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GEOTECHNICAL ENVIRONMENTAL

WINVIC CONSTRUCTION LIMITED

MAYLANDS GATEWAY, HEMEL HEMPSTEAD, HERTFORDSHIRE

SUPPLEMENTARY GROUND INVESTIGATION REPORT

The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Tel: 01926 815678
Fax: 01926 815222
mail@crossfield-consulting.co.uk

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www.crossfield-consulting.co.uk

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1. INTRODUCTION

It is proposed to develop a site identified as 'Maylands Gateway', Hemel Hempstead, Hertfordshire, for commercial purposes. Currently, the site is vacant, but areas within the site have been previously used as a caravan park, stables, a tennis court and sport fields. It is understood that the proposed development comprises seven warehouse units together with associated access roads, service yards, car parking areas, an attenuation pond and areas of managed landscaping. Earthworks will be required at the site to enable construction.

RPS Group PLC has produced a Phase I Environmental Liability Review (February 2016) and a Phase II Geoenvironmental Site Investigation and Risk Assessment Report (April 2016) for the site. The Phase I Report contains desk study researches relevant to the site and a summary of the findings is presented in this report. The relevant factual data and laboratory tests results from the Phase II ground investigation are included within Appendix I of this report.

Crossfield Consulting Limited has been commissioned to undertake an investigation of the site to identify potential constraints to redevelopment relating to the ground conditions and including a risk-based environmental assessment and recommendations for remediation works, earthworks, retaining structures, foundations and road pavement design and general construction advice in the context of the above development proposals.

This report presents the information obtained from the desk study and ground investigations. Sections 2 to 5 of the report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007. The report also includes information required to form a Geotechnical Design Report as defined in BS EN 1997-1:2004.

A risk-based assessment of potential contamination is included in Section 7 of the report. This assessment makes reference to the desk study, ground investigation information and a Conceptual Site Model. It is considered that the report complies with National Planning Policy Framework and is in general accordance with guidance published by the Environment Agency.

It is considered that the report is suitable for submission in support of a planning application and the report is appropriate to assist in an appraisal of development solutions and costs, together with the preparation of engineering designs for the development. The report also complies with the published guidance relating to the requirements of a Building Control authority.

2. THE SITE

2.1 Location

The site is located within an area referred to as 'Maylands Gateway', approximately 2.7 km east of Hemel Hempstead town centre, as shown on Figure 1. The National Grid Reference for the site is TL 0835 0770. As shown on Figure 2, the site is bound by Breakspears Way to the south, Buncefield Lane to the east, Wood Lane End along with residential properties to the north and commercial units to the west. A petrol station is located adjacent to the southeast site boundary. Further north, beyond Wood Lane End is Hemel Hempstead industrial estate with commercial units. An oil storage terminal known as Buncefield Terminal is located approximately 200 m to the northeast.

2.2 Site Description

This site description is based on observations made during a supplementary ground investigation in March 2017. Reference should also be made to the topographical survey, presented as Figure 3.

The site is irregularly shaped and up to 400 m wide by 470 m long. The site levels fall from approximately 137.0 m O.D. in the northeast corner to 125.9 m O.D. in the southwest corner.

Mature trees, hedgerows and fencing are present around the perimeter of the site. There are three site entrances via padlocked gates: two along Buncefield Way and one along Wood Lane End. Public footpaths cross the site.

The site can be split into three zones (denoted as Zone A, B and C on Figure 3) that are separated by hedgerows with dense vegetation and wooden fencing.

2.2.1 Zone A

This area of the site is predominantly occupied by a large field with areas of overgrown dense vegetation around the boundaries. The eastern part of the field slopes down towards the west with a gradient of approximately 1 in 25 (vertical to horizontal), whereas, the remainder of the field slopes gently towards the south. There is a slope feature, with a gradient of approximately 1 in 8 (vertical to horizontal), within the centre of Zone A. An area of gravel surfacing and a concrete slab (associated with a former building) are present within the western site margin of Zone A and a man-made bund is present to the east of the slab and gravel-covered area. The southern part of Zone A is occupied by a former running track, which is surrounded by steep embankments with gradients of up to approximately 1 in 3.5 (vertical to horizontal). Metal railings are present within the running track.

2.2.2 Zone B

Zone B is predominantly occupied by a field that was, until recently, used as equine grazing land/a horse paddock. Areas of overgrown dense vegetation are present around the boundaries. In the western and northwestern parts of Zone B lie areas of tarmac and concrete surfacing including a disused tennis court. To the south of the former tennis court lies an area of grass that appears to have been previously used as a bowling green. At the time of the supplementary ground investigation, small areas of fly-tipped materials and evidence of fires were present within the northwestern corner of the larger field.

2.2.3 Zone C

Zone C comprises the former caravan park and is predominantly covered by grass with isolated areas of overgrown vegetation and mature deciduous trees. Areas of overgrown dense vegetation are present around the boundaries and a bund is present around the southern margin. A circular tarmac-surfaced track is present in the former caravan park and the former caravan pitches comprise areas of gravel that are separated by hedgerows. Concrete slabs are present in the southern part of Zone C in the area of former buildings.

2.3 Site History

Historical maps are presented in the RSP Phase I Environmental Liability Review, dated February 2016. The plans indicate the following development has taken place on and around the site.

The earliest map editions, dated 1877/78, show that the site was undeveloped land. The surrounding area was predominantly used as fields. The 1963 plan indicates that roads had been constructed to the north, east

and south along with residential properties to the northwest and a factory adjacent to the eastern site boundary. The site remained undeveloped land until the 1970s.

The 1982 plan shows that sports pitches and a running track were developed within the northeast and southwest area of the site and that small buildings (pavilions) were constructed within the western and northern site boundary. It is evident that earthworks had taken place within the site boundary to form the sports pitches. By this time, a caravan park was also present within the southeastern corner of the site. Residential and commercial development, including an engineering works, oil storage depot and a petrol station, were constructed within the surrounding area.

On the 1991 plan, tennis courts are identified within the northwest corner of the site. The remainder of the site and the surrounding area remain relatively unchanged.

The plans dated 2010 and 2014 indicate that no significant changes had occurred within the site. However, aerial images available on the internet show that by 2006 the site was no longer used as a sport ground and that the caravan park has been vacant since 2011.

3. PUBLISHED GEOLOGY

Geological map data published by the British Geological Survey (BGS) online and in print, on 1:50,000 scale Sheet No.238 (Aylesbury) indicate that superficial deposits comprising Clays-with-Flints strata underlie the majority of the site but are shown to be absent in the northern part of the site and locally in the northwestern-most and southern parts of the site.

The solid strata beneath the northwestern-most and northeastern parts of the site are indicated to comprise Lambeth Group strata, which consists of clays, silts and sands. Upper Chalk strata of the Cretaceous System (Lewes Nodular Chalk and Seaford Chalk Formation) are shown to be present beneath the site below either the Clays-with-Flints or Lambeth Group strata.

4. DESK STUDY ENQUIRIES

Detailed desk study information is included in the RPS Phase I Environmental Liability Review (February 2016).

Hydrogeological information indicates that the Clays-with-Flints strata underlying the majority of the site are classed as 'Unproductive' (i.e. non-aquifer) strata. Where present, the Lambeth Group strata are classed as a 'Secondary A' aquifer. The Upper Chalk is classified as a 'Principal' aquifer. The site is located within a Zone 3 – Total Catchment Source Protection Zone (SPZ).

Available hydrological information indicates that the site is not within a Flood plain area, as defined by the Environment Agency (EA). There are no recorded watercourses within approximately 1 km of the site.

Information in the GroundSure database indicates that a facility approximately 250 m northeast of the site is associated with a pollution incident dated December 2007. This incident has been identified as a significant impact (Category 2) to land and air and a minor impact (Category 3) to water. Available information indicates that this recorded incident is likely to be related to the 'Buncefield Fire' at the Hertfordshire Oil Storage Terminal, which actually took place in December 2005.

There are no active or historical landfills recorded within 250 m of the site.

A GeoInsight report, (presented within the RPS report) indicates that the risk of dissolution features varies across the site from low to moderate to high risk, depending on the underlying geology. A solution pipe has been recorded approximately 40 m to the northwest of the site within Hales Park Close and 6 no. solution pipes have been recorded approximately 635 m to the west.

Available information indicates that features associated with historical surface workings are present locally within the western margin of the site and immediately outside of the site boundary to the north, east and south. The surface workings on site appear to be related to earthworks but could be indicative of localised chalk excavation. The GeoInsight report indicates that the risk of non-coal mining is unlikely (small scale mining may have occurred but restricted in extent) to highly unlikely (rare and localised small scale chalk mining may have occurred).

BRE Document BR 211 – Radon: *Guidance on Protective Measures for New Buildings* (2015) indicates that the site is not within an area where radon precautions are required in new buildings. This is confirmed in the GroundSure EnviroInsight report and with reference to the data on the Public Health England (UK Radon) website.

5. GROUND CONDITIONS AND GEOLOGICAL MODEL

5.1 Ground Investigation

A ground investigation was undertaken by RPS Group in February 2016 and relevant factual records are presented in Appendix I.

A supplementary ground investigation was undertaken by Crossfield Consulting Limited in March 2017. Details of the rationale and scope of the supplementary ground investigation and laboratory testing, together with exploratory hole logs, in-situ and laboratory test results, are presented in Appendix II.

The ground investigations have identified the following, beneath the site.

5.2 Buried Foundations and Services

Based on the site's history, buried obstructions and/or foundations, associated with former structures, may be present within the northern, southeastern and western site boundaries.

A surface water sewer and a foul water sewer, trending northeast to southwest, are recorded to cross the central-eastern part of the site and man holes are present along the line of the sewers. There is also a BT line indicated within the southeast site boundary in the southern part of the former caravan park. It is understood that there is a fibre optic cable running along the eastern site boundary.

During the supplementary ground investigation a manhole cover was encountered beneath the grass at the eastern end of the former running track. Unrecorded services should be anticipated in this area.

5.3 Strata Encountered

Topsoil
Topsoil is present across majority of the site and typically comprises soft to firm consistency slightly gravelly silty clay with an abundance of roots and rootlets. The topsoil was typically encountered to depths of between approximately 0.2 m and 0.4 m.

Made Ground
With reference to Figure 3, Made Ground has been recorded across the western half of Zone A and locally beneath Zones B and C.

Across the western half of Zone A and where present beneath Zone C, the Made Ground generally comprises reworked natural strata with occasional brick fragments. The Made Ground in these areas has been recorded to depths of between 0.6 m and 3.0 m. However, the boundary between the Made Ground and the natural soils can be difficult to identify. Undrained shear strengths of between 30 kN/m^2 and 124 kN/m^2 have been recorded in these materials.

Coarse-grained Made Ground with ash, clinker and cinder fragments were encountered to depths of approximately 0.3 m beneath the gravel-surfaced area in the western part of Zone A and beneath the topsoil covering the former running track in the southern part of Zone A.

Within the western part of Zone B (former tennis court) and across Zone C there are areas of concrete and/or tarmac surfacing. These areas are generally underlain by coarse-grained Made Ground materials.

Below the northwestern corner of Zone B, the Made Ground typically comprises gravelly organic clay with some brick fragments and ashy deposits. Slight organic odours were recorded within these materials.

Deep Made Ground (to depths greater than 3.5 m) has been recorded locally beneath the central part of Zone B. The Made Ground materials in this area generally comprise soft to firm consistency, brown and grey, gravelly clay with fragments of brick, metal, wood, slag and ash. Slight to moderate hydrocarbon odours were noted in these materials and undrained shear strengths of between 30 kN/m^2 and 90 kN/m^2 have been recorded. During an archaeological investigation undertaken for RPS Group, buried steel drums and localised hydrocarbon impaction were recorded locally within this area. From the CPT data, the Made Ground materials in this area could extend to approximately 4.7 m depth.

No significant Made Ground was recorded across the remainder of the site (i.e. the eastern half of Zone A and the majority of Zones B and C).

Clays-with-Flints
Clay-with-Flints strata have been recorded across the site beneath the topsoil and/or Made Ground. These strata typically comprise firm to very stiff consistency, orangish brown mottled grey, gravelly silty clay with cobbles, boulders and large boulders of flint. Undrained shear strengths typically between 50 kN/m^2 and 110 kN/m^2 have been recorded in the Clay-with-Flints. Where standard Penetration Tests (SPTs) were undertaken within the Clay-with-Flints strata, SPT 'N' values of between 13 and 30 have been recorded.

Based on the borehole and trial pit records, the depth to the base of the Clay-with-Flints strata varies between approximately 0.7 m and 8.5 m. From the CPT data, the Clay-with-Flints strata could extend to 11.5 m depth in the northern part of Zone A.

Lambeth Group
Lambeth Group strata are recorded to underlie the site on the available BGS data. However, no materials considered to be Lambeth Group strata have been identified within the ground investigations.

Upper Chalk
The Chalk strata predominantly comprise structureless weathered chalk gravel in a clay/silt matrix with very weak to moderately weak, low to medium density clasts (Grade Dc). Locally, the structureless weathered chalk consists of firm to stiff consistency gravelly silty clay with extremely weak, low density clasts of chalk (Grade Dm). Flint gravels are present within the chalk strata.

Where Standard Penetration Tests (SPTs) were undertaken within the Upper Chalk Strata, SPT 'N' values are typically 15 in the shallow strata and increase to 30 with depth.

Anomalous Ground
Within the western site boundary, dense, coarse-grained strata were identified within CPT CCL32 at depths of between 3.5 m and 6.0 m. A trial pit (TP CCL10) was undertaken in the CPT location but the trial pit was unable to extend deep enough to inspect the coarse-grained materials. Four no. CPTs (CPT CCL29, CPT CCL30, CPT CCL33 and CPT CCL38 were undertaken at 5 m spacing around the CPT CCL32 location. Thinner horizons of dense, coarse-grained strata were identified within CPT CCL29, CPT CCL33 and CPT CCL38.

5.4 Groundwater

Groundwater strikes were not encountered in any of the exploratory holes during the ground investigations.

RPS Group installed monitoring standpipes within twenty four window sample holes at the site and groundwater monitoring was undertaken. Water was encountered within twelve of the monitoring standpipes at variable depths, ranging between approximately 1.4 m and 5.5 m. However, it should be noted that the RPS data is conflicting as some of the recorded water depths have been recorded at depths deeper than the associated window sample holes and monitoring standpipes.

The groundwater conditions are based on observations made at the time of the fieldwork. It should be noted that groundwater levels may vary due to seasonal and other effects.

5.5 Ground Gases

RPS Group installed monitoring standpipes within twenty four window sample holes at the site and ground gas monitoring was undertaken on six occasions by RPS Group over a two month period.

A maximum carbon dioxide concentration of 9.6% was recorded (in the western part of Zone A) and a maximum methane concentration of 7.1% was recorded (in the centre of Zone B). Ground gas flow rates of up to 12 l/hr were recorded but values were typically much lower and often negligible (<0.1 l/hr).

It is noted that methane was only recorded in one location during the second monitoring visit and all other methane concentrations were below the detection limits of the monitoring equipment used. It is also noted that the ground gas flow rates recorded in the earlier visits were much larger than the ground gas flow rates recorded in the final three visits which were typically below the detection limits of the monitoring equipment used.

6. PROPOSED DEVELOPMENT

A proposed development plan is presented as Figure 4. The proposed development includes the construction of seven warehouse units together with associated access roads, service yards, car parking areas, an attenuation pond and areas of managed landscaping. Three retaining structures, up to approximately 2.5 m in height, are proposed. These structures will be constructed north of Unit 2/3, between Units 4 and 5 and south of Unit 6.

To enable the construction of the proposed development, earthworks are required at the site. Up to 3.0 m cut and 4.4 m fill is proposed, as shown in Figure 5.

An attenuation pond up to 3.0 m deep and approximately 100 m long by 20 m wide is proposed adjacent to the southwest boundary of the site.

The existing sewers will be realigned to trend north to south straight across the centre of the site and away from proposed building footprints.

7. ASSESSMENT OF POTENTIAL CONTAMINATION AND GROUND GASES

7.1 Assessment Criteria

Assessment of potential contamination and ground gases has been undertaken using a risk assessment based approach, as recommended within the Environmental Protection Act (1990), CLR11 (2004), CLEA Model (2004-2009), BS 10175:2011+A1:2013, CIRIA C552 (2001) and NHBC R&D Report 66 (2008). This approach considers the likely source of contamination, given the history and location of the site, and the possible migration pathways by which these potentially hazardous substances may reach likely receptors, such as end users of the site, controlled waters or the wider environment, in the context of the proposed development.

Part IIA of the Environmental Protection Act (1990) states that

"Contaminated Land is any 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) significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused;"

All risk assessments carried out as part of this investigation have been carried out with respect to the definition of "contaminated land" within Part IIA of the Environmental Protection Act (1990) and have considered the site both before and on completion of the development. The basis of the risk assessment is the Conceptual Site Model, which is derived from the desk study and initial information and identifies potential pollutant linkages that could affect receptors relevant to the site and the wider environment. The Conceptual Site Model is presented in Table 1.

Based on the model, a ground investigation was designed to obtain relevant information to assess further the identified pollutant linkages. Where relevant this included the recovery of representative samples and subsequent analytical laboratory testing. The rationale for the sampling and testing is set out in Appendix II. The results of the analytical testing are presented in in Appendix I (RPS data) and Appendix II (CCL data) and summarised in Table 2 and Table 3. Ground gas monitoring was undertaken as part of the 2016 ground investigation by RPS Group and the monitoring data is presented and assessed in Tables 4 and 5. On the basis of the conceptual site model and the results of the analytical laboratory testing, an assessment of the identified pollutant linkages is presented in Table 6.

7.2 Potential Sources of Contamination

Historical information indicates that the site was undeveloped land until the 1970s when earthworks were undertaken to form sports grounds in the western and northeastern parts of the site and a caravan park was constructed in the southeastern part of the site. The site was no longer used as sport grounds by 2006 and the caravan park became disused from 2011. It is understood that, until recently, the northeastern area of the site was used as a horse paddock with stables.

The ground investigations have identified that the ground conditions beneath the site typically comprise topsoil overlying Clay-with-Flints strata over Upper Chalk strata. Within the western half of the site, extensive Made Ground (predominantly reworked natural strata) is present. Areas of ashy Made Ground and/or Made Ground impacted with hydrocarbons have been identified locally.

Based on available information, it is considered that there are no credible off-site sources of contamination that are likely to impact the site.

Table 2 provides a summary of the analytical testing undertaken on the soil samples recovered from the Made Ground at the site and compares the results with human health generic assessment criteria (GAC) that are relevant for the proposed development type (commercial). The Table also includes analytical results obtained from the 2016 RPS Group ground investigation, as presented in Appendix I. Polyaromatic hydrocarbons (PAHs) have been recorded at concentrations above human health GAC for a commercial development at one location within the northwestern corner of Zone B (former tennis court surfacing materials).

There is evidence of asbestos containing materials (ACMs) within the ashy Made Ground materials that are present beneath the former running track in the southwestern part of Zone A and within ashy materials present locally in the central part of Zone A.

No adverse sulphate conditions have been identified. Potential contaminants have been recorded at very low to negligible concentrations within the Made Ground materials. The risk and implications to buried concrete and potable water supply pipe materials are discussed in Section 7.3.2.

Concentrations of phytotoxic metals have been recorded locally within the Made Ground across the site that may be considered a risk to healthy plant growth, based on BS 3882:2015 for topsoil. Further assessment is outlined in Section 7.3.3.

Based on available information, no significant concentrations of inorganic contaminants have been recorded at the site and the organic contaminants identified are typically of low mobility and solubility. On this basis, no significant sources of potential contamination that may influence groundwater have been identified at the site or in the surrounding area.

Notwithstanding the above, water monitoring/sampling was undertaken in 2016 by RPS Group. As presented in Table 3, laboratory tests undertaken on water samples collected by RPS have identified elevated concentrations of metals zinc and chromium. However, it should be noted that groundwater is expected to lie at depth beneath the site and the water sampled by RPS Group appears to be perched water within the Made Ground above the low permeability Clay-with-Flints strata. Further assessment is outlined in Section 7.3.4.

The site is not within an area where radon precautions are required and there are no recorded landfills (historical or active) within the surrounding area. However, putrescible materials may be present locally within the Made Ground beneath the site. Therefore, there is the potential for ground gas generation, associated with the degradation of this material, to be present beneath the site. Ground gas monitoring was undertaken during the RPS Group ground investigation on six occasions over a two month period and an assessment of the monitoring data is outlined in Section 7.4.

7.3 Pollutant Linkages – Solids and Liquids

Based on the Conceptual Site Model, consideration is given below to identified pollutant linkages and a risk evaluation is undertaken of each possible source-pathway-receptor linkage that may occur at the site. The risk evaluation considers the potential consequences and probability of occurrence in accordance with CIRIA C552 (2001). Where risks are identified as “negligible”, then by implication such risks are within normally

accepted levels for the proposed development, and the further reduction of such risks by remediation works is considered unnecessary. Where risks are identified that are "low" as defined in CIRIA C552 (2001), or worse, then consideration is given to the management of the identified risks, with appropriate recommended actions that may include engineering solutions/remediation works as described in the following sections.

7.3.1 Human Health

PAHs have been recorded at concentrations above the GAC for a commercial development within the Made Ground beneath the northwestern corner of Zone B (associated with the former tennis court surfacing materials).

Asbestos has been identified in three locations within the western part of Zone A. Traces of chrysotile, crocidolite and amosite, up to 0.001% in concentration, have been recorded within ashy Made Ground beneath the former running track and to the north of the former running track.

It is recommended that appropriate personal protective equipment (PPE) be worn and high levels of personal hygiene be maintained by groundworkers during any development works. To prevent dust from the shallow soils migrating off site via aerial migration pathways, especially those impacted by loose asbestos fibres, and subsequently becoming a risk or nuisance to neighbours or the general public, it is recommended that soil dampening be undertaken when earth-moving operations are being undertaken during construction.

Although, no visible ACM were identified during the ground investigation, any visible ACM encountered during the works should be hand-picked for disposal. All hand-picked asbestos-containing materials should be stored appropriately and disposed of off-site, as outlined in Section 15.

With respect to end users, the proposed development includes large areas of hardstanding, which will provide an effective barrier between the end users and the existing ground such that there would be no realistic exposure pathways in these areas following development. Earthworks are required at the site to form the required levels. Such operations could be managed/designed such that the ashy Made Ground materials are incorporated into the works and are buried/capped beneath a thickness of reworked natural strata. If following the earthworks, ashy Made Ground materials are present at the surface in areas of proposed soft landscaping, additional testing may be required and/or there may be a requirement to provide a thickness of appropriate capping materials to form an effective barrier between the end users of the site and the Made Ground.

Hydrocarbon impacted materials have been identified locally beneath the central part of Zone B and it is recommended that additional investigation be undertaken in this area of the site to delineate the extent of these materials. In the event that other impacted materials are encountered beneath the site, a geoenvironmental specialist should be notified and the area investigated.

7.3.2 Durability of Buried Structures and Services

In view of the low soluble sulphate content and near-neutral soil conditions, there are no special precautions required for the protection of good quality buried foundation concrete. Based on guidance within *BRE Special Digest 1* (2005), the specified DC Class of concrete for buried structures and foundations should be suitable for an ACEC site classification of AC-1.

It should be noted that earthworks are required at the site and that the selection of pipe materials should be compatible with the materials present along the line of proposed water pipes following completion of the earthworks.

The site has not been associated with past fuel and/or chemical storage and there are no such storage facilities in close proximity. Therefore, the site would not be considered to be 'brownfield' under the definition provided by UKWIR (2010) with respect to the assessment of ground for water supply pipes. However, hydrocarbon-impacted materials have been identified locally in the central part of Zone B. If these materials remain in-situ in areas of potable water supply pipes, it may not be suitable to use conventional plastic materials for potable water supply pipes without further testing. Alternatively, multi-layer barrier pipe could be used in this area of the site. It is considered that conventional plastic materials are likely to be suitable for potable water supply pipes in other areas of the development.

It should be noted that individual water companies may have in-house requirements for the assessment of ground conditions for potable water supply pipes and these requirements may be in addition to, or may contradict, the guidance provided by UKWIR. Therefore, it is recommended that the relevant water supply company be consulted prior to finalising the potable water supply design.

7.3.3 Landscape Areas

The proposed development includes limited areas of managed soft landscaping. Earthworks are required at the site to form the required levels and, following completion of the earthworks, there will be a requirement to place topsoil in areas of managed soft landscaping.

If ashy Made Ground materials are present at the surface in areas of proposed soft landscaping following the earthworks, additional testing may be required and/or there may be a requirement to provide a thickness of topsoil to form a suitable growing medium. Alternatively, the earthworks operations could be managed/designed such that the ashy Made Ground materials are incorporated into the works and are buried/capped beneath a thickness of reworked natural strata.

7.3.4 Controlled Waters

The Clay-with-Flints that underlie the majority of the site are of low permeability and classed as 'Unproductive' (i.e. non-aquifer) strata. The Upper Chalk strata are classified as a 'Principal' aquifer. The site is located within a Zone 3 – Total Catchment Source Protection Zone (SPZ).

The potential contaminants identified within the shallow Made Ground beneath the site are generally of very low solubility and, hence, are relatively immobile and there appears to be no significant source of substances within the shallow soils that could significantly impact groundwater. Where potentially mobile substances have been reported, these have been recorded at negligible concentrations. The shallow Made Ground is underlain by low permeability reworked natural strata and/or Clay-with-Flints strata, which should effectively preclude the downward migration of potential mobile contaminants.

Available information indicates that groundwater lies at depth beneath the site within the Chalk. During water monitoring undertaken in 2016 by RPS Group, water was identified locally at depths of between 1.5 m and 5.5 m although the recorded water depths are not compatible with the recorded standpipe installations. This water appears to be perched water above the Clay-with-Flints strata but may have entered the standpipes from the surface. Water sampling and testing, undertaken by RPS, has recorded certain metals (zinc and chromium) locally within the perched water at concentrations marginally elevated above the relevant quality standards.

Following development, large areas of hardstanding surfacing will be present across the site and will inhibit rainwater infiltration. There will be limited possibility for leaching of potential contaminants in permeable surfaced areas, such as soft landscaping. However, the presence of low permeability reworked natural strata, Clay-with-Flints strata and weathered Upper Chalk strata between the Made Ground and groundwater at

depth would prevent significant vertical migration. Based on the above, there appears to be no valid pollutant linkage from shallow soils in relation to controlled waters.

On the basis of the above assessment, it is considered that the ground conditions beneath the site pose a negligible risk to controlled waters.

7.4 Pollutant Linkages – Gases

Based on the Conceptual Site Model, consideration is given below to identified pollutant linkages and a risk evaluation is undertaken of each possible source-pathway-receptor linkage that may occur at the site. Where risks are identified as "negligible", then by implication such risks are within normally accepted levels for the proposed development, and the further reduction of such risks by remediation works is considered unnecessary. Where risks are identified that are "low" as defined in CIRIA C552 (2001), or worse, then consideration is given to the management of the identified risks, with appropriate recommended actions that may include engineering solutions with remediation works or ground gas protection and control systems as described below. Reference is made to guidance published in BRE BR211 (2015) as referenced by the Building Regulations, and to relevant assessment criteria published in the Ground Gas Handbook and BS 8485:2015 and BS 8576:2013, as listed in the References.

Made Ground is present beneath parts of the site. The Made Ground materials typically comprise reworked natural strata that are considered not to provide a significant source of putrescible materials and/or ground gas generation. Locally, organic Made Ground has been recorded and there is the potential for ground gas generation associated with the degradation of organic materials within these soils.

There are no landfills or other identifiable potential sources of ground gases indicated within influencing distance of the site and the site does not lie within an area where radon precautions are required in new buildings.

Ground gas monitoring was undertaken on six occasions by RPS Group over a two month period within monitoring standpipes installed in twenty four window sample holes. A maximum carbon dioxide concentration of 9.6 % was recorded (in the western part of Zone A) and a maximum methane concentration of 7.1 % was recorded (in the centre of Zone B). Ground gas flow rates of up to 12 l/hr were recorded but values were typically much lower and often negligible (<0.1 l/hr). It is noted that methane was only recorded in one location during the second monitoring visit and all other methane concentrations were below the detection limits of the monitoring equipment used. It is also noted that the ground gas flow rates recorded in the earlier visits were much larger than the ground gas flow rates recorded in the final three visits which were typically below the detection limits of the monitoring equipment used.

With reference to all of the available site data, as presented in Tables 4 and 5, and the guidance published in BS 8485:2015, the site could be classified as a Characteristic Gas Situation 2 (CS 2) site. Therefore, it is recommended that an allowance be made to provide ground gas precautions that are compatible with CS 2. However, it should be noted that earthworks are required to form the development levels. Made Ground materials should be removed from beneath the proposed building footprints and replaced with Engineered Fill. Organic/putrescible materials will not be permitted within the Engineered Fill materials.

Once the proposed earthworks have been completed, consideration could be given to additional plot-specific ground gas monitoring to confirm whether ground gas precautions are still required. If additional monitoring is not undertaken, ground gas precautions, compatible with CS 2, should be installed.

7.5 Recommended Remedial Works

On the basis of the available information, an allowance should be made for the following:

- Further investigation is required in the central area of Zone B where localised deep Made Ground and hydrocarbon-impacted materials have been encountered. The extent of the Made Ground area of impacted materials should be delineated.
- It is recommended that a Discovery Strategy be put in place during site development works, such that any unidentified contamination encountered is reported to a geoenvironmental specialist and further investigation undertaken.
- If visible asbestos-containing materials (ACMs) are identified, such materials should be hand-picked for disposal off site.
- A capping layer may be required in proposed landscaped areas if impacted materials remain at the surface following the proposed earthworks.
- Barrier pipes may be required in areas of hydrocarbon-impacted soils, if they are not removed during the earthworks.
- If additional, post-earthworks, ground gas monitoring is not undertaken, allowance should be made to provide ground gas precautions that are compatible with CS 2.

It is considered that there are no other requirements for remedial works in order for the development to commence.

Following completion of the proposed earthworks, a Remediation Implementation Plan should be produced that will detail the work to be undertaken and how it will be verified such that a Remediation Verification Report can be prepared to demonstrate that the risks to receptors have been effectively negated. The preparation of these documents would meet the normal requirements of a local planning authority.

7.6 Potential Liabilities

Based on available data, it is considered that there should be no environmental liabilities associated with site ownership and this should not change following completion of the development providing any necessary remedial works are implemented.

8. ASSESSMENT OF MINING, QUARRYING AND OVERALL GROUND STABILITY

The desk study information indicates that features associated with historical surface workings are present within the western-most part of the site. The historical surface workings appear to be related to earthworks but could be indicative of localised chalk excavation. The risk of dissolution features varies across the site from low to moderate to high risk, depending on the underlying geology. However, on the basis that the Lambeth Group was not encountered on site the risk of dissolution features is likely to be low. A solution pipe has been recorded approximately 40 m to the northwest of the site within Hales Park Close and 6 no. solution pipes have been recorded approximately 635 m to the west.

Based on observations made during both phases of the ground investigation, there is no evidence of chalk mining on site, nor is there any evidence of loose or voided strata associated with potential solution features.

Within the central part of Zone B, hydrocarbon-impacted Made Ground was encountered to an approximate depth of 4.5 m. The reason for deep Made Ground in this area of the site is not clear and further investigation is recommended.

As expected, the depth to the top of the Upper Chalk strata is highly variable across the site from 0.7 m to 11.5 m depth. However, due to the depth of the Chalk strata in the northern part of Zone A, additional investigation in this area is recommended.

Dense, coarse-grained materials have been identified locally at depth within the western part of Zone A and further investigation is also recommended in this area.

To assess the potential for unrecorded mine workings and/or solution features to be present beneath the site, it is recommended that the Made Ground materials beneath proposed building footprints be removed and replaced with Engineered Fill. An inspection of the formation strata following the removal of Made Ground and prior to the placement of Engineered Fill should be made by a suitably qualified Geotechnical Engineer. If unrecorded mine workings and/or solution features are identified, the foundation arrangements should be reviewed.

With reference to published information provided by the British Geological Survey, and in the context of the low sensitivity of the proposed structure to very minor background seismic events recorded in the UK, it is considered that the foundation solution should not be constrained by potential ground vibrations from natural sources and that more detailed assessment is not necessary.

9. ASSESSMENT OF EARTHWORKS

9.1 Earthworks Operations

The site slopes down from the northeast to the southwest with a fall of approximately 11 m. Earthworks are required at the site to create the required development platforms. Up to 3.0 m of cut and up to 4.4 m of fill is proposed across the site. Retaining structures, up to approximately 2.5 m in height, are proposed. Permanent cut slopes and fill slopes will also be required as part of the earthworks.

Beneath the proposed building footprints, the following cut and fill is proposed:

- Unit 1 – Up to 1.9 m cut (no fill)
- Units 2 & 3 – Up to 1.2 m cut and up to 1.7 m fill
- Unit 4 – Up to 1.6 m cut and up to 2.5 m fill
- Unit 5 – Up to 0.9 m cut and up to 4.4 m fill
- Unit 6 – Up to 3.7 m fill (0.4 m cut from bund only)
- Unit 7 – Up to 1.5 m cut and up to 1.1 m fill

It is also proposed to excavate a pond in the southwestern corner of the site and up to 3.0 m of cut is required to form the pond.

9.2 Earthworks Strategy

It is recommended that Engineered Fill materials beneath the proposed building footprints should be placed in accordance with a Specification based on recommendations by Trenter and Charles (1996) as presented in BRE FB 75 Building on Fill: Geotechnical Aspects (2015).

In accordance with the Specification, the earthworks must be subjected to rigorous quality control, ensuring proper material selection, placement and compaction. Failure to control the earthworks may result in excessive settlements occurring within fill areas. Trial embankments (one per material source) should be

constructed at the start of earthmoving to confirm that the required densities can be achieved with the contractor's choice of plant and method of working.

If the proposed building footprints have not been finalised, all Engineered Fill could be designed such that it will be suitable to support shallow pad foundations and ground-bearing floor slabs anywhere within the plots. If it is required to adopt this strategy, there may be a requirement to remove the Made Ground from beneath the entire site and replace with Engineered Fill.

The Engineered Fill materials placed within the external areas may be placed in accordance with a Method-Based Specification. The Method-Based Specification could be based on the Specification for Highway Works or based on the Specification used for the building earthworks.

Prior to the placement of fill materials, the formation strata should be proof-rolled and inspected by a Geotechnical Engineer. Any soft strata should be excavated and replaced with Engineered Fill. It is recommended that all Made Ground materials be excavated from beneath the proposed building footprints and replaced with Engineered Fill. The removal of Made Ground will be required to provide support to the foundations and floor slabs and reduce the risk of chalk mining features going undiscovered.

There is a potential for desiccated materials to be present in the vicinity of exiting trees, such materials should be dug out and replaced with Engineered Fill.

It is recommended that benches be cut into the existing slope before any fill is placed. The recommended height of these benches is not greater than 300 mm. The bench width should be compatible with the compaction plant used.

9.3 Assessment of Fill Materials

Topsoil should not be used as Engineered Fill and, where possible, should be re-used in areas of soft managed landscaping.

The main cut materials at the site are likely to comprise the Made Ground and Clay-with-Flints strata. Significant volumes of Upper Chalk strata are not anticipated to be excavated from areas of proposed cut but may be encountered locally and within foundation and service excavations.

It is recommended that the ashy Made Ground materials (present in the former running track and locally beneath other areas of the site) should not be used within the earthworks placed beneath the proposed building footprints. Such materials may be suitable for re-use within external areas of the development (i.e. car parking, access roads and/or service yards). It should be noted that asbestos has been identified within these materials and the use of suitable PPE and dust control measures will be required during the earthworks.

It is considered that the Made Ground and the Clay-with-Flints materials are suitable for re-use as Engineered Fill. Earthworks testing has been undertaken on these materials from areas of proposed cut to enable preliminary acceptability envelopes (relating to fill placement beneath buildings) to be produced. Preliminary acceptability envelopes for As-Dug Made Ground and Clay-with-Flints materials are presented as Figures 6 and 7. A summary of moisture content with depth is shown on Figure 8.

Figure 6 shows the preliminary acceptability envelope for As-Dug Made Ground materials. Lower and upper moisture contents of 16% and 25.5% are considered suitable for these materials.

Figure 7 shows the preliminary acceptability envelope for As-Dug Clay-with-Flints materials. Lower and upper moisture contents of 18.5% and 28.5% are considered suitable for these materials.

As can be seen from Figure 8, some of the Made Ground materials are likely to be too wet for re-use (beneath buildings) in an As-Dug condition and will require to be either dried out or modified with lime prior to placement. Figure 9 presents the preliminary acceptability envelope for the Made Ground modified with 2% Lime.

Figure 8 shows that approximately half of the Clay-with-Flints materials could be too wet for re-use (beneath buildings) in an As-Dug condition and are likely to require to be either dried out or modified with lime prior to placement. Figure 10 presents the preliminary acceptability envelope for the Clay-with-Flints materials modified with 2% Lime.

It should be noted that these materials are likely to be susceptible to small changes in moisture content. The earthworks should be carried out during periods of dry weather if possible. In the event that the materials become too wet for re-use As-Dug, it may be possible to dry out materials naturally by spreading the materials out in thin layers and/or rotovating the materials. However, if the works are undertaken following periods of wet weather, the use of lime may be required. Based on the results of the sulphate testing, modification with lime should be possible.

Where fine-grained Made Ground (reworked natural strata) and/or Clay-with-Flints materials are placed within the external areas of the development, these materials may be placed in accordance with the Specification for Highway Works. It is considered that the majority of these materials are likely to be classified as Class 2A/2B or Class 2C materials, as defined in the Specification for Highway Works.

Significant volumes of Upper Chalk strata are not expected to be encountered in areas of cut but chalk strata are likely to be encountered in foundation and service excavations. Based on the investigation and laboratory testing, it is considered that the Upper Chalk strata beneath the site should be classified as Class 3 materials, as defined in the Specification for Highway Works. These materials should be used within external areas of the development, where possible.

Chalk is very susceptible to small changes in moisture content and can quickly become too wet for re-use during periods of wet weather. Moisture can also be released from the chalk as a result of excavation, trafficking, handling and compaction and this additional free moisture can also make materials too wet for re-use. Clause 605 of the Specification for Highway Works details trafficking and transportation requirements, together with subgrade protection measures. Chalk earthworks should not be undertaken during periods of rainfall. Winter working is also not recommended. Wet chalk material can dry relatively quickly under dry conditions. However, lime modification could be used (subject to laboratory testing and site trials). If natural moisture contents are noted to be below 20%, there may be a requirement to add water to enable compaction.

Any placed chalk fill should be sealed with a roller to prevent water ingress and CIRIA C574 recommends falls >1 in 40 to encourage run-off. Although rollers may ‘seal’ the formation, subsequent wetting and drying could lead to significant degradation of the fill surface.

10. ASSESSMENT OF SLOPES AND RETAINING STRUCTURES

The proposed earthworks are understood to include up to approximately 3.0 m of cut and up to approximately 4.4 m of fill. Retaining structures, up to approximately 2.5 m in height, are proposed. Permanent cut slopes and fill slopes will also be required as part of the earthworks.

The recommended maximum design slopes for the materials likely to be encountered are as follows:

Engineered Fill	1 in 2.5 (vertical to horizontal)
Made Ground	1 in 2.5 (vertical to horizontal)
Clay-with-Flints	1 in 2.5 (vertical to horizontal)

It is considered that Upper Chalk strata should not be present within areas of proposed slopes and retaining structures.

The above parameters are based on permanent slopes up to 3.0 m high and the assumption that no unacceptable loadings (i.e. buildings or landscaping bunds) are proposed within 10 m of the crest of proposed slopes and that any loading of slopes will be due to traffic loading only. If the above criteria cannot be met, further assessment will be required.

Where there is inadequate space for self-supported slopes, retaining structures will be required. As shown on Figure 4, retaining walls are currently proposed in the northern, southwestern and central parts of the site.

It is understood that the following heights are to be retained:

- Northern Wall – Up to 1.5 m
- Southwestern Wall – Up to 2.5 m
- Central Wall – Up to 1.5 m

It is considered that new retaining walls may be designed using the following parameters:

	Total Stress			Effective Stress	
Imported Granular Backfill	γ = 19 kN/m^3	C_u = 0 kN/m^2	ϕ_u = 40°	c′ = 0 kN/m^2	ϕ' = 40°
Engineered Fill	γ = 20 kN/m^3	C_u = 80 kN/m^2	ϕ_u = 0°	c′ = 0 kN/m^2	ϕ' = 24°
Made Ground	γ = 20 kN/m^3	C_u = 50 kN/m^2	ϕ_u = 0°	c′ = 0 kN/m^2	ϕ' = 24°
Clay-with-Flints	γ = 20 kN/m^3	Cu = 75 kN/m^2	ϕu = 0°	c′ = 0 kN/m^2	ϕ' = 24°

It is considered that the use of gabions, crib walls or reinforced concrete cantilever walls should be suitable for this site. If there is insufficient space to form the required temporary works, consideration could be given to utilising an embedded retaining wall solution, such as sheet piles or soldier piles.

It should be noted that the actual coefficient of earth pressure used for design should reflect the form of construction employed and the temporary works required. For the in-situ natural materials present at the site, the coefficient of earth pressure at rest is probably in excess of 1 and the design of any retaining wall will need to take this into account.

Adequate drainage should be provided above, below and within all slopes and retaining structures, particularly if any groundwater seepages are evident. In addition, surface water drainage should be installed and vegetation established on slopes as soon as is practicable to reduce the effects of surface erosion.

11. FOUNDATION RECOMMENDATIONS

11.1 Design Approach

In compliance with the requirements of the National Annex of BS EN 1997-1:2004 the geotechnical design assessment is based on Design Approach 1 (as defined in BS EN 1997-1:2004). As the structural loads for the proposed building are well defined, uncertainty and risks of potential unfavourable conditions (or deviations from characteristic values) are primarily associated with the ground conditions.

Consideration is given to the assessment of ultimate limit state (ULS) conditions, where full collapse or failure conditions are considered, and relevant design information is presented in Appendix III in this regard. In addition, the assessment considers serviceability limit states (SLS), to ensure that the recommended design parameters are compatible with an acceptably low risk of serviceability criteria being exceeded during the standard design life of the structure. It is noted that the SLS has a greater influence on the design parameters in comparison to ULS conditions and this is considered in the following assessment.

11.2 Proposed Structural Loadings and Serviceability Criteria

Details of imposed foundation loads (i.e. actions imposed by the building structure) and serviceability limit values are not currently available for the proposed structures. The geotechnical assessment presented in the report has considered generic values for the proposed development type, which is considered appropriate for the appraisal of engineering solutions and preliminary design, and these are listed below:

Imposed Load on Foundations:	Column loads up to 1350 kN
Imposed Load from Floor Slab:	up to 50 kN/m^2 (time averaged load of 35 kN/m^2 used for settlement assessments)

Serviceability Limit Values (Columns)

Maximum Total Settlement:	25 mm
Maximum Differential Settlement:	15 mm

Serviceability Limit Values (Floor Slab)

Angular Distortion:	1/500

If loads are significantly different to these stated above, additional assessment will be required.

11.3 Geotechnical Category of Proposed Structures

In view of the nature of the proposed structures and with reference to the indicated ground conditions, as outlined in Section 5, it is considered that the development is compatible with Geotechnical Category 2, as defined in BS EN 1997-1:2004, and the necessary information relating to the Ground Investigation and Geotechnical Design Reports has been obtained and assessed on this basis.

11.4 Assessment of Foundation Solutions

With reference to the recorded ground conditions and corresponding Geological Model presented in Section 5, characteristic values relating to the geotechnical properties of the strata within influencing distance of the proposed structures are presented in Appendix III.

The Made Ground and low strength natural strata are considered unsuitable as founding strata due to the unpredictable settlements that may occur in these materials. Based on the ground conditions, it is considered that pad foundations should be possible at this site but such foundations should be placed in either high strength Engineered Fill, medium to high strength Clay-with-Flints or the underlying Upper Chalk strata.

Historical surface workings are have been recorded locally within the western margin of the site and immediately outside of the site boundary to the north, east and south. The surface workings on site appear to be related to earthworks but could be indicative of localised chalk excavation. If mining-related ground conditions are encountered during the earthworks, additional investigation, and potentially alternative foundation solutions, may be required. To minimise the potential for unrecorded workings to remain beneath proposed buildings, it is recommended that, as part of the earthworks, all Made Ground is removed from beneath building footprints and replaced with Engineered Fill.

Below are development-specific assessments of ground conditions and proposed foundations for each unit.

11.4.1 Unit 1

Based on the available information, the ground conditions below Unit 1 are expected to comprise medium to high strength Clay-with-Flints strata to approximately 2.5 m and 3.0 m depth. These deposits are underlain by competent Upper Chalk strata.

To the immediate south of the proposed Unit 1 building footprint, Made Ground has been encountered to depths greater than 3.5 m depth. In the event that this Made Ground extends below the Unit 1 building footprint, there will be a requirement to excavate and replace these materials with high strength Engineered Fill. It is recommended that additional investigation be undertaken to determine the extent of the Made Ground in this area.

Based on the cut/fill drawing provided, Unit 1 lies in an area of proposed cut with up to 1.9 m cut proposed. However, if Made Ground is present beneath the Unit 1 building footprint, additional earthworks will be required, as outlined above. Following the recommended earthworks (as outlined in Section 9) the proposed Unit will be underlain by either high strength Engineered Fill and/or medium to high strength Clay-with-Flints strata. On this basis, it should be suitable to support the building on shallow pad foundations within the natural strata or Engineered Fill.

If the additional investigation identifies extensive Made Ground beneath the building footprint, and subject to the extent of any hydrocarbon impaction, consideration could be given to ground treatment using vibro-replacement techniques (stone columns). The suitability of ground treatment will require confirmation by a specialist ground treatment contractor and acceptance by the Environment Agency.

11.4.2 Unit 2/3

Based on the available information, the ground conditions below Unit 2/3 are expected to comprise Made Ground below the western and southern building footprint to approximately 3.0 m depth underlain by high strength Clay-with-Flints strata. The remainder of the unit is expected to be underlain by medium to high strength Clay-with-Flints to approximately 2.5 m depth over Upper Chalk strata.

Based on the cut/fill drawing provided, there will be up to 1.2 m cut beneath the northern part of the unit and 1.7 m fill below southern section. There will be a requirement to excavate any Made Ground materials and/or low strength strata and replace these materials with high strength Engineered Fill. Providing earthworks are undertaken as outlined in Section 9, the proposed Unit will be underlain by either high strength Engineered Fill and/or medium to high strength Clay-with-Flints. On this basis, it should be possible to support the proposed building on shallow pad foundations within the natural strata or Engineered Fill.

As an alternative to earthworks, it may be possible to treat the Made Ground using vibro-replacement techniques (stone columns), but this will require confirmation by a specialist ground treatment contractor and acceptance by the Environment Agency.

11.4.3 Unit 4

Based on the available information, the ground conditions below the majority of Unit 4 are expected to comprise medium to high strength Clay-with-Flints to approximate depths of between 2.0 m and 3.0 m over Upper Chalk strata. Beneath the southeastern part of the building, Made Ground is expected to be present to approximately 1.0 m depth over medium to high strength Clay-with-Flints and Upper Chalk strata.

Based on the cut/fill drawing provided, there will be up to 1.6 m cut beneath the northern part of Unit 4 and 2.5 m fill below southern part. There will be a requirement to excavate any Made Ground materials and/or low strength strata and replace these materials with high strength Engineered Fill. Providing earthworks are undertaken as outlined in Section 9, the proposed Unit will be underlain by either high strength Engineered Fill and/or medium to high strength Clay-with-Flints strata. On this basis, it should be possible to support the proposed building on shallow pad foundations within the natural strata or Engineered Fill.

11.4.4 Unit 5

Based on the available information, the ground conditions below majority of Unit 5 are expected to comprise medium to high strength Clay-with-Flints strata to approximate depths of between 1.4 m and 3.0 m over Upper Chalk strata.

To the northwest of the proposed unit, Made Ground has been encountered to approximately 1.2 m depth. In the event that Made Ground extends beneath the building, there will be a requirement to excavate and replace these materials with high strength Engineered Fill. Additional investigation should be undertaken to determine the extent of the Made Ground.

Based on the cut/fill drawing provided, there will be up to 0.9 m cut beneath the northeast corner of Unit 5 and up to 4.4 m of fill below the remaining building footprint area. Providing earthworks are undertaken as outlined in Section 9, the proposed Unit will be underlain by either high strength Engineered Fill, medium to high strength Clay-with-Flints strata and/or Upper Chalk strata. On this basis, it should be possible to support the building on shallow pad foundations within the natural strata or Engineered Fill.

11.4.5 Unit 6

Based on the available information, the ground conditions below Unit 6 are expected to comprise a significant thickness of Made Ground (predominantly reworked natural strata) to approximately 3.0 m depth. Below the Made Ground, medium to high strength Clay-with-Flints strata are present and Upper Chalk strata underlie the Clay-with-Flints. It should be noted that ashy Made Ground is present beneath the southern part of the Unit 6 building footprint to approximately 0.3 m depth.

It is recommended that additional ground investigation be undertaken in the vicinity of Unit 6 plot as anomalous ground has been identified during the supplementary ground investigation and historical ground workings have also been recorded in this part of the site. The findings of the additional investigation may alter the recommendations made below.

Based on the cut/fill drawing provided, there will be up to 3.7 m fill and 0.4 m cut from the man-made bund along the western site boundary. There will be a requirement to excavate any Made Ground materials and/or low strength strata and replace these materials with high strength Engineered Fill. Providing earthworks are undertaken as outlined in Section 9, the proposed Unit 6 building footprint will be underlain by high strength Engineered Fill. On this basis, it should be possible to support the building on shallow pad foundations within the natural strata or Engineered Fill.

As an alternative to earthworks, it may be possible to treat the Made Ground using vibro-replacement techniques (stone columns), but this will require confirmation by a specialist ground treatment contractor and accepted by the Environment Agency.

If ground treatment is proposed, it is recommended that in situ probing be undertaken around the footprint of the proposed unit prior to any ground treatment.

11.4.6 Unit 7

Based on the available information, the ground conditions below majority of Unit 7 are expected to comprise medium to high strength Clay-with-Flints strata to approximate depths of approximately 6.0 m over Upper Chalk strata. Beneath the southern part of the building, Made Ground is present to approximately 0.6 m depth followed by medium to high strength Clay-with-Flints strata and Upper Chalk strata.

With reference to the cut/fill drawing provided, there will be up to 1.5 m cut beneath the western part of Unit 7 and 1.1 m fill below eastern part. There will be a requirement to excavate any Made Ground materials and/or low strength strata and replace these materials with high strength Engineered Fill. Providing earthworks are undertaken as outlined in Section 9, the proposed Unit will be underlain by either high strength Engineered Fill and/or medium to high strength Clay-with-Flints strata. On this basis, it should be possible to support the building on shallow pad foundations within the natural strata or Engineered Fill.

Due to the variable depth to Chalk beneath Unit 7, it is recommended that additional ground investigation be undertaken in this area. The findings of the additional investigation may alter the recommendations made above.

11.5 Recommended Foundation Design Parameters

11.5.1 Pad Foundations

As outlined above, it is considered that following the earthworks pad foundations should provide the most appropriate foundation solution for majority of the proposed units. On the basis of the ground conditions and structures described in the report, the recommended parameters for the foundation design are as follows:

Foundation Strata :	High strength Engineered Fill or; Medium to high strength Clay-with-Flints Strata or; Upper Chalk Strata

Foundation Depth :	Minimum 1.0 m, deepened within influence of trees, as required.
Foundation Width/Size:	Up to 3.0 m wide (pads)
Nett Allowable Bearing Pressure:	150 kN/m^2

It is considered that total settlement of foundations designed on the above basis should be less than the normal serviceability limit state for this development (i.e. total settlements of 25 mm) as outlined in the assessment presented in Appendix III.

Laboratory testing results indicate the clayey horizons at the site comprise 'medium and high volume change' potential soils, as defined in NHBC Standards (2017). Within the influence zones of existing or proposed trees, suitable foundation precautions should be adopted, as outlined in NHBC Standards (2017).

Based on guidance published within BRE Special Digest 1 (2005), the specified DC Class of concrete for buried structures and foundations should be suitable for an ACEC site classification of AC-1.

11.5.2 Ground Treatment

Based on the recorded ground conditions, Units 1, 2/3 and 6 are underlain by areas of Made Ground that are considered not to be suitable to support the proposed developments.

In the event that the Made Ground is not replaced by Engineered Fill, it may be feasible to treat the Made Ground using vibro-replacement techniques (stone columns) and to then use shallow pad foundations within the treated ground. The nett allowable bearing pressure associated with the treated ground would be subject to guarantees provided by a vibro-contractor but should be in the order of 125 kN/m^2 to 150 kN/m^2. The feasibility of such a solution will require to be confirmed with a specialist ground treatment contractor and agreed with the Environment Agency.

If ground treatment is proposed, it is recommended that in situ probing be undertaken in and around the footprint of the proposed units prior to any ground treatment. The probing should comprise static cone penetration tests (CPTs) and should be undertaken on a grid spacing. This probing should provide added confidence that mining and/or solution features are not present beneath the proposed building footprints and provide an indication of the required depth of ground treatment. If solution features are identified, alternative foundation solutions may be required.

11.6 Floor Slab Recommendations

On the basis that floor slab loads of up to 50 kN/m^2 (UDL) are proposed, it is considered that the existing Made Ground will not be suitable in its current condition to support ground bearing floor slabs. On this basis, there will be a requirement to remove the Made Ground materials and replace them with Engineered Fill, placed in accordance with a suitable Earthworks Specification.

As an alternative it may be possible to treat the Made Ground using vibro-replacement techniques (stone columns) to support a ground-bearing floor. This solution will require confirmation by a specialist ground treatment contractor and acceptance by the Environment Agency.

Additional investigation is recommended in areas of recorded anomalous ground conditions and in the area of recorded historical surface workings within the western margin of the site.

There is a potential for desiccated materials to be present in the vicinity of exiting trees, such materials should be dug out and replaced with Engineered Fill, as outlined in Section 9.

11.7 General Construction Advice

All formations should be cleaned, and subsequently inspected by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Care should be taken to ensure that any field drains encountered are carefully and satisfactorily blocked to prevent water seeping through the drains and into any excavations.

The locations of any trial pits undertaken as part of this investigation should be accurately surveyed in order that their precise locations are known and that appropriate precautions can be taken when building over or near to these locations.

12. TEMPORARY WORKS

Conventional plant is considered appropriate for the excavation works at this site.

Shallow excavations should remain stable in the short term. However, instability should be anticipated in excavations left open for extended periods of time. Support should be provided, or the sides battered back, in any excavations requiring man entry.

Shallow groundwater is not anticipated but localised perched water may be present. If perched water seepages are encountered during the works, it is considered that such seepages should be controllable using conventional sump pumping techniques.

If vibro-replacement ground treatment is proposed, it will be necessary to install a working platform for the tracked plant to be used in the proposed foundation works. The platform should be designed by a geotechnical specialist in accordance with the requirements of the Federation of Piling Specialists (FPS) and with reference to BRE 470. The piling platform may form part of the temporary works or be incorporated into the final levels.

13. ASSESSMENT OF SOAKAWAY DRAINAGE

Soakaway drainage should not be used in areas of Made Ground and/or Engineered Fill. The Clay-with-Flints strata are unlikely to be suitable for soakaway drainage due to the low permeability of these strata.

In addition to the above, due to the potential for dissolution features to be present within the Upper Chalk strata, soakaway drainage is not recommended. Therefore, an alternative method of site drainage should be identified.

14. ROAD PAVEMENTS

Road Pavement design should be based on the materials that are present at subgrade following the earthworks. However, based on examination of the soils present beneath the site, and the guidance of IAN73/06 and TRRL Report LR1132, it is considered that an equilibrium design CBR value of 3 % may be used for preliminary pavement design at the site.

The majority of the materials beneath the site are likely to be non-frost susceptible. However, if following the proposed earthworks, chalk strata are present at formation depth, such materials could be frost susceptible.

Design CBR values greater than 15% should be possible if stabilisation is undertaken, subject to material suitability.

15. ASSESSMENT OF MATERIALS FOR WASTE DISPOSAL

There is no requirement to remove soils from site to permit development and, therefore, development levels should set such that soils can be retained and reused on site where possible. Providing development levels are set to accommodate soil arisings (for example, from foundation excavations), such materials would not be classified as waste if retained and re-used on site. However, if materials are excess to requirements, they should be taken to an appropriately permitted waste facility.

If material is identified for removal to a waste facility, it will be necessary to provide a description of the material and laboratory test data to the receiving facility. This information is included in Appendix I and II. It should be noted that additional testing may be required.

The available analytical laboratory test data have been used to provide preliminary waste disposal advice. It should be noted that these test results may not specifically relate to materials that are, or will be, scheduled for removal from site. However, the results are appropriate for preliminary guidance and costing purposes.

The topsoil is likely to be classified as 'non-hazardous' waste if taken to a landfill due to the organic content of such materials. Alternatively, these materials could be taken to a recycling facility.

In the western area of the site, asbestos has been recorded locally within ashy Made Ground with recorded concentrations of <0.001%. The detected asbestos is below 0.1% therefore these materials should be classified as 'non-hazardous' and could be disposed at a non-hazardous landfill.

Although, no visible asbestos-containing materials (ACM) were identified during the ground investigation, any visible ACM encountered during the works will require to be hand-picked for disposal. ACM should be bagged, placed in a lidded skip/bin only for asbestos and removed from site as 'hazardous' waste.

The ashy Made Ground in the western part of the site and the hydrocarbon-impacted Made Ground in the northeastern corner of the site may be classified as 'hazardous' waste if taken off site. This is due to elevated concentrations of petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAHs) and organic content. If these materials are removed from the site additional testing should be undertaken to confirm waste classification and landfill acceptance.

Made Ground that comprises reworked natural strata should be classified as 'inert' waste but WAC testing will be required to confirm this assessment.

If taken off site, the natural strata should be classified as 'inert' waste (providing they are not visibly impacted by potential contaminants). As these materials comprise natural strata, no analytical testing should be required on these materials to confirm waste classification.

Waste requires pre-treatment prior to disposal at landfill and this may take the form of physical or chemical treatment to reduce hazards and/or waste volumes. The segregation and screening of waste soils into separate, and appropriately classified, waste streams would satisfy the pre-treatment criteria by ensuring that volumes of each waste category are minimised. Segregation of waste streams is also important to prevent materials being classified within a worse-case category and, therefore, incurring higher disposal costs. Mixing of different waste streams to dilute hazardous properties is not permitted.

It should be noted that the above assessment is provided in accordance with current waste disposal and environmental permitting legislation and guidance documents. However, individual landfills and other waste disposal facilities may have variances in their permit that differs from standard guidance. Waste facilities may also make decisions with respect to accepting waste on a commercial basis. Therefore, landfills or other waste facilities should be approached to confirm that they will accept waste materials prior to finalising waste disposal proposals.

16. RECOMMENDATIONS FOR SUPPLEMENTARY GROUND INVESTIGATIONS

It is recommended that an allowance be made to undertake additional investigation works at the site. Such works should comprise trial pits to investigate the following:

- Delineate the extent of the Made Ground in the central part of Zone B.
- Investigate anomalous ground beneath Unit 7 and in the western part of Unit 6.

17. RECOMMENDED SUPERVISION AND MONITORING

In compliance with the requirements in BS EN 1997-1:2004 and BE EN 1997-2:2007, construction and workmanship of the engineering solutions recommended in this report shall be supervised. In particular, issues listed in Section 11.7 General Construction Advice shall be considered in the implementation of the works and design of any necessary temporary works set out in Section 12.

In relation to the foundation solutions and ground floor slab recommendations in Section 11, the following supervision and monitoring is recommended.

- Inspection of formation strata following the removal of topsoil (and Made Ground beneath proposed building footprint) and prior to placement of Engineered Fill
- Verification testing required ensuring earthworks operations are in accordance within the specification
- Inspection of formation strata in excavations for pad footings
- If undertaken, verification testing is required following vibro-replacement ground treatment

18. SUMMARY

It is proposed to develop a site identified as 'Maylands Gateway', Hemel Hempstead, Hertfordshire, for commercial purposes. Currently, the site is vacant, but areas within the site have been previously used as a caravan park, stables, a tennis court and sport fields. The proposed development is understood to comprises seven warehouse units together with associated access roads, service yards, car parking areas, an attenuation pond and areas of managed landscaping. Earthworks will be required at the site to enable construction.

Ground conditions beneath the site typically comprise topsoil overlying Clay-with-Flints strata over Upper Chalk strata. However, Made Ground has been recorded across the western half of Zone A and locally beneath Zones B and C. Across the western half of Zone A and where present beneath Zone C, the Made Ground generally comprise reworked natural strata with occasional brick fragments to depths of up to 3.0 m. Coarse-grained ashy Made Ground were encountered to depths of approximately 0.3 m in the western and southern parts of Zone A. Within the western part of Zone B (former tennis court) and across Zone C there are areas of concrete and/or tarmac surfacing and these areas are generally underlain by coarse-grained Made Ground materials. Deep, hydrocarbon-impacted Made Ground (to depths greater than 3.5 m) has been recorded locally beneath the central part of Zone B. From the CPT data, the Made Ground materials in this area could extend to approximately 4.7 m depth.

Within the western site boundary, dense, coarse-grained strata were identified within some of the CPTs at depths of between 3.5 m and 6.0 m. A trial pit was undertaken in this area but the trial pit was unable to extend deep enough to inspect the coarse-grained materials and, therefore, additional investigation is recommended in this area.

Polyaromatic hydrocarbons and asbestos have been identified locally in Made Ground. A capping layer may be required in proposed landscaped areas if impacted materials remain at the surface following the proposed earthworks. Barrier pipes may be required in areas of hydrocarbon-impacted soils, if they are not removed during the earthworks.

If additional, post-earthworks, ground gas monitoring is not undertaken, allowance should be made to provide ground gas precautions.

No unacceptable risks to controlled waters have been identified.

It is recommended that a Discovery Strategy be put in place during site development works, such that any unidentified contamination encountered is reported to a geoenvironmental specialist and further investigation undertaken. If visible asbestos-containing materials (ACMs) are identified, such materials should be hand-picked for disposal off site.

Historical surface workings are recorded within the western-most part of the site and the risk of dissolution features at the site is likely to be low. Based on observations made during both phases of the ground investigation, there is no evidence of chalk mining on site, nor is there any evidence of loose or voided strata associated with potential solution features. The depth to the top of the Upper Chalk strata is highly variable across the site from 0.7 m to 11.5 m depth and dense, coarse-grained materials have been identified locally at depth within the western part of Zone A. Therefore, to assess the potential for unrecorded mine workings and/or solution features to be present beneath the site, it is recommended that the Made Ground materials beneath proposed building footprints are removed and replaced with Engineered Fill. The formation strata should be inspected following the removal of Made Ground and prior to the placement of Engineered Fill. If unrecorded mine workings and/or solution features are identified, the foundation arrangements should be reviewed.

Earthworks are required at the site to create the required development platforms with up to 3.0 m of cut and up to 4.4 m of fill proposed across the site. It is recommended that Engineered Fill materials beneath the proposed building footprints should be placed in accordance with a Specification based on recommendations by Trenter and Charles (1996). The Engineered Fill materials placed within the external areas may be placed in accordance with a Method-Based Specification. It is recommended that all Made Ground materials be excavated from beneath the proposed building footprints and replaced with Engineered Fill.

Topsoil should not be used as Engineered Fill and, where possible, should be re-used in areas of soft managed landscaping. The main cut materials at the site are likely to comprise the Made Ground and Clay-with-Flints strata. Significant volumes of Upper Chalk strata are anticipated not to be excavated from areas of proposed cut but may be encountered locally and within foundation and service excavations. It is recommended that the ashy Made Ground materials (present in the former running track and locally beneath other areas of the site) are not used within the earthworks placed beneath the proposed building footprints but such materials may be suitable for re-use within external areas of the development (i.e. car parking, access roads and/or service yards). It should be noted that asbestos has been identified within these materials and the use of suitable PPE and dust control measures will be required during the earthworks.

Retaining structures, up to approximately 2.5 m in height, are proposed and it is considered that the use of gabions, crib walls or reinforced concrete cantilever walls should be suitable for this site. If there is insufficient space to form the required temporary works, consideration could be given to utilising an embedded retaining wall solution, such as sheet piles or soldier piles.

The Made Ground and low strength natural strata are considered unsuitable founding strata due to the unpredictable settlements that may occur in these materials. Based on the ground conditions, it is considered that pad foundations should be possible at this site but such foundations should be placed in either high strength Engineered Fill, medium to high strength Clay-with-Flints or the underlying Upper Chalk strata. To minimise the potential for unrecorded workings to remain beneath proposed buildings, it is recommended that, as part of the earthworks, all Made Ground be removed from beneath building footprints and replaced with Engineered Fill.

Consideration could be given to ground treatment using vibro-replacement techniques (stone columns) for some of the proposed units. However, the suitability of ground treatment will require confirmation by a specialist ground treatment contractor and acceptance by the Environment Agency. If ground treatment is proposed, it is recommended that in situ probing be undertaken in and around the footprint of the proposed units prior to any ground treatment.

On this basis that the Made Ground materials will be excavated and replaced with Engineered Fill and/or the Made Ground is treated using vibro-replacement techniques (stone columns), ground-bearing floors may be used.

Soakaway drainage should not be used in areas of Made Ground and/or Engineered Fill. The Clay-with-Flints strata are unlikely to be suitable for soakaway drainage due to the low permeability of these strata. In addition, due to the potential for dissolution features to be present within the Upper Chalk strata, soakaway drainage is not recommended. Therefore, an alternative method of site drainage should be identified.

Allowance should be made for further investigation in the central area of Zone B where localised deep Made Ground has been encountered and within the northern and western parts of Zone A where anomalous ground has been identified.

REFERENCES

Site-Specific References

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RPS Group PLC (April 2016) *Maylands Gateway, Hemel Hempstead, Phase 2: Geoenvironmental Site Investigation and Risk Assessment* Report Ref: RCEI39093-003 R

Technical References

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BRE (2015) *BR211 – Radon: Guidance on protective measures for new buildings* BRE Press

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BSI (2015) *BS 8485:2015 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings* British Standards Institution

BSI (2013) *BS 8576:2013 Guidance of Investigations for Ground Gas – Permanent Gases and Volatile Organic Compounds (VOCs)* British Standards Institution

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BSI (2004) *BS EN1997-1:2004 Eurocode 7: Geotechnical Design – Part 1: General Rules* British Standards Institution

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UKWIR (2010) *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites Report Ref. No. 10/WM/03/21* UK Water Industry Research

Wilson, S., Card, G. and Haines, S. (2009) *Ground Gas Handbook* Whittles Publishing

GENERAL NOTES

1. This report is provided in the context of the stated development proposals and should not be used in a different context.

2. The accuracy of map extracts cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.

3. Any borehole data from the British Geological Survey sources are included on the following basis: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation.

4. Where any data supplied by the Client or by other external sources, including previous site investigation data, have been used it has been assumed that the information is correct unless otherwise stated. No responsibility can be accepted by Crossfield Consulting Limited for inaccuracies within the data supplied by others.

5. Exploratory hole locations provided in the report are generally established by tape measurement from existing features or boundaries. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically requested.

6. Any assessments made in this report are based on the ground conditions indicated by the trial pits and/or boreholes, together with the results of any field or laboratory testing undertaken and, where appropriate, other relevant site data which may have been obtained for the site. Variations in ground conditions may occur between exploratory hole locations and there may be special conditions appertaining to the site which have not been revealed by the investigation and which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.

7. The report is provided for the sole use by the Client or its assignees and is confidential to the Client's professional advisers. No responsibility whatsoever for the contents of this report will be accepted to any person other than the Client or its assignees.

8. New information, improved practices and legislation may necessitate an alteration to the report in whole, or in part, after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Crossfield Consulting Limited for re-assessment and, if necessary, re-appraisal.

TABLES

TABLE 1

CONCEPTUAL SITE MODEL

Potential Contaminant Source	Potential Migration Routes	Receptors and Assessed Pollutant Linkage
Solids *Toxic metals*: Potential minor source associated with Made Ground. *Phytotoxic metals*: Potential minor source associated with Made Ground. *Polyaromatic hydrocarbons*: Potential minor source associated with Made Ground. *Petroleum Hydrocarbons:* Potential minor source associated with Made Ground. *Asbestos:* Potential sources associated with the demolition of former buildings (pavilions) and Made Ground. *Off-site source:* No source identified	***Movement of Solids*** Direct dermal contact, ingestion of soil and inhalation of dust are all viable pathways during construction. Dust exposure pathways may be present in proposed soft landscaping following development but new building and hardstanding will provide effective barrier to negate dermal, ingestion and inhalation pathways across the majority of the site. ***Release into Liquid Phase*** Metal solubility generally low at typical soil temperature and pH. Low possibility of metal uptake by plants. Polyaromatic hydrocarbons typically of low solubility and mobility. Weathered petroleum hydrocarbons generally low solubility. ***Release into Vapour Phase*** Not applicable (no source)	***Human Health*** *End Users:* Possible pollutant linkage *Construction Workers:* Possible pollutant linkage during development *Adjacent Properties:* Possible pollutant linkage during development ***Buried Structures & Services*** *Plastic pipes for potable water:* Possible pollutant linkage *Buried concrete:* No pollutant linkage *Other structures and services:* No pollutant linkage ***Landscape Areas*** Possible pollutant linkage
Liquids No known current source	***Movement of Liquids*** Not applicable (no source)	***Controlled Waters*** *Groundwater*: No pollutant linkage *Surface Water*: No pollutant linkage
Ground Gases *Ground Gases:* Potential minor source associated with the presence of Made Ground containing organic materials. *Radon:* No significant sources	***Movement of Gases*** Potential for migration through Made Ground.	***Human Health*** Possible pollutant linkage

NOTES

1. The above conceptual model is based on CIRIA C552 (2001) and BS 10175:2011+A1:2013.
2. The Conceptual Site Model is prepared from available desk study information. Where a site walkover or ground investigation identifies information that was not known at the desk study stage, such information is used to modify the Model.
3. Where a pollutant linkage is identified, any subsequent ground investigation is designed to obtain relevant information to assess the pollutant linkage. See Table 6 for a summary of pollutant linkage assessments.

SUMMARY OF ANALYTICAL TEST DATA: SOILS
POTENTIAL RISKS TO HUMAN HEALTH

Determinand	Units	No of Tests[6]	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
Arsenic	mg/kg	33	<0.1	49	640[1]	0	640[4]	0
Cadmium	mg/kg	33	<0.1	1.8	190[1]	0	410[4]	0
Chromium (Total)[5]	mg/kg	33	13	68	8600[1]	0	-	-
Chromium (VI)	mg/kg	33	<1.0	<4.0	33[1]	0	49[4]	0
Lead	mg/kg	33	5.2	210	1200[2]	0	2330[4]	0
Inorganic Mercury	mg/kg	33	<0.05	1.9	1100[1]	0	-	-
Nickel	mg/kg	33	3.5	91	980[1]	0	-	-
Selenium	mg/kg	33	<0.5	5.1	12,000[1]	0	-	-
Copper	mg/kg	33	3.3	230	68,000[1]	0	-	-
Zinc	mg/kg	33	24	530	730,000[1]	0	-	-
Phenols	mg/kg	10	<1.0	<1.0	440[1]	0	-	-
Petroleum Hydrocarbons								
Aliphatics $C_5 - C_6$	mg/kg	34	<0.01	<0.1	5900[1]	0	-	-
Aliphatics $C_6 - C_8$	mg/kg	34	<0.01	<0.1	17,000[1]	0	-	-
Aliphatics $C_8 - C_{10}$	mg/kg	34	<0.01	<0.1	4800[1]	0	-	-
Aliphatics $C_{10} - C_{12}$	mg/kg	34	<1.0	<1.5	23,000[1]	0	-	-
Aliphatics $C_{12} - C_{16}$	mg/kg	34	<1.2	36	82,000[1]	0	-	-
Aliphatics $C_{16} - C_{35}$	mg/kg	34	<1.5	1020	1,000,000[1]	0	-	-
Aromatics $C_6 - C_7$	mg/kg	34	<0.01	<0.1	46,000[1]	0	-	-
Aromatics $C_7 - C_8$	mg/kg	34	<0.01	<0.1	110,000[1]	0	-	-
Aromatics $C_8 - C_{10}$	mg/kg	34	<0.01	<0.1	8100[1]	0	-	-
Aromatics $C_{10} - C_{12}$	mg/kg	34	<0.9	1.7	28,000[1]	0	-	-
Aromatics $C_{12} - C_{16}$	mg/kg	34	<0.5	21	37,000[1]	0	-	-
Aromatics $C_{16} - C_{21}$	mg/kg	34	<0.6	190	28,000[1]	0	-	-
Aromatics $C_{21} - C_{35}$	mg/kg	34	<1.4	2000	28,000[1]	0	-	-
VOCs								
Benzene	mg/kg	34	<0.01	<0.001	47[1]	0	98[4]	0
Toluene	mg/kg	34	<0.01	<0.001	110,000[1]	0	-	-
Ethylbenzene	mg/kg	34	<0.01	<0.001	13,000[1]	0	-	-
Xylene	mg/kg	34	<0.01	<0.001	14,000[1]	0	-	-
MTBE	mg/kg	34	<0.01	<0.001	13,000[3]	0	-	-

Determinand	Units	No of Tests[6]	Concentration (mg/kg)		Generic Assessment Criteria (mg/kg) Commercial		Category 4 Screening Level (mg/kg) Commercial	
			Min	Max	Value	No>GAC	Value	No>C4SL
PAHs								
Naphthalene	mg/kg	34	<0.05	0.8	460[1]	0	-	-
Acenaphthylene	mg/kg	34	<0.10	6.0	97,000[1]	0	-	-
Acenaphthene	mg/kg	34	<0.10	6.7	97,000[1]	0	-	-
Fluorene	mg/kg	34	<0.10	7.5	680,000[1]	0	-	-
Phenanthrene	mg/kg	34	<0.10	38	22,000[1]	0	-	-
Anthracene	mg/kg	34	<0.10	15	540,000[1]	0	-	-
Fluoranthene	mg/kg	34	<0.10	57	23,000[1]	0	-	-
Pyrene	mg/kg	34	<0.10	63	54,000[1]	0	-	-
Benz(a)anthracene	mg/kg	34	<0.10	35	170[1]	0	-	-
Chrysene	mg/kg	34	<0.05	39	350[1]	0	-	-
Benzo(b)fluoranthene	mg/kg	34	<0.10	41	44[1]	0	-	-
Benzo(k)fluoranthene	mg/kg	34	<0.10	23	1200[1]	0	-	-
Benzo(a)pyrene	mg/kg	34	<0.10	56	35[1]	1	76[4]	0
Indeno(123cd)pyrene	mg/kg	34	<0.10	39	510[1]	0	-	-
Dibenzo(ah)anthracene	mg/kg	34	<0.10	7.8	3.6[1]	1	-	-
Benzo(ghi)perylene	mg/kg	34	<0.05	35	4000[1]	0	-	-

NOTES

1. Suitable for Use Level (S4UL) published by LQM/CIEH, 2015 – Commercial landuse. S4UL assumptions comprise 2.5% soil organic matter, soil pH of 7 and sandy loam soil type. Where S4UL presented by LQM is greater than 100%, the S4UL for this assessment has been capped at 1,000,000 mg/kg. S4ULs are copyright © Land Quality Management Limited reproduced with permission; Publication Number S4UL3133.
2. Generic assessment criteria (GAC) for lead calculated using CLEA Software version 1.06 (Environment Agency, 2009) with a lead intake based on a target blood level of 3.5 µg/dL. Other model assumptions comprise 2.5% soil organic matter, soil pH of 7 and sandy loam soil type.
3. Soil GAC for Human Health Risk Assessment produced by CL:AIRE (2010) – Commercial. Assumption of 2.5% soil organic matter.
4. Category 4 Screening Level (C4SL), Department for Environment Food and Rural Affairs (March 2014)
5. In the absence of desk study or historical map evidence indicating a potential source of chromium (VI) usage at or in the near vicinity of the site, total chromium concentrations have been compared to the GAC for chromium (III).
6. Results from the 2016 Phase II Geoenvironmental Site Investigation and Risk Assessment Report by RSP Group PLC have been included (source data presented in Appendix I) along with the results from the supplementary ground investigation by Crossfield Consulting Ltd (source data presented in Appendix II).

