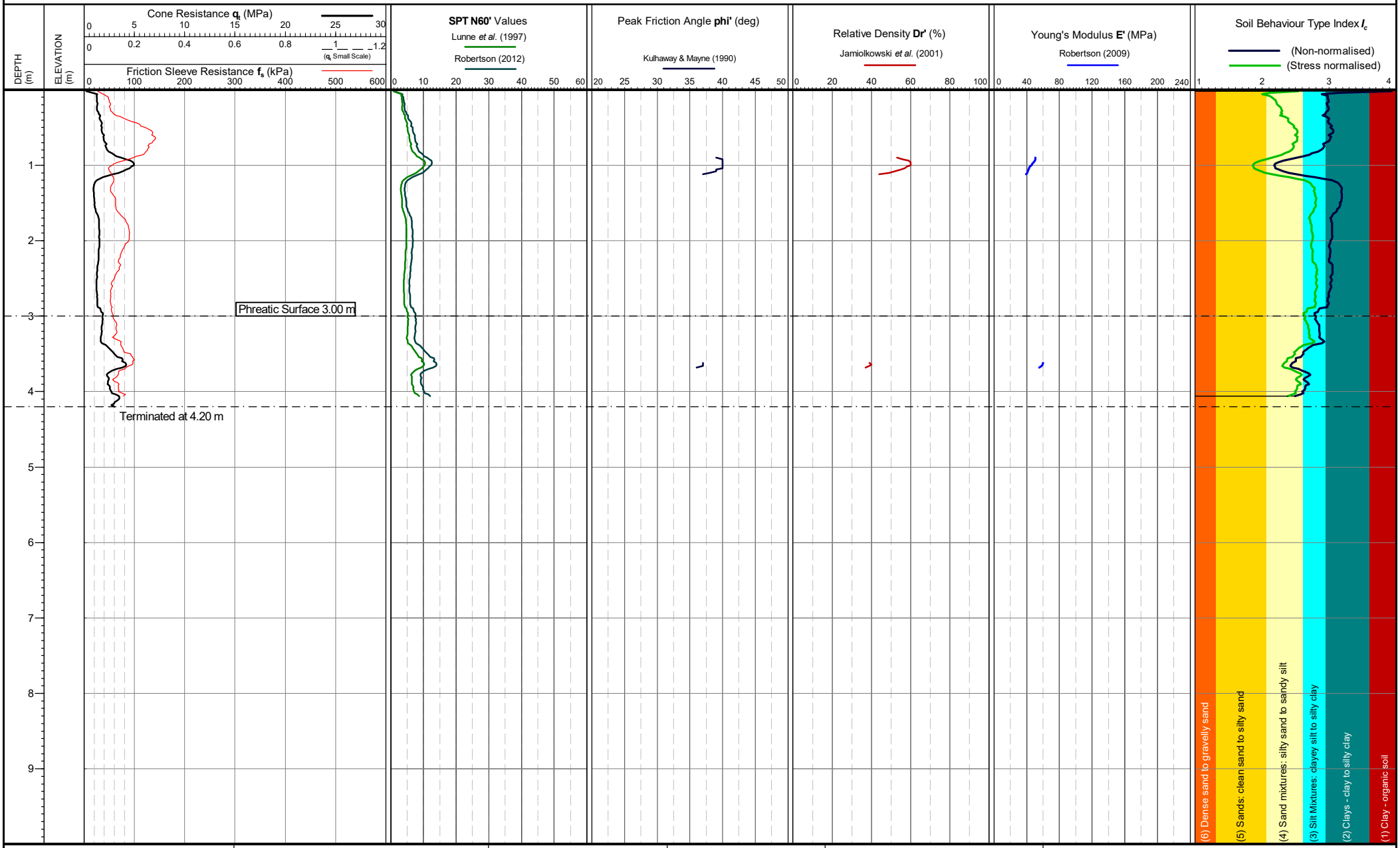
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-06

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 11:01:27

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

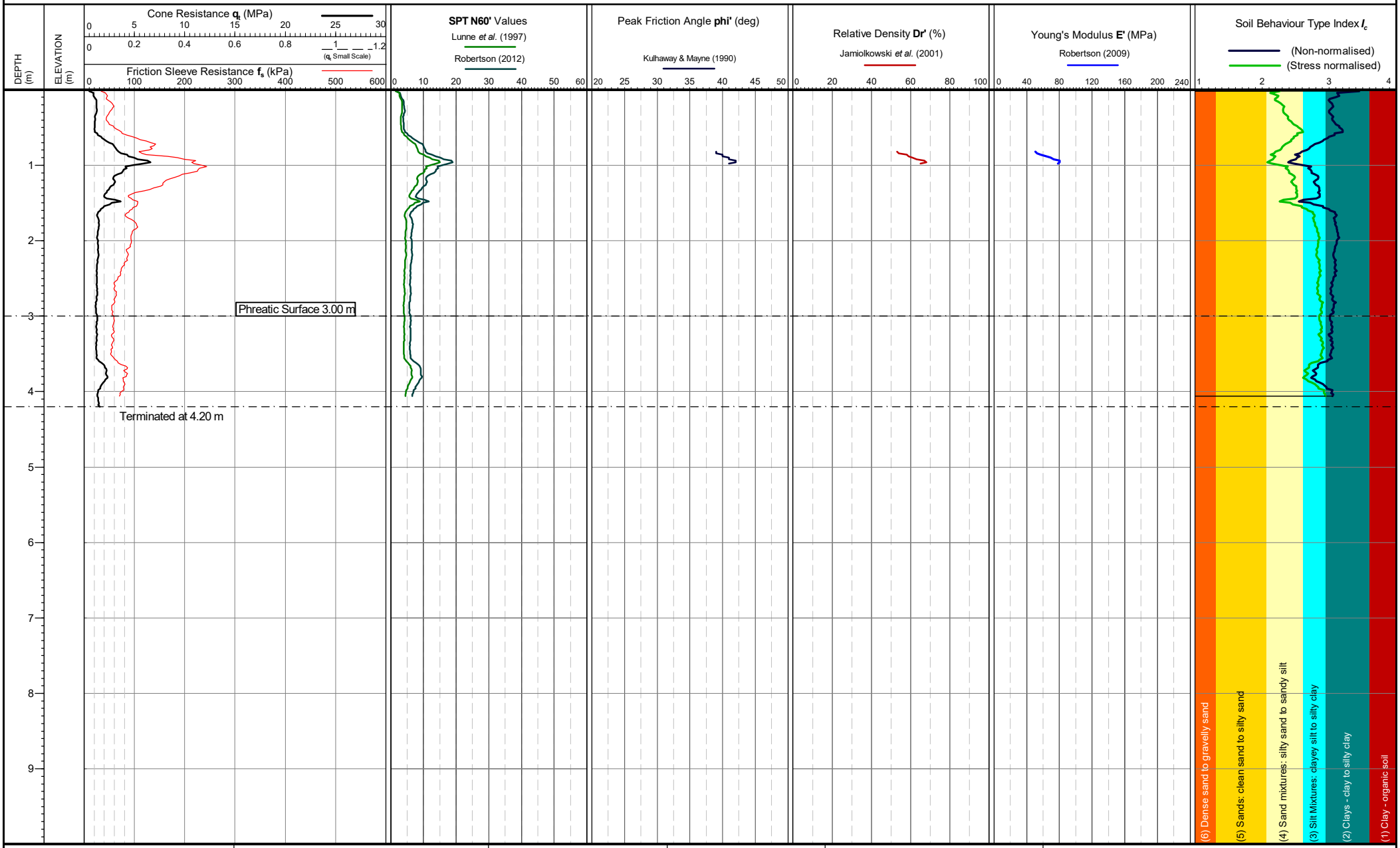
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-07

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 14:57:03

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

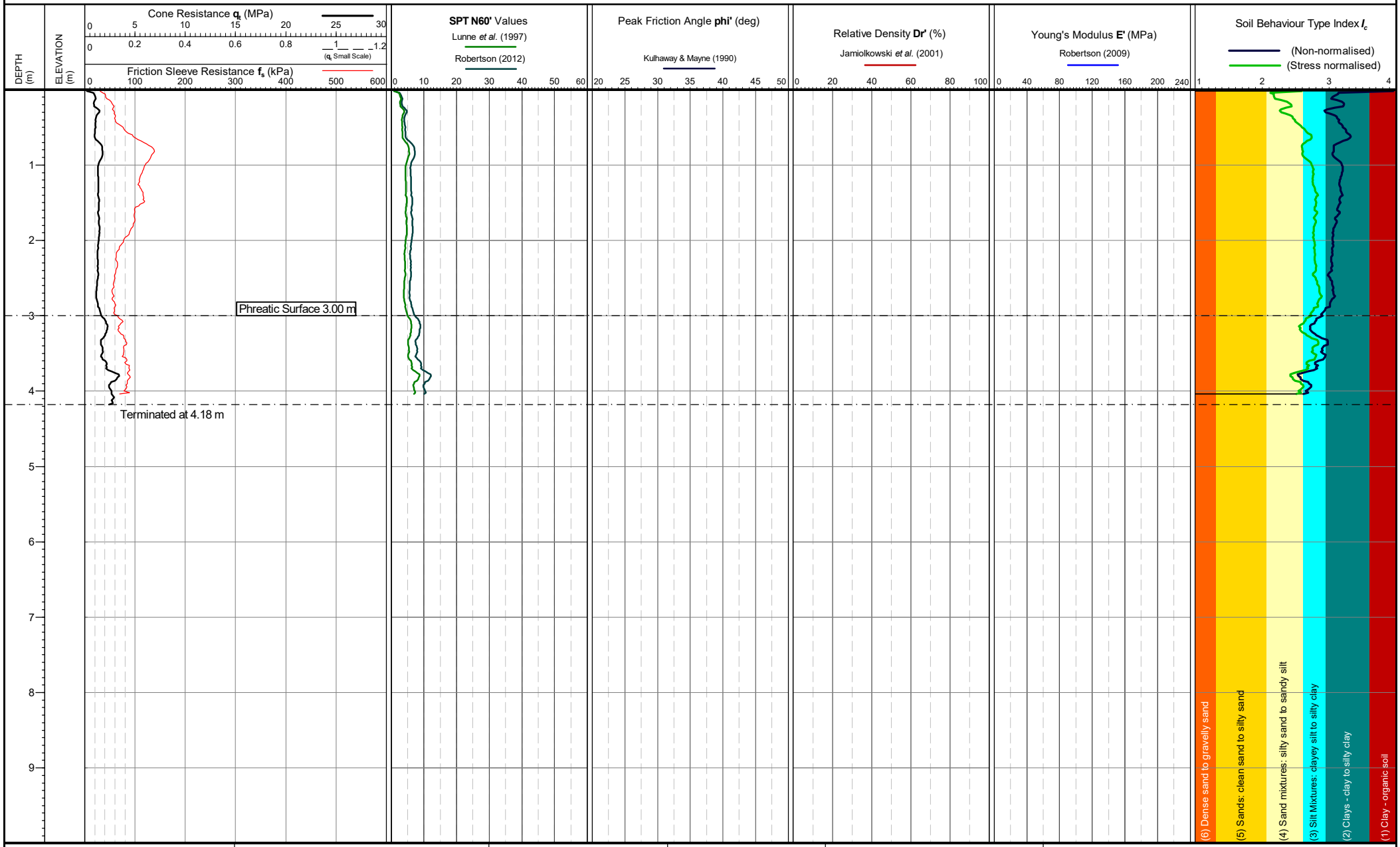
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-08

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 16:12:56

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

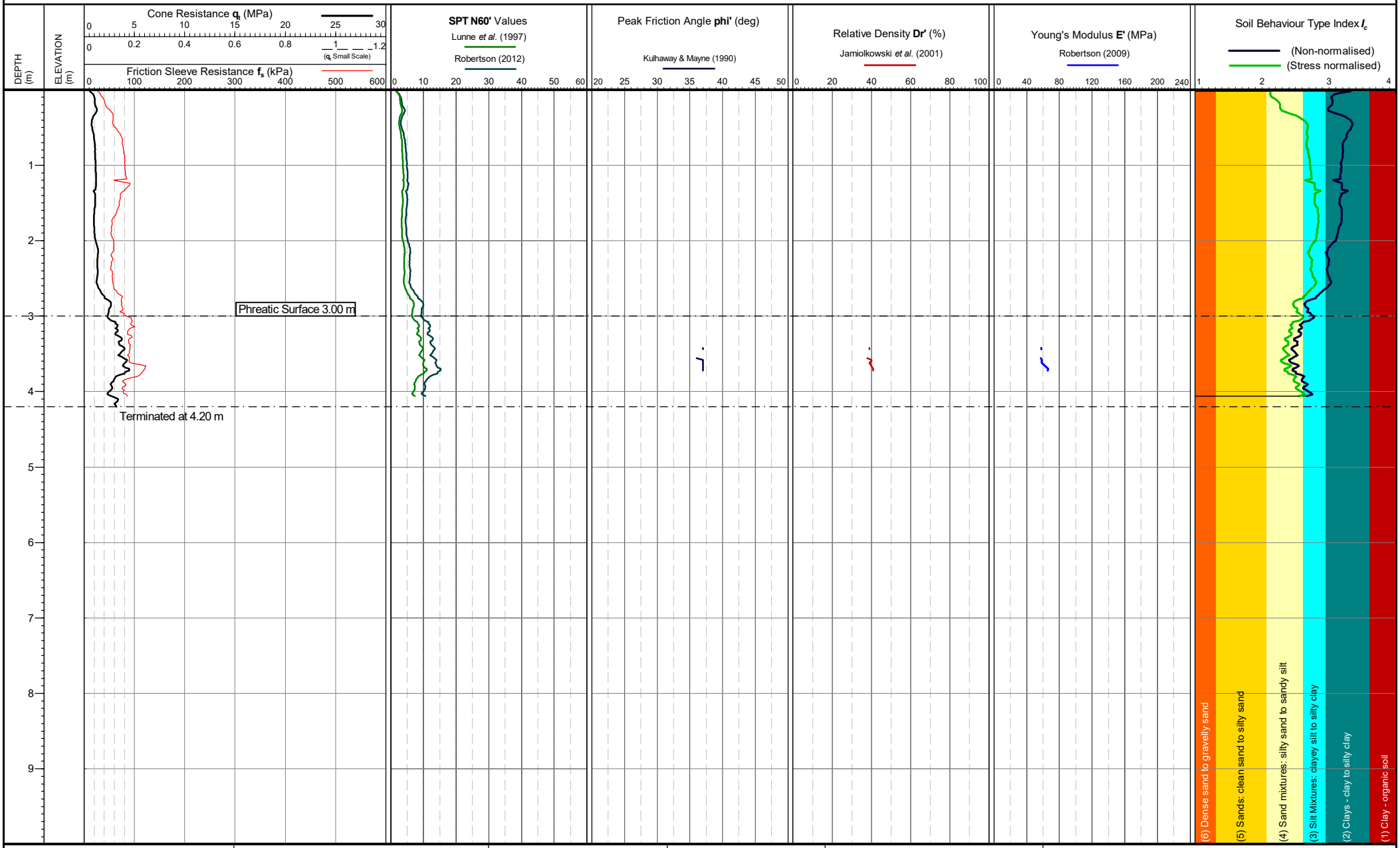
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-09

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 11:14:45

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

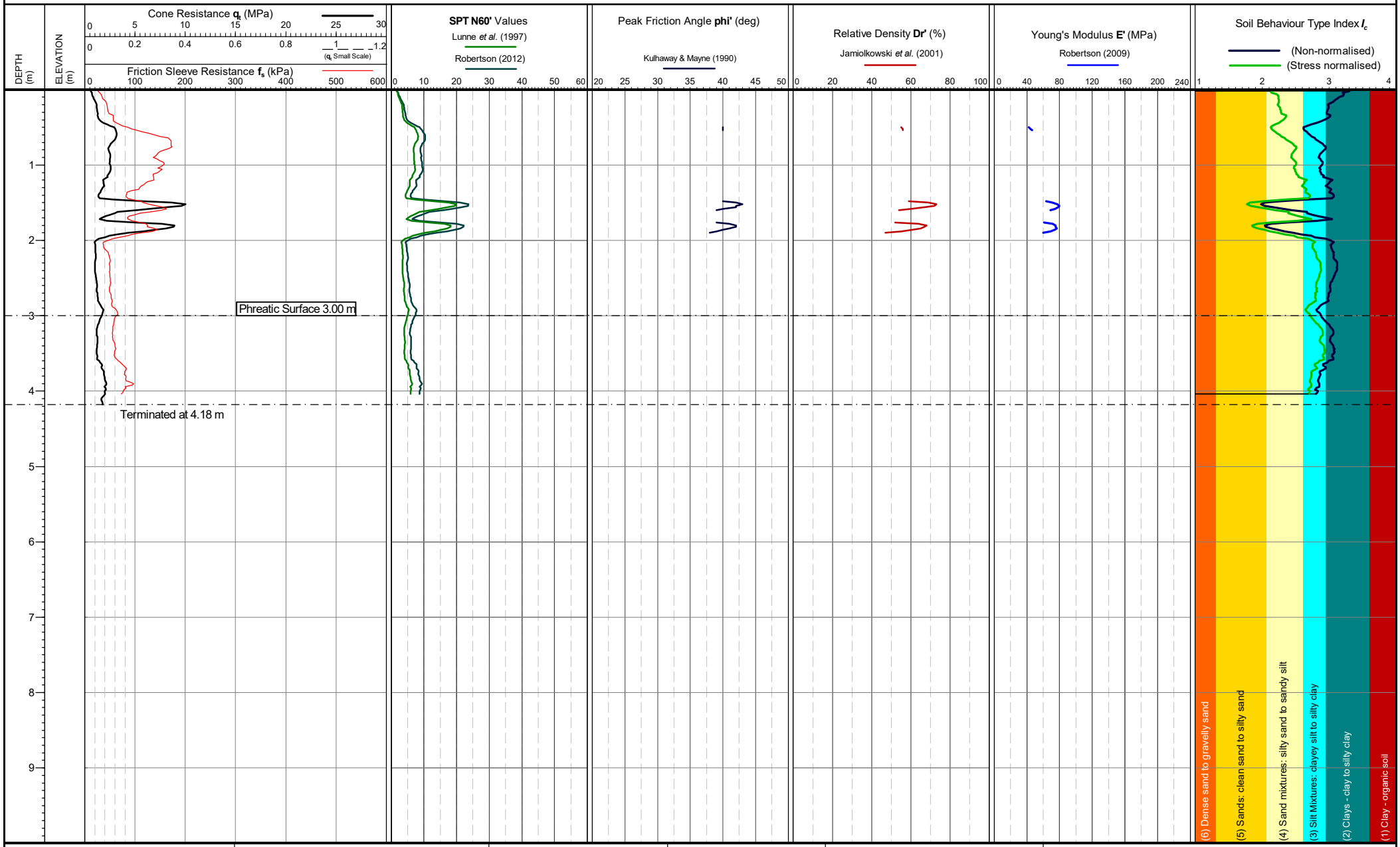
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-10

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 12:40:31

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25

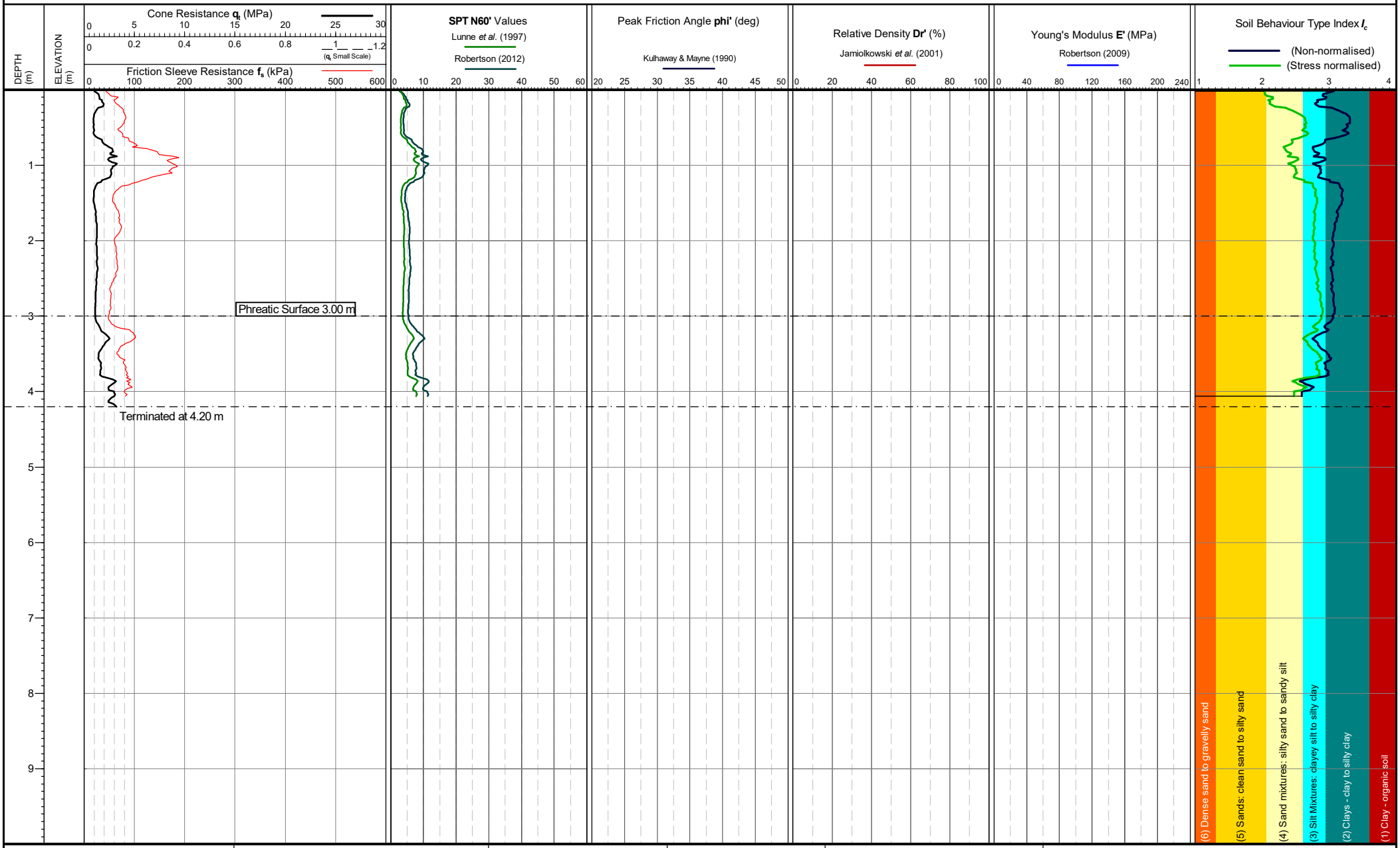
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-11

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 14:44:47

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

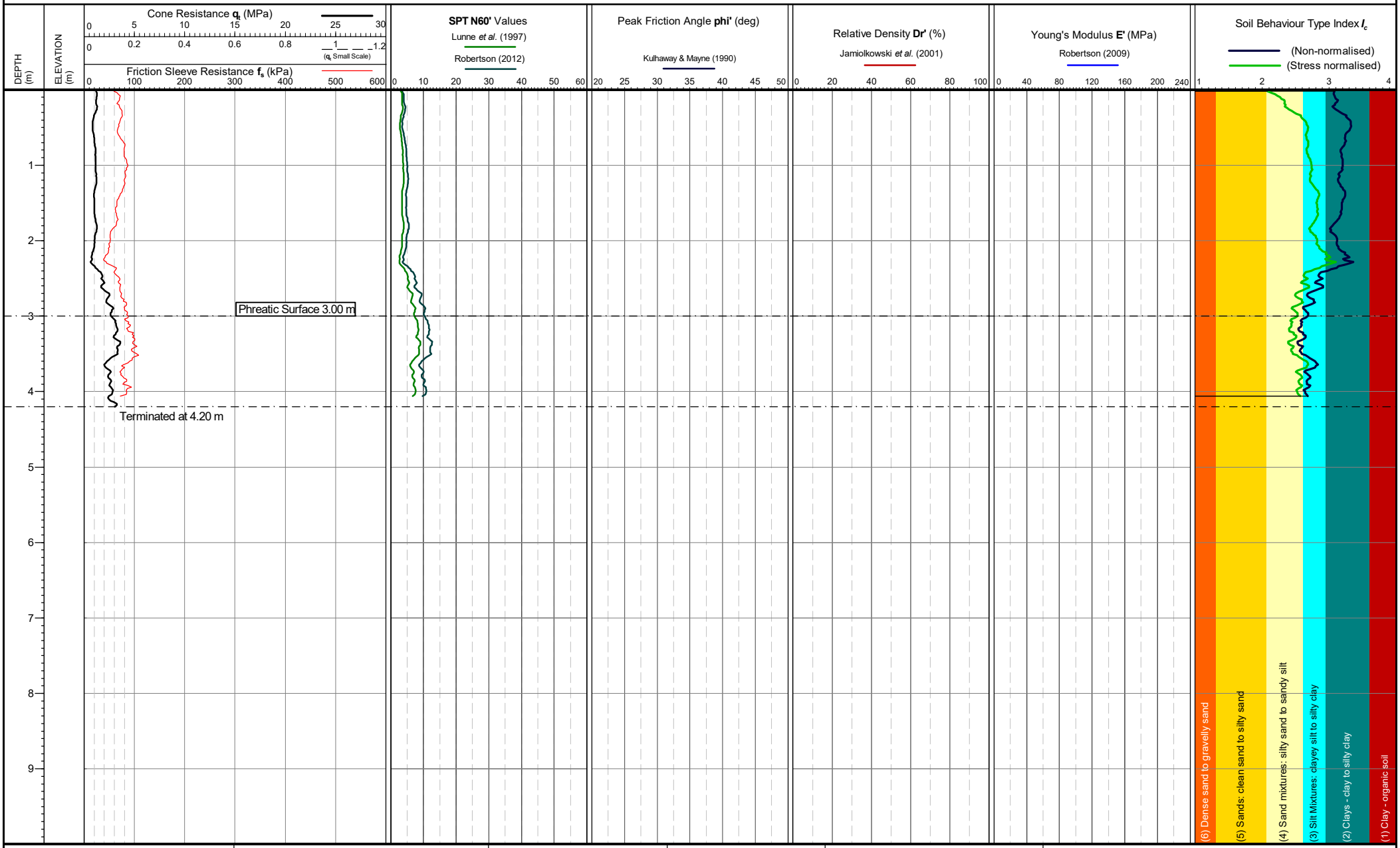
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-12

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 16:26:17

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

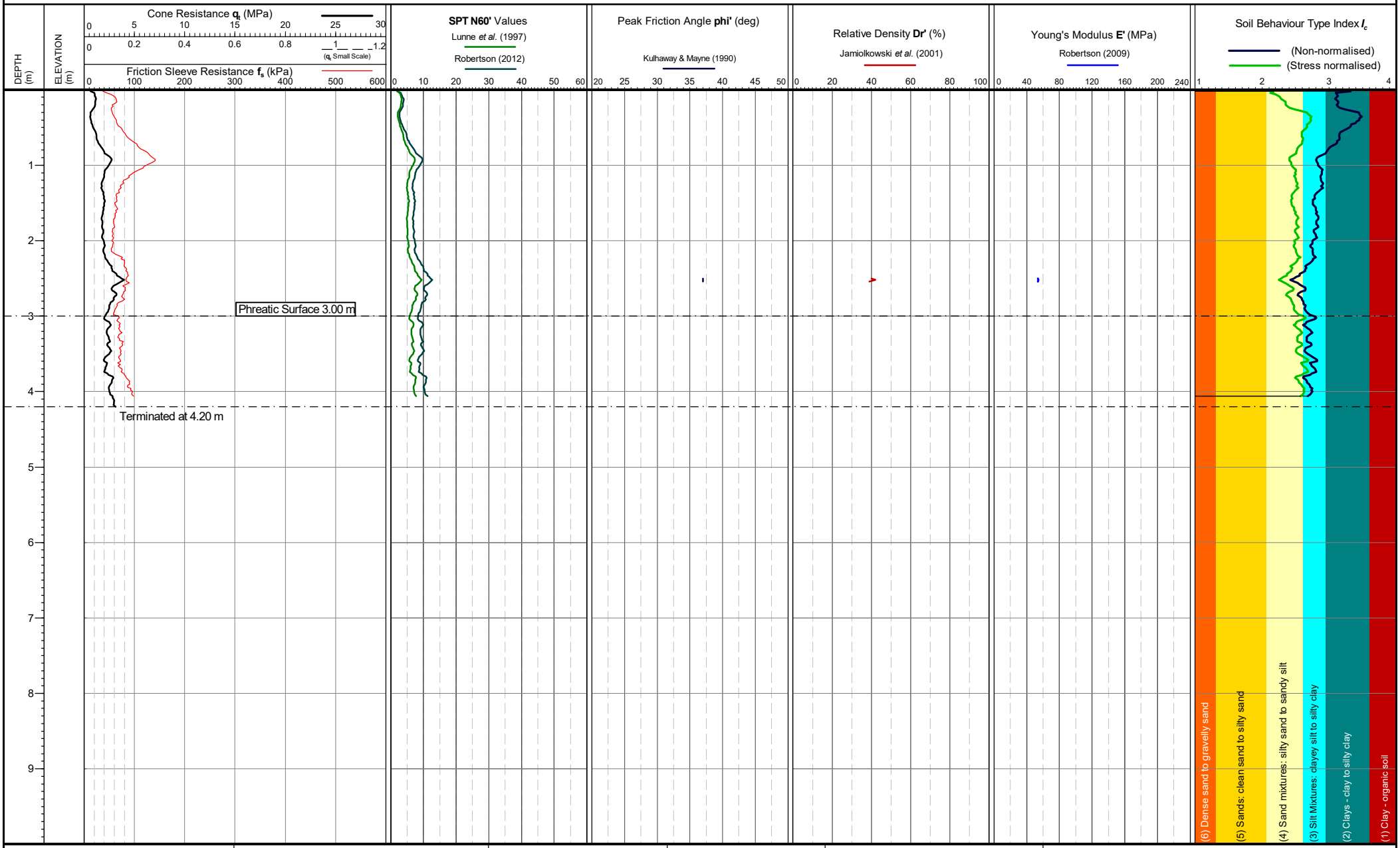
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-13

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 17:16:57

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

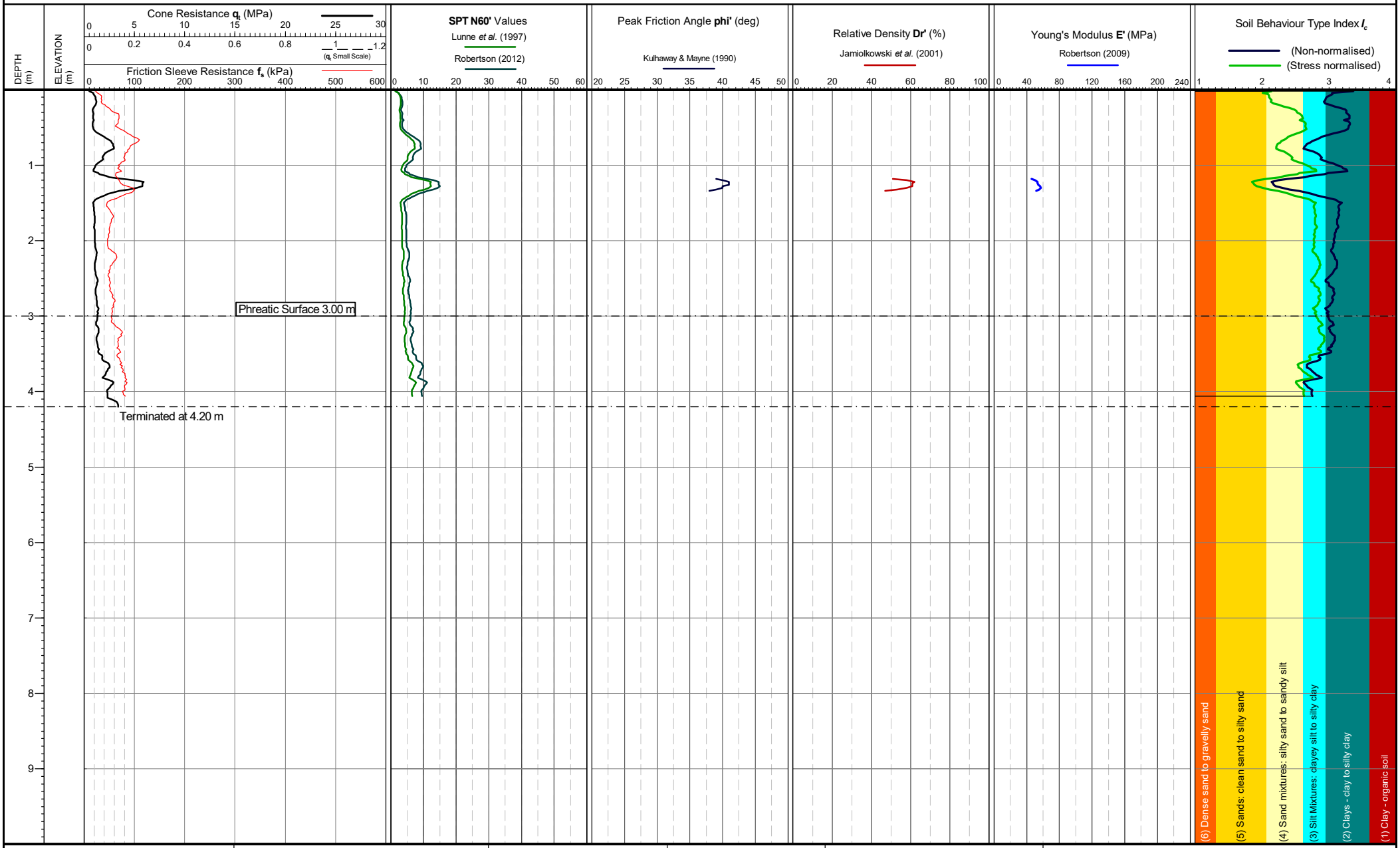
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-14

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 12:59:12

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

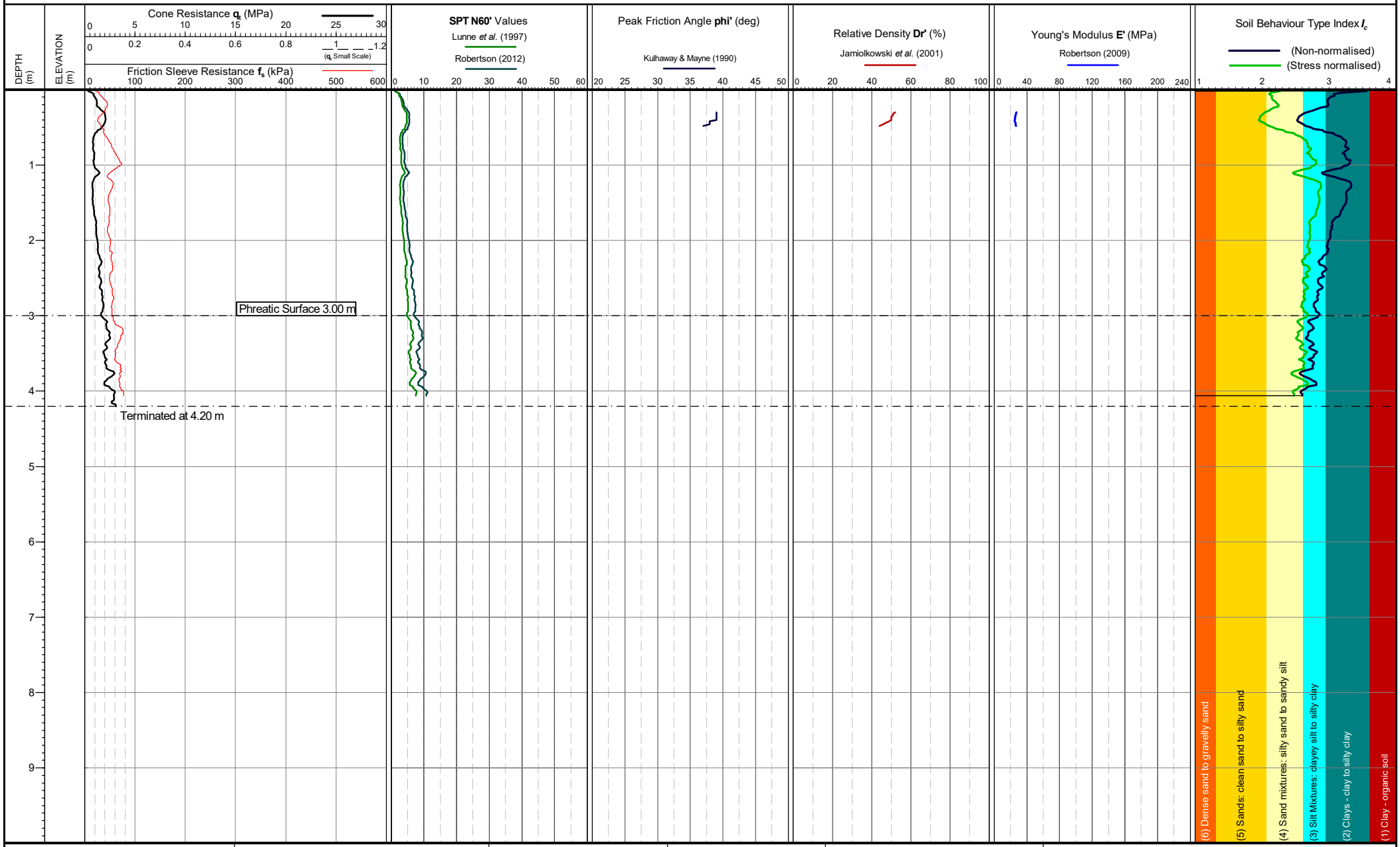
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-15

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 13:24:55

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

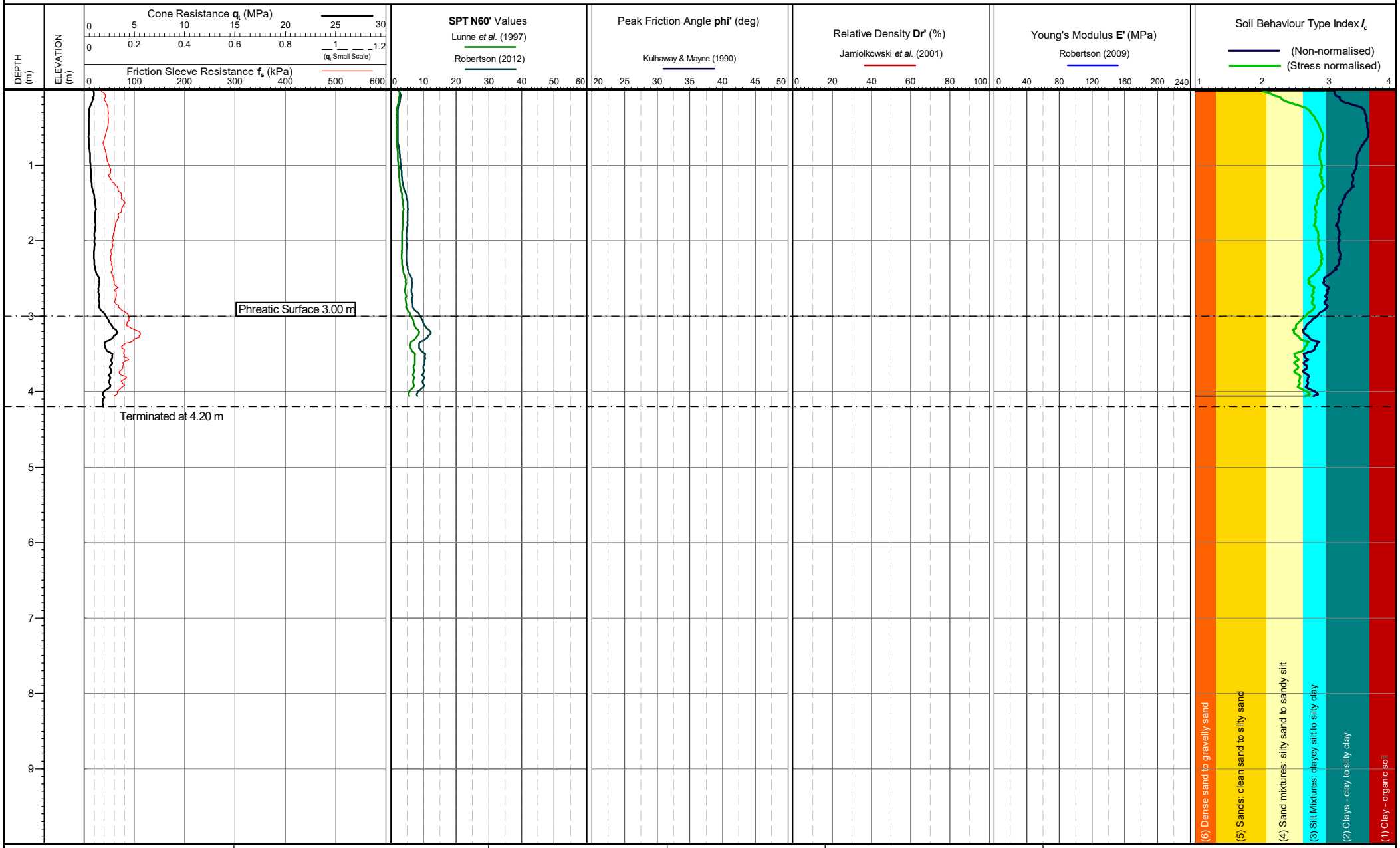
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-16

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 14:33:18

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

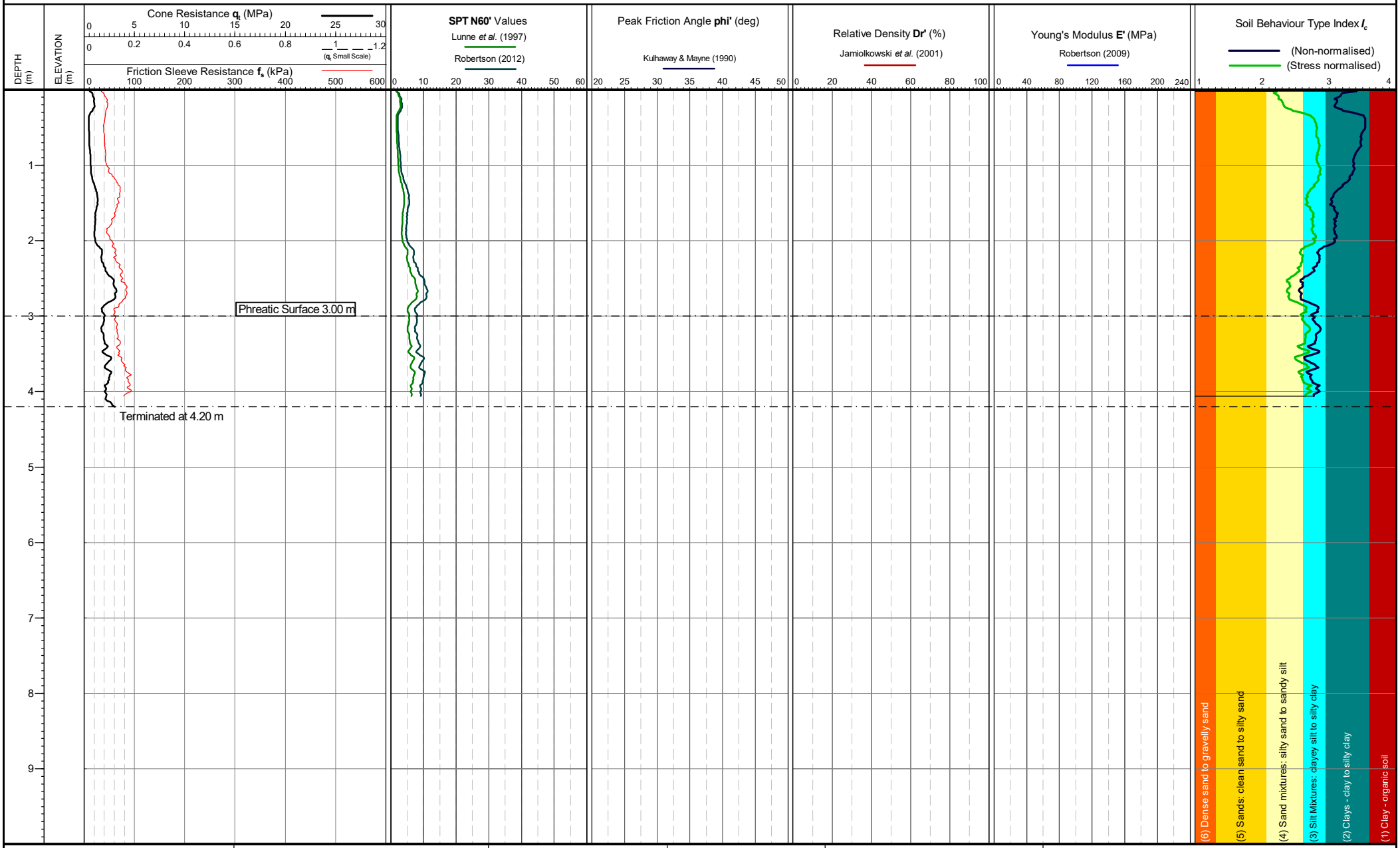
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-17

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 14:04:07

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

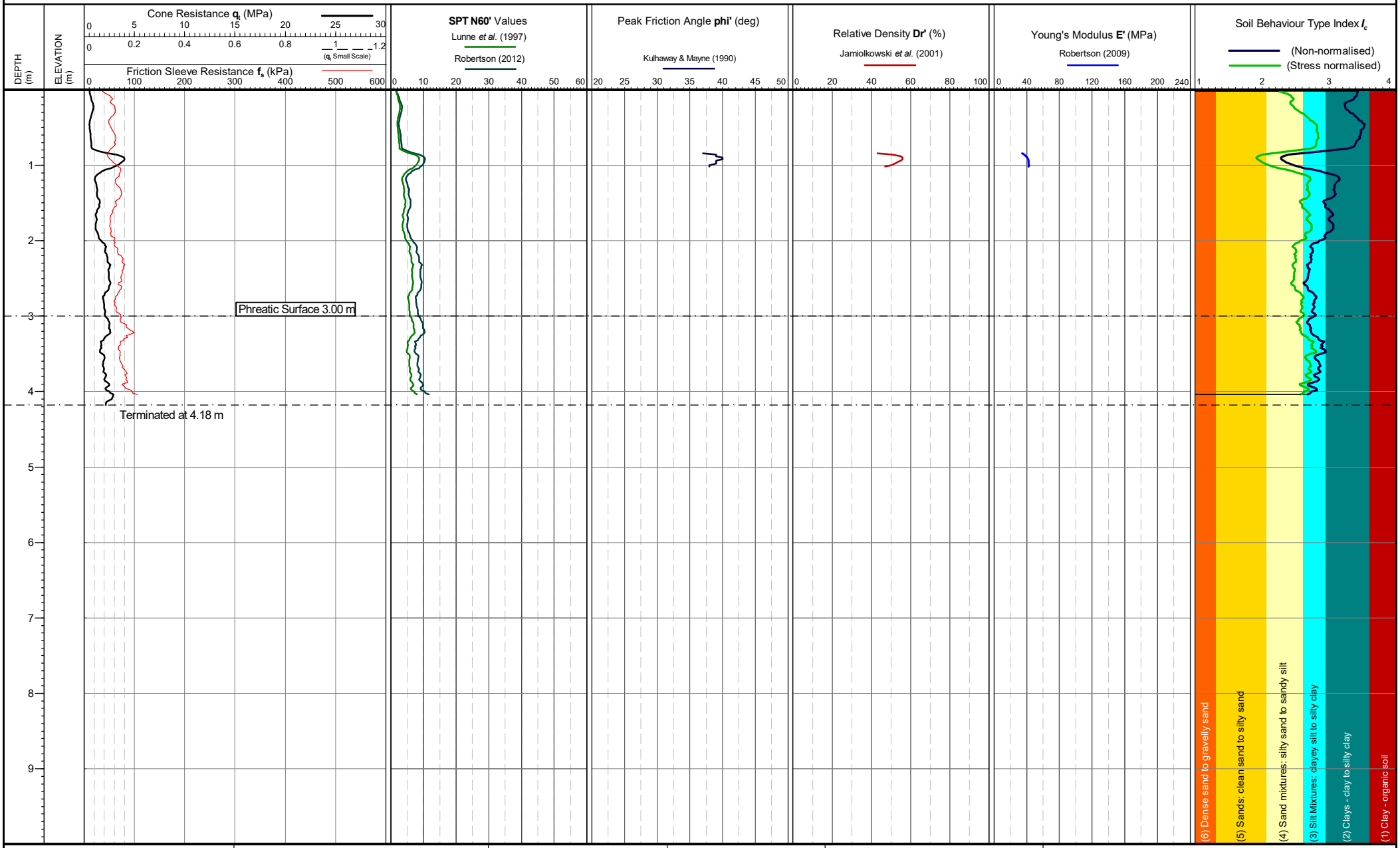
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-18

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 13:36:46

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

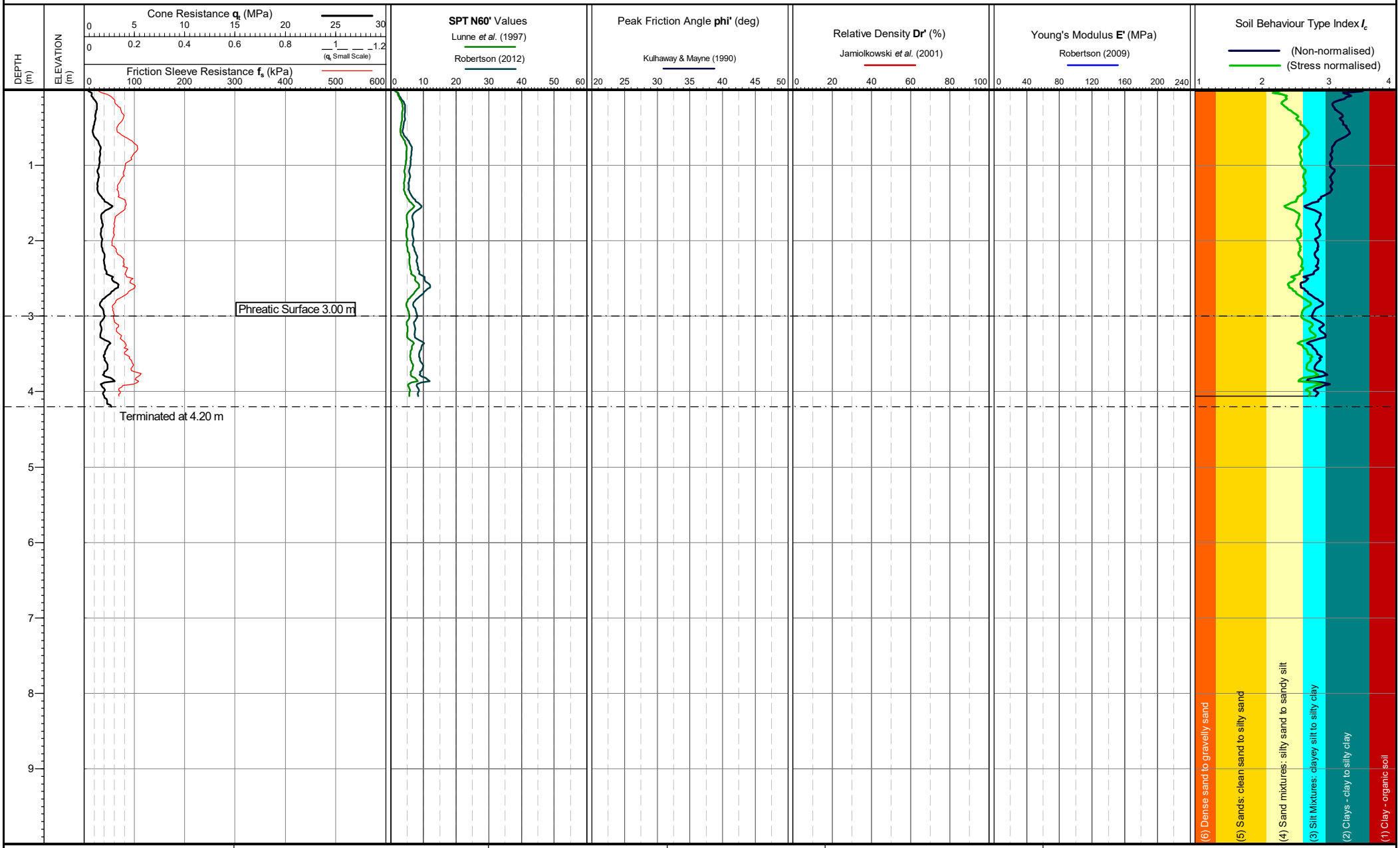
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-19

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 13:50:58

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

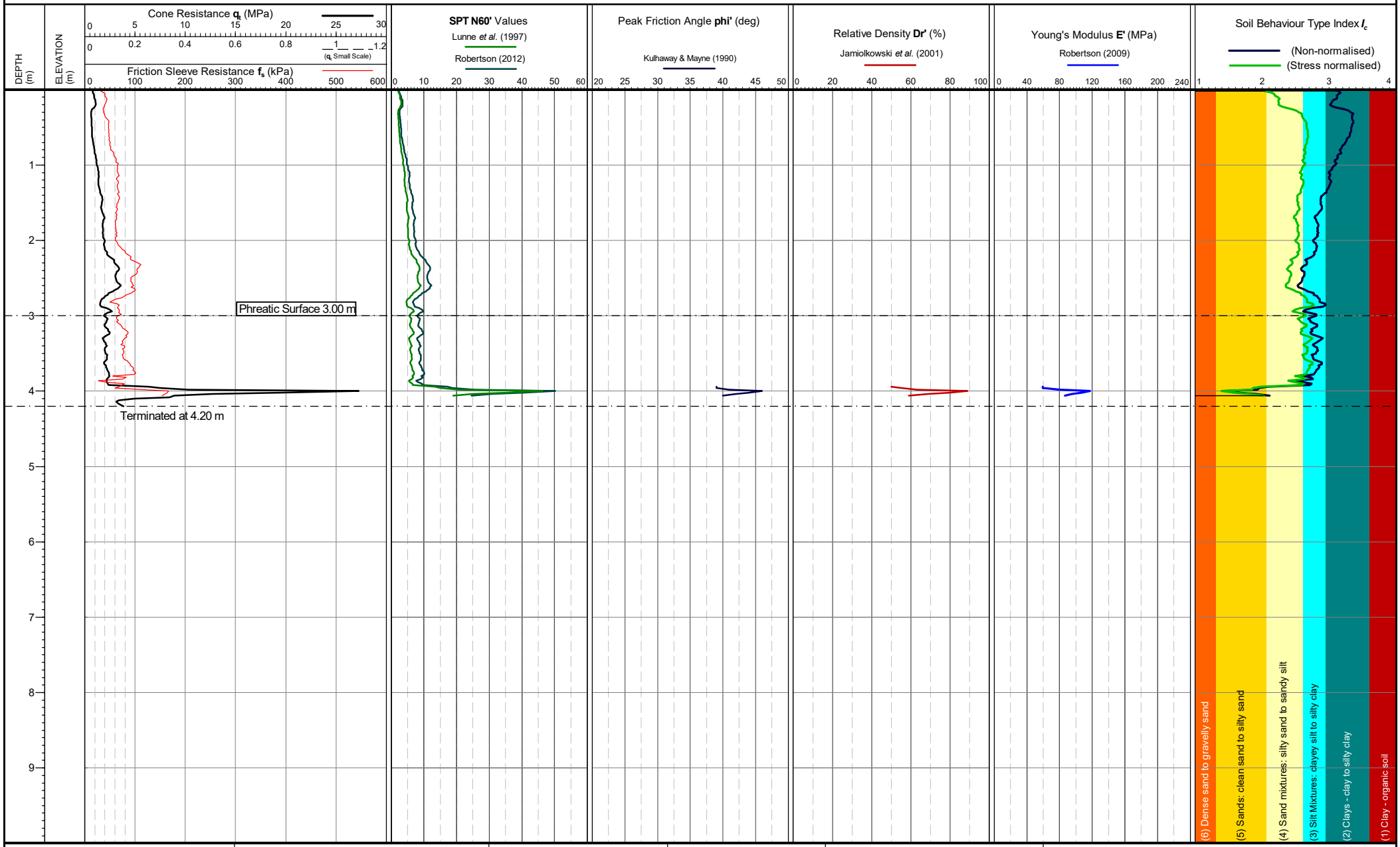
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-20

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 16:37:37

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

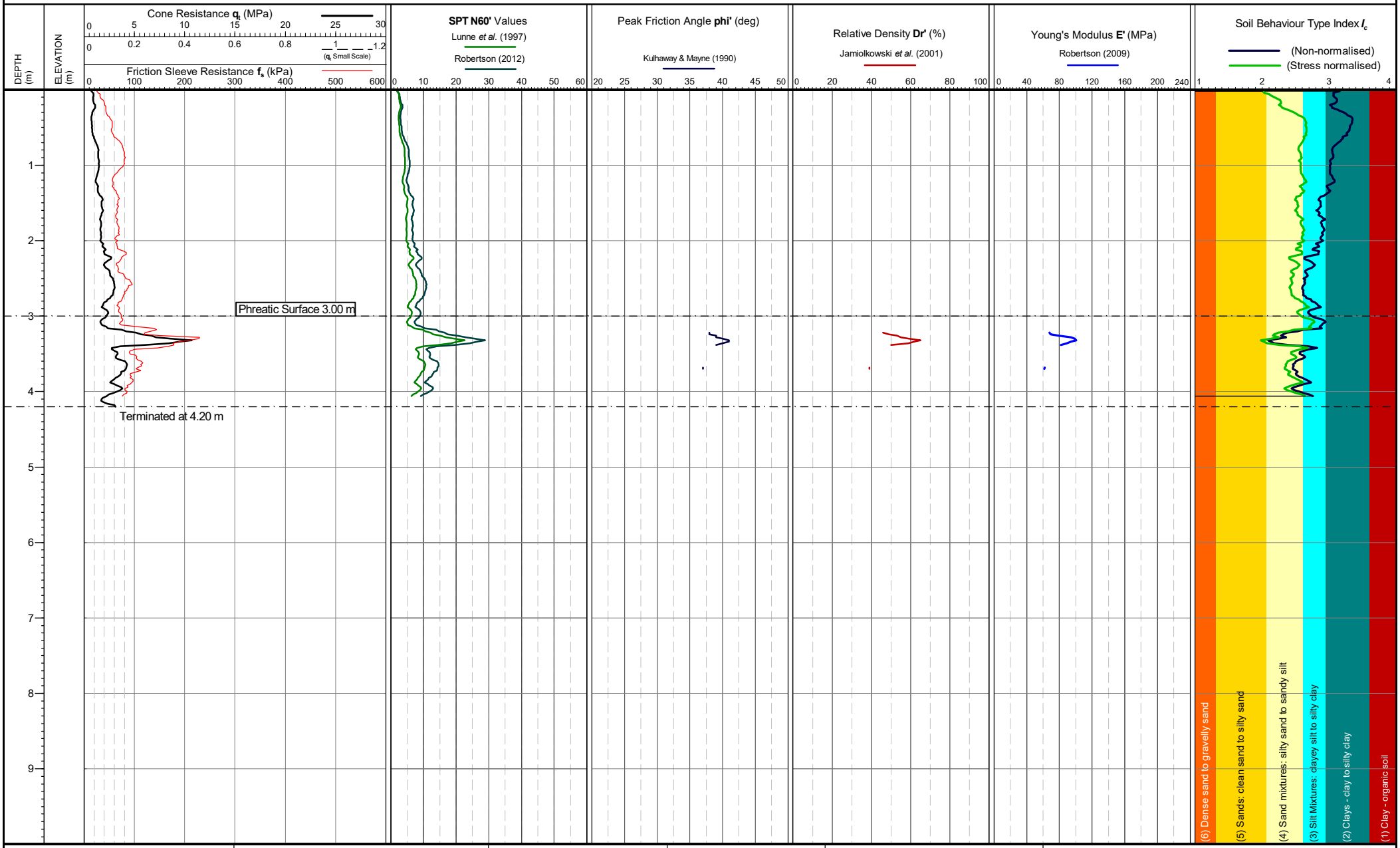
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-21

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 29/09/2025 16:58:55

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25

Checked by: Chris Player

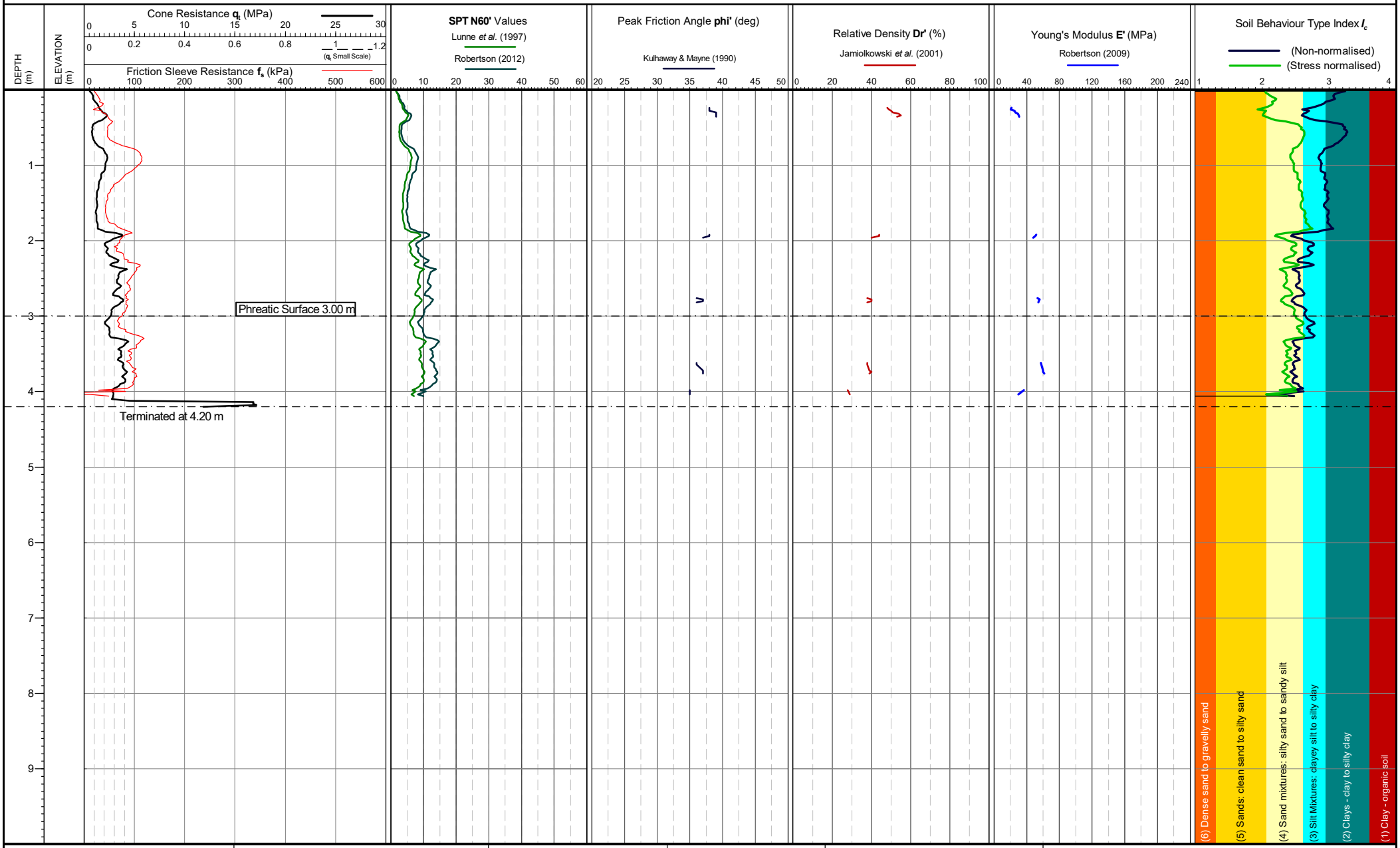
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-22

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 11:57:31

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

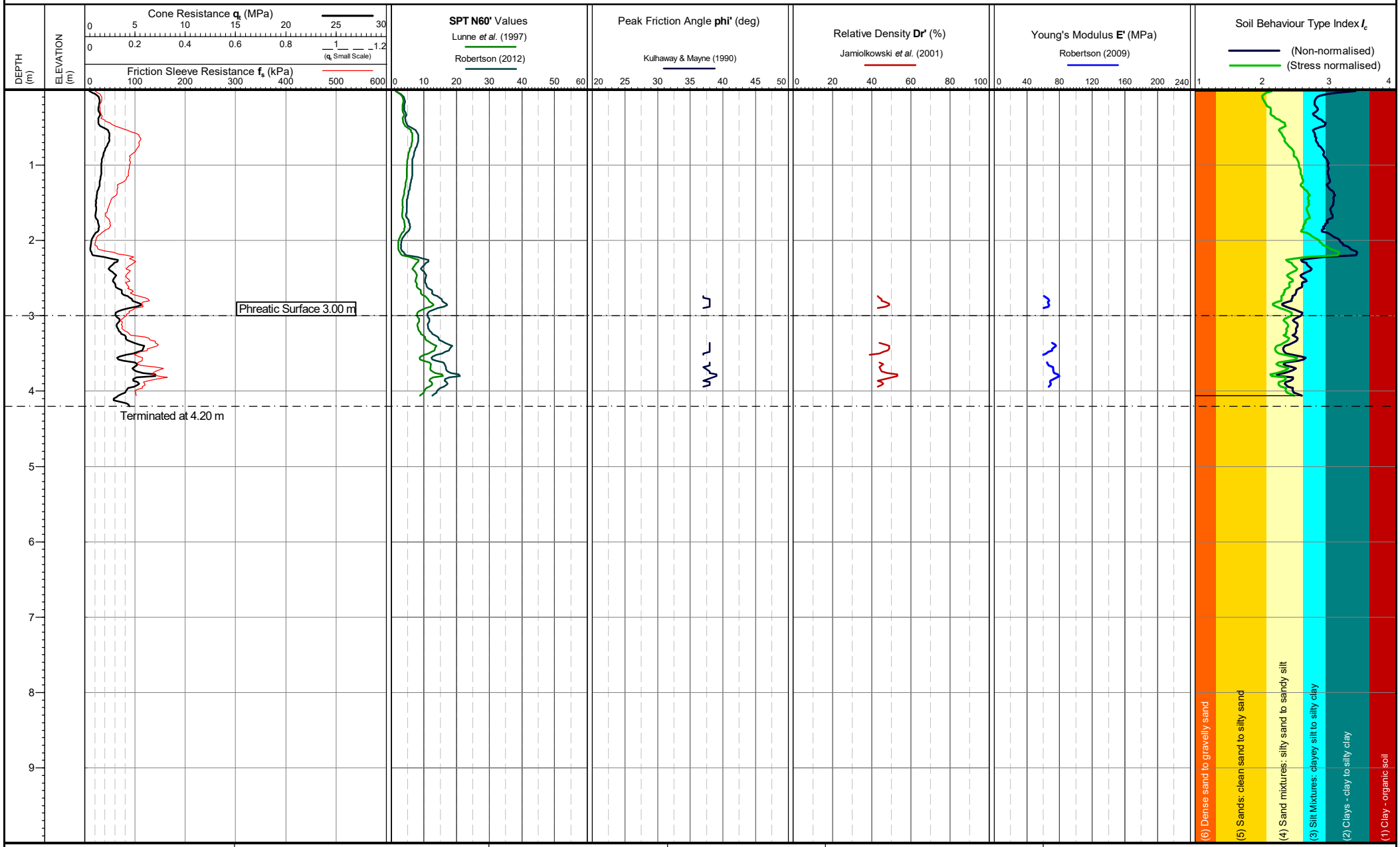
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-23

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 11:37:40

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

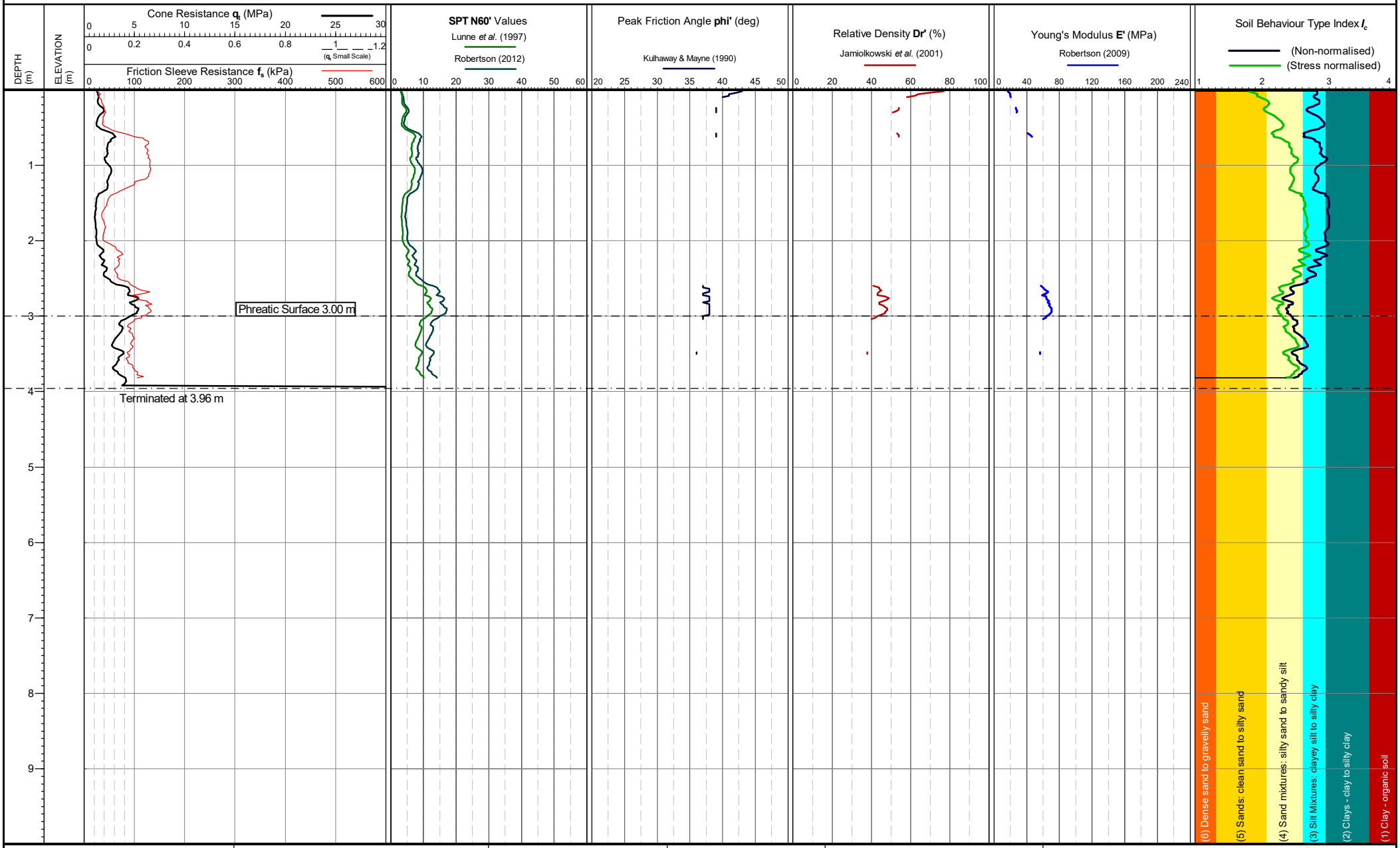
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-24

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 12:35:44

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

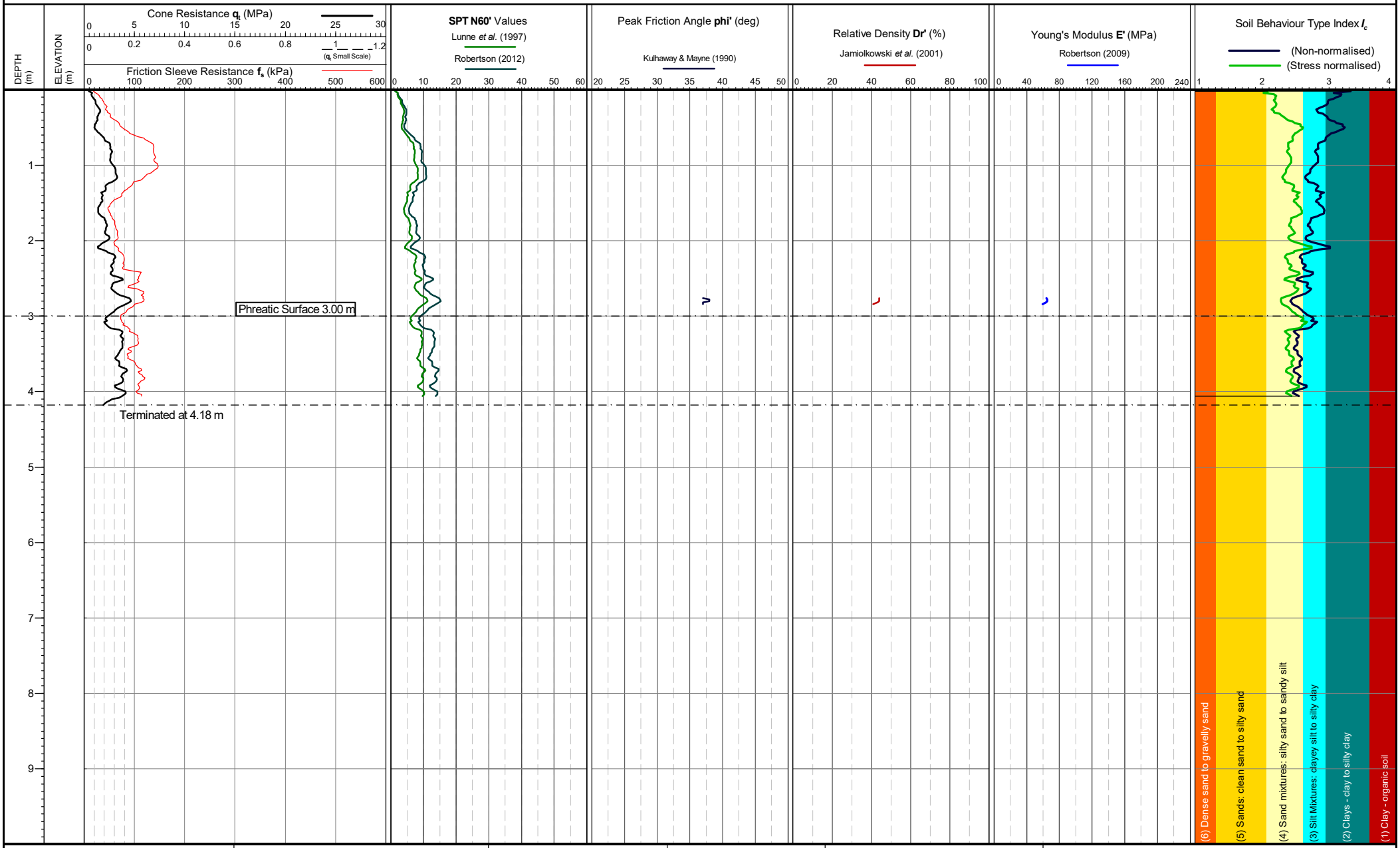
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-25

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 12:22:10

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

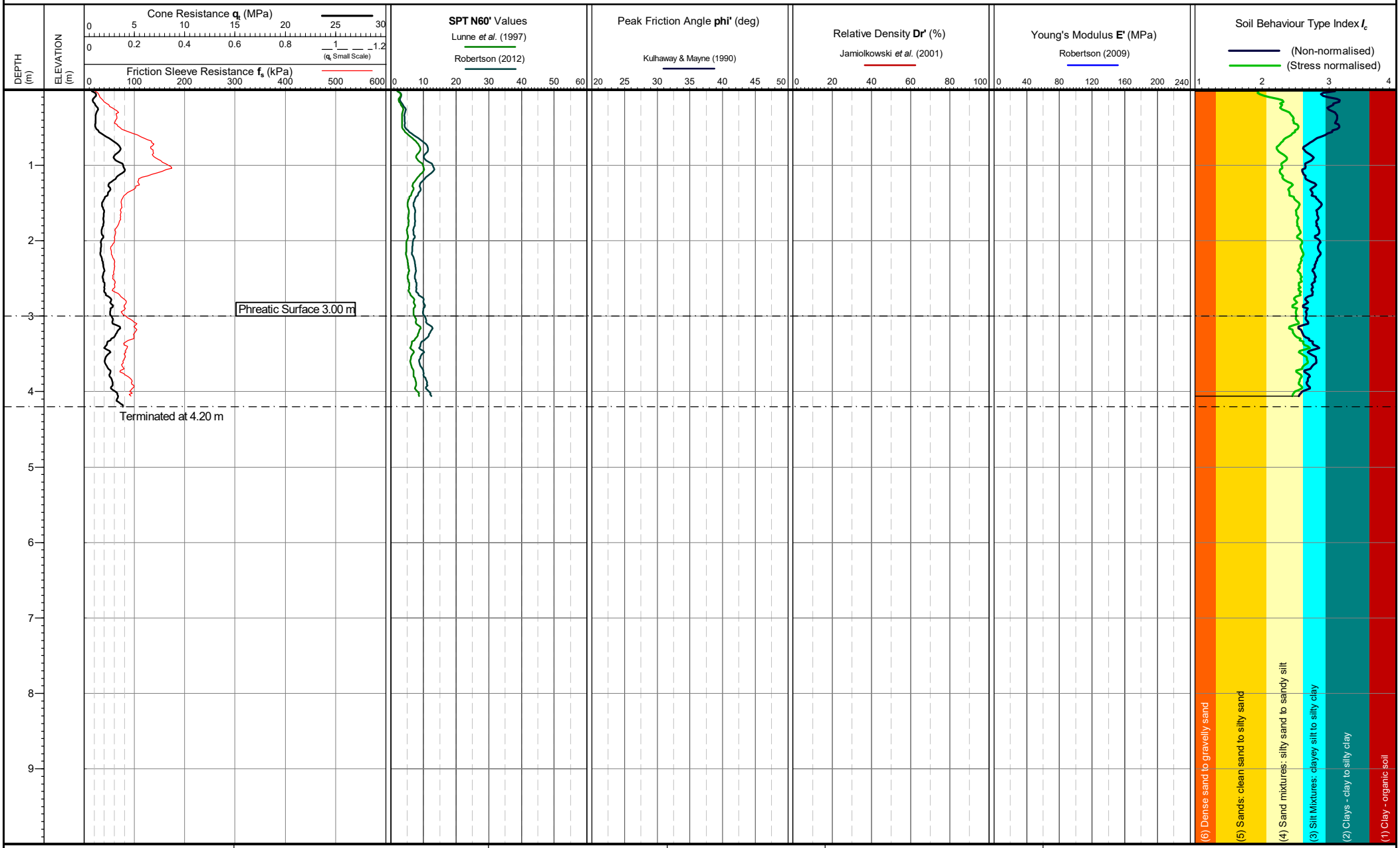
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-26

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 13:50:52

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

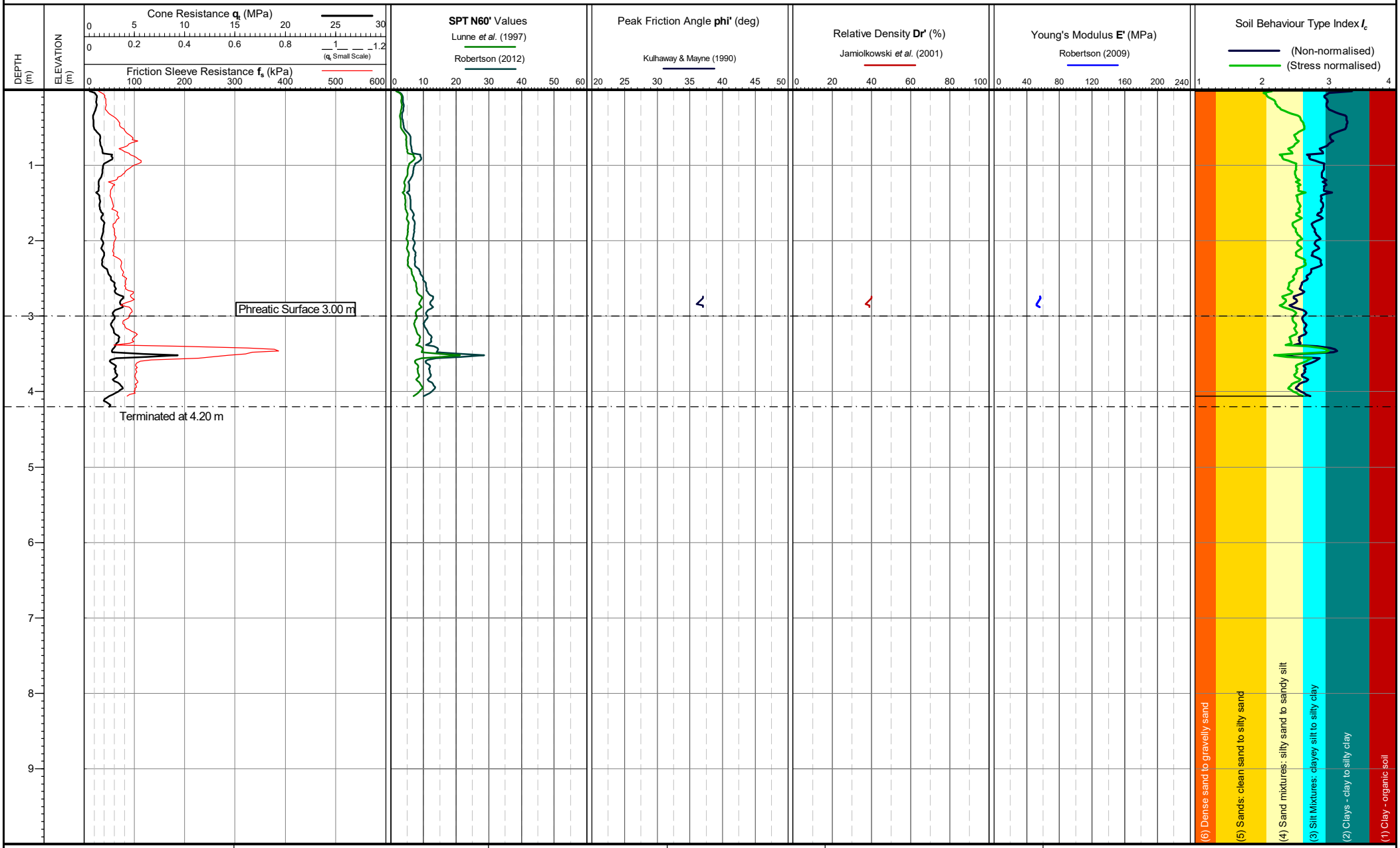
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-27

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 13:19:55

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

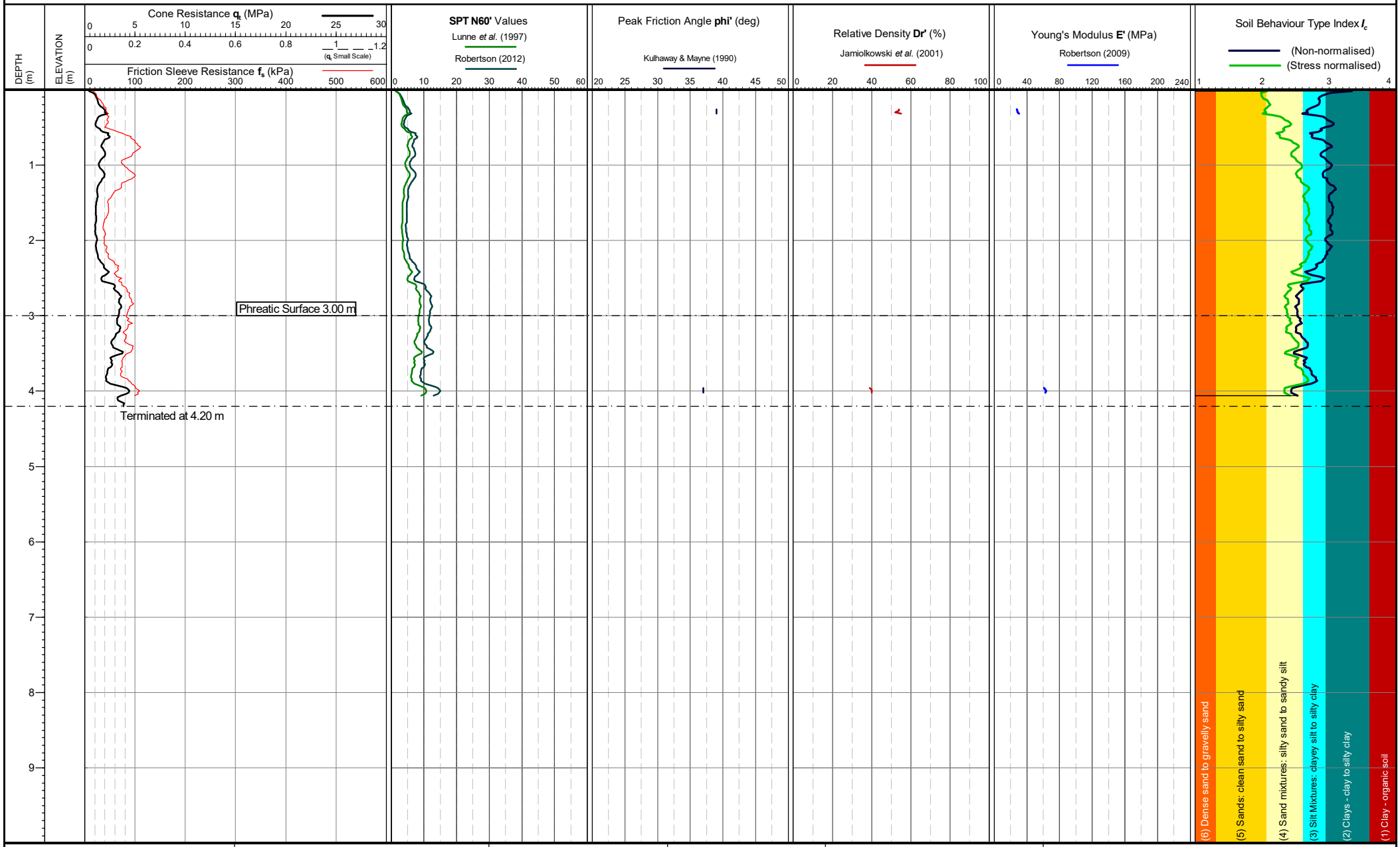
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-28

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 13:05:28

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

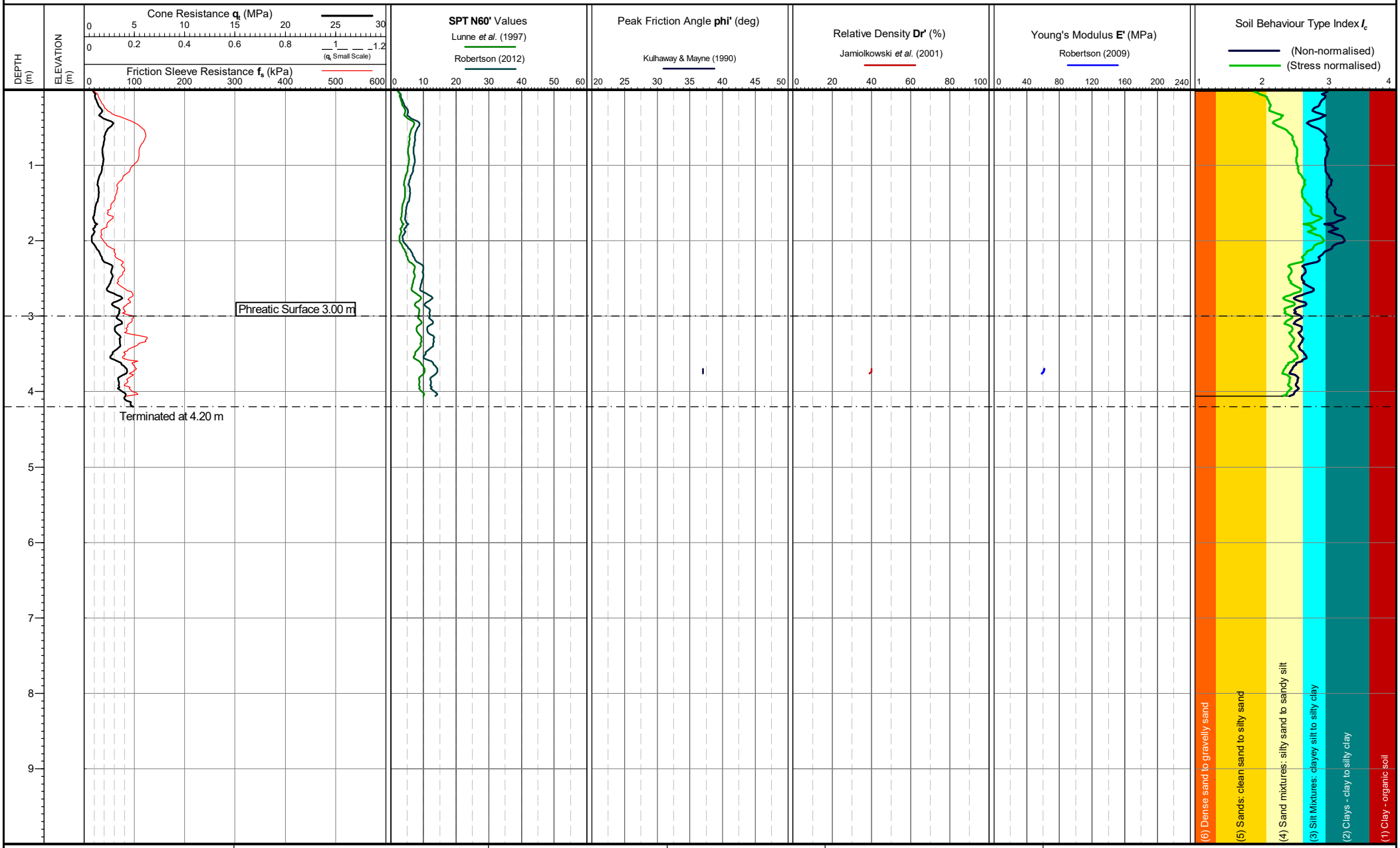
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-29

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 12:45:44

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

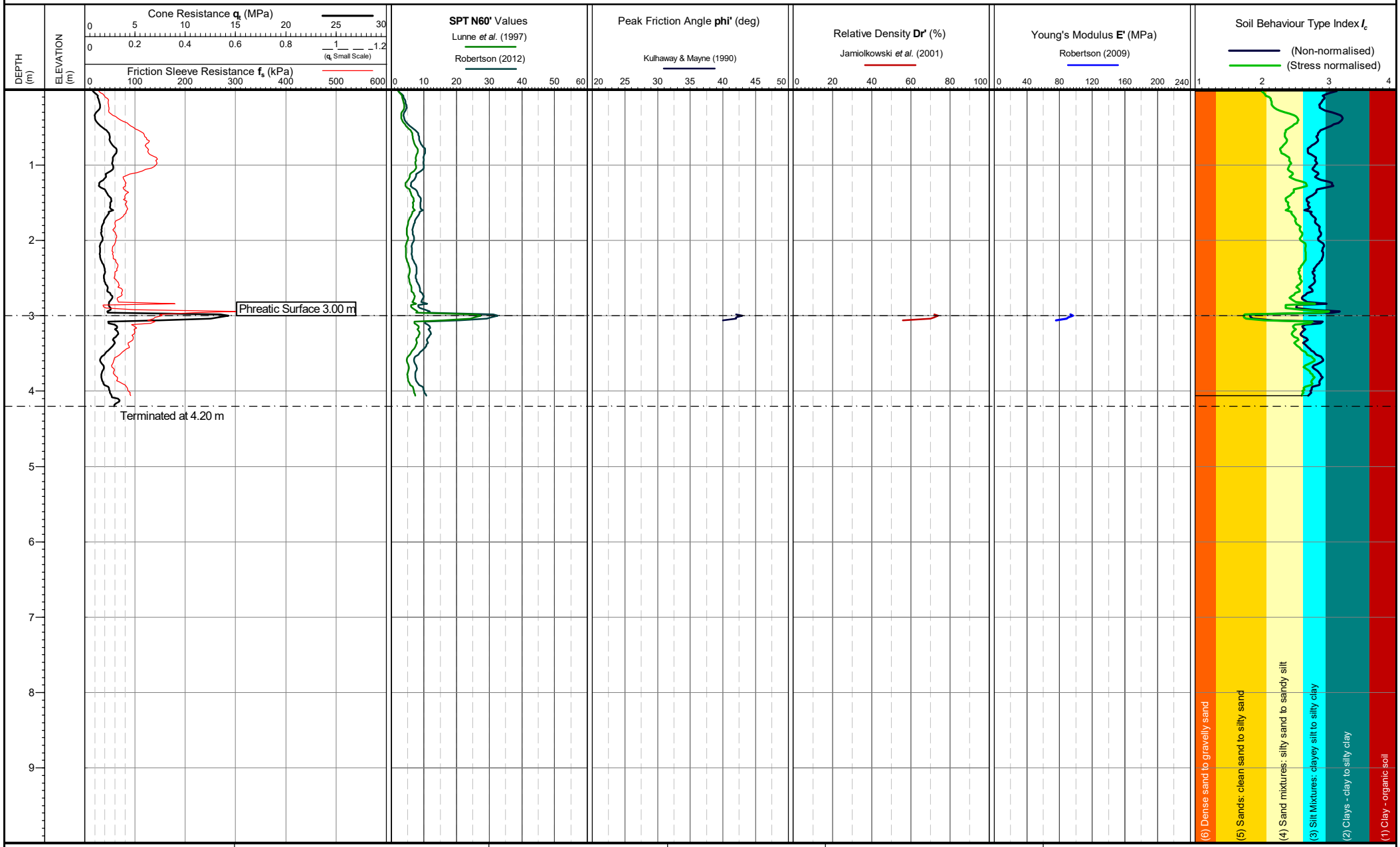
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-30

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 14:05:51

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

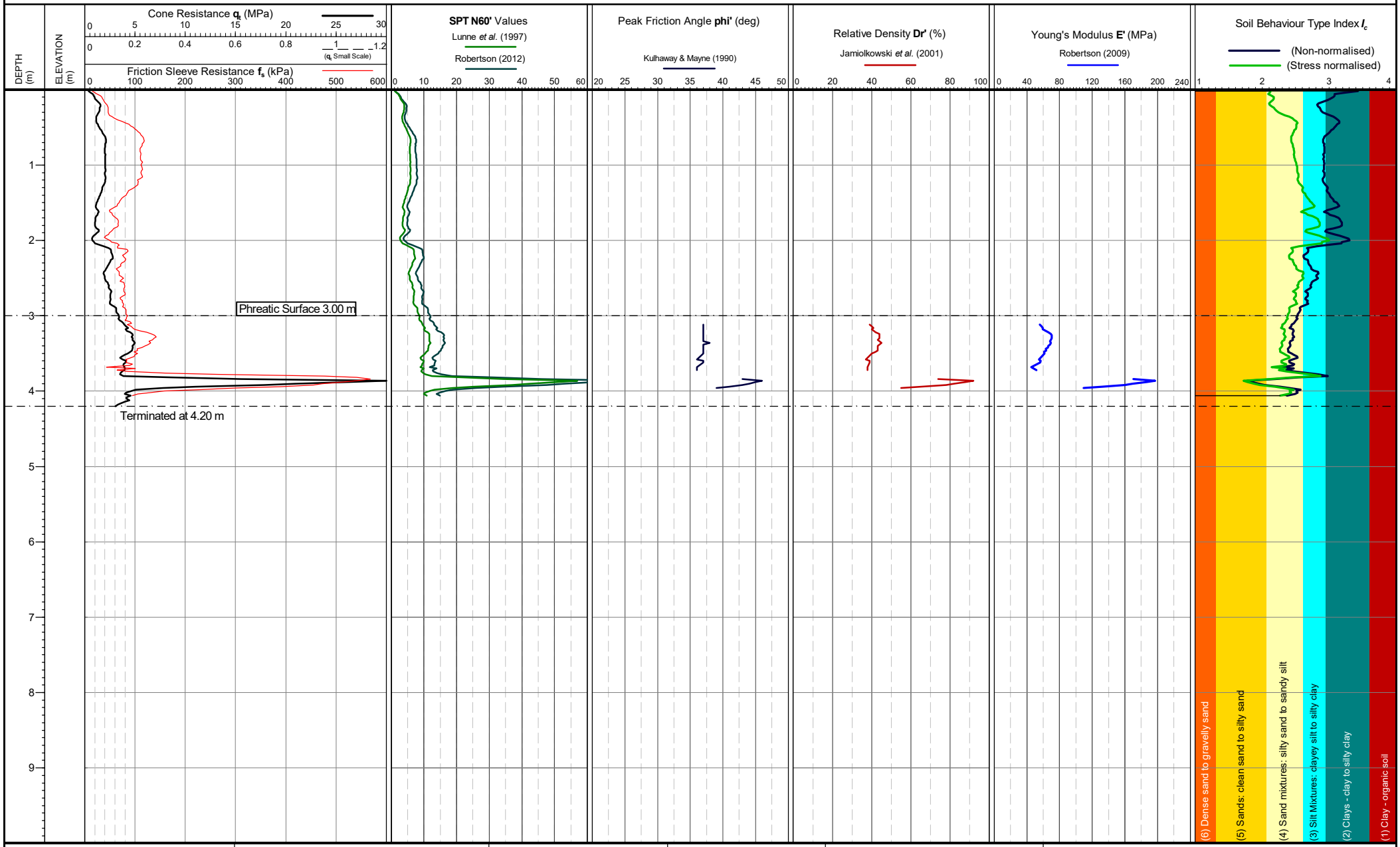
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-31

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 15:51:01

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

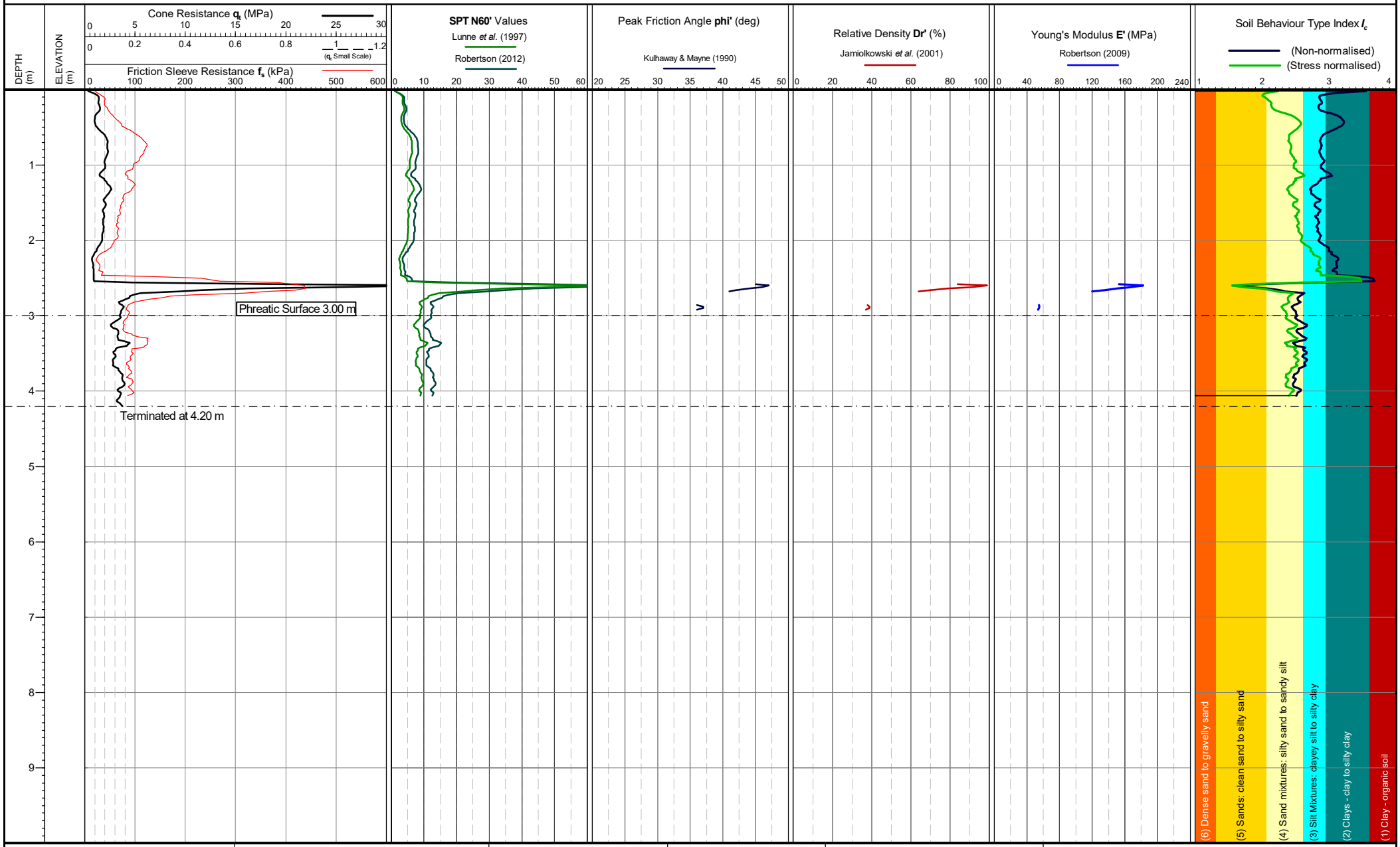
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-32

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 14:14:52

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

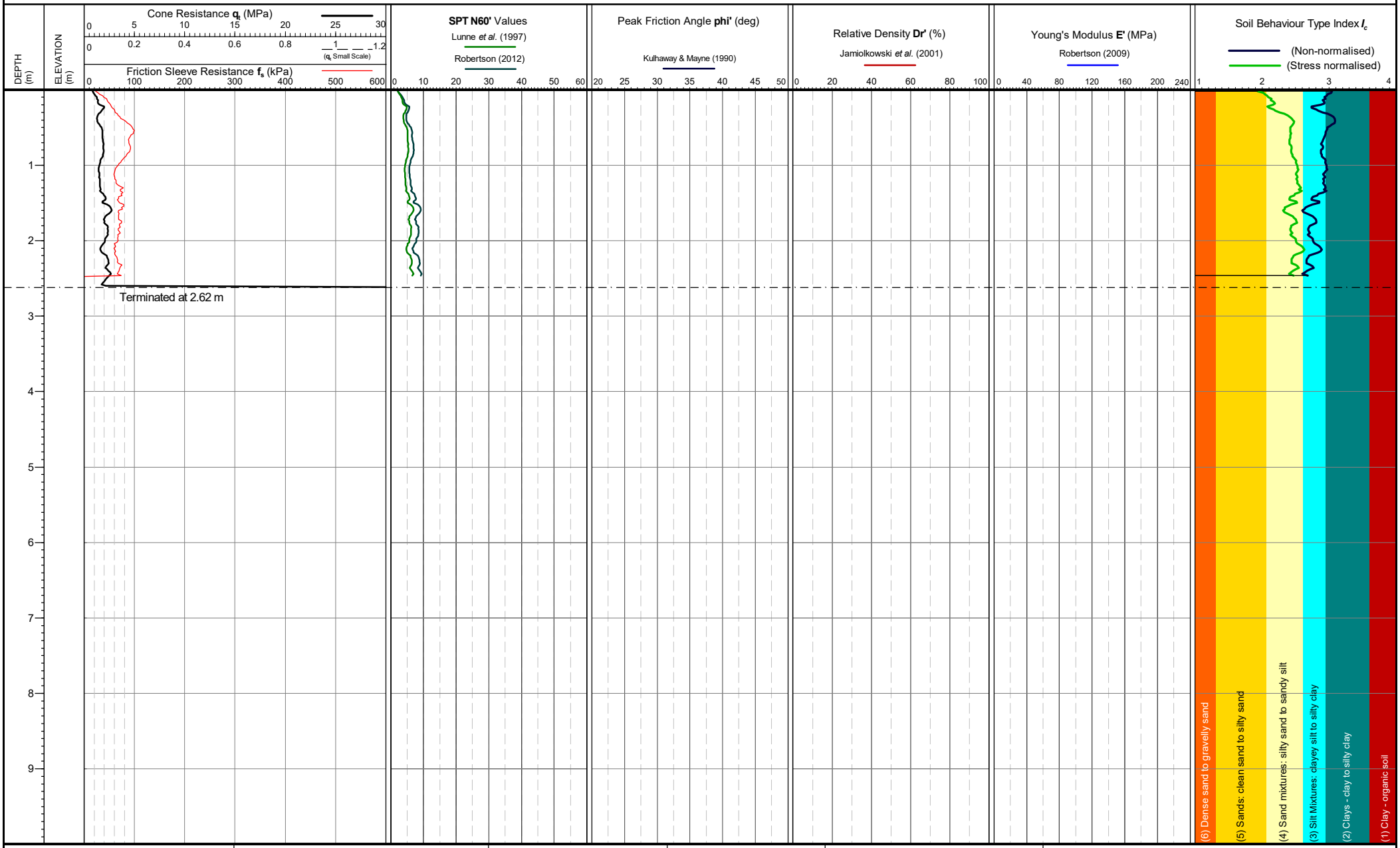
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-33

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 14:29:32

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

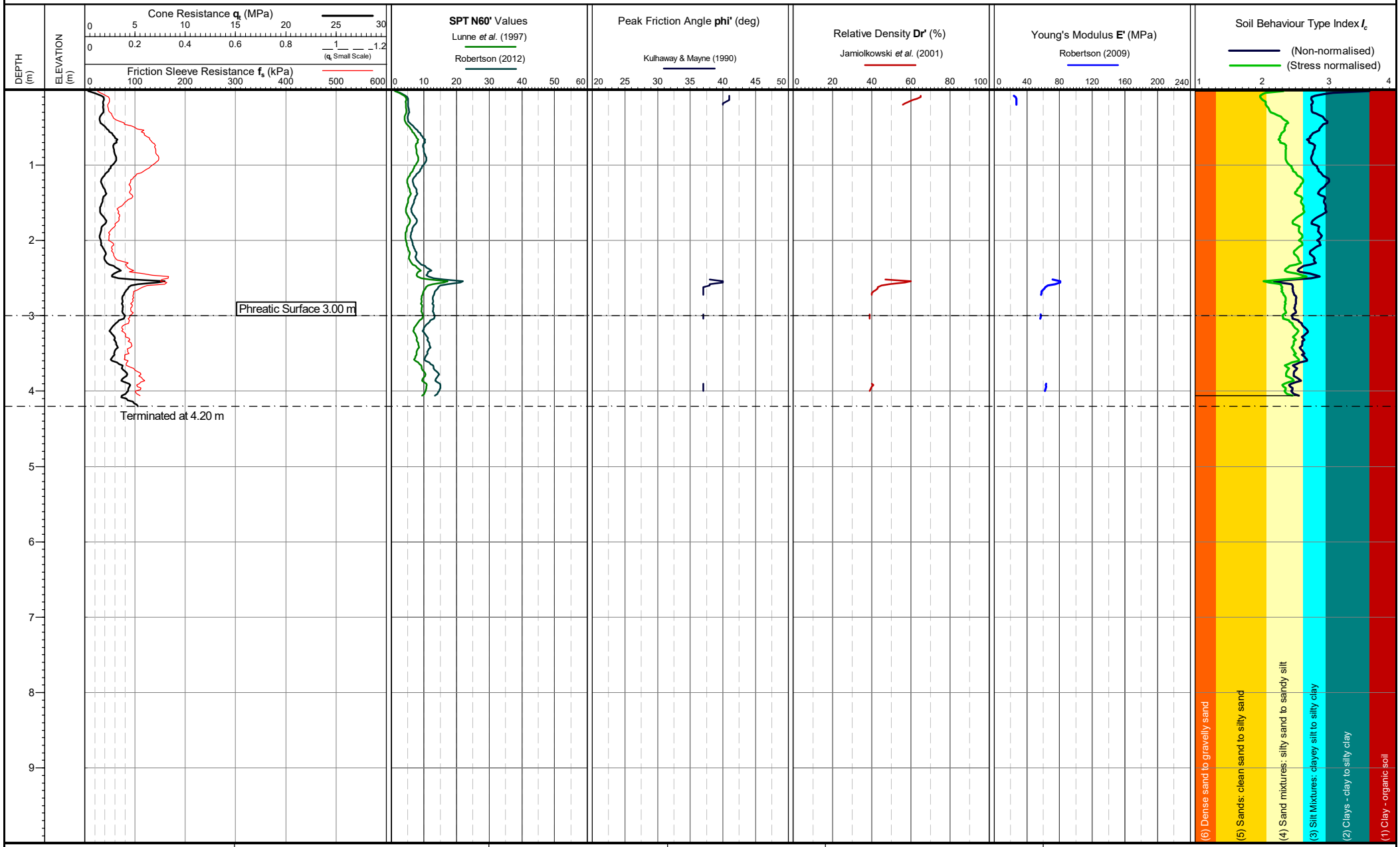
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-34