SUMMARY OF ANALYTICAL TEST DATA: PERCHED WATER/GROUNDWATER

Determinand	No of Tests	Concentration (µg/l)		Published Environmental Quality Standard (as listed in the Notes)	
		Min	Max	Value (µg/l)	No > Value[6]
Hardness	3	302	449	-	-
Sulphate	3	54	160	-	-
Arsenic	3	0.63	1.2	50 [1,4]	0
Cadmium	3	<0.03	0.08	1.5 [1]	0
Chromium	3	0.35	9.4	4.7 [1,4]	1
Lead	3	0.10	5.6	7.2 [1,4]	0
Mercury	3	<0.01	<0.01	0.07[1]	0
Copper	3	4.1	11	28 [1,4]	0
Nickel	3	6.1	15	20 [1,4]	0
Zinc	3	71	140	125 [1,4]	1
Selenium	3	0.6	1.7	10 [2]	0
Total Petroleum Hydrocarbons $C_5 - C_{35}$					
Aliphatics $C_5 - C_6$	2	<0.1	<0.1	-[5]	-
Aliphatics $C_6 - C_8$	2	<0.1	<0.1	-[5]	-
Aliphatics $C_8 - C_{10}$	2	<0.1	<0.1	-[5]	-
Aliphatics $C_{10} - C_{12}$	2	<1.0	1.9	-[5]	-
Aliphatics $C_{12} - C_{16}$	2	<1.0	24	-[5]	-
Aliphatics $C_{16} - C_{21}$	2	<1.0	31	-[5]	-
Aliphatics $C_{21} - C_{35}$	2	14	160	-[5]	-
Aromatics $C_6 - C_7$	2	<0.1	<0.1	-[5]	-
Aromatics $C_7 - C_8$	2	<0.1	<0.1	-[5]	-
Aromatics $C_8 - C_{10}$	2	<0.1	<0.1	-[5]	-
Aromatics $C_{10} - C_{12}$	2	<1.0	<1.0	-[5]	-
Aromatics $C_{12} - C_{16}$	2	<1.0	<1.0	-[5]	-
Aromatics $C_{16} - C_{21}$	2	<1.0	<1.0	-[5]	-
Aromatics $C_{21} - C_{35}$	2	<1.0	<1.0	-[5]	-

Determinand	No of Tests	Concentration (µg/l)		Published Environmental Quality Standard (as listed in the Notes)	
		Min	Max	Value (µg/l)	No > Value[6]
VOCs[6]					
Benzene	2	<1.0	<1.0	50[1]	0
Toluene	2	<1.0	<1.0	380[1]	0
Ethylbenzene	2	<1.0	<1.0	200[3]	0
Xylene	2	<1.0	<1.0	30[1,4]	0
MTBE	2	<1.0	<1.0	-	-
Polyaromatic Hydrocarbons					
Naphthalene	2	<0.01	<0.01	2.4[1,4]	0
Fluoranthene	2	<0.01	0.08	1[1]	0
Benzo(b)fluoranthene + Benzo(k)fluoranthene	2	<0.01	<0.01	0.03[1,4]	0
Benzo(a)pyrene	2	<0.01	<0.01	0.1[1]	0
Indeno(123cd)pyrene + Benzo(ghi)perylene	2	<0.01	<0.01	0.002[1,4]	0

NOTES

1. The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015. Type 7 River with moderate overall physic-chemical quality. Thresholds selected for "Good Standard for Rivers and Freshwater Lakes".
2. The Water Supply (Water Quality) Regulations 2010 and World Health Organisation values
3. Value based on the Dangerous Substance Directive (List II). The Environmental quality standard has not been updated for this chemical under the Water Framework Directive
4. Value is an annual average and not a maximum acceptable concentration
5. No standard value in the reference given in number 1, above. Environment Agency notes that acceptable quality relates to no visible evidence of petroleum hydrocarbons (such as free-phase product or oily sheens).
6. All other VOCs below laboratory detection limits
7. Value given is number of detectable concentrations greater than the environmental quality standard
8. Results from the 2016 Phase II Geoenvironmental Site Investigation and Risk Assessment Report by RSP Group PLC have been included (source data presented in Appendix I)

SUMMARY OF GROUND GAS CONDITIONS

Date	Standpipe Ref	Methane $C_{hg}CH_4$ (%)	Carbon Dioxide $C_{hg}CO_2$ (%)	Oxygen (%)	Trace Gases		Atm [1] (mb)	Standpipe Pressure [2] (mb)	Ground Gas [2,3] Flow Rate (litre/hr)	Characteristic Hazardous gas Flow Rate Methane $Q_{hgs}CH_4$ [4] (litre/hr)	Characteristic Hazardous gas Flow Rate Carbon Dioxide $Q_{hgs}CO_2$ [4]
					H_2S (ppm)	CO (ppm)					
1.03.16	WS01	<0.1	6.3	5.0	0	0	990	-	3.1	0.0031	0.1953
	WS02	<0.1	1.0	15.4	0	0	990	-	<0.1	0.0001	0.001
	WS03	<0.1	*	*	*	*	*	-	*	See Note 6	See Note 6
	WS04	<0.1	6.9	17.6	0	0	989	-	3.6	0.0036	0.2484
	WS05	<0.1	1.4	18.2	0	0	990	-	0.6	0.0006	0.0084
	WS06	<0.1	2.0	12.5	0	0	1020	-	5.1	0.0051	0.102
	WS07	<0.1	2.3	7.3	0	0	1004	-	3.1	0.0031	0.0713
	WS08	<0.1	2.2	14.5	0	0	997	-	1.9	0.0019	0.0418
	WS09	<0.1	1.6	18.3	0	0	995	-	1.0	0.001	0.016
	WS10	<0.1	1.5	17.1	0	0	997	-	1.5	0.0015	0.0225
	WS11	<0.1	1.6	17.1	0	0	1009	-	3.4	0.0034	0.0544
	WS12	<0.1	0.6	19.3	0	0	1000	-	2.1	0.0021	0.0126
	WS13	<0.1	3.0	17.0	0	0	989	-	1.2	0.0012	0.036
	WS14	<0.1	3.5	4.6	0	0	1001	-	11.1	0.0111	0.3885
	WS15	<0.1	3.3	9.2	0	0	1004	-	2.7	0.0027	0.0891
	WS16	<0.1	1.0	17.8	0	0	1006	-	3.2	0.0032	0.032
	WS17	<0.1	0.6	19.0	0	0	995	-	1.0	0.001	0.006
	WS18	<0.1	3.1	15.4	0	0	1001	-	2.5	0.0025	0.0775
	WS19	<0.1	2.1	18.4	0	0	1015	-	12.0	0.012	0.252
	WS20	<0.1	2.5	15.7	0	0	1003	-	2.7	0.0027	0.0675
	WS21	*	*	*	*	*	*	-	*	See Note 6	See Note 6
	WS22	<0.1	<0.0	8.6	0	0	990	-	<0.1	0.0001	0.0001
	WS23	<0.1	1.2	12.5	0	0	995	-	0.4	0.0004	0.0048
	WS24	<0.1	5.0	6.2	0	0	995	-	<0.1	0.0001	0.005
10.3.16	WS01	<0.1	6.8	3.1	0	0	1002	-	1.0	0.001	0.068
	WS02	<0.1	2.0	14.2	0	0	1000	-	8.0	0.008	0.16
	WS03	<0.1	1.9	13.2	0	0	999	-	<0.1	0.0001	0.0019
	WS04	<0.1	2.0	19.3	0	0	1002	-	0.4	0.0004	0.008
	WS05	7.1	5.2	0.4	0	0	1000	-	1.2	0.0852	0.0624
	WS06	<0.1	2.1	12.2	0	0	1003	-	<0.1	0.0001	0.0021
	WS07	<0.1	2.3	7.3	0	0	1004	-	3.1	0.0031	0.0713
	WS08	*	*	*	*	*	*	-	*	See Note 6	See Note 6
	WS09	<0.1	1.5	15.9	0	0	1000	-	<0.1	0.0001	0.0015
	WS10	<0.1	3.3	2.2	0	0	1003	-	<0.1	0.0001	0.0033
	WS11	<0.1	1.3	16.7	0	0	1004	-	1.0	0.001	0.013
	WS12	<0.1	0.8	19.1	0	0	1002	-	<0.1	0.0001	0.0008
	WS13	<0.1	1.2	19.2	0	0	1003	-	0.4	0.0004	0.0048
	WS14	<0.1	0.3	4.5	0	0	1004	-	<0.1	0.0001	0.0003
	WS15	<0.1	0.8	2.7	0	0	1004	-	<0.1	0.0001	0.0008
	WS16	<0.1	1.9	17.2	0	0	1003	-	1.2	0.0012	0.0228
	WS17	<0.1	0.7	16.8	0	0	1001	-	<0.1	0.0001	0.0007
	WS18	<0.1	3.4	14.5	0	0	1004	-	<0.1	0.0001	0.0034
	WS19	<0.1	0.6	18.0	0	0	1004	-	<0.1	0.0001	0.0006
	WS20	<0.1	1.0	9.8	0	0	1003	-	0.8	0.0008	0.008
	WS21	<0.1	2.7	12.1	0	0	1002	-	1.0	0.001	0.027
	WS22	<0.1	2.7	8.7	0	0	1002	-	1.2	0.0012	0.0324
	WS23	<0.1	2.6	16.7	0	0	1001	-	<0.1	0.0001	0.0026
	WS24	<0.1	4.4	7.4	0	0	1002	-	<0.1	0.0001	0.0044

Date	Standpipe Ref	Methane $C_{hg}CH_4$ (%)	Carbon Dioxide $C_{hg}CO_2$ (%)	Oxygen (%)	Trace Gases		Atm [1] (mb)	Standpipe Pressure [2] (mb)	Ground Gas [2,3] Flow Rate (litre/hr)	Characteristic Hazardous gas Flow Rate Methane $Q_{hgs}CH_4$ [4] (litre/hr)	Characteristic Hazardous gas Flow Rate Carbon Dioxide $Q_{hgs}CO_2$ [4]
					H_2S (ppm)	CO (ppm)					
15.03.16	WS01	<0.1	6.8	3.8	0	0	1012	-	1.9	0.0019	0.1292
	WS02	<0.1	2.0	14.2	0	0	1012	-	<0.1	0.0001	0.002
	WS03	<0.1	2.1	11.8	0	0	1011	-	0.1	0.0001	0.0021
	WS04	<0.1	4.7	15.4	0	0	1012	-	< 0.1	0.0001	0.0047
	WS05	<0.1	1.3	19.2	0	0	1010	-	0.1	0.0001	0.0013
	WS06	<0.1	2.3	12.1	0	0	1012	-	<0.1	0.0001	0.0023
	WS07	<0.1	2.4	9.3	0	0	1012	-	<0.1	0.0001	0.0024
	WS08	<0.1	2.3	16.2	0	0	1013	-	2.3	0.0023	0.0529
	WS09	<0.1	2.1	15.2	0	0	1010	-	0.4	0.0004	0.0084
	WS10	<0.1	3.8	12.0	0	0	1012	-	0.1	0.0001	0.0038
	WS11	<0.1	1.7	17.2	0	0	1013	-	1.0	0.001	0.017
	WS12	<0.1	0.9	18.8	0	0	1012	-	2.3	0.0023	0.0207
	WS13	<0.1	3.3	15.2	0	0	1012	-	0.6	0.0006	0.0198
	WS14	<0.1	1.8	5.9	0	0	1013	-	0.4	0.0004	0.0072
	WS15	<0.1	3.1	1.7	0	0	1013	-	1.6	0.0016	0.0496
	WS16	<0.1	1.8	18.6	0	0	1013	-	1.2	0.0012	0.0216
	WS17	<0.1	0.6	15.1	0	0	1012	-	<0.0	0.0001	0.0006
	WS18	<0.1	3.9	13.3	0	0	1013	-	0.4	0.0004	0.0156
	WS19	<0.1	0.9	12.5	0	0	1013	-	0.6	0.0006	0.0054
	WS20	<0.1	1.2	16.4	0	0	1013	-	1.5	0.0015	0.018
	WS21	<0.1	2.4	12.9	0	0	1012	-	1.8	0.0018	0.0432
	WS22	<0.1	2.3	10.3	0	0	1013	-	1.6	0.0016	0.0368
	WS23	<0.1	0.7	13.3	0	0	1012	-	1.6	0.0016	0.0112
	WS24	<0.1	5.6	3.1	0	0	1012	-	2.1	0.0021	0.1176
23.03.16	WS01	<0.1	7.6	1.6	0	0	996	-	<0.1	0.0001	0.0076
	WS02	<0.1	3.3	16.8	0	0	996	-	<0.1	0.0001	0.0033
	WS03	<0.1	2.5	8.4	0	0	996	-	<0.1	0.0001	0.0025
	WS04	<0.1	6.8	14.3	0	0	996	-	<0.1	0.0001	0.0068
	WS05	<0.1	1.8	18.2	0	0	994	-	<0.1	0.0001	0.0018
	WS06	<0.1	2.6	12.4	0	0	994	-	<0.1	0.0001	0.0026
	WS07	<0.1	7.6	1.6	0	0	995	-	<0.1	0.0001	0.0076
	WS08	<0.1	2.6	15.7	0	0	996	-	<0.1	0.0001	0.0026
	WS09	<0.1	2.4	15.5	0	0	996	-	<0.1	0.0001	0.0024
	WS10	<0.1	4.5	10.4	0	0	996	-	<0.1	0.0001	0.0045
	WS11	<0.1	2.1	16.6	0	0	996	-	<0.1	0.0001	0.0021
	WS12	<0.1	1.3	19.3	0	0	996	-	<0.1	0.0001	0.0013
	WS13	<0.1	2.4	15.4	0	0	995	-	<0.1	0.0001	0.0024
	WS14	<0.1	3.1	5.2	0	0	995	-	4.2	0.0042	0.1302
	WS15	<0.1	4.7	2.2	0	0	996	-	<0.1	0.0001	0.0047
	WS16	<0.1	2.0	18.8	0	0	996	-	<0.1	0.0001	0.002
	WS17	<0.1	0.9	19.6	0	0	996	-	<0.1	0.0001	0.0009
	WS18	<0.1	4.6	11.8	0	0	995	-	<0.1	0.0001	0.0046
	WS19	<0.1	1.1	17.1	0	0	995	-	5.3	0.0053	0.0583
	WS20	<0.1	2.2	18.3	0	0	996	-	<0.1	0.0001	0.0022
	WS21	<0.1	3.1	12.1	0	0	996	-	<0.1	0.0001	0.0031
	WS22	<0.1	2.9	8.5	0	0	996	-	<0.1	0.0001	0.0029
	WS23	<0.1	1.0	16.9	0	0	996	-	<0.1	0.0001	0.001
	WS24	<0.1	6.2	0.7	0	0	996	-	<0.1	0.0001	0.0062

Date	Standpipe Ref	Methane $C_{hg}CH_4$ (%)	Carbon Dioxide $C_{hg}CO_2$ (%)	Oxygen (%)	Trace Gases H_2S (ppm)	Trace Gases CO (ppm)	Atm [1] (mb)	Standpipe Pressure [2] (mb)	Ground Gas [2,3] Flow Rate (litre/hr)	Characteristic Hazardous gas Flow Rate Methane $Q_{hgs}CH_4$ [4] (litre/hr)	Characteristic Hazardous gas Flow Rate Carbon Dioxide $Q_{hgs}CO_2$ [4]
5.04.2016	WS01	<0.1	7.5	1.8	0	-11	985	-	<0.1	0.0001	0.0037
	WS02	<0.1	3.7	15.6	0	-11	985	-	<0.1	0.0001	0.0037
	WS03	<0.1	3.1	5.9	0	-18	987	-	<0.1	0.0001	0.0031
	WS04	<0.1	6.7	14.4	0	-11	985	-	<0.1	0.0001	0.0067
	WS05	<0.1	2.0	19.0	0	-16	986	-	<0.1	0.0001	0.002
	WS06	<0.1	2.9	11.6	0	-13	986	-	<0.1	0.0001	0.0029
	WS07	<0.1	2.5	9.7	0	-14	987	-	<0.1	0.0001	0.0025
	WS08	<0.1	2.5	16.0	0	-3	986	-	<0.1	0.0001	0.0025
	WS09	<0.1	0.3	20.6	0	-13	985	-	<0.1	0.0001	0.0003
	WS10	<0.1	9.6	4.2	0	-12	986	-	<0.1	0.0001	0.0096
	WS11	<0.1	2.0	17.0	0	-11	985	-	<0.1	0.0001	0.002
	WS12	<0.1	2.1	19.4	0	-13	986	-	<0.1	0.0001	0.0021
	WS13	<0.1	4.2	11.6	0	-10	985	-	<0.1	0.0001	0.0042
	WS14	<0.1	3.4	7.2	0	-12	987	-	<0.1	0.0001	0.0034
	WS15	<0.1	3.6	4.4	0	-11	985	-	<0.1	0.0001	0.0036
	WS16	<0.1	2.1	19.1	0	-12	986	-	<0.1	0.0001	0.0021
	WS17	<0.1	1.6	17.3	0	-12	985	-	<0.1	0.0001	0.0016
	WS18	<0.1	4.9	10.5	0	-13	987	-	<0.1	0.0001	0.0049
	WS19	<0.1	1.3	16.4	0	-12	987	-	<0.1	0.0001	0.0013
	WS20	<0.1	2.4	16.0	0	-13	985	-	<0.1	0.0001	0.0024
	WS21	<0.1	2.8	12.3	0	-12	987	-	<0.1	0.0001	0.0028
	WS22	<0.1	2.9	8.7	0	-13	986	-	<0.1	0.0001	0.0029
	WS23	<0.1	0.4	19.3	0	-13	985	-	<0.1	0.0001	0.0004
	WS24	<0.1	6.1	0.1	0	-12	985	-	<0.1	0.0001	0.0061
22.04.16	WS01	<0.1	8.1	1.9	0	-11	1002	-	<0.1	0.0001	0.0081
	WS02	<0.1	4.2	14.3	0	-12	1003	-	<0.1	0.0001	0.0042
	WS03	<0.1	3.5	3.4	0	-12	1002	-	<0.1	0.0001	0.0035
	WS04	<0.1	6.6	14.6	0	-11	1002	-	<0.1	0.0001	0.0066
	WS05	<0.1	1.5	19.7	0	-12	1002	-	<0.1	0.0001	0.0015
	WS06	<0.1	2.9	13.1	0	-10	1002	-	<0.1	0.0001	0.0029
	WS07	<0.1	3.4	6.0	0	-10	1003	-	<0.1	0.0001	0.0034
	WS08	<0.1	2.6	15.7	0	-14	1002	-	<0.1	0.0001	0.0026
	WS09	<0.1	2.8	13.7	0	-11	1002	-	<0.1	0.0001	0.0028
	WS10	<0.1	1.3	18.5	0	-10	1002	-	<0.1	0.0001	0.0013
	WS11	<0.1	2.1	16.6	0	-13	1004	-	<0.1	0.0001	0.0021
	WS12	<0.1	1.4	19.4	0	-12	1003	-	<0.1	0.0001	0.0014
	WS13	<0.1	4.0	11.6	0	-11	1002	-	<0.1	0.0001	0.004
	WS14	<0.1	3.7	9.0	0	-11	1003	-	<0.1	0.0001	0.0037
	WS15	<0.1	2.7	8.3	0	-11	1003	-	<0.1	0.0001	0.0027
	WS16	<0.1	2.0	19.0	0	-15	1004	-	<0.1	0.0001	0.002
	WS17	<0.1	1.8	15.9	0	-12	1003	-	<0.1	0.0001	0.0018
	WS18	<0.1	5.2	9.2	0	-11	1003	-	<0.1	0.0001	0.0052
	WS19	<0.1	1.4	16.4	0	-12	1004	-	<0.1	0.0001	0.0014
	WS20	<0.1	1.8	17.1	0	-13	1005	-	<0.1	0.0001	0.0018
	WS21	<0.1	3.1	11.6	0	-12	1003	-	<0.1	0.0001	0.0031
	WS22	<0.1	2.9	9.3	0	-12	1003	-	<0.1	0.0001	0.0029
	WS23	<0.1	0.6	14.9	0	-12	1003	-	<0.1	0.0001	0.0006
	WS24	<0.1	5.9	0.1	0	-12	1003	-	<0.1	0.0001	0.0059

NOTES:

1. Atm denotes atmospheric pressure. R: rising F: falling S: static (pressure trend is over day of measurement, as indicated on the record sheets).

2. Negative recorded flow/pressure values are indicative of flow from the atmosphere into the standpipe and are associated with negligible ground gas emissions to atmosphere.

3. Ground Gas Flow Rate (q) measured at the gas tap on monitoring standpipe.

4. Characteristic Hazardous Gas Flow Rate (Q_{hgs}) = (C_{hg} / 100) x q (from BS 8485:2015). This value has been calculated for each gas under highest recorded flow conditions.
This parameter is similar to the "Gas Screening Value" (GSV) in NHBC/RSK Report 10627-R01.04 (2007) and in CIRIA C665 (2007).

5. Results from the 2016 Phase II Geoenvironmental Site Investigation and Risk Assessment Report by RSP Group PLC have been included (source data presented in Appendix I)

6. Gas Tap open – No readings were taken on this occasion

7. The values presented in the ground gas monitoring data for Hydrogen Sulphide (ppm) on the 5th and 6th visit are unclear regarding what has actually been recorded.

TABLE 5

GROUND GAS DATA SUFFICIENCY ASSESSMENT

The following assessment is based on Table F1: BS8576 (2013).

Action	Result	
Recorded Ground Gas Regime	Characteristic Hazardous Gas Flow Rate[1]: Methane	0.08 litre/hr
	Characteristic Methane Concentration:	7.1 %
	Characteristic Hazardous Gas Flow Rate[1]: Carbon dioxide	0.19 litre/hr
	Characteristic Carbon dioxide Concentration:	6.3 %
	Other gases of concern:	None
	Characteristic Situation (CS) [2]	CS 2
Increase in Ground Gas Concentration required increase level of risk/gas protection requirements.	Assuming a constant gas flow rate of 3.1 l/hr, the concentration of methane or carbon dioxide would need to increase to 22 % to increase protection requirements to CS 3.	
Increase in Ground Gas Flow rate required increase level of risk/gas protection requirements.	Assuming constant methane concentrations of 7.1 % and carbon dioxide concentrations of 6.3 %, gas flow rate would need to increase to 10 l/hr or 11 l/hr. Although flow rates of 11 l/hr and 12 l/hr have locally been recorded, the values are anomalous and not characteristic of the data set as a whole. Such flow rates would be more typical of a landfill source.	
Likelihood of increase in Ground Gas Concentration required increase level of risk/gas protection requirements.	Effectively **no** likelihood of the above increase in ground gas concentrations, as there is only a minor potential source associated with the presence of low organic matter content in the Made Ground material at the site.	
Likelihood of increase in Ground Gas Flow Rate required increase level of risk/gas protection requirements.	There is no valid mechanism for a future increase in gas generation and associated flow rates.	
Conclusion: Requirement for Additional Ground Gas Monitoring	**No** – Based on the above assessment, additional ground gas monitoring is not required to support an assessment compliant with BS8485 (2015) and BS8576 (2013).	

NOTES:

1. Characteristic Hazardous Gas Flow Rate as defined in BS8485:2015. This parameter is synonymous with the "Gas Screening Value" (GSV) in NHBC/RSK Report 10627-R01.04 (2007) and in CIRIA C665 (2007).
2. Reference should also be made to the accompanying detailed assessment presented in Section 7 of the report.

ASSESSMENT OF POLLUTANT LINKAGES

NOTES:
1. Pollutant linkage validity assessed following qualitative or semi-quantitative risk assessment.
2. Pollutant linkage assessed following detailed quantitative risk assessment or assuming the recommended remediation or mitigation measures are in place

		Consequence (C)			
		Severe	Medium	Mild	Minor
Probability (P)	High likelihood (HL)	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
	Likely (L)	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
	Low likelihood (LL)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely (UL)	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

All terminology in accordance with the definitions provided in CIRIA C552 (2001)

Pollutant Linkage			Assessment of Pollutant Linkage following Ground Investigation	Pollutant Linkage Valid? [1]	Risk Rating			Quantitative Risk Assessment	Recommended Remediation/Mitigation (See Section 7 for further details)	Recommended Work Verified?	Pollutant Linkage Valid? [2]
Source	Pathway	Receptor			C	P	Risk				
Toxic Metals Petroleum Hydrocarbons PAHs Asbestos	Dermal Contact (dust), Ingestion (dust)	End Users	Certain PAHs (benzo(a)pyrene and dibenzo(an)anthracene) elevated above the GAC at one location. Loose fibres of chrysotile, amosite asbestos were identified at three locations within the western area with maximum concentrations of 0.001%.	Yes Yes	Med Sev	LL UL	Mod/Low Mod/Low	Not applicable	The commercial proposed development will include a large area of hardstanding/buildings that will potential inhibit any pathway for contaminants following development. However, if soft landscaping is proposed within the area of PAHs and asbestos impaction, it is recommended allowance be made for the placement of a capping layer within these areas.	To be confirmed during construction phase	No
Toxic Metals Petroleum Hydrocarbons PAHs Asbestos	Dermal Contact (dust), Ingestion (dust)	Construction Workers	All test below concentrations considered to be short term (acute) risk. No further assessment required. Loose fibres of chrysotile and amosite asbestos were identified at three locations within the western area with maximum concentrations of 0.001%.	No Yes	n/a Sev	n/a UL	n/a Mod/Low	Not applicable	Not applicable but standard personal protective equipment is recommended as good practice. Any visible ACMs fragments should be hand-picked and bagged before being removed from site in a skip/bin with a lid. Dust suppression measures to be adopted when undertaking ground works.	To be confirmed during construction phase	No
Toxic Metals Petroleum Hydrocarbons PAHs Asbestos	Dermal Contact (dust), Ingestion (dust)	Neighbours/general public	Certain PAHs (benzo(a)pyrene and dibenzo(an)anthracene) elevated above the GAC at one location. Loose fibres of chrysotile, amosite asbestos were identified at three locations within the western area with maximum concentrations of 0.001%.	Yes Yes	Med Sev	UL UL	Low Mod/Low	Not applicable	Conventional dust control to be used during construction.	To be confirmed during construction phase	No
Phytotoxic Metals	Plant uptake	Landscape planting	Phytotoxic metals (nickel, zinc and copper) recorded at elevated levels in the Made Ground which may be detritus to healthy plant growth across the site.	Yes	Mild	LL	Low	Not applicable	A thickness of subsoil/ topsoil may be required to act as a growing medium for the proposed plants. It should be possible to reuse the topsoil across the site	To be confirmed during construction phase	No
Heavy Metals Petroleum hydrocarbons	Migration through shallow strata	Controlled waters	Concentrations of metals generally below EQS with small volume of zinc and chromium marginally above the EQS.	No	n/a	n/a	n/a	Not applicable.	Not applicable	Not applicable	No

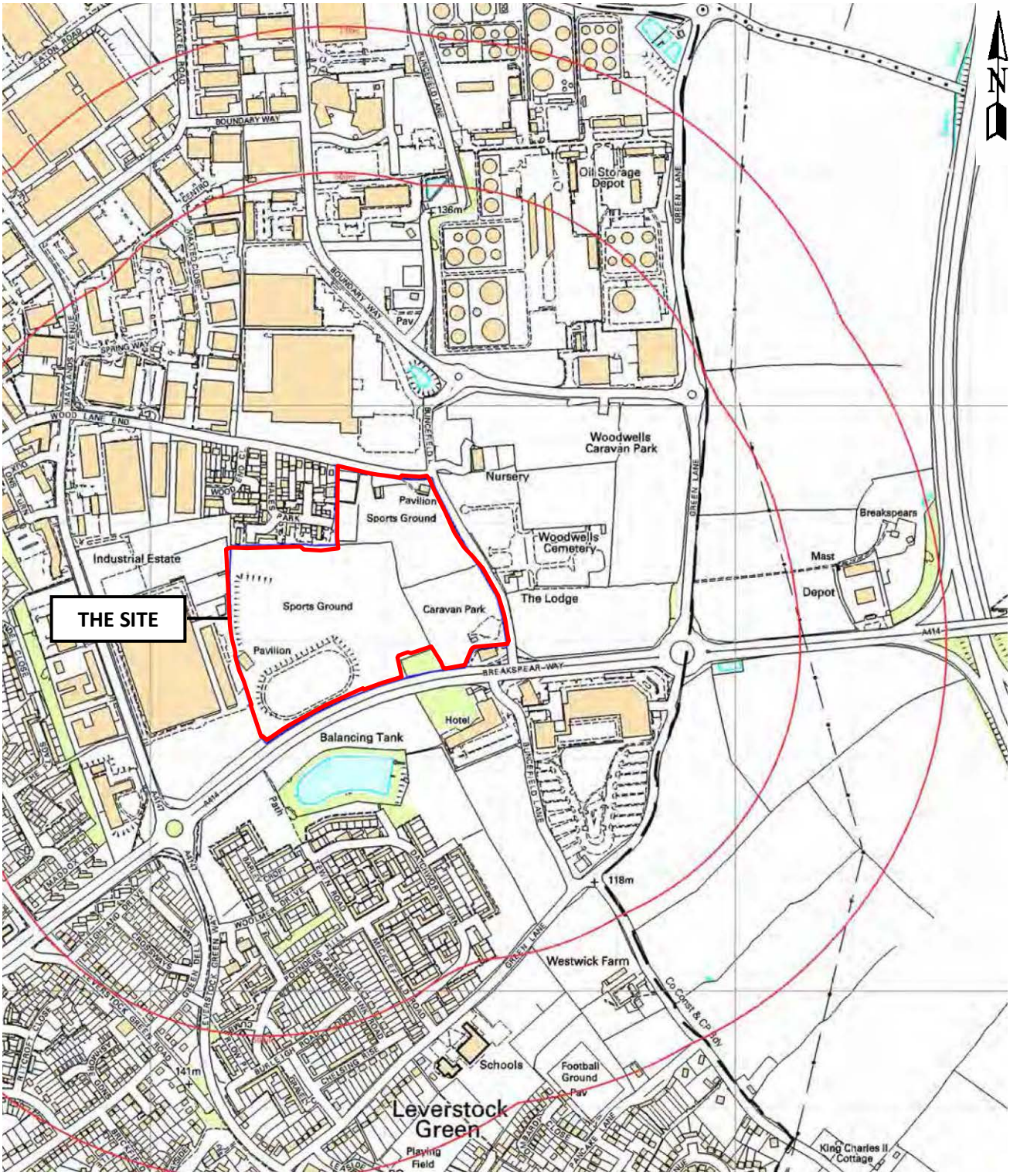
FIGURES

FIGURE 1

SITE LOCATION PLAN

Scale 1: 50,000

FIGURE 2



SITE PLAN
Scale 1:1000

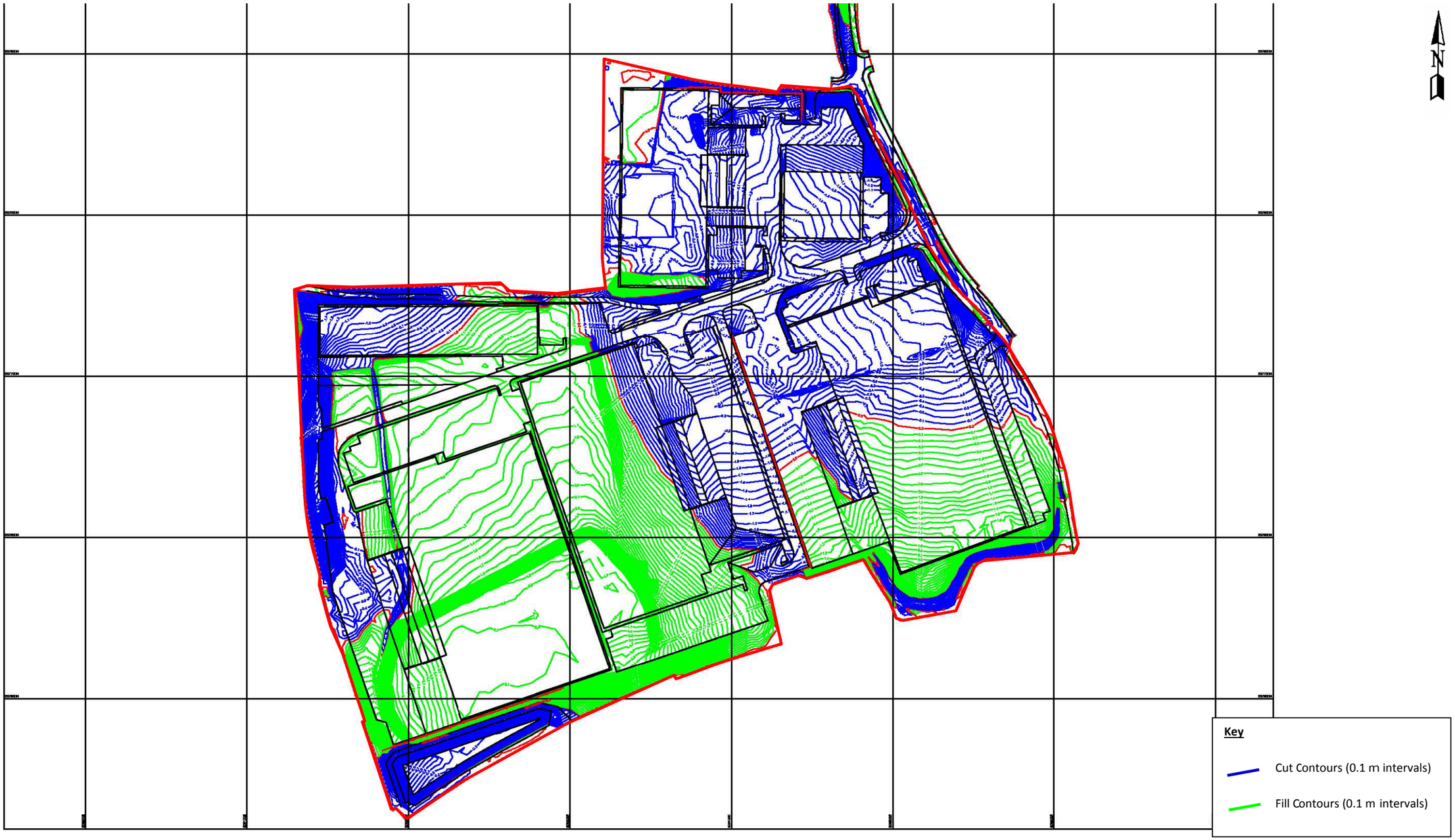
TOPOGRAPHICAL SITE SURVEY
Scale 1:2500

Plan based on the Topographical Survey drawing by Greenhatch Group, dated January 2016. Drawing No. 22846_T. Rev. 1

PROPOSED DEVELOPMENT PLAN

Scale 1:2500

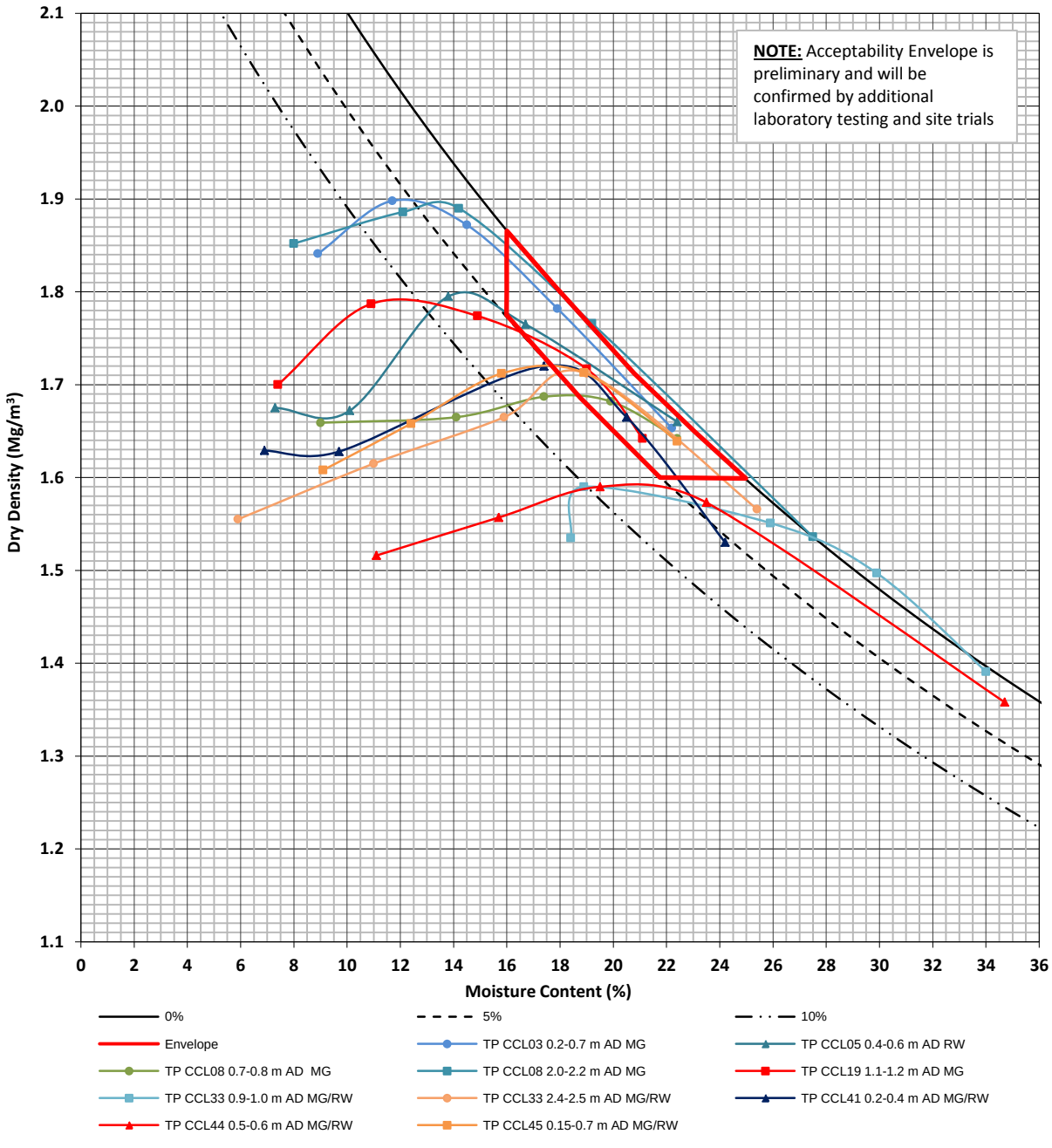
Reproduced from the Proposed Finished Levels Plan (NK18226-RPS-SI-XX-DR-C-SK-0202) drawing, dated February 2017. Drawing No. 9051a



CUT & FILL CONTOURS PLAN
Scale 1:2500

Reproduced from the Cut & Fill Contours Plan (NK18226-RPS-SI-XX-DR-C-SK-0202) drawing, dated February 2017. Drawing No. 9051b

FIGURE 6

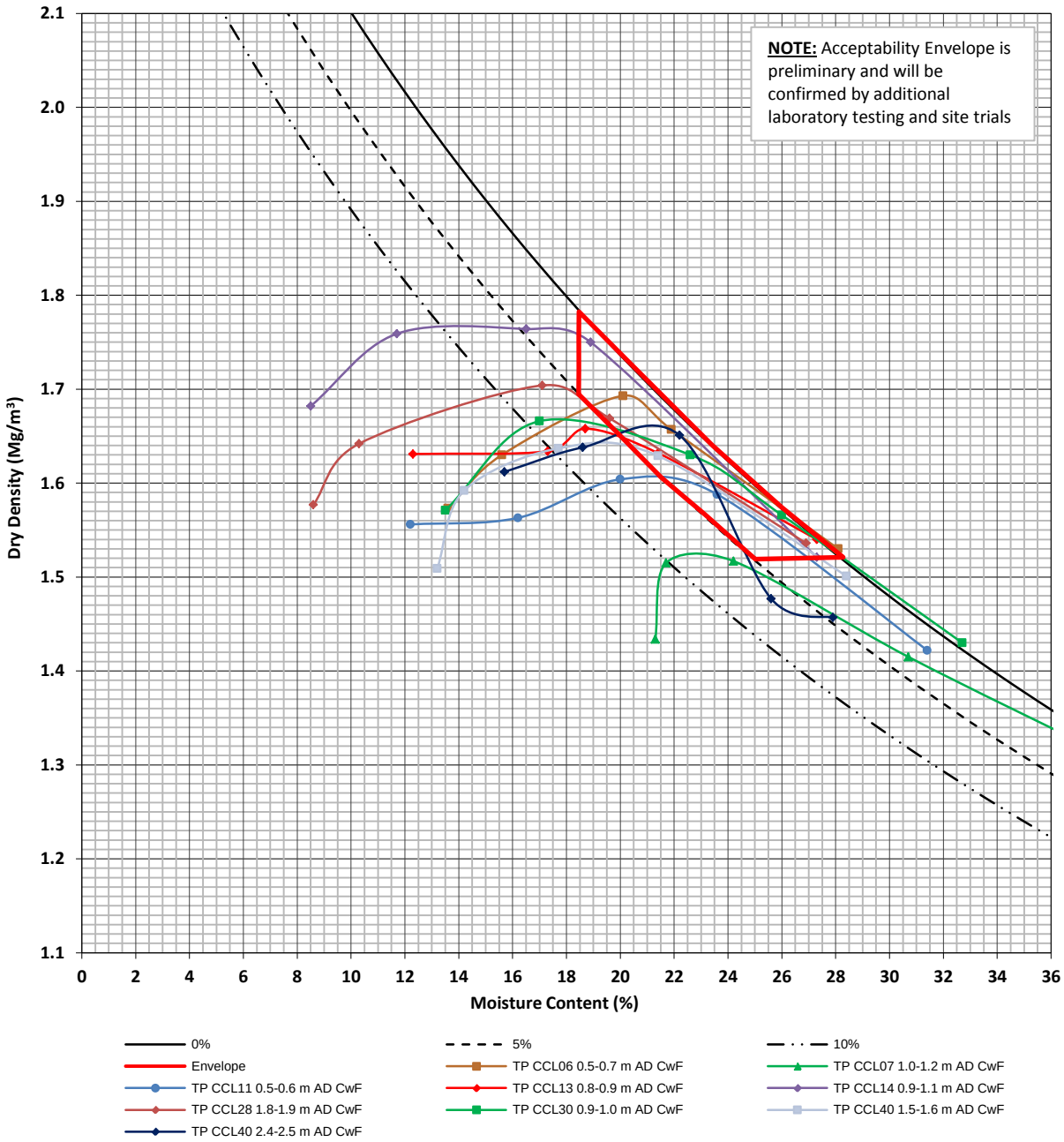


Specific Gravity = 2.66 Mg/m^3

Minimum Acceptable Dry Density = 1.60 Mg/m^3

MOISTURE CONTENT v DRY DENSITY RELATIONSHIP & PRELIMINARY ACCEPTABILITY ENVELOPE: MADE GROUND (AS-DUG)

FIGURE 7

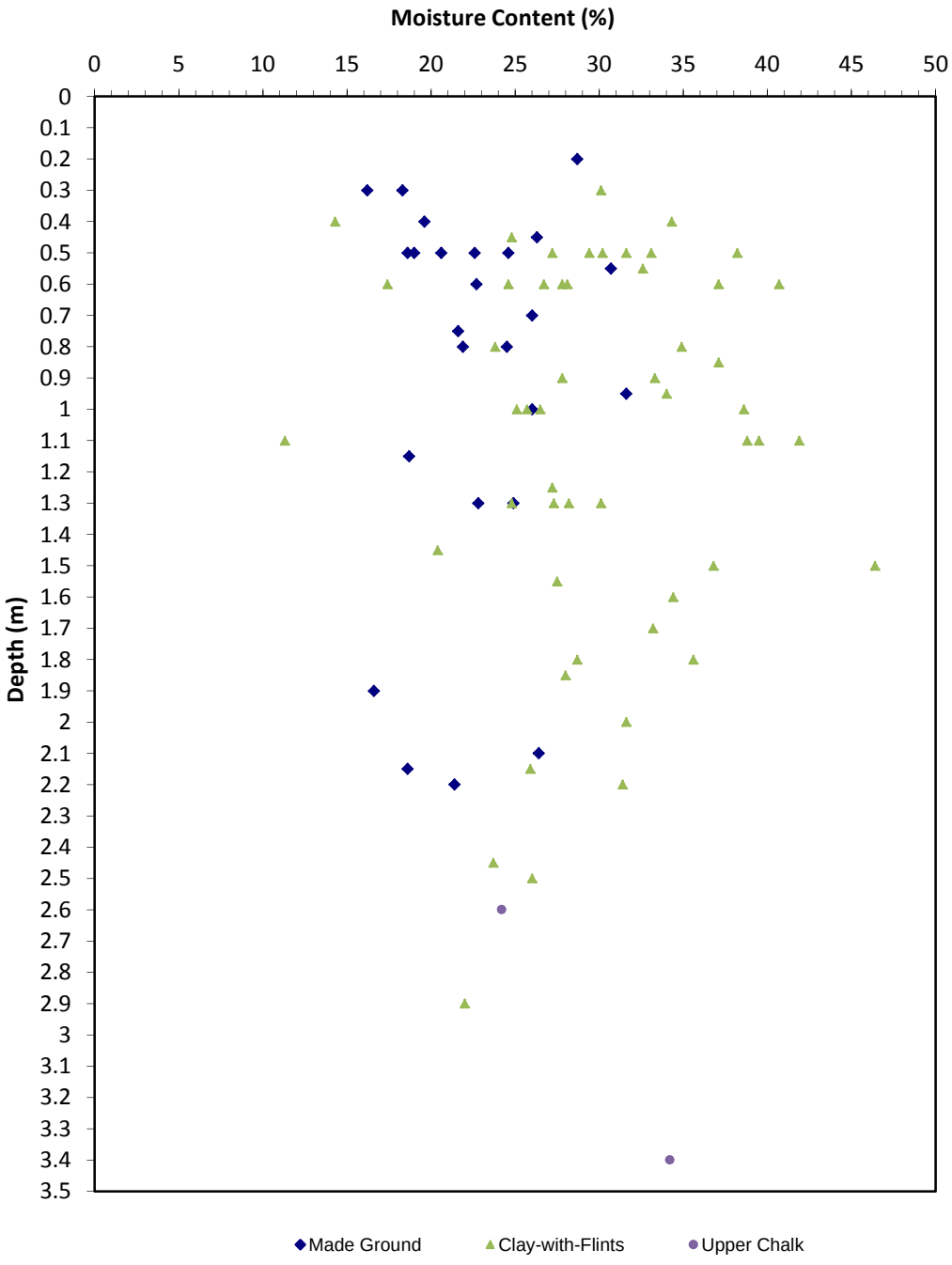


Specific Gravity = 2.66 Mg/m^3

Minimum Acceptable Dry Density = 1.52 Mg/m^3

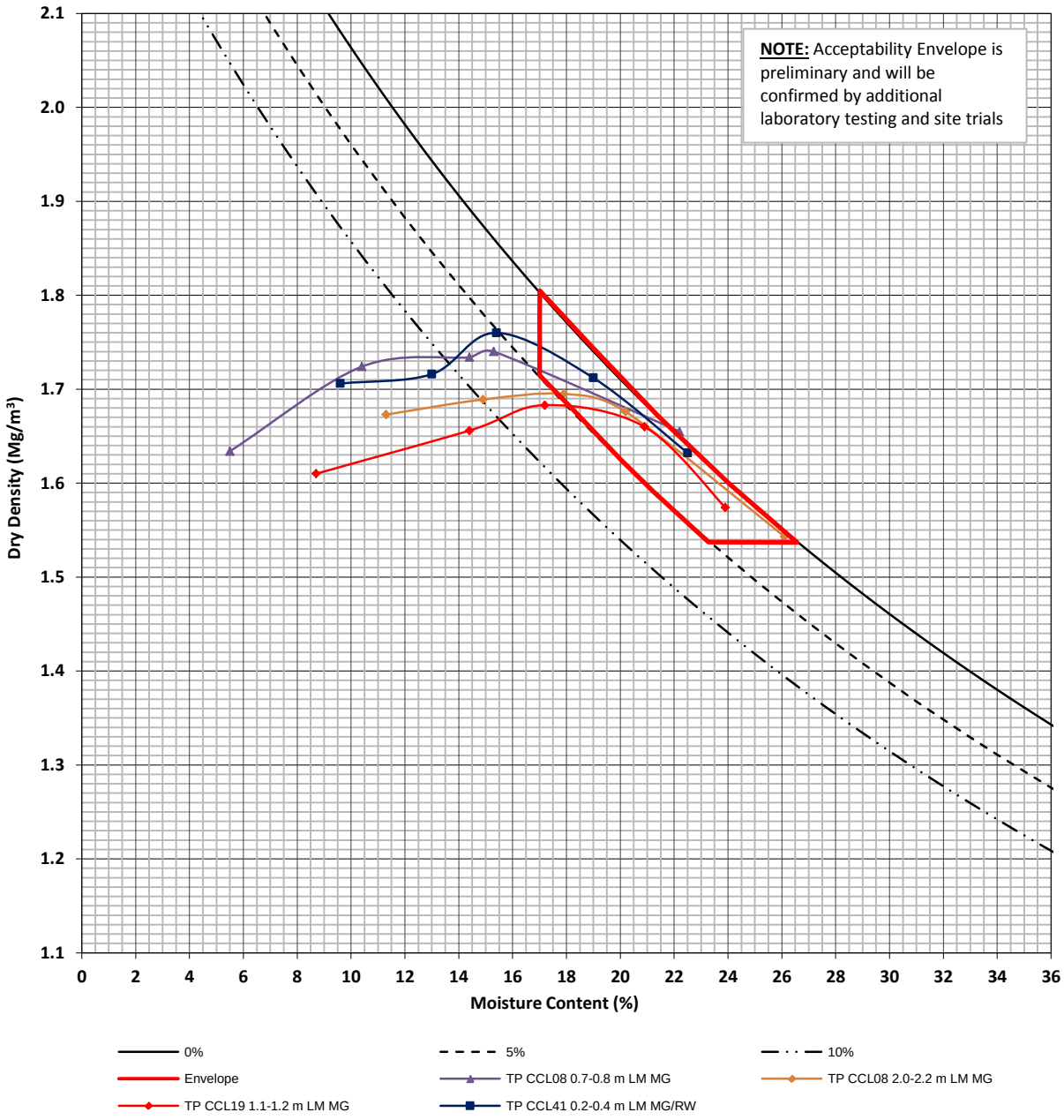
MOISTURE CONTENT v DRY DENSITY RELATIONSHIP & PRELIMINARY ACCEPTABILITY ENVELOPE: CLAY-WITH-FLINTS (AS-DUG)

FIGURE 8



MOISTURE CONTENT v DEPTH

FIGURE 9

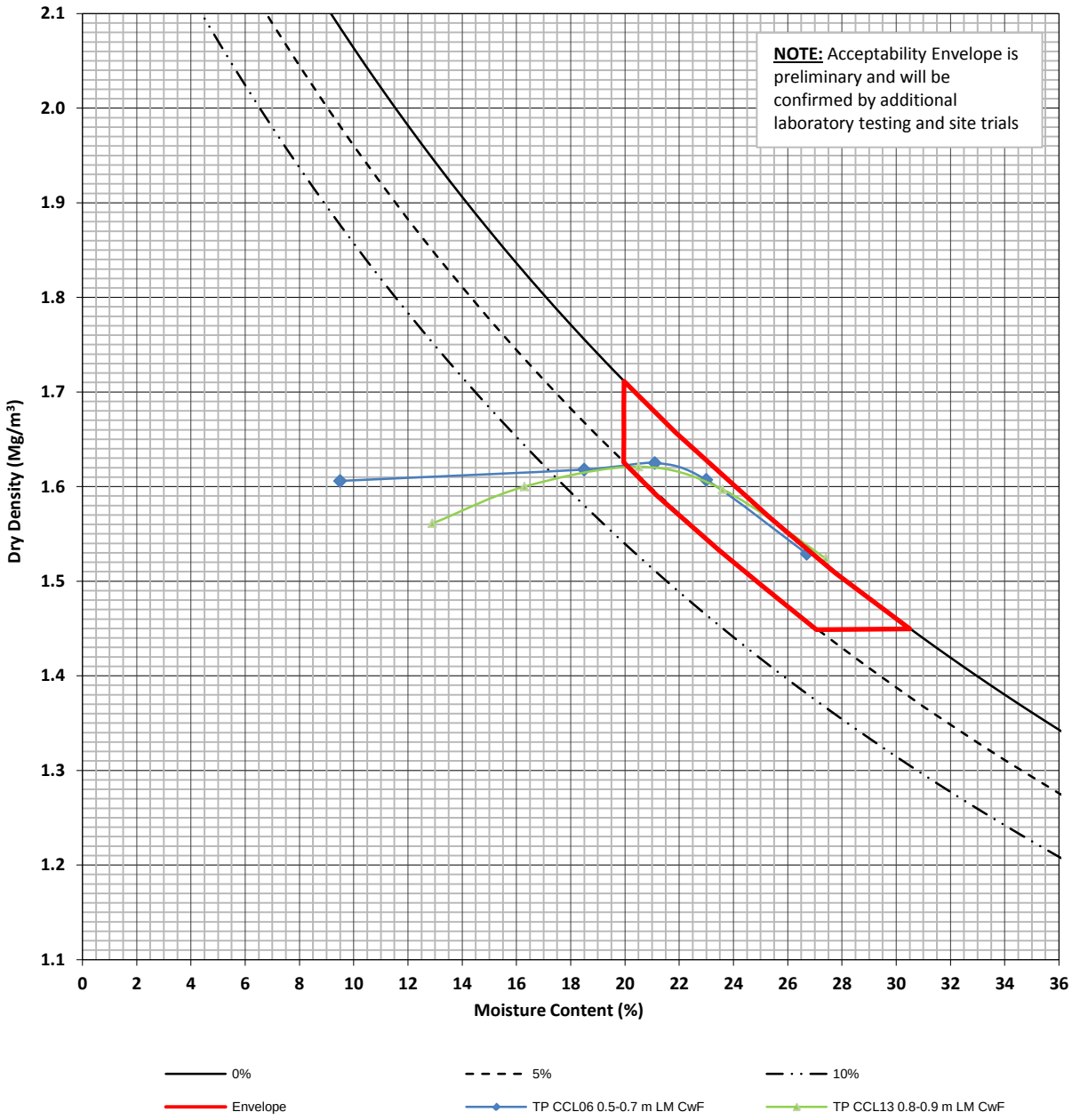


Specific Gravity = 2.60 Mg/m^3

Minimum Acceptable Dry Density = 1.54 Mg/m^3

MOISTURE CONTENT v DRY DENSITY RELATIONSHIP & PRELIMINARY ACCEPTABILITY ENVELOPE: MADE GROUND (2% LIME)

FIGURE 10



Specific Gravity = 2.60 Mg/m^3

Minimum Acceptable Dry Density = 1.46 Mg/m^3

MOISTURE CONTENT v DRY DENSITY RELATIONSHIP & PRELIMINARY ACCEPTABILITY ENVELOPE: CLAY-WITH-FLINTS (2% LIME)

APPENDIX I

APPENDIX I – GROUND INVESTIGATION BY RPS GROUP PLC (2016)

This Appendix presents the relevant factual records from a ground investigation undertaken at the site by RPS Group PLC in February 2016 (Reported in April 2016).

The following information is included:

- Trial Pit Logs (TP01 to TP24)
- Window Sample Logs (WS01 to WS24)
- Soil Infiltration Tests (TP20, TP21 and TP22)
- Analytical laboratory test results (soil and water)
- Ground Gas monitoring records
- Exploratory Hole Location Plan

TRIAL PIT LOG

Pit No. **TP01** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 0°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20	ES		0.00 0.25	(0.25)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		1.00	ES			(1.50)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
		1.50	B		1.75				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
		2.50	B			(1.25)			Terminated at 3.00m bgl as ground too hard. End of Pit at 3.00m	3
										4
										5
										6
										7
										8
										9
										10

Remarks: Terminated at 3.00m bgl as ground too hard

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP02** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20	ES		0.00	(0.50)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
					0.50				Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	1
		1.50	B			(1.90)				
		1.50	ES							2
		2.20	B							
					2.40				Structureless CHALK composed of very silty cream CLAY weak, low density chalk gravel and fine to medium, sub-angular to sub-rounded rinded flint gravel; occasional veins of dark brown silty clay (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
						(2.40)				4
		4.80	B						Terminated at target depth. End of Pit at 4.80m	5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

AGS

TRIAL PIT LOG

Pit No. **TP03** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 0°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					0.00				Grass over dark brown silty gravelly sand with frequent fine to coarse, angular to sub-rounded gravels comprising flint, mixed lithology, red brick and metal with wood fragments. (MADE GROUND)	
		0.50	ES			(1.10)				
					1.10				Orange / brown mottled grey fissured silty CLAY with fine to medium, angular to sub-rounded flint gravel and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
		1.20	ES							
		1.50	B			(1.10)				
					2.20				Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	2
		2.20	B							
						(1.40)				3
									Terminated as ground too hard. End of Pit at 3.60m	4
										5
										6
										7
										8
										9
										10

Remarks: Terminated at 3.60m bgl as ground too hard. Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable.

TRIAL PIT LOG

Pit No. **TP04** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 45°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00 0.20	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		1.00	ES			(2.10)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
		2.00	B		2.30				Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
						(2.15)				3
		4.45	B						Terminated at target depth. End of Pit at 4.45m	4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

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TRIAL PIT LOG

Pit No. **TP05** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.25)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		0.70	ES		0.25	(4.25)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1 2 3 4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5 6 7 8 9 10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable.

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TRIAL PIT LOG

Pit No. **TP06** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00 0.20	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (MADE GROUND)	
		0.50	ES			(1.20)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	1
					1.40				Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	2
						(3.10)				3
										4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5
										6
										7
										8
										9
										10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP07** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		0.50	ES		0.20				Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.00	B			(1.10)				1
					1.30				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
						(2.70)				3
					4.00	(0.20)			Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	4
		4.20	B						Terminated at target depth. End of Pit at 4.20m	5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP08** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20	ES		0.00	(0.35)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		0.60	ES		0.35	(0.25)			Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAYGATE MEMBER)	
		1.30	B		0.60	(0.90)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
					1.50				Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay. (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
						(3.00)				3
		4.50	B						Terminated at target depth. End of Pit at 4.50m	4
										5
										6
										7
										8
										9
										10

Remarks: Pit stable. No groundwater encountered.

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP09** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20	ES		0.00	(0.35)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
					0.35	(0.75)			Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.00	ES		1.10	(1.00)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
		1.50	B		2.10	(2.40)			Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
		4.50	B						Terminated at target depth. End of Pit at 4.50m	3
										4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP10** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 0°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: MH	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.15)			Very dark brown sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular and of concrete and mixed lithology. (ASPHALT)	
		0.50	ES		0.15	(1.05)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (MADE GROUND)	1
					1.20	(3.30)			Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	2 3 4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5 6 7 8 9 10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable.

TRIAL PIT LOG

Pit No. **TP11** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20 - 0.25	ESE1		0.00 0.20	(0.20)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
						(1.60)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	1
		1.70 1.70 - 1.75	BB1 ESE2		1.80	(0.20)			Dark brown very silty clay with visible organic matter. (FILL)	2
					2.00				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	
						(2.00)				3
		4.00	BB2						Terminated at 4.0m.bgl as ground hard. End of Pit at 4.00m	4
										5
										6
										7
										8
										9
										10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable

AGS

TRIAL PIT LOG

Pit No. **TP12** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.20 - 0.25	ESE1		0.00	(0.30)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
					0.30				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	
		0.80 - 0.85	ESE2			(0.90)				1
					1.20				Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
						(3.30)				2
										3
										4
		4.50	BB1						Terminated at target depth. End of Pit at 4.50m	5
										6
										7
										8
										9
										10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable

AGS

TRIAL PIT LOG

Pit No. **TP13** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (MADE GROUND)	
		0.60	ES		0.20	(0.20)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint (FILL)	
					0.40	(1.60)			Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
		1.80	B							
					2.00	(0.50)			Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
					2.50	(2.00)			Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
		4.50	B							4
									Terminated at target depth. End of Pit at 4.50m	5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP14** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 90°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (MADE GROUND)	
					0.20	(0.20)			Orange / brown sandy gravely CLAY. Sand fraction is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. (FILL)	
		0.80	ES		0.40				Orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and occasional cobbles. (CLAY-WITH-FLINTS FORMATION)	1
						(3.10)				2
		3.40	B		3.50				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
						(1.00)				4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP15** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 135°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: MH	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00 0.20	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint gravels and rootlets. (TOPSOIL)	
		0.60	ES						Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	1
						(3.40)				2
		3.50	B		3.60				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
		4.50	B			(0.90)			Terminated at target depth. End of Pit at 4.50m	4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable.

AGS

TRIAL PIT LOG

Pit No. **TP16** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:	Orientation: 0°	TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES		0.00	(0.20)			Very dark brown sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular and of concrete and mixed lithology. (ASPHALT)	
		0.40	ES		0.20	(0.20)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	
					0.40				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	
						(2.50)				
		2.80	B							
					2.90				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
						(1.50)				
		4.40	B							
									Terminated at target depth. End of Pit at 4.50m	

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

AGS

TRIAL PIT LOG

Pit No. **TP17** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: MH	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10 - 0.15	ES		0.00	(0.20)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
		0.50 - 0.55	ES		0.20				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	
						(2.50)				1
										2
					2.70	(0.15)			Dark brown very silty clay with visible organic matter. (FILL)	
					2.85				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	3
						(1.65)				4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	
										5
										6
										7
										8
										9
										10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered

Stability: Stable

AGS

TRIAL PIT LOG

Pit No. **TP18** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.05 - 0.10	ES		0.00	(0.10)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
		0.50 - 0.55	ES		0.10	(1.10)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	1
					1.20	(0.50)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	
					1.70	(1.30)			Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
					3.00	(1.50)			Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
		4.50	B						Terminated at target depth. End of Pit at 4.50m	4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

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TRIAL PIT LOG

Pit No. **TP19** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.20 - 0.25	ES		0.00	(0.30)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (TOPSOIL)	
					0.30				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	
		1.00 - 1.05	ES			(2.10)				1
										2
					2.40				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	3
						(1.40)				
					3.80				Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	4
		4.50	B			(0.70)			Terminated at target depth.	
									End of Pit at 4.50m	5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

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TRIAL PIT LOG

Pit No. **TP20** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: MH	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.10 - 0.15	ES		0.00	(0.15)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular flint and red brick gravels and rootlets. (MADE GROUND)	
		0.40 - 0.45	ES		0.15	(0.90)			Orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.05	B		1.05	(3.45)			Structureless CHALK composed of cream very silty GRAVEL/COBBLES. Clasts are weak, low density cream chalk with brown staining and black specks; occasional veins of dark brown silty clay (Grade Dc). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	1 2 3 4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5 6 7 8 9 10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

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TRIAL PIT LOG

Pit No. **TP21** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20 - 0.25	ES		0.00	(0.40)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
		0.45 - 0.50	ES		0.40	(0.10)			Very dark brown coarse angular gravel. (MADE GROUND)	
		0.60 - 0.65	ES		0.50				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (MADE GROUND)	1
						(2.10)				2
					2.60	(0.30)			Dark brown very silty clay with visible organic matter. (MADE GROUND)	
		3.00	B		2.90	(0.10)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	3
									Terminated at target depth. End of Pit at 3.00m	4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

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TRIAL PIT LOG

Pit No. **TP22** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.20 - 0.25	ES		0.00	(0.30)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (TOPSOIL)	
					0.30				Orange/brown with dark brown mottling silty CLAY with fine to medium, angular to sub-angular gravels comprising rinded flints. (CLAY-WITH-FLINTS FORMATION)	
		1.00 - 1.05	ESE2							1
						(2.30)				2
					2.60				Structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		3.00	B			(0.40)			Terminated at target depth. End of Pit at 3.00m	3
										4
										5
										6
										7
										8
										9
										10

Remarks:

Groundwater: No groundwater encountered.

Stability: Stable

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TRIAL PIT LOG

Pit No. **TP23**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: MH	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10 - 0.15	ES		0.00	(0.30)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
		0.40 - 0.45	ESE2		0.30	(1.20)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	1
					1.50	(0.20)			Dark brown very silty clay with visible organic matter. (FILL)	
					1.70	(2.80)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	2 3 4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5 6 7 8 9 10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable

TRIAL PIT LOG

Pit No. **TP24** Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Equipment:		TP
Location:	Hemel Hempstead	Northing:	JCB 3CX	Pit Length: 2.00 m	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	Pit Width: 0.60 m	1:50

Backfill	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.10 - 0.15	ES		0.00	(0.20)			Grass over dark brown very silty clay with gravel of fine to medium, angular to sub-angular flint and rootlets. (MADE GROUND)	
		0.40 - 0.45	ES		0.20	(1.00)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	1
		1.20 - 1.25	ES		1.20	(0.30)			Dark brown very silty clay with visible organic matter. (FILL)	
					1.50	(3.00)			Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint. (CLAY-WITH-FLINTS FORMATION)	2 3 4
		4.50	B						Terminated at target depth. End of Pit at 4.50m	5 6 7 8 9 10

Remarks: Chalk not encountered.

Groundwater: No groundwater encountered.

Stability: Stable

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WINDOW SAMPLE LOG

Borehole No. **WS01**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00				(TARMACADAM)	
					0.02	(0.28)			Dark brown sandy gravel. Gravel is fine to coarse, angular to sub-angular and composed of flint and mixed lithology with wood fragments.	
		0.20	PID1	0.0ppm					(MADE GROUND)	
		0.20 - 0.25	ES1		0.30				Soft brown mottled orange sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded and of flint.	
		0.80	PID2	0.0ppm					(MADE GROUND)	
						(1.20)				
		1.00	SPT(S)	N=11 (1,3/3,2,3,3)						1
		1.00 - 2.00	Core							
					1.50				Soft grey/brown silty gravelly CLAY. Gravel is fine to coarse, angular to sub-rounded and of flint and red brick fragments.	
		1.60	PID3	0.0ppm					(MADE GROUND)	
		1.70 - 1.75	ES2							
		1.90	PID4	0.0ppm						
		2.00	SPT(S)	N=11 (2,3/2,2,3,4)						2
		2.00 - 3.00	Core			(1.20)				
		2.70	PID5	0.0ppm	2.70				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels.	
		3.00	SPT(S)	N=16 (3,2/3,4,4,5)					(CLAY-WITH-FLINTS FORMATION)	3
		3.00 - 4.00	Core			(1.25)				
		3.60 - 3.65	ES3							
					3.95				Soft structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins. (Grade Dm)	
		4.00	PID6	0.0ppm					(LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	4
		4.00	SPT(S)	N=5 (1,1/1,2,1,1)						
		4.00 - 5.00	Core			(1.05)				
		4.80 - 4.85	ES4							
		5.00	PID7	0.0ppm					End of Borehole at 5.00m	5
		5.00	SPT(S)	N=7 (1,1/1,2,1,3)						

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

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WINDOW SAMPLE LOG

Borehole No. **WS02**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 15/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm	WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm) / Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM		1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
					0.00				Grass over dark brown slightly clayey silty sandy gravel with freq. rootlets. Gravel is fine to coarse, sub-angular to sub-rounded and of flint with metal and wood fragments. Sand is fine to coarse. (MADE GROUND)	
		0.20	ES1			(0.40)				
		0.20	PID1	0.0ppm						
					0.40				Orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint and mixed lithology, visible organic matter and lenses of chalk. (FILL)	
		0.60	ES2							
		0.60	PID2	0.0ppm		(0.60)				
		1.00	SPT(S)	N=8 (2,2/2,2,2,2)	1.00				Soft orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	1
		1.50	ES3							
		1.50	PID3	0.0ppm						
						(1.75)				
		2.00	SPT(S)	N=16 (3,3/3,4,4,5)						2
					2.75				Firm - stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		3.00	SPT(S)	N=25 (4,4/5,5,6,9)						3
						(1.85)				
		4.00	SPT(S)	N=22 (4,4/4,6,5,7)						4
					4.60				Firm structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD	
		4.80	ES4			(0.40)				
		4.80	PID4	0.0ppm						
		5.00	SPT(S)	N=22 (3,2/4,6,5,7)						5

Continued on next sheet

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

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WINDOW SAMPLE LOG

Borehole No. **WS02**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 15/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results					CHALK FORMATION (undifferentiated))	
									End of Borehole at 5.00m	

6

7

8

9

10

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

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WINDOW SAMPLE LOG

Borehole No. **WS03**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 15/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES1		0.00	(0.20)			Grass over dark brown gravelly very silty clay with rootlets. Gravel is angular fine to medium flint and red brick fragments. (TOPSOIL)	
		0.10	PID1	0.0ppm	0.20					
		0.30	ES2						Brown mottled dark brown gravelly very silty clay. Gravel is angular fine to medium flint and red brick fragments. (MADE GROUND)	
		0.30	PID2	0.0ppm		(0.40)				
					0.60				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels and red brick fragments. (MADE GROUND)	
		0.90	ES3			(0.60)				
		0.90	PID3	0.0ppm						1
		1.00	SPT(S)	N=9 (1,2/2,2,2,3)						
					1.20				Firm - stiff orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.00	SPT(S)	N=16 (2,3/3,4,4,5)						2
		3.00	PID4	0.0ppm						
		3.00	SPT(S)	N=26 (3,5/5,6,7,8)		(4.80)				3
		4.00	SPT(S)	N=22 (4,5/5,5,5,7)						4
		5.00	PID5	0.0ppm						
		5.00	SPT(S)	N=22 (5,7/5,5,5,7)						5
									Continued on next sheet	

Remarks

No groundwater encountered. Chalk not encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS03**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 15/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		6.00	SPT(S)	50 (25 for 30mm/50 for 65mm)					End of Borehole at 6.00m	6 7 8 9 10

Remarks

No groundwater encountered. Chalk not encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS04**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
					0.00	(0.15)			Grass over dark brown slightly clayey silty sandy gravel with freq. rootlets. Gravel is fine to coarse, sub-angular to sub-rounded and of flint. Sand is fine to coarse. (TOPSOIL)	
		0.10	ES1		0.15					
		0.10	PID1	0.0ppm					Soft brown mottled orange clay with fine to coarse, angular to sub-angular gravels of flint. (FILL)	
		0.50	PID2	0.0ppm						
		0.90	PID3	0.0ppm						
		1.00	SPT(S)	N=5 (1,1/1,1,1,2)		(1.85)				1
		1.50	ES2							
		1.50	PID4	0.0ppm						
		2.00	PID5	0.0ppm	2.00				Soft dark orange/brown sandy CLAY. Sand is fine to coarse. (FILL)	2
		2.00	SPT(S)	N=11 (1,2/3,2,3,3)		(0.30)				
					2.30				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.50	PID6	0.0ppm						
		2.80	ES3			(1.00)				
		3.00	PID7	0.0ppm						3
		3.00	SPT(S)	N=17 (3,4/4,4,4,5)						
					3.30				Firm - stiff structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		3.50	PID8	0.0ppm						
		4.00	SPT(S)	N=23 (4,5/5,5,6,7)		(1.70)				4
		4.70	ES4							
		4.80	PID9	0.0ppm						
		5.00	SPT(S)	N=21 (4,3/4,3,5,9)						5
									Continued on next sheet	

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS04**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results					End of Borehole at 5.00m	

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS05**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.10	ES1		0.00	(0.15)			Grass over dark brown clayey gravelly fine to medium sand with frequent rootlets. Gravel is subangular to subrounded fine to coarse flint. (TOPSOIL)	
		0.10	PID1	0.0ppm	0.15				Soft orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.00	SPT(S)	N=4 (1,1/1,1,1,1)						1
						(2.45)				
		1.50	ES2							
		1.50	PID2	69.5ppm						
		2.00	SPT(S)	N=5 (1,0/1,1,1,2)						2
		2.50	PID3	8.2ppm						
					2.60				Soft - firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		3.00	PID4	0.0ppm						3
		3.00	SPT(S)	N=6 (1,1/1,1,2,2)						
		3.50	ES3							
						(3.40)				
		4.00	PID5	0.0ppm						4
		4.00	SPT(S)	N=15 (2,2/3,4,3,5)						
		5.00	PID6	0.0ppm						5
		5.00	SPT(S)	N=11 (,3/2,3,2,4)						

Continued on next sheet

Remarks

No groundwater encountered. Chalk not encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS05**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		6.00 6.00	PID7 SPT(S)	0.0ppm N=11 (2,3/2,2,3,4)					End of Borehole at 6.00m	6 7 8 9 10

Remarks

No groundwater encountered. Chalk not encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS06**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm	WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm) / Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM/LB		1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00				Grass onto dark brown very silty CLAY with fine to medium, angular gravels of flint. (TOPSOIL)	
		0.20 - 0.25	D1			(0.30)				
					0.30				Firm - stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		0.80 - 0.85	D2							
		1.00	SPT(S)	N=13 (1,2/2,3,4,4)						1
		1.00 - 2.00	Core							
		2.00	SPT(S)	N=16 (2,3/3,4,4,5)						2
		2.00 - 3.00	Core							
						(5.70)				
		3.00	SPT(S)	N=20 (3,3/4,4,5,7)						3
		3.00 - 4.00	Core							
		4.00	SPT(S)	N=21 (4,4/5,5,5,6)						4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=22 (2,2/3,4,7,8)						5
		5.00 - 6.00	Core							

Continued on next sheet

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS06**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM/LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
									End of Borehole at 6.00m	6
										7
										8
										9
										10

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS07**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm	WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm) / Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM		1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00	(0.20)			Grass onto dark brown very silty clay with fine to medium, angular gravels of flint. (FILL)	
					0.20				Orange/brown with dark brown mottling silty clay with fine to coarse, angular to sub-rounded flint gravel. (FILL)	
		0.40 - 0.45	ES1			(0.60)				
		0.90 - 0.95	ES2		0.80				Soft dark brown very silty clay with fine, angular flint gravels and organic matter. (FILL)	
		1.00	SPT(S)	N=9 (3,3/3,2,2,2)		(0.40)				1
		1.00 - 2.00	Core		1.20				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.50 - 1.55	ES3							
		2.00	SPT(S)	N=5 (2,1/1,1,2,1)						2
		2.00 - 3.00	Core			(2.00)				
		3.00	SPT(S)	N=6 (1,1/1,2,1,2)						3
		3.00 - 4.00	Core		3.20				Soft structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
						(0.80)				
		4.00	SPT(S)	N=8 (2,2/2,2,2,2)					End of Borehole at 4.00m	4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS08**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					0.00	(0.30)			Grass over brown silty gravelly clay with frequent rootlets. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)	
		0.20	ES1							
		0.20	PID1	0.0ppm	0.30				Firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		0.80	PID2	0.0ppm						
		1.00	SPT(S)	N=10 (1,2/2,2,2,4)						1
						(2.80)				
		1.80	PID3	0.0ppm						
		2.00	SPT(S)	N=17 (2,3/3,4,4,6)						2
		2.80	PID4	0.0ppm						
		3.00	SPT(S)	N=14 (3,6/3,4,3,4)						3
					3.10				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		3.50	ES2							
						(1.30)				
		3.80	PID5	0.0ppm						
		4.00	SPT(S)	N=7 (1,2/1,2,2,2)						4
					4.40				Firm structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		4.50	PID6	0.0ppm						
						(0.60)				
		4.80	ES3							
		5.00	SPT(S)	N=12 (3,3/3,3,3,3)						5
									End of Borehole at 5.00m	

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS09**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 16/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: LB			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					0.00				Grass over brown sandy gravelly clay. Sand fraction is fine to coarse. Gravel is angular to subrounded fine to coarse flint. (TOPSOIL)	
		0.30	ES1			(0.50)				
					0.50				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.00	SPT(S)	N=12 (1,2/2,3,3,4)						1
		1.50	ES2							
		2.00	SPT(S)	N=17 (2,3/3,4,5,5)						2
						(4.50)				
		3.00	SPT(S)	N=21 (3,3/4,5,5,7)						3
		4.00	SPT(S)	N=21 (3,4/5,5,5,6)						4
		5.00	SPT(S)	N=19 (3,3/5,4,4,6)						5
									End of Borehole at 5.00m	

Remarks

No groundwater encountered. Chalk not encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS10**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm	WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm) / Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM		1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00				Grass onto dark brown very silty clay with fine to medium, angular to sub-rounded gravels comprising flint, red brick and mixed lithology. (MADE GROUND)	
		0.40 - 0.45	ES1			(0.90)				
		1.00	SPT(S)	N=8 (1,1/1,2,2,3)	0.90				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	1
		1.00 - 2.00	Core							
		1.10 - 1.15	ES2							
		2.00	SPT(S)	N=5 (1,1/1,1,1,2)						2
		2.00 - 3.00	Core							
		3.00	SPT(S)	N=6 (1,1/1,1,2,2)		(4.10)				3
		3.00 - 4.00	Core							
		4.00	SPT(S)	N=8 (1,1/2,1,2,3)						4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=8 (1,1/1,2,2,3)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered. No Chalk encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS11**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00	(0.15)			Grass onto dark brown very silty clay with occ. fine to medium, angular gravels of flint. (TOPSOIL)	
		0.10 - 0.15	ES1		0.15				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		0.60 - 0.65	ES2			(0.85)				
		1.00	SPT(S)	N=9 (3,3/2,2,3,2)	1.00				Soft structureless CHALK comprising cream very silty CLAY with weak, low density chalk gravels and orange staining; occ. orange/brown silty clay veins and fine to medium, angular to sub-rounded rinded flints (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	1
		1.00 - 2.00	Core							
		1.30 - 1.35	ES3							
		2.00	SPT(S)	N=8 (2,2/2,2,2,2)		(2.00)				2
		2.00 - 3.00	Core							
		3.00	SPT(S)	N=6 (1,2/2,1,1,2)					End of Borehole at 3.00m	3
										4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS12**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00	(0.35)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular gravels of flint. (TOPSOIL)	
		0.30 - 0.35	ES1		0.35				Soft orange with red/brown/blue/grey mottling very silty CLAY with rare fine to medium, angular gravels of rinded flint. (CLAY-WITH-FLINTS FORMATION)	
		0.80 - 0.85	ES2							
		1.00	SPT(S)	N=9 (1,1/2,2,2,3)						1
		1.00 - 2.00	Core			(1.45)				
					1.80				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.00	SPT(S)	N=14 (5,4/3,3,3,5)						2
		2.00 - 3.00	Core			(0.90)				
					2.70				Loose - medium dense structureless CHALK comprising cream silty GRAVEL. Clasts are weak, low density with brown staining interbedded with Structureless CHALK comprising cream very silty CLAY with weak, low density chalk gravels, brown staining and occ. brown silty clay veins (Grade Dc) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		3.00	SPT(S)	N=8 (2,2/2,2,2,2)						3
		3.00 - 4.00	Core			(1.30)				
		4.00	SPT(S)	N=16 (2,3/4,4,4,4)					End of Borehole at 4.00m	4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS13**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00	(0.30)			Grass onto dark brown very silty CLAY with fine to medium, angular, gravels of flint. (TOPSOIL)	
		0.20 - 0.25	ES1		0.30				Firm orange with red/brown/blue/grey mottling very silty CLAY with rare fine to medium, angular gravels of rinded flint. (FILL)	
		0.80 - 0.85	ES2							
		1.00	SPT(S)	N=20 (2,3/4,4,5,7)						1
		1.00 - 2.00	Core			(1.60)				
		2.00	SPT(S)	N=28 (4,5/6,7,8,7)	1.90				Stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	2
		2.00 - 3.00	Core							
		3.00	SPT(S)	N=33 (6,7/8,8,8,9)						3
		3.00 - 4.00	Core			(3.10)				
		4.00	SPT(S)	N=32 (6,6/6,7,7,12)						4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=46 (6,7/8,10,12,16)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS14**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00	(0.10)			Grass onto dark brown very silty clay with fine to medium, angular, gravels of flint. (MADE GROUND)	
		0.30 - 0.35	ES1		0.10				Firm - stiff range/brown with brown mottling silty clay with fine to medium, angular gravels of flint. (FILL)	
		1.00	SPT(S)	N=17 (2,2/3,4,4,6)						1
		1.00 - 2.00	Core			(2.90)				
		2.00	SPT(S)	N=24 (6,6/4,5,7,8)						2
		2.00 - 3.00	Core							
		3.00	SPT(S)	N=27 (3,5/6,6,6,9)	3.00				Firm - stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	3
		3.00 - 4.00	Core							
		4.00	SPT(S)	N=22 (3,4/4,4,6,8)		(2.00)				4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=19 (3,4/5,5,4,5)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS15**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 18/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00				Grass onto dark brown very silty clay with fine to medium, angular, gravels of flint. (MADE GROUND)	
		0.20 - 0.25	ES1			(0.30)				
					0.30				Soft orange/brown with brown mottling silty clay with fine to medium, angular gravels of flint and occ. chalk lenses. (MADE GROUND)	
		0.85	ES2							
		1.00	SPT(S)	N=8 (1,1/2,2,2,2)						1
		1.00 - 2.00	Core							
						(2.50)				
		2.00	SPT(S)	N=11 (2,2/3,2,3,3)						2
		2.00 - 3.00	Core							
					2.80				Firm dark brown very silty CLAY with fine to medium, angular flints and organic matter. (MADE GROUND)	
						(0.20)				
		3.00	SPT(S)	N=13 (3,3/3,3,3,4)	3.00				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	3
		3.00 - 4.00	Core							
		4.00	SPT(S)	N=14 (2,3/3,3,3,5)		(2.00)				4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=16 (3,3/3,4,4,5)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered. No Chalk encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS16**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00	(0.30)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular gravels of flint. (TOPSOIL)	
		0.20 - 0.25	ES1		0.30				Soft orange with red/brown/blue/grey mottling very silty CLAY with rare fine to medium, angular gravels of rinded flint. (CLAY-WITH-FLINTS FORMATION)	
		0.50 - 0.55	ES2							
		1.00	SPT(S)	N=11 (1,2/2,3,3,3)						1
		1.00 - 2.00	Core			(1.70)				
		2.00	SPT(S)	N=12 (4,4/3,3,2,4)	2.00				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	2
		2.00 - 3.00	Core			(0.50)				
					2.50				Soft structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		3.00	SPT(S)	N=6 (1,0/1,0,2,3)		(0.50)			End of Borehole at 3.00m	3
										4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS17**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016		Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm	WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm) / Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM		1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
					0.00	(0.10)			Grass over dark brown very silty clay with frequent rootlets and rare angular medium flint gravel. (TOPSOIL)	
		0.20	ES1		0.10				Soft orange/brown with dark brown mottling silty clay with fine to medium, angular to rounded, gravels of flint (FILL)	
						(1.10)				
		1.00	SPT(S)	N=9 (1,2/2,2,2,3)						1
		1.30	ES2		1.20				Firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.00	SPT(S)	N=16 (2,3/3,4,4,5)						2
						(1.90)				
		3.00	SPT(S)	N=25 (5,5/8,5,4,8)						3
					3.10				Stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
						(0.50)				
					3.60				Firm structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
						(0.40)				
		4.00	SPT(S)	N=12 (4,4/4,3,2,3)						4
									End of Borehole at 4.00m	
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS18**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00	(0.50)			Grass onto dark brown very silty clay with fine to medium, angular, gravels of flint. (MADE GROUND)	
		0.40 - 0.45	ES1		0.50				Firm - stiff orange with red/brown/blue/grey mottling very silty CLAY with rare fine to medium, angular gravels of rinded flint. (FILL)	
		1.00	SPT(S)	N=15 (2,2/3,4,3,5)						1
		1.00 - 2.00	Core			(2.50)				
		2.00	SPT(S)	N=26 (3,3/5,6,7,8)						2
		2.00 - 3.00	Core							
		3.00	SPT(S)	N=24 (4,5/5,6,6,7)	3.00				Stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	3
		3.00 - 4.00	Core							
		4.00	SPT(S)	N=22 (4,4/4,6,5,7)		(2.00)				4
		4.00 - 5.00	Core							
		5.00	SPT(S)	N=25 (4,4/5,6,6,8)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS19**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM	200	4.00	1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00				Grass onto dark brown very silty clay with occasional fine to medium, angular, flint gravels. (MADE GROUND)	
		0.20 - 0.25	D1			(0.30)				
					0.30				Soft orange/brown with brown mottling silty clay with fine to medium, angular gravels of flint and occ. chalk lenses. (FILL)	
						(0.80)				
		0.90 - 0.95	D2							
		1.00	SPT(S)	N=11 (1,1/2,2,3,4)						1
		1.00 - 2.00	Core		1.10				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.00	SPT(S)	N=17 (2,2/3,4,4,6)						2
		2.00 - 3.00	Core			(2.45)				
		3.00	SPT(S)	N=14 (3,3/4,3,3,4)						3
		3.00 - 4.00	Core							
					3.55				Soft structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
						(0.45)				
		4.00	SPT(S)	N=11 (2,2/3,3,2,3)						4
		4.00 - 5.00	Core						End of Borehole at 4.00m	
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS20**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 19/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00	(0.20)			Grass onto dark brown very silty CLAY with fine to medium, angular to sub-angular gravels of flint. (TOPSOIL)	
		0.20 - 0.25	ES1		0.20				Soft orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		0.90 - 0.95	ES2							
		1.00	SPT(S)	N=9 (1,1/2,2,2,3)						1
		1.00 - 2.00	Core			(1.80)				
		2.00	SPT(S)	N=6 (1,1/2,1,2,1)	2.00				Soft structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins. (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	2
		2.00 - 3.00	Core			(1.00)				
		3.00	SPT(S)	N=9 (1,1/2,2,3,2)					End of Borehole at 3.00m	3
		3.00 - 4.00	Core							
		4.00 - 5.00	Core							4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS21**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00				Grass over dark brown silty gravelly clay with frequent rootlets. Gravel is angular medium flint. (MADE GROUND)	
		0.10	ES1			(0.25)				
					0.25				Orange / brown silty gravelly CLAY with black veins. Gravel is angular medium to coarse flint. (MADE GROUND)	
		0.50	ES2			(0.40)				
					0.65				Firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		1.00	SPT(S)	N=11 (1,2/2,2,3,4)						1
		1.00 - 2.00	Core							
						(2.15)				
		2.00	SPT(S)	N=13 (2,2/3,3,3,4)						2
		2.00 - 3.00	Core							
					2.80				Firm orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		3.00	SPT(S)	N=15 (2,3/3,3,4,5)						3
						(1.15)				
					3.95				Firm structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins Grade Dm). (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		4.00	SPT(S)	N=13 (1,2/1,3,5,4)						4
						(1.05)				
		5.00	SPT(S)	N=13 (7,3/3,2,3,5)						5
									End of Borehole at 5.00m	

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS22**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		0.00 - 1.00	Core		0.00	(0.05)			Grass over dark brown very silty CLAY with frequent rootlets. (MADE GROUND)	
		0.20	ES1		0.05	(0.45)			Dark brown silty gravelly clay with occasional lenses of coarse grey sand. Gravel is angular to subrounded fine to medium flint and stones of mixed lithology and red brick and concrete fragments. (MADE GROUND)	
		0.80	ES2		0.50				Firm orange/brown mottled dark brown silty CLAY with occasional angular coarse rinded flint gravel. (CLAY-WITH-FLINTS FORMATION)	
		1.00	SPT(S)	N=11 (2,1/3,2,3,3)		(1.00)				1
		1.00 - 2.00	Core							
					1.50				Soft structureless CHALK composed of cream very silty gravelly CLAY. Gravel is weak, low density chalk with black specks and brown veins of silty clay. Occasional angular fine to medium rinded flint gravel (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
		2.00	SPT(S)	N=8 (1,0/1,2,3,2)						2
		2.00 - 3.00	Core			(1.50)				
		3.00	SPT(S)	N=11 (3,3/3,3,3,2)					End of Borehole at 3.00m	3
										4
										5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS23**

Sheet 1 of 1

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					0.00	(0.05)			Dark brown very silty clay with frequent rootlets. (MADE GROUND)	
		0.20	ES1		0.05				Soft orange/brown mottled dark brown gravelly very silty CLAY. Gravel is angular to rounded fine to medium stones of mixed lithology and flint. Visible organic matter. (MADE GROUND)	
						(1.05)				
		1.00	SPT(S)	N=9 (1,1/1,2,3,3)						1
		1.20	ES2		1.10				Firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		2.00	SPT(S)	N=17 (2,2/3,4,5,5)						2
						(3.40)				
		3.00	SPT(S)	N=22 (3,4/4,5,6,7)						3
		4.00	SPT(S)	N=18 (3,3/3,4,4,7)						4
					4.50				Stiff structureless CHALK composed of cream very silty CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	
						(0.50)				
		5.00	SPT(S)	N=24 (5,4/3,7,6,8)					End of Borehole at 5.00m	5

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS24**

Sheet 1 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
		0.00 - 1.00	Core		0.00				Dark brown very silty gravelly clay. Gravel is angular to subrounded fine to coarse stones of mixed lithology, flint, and red brick and glass fragments. (MADE GROUND)	
		0.40	ES1			(0.60)				
					0.60				Soft - firm orange with blue/grey/red/brown mottling very silty CLAY with rare fine to medium, angular to rounded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		0.80	ES2							
		1.00	SPT(S)	N=9 (2,3/2,2,2,3)						1
		1.00 - 2.00	Core			(1.80)				
		2.00	SPT(S)	N=23 (4,5/6,6,6,5)						2
		2.00 - 3.00	Core							
					2.40				Firm - stiff orange/brown with dark brown mottling silty CLAY with fine to coarse, angular to sub-rounded rinded flint gravels. (CLAY-WITH-FLINTS FORMATION)	
		3.00	SPT(S)	N=20 (3,3/4,5,5,6)						3
		3.00 - 4.00	Core			(2.50)				
		4.00	SPT(S)	N=23 (6,6/5,6,6,6)						4
		4.00 - 5.00	Core							
					4.90				Soft structureless CHALK composed of cream very silty	
		5.00	SPT(S)	N=6 (2,1/2,1,2,1)		(0.10)				5

Continued on next sheet

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

WINDOW SAMPLE LOG

Borehole No. **WS24**

Sheet 2 of 2

Project Name:	Maylands Gateway	Co-ordinates:	Date(s): 17/02/2016			Hole Type:
Project No:	RCEI39093	Easting:	Drilling Method:	Pipe Diameter: 35mm		WS
Location:	Hemel Hempstead	Northing:	DART	Casing Diameter (mm)	Casing Depth (m)	Scale:
Client:	Prologis	Ground Level (mAOD):	Logged By: EM			1:25

Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results					CLAY with weak, low density chalk gravels and medium, sub-angular to angular rinded flint gravels; brown staining and occasional brown silty veins. (Grade Dm) (LEWES NODULAR CHALK FORMATION AND SEAFORD CHALK FORMATION (undifferentiated))	6
									End of Borehole at 5.00m	7
										8
										9
										10

Remarks

No groundwater encountered.