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 14:58:03

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

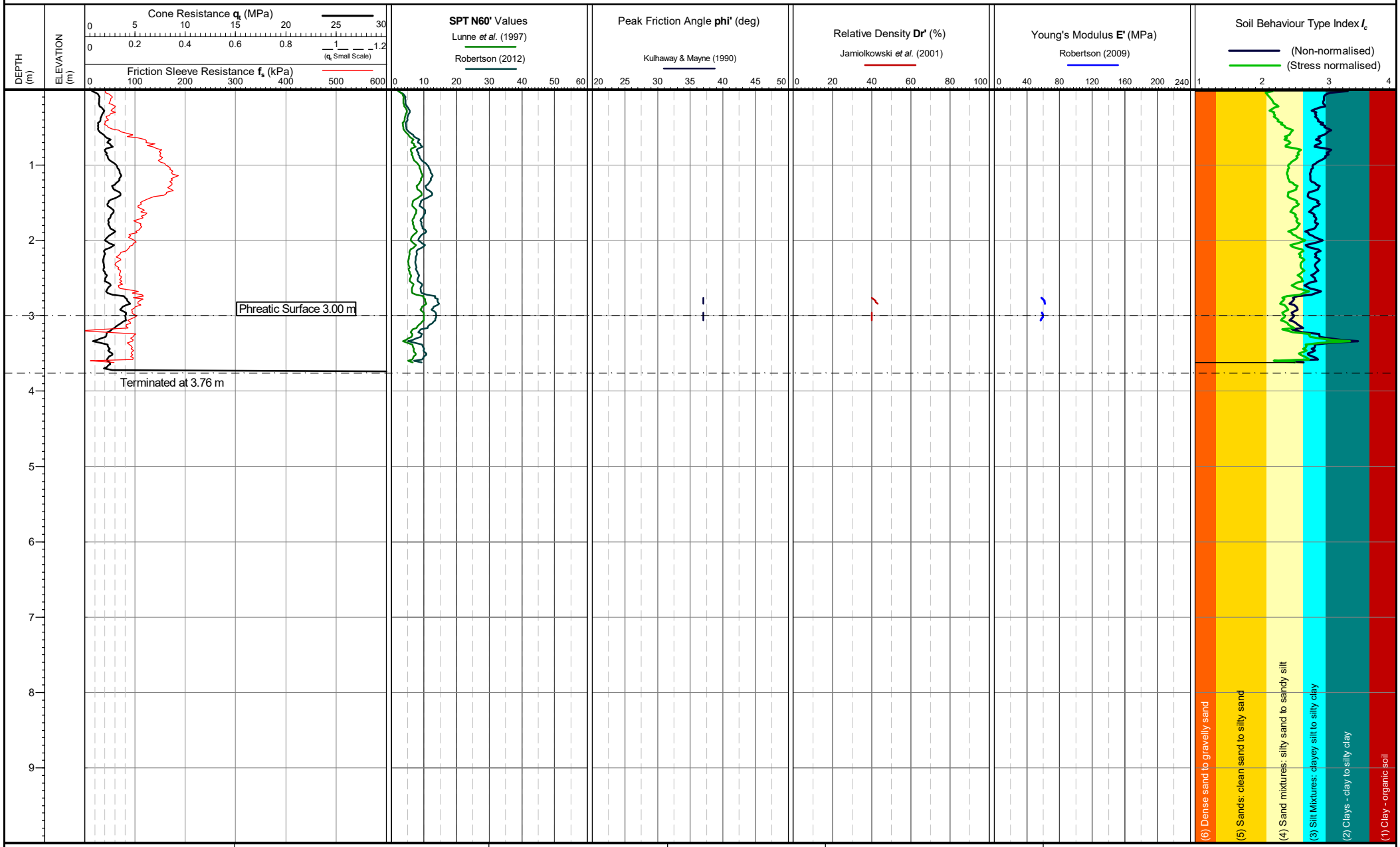
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-35

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 30/09/2025 08:08:51

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

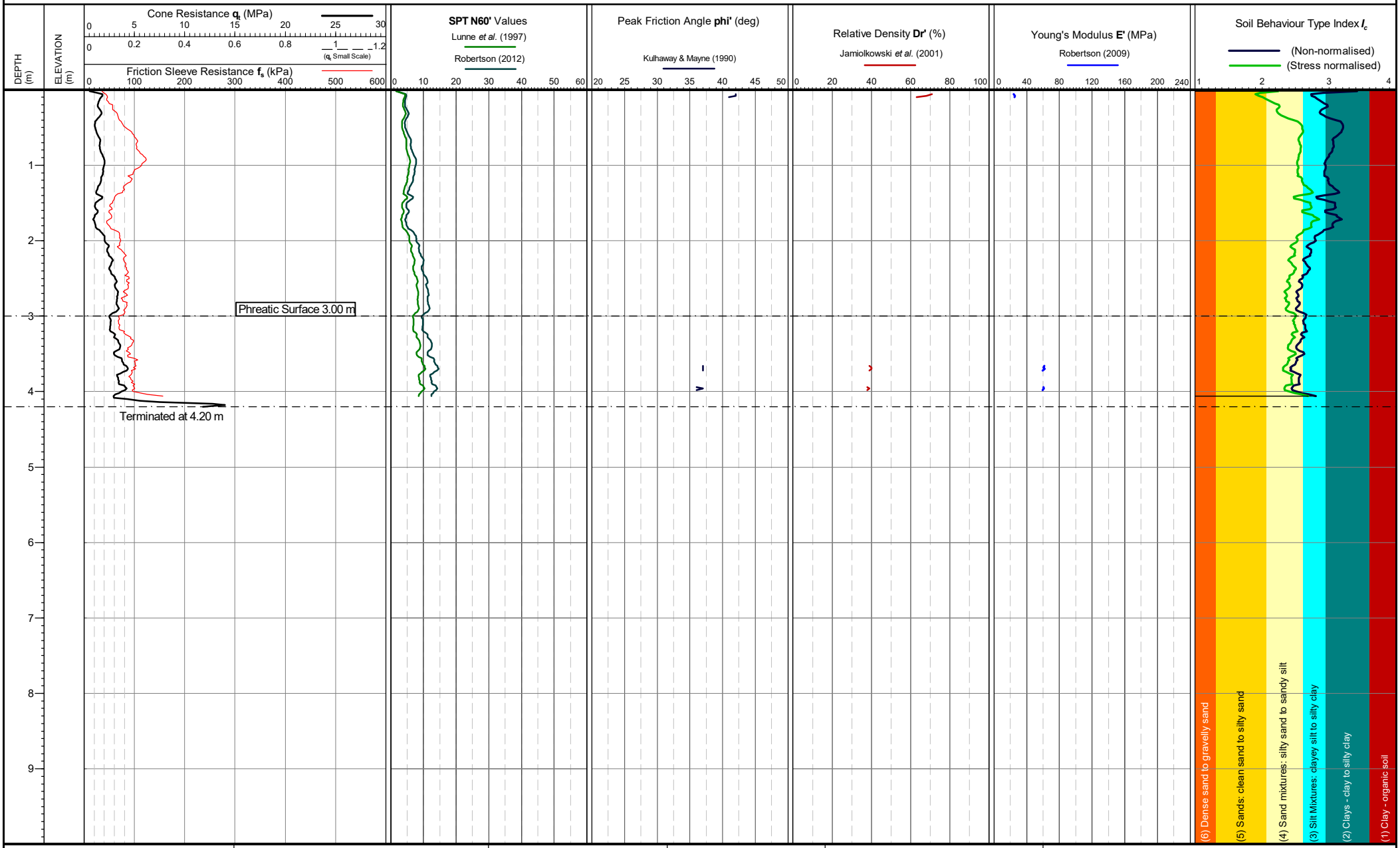
Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-36

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2074
Operator: Owen Treharne
Date of test: 30/09/2025 08:33:54

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

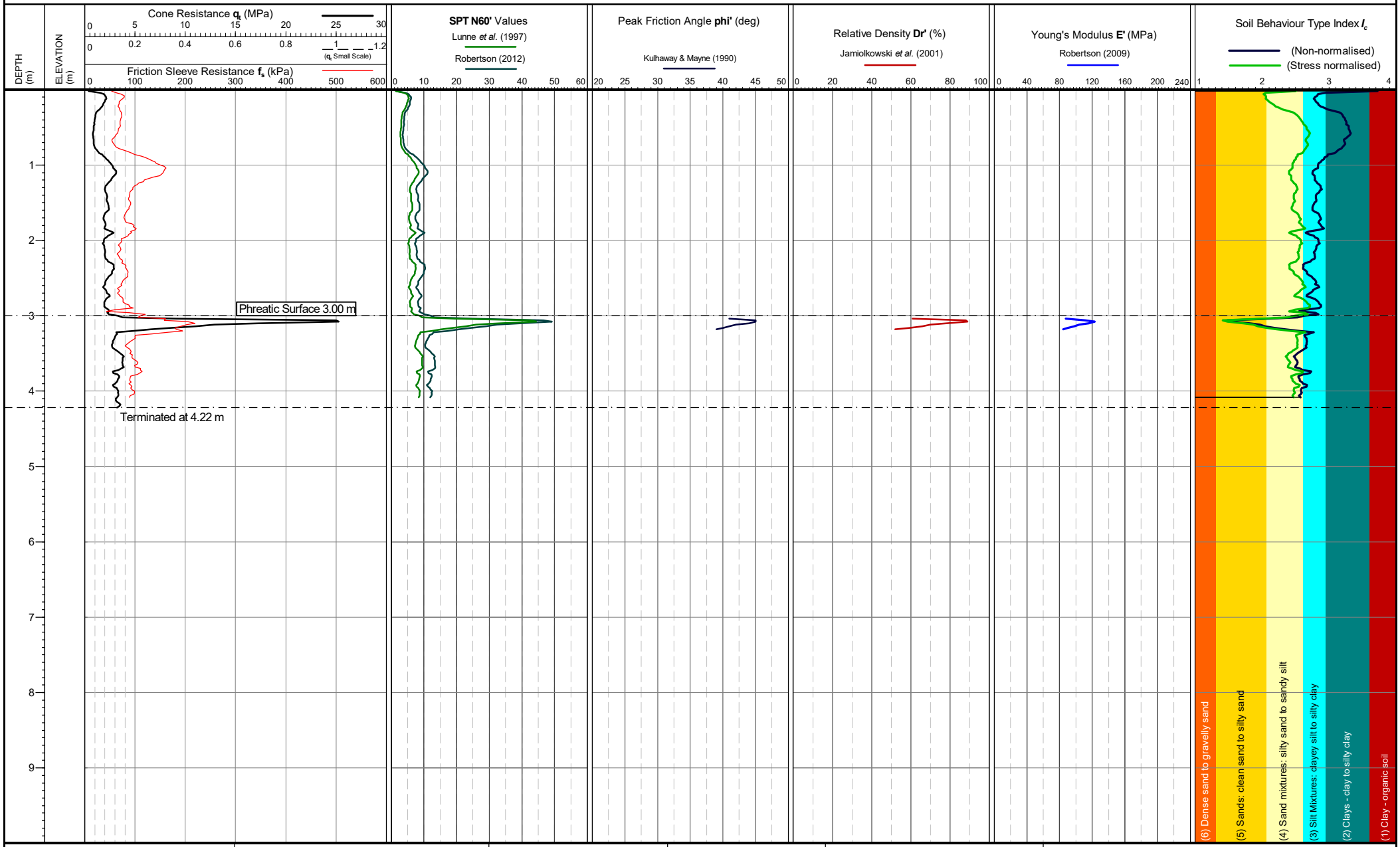
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-37

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 08:58:34

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

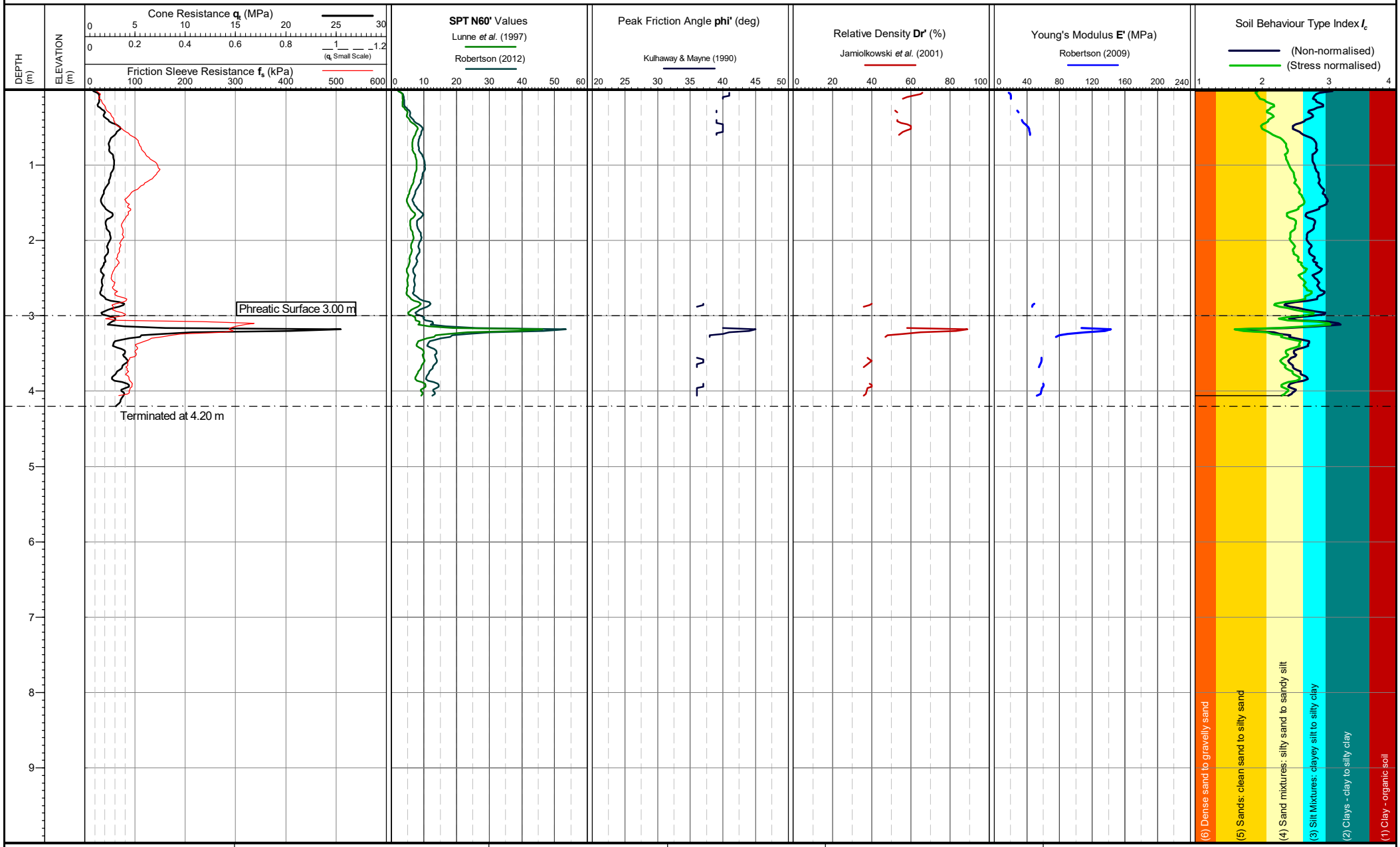
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-38

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 15:12:42

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

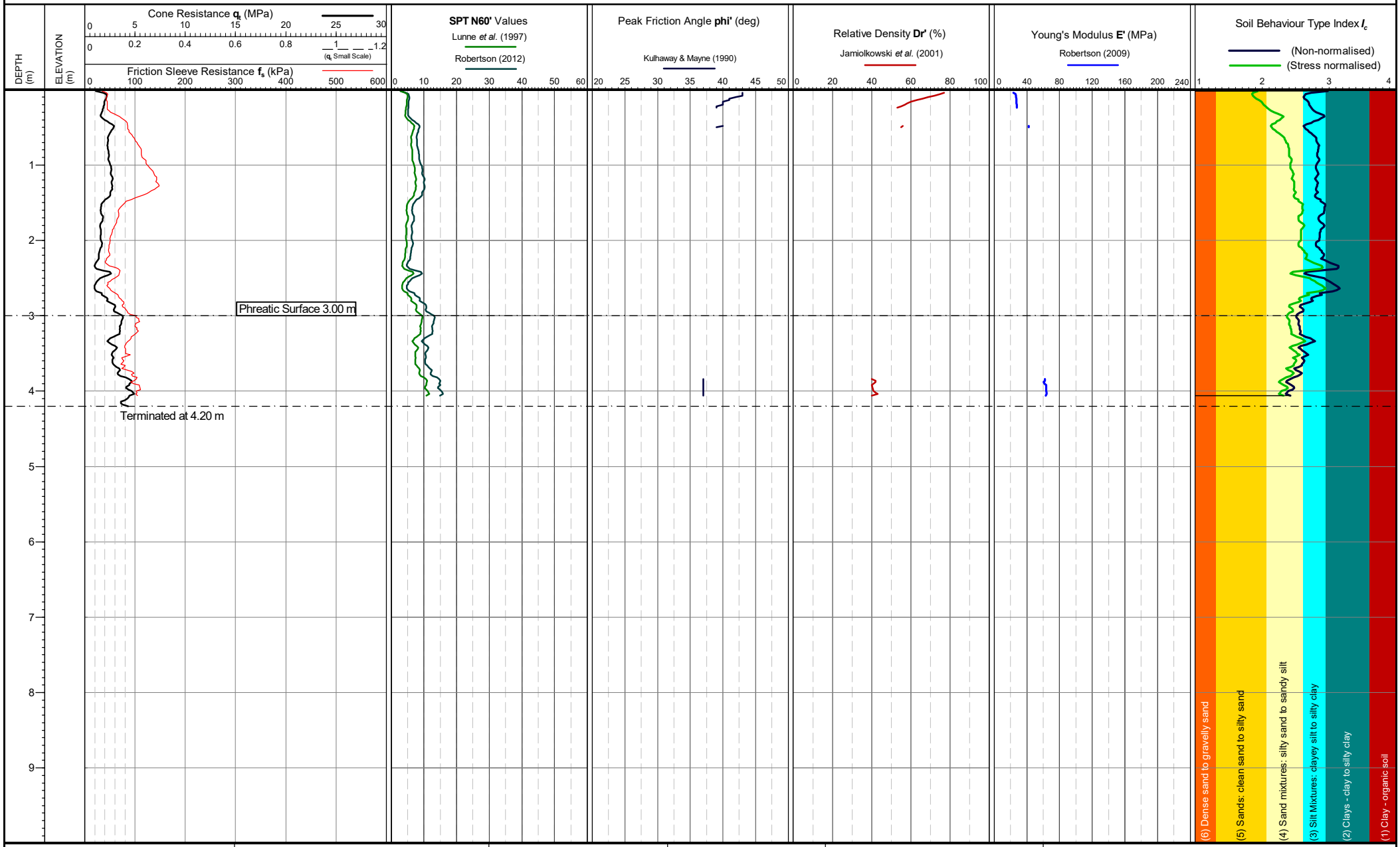
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-39

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 15:33:05

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

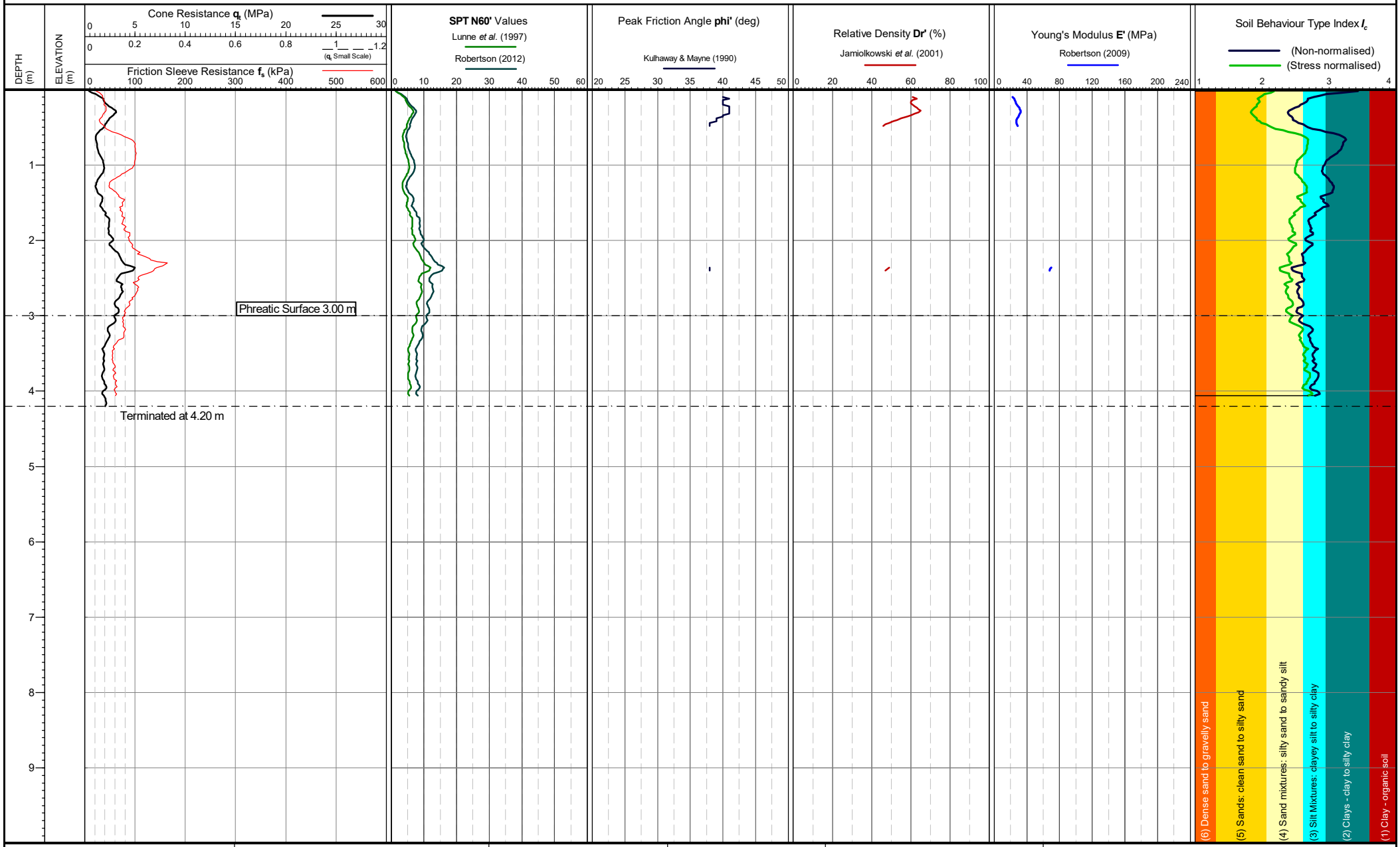
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-40

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 09:29:08

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

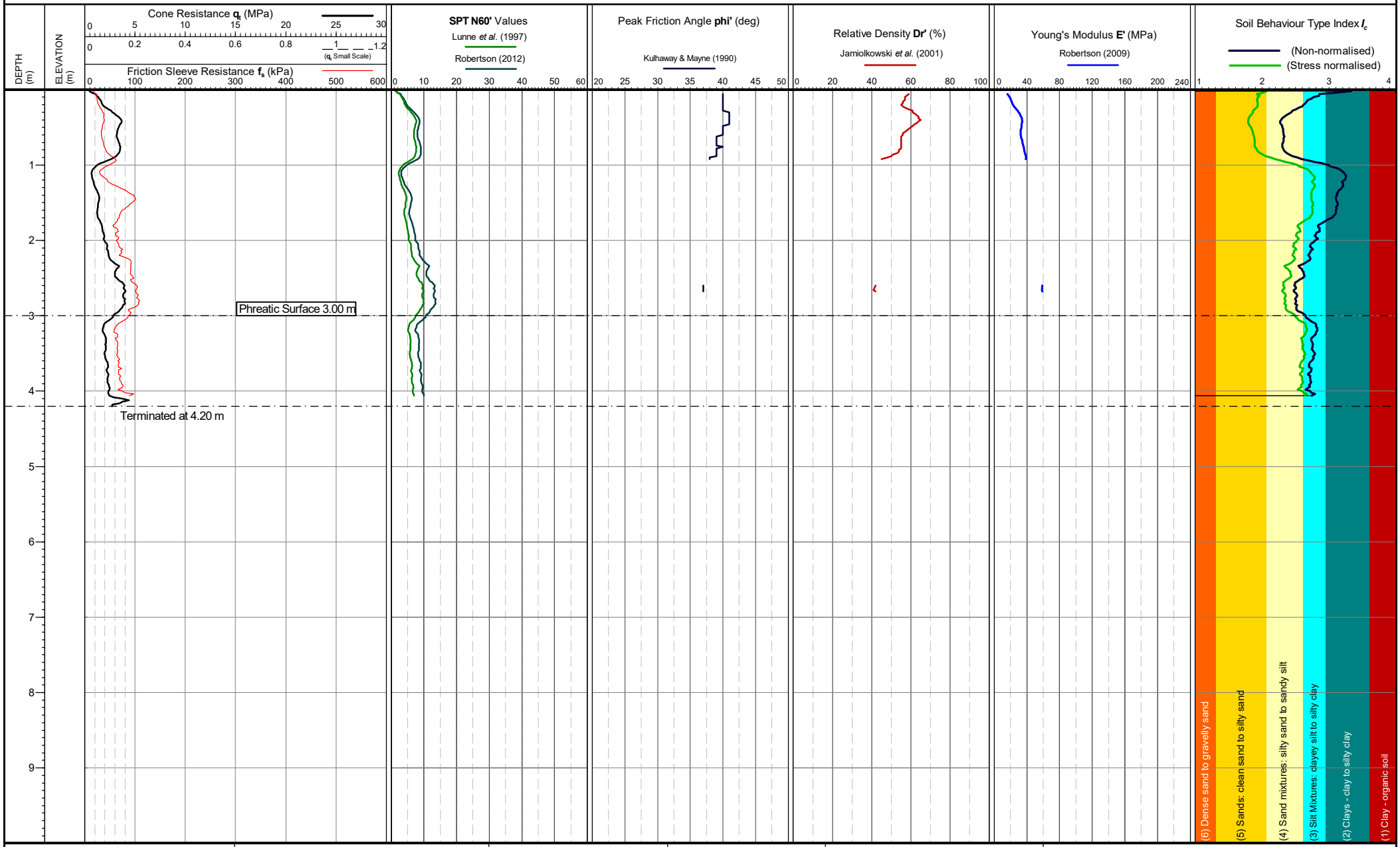
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-41

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 09:39:35

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

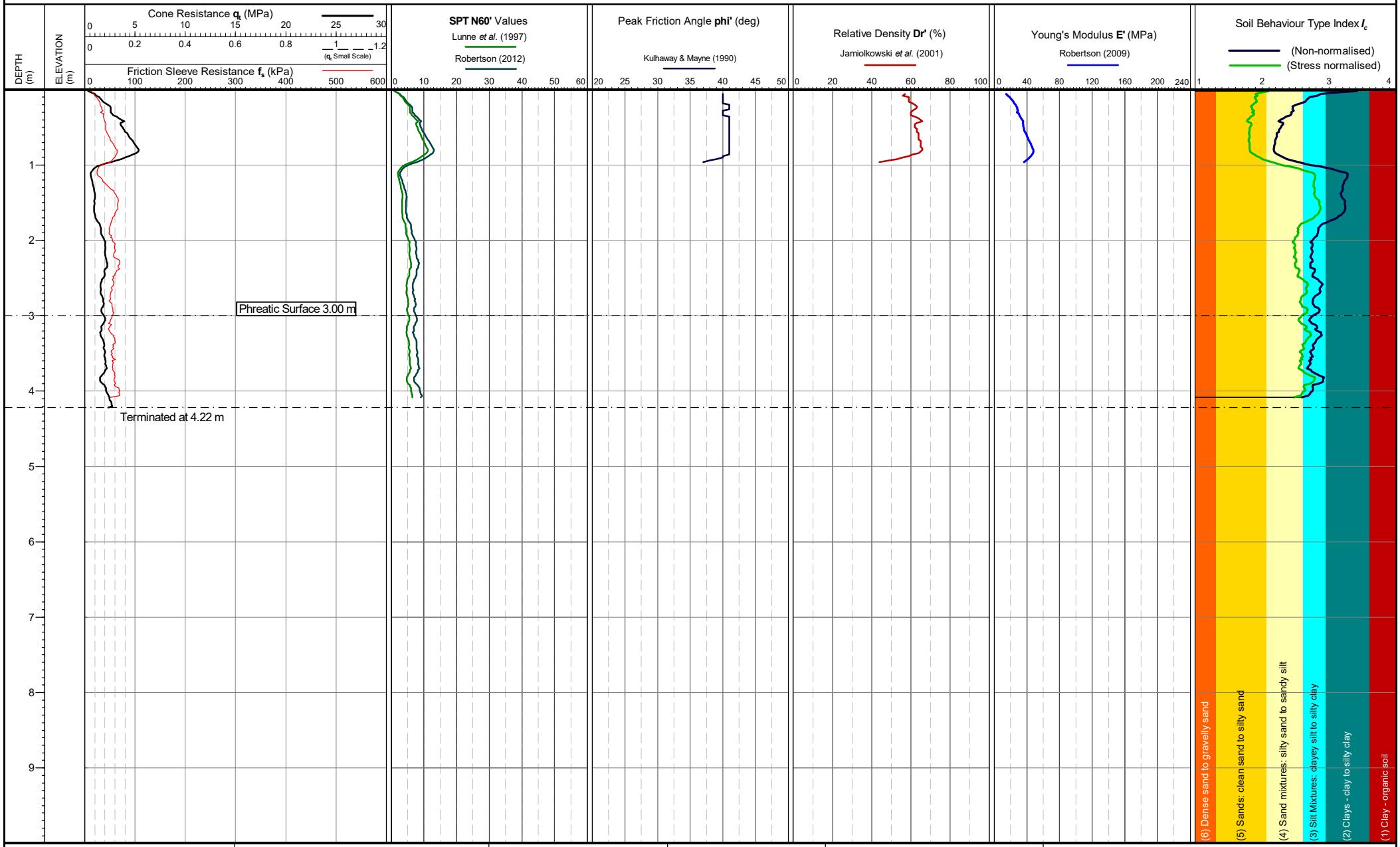
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-42

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 09:52:18

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

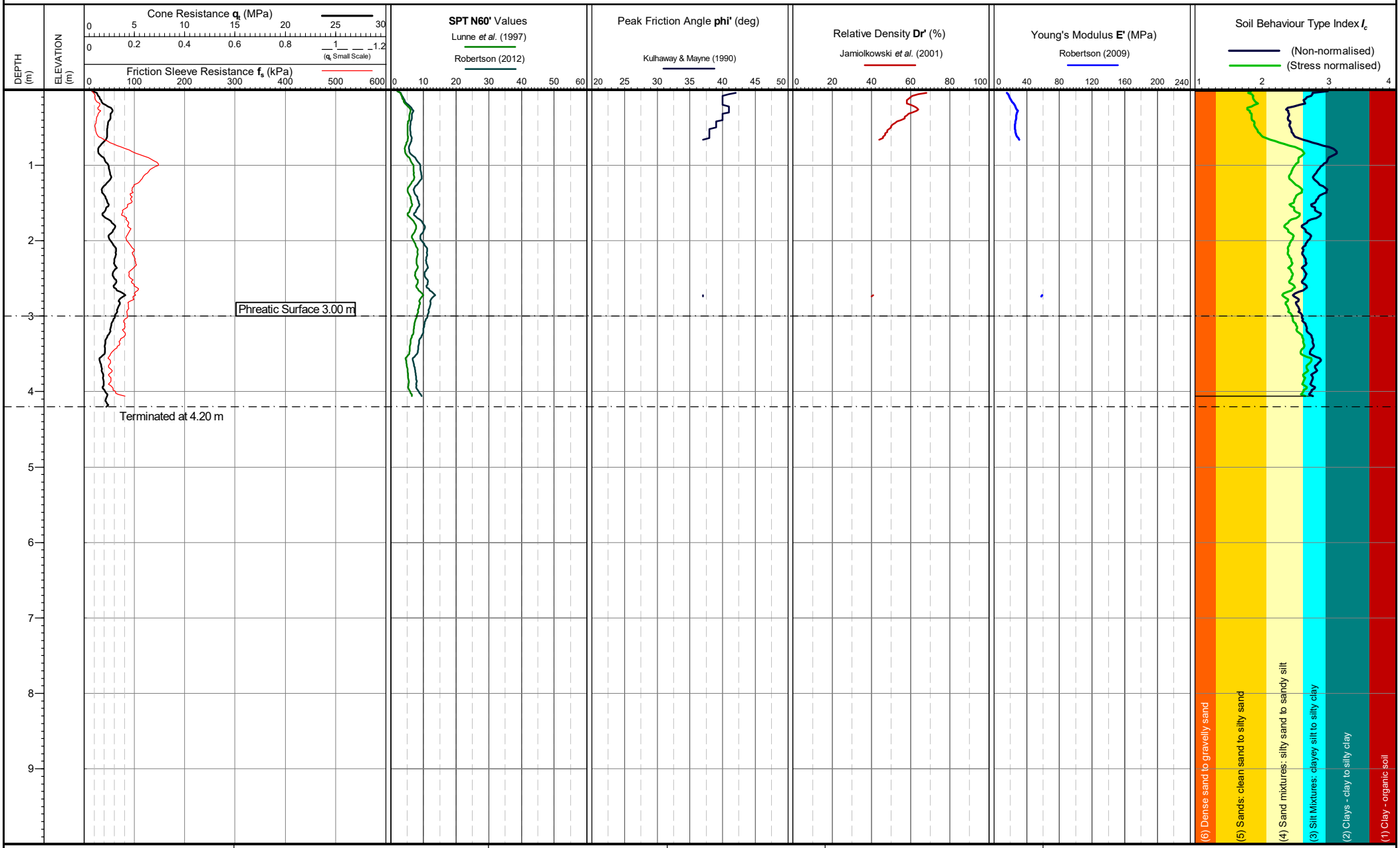
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-43

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 15:21:14

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25

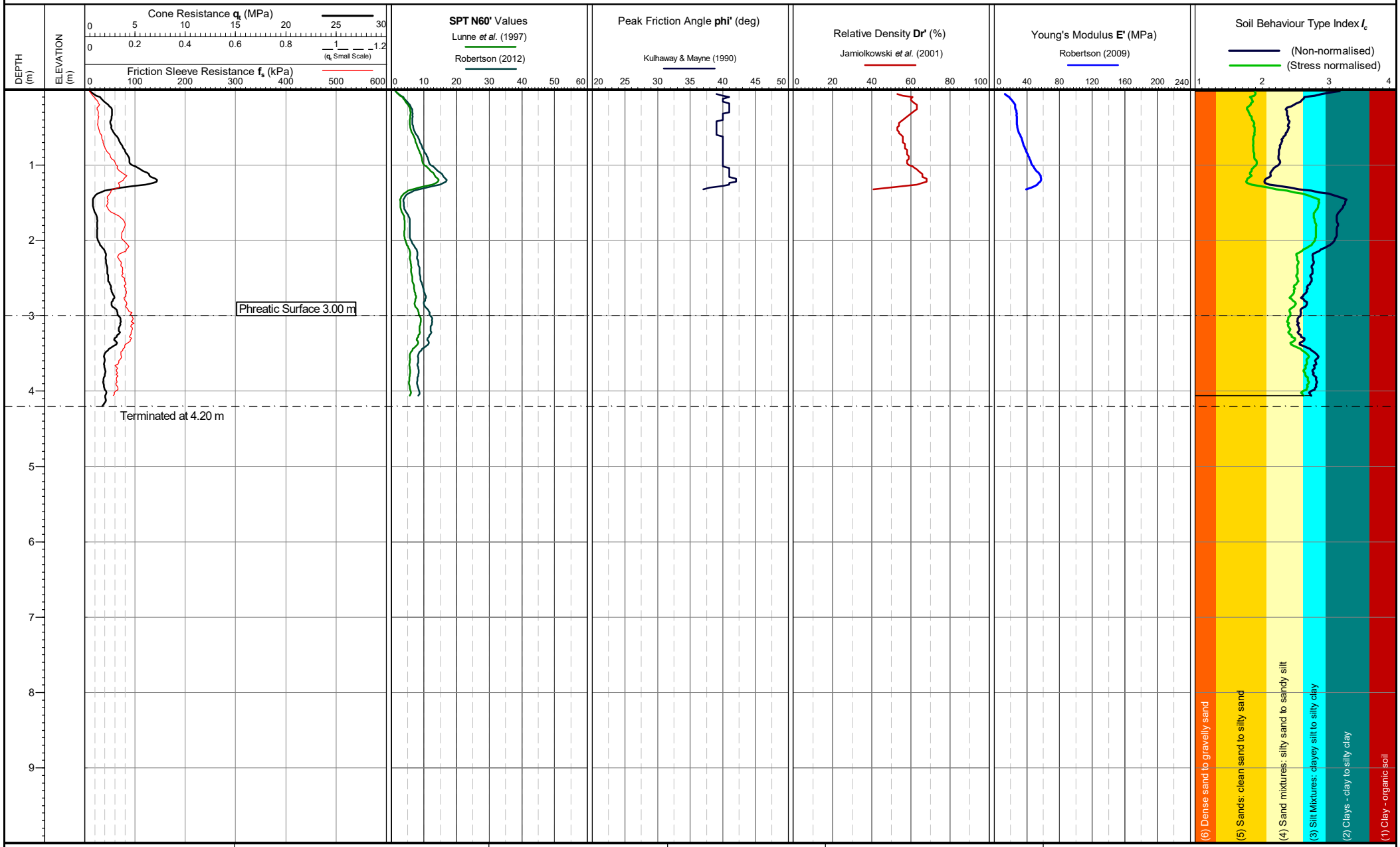
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-44

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 10:01:52

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

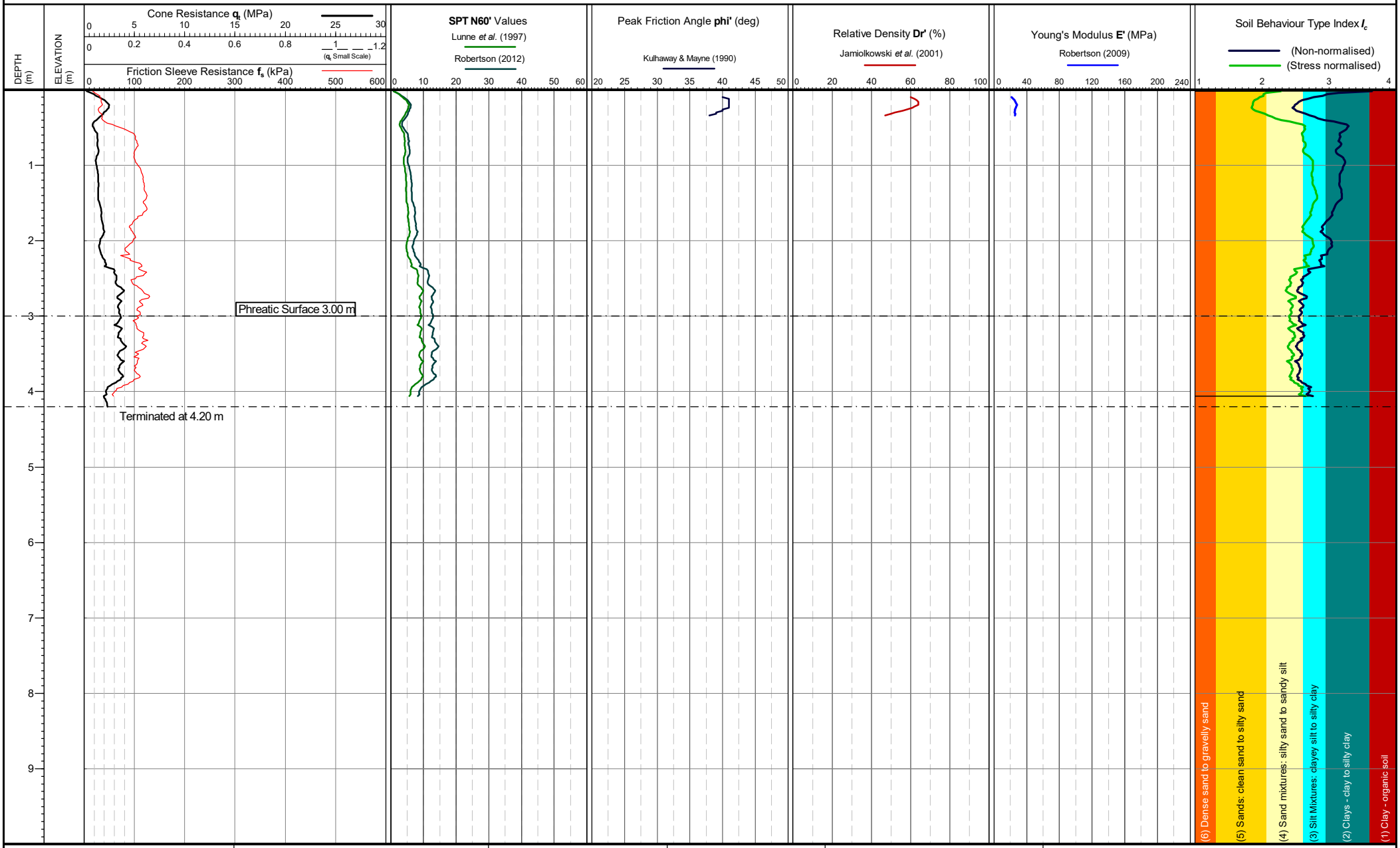
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-45

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 10:26:03

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

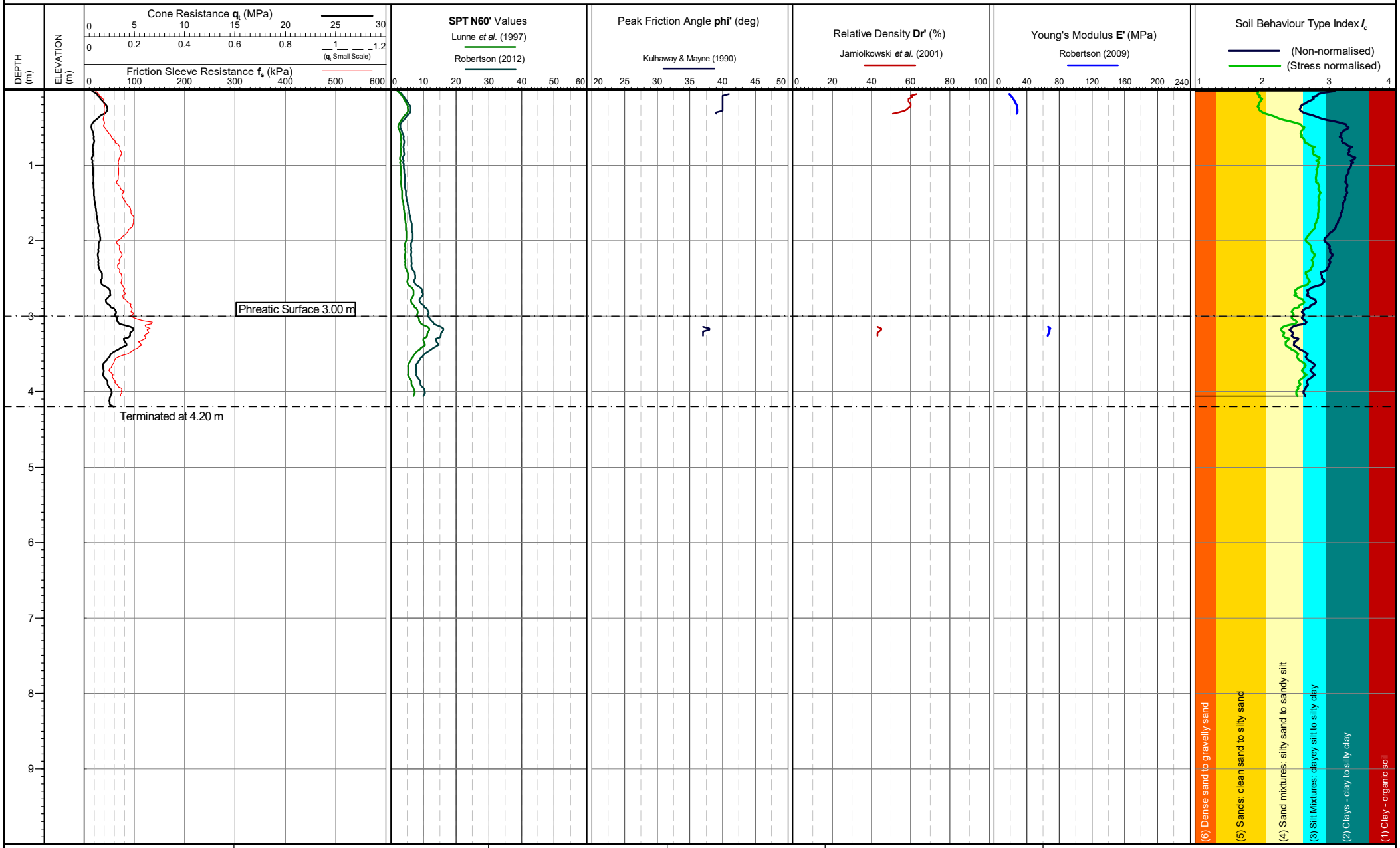
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-46

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 10:36:17

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

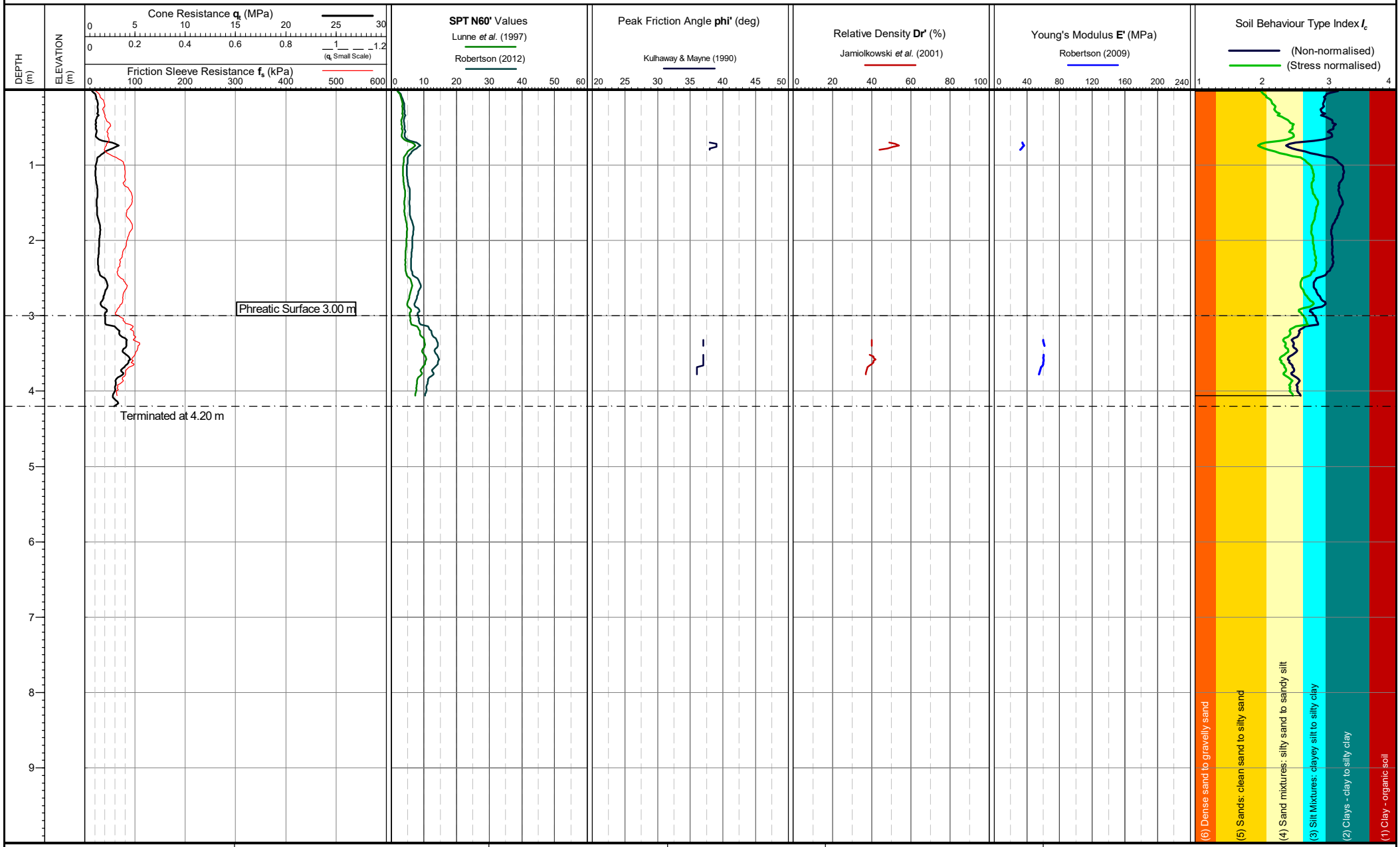
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-47

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 10:50:04

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

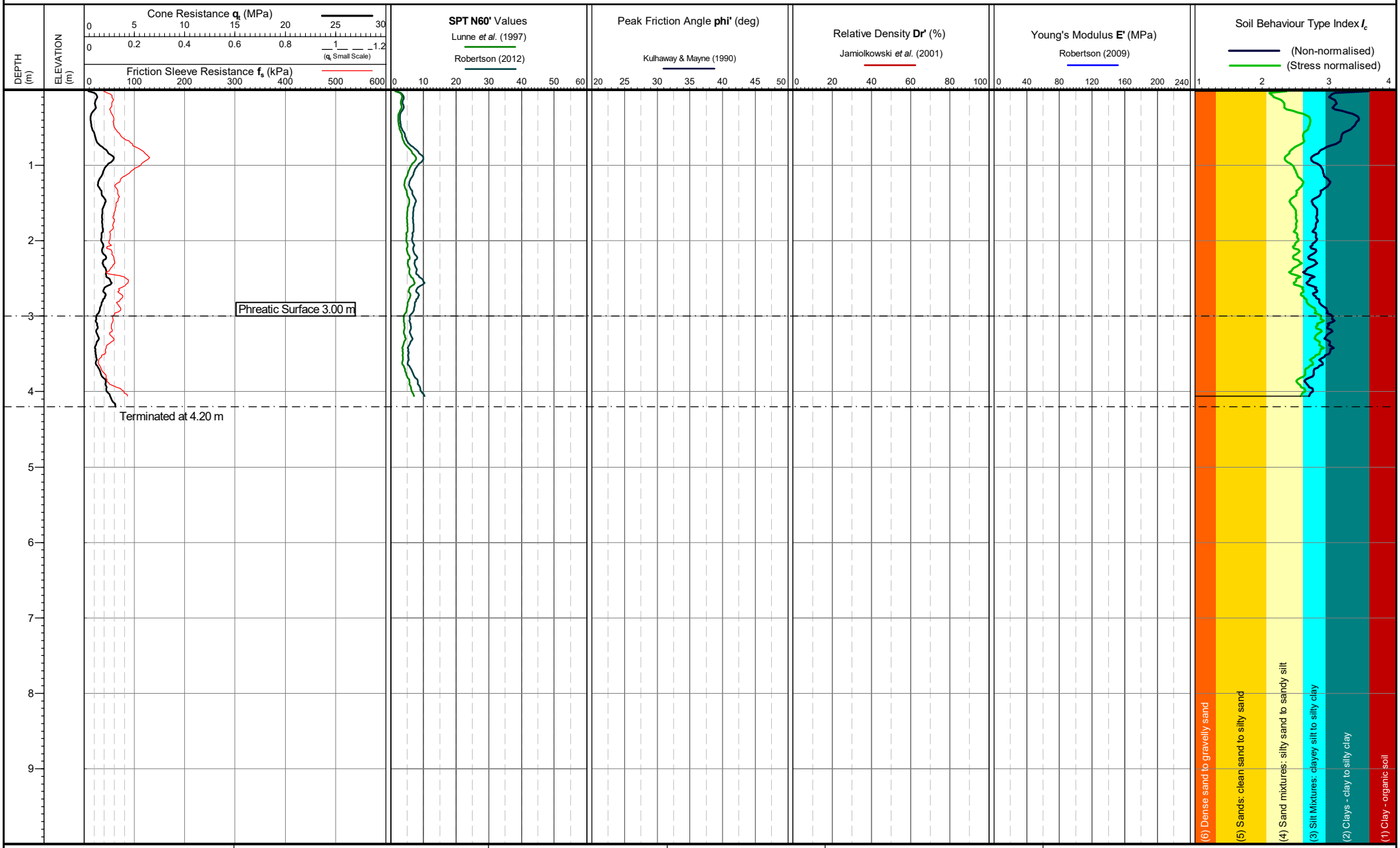
Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-48

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2):
Cone ID: S15-CFIPTT.2477
Operator: Owen Treharne
Date of test: 30/09/2025 11:25:23

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

Both drained and undrained parameters are calculated for mixed SBTs = Ic 2.40-2.70. See report text for methods and discussion of parameter evaluation.

Date of plot: 01-10-25
Checked by: Chris Player

Lankelma Project Ref: 25-32-30218-1

TEST ID: SPT-14

APPENDIX G PENETROMETER TEMPERATURE RESULTS

The logs of this Appendix present the recorded temperature of the penetrometer tip load cell. The data is used for QC purposes during fieldwork and post processing, and the reader may compare the data to the temperature verification section of the corresponding calibration certificate. The data has been used during post processing to correct the tip and pore pressure results for transient and static temperature effects.

Note:

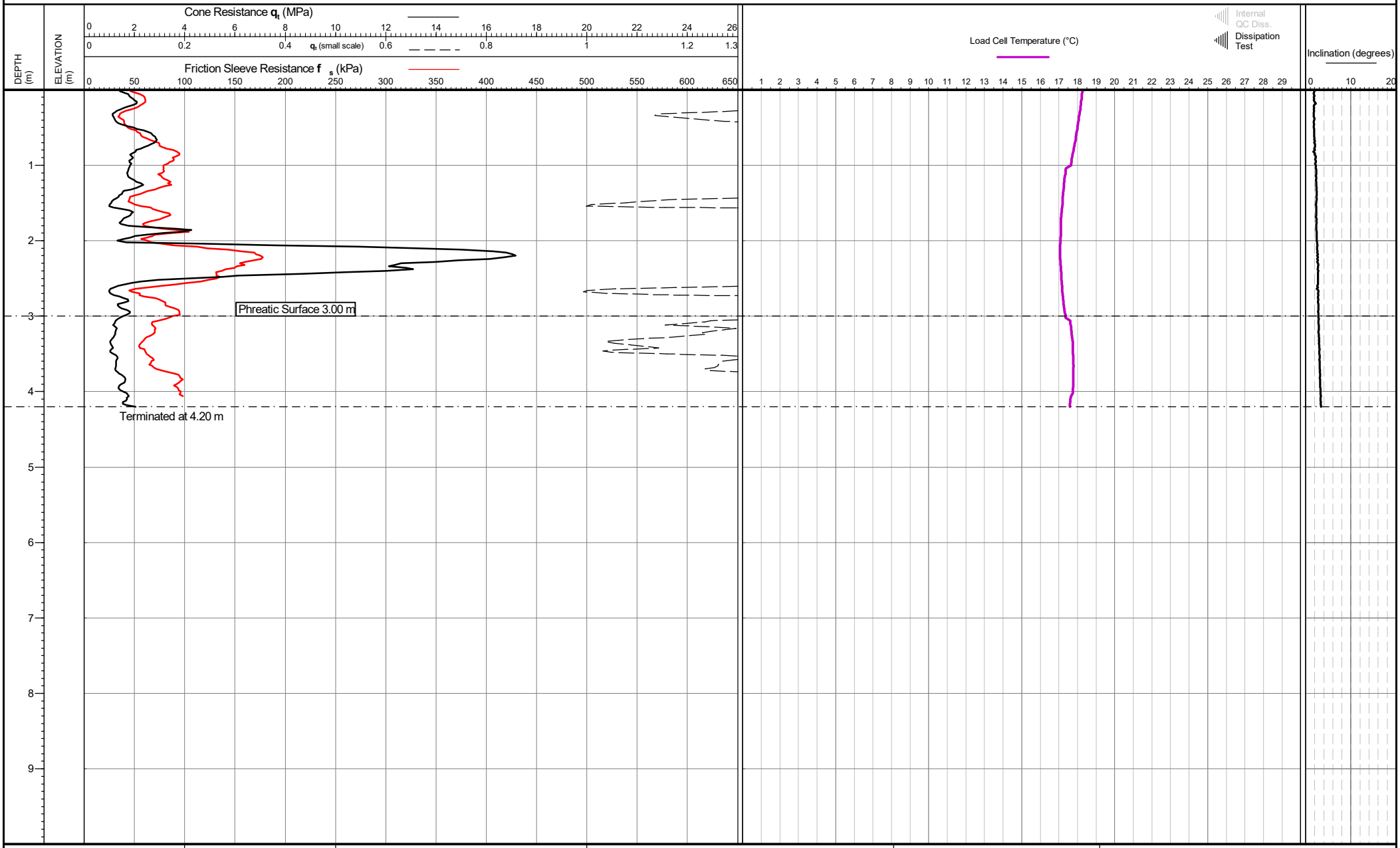
Ground temperature is only represented within 0.5 degrees of the true value following a penetration pause of 20-50 minutes, depending on the thermal properties of the soil.

Plots will not be provided for tests performed with magnetometer readings.

Near horizontal lines (steps) in the temperature plots indicate change in temperature during a pause in penetration.

Project: SOUTHAMPTON

Client: SOILS LTD.

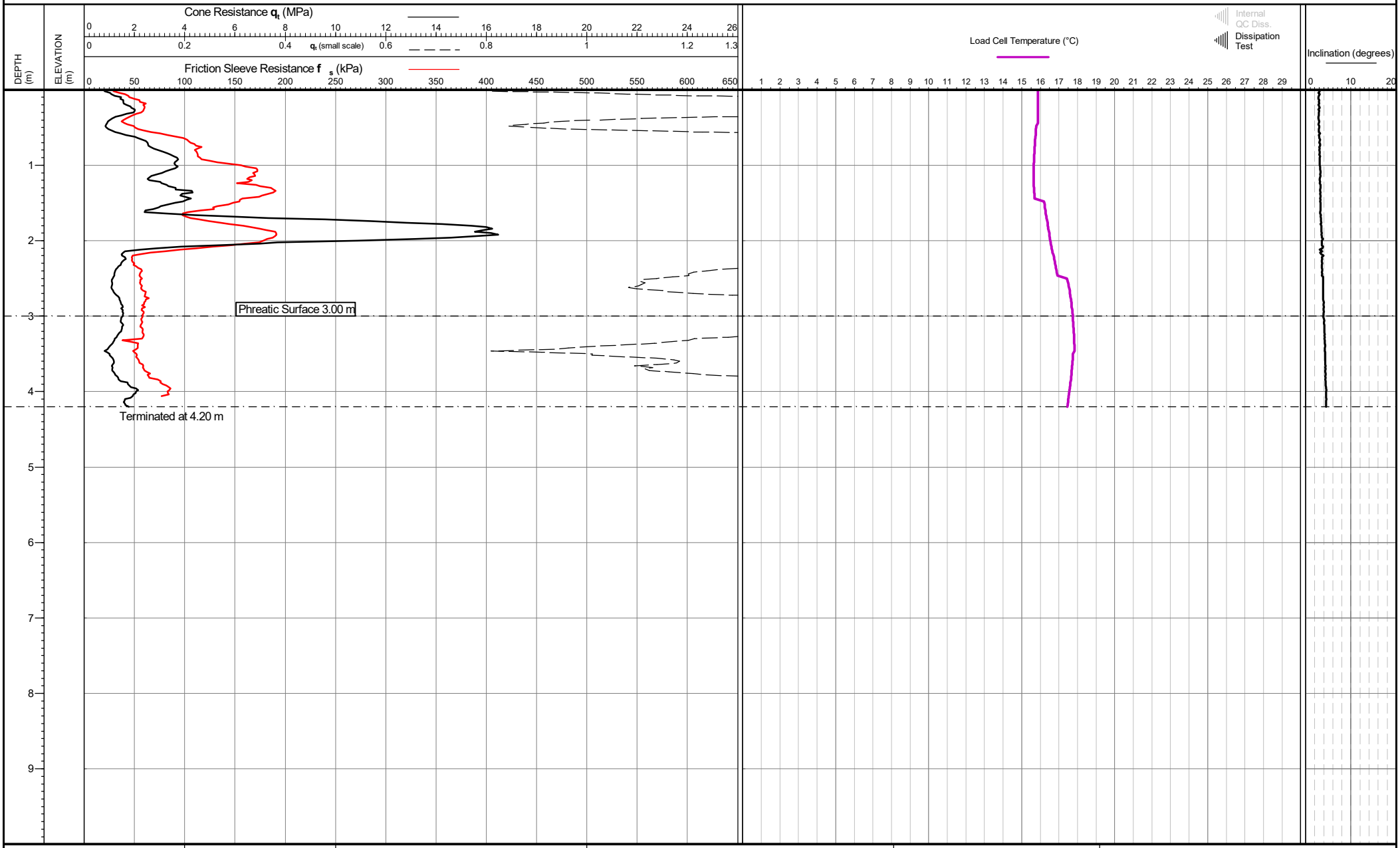


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:10:55	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 u_2 (kPa): -6.7	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-01

Project: SOUTHAMPTON

Client: SOILS LTD.

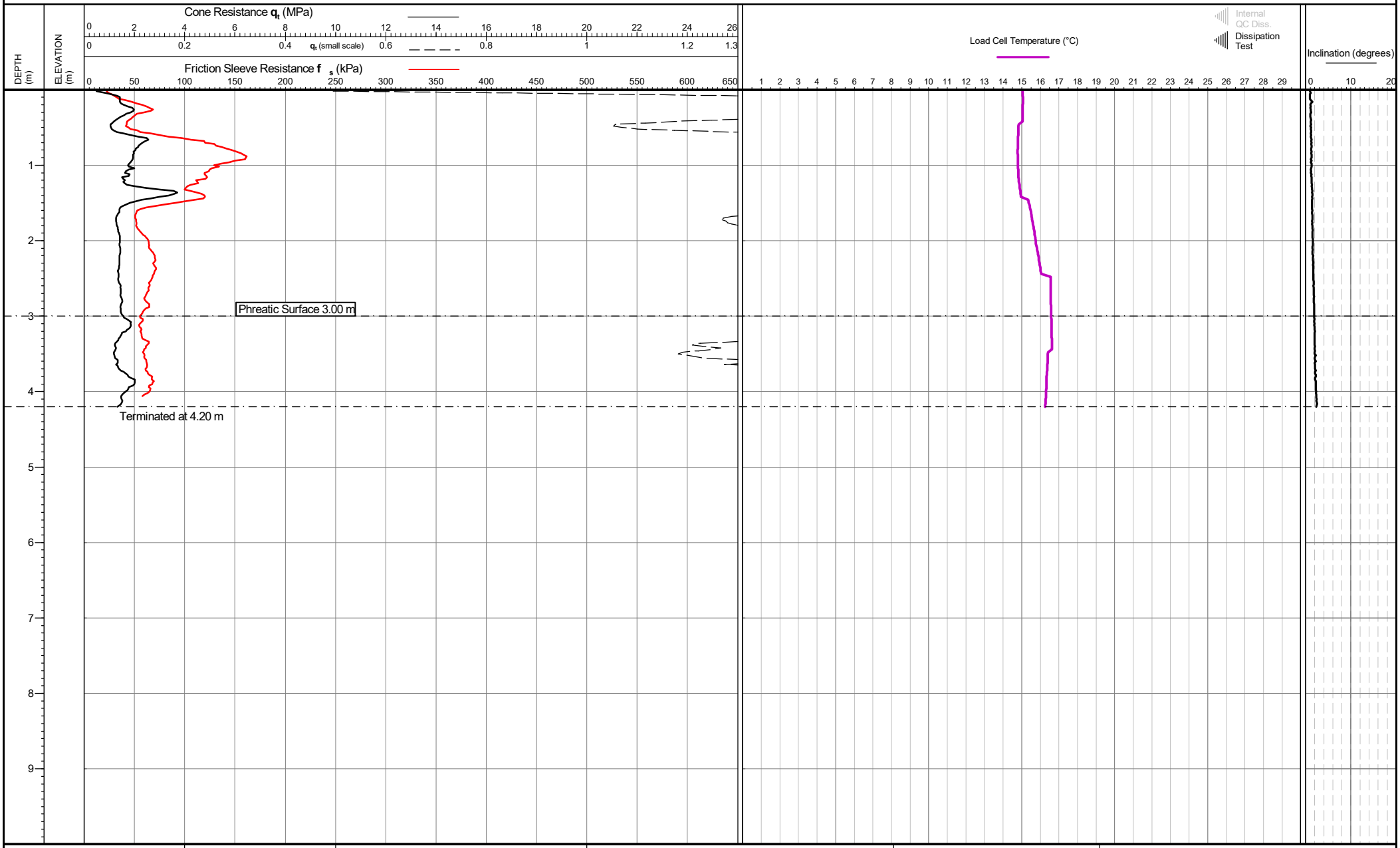


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 11:30:59	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 u_2 (kPa): -6.7	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-02

Project: SOUTHAMPTON

Client: SOILS LTD.

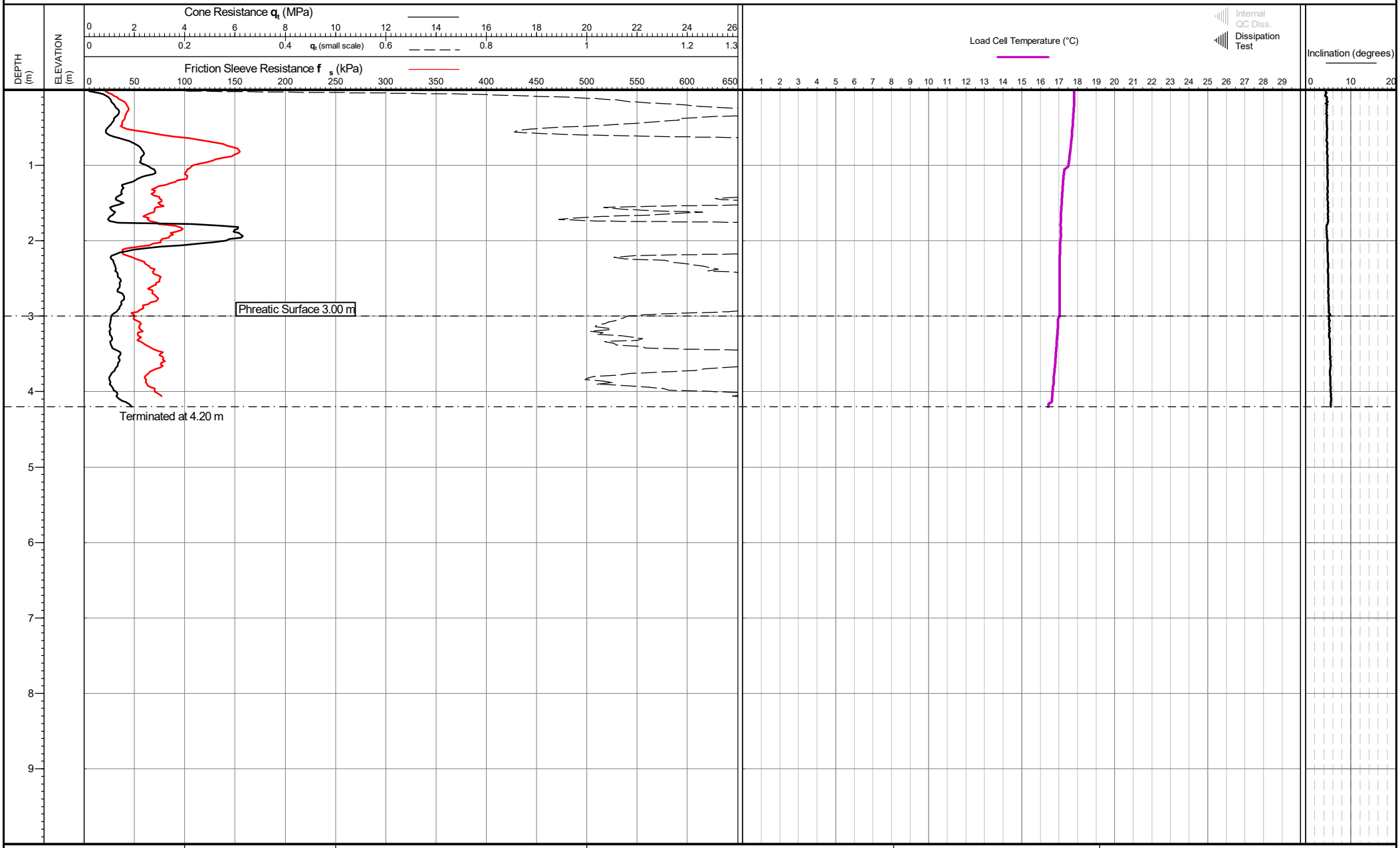


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 10:41:56	Zero drift (Pre/post test) q_c (kPa): -20.6 f_s (kPa): 0.3 u_2 (kPa): -1.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-03

Project: SOUTHAMPTON

Client: SOILS LTD.

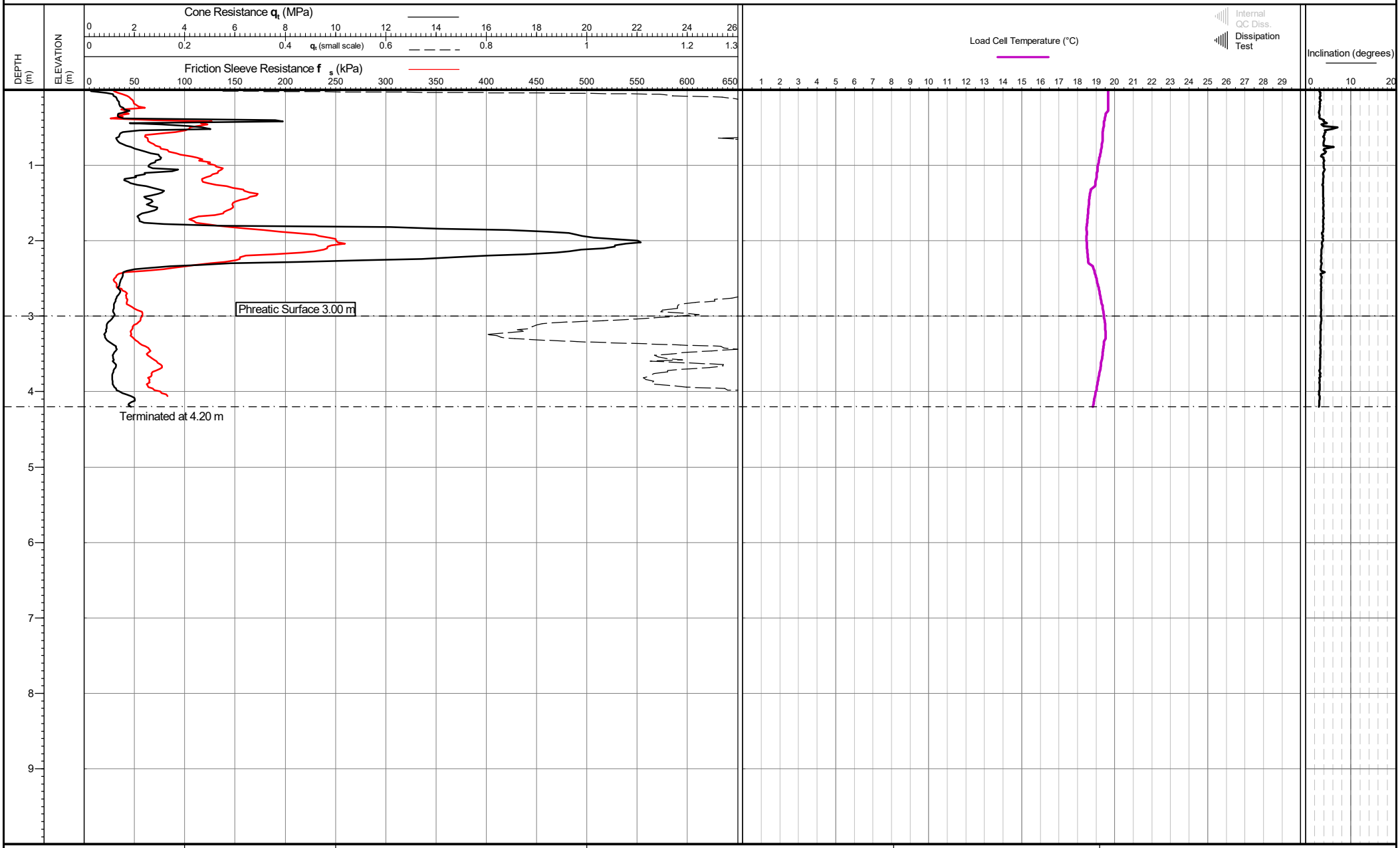


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:24:30	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 u_2 (kPa): -6.7	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-04

Project: SOUTHAMPTON

Client: SOILS LTD.

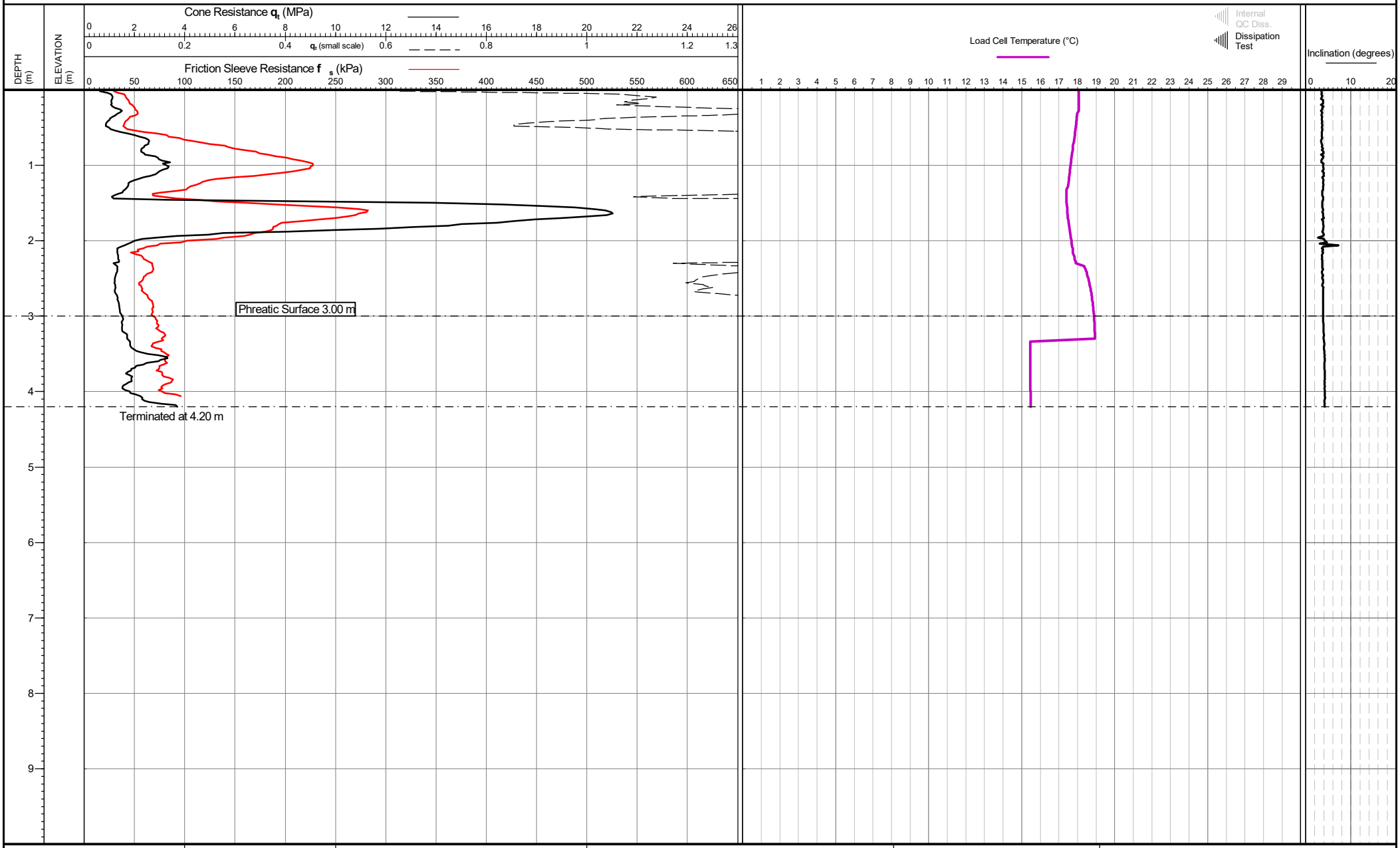


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 15:12:32	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 u_2 (kPa): -3.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-05

Project: SOUTHAMPTON

Client: SOILS LTD.

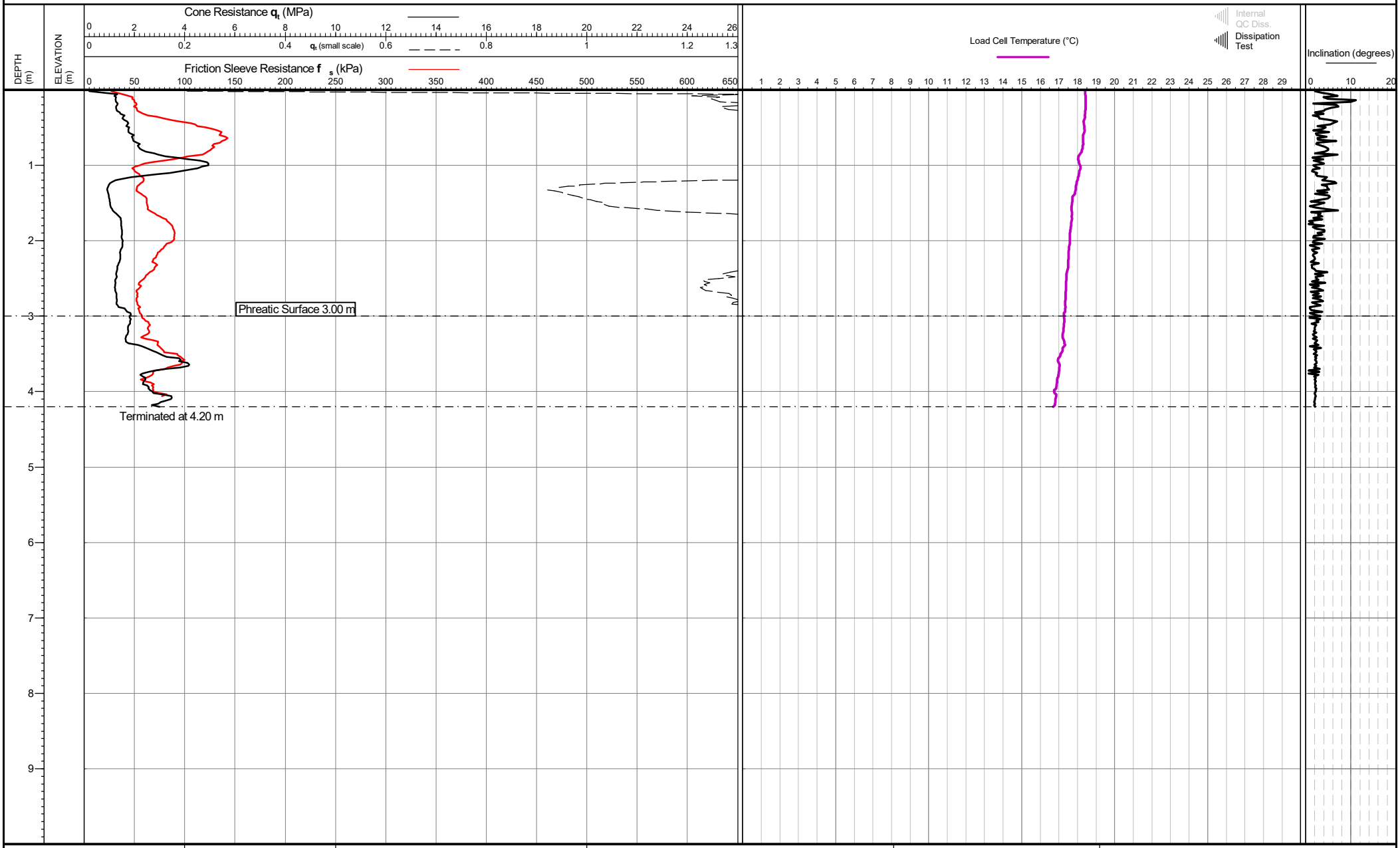


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 15:46:10	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 u_2 (kPa): -3.4	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-06

Project: SOUTHAMPTON

Client: SOILS LTD.

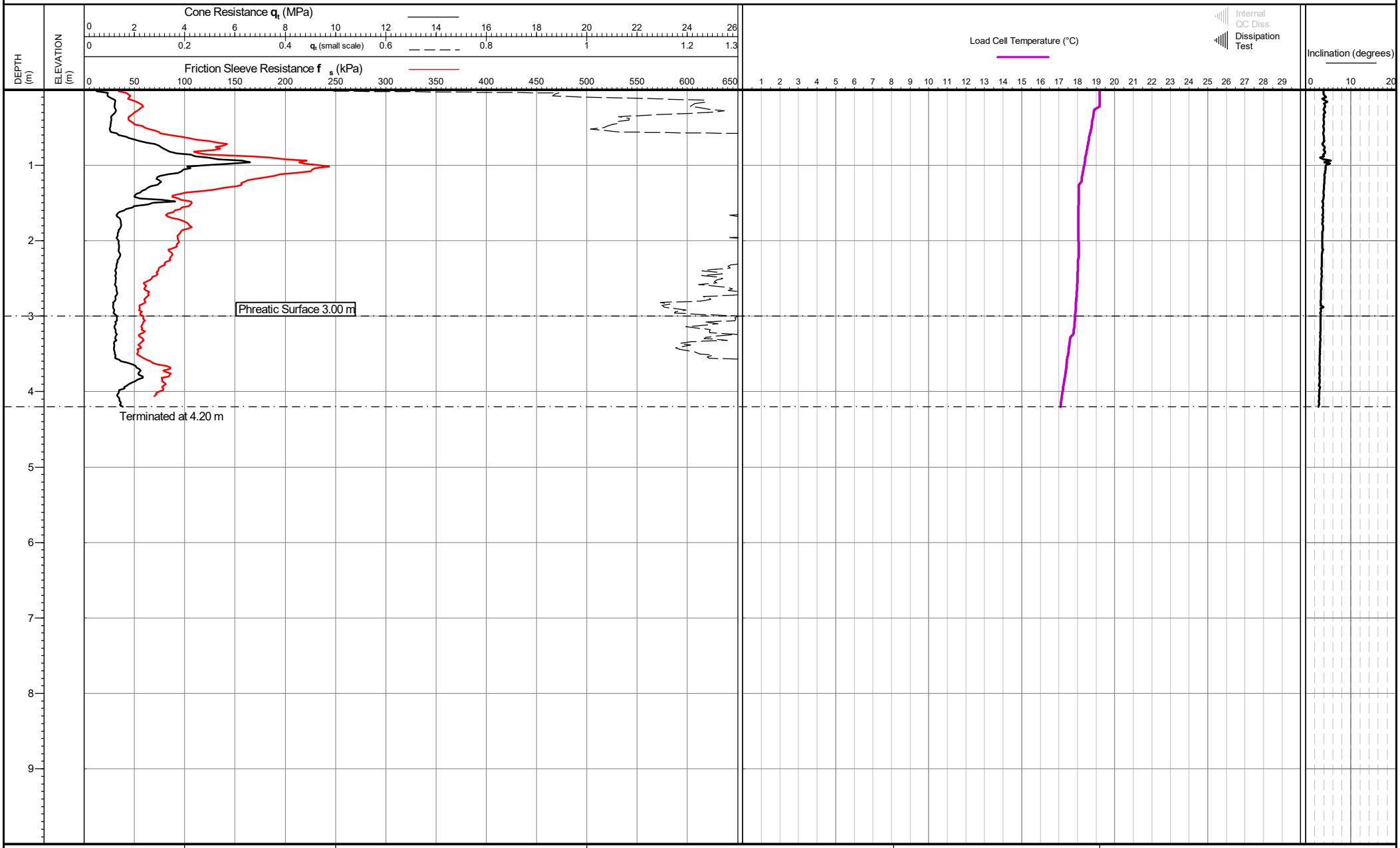


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:01:27	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-07

Project: SOUTHAMPTON

Client: SOILS LTD.

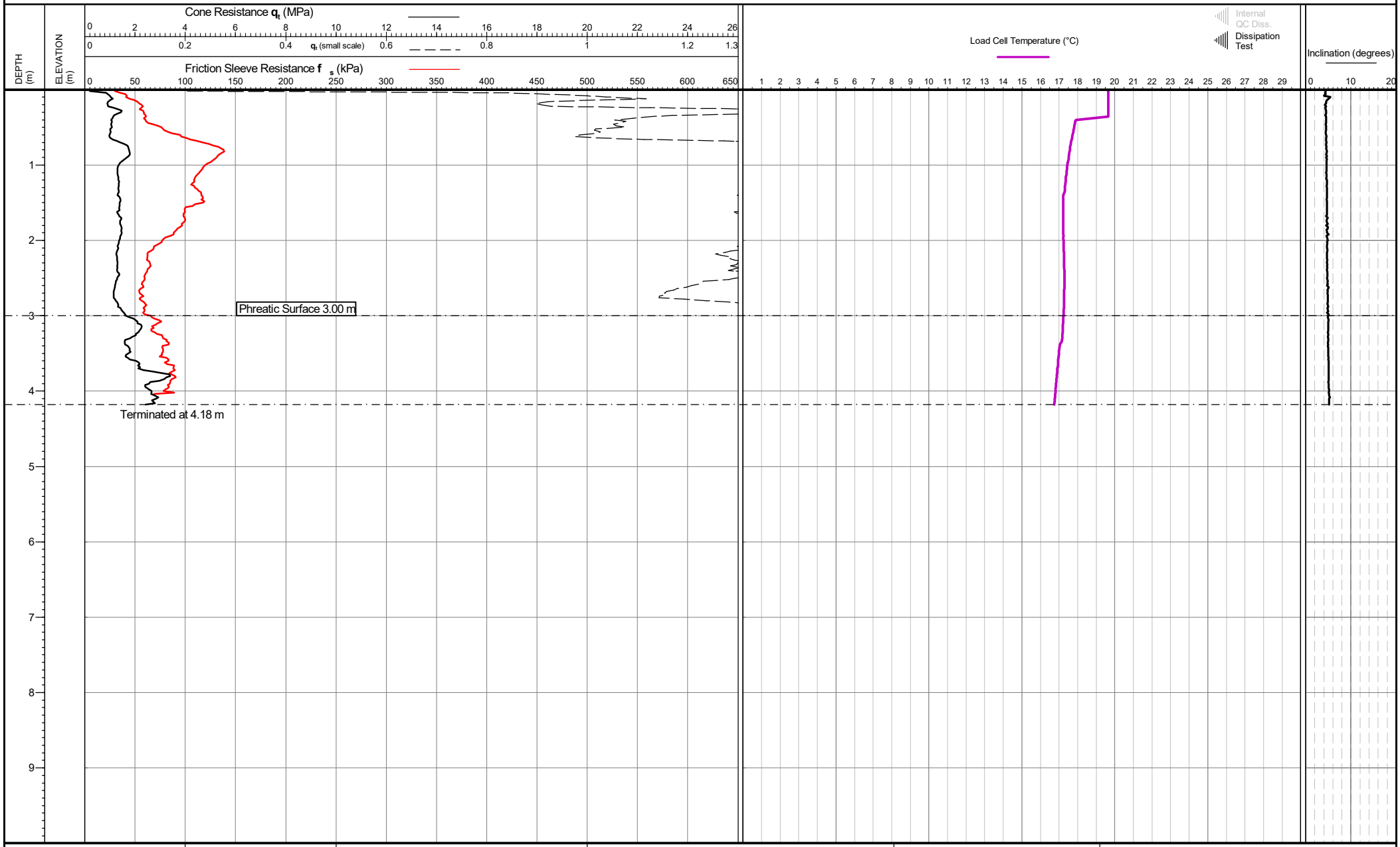


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:57:03	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 u_2 (kPa): -3.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-08

Project: SOUTHAMPTON

Client: SOILS LTD.



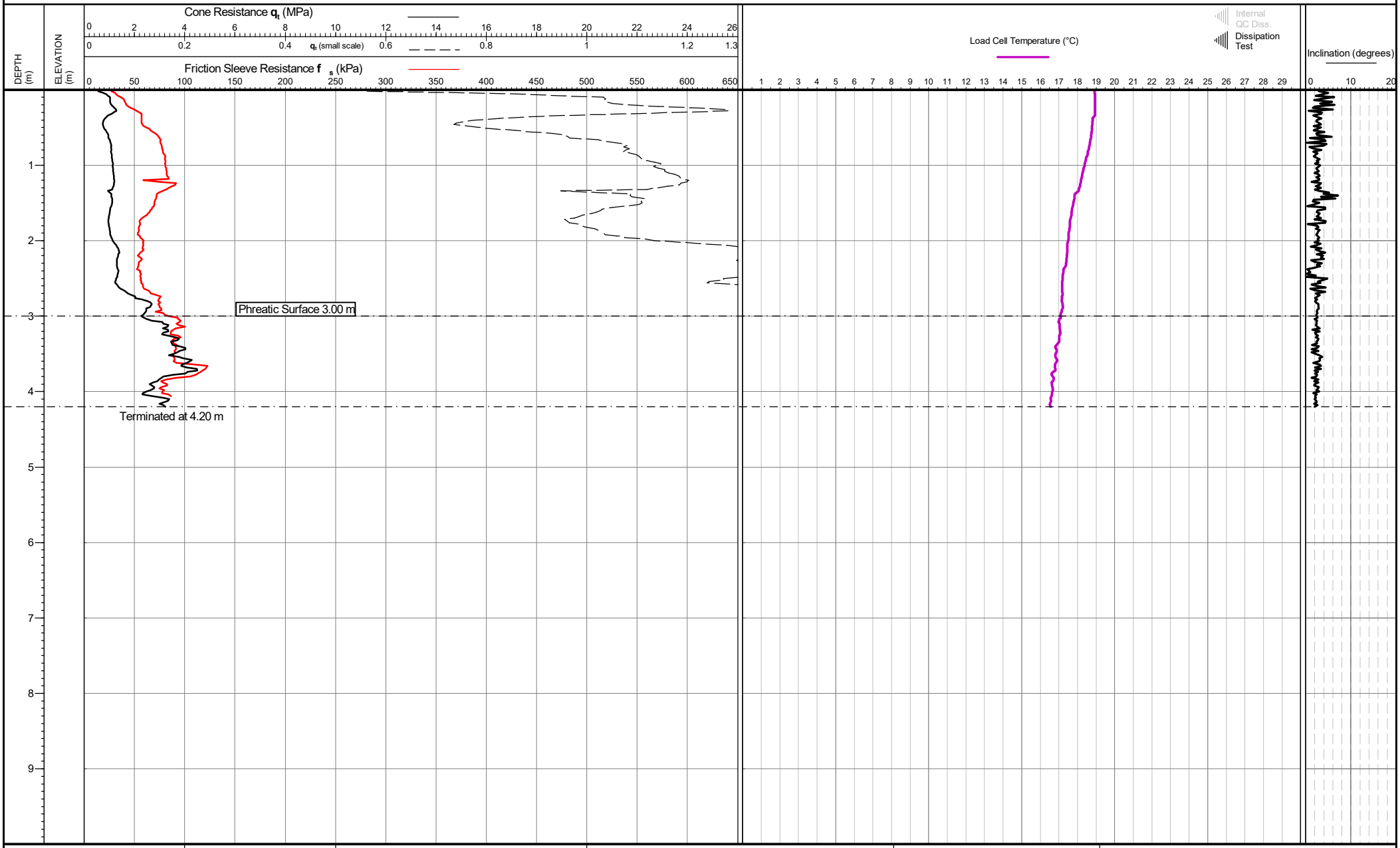
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:12:56	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 u_2 (kPa): -3.4	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-09

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

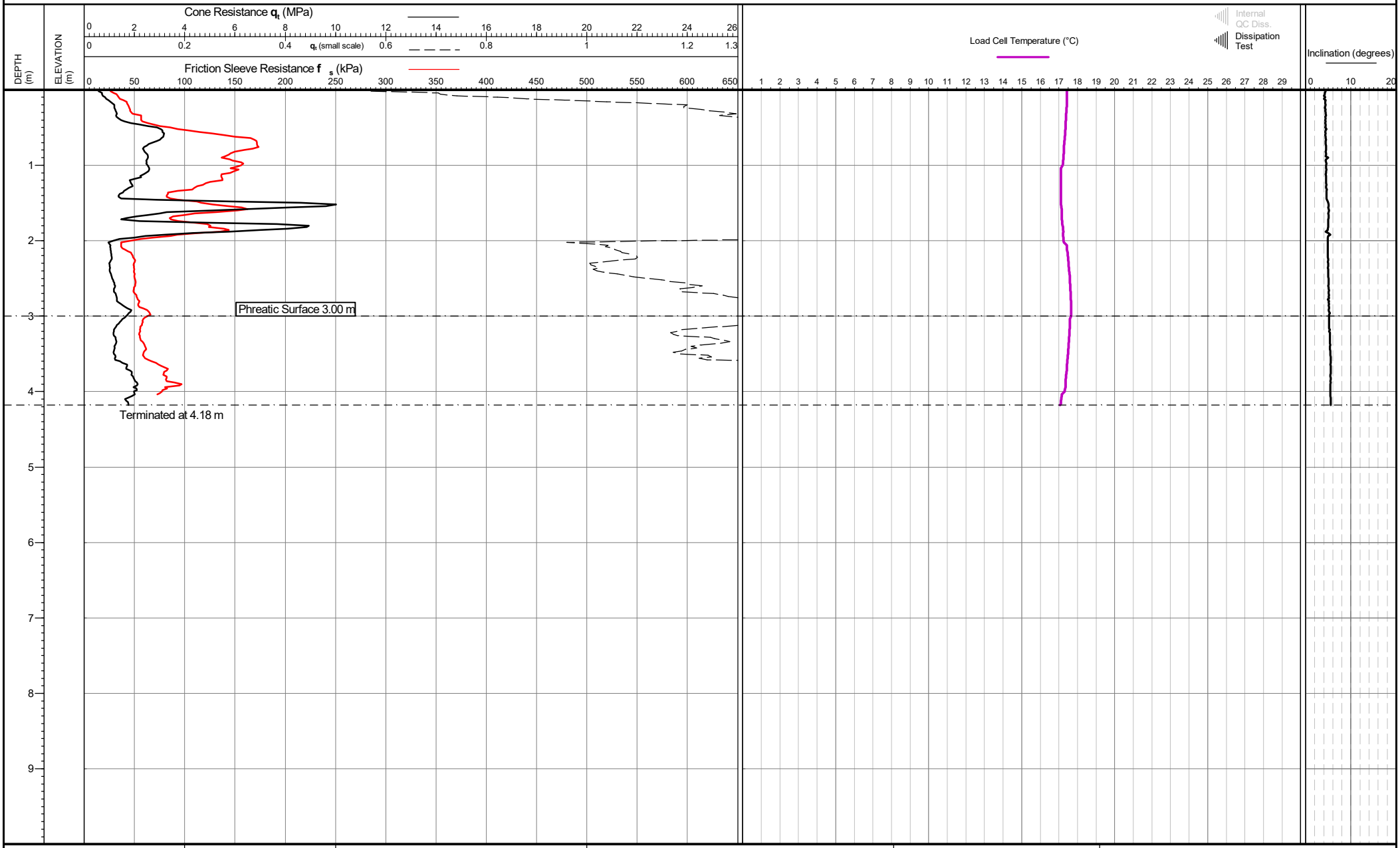


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:14:45	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-10

Project: SOUTHAMPTON

Client: SOILS LTD.



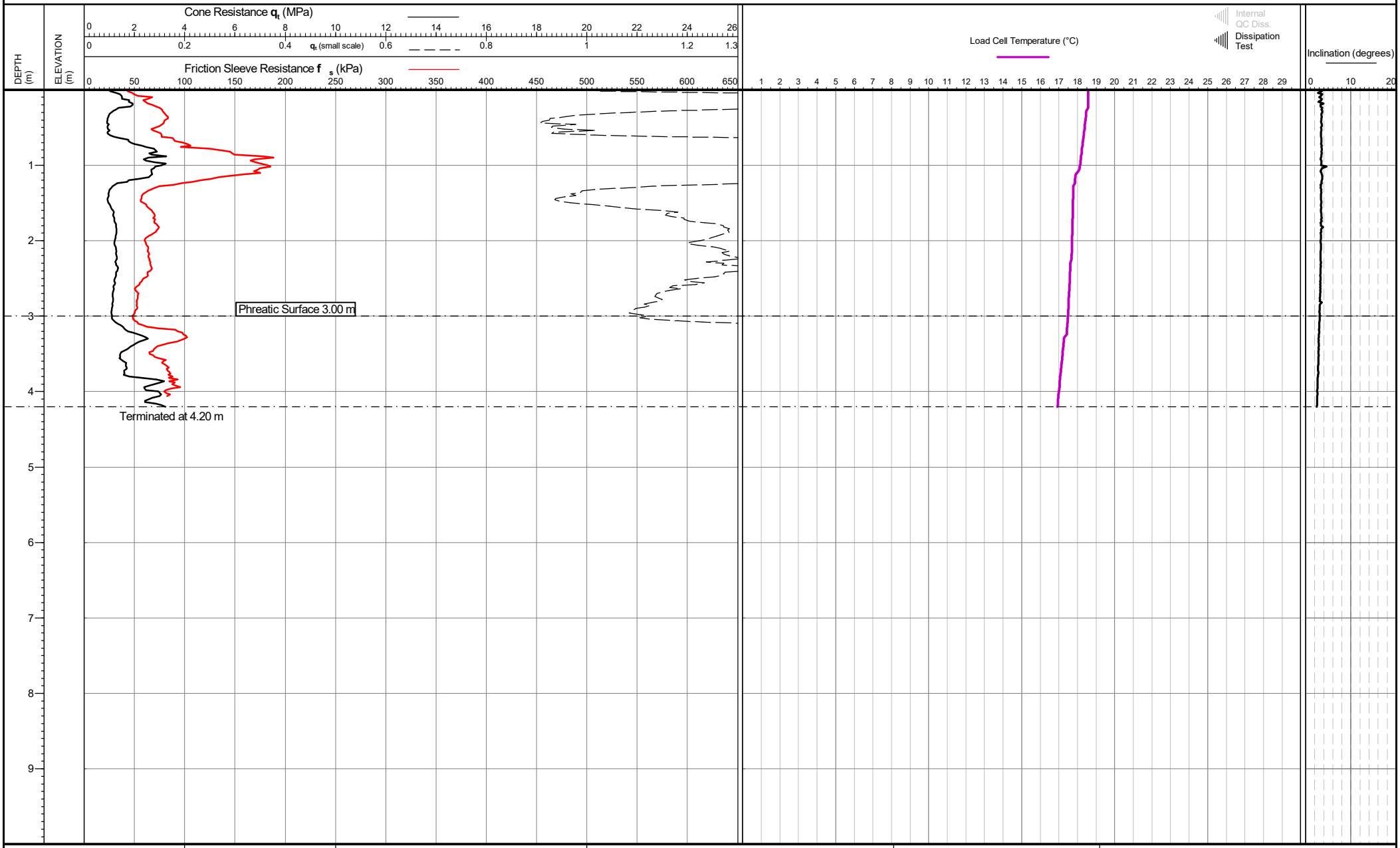
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:40:31	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 u_2 (kPa): -6.7	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-11

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

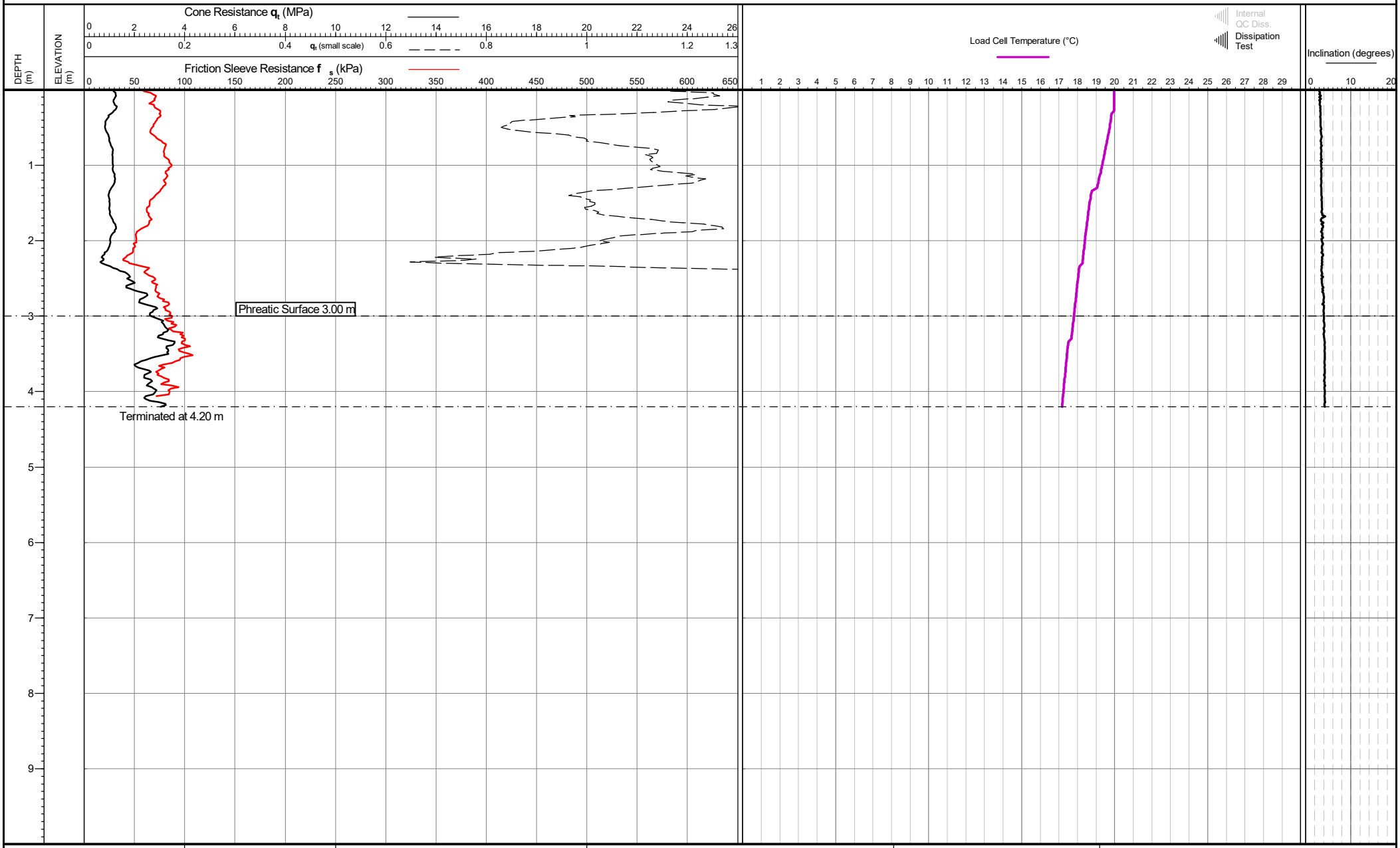


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:44:47	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 u_2 (kPa): -3.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-12

Project: SOUTHAMPTON

Client: SOILS LTD.

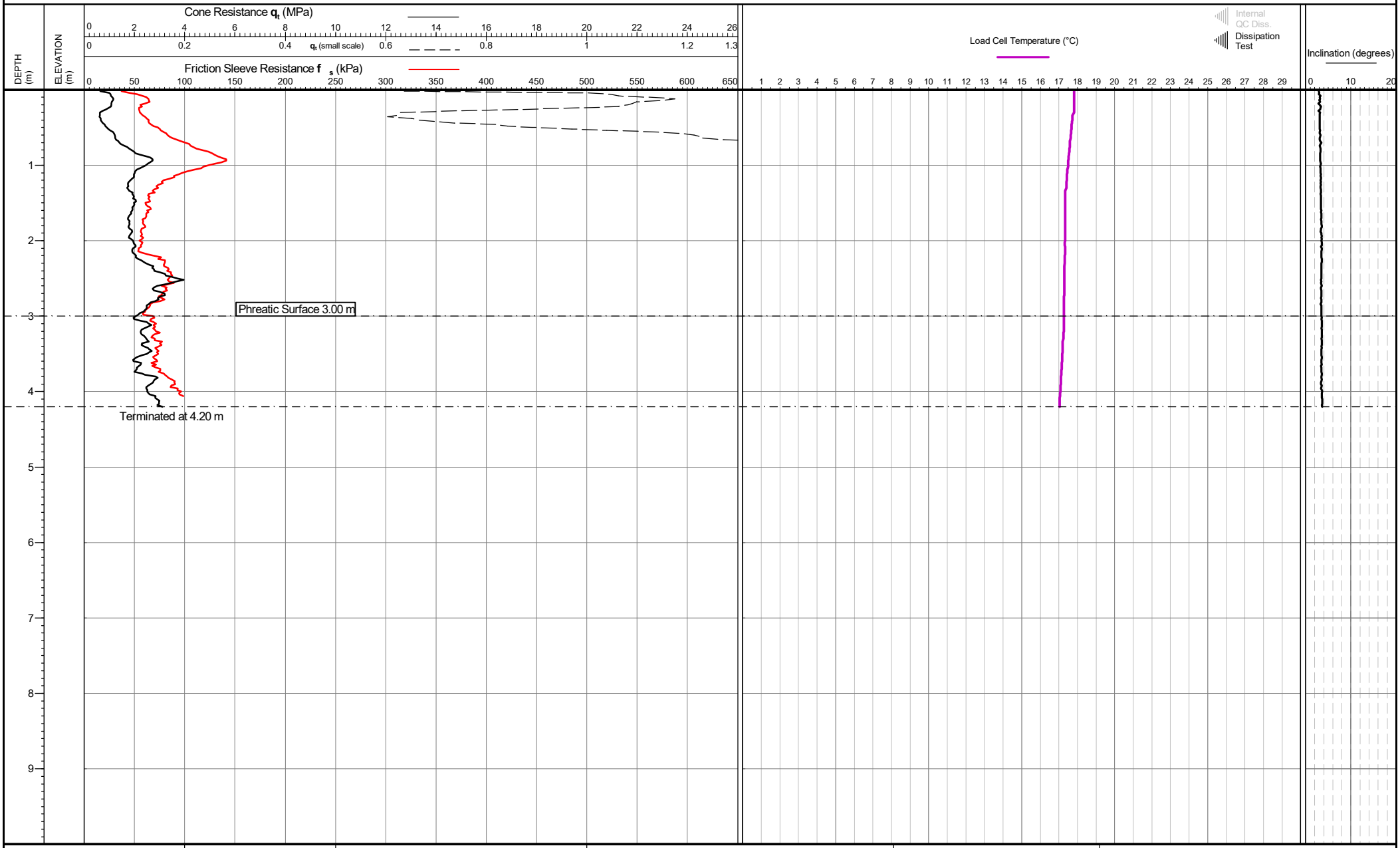


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:26:17	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 u_2 (kPa): -3.4	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-13

Project: SOUTHAMPTON

Client: SOILS LTD.