Groundwater			Chiselling		
Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)

AGS

RPS Group
Watersedge Business Park
Modwen Road
Salford Quays
M5 3EZ

Soil Infiltration Test (BRE Digest 365)

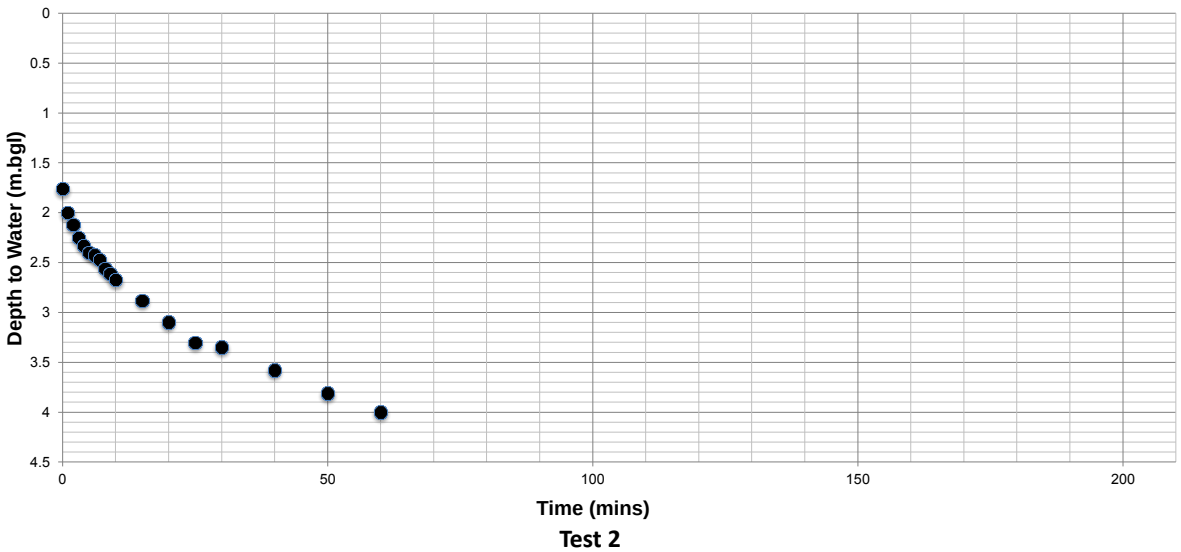
Client:	Prologis	Report Ref:	RCEI39093	**TP20**
Site:	Maylands Gateway, Hemel Hempstead	Date:	18th February 2016	

Soil Type: Silty clay with gravels over chalk.
Groundwater: No groundwater encountered.
Drain Invert Level: Not Known
Sidewall Stability: Stable.
Remarks:

Soil Infiltration Rate:

$$f = \frac{Vp75 - 25}{ap50 \times tp75 - 25}$$

		Test 1	Test 2
Dimensions of Trial Pit:	Depth (m)	4.5	4.5
	Width (m)	0.6	0.6
	Length (m)	2	2
Effective Depth (m)		3.5	3.5
V_{p75-25}: volume of the trial pit between 75% and 25% of the effective depth (m^3)		2.1	2.1
a_{p50}: internal surface area of trial pit up to 50% effective depth (m^2)		10.3	10.3
t_{p75-25}: time for water to fall from 75% to 25% effective depth (secs)		NA	2765
f: Soil Infiltration Rate (ms^{-1})			7.37E-05



Test 2

RPS Group Watersedge Business Park Modwen Road Salford Quays M5 3EZ	**Soil Infiltration Test (BRE Digest 365)**

Client:	Prologis	Report Ref:	RCEI39093	**TP21**
Site:	Maylands Gateway, Hemel Hempstead	Date:	18th February 2016	

Soil Type: Silty clay with gravel

Groundwater: No groundwater encountered

Drain Invert Level: Not Known

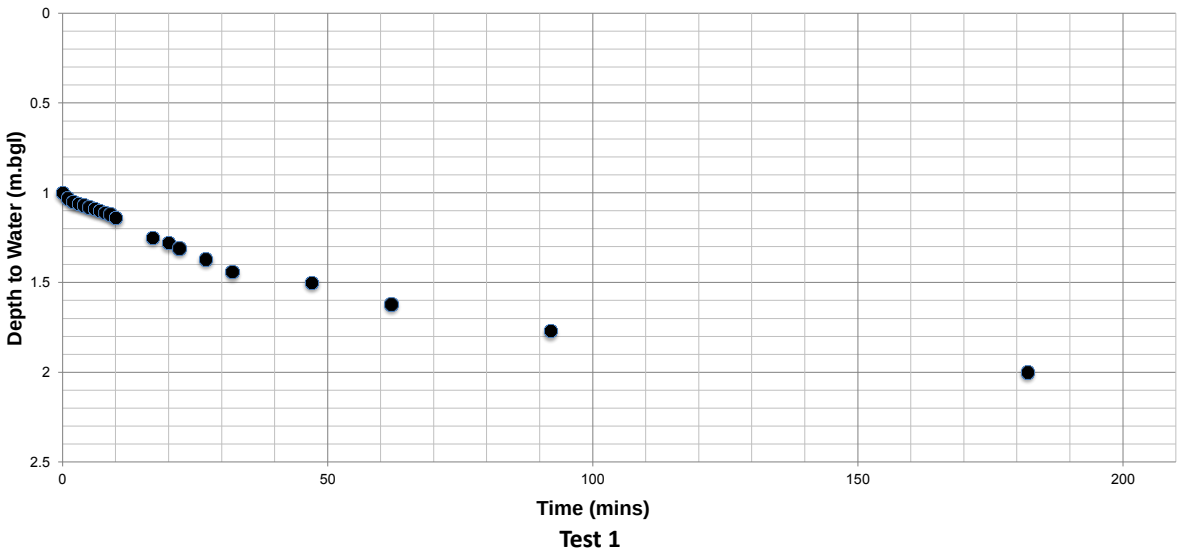
Sidewall Stability: Stable

Remarks: 25% not reached

Soil Infiltration Rate:

$$f = \frac{Vp75 - 25}{ap50 \times tp75 - 25}$$

		Test 1
Dimensions of Trial Pit:	Depth (m)	2.9
	Width (m)	0.6
	Length (m)	2
Effective Depth (m)		1.9
V_{p75-25}: volume of the trial pit between 75% and 25% of the effective depth (m^3)		1.14
a_{p50}: internal surface area of trial pit up to 50% effective depth (m^2)		6.14
t_{p75-25}: time for water to fall from 75% to 25% effective depth (secs)		NA
f: Soil Infitration Rate (ms^{-1})		



Test 1

RPS Group
Watersedge Business Park
Modwen Road
Salford Quays
M5 3EZ

Soil Infiltration Test (BRE Digest 365)

Client:	Prologis	Report Ref:	RCEI39093	**TP22**
Site:	Maylands Gateway, Hemel Hempstead	Date:	18th February 2016	

Soil Type: Silty clay with gravels. Structureless chalk at base.

Groundwater: No groundwater encountered.

Drain Invert Level: Not Known

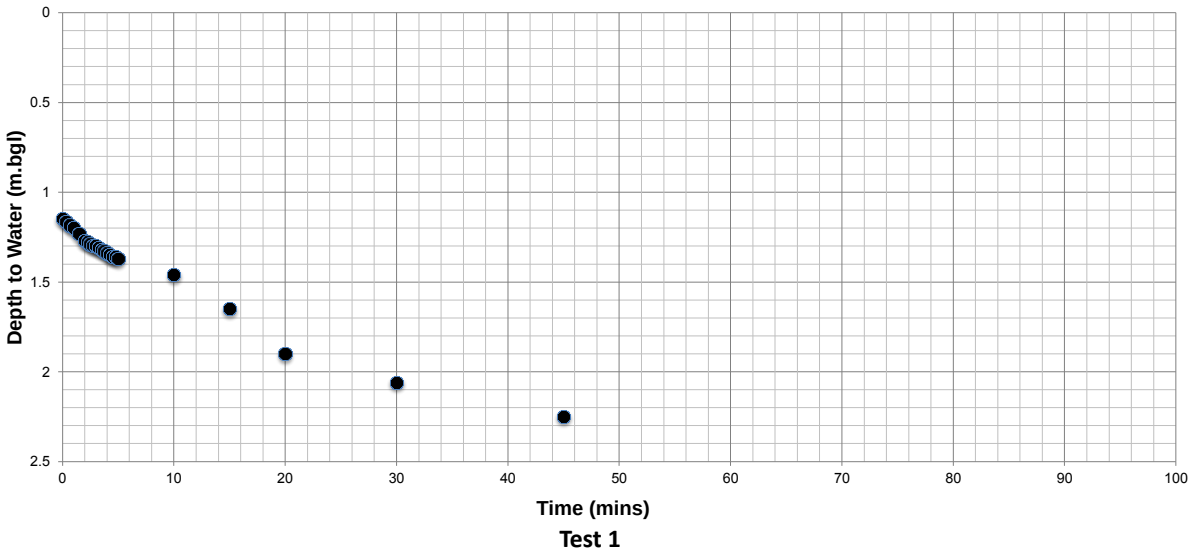
Sidewall Stability: Stable

Remarks: Results have not been interpolated.

Soil Infiltration Rate:

$$f = \frac{Vp75-25}{ap50 \times tp75-25}$$

		Test 1	Test 2
Dimensions of Trial Pit:	Depth (m)	3	3
	Width (m)	0.6	0.6
	Length (m)	2	2
Effective Depth (m)		2	2
V_{p75-25}: volume of the trial pit between 75% and 25% of the effective depth (m^3)		1.2	1.2
a_{p50}: internal surface area of trial pit up to 50% effective depth (m^2)		6.4	6.4
t_{p75-25}: time for water to fall from 75% to 25% effective depth (secs)		NA	NA
f: Soil Infiltration Rate (ms^{-1})			



Test 1

Test	Method	LOD	Units	S4UL	WS01	WS02	WS03	WS05	WS08	WS09	WS11	WS12	WS13	WS15	WS16	WS19	WS21	WS24	TP03	TP05	TP14	TP16	TP21	TP22	TP24	WS02	WS03	WS22	TP17	TP6	WS07	WS16	Min	Max	Mean	>S4UL
Lab No					946626	946627	946628	946629	946630	946631	946632	946633	946634	946635	946636	946637	946638	946639	946640	946641	946642	946643	946644	946645	946646	946647	946648	946649	948507	948508	948509	948510				
Sample ID					WS01	WS02	WS03	WS05	WS08	WS09	WS11	WS12	WS13	WS15	WS16	WS19	WS21	WS24	TP03	TP05	TP14	TP16	TP21	TP22	TP24	WS02	WS03	WS22	TP17	TP6	WS07	WS16				
Depth					0.2	0.6	0.3	0.1	0.2	0.3	0.1	0.3	0.2	0.2	0.4	0.2	0.5	0.4	0.5	0.1	0.1	0.4	0.6	0.2	1.2	0.2	0.1	0.2	0.5	0.1	1.5	0.2				
Other ID																																				
Sample Type					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL				
Sampling Date					16/02/16	16/02/16	16/02/16	16/02/16	16/02/16	16/02/16	18/02/16	14/02/16	19/02/16	18/02/16	17/02/16	19/02/16	16/02/16	16/02/16	16/02/16	17/02/16	16/02/16	18/02/16	18/02/16	18/02/16	08/02/16	16/02/16	16/02/16	16/02/16	17/02/16	17/02/16	18/02/16	17/02/16				
Sampling Time				S4UL	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	Min	Max	Mean	>S4UL
Test	**Method**	**LOD**	**Units**	**Comm**																																
Arsenic	DETSC 2301#	0.2	mg/kg	640	3.8	15	15	20	14	14	18	17	20	22	23	15	24	21	27	23	18	28	16	19	23				12	12	17		3.8	28	18.20	
Cadmium	DETSC 2301#	0.1	mg/kg	8600	0.1	0.6	0.6	1.2	0.6	0.4	0.8	0.7	0.6	0.8	1.8	1.3	1	1.1	1	0.7	0.7	0.7	0.5	0.6	1				0.5	0.7	0.9		0.1	1.8	0.79	
Chromium	DETSC 2301#	0.15	mg/kg	8600	13	31	27	35	26	29	34	33	37	50	68	28	50	36	39	45	34	58	35	41	38				30	29	30		13	68	36.50	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1	1	1.00	
Copper	DETSC 2301#	0.2	mg/kg	68000	3.3	11	7.5	74	11	12	15	13	11	16	22	97	17	13	29	27	29	35	17	14	24				14	22	34		3.3	97	23.66	
Lead	DETSC 2301#	0.3	mg/kg	2300	5.2	41	22	200	150	29	83	55	44	50	81	120	59	48	210	63	63	32	52	48	41				19	45	29		5.2	210	66.22	
Mercury	DETSC 2325#	0.05	mg/kg	58	0.05	0.05	0.05	0.42	0.05	0.05	0.09	0.1	0.06	0.09	0.17	0.13	0.09	0.11	0.18	0.1	0.1	0.06	0.09	0.07	0.11				0.05	0.1	0.15		0.05	0.42	0.11	
Nickel	DETSC 2301#	1	mg/kg	980	3.5	25	19	34	23	23	33	26	22	35	62	79	53	24	33	28	30	91	32	27	58				17	23	63		3.5	91	35.98	
Selenium	DETSC 2301#	0.5	mg/kg	12000	0.9	1.1	1.1	0.5	1	0.6	0.6	0.9	1.6	1.2	0.5	0.6	0.8	0.5	0.5	1.2	0.7	1	0.9	1.4	0.5				0.5	0.5	0.5		0.5	1.6	0.82	
Zinc	DETSC 2301#	1	mg/kg	730000	24	62	44	210	56	61	75	68	63	88	350	220	140	160	530	78	98	150	70	78	130				44	67	86		24	530	123.00	
pH	DETSC 2008#			-	10.7	8	7.9	7.6	6.5	7.2	6.4	6.7	7	6.4	7.6	7.2	7.3	7.6	9.4	5.9	6.8	7.2	7.3	7.3	7.7				7.1	7.2	7.5		5.9	10.7	7.40	
Cyanide, Total	DETSC 2130#	0.1	mg/kg	53	0.1	0.1	0.1	0.2	0.2	0.1	0.4	0.3	0.2	0.3	0.1	0.3	0.1	0.3	0.4	0.4	0.3	0.1	0.2	0.2	0.3				0.1	0.5	0.1		0.1	0.5	0.23	
Organic matter	DETSC 2002#	0.1	%	-	5.8	1.3	1.4	4	4.6	1.1	6	3.4	1.2	2.2	0.7	5.2	1	2.3	1	4	1.5	0.3	4.7	1.3	0.6				0.5	7.3	0.2		0.2	7.3	2.57	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	-	78	12	13	10	10	10	10	10	10	16	10	16	10	25	130	13	35	10	12	15	17				23	28	15		10	130	22.42	
Sulphide	DETSC 2024#	10	mg/kg	-	12	24	20	24	10	10	16	28	12	12	20	16	28	36	32	28	20	12	10	10	10				10	16	10		10	36	17.75	
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	304	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	144	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	78	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	48	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5				1.5	1.5	1.5		1.5	1.5	1.50	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	24	7.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2				1.2	1.2	1.2		1.2	7.8	1.48	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	1600000	22	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5				1.5	1.5	1.5		1.5	22	2.35	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	1600000	240	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	32	3.4	3.4	3.4	3.4	3.4	3.4	3.4				3.4	3.4	3.4		3.4	240	14.45	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	-	270	10	10	10	10	10	10	10	10	10	10	10	10	32	10	10	10	10	10	10	10				10	10	10		10	270	21.75	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	1220	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	869	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	613	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	364	1.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9				0.9	0.9	0.9		0.9	1.7	0.93	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	169	21	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5				0.5	0.5	0.5		0.5	21	1.35	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	28000	150	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.1	0.6	0.7	0.6	0.6	0.6	0.6	0.6				0.6	0.6	0.6		0.6	150	6.85	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	28000	820	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	33	1.4	1.4	1.4	1.4	1.4	1.4	1.4				1.4	1.4	1.4		1.4	820	36.83	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	-	990	10	10	10	10	10	10	10	10	10	10	10	10	34	10	10	10	10	10	10	10				10	10	10		10	990	51.83	
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	-	1300	10	10	10	10	10	10	10	10	10	10	10	10	66	10	10	10	10	10	10	10				10	10	10		10	1300	66.08	
Benzene	DETSC 3321#	0.01	mg/kg	27	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	518	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Toluene	DETSC 3321#	0.01	mg/kg	869	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Xylene	DETSC 3321#	0.01	mg/kg	478	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
MTBE	DETSC 3321	0.01	mg/kg	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	0.01		0.01	0.01	0.01	
Naphthalene	DETSC 3301	0.1	mg/kg	76.4	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	0.8	0.13	
Acenaphthylene	DETSC 3301	0.1	mg/kg	86.1	6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	6	0.35	
Acenaphthene	DETSC 3301	0.1	mg/kg	57	6.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	6.7	0.38	
Fluorene	DETSC 3301	0.1	mg/kg	30.9	7.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	7.5	0.41	
Phenanthrene	DETSC 3301	0.1	mg/kg	22000	38	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.7	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	38	1.72	
Anthracene	DETSC 3301	0.1	mg/kg	520000	15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	15	0.73	
Fluoranthene	DETSC 3301	0.1	mg/kg	23000	57	0.1	0.1	0.6	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.4	2.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	57	2.61	
Pyrene	DETSC 3301	0.1	mg/kg	54000	63	0.1	0.1	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.1	0.5	1.9	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	63	2.86	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	170	35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	1.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	35	1.61	
Chrysene	DETSC 3301	0.1	mg/kg	350	39	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	39	1.75	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.99	41	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.7	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	41	1.84	1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	1200	23	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	23	1.07	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	35	56	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	56	2.48	1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	500	39	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	39	1.75	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	3.5	7.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	7.8	0.43	1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	3900	35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.8	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.1		0.1	35	1.58	
PAH Total	DETSC 3301	1.6	mg/kg	-	470	1.6	1.6	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	3	1.6	1.6	11	1.6	1.6	1.6	1.6	1.6	1.6				1.6	1.6	1.6		1.6	470	21.57	
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	440	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3				0.3	0.9	0.3		0.3	0.9	0.33	
Perfluorooctyl sulphonate (PFOS)	$	0.1	**ug/kg**	16.7	0.6			1.4	0.4	0.1	1.2		0.1	0.1		0.4					0.3	0.1			0.1	2.3	0.3	1		0.9		1.8	0.1	2.3	0.69	

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

			Lab No	946626	946627	946628	946629	946630	946631
			Sample ID	WS01	WS02	WS03	WS05	WS08	WS09
			Depth	0.20	0.60	0.30	0.10	0.20	0.30
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	16/02/16	16/02/16	16/02/16	16/02/16	16/02/16	16/02/16
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	3.8	15	15	20	14	14
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.6	0.6	1.2	0.6	0.4
Chromium	DETSC 2301#	0.15	mg/kg	13	31	27	35	26	29
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	3.3	11	7.5	74	11	12
Lead	DETSC 2301#	0.3	mg/kg	5.2	41	22	200	150	29
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.42	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	3.5	25	19	34	23	23
Selenium	DETSC 2301#	0.5	mg/kg	0.9	1.1	1.1	< 0.5	1.0	0.6
Zinc	DETSC 2301#	1	mg/kg	24	62	44	210	56	61
Inorganics									
pH	DETSC 2008#			10.7	8.0	7.9	7.6	6.5	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.1	< 0.1	0.2	0.2	< 0.1
Organic matter	DETSC 2002#	0.1	%	5.8	1.3	1.4	4.0	4.6	1.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	78	12	13	< 10	< 10	< 10
Sulphide	DETSC 2024#	10	mg/kg	12	24	20	24	< 10	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	7.8	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	22	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	240	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	270	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	1.7	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	21	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	150	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	820	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	990	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	1300	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

			Lab No	946626	946627	946628	946629	946630	946631
			Sample ID	WS01	WS02	WS03	WS05	WS08	WS09
			Depth	0.20	0.60	0.30	0.10	0.20	0.30
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	16/02/16	16/02/16	16/02/16	16/02/16	16/02/16	16/02/16
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Acenaphthylene	DETSC 3301	0.1	mg/kg	6.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	6.7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	7.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	38	< 0.1	< 0.1	0.3	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	15	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	57	< 0.1	< 0.1	0.6	0.3	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	63	< 0.1	< 0.1	0.6	0.2	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	35	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	39	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	41	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	23	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	56	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	39	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	7.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	35	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	470	< 1.6	< 1.6	1.7	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted									
Perfluorooctyl sulphonate (PFOS)	$	0.1	ug/kg	0.6			1.4	0.4	0.1

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

				Lab No	946632	946633	946634	946635	946636	946637
				Sample ID	WS11	WS12	WS13	WS15	WS16	WS19
				Depth	0.10	0.30	0.20	0.20	0.40	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	18/02/16	14/02/16	19/02/16	18/02/16	17/02/16	19/02/16
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg		18	17	20	22	23	15
Cadmium	DETSC 2301#	0.1	mg/kg		0.8	0.7	0.6	0.8	1.8	1.3
Chromium	DETSC 2301#	0.15	mg/kg		34	33	37	50	68	28
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		15	13	11	16	22	97
Lead	DETSC 2301#	0.3	mg/kg		83	55	44	50	81	120
Mercury	DETSC 2325#	0.05	mg/kg		0.09	0.10	0.06	0.09	0.17	0.13
Nickel	DETSC 2301#	1	mg/kg		33	26	22	35	62	79
Selenium	DETSC 2301#	0.5	mg/kg		0.6	0.9	1.6	1.2	< 0.5	0.6
Zinc	DETSC 2301#	1	mg/kg		75	68	63	88	350	220
Inorganics										
pH	DETSC 2008#				6.4	6.7	7.0	6.4	7.6	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.4	0.3	0.2	0.3	< 0.1	0.3
Organic matter	DETSC 2002#	0.1	%		6.0	3.4	1.2	2.2	0.7	5.2
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		< 10	< 10	< 10	16	< 10	16
Sulphide	DETSC 2024#	10	mg/kg		16	28	12	12	20	16
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg		< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Key: * -not accredited. # -MCERTS (accreditation only implied if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

			Lab No	946632	946633	946634	946635	946636	946637
			Sample ID	WS11	WS12	WS13	WS15	WS16	WS19
			Depth	0.10	0.30	0.20	0.20	0.40	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	18/02/16	14/02/16	19/02/16	18/02/16	17/02/16	19/02/16
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.6
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	3.0
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted									
Perfluorooctyl sulphonate (PFOS)	$	0.1	ug/kg	1.2		< 0.1	< 0.1		0.4

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

				Lab No	946638	946639	946640	946641	946642	946643
				Sample ID	WS21	WS24	TP03	TP05	TP14	TP16
				Depth	0.50	0.40	0.50	0.10	0.10	0.40
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	16/02/16	16/02/16	16/02/16	17/02/16	16/02/16	18/02/16
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg		24	21	27	23	18	28
Cadmium	DETSC 2301#	0.1	mg/kg		1.0	1.1	1.0	0.7	0.7	0.7
Chromium	DETSC 2301#	0.15	mg/kg		50	36	39	45	34	58
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg		17	13	29	27	29	35
Lead	DETSC 2301#	0.3	mg/kg		59	48	210	63	63	32
Mercury	DETSC 2325#	0.05	mg/kg		0.09	0.11	0.18	0.10	0.10	0.06
Nickel	DETSC 2301#	1	mg/kg		53	24	33	28	30	91
Selenium	DETSC 2301#	0.5	mg/kg		0.8	0.5	< 0.5	1.2	0.7	1.0
Zinc	DETSC 2301#	1	mg/kg		140	160	530	78	98	150
Inorganics										
pH	DETSC 2008#				7.3	7.6	9.4	5.9	6.8	7.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg		< 0.1	0.3	0.4	0.4	0.3	< 0.1
Organic matter	DETSC 2002#	0.1	%		1.0	2.3	1.0	4.0	1.5	0.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		10	25	130	13	35	10
Sulphide	DETSC 2024#	10	mg/kg		28	36	32	28	20	12
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	32	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	32	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	1.1	< 0.6	0.7	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	33	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	34	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg		< 10	66	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Key: * -not accredited. # -MCERTS (accreditation only implied if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

			Lab No	946638	946639	946640	946641	946642	946643
			Sample ID	WS21	WS24	TP03	TP05	TP14	TP16
			Depth	0.50	0.40	0.50	0.10	0.10	0.40
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	16/02/16	16/02/16	16/02/16	17/02/16	16/02/16	18/02/16
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.7	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	2.1	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.5	1.9	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	1.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.7	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	1.0	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.9	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.8	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	11	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Subcontracted									
Perfluorooctyl sulphonate (PFOS)	$	0.1	ug/kg					0.3	< 0.1

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

				Lab No	946644	946645	946646	946647	946648	946649
				Sample ID	TP21	TP22	TP24	WS02	WS03	WS22
				Depth	0.60	0.20	1.20	0.20	0.10	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	18/02/16	18/02/16	08/02/16	16/02/16	16/02/16	16/02/16
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg		16	19	23			
Cadmium	DETSC 2301#	0.1	mg/kg		0.5	0.6	1.0			
Chromium	DETSC 2301#	0.15	mg/kg		35	41	38			
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0	< 1.0	< 1.0			
Copper	DETSC 2301#	0.2	mg/kg		17	14	24			
Lead	DETSC 2301#	0.3	mg/kg		52	48	41			
Mercury	DETSC 2325#	0.05	mg/kg		0.09	0.07	0.11			
Nickel	DETSC 2301#	1	mg/kg		32	27	58			
Selenium	DETSC 2301#	0.5	mg/kg		0.9	1.4	< 0.5			
Zinc	DETSC 2301#	1	mg/kg		70	78	130			
Inorganics										
pH	DETSC 2008#				7.3	7.3	7.7			
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.2	0.2	0.3			
Organic matter	DETSC 2002#	0.1	%		4.7	1.3	0.6			
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		12	15	17			
Sulphide	DETSC 2024#	10	mg/kg		< 10	< 10	< 10			
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5			
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2	< 1.2	< 1.2			
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5	< 1.5	< 1.5			
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4	< 3.4	< 3.4			
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10			
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01	0.01	0.01			
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9	< 0.9	< 0.9			
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5	< 0.5	< 0.5			
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6	< 0.6	< 0.6			
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4	< 1.4	< 1.4			
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10	< 10	< 10			
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg		< 10	< 10	< 10			
Benzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Ethylbenzene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Toluene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
Xylene	DETSC 3321#	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01	< 0.01			
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 0.1	< 0.1			

Key: * -not accredited. # -MCERTS (accreditation only implied if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 16-58949
Client Ref RCEI39093
Contract Title Marylands

			Lab No	946644	946645	946646	946647	946648	946649
			Sample ID	TP21	TP22	TP24	WS02	WS03	WS22
			Depth	0.60	0.20	1.20	0.20	0.10	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	18/02/16	18/02/16	08/02/16	16/02/16	16/02/16	16/02/16
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1			
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6			
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3			
Subcontracted									
Perfluorooctyl sulphonate (PFOS)	$	0.1	ug/kg			< 0.1	2.3	0.3	1.0

Summary of Chemical Analysis
Soil Samples

Our Ref 16-59251
Client Ref RCEI39093
Contract Title Maylands

			Lab No	948507	948508	948509	948510
			Sample ID	TP17	TP6	WS07	WS16
			Depth	0.50	0.10	1.50	0.20
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	17/02/16	17/02/16	18/02/16	17/02/16
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	12	12	17	
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.7	0.9	
Chromium	DETSC 2301#	0.15	mg/kg	30	29	30	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	14	22	34	
Lead	DETSC 2301#	0.3	mg/kg	19	45	29	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.10	0.15	
Nickel	DETSC 2301#	1	mg/kg	17	23	63	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	
Zinc	DETSC 2301#	1	mg/kg	44	67	86	
Inorganics							
pH	DETSC 2008#			7.1	7.2	7.5	
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.5	< 0.1	
Organic matter	DETSC 2002#	0.1	%	0.5	7.3	0.2	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	23	28	15	
Sulphide	DETSC 2024#	10	mg/kg	< 10	16	< 10	
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	

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Summary of Chemical Analysis
Soil Samples

Our Ref 16-59251
Client Ref RCEI39093
Contract Title Maylands

			Lab No	948507	948508	948509	948510
			Sample ID	TP17	TP6	WS07	WS16
			Depth	0.50	0.10	1.50	0.20
			Other ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sampling Date	17/02/16	17/02/16	18/02/16	17/02/16
			Sampling Time	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.9	< 0.3	
Subcontracted							
Perfluorooctyl sulphonate (PFOS)	$	0.1	ug/kg		0.9		1.8

Key: * -not accredited. # -MCERTS (accreditation only implied if report carries the MCERTS logo). $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 16-61475
Client Ref HLEI 40310
Contract Title Mayland Gateway

				Lab No		960667	960668	960669				
				Sample ID		WS02	WS09	WS17				
				Depth								
				Other ID								
				Sample Type		WATER	WATER	WATER				
				Sampling Date		15/03/16	15/03/16	15/03/16				
				Sampling Time		n/s	n/s	n/s				
Test	**Method**	**LOD**	**Units**	**DWS**	**EQS**							
Subcon to Mountain	$	0				Y	Y	Y				
Mountainheath Subcon Prep	$	0				Y	Y	Y				
Metals									Min	Max	Mean	
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	10	50	0.63	1.20	0.75	0.63	1.20	0.86	
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	5	5	0.05	0.08	0.03	0.03	0.08	0.05	
Chromium, Dissolved	DETSC 2306	0.25	ug/l	50	4.7	3.90	9.40	0.35	0.35	9.40	4.55	
Chromium, Hexavalent	DETSC 2203	3	ug/l	-	-	3.00	3.00	3.00	3.00	3.00	3.00	
Copper, Dissolved	DETSC 2306	0.4	ug/l	2000	28	4.10	5.70	11.00	4.10	11.00	6.93	
Lead, Dissolved	DETSC 2306	0.09	ug/l	10	7.2	0.47	5.60	0.10	0.10	5.60	2.06	
Mercury, Dissolved	DETSC 2306	0.01	ug/l	1	0.05	0.01	0.01	0.01	0.01	0.01	0.01	
Nickel, Dissolved	DETSC 2306	0.5	ug/l	20	20	15.00	6.60	6.10	6.10	15.00	9.23	
Selenium, Dissolved	DETSC 2306	0.25	ug/l	10	-	1.70	0.60	1.30	0.60	1.70	1.20	
Zinc, Dissolved	DETSC 2306	1.3	ug/l	-	125	90.00	140.00	71.00	71.00	140.00	100.33	For salmonid fish
Inorganics												
pH	DETSC 2008			6.5-10	6.0-9	7.40	7.60	7.70	7.40	7.70	7.57	
Cyanide, Total	DETSC 2130	40	ug/l	50	1	40.00	40.00	40.00	40.00	40.00	40.00	Detection limit greater than EQS
Hardness	DETSC 2303	0.1	mg/l	N/A	N/A	449.00	302.00	315.00	302.00	449.00	355.33	
Sulphate as SO4	DETSC 2055	0.1	mg/l	250	-	160.00	54.00	100.00	54.00	160.00	104.67	
Sulphide	DETSC 2208	10	ug/l	N/A	N/A	14.00	10.00	10.00	10.00	14.00	11.33	
Total Organic Carbon	DETSC 2085	1	mg/l	N/A	N/A	7.80	22.00	9.00	7.80	22.00	12.93	
Petroleum Hydrocarbons												
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aliphatic C10-C12	DETSC 3072*	1	ug/l	N/A	N/A	1.90		1.00	1.00	1.90	1.45	
Aliphatic C12-C16	DETSC 3072*	1	ug/l	N/A	N/A	24.00		1.00	1.00	24.00	12.50	
Aliphatic C16-C21	DETSC 3072*	1	ug/l	N/A	N/A	31.00		1.00	1.00	31.00	16.00	
Aliphatic C21-C35	DETSC 3072*	1	ug/l	N/A	N/A	14.00		160.00	14.00	160.00	87.00	
Aliphatic C5-C35	DETSC 3072*	10	ug/l	N/A	N/A	70.00		160.00	70.00	160.00	115.00	
Aromatic C5-C7	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aromatic C7-C8	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aromatic C8-C10	DETSC 3322	0.1	ug/l	N/A	N/A	0.10		0.10	0.10	0.10	0.10	
Aromatic C10-C12	DETSC 3072*	1	ug/l	N/A	N/A	1.00		1.00	1.00	1.00	1.00	
Aromatic C12-C16	DETSC 3072*	1	ug/l	N/A	N/A	1.00		1.00	1.00	1.00	1.00	
Aromatic C16-C21	DETSC 3072*	1	ug/l	N/A	N/A	1.00		1.00	1.00	1.00	1.00	
Aromatic C21-C35	DETSC 3072*	1	ug/l	N/A	N/A	1.00		1.00	1.00	1.00	1.00	
Aromatic C5-C35	DETSC 3072*	10	ug/l	N/A	N/A	10.00		10.00	10.00	10.00	10.00	
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	10	N/A	70.00		160.00	70.00	160.00	115.00	
Benzene	DETSC 3322	1	ug/l	1	10	1.00		1.00	1.00	1.00	1.00	
Toluene	DETSC 3322	1	ug/l	-	50	1.00		1.00	1.00	1.00	1.00	
Ethylbenzene	DETSC 3322	1	ug/l	-	-	1.00		1.00	1.00	1.00	1.00	
Xylene	DETSC 3322	1	ug/l	-	30	1.00		1.00	1.00	1.00	1.00	
MTBE	DETSC 3322	1	ug/l	-	-	1.00		1.00	1.00	1.00	1.00	
PAHs												
Naphthalene	DETS 074*	0.01	ug/l	-	2.4	0.01		0.01	0.01	0.01	0.01	
Acenaphthylene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
Acenaphthene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
Fluorene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
Phenanthrene	DETS 074*	0.01	ug/l	-	-	0.01		0.01	0.01	0.01	0.01	
Anthracene	DETS 074*	0.01	ug/l	-	0.1	0.01		0.01	0.01	0.01	0.01	
Fluoranthene	DETS 074*	0.01	ug/l	-	0.1	0.01		0.08	0.01	0.08	0.05	
Pyrene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
Benzo(a)anthracene	DETS 074*	0.01	ug/l	-	-	0.01		0.01	0.01	0.01	0.01	
Chrysene	DETS 074*	0.01	ug/l	-	-	0.01		0.08	0.01	0.08	0.05	
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	-	0.03	0.01		0.01	0.01	0.01	0.01	
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	-	0.03	0.01		0.01	0.01	0.01	0.01	
Benzo(a)pyrene	DETS 074*	0.01	ug/l	0.01	0.05	0.01		0.01	0.01	0.01	0.01	
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	ug/l	-	0.002	0.01		0.01	0.01	0.01	0.01	Detection limit greater than EQS
Dibenzo(a,h)anthracene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
Benzo(g,h,i)perylene	DETS 074*	0.01	ug/l	N/A	N/A	0.01		0.01	0.01	0.01	0.01	
PAH Total	DETS 074*	0.2	ug/l	0.1	-	0.20		0.20	0.20	0.20	0.20	Detection limit greater than EQS
Phenols												
Phenol - Monohydric	DETSC 2130	100	ug/l	-	7.7	100.00		100.00	100.00	100.00	100.00	
Subcontracted Analysis												
perfluorooctyl sulphonate (PFOS)	$*	0.1	ug/l	N/A	N/A	0.10	0.10	0.10	0.10	0.10	0.10	

Key: * -not accredited. $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 16-61475
Client Ref HLEI 40310
Contract Title Mayland Gateway

			Lab No	960667	960668	960669
			Sample ID	WS02	WS09	WS17
			Depth			
			Other ID			
			Sample Type	WATER	WATER	WATER
			Sampling Date	15/03/16	15/03/16	15/03/16
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Subcon to Mountain	$	0		Y	Y	Y
Mountainheath Subcon Prep	$	0		Y	Y	Y
Metals						
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.63	1.2	0.75
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.05	0.08	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	3.9	9.4	0.35
Chromium, Hexavalent	DETSC 2203	3	ug/l	< 3.0	< 3.0	< 3.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	4.1	5.7	11
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.47	5.6	0.10
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	15	6.6	6.1
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.7	0.60	1.3
Zinc, Dissolved	DETSC 2306	1.3	ug/l	90	140	71
Inorganics						
pH	DETSC 2008			7.4	7.6	7.7
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40
Hardness	DETSC 2303	0.1	mg/l	449	302	315
Sulphate as SO4	DETSC 2055	0.1	mg/l	160	54	100
Sulphide	DETSC 2208	10	ug/l	14	10	< 10
Total Organic Carbon	DETSC 2085	1	mg/l	7.8	22	9.0

Key: * -not accredited. $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 16-61475
Client Ref HLEI 40310
Contract Title Mayland Gateway

			Lab No	960667	960668	960669
			Sample ID	WS02	WS09	WS17
			Depth			
			Other ID			
			Sample Type	WATER	WATER	WATER
			Sampling Date	15/03/16	15/03/16	15/03/16
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Petroleum Hydrocarbons						
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	1.9		< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	24		< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	31		< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	14		160
Aliphatic C5-C35	DETSC 3072*	10	ug/l	70		160
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1		< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0		< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0		< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0		< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0		< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10		< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	70		160
Benzene	DETSC 3322	1	ug/l	< 1.0		< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0		< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0		< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0		< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0		< 1.0
PAHs						
Naphthalene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Acenaphthylene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Acenaphthene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Fluorene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Phenanthrene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Anthracene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Fluoranthene	DETS 074*	0.01	ug/l	< 0.01		0.08
Pyrene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Benzo(a)anthracene	DETS 074*	0.01	ug/l	< 0.01		0.01
Chrysene	DETS 074*	0.01	ug/l	< 0.01		0.08
Benzo(b)fluoranthene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Benzo(k)fluoranthene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Benzo(a)pyrene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Indeno(1,2,3-c,d)pyrene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Dibenzo(a,h)anthracene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
Benzo(g,h,i)perylene	DETS 074*	0.01	ug/l	< 0.01		< 0.01
PAH Total	DETS 074*	0.2	ug/l	< 0.20		< 0.20

Key: * -not accredited. $ -subcontracted. n/s -not supplied.

Summary of Chemical Analysis
Water Samples

Our Ref 16-61475
Client Ref HLEI 40310
Contract Title Mayland Gateway

			Lab No	960667	960668	960669
			Sample ID	WS02	WS09	WS17
			Depth			
			Other ID			
			Sample Type	WATER	WATER	WATER
			Sampling Date	15/03/16	15/03/16	15/03/16
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Phenols						
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100		< 100
Subcontracted Analysis						
perfluorooctyl sulphonate (PFOS)	$*	0.1	ug/l	< 0.1	< 0.1	< 0.1

Key: * -not accredited. $ -subcontracted. n/s -not supplied.

Well	Visit No	Atmospheric Pressure (mb)	Flow (l/hr) Peak	Flow (l/hr) Steady	CH^4 (%)	CO^2 (%)	O^2 (%)	H_2S	CO	PID Max	PID Steady	DTW (m.bgl)	DTB (m.bgl)	Gas monitor serial no.	Calibration due date
WS01	1	990	3.9	3.1	0.0	6.3	5.0	0.0	0.0	0.0	0.0	-	1.100	307855	18/03/2016
	2	1002	1.0	1.0	0.0	6.8	3.1	0.0	0.0	0.0	0.0	-	1.110	307855	18/03/2016
	3	1012	2.0	1.9	0.0	6.8	3.8	0.0	0.0	0.0	0.0	-	1.110	307855	18/03/2016
	4	996	0.0	0.0	0.0	7.6	1.6	0.0	0.0	0.0	0.0	-	3.459	12020	21/12/2016
	5	985	0.0	0.0	0.0	7.5	1.8	0.0	-11.0	*	*	-	3.454	12020	21/12/2016
	6	1002	0.0	0.0	0.0	8.1	1.9	0.0	-11.0	1.4	1.0	-	3.452	12020	21/12/2016
WS02	1	990	0.2	0.0	0.0	1.0	15.4	0.0	0.0	1.0	1.0	2.650	3.100	307855	18/03/2016
	2	1000	42.0	8.0	0.0	2.0	14.2	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	3	1012	0.0	0.0	0.0	2.0	14.2	0.0	0.0	0.0	0.0	2.630	3.100	307855	18/03/2016
	4	996	0.0	0.0	0.0	3.3	16.8	0.0	0.0	0.0	0.0	3.752	4.059	12020	21/12/2016
	5	985	0.0	0.0	0.0	3.7	15.6	0.0	-11.0	*	*	3.348	4.048	12020	21/12/2016
	6	1003	6.0	0.0	0.0	4.2	14.3	0.0	-12.0	0.3	0.3	3.264	4.067	12020	21/12/2016
WS03	1**													307855	18/03/2016
	2	999	0.0	0.0	0.0	1.9	13.2	0.0	0.0	0.0	0.0	-	1.090	307855	18/03/2016
	3	1011	0.1	0.1	0.0	2.1	11.8	0.0	0.0	0.0	0.0	-	1.100	307855	18/03/2016
	4	996	0.0	0.0	0.0	2.5	8.4	0.0	0.0	0.0	0.0	-	5.009	12020	21/12/2016
	5	987	0.1	0.0	0.0	3.1	5.9	0.0	-18.0	*	*	-	5.004	12020	21/12/2016

WS04	6	1002	0.0	0.0	0.0	3.5	3.4	0.0	-12.0	1.5	0.5	-	5.021	12020	21/12/2016
	1	989	3.8	3.6	0.0	6.9	17.6	0.0	0.0	0.0	0.0	-	0.820	307855	18/03/2016
	2	1002	0.4	0.4	0.0	2.0	19.3	0.0	0.0	0.0	0.0	-	1.830	307855	18/03/2016
	3	1012	2.1	1.9	0.0	4.7	15.4	0.0	0.0	0.0	0.0	-	1.830	307855	18/03/2016
	4	996	0.0	0.0	0.0	6.8	14.3	0.0	0.0	0.0	0.0	-	5.706	12020	21/12/2016
	5	985	0.0	0.0	0.0	6.7	14.4	0.0	-11.0	*	*	-	5.701	12020	21/12/2016
	6	1002	0.0	0.0	0.0	6.6	14.6	0.0	-11.0	9.5	7.7	-	5.761	12020	21/12/2016
WS05	1	990	0.6	0.6	0.0	1.4	18.2	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	2	1000	1.2	1.2	7.1	5.2	0.4	0.0	0.0	0.0	0.0	-	1.110	307855	18/03/2016
	3	1010	0.4	0.1	0.0	1.3	19.2	0.0	0.0	0.0	0.0	-	1.140	307855	18/03/2016
	4	994	0.0	0.0	0.0	1.8	18.2	0.0	0.0	0.0	0.0	3.822	5.029	12020	21/12/2016
	5	986	0.0	0.0	0.0	2.0	19.0	0.0	-16.0	*	*	3.786	5.013	12020	21/12/2016
	6	1002	0.0	0.0	0.0	1.5	19.7	0.0	-12.0	0.5	0.5	-	3.054	12020	21/12/2016
WS06	1	1020	5.4	5.1	0.0	2.0	12.5	0.0	0.0	0.0	0.0	-	3.070	307855	18/03/2016
	2	1003	0.0	0.0	0.0	2.1	12.2	0.0	0.0	0.0	0.0	-	2.120	307855	18/03/2016
	3	1012	0.0	0.0	0.0	2.3	12.1	0.0	0.0	0.0	0.0	-	2.120	307855	18/03/2016
	4	994	0.0	0.0	0.0	2.6	12.4	0.0	0.0	0.0	0.0	-	6.005	12020	21/12/2016
	5	986	0.0	0.0	0.0	2.9	11.6	0.0	-13.0	*	*	-	6.001	12020	21/12/2016
	6	1002	0.0	0.0	0.0	2.9	13.1	0.0	-10.0	0.0	0.0	-	5.047	12020	21/12/2016
WS07	1	1004	3.3	3.1	0.0	2.3	7.3	0.0	0.0	0.0	0.0	-	3.060	307855	18/03/2016

	2	1003	0.6	0.4	0.0	0.1	0.1	0.0	0.0	0.0	0.0	-	1.060	307855	18/03/2016
	3	1012	0.1	0.0	0.0	2.4	9.3	0.0	0.0	0.0	0.0	-	1.060	307855	18/03/2016
	4	995	0.0	0.0	0.0	7.6	1.6	0.0	0.0	0.0	0.0	-	3.459	12020	21/12/2016
	5	987	-8.0	0.0	0.0	2.5	9.1	0.0	-14.0	*	*	2.986	3.019	12020	21/12/2016
	6	1003	0.0	0.0	0.0	3.4	6.0	0.0	-10.0	0.0	0.0	2.168	3.013	12020	21/12/2016
	1	997	1.9	1.9	0.0	2.2	14.5	0.0	0.0	0.0	0.0	-	1.080	307855	18/03/2016
	2**													307855	18/03/2016
	3	1013	2.5	2.3	0.0	2.3	16.2	0.0	0.0	0.0	0.0	-	1.080	307855	18/03/2016
WS08	4	996	0.0	0.0	0.0	2.6	15.7	0.0	0.0	0.0	0.0	4.015	4.028	12020	21/12/2016
	5	986	0.0	0.0	0.0	2.5	16.0	0.0	-3.0	*	8	-	4.010	12020	21/12/2016
	6	1002	0.0	0.0	0.0	2.6	15.7	0.0	-14.0	3.0	0.9	-	4.025	12020	21/12/2016
	1	995	1.2	1.0	0.0	1.6	18.3	0.0	0.0	0.0	0.0	5.460	5.790	307855	18/03/2016
	2	1000	0.0	0.0	0.0	1.5	15.9	0.0	0.0	0.0	0.0	5.340	5.790	307855	18/03/2016
	3	1010	0.6	0.4	0.0	2.1	15.2	0.0	0.0	0.0	0.0	5.340	5.790	307855	18/03/2016
WS09	4	996	0.0	0.0	0.0	2.4	15.5	0.0	0.0	0.0	0.0	5.521	5.754	12020	21/12/2016
	5	985	0.0	0.0	0.0	0.3	20.6	0.0	-13.0	*	*	5.352	5.747	12020	21/12/2016
	6	1002	0.0	0.0	0.0	2.8	13.7	0.0	-11.0	1.0	0.5	5.229	5.758	12020	21/12/2016
	1	997	1.6	1.5	0.0	1.5	17.1	0.0	0.0	0.0	0.0	-	1.790	307855	18/03/2016
WS10	2	1003	256.0	0.0	0.0	3.3	2.2	0.0	0.0	0.0	0.0	-	0.810	307855	18/03/2016
	3	1012	0.1	0.1	0.0	3.8	12.0	0.0	0.0	0.0	0.0	-	0.810	307855	18/03/2016

WS11	4	996	0.0	0.0	0.0	4.5	10.4	0.0	0.0	0.0	0.0	-	4.718	12020	21/12/2016
	5	986	0.0	0.0	0.0	9.6	4.2	0.0	-12.0	*	*	-	4.710	12020	21/12/2016
	6	1002	0.0	0.0	0.0	1.3	18.5	0.0	-10.0	0.0	0.0	-	4.705	12020	21/12/2016
	1	1009	3.6	3.4	0.0	1.6	17.1	0.0	0.0	0.0	0.0	-	3.070	307855	18/03/2016
	2	1004	1.5	1.0	0.0	1.3	16.7	0.0	0.0	0.0	0.0	-	3.080	307855	18/03/2016
	3	1013	1.6	1.0	0.0	1.7	17.2	0.0	0.0	0.0	0.0	-	3.080	307855	18/03/2016
	4	996	0.0	0.0	0.0	2.1	16.6	0.0	0.0	0.0	0.0	-	3.035	12020	21/12/2016
	5	985	0.0	0.0	0.0	2.0	17.0	0.0	-11.0	*	*	-	3.033	12020	21/12/2016
	6	1004	0.0	0.0	0.0	2.1	16.6	0.0	-13.0	0.0	0.0	-	3.043	12020	21/12/2016
WS12	1	1000	2.3	2.1	0.0	0.6	19.3	0.0	0.0	0.0	0.0	-	4.570	307855	18/03/2016
	2	1002	0.0	0.0	0.0	0.8	19.1	0.0	0.0	0.0	0.0	-	4.580	307855	18/03/2016
	3	1012	2.5	2.3	0.0	0.9	18.8	0.0	0.0	0.0	0.0	-	4.550	307855	18/03/2016
	4	996	0.5	0.0	0.0	1.3	19.3	0.0	0.0	0.0	0.0	4.521	4.536	12020	21/12/2016
	5	986	3.0	0.0	0.0	2.1	19.4	0.0	-13.0	*	*	-	4.533	12020	21/12/2016
	6	1003	0.0	0.0	0.0	1.4	19.4	0.0	-12.0	25.7	7.4	-	4.535	12020	21/12/2016
WS13	1	989	1.6	1.2	0.0	3.0	17.0	0.0	0.0	0.0	0.0	-	5.140	307855	18/03/2016
	2	1003	0.6	0.4	0.0	1.2	19.2	0.0	0.0	0.0	0.0	-	5.160	307855	18/03/2016
	3	1012	6.8	0.6	0.0	3.3	12.5	0.0	0.0	0.0	0.0	-	5.160	307855	18/03/2016
	4	995	0.0	0.0	0.0	2.4	15.4	0.0	0.0	0.0	0.0	-	5.129	12020	21/12/2016
	5	985	0.0	0.0	0.0	4.2	11.6	0.0	-10.0	*	*	-	5.123	12020	21/12/2016

WS14	6	1002	0.0	0.0	0.0	4.0	11.6	0.0	-11.0	0.0	0.0	-	5.134	12020	21/12/2016
	1	1001	11.1	11.1	0.0	3.5	4.6	0.0	0.0	0.0	0.0	-	5.030	307855	18/03/2016
	2	1004	0.0	0.0	0.0	0.3	4.5	0.0	0.0	0.0	0.0	-	5.020	307855	18/03/2016
	3	1013	0.4	0.4	0.0	1.8	5.9	0.0	0.0	0.0	0.0	-	5.020	307855	18/03/2016
	4	995	4.2	4.2	0.0	3.1	5.2	0.0	0.0	0.0	0.0	-	4.977	12020	21/12/2016
	5	987	0.0	0.0	0.0	3.4	7.2	0.0	-12.0	*	*	-	4.964	12020	21/12/2016
	6	1003	0.0	0.0	0.0	3.7	9.0	0.0	-11.0	0.0	0.0	-	4.984	12020	21/12/2016
WS15	1	1004	3.0	2.7	0.0	3.3	9.2	0.0	0.0	0.0	0.0	-	4.850	307855	18/03/2016
	2	1004	0.4	0.0	0.0	0.8	2.7	0.0	0.0	0.0	0.0	-	4.850	307855	18/03/2016
	3	1013	1.9	1.6	0.0	3.1	1.7	0.0	0.0	0.0	0.0	-	4.850	307855	18/03/2016
	4	996	0.0	0.0	0.0	4.7	2.2	0.0	0.0	0.0	0.0	3.432	4.819	12020	21/12/2016
	5	985	0.0	0.0	0.0	3.6	4.4	0.0	-11.0	*	*	3.172	4.808	12020	21/12/2016
	6	1003	0.0	0.0	0.0	2.7	8.3	0.0	-11.0	0.2	0.0	2.101	4.803	12020	21/12/2016
WS16	1	1006	3.4	3.2	0.0	1.0	17.8	0.0	0.0	0.0	0.0	-	2.110	307855	18/03/2016
	2	1003	1.2	1.2	0.0	1.9	17.2	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	3	1013	1.3	1.2	0.0	1.8	18.6	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	4	996	0.0	0.0	0.0	2.0	18.8	0.0	0.0	0.0	0.0	-	2.093	12020	21/12/2016
	5	986	0.0	0.0	0.0	2.1	19.1	0.0	-12.0	*	*	-	2.087	12020	21/12/2016
	6	1004	0.0	0.0	0.0	2.0	19.0	0.0	-15.0	1.7	0.3	-	2.087	12020	21/12/2016
WS17	1	995	1.0	1.0	0.0	0.6	19.0	0.0	0.0	0.0	0.0	1.410	3.090	307855	18/03/2016

	2	1001	0.0	0.0	0.0	0.7	16.8	0.0	0.0	0.0	0.0	1.490	3.100	307855	18/03/2016
	3	1012	0.0	0.0	0.0	0.6	15.1	0.0	0.0	0.0	0.0	1.490	3.100	307855	18/03/2016
	4	996	75.8	0.0	0.0	0.9	19.6	0.0	0.0	167.0	0.0	2.864	3.068	12020	21/12/2016
	5	985	0.0	0.0	0.0	1.6	17.3	0.0	-12.0	*	*	2.583	3.062	12020	21/12/2016
	6	1003	0.0	0.0	0.0	1.8	15.9	0.0	-12.0	3.0	1.6	2.358	3.083	12020	21/12/2016
	1	1001	17.0	2.5	0.0	3.1	15.4	0.0	0.0	0.0	0.0	-	3.110	307855	18/03/2016
	2	1004	0.0	0.0	0.0	3.4	14.5	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
WS18	3	1013	0.6	0.4	0.0	3.9	13.3	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	4	995	0.0	0.0	0.0	4.6	11.8	0.0	0.0	0.0	0.0	-	5.019	12020	21/12/2016
	5	987	-14.0	0.0	0.0	4.9	10.5	0.0	-13.0	*	*	-	5.014	12020	21/12/2016
	6	1003	0.0	0.0	0.0	5.2	9.2	0.0	-11.0	0.0	0.0	-	5.032	12020	21/12/2016
	1	1015	12.0	12.0	0.0	2.1	18.4	0.0	0.0	0.0	0.0	-	3.040	307855	18/03/2016
	2	1004	0.0	0.0	0.0	0.6	18.0	0.0	0.0	0.0	0.0	-	3.050	307855	18/03/2016
WS19	3	1013	1.2	0.6	0.0	0.9	12.5	0.0	0.0	0.0	0.0	-	3.050	307855	18/03/2016
	4	996	5.3	5.3	0.0	1.1	17.1	0.0	0.0	0.0	0.0	-	3.022	12020	21/12/2016
	5	987	0.0	0.0	0.0	1.3	16.4	0.0	-12.0	*	*	-	3.010	12020	21/12/2016
	6	1004	0.0	0.0	0.0	1.4	16.4	0.0	-12.0	0.4	0.0	-	3.014	12020	21/12/2016
	1	1003	2.7	2.7	0.0	2.5	15.7	0.0	0.0	0.0	0.0	-	2.080	307855	18/03/2016
WS20	2	1003	1.2	0.8	0.0	1.0	9.8	0.0	0.0	0.0	0.0	-	1.130	307855	18/03/2016
	3	1013	1.5	1.5	0.0	1.2	16.4	0.0	0.0	0.0	0.0	-	1.130	307855	18/03/2016

WS21	4	996	0.6	0.0	0.0	2.2	18.3	0.0	0.0	0.0	0.0	-	2.065	12020	21/12/2016
	5	985	0.0	0.0	0.0	2.4	16.0	0.0	-13.0	*	*	-	2.057	12020	21/12/2016
	6	1005	0.0	0.0	0.0	1.8	17.1	0.0	-13.0	0.0	0.0	-	2.048	12020	21/12/2016
	1**													307855	18/03/2016
	2	1002	1.0	1.0	0.0	2.7	12.1	0.0	0.0	0.0	0.0	-	2.130	307855	18/03/2016
	3	1012	2.1	1.8	0.0	2.4	12.9	0.0	0.0	0.0	0.0	-	2.130	307855	18/03/2016
	4	996	0.0	0.0	0.0	3.1	12.1	0.0	0.0	0.0	0.0	-	3.544	307855	18/03/2016
	5	987	-63.0	0.0	0.0	2.8	12.3	0.0	-12.0	*	*	-	3.532	12020	21/12/2016
	6	1003	-4.3	0.0	0.0	3.1	11.6	0.0	-12.0	3.5	1.8	-	3.556	12020	21/12/2016
WS22	1	990	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0	-	1.130	307855	18/03/2016
	2	1002	1.2	1.2	0.0	2.7	8.7	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	3	1013	1.6	1.6	0.0	2.3	10.3	0.0	0.0	0.0	0.0	-	1.120	307855	18/03/2016
	4	996	0.0	0.0	0.0	2.9	8.5	0.0	0.0	0.0	0.0	3.048	3.076	12020	21/12/2016
	5	986	1.6	0.0	0.0	2.9	8.7	0.0	-13.0	*	*	3.033	3.065	12020	21/12/2016
	6	1003	0.0	0.0	0.0	2.9	9.3	0.0	-12.0	2.1	1.6	3.012	3.083	12020	21/12/2016
WS23	1	995	0.8	0.4	0.0	1.2	12.5	0.0	0.0	0.0	0.0	-	1.100	307855	18/03/2016
	2	1001	0.0	0.0	0.0	2.3	16.2	0.0	0.0	0.0	0.0	-	1.110	307855	18/03/2016
	3	1012	1.9	1.6	0.0	0.7	13.3	0.0	0.0	0.0	0.0	-	1.110	307855	18/03/2016
	4	996	0.0	0.0	0.0	1.0	16.9	0.0	0.0	0.0	0.0	3.998	4.031	12020	21/12/2016
	5	985	0.0	0.0	0.0	0.4	19.3	0.0	-13.0	*	*	-	4.049	12020	21/12/2016

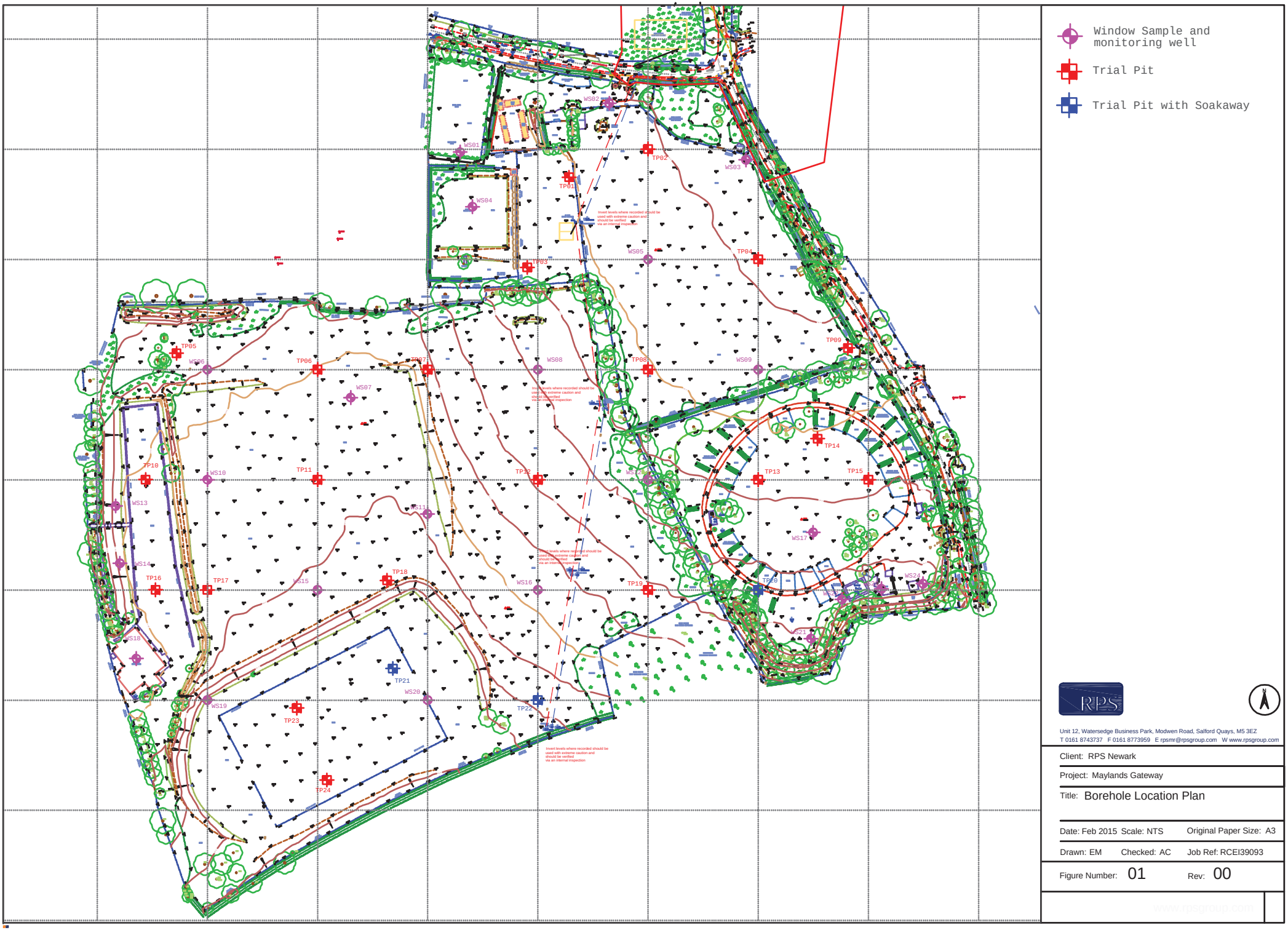
WS24	6	1003	0.3	0.0	0.0	0.6	14.9	0.0	-12.0	0.6	0.5	-	4.076	12020	21/12/2016
	1	995	0.6	0.0	0.0	5.0	6.2	0.0	0.0	0.0	0.0	-	1.070	307855	18/03/2016
	2	1002	0.0	0.0	0.0	4.4	7.4	0.0	0.0	0.0	0.0	-	3.050	307855	18/03/2016
	3	1012	2.1	2.1	0.0	5.6	3.1	0.0	0.0	0.0	0.0	-	3.050	307855	18/03/2016
	4	996	0.0	0.0	0.0	6.2	0.7	0.0	0.0	0.0	0.0	3.919	4.006	12020	21/12/2016
	5	985	0.0	0.0	0.0	6.1	0.1	0.0	-12.0	*	*	-	3.994	12020	21/12/2016
	6	1003	0.0	0.0	0.0	5.9	0.1	0.0	-12.0	0.0	0.0	3.778	4.001	12020	21/12/2016

* = PID not available

** = Gas tap open. No readings taken on this occasion.

- = Dry (no groundwater encountered)

Visit Number	Date
1	1/3/2016
2	10/3/2016
3	15/3/2016
4	23/3/2016
5	5/4/2016
6	22/04/2016



Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T 0161 8743737 F 0161 8773959 E rpsmr@rpsgroup.com W www.rpsgroup.com

Client: RPS Newark

Project: Maylands Gateway

Title: Borehole Location Plan

Date: Feb 2015 Scale: NTS Original Paper Size: A3

Drawn: EM Checked: AC Job Ref: RCEI39093

Figure Number: 01 Rev: 00

APPENDIX II

APPENDIX II – SUPPLEMENTARY GROUND INVESTIGATION BY CROSSFIELD CONSULTING LIMITED (2017)

Introduction

This Appendix, together with Appendix I and Sections 2 to 5 of the report, forms the Ground Investigation Report for the development described in the report, in compliance with the requirements of BS 5930:2015, BS EN1997-1:2004(2007) and BS EN1997-2:2007(2007).

The site operations were carried out between 27th and 31st March 2017 under the supervision of a geotechnical engineer from Crossfield Consulting Limited. The scope and rationale for the design of the investigation is presented in Table II-1.

The ground investigation was designed and supervised by qualified and experienced geotechnical specialists from Crossfield Consulting Limited. Where appropriate, and as outlined below, specialist drilling/sampling equipment was procured together with trained and experienced operators. Unless otherwise indicated, sampling and logging remained the responsibility of trained staff from Crossfield Consulting Limited and field records were prepared on site, during or immediately following drilling/sampling or in-situ measurements/tests. The results of in situ tests are presented on the relevant record sheets in this Appendix and the data are summarised on Figures II-1 to 3.

An exploratory hole location plan is presented as Figure II-4.

Trial Pits

Forty five trial pits, denoted as TP CCL1 to TP CCL45, were excavated by a JCB 3CX excavator between 27th and 31st March 2017. The trial pit records from the investigation are presented in this Appendix and these records include the descriptions and depths of the strata encountered, together with sample depths, groundwater observations and other pertinent comments.

In-situ hand vane tests were carried out on fine-grained soils, where appropriate, to provide undrained shear strength data representative of the tested horizon. The tests were carried out using Pilcon-Edeco hand vane tester, with extension rods in accordance with the site health and safety method statement. With reference to the guidance published in Serota & Jangle (1972), it is noted that this instrument is calibrated and scaled to provide a direct reading of undrained shear strength, such that application of additional correction factors on the recorded measurements is not necessary. Published correlations with undrained shear strength, as measured by immediate undrained triaxial tests, indicate this hand vane tester provides measurements with a significantly lower scatter in comparison to triaxial tests, with fewer anomalous results. Specific test measurements are listed on the exploratory hole records and summaries of the test data are presented in this Appendix as Figures II-1 and II-2.

Boreholes

Six boreholes, denoted as BH CCL1 to BH CCL6, were sunk by RD Drilling, between 27th March and 29th March 2017, to depths of between 7.5 m and 15.0 m. All exploratory holes were vertical, unless otherwise indicated on the record sheets. The drilling equipment and methods comprised light cable percussion boring, using a Dando rig with clay-cutter and chisel drop-tools and in conjunction with 150 mm diameter temporary steel casing. Disturbed soil samples were recovered from arisings recovered from boring operations immediately following strata changes and at intervals not exceeding 1.5 m. These samples have been used for descriptive and geotechnical testing purposes. 100 mm diameter “undisturbed” samples (denoted PS-T/W in BS EN 22475-1:2006) of fine-grained strata were taken for descriptive purposes. The borehole record is based on the inspection of both drilling arisings and the recovered samples. Standard Penetration Tests (SPT) were carried out at regular intervals to provide data on the in-situ density of coarse-grained strata and an indication of strength within fine-grained strata. A summary of SPT/depth data is presented as Figure II-3 in this Appendix. The SPTs were carried out in accordance with BS EN ISO 22476-3:2005(2007).

To minimise risks of introducing polluting substances, bio-degradable vegetable-based oils/greases were used on drilling/boring tools and casing.

On completion, the exploratory holes were backfilled with arisings recovered from drilling/boring operations, with soil materials returned to the relevant location from where they were extracted.

The borehole records from this investigation are presented in this Appendix. These records include the descriptions and depths of the strata encountered, together with sample depths, in-situ test results (uncorrected values), groundwater observations, details of installations/backfill within exploratory holes and other pertinent comments.

Static Cone Penetration Testing

Thirty nine static electric cone penetration tests, denoted as CPT01 to CPT38 and CPT02A, were carried out, by Lankelma between 27th March and 29th March 2017, to between 1.62 m and 15.08 m depth.

The CPTs were generally terminated upon reaching approximately 15.0 m depth. However, some of the CPTs were terminated upon encountering very dense strata that precluded penetration by the equipment (ballasted to approximately 15 tonnes). The CPTs included measurement of cone end-resistance and local side friction on a 10 cm^2 area electric cone.

The results from the testing are presented in this Appendix and the record sheets include a brief strata description, based on the soil type estimated from the in situ test data that has been assessed in conjunction with other exploratory hole data for the site, as available at the time of the CPT site works.

Soil Samples

All samples for analytical testing were collected in appropriate containers, stored in cool boxes (where appropriate) and sent to the testing laboratory overnight. The sample containers, storage and handling procedures were all compatible with the relevant recommendations of the UKAS accredited testing laboratory for the specific testing proposed.

Samples designated for geotechnical testing were collected, stored and transported in accordance with the published requirements for the specific tests scheduled, such that moisture content and soil structure integrity was maintained, as necessary for the test requirements.

Analytical Laboratory Testing

The rationale for the analytical testing is set out in Table II-2.

Selected samples of the soils encountered were submitted for screening analysis of the following determinands:

- Arsenic (Total)
- Chromium (Total)
- Chromium (Hexavalent)
- Lead (Total)
- Nickel (Total)
- Selenium (Total)
- Cyanide (Total)
- Sulphate (Water soluble)
- pH
- Sulphur (Total)
- Asbestos Quantification
- Cadmium (Total)
- Copper (Total)
- Mercury (Total)
- Zinc (Total)
- Boron (Water soluble)
- Sulphate (Acid soluble)
- Sulphide (Total)
- Phenols (Total-monohydric)
- Total Organic Carbon
- Asbestos Screen

Note: Total determinands are based on an aqua-regia extract.

Selected samples of the soils encountered were submitted for analysis of the following determinands:

- Total Petroleum Hydrocarbons – aromatic/aliphatic split and carbon number banding, using GC-FID techniques
- BTEX and MTBE – using GC-MS techniques
- Polyaromatic Hydrocarbons – using GC-MS techniques

The analyses were carried out by i2 Analytical Limited, a UKAS accredited laboratory, and the results are presented in this Appendix. Soil testing was undertaken in accordance with the Environment Agency's Monitoring Certification Scheme (MCERTS).