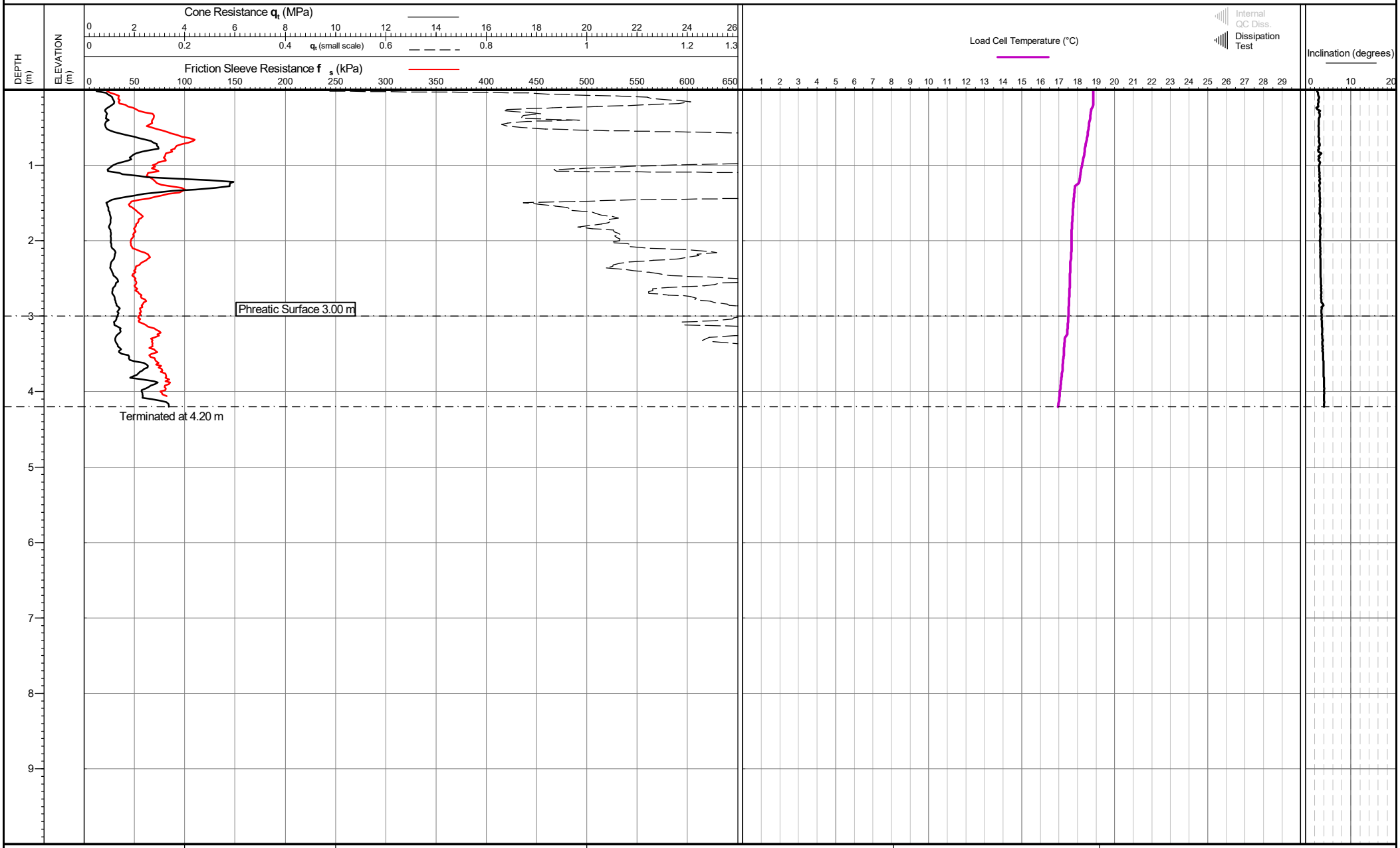


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 17:16:57	Zero drift (Pre/post test) q_c (kPa): 6.6 f_s (kPa): 0.6 u_2 (kPa): -0.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-14

Project: SOUTHAMPTON

Client: SOILS LTD.



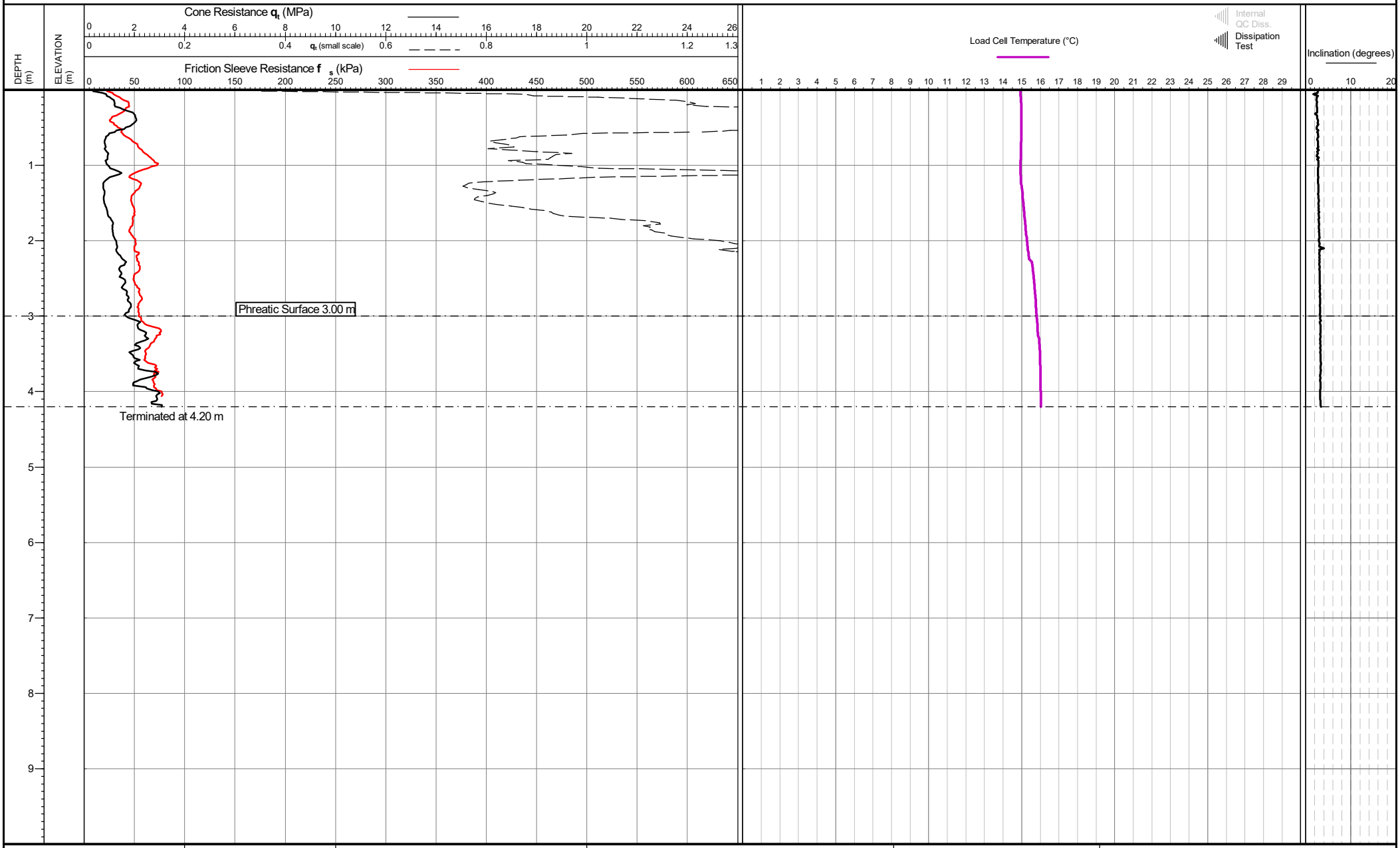
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 12:59:12	Zero drift (Pre/post test) q_c (kPa): -24.0 f_s (kPa): 1.0 u_2 (kPa): -6.7	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-15

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

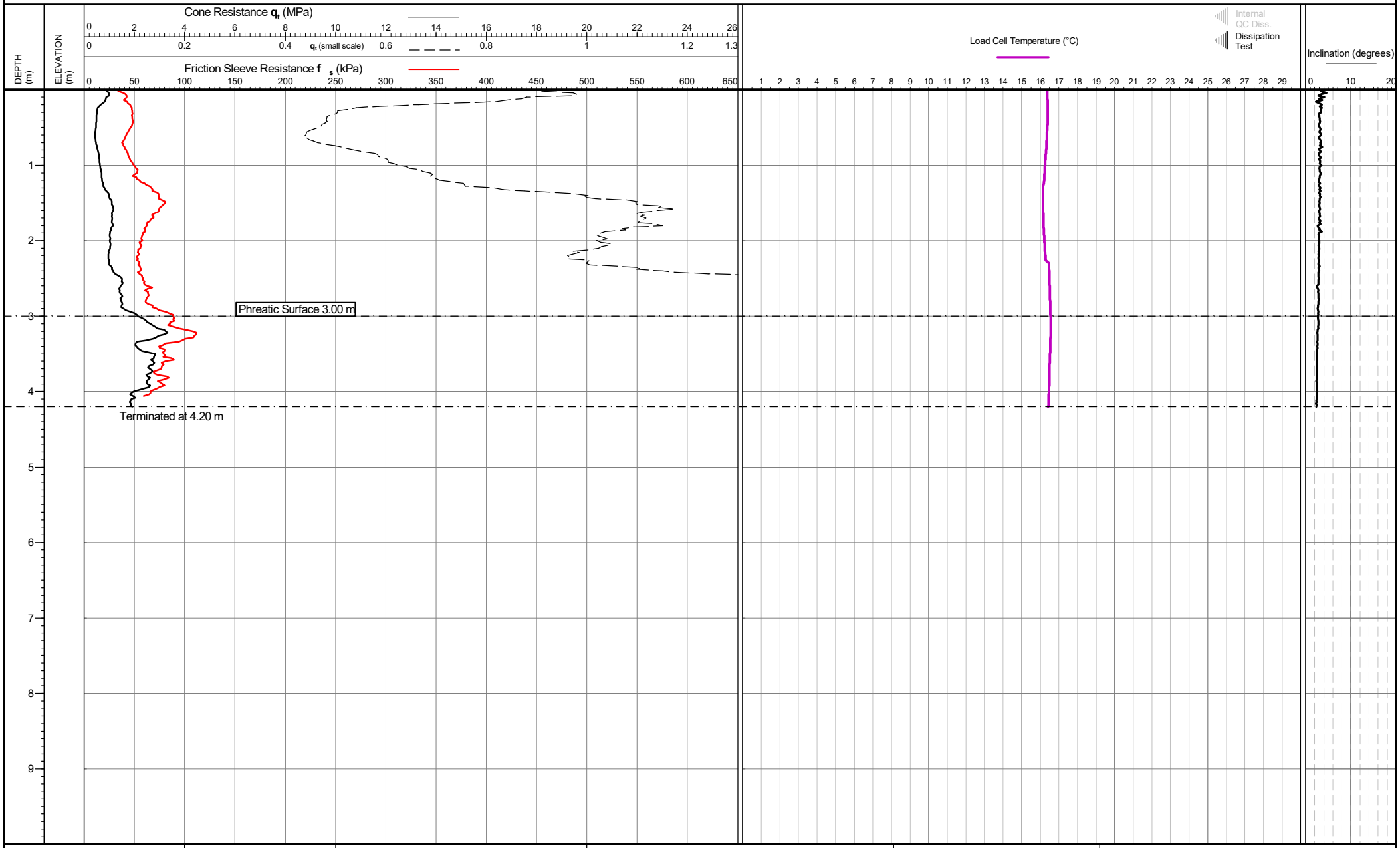


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:24:55	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 u_2 (kPa): -2.9	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-16

Project: SOUTHAMPTON

Client: SOILS LTD.

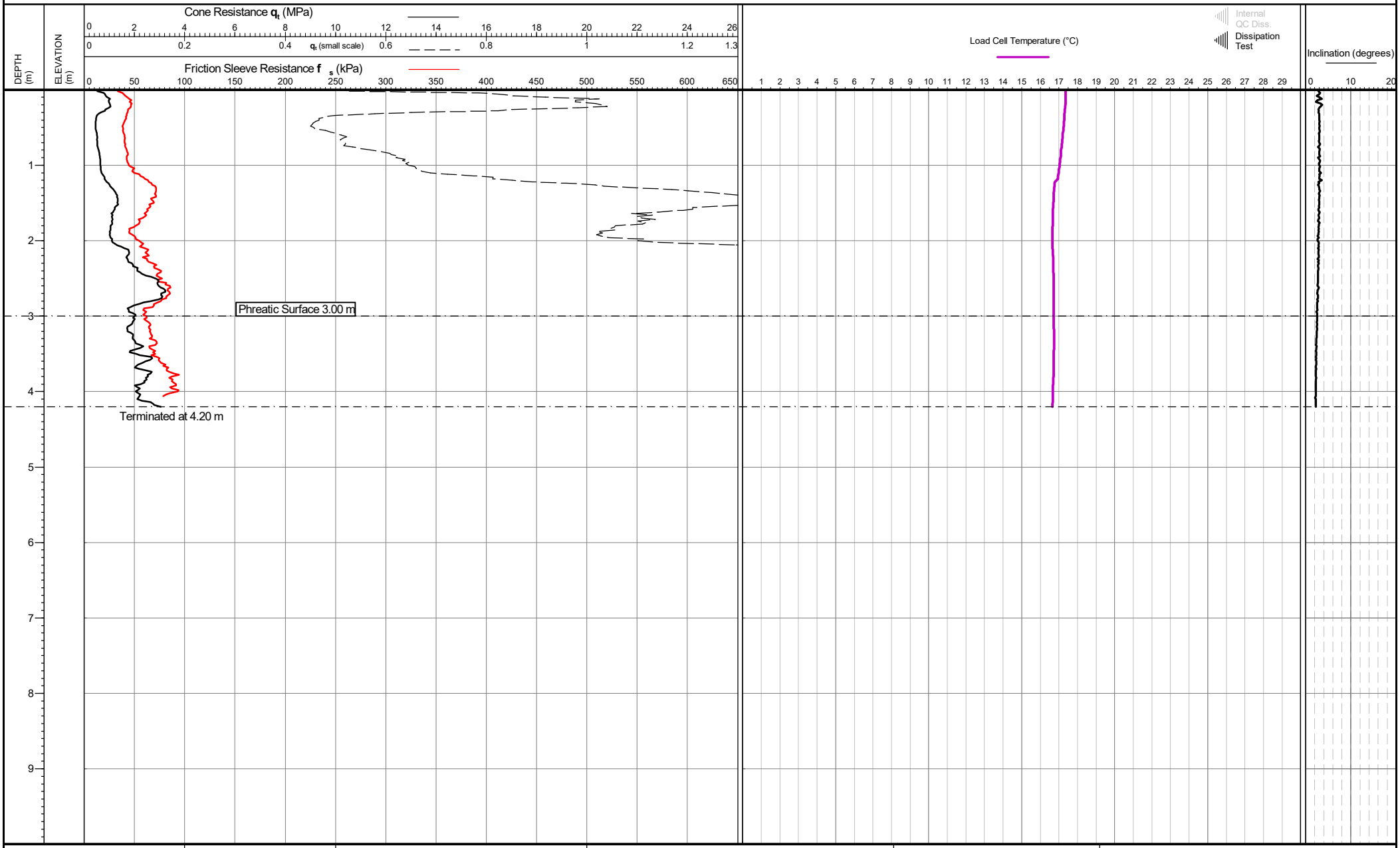


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:33:18	Zero drift (Pre/post test) q_c (kPa): 1.8 f_s (kPa): -1.3 u_2 (kPa): -3.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-17

Project: SOUTHAMPTON

Client: SOILS LTD.

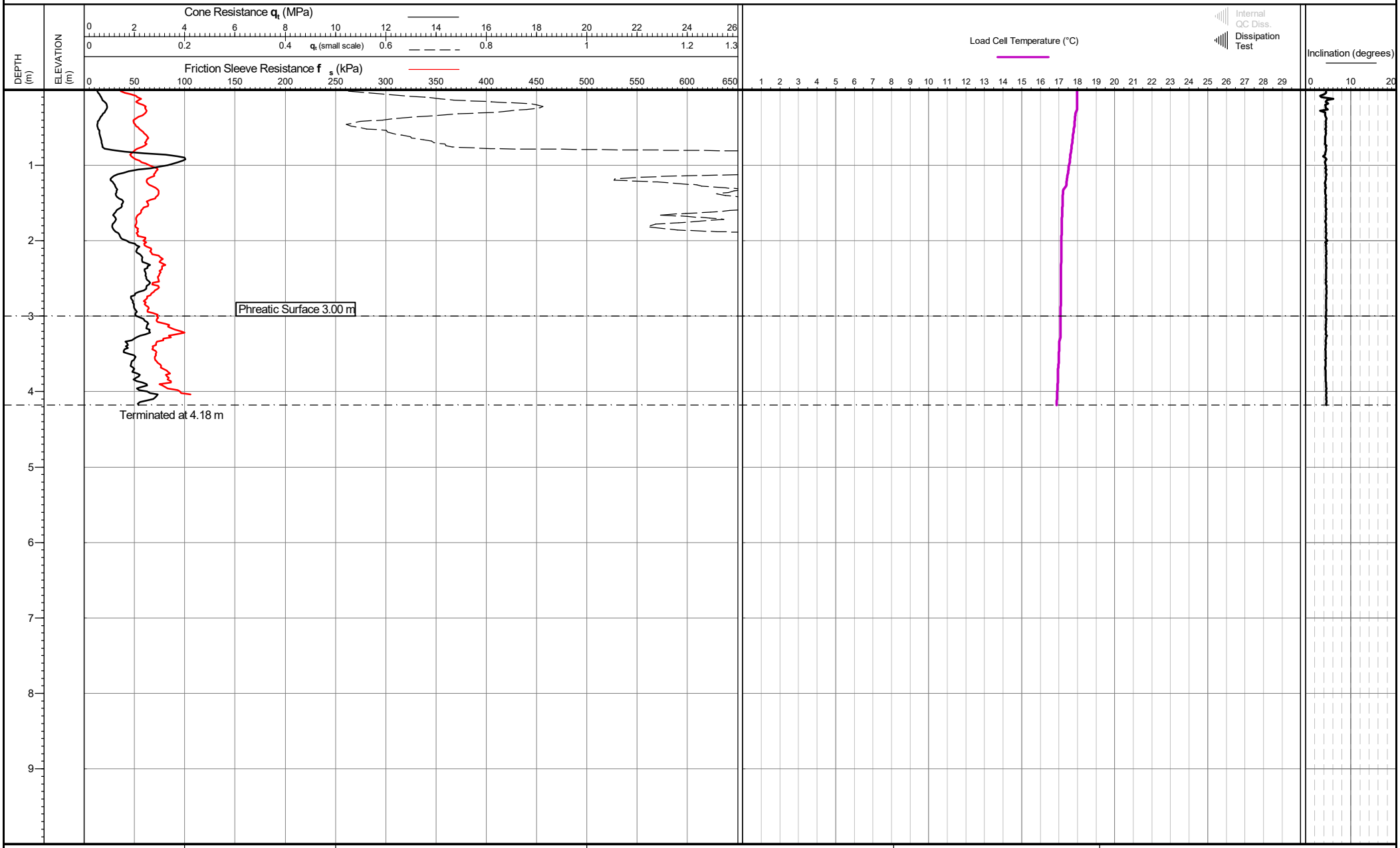


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 14:04:07	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 u_2 (kPa): -2.9	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-18

Project: SOUTHAMPTON

Client: SOILS LTD.

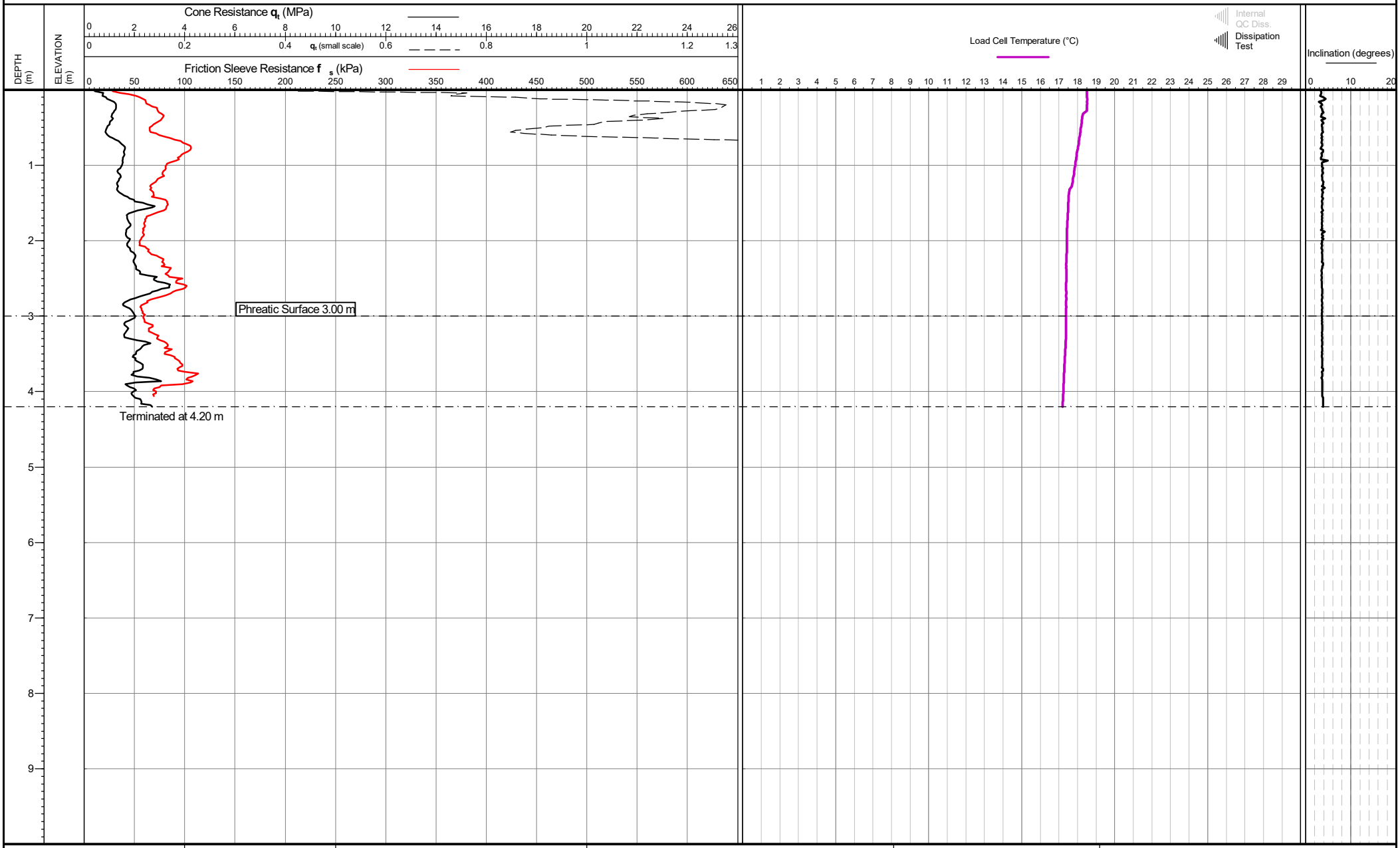


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:36:46	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 u_2 (kPa): -2.9	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-19

Project: SOUTHAMPTON

Client: SOILS LTD.

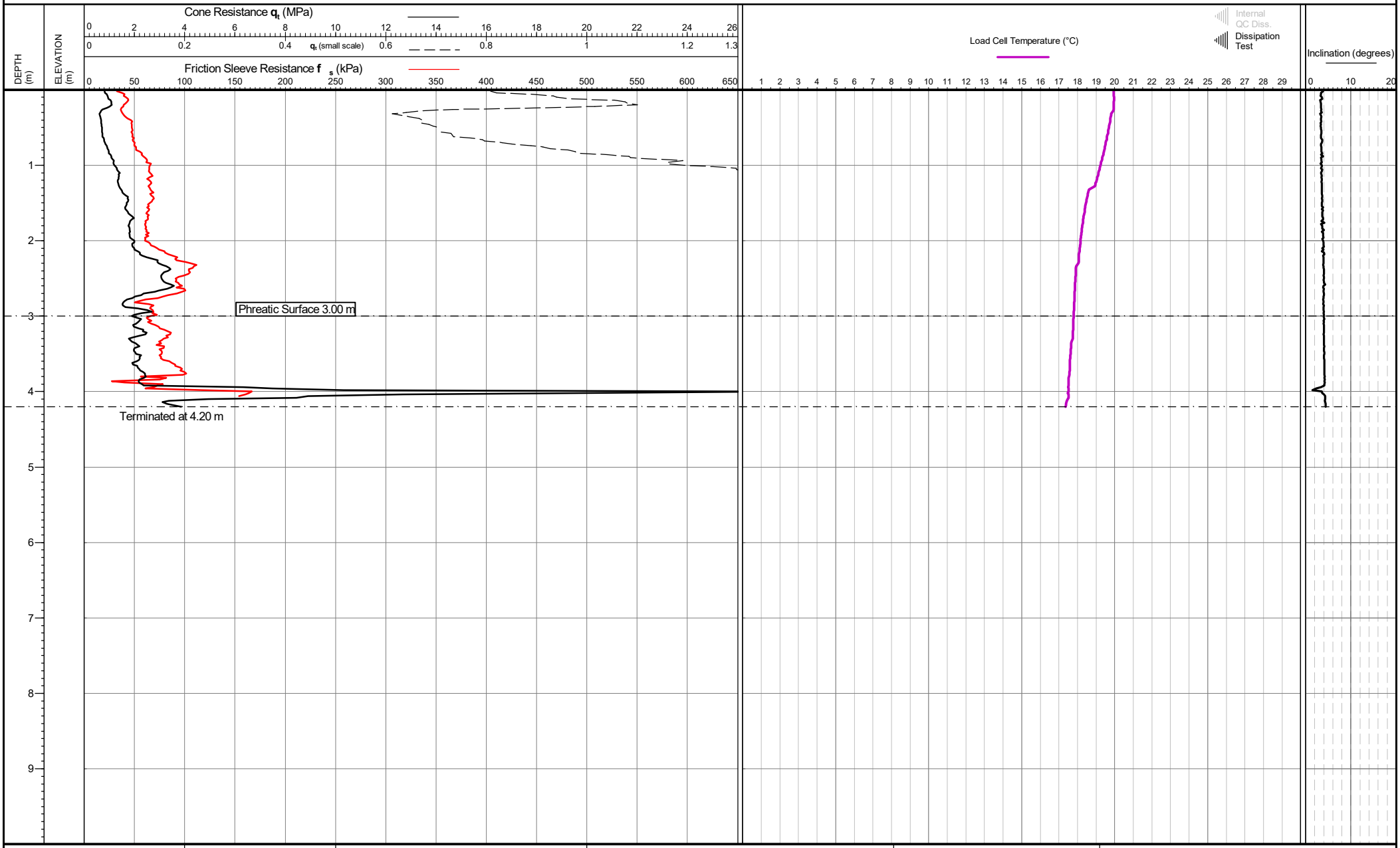


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 13:50:58	Zero drift (Pre/post test) q_c (kPa): -35.4 f_s (kPa): 2.2 u_2 (kPa): -2.9	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-20

Project: SOUTHAMPTON

Client: SOILS LTD.

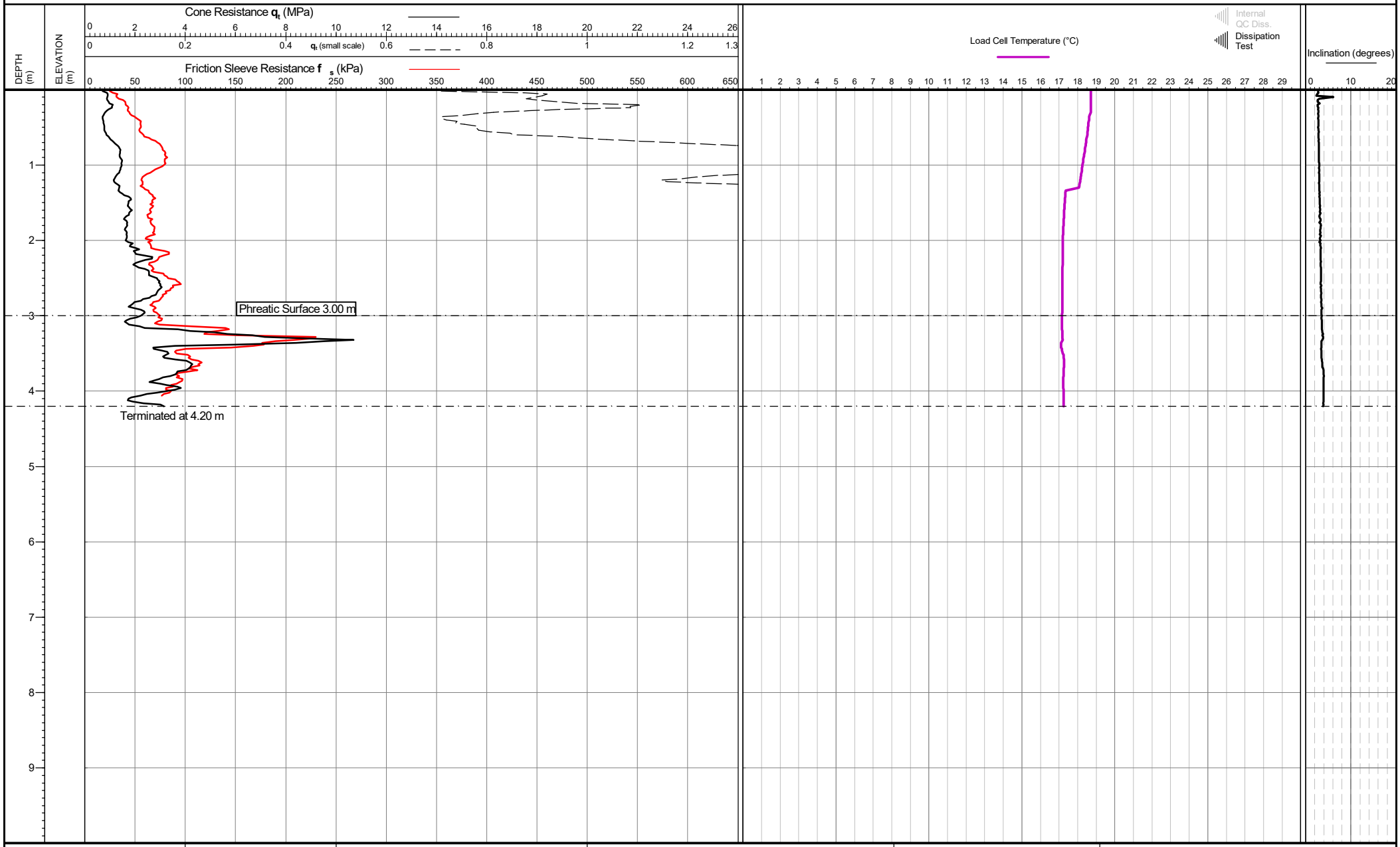


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:37:37	Zero drift (Pre/post test) q_c (kPa): -39.2 f_s (kPa): 0.5 u_2 (kPa): -3.4	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-21

Project: SOUTHAMPTON

Client: SOILS LTD.

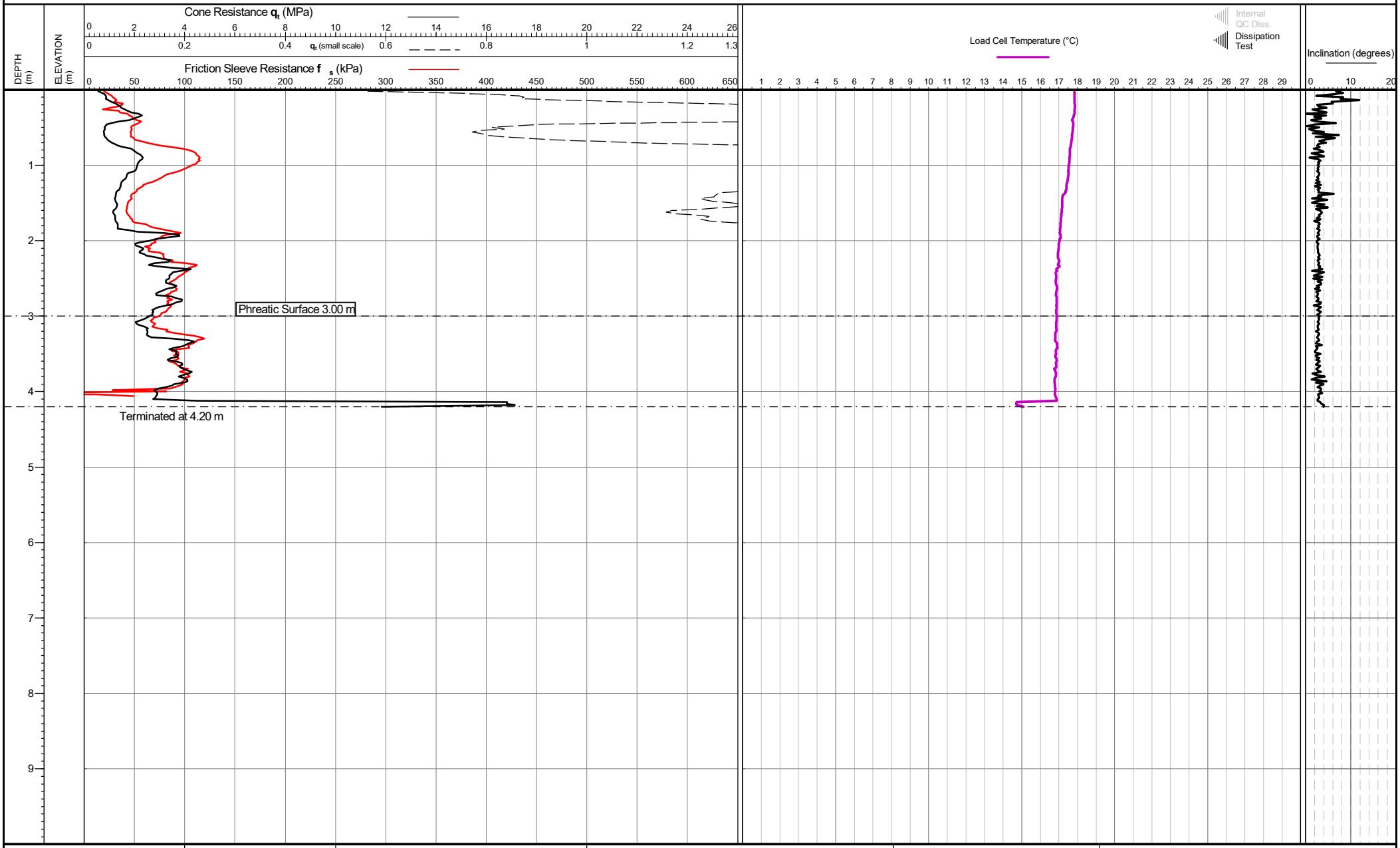


Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 29/09/2025 16:58:55	Zero drift (Pre/post test) q_c (kPa): 6.6 f_s (kPa): 0.6 u_2 (kPa): -0.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-22

Project: SOUTHAMPTON

Client: SOILS LTD.

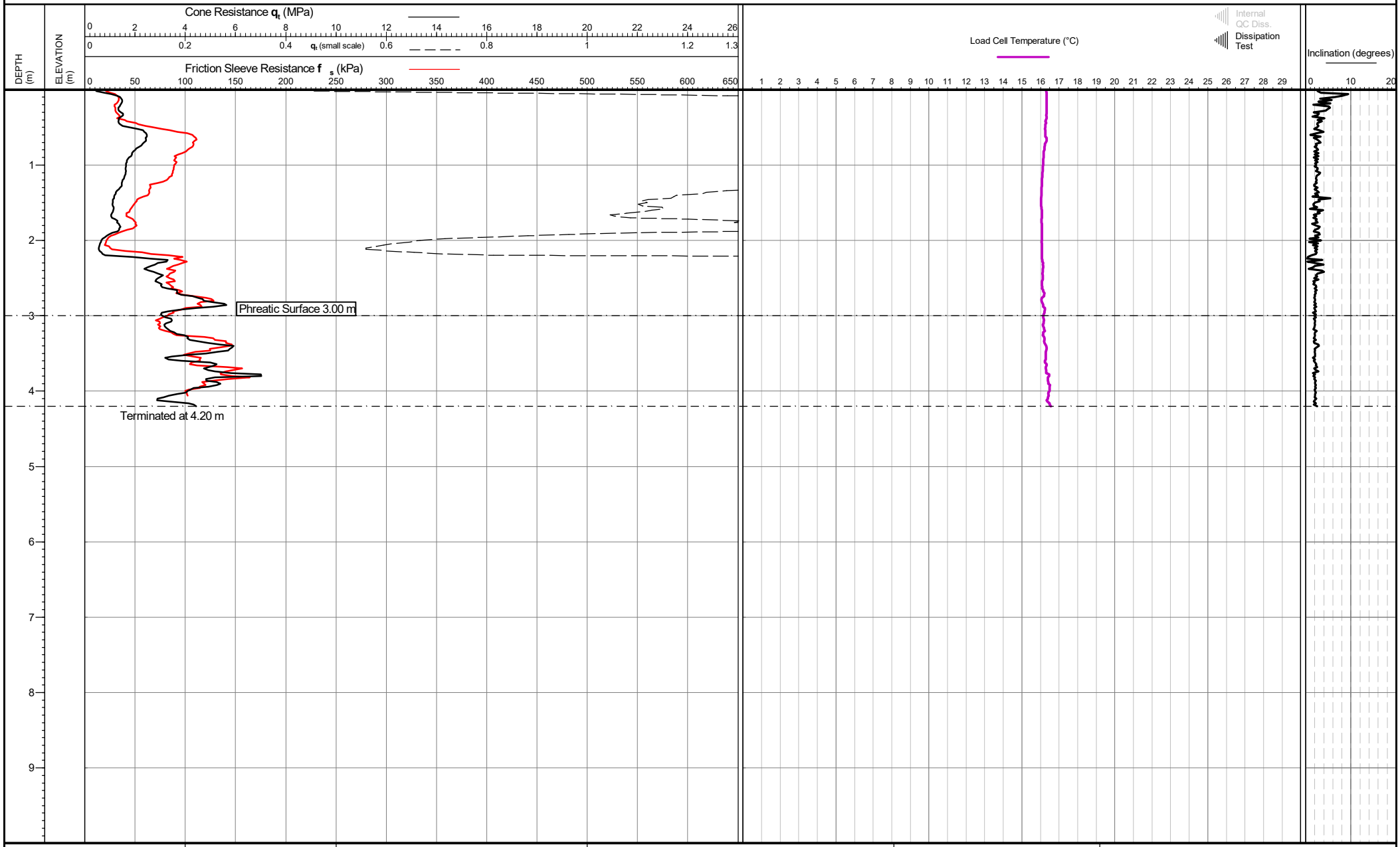


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:57:31	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-23

Project: SOUTHAMPTON

Client: SOILS LTD.

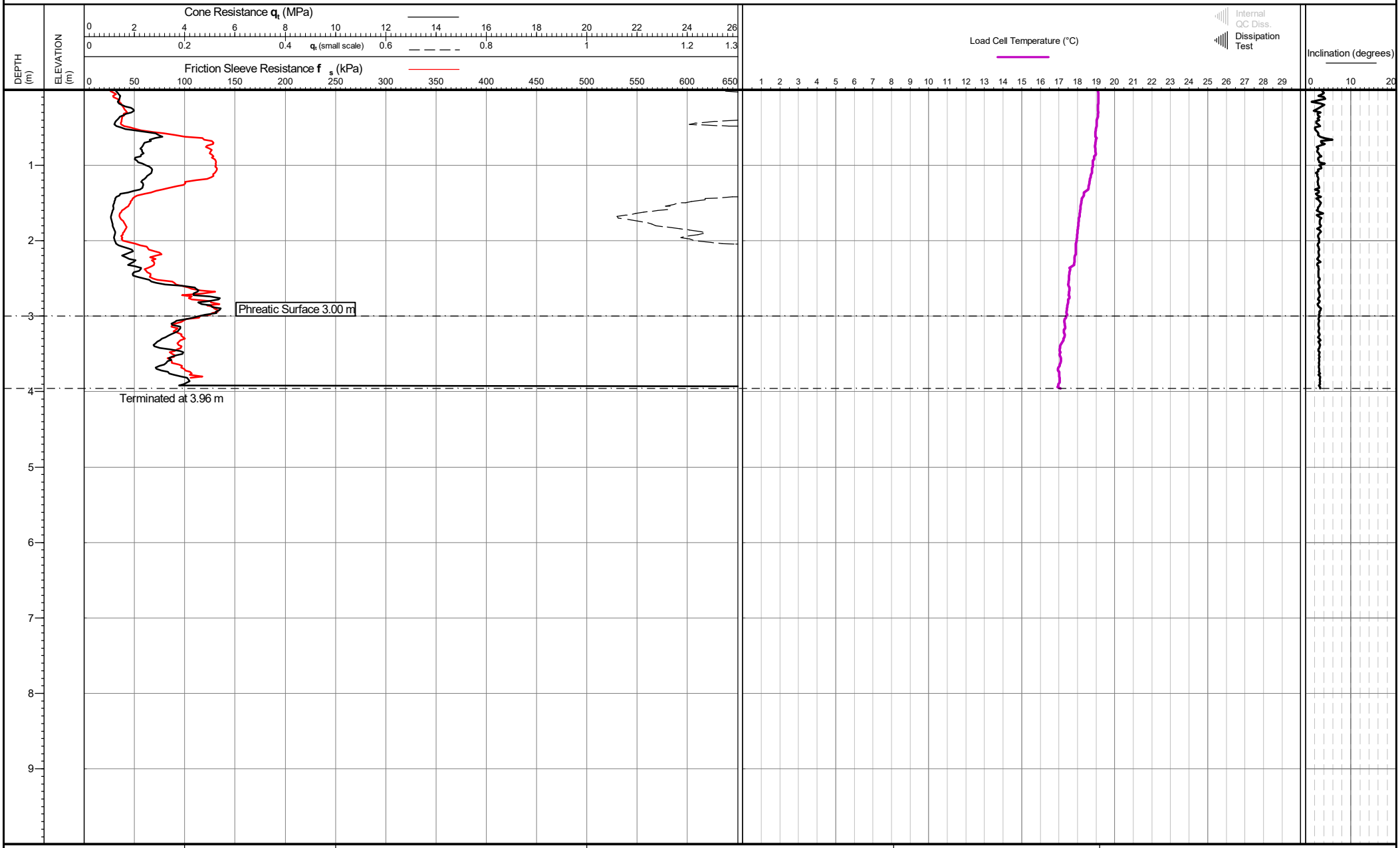


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:37:40	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-24

Project: SOUTHAMPTON

Client: SOILS LTD.

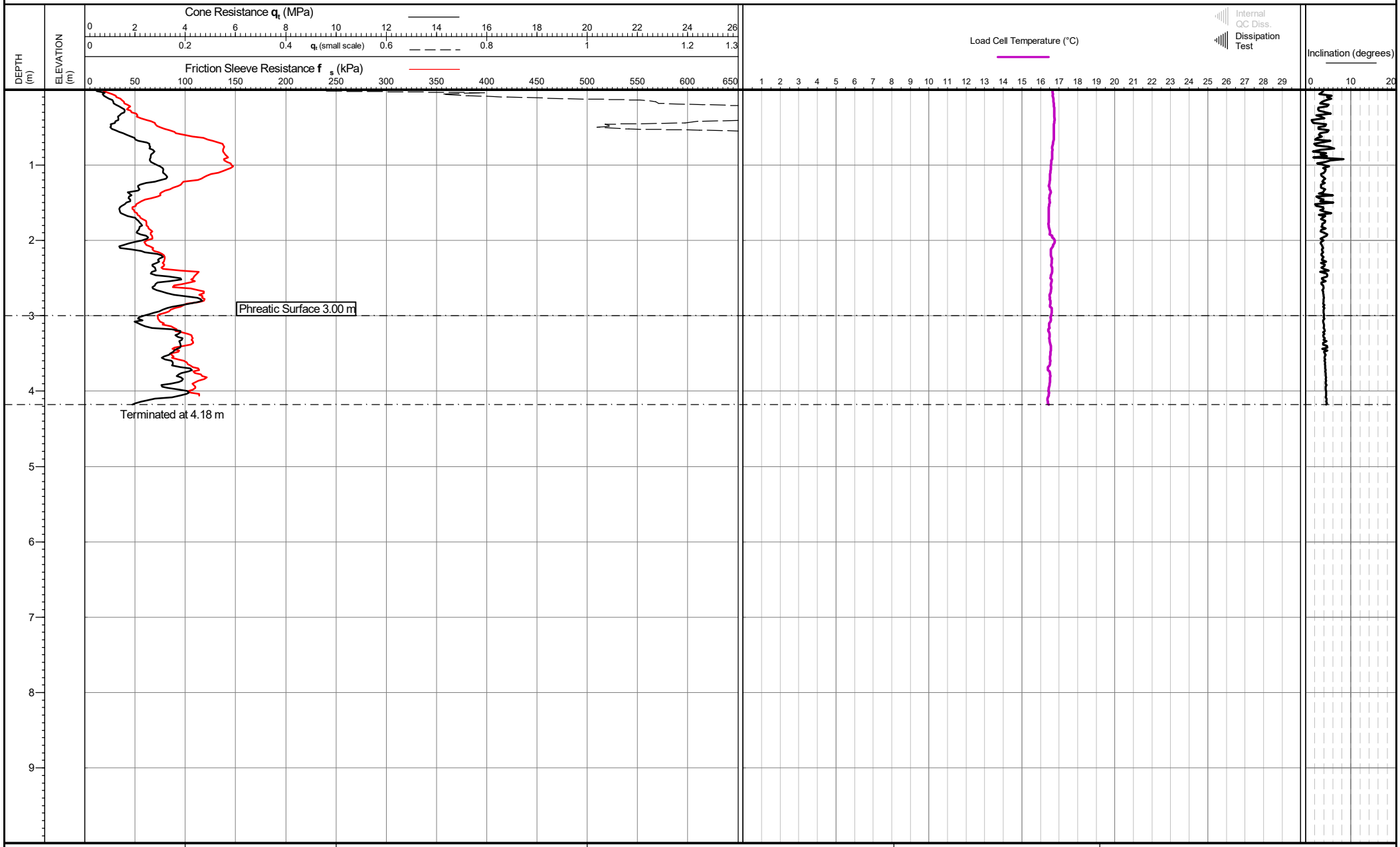


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:35:44	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Total reaction force	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-25

Project: SOUTHAMPTON

Client: SOILS LTD.

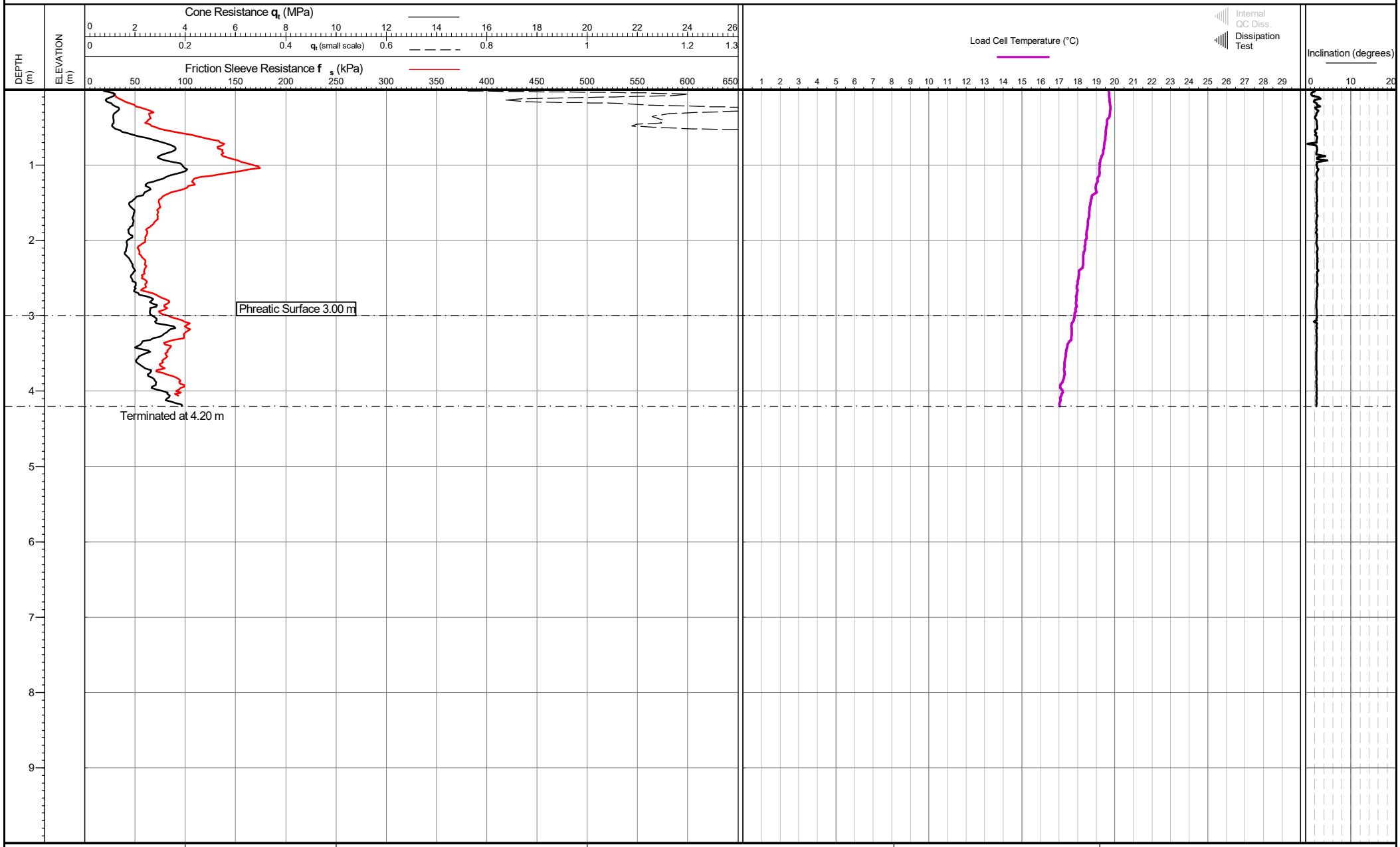


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:22:10	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-26

Project: SOUTHAMPTON

Client: SOILS LTD.