Geotechnical Laboratory Testing

The rationale for the geotechnical laboratory testing is set out in the Table II-3.

Selected samples of the soils encountered were submitted for analysis for the following tests:

- Moisture content
- Atterberg Limits
- Particle size distribution (wet sieve)
- pH value
- Specific gravity
- Undrained shear strength of remoulded materials
- Water soluble sulphate
- Acid soluble sulphate
- Total sulphur
- Dry density/moisture content relationship (4.5 kg rammer) – as-dug and 2% Lime
- Intact dry density & Saturated moisture content of chalk

The analyses were carried out by Construction Testing Solutions (CTS) Limited and i2 Analytical Limited, both UKAS accredited laboratories, and the results are presented in this Appendix.

TABLE II-1

RATIONALE FOR THE DESIGN OF THE GROUND INVESTIGATION

The scope of the supplementary ground investigation was designed with reference to the published geology and ground conditions indicated in the desk study information. In addition, reference was also made to the RPS factual records presented within Appendix I.

In compliance with the guidance published in BS EN 1997-2:2007, the ground investigation was designed to verify the preliminary ground model, established from the desk study information and to characterise the ground conditions within influencing distance of the proposed structures. In this regard, the exploratory holes were targeted within relevant areas of the site to provide information on the strata profile down to competent materials. With reference to the desk study information and the support requirements of the proposed development, it is evident that adequate support is provided by the strata that continue below the depths of the exploratory holes.

In compliance with the guidance published in BS 10175:2011+A1:2013 and BS 5930:2015, the layout of the exploratory holes and sampling regime also considers the Conceptual Site Model and potential pollutant linkages, such that the spatial arrangement of the investigation provides the necessary information to support a risk assessment of the identified potential pollutant linkages.

Exploratory Hole and Technique	**Rationale for Hole Location**	**Depth (m)**	**Sampling/In Situ Testing and Monitoring**
TP CC1 to TP CCL45	Exploratory hole locations were chosen to provide general site coverage and supplement the existing ground investigation data. Earthworks are proposed at the site and some exploratory holes were located in areas of proposed cut to enable samples to be taken for earthworks classification and suitability testing.	Up to 3.60 m	Selected soil samples were recovered from the trial pits for analytical and geotechnical laboratory testing. In-situ hand vane tests were carried out on fine-grained soils (where possible and appropriate) to provide undrained shear strength data representative of the tested horizons.
BH CC1 to BH CCL6	Borehole locations were chosen to provide general site coverage and supplement the existing ground investigation data.	Up to 15.0 m	Selected soil samples were recovered from the boreholes for geotechnical laboratory testing. Standard Penetration Tests (SPTs) were carried out at regular intervals to provide data on the in-situ density of coarse strata and an indication of strength within fine grained strata. In-situ hand vane tests were carried out on extruded samples of fine-grained soils (where possible and appropriate) to provide undrained shear strength data representative of the tested horizons.
CPT01 to CPT38	Static Cone Penetration Tests (CPTs) were located within the proposed building footprints (where access permitted) to provide in-situ measurements on the strata beneath the site. CPT's were undertaken to supplement the borehole data and confirm the presence of any dissolution features and possible chalk mining.	Up to 15.08 m	Measurements of end resistance and side friction recorded at regular intervals.

Key

TP CCL*X*	Machine Dug Trial Pit	BH CCL*X*	Light Cable Percussion Borehole
CPT CCL*X*	Cone Penetration Test		

TABLE II-2

RATIONALE FOR THE ANALYTICAL TESTING SUITE

Exploratory Hole and Samples	Selection Criteria	Analytical Tests
TP CCL01 1.10 m TP CCL04 2.30 m TP CCL08 2.20 m TP CCL08 3.40 m TP CCL10 0.00-0.20 m TP CCL17 0.00-0.30 m TP CCL24 0.20-0.30 m TP CCL39 0.00-0.20 m TP CCL41 0.00-0.20 m	Samples were recovered from shallow soils to assess the presence of potential contaminants associated with the site history.	Metal and metalloids, cyanide (total), pH, phenol, sulphate (water and acid soluble), sulphide, sulphur (total), total organic carbon and asbestos identification and quantification.
TP CCL01 1.10 m TP CCL01 1.50 m TP CCL04 2.30 m TP CCL08 2.20 m TP CCL08 3.40 m TP CCL10 0.00-0.20 m TP CCL17 0.00-0.30 m TP CCL24 0.20-0.30 m TP CCL39 0.00-0.20 m TP CCL41 0.00-0.20 m	Samples were recovered from shallow soils to assess the presence of potential contaminants associated with the site history.	Petroleum Hydrocarbons Polyaromatic Hydrocarbons (PAHs) BTEX

RATIONALE FOR THE GEOTECHNICAL TESTING SUITE

Exploratory Hole and Sample		Selection Criteria	Geotechnical Tests
TP CCL01 0.60 m	TP CCL18 1.00 m	Earthwork classification and suitability	Moisture content
TP CCL03 0.20-0.70 m	TP CCL19 0.70 m		
TP CCL03 1.30 m	TP CCL19 1.10-1.20 m		
TP CCL03 1.80 m	TP CCL20 0.60 m		
TP CCL03 2.10-2.20 m	TP CCL21 0.40 m		
TP CCL03 3.40 m	TP CCL21 0.90 m		
TP CCL04 0.20 m	TP CCL21 1.20-1.40 m		
TP CCL04 0.80 m	TP CCL21 1.80 m		
TP CCL05 0.40-0.60 m	TP CCL22 1.40-1.50 m		
TP CCL05 0.50 m	TP CCL23 0.50 m		
TP CCL06 0.50-0.7 m	TP CCL28 1.30 m		
TP CCL06 0.50 m	TP CCL28 1.80-1.90 m		
TP CCL06 1.10 m	TP CCL28 2.20 m		
TP CCL06 1.70 m	TP CCL29 0.50 m		
TP CCL07 0.50 m	TP CCL29 1.20-1.30 m		
TP CCL07 1.00 m	TP CCL30 0.50 m		
TP CCL07 1.00-1.20 m	TP CCL30 0.90-1.00 m		
TP CCL07 1.50 m	TP CCL30 1.30 m		
TP CCL07 2.60 m	TP CCL31 0.60 m		
TP CCL08 0.50 m	TP CCL33 0.90-1.00 m		
TP CCL08 0.70-0.80 m	TP CCL33 2.40-2.50 m		
TP CCL08 1.00 m	TP CCL36 0.50 m		
TP CCL08 1.30 m	TP CCL37 0.60 m		
TP CCL08 2.00-2.20 m	TP CCL40 0.60 m		
TP CCL08 2.20 m	TP CCL40 1.00 m		
TP CCL09 0.30 m	TP CCL40 1.50-1.60 m		
TP CCL09 0.80 m	TP CCL40 2.00 m		
TP CCL11 0.50-0.60 m	TP CCL40 2.40-2.50 m		
TP CCL13 0.40 m	TP CCL40 2.90 m		
TP CCL13 0.80-0.90 m	TP CCL41 0.20-0.40 m		
TP CCL14 0.60 m	TP CCL41 0.80 m		
TP CCL14 0.90-1.10 m	TP CCL41 1.30 m		
TP CCL14 1.50 m	TP CCL41 1.90 m		
TP CCL15 0.40-0.50 m	TP CCL41 2.10-2.20 m		
TP CCL15 0.90 m	TP CCL41 2.50 m		
TP CCL16 0.50 m	TP CCL42 0.50 m		
TP CCL16 0.80 m	TP CCL44 0.50-0.60 m		
TP CCL16 1.00-1.20 m	TP CCL44 1.00 m		
TP CCL17 0.60 m	TP CCL44 1.60 m		
TP CCL18 0.30 m	TP CCL45 0.15-0.70 m		
TP CCL03 0.20-0.70 m	TP CCL22 1.40-1.50 m	Material classification and to assess materials volume change potential	Atterberg Limits
TP CCL03 2.10-2.20 m	TP CCL28 1.80-1.90 m		
TP CCL06 0.50 m	TP CCL28 2.20 m		
TP CCL06 1.70 m	TP CCL30 1.30 m		
TP CCL08 0.70-0.80 m	TP CCL33 0.90-1.00 m		
TP CCL08 2.00-2.20 m	TP CCL33 2.40-2.50 m		
TP CCL09 0.30 m	TP CCL40 1.50-1.60 m		
TP CCL13 0.80-0.90 m	TP CCL41 0.20-0.40 m		
TP CCL14 1.50 m	TP CCL41 2.10-2.20 m		
TP CCL21 1.80 m	TP CCL44 1.00 m		

TABLE II-3
(Sheet 2 of 2)

Exploratory Hole and Sample		Selection Criteria	Geotechnical Tests
TP CCL03 0.20-0.70 m TP CCL08 0.70-0.80 m TP CCL08 2.00-2.20 m	TP CCL29 1.20-1.30 m TP CCL33 0.90-1.00 m TP CCL40 2.40-2.50 m	Earthwork classification and suitability	Particle size distribution (wet sieve)
TP CCL03 0.20-0.70 m TP CCL03 3.40 m TP CCL04 0.80 m TP CCL05 0.50 m TP CCL05 1.00 m TP CCL06 0.50 m TP CCL06 1.70 m TP CCL06 2.50 m TP CCL07 2.60 m TP CCL08 0.50 m	TP CCL09 0.30 m TP CCL11 1.00 m TP CCL12 0.40 m TP CCL15 2.20 m TP CCL30 0.90-1.00 m TP CCL40 2.40-2.50 m TP CCL41 0.20-0.40 m TP CCL41 2.10-2.20 m TP CCL44 0.50-0.60 m TP CCL45 0.15-0.70 m	To aid foundation concrete design To assess suitability for lime modification	pH Water soluble sulphate Acid soluble sulphate Total sulphur
TP CCL03 0.20-0.70 m TP CCL05 0.40-0.60 m TP CCL06 0.50-0.70 m TP CCL07 1.00-1.20 m TP CCL08 0.70-0.80 m TP CCL08 2.00-2.20 m TP CCL11 0.50-0.60 m TP CCL13 0.80-0.90 m TP CCL14 0.90-1.10 m TP CCL19 1.10-1.20 m	TP CCL28 1.80-1.90 m TP CCL30 0.90-1.00 m TP CCL33 0.90-1.00 m TP CCL33 2.40-2.50 m TP CCL40 1.50-1.60 m TP CCL40 2.40-2.50 m TP CCL41 0.20-0.40 m TP CCL44 0.50-0.60 m TP CCL45 0.15-0.70 m	Earthwork classification and to determine acceptability criteria	Dry density/moisture content relationship (4.5 kg rammer) As-Dug
TP CCL06 0.50-0.70 m TP CCL08 0.70-0.80 m TP CCL08 2.00-2.20 m	TP CCL13 0.80-0.90 m TP CCL19 1.10-1.20 m TP CCL41 0.20-0.40 m	Earthwork classification and to determine acceptability criteria	Dry density/moisture content relationship (4.5 kg rammer) 2% Lime
TP CCL06 2.50 m TP CCL15 2.20 m	TP CCL20 2.50-2.90 m TP CCL29 3.20 m	Samples of chalk were collected to provide strength and classification data.	Intact dry density/Saturated moisture content of Chalk

TRIAL PIT RECORDS

KEY

	J	Disturbed Jar Sample	Category B Samples
	G	Soil Sample in Glass Container	
	g	Soil Sample in Glass Vial	
	B	Disturbed Bulk Sample	
	C	"Undisturbed" CBR Mould Sample (denoted Category A: OS-TK/W in BS EN 22475-1:2006)	
	W	Water Sample	
FVT	c_{fv}	Undrained Shear Strength (from hand vane shear vane test)	
	c_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)	
	c_{fv} *	Undrained Shear Strength from Hand Vane Shear Strength Test on block sample dug from pit by excavator	

Notes:

1. All measurement values on record sheets are uncorrected, unless otherwise indicated.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004, BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc.) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14)
5. Undrained shear strength (low, medium, high etc.) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc.) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Hole Ref.	**TPCCL01**
Sheet	1 of 2
Job No.	CCL02935
Bearing:	West
Plant	JCB 3CX
Trial Pit	A
Plan	B / C
Shoring	None used
Stability	Sides were stable and vertical during excavation
Water	None encountered
Ground Level	134.64 m OD
Co-ordinates	
Logged by	SR — Logged on site during excavation
Checked by	

Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
0.20				0.20
		(2)		
0.70				0.70
0.80		(3)		0.80
		(4)		
1.10				1.10
		(5)		
1.40				1.40
		(6)		
1.80				1.80
		(7)		
2.70				2.70
		(8)		
3.00				3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.10/0.20	Firm consistency brown very gravelly clay with rootlets and grass. Gravel is fine to coarse angular of flint, brick and occasional chalk fragments. Slightly ashy (MADE GROUND/TOPSOIL)
0.40	c_{fv}	60/60/50	2	0.10/0.20 - 0.70	Firm consistency orangish brown gravelly clay with occasional rootlets and roots and ashy deposits. Gravel is fine to coarse angular of brick and flint. Clay is friable
0.60	JJ				(MADE GROUND)
0.70	J		3	0.70 - 0.80	Orange and orangish brown coarse grained sand and gravel. Gravel is fine to coarse subangular to rounded with occasional flint (MADE GROUND)
0.90	c_{fv}	80/80/80	4	0.80 - 1.10	Firm consistency orangish brown slightly sandy gravelly clay with occasional rootlets. Gravel is fine to coarse angular to subrounded of flint, chalk and brick
1.10	JJGg				(MADE GROUND)
1.30	c_{fv}	90/90/100	5	1.10 - 1.40	Firm consistency blackish grey and grey gravelly sandy clay. Gravel is fine to coarse angular to subangular with abundance of brick and ashy deposits. Slight hydrocarbon odour (MADE GROUND)
					(Continued on sheet 2 of 2)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Hole Ref.	**TPCCL01**
Sheet	2 of 2
Job No.	CCL02935
Bearing:	West
Shoring	None used
Ground Level	134.64 m OD
Plant	JCB 3CX
Stability	Sides were stable and vertical during excavation
Co-ordinates	
Trial Pit	A
Plan	B / C
Water	None encountered
Logged by	SR — Logged on site during excavation
Checked by	

Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
0.20				0.20
		(2)		
0.70				0.70
0.80		(3)		0.80
		(4)		
1.10				1.10
		(5)		
1.40				1.40
		(6)		
1.80				1.80
		(7)		
2.70				2.70
		(8)		
3.00				3.00
		Base of trial pit		

Sampling | Strata

Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
					(Continued from sheet 1 of 2)
1.50	J		6	1.40 - 1.80	Stiff consistency orangish brown mottled grey gravelly clay. Gravel is fine to coarse angular to subangular with flint, chalk and occasional brick fragments. Slight hydrocarbon odour (MADE GROUND)
1.80	c_{fv}	80/80	7	1.80 - 2.70	Firm consistency light grey gravelly silty clay with organic content. Gravel is fine to coarse angular to subanagular with flint and rare brick fragments. Slightly organic odour
1.80	JJ				(MADE GROUND)
2.80	J		8	2.70 - 3.00	Stiff consistency orange mottled grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint. Clay is friable (CLAY-WITH-FLINTS)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL02**
Date	29/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:		**Shoring**	None used
Ground Level	136.21 m OD		
Plant	JCB 3CX	**Stability**	Not applicable
Co-ordinates			
Trial Pit	A	**Logged by**	SR
Plan	B	**Water**	Not applicable
	C	**Checked by**	Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
1.50		(1)		1.50
		Base of stockpile		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 1.50	Nettles over brown humic clay with organic matter, rootlets and roots (STOCKPILE SAMPLE/MADE GROUND)

Remarks

Stockpile of Made Ground materials were logged

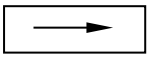
Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Hole Ref.	**TPCCL03**
Sheet	1 of 2
Job No.	CCL02935
Bearing:	Northwest
Shoring	None used
Ground Level	136.73 m OD
Plant	JCB 3CX
Stability	Sides were stable and vertical during excavation
Co-ordinates	
Trial Pit	A
Plan	 B / C
Water	None encountered
Logged by	SR — Logged on site during excavation
Checked by	

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.70		(2)		0.70
0.90		(3)		0.90
2.70		(4)		2.70
3.00		(5)		3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency light brown slightly silty gravelly clay with rootlets and grass, Gravel is fine to coarse angular to subrounded of flint, brick fragments. Ashy (MADE GROUND/TOPSOIL)
0.20 - 0.70	JJ BB		2	0.20 - 0.70	Firm consistency orangish brown and brown clay with rootlets. Gravel is fine to coarse angular to subangular with flint and rare concrete fragment
0.70	c_{fv}	50/60/50			(MADE GROUND)
0.90	c_{fv}	70/70/80	3	0.70 - 0.90	Firm consistency dark brown slightly gravelly silty clay with rootlets. Gravel is fine to coarse angular to subangular of flint and brick (RELIC TOPSOIL/MADE GROUND)
1.30	J		4	0.90 - 2.70/3.00	Firm consistency orangish brown mottled black gravelly CLAY. Gravel is fine to coarse subangular to rounded of flint. Clay is friable
1.80	J				(CLAY-WITH-FLINTS)
					…boulders of flint below 1.8 m depth at 400 mm diameter
1.80	c_{fv}	90/90/100			…becoming stiff consistency CLAY below 1.8 m depth
					…becoming light yellowish orange below 2.5 m depth
2.10 - 2.20	JJ BB				
					(Continued on sheet 1 of 2)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL03**
Date	28/03/2017	**Sheet**	2 of 2
		Job No.	CCL02935
Bearing:	Northeast	**Shoring**	None used
Ground Level	136.73 m OD		
Plant	JCB 3CX	**Stability**	Sides were stable and vertical during excavation
Co-ordinates			
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Checked by**	
Water	None encountered		Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.70		(2)		0.70
0.90		(3)		0.90
2.70		(4)		2.70
3.00		(5)		3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
3.40	JJ		5	2.70 - 3.00	(contnued from sheet 1 of 2) Structureless CHALK composed of white silty fine to coarse subangular GRAVEL with occasional flint. Clasts are extremely weak to weak low density (UPPER CHALK: GRADE Dc)

Remarks
Coordinates and elevations provided by Winvic

Notes
1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

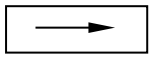
Trial Pit Record Sheet

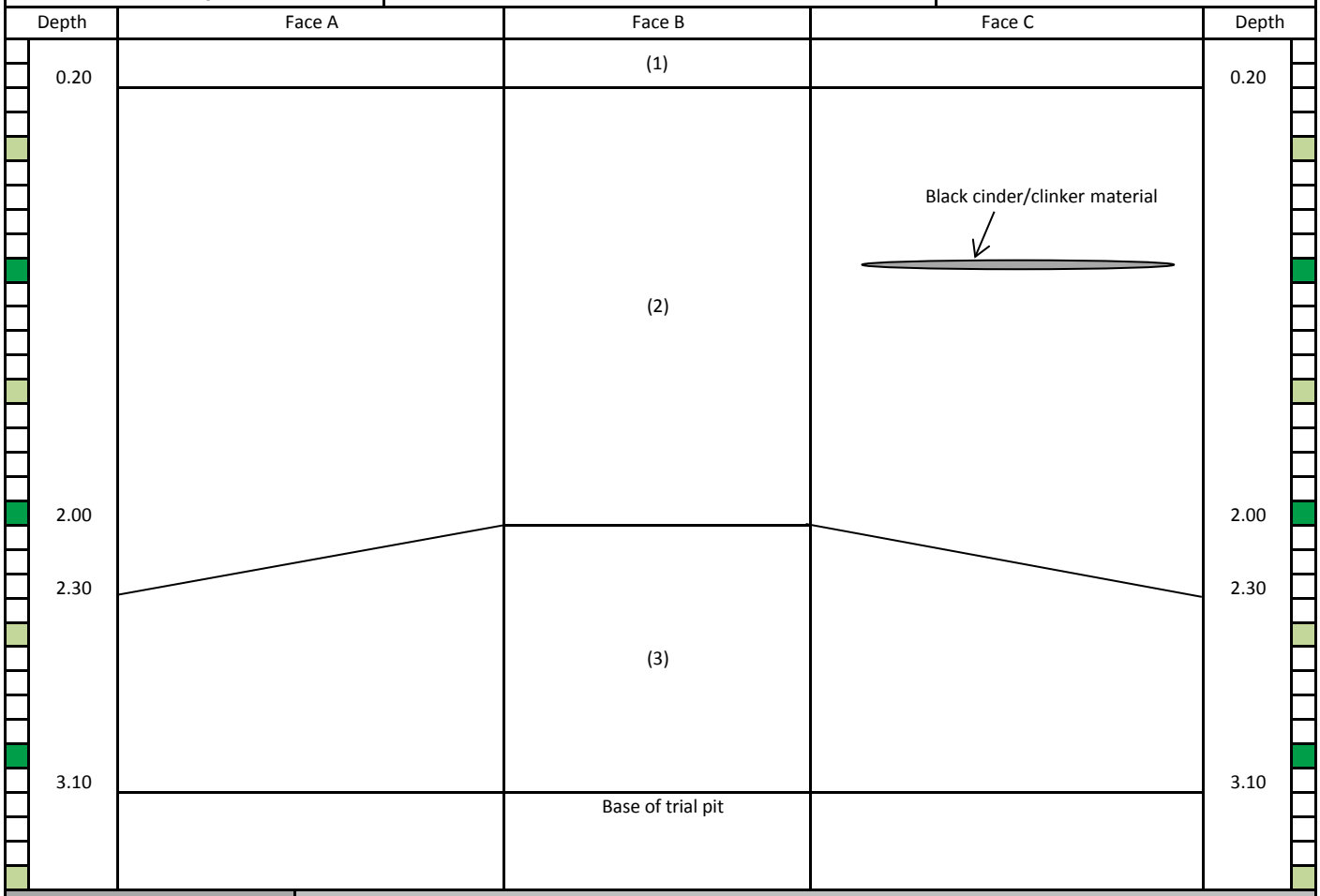
Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL04**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	133.94 m OD
Co-ordinates	508327 207775
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C





Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (MADE GROUND/TOPSOIL)
0.20	JJ		2	0.20 - 2.00/2.30	Firm consistency orangish brown and orange mottled red gravelly clay with rootlets. Gravel is fine to coarse angular to subrounded of flint, clinker and cinder. Ashy (MADE GROUND)
0.30	c_{fv}	50/50/60			
0.70	c_{fv}	100/110			
0.80	JJ				…becoming orange brown mottled grey below 0.8 m depth
1.00	c_{fv}	90/80/90			…FACE C: Black ashy deposits of clinker/cinder at 1.0 m
1.10	JJ				…becoming orangish brown below 1.4 m depth
1.50	c_{fv}	100/110			
2.30	JJGg		3	2.00/2.30 - 3.10	Firm consistency grey mottled brown with black staining slightly gravelly ashy clay with rootlets. Gravel is fine to coarse angular to subangular with flint and brick fragments. Slight hydrocarbon odour (MADE GROUND)

Remarks
Coordinates and elevations provided by Winvic

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL05**
Date	27/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	North	**Shoring**	None used
Ground Level	134.64 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508377 207804		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Water**	Groundwater not encountered.
Checked by			Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.35		(1)		0.35
0.80		(2)		0.80
2.50		(3)		2.50
3.00		(4)		3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.35	Firm consistency dark brown gravelly clay with rootlets and grass. Gravel is fine to coarse with flint, brick and occasional chalk. Ashy (MADE GROUND/TOPSOIL)
0.40	c_{fv}	80/80/85	2	0.35 - 0.80	Stiff consistency brownish orange gravelly clay with rootlets. Gravel is fine to coarse with flint and occasional brick fragments (MADE GROUND)
0.50	JJ				
0.40 - 0.60	BB				
1.00	c_{fv}	90/100/90	3	0.80 - 2.50	Stiff consistency orangish brown mottled grey gravelly CLAY. Gravel is fine to coarse angular to subangular with flint (CLAY-WITH-FLINTS)
1.00	JJ				
1.70	JJ				...becoming silty CLAY below 1.7 m depth
1.80	c_{fv}	80/90/90			...abundance of boulder size flint at 1.9 m depth
					...becoming very stiff consistency orange mottled grey CLAY below 2.0 m depth
2.30	c_{fv}*	80/70/80			
			4	2.50 - 3.00	Structureless CHALK composed of white silty fine to coarse subangular GRAVEL with occasional flint. Clasts are extremely weak to weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

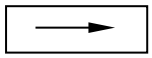
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	27/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL06**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	135.32 m OD
Co-ordinates	508421 207805
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	North
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Depth	Face A	Face B	Face C	Depth
0.35		(1)		0.35
		(2)		
2.40		(3)		2.40
2.80				
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.35	Firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to rounded of flint (TOPSOIL)
0.40	c_{fv}	50/50/55	2	0.35 - 2.40/2.80	Firm consistency brownish orange slightly gravelly CLAY. Gravel is fine to coarse angular of flint (CLAY-WITH-FLINTS)
0.50	J				
0.50 - 0.70	BB JJ				.....becoming orangish brown mottled grey below 0.80 m
1.10	J				.....boulders (600 - 800 mm) of flint at 1.00 m
1.20	c_{fv}	80/85/90			.....becoming stiff consistency below 1.20 m
1.70	JJJ				.....becoming gravelly below 1.40 m
					.....occasional chalk gravel below 1.80 m
2.50	JJ		3	2.40/2.80 - 3.00	Structureless CHALK composed of white silty fine to coarse subangular GRAVEL with occasional flint. Clasts are extremely weak to weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	27/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL07**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	135.98 m OD
Co-ordinates	508458 207821
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan A → B, C

Depth	Face A	Face B	Face C	Depth
0.25		(1)		0.25
2.10		(2)		2.10
3.20		(3)		3.20
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Firm consistency orangish brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular of flint (TOPSOIL)
0.50	c_{fv}	55/45/45	2	0.25 - 2.10	Firm consistency brownish orange and orange slightly gravelly CLAY with occasional chalk fragments. Gravel is fine to coarse subangular to rounded of flint (CLAY-WITH-FLINTS)
0.50	J				
1.00	JJ				
1.00 - 1.20	BB JJ				.....becoming orangish brown mottled grey gravelly CLAY with boulders (200 - 300 mm) of flint below 0.50 m
1.20	c_{fv}	80/75/80			
1.50	J				.....becoming stiff consistency with boulders (600 mm) of flint below 1.00 m
2.00	J				
2.60	JJ		3	2.10 - 3.20	Structureless CHALK composed of white silty fine to coarse subangular GRAVEL with occasional flint. Clasts are extremely weak to weak low density (UPPER CHALK: GRADE Dc)

Remarks
Coordinates and elevations provided by Winvic

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL08**
Sheet	1 of 2
Job No.	CCL02935
Ground Level	135.62 m OD
Co-ordinates	508461 207775
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.70		(2)		0.70
1.10		(3)		1.10
1.40		(4)		1.40
3.50		(5) Base of trial pit		3.50

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency dark brown slightly sandy gravelly clay with rootlets and grass and brick and glass fragments. Gravel is fine to medium angular to subangular of flint (MADE GROUND)
0.50	c_{fv}	80/ 70/ 60	2	0.20 - 0.70	Firm consistency orangish brown mottled grey gravelly silty clay with occasional sand pockets. Sand is coarse. Gravel is fine to coarse angular to rounded of flint (MADE GROUND)
0.50	J				
0.70 - 0.80	BB JJ		3	0.70 - 1.10	Firm consistency brownish light grey and orangish brown mottled grey slightly sandy gravelly clay with brick boulders (400 mm) and ashy deposits. Gravel is fine to coarse angular of flint (MADE GROUND) .....becoming stiff consistency below 1.00 m
1.00	c_{fv}	80/ 90/ 90			
1.00	J				
1.30	c_{fv}	70/ 80/ 80	4	1.10 - 1.40	Stiff consistency orangish brown mottled grey and greyish green slightly gravelly silty clay with occasional wood fragments. Gravel is fine to coarse angular to rounded of flint (MADE GROUND) .....becoming gravelly clay with rare brick fragments below 1.20 m
1.30	J				
					(Continued on Sheet 2 of 2)

Remarks
Coordinates and elevations provided by Winvic
Slight hydrocarbon odours detected between 1.10 - 1.40 m and at 3.00 m

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL08**
Sheet	2 of 2
Job No.	CCL02935
Ground Level	135.62 m OD
Co-ordinates	508461 207775
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.70		(2)		0.70
1.10		(3)		1.10
1.40		(4)		1.40
3.50		(5) Base of trial pit		3.50

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
					(Continued from Sheet 1 of 2)
2.00 - 2.20	BB JJ		5	1.40 - 3.50	Soft consistency greenish grey mottled brown with black staining gravelly clay with roots rare brick
2.10	c_{fv}*	30/30/40			fragments and a rare paint tin. Gravel is fine to coarse angular to subrounded of flint
2.20	J JJGg				(MADE GROUND)
3.40	JJGg				.....boulder (300 mm) of slag/cinder encountered at 3.4 m

Remarks
Coordinates and elevations provided by Winvic
Slight hydrocarbon odours detected between 1.10 - 1.40 m and at 3.00 m to 3.5 m

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

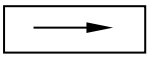
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL09**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	136.50 m OD
Co-ordinates	508513 207788
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	South
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Depth	Face A	Face B	Face C	Depth
0.25		(1)		0.25
		(2)		
2.90			(3)	2.90
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Firm consistency orangish brown gravelly clay with rootlets and grass and rare chalk fragments. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.30	JJ		2	0.25 - 2.90	Firm consistency orangish brown and orange mottled black gravelly CLAY. Gravel is fine to coarse angular to subrounded of flint
0.30	c_{fv}	70/60/60			(CLAY-WITH-FLINTS)
0.80	J				.....boulders (400 mm) of flint below 0.70 m
0.80	c_{fv}	70/70/70			.....becoming orangish brown mottled grey below 1.00 m
1.40	c_{fv}	90/90/80			.....becoming stiff consistency below 1.40 m
2.00	c_{fv}	120			.....becoming very stiff consistency friable CLAY below 2.00 m
			3	2.90 - 3.00	Structureless CHALK composed of white silty fine to coarse subangular GRAVEL with occasional flint. Clasts are extremely weak to weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL10**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	129.41 m OD
Co-ordinates	
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: South
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.40		(2)		0.40
		(3)		
2.80		Base of trial pit		2.80

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.00 - 0.20	JJGg		1	0.00 - 0.20	Vegetation over black and brown sandy fine to coarse angular to subangular gravel with concrete fragments (MADE GROUND)
0.30	c_{fv}	50/62/72	2	0.20 - 0.40	Light grey sandy fine to coarse angular to subangular gravel with concrete fragments (MADE GROUND)
0.80	c_{fv}	80/90/92	3	0.40 - 2.80	Firm consistency light brown and orangish brown gravelly clay with rare ash deposits. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
1.60	c_{fv}	111/88/103			
1.60	JJ				.....becoming orangish brown below 0.6 m
1.90	c_{fv}	110/109/116			.....becoming stiff consistency orangish brown mottled grey below 1.0 m
					.....flint boulders at 1.9 m
					.....flint gravel horizon below 2.0 m

Remarks
Coordinates and elevations provided by Winvic
Further excavation precluded by flint boulder

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL11**
Date	30/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	West	**Shoring**	None used
Ground Level	131.50 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508191 207730		
Trial Pit	A	**Logged by**	SR
Plan	→ B	**Water**	Groundwater not encountered.
	C	**Checked by**	Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.30				0.30
		(2)		
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20/0.30	Soft to firm consistency brown and orangish brown slightly gravelly CLAY with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.50 - 0.60	BB JJ		2	0.20/0.30 - 3.00	Firm to stiff consistency orangish brown gravelly CLAY with rare rootlets. Gravel is fine to coarse angular to subangular of flint. Clay is friable (CLAY-WITH-FLINTS)
0.60	c_{fv}	75/98/99			
1.00	c_{fv}	68/72/88			
1.00	JJ				
					.....becoming reddish orange mottled grey below 1.4 m
					.....becoming very stiff consistency below 1.6 m
					.....flint boulders (approx. 200 mm) at 1.8 m
					.....becoming very friable below 2.0 m

Remarks

Coordinates and elevations provided by Winvic

Notes

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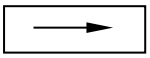
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL12**
Date	30/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	North	**Shoring**	None used
Ground Level	130.30 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508252 207731		
Trial Pit	A	**Logged by**	SR
Plan	 B	**Checked by**	Logged on site during excavation
	C	**Water**	Groundwater not encountered.

Depth	Face A	Face B	Face C	Depth
		(1)		
0.25				0.25
		(2)		
0.60				0.60
		(3)		
3.00				3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Soft to firm consistency brown gravelly clay with rootlets, grass and flint. Gravel is fine to coarse angular to subangular. (MADE GROUND)
0.40	J		2	0.25 - 0.60	Firm consistency brown gravelly clay with rare rootlets. Gravel is fine to coarse angular to
0.60	c_{fv}	58/62/72			subangular of flint (MADE GROUND)
0.70	J		3	0.60 - 3.00	Firm consistency orangish brown mottled black gravelly CLAY. Gravel is fine to coarse angular to
1.00	c_{fv}	64/58/52			subangular of flint
1.50	c_{fv}	82/88/78			(CLAY-WITH-FLINTS)
1.80	c_{fv}	90/92/94			.....rare rootlets at 0.7 m
2.40	c_{fv}*	88/84/80			.....becoming orangish brown mottled grey below 1.2 m
					.....becoming stiff consistency reddish orange mottled grey friable CLAY below 1.5 m
					.....occasional chalk gravel and flint boulders (300 mm) below 1.8 m

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	27/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL13**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	131.60 m OD
Co-ordinates	508328 207734
Logged by	SR
Checked by	

Bearing: East
Plant JCB 3CX
Trial Pit A
Plan B C

Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
		(1)		0.25
0.30				
		(2)		
2.40				2.40
2.60		(3)		2.60
3.10		Base of trial pit		3.10

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25/0.30	Firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to rounded of flint (TOPSOIL)
0.40	J		2	0.25/0.30 - 2.40/2.60	Firm consistency orangish brown mottled grey gravelly silty CLAY. Gravel is fine to coarse angular of flint
0.70	c_{fv}	50/55/55			(CLAY-WITH-FLINTS)
0.80-0.90	BB				
1.00	JJ				.....becoming slightly gravelly with occasional boulders of flint (400 mm) below 0.80 m
1.30	c_{fv}	70/80/70			.....becoming stiff consistency gravelly CLAY below 1.40 m
1.60	J				
2.00	c_{fv}*	80/90		2.40/2.60 - 3.10	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)
3.00	J				

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	27/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL14**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	133.97 m OD
Co-ordinates	508393 207745
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Northeast
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
		(1)		
0.35				0.35
		(2)		
3.00				3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.35	Soft consistency brown slightly gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to rounded of flint and chalk (TOPSOIL)
0.60	c_{fv}	30/45/50	2	0.35 - 3.00	Soft to firm consistency orange mottled grey slightly gravelly CLAY. Gravel is fine to coarse angular of flint
0.60	J				
0.90 - 1.10	BB JJ				(CLAY-WITH-FLINTS)
1.00	c_{fv}	70/60/60			.....becoming firm consistency below 0.9 m
1.40	c_{fv}	70/50/60			.....occasional chalk fragments below 1.8 m
1.50	JJ				.....becoming stiff consistency below 2.0 m
2.00	J				.....becoming reddish orange and red mottled grey below 1.5 m
					.....becoming silty CLAY below 2.3 m

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL15**
Sheet	1 of 2
Job No.	CCL02935
Ground Level	135.40 m OD
Co-ordinates	508461 207731
Logged by	SR
Checked by	

Bearing:	North
Plant	JCB 3CX
Trial Pit	A
Plan	B / C

Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
		1		
0.35				0.35
		2		
2.10				2.10
		3		
3.50		(Continued on Sheet 2 of 2)		3.50

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.40	c_{fv}	50/50/60		0.00 - 0.35/0.40	Firm consistency brown and orangish brown gravelly clay with rootlets, grass and occasional brick fragments. Gravel is fine to coarse angular of flint (MADE GROUND)
0.40 - 0.50	BB JJ			0.35/0.40 - 2.10	Firm consistency orangish brown mottled grey slightly gravelly silty CLAY. Gravel is fine to coarse angular of flint
0.90	c_{fv}	70/70/80			(CLAY-WITH-FLINTS)
0.90	J				
1.40	JJ				.....boulders (400 mm) of flint below 1.00 m
1.40	c_{fv}	80/70/70			.....becoming gravelly CLAY below 1.10 m
					.....becoming red mottled black with boulders (600 mm) of flint below 1.70 m
					.....becoming stiff consistency below 2.00 m
2.20	JJ			2.10 - 3.60	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)
					(Continued on Sheet 2 of 2)

Remarks

Coordinates and elevations provided by Winvic

Notes

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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Hole Ref.	**TPCCL15**
Sheet	2 of 2
Job No.	CCL02935
Bearing:	North
Plant	JCB 3CX
Trial Pit	A
Plan	B / C
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.
Ground Level	135.40 m OD
Co-ordinates	508461 207731
Logged by	SR
Checked by	

Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
3.60		(3) Base of trial pit		3.60

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
				2.10-3.60	(Continued from sheet 1 of 2) Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL16**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	135.78 m OD
Co-ordinates	508525 207728
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: East
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
		(1)		
0.35				0.35
		(2)		
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.30	c_{fv}	50/60/70	1	0.00 - 0.35	Firm consistency brown slightly gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint and occasional chalk (TOPSOIL)
0.50	J		2	0.35 - 3.00	Firm consistency orangish brown gravelly CLAY. Gravel is fine to coarse angular to rounded of flint
0.80	JJ				(CLAY-WITH-FLINTS)
1.00 - 1.20	BB JJ				.....boulders (400-600 mm) of flint below 0.6 m
1.00	c_{fv}	80/80/70			.....becoming orangish brown mottled grey below 0.8 m
1.70	JJ				.....becoming stiff consistency below 1.5 m
1.80	c_{fv}	90/90/80			.....becoming friable below 2.0 m
2.30	JJ				.....occasional chalk gravel below 2.4 m
3.00	c_{fv}*	90/100			.....becoming very stiff consistency below 2.8 m

Remarks
Coordinates and elevations provided by Winvic

Notes
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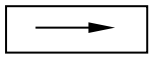
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL17**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	130.25 m OD
Co-ordinates	508148 207672
Logged by	SR
Checked by	Logged on site during excavation

Bearing:	East
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Depth	Face A	Face B	Face C	Depth
		(1)		
0.30				0.30
		(2)	(3)	
3.00		Base of trial pit		2.90 3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.00-0.30	JJGg		1	0.00 - 0.30	Black and brown slightly sandy fine to coarse angular to subangular gravel with concrete and brick fragments and ash deposits and geotextile sheet at base of Made Ground (MADE GROUND)
0.60	c_{fv}	87/89/92	2	0.30 - 2.90/3.00	Firm consistency orangish brown mottled grey gravelly CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.60	J				
1.20	c_{fv}	132/110/131			.....boulders (500 mm) of flint
					.....becoming stiff consistency friable clay below 1.0 m
			3	2.90 - 3.00	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL18**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	129.94 m OD
Co-ordinates	508220 207690
Logged by	SR
Checked by	Logged on site during excavation

Bearing:	Northeast
Plant	JCB 3CX
Trial Pit	A
Plan	B / C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.60		(2)		0.60
2.80		(3)		2.80
2.90		(4) Base of trial pit		2.90

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Soft to firm consistency brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.30	c_{fv}	72/82/110	2	0.20 - 0.60	Firm to stiff consistency orangish brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (MADE GROUND)
0.30	JJ				
0.80	c_{fv}	88/88/92	3	0.60 - 2.80	Firm consistency orange and brownish orange slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint. (CLAY-WITH-FLINTS)
1.00	J				
1.20	c_{fv}	71/72/78			
1.80	c_{fv}	98/111/118			.....becoming orange mottled grey friable CLAY below 1.00 m
					.....becoming very stiff consistency CLAY below 1.80 m
			4	2.80 - 2.90	Structureless CHALK composed of firm consistency white SILT (UPPER CHALK: GRADE Dm)

Remarks

Coordinates and elevations provided by Winvic

Notes

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2. Symbols and abbreviations are explained on the accompanying key
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL19**
Date	30/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	North	**Shoring**	None used
Ground Level	129.37 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508284 207684		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Water**	Groundwater not encountered.
Checked by			Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.90		(2)		0.90
1.20		(3)		1.20
2.80		(4)		2.80
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Soft to firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.50 0.70	c_{fv} JJ	74/96/82	2	0.20 - 0.90	Firm consistency orangish brown gravelly clay with rare chalk fragments. Gravel is fine to coarse angular to subrounded of flint
0.80	c_{fv}	92/110/100			(MADE GROUND)
1.00 1.10 - 1.20	c_{fv} BB JJ	40/50/48	3	0.90 - 1.20	Soft to firm consistency dark grey and brown slightly gravelly clay with rare brick fragments and occasional rootlets. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
1.50	c_{fv}	58/60/54	4	1.20 - 2.80	Firm consistency reddish orange mottled orange slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS) .....becoming dark orange mottled grey below 1.80 m .....becoming stiff consistency with black mottling and boulders of flint (200 mm) below 2.00 m

Remarks
Coordinates and elevations provided by Winvic

Notes
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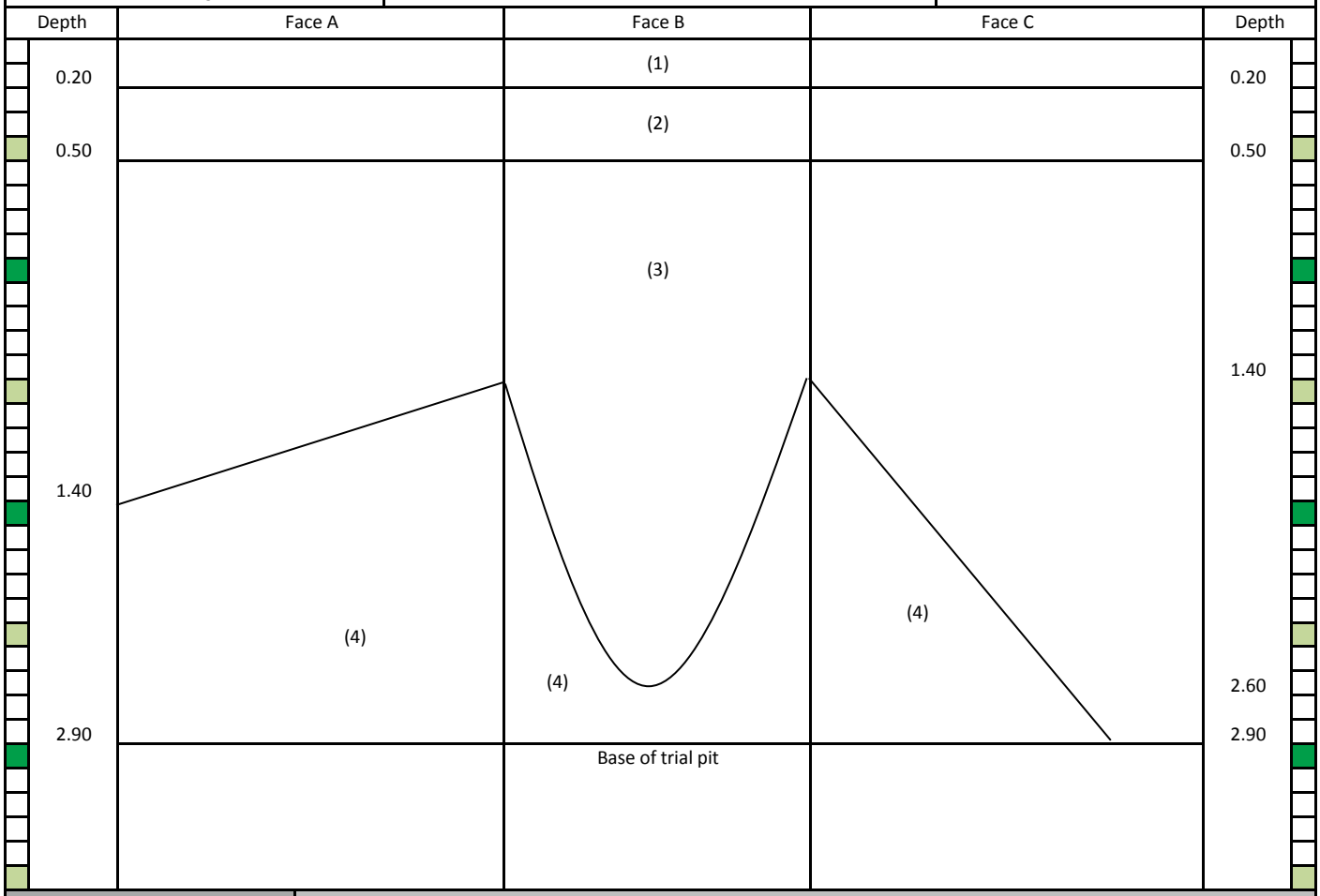
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL20**
Date	31/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	West	**Shoring**	None used
Plant	JCB 3CX	**Ground Level**	130.83 m OD
Trial Pit	A	**Stability**	Trial Pit remained stable throughout excavation.
Plan	B / C	**Co-ordinates**	508333 207678
		Logged by	SR
		Checked by	Logged on site during excavation
		Water	Groundwater not encountered.



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency brown slightly gravelly clay with rootlets and grass and chalk fragments. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
			2	0.20 - 0.50	Firm consistency orangish brown slightly gravelly silty clay with rootlets. Gravel is fine to coarse angular to subrounded of flint (SUBSOIL)
0.50	c_{fv}	50/48/52	3	0.50 - 1.40/2.80	Firm consistency reddish orange mottled grey slightly gravelly silty CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.60	JJ				
0.70	c_{fv}	78/75/80			
0.75	c_{fv}	96/98/88			.....boulders of flint below 1.00 m
1.60	J				.....becoming dark reddish orange mottled black with rare rootlets and occasional chalk fragments below 1.6 m
2.50 - 2.90	J		4	1.40/2.80 - 2.90	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

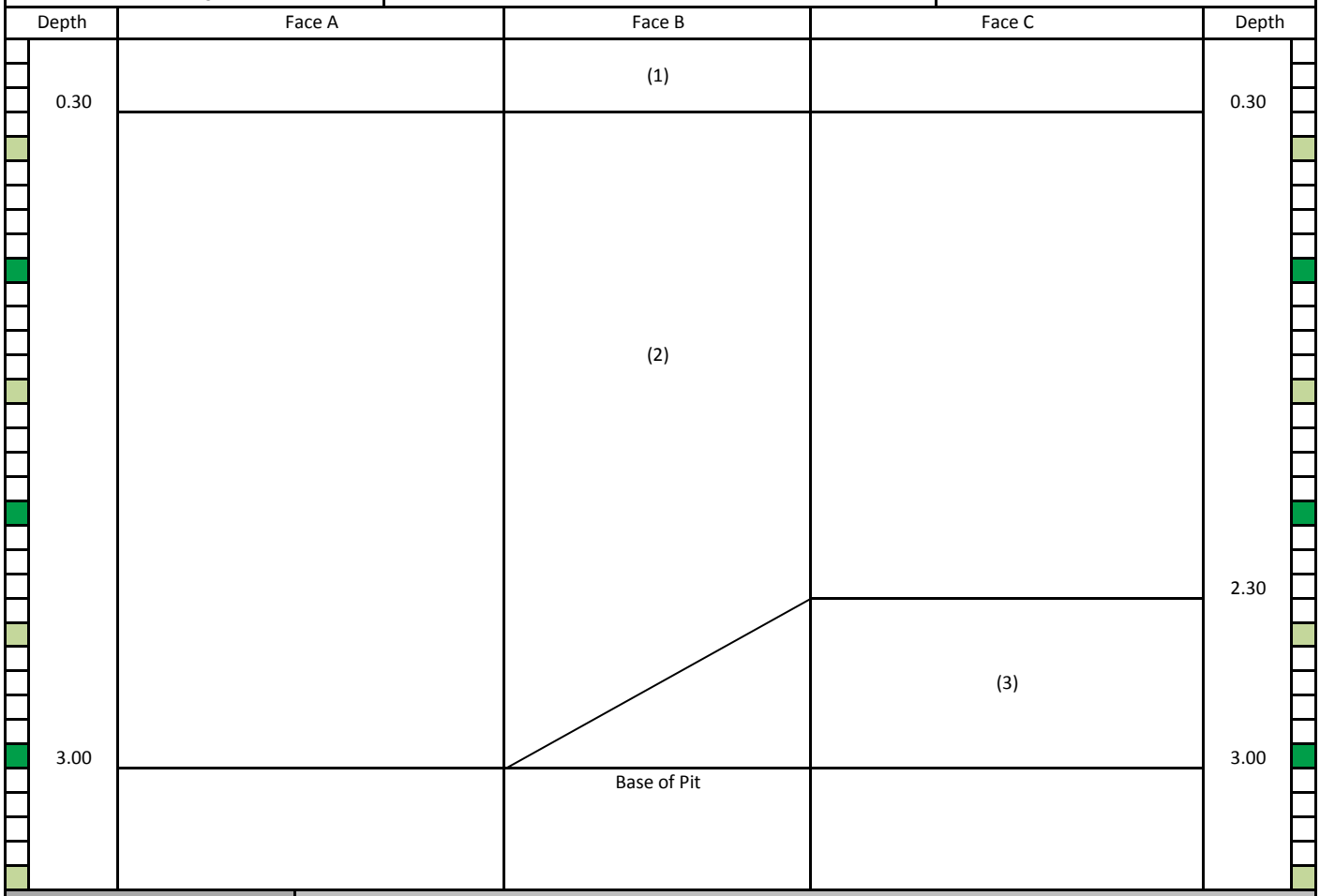
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL21**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	132.18 m OD
Co-ordinates	508363 207682
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Northeast
Plant JCB 3CX
Trial Pit A
Plan A → B, C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m²)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Firm consistency brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.40	c_{fv}	60/60/65	2	0.30 - 2.30/3.00	Firm consistency orangish brown and orange gravelly CLAY with roots. Gravel is fine to coarse angular to subrounded of flint
0.40	J				(CLAY-WITH-FLINTS)
0.90	J				
0.90	c_{fv}	40/50/40			.....becoming orangish brown mottled grey with occasional red mottling below 0.9 m
1.20-1.40	BB JJ				.....becoming slightly black slightly gravelly friable CLAY below 1.0 m
1.50	c_{fv}	60/70/70			.....becoming gravelly CLAY with boulders of flint at 400-600 mm diameter below 1.5 m
1.70	c_{fv}	90/100/110			.....becoming very stiff consistency below 1.7 m
					.....becoming dark orange mottled grey below 1.8 m
1.80	J				
			3	2.30 - 3.00	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks
Coordinates and elevations provided by Winvic

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL22**
Date	30/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	West	**Shoring**	None used
Ground Level	131.38 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508150 207606		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Checked by**	Logged on site during excavation
		Water	Groundwater not encountered.

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
2.80		(2)		2.80
		Base of Pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Soft to firm consistency brown slightly gravelly clay with rootlets, grass and roots. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.60	c_{fv}	75/111/112	2	0.30 - 2.80	Firm to stiff consistency orangish brown slightly gravelly CLAY with rootlets and roots. Gravel is fine to coarse angular to subangular of flint
1.10	c_{fv}	115/82/83			(CLAY-WITH-FLINTS)
					.....becoming gravelly CLAY below 1.0 m
1.40-1.50	BB JJ				.....becoming dark orange mottled grey below 1.5 m
1.50	c_{fv}	112/82			.....boulders (200-400 mm) of flint below 1.9 m
1.80	JJ				.....becoming very gravelly friable CLAY below 2.0 m

Remarks

Coordinates and elevations provided by Winvic

Trial pit has been undertaken on an embankment/slope feature

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL23**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	129.46 m OD
Co-ordinates	508204 207612
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
		(2)		
2.70		Base of Pit		2.70

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Soft to firm consistency brown gravelly clay with rootlets, grass and occasional brick fragments. Gravel is fine to coarse angular to subangular of flint. Clay is friable (MADE GROUND)
0.50	c_{fv}	85/85/72	2	0.30 - 2.70	Firm consistency orangish brown slightly gravelly CLAY with occasional rootlets down to 0.50 m. Gravel is fine to coarse angular to subangular of flint
0.50	JJ				(CLAY-WITH-FLINTS)
1.00	c_{fv}	75/90/82			...becoming gravelly CLAY below 0.8 m
1.20	c_{fv}	83/92/114			...boulders of flint below 1.2 m at approximately 200-300 mm length
1.90	c_{fv}	108/104/105			...becoming very gravelly CLAY below 2.0 m

Remarks
Coordinates and elevations provided by Winvic

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3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL24**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	129.48 m OD
Co-ordinates	508231 207647
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Southwest
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.30		(2)		0.30
		(3)		
1.40				1.40
		(4)		
3.20				3.20
		(5)		
3.50		Base of Pit		3.50

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Fim consistency brown slightly gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.20 - 0.30	JJGg		2	0.20 - 0.30	Black slightly sandy fine to coarse angular gravel of cinder/clinker and brick. Significantly ashy (MADE GROUND)
0.50	c_{fv}	93/95/110	3	0.30 - 1.40	Stiff consistency brownish orange and orange very gravelly clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
0.80	JJ				
1.00	c_{fv}	58/62/64			
1.70	c_{fv}	34/40/41	4	1.40 - 3.20	Soft and firm consistency greyish brown slightly gravelly clay. Gravel is fine to coarse angular to subangular of flint and occasional brick (MADE GROUND) …becoming soft consistency gravelly clay below 2.5 m
1.60 - 1.70	BB JJ				
2.20	c_{fv}	30/40/48			
			5	3.20 - 3.50	Firm consistency brownish orange mottled black slightly gravelly CLAY. Gravel is fine to coarse angular of flint (CLAY-WITH-FLINTS)

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL25**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	129.13 m OD
Co-ordinates	508265 207636
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Southwest
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
0.80		(2)		0.80
1.30		(3)		1.30
1.60		(4)		1.60
3.10		(5)		3.10
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Soft to firm consistency brown slightly gravlly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.65 0.65	c_{fv} JJ	68/98/84	2	0.30 - 0.80	Firm consistency orangish brown slightly gravelly clay with rootlets. Gravel is fine to coarse angular to subangular of flint (SUBSOIL)
1.00 1.10	c_{fv} J	88/92/82	3	0.80 - 1.30	Firm consistency brownish reddish orange gravelly clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND) …becoming stiff consistency below 1.0 m
			4	1.30 - 1.60	Soft to firm consistency grey gravelly clay. Gravel is fine to coarse angular to subangular of flint and occasional brick (MADE GROUND)
1.70	JJJ		5	1.60 - 3.10	Firm consistency brown and grey gravelly clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL26**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	128.56 m OD
Co-ordinates	508296 207605
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Southeast
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.70	(3)	(2) Pipe (3)	(3)	0.70
1.00				1.00
1.40		(4)		1.40
3.10		(5)		3.10
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency brown gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint and occasional chalk (TOPSOIL)
			2	0.20 - 0.70 (FACE B)	Black and brown slightly sandy fine to coarse angular gravel of cinder/clinker and brick. Significantly ashy (MADE GROUND) …Porcelain pipe encountered on FACE B at 0.6 to 0.7 m
0.70	J		3	0.20/0.70 - 1.00	Firm consistency brownish orange gravelly clay with occasional rootlets. Gravel is fine to coarse angular to subangular of flint and occasional chalk (MADE GROUND)
0.80	c_{fv}	80/53/66			
1.10	c_{fv}	85/75/89	4	1.00 - 1.40	Firm consistency orangish brown mottled grey gravelly clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND) …occasional pockets of soft consistency grey clay
2.10	c_{fv}	96/90/82	5	1.40 - 3.10	Firm to stiff consistency orangish brown slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

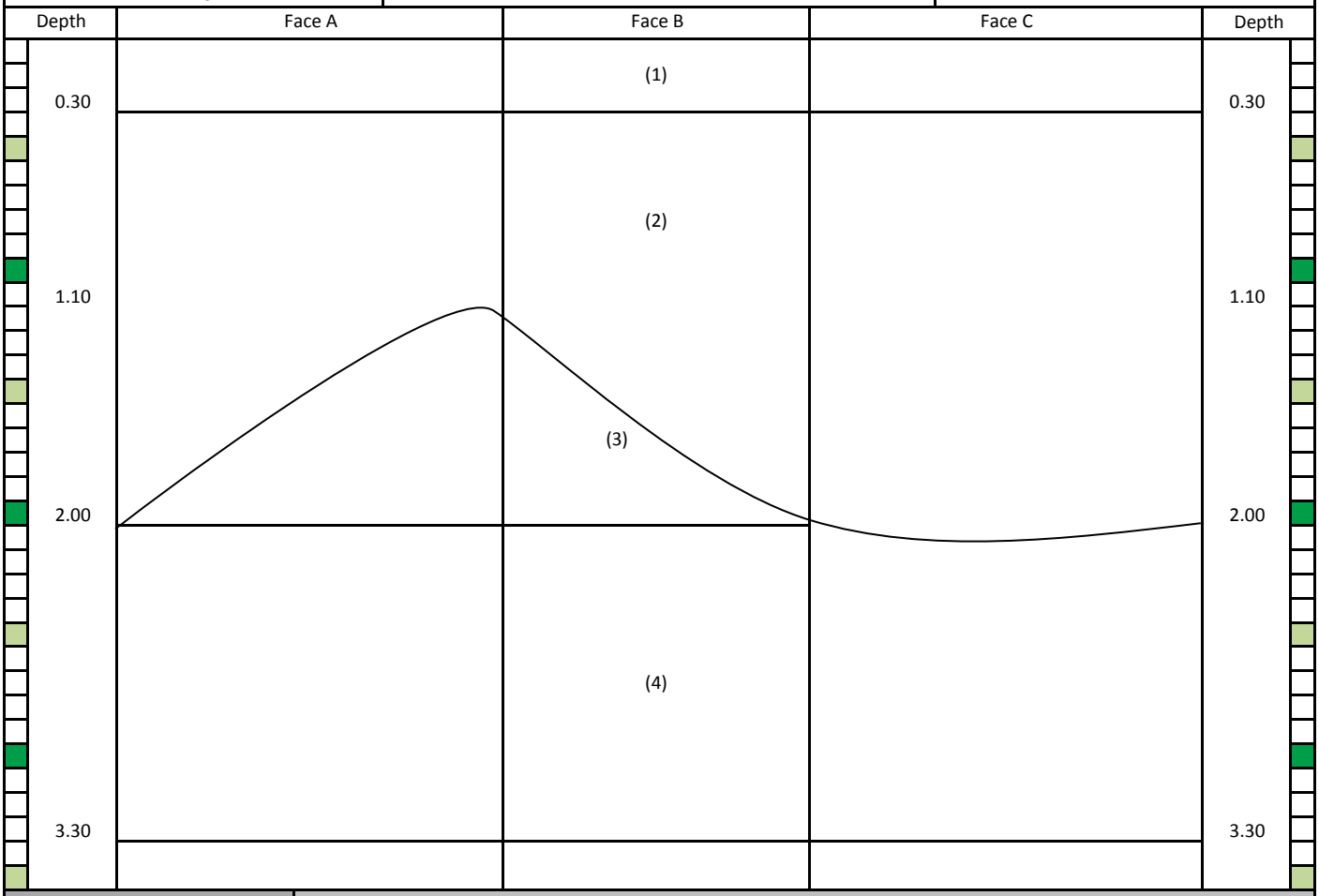
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL27**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	130.31 m OD
Co-ordinates	508363 207612
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: South
Plant JCB 3CX
Trial Pit A
Plan B C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Firm consistency brown gravelly slightly silty clay with rootlets and grass. Gravel is fine to coarse angular to subrounded with flint (TOPSOIL)
0.30	c_{fv}	65/70/72	2	0.30 - 1.10/3.00	Firm consistency brownish orange slightly gravelly friable CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular with flint (CLAY-WITH-FLINTS)
0.60	JJ				
0.70	c_{fv}	88/82/72			
1.10	c_{fv}	80/78/76			…boulders of flint below 1.5 m
1.70	c_{fv}	80/78/76	3	1.10 - 2.00 (FACE A & B)	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)
2.20	J		4	2.00 - 3.30	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks
Coordinates and elevations provided by Winvic

Notes
1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL28**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	132.54 m OD
Co-ordinates	508394 207662
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	Northeast
Plant	JCB 3CX
Trial Pit	A
Plan	B / C

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
	(2)	(2)	(2)	
2.60		(3)		2.60
3.20		Base of trial pit		3.20

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.40	c_{fv}	50/50/40	2	0.30 - 2.60/3.20	Firm consistency orange mottled grey slightly gravelly CLAY with occasional rootlets to 0.6 m. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.70	JJ				
1.00	c_{fv}	90/100/100			…becoming stiff consistency below 1.0 m
1.30	J				…becoming reddish orange mottled black below 1.0 m
1.40	c_{fv}	80/90/80			…occasional boulder of flint below 1.5 m
1.80 - 1.90	BB JJ				…becoming very stiff consistency below 2.0 m
1.90	c_{fv}	100/110			
2.20	JJ		3	2.60 - 3.20 (FACE B)	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

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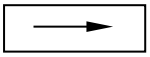
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	28/03/2017
Hole Ref.	**TPCCL29**
Sheet	1 of 1
Job No.	CCL02935
Bearing:	Northeast
Shoring	None used
Ground Level	132.42 m OD
Plant	JCB 3CX
Stability	Trial Pit remained stable throughout excavation.
Co-ordinates	508425 207630
Trial Pit	A
Plan	 B / C
Logged by	SR — Logged on site during excavation
Checked by	
Water	Groundwater not encountered.

Depth	Face A	Face B	Face C	Depth
		(1)		
0.25				0.25
		(2)		
2.30				2.30
		(3)		
3.20				3.20
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Firm consistency brownish orange and brown gravely clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.50	c_{fv}	40/40/50	2	0.25 - 2.30	Firm consistency orangish brown mottled red gravelly CLAY with occasional rootlets to 0.6 m.
0.50	JJ				Gravel is fine to coarse angular to subangular of flint
0.90	c_{fv}	70/70/80			(CLAY-WITH-FLINTS)
1.20 - 1.30	BB JJ				…boulder of flint below 1.30 (400 mm diameter)
1.40	c_{fv}	80/90/90			…Very stiff consistency below 1.8 m
1.60	JJ				…becoming friable CLAY below 2.0 m
1.80	c_{fv}	90/110/100	3	2.30 - 3.20	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)
3.20	J				

Remarks

Coordinates and elevations provided by Winvic

Notes

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3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL30**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	134.07 m OD
Co-ordinates	508460 207670
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: West
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
0.30				0.30
		(2)		
0.90				0.90
		(3)		
3.00				3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20/0.30	Firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint and brick (MADE GROUND/TOPSOIL)
0.50	c_{fv}	70/70/66	2	0.20/0.30 - 0.90	Firm consistency orangish brown slightly gravelly clay with rootlets. Gravel is fine to coarse angular to subangular of flint and occasional brick (MADE GROUND)
0.50	J				
0.90	c_{fv}	62/63/65			
0.90 - 1.00	BB JJ				
1.30	c_{fv}	103/82/78	3	0.90 - 3.00	Firm consistency orange mottled grey slightly silty CLAY. Clay is friable. (CLAY-WITH-FLINTS)
1.30	J				
1.90	c_{fv}	111/93/91			...becoming reddish brown motted grey below 1.0 m
1.90	J				...stiff consistency CLAY below 1.2 m

Remarks
Coordinates and elevations provided by Winvic

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

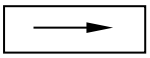
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL31**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	134.80 m OD
Co-ordinates	508537 207678
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C



Depth	Face A	Face B	Face C	Depth
		(1)		
0.30				0.30
	(2)	(2)	(2)	
1.40				
	(3)			
		(3)		2.70
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular with fline and occasional brick fragments. Slightly ashy (TOPSOIL/MADE GROUND)
0.35	JJ		2	0.30 - 1.40/3.00 (FACE C)	Firm consistency orangish brown and orange mottled black gravelly CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.40	c_{fv}	50/40/40			
0.60	JJ				
0.70	c_{fv}	55/65/60			…boulders of flint below 0.8 m depth with diameter of approximately 600 mm
1.00	c_{fv}	80/80/90			
1.50	c_{fv}	60/70/70	3	1.40/2.70 - 3.00 (FACE A & B)	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)

Remarks
Coordinates and elevations provided by Winvic

Notes
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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL32**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	128.85 m OD
Co-ordinates	508211 207560
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	South
Plant	JCB 3CX
Trial Pit	A
Plan	B / C

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
		(2)		
0.60				0.60
0.80		(3)		0.80
		(4)		
2.70		Base of trial pit		2.70

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20	Firm consistency brown slightly gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.30	c_{fv}	105/105/108	2	0.20 - 0.60	Stiff consistency orangish brown slightly gravelly clay. Gravel is fine to coarse angular to subangular of flint
0.20 - 0.60	J				(MADE GROUND)
0.70	c_{fv}	47/45/32	3	0.60 - 0.80	Firm dark brown slightly gravelly silty clay with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
0.80	c_{fv}	92/107/93	4	0.80 - 2.70	Stiff consistency brownish orange mottled grey and black gravelly CLAY. Gravel is fine to coarse angular to subangular of flint. Clay is friable
1.30	c_{fv}	103/88/88			(CLAY-WITH-FLINTS)
1.70	JJ				...boulders of flint at 1.80 m depth
1.80	c_{fv}	80/98/96			...becoming dark reddish orange mottled grey below 1.80 m depth
2.10	c_{fv}	102/98/92			

Remarks

Coordinates and elevations provided by Winvic

Difficult to excavate further than 2.70 m depth due to hard ground conditions

Notes

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Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL33**
Date	31/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	Northeast	**Shoring**	None used
Ground Level	126.45 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508265 207567		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Water**	Groundwater not encountered.
Checked by			Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
0.20		(2)		0.20
0.30		(3)		0.30
		(4)		
3.00		Base of Pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.10	Firm consistency brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint. Moderately ashy (TOPSOIL/MADE GROUND)
			2	0.10 - 0.20	Black slightly sandy fine to coarse angular to subangular gravel with clinker/cinder and brick fragments. Moderately ashy (MADE GROUND)
			3	0.20 - 0.30	Firm consistency orangish brown gravelly clay with occasional rootlets. Gravel is fine to medium angular to subangular of flint and chalk (MADE GROUND) …metal rebar on FACE C at 0.60 - 0.70 m depth
0.40	c_{fv}	100/103/110	4	0.30 - 3.00	Firm consistency orangish brown gravelly clay. Gravel is fine to coarse angular to subangular of flint, brick, concrete. Moderately ashy (MADE GROUND) …becoming dark brown below 1.0 m depth …abundance of brick and ashy deposits between 1.0 m to 3.0 m depth
0.90 - 1.00	JJ/BB				
1.00	c_{fv}	92/90/113			
1.60	c_{fv}	84/86/83			
2.30	c_{fv}	86/84/74			
2.40 - 2.50	JJ/BB				

Remarks

Coordinates and elevations provided by Winvic

Notes

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3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL34**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	126.65 m OD
Co-ordinates	508319 207577
Logged by	SR
Checked by	Logged on site during excavation

Bearing: Northeast
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.10	(1)	(1)	(1)	0.10
0.20		(2)		0.20
0.70	(3)		(3)	0.70
1.00				1.00
1.20		(3)		1.20
3.40	(4)	(4)	(4)	3.40
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.10/0.20 (FACE A & C)	Firm consistency brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint and occasional chalk (TOPSOIL)
			2	0.10 - 1.00 (FACE B)	Concrete slabs over a bricked wall structure. Three concrete slabs of 0.95 m x 0.95 m with two circular depressions in the centre slab (MADE GROUND)
0.70	c_{fv}	88/78/78	3	0.20/1.00 - 0.70 -1.20	Firm consistency reddish orange mottled grey slightly gravelly CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
1.00	J		4	0.70/1.20 - 3.40	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: Grade Dm) …chalk clasts becoming weak below 2.0 m depth

Remarks
Coordinates and elevations provided by Winvic

Notes
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3. All linear dimensions are in metres unless otherwise stated

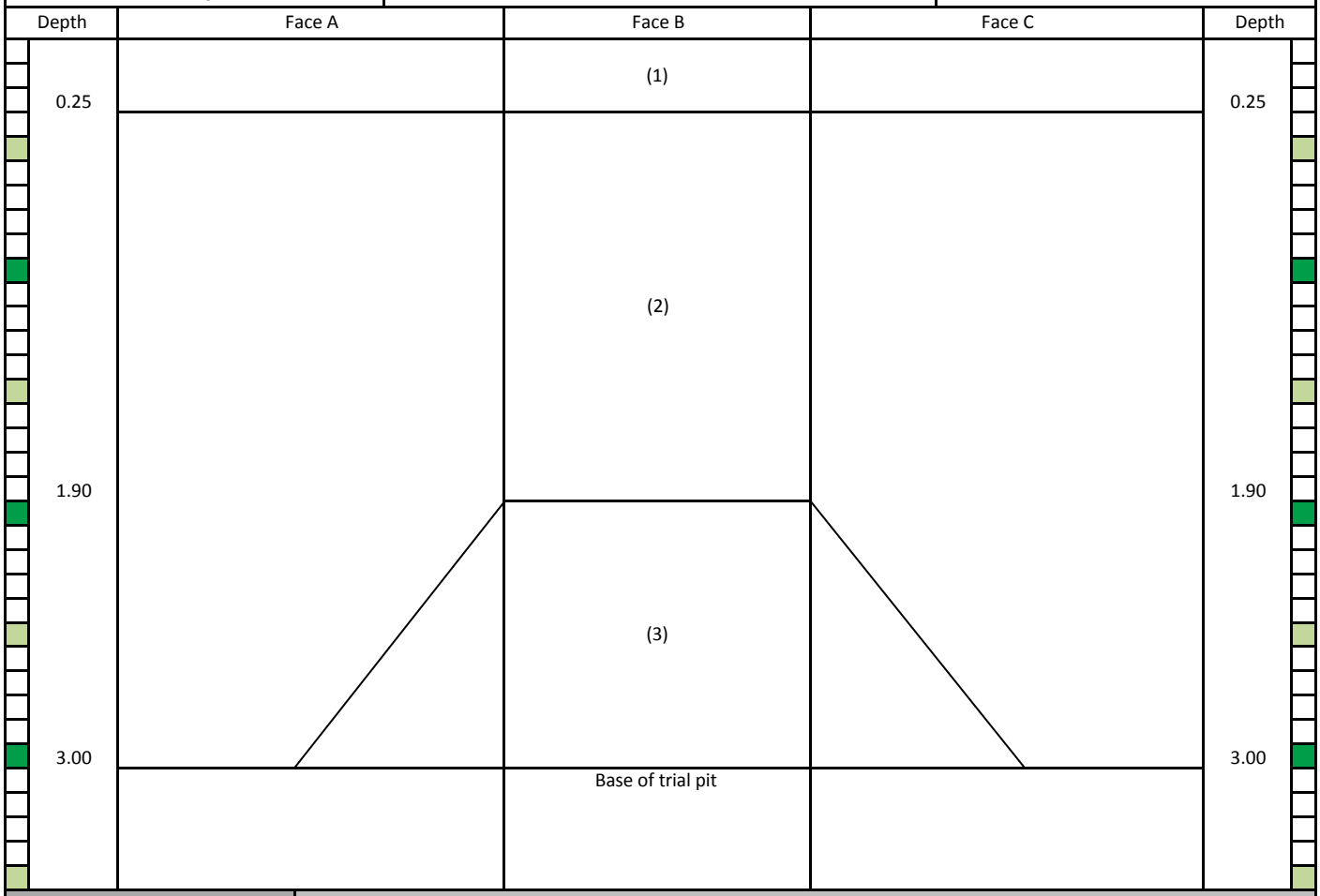
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL35**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	131.96 m OD
Co-ordinates	508452 207598
Logged by	SR
Checked by	Logged on site during excavation

Bearing: South
Plant JCB 3CX
Trial Pit A
Plan B C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Soft to firm consistency dark to light brown slightly gravelly CLAY with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint and occasional chalk (TOPSOIL)
0.30	c_{fv}	51/52/61	2	0.25 - 1.90/3.00	Firm consistency orangish red mottled grey CLAY with occasional rootlets. Clay is friable (CLAY-WITH-FLINTS)
0.60	JJ				
0.60	c_{fv}	42/58/67			…boulders of flint at 0.90 m depth at approximately 300 mm diameter
0.80	c_{fv}	75/72/65			…becoming gravelly CLAY below 1.0 m. Gravel is fine to coarse angular of flint
1.10	c_{fv}	62/78/81			…becoming dark orangish brown below 1.6 m depth
1.80	c_{fv}	75/81/90			…occasional chalk gravel below 1.8 m depth
			3	1.90 - 3.00	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)

Remarks
Coordinates and elevations provided by Winvic

Notes
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2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL36**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	133.17 m OD
Co-ordinates	508513 207616
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
0.40				0.40
		(2)		
1.40				1.40
		(3)		
1.80				1.80
		(4)		
3.00		Base of trial pit		3.00

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30/0.40	Soft to firm consistency brown and orangish brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.50	c_{fv}	70/70/75	2	0.30/0.40 - 1.40	Firm consistency orangish brown slightly gravelly CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS) …becoming friable below 1.0 m depth
0.50	JJ				
0.80	c_{fv}	90/80/90			
1.40	c_{fv}	80/80/70	3	1.40 - 1.80	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)
1.80	J		4	1.80 - 3.00	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks
Coordinates and elevations provided by Winvic

Notes
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3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL37**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	133.60 m OD
Co-ordinates	508567 207635
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	East
Plant	JCB 3CX
Trial Pit	A
Plan	B / C

Depth	Face A	Face B	Face C	Depth
0.25		(1)		0.25
3.00		(2)		3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25	Soft to firm consistency orangish brown and brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.30	JJ		2	0.25 - 3.00	Firm consistency orange mottled grey silty CLAY with occasional rootlets
0.40	c_{fv}	40/40/45			(CLAY-WITH-FLINTS)
0.60	J				…becoming slightly gravelly CLAY below 0.6 m depth. Gravel is fine to coarse angular of flint -
0.80	c_{fv}	50/50/60			No rootlets
1.30	c_{fv}	50/60/70			…two boulders of flint at 0.8 m depth at approximately 200 mm diameter
2.00	c_{fv}	70/80/80			…becoming stiff consistency friable CLAY below 1.0 m depth
3.00	c_{fv}*	70/60/70			…becoming grey mottled orange below 1.8 m depth

Remarks

Coordinates and elevations provided by Winvic

Notes

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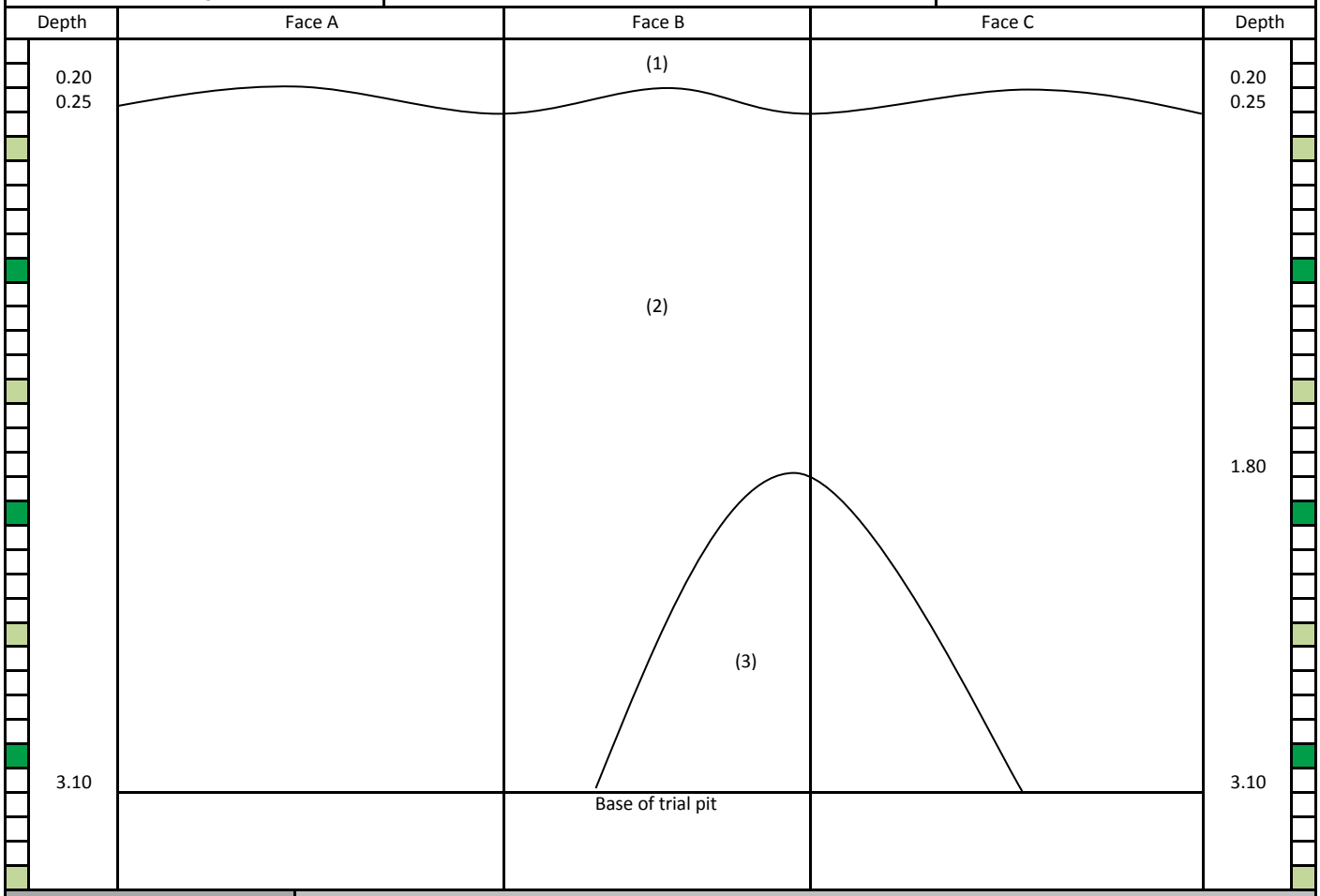
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL38**
Date	29/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	North	**Shoring**	None used
Ground Level	134.04 m OD		
Plant	JCB 3CX	**Stability**	
Co-ordinates	508520 207656		
Trial Pit	A	**Logged by**	SR
Plan	B	**Water**	
Checked by	Logged on site during excavation		

C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.20/0.25	Firm consistency orangish brown slightly gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subrounded of flint (TOPSOIL)
0.40	c_{fv}	60/65/75	2	0.20/0.25 - 1.80/3.10	Firm consistency brown and orange slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.80	c_{fv}	75/75/80			
1.60	JJ				
1.80	c_{fv}	90/100/110			…becoming friable below 0.8 m depth …boulders of flint below 0.9 m depth at approximately 800 mm diameter …becoming orangish brown mottled grey below 1.7 m depth
			3	1.80 - 3.10	Structureless CHALK composed of firm consistency white and yellowish white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL39**
Date	31/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	East	**Shoring**	None used
Ground Level	126.70 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508193 207512		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Checked by**	Logged on site during excavation
		Water	Groundwater not encountered.

Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
0.20		(2)		0.20
		(3)		
2.90		Base of trial pit		2.90

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.00 - 0.20	JJGg		1	0.00 - 0.10	Black and dark brown slightly gravelly silty coarse sand with rootlets and grass. Gravel is fine to coarse angular to subangular of clinker/cinder (TOPSOIL/MADE GROUND)
			2	0.10 - 0.20	Black slightly sandy fine to coarse angular gravel of clinker/cinder and occasional brick (MADE GROUND)
0.40	c_{fv}	105/98/87	3	0.20 - 2.90	Firm consistency brownish orange and orange mottled grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint. Clay is friable
0.80	JJ				
0.90	c_{fv}	105/96/98			(CLAY-WITH-FLINTS)
					...boulders of flint below 1.0 m depth
1.20	c_{fv}	125/120/105			...becoming stiff consistency below 1.20 m depth
					...becoming dark reddish brown mottled black below 2.0 m depth
1.70	c_{fv}	102/107/106			

Remarks
Coordinates and elevations provided by Winvic

Notes
1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

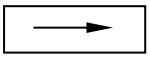
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	30/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL40**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	127.20 m OD
Co-ordinates	508202 207463
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: Southeast
Plant JCB 3CX
Trial Pit A
Plan B C



Depth	Face A	Face B	Face C	Depth
0.10		(1)		0.10
0.20				0.20
		(2)		
0.70				0.70
		(3)		
3.50		Base of trial pit		3.50

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.10/0.20	Soft to firm consistency brown gravelly clay with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.60	J		2	0.10/0.20 - 0.70	Firm to stiff consistency orangish brown gravelly CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
0.60	c_{fv}	100/106/84			
0.80		92/90/ 90	3	0.70 - 3.50	Stiff consistency reddish orange mottled grey gravelly CLAY. Gravel is fine to coarse angular to subangular of flint
1.00	J				(CLAY-WITH-FLINTS)
1.60	c_{fv}	100/107/90			...becoming very stiff consistency friable CLAY below 1.5 m depth
1.50 - 1.60	BB JJ				...boulders of flint at 1.9 m depth
2.00	c_{fv}	105/97/105			
2.00	J				
2.40 - 2.50	BB JJ				
2.90	J				

Remarks
Coordinates and elevations provided by Winvic

Notes
1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL41**
Date	30/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	Northeast	**Shoring**	None used
Ground Level	126.48 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508248 207471		
Trial Pit	A	**Logged by**	SR
Plan	→ B	**Checked by**	
	C	**Water**	Groundwater not encountered.

Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.20		(1)		0.20
1.30		(2)		1.30
2.20		(3)		2.20
3.00		(4)		3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
0.0-0.20	JJGg		1	0.0 - 0.20	Black and brown coarse sand and fine to coarse angular to subangular gravel of clinker/cinder. Significantly ashy (MADE/REWORKED GROUND)
0.40	c_{fv}	58/62/92	2	0.20 - 1.30	Firm consistency brown and orangish brown very gravelly clay. Gravel fine to coarse angular to subangular of flint. Moderately ashy
0.20-0.40	BB JJ				
0.80	c_{fv}	54/58/60			(MADE GROUND)
0.80	J				…becoming light grey mottled orange at 1.3 m depth
1.30	J				…becoming very stiff consistency below 1.3 m depth
1.50	c_{fv}	57/47/50			
1.90	J		3	1.80 - 2.20	Soft consistency orangish brown slightly gravelly silty clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
2.10 - 2.20	BB JJ				
2.50	J		4	2.20 - 3.00	Firm consistency orangish red mottled grey slightly gravelly CLAY. Gravel fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

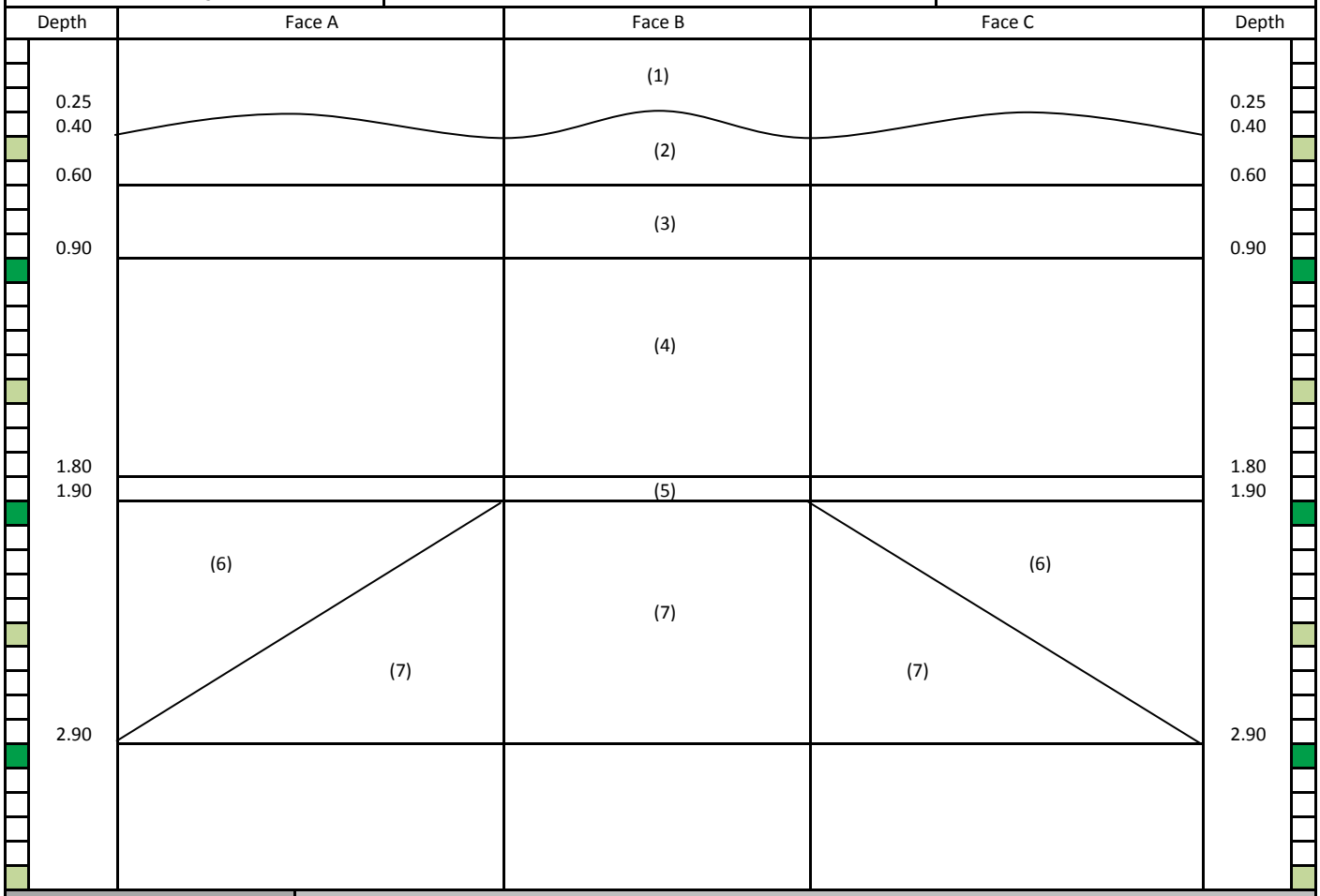
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation
Water	Slight water seepage at 1.9 m depth - ceased below this depth

Hole Ref.	**TPCCL42**
Sheet	1 of 2
Job No.	CCL02935
Ground Level	126.66 m OD
Co-ordinates	508306 207520
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	West
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.25/0.40	Firm consistency slightly gravelly silty CLAY with rootlets and grass. Gravel is fine to coarse angular to subangular of flint (TOPSOIL)
0.40 0.50	c_{fv} JJ	96/99/124	2	0.25/0.40 - 0.60	Firm consistency brownish orange very gravelly clay with rootlets. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
0.70	c_{fv}	82/92/80	3	0.60 - 0.90	Firm consistency dark brown slightly gravely clay with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (MADE GROUND/RELIC TOPSOIL)
1.20 1.50	c_{fv} c_{fv}	100/92/80 78/58/62	4	0.90 - 1.80	Stiff consistency orangish brown gravelly clay. Gravel is fine to coarse angular to subangular of flint (MADE GROUND)
			5	1.80 - 1.90	Firm consistency grey very gravelly silty clay. Gravel is fine to coarse angular to subrounded of flint. Slightly organic odour (MADE GROUND/RELIC TOPSOIL) (Continued on sheet 2 of 2)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

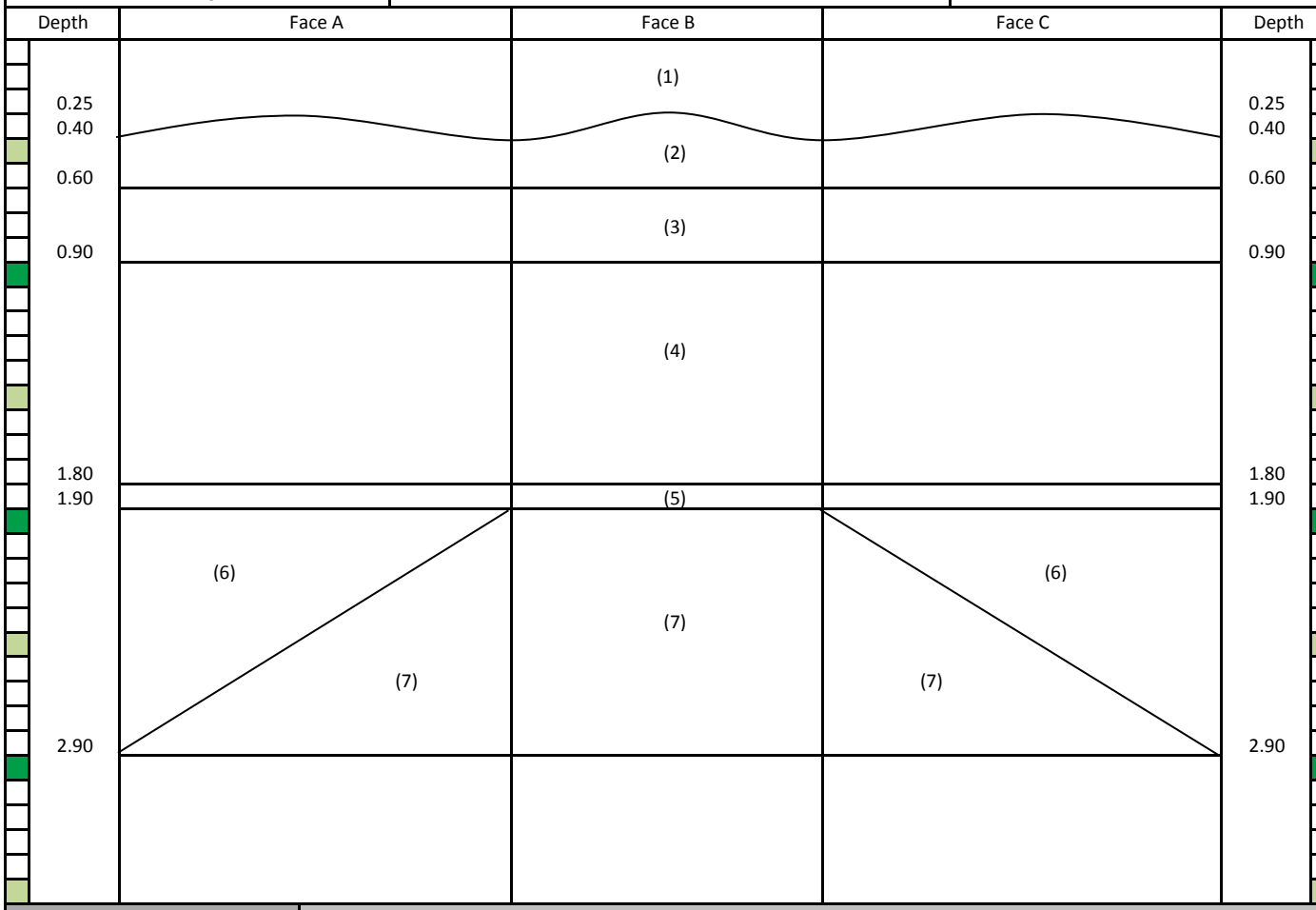
Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Slight water seepage at 1.6 m depth - water seepage ceased below 1.9 m depth

Hole Ref.	**TP CCL42**
Sheet	2 of 2
Job No.	CCL02935
Ground Level	126.70 m OD
Co-ordinates	508306 207520
Logged by	SR
Checked by	Logged on site during excavation

Bearing:	West
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
					(Continued from sheet 1 of 2)
2.20	c_{fv}	86/90/80	6	1.90 - 2.90	Firm to stiff consistency orangish brown and orange slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
			7	1.90 - 2.90	Structureless CHALK composed of white silty fine to coarse angular GRAVEL. Clasts are extremely weak low density (UPPER CHALK: GRADE Dc)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

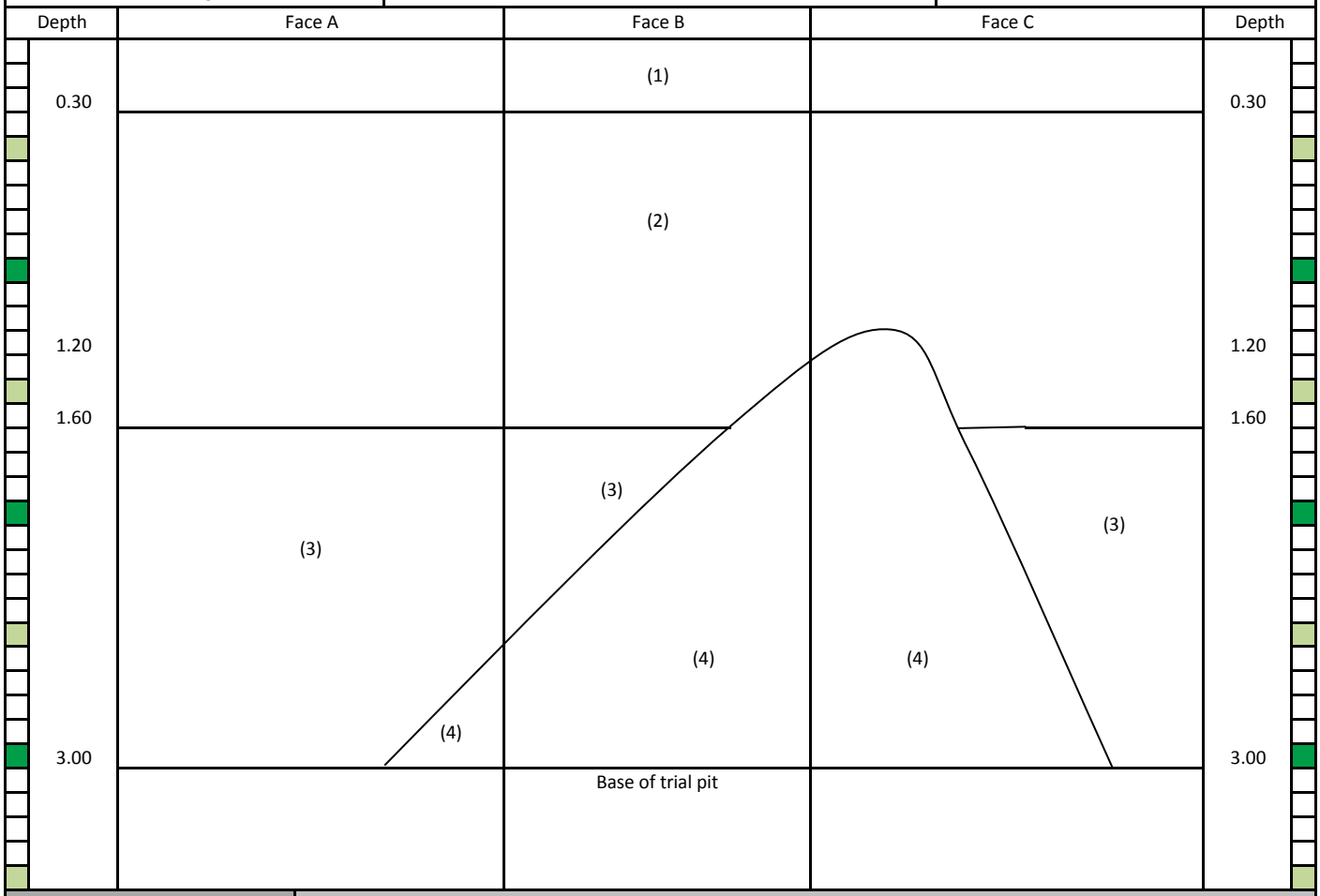
Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	31/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL43**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	127.92 m OD
Co-ordinates	508363 207540
Logged by	SR
Checked by	

Logged on site during excavation

Bearing:	Southeast
Plant	JCB 3CX
Trial Pit	A
Plan	B / C



Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Firm consistency brown slightly gravelly silty clay with rootlets and grass. Gravel is fine to coarse angular to subrounded with flint and occasional brick fragments (TOPSOIL/MADE GROUND)
0.40	c_{fv}	84/88/78	2	0.30 - 1.20/1.60	Firm to stiff consistency brownish orange gravelly friable CLAY with occasional rootlets. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS) ...boulders of flint below 1.0 m depth
0.80	c_{fv}	78/64/72			
1.00	c_{fv}	72/78/64			
1.80	c_{fv}	73/58/98	3	1.60 - 3.00	Stiff consistency orangish red mottled grey gravelly friable CLAY. Gravel is fine to coarse angular to subangular of flint (CLAY-WITH-FLINTS)
			4	1.20 - 3.00	Structureless CHALK composed of firm consistency white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead
Date	29/03/2017
Shoring	None used
Stability	Trial Pit remained stable throughout excavation.
Water	Groundwater not encountered.

Hole Ref.	**TPCCL44**
Sheet	1 of 1
Job No.	CCL02935
Ground Level	131.99 m OD
Co-ordinates	508514 207577
Logged by	SR
Checked by	

Logged on site during excavation

Bearing: North
Plant JCB 3CX
Trial Pit A
Plan B C

Depth	Face A	Face B	Face C	Depth
0.30		(1)		0.30
0.70		(2)		0.70
3.00		(3)	(4)	1.40 / 3.00
		Base of trial pit		

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.30	Soft to firm consistency brown slightly gravelly CLAY with rootlets and grass. Gravel is fine to coarse angular to rounded of flint (TOPSOIL)
0.30	c_{fv}	75/60/65	2	0.30 - 0.70	Firm consistency orangish brown and orange gravelly clay with occasional rootlets. Gravel is fine to coarse angular to subangular of flint and occasional brick (MADE GROUND)
0.50 - 0.60	BB JJ				…boulders of flint at approximately 300 mm diameter
0.70	c_{fv}	70/70/80	3	0.70 - 3.00	Firm consistency orange mottled grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of flint
1.00	JJ				(CLAY-WITH-FLINTS)
1.80	c_{fv}	90/100/90			…becoming stiff consistency below 2.0 m depth
2.30	c_{fv}*	80/90			…beoming reddish orange mottled black below 2.5 m depth
1.60	J		4	1.40 - 3.00	Structureless CHALK composed of firm consistency white slightly gravelly silty CLAY with flint. Clasts are extremely weak low density (UPPER CHALK: GRADE Dm)

Remarks
Coordinates and elevations provided by Winvic

Notes
1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Trial Pit Record Sheet

Project	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**TPCCL45**
Date	29/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Bearing:	South	**Shoring**	None used
Ground Level	133.48 m OD		
Plant	JCB 3CX	**Stability**	Trial Pit remained stable throughout excavation.
Co-ordinates	508591 207597		
Trial Pit	A	**Logged by**	SR
Plan	→ B, C	**Water**	Groundwater not encountered.
Checked by			Logged on site during excavation

Depth	Face A	Face B	Face C	Depth
0.15		(1)		0.15
		(2)		
0.80		Base of trial pit		0.80

Sampling			Strata		
Sample/Test Depth	Type	Strength (kN/m^2)	Ref. No.	Strata Depth	Description
			1	0.00 - 0.15	Firm consistency brown slightly gravelly clay with roots, rootlets and grass. Gravel fine to coarse angular to subrounded of flint (TOPSOIL/MADE GROUND)
0.15 - 0.70 0.80	BB JJ c_{fv}	70/80/80	2	0.15 - 0.80	Firm consistency orangish brown and brown gravelly clay with occasional rootlets. Gravel is fine to coarse angular of flint (MADE GROUND)

Remarks

Coordinates and elevations provided by Winvic

Trial pit excavated and logged within a man-made bund

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. Symbols and abbreviations are explained on the accompanying key
3. All linear dimensions are in metres unless otherwise stated

BOREHOLE & PROBING RECORDS

KEY

Sampling

J	Soil Sample: Plastic Jar	Category B Samples
G	Soil Sample: Glass Jar	
g	Soil Sample: Glass Vial	
D	Soil Sample: Small Bag Sample	
B	Disturbed Bulk Soil Sample	
W	Water Sample – recovered during boring operations	
U	"Undisturbed" 100 mm Diameter Soil Sample (denoted Category A OS-TK/W in BS EN 22475-1:2006)	
P	"Undisturbed" Piston Soil Sample (denoted PS-T/W in BS EN 22475-1:2006)	
NR	Sample not recovered	
S	Standard Penetration Test (SPT: split spoon sampler)	
SPT(C)	SPT carried out with a 60° cone	
IC	Nett sample recovery ratio (ratio of length of recovered sample to length of sample run)	

In Situ Measurements

FVT	c_{fv}	Undrained Shear Strength (from hand vane shear vane test)
	c_{rv}	Undrained Remoulded Shear Strength (from hand vane shear vane test)
	c_{fv} *	Hand Vane Shear Strength Test (on Category A: OS-TK/W soil sample "U" type, as outlined above)
SPT N	100	'N' Value from SPT test
	(10)	Number of blows to drive U100
	N_{10}	Dynamic Probe Test: Number of blows to drive 100 mm
DPH	N_{H10}	Dynamic Probe Test: Heavy (30 kg mass & 500 mm fall)
DPSH-A	N_{SHA10}	Dynamic Probe Test: Super-Heavy A (63.5 kg mass & 500 mm fall)
DPSH-B	N_{SHB10}	Dynamic Probe Test: Super-Heavy B (63.5 kg mass & 750 mm fall)
	x / y mm	x Blows per y Driving Distance (for non-standard driving distance)
T		Torque (max) required to turn rods (unit: Nm, unless otherwise shown)

Notes:

1. All measurement values on record sheets are uncorrected.
2. For corrected test values, refer to report.
3. Identification and classification of strata is based on the guidance published in the current edition of BS5930 together with BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004, BS EN ISO 14689-1:2003
4. Consistency (soft, firm, stiff etc) relates to a manual test/inspection on site (in compliance with BS EN ISO 14688-1:2002 Section 5.14)
5. Undrained shear strength (low, medium, high etc) relates to in situ or laboratory test data and the associated assessed strength of a stratum (in compliance with BS EN ISO 14688-2:2004 Section 5.3 and Table 5).
6. The density of coarse-grained soils is based on SPT N values (or equivalent Dynamic Probe test or CPT data) as outlined in BS5930 and BS EN ISO 14688-2:2004.
7. Rock strength (weak, strong etc) is based on field identification (and/or strength test data), as outlined in BS EN ISO 14689-1:2003 Table 5.

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL1**
Start Date	27/03/2017 **End Date** 27/03/2017	**Sheet**	1 of 2
		Job No.	CCL02935
Contractor	RD Drilling	**Equipment**	Dando 2000 Mk2
Ground Level	134.92 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508392 207831
Boring Diameter	150 mm	**Logged by:**	CJW — Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Grass over soft to firm consistency brown slightly sandy slightly gravelly humic clay with roots and rootlets. Gravel is fine to medium angular to rounded of flint (TOPSOIL)	0.30			134.62
1.00	c_{fv}*			65/70	Firm to stiff consistency orangish brown mottled grey gravelly CLAY. Gravel is fine to medium angular of flint (CLAY-WITH-FLINTS)				
1.00	J								
1.50-1.95	S	1.50	DRY	19					
2.00	c_{fv}*			>140					
2.00	J					2.20			132.72
2.20	J				Structureless CHALK composed of white gravelly SILT. Clasts are very weak low density (UPPER CHALK)				
3.00	U	1.50	DRY	(100)					
4.00	J								
4.50-4.95	S	1.50	DRY	28					
5.00	J								
6.00-6.45	U	1.50	DRY	(65)					
6.45-6.50	J								
7.50-7.95	S	1.50	DRY	25					
9.00-9.45	S	1.50	DRY	24					
10.00	J				...continued on Sheet 2 of 2				

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
27/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Hole Ref.	**BH CCL1**		
Project:	Maylands Gateway, Hemel Hempstead	**Sheet**	2 of 2
Start Date	27/03/2017 **End Date** 27/03/2017	**Job No.**	CCL02935
Contractor	RD Drilling	**Equipment**	Dando 2000 Mk2
Ground Level	134.92 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508392 207831
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					...continued from Sheet 1 of 2				
10.50-10.95	S	1.50	DRY	27	(Structureless CHALK composed of white gravelly SILT. Clasts are very weak low density)				
11.00	J								
12.00-12.45	U	1.50	DRY	(60)					
13.00	J								
13.50-13.95	S	1.50	DRY	29					
14.00	J								
15.00-15.45	S	1.50	DRY	30		15.00			119.92
					Base of Hole				

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
27/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Hole Ref.	**BH CCL2**		
Project:	Maylands Gateway, Hemel Hempstead	**Sheet**	1 of 2
Start Date	27/03/2017 **End Date** 27/03/2017	**Job No.**	CCL02935
Contractor	RD Drilling **Equipment** Dando 2000 Mk2	**Ground Level**	130.91 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508220 207728
Boring Diameter	150 mm	**Logged by:** CJW	Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Backfill	Level O.D.
					Grass over brown slightly sandy humic clay with roots and rootlets (TOPSOIL)	0.50		130.41
1.00	J				Stiff consistency brown CLAY with rare fine to medium angular flint gravel (CLAY-WITH-FLINTS)			
1.50-1.95	S	1.50	DRY	16				
2.00	J							
3.00	J							
3.00-3.45	S	1.50	DRY	16				
4.00	J							
4.50-4.95	S	1.50	DRY	16				
5.00	J							
6.00-6.45	S	1.50	DRY	13				
6.20	J				Structureless CHALK composed of white with black specks slightly gravelly SILT. Clasts are very weak low density (UPPER CHALK)	6.20		124.71
7.50-7.95	S	1.50	DRY	14				
8.00	J							
9.00-9.45	U	1.50	DRY	(60)				
10.00	J				...continued on Sheet 2 of 2			

Progress/Groundwater

Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed
27/03/17	15.00	1.50	DRY	-	-	-

Chiselling

Depth Range	Time (hours)

Additional Tests

Test Type	Test Depth	Test Value

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL2**
Start Date	27/03/2017 **End Date** 27/03/2017	**Sheet**	2 of 2
		Job No.	CCL02935
Contractor	RD Drilling **Equipment** Dando 2000 Mk2	**Ground Level**	130.91 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508220 207728
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					...continued from Sheet 1 of 2				
10.50-10.95	S	1.50	DRY	23	(structureless CHALK composed of white with black specks slightly gravelly SILT. Clasts are very weak low density)				
11.00	J								
12.00-12.45	S	1.50	DRY	26					
13.50-13.95	U	1.50	DRY	(55)					
14.00	J								
15.00-15.45	S	1.50	DRY	36		15.00			115.91
					Base of Hole				

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
27/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL3**
Start Date	28/03/2017 **End Date** 28/03/2017	**Sheet**	1 of 2
		Job No.	CCL02935
Contractor	RD Drilling	**Equipment**	Dando 2000 Mk2
Ground Level	130.20 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508339 207638
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Backfill	Level O.D.
					Grass over firm consistency dark brown humic clay with roots and rootlets (TOPSOIL/POSSIBLE MADE GROUND)			
1.00	J							
1.30	J					1.30		128.90
1.30	c_{fv}*			60/63	Firm to stiff consistency orangish brown mottled light grey CLAY			
1.50-1.95	S	1.50	DRY	14	(CLAY-WITH-FLINTS)			
2.00	J				…becoming stiff to very stiff consistency orangish brown mottled black CLAY below 2.0 m depth			
3.00	J					3.00		127.20
3.00-3.45	S	1.50	DRY	14	Structureless CHALK composed of white gravelly SILT. Clasts are fine to medium very weak low density (UPPER CHALK)			
4.00	J							
4.50-4.95	U	1.50	DRY	(50)		4.50		125.70
5.00	J				Structureless CHALK composed of white slightly silty GRAVEL. Clasts are very weak low density (UPPER CHALK)			
6.00-6.45	S	1.50	DRY	17				
7.00	J							
7.50-7.95	S	1.50	DRY	18				
8.00	J							
9.00	U	1.50	DRY	(50)				
10.00	J				…continued on Sheet 2 of 2			

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
28/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Hole Ref.	**BH CCL3**		
Project:	Maylands Gateway, Hemel Hempstead	**Sheet**	2 of 2
Start Date	28/03/2017 **End Date** 28/03/2017	**Job No.**	CCL02935
Contractor	RD Drilling	**Equipment**	Dando 2000 Mk2
Ground Level	130.20 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508339 207638
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					...continued from Sheet 1 of 2				
10.50-10.95	S	1.50	DRY	20	(Structureless CHALK composed of white slightly silty GRAVEL. Clasts are very weak low density)				
11.00	J								
12.00-12.45	S	1.50	DRY	24					
13.00	J								
13.50-13.95	S	1.50	DRY	27					
14.00	J								
15.00-15.45	S	1.50	DRY	30		15.00			115.20
					Base of Hole				

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
28/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL4**
Start Date	28/03/2017 **End Date** 29/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Contractor	RD Drilling	**Equipment**	Dando 2000 Mk2
Ground Level	134.83 m OD		
Method	0 m - 7.5 m Light Cable Percussion Boring	**Co-ordinates**	508500 207682
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Grey fine angular gravel (MADE GROUND)	0.05			134.78
					Brown humic clay underlain by geotextile (MADE GROUND)	0.25			134.58
					Firm consistency brown slightly gravelly CLAY. Gravel is fine to medium angular of flint (CLAY-WITH-FLINTS)				
1.00	J								
1.50-1.95	C	1.50	DRY	21					
2.00	J								
3.00	J								
3.00-3.45	S	1.50	DRY	14		3.00			131.83
					Structureless CHALK composed of white mottled brown slightly gravelly SILT with rare flint gravel. Clasts are very weak low density (UPPER CHALK)				
4.00	J								
4.00-4.45	U	1.50	DRY	(43)					
5.00	J								
6.00	S	1.50	DRY	18					
7.00	J								
7.50-7.66	S	1.50	DRY	50 for 10 mm		7.50			127.33
					Base of Hole				

Progress/Groundwater

Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed
29/03/17	7.50	1.50	DRY	-	-	-

Chiselling

Depth Range	Time (hours)

Additional Tests

Test Type	Test Depth	Test Value

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

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GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL5**
Start Date	28/03/2017 **End Date** 28/03/2017	**Sheet**	1 of 2
		Job No.	CCL02935
Contractor	RD Drilling	**Ground Level**	126.76 m OD
Equipment	Dando 2000 Mk2	**Co-ordinates**	508263 207534
Method	0 m - 15.0 m Light Cable Percussion Boring	**Logged by:**	CJW Logged on site during drilling operations
Boring Diameter	150 mm	**Checked by:**	
Casing Diameter	150 mm		

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					Grass over firm consistency dark brown humic clay (TOPSOIL)	0.60			126.16
1.00	J				Firm consistency brown CLAY (CLAY-WITH-FLINTS)				
1.50-1.95	S	1.50	DRY	13					
2.00	J					2.00			124.76
					Stiff to very stiff consistency brown CLAY with rare fine angular flint gravel (CLAY-WITH-FLINTS)				
3.00	J								
3.00-3.45	S	1.50	DRY	14					
4.00	c_{fv}*			108					
4.00	J								
4.50-4.95	S	1.50	DRY	16					
5.00	c_{fv}*			100					
5.00	J								
6.00-6.45	S	1.50	DRY	24					
7.00	J								
7.50-7.95	S	1.50	DRY	27					
						8.50			118.26
9.00	J				Structureless CHALK composed of white silty fine to medium angular GRAVEL. Clasts are very weak low density (UPPER CHALK)				
10.00-10.45	U	1.50	DRY	(50)	...continued on Sheet 2 of 2				

Progress/Groundwater

Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed
28/03/17	15.00	1.50	DRY	-	-	-

Chiselling

Depth Range	Time (hours)

Additional Tests

Test Type	Test Depth	Test Value

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL5**
Start Date	28/03/2017 **End Date** 28/03/2017	**Sheet**	2 of 2
		Job No.	CCL02935
Contractor	RD Drilling **Equipment** Dando 2000 Mk2	**Ground Level**	126.76 m OD
Method	0 m - 15.0 m Light Cable Percussion Boring	**Co-ordinates**	508263 207534
Boring Diameter	150 mm	**Logged by:**	CJW Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Legend	Backfill	Level O.D.
					…continued from Sheet 1 of 2				
					(Structureless CHALK composed of white silty fine to medium angular GRAVEL. Clasts are very weak low density)				
11.50-11.95	S	1.50	DRY	24					
13.00-13.45	U	1.50	DRY	(60)					
14.00	J								
14.50-14.95	S	1.50	DRY	30					
						15.00			111.76
					Base of Hole				

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
28/03/17	15.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

Crossfield CONSULTING
GEOTECHNICAL ENVIRONMENTAL

Light Cable Percussion Borehole Record Sheet

Project:	Maylands Gateway, Hemel Hempstead	**Hole Ref.**	**BH CCL6**
Start Date	29/03/2017 **End Date** 29/03/2017	**Sheet**	1 of 1
		Job No.	CCL02935
Contractor	RD Drilling **Equipment** Dando 2000 Mk2	**Ground Level**	132.81 m OD
Method	0 m - 9.0 m Light Cable Percussion Boring	**Co-ordinates**	508563 207605
Boring Diameter	150 mm	**Logged by:**	SC Logged on site during drilling operations
Casing Diameter	150 mm	**Checked by:**	

Sample Depth	Sample or Test	Casing Depth	Water Depth	Test Value	Description	Depth	Backfill	Level O.D.
					Grey fine angular gravel (MADE GROUND)	0.20		132.61
					Dark brown humic clay (TOPSOIL)			
1.00	c_{fv}*			80		0.90		131.91
1.00	J				Stiff consistency brown CLAY (CLAY-WITH-FLINTS)			
1.50-1.95	S	1.50	DRY	16				
2.00	c_{fv}*			100				
2.00	J							
3.00	J					3.00		129.81
3.00-3.45	S	1.50	DRY	20	Stiff consistency brown with black specks gravelly CLAY. Gravel is fine angular of flint (CLAY-WITH-FLINTS)			
4.00	J							
4.50-4.95	C	1.50	DRY	30				
5.10	J					5.10		127.71
					Structureless CHALK composed of white with rare brown mottling gravelly SILT with rare fine to medium angular flint. Clasts are very weak low density (UPPER CHALK)			
6.00-6.45	U	1.50	DRY	(80)				
7.00	J							
7.50-7.95	S	1.50	DRY	29				
8.00	J							
9.00-9.45	S	1.50	DRY	21		9.00		123.81
					Base of Hole			

Progress/Groundwater							Chiselling		Additional Tests		
Date/Time	Hole Depth	Case Depth	Water Depth	Depth Struck	Depth after 20 min	Depth Sealed	Depth Range	Time (hours)	Test Type	Test Depth	Test Value
29/03/17	9.00	1.50	DRY	-	-	-					

Remarks

Coordinates and elevations provided by Winvic

Notes

1. All logging and sampling in accordance with BS 5930:2015
2. The depths to strata change are approximate only
3. Symbols and abbreviations are explained on the accompanying key
4. All linear dimensions are in metres unless otherwise stated
5. Undrained shear strength test value given in kN/m^2

SUMMARY TABLES

Table 1 CPT Test Summary

TEST ID	FINAL DEPTH (mBGL)	Cone ID {C=Cone tip; F=Friction Sleeve; I= Inclination; P = Piezo; S=Subtraction cone; 15/10 = cone projected area (cm2))}	CPT RIG	PRE DRILLED / INSPECTION PIT (m)	CASING DEPTH (m)	REFUSAL FACTOR	DISSIPATIONS	SEISMIC CONE	SAMPLES	EASTING	NORTHING	ELEVATION (m)	DATE OF TEST	REMARKS
CCL01	14.71	S15-CFIP.1411	UK15			Target depth				508369.033	207875.419	135.13	29/03/2017	
CCL02	1.62	S15-CFIP.1411	UK15			Target depth				508406.924	207856.079	135.284	29/03/2017	
CCL02A	15.07	S15-CFIP.1411	UK15			Target depth				508406.924	207856.079	135.284	29/03/2017	
CCL03	15.07	S15-CFIP.1411	UK15			Target depth				508358.026	207819.581	134.29	29/03/2017	
CCL04	15.07	S15-CFIP.1411	UK15			Target depth				508350.443	207774.593	134.341	29/03/2017	
CCL05	15.07	S15-CFIP.1411	UK15			Target depth				508387.668	207752.494	133.965	27/03/2017	
CCL06	15.07	S15-CFIP.1411	UK15			Target depth				508435.35	207823.331	135.64	27/03/2017	
CCL07	15.07	S15-CFIP.1411	UK15			Target depth				508476.989	207823.511	136.39	27/03/2017	
CCL08	15.07	S15-CFIP.1411	UK15			Target depth				508433.827	207788.124	135.29	27/03/2017	
CCL09	15.07	S15-CFIP.1411	UK15			Target depth				508484.1	207767.453	135.83	27/03/2017	
CCL10	15.07	S15-CFIP.1411	UK15			Target depth				508527.61	207754.884	136.2	27/03/2017	
CCL11	15.07	S15-CFIP.1411	UK15			Target depth				508171.069	207731.741	131.753	28/03/2017	
CCL12	15.07	S15-CFIP.1411	UK15			Target depth				508160.863	207694.942	130.256	28/03/2017	
CCL13	15.07	S15-CFIP.1411	UK15			Target depth				508209.163	207728.982	131.15	27/03/2017	
CCL14	15.07	S15-CFIP.1411	UK15			Target depth				508278.581	207743.837	130.65	27/03/2017	
CCL15	15.08	S15-CFIP.1411	UK15			Target depth				508276.337	207717.285	129.67	27/03/2017	
CCL16	14.03	S15-CFIP.1411	UK15			Target depth				508270.137	207695.723	129.54	28/03/2017	
CCL17	15.07	S15-CFIP.1411	UK15			Target depth				508339.288	207714.211	131.76	27/03/2017	
CCL18	15.07	S15-CFIP.1411	UK15			Target depth				508439.759	207729.16	135.13	27/03/2017	
CCL19	15.07	S15-CFIP.1411	UK15			Target depth				508164.423	207630.55	129.8	28/03/2017	
CCL20	15.07	S15-CFIP.1411	UK15			Target depth				508271.205	207661.637	129.308	28/03/2017	
CCL21	15.07	S15-CFIP.1411	UK15			Target depth				508323.275	207634.071	129.03	28/03/2017	
CCL22	13.70	S15-CFIP.1411	UK15			Target depth				508521.21	207657.056	131.96	29/03/2017	
CCL23	14.09	S15-CFIP.1411	UK15			Target depth				508249.991	207602.376	128.99	28/03/2017	

TEST ID	FINAL DEPTH (mBGL)	Cone ID {C=Cone tip; F=Friction Sleeve; I= Inclination; P = Piezo; S=Subtraction cone; 15/10 = cone projected area (cm2))}	CPT RIG	PRE DRILLED / INSPECTION PIT (m)	CASING DEPTH (m)	REFUSAL FACTOR	DISSIPATIONS	SEISMIC CONE	SAMPLES	EASTING	NORTHING	ELEVATION (m)	DATE OF TEST	REMARKS
CCL24	14.71	S15-CFIP.1411	UK15			Target depth				508232.408	207490.614	126.74	28/03/2017	
CCL25	10.92	S15-CFIP.1411	UK15			Target depth				508266.411	207528.452	126.8	28/03/2017	
CCL26	14.42	S15-CFIP.1411	UK15			Target depth				508322.303	207551.227	126.645	28/03/2017	
CCL27	11.21	S15-CFIP.1411	UK15			Target depth				508323.515	207519.934	126.71	28/03/2017	
CCL28	11.45	S15-CFIP.1411	UK15			Target depth				508410.235	207574.058	130.41	28/03/2017	
CCL29	8.00	S15-CFIP.1411	UK15			Target depth				508180.602	207569.386	129.497	29/03/2017	
CCL30	7.07	S15-CFIP.1411	UK15			Target depth				508186.196	207572.37	129.289	29/03/2017	
CCL31	15.07	S15-CFIP.1411	UK15			Target depth				508212.84	207662.764	129.738	28/03/2017	
CCL32	11.79	S15-CFIP.1411	UK15			Target depth				508185.313	207567.38	129.408	28/03/2017	
CCL33	8.20	S15-CFIP.1411	UK15			Target depth				508190.448	207567.019	129.288	29/03/2017	
CCL34	6.94	S15-CFIP.1411	UK15			Target depth				508460.378	207780.231	135.684	29/03/2017	
CCL35	8.50	S15-CFIP.1411	UK15			Target depth				508466.61	207776.764	135.639	29/03/2017	
CCL36	6.50	S15-CFIP.1411	UK15			Target depth				508463.594	207770.35	135.468	29/03/2017	
CCL37	6.50	S15-CFIP.1411	UK15			Target depth				508456.734	207773.543	135.486	29/03/2017	
CCL38	8.51	S15-CFIP.1411	UK15			Target depth				508185.032	207562.503	129.472	29/03/2017	

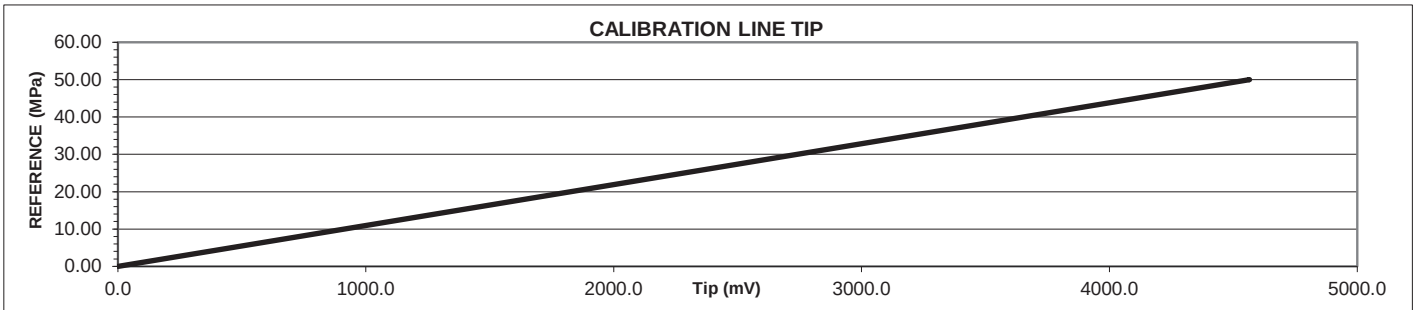
CPT Test Plots are presented in Appendices B & C

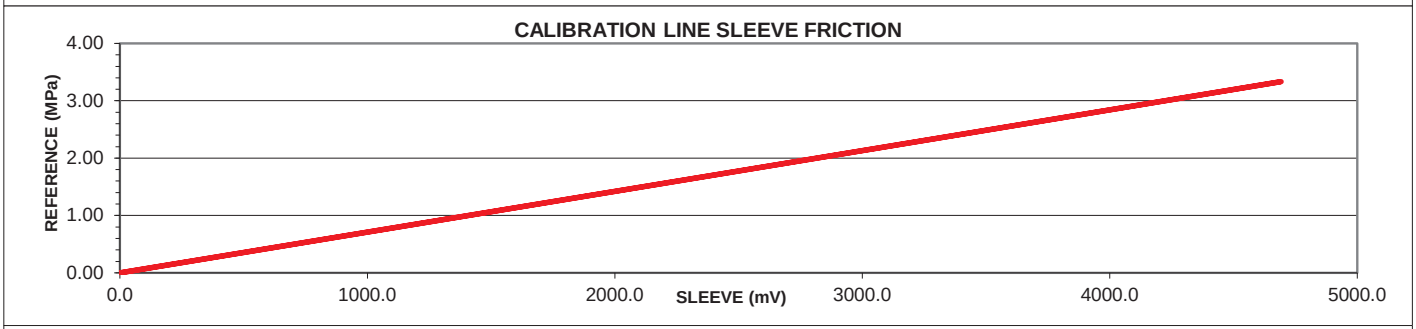
CALIBRATION CERTIFICATE

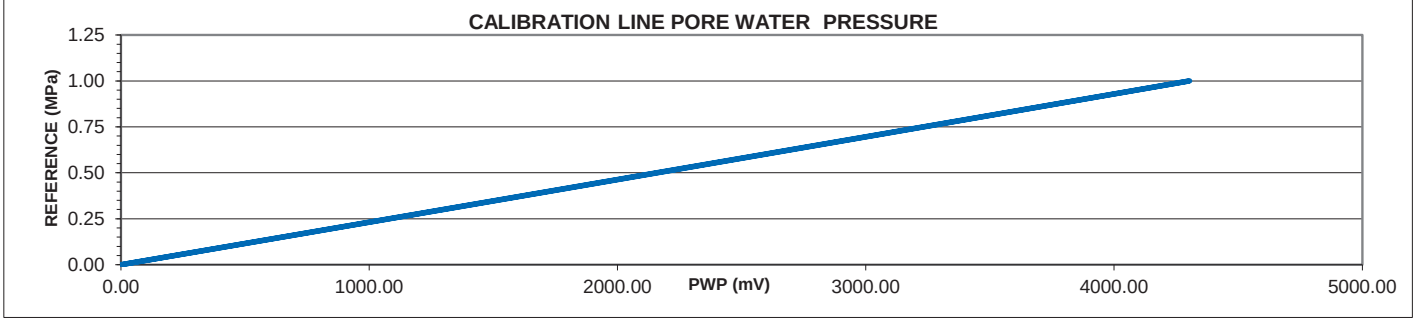
Geopoint-S15-150kN-2MPa

Cone Serial Number: S15-CFIIP.1411

REFERENCE INSTRUMENTS:	CONE END RESISTANCE	SLEEVE FRICTION	PORE WATER PRESSURE
ID	5623	5623	4009509
TYPE	Richmond 300	Richmond 300	Druck DPI 104
UNCERTAINTY (±%)	0.1	0.1	0.05
Nominal pressure (MPa,MPa,MPa)	50.00	3.33	1.00
Maximum pressure (MPa,MPa,MPa)	100.00	6.67	2.00
Area (cm^2)	15	225	N/A
Sensitivity (mV/MPa)	91.29	1407.52	4302.41
Calibration file scaling factor:			
Nominal cal force (kN, kN, BAR)	75	75	10
Calibration number (mV)	4565	4692	4302
Zero point (mV)	257	289	194
Sensitivity (mV/kN, mV/kN, mV/BAR)	60.861	62.556	430.241
Inclination factors (mV)	X -20°= 564, 0°= 2430, 20°= 4531	/ Y -20°= 421, 0°= 2305, 20°= 4389	
Measured alpha factor:	0.69		
Uncertainty (%):			
Reproducibility	0.03	0.02	0.08
Linearity	0.05	0.07	0.12
Hysteresis	0.05	0.05	0.16
Combined expanded (k=2)	0.26	0.53	0.46
Application class	1	1	1







Instrument:	S15-150kN	Location:	Lankelma Calibration Laboratory
Serial Number:	S15-CFIIP.1411	Temperature(° C)	20.0
Manufacturer:	Geopoint	Calibration Engineer	A Harman
Date of calibration:	01/02/2017	Calibration Expiry	30/04/2017

Calibration signed and dated by:

A Harman

Digitally signed by Alastair Harman
DN: cn=Alastair Harman, o=Lankelma Ltd, ou=Instrument Engineer, email=Alastairharman@lankelma.com, c=GB
Date: 2017.02.01 10:46:05 Z

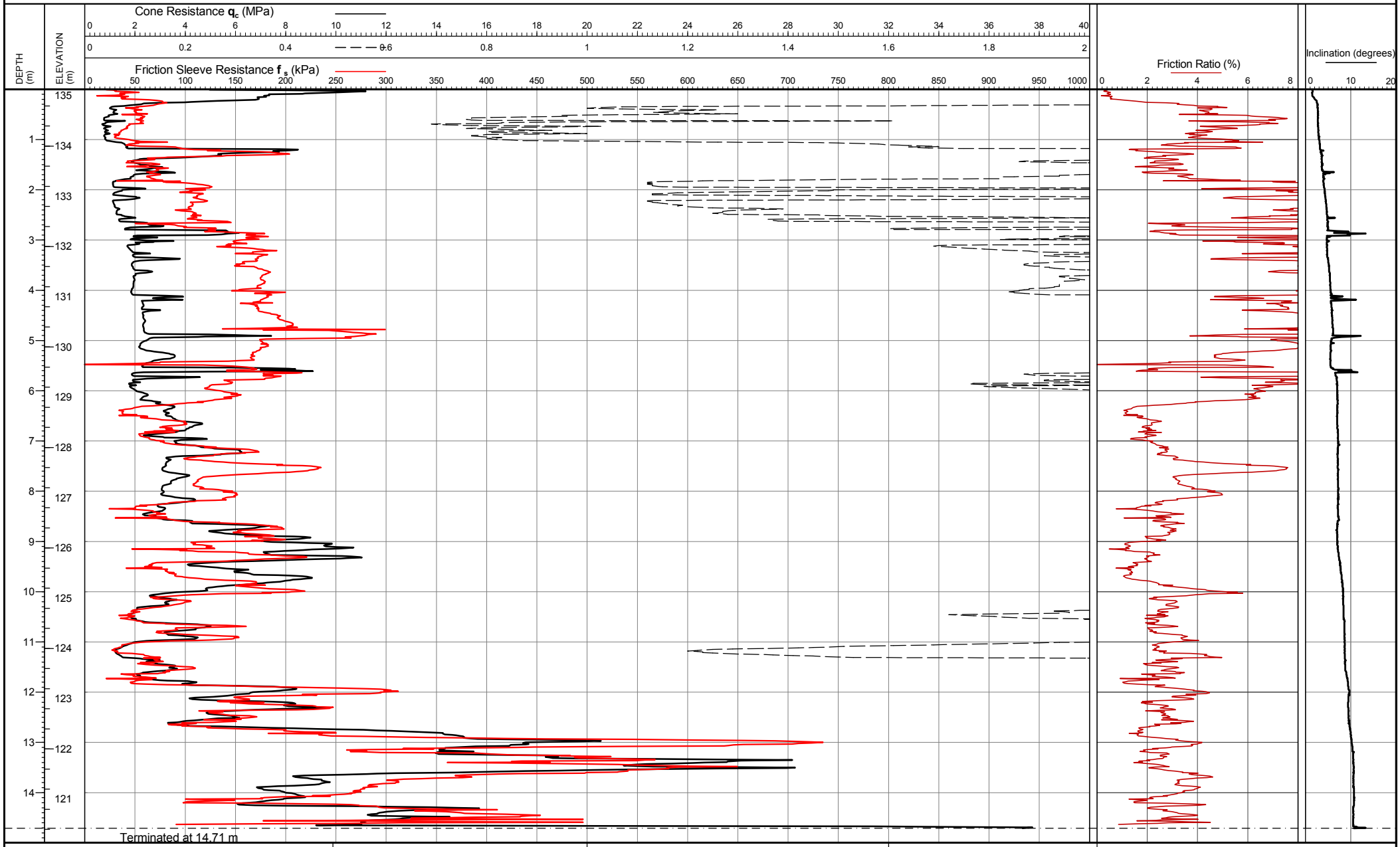
Calibration checked and dated by:

Digitally signed by Christopher Player
DN: cn=Christopher Player, o=Lankelma Ltd., ou=Onland, email=christopherplayer@lankelma.co.uk, c=GB
Date: 2017.02.01 11:22:35 Z

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

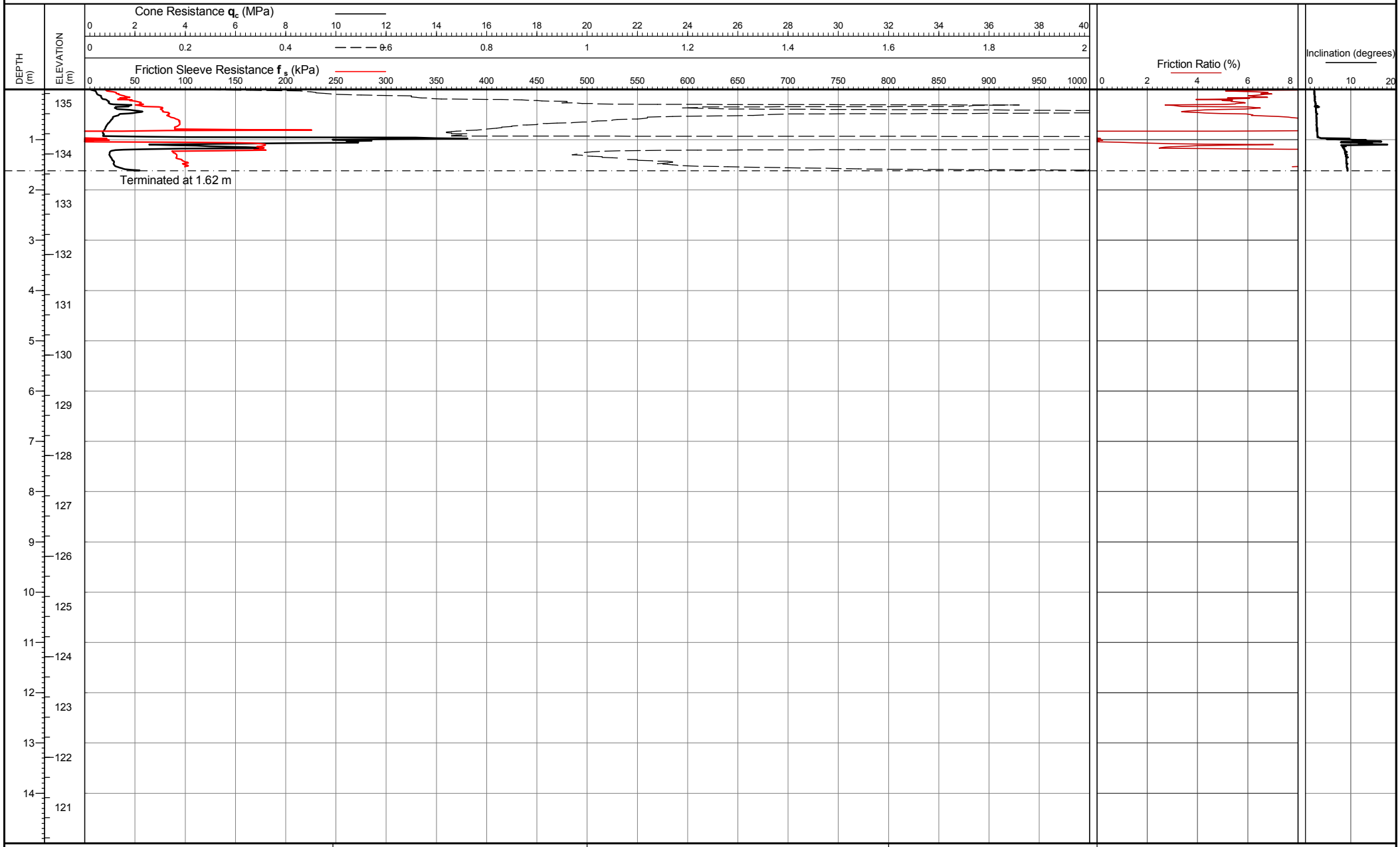


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 08:25:55	Location: Hemel Hempstead, UK Coordinates: 508369.033, 207875.419 Elevation: 135.13	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL01** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



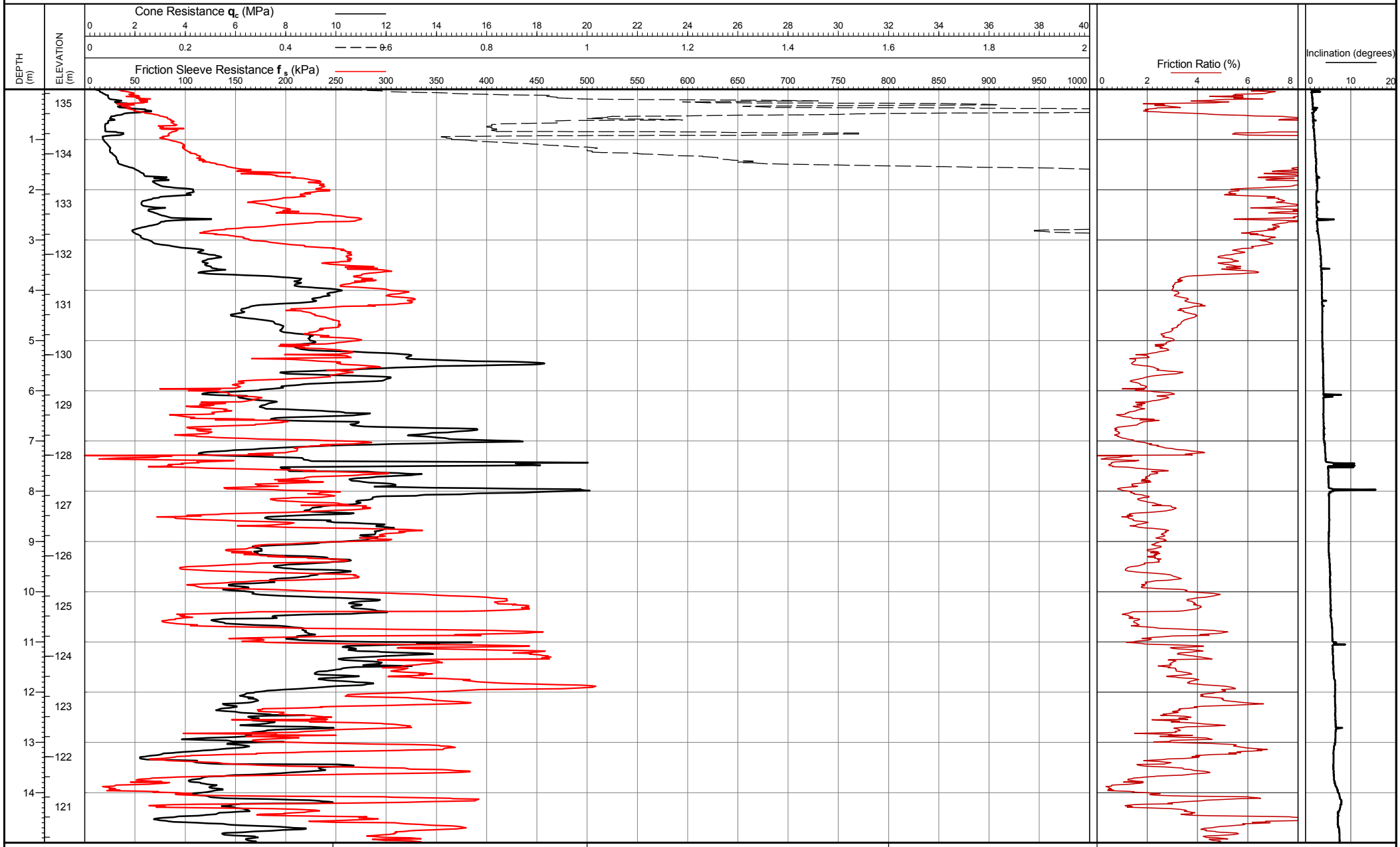
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 09:07:41	Location: Hemel Hempstead, UK Coordinates: 508406.924, 207856.079 Elevation: 135.284	Remarks: Refusal criteria: Inclination	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL02

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:12:11

Location: Hemel Hempstead, UK

Coordinates: 508406.924, 207856.079

Elevation: 135.284

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

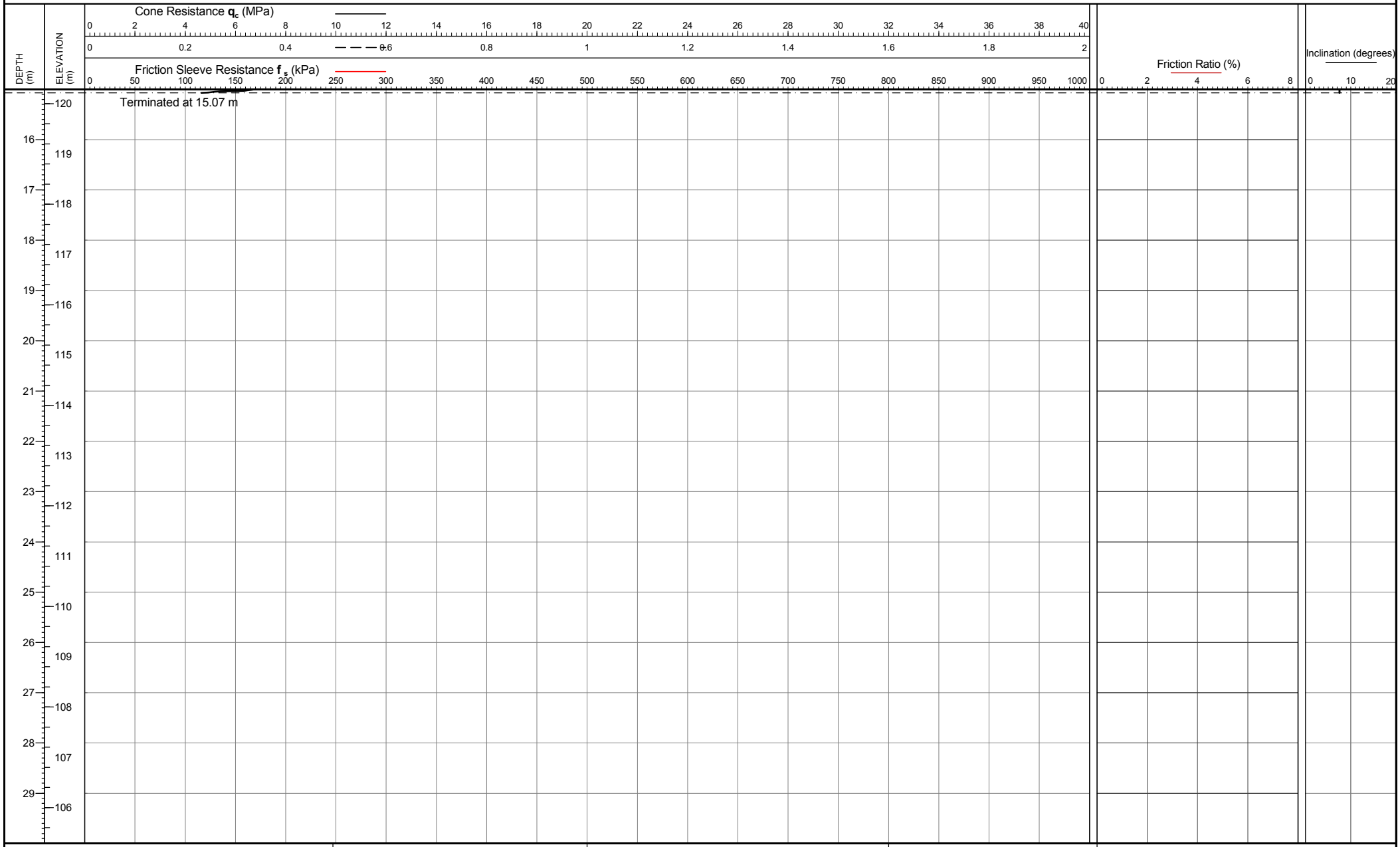
Checked by: Josh Zon

TEST ID: CCL02A

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:12:11

Location: Hemel Hempstead, UK

Coordinates: 508406.924, 207856.079

Elevation: 135.284

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

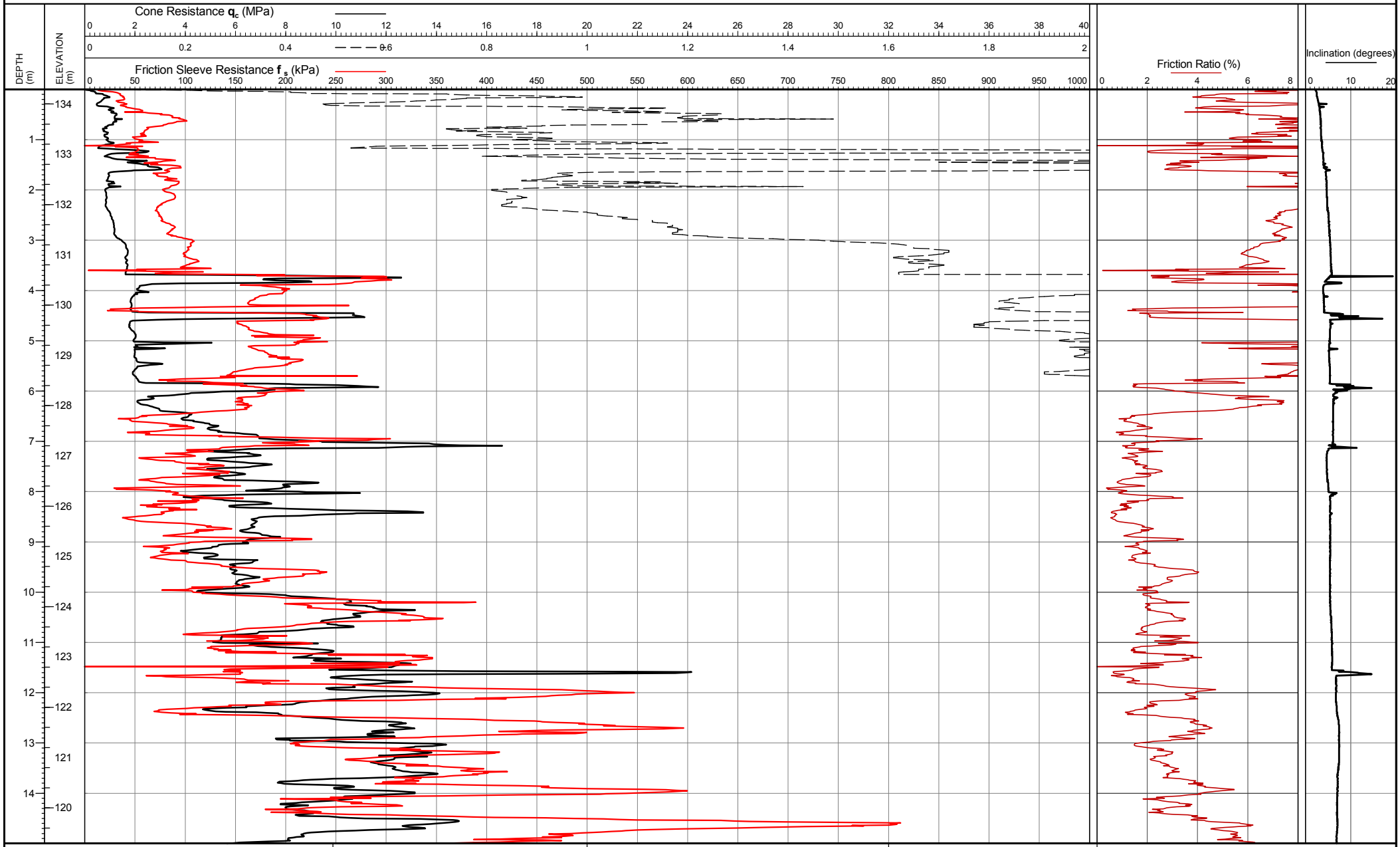
Checked by: Josh Zon

TEST ID: CCL02A

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



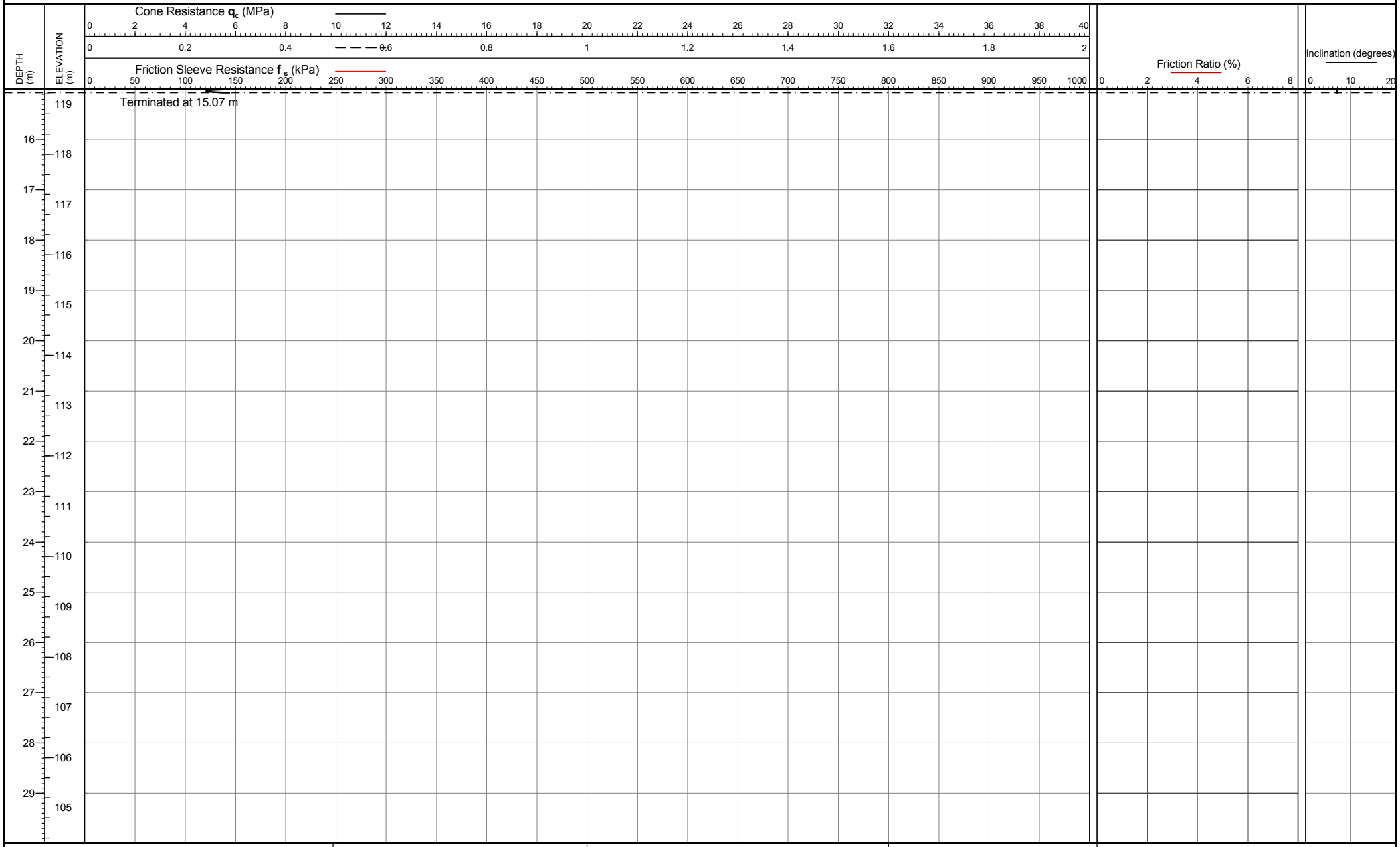
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 11:12:19	Location: Hemel Hempstead, UK Coordinates: 508358.026, 207819.581 Elevation: 134.29	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL03

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:12:19

Location: Hemel Hempstead, UK

Coordinates: 508358.026, 207819.581

Elevation: 134.29

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

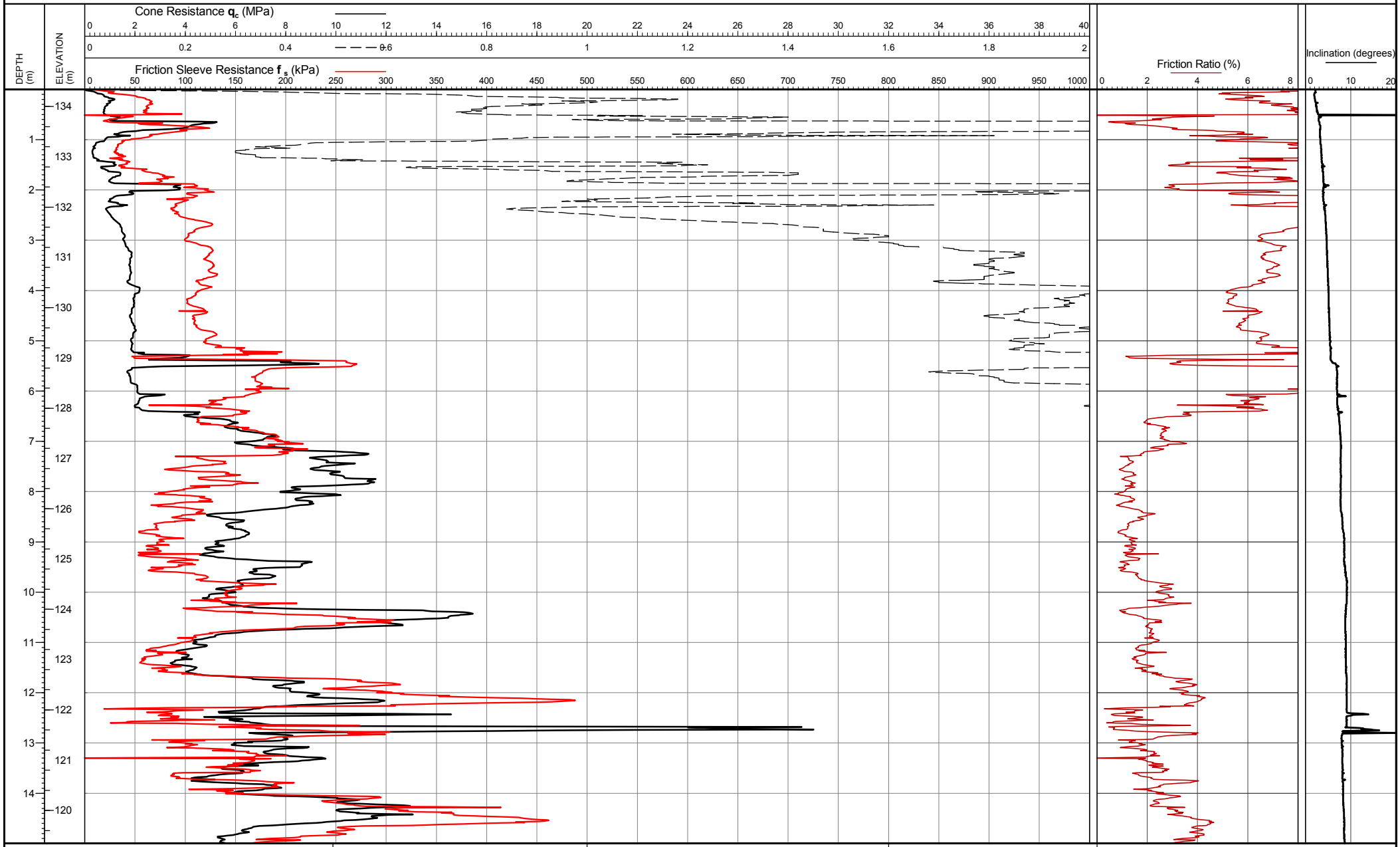
Checked by: Josh Zon

TEST ID: CCL03

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

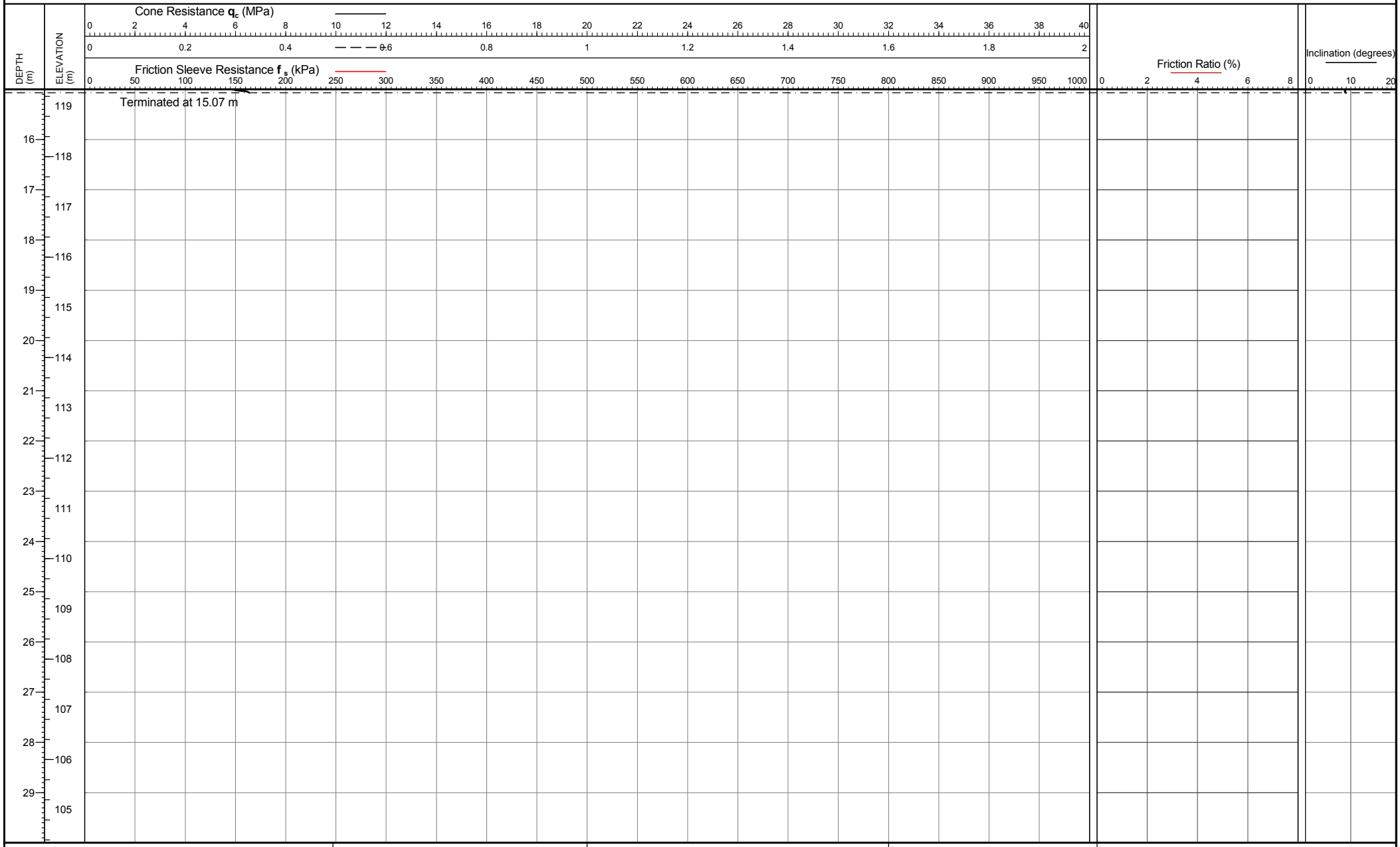


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 11:40:18	Location: Hemel Hempstead, UK Coordinates: 508350.443, 207774.593 Elevation: 134.341	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL04** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:40:18