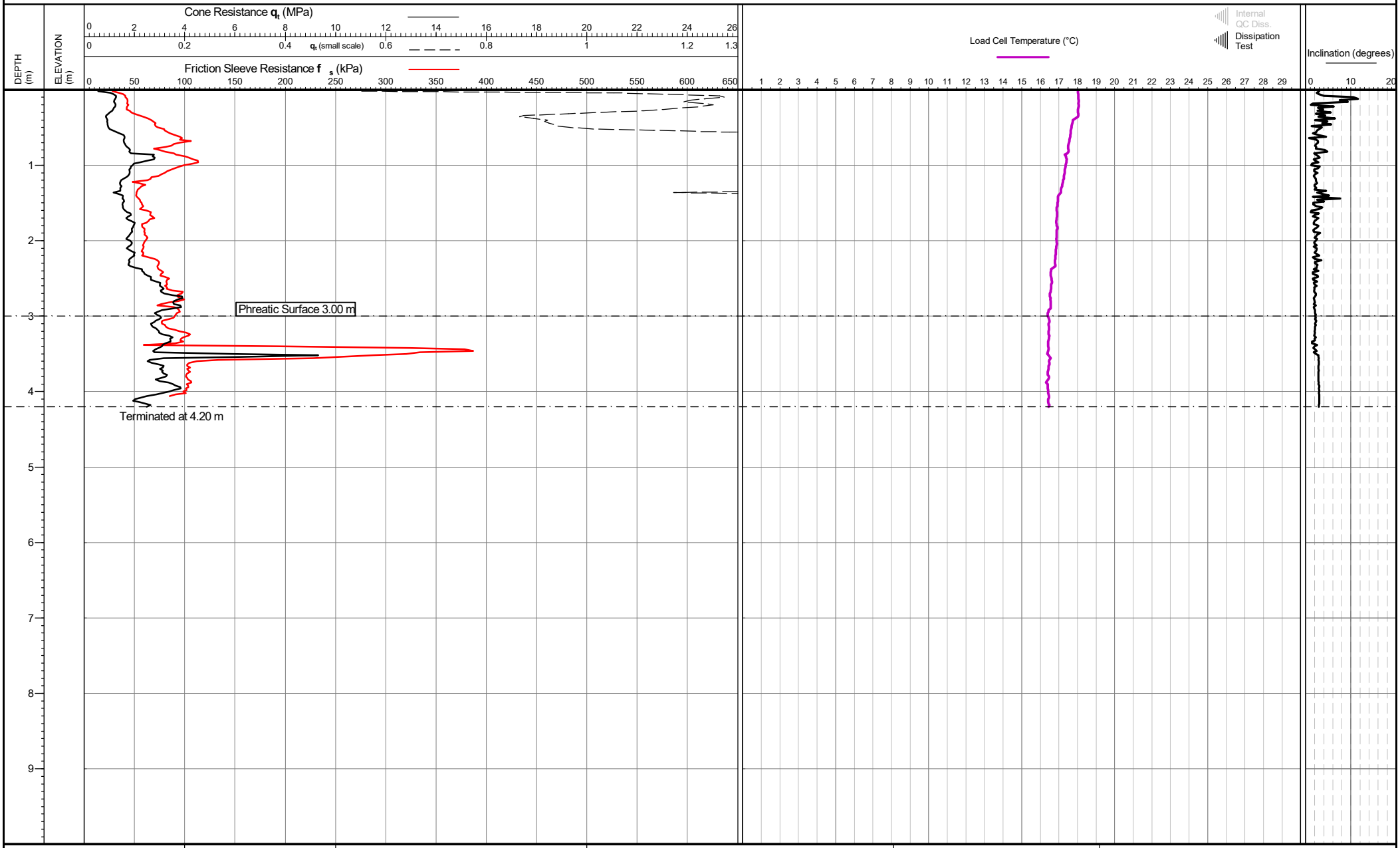
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:50:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-27

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



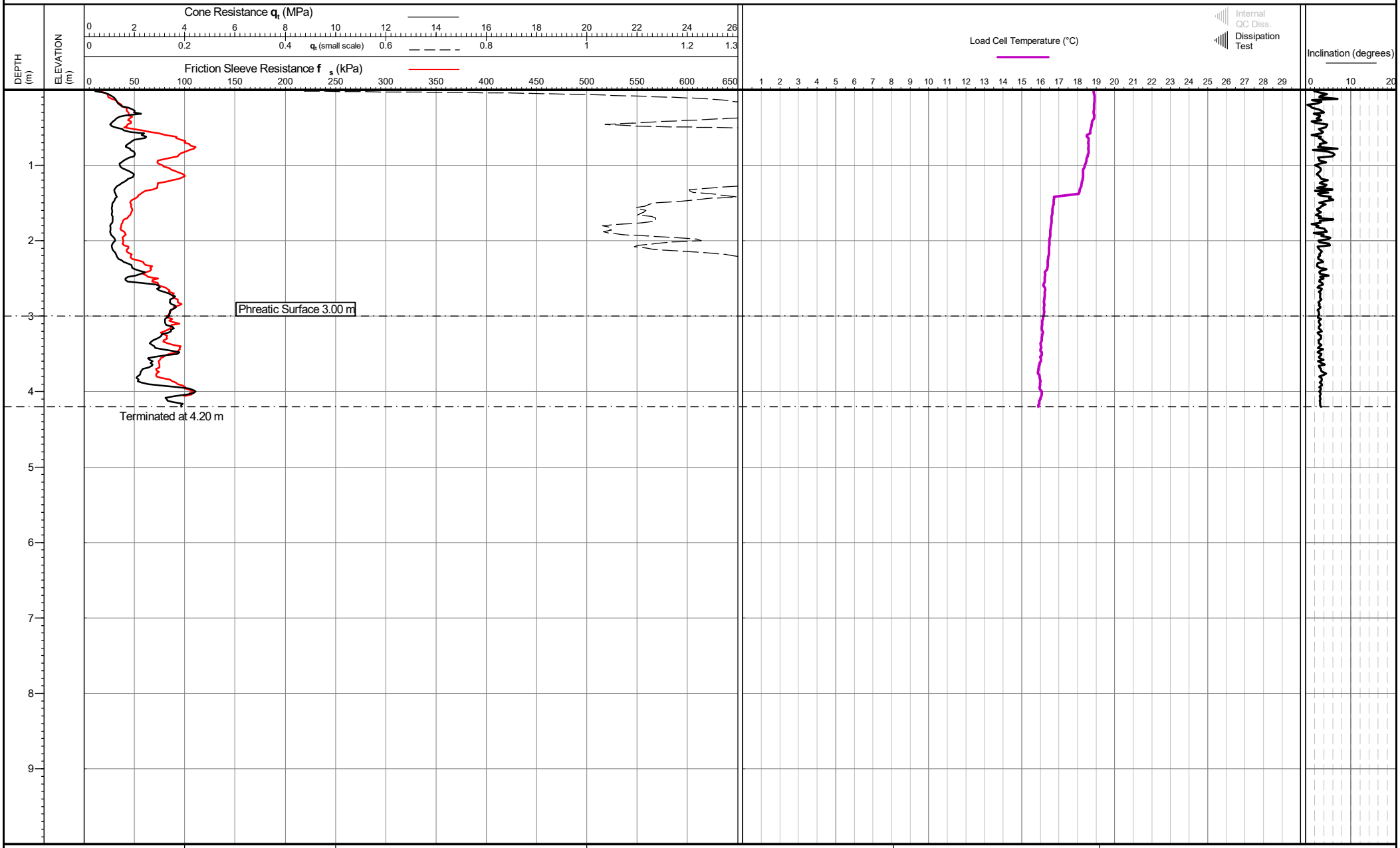
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:19:55	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-28

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

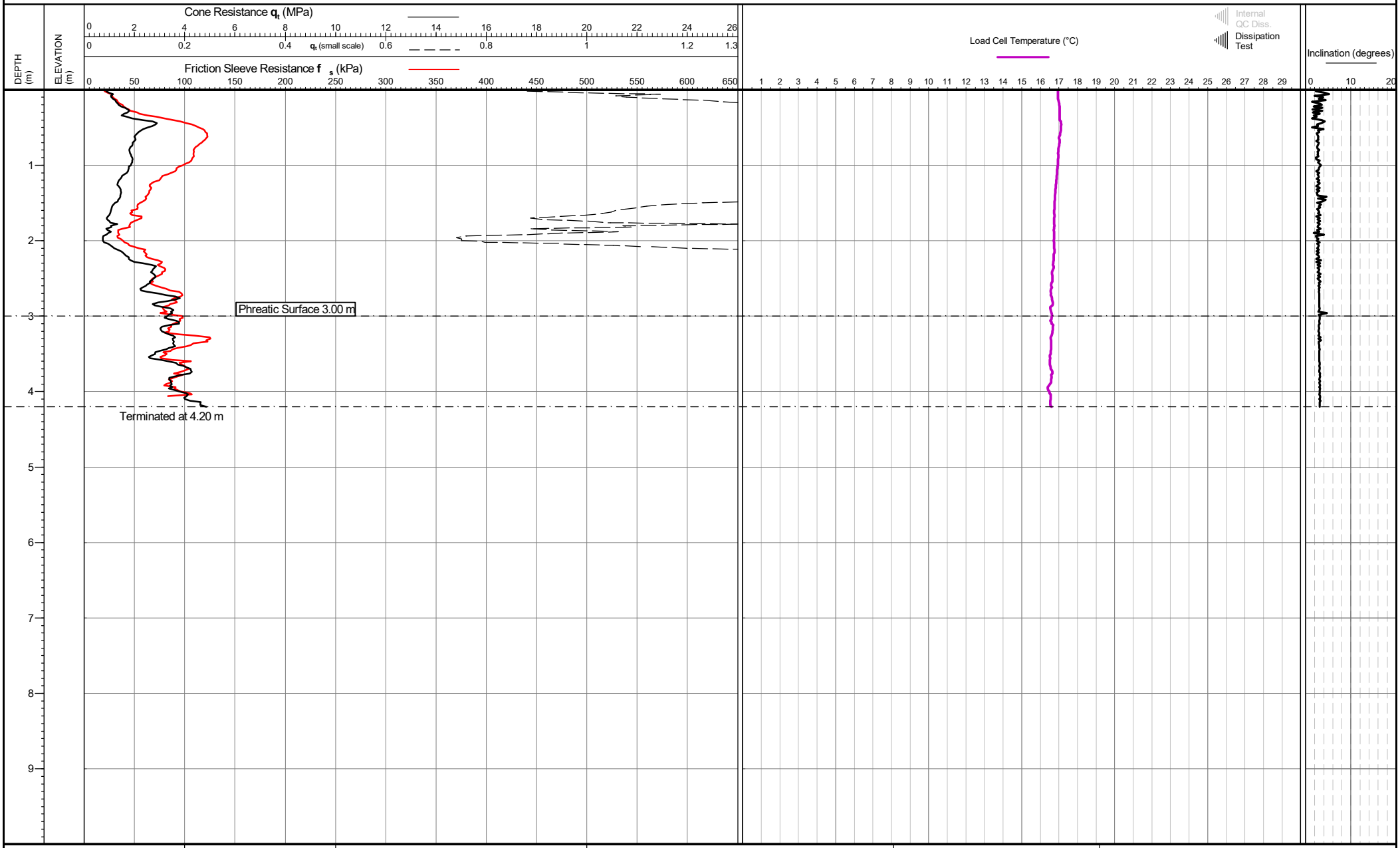


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 13:05:28	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-29

Project: SOUTHAMPTON

Client: SOILS LTD.

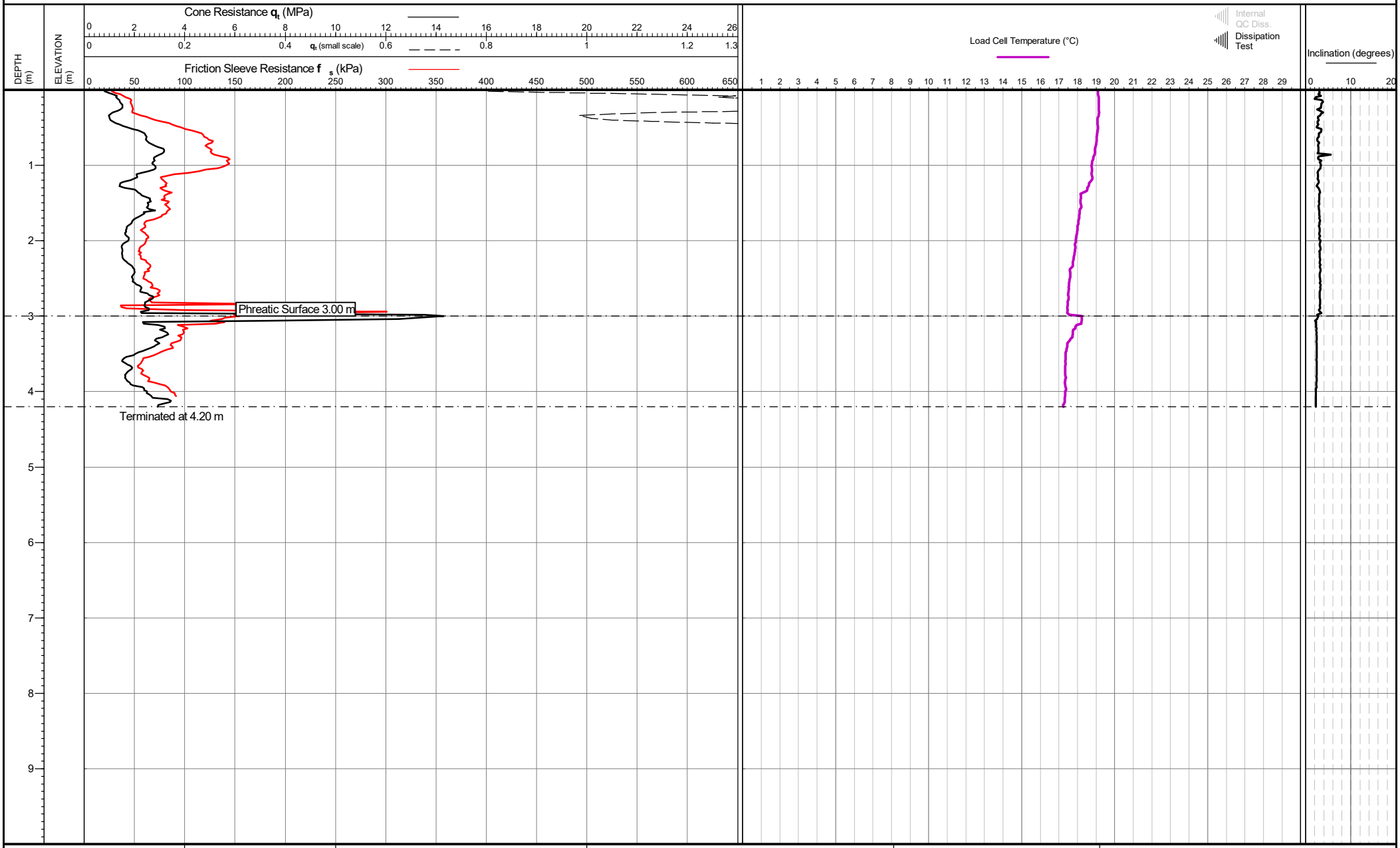


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 12:45:44	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-30

Project: SOUTHAMPTON

Client: SOILS LTD.

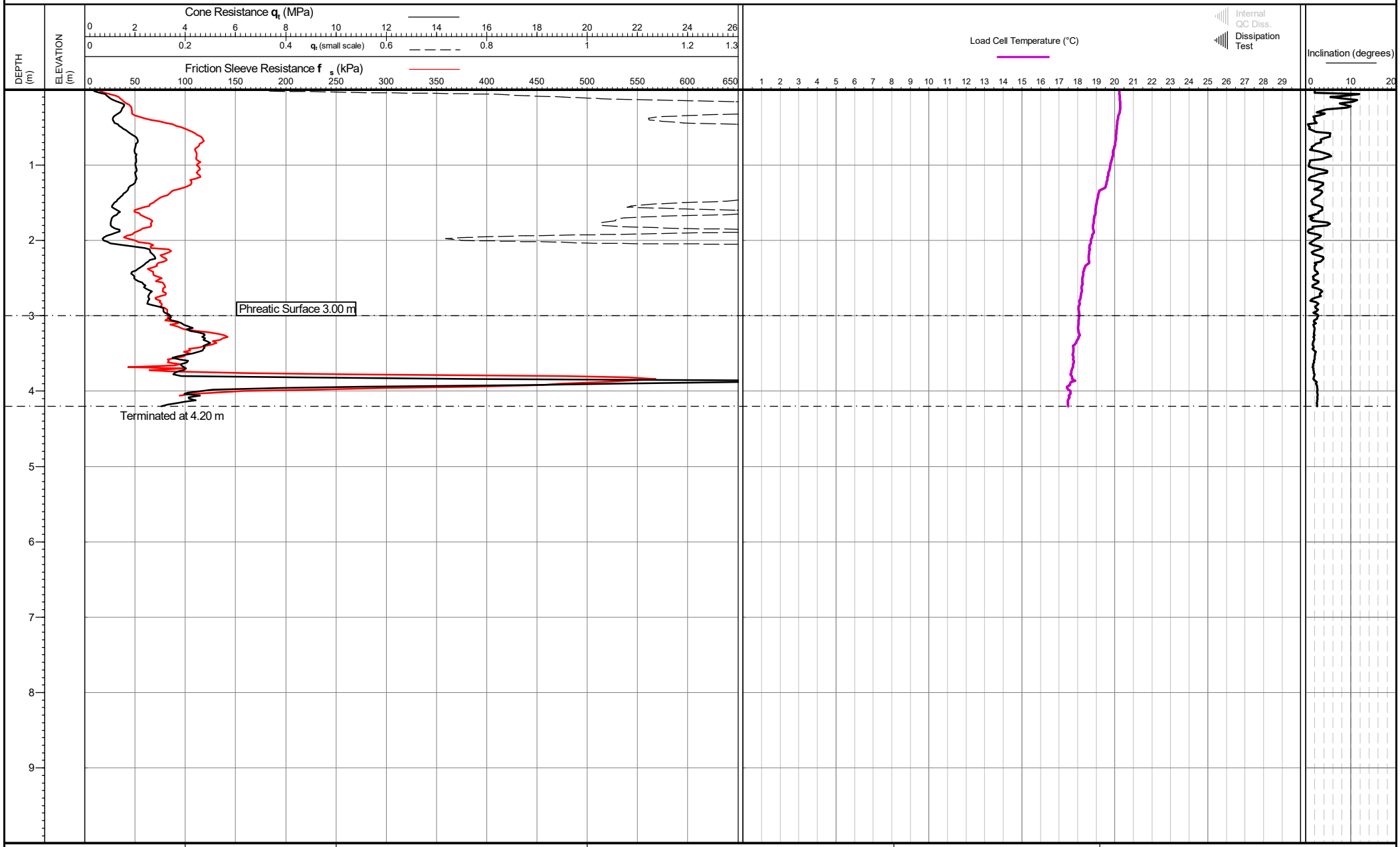


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:05:51	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-31

Project: SOUTHAMPTON

Client: SOILS LTD.

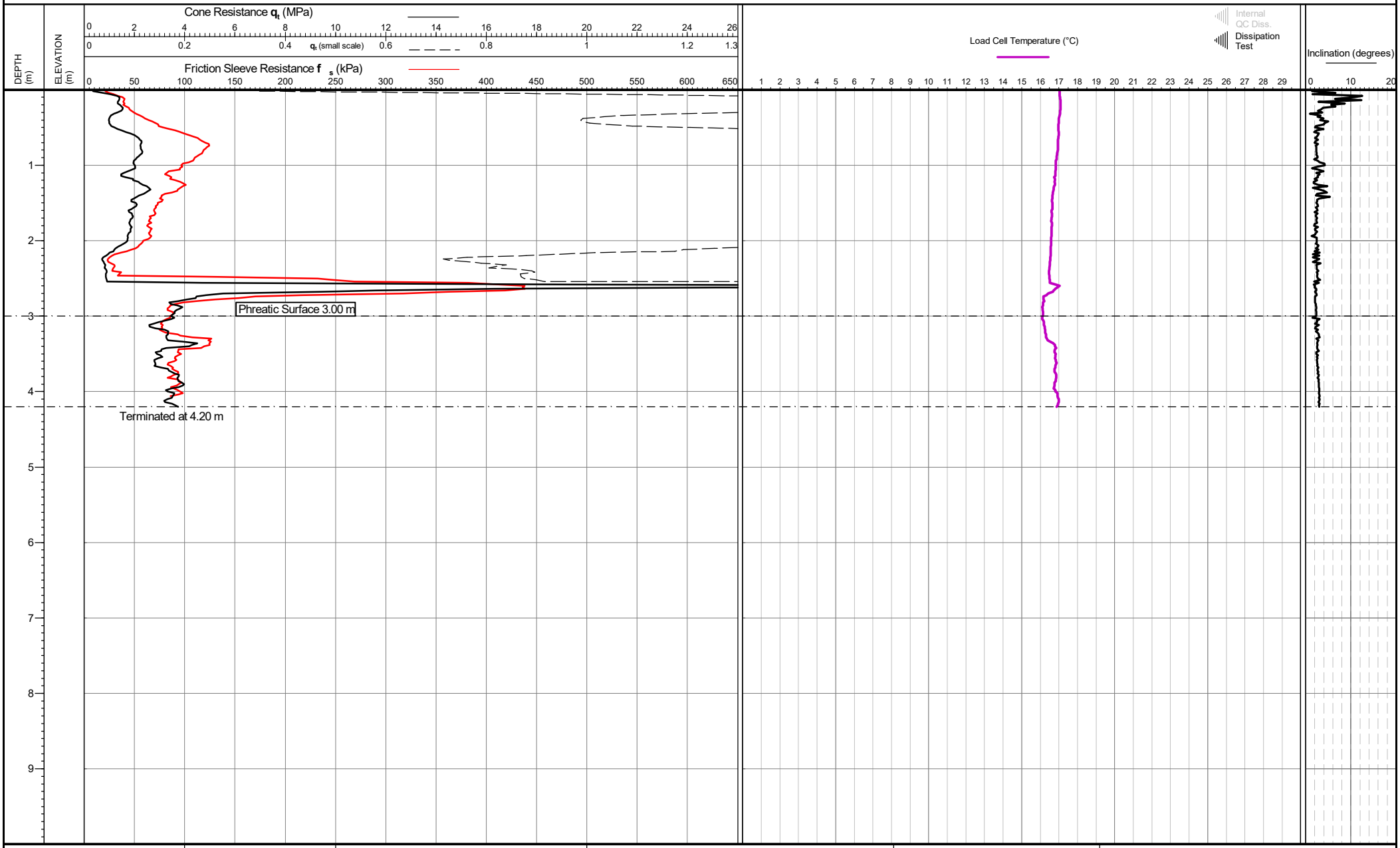


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:51:01	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 u_2 (kPa): 5.2	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-32

Project: SOUTHAMPTON

Client: SOILS LTD.

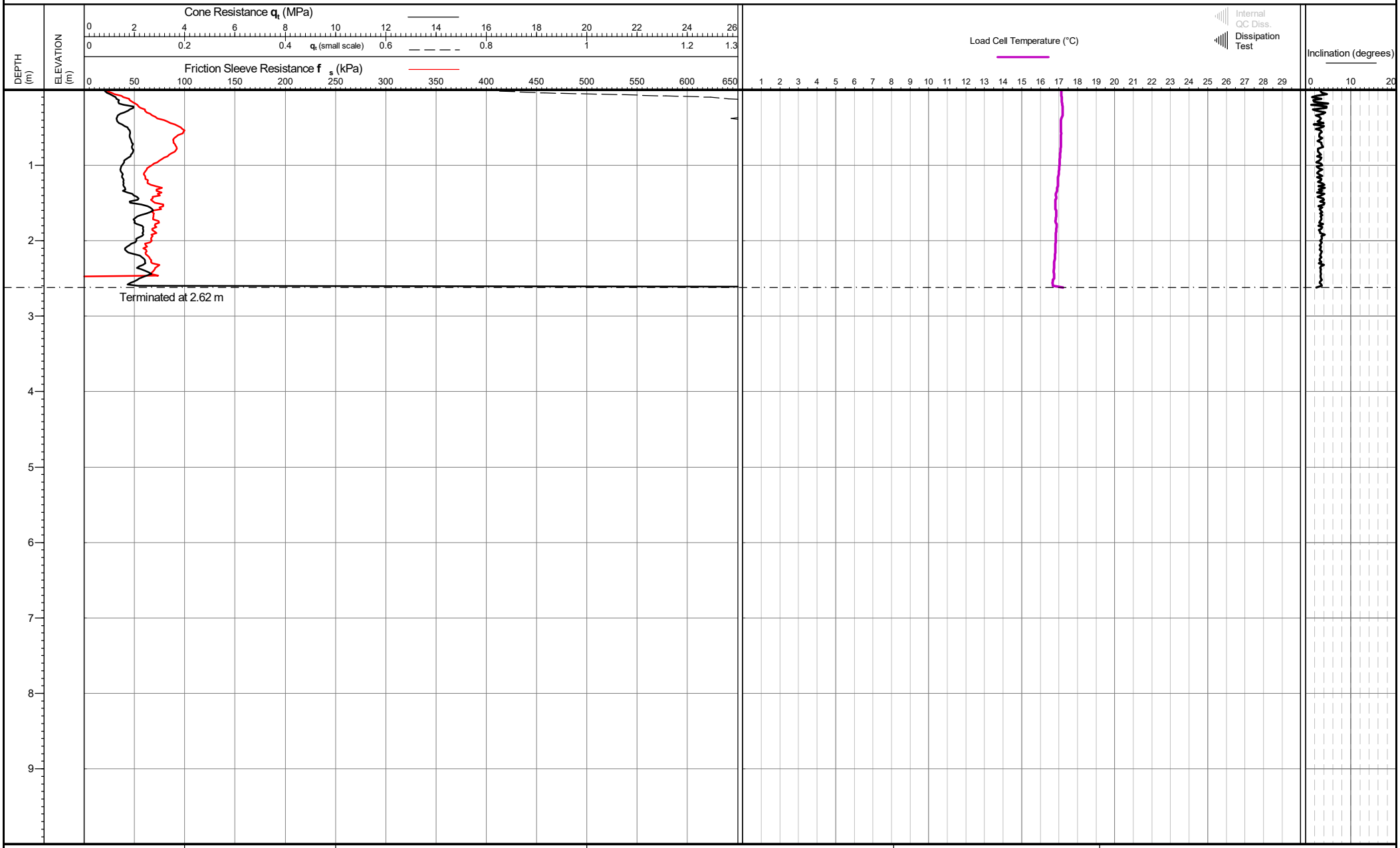


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:14:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-33

Project: SOUTHAMPTON

Client: SOILS LTD.

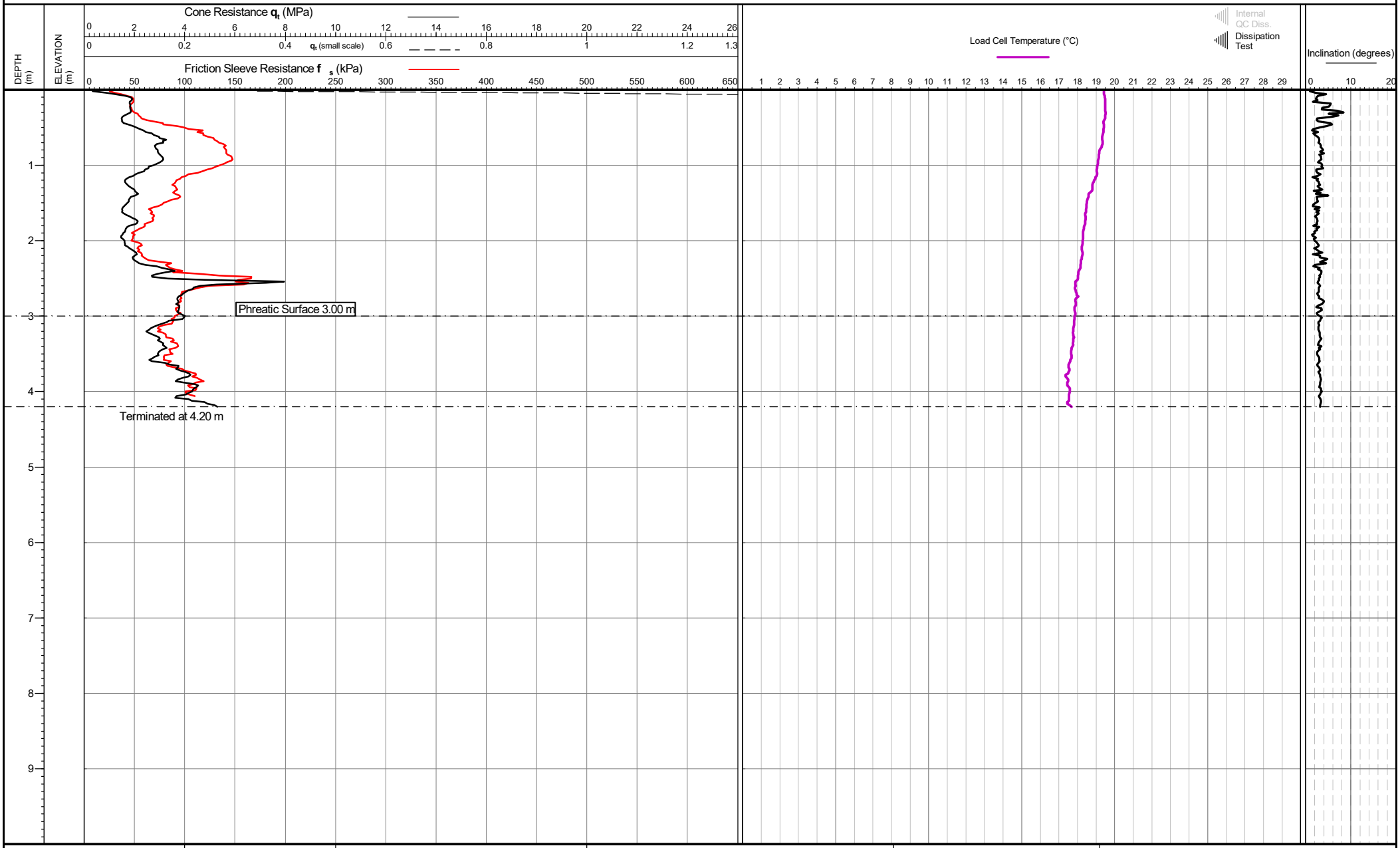


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:29:32	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 1.2 u_2 (kPa): 8.0	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-34

Project: SOUTHAMPTON

Client: SOILS LTD.



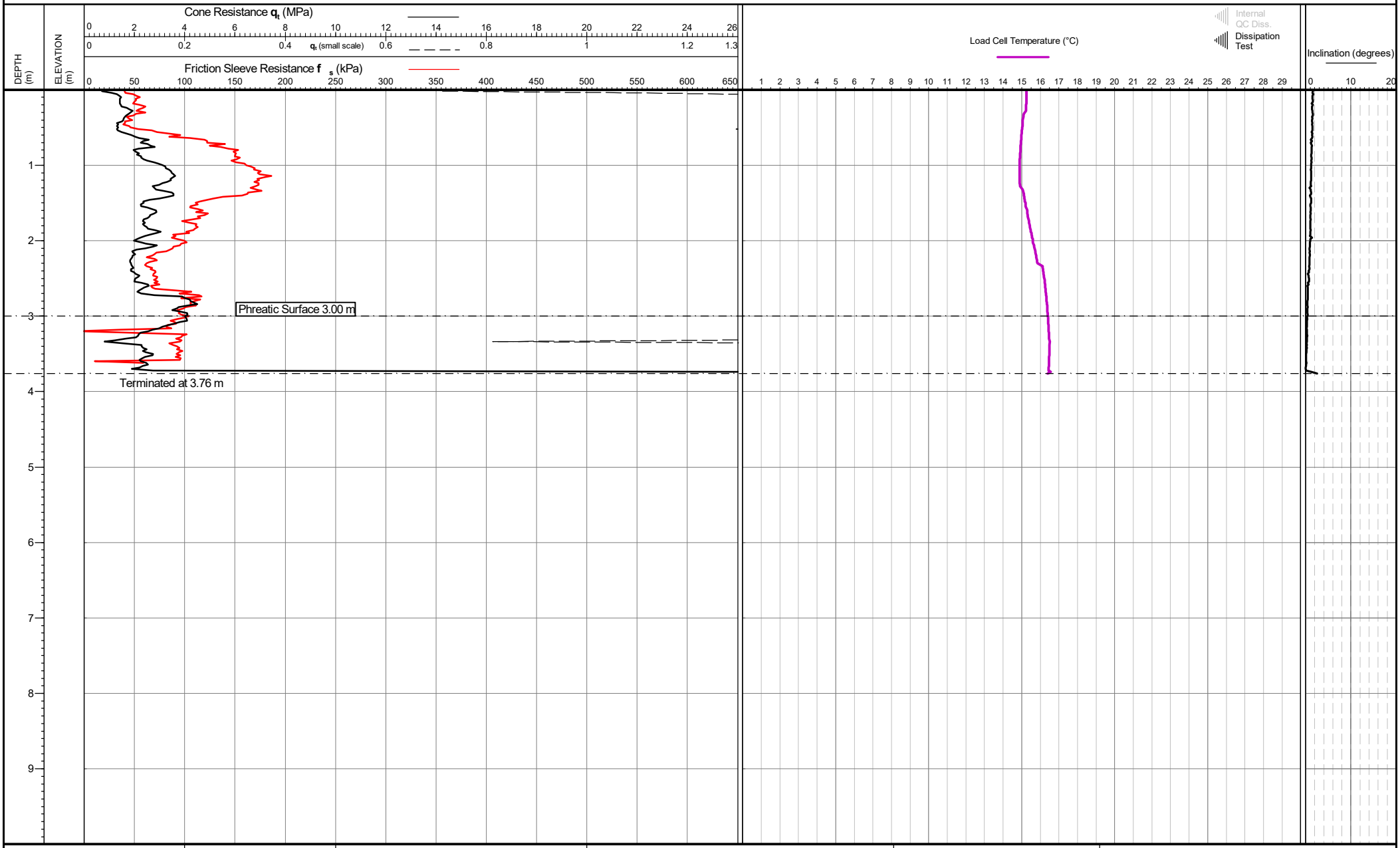
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 14:58:03	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 u_2 (kPa): 5.2	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-35

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



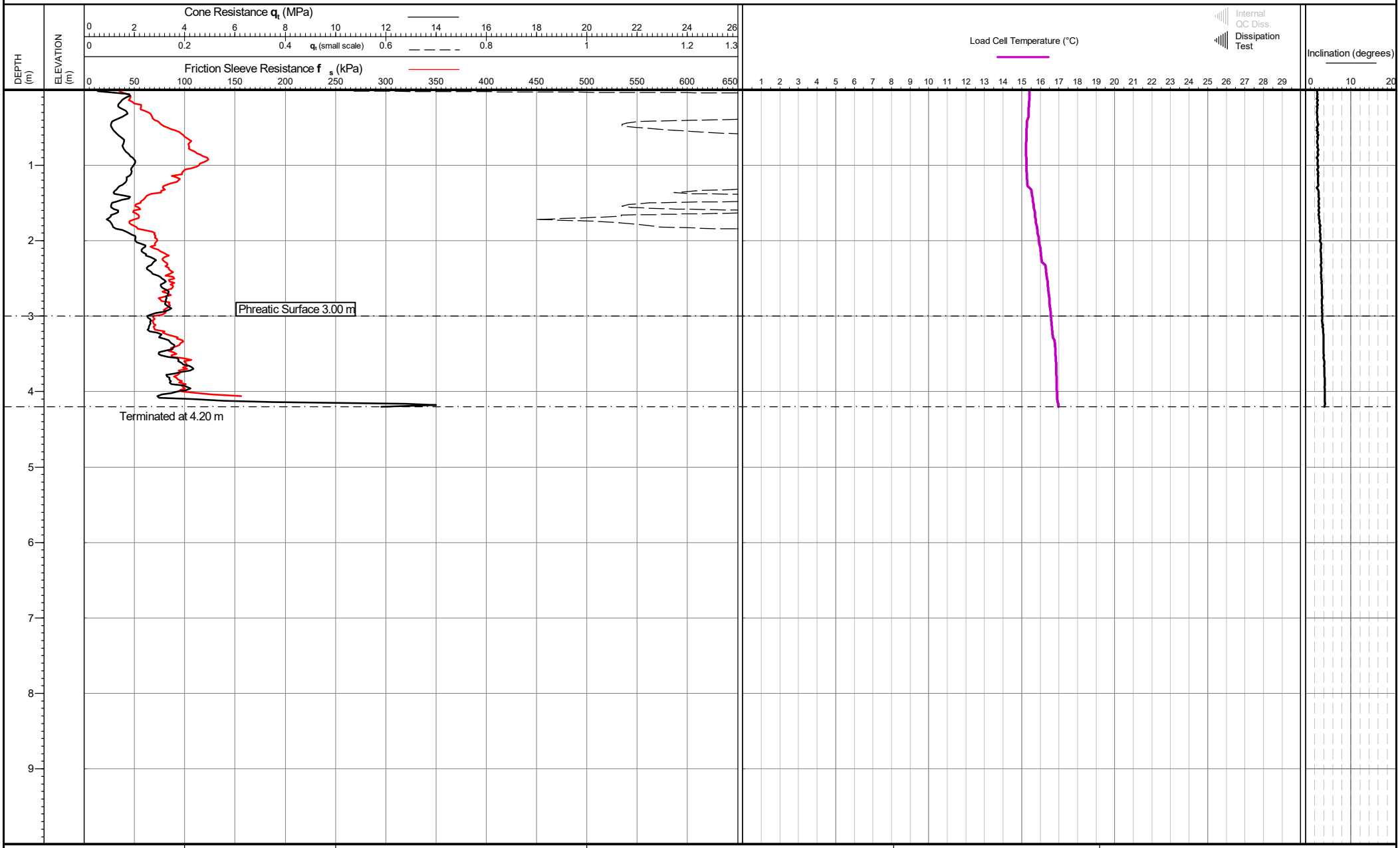
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:08:51	Zero drift (Pre/post test) q_c (kPa): -19.6 f_s (kPa): -0.8 u_2 (kPa): -0.9	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Total reaction force	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-36

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



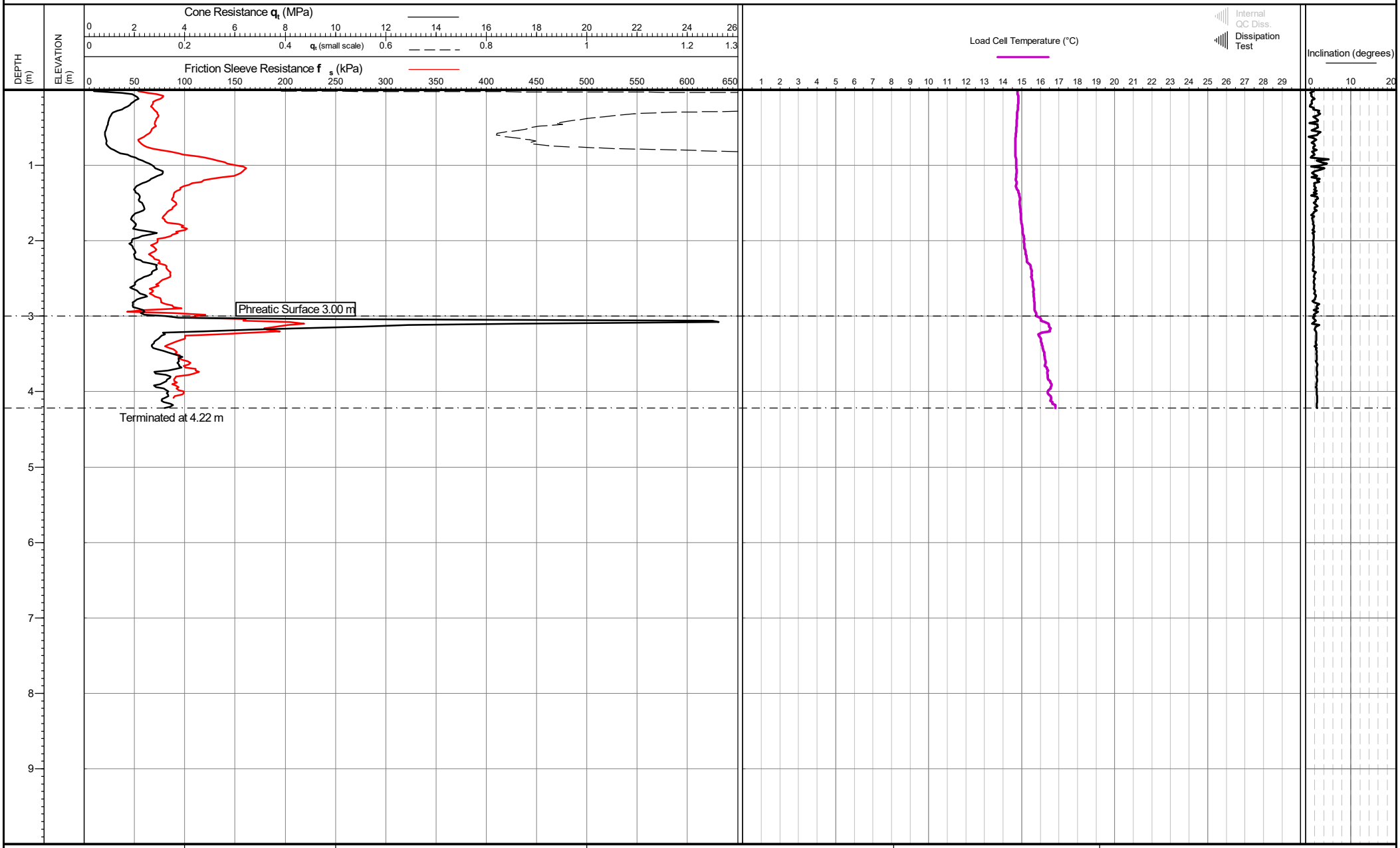
Cone area (mm2): Cone ID: S15-CFIPTT.2074 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:33:54	Zero drift (Pre/post test) q_c (kPa): -26.4 f_s (kPa): 2.3 u_2 (kPa): -4.4	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-37

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

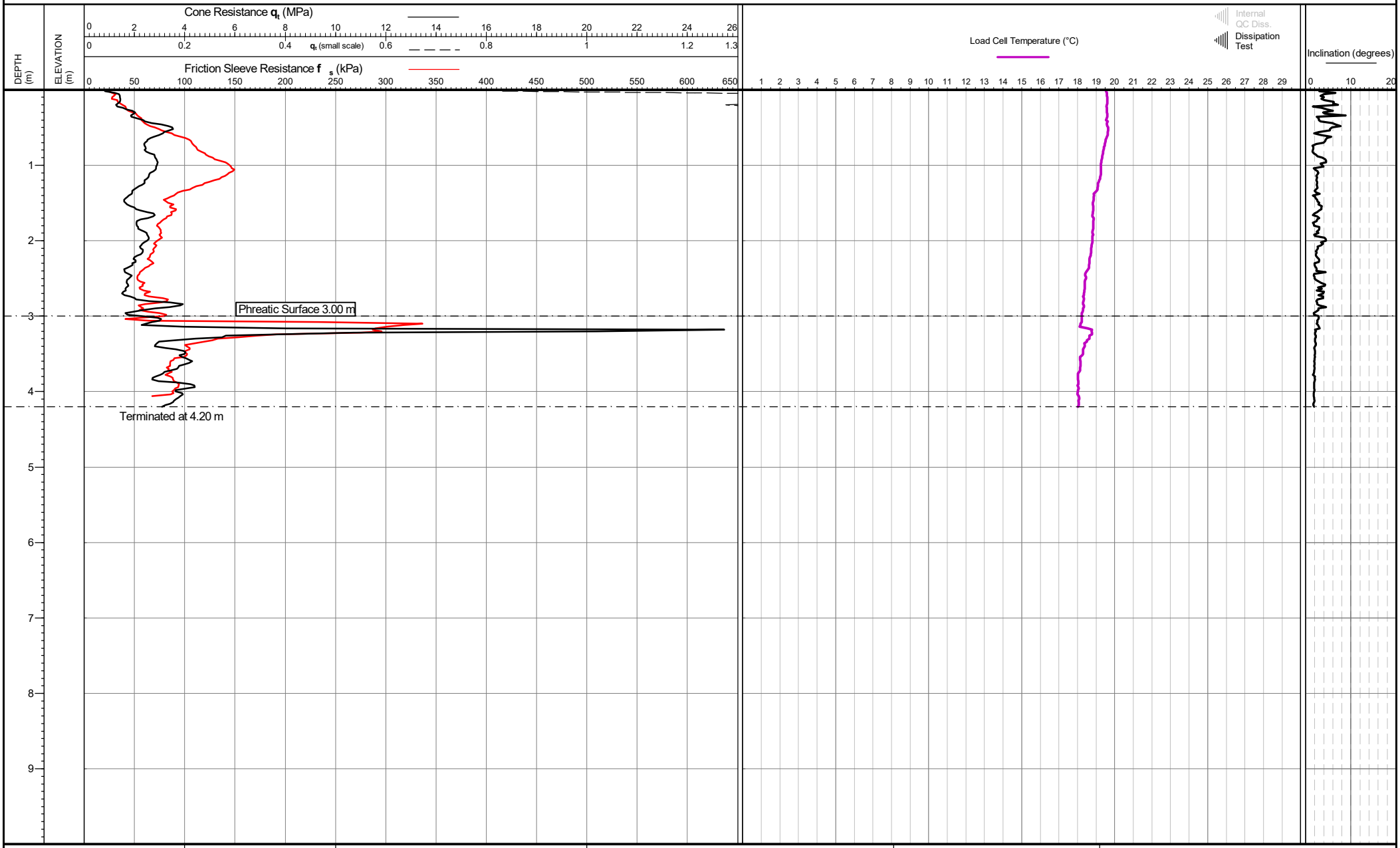


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 08:58:34	Zero drift (Pre/post test) q_c (kPa): 34.2 f_s (kPa): -1.8 u_2 (kPa): -3.3	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-38

Project: SOUTHAMPTON

Client: SOILS LTD.



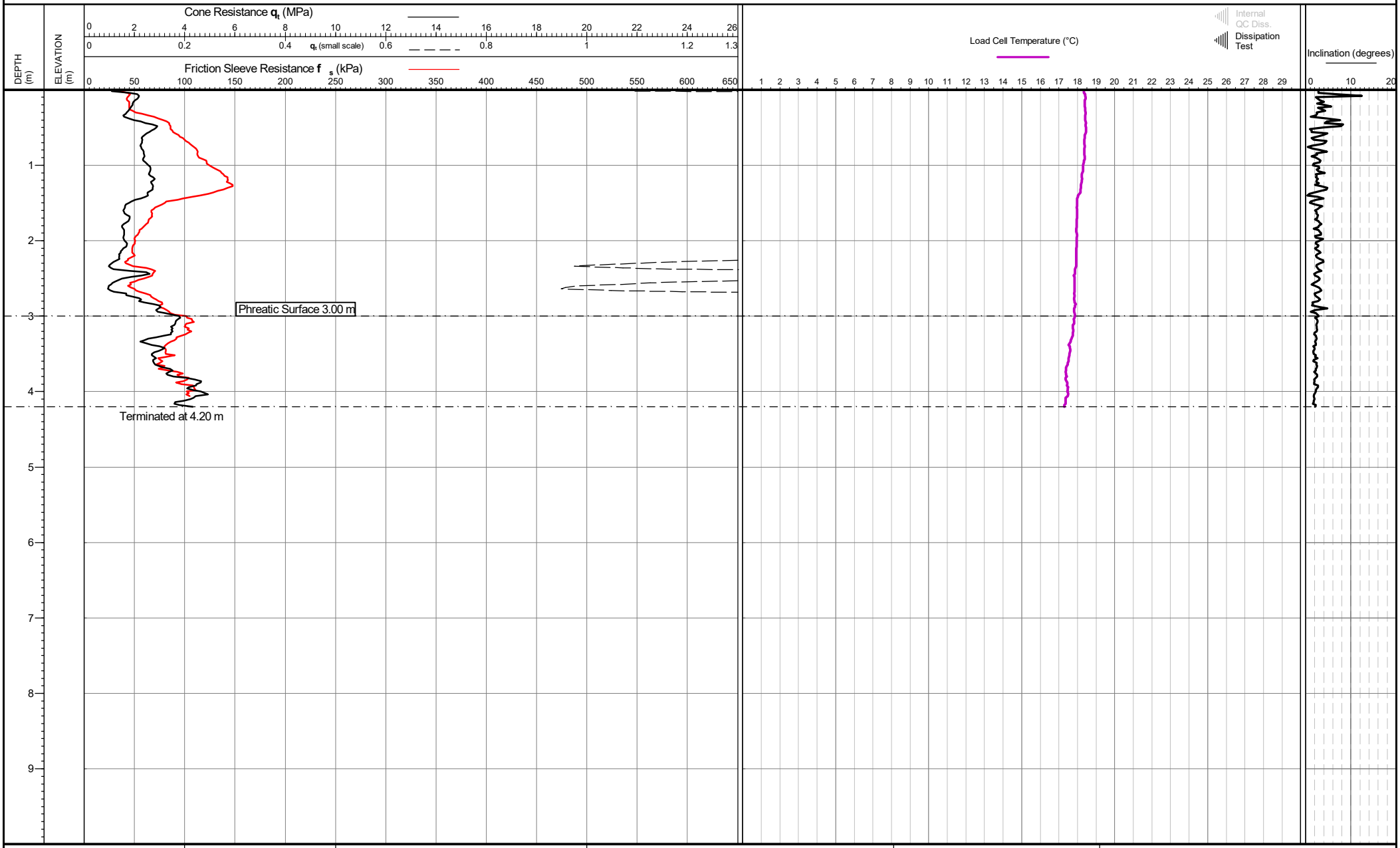
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:12:42	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 u_2 (kPa): 5.2	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-39

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



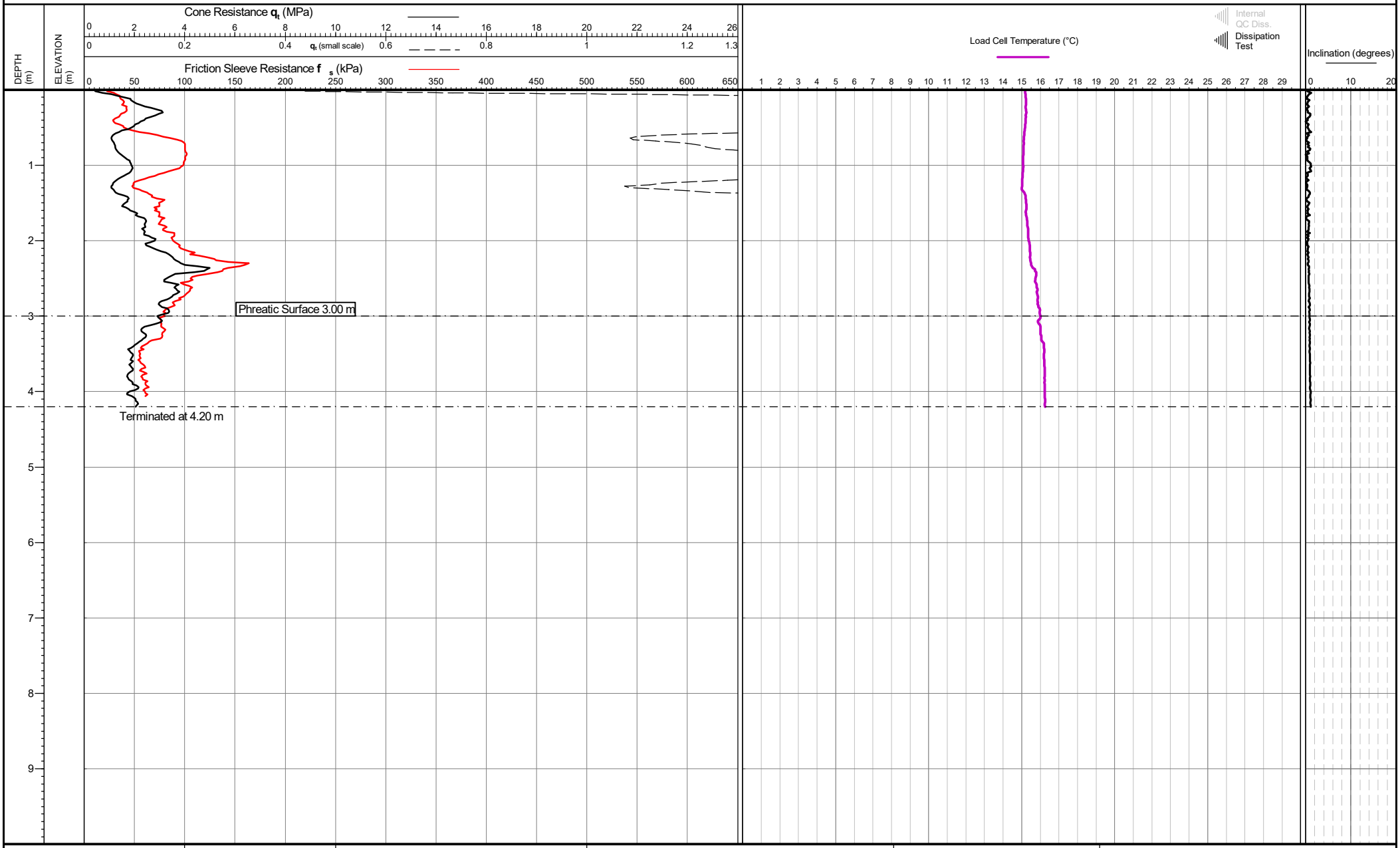
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:33:05	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 u_2 (kPa): 5.2	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-40

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



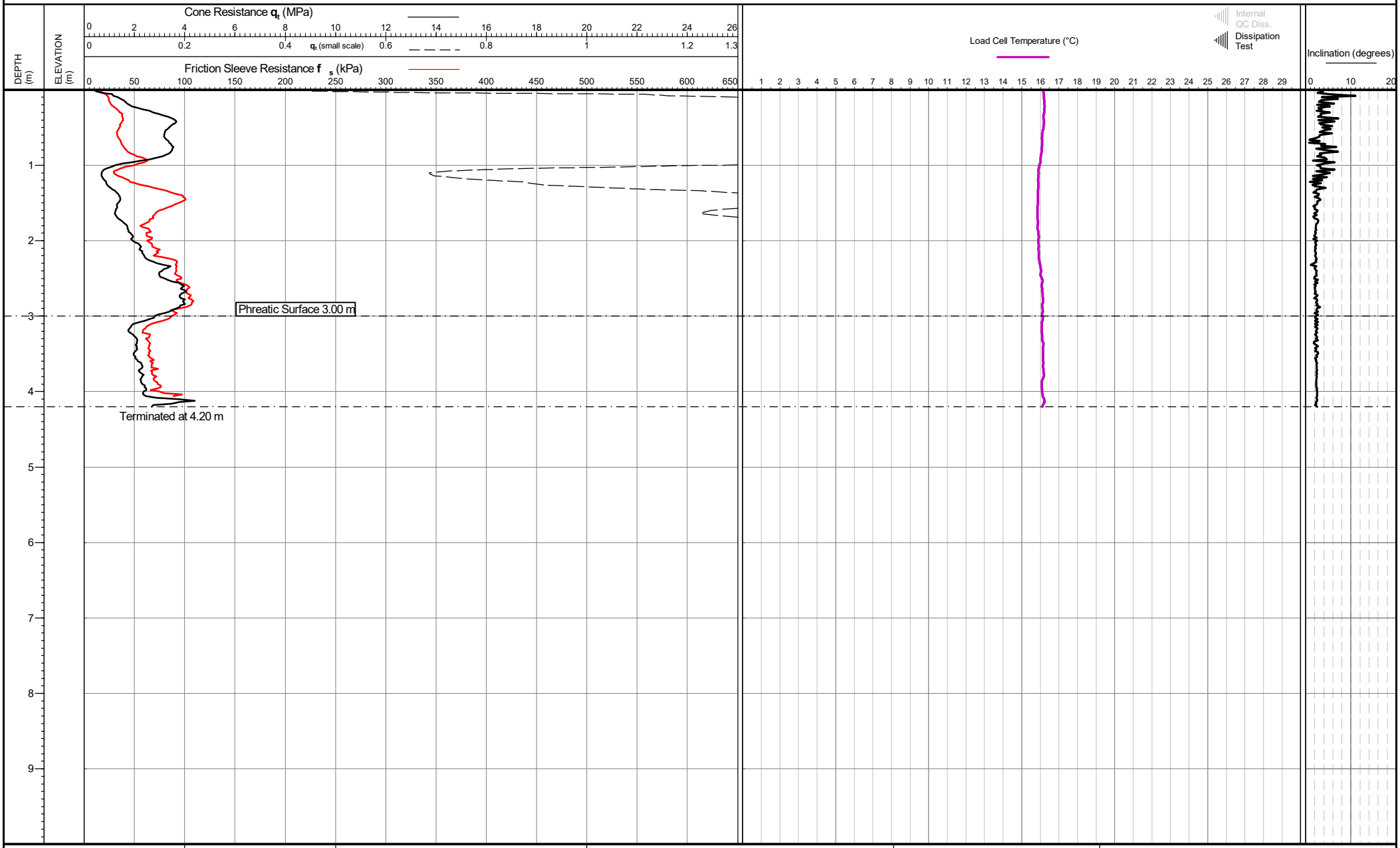
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:29:08	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 u_2 (kPa): 0.1	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-41

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



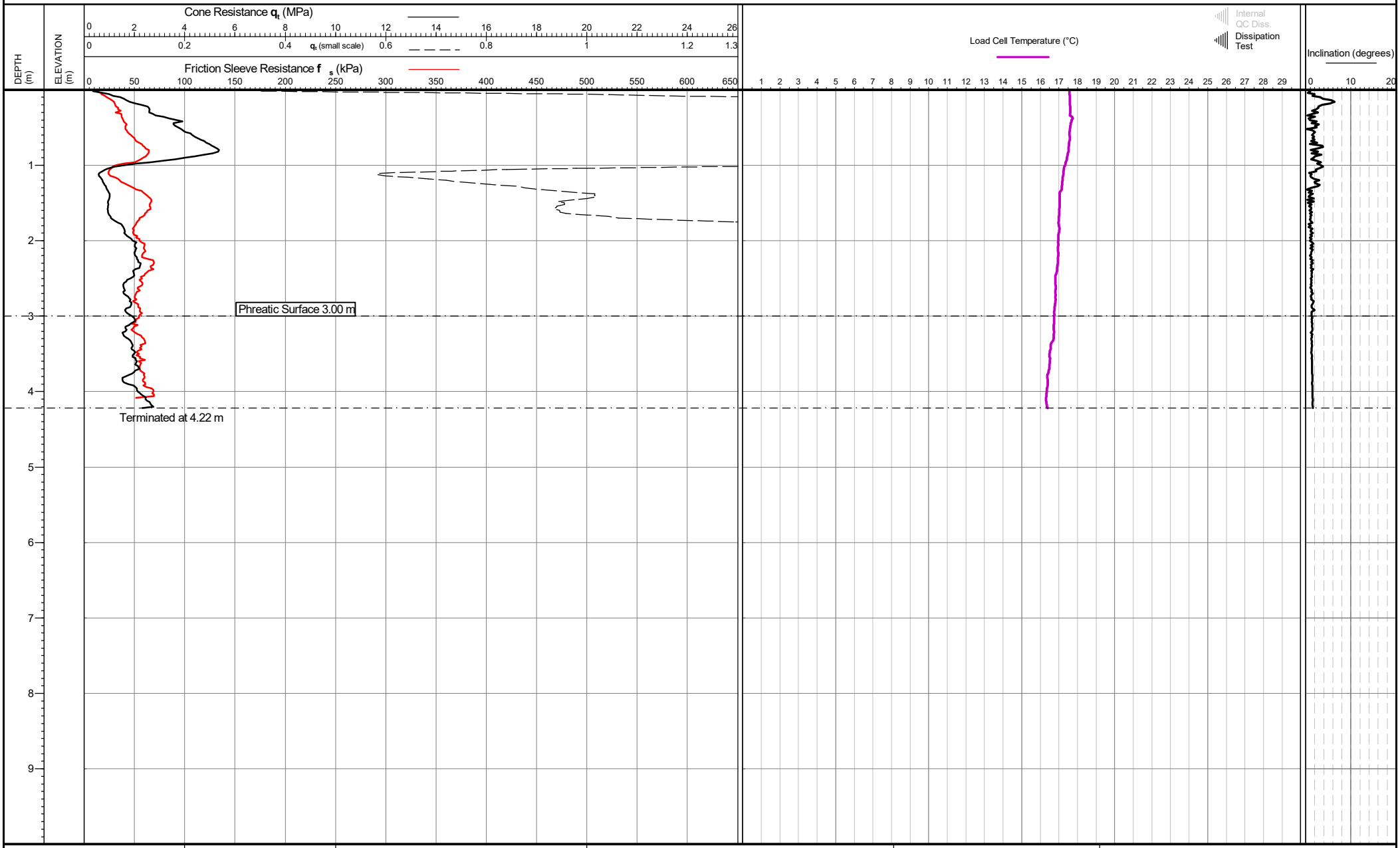
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:39:35	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 u_2 (kPa): 0.1	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-42

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

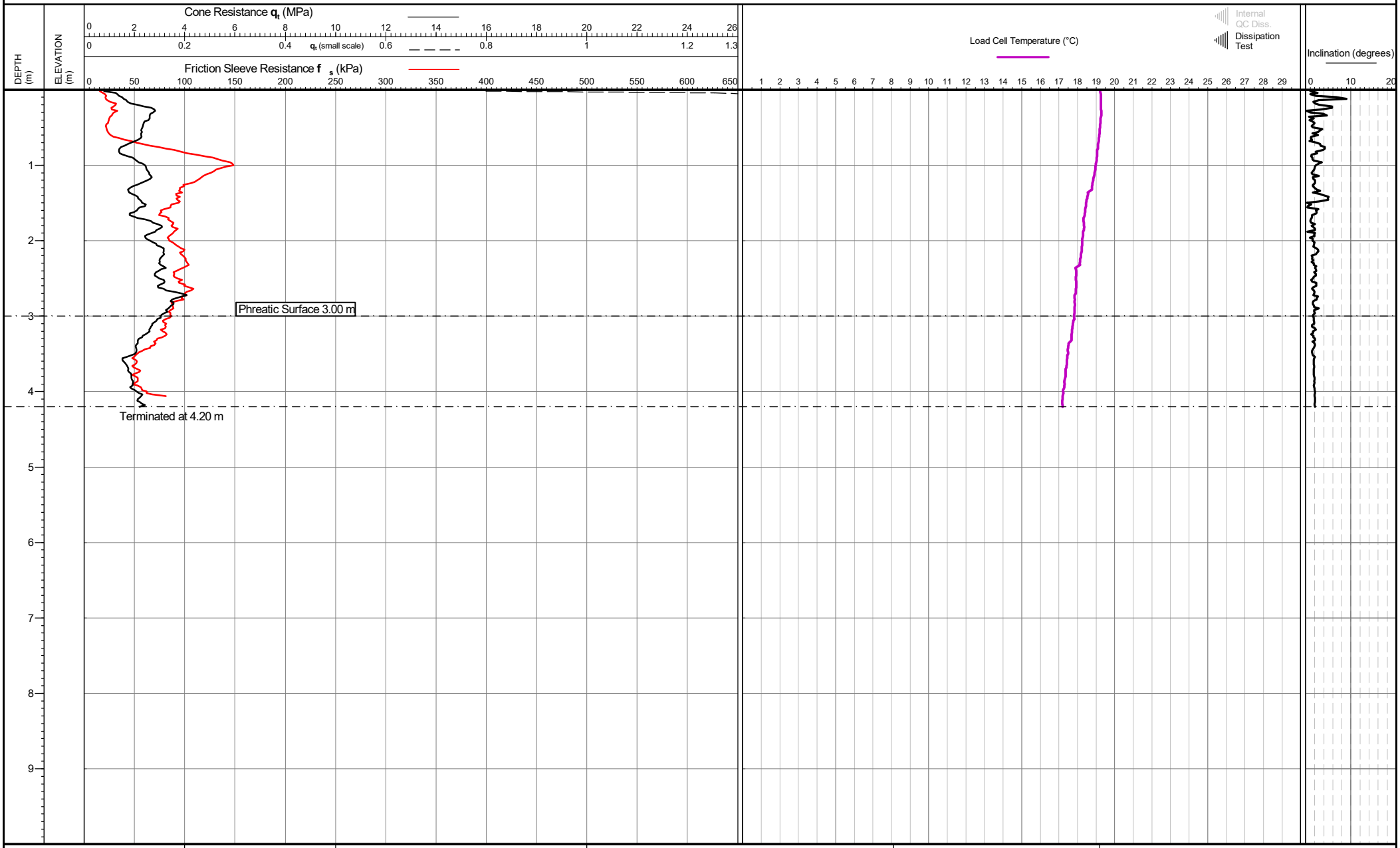


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 09:52:18	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 u_2 (kPa): 0.1	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-43

Project: SOUTHAMPTON

Client: SOILS LTD.

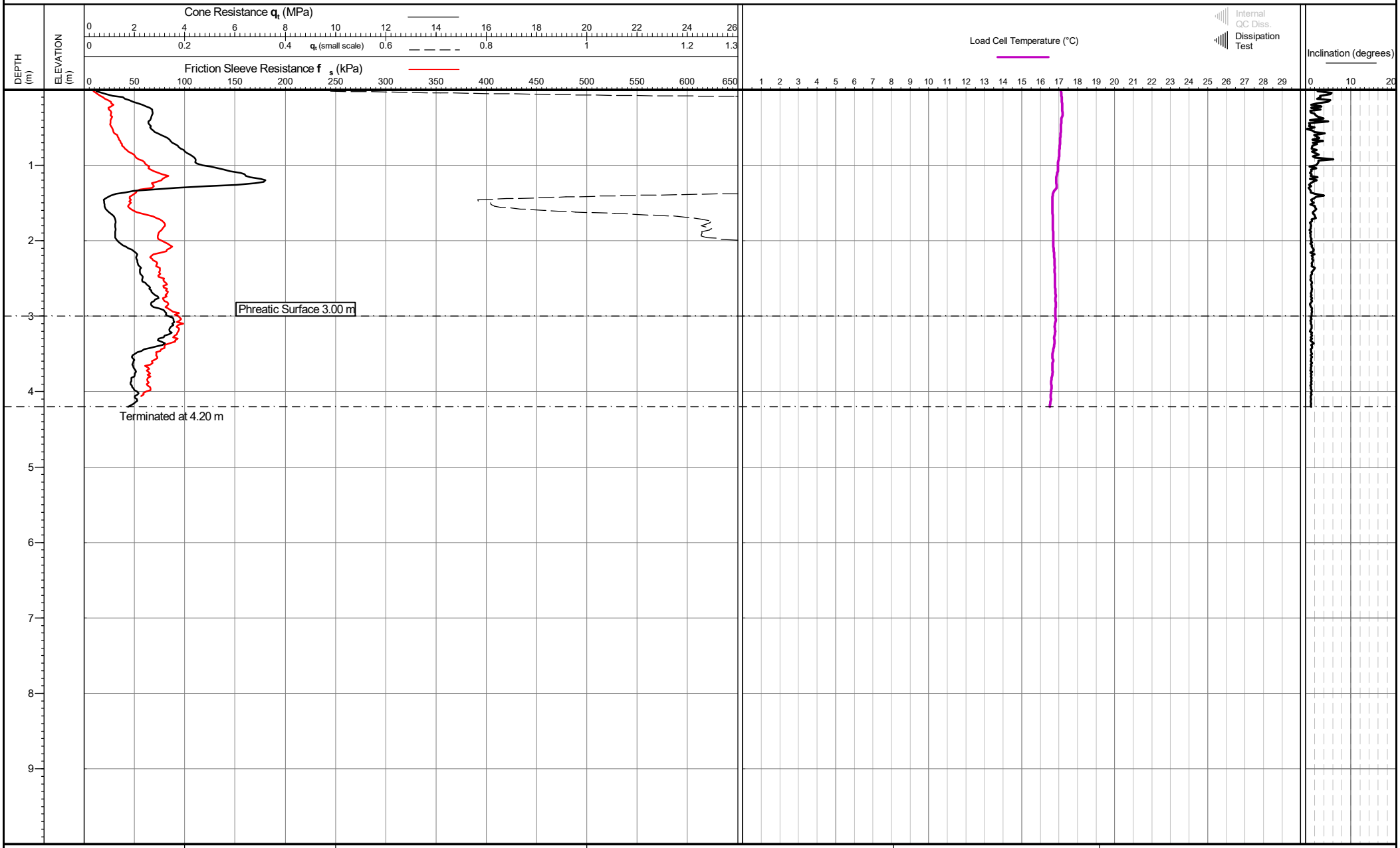


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 15:21:14	Zero drift (Pre/post test) q_c (kPa): 8.8 f_s (kPa): -1.5 u_2 (kPa): 5.2	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-44

Project: SOUTHAMPTON

Client: SOILS LTD.



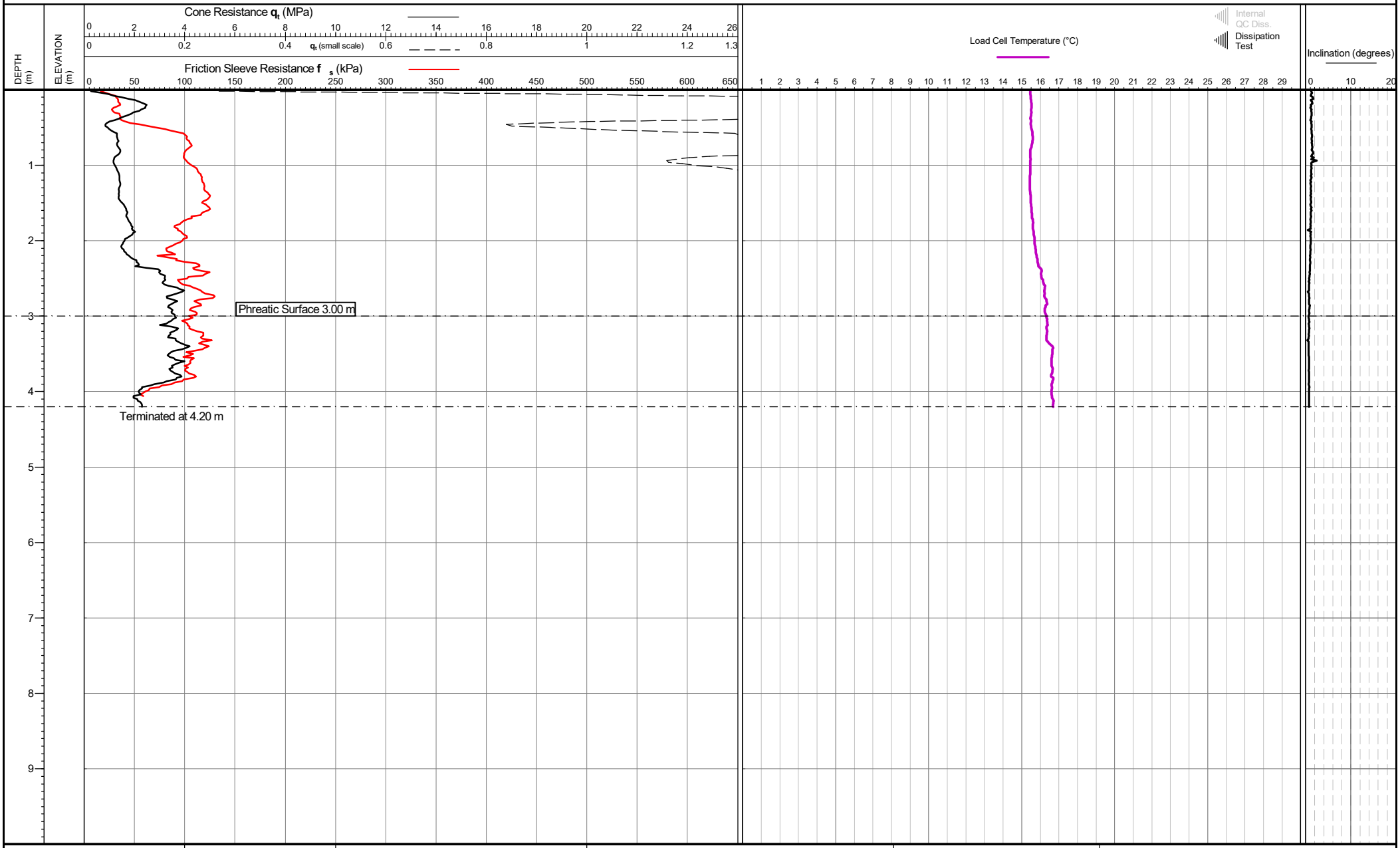
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:01:52	Zero drift (Pre/post test) q_c (kPa): 3.0 f_s (kPa): 0.1 u_2 (kPa): 0.1	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-45

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.

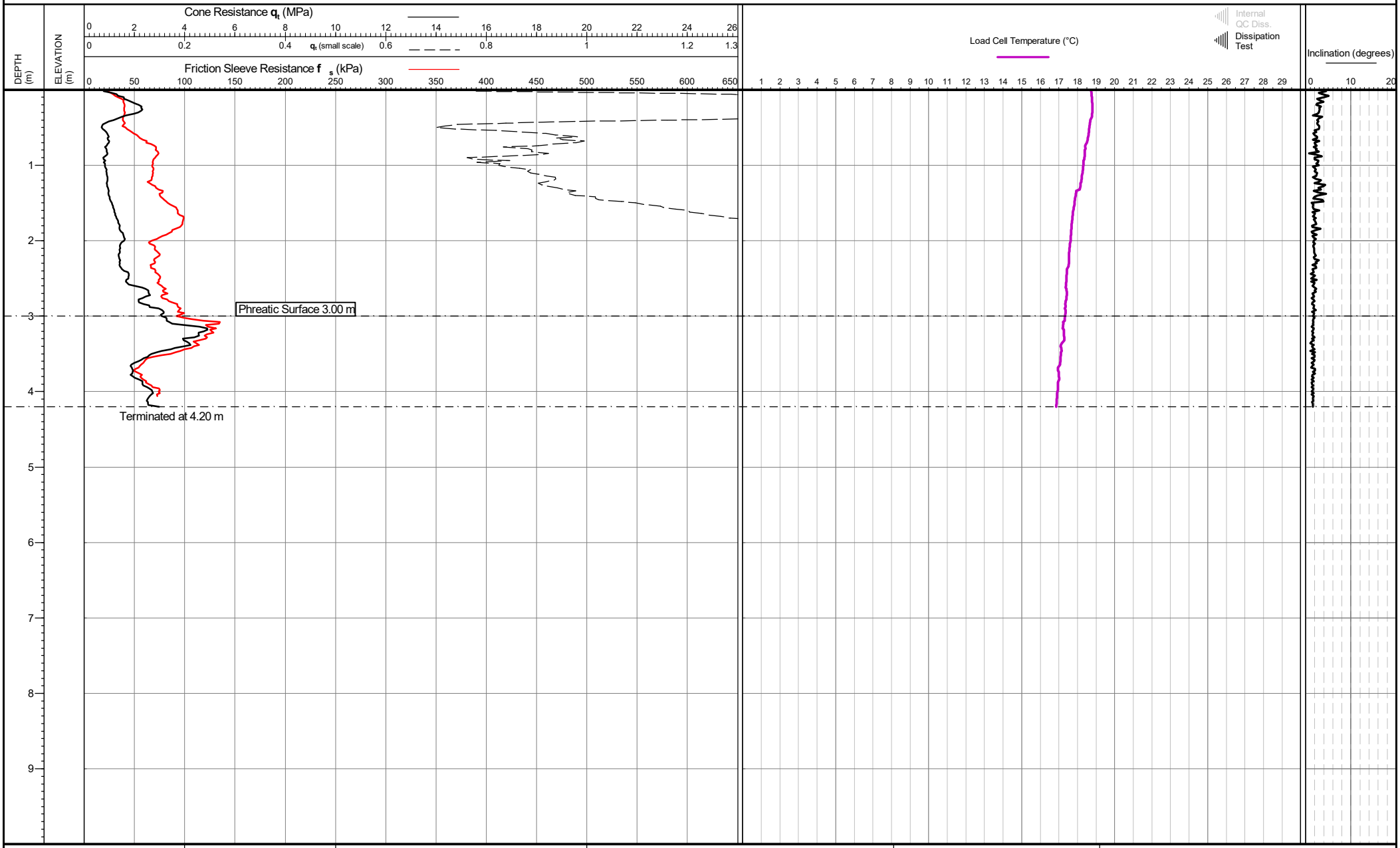


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:26:03	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-46

Project: SOUTHAMPTON

Client: SOILS LTD.

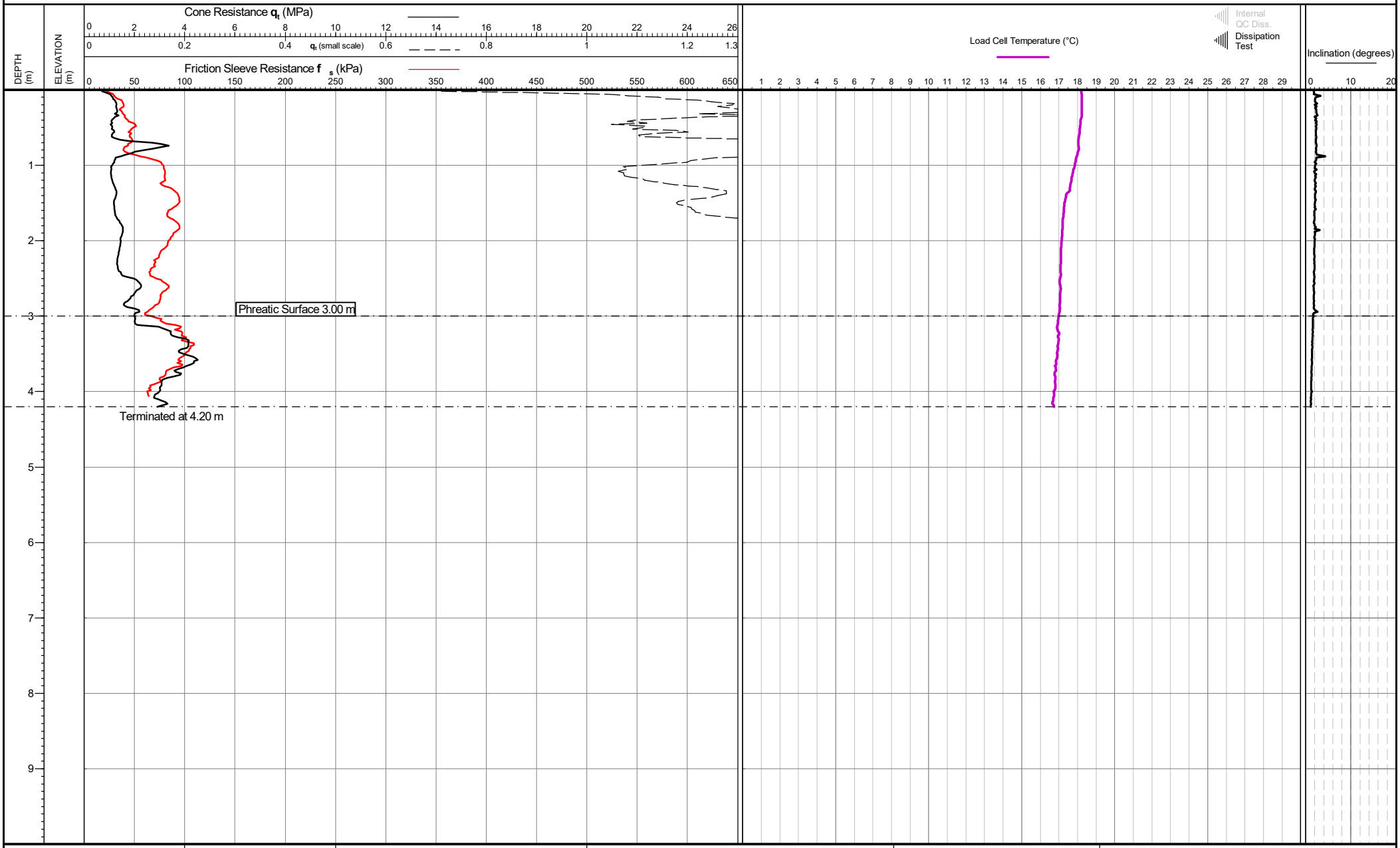


Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:36:17	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-47

Project: SOUTHAMPTON

Client: SOILS LTD.



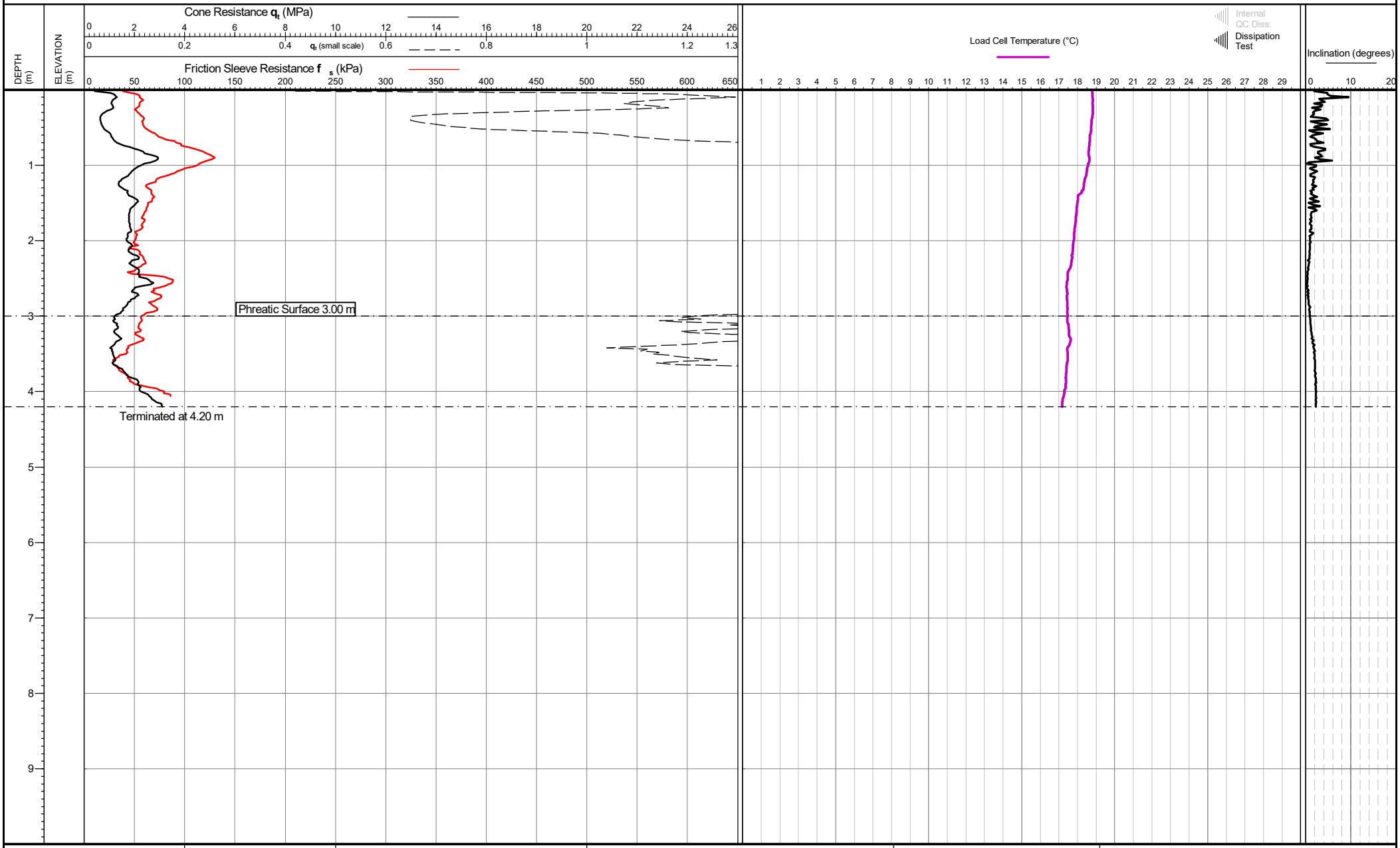
Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 10:50:04	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: CPT-48

LANKELMA

Project: SOUTHAMPTON

Client: SOILS LTD.



Cone area (mm2): Cone ID: S15-CFIPTT.2477 Operator: Owen Treharne Rig Used: UK22 Date of test: 30/09/2025 11:25:23	Zero drift (Pre/post test) q_c (kPa): -19.0 f_s (kPa): 0.7 u_2 (kPa): 1.8	Location: Hampshire, UK Coordinates: , Elevation: Coordinate system:	Remarks: *Phreatic surface origin: Arbitrary value Termination Remark: Target depth	Date of plot: 01-10-25 Checked by: Chris Player	Lankelma Project Ref: 25-32-30218-1

TEST ID: SPT-14

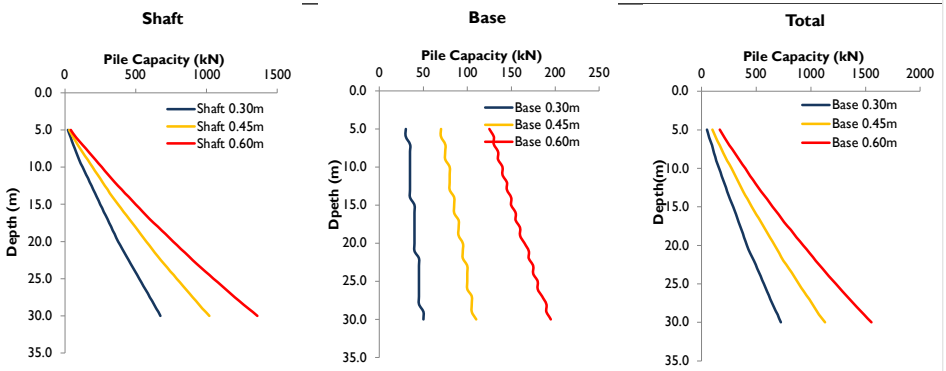
Appendix E Foundation Design

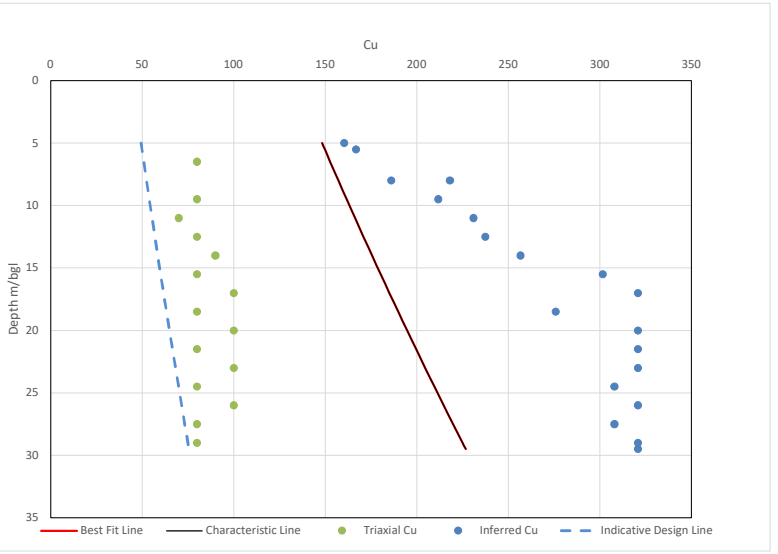
Appendix E.1 Preliminary Pile Design

Preliminary Pile Working Loads

Single Vertically Loaded Pile (kN)

Name:	**OK**	**N_c value**	**9**	**Pile Start Depth:**	**4**	**FOS**	
Job No:	**21876**	**α value:**	**0.45**	**Pile Final Depth:**	**30**	**Shaft**	**Base**
Date:	**3.6.25**			**Pile Increment:**	**1**	**3**	**3**





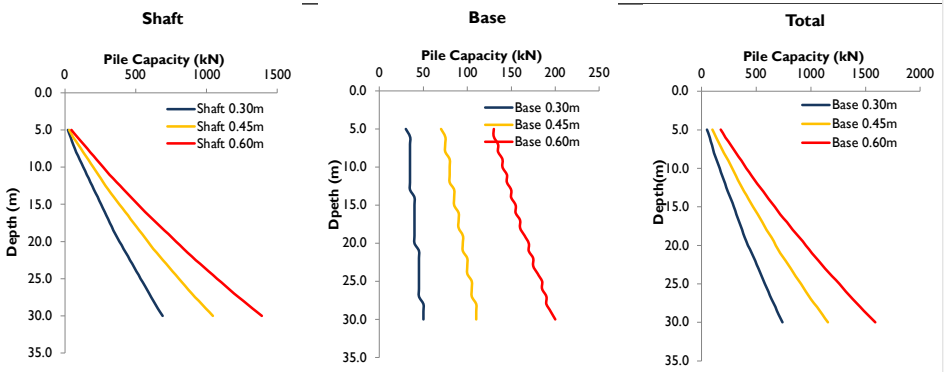
Pile Diameter (m):

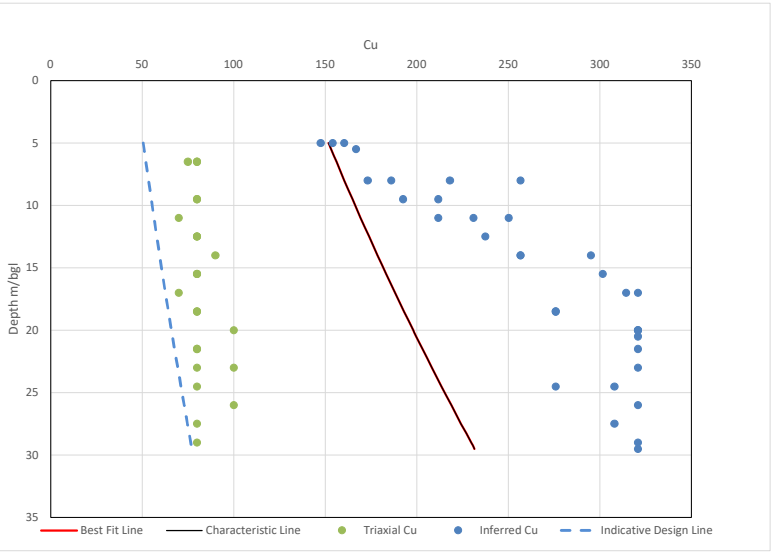
Pile Depths		**0.30**			**0.45**			**0.60**	
(m bgl)	**Shaft**	**Base**	**Total**	**Shaft**	**Base**	**Total**	**Shaft**	**Base**	**Total**
4.0									
5.0	20	30	50	30	70	100	40	125	165
6.0	40	30	70	60	70	130	80	130	210
7.0	60	35	95	90	75	165	125	130	255
8.0	80	35	115	125	75	200	170	135	305
9.0	100	35	135	160	75	235	215	135	350
10.0	125	35	160	195	80	275	260	140	400
11.0	150	35	185	230	80	310	305	140	445
12.0	175	35	210	265	80	345	350	145	495
13.0	200	35	235	300	80	380	400	145	545
14.0	225	35	260	335	85	420	450	150	600
15.0	250	40	290	375	85	460	500	150	650
16.0	275	40	315	415	85	500	550	155	705
17.0	300	40	340	455	90	545	600	155	755
18.0	325	40	365	495	90	585	655	160	815
19.0	350	40	390	535	90	625	710	160	870
20.0	375	40	415	575	95	670	765	165	930
21.0	405	40	445	615	95	710	820	170	990
22.0	435	45	480	655	95	750	875	170	1045
23.0	465	45	510	700	100	800	930	175	1105
24.0	495	45	540	745	100	845	990	175	1165
25.0	525	45	570	790	100	890	1050	180	1230
26.0	555	45	600	835	100	935	1110	180	1290
27.0	585	45	630	880	105	985	1170	185	1355
28.0	615	45	660	925	105	1030	1230	190	1420
29.0	645	50	695	970	105	1075	1295	190	1485
30.0	675	50	725	1020	110	1130	1360	195	1555

Preliminary Pile Working Loads

Single Vertically Loaded Pile (kN)

Name:	**OK**	**N_c value**	**9**	**Pile Start Depth:**	**4**	**FOS**	
Job No:	**21876**	**α value:**	**0.45**	**Pile Final Depth:**	**30**	**Shaft**	**Base**
Date:	**3.6.25**			**Pile Increment:**	**1**	**3**	**3**





Pile Diameter (m):

Pile Depths	0.30			0.45			0.60		
(m bgl)	Shaft	Base	Total	Shaft	Base	Total	Shaft	Base	Total
4.0									
5.0	20	30	50	30	70	100	45	130	175
6.0	40	35	75	60	75	135	90	130	220
7.0	60	35	95	95	75	170	135	135	270
8.0	80	35	115	130	75	205	180	135	315
9.0	105	35	140	165	80	245	225	140	365
10.0	130	35	165	200	80	280	270	140	410
11.0	155	35	190	235	80	315	315	145	460
12.0	180	35	215	270	80	350	365	145	510
13.0	205	35	240	305	85	390	415	150	565
14.0	230	40	270	345	85	430	465	150	615
15.0	255	40	295	385	85	470	515	155	670
16.0	280	40	320	425	90	515	565	155	720
17.0	305	40	345	465	90	555	620	160	780
18.0	330	40	370	505	90	595	675	160	835
19.0	355	40	395	545	95	640	730	165	895
20.0	385	40	425	585	95	680	785	170	955
21.0	415	45	460	625	95	720	840	170	1010
22.0	445	45	490	670	100	770	895	175	1070
23.0	475	45	520	715	100	815	955	175	1130
24.0	505	45	550	760	100	860	1015	180	1195
25.0	535	45	580	805	105	910	1075	185	1260
26.0	565	45	610	850	105	955	1135	185	1320
27.0	595	45	640	895	105	1000	1195	190	1385
28.0	625	50	675	945	110	1055	1260	190	1450
29.0	655	50	705	995	110	1105	1325	195	1520
30.0	690	50	740	1045	110	1155	1390	200	1590

Appendix F Chemical Laboratory Analyses

Appendix F.1 Conceptual Site Model

Table F.1.1 CSM Revised Pre-Chemical Analyses

Source (Error! Reference source not found. & Error! Reference source not found.)	Potential Contaminant (Error! Reference source not found.)	Exposure Pathway (Error! Reference source not found.)	Receptor (Error! Reference source not found.)	Initial Assessment from Preliminary Investigation Report Information			Comments	Further Works
				Severity	Probability	Risk		
Tanhouse Off-site sources from which potential contamination would have migrated onto the site.	Metals, Semi-metals and non-metals, PAHs	Inhalation of dust	Site Workers/Site Maintenance	Medium	Low	Low	Site located on bedrock of the Whitecliff Sand Member and London Clay Formation. Whitecliff Sand Member classified as a Secondary A aquifer which could support groundwater at a local scale. London Clay Formation classed as Unproductive Strata which and would act as an aquiclude to the deep groundwater receptors. The Ground investigation did not record any anthropogenic materials and the absence of Made Ground. From the ground conditions encountered, low groundwater levels and the fact that the new drainage regime will control water flows the risk to controlled waters was considered to be low.	Chemical testing prior to undertaking a generic quantitative risk assessment. However, the risk is Low, precautionary Site Investigation works and testing should be undertaken.
			End Users	Medium	Unlikely	Low		
	PAHs, TPHs	Inhalation of vapour/gases	Site Workers/Site Maintenance	Mild	Low			
			End Users					
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Medium	Unlikely			
			End Users					
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Migration via surface runoff	Surface Water	Medium	Low	Low		
		Migration in solution via groundwater	Surface Water	-				
			Shallow Aquifer					
			Deep Aquifer					
		Direct contact with construction material	Buried Structures	Mild	Low	Low		
			Buried Services					
	PAHs, TPHs	Migration of gases via permeable soils	Site Workers/Site Maintenance	Medium	Unlikely			
			End Users					
			Building and Confined Spaces					

Table F.1.2 CSM Revised Post-Chemical Analyses

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Desk Study and Main Investigation Report Information			Comments	Further Works
				Severity	Probability	Risk		
Tanhouse Off-site sources from which potential contamination would have migrated onto the site.	Metals, Semi-metals and non-metals, PAHs	Inhalation of dust	Site Workers/Site Maintenance	Medium	Low	Low	Site located on bedrock of the Whitecliff Sand Member and London Clay Formation. Whitecliff Sand Member classified as a Secondary A aquifer which could support groundwater at a local scale. London Clay Formation classed as Unproductive Strata which and would act as an aquiclude to the deep groundwater receptors. The Ground investigation did not record any anthropogenic materials and the absence of Made Ground. From the ground conditions encountered, low groundwater levels and the fact that the new drainage regime will control water flows the risk to controlled waters was considered to be low.	No further works required subject to regulatory agreement. Discovery strategy in place. H&S precautions for ground workers.
			End Users	Medium	Unlikely	Low		
	PAHs, TPHs	Inhalation of vapour/gases	Site Workers/Site Maintenance	Mild	Low			
			End Users					
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Medium	Unlikely			
			End Users					
	Metals, Semi-metals and non-metals, PAHs, TPHs, pH	Migration via surface runoff	Surface Water	Medium	Low	Low		
		Migration in solution via groundwater	Surface Water	-				
			Shallow Aquifer					
			Deep Aquifer					
		Direct contact with construction material	Buried Structures	Mild	Low	Low		
			Buried Services					
	PAHs, TPHs	Migration of gases via permeable soils	Site Workers/Site Maintenance	Medium	Unlikely			
			End Users					
			Building and Confined Spaces					

Appendix F.2 Chemical Laboratory Results

Normec DETS

UKAS TESTING 4480

Alex Stratford
Soils Ltd
Thomas Telford House - Unit 11
Sun Valley Business Park
Winnall Close
Winchester
SO23 0LB

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

DETS Report No: 25-04477

Site Reference:	Kings Copse Avenue, Hedge End, Hampshire
Project / Job Ref:	21876
Order No:	21876/AS
Sample Receipt Date:	28/04/2025
Sample Scheduled Date:	28/04/2025
Report Issue Number:	1
Reporting Date:	02/05/2025

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.

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Lenham Heath
Maidstone
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Soil Analysis Certificate						
DETS Report No: 25-04477	**~Date Sampled**	22/04/25	22/04/25	22/04/25	22/04/25	22/04/25
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	**~TP / BH No**	WS1	WS2	WS3	WS4	WS5
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: 21876/AS	**~Depth (m)**	0.10	0.20	0.50	0.80	0.10
Reporting Date: 02/05/2025	**DETS Sample No**	774300	774301	774302	774303	774304

Determinand	Unit	RL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	6.8	7.3	7.3	7.8	7.1
Organic Matter (SOM)	%	< 0.1	MCERTS	1.9	2	0.9	0.7	2.4
Arsenic (As)	mg/kg	< 2	MCERTS	6	8	10	13	7
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	7	13	29	22	18
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	6	13	23	19	10
Lead (Pb)	mg/kg	< 3	MCERTS	15	26	21	12	16
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	< 3	6	18	16	9
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	MCERTS	13	24	47	35	34
Zinc (Zn)	mg/kg	< 3	MCERTS	20	28	50	39	28
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

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Soil Analysis Certificate						
DETS Report No: 25-04477	**~Date Sampled**	22/04/25	22/04/25	22/04/25		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	**~TP / BH No**	WS6	WS7	WS8		
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21876/AS	**~Depth (m)**	0.20	0.50	1.00		
Reporting Date: 02/05/2025	**DETS Sample No**	774305	774306	774307		

Determinand	Unit	RL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		
pH	pH Units	N/a	MCERTS	6.6	6.5	7.6		
Organic Matter (SOM)	%	< 0.1	MCERTS	2.3	1.3	0.5		
Arsenic (As)	mg/kg	< 2	MCERTS	6	5	11		
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (Cr)	mg/kg	< 2	MCERTS	13	11	25		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	16	9	16		
Lead (Pb)	mg/kg	< 3	MCERTS	17	8	10		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	5	4	16		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Vanadium (V)	mg/kg	< 1	MCERTS	25	16	33		
Zinc (Zn)	mg/kg	< 3	MCERTS	23	17	41		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 25-04477	~Date Sampled	22/04/25	22/04/25	22/04/25	22/04/25	22/04/25
Soils Ltd	~Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	~TP / BH No	WS1	WS2	WS3	WS4	WS5
~Project / Job Ref: 21876	~Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: 21876/AS	~Depth (m)	0.10	0.20	0.50	0.80	0.10
Reporting Date: 02/05/2025	DETS Sample No	774300	774301	774302	774303	774304

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 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	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 25-04477	**~Date Sampled**	22/04/25	22/04/25	22/04/25		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	**~TP / BH No**	WS6	WS7	WS8		
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21876/AS	**~Depth (m)**	0.20	0.50	1.00		
Reporting Date: 02/05/2025	**DETS Sample No**	774305	774306	774307		

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6		

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Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 25-04477	**~Date Sampled**	22/04/25	22/04/25	22/04/25	22/04/25	22/04/25
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	**~TP / BH No**	WS1	WS2	WS3	WS4	WS5
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
~Order No: 21876/AS	**~Depth (m)**	0.10	0.20	0.50	0.80	0.10
Reporting Date: 02/05/2025	**DETS Sample No**	774300	774301	774302	774303	774304

Determinand	Unit	RL	Accreditation					
EPH Texas (C6 - C8) : HS_1D_MS _Total	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Texas (>C8 - C10) : EH_1D_Total	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C10 - C12) : EH_1D_Total	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C12 - C16) : EH_1D_Total	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C16 - C21) : EH_1D_Total	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C21 - C40) : EH_1D_Total	mg/kg	< 6	**MCERTS**	< 6	< 6	< 6	< 6	< 6
EPH Texas (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	< 6	< 6	< 6	< 6	< 6

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Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 25-04477	**~Date Sampled**	22/04/25	22/04/25	22/04/25		
Soils Ltd	**~Time Sampled**	None Supplied	None Supplied	None Supplied		
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	**~TP / BH No**	WS6	WS7	WS8		
~Project / Job Ref: 21876	**~Additional Refs**	None Supplied	None Supplied	None Supplied		
~Order No: 21876/AS	**~Depth (m)**	0.20	0.50	1.00		
Reporting Date: 02/05/2025	**DETS Sample No**	774305	774306	774307		

Determinand	Unit	RL	Accreditation					
EPH Texas (C6 - C8) : HS_1D_MS _Total	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
EPH Texas (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1		
EPH Texas (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6	< 6	< 6		
EPH Texas (C6 - C40) : HS_1D_MS+EH_1D_Total	mg/kg	< 6	NONE	< 6	< 6	< 6		

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 25-04477	
Soils Ltd	
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire	
~Project / Job Ref: 21876	
~Order No: 21876/AS	
Reporting Date: 02/05/2025	

DETS Sample No	~TP / BH No	~Additional Refs	~Depth (m)	Moisture Content (%)	Sample Matrix Description
774300	WS1	None Supplied	0.10	6.8	Light brown sandy clay with vegetation
774301	WS2	None Supplied	0.20	12.6	Brown sandy clay
774302	WS3	None Supplied	0.50	18.1	Light brown clay
774303	WS4	None Supplied	0.80	19.5	Light brown clay
774304	WS5	None Supplied	0.10	12.2	Light brown sandy clay with vegetation
774305	WS6	None Supplied	0.20	9.6	Light brown sandy clay with vegetation
774306	WS7	None Supplied	0.50	12.9	Light brown sandy clay with stones
774307	WS8	None Supplied	1.00	17.7	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 25-04477

Soils Ltd

~Site Reference: Kings Copse Avenue, Hedge End, Hampshire

~Project / Job Ref: 21876

~Order No: 21876/AS

Reporting Date: 02/05/2025

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

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Rose Lane
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Tel : 01622 850410

List of HWOL Acronyms and Operators
DETS Report No: 25-04477
Soils Ltd
~Site Reference: Kings Copse Avenue, Hedge End, Hampshire
~Project / Job Ref: 21876
~Order No: 21876/AS
Reporting Date: 02/05/2025

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

EPH Texas (C10 - C12) - EH_1D_Total
EPH Texas (C12 - C16) - EH_1D_Total
EPH Texas (C16 - C21) - EH_1D_Total
EPH Texas (C21 - C40) - EH_1D_Total
EPH Texas (C6 - C40) - HS_1D_MS+EH_1D_Total
EPH Texas (C6 - C8) - HS_1D_MS _Total
EPH Texas (C8 - C10) - EH_1D_Total

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Certificate Key

Symbol	Description
F	Filtered sample
UF	Unfiltered sample
D	Dried sample
AR	As received sample
RL	Reporting limit
~	Sample details provided by customer and can affect the validity of results
M/S	Missing Sample
S	Subcontracted analysis
M	MCERTS accredited test
U	UKAS accredited test

Appendix F.3 General Assessment Criteria

HUMAN HEALTH RISK ASSESSMENT

Introduction

The statutory definition of contaminated land was initially defined in the Environmental Protection Act 1990, ref. 1.1, which was introduced by the Environment Act 1995, ref. 1.2, and retained in the Environment Act 2021, ref 1.3, as;

'Land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

> (a) significant harm is being caused or there is a significant possibility of such harm being caused; or
> (b) pollution of controlled waters is being, or is likely to be, caused.'

The UK guidance on the assessment of contaminated land has developed as a direct result of the introduction of these Acts. The technical guidance supporting the original legislation was summarised in a number of key documents collectively known as the Contaminated Land Reports (CLRs). These have since been replaced or superseded by Land Contamination Risk Management (LCRM) 2021, ref 1.4 produced and administrated by the Environment Agency online through the .GOV.uk website https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm .

However, the basic definitions, methodology and guidance remain essentially the same utilizing the UK Contaminated Land Exposure Assessment Models (CLEA) as within the original CLR and planning guidance it replaces or supersedes.

In establishing whether a site fulfils the statutory definition of 'contaminated land' it remains necessary to identify, whether a pollutant linkage exists in respect of the land in question and whether the pollutant linkage:

- is resulting in significant harm being caused to the identified receptor in the pollutant linkage,
- presents a significant possibility of significant harm being caused to that receptor,
- is resulting in the pollution of the controlled waters which constitute the receptor, or
- is likely to result in such pollution.

A 'pollutant linkage' may therefore be defined as the confirmation of a link between a contaminant 'source' and a vulnerable at risk 'receptor' by means of a 'pathway' and that the risk is potentially significant. If there is no complete linkage, risk defaults to low to negligible and can never be potentially significant.

Assessment Methodology

A four-stage assessment process is followed for identifying potential pollutant linkages on a site. These stages are summarised in the table below:

No.	Process	Description
1	Hazard Identification	Establishing contaminant sources, pathways and receptors (the conceptual model).
2	Hazard Assessment	Analysing the potential for unacceptable risks (what linkages could be present, what could be the effects).
3	Risk Estimation	Trying to establish the magnitude and probability of the possible consequences (what degree of harm might result and to what receptors, and how likely is it).
4	Risk Evaluation	Deciding whether the risk is unacceptable in the context of existing and future proposals.

Stages 1 and 2 develop an initial *'conceptual model'* based upon information collated from desk-based available and existing site information and a walkover of the site as recommended in BS10175 and LCRM. The formation of any conceptual model is an iterative process and as such it should be updated and refined throughout each phase of the project to reflect any additional information obtained and unknowns being resolved and identify the potential contaminants of concern at the site, i.e. those with the potential to cause significant harm to identified receptors.

The extent of the desk studies and enquiries to be conducted should be in general accordance with BS10175 and other UK guidance to produce an initial conceptual model highlighting the known potential risks, remaining unknowns and contaminants of concern. The information from these enquiries is presented in a desk study or preliminary report with recommendations, if necessary, for further work based upon the conceptual model findings and any identified or unresolved unknowns.

If potential pollutant linkages or potentially significant unknowns are identified within the initial conceptual model, further site investigation and report will be recommended and usually required under planning. Such investigation should be based on and driven by the findings of the initial conceptual model and planned in general accordance with BS10175, LCRM and other current UK guidance where relevant. The number of exploratory holes and samples collected for analysis should be consistent with the size, extent and nature of the site, the identified contaminants of concern and the level of initial risk identified in the initial conceptual model. This will enable a contamination risk assessment to be conducted in accordance with current UK requirements, at which point the conceptual model can be updated and any relevant pollutant linkages can be further quantified and any remaining unknowns resolved. As previously this is an iterative process that may highlight or require additional investigation to resolve to the satisfaction of the regulator.

A two-stage investigation process may therefore be more appropriate where time constraints are less of an issue with the first intrusive investigation being conducted as an initial or screening assessment to confirm or validate the presence of potential sources on site identified in the initial conceptual model and to investigate if additional unknown sources not previously identified are present. This helps to define the scope, extent and requirements of a second more refined and targeted investigation to delineate wherever possible the extent of the identified contamination, contaminants of concern and/or remaining unknowns.

All site works should be undertaken in general accordance with the British Standards BS 10175, ref. 5, for environmental only investigations and BS 5930:2015, ref. 1.6, in the case of combined Geoenvironmental and/or Geotechnical investigations.