Location: Hemel Hempstead, UK

Coordinates: 508350.443, 207774.593

Elevation: 134.341

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

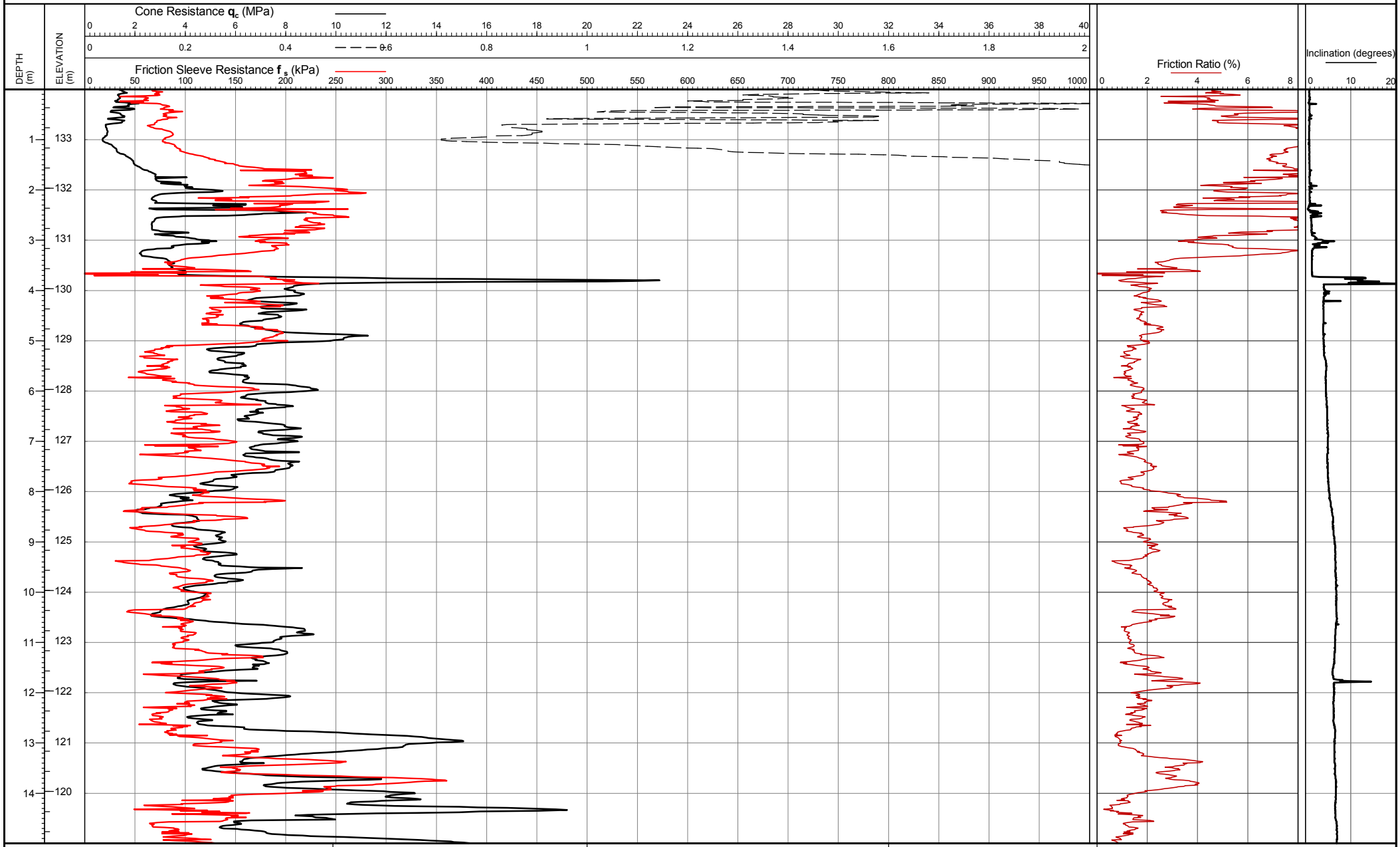
Checked by: Josh Zon

TEST ID: CCL04

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 14:38:09

Location: Hemel Hempstead, UK

Coordinates: 508387.668, 207752.494

Elevation: 133.965

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

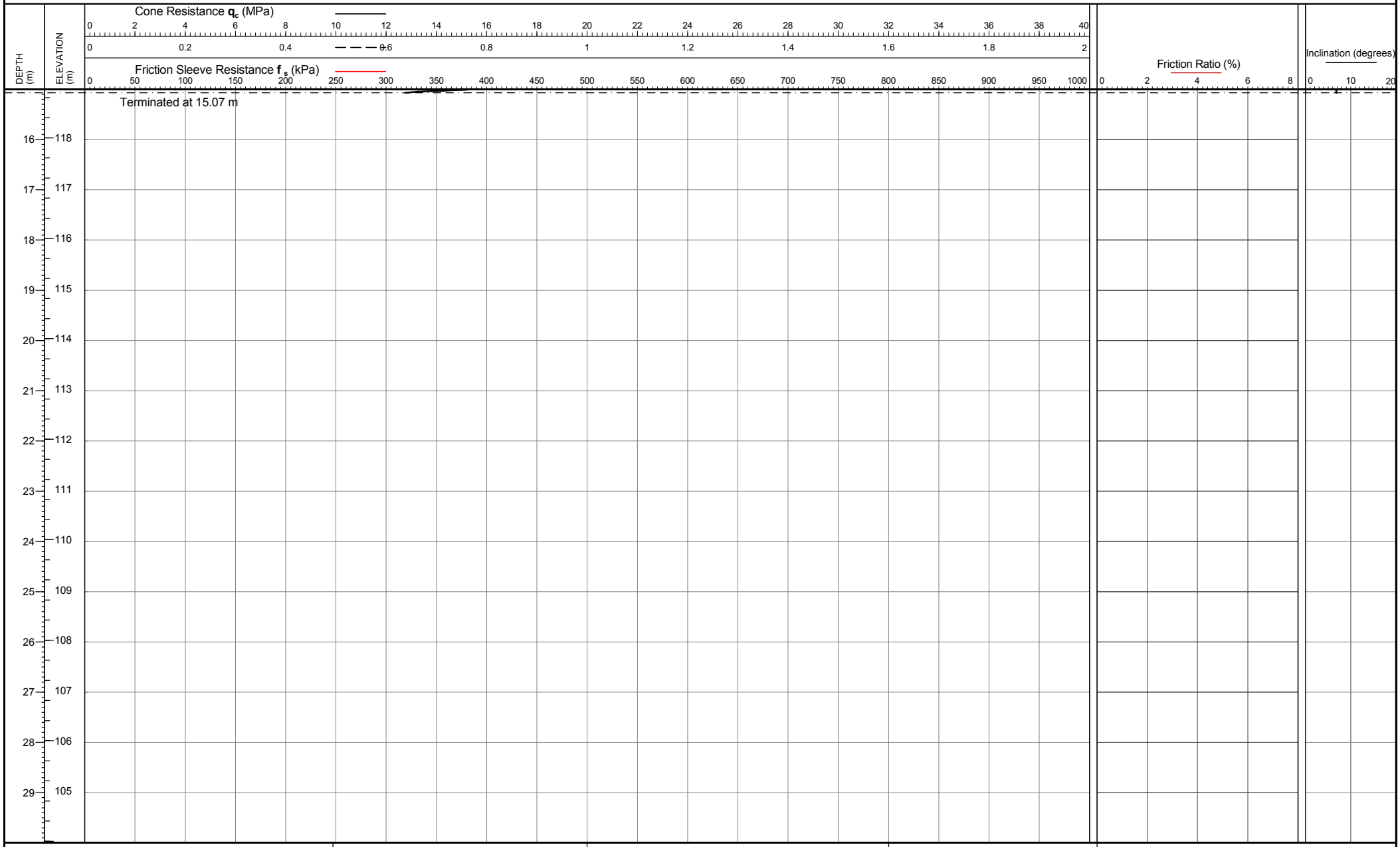
Checked by: Josh Zon

TEST ID: CCL05

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 14:38:09

Location: Hemel Hempstead, UK

Coordinates: 508387.668, 207752.494

Elevation: 133.965

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

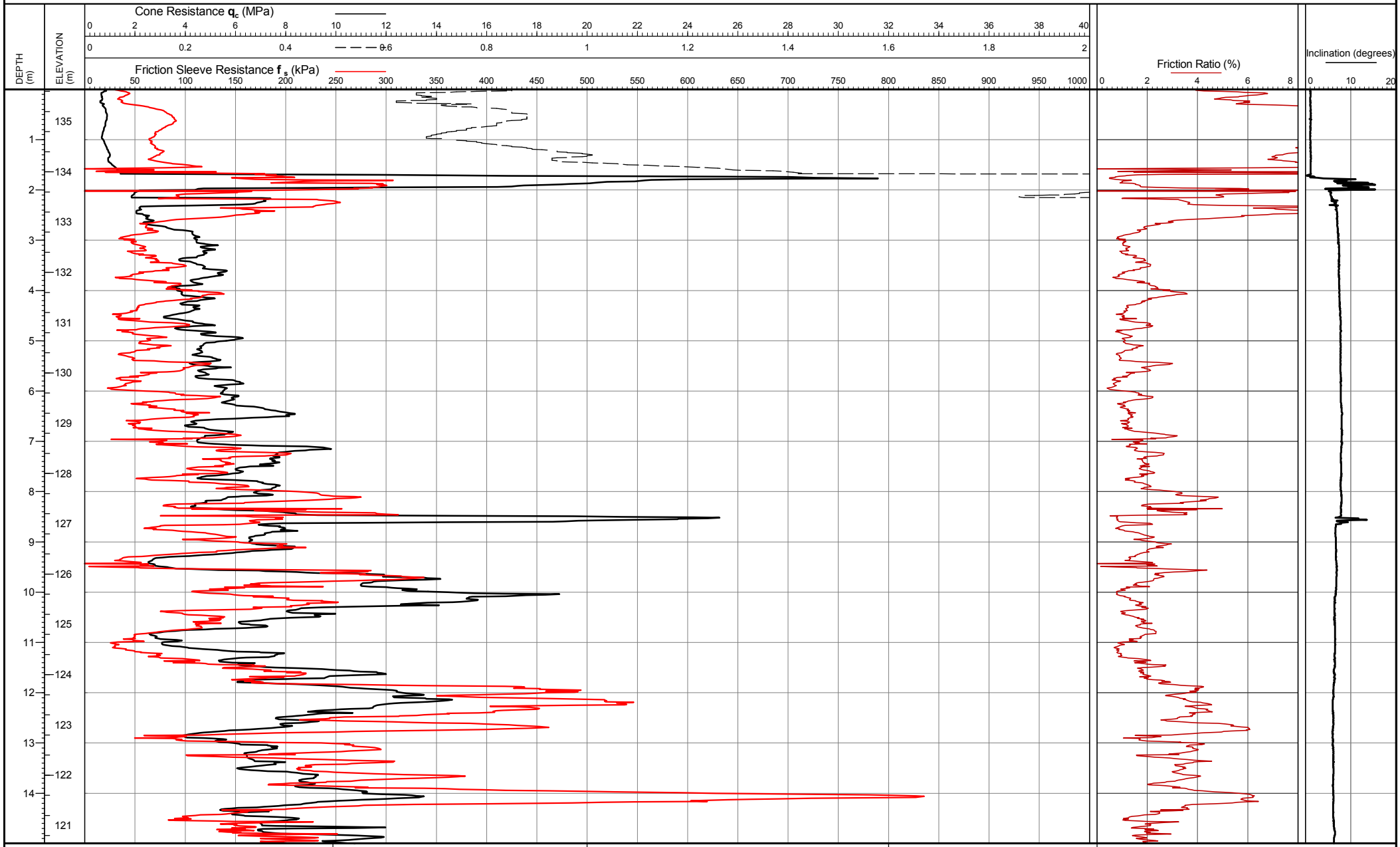
Checked by: Josh Zon

TEST ID: CCL05

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

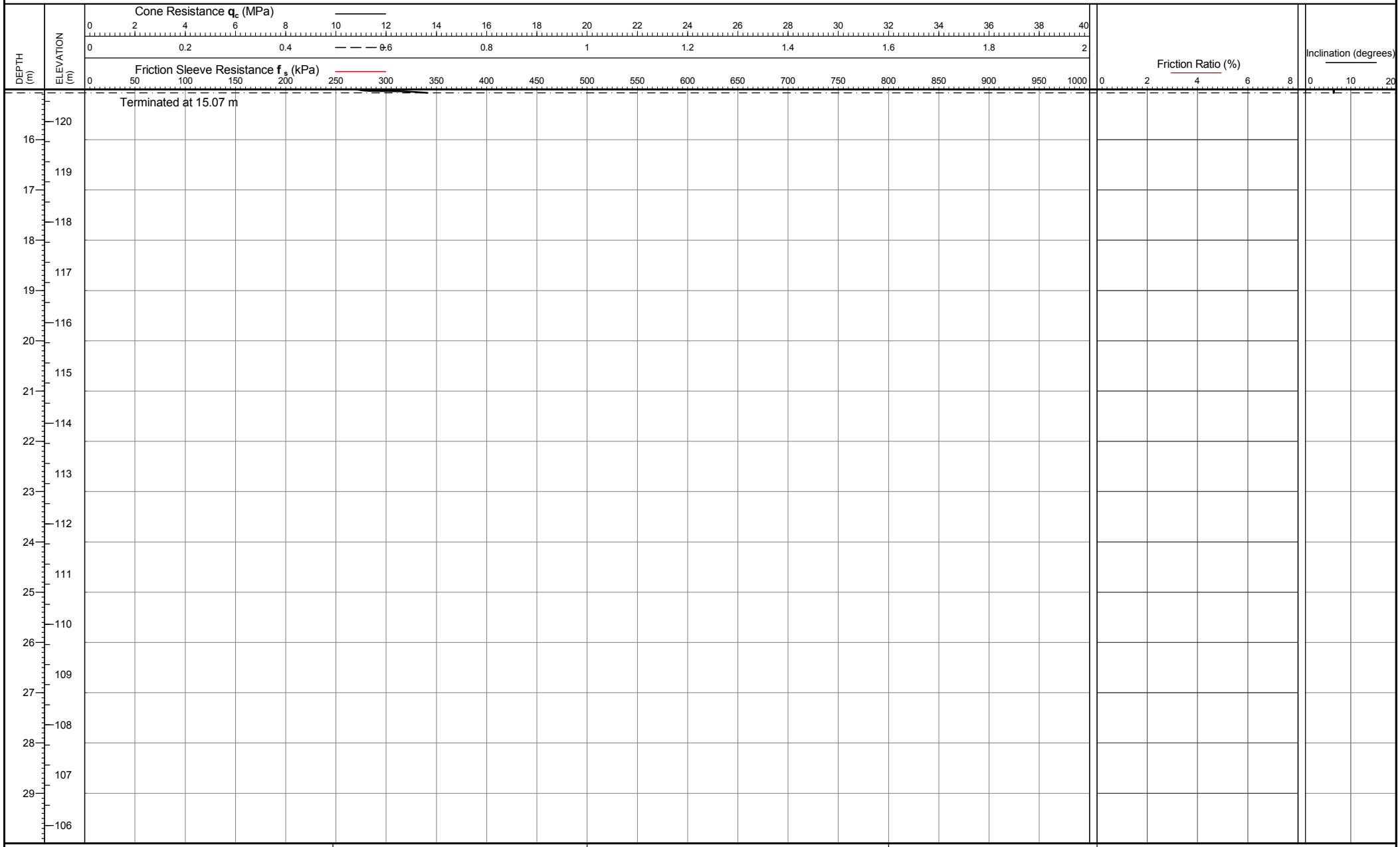


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 11:15:34	Location: Hemel Hempstead, UK Coordinates: 508435.35, 207823.331 Elevation: 135.64	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL06** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:15:34

Location: Hemel Hempstead, UK

Coordinates: 508435.35, 207823.331

Elevation: 135.64

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

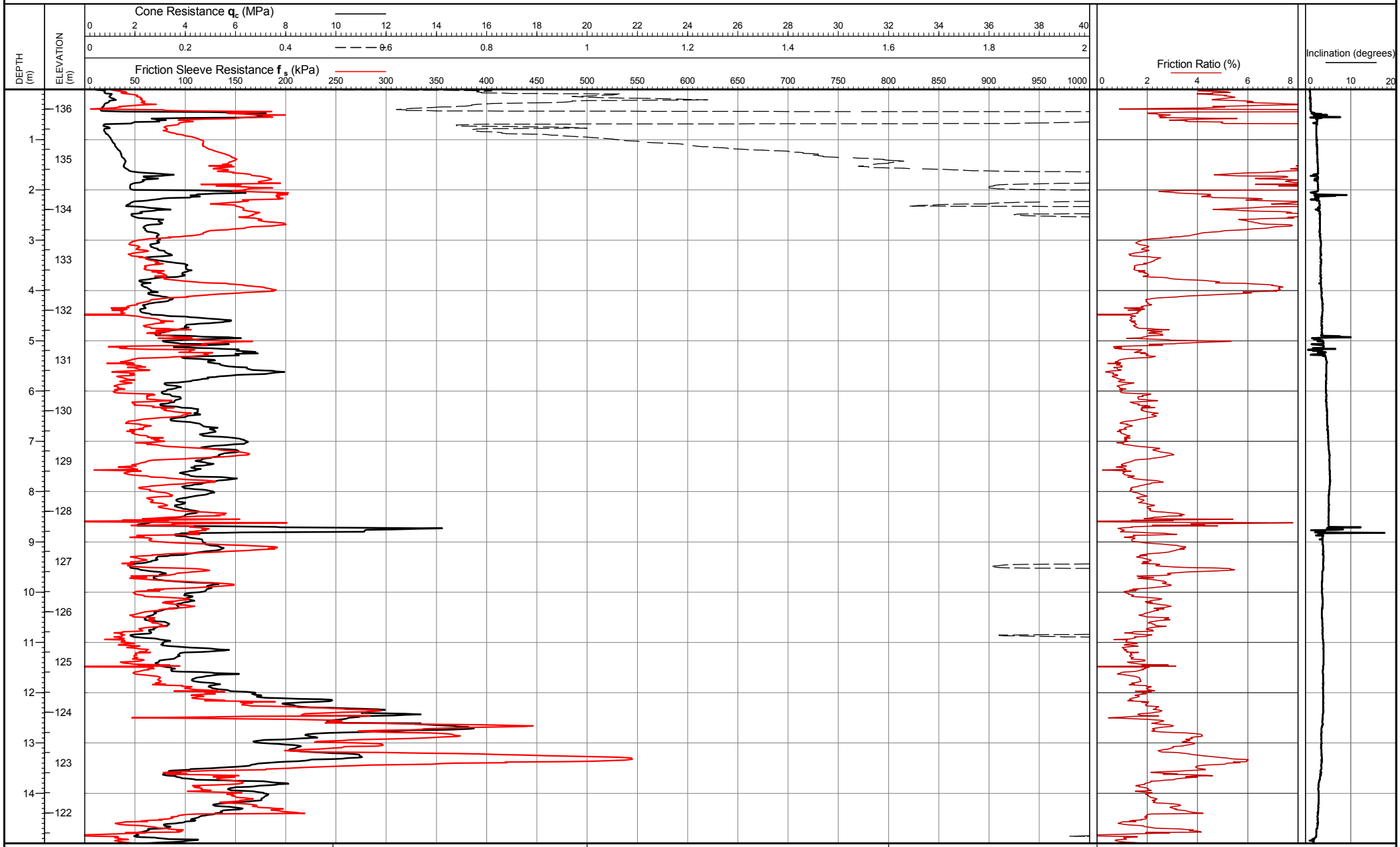
Checked by: Josh Zon

TEST ID: CCL06

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

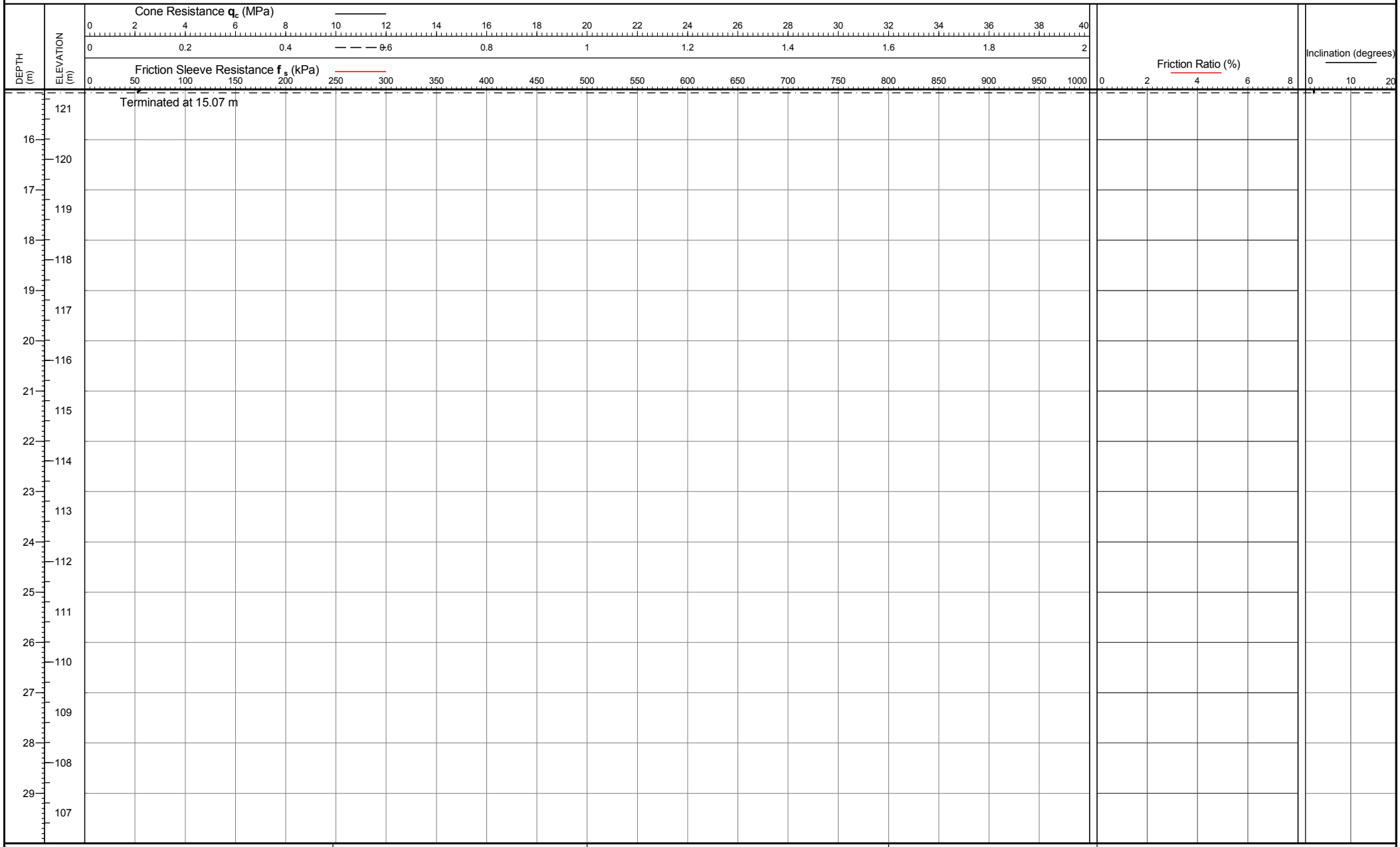


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 13:49:02	Location: Hemel Hempstead, UK Coordinates: 508476.989, 207823.511 Elevation: 136.39	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL07** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:49:02

Location: Hemel Hempstead, UK

Coordinates: 508476.989, 207823.511

Elevation: 136.39

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

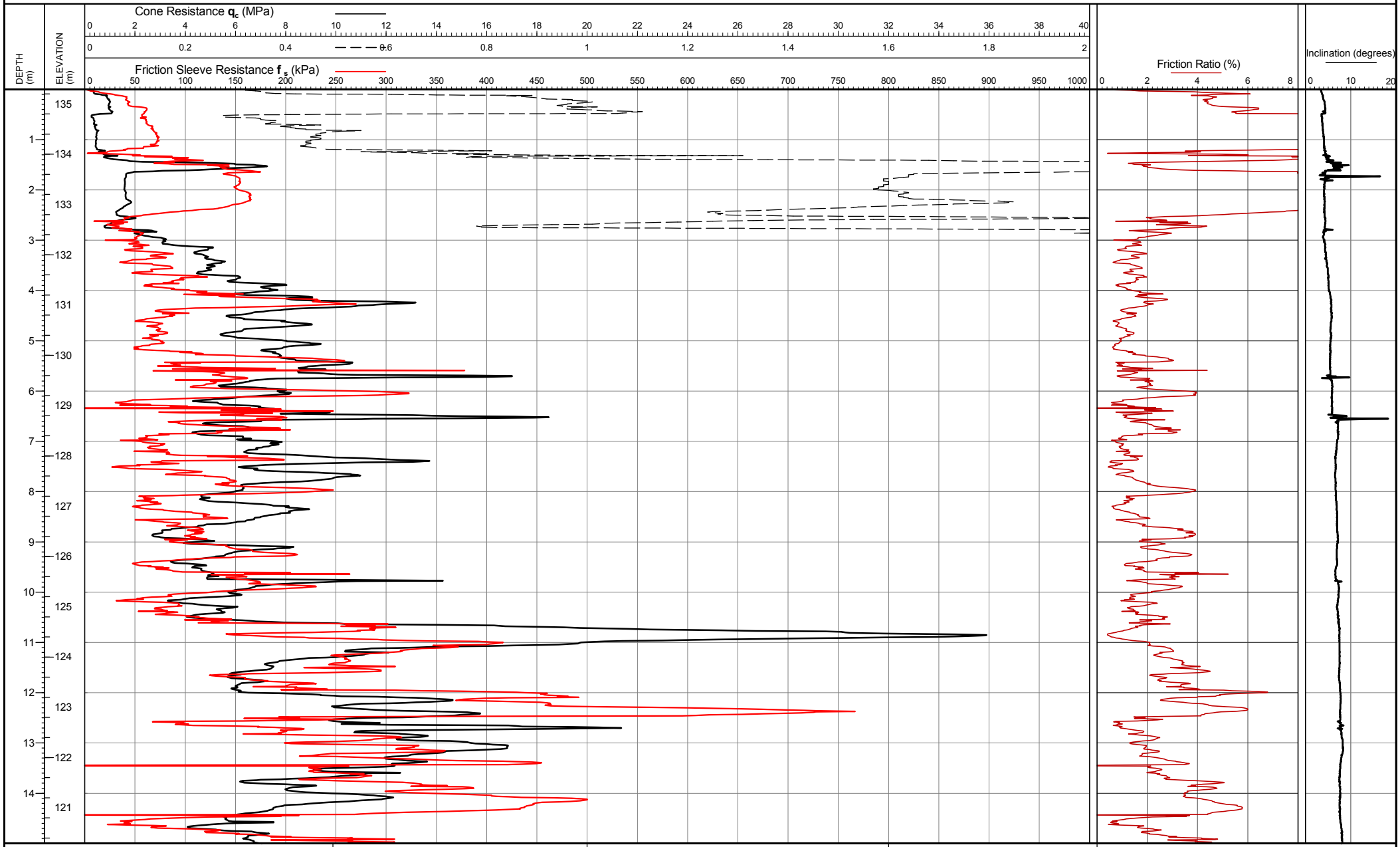
Checked by: Josh Zon

TEST ID: CCL07

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

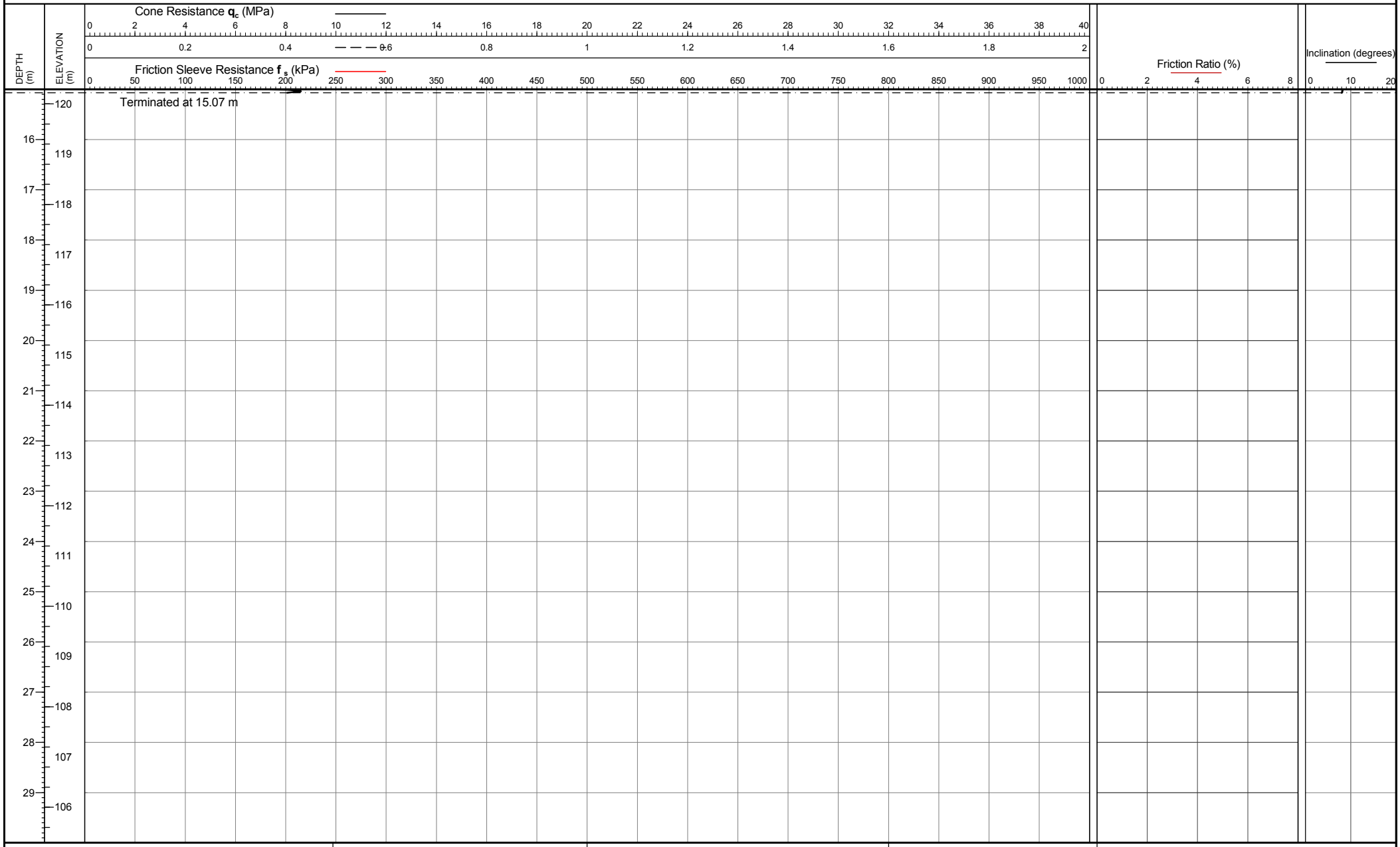


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 11:48:33	Location: Hemel Hempstead, UK Coordinates: 508433.827, 207788.124 Elevation: 135.29	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL08** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:48:33

Location: Hemel Hempstead, UK

Coordinates: 508433.827, 207788.124

Elevation: 135.29

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

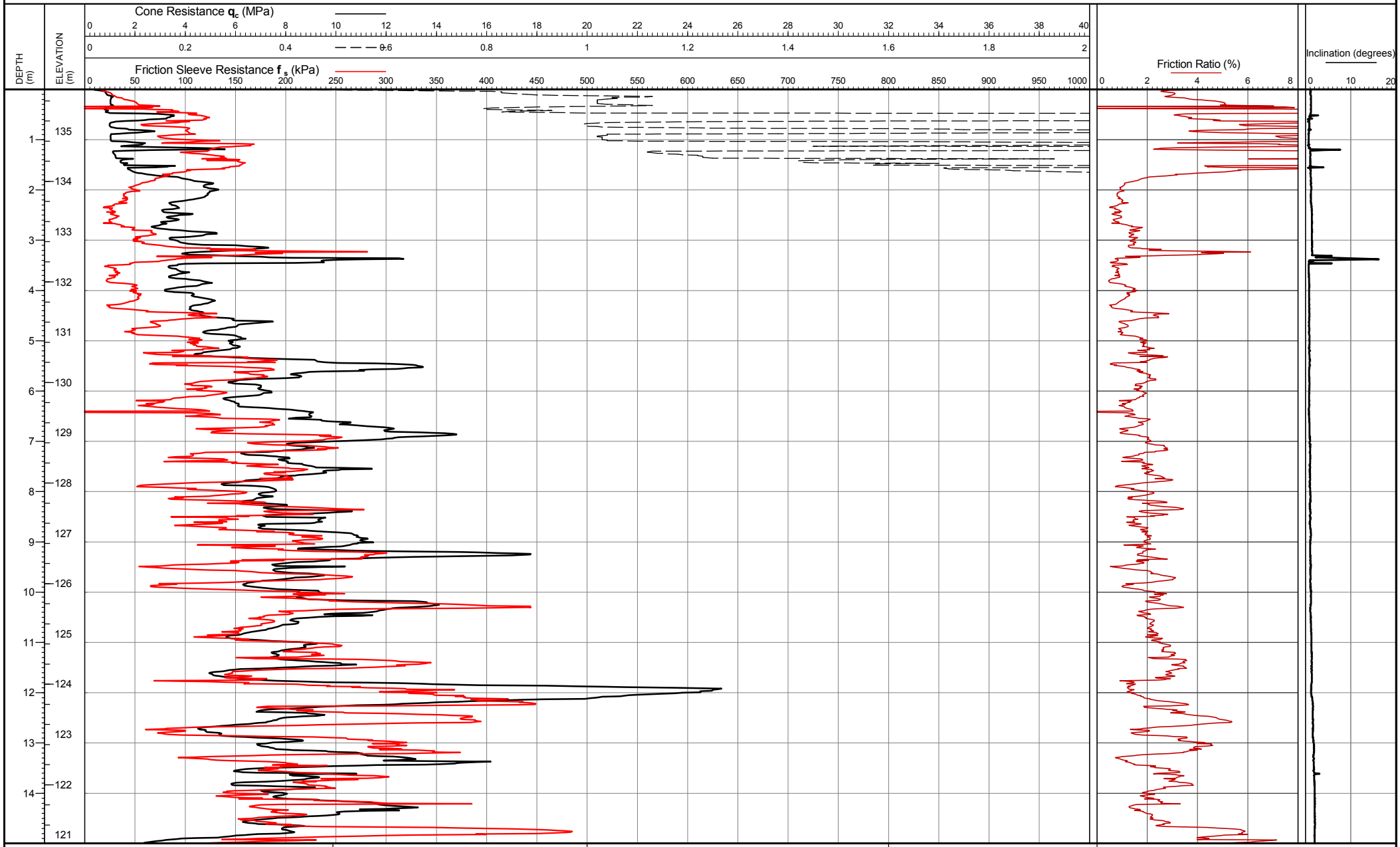
Checked by: Josh Zon

TEST ID: CCL08

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

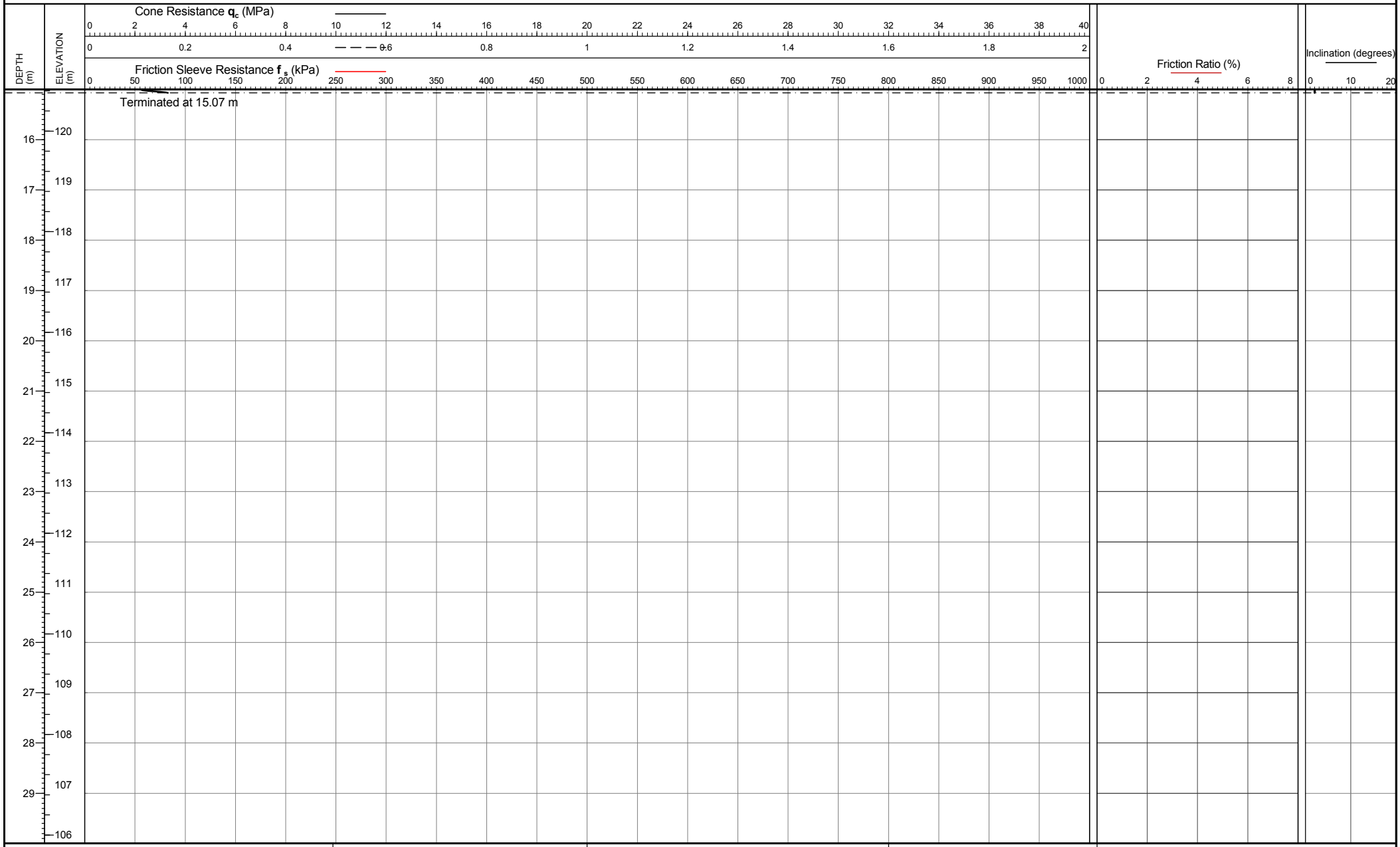


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 13:17:33	Location: Hemel Hempstead, UK Coordinates: 508484.1, 207767.453 Elevation: 135.83	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL09** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:17:33

Location: Hemel Hempstead, UK

Coordinates: 508484.1, 207767.453

Elevation: 135.83

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

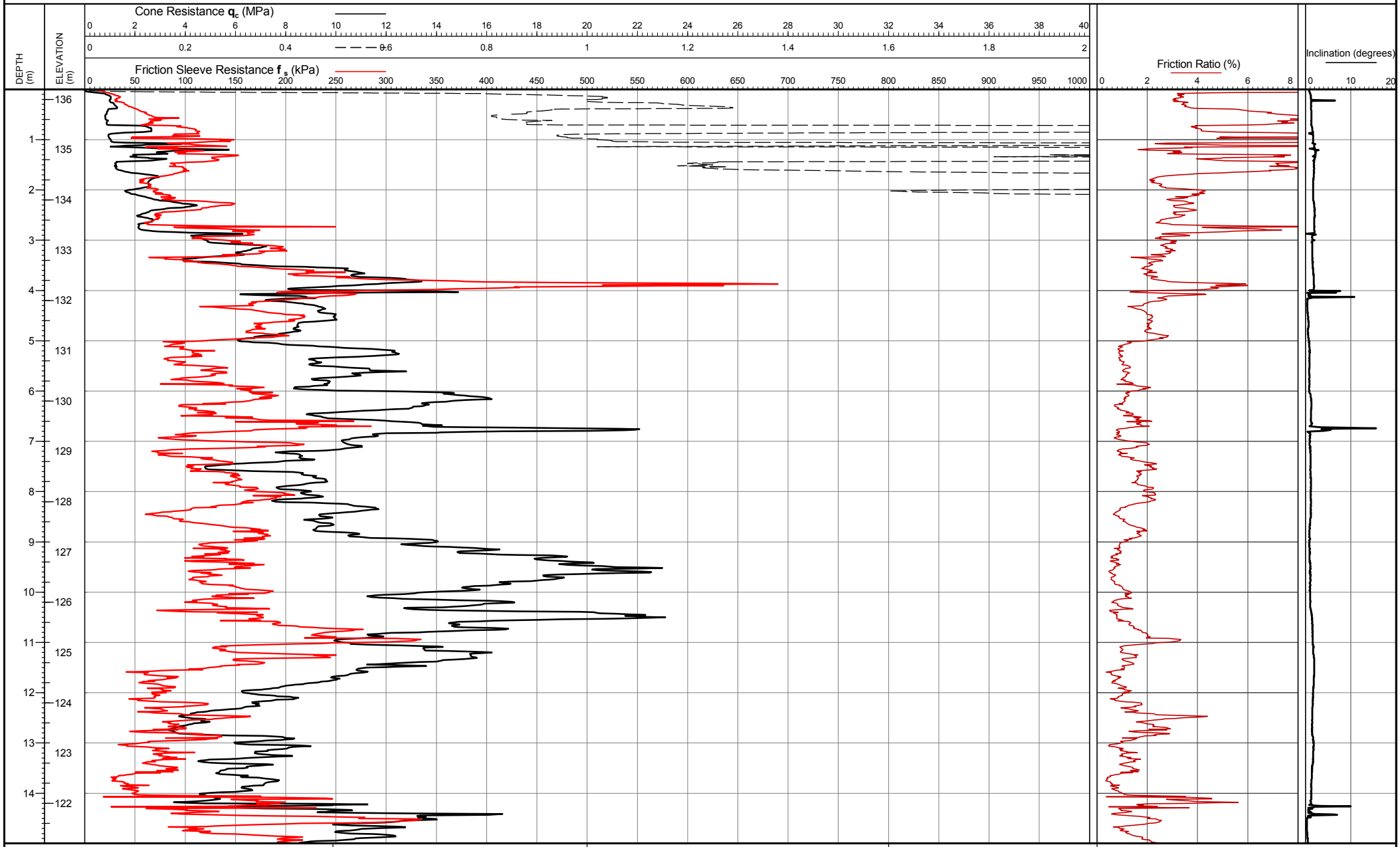
Checked by: Josh Zon

TEST ID: CCL09

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



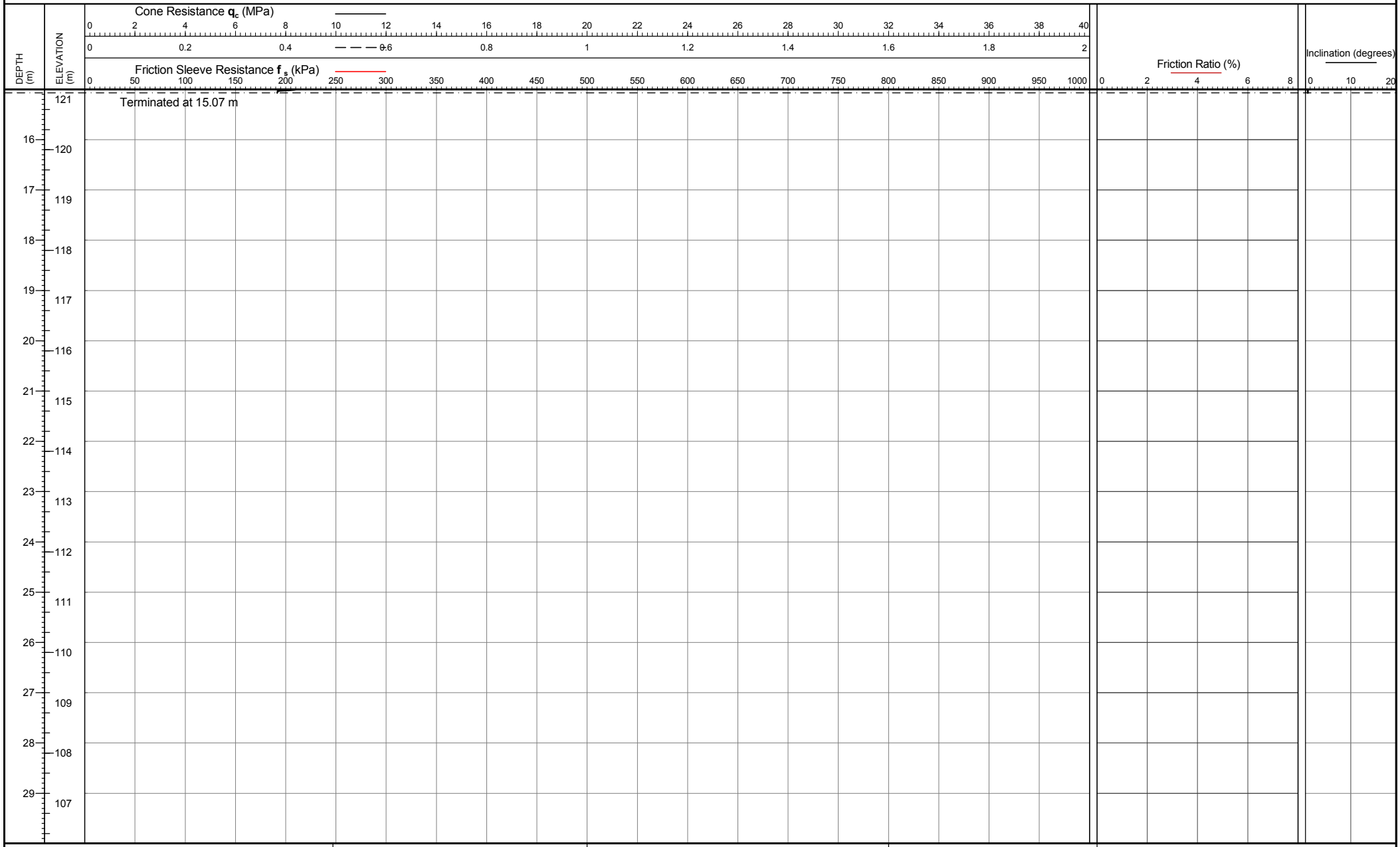
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 12:45:47	Location: Hemel Hempstead, UK Coordinates: 508527.61, 207754.884 Elevation: 136.2	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL10

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:45:47

Location: Hemel Hempstead, UK

Coordinates: 508527.61, 207754.884

Elevation: 136.2

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

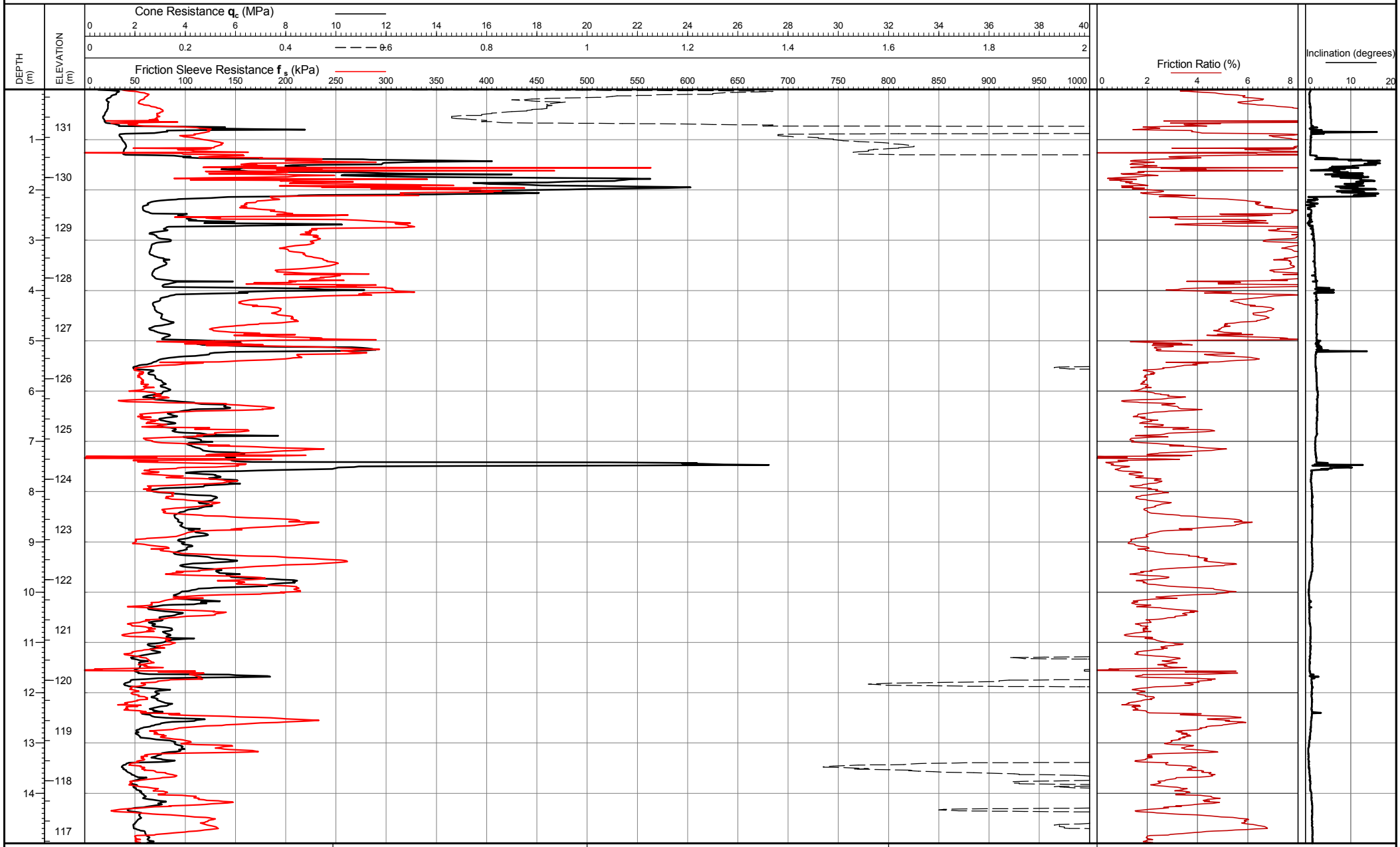
Checked by: Josh Zon

TEST ID: CCL10

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 14:18:28

Location: Hemel Hempstead, UK

Coordinates: 508171.069, 207731.741

Elevation: 131.753

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

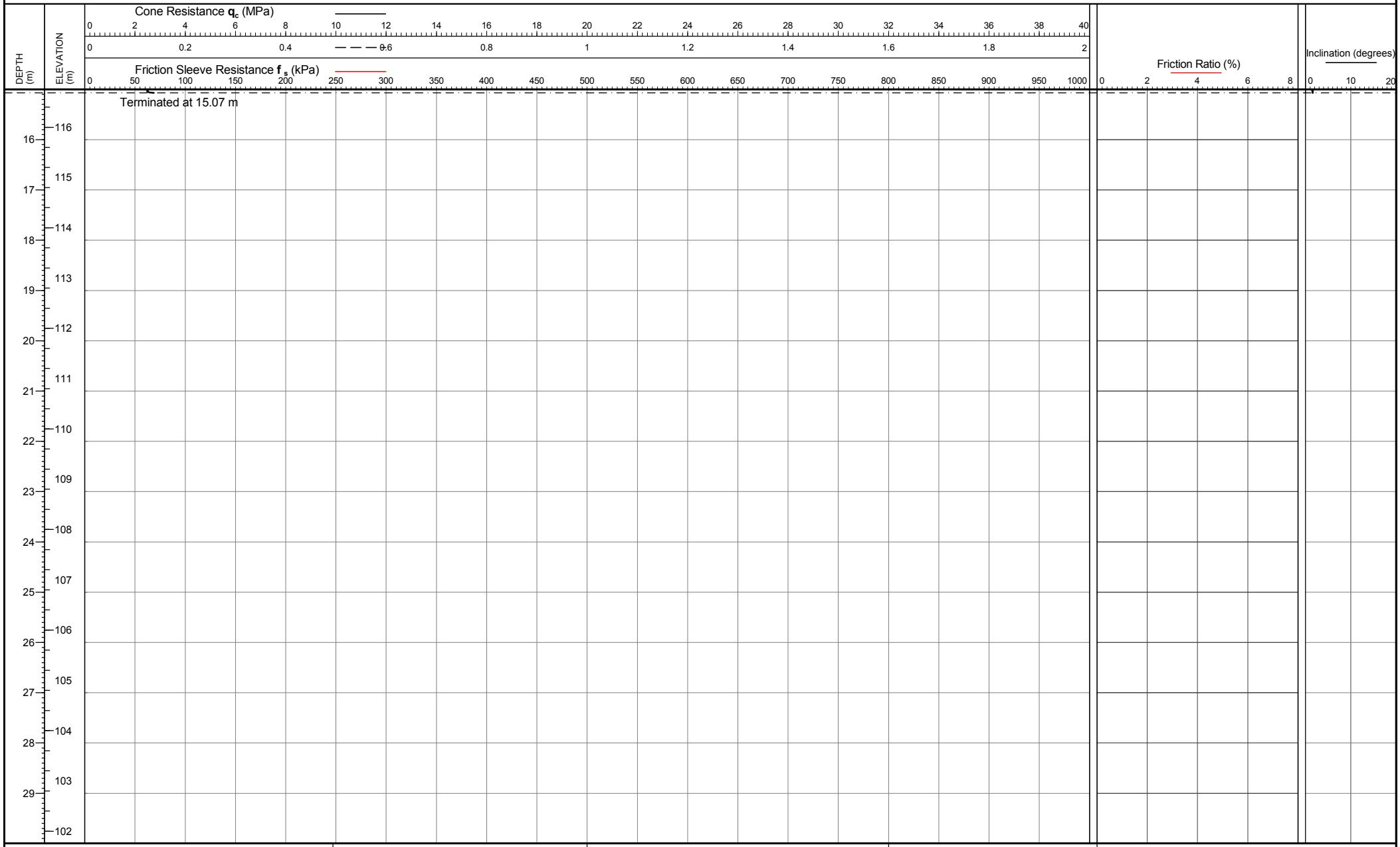
Checked by: Josh Zon

TEST ID: CCL11

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 14:18:28

Location: Hemel Hempstead, UK

Coordinates: 508171.069, 207731.741

Elevation: 131.753

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

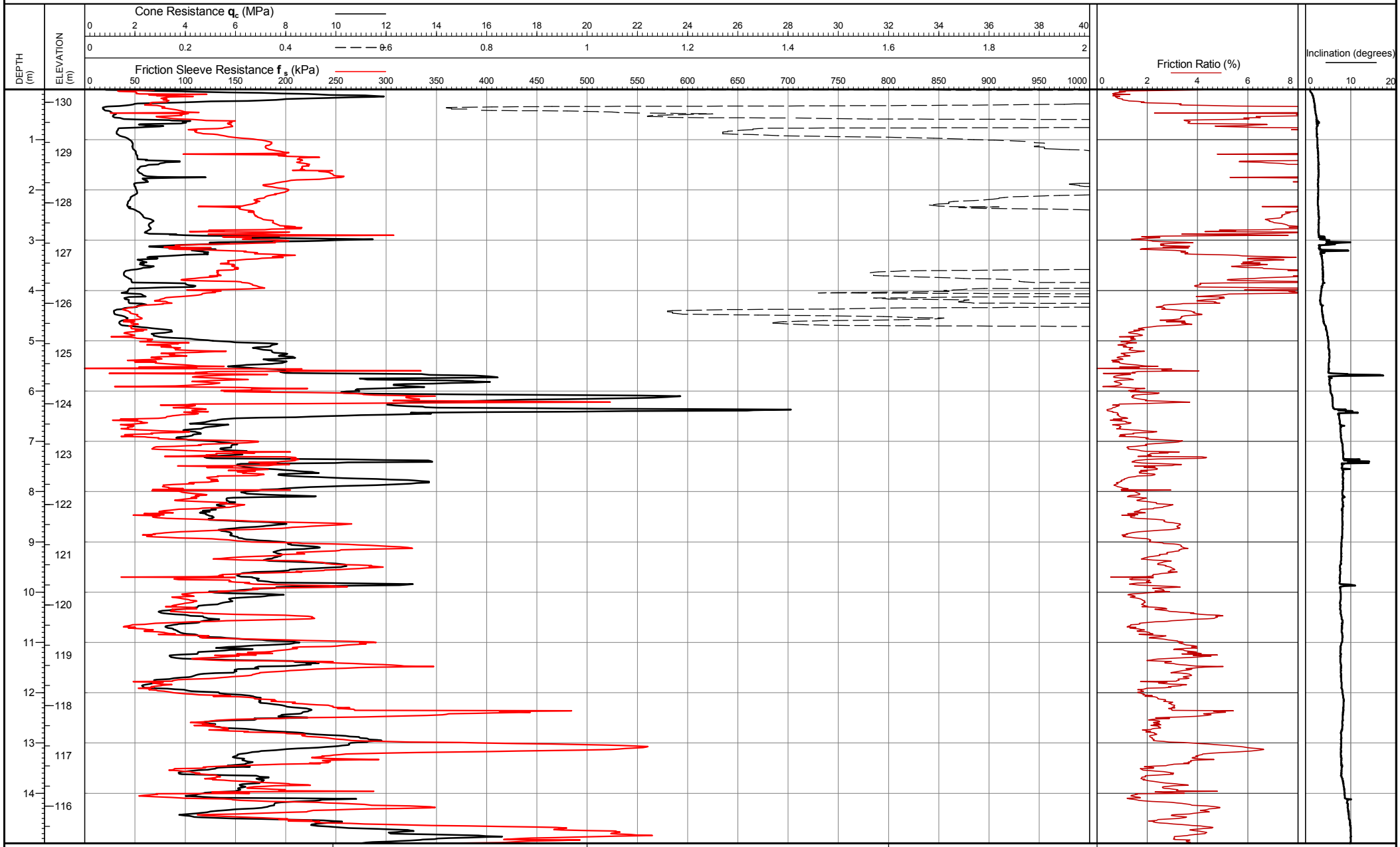
Checked by: Josh Zon

TEST ID: CCL11

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



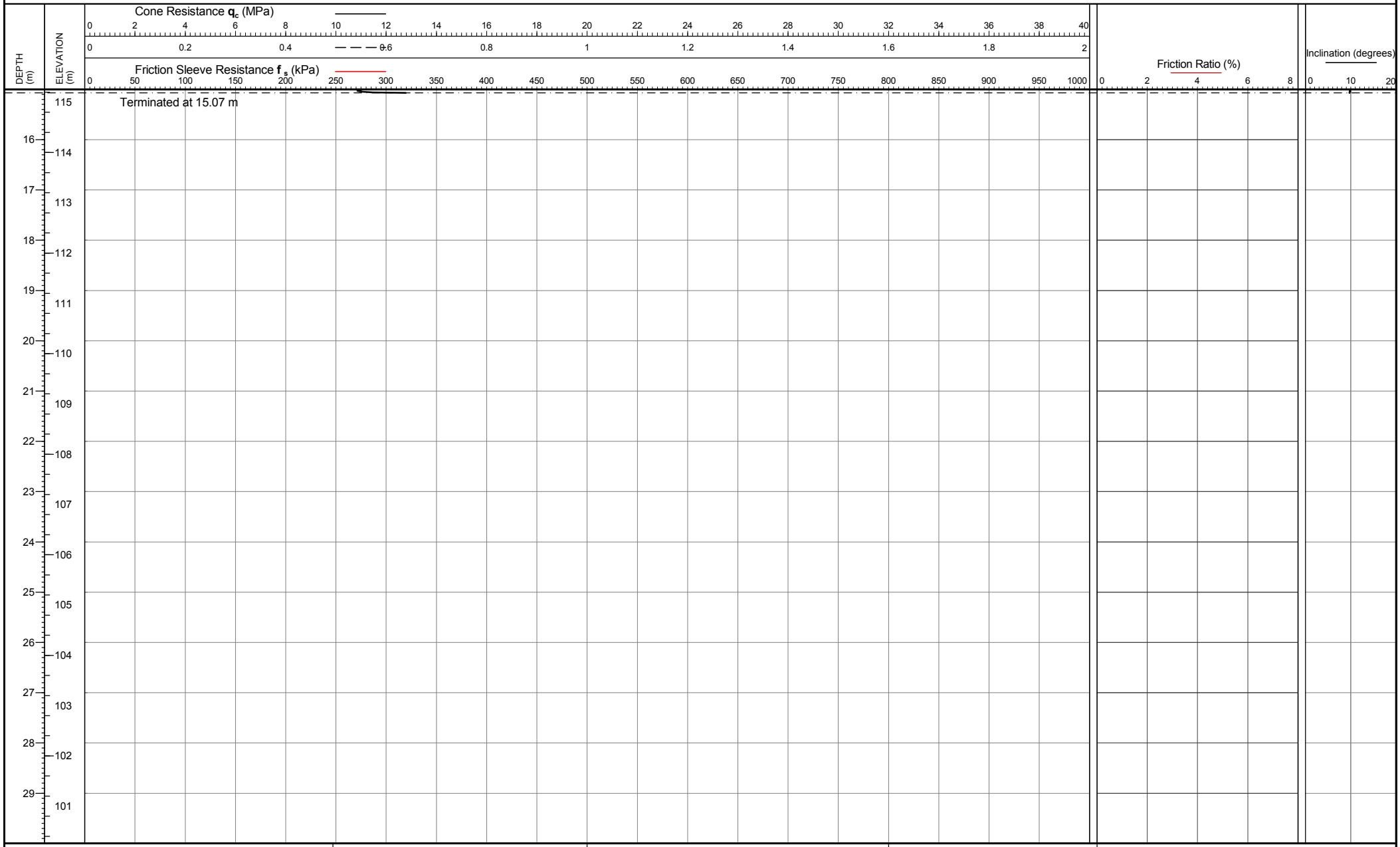
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 13:05:54	Location: Hemel Hempstead, UK Coordinates: 508160.863, 207694.942 Elevation: 130.256	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL12

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:05:54

Location: Hemel Hempstead, UK

Coordinates: 508160.863, 207694.942

Elevation: 130.256

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

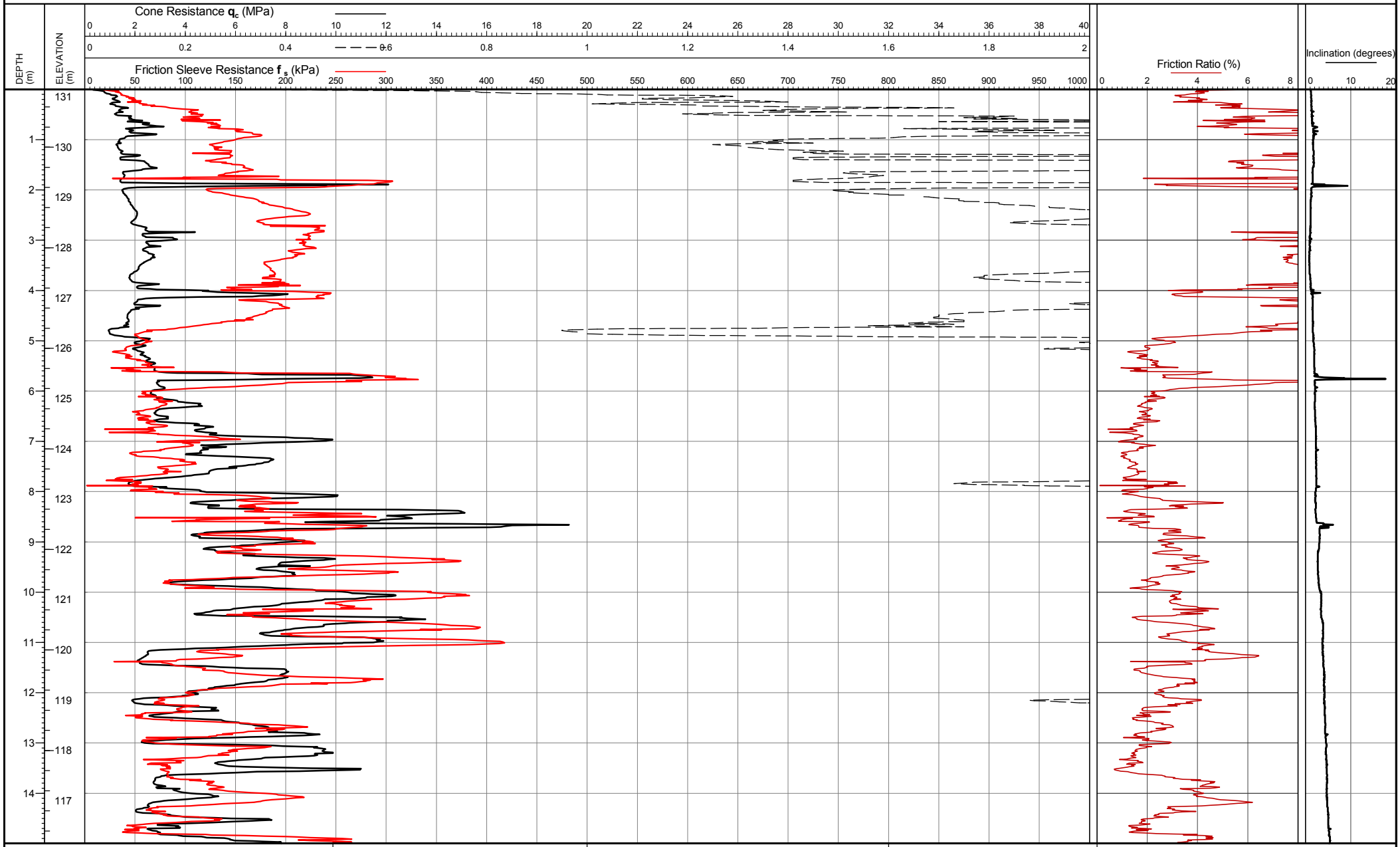
Checked by: Josh Zon

TEST ID: CCL12

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

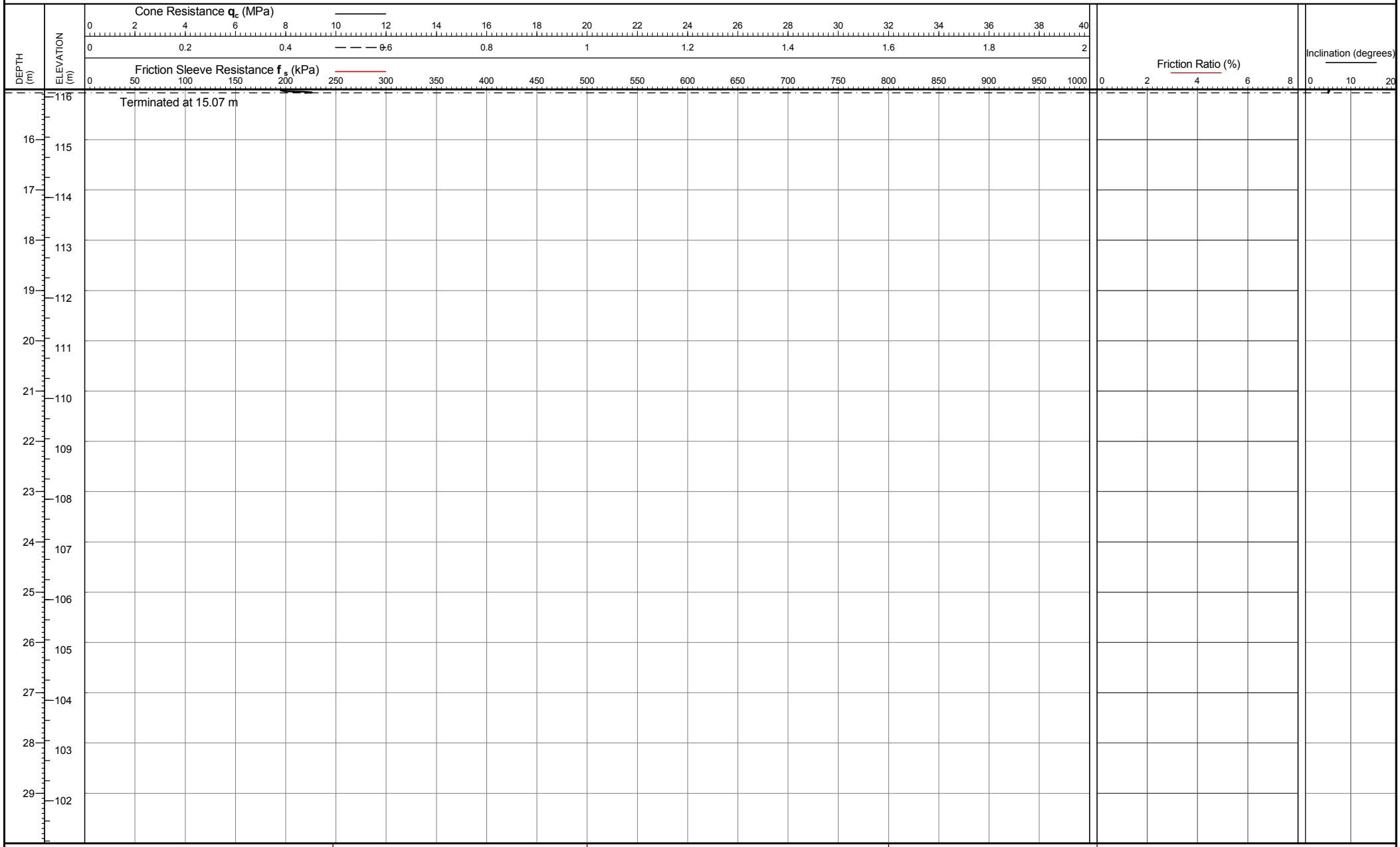


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 15:42:26	Location: Hemel Hempstead, UK Coordinates: 508209.163, 207728.982 Elevation: 131.15	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL13** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:42:26

Location: Hemel Hempstead, UK

Coordinates: 508209.163, 207728.982

Elevation: 131.15

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

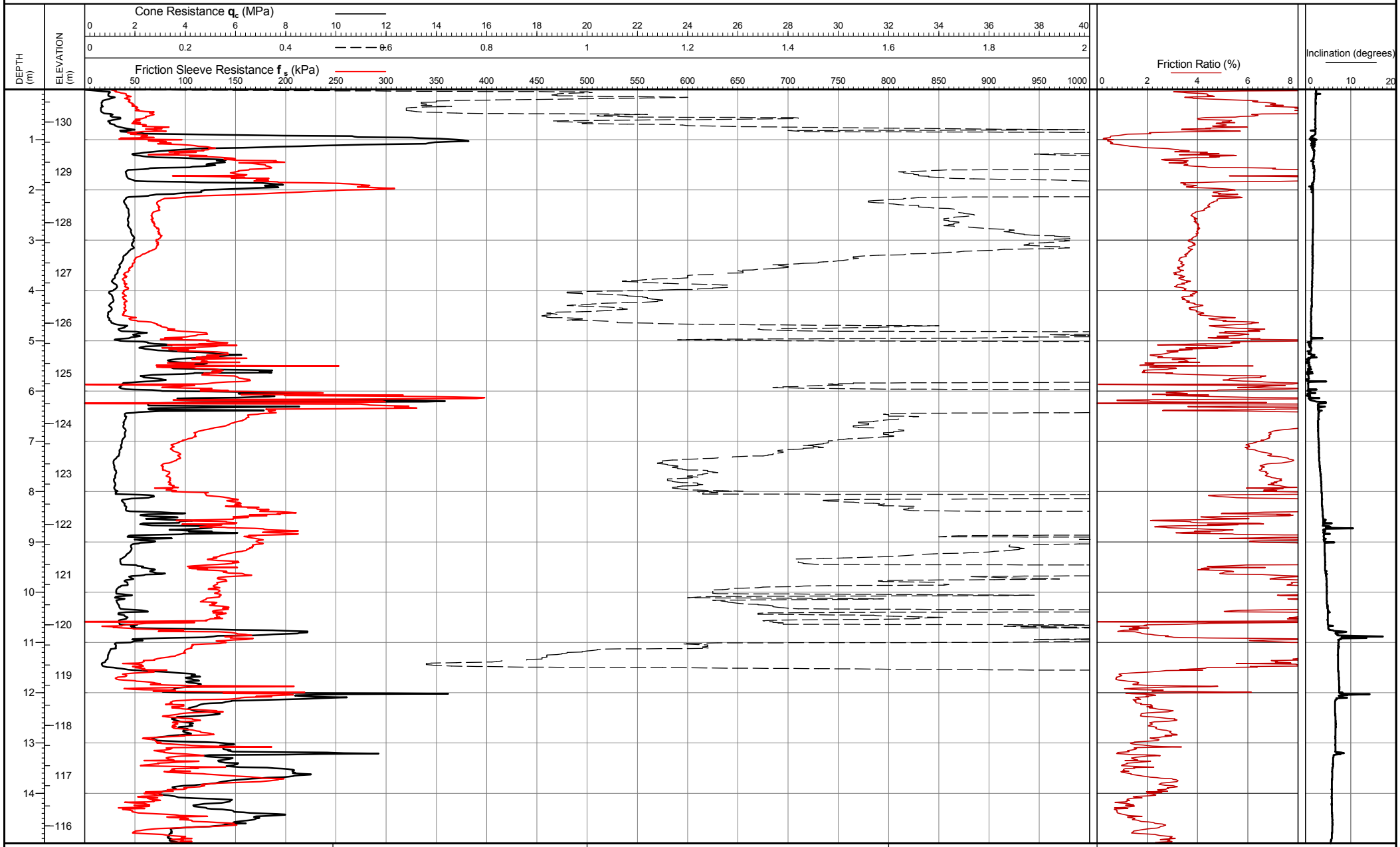
Checked by: Josh Zon

TEST ID: CCL13

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

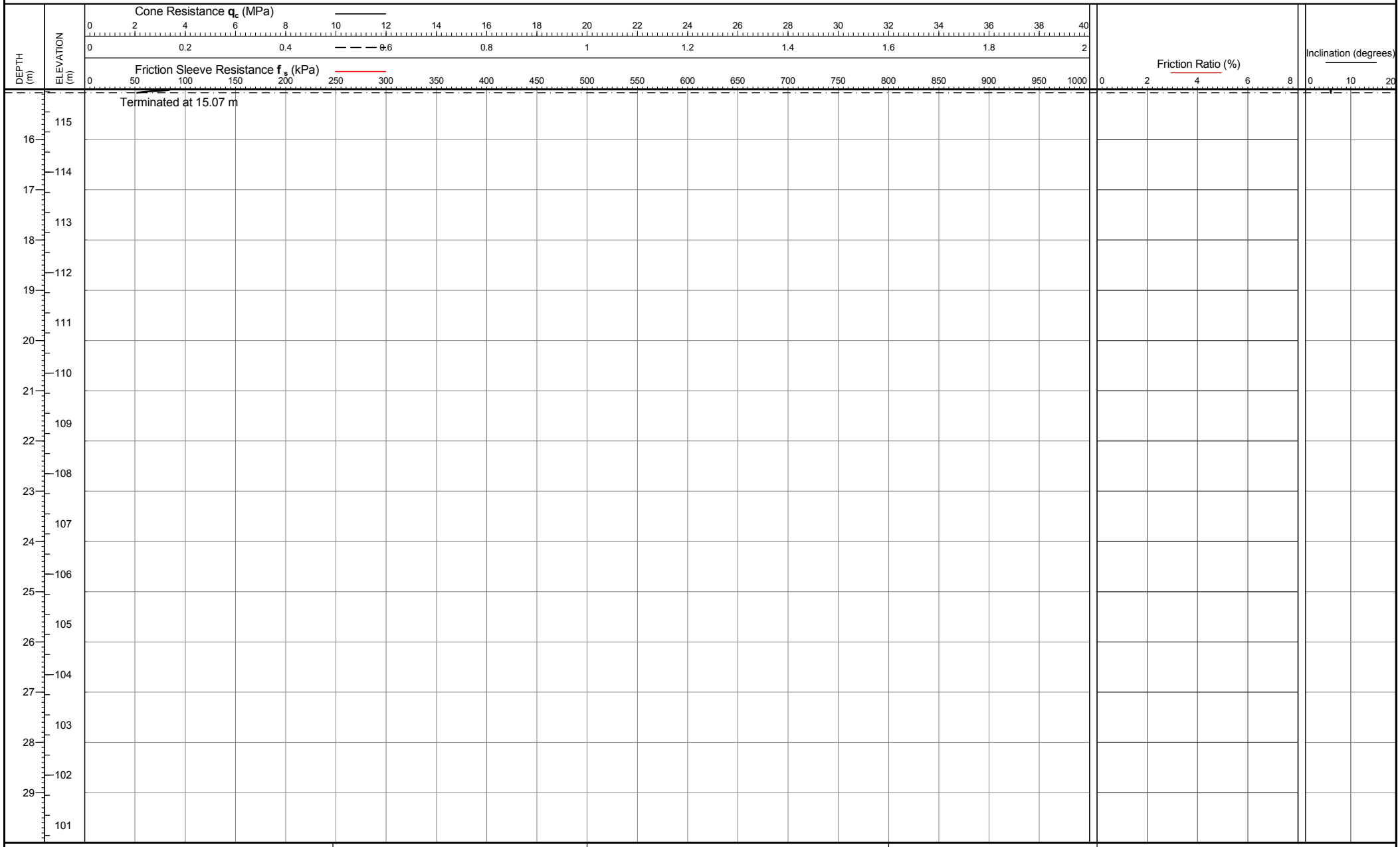


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 15:09:38	Location: Hemel Hempstead, UK Coordinates: 508278.581, 207743.837 Elevation: 130.65	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL14** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:09:38

Location: Hemel Hempstead, UK

Coordinates: 508278.581, 207743.837

Elevation: 130.65

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

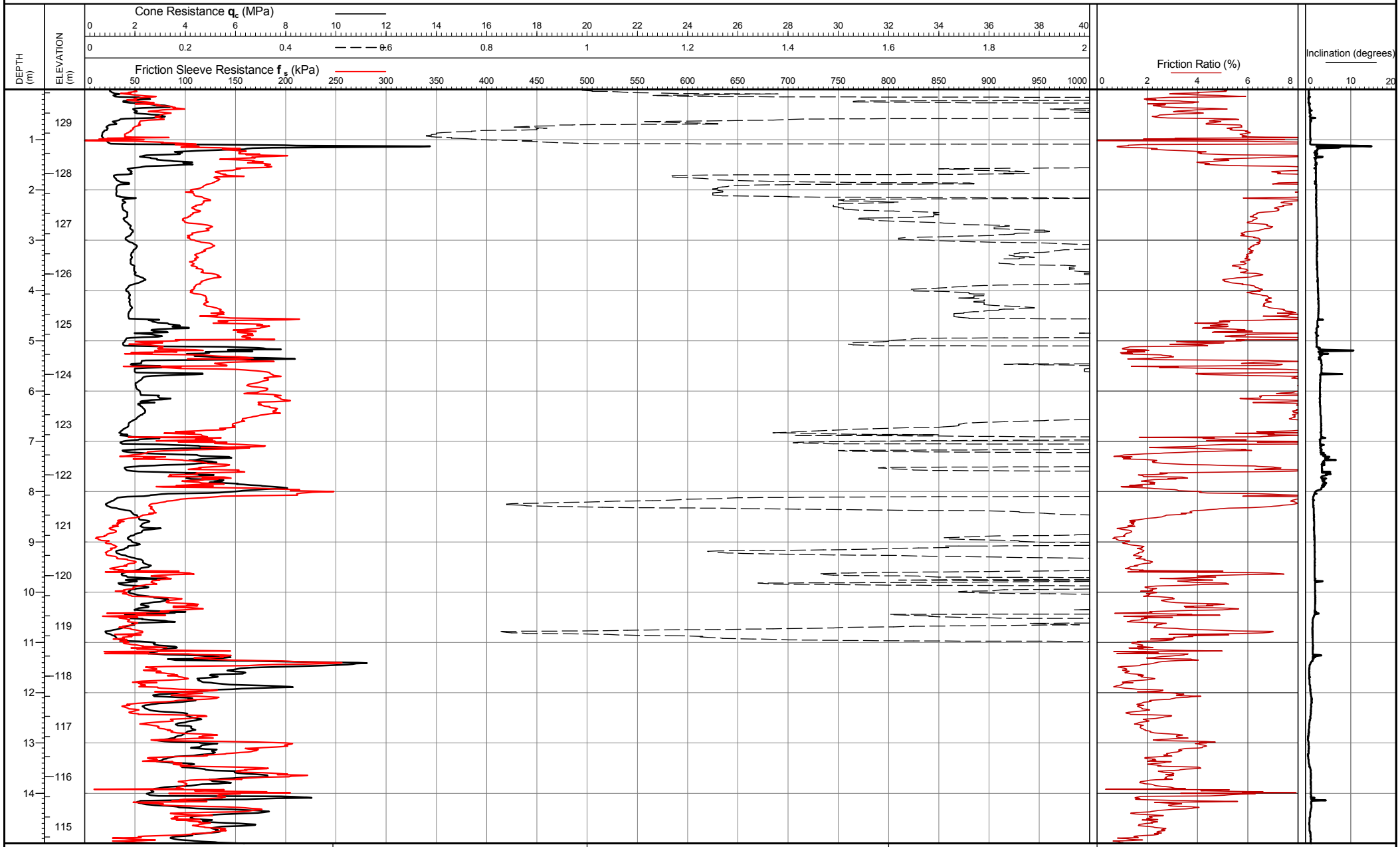
Checked by: Josh Zon

TEST ID: CCL14

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:15:13

Location: Hemel Hempstead, UK

Coordinates: 508276.337, 207717.285

Elevation: 129.67

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

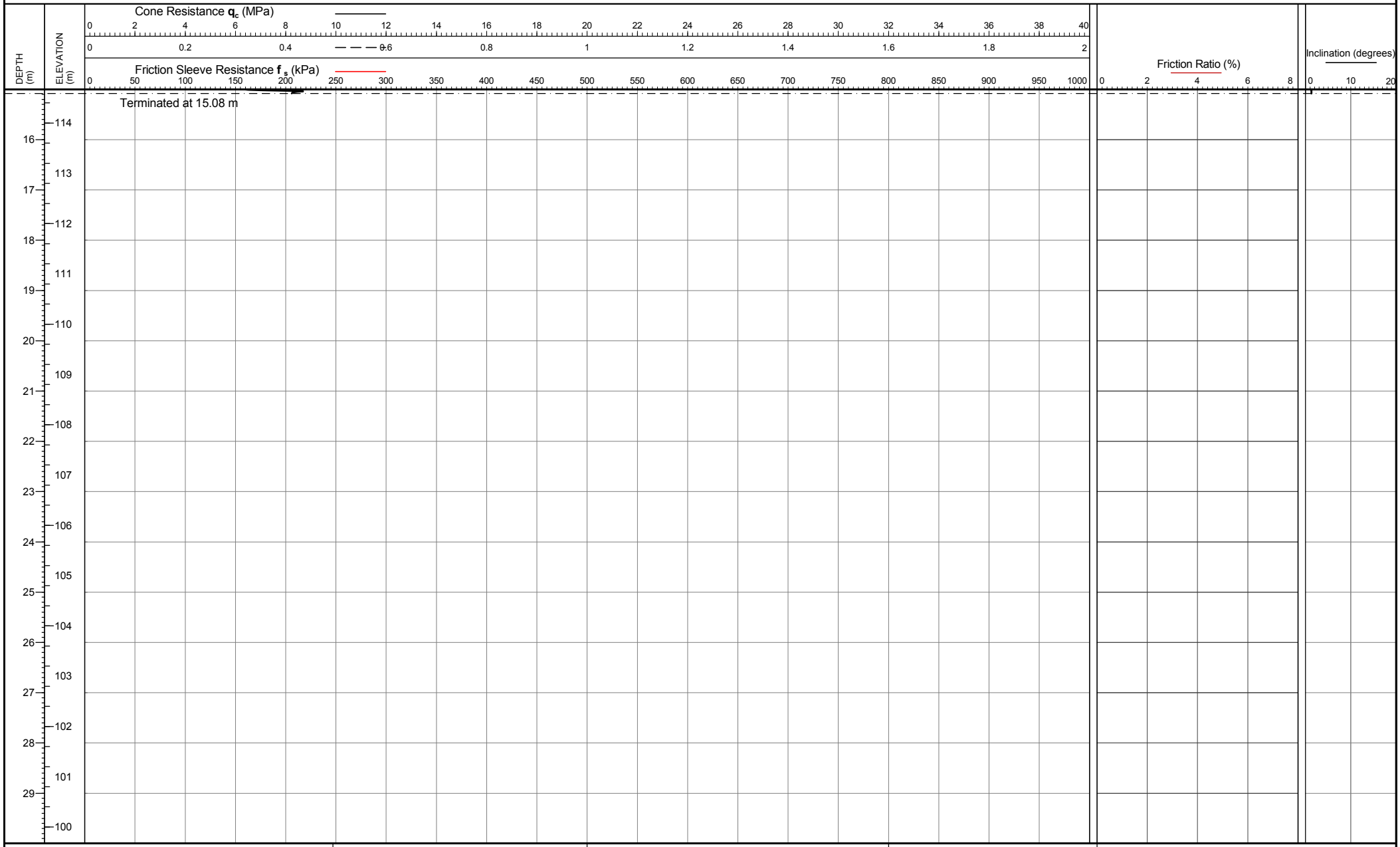
Checked by: Josh Zon

TEST ID: CCL15

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:15:13

Location: Hemel Hempstead, UK

Coordinates: 508276.337, 207717.285

Elevation: 129.67

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

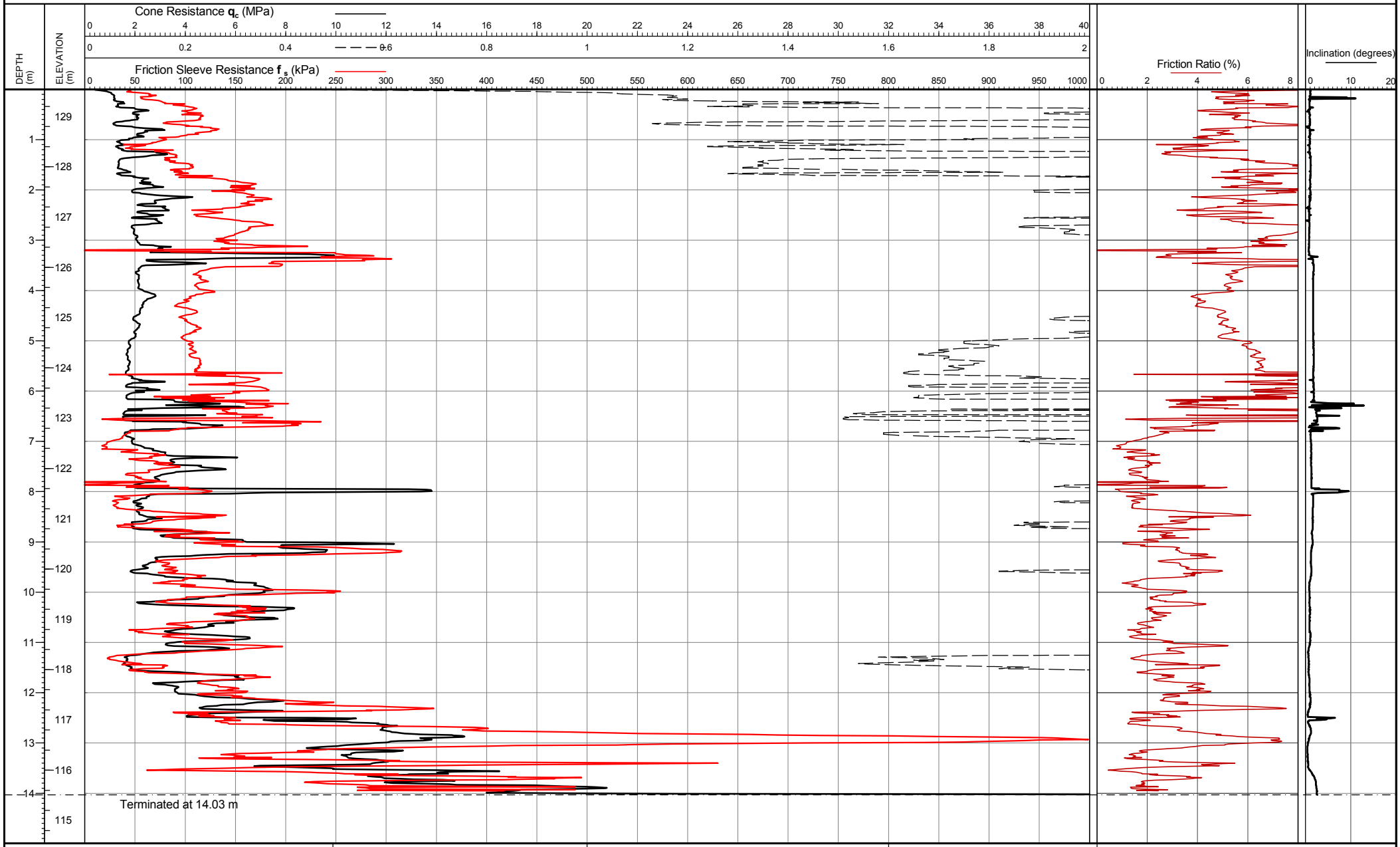
Checked by: Josh Zon

TEST ID: CCL15

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:22:53

Location: Hemel Hempstead, UK

Coordinates: 508270.137, 207695.723

Elevation: 129.54

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

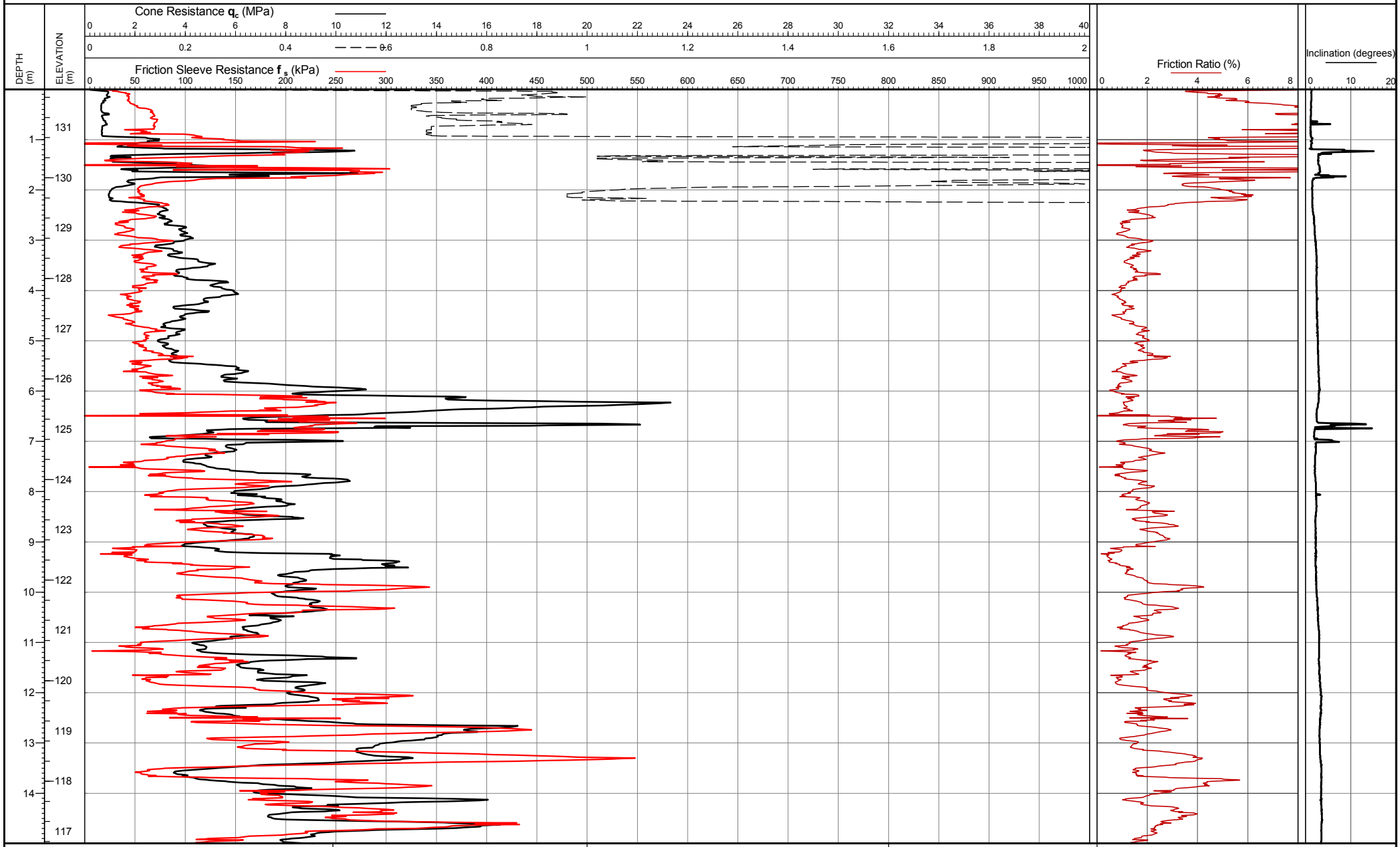
Checked by: Josh Zon

TEST ID: CCL16

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

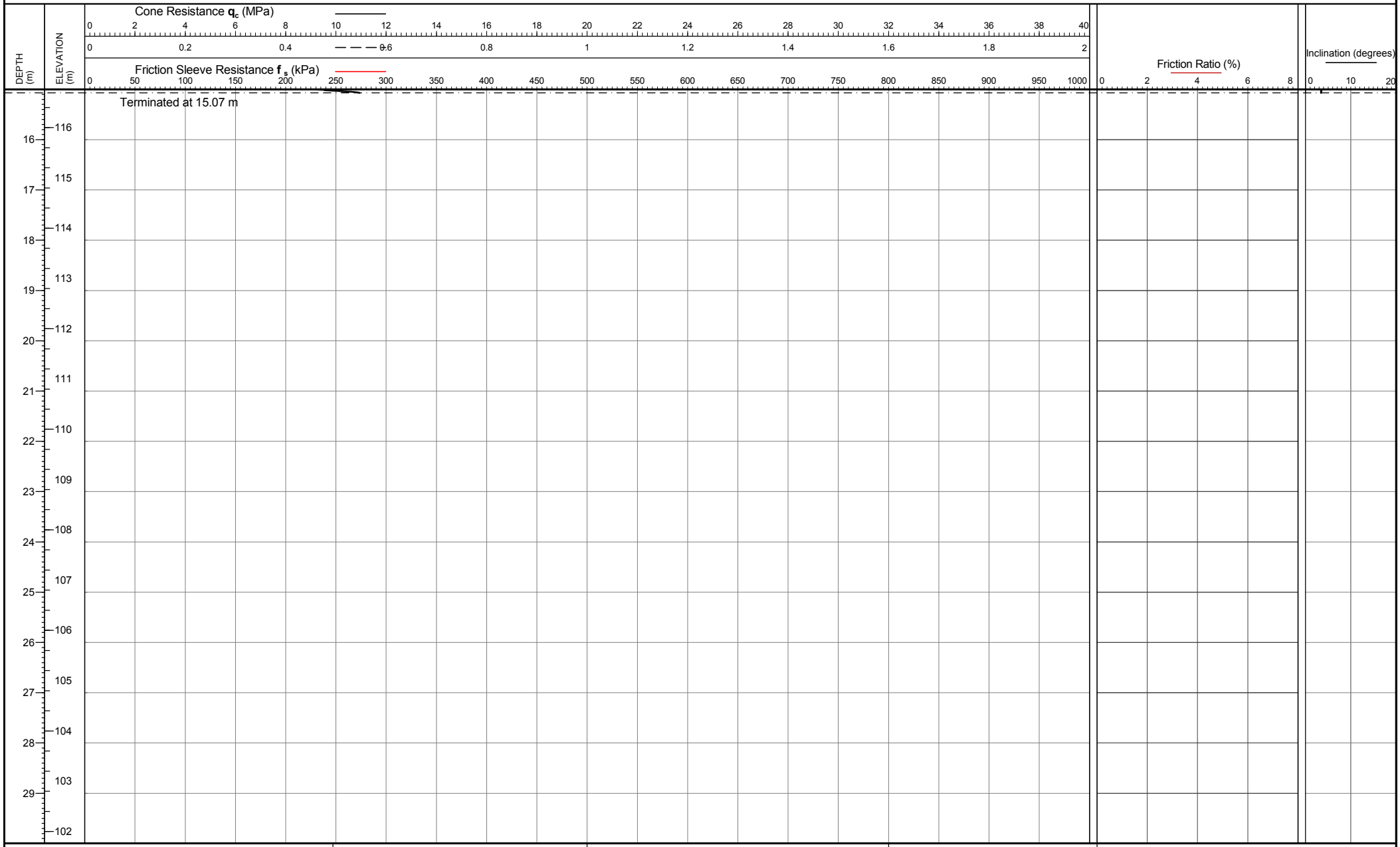


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 16:50:24	Location: Hemel Hempstead, UK Coordinates: 508339.288, 207714.211 Elevation: 131.76	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL17** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:50:24

Location: Hemel Hempstead, UK

Coordinates: 508339.288, 207714.211

Elevation: 131.76

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

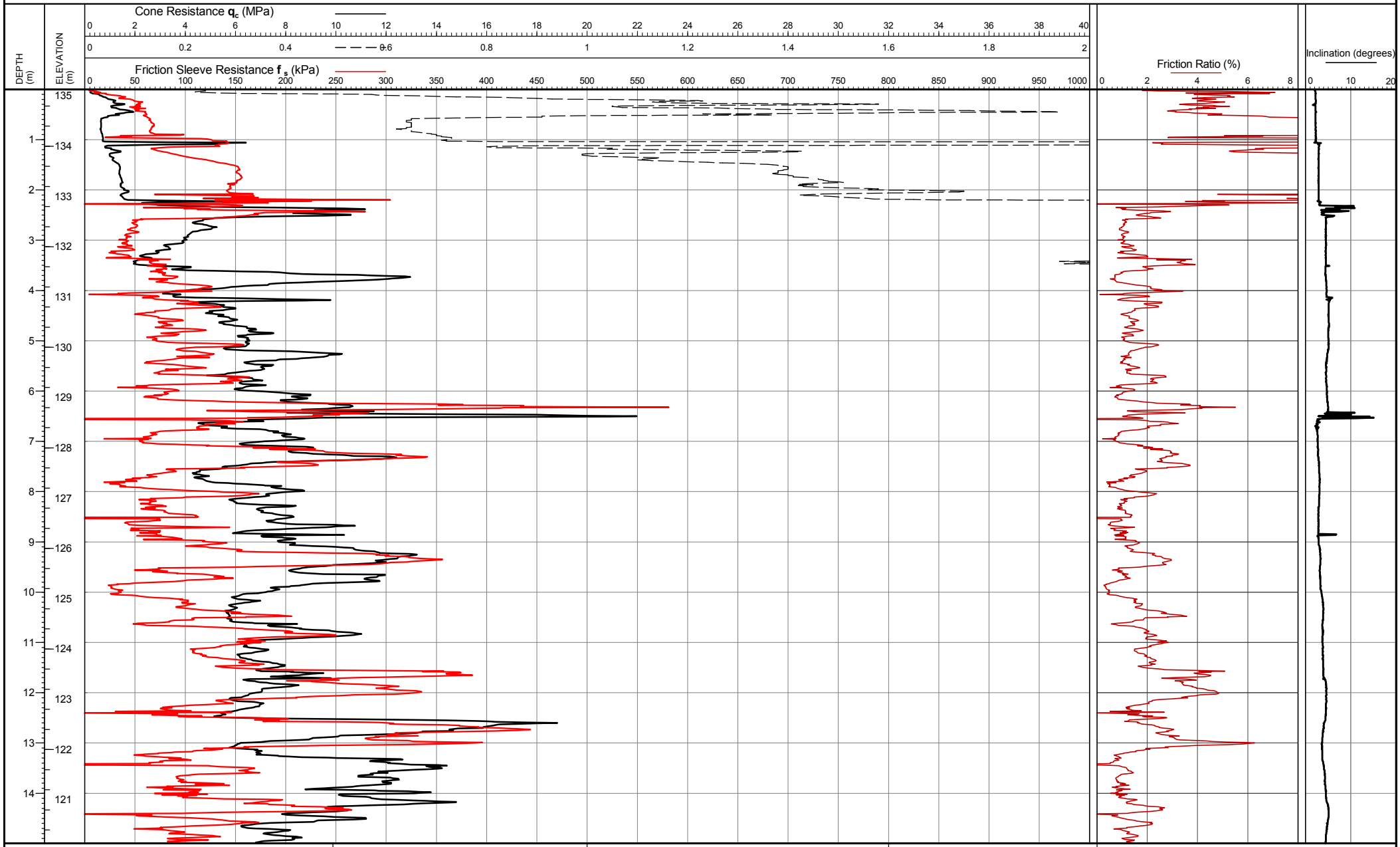
Checked by: Josh Zon

TEST ID: CCL17

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



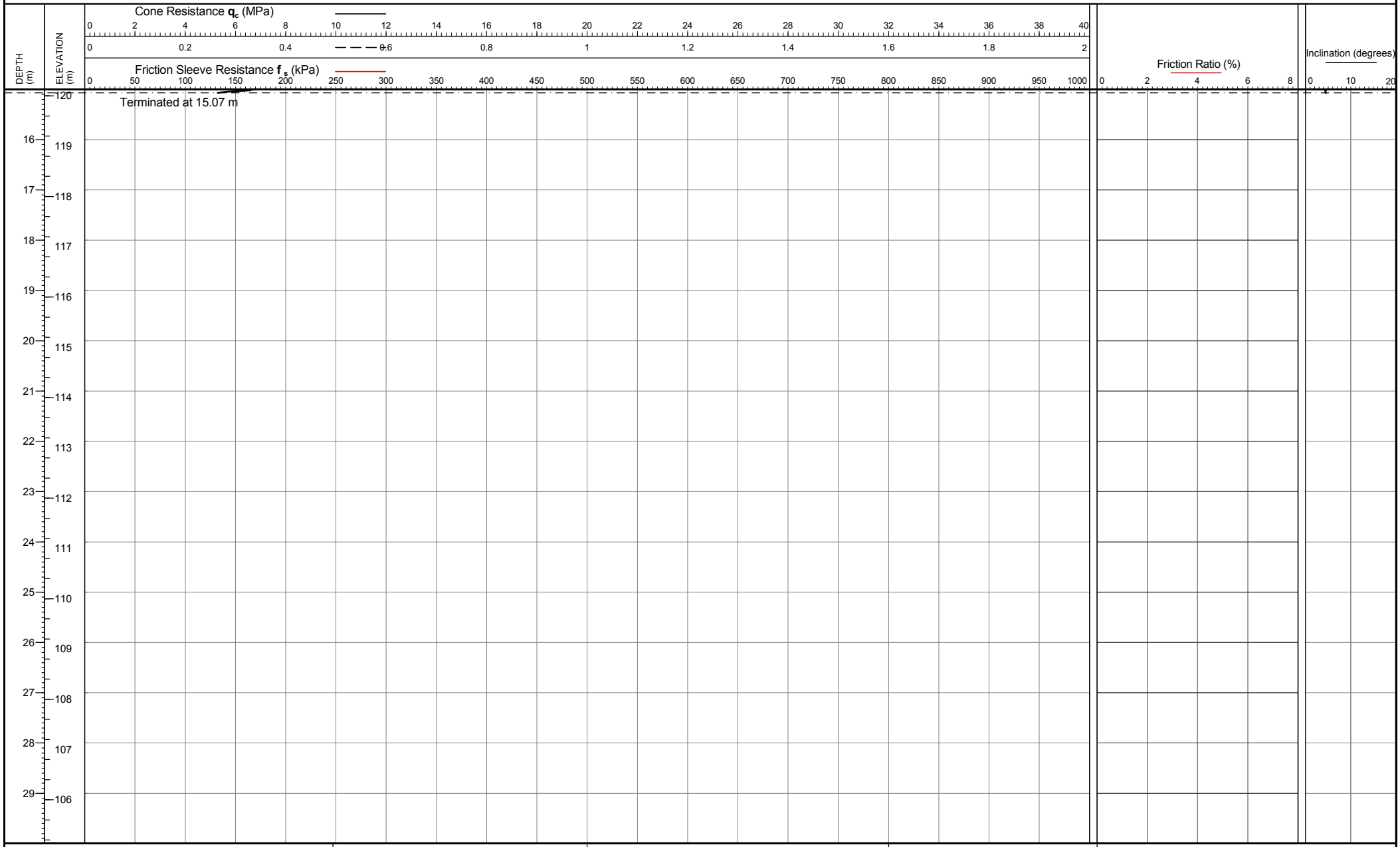
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 27/03/2017 12:18:14	Location: Hemel Hempstead, UK Coordinates: 508439.759, 207729.16 Elevation: 135.13	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL18

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:18:14

Location: Hemel Hempstead, UK

Coordinates: 508439.759, 207729.16

Elevation: 135.13

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

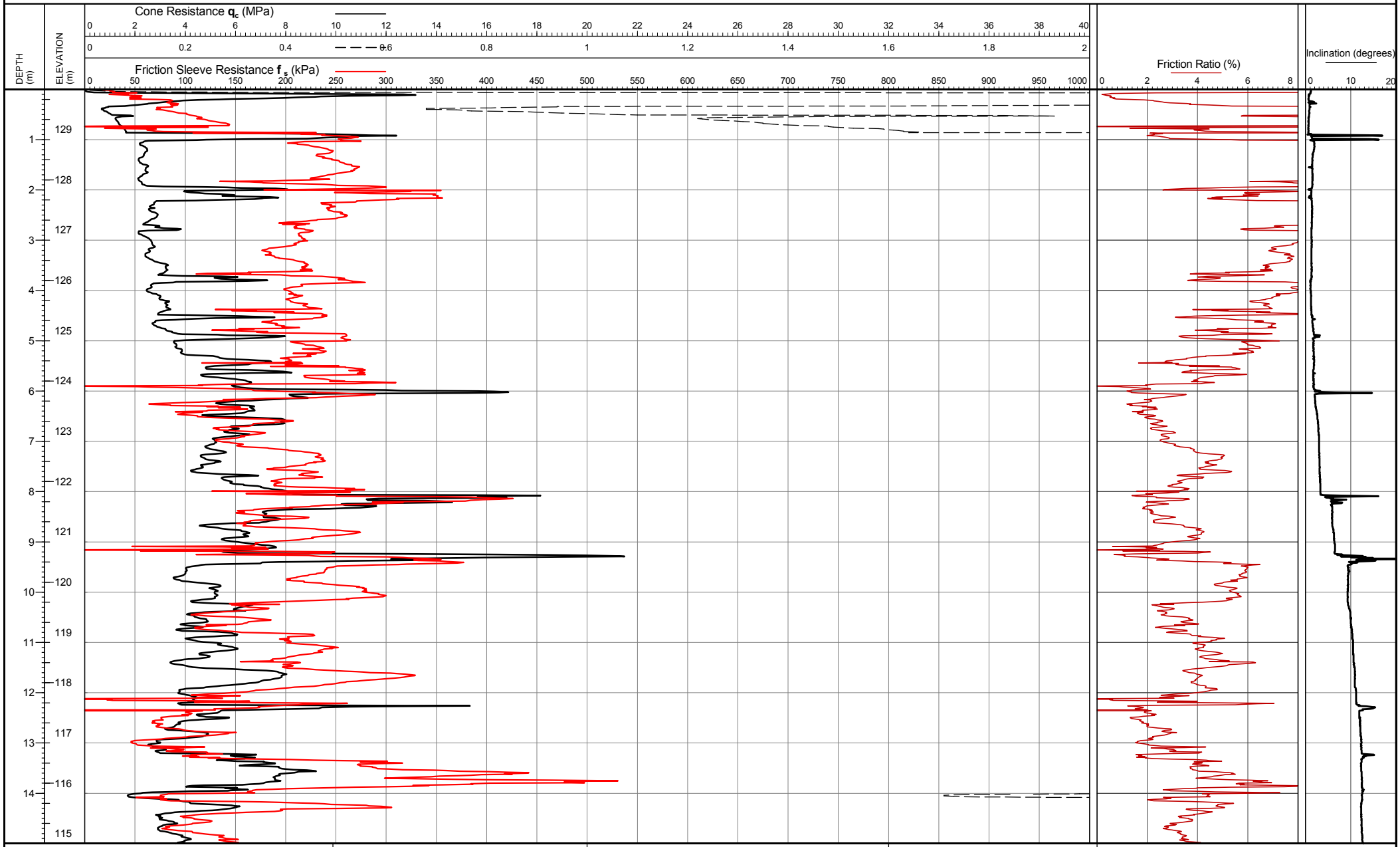
Checked by: Josh Zon

TEST ID: CCL18

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

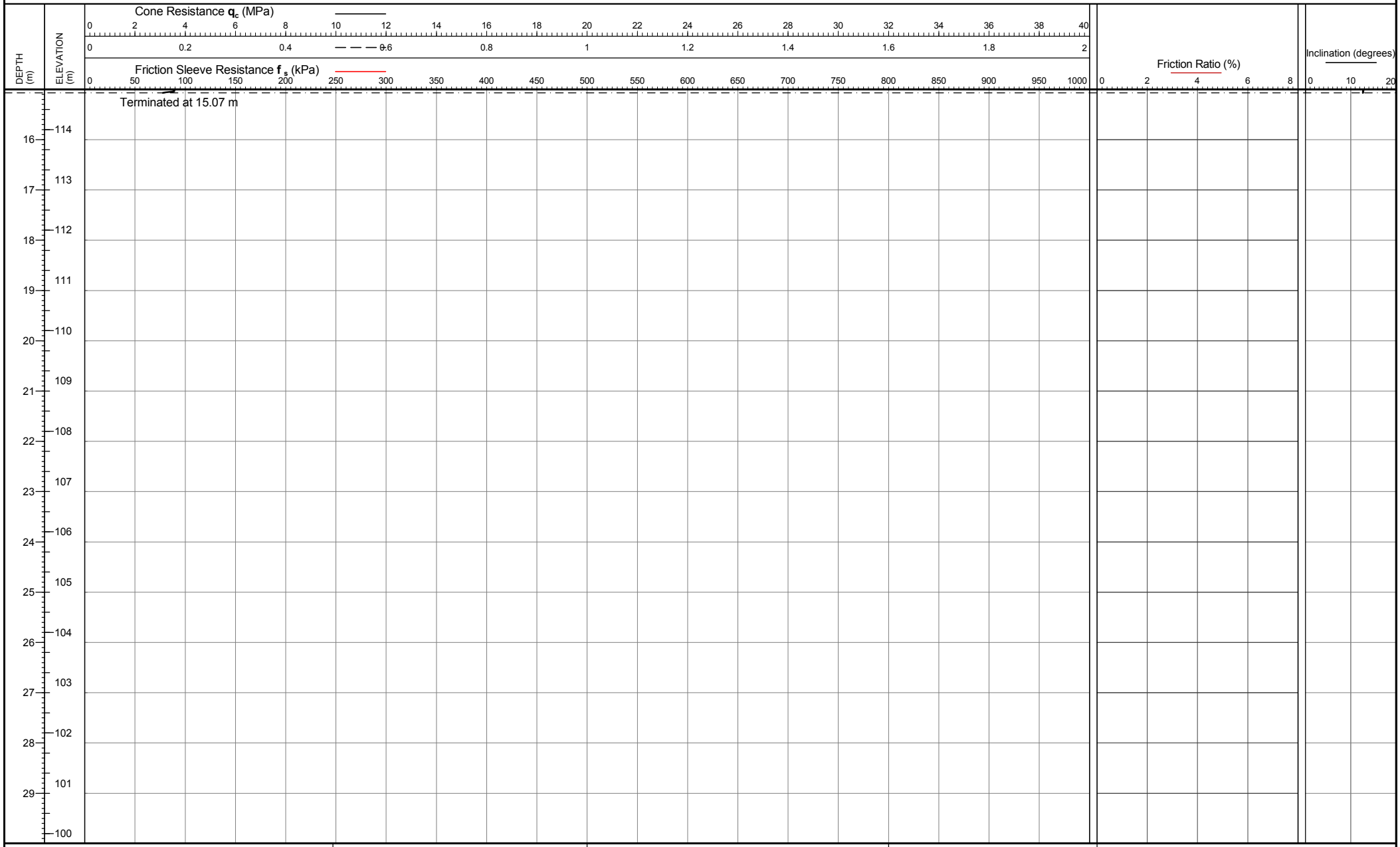


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 12:35:17	Location: Hemel Hempstead, UK Coordinates: 508164.423, 207630.55 Elevation: 129.8	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL19** Page 1 of 2

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 12:35:17

Location: Hemel Hempstead, UK

Coordinates: 508164.423, 207630.55

Elevation: 129.8

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

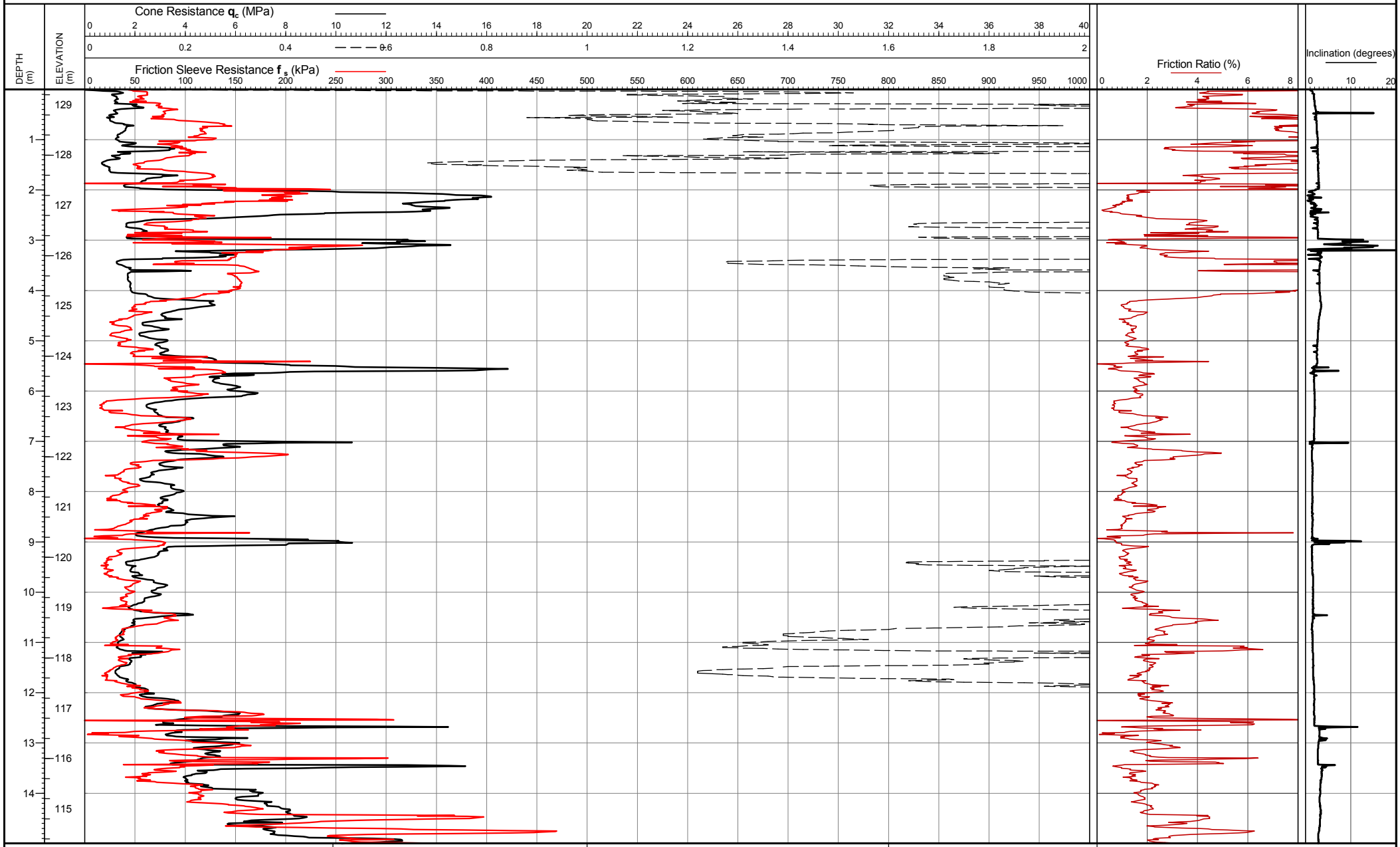
Checked by: Josh Zon

TEST ID: CCL19

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:55:54

Location: Hemel Hempstead, UK

Coordinates: 508271.205, 207661.637

Elevation: 129.308

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

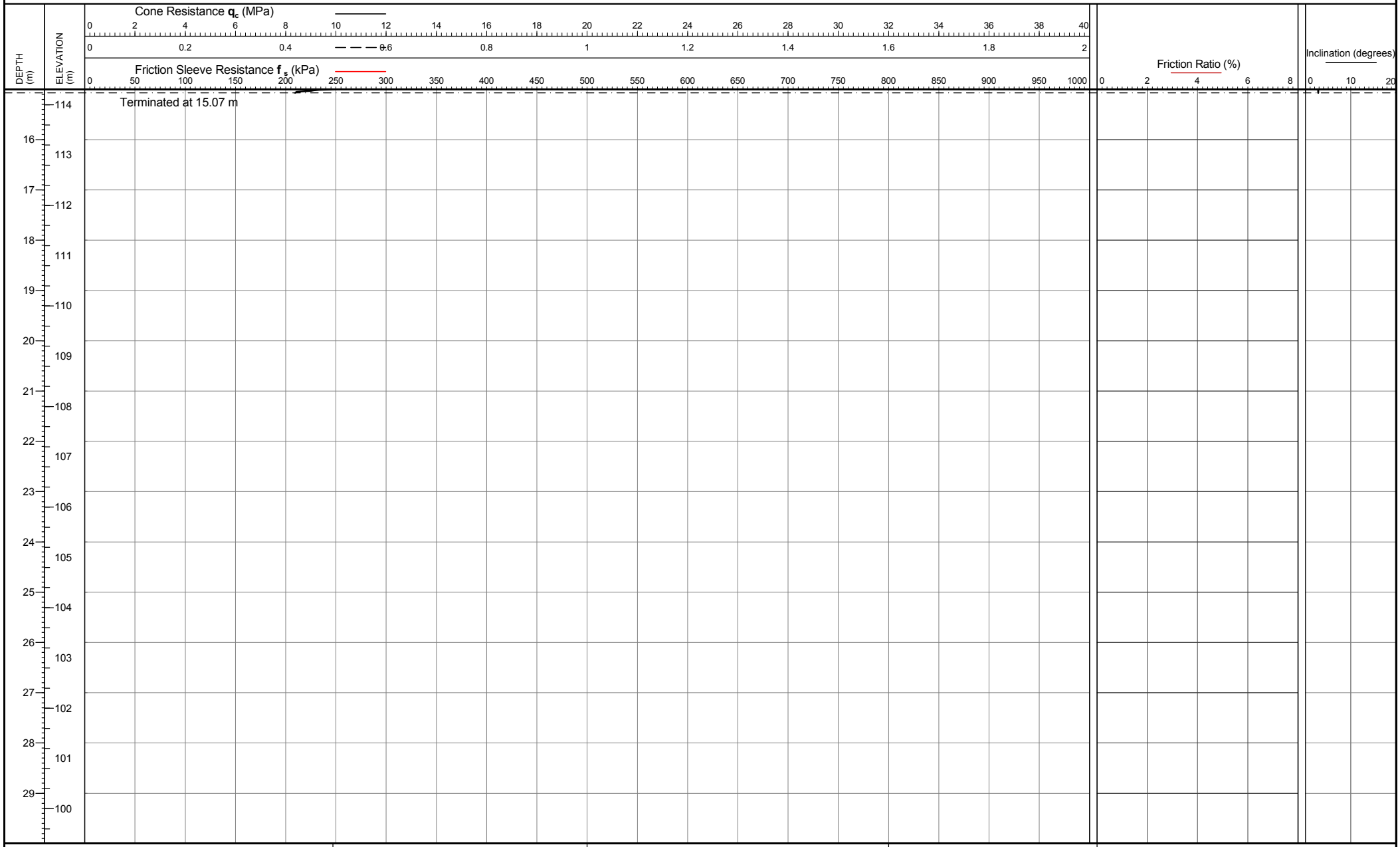
Checked by: Josh Zon

TEST ID: CCL20

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:55:54

Location: Hemel Hempstead, UK

Coordinates: 508271.205, 207661.637

Elevation: 129.308

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

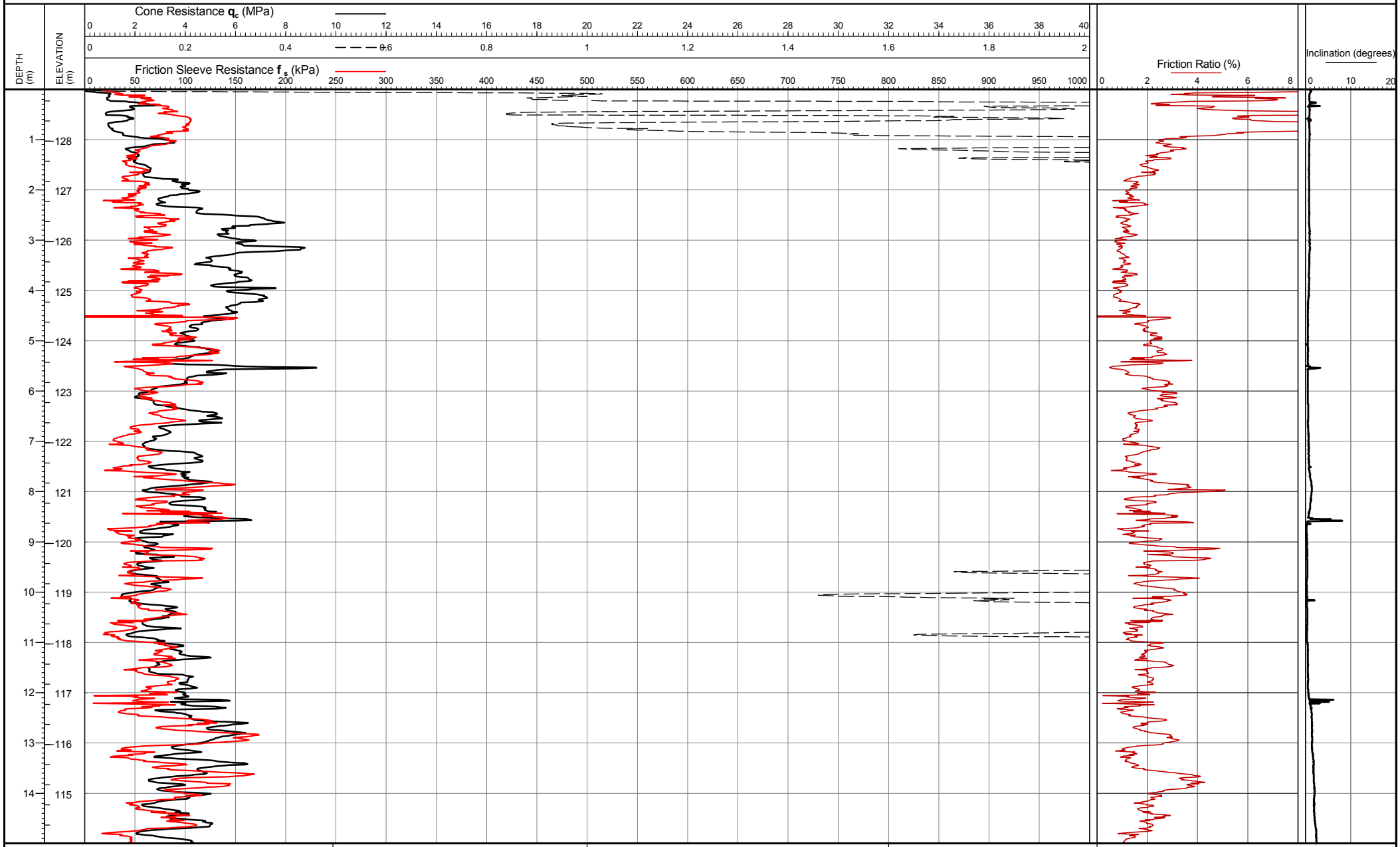
Checked by: Josh Zon

TEST ID: CCL20

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 09:30:06

Location: Hemel Hempstead, UK

Coordinates: 508323.275, 207634.071

Elevation: 129.03

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

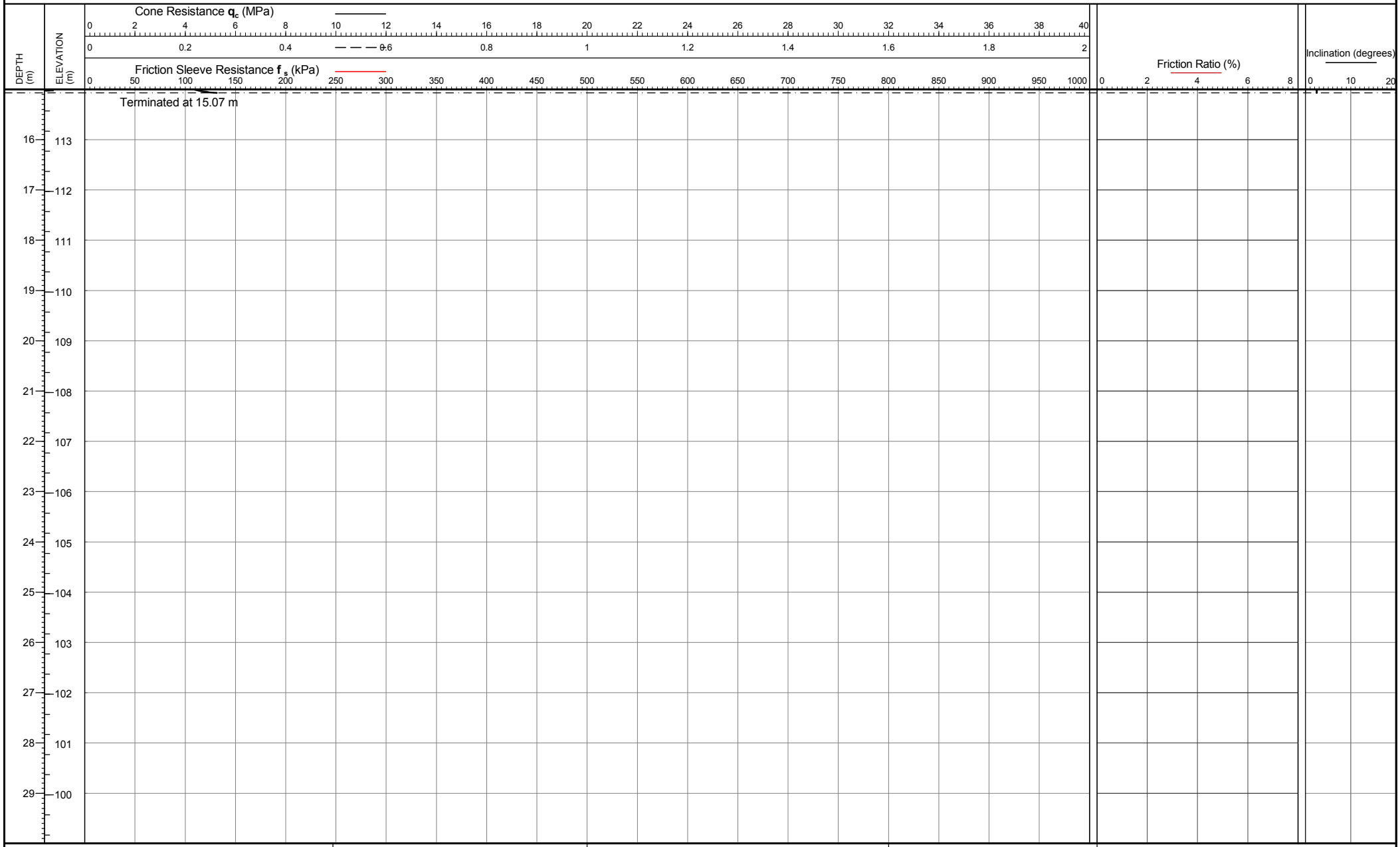
Checked by: Josh Zon

TEST ID: CCL21

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 09:30:06

Location: Hemel Hempstead, UK

Coordinates: 508323.275, 207634.071

Elevation: 129.03

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

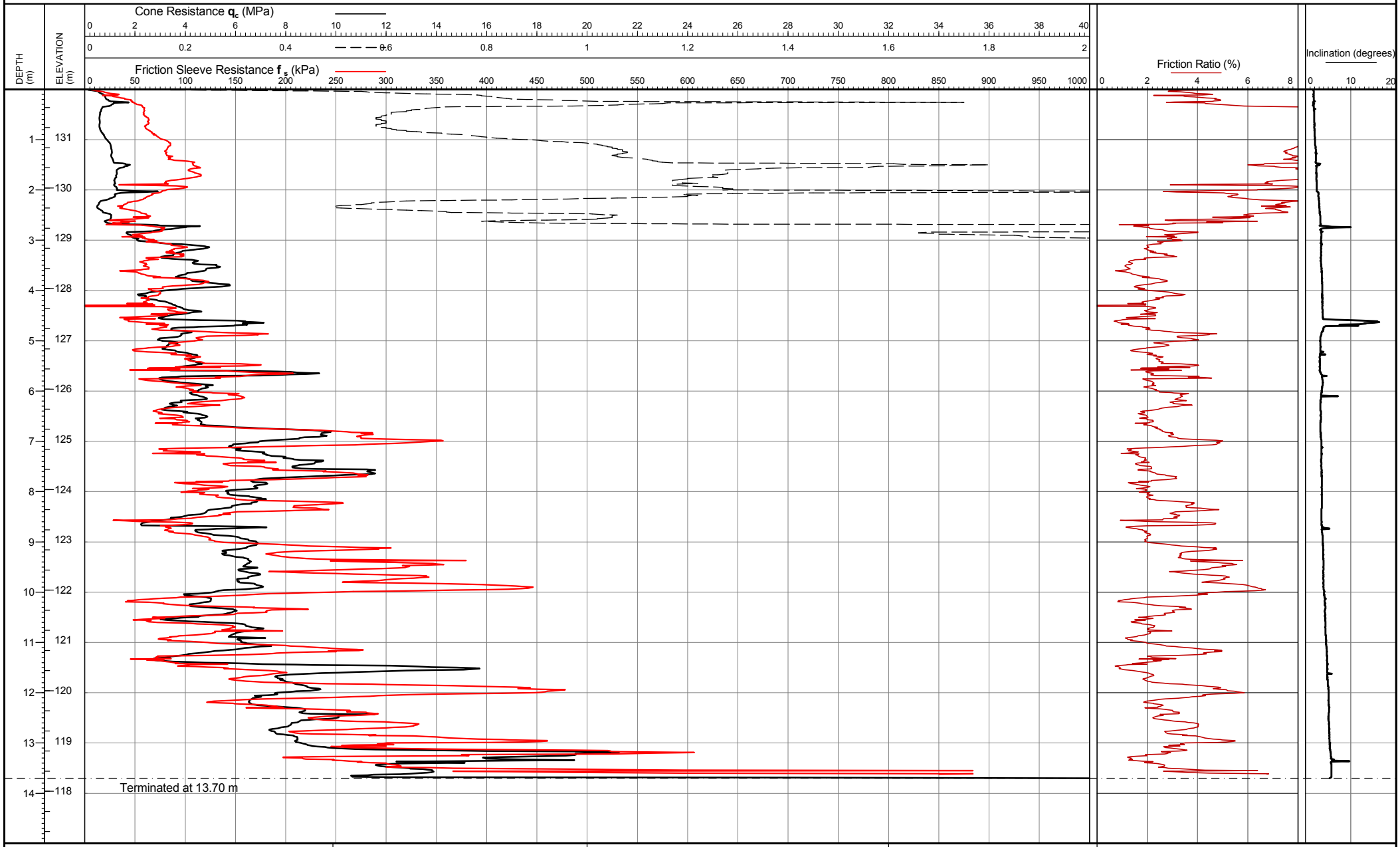
Checked by: Josh Zon

TEST ID: CCL21

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 12:24:12

Location: Hemel Hempstead, UK

Coordinates: 508521.21, 207657.056

Elevation: 131.96

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

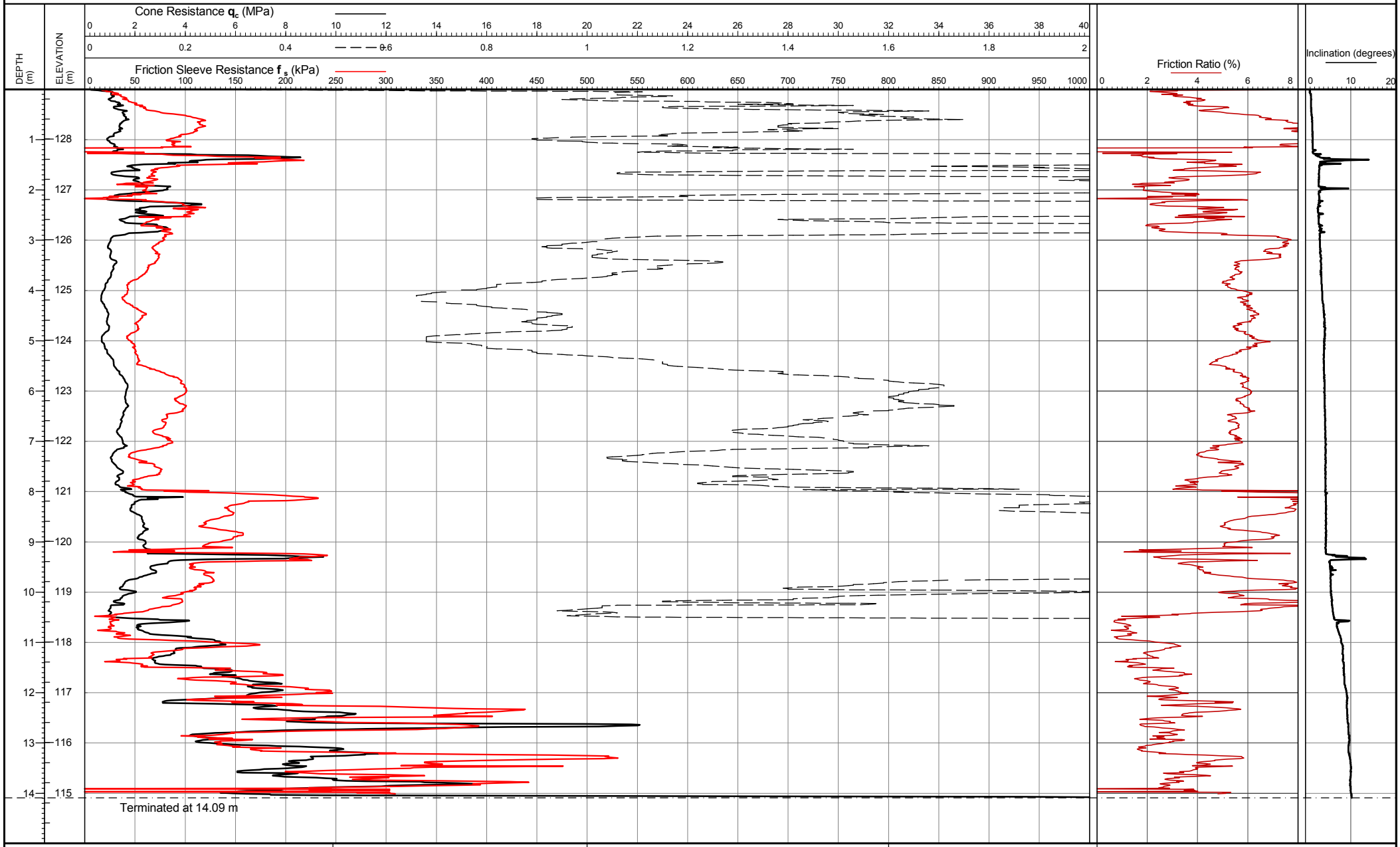
Checked by: Josh Zon

TEST ID: CCL22

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

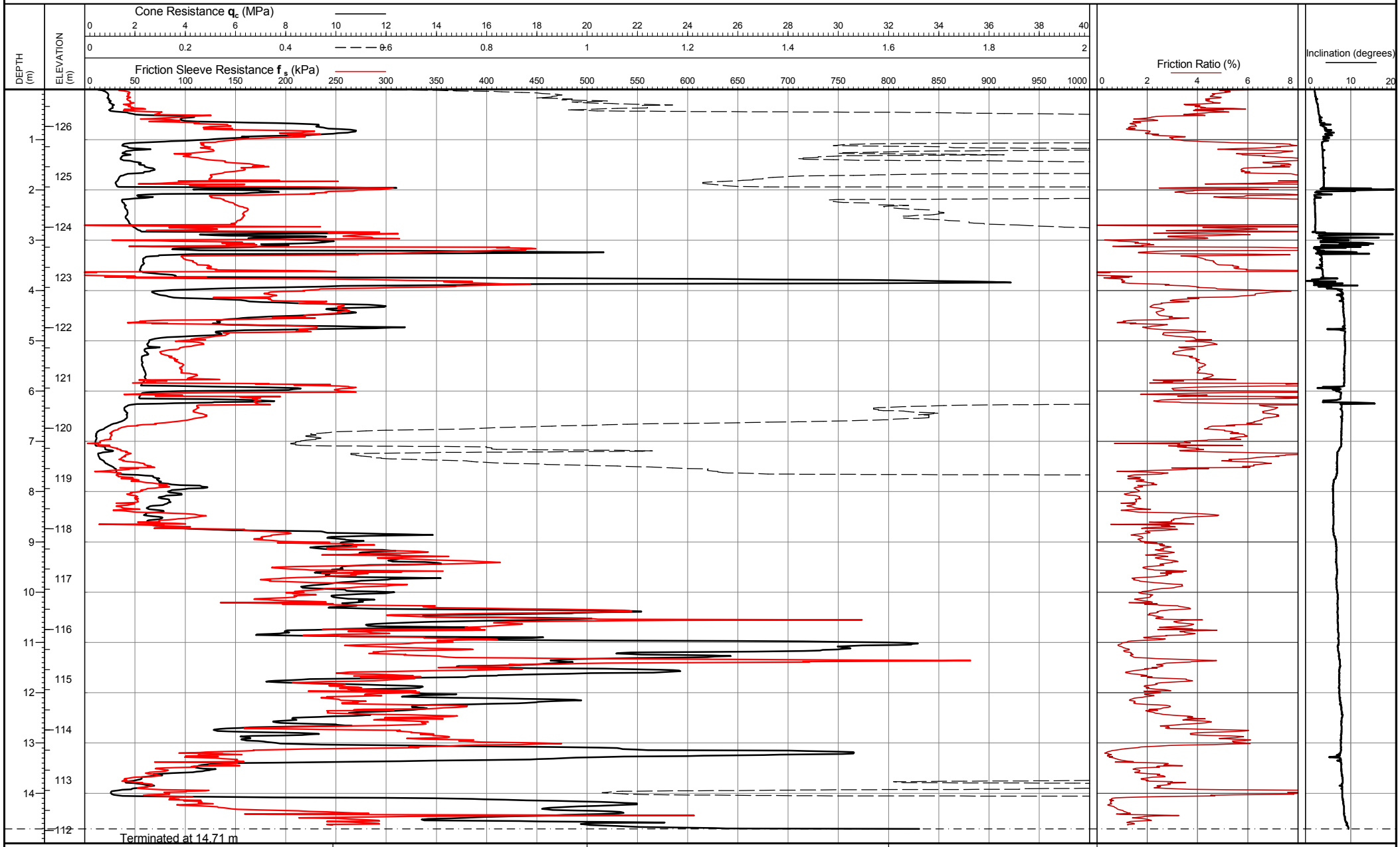


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 14:57:40	Location: Hemel Hempstead, UK Coordinates: 508249.991, 207602.376 Elevation: 128.99	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL23** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

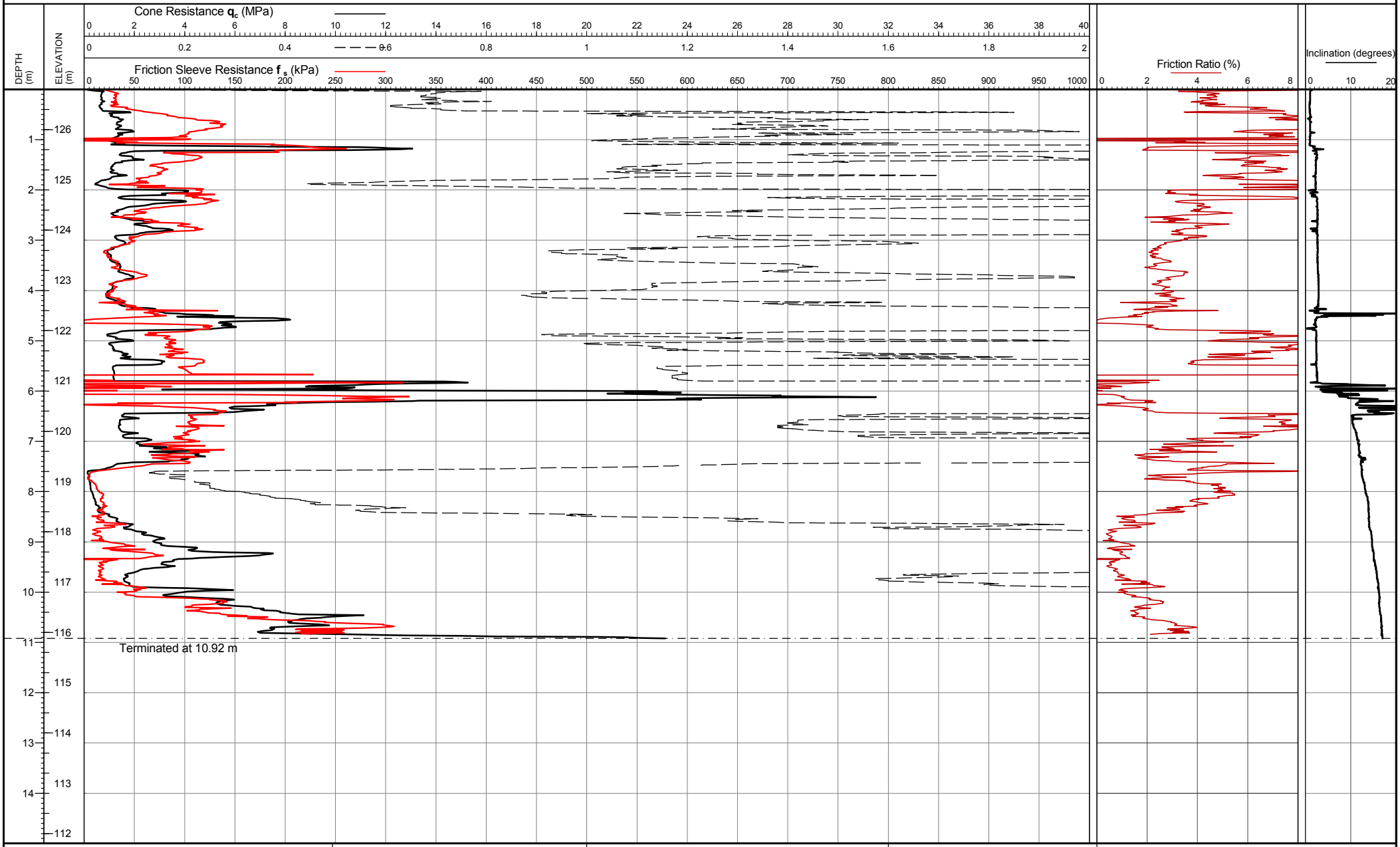


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 11:22:49	Location: Hemel Hempstead, UK Coordinates: 508232.408, 207490.614 Elevation: 126.74	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL24** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 10:55:42

Location: Hemel Hempstead, UK

Coordinates: 508266.411, 207528.452

Elevation: 126.8

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

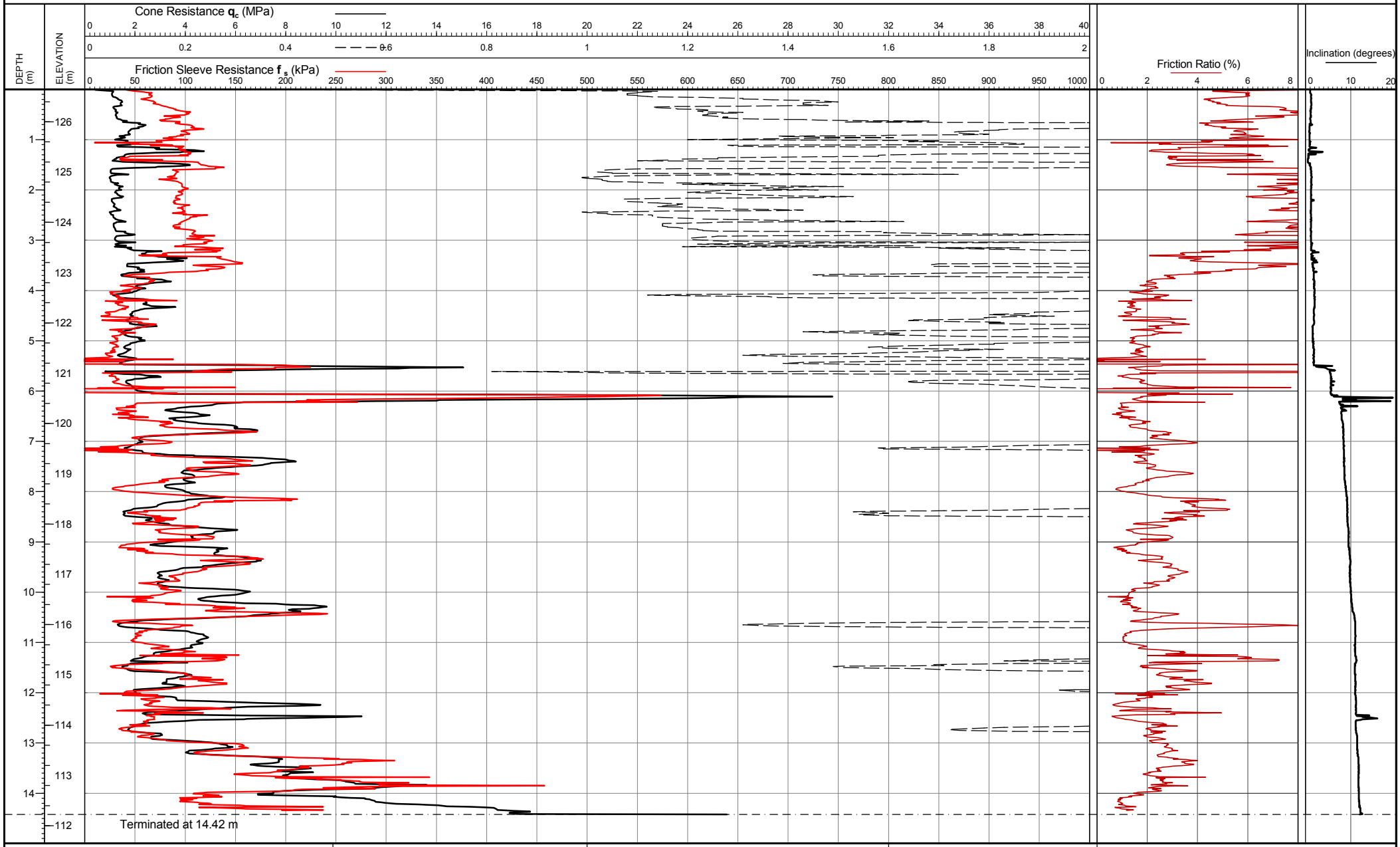
Checked by: Josh Zon

TEST ID: CCL25

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

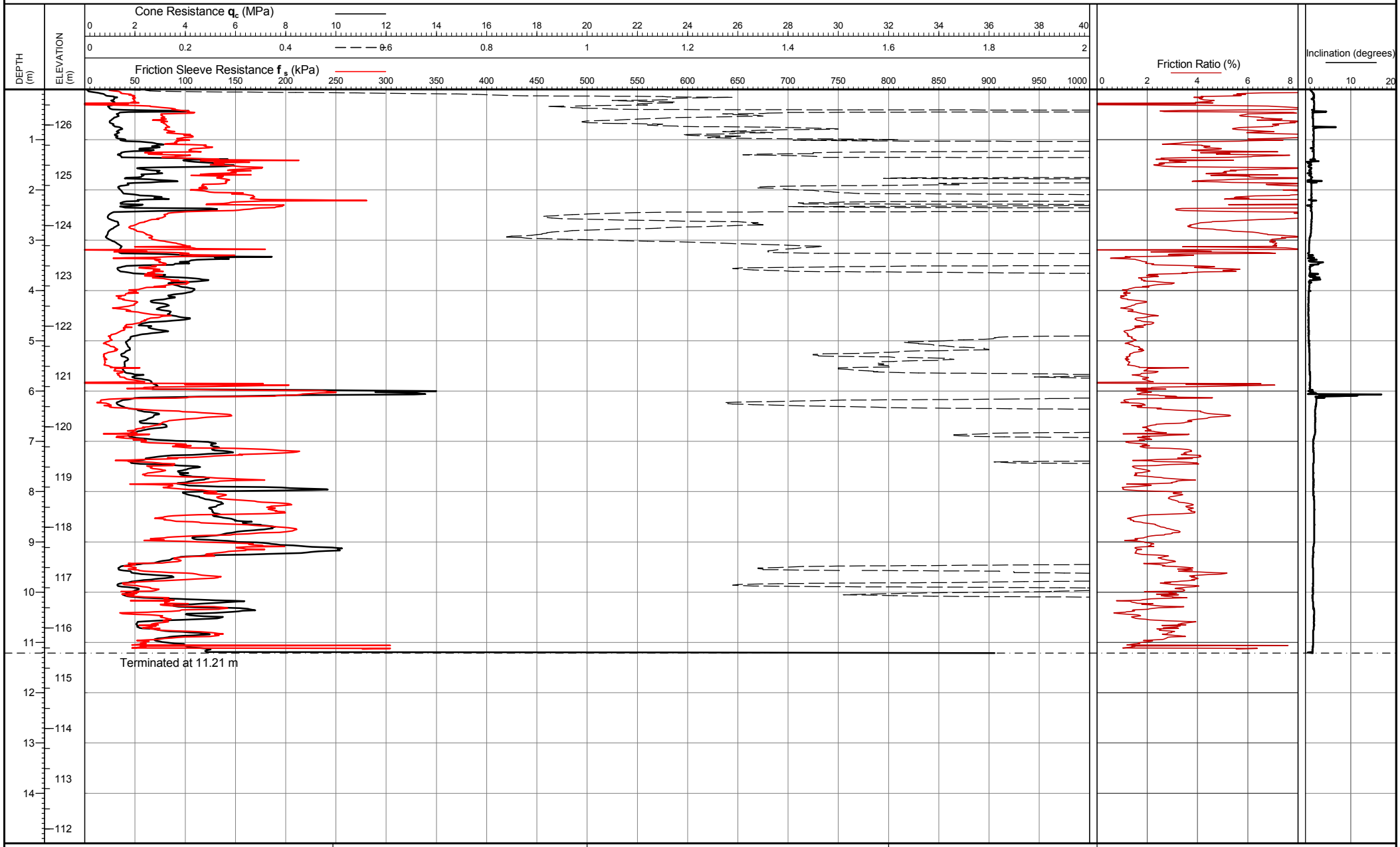


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 10:03:43	Location: Hemel Hempstead, UK Coordinates: 508322.303, 207551.227 Elevation: 126.645	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL26** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

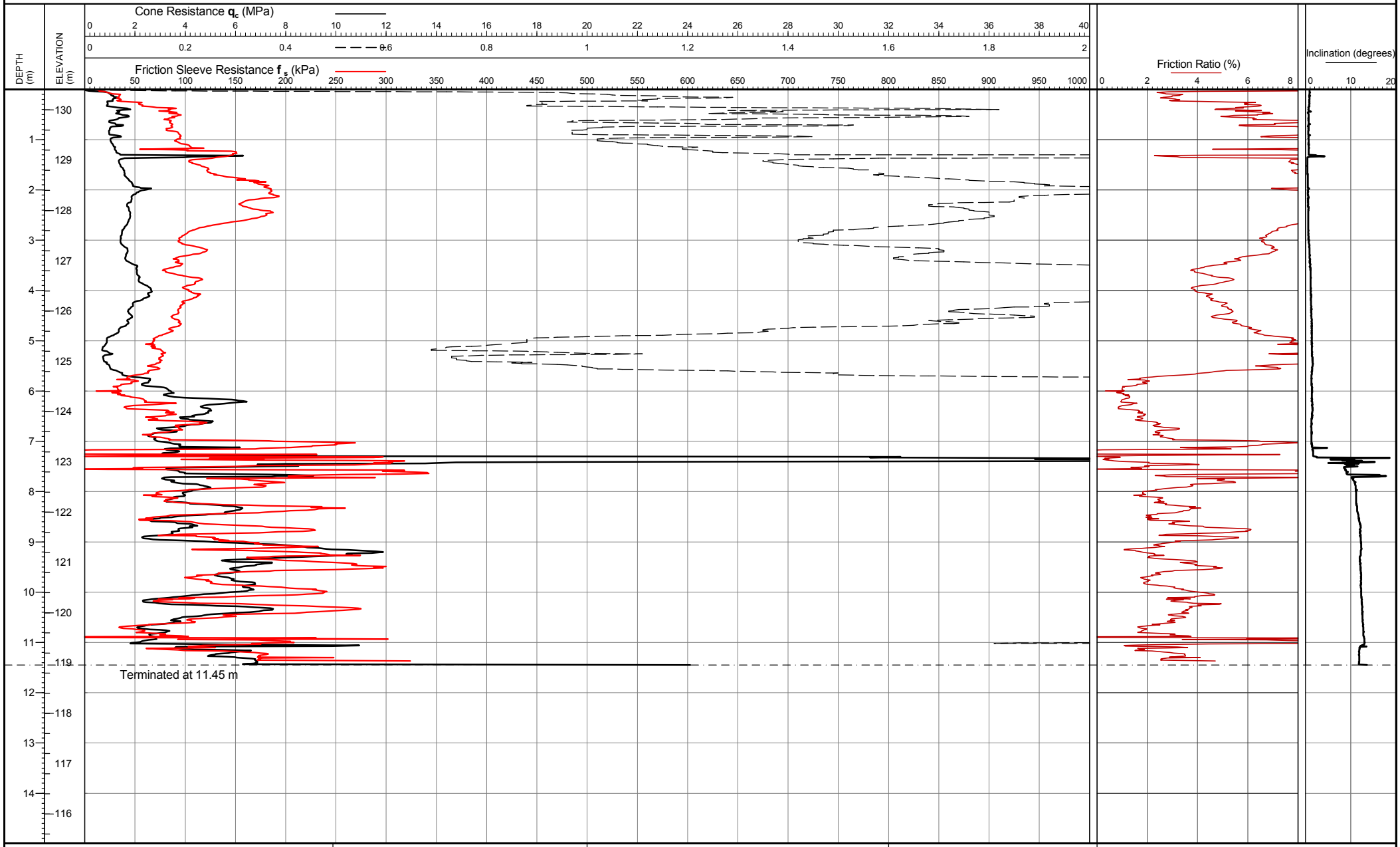


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 10:30:54	Location: Hemel Hempstead, UK Coordinates: 508323.515, 207519.934 Elevation: 126.71	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL27** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