The results of analysis are compared initially against generic guidance values which are dependent on the proposed end-use of the development and which must ultimately be based on traceable, scientifically valid and justified exposure and chemical data using the UKCLEA methodology.

The end-use and therefore potential exposure pathways may be defined as one of the following under current UK guidance;

- Residential with homegrown produce i.e. typical low rise and low-density housing with gardens where vegetables and fruits may be grown for home consumption.
- Residential without homegrown produce i.e. low-density housing where no gardens are present where vegetables and fruits could be grown for home consumption.
- Allotments – i.e. areas where vegetables and fruits are grown for home consumption but are not specifically associated with a residential property.
- Public open space residential – i.e. grassed areas adjacent and/or directly related to high density housing and other common or communal open areas on which underlying soils could be exposed but on which vegetables and fruits are not grown for consumption.
- Public open space – i.e. areas such as parks, playing fields and other recreational areas to which public access is possible but otherwise to which there is no direct residential linkage.
- Commercial – i.e. industrial premises where there is limited exposure to soil and residents are not present on site.

Standard Land-use Scenarios

The standard land-use scenarios used to develop exposure models are further detailed in the following sections:

Residential with homegrown produce

Generic scenario assumes a house built on a ground bearing slab with a private garden having a lawn, flowerbeds and a small fruit and vegetable patch.

- Critical receptor is assumed to be a young female child (zero to six years old)
- Exposure pathways include direct soil and indoor dust ingestion, consumption of home-grown produce and any adhering soil, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.

A sub-set of the Residential land-use is **Residential without Homegrown produce**. The generic scenario assumes low density housing with communal landscaped gardens where the consumption of homegrown vegetables will not occur and the pathways of direct ingestion and produce inputs are suitably moderated.

Allotments

Areas of open space commonly made available to local users but remote from residential properties, but on which tenants may grow fruit and vegetables for their own consumption. Typically, there are a number of plots to a site which may have a total area of up to 1 hectare. The tenants are assumed to be adults and that young children make only occasional accompanied visits.

Although some allotment holders may choose to keep animals on allotments, potential exposure to animal products is not currently considered within the CLEA model.

- Critical receptor is a young female child (zero to six years old)
- Exposure pathways include direct soil ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and inhalation of outdoor dust and vapours but at reduced exposure levels reflecting non-residential status.

Commercial

This generic scenario assumes a typical commercial or light industrial property at which employees spend most time indoors and are involved in office-based or relatively light physical work.

- Critical receptor is a working female adult (aged 16 to 65 years old).
- Exposure duration is over working lifetime
- Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts and inhalation of dust and vapours but exposure reduced to reflect non-residential nature and general lack of open spaces.

Public Open Space within Residential Area

This generic scenario refers to any grassed area up to 0.05 ha that is associated with residential properties but is not for their exclusive use and on which no fruit or vegetables are grown for home consumption.

- Grassed area of up to 0.05 ha and a considerable proportion of this (up to 50%) may be bare soil which can be interacted with directly
- Predominantly used by children for play and/or access
- Sufficiently close proximity to home for tracking back of soil to occur, thus indoor exposure pathways apply

- older children chosen as the critical receptor on basis that they will use site most frequently (age class 4-9 years)
- ingestion rate assumed to be 75 mg.day^{-1}

Public Open Space Park

This generic scenario refers to any public park or grassed space that is more than 0.5ha in area:

- Public park (>0.5 ha), predominantly grassed and may also contain children's play equipment and border areas of soil containing flowers or shrubs (75% assumed cover)
- Female child age classes 1-6
- Soil ingestion rate of 50 mg.day^{-1}
- Occupancy period outdoors = 2 hours.day^{-1}
- Exposure frequency of 170 days.year-1 for age classes 2-18 and 85
- days.year^{-1} for age class 1
- Outdoor exposure pathways only (no tracking back of soils).

Human Health Generic Quantitative Risk Assessment (GQRA) involves the comparison of contaminant concentrations measured in soil at the site with Generic Assessment Criteria (GAC) generated using the CLEA model based on the exposure and land use scenario assumptions noted above.

GAC's are deliberately conservative values adopted to ensure that they are applicable to the majority of possible contaminated sites and below which there is considered a low to negligible risk to identified human health receptors, i.e. there can be no harm. These values may be published Contaminated Land Exposure Assessment Model (CLEA) derived GAC's derived by a competent third party or the Environment Agency / DEFRA. It is imperative to the risk assessor to understand the uncertainties and limitations associated with these GAC's to ensure that they are used appropriately.

Where the adoption of a GAC is not appropriate, for instance when the intended land-use is at variance the CLEA standard land-uses or the contaminant is susceptible to wide variation depending on factors such as form and bioavailability, then a Detailed Quantitative Risk Assessment (DQRA) may be undertaken to develop site specific or remediation values for relevant soil contaminants based on site and contaminant specific conditions.

In 2014, the publication of Category 4 Screening Levels (C4SL), refs 1.8 and 1.9, as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3) ref 1.7 used in the generation of SGVs. C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern. Where a C4SL has been published, Soils Limited has adopted them as GAC for these six substances.

For all other substances the soils will be compared to Suitable For Use Levels (S4ULs) published by LQM, ref. 1.10, which were developed for around 85 substances and are

intended to enable a screening assessment of the risks posed by soil quality on development sites. The updated LQM/CIEH GAC publication was developed to accommodate recent developments in the understanding of chemical, toxicological and routine exposure to soil-based contaminants.

Where no S4UL or C4SL is available, assessment criteria may be generated using the Contaminated Land Exposure Assessment (CLEA) Software Version 1.07, ref. 1.11, Toxicological and physico-chemical/fate and transport data used to generate the criteria has been derived from a hierarchy of data sources as follows:

1. Environment Agency or Department of Environment Food and Rural Affairs (DEFRA) documents;
2. Other documents produced by UK Government or state organisations;
3. European institution documents;
4. International organisation documents;
5. Foreign government institutions.

In the case of the majority of contaminants considered, the toxicological data has been drawn originally from the relevant CLR 9 TOX report, or updated toxicological data published by the Environment Agency (2009), where available. Where no TOX report is available reference has been made to appropriately determined health criteria values, derived from the above-noted hierarchy, as this is considered to represent appropriate peer reviewed data sources. Similarly, fate and transport data should also be determined by reference to appropriate sources and the CLEA model assumptions.

Chemical laboratory test results are processed as follows. A statistical analysis of the results is conducted, as detailed in CIEH and CL:AIRE ‘Guidance on Comparing Soil Contamination Data with a Critical Concentration’, ref. 1.12. Individual concentrations are then compared to the selected guideline values to identify and isolate concentrations of contaminants that are in excess of the selected screening low or no risk criteria.

Where the risk estimation identifies significant concentrations of one or more contaminants, further risk evaluation needs to be undertaken often as a site specific DQRA in line with current guidance to determine and confirm if the identified exceedances are significant in the context of the proposed development or activity.

References

1.1 The Environmental Protection Act, Part IIA, Section 78, DoE 1990.

1.2 Environment Act 1995, Section 57, DoE 1995.

1.3 Environment Act 2021 OEP 2021.

1.4 Land Contamination Risk Management Gov.UK (EA) 2021

1.5 BS 10175: 2011+A2:2017 '*Investigation of potentially contaminated sites. Code of practice*', British Standards Institute, 2017

1.6 BS 5930: 2015+A1:2020 '*Code of practice for ground investigations*', British Standards Institute, 2015

1.7 Science Report SC050021/SR3 '*Updated technical background to the CLEA model*', Environment Agency, 2008

1.8 DEFRA SP1010: Development of Category 4 Screening Levels for the Assessment of Land Affected by Contamination, published March 2014.

1.9 Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010.

1.10 The LQM/S4ULs for Human Health Risk Assessment, Nathanail P, McCaffery C, Gillett A, Ogden R, and Nathanail J, Land Quality Press, Nottingham, published 2015.

1.11 CLEA '*Software Version 1.071*' (downloaded from the CL:AIRE website , https://www.claire.co.uk/home/news/44-risk-assessment/178-soil-guideline-values)

1.12 CIEH '*Guidance on Comparing Soil Contamination Data with a Critical Concentration*', Chartered Institute of Environmental Health (CIEH) and Contaminated Land: Applications in Real Environments (CL:AIRE), May 2008.

Land Use				Residential With or Without Plant Uptake							Allotments			Commercial			Public Open Space (POS)								
				With home-grown produce				Without home-grown produce									Residential			Park					
				SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	Name	Authority	Date
Type	Contaminants	Species	Year																						
	Antimony		2010						550							7500							EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Arsenic		2014			37			40		49			640			79			168			C4SL	DEFRA	2014
			2015			37			40		40			640			79			170			S4UL	LQM/CIEH	2015
	Barium		2010						1300					22000									EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Beryllium		2015			1.7			1.7		35			12			2.2			63			S4UL	LQM/CIEH	2015
	Boron		2015			290			11000		45			240000			21000			46000			S4UL	LQM/CIEH	2015
	Cadmium		2015			11			85		1.9			190			120			532			S4UL	LQM/CIEH	2015
			2014			26			149		4.9			410			220			880			C4SL	DEFRA	2014
	Chromium	III	2015			910			910		18000			8600			1500			33000			S4UL	LQM/CIEH	2015
		VI	2014			21			21		170			49			23			250			C4SL	DEFRA	2014
		VI	2015			6			6		1.8			33			7.7			220			S4UL	LQM/CIEH	2015
	Copper		2015			2400			7100		520			68000			12000			44000			S4UL	LQM/CIEH	2015
	Lead		2014*			82-210			130-310		30-84			1100-6000			270-760			580-1400			C4SL	DEFRA	2014
Metals	Mercury	Elemental	2012			1.0			1.0		26			26									210	DEFRA	2012
			2015			1.2			1.2		21			*58*			16			*30*			S4UL	LQM/CIEH	2015
		Inorganic	2012			170			170		80			36000									SGV	DEFRA	2012
			2015			40			56		19			1100			120			240			S4UL	LQM/CIEH	2015
		Methyl	2012			11			11		8			410									SGV	DEFRA	2012
			2015			11			15		6			320			40			68			S4UL	LQM/CIEH	2015
	Molybdenum		2010						670					17000									EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010
	Nickel		2012			130			130		230			1800									SGV	DEFRA	2012
			2015			130			180		53			980			230			800			S4UL	LQM/CIEH	2015
	Selenium		2012			350			595		120			13000									SGV	DEFRA	2012
			2015			250			430		88			12000			1100			1800			S4UL	LQM/CIEH	2015
	Vanadium		2015			410			1200		91			9000			2000			5000			S4UL	LQM/CIEH	2015
	Zinc		2015			3700			40000		620			730000			81000			170000			S4UL	LQM/CIEH	2015
	Benzene		2012			0.33			0.33		0.07			95									SGV	DEFRA	2012
			2014			0.87			3.3		0.18			98			140			230			C4SL	DEFRA	2014
			2015	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	S4UL	LQM/CIEH	2015
	Toluene		2012			610			610		120			4400									SGV	DEFRA	2012
			2015	130	290	660	*880*	1900	3900	22	51	120	*56000*	*110000*	*180000*	56000	56000	56000	*87000*	*95000*	*100000*	S4UL	LQM/CIEH	2015
	Ethylbenzene		2012			350			350		90			2800									SGV	DEFRA	2012
			2015	47	110	260	83	190	440	16	39	91	*5700*	*13000*	*27000*	24000	24000	25000	*17000*	*22000*	*27000*	S4UL	LQM/CIEH	2015
BTEX & MTBE	Xylenes	o-xylene	2012			250			250		160			2600									SGV	DEFRA	2012
			2015	60	140	330	88	210	480	28	67	160	*6600*	*15000*	*33000*	41000	42000	43000	*17000*	*24000*	*33000*	S4UL	LQM/CIEH	2015
		m-xylene	2012			240			240		180			3500									SGV	DEFRA	2012
			2015	59	140	320	82	190	450	31	74	170	*6200*	*14000*	*31000*	41000	42000	43000	*17000*	*24000*	*32000*	S4UL	LQM/CIEH	2015
		p-xylene	2012			230			230		160			3200									SGV	DEFRA	2012
			2015	56	130	310	79	180	430	29	69	160	*5900*	*14000*	*30000*	41000	42000	43000	*17000*	*23000*	*31000*	S4UL	LQM/CIEH	2015
Petroleum Hydrocarbons Fractions	Aliphatic >C5 - C6		2015	42	78	160	42	78	160	730	1700	3900	*3200*	*5900*	*12000*	*570000*	590000	600000	*95000*	*5900*	*12000*	S4UL	LQM/CIEH	2015
	Aliphatic >C6 - C8		2015	100	230	530	100	230	530	2300	5600	13000	*7800*	*17000*	*40000*	600000	610000	620000	*150000*	*17000*	*40000*	S4UL	LQM/CIEH	2015
	Aliphatic >C8 - C10		2015	27	65	150	27	65	150	320	770	1700	*2000*	*4800*	*11000*	13000	13000	13000	*14000*	*4800*	*11000*	S4UL	LQM/CIEH	2015
	Aliphatic >C10 - C12		2015	*130*	*330*	*760*	*130*	*330*	*770*	2200	4400	7300	*9700*	*23000*	*47000*	13000	13000	13000	*21000*	*23000*	*47000*	S4UL	LQM/CIEH	2015
	Aliphatic >C12 - C16		2015	*1100*	*2400*	*4300*	*1100*	*2400*	*4400*	11000	13000	13000	*59000*	*82000*	*90000*	13000	13000	13000	*25000*	*82000*	*90000*	S4UL	LQM/CIEH	2015
	Aliphatic >C16 - C35		2015	*65000*	*92000*	*110000*	*65000*	*92000*	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	170000	180000	S4UL	LQM/CIEH	2015
	Aliphatic >C35 - C44		2015	*65000*	*92000*	*140000*	*65000*	*92000*	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	170000	180000	S4UL	LQM/CIEH	2015
	Aromatic >C5 - C7		2015	70	140	300	370	690	1400	13	27	57	*26000*	*46000*	*86000*	56000	56000	56000	*76000*	*84000*	*92000*	S4UL	LQM/CIEH	2015
	Aromatic >C7 - C8		2015	130	290	660	860	1800	3900	22	51	120	*56000*	*110000*	*180000*	56000	56000	56000	*87000*	*95000*	*100000*	S4UL	LQM/CIEH	2015

Land Use			Residential With or Without Plant Uptake									Allotments			Commercial			Public Open Space (POS)								
			With home-grown produce			Without home-grown produce												Residential			Park					
		SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	Name	Authority	Date
Type	Contaminants Species	Year																					
	Aromatic >C8 - C10	2015	34	83	190	47	110	270	8.6	21	51	*3500*	*8100*	*17000*	5000	5000	5000	*7200*	*8500*	*9200*	S4UL	LQM/CIEH	2015
	Aromatic >C10 - C12	2015	74	180	380	250	590	1200	13	31	74	*16000*	*28000*	*34000*	5000	5000	5000	*9200*	*9700*	*10000*	S4UL	LQM/CIEH	2015
	Aromatic >C12 - C16	2015	140	330	660	1800	2300	2500	23	57	130	*36000*	*37000*	*38000*	5100	5100	5000	10000	10000	10000	S4UL	LQM/CIEH	2015
	Aromatic >C16 - C21	2015	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	S4UL	LQM/CIEH	2015
	Aromatic >C21 - C35	2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aromatic >C34 - C44	2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aliphatic + Aromatic >C44 - C70		1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	28000	28000	7800	7800	7900	S4UL	LQM/CIEH	2015
Polycyclic Aromatic Hydrocarbons (PAH's) (mg/kg)	Acenaphthene	2015	210	510	1100	*3000*	*4700*	*6000*	34	85	200	*84000*	*97000*	100000	15000	15000	15000	29000	29000	29000	S4UL	LQM/CIEH	2015
	Acenaphthylene	2015	170	420	920	*2900*	*4600*	*6000*	28	69	160	*83000*	*97000*	100000	15000	15000	15000	29000	29000	29000	S4UL	LQM/CIEH	2015
	Anthracene	2015	2400	5400	11000	*31000*	*35000*	*37000*	380	950	2200	520000	54000	540000	74000	74000	74000	150000	150000	150000	S4UL	LQM/CIEH	2015
	Benzo(a)anthracene	2015	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	S4UL	LQM/CIEH	2015
	Benzo(a)pyrene	2014			5			5.3			5.7			76			10			21	C4SL	DEFRA	2014
		2015	2.2	2.7	3	3.2	3.2	3.2	0.79	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	S4UL	LQM/CIEH	2015
	Benzo(b)fluoranthene	2015	2.6	3.3	3.7	3.9	4.0	4.0	0.99	2.1	3.9	44	44	45	7.1	7.2	7.2	13	15	16	S4UL	LQM/CIEH	2015
	Benzo(ghi)perylene	2015	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	S4UL	LQM/CIEH	2015
	Benzo(k)fluoranthene	2015	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	S4UL	LQM/CIEH	2015
	Chrysene	2015	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	S4UL	LQM/CIEH	2015
	Dibenz(a,h)anthracene	2015	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	S4UL	LQM/CIEH	2015
	Fluoranthene	2015	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400	S4UL	LQM/CIEH	2015
	Fluorene	2015	170	400	860	*2800*	*3800*	*4500*	27	67	160	63000	68000	71000	9900	9900	9900	20000	20000	20000	S4UL	LQM/CIEH	2015
	Indeno(1,2,3-cd)pyrene	2015	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	S4UL	LQM/CIEH	2015
	Naphthalene	2015	2.3	5.6	13	2.3	5.6	13	4.1	10	24	*190*	*460*	*1100*	4900	4900	4900	*1200*	*1900*	*3000*	S4UL	LQM/CIEH	2015
	Phenanthrene	2015	95	220	440	*1300*	*1500*	*1500*	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	S4UL	LQM/CIEH	2015
	Pyrene	2015	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	S4UL	LQM/CIEH	2015
	Coal Tar (Bap as surrogate matter)	2015	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	S4UL	LQM/CIEH	2015
Chloroalkanes & alkenes	1,2 Dichloroethane	2015	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	S4UL	LQM/CIEH	2015
	1,1,1 Trichloroethane	2015	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	*140000*	*57000*	*76000*	*100000*	S4UL	LQM/CIEH	2015
	1,1,2,2 Tetrachloroethane	2015	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	S4UL	LQM/CIEH	2015
	1,1,1,2 Tetrachloroethane	2015	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	110	250	560	1400	1400	1400	1500	1800	2100	S4UL	LQM/CIEH	2015
	Tetrachloroethene (PCE)	2015	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	42	95	1400	1400	1400	*810*	*1100*	1500	S4UL	LQM/CIEH	2015
		2021	0.31	0.7	1.6	0.32	0.71	1.6	2	4.8	11	24	55	130	3200	3300	3400	1400	1900	2500	C4SL	CLAIRE	2021
	Tetrachloromethane (Carbon Tetrachloride)	2015	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	S4UL	LQM/CIEH	2015
	Trichloroethene (TCE)	2015	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	S4UL	LQM/CIEH	2015
		2021	0.0093	0.02	0.043	0.0097	0.02	0.045	0.032	0.072	0.16	0.73	1.5	3.4	76	78	79	41	54	69	C4SL	CLAIRE	2021
	Trichloromethane (Chloroform)	2015	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	S4UL	LQM/CIEH	2015
	Vinyl Chloride (Cloroethene)	2015	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	S4UL	LQM/CIEH	2015
		2021	0.0064	0.01	0.017	0.015	0.019	0.029	0.0017	0.0031	0.0058	1.1	1.4	2.2	7.8	7.8	7.8	18	19	19	C4SL	CLAIRE	2021
Explosives	2,4,6 Trinitrotoluene	2015	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	S4UL	LQM/CIEH	2015
	RDX (Hexogen/Cyclonite/1,3,5-trinitro-1,3,5-triazacyclohexane)	2015	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000	51000	53000	S4UL	LQM/CIEH	2015
	HMX (Octogen/1,3,5,7-tetrenitro-1,3,5,7-tetrazacyclo-octane)	2015	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	*23000*	*23000*	*24000*	S4UL	LQM/CIEH	2015
Pesticides	Aldrin	2015	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	S4UL	LQM/CIEH	2015
	Dieldrin	2015	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170	170	170	18	18	18	30	30	31	S4UL	LQM/CIEH	2015
	Atrazine	2015	3.3	7.6	17.4	610	620	620	0.5	1.2	2.7	9300	9400	9400	1200	1200	1200	2300	2400	2400	S4UL	LQM/CIEH	2015
	Dichlorvos	2015	0.032	0.066	0.14	6.4	6.5	6.6	0.0049	0.01	0.022	140	140	140	16	16	16	26	26	27	S4UL	LQM/CIEH	2015
	Alpha - Endosulfan	2015	7.4	18	41	*160*	*280*	*410*	1.2	2.9	6.8	*5600*	*7400*	*8400*	1200	1200	1200	2400	2400	2500	S4UL	LQM/CIEH	2015
	Beta - Endosulfan	2015	7	17	39	*190*	*320*	*440*	1.1	2.7	6.4	*6300*	*7800*	*8700*	1200	1200	1200	2400	2400	2500	S4UL	LQM/CIEH	2015
	Alpha -Hexachlorocyclohexanes	2015	0.23	0.55	1.2	6.9	9.2	11	0.035	0.087	0.21	170	180	180	24	24	24	47	48	48	S4UL	LQM/CIEH	2015
	Beta -Hexachlorocyclohexanes	2015	0.085	0.2	0.46	3.7	3.8	3.8	0.013	0.032	0.077	65	65	65	8.1	8.1	8.1	15	15	16	S4UL	LQM/CIEH	2015
	Gamma -Hexachlorocyclohexanes	2015	0.06	0.14	0.33	2.9	3.3	3.5	0.0092	0.023	0.054	67	69	70	8.2	8.2	8.2	14	15	15	S4UL	LQM/CIEH	2015

Land Use			Residential With or Without Plant Uptake							Allotments			Commercial			Public Open Space (POS)								
			With home-grown produce			Without home-grown produce										Residential			Park					
		SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	Name	Authority	Date
Type	**Contaminants**	**Species**	**Year**																					
Chlorobenzenes	**Chlorobenzene**		**2015**	**0.46**	**1**	**2.4**	**0.46**	**1**	**2.4**	**5.9**	**14**	**32**	**56**	**130**	**290**	**11000**	**13000**	**14000**	***1300***	***2000***	***2900***	**S4UL**	**LQM/CIEH**	**2015**
	1,2-Dichlorobenzene		**2015**	**23**	**55**	**130**	**24**	**57**	**130**	**94**	**230**	**540**	***2000***	***4800***	***11000***	**90000**	**95000**	**98000**	***24000***	***36000***	***51000***	**S4UL**	**LQM/CIEH**	**2015**
	1,3-Dichlorobenzene		**2015**	**0.4**	**1**	**2.3**	**0.44**	**1.1**	**2.5**	**0.25**	**0.6**	**1.5**	**30**	**73**	**170**	**300**	**300**	**300**	**390**	**440**	**470**	**S4UL**	**LQM/CIEH**	**2015**
	1,4-Dichlorobenzene		**2015**	**61**	**150**	**350**	**61**	**150**	**350**	**15**	**37**	**88**	***4400***	***10000***	***25000***	**17000**	**17000**	**1700**	***36000***	***36000***	***36000***	**S4UL**	**LQM/CIEH**	**2015**
	1,2,3,-Trichlorobenzene		**2015**	**1.5**	**3.6**	**8.6**	**1.5**	**3.7**	**8.8**	**4.7**	**12**	**28**	**102**	**250**	**590**	**1800**	**1800**	**1800**	***770***	***1100***	***1600***	**S4UL**	**LQM/CIEH**	**2015**
	1,2,4,-Trichlorobenzene		**2015**	**2.6**	**6.4**	**15**	**2.6**	**6.4**	**15**	**55**	**140**	**320**	**220**	**530**	**1300**	**15000**	**17000**	**19000**	***1700***	***2600***	***4000***	**S4UL**	**LQM/CIEH**	**2015**
	1,3,5,-Trichlorobenzene		**2015**	**0.33**	**0.81**	**1.9**	**0.33**	**0.81**	**1.9**	**4.7**	**12**	**28**	**23**	**55**	**130**	**1700**	**1700**	**1800**	***380***	***580***	***860***	**S4UL**	**LQM/CIEH**	**2015**
	1,2,3,4,-Tetrachlorobenzene		**2015**	**15**	**36**	**78**	**24**	**56**	**120**	**4.4**	**11**	**26**	**1700**	**3080**	**4400**	**830**	**830**	**830**	***1500***	***1600***	***1600***	**S4UL**	**LQM/CIEH**	**2015**
	1,2,3,5,- Tetrachlobenzene		**2015**	**0.66**	**1.6**	**3.7**	**0.75**	**1.9**	**4.3**	**0.38**	**0.9**	**2.2**	***49***	***120***	***240***	**78**	**79**	**79**	***110***	***120***	***130***	**S4UL**	**LQM/CIEH**	**2015**
	1,2,4, 5,- Tetrachlobenzene		**2015**	**0.33**	**0.77**	**1.6**	**0.73**	**1.7**	**3.5**	**0.06**	**0.16**	**0.37**	***42***	***72***	***96***	**13**	**13**	**13**	**25**	**26**	**26**	**S4UL**	**LQM/CIEH**	**2015**
	Pentachlrobenzene		**2015**	**5.8**	**12**	**22**	**19**	**30**	**38**	**1.2**	**3.1**	**7**	***640***	***770***	***830***	**100**	**100**	**100**	**190**	**190**	**190**	**S4UL**	**LQM/CIEH**	**2015**
	Hexachlorobenzene		**2015**	***1.8***	***3.3***	**4.9**	***4.1***	***5.7***	***6.7***	**0.47**	**1.1**	**2.5**	***110***	**120**	**120**	**16**	**16**	**16**	**30**	**30**	**30**	**S4UL**	**LQM/CIEH**	**2015**
Phenols & Chlorophenols																								
	Phenols		**2012**			**420**			**420**			**280**			***3200***								**SGV**	**DEFRA**	**2012**
			2015	120	200	380	440	690	1200	23	42	83	*440*	*690*	*1300*	*440*	*690*	*1300*	*440*	*690*	*1300*	S4UL	LQM/CIEH	2015
	Chlorophenols (4 Congeners)		**2015**	**0.87**	**2**	**4.5**	**94**	**150**	**210**	**0.13**	**0.3**	**0.7**	**3500**	**4000**	**4300**	**620**	**620**	**620**	**1100**	**1100**	**1100**	**S4UL**	**LQM/CIEH**	**2015**
	Pentachlorophenols		**2015**	**0.22**	**0.52**	**1.2**	***27***	**29**	**31**	**0.03**	**0.08**	**0.19**	**400**	**400**	**400**	**60**	**60**	**60**	**110**	**120**	**120**	**S4UL**	**LQM/CIEH**	**2015**
Others																								
	Carbon Disulphide		**2015**	**0.14**	**0.29**	**0.62**	**0.14**	**0.29**	**0.62**	**4.8**	**10**	**23**	**11**	**22**	**47**	**11000**	**11000**	**12000**	**1300**	**1900**	**2700**	**S4UL**	**LQM/CIEH**	**2015**
	Hexachloro-1,3-Butadiene		**2015**	**0.29**	**0.7**	**1.6**	**0.32**	**0.78**	**1.8**	**0.25**	**0.61**	**1.4**	**31**	**66**	**120**	**25**	**25**	**25**	**48**	**50**	**51**	**S4UL**	**LQM/CIEH**	**2015**
	Sum of PCDDs, PCDFs and dioxin-like PCB's.		**2012**			**8**			**8**			**8**			**240**							**SGV**	**DEFRA**	**2012**

NOTE

Priority	Guideline (mg kg^{-1})
1	Site Specific Assessment Criteria (SSAC) (Soils Limited)
2	2014: Category 4 Screening Level (C4SL) (Contaminated Land: Application in Real Environment (CL:ARE), 2014 and 2021) * Use upper range value for Lead unless otherwise indicated
3	2012: Soil Guideline Value (SGV) (Environment Agency, 2009)
4	2015: Suitable 4 Use Level (S4UL) (Nathanail *et al*, 2015)

For Generic Risk Assessment, the values in Bold should have priority unless site specific, Client or regulatory requirements dictate otherwise – which must be justified

Table reviewed January 2024

Appendix G HazWasteOnline Report

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.

G9VOG-9W7GN-N2I3B

Report is invalid if pages are removed.

Job name

21876

Description/Comments

Project

21876(1)

Site

Kings Copse Avenue, Hedge End, SO30 2SZ

Classified by

Name:
Margaret Lo
Date:
30 May 2025 13:53 GMT
Telephone:
07467803676

Company:
Soils Ltd
Pool Innovation Centre
Redruth
Cornwall
TR15 3PL

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	06 Apr 2023

Next 3 year Refresher due by Apr 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Kings Copse Avenue, Hedge End, **Post Code** SO30 2SZ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Residential development

Description of the specific process, sub-process and/or activity that created the waste

Residential development

Description of the waste

Residential development

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1 774308/0.30/2025-04-22		Non Hazardous		3
2	WS3 774309/0.10/2025-04-22		Non Hazardous		5
3	WS4 774310/0.50/2025-04-22		Non Hazardous		7
4	WS8 774311/0.60/2025-04-22		Non Hazardous		9
5	TP1 774312/0.30/2025-04-22		Non Hazardous		11
6	TP2 774313/0.90/2025-04-22		Non Hazardous		13

Related documents

#	Name	Description
1	25-09347.hwol	DETS North .hwol file used to populate the Job
2	Soils Suite 2 2025	waste stream template used to create this Job

Report

Created by: Margaret Lo

Created date: 30 May 2025 13:53 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: WS1 774308/0.30/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS1 774308/0.30/2025-04-22
Moisture content:
9.7%
(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: 9.7% 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		4.1 mg/kg	1.32	4.888 mg/kg	0.000489 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.2 mg/kg	3.22	0.582 mg/kg	0.0000582 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.1 mg/kg	1.142	0.103 mg/kg	0.0000103 %	✓	
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7.9 mg/kg	1.462	10.426 mg/kg	0.00104 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9.1 mg/kg	1.126	9.252 mg/kg	0.000925 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	14 mg/kg	1.56	19.719 mg/kg	0.00126 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		3.5 mg/kg	2.976	9.406 mg/kg	0.000941 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		14 mg/kg	1.785	22.568 mg/kg	0.00226 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		23 mg/kg	2.774	57.616 mg/kg	0.00576 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
14	pH			PH		8 pH		8 pH	8pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0127 %		

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: WS3 774309/0.10/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS3 774309/0.10/2025-04-22
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.6 mg/kg	1.32	7.581 mg/kg	0.000758 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.4 mg/kg	3.22	1.121 mg/kg	0.000112 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.1 mg/kg	1.142	0.0994 mg/kg	0.00000994 %	✓	
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	21.616 mg/kg	0.00216 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16 mg/kg	1.126	15.672 mg/kg	0.00157 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	36 mg/kg	1.56	48.853 mg/kg	0.00313 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		7.6 mg/kg	2.976	19.679 mg/kg	0.00197 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		30 mg/kg	1.785	46.593 mg/kg	0.00466 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		41 mg/kg	2.774	98.954 mg/kg	0.0099 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
14	pH			PH		9.5 pH		9.5 pH	9.5 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0243 %		

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: WS4 774310/0.50/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS4 774310/0.50/2025-04-22
Moisture content:
23%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	11.183 mg/kg	0.00112 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.5 mg/kg	3.22	1.24 mg/kg	0.000124 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2 mg/kg	1.142	0.176 mg/kg	0.0000176 %	✓	
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34 mg/kg	1.462	38.264 mg/kg	0.00383 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21 mg/kg	1.126	18.206 mg/kg	0.00182 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	41 mg/kg	1.56	49.243 mg/kg	0.00316 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.07 mg/kg	1.353	0.073 mg/kg	0.0000073 %	✓	
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12 mg/kg	2.976	27.501 mg/kg	0.00275 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		57 mg/kg	1.785	78.352 mg/kg	0.00784 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		74 mg/kg	2.774	158.071 mg/kg	0.0158 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
14	pH			PH		7.7 pH		7.7 pH	7.7 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<LOD
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0365 %		

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: WS8 774311/0.60/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS8 774311/0.60/2025-04-22
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10	mg/kg	1.32	10.563	mg/kg	0.00106 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.3	mg/kg	3.22	0.773	mg/kg	0.0000773 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34	mg/kg	1.462	39.754	mg/kg	0.00398 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9.9	mg/kg	1.126	8.917	mg/kg	0.000892 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	12	mg/kg	1.56	14.974	mg/kg	0.00096 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12	mg/kg	2.976	28.572	mg/kg	0.00286 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		52	mg/kg	1.785	74.264	mg/kg	0.00743 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		41	mg/kg	2.774	90.992	mg/kg	0.0091 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
14	pH			PH		8.3	pH		8.3	pH	8.3 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0263 %		

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: TP1 774312/0.30/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP1 774312/0.30/2025-04-22
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.8	mg/kg	1.32	10.869	mg/kg	0.00109 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.3	mg/kg	3.22	0.811	mg/kg	0.0000811 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1	mg/kg	1.142	<0.114	mg/kg	<0.0000114 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		28	mg/kg	1.462	34.376	mg/kg	0.00344 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1	mg/kg	2.27	<2.27	mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9.4	mg/kg	1.126	8.89	mg/kg	0.000889 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	10	mg/kg	1.56	13.102	mg/kg	0.00084 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05	mg/kg	1.353	<0.0677	mg/kg	<0.00000677 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		13	mg/kg	2.976	32.501	mg/kg	0.00325 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5	mg/kg	2.554	<1.277	mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		50	mg/kg	1.785	74.978	mg/kg	0.0075 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		39	mg/kg	2.774	90.881	mg/kg	0.00909 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10	mg/kg		<10	mg/kg	<0.001 %		<**LOD**
14	pH			PH		7.3	pH		7.3	pH	7.3 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0262 %		

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: TP2 774313/0.90/2025-04-22

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP2 774313/0.90/2025-04-22
Moisture content:
20%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.7 mg/kg	1.32	7.077 mg/kg	0.000708 %	✓	
2	boron { diboron trioxide }	005-008-00-8	215-125-8	1303-86-2		0.4 mg/kg	3.22	1.03 mg/kg	0.000103 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<**LOD**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27 mg/kg	1.462	31.57 mg/kg	0.00316 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1 mg/kg	2.27	<2.27 mg/kg	<0.000227 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		5.5 mg/kg	1.126	4.954 mg/kg	0.000495 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	7.3 mg/kg	1.56	9.109 mg/kg	0.000584 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.05 mg/kg	1.353	<0.0677 mg/kg	<0.00000677 %		<**LOD**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		4.5 mg/kg	2.976	10.715 mg/kg	0.00107 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<0.5 mg/kg	2.554	<1.277 mg/kg	<0.000128 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		40 mg/kg	1.785	57.126 mg/kg	0.00571 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		23 mg/kg	2.774	51.044 mg/kg	0.0051 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<**LOD**
14	pH			PH		7.1 pH		7.1 pH	7.1 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**LOD**
16	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<**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									
17		acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		benzo[a]pyrene; benzo[def]chrysene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
28		indeno[123-cd]pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-893-2	193-39-5									
29		dibenz[a,h]anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
30		benzo[ghi]perylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<0.3	mg/kg		<0.3	mg/kg	<0.00003 %		<**LOD**
				P1186									
32		polychlorobiphenyls; PCB				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**LOD**
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.0169 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

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

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Unknown Oil

Hazard statements taken from WM3 1st Edition 2015
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

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

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

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

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 (edit as required)

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 (edit as required)

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. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in Cr(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 (edit as required)

chromium in Cr(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case species (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.142.6646.12090 (22 May 2025)
HazWasteOnline Database: 2025.142.6646.12090 (22 May 2025)

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
GB MCL List v6.0 - version 6.0 of 15th February 2025

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.

ILX9V-RCHA0-0LURA

Report is invalid if pages are removed.

Job name

21876[2]

Description/Comments

Project

21876(2)

Site

Kings Copse Avenue, Hedge End, SO30 2SZ

Classified by

Name:
Margaret Lo
Date:
30 May 2025 13:55 GMT
Telephone:
07467803676

Company:
Soils Ltd
Pool Innovation Centre
Redruth
Cornwall
TR15 3PL

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	06 Apr 2023

Next 3 year Refresher due by Apr 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Kings Copse Avenue, Hedge End, **Post Code** SO30 2SZ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Residential development

Description of the specific process, sub-process and/or activity that created the waste

Residential development

Description of the waste

Residential development

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS1-0.10-22/04/2025	0.10	Non Hazardous		3
2	WS2-0.20-22/04/2025	0.20	Non Hazardous		5
3	WS3-0.50-22/04/2025	0.50	Non Hazardous		7
4	WS4-0.80-22/04/2025	0.80	Non Hazardous		9
5	WS5-0.10-22/04/2025	0.10	Non Hazardous		11
6	WS6-0.20-22/04/2025	0.20	Non Hazardous		13
7	WS7-0.50-22/04/2025	0.50	Non Hazardous		15
8	WS8-1.00-22/04/2025	1.00	Non Hazardous		17

Related documents

#	Name	Description
1	25-04477.1 (1).hwol	DETS South .hwol file used to populate the Job
2	Soils Suite 2 2025	waste stream template used to create this Job

Report

Created by: Margaret Lo

Created date: 30 May 2025 13:55 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	19
Appendix B: Rationale for selection of metal species	20
Appendix C: Version	21

Classification of sample: WS1-0.10-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS1-0.10-22/04/2025
Sample Depth:
0.10 m
Moisture content:
6.8%
(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: 6.8% 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		6 mg/kg	1.32	7.383 mg/kg	0.000738 %	✓	
2	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
3	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
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7 mg/kg	1.462	9.535 mg/kg	0.000954 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		6 mg/kg	1.126	6.296 mg/kg	0.00063 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	15 mg/kg	1.56	21.806 mg/kg	0.0014 %	✓	
8	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
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		<3 mg/kg	2.976	<8.929 mg/kg	<0.000893 %		<LOD
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<LOD
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		13 mg/kg	1.785	21.629 mg/kg	0.00216 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		20 mg/kg	2.774	51.71 mg/kg	0.00517 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6 mg/kg		<6 mg/kg	<0.0006 %		<LOD
14	pH			PH		6.8 pH		6.8 pH	6.8 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0111 %		

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: WS2-0.20-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS2-0.20-22/04/2025
Sample Depth:
0.20 m
Moisture content:
12.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.6% 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		8	mg/kg	1.32	9.232	mg/kg	0.000923 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13	mg/kg	1.462	16.606	mg/kg	0.00166 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	12.792	mg/kg	0.00128 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26	mg/kg	1.56	35.445	mg/kg	0.00227 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		6	mg/kg	2.976	15.608	mg/kg	0.00156 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		24	mg/kg	1.785	37.446	mg/kg	0.00374 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		28	mg/kg	2.774	67.889	mg/kg	0.00679 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		7.3	pH		7.3	pH	7.3 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0182 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3-0.50-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS3-0.50-22/04/2025
Sample Depth:
0.50 m
Moisture content:
18.1%
(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: 18.1% 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		10	mg/kg	1.32	10.813	mg/kg	0.00108 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29	mg/kg	1.462	34.713	mg/kg	0.00347 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		23	mg/kg	1.126	21.208	mg/kg	0.00212 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	21	mg/kg	1.56	26.827	mg/kg	0.00172 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18	mg/kg	2.976	43.876	mg/kg	0.00439 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		47	mg/kg	1.785	68.717	mg/kg	0.00687 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		50	mg/kg	2.774	113.601	mg/kg	0.0114 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		7.3	pH		7.3	pH	7.3 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.031 %		

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: WS4-0.80-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS4-0.80-22/04/2025
Sample Depth:
0.80 m
Moisture content:
19.5%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 19.5% 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		13	mg/kg	1.32	13.817	mg/kg	0.00138 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	25.884	mg/kg	0.00259 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	17.22	mg/kg	0.00172 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	12	mg/kg	1.56	15.068	mg/kg	0.000966 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16	mg/kg	2.976	38.334	mg/kg	0.00383 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		35	mg/kg	1.785	50.298	mg/kg	0.00503 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		39	mg/kg	2.774	87.094	mg/kg	0.00871 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		7.8	pH		7.8	pH	7.8 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0242 %		

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: WS5-0.10-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS5-0.10-22/04/2025
Sample Depth:
0.10 m
Moisture content:
12.2%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.2% 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		7	mg/kg	1.32	8.115	mg/kg	0.000811 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18	mg/kg	1.462	23.098	mg/kg	0.00231 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		10	mg/kg	1.126	9.885	mg/kg	0.000989 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16	mg/kg	1.56	21.912	mg/kg	0.0014 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		9	mg/kg	2.976	23.518	mg/kg	0.00235 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		34	mg/kg	1.785	53.291	mg/kg	0.00533 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		28	mg/kg	2.774	68.2	mg/kg	0.00682 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		7.1	pH		7.1	pH	7.1 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.02 %		

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: WS6-0.20-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS6-0.20-22/04/2025
Sample Depth:
0.20 m
Moisture content:
9.6%
(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: 9.6% 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		6	mg/kg	1.32	7.161	mg/kg	0.000716 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13	mg/kg	1.462	17.176	mg/kg	0.00172 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	16.285	mg/kg	0.00163 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17	mg/kg	1.56	23.971	mg/kg	0.00154 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		5	mg/kg	2.976	13.453	mg/kg	0.00135 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		25	mg/kg	1.785	40.345	mg/kg	0.00403 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		23	mg/kg	2.774	57.68	mg/kg	0.00577 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		6.6	pH		6.6	pH	6.6 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0167 %		

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: WS7-0.50-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS7-0.50-22/04/2025
Sample Depth:
0.50 m
Moisture content:
12.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.9% 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	5.75	mg/kg	0.000575 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11	mg/kg	1.462	14.003	mg/kg	0.0014 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9	mg/kg	1.126	8.826	mg/kg	0.000883 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	8	mg/kg	1.56	10.869	mg/kg	0.000697 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		4	mg/kg	2.976	10.369	mg/kg	0.00104 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		16	mg/kg	1.785	24.878	mg/kg	0.00249 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		17	mg/kg	2.774	41.077	mg/kg	0.00411 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		6.5	pH		6.5	pH	6.5 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0112 %		

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: WS8-1.00-22/04/2025

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS8-1.00-22/04/2025
Sample Depth:
1.00 m
Moisture content:
17.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 17.7% 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		11	mg/kg	1.32	11.953	mg/kg	0.0012 %	✓	
2	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**
3	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**
4	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	30.072	mg/kg	0.00301 %	✓	
5	chromium in Cr(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2	mg/kg	2.27	<4.54	mg/kg	<0.000454 %		<**LOD**
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	14.826	mg/kg	0.00148 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	10	mg/kg	1.56	12.837	mg/kg	0.000823 %	✓	
8	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**
9	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16	mg/kg	2.976	39.191	mg/kg	0.00392 %	✓	
10	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2	mg/kg	2.554	<5.108	mg/kg	<0.000511 %		<**LOD**
11	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		33	mg/kg	1.785	48.484	mg/kg	0.00485 %	✓	
12	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		41	mg/kg	2.774	93.608	mg/kg	0.00936 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<6	mg/kg		<6	mg/kg	<0.0006 %		<**LOD**
14	pH			PH		7.6	pH		7.6	pH	7.6 pH		
15	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-917-1	208-96-8									
17		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-469-6	83-32-9									
18		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-695-5	86-73-7									
19		phenanthrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			201-581-5	85-01-8									
20		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-371-1	120-12-7									
21		fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-912-4	206-44-0									
22		pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			204-927-3	129-00-0									
23		benzo[a]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
24		chrysene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
25		benzo[b]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
26		benzo[k]fluoranthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
27		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									
28		indeno[123-cd]pyrene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-893-2	193-39-5									
29		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									
30		benzo[ghi]perylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<**LOD**
			205-883-8	191-24-2									
31		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<**LOD**
				P1186									
										Total:	0.0246 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

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

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Unknown Oil

Hazard statements taken from WM3 1st Edition 2015
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

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

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 (edit as required)

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 (edit as required)

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. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in Cr(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 (edit as required)

chromium in Cr(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case species (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.142.6646.12090 (22 May 2025)
HazWasteOnline Database: 2025.142.6646.12090 (22 May 2025)

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
GB MCL List v6.0 - version 6.0 of 15th February 2025

Appendix H Information Provided by Client

North boundary elevation

East boundary elevation

West boundary elevation

South boundary elevation

A

B

C

D

E

F

Notes

1. This drawing is the copyright of MH Architects Ltd
2. Do not scale this drawing except for Local Authority planning purposes
3. All dimensions must be checked on site by the contractor prior to commencement of the works.

Client Approval

X	A - Approved
X	B - Approved with comments
X	C - Do not use

Rev.	Revision Note/Purpose of Issue	Drw By	Date	Chk By	Date
A	Issued for Information [First Issue]	MW	16.11.23	HJG	16.11.23

Schedule of accommodation

plot	type / Nbeds	total GIA / height	BBC name
1	4SBP	124.2 3q	UU
2	4SBP	124.7 3q	TF
3	2SBP	124.5 2q	WV
4	4SBP	124.7 3q	TF
5	4SBP	124.7 3q	UU
6	3SBP	124.7 2.5	NW/EB/LR/DR
7	2SBP	79.6 2q	BB
8	2SBP	79.6 2q	BB
9	4SBP	124.7 3q	UU
10	3SBP	124.7 2.5	NW
11	2SBP	79.6 2q	BB
12	2WB	79.6 2q	MM
13	4SBP	124.7 3q	TF
14	4SBP	124.7 3q	TF
15	2SBP	79.6 2q	BB
16	2SBP	79.6 2q	BB
17	3SBP	124.7 2.5	NW/EB/LR/DR
18	3SBP	124.7 2.5	NW
19	2SBP	79.6 2q	BB
20	2SBP	79.6 2q	BB
21	2WB	79.6 2q	MM
22	2WB	79.6 2q	MM
23	2SBP	79.6 2q	BB
24	2WB	79.6 2q	MM
25	2SBP	79.6 2q	BB
26	3SBP	100.5 2.5	OG
27	3SBP	100.5 2.5	OG
28	3SBP	96.6 2.5	UU
29	2WB	79.6 2q	MM
30	4SBP	124.7 3q	TF
31	4SBP	124.7 3q	TF
32	4SBP	124.7 3q	TF
33	4SBP	124.7 3q	TF
34	4SBP	124.7 3q	TF
35	2WB	79.6 2q	BB
36	2WB	79.6 2q	MM
37	3SBP	116 2.5	TF
38	3SBP	116 2.5	TF
39	2WB	79.6 2q	BB
40	3SBP	116 2.5	TF
41	3SBP	116 2.5	TF
42	2WB	79.6 2q	BB
43	3SBP	116 2.5	TF
44	3SBP	116 2.5	TF
45	2SBP	79.6 2q	BB
46	2WB	79.6 2q	MM
47	3SBP	116 2.5	TF
48	3SBP	137.7 2.5	NW/EB/LR/DR
49	3SBP	137.7 2.5	NW/EB/LR/DR
50	3SBP	137.7 2.5	NW
51	2WB	79.6 2q	BB
52	2SBP	79.6 2q	BB
53	2WB	79.6 2q	DD
54	2WB	79.6 2q	BB
55	3SBP	137.7 2.5	NW
56	3SBP	122.5 2.5	NW
57	3SBP	116 2.5	NW
58	3SBP	137.7 2.5	NW
59	2WB	79.6 2q	BB
60	2WB	79.6 2q	MM
61	2WB	79.6 2q	MM
62	2SBP	79.6 2q	BB
63	2SBP	79.6 2q	BB
64	2WB	79.6 2q	MM
65	3SBP	100.5 2.5	OG
66	3SBP	137.7 2.5	NW
67	2WB	79.6 2q	BB
68	2WB	79.6 2q	BB
69	2WB	79.6 2q	MM
70	3SBP	122.5 2.5	NW
71	3SBP	137.7 2.5	NW
72	3SBP	137.7 2.5	NW
73	4SBP	124.7 3q	TF
74	4SBP	124.7 3q	TF
75	4SBP	124.7 3q	TF
76	3SBP	100.5 2.5	OG
77	2WB	79.6 2q	MM
78	3SBP	116 2.5	TF
79	3SBP	116 2.5	TF
80	2WB	79.6 2q	BB
81	2WB	79.6 2q	MM
82	2WB	79.6 2q	BB
83	2WB	79.6 2q	BB
84	2WB	79.6 2q	BB
85	3SBP	100.5 2.5	OG
86	3SBP	137.7 2.5	NW
87	3SBP	137.7 2.5	NW
88	3SBP	137.7 2.5	NW
89	3SBP	137.7 2.5	NW
90	3SBP	137.7 2.5	NW
91	3SBP	137.7 2.5	NW
92	3SBP	137.7 2.5	NW
93	3SBP	137.7 2.5	NW
94	3SBP	137.7 2.5	NW
95	3SBP	137.7 2.5	NW
96	3SBP	137.7 2.5	NW
97	3SBP	137.7 2.5	NW
98	3SBP	137.7 2.5	NW
99	3SBP	137.7 2.5	NW

Schedule of accommodation

plot		type / Nbeds	total GIA / height	form
GD	GD		70.4	KF
G1	B1	1B2P	50.1	KF
G2	B2	2B3P	70.4	KF
G3	B3	2B4P	70.1	KF
G4	B4	1B2P	50.3	KF
G5	B5	2B4P	74.4	KF
G6	B6	2B4P	70.1	FF
G7	B7	2B4P	70.4	FF
G8	B8	1B2P	50.3	FF
G9	B9	1B2P	50.3	FF
C00	B10	2B4P	74.4	FF
C01	B11	2B4P	70.4	FF
C02	B12	1B2P	50.1	FF
C03	B13	2B4P	70.4	FF
C04	B14	2B4P	70.1	FF
C05	B15	1B2P	50.3	FF
C06	B16	2B4P	74.4	FF
C07	B17	2B4P	70.4	FF
C08	B18	2B4P	70.4	FF
C09	B19	2B4P	70.1	FF
C00	B20	1B2P	50.3	FF
C01	B21	2B4P	70.4	FF
FD	A0		50.0	KF
01	A1	1b2p	53.1	KF
02	A2	1b2p	50.0	KF
03	A3	1b2p	50.0	KF
04	A4	1b2p	50.3	KF
D5	A5	2b3p	70.4	KF
D5	A6	1b2p	50.1	KF
07	A7	1b2p	50.0	FF
D8	A8	1b2p	53.1	FF
D9	A9	1b2p	50.0	FF
D10	A10	1b2p	50.0	FF
D11	A11	1b2p	50.3	FF
D12	A12	2b4p	70.4	FF
D13	A13	2b4p	70.1	FF
D14	A14	1b2p	50.0	SF
D15	A15	1b2p	53.1	SF
D16	A16	1b2p	50.0	SF
D17	A17	1b2p	50.0	SF
D18	A18	1b2p	50.3	SF
D19	A19	2b4p	70.4	SF
D20	A20	1b2p	50.1	SF
D21	A21	2b4p	74.4	SF
D22	A22	2b4p	70.4	SF
D23	A23	2b4p	70.1	SF
D24	A24	2b4p	70.4	SF

N

Site Plan 1:500 @ A1

1:500

10 0 10 20 30 40 50m

10 0 10 20 30 40 50 60 70 80 90

Client

Eastleigh Borough Council

Job title

Kings Copse Avenue

Drawing title

Proposed Site Plan

Drawn	Date	Checked	Date	Scale at A1
JDM	JUNE 25	HJG	JUNE 25	1:500

Job No.	Pro.	Org.	Zone	Level	Type	Role	No.	Rev.
22-148	KCA	MHA	ZZ	XX	DR	A	0003	C01

Purpose of Issue

PLANNING

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ARCHITECTS

IDENTIFIES RISKS DURING THE CONSTRUCTION PROCESS ON THE DRAWINGS:

NOTE: The list below and notes on the drawing identify risks which are deemed to be unusual, abnormal, residual or unexpected to a competent contractor carrying out the works. These notes relate to risks which we have been unable to design out.

ises



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GENERAL NOTES

1. All setting out to be in accordance with the Architects drawings. Any discrepancies between the Engineers and the Architects drawings to be referred to the Architect before proceeding. Dimensions must not be scaled.
2. The existing suface has been created from 23295_F by Maptec Surveys. The proposed surface has been created from 22-148 0003 P04 by MH Architects
3. Construction depths used: Buildings 525mm under FFl 650mm under roads, 450mm under footpaths.
4. No bulking factor has been included in these calculations.
5. It is assumed that all material is suitable for re-use. The figures below identify a total cut or fill value and do not allow for any volume(s) of possible contamination that would need to be removed from site.
6. No allowance has been given for foundations, services or drainage.

Height Bands
- Fill 1.5m - 2m
- Fill 1m - 1.5m
- Fill 0.5m - 1m
- Fill 0m - 0.5m
- Cut 0m - 0.5m
- Cut 0.5m - 1m
- Cut 1m - 1.5m
- Cut 1.5m - 2m
- Cut 2m - 2.5m
- Cut 2.5m - 3m

Total Cut:	15,011.05m³
Total Fill:	4,684.02m³
Net cut:	10,327.03m³

WORK IN PROGRESS

Rev.	Amendment	Drn	Chkd	Date
P01	Initial issue	CJ	AS	23.07.24

Drg. Status **PRELIMINARY** Suitability **S2**

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☐ Hitchin
■ Oxford
☐ Southampton

Client **Eastleigh Borough Council**

Project **Kings Copse Close**

Title **Cut and Fill to Formation Level**

Reviewed Scheme	09.07.24	Date	AS
Reviewed Final		Date	
Scales at A1	1:500	Project No.	L241014

Project Ref.	Originator	Zone	Level	Type	Role	Drg No.	Rev.
AKSW	XX	XX	DR	C	9110		WIP