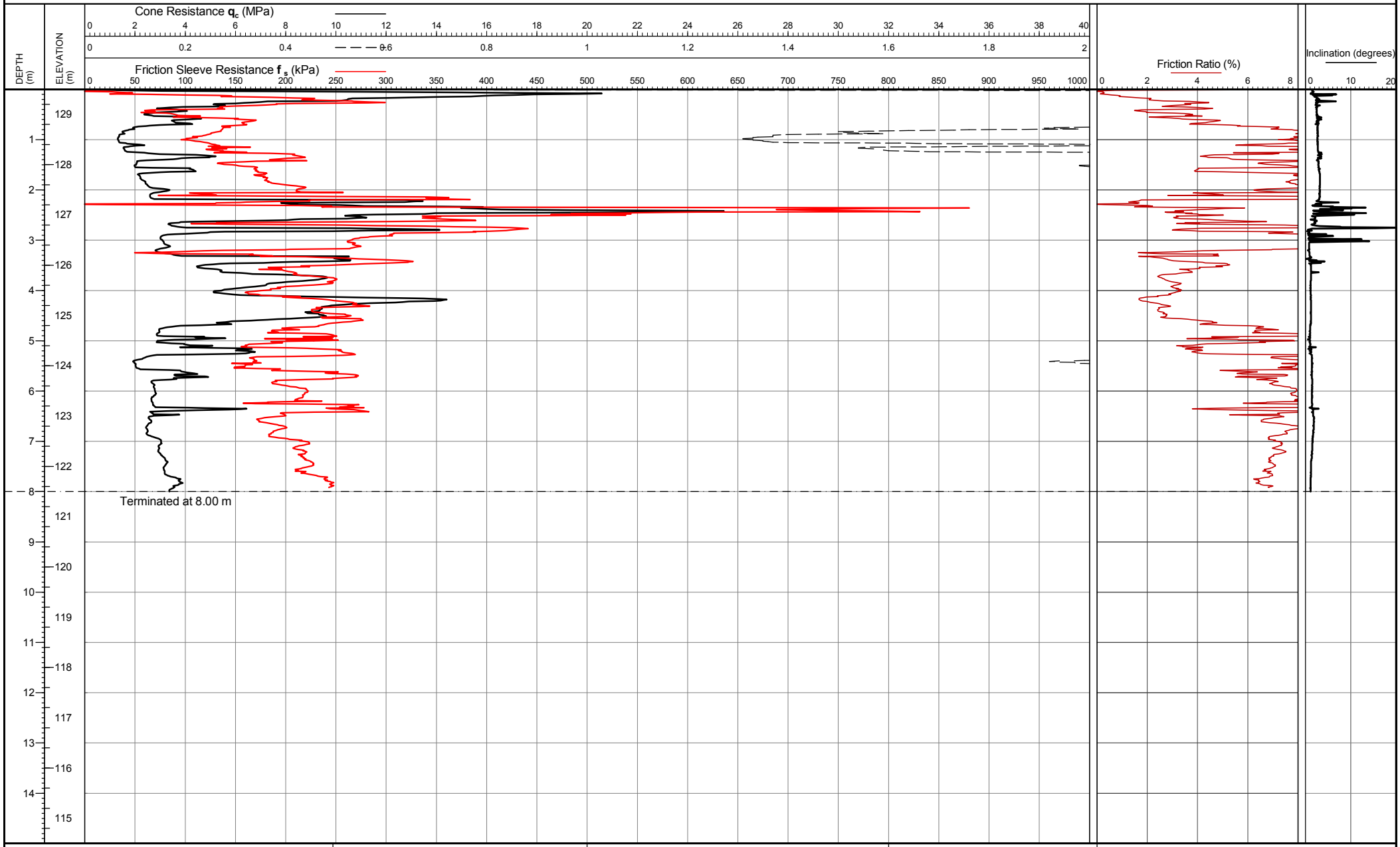


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 15:30:48	Location: Hemel Hempstead, UK Coordinates: 508410.235, 207574.058 Elevation: 130.41	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL28** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 12:58:09

Location: Hemel Hempstead, UK

Coordinates: 508180.602, 207569.386

Elevation: 129.497

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

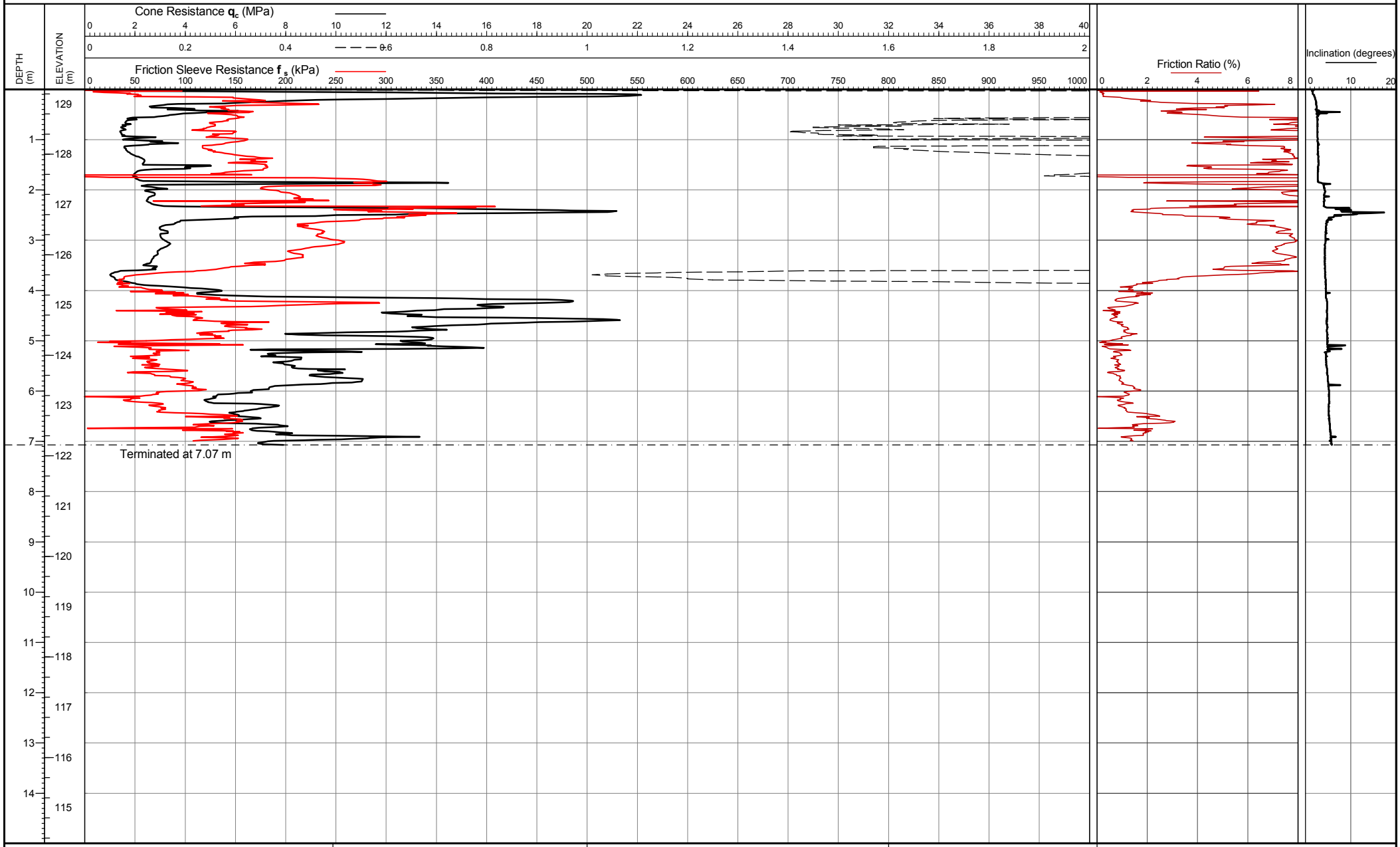
Checked by: Josh Zon

TEST ID: CCL29

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

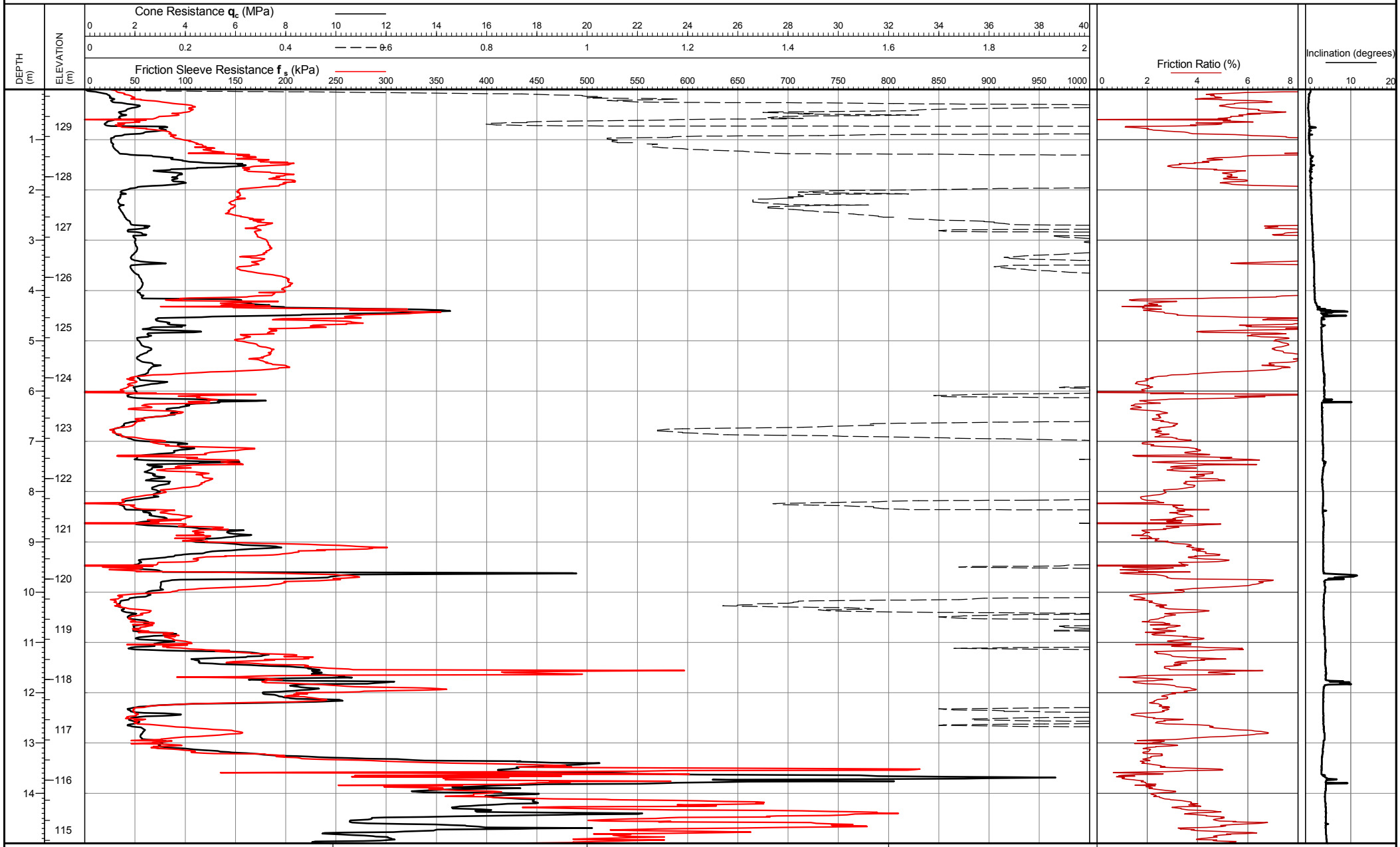


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 13:33:27	Location: Hemel Hempstead, UK Coordinates: 508186.196, 207572.37 Elevation: 129.289	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL30** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



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Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:41:59

Location: Hemel Hempstead, UK

Coordinates: 508212.84, 207662.764

Elevation: 129.738

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

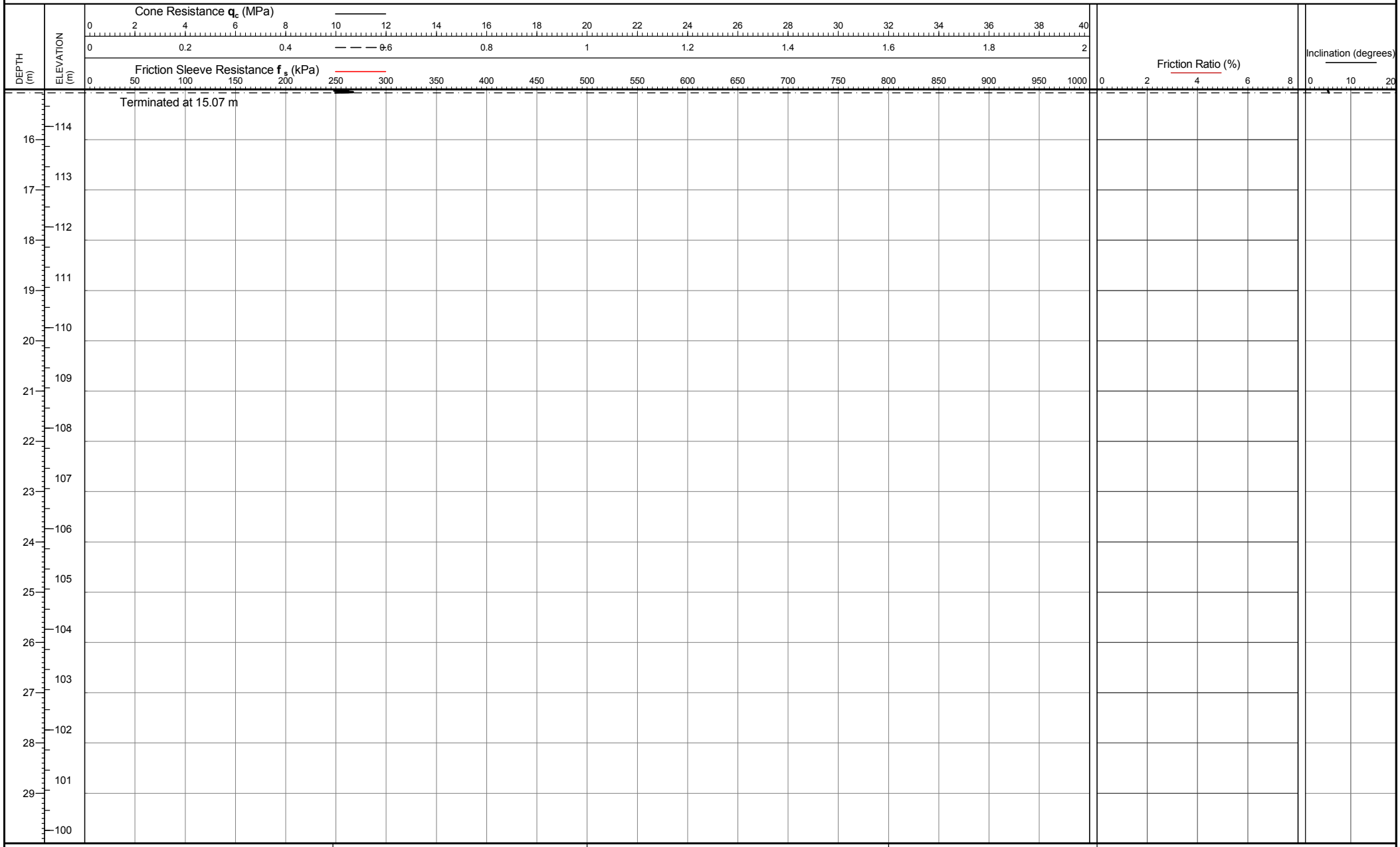
Checked by: Josh Zon

TEST ID: CCL31

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:41:59

Location: Hemel Hempstead, UK

Coordinates: 508212.84, 207662.764

Elevation: 129.738

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

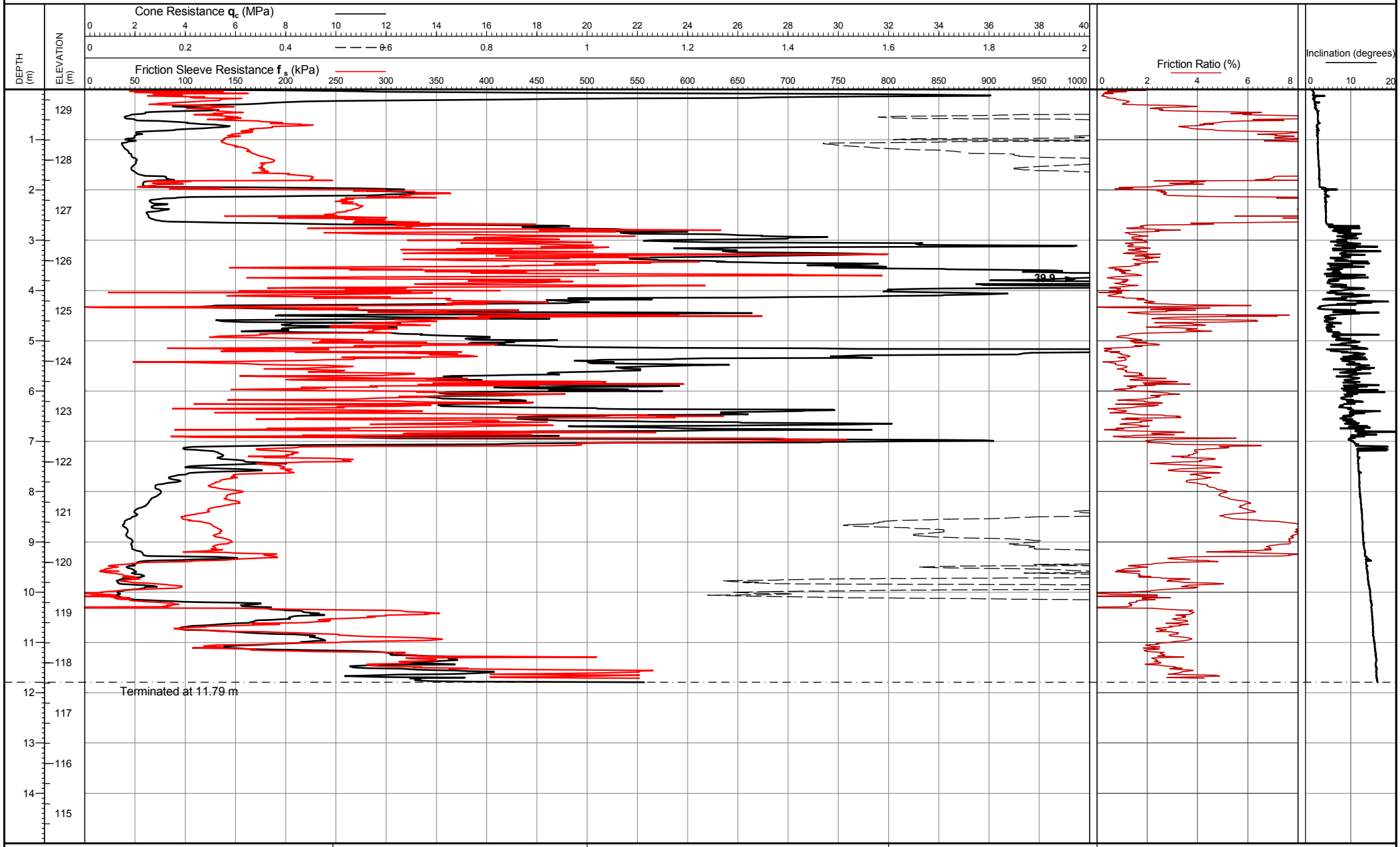
Checked by: Josh Zon

TEST ID: CCL31

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

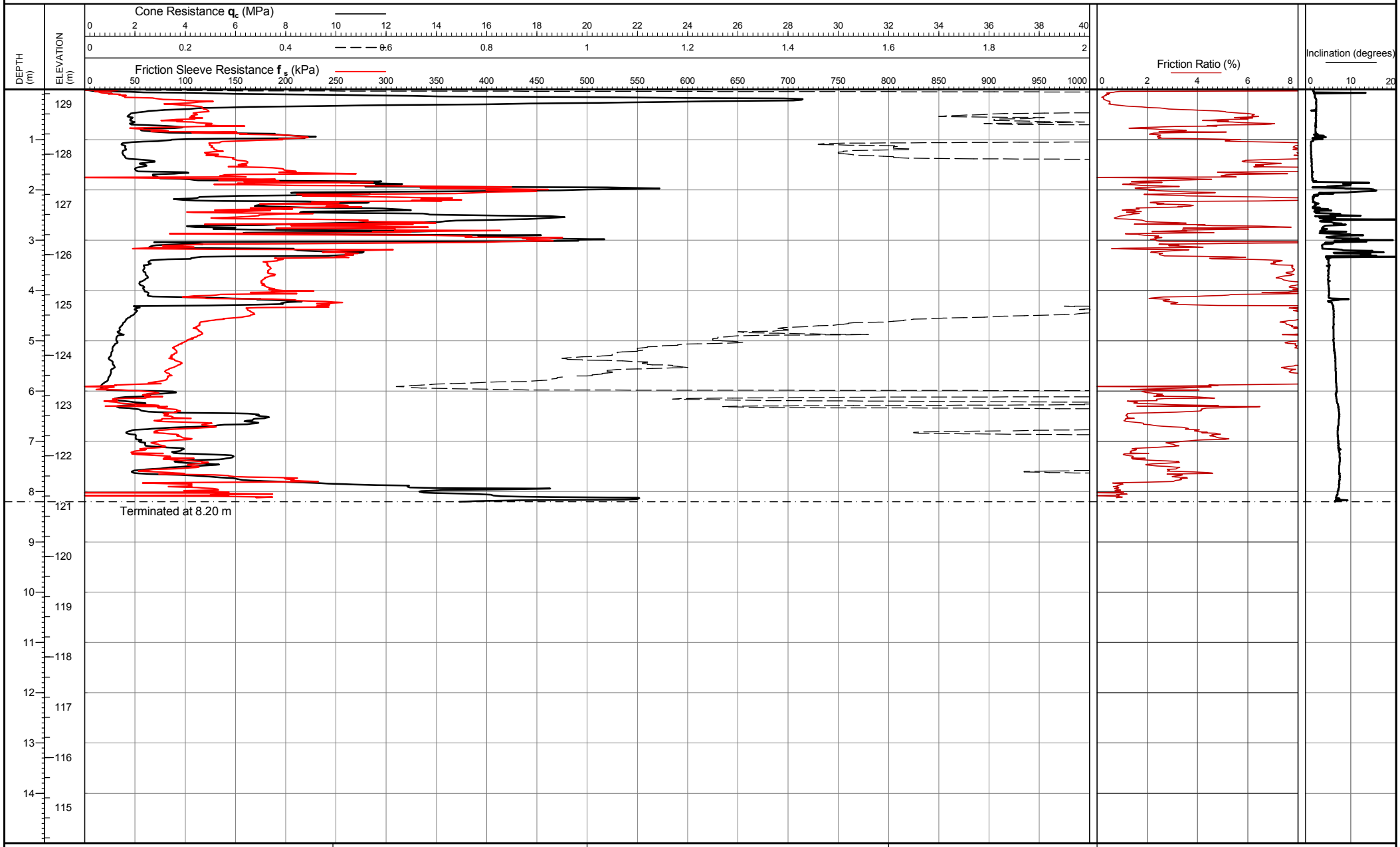


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 28/03/2017 12:01:29	Location: Hemel Hempstead, UK Coordinates: 508185.313, 207567.38 Elevation: 129.408	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL32** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 13:47:49

Location: Hemel Hempstead, UK

Coordinates: 508190.448, 207567.019

Elevation: 129.288

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

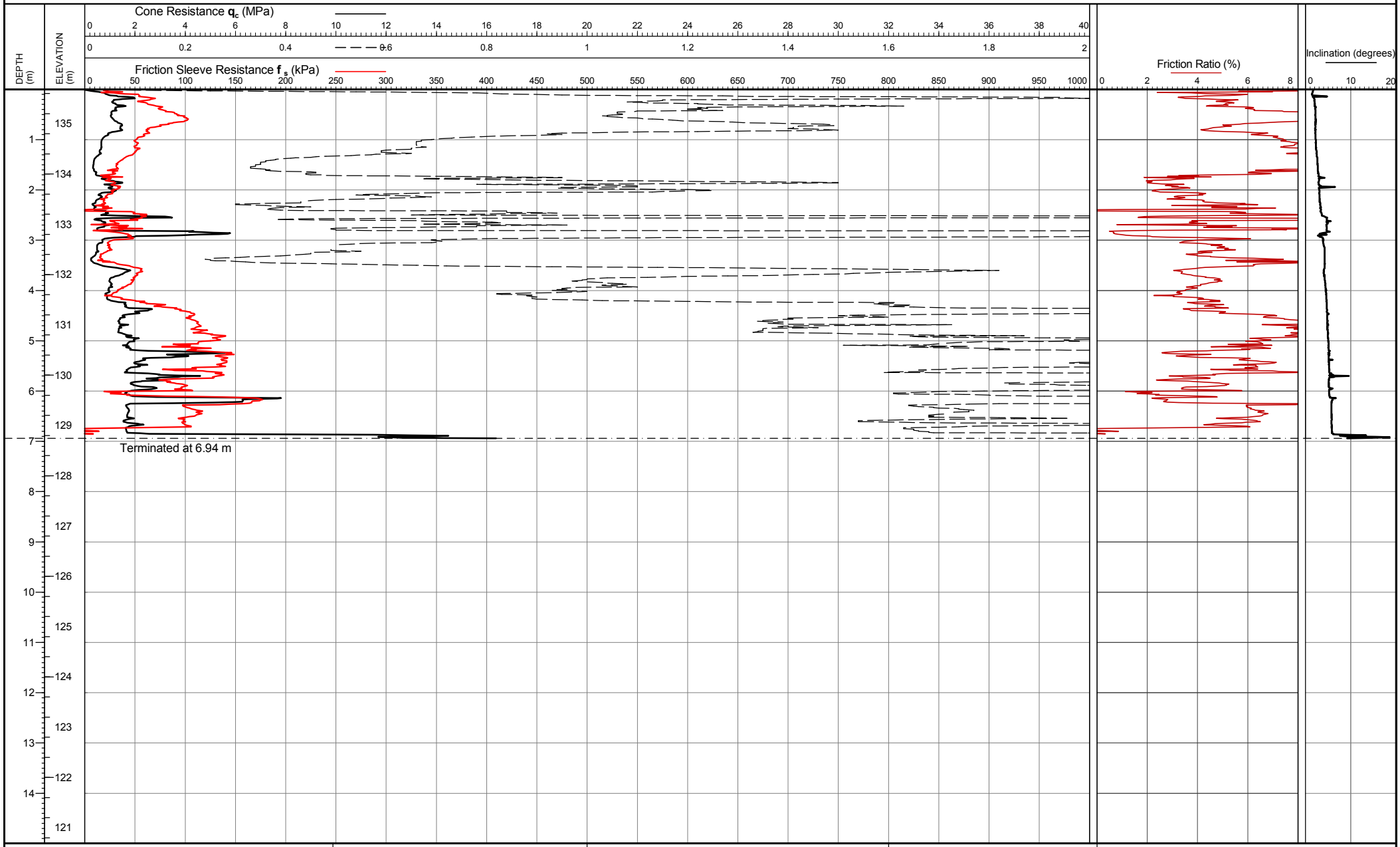
Checked by: Josh Zon

TEST ID: CCL33

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

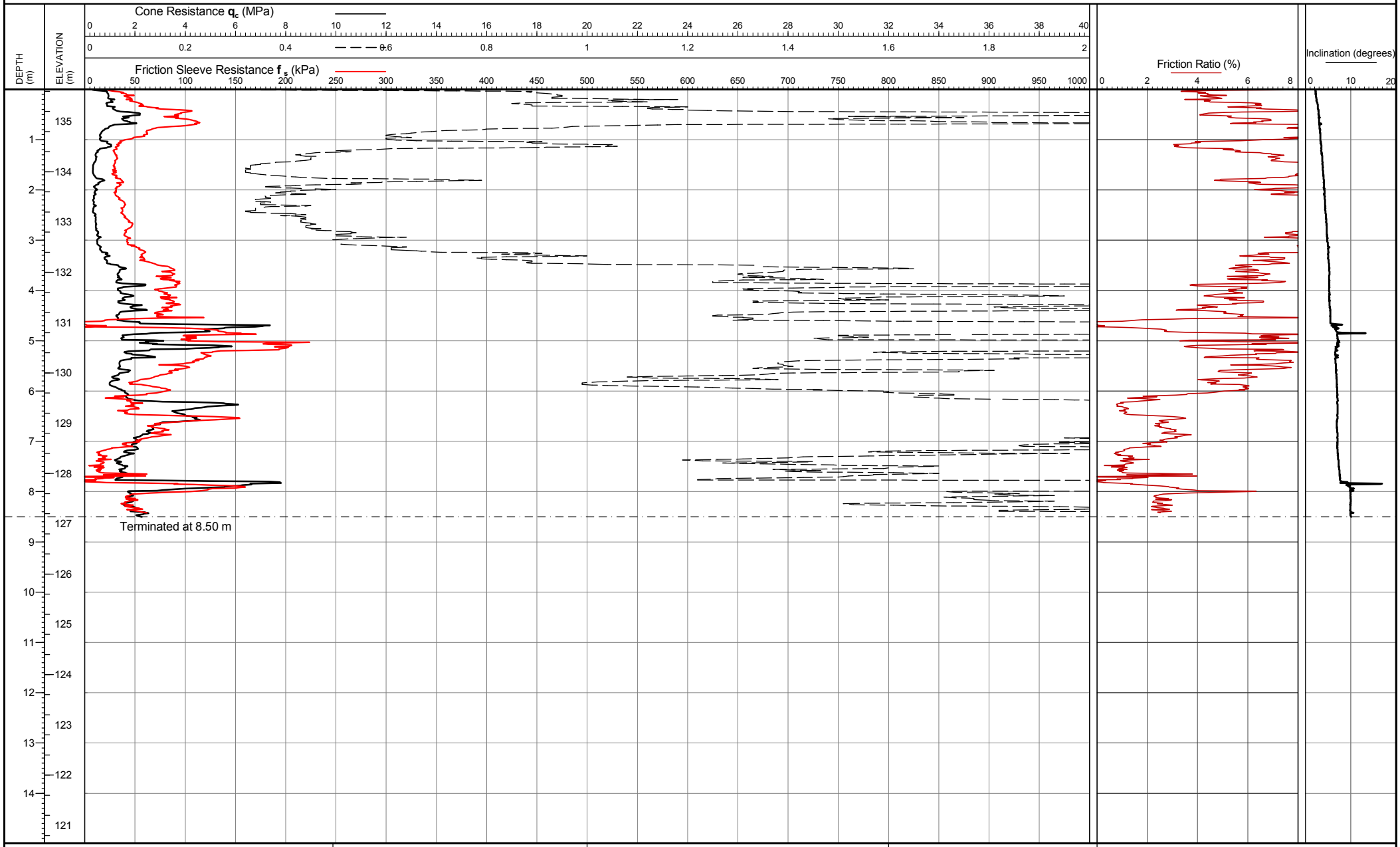


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 10:41:57	Location: Hemel Hempstead, UK Coordinates: 508460.378, 207780.231 Elevation: 135.684	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL34** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
Cone ID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 10:23:14

Location: Hemel Hempstead, UK

Coordinates: 508466.61, 207776.764

Elevation: 135.639

Remarks:

Refusal criteria: Target depth

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

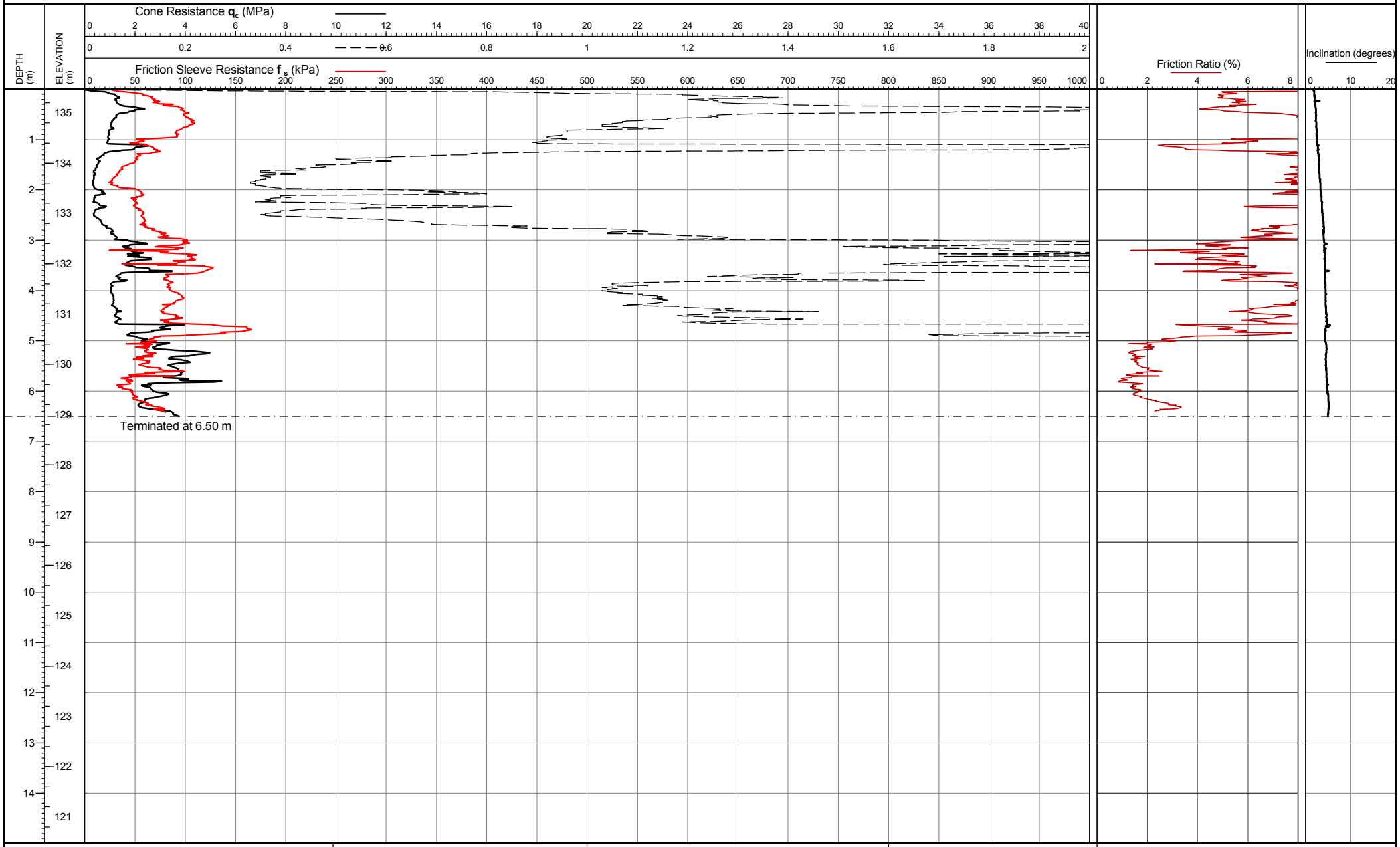
Checked by: Josh Zon

TEST ID: CCL35

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

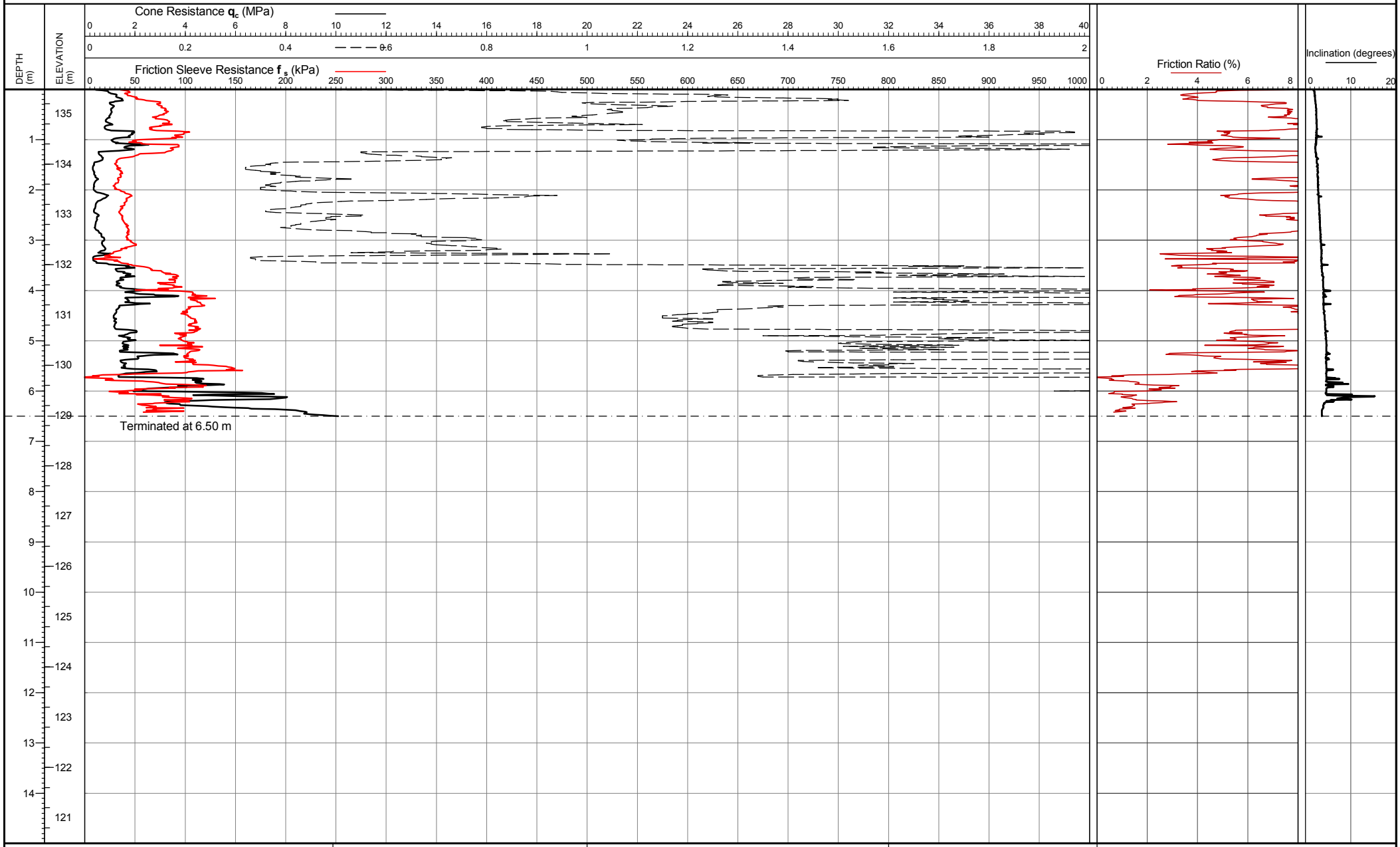


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 09:53:03	Location: Hemel Hempstead, UK Coordinates: 508463.594, 207770.35 Elevation: 135.468	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1	**TEST ID: CCL36** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA

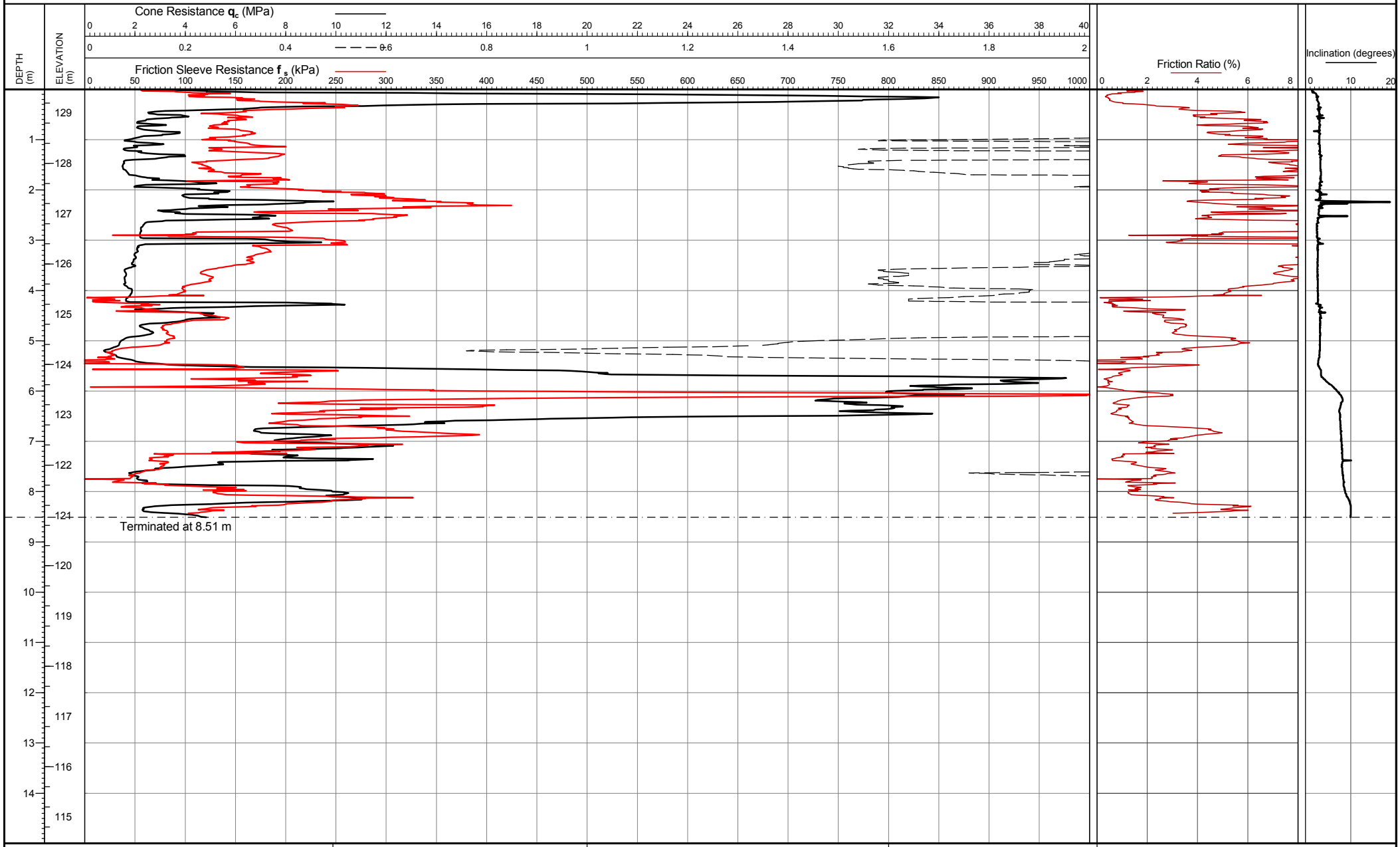


Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 10:05:37	Location: Hemel Hempstead, UK Coordinates: 508456.734, 207773.543 Elevation: 135.486	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Lankelma Project Ref: P-106628-1 Checked by: Josh Zon	**TEST ID: CCL37** Page 1 of 1

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



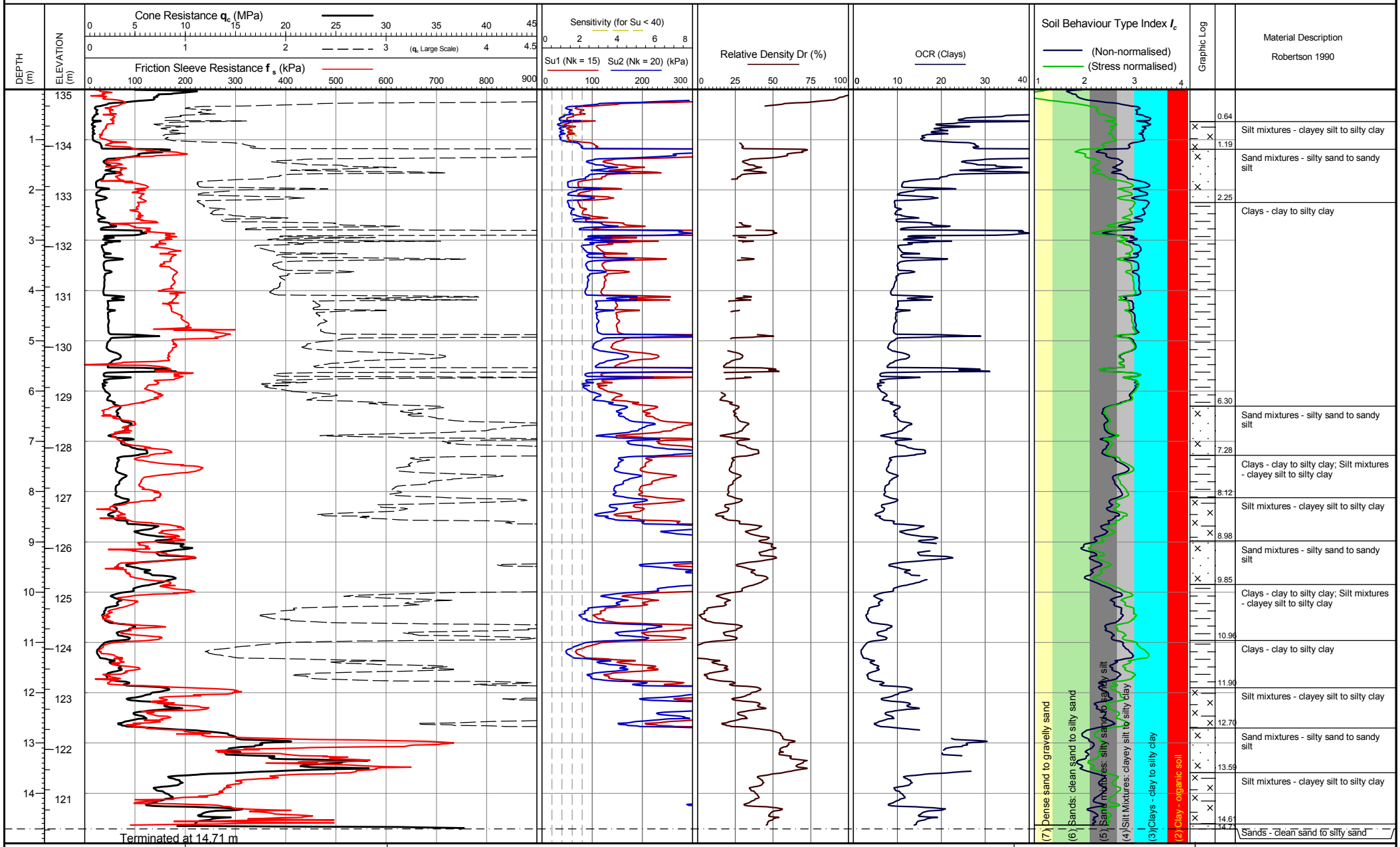
Cone area (mm2):1500 Cone ID: S15-CFIP.1411 Operator: Ben Ranson Rig Used: UK15 Date of test: 29/03/2017 13:14:59	Location: Hemel Hempstead, UK Coordinates: 508185.032, 207562.503 Elevation: 129.472	Remarks: Refusal criteria: Target depth	Date of plot: 02-05-17 Checked by: Josh Zon	Lankelma Project Ref: P-106628-1

TEST ID: CCL38

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 08:25:55

Location: Hemel Hempstead, UK

Coordinates: 508369.033, 207875.419

Elevation: 135.13

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

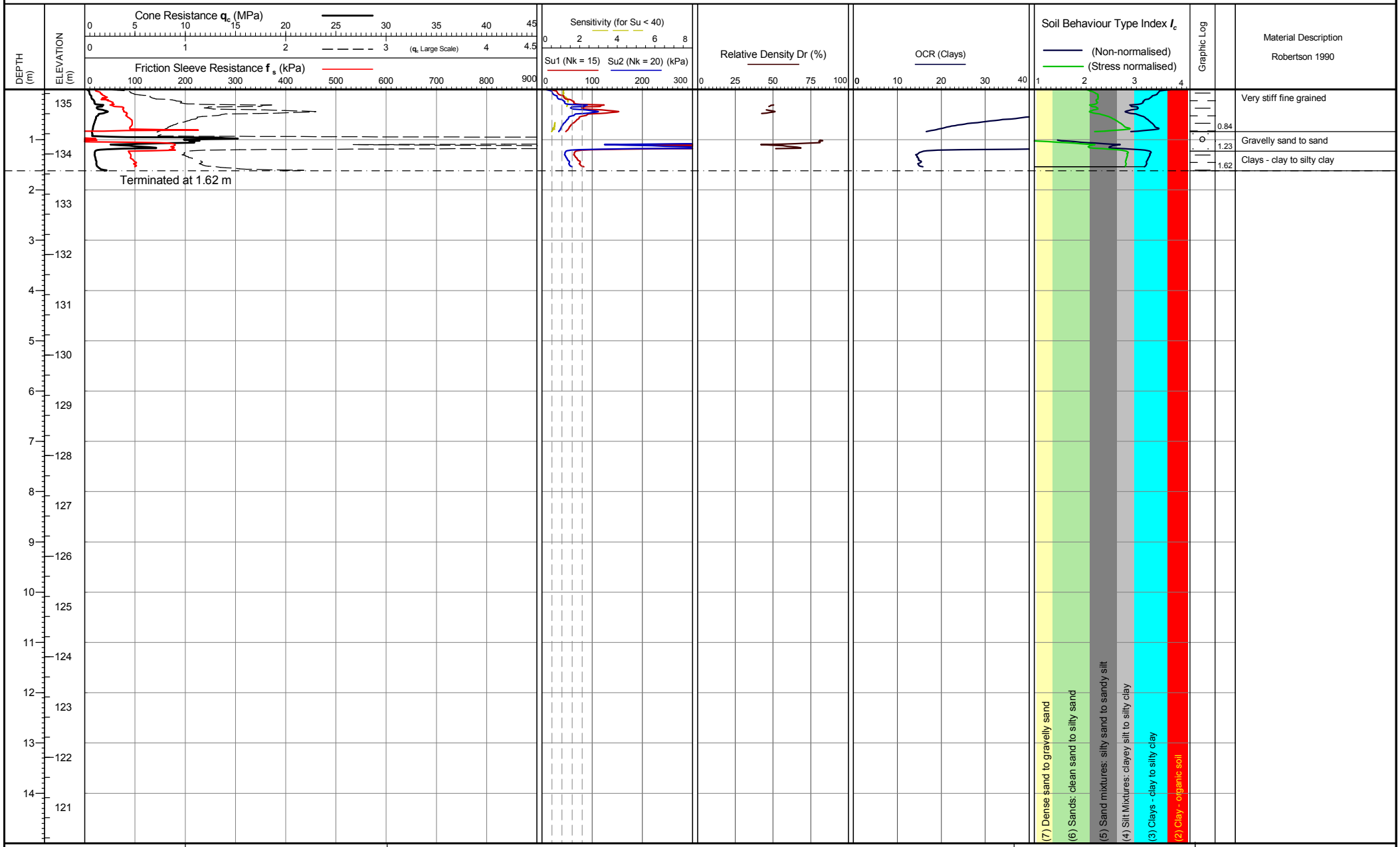
Checked by: Josh Zon

TEST ID: CCL01

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:07:41

Location: Hemel Hempstead, UK

Coordinates: 508406.924, 207856.079

Elevation: 135.284

Remarks:

Termination Remark:
Inclination

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

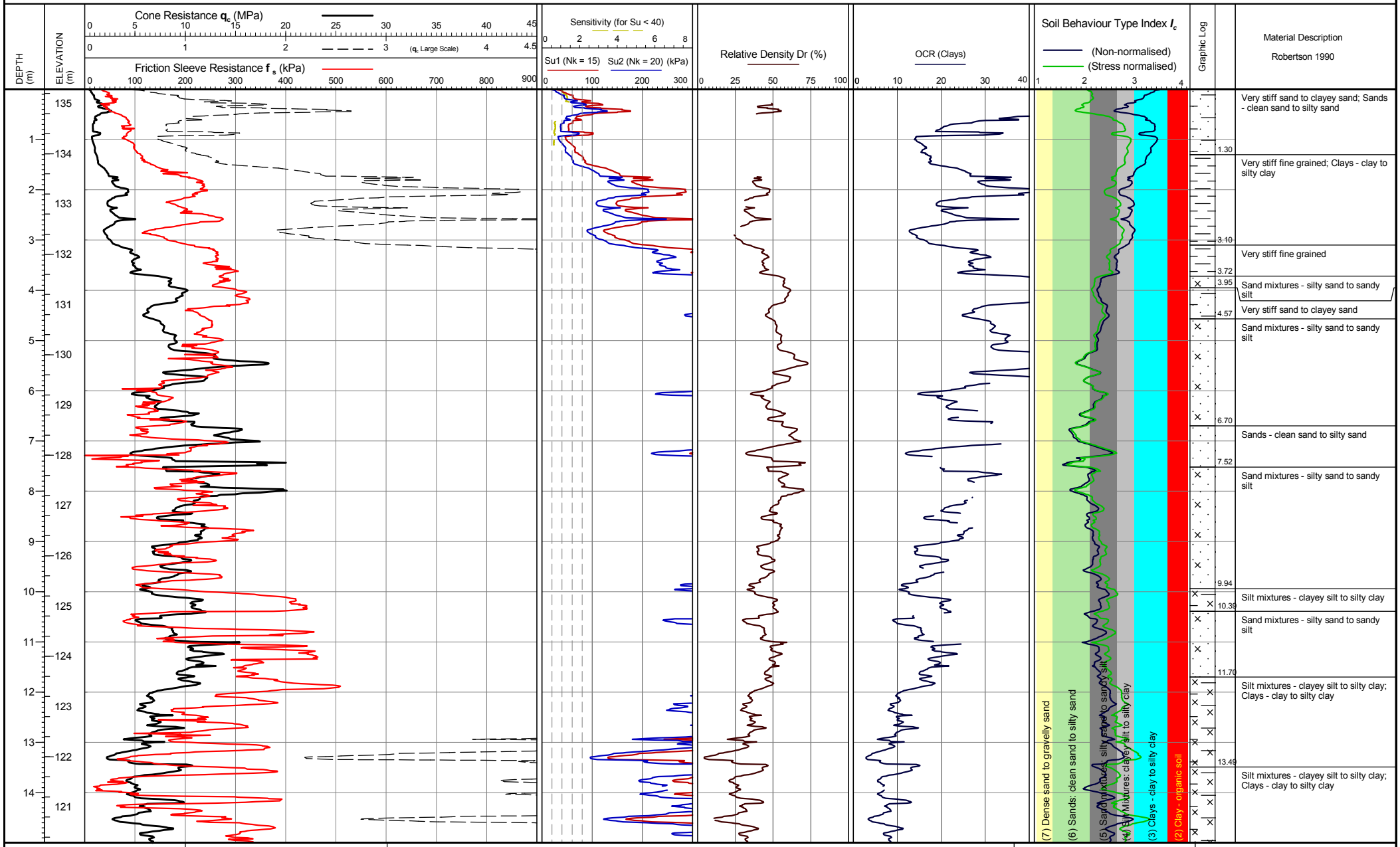
Checked by: Josh Zon

TEST ID: CCL02

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:12:11

Location: Hemel Hempstead, UK

Coordinates: 508406.924, 207856.079

Elevation: 135.284

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

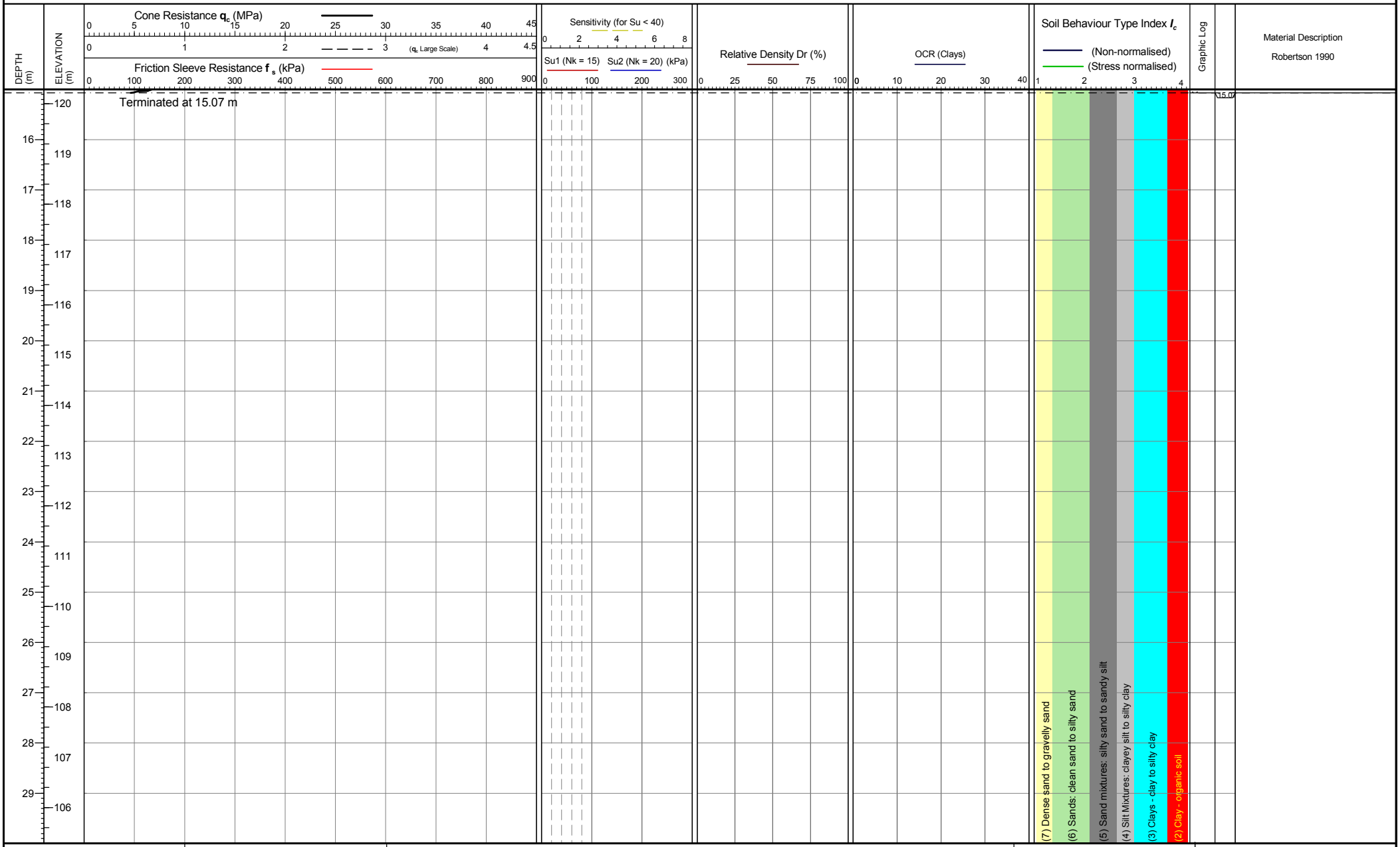
Checked by: Josh Zon

TEST ID: CCL02A

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:12:11

Location: Hemel Hempstead, UK

Coordinates: 508406.924, 207856.079

Elevation: 135.284

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

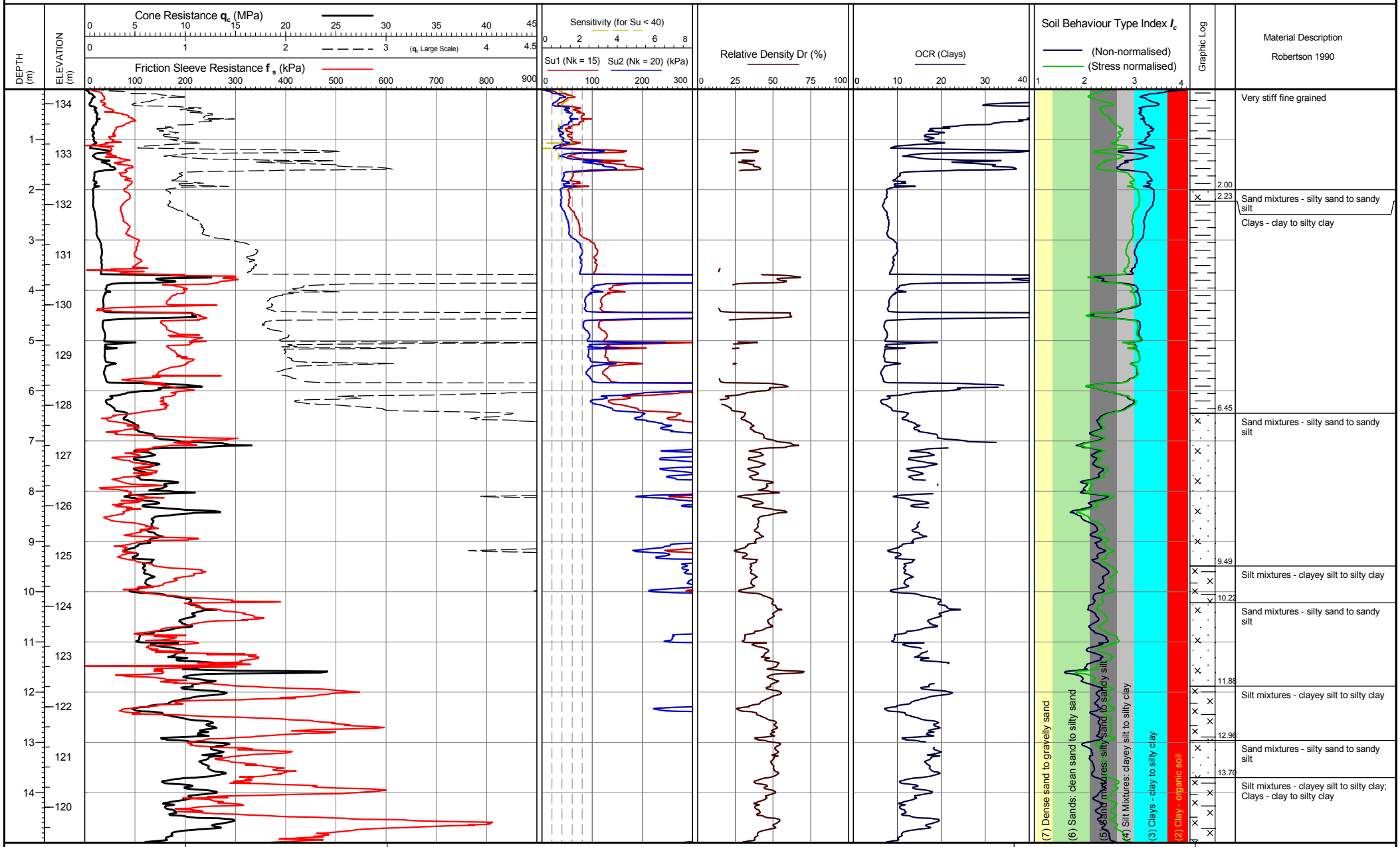
Checked by:
Josh Zon

TEST ID: CCL02A

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:12:19

Location: Hemel Hempstead, UK

Coordinates: 508358.026, 207819.581

Elevation: 134.29

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

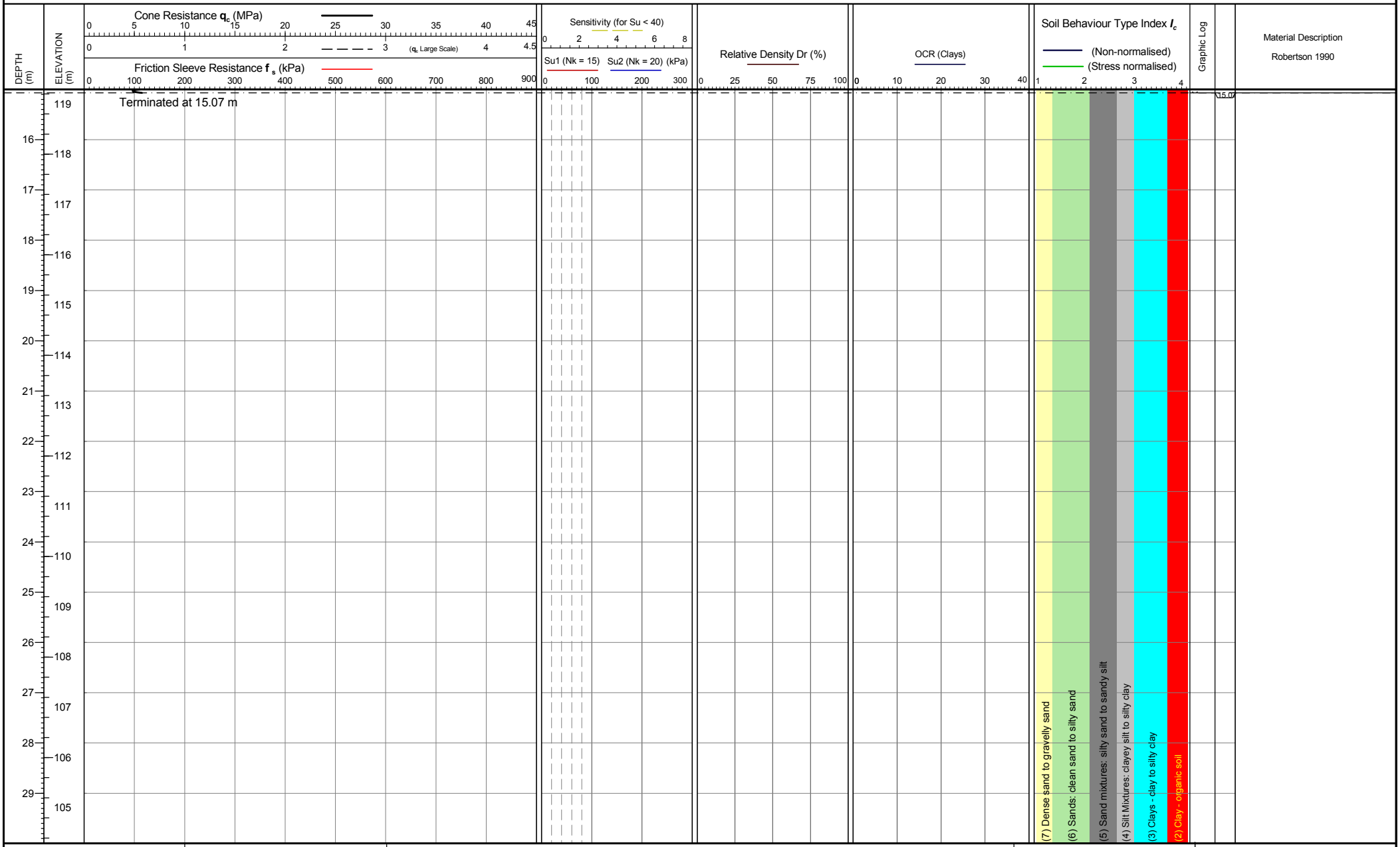
Checked by: Josh Zon

TEST ID: CCL03

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:12:19

Location: Hemel Hempstead, UK

Coordinates: 508358.026, 207819.581

Elevation: 134.29

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

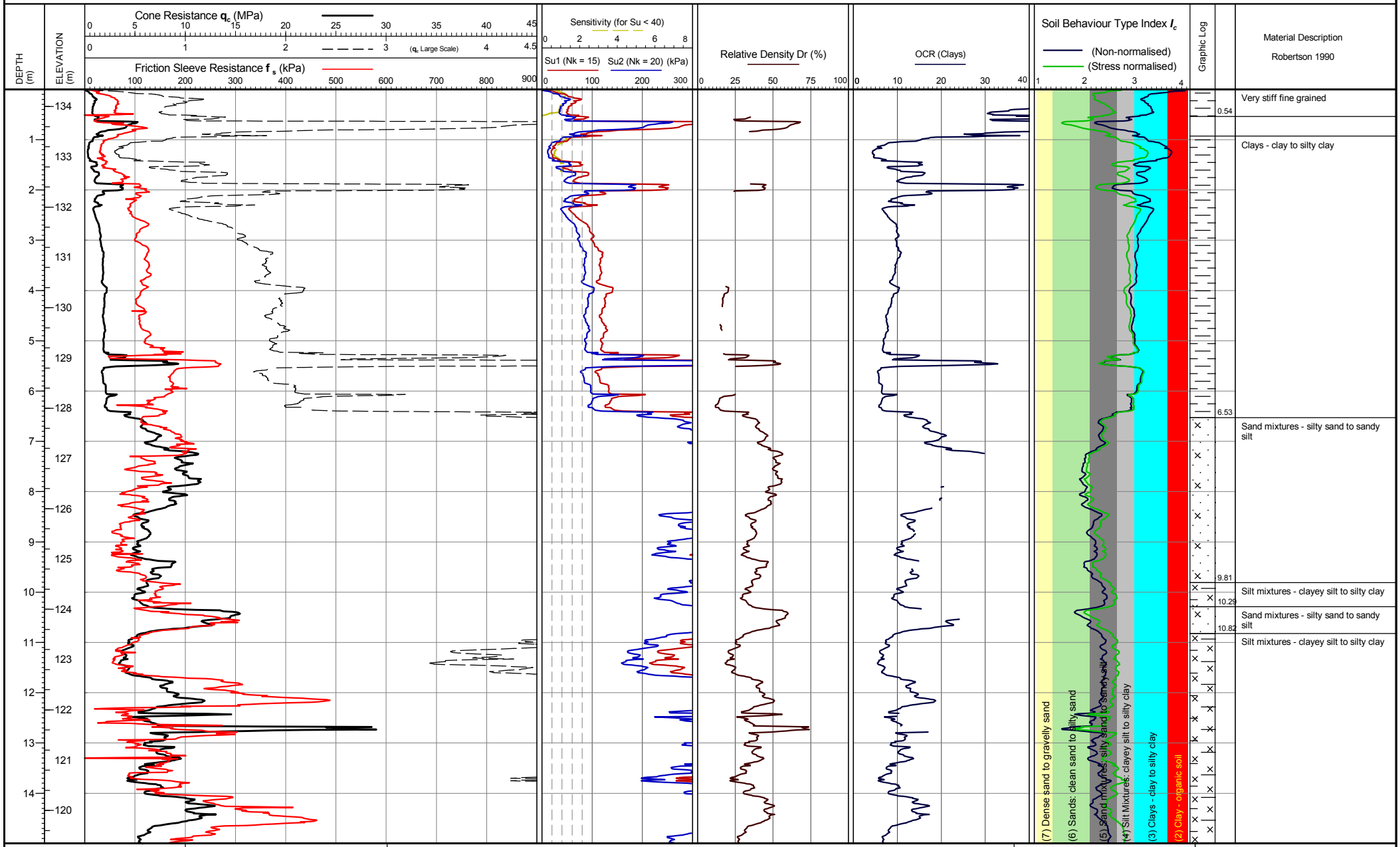
Checked by:
Josh Zon

TEST ID: CCL03

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:40:18

Location: Hemel Hempstead, UK

Coordinates: 508350.443, 207774.593

Elevation: 134.341

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

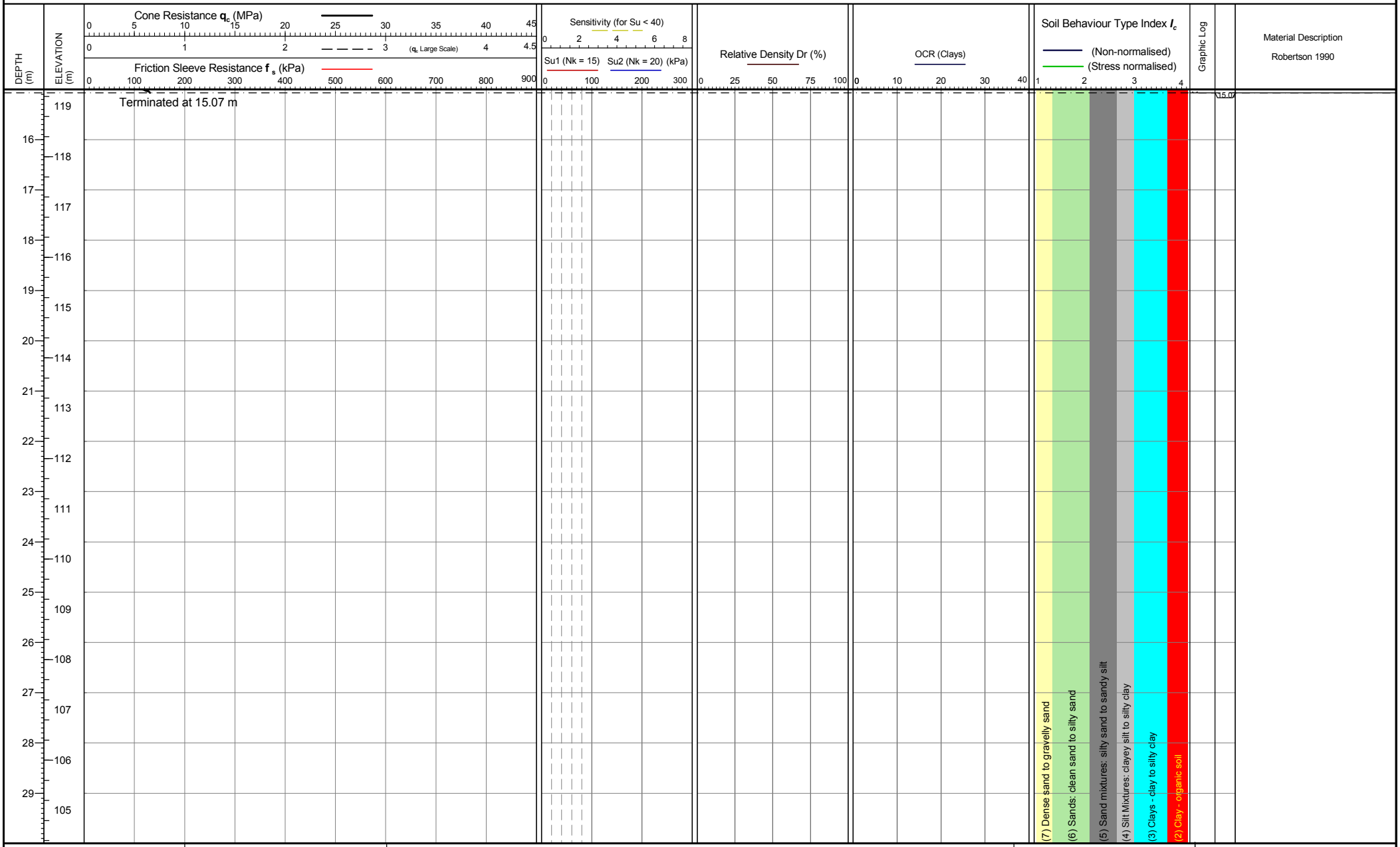
Checked by:
Josh Zon

TEST ID: CCL04

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 11:40:18

Location: Hemel Hempstead, UK

Coordinates: 508350.443, 207774.593

Elevation: 134.341

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

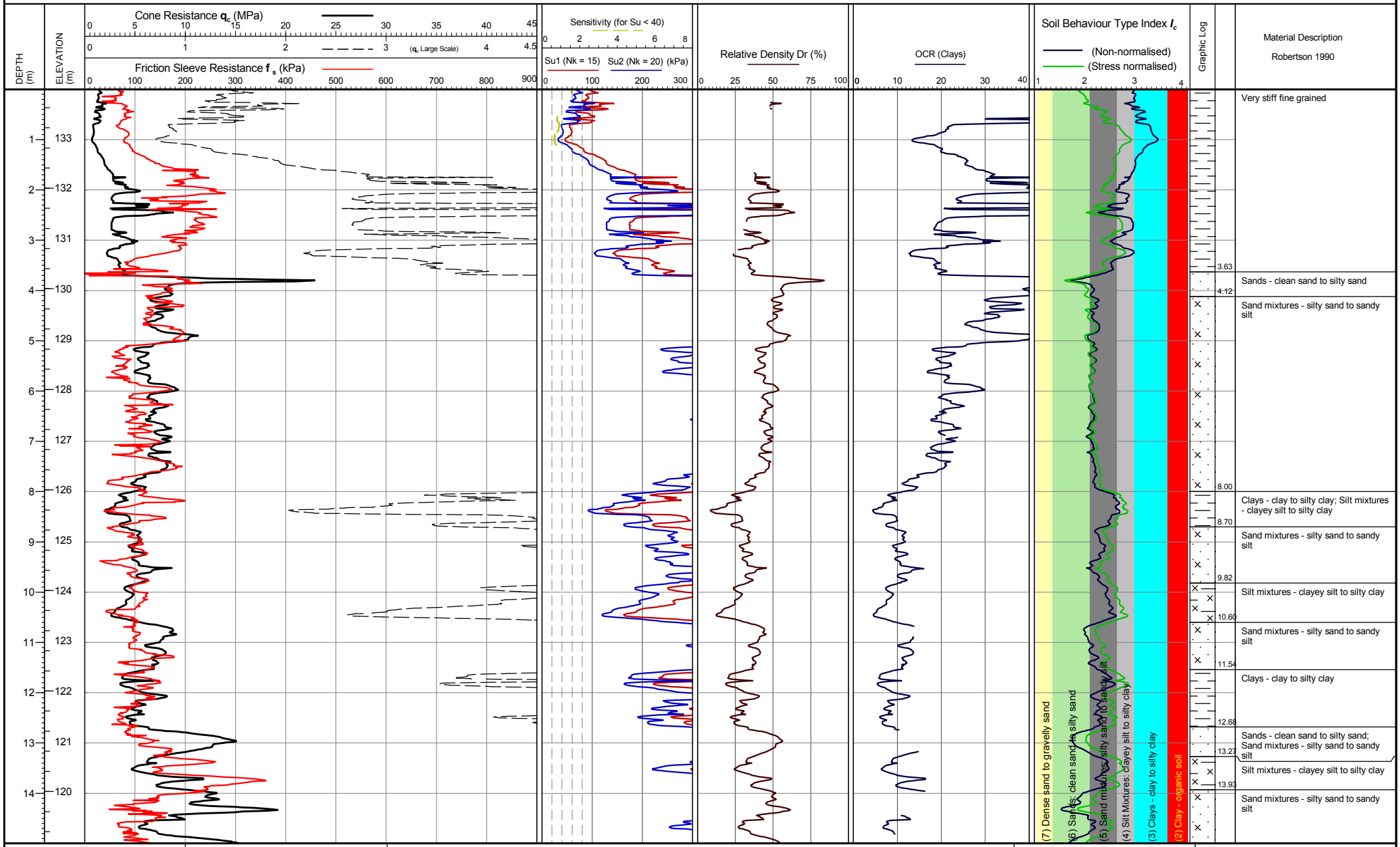
Checked by:
Josh Zon

TEST ID: CCL04

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 14:38:09

Location: Hemel Hempstead, UK

Coordinates: 508387.668, 207752.494

Elevation: 133.965

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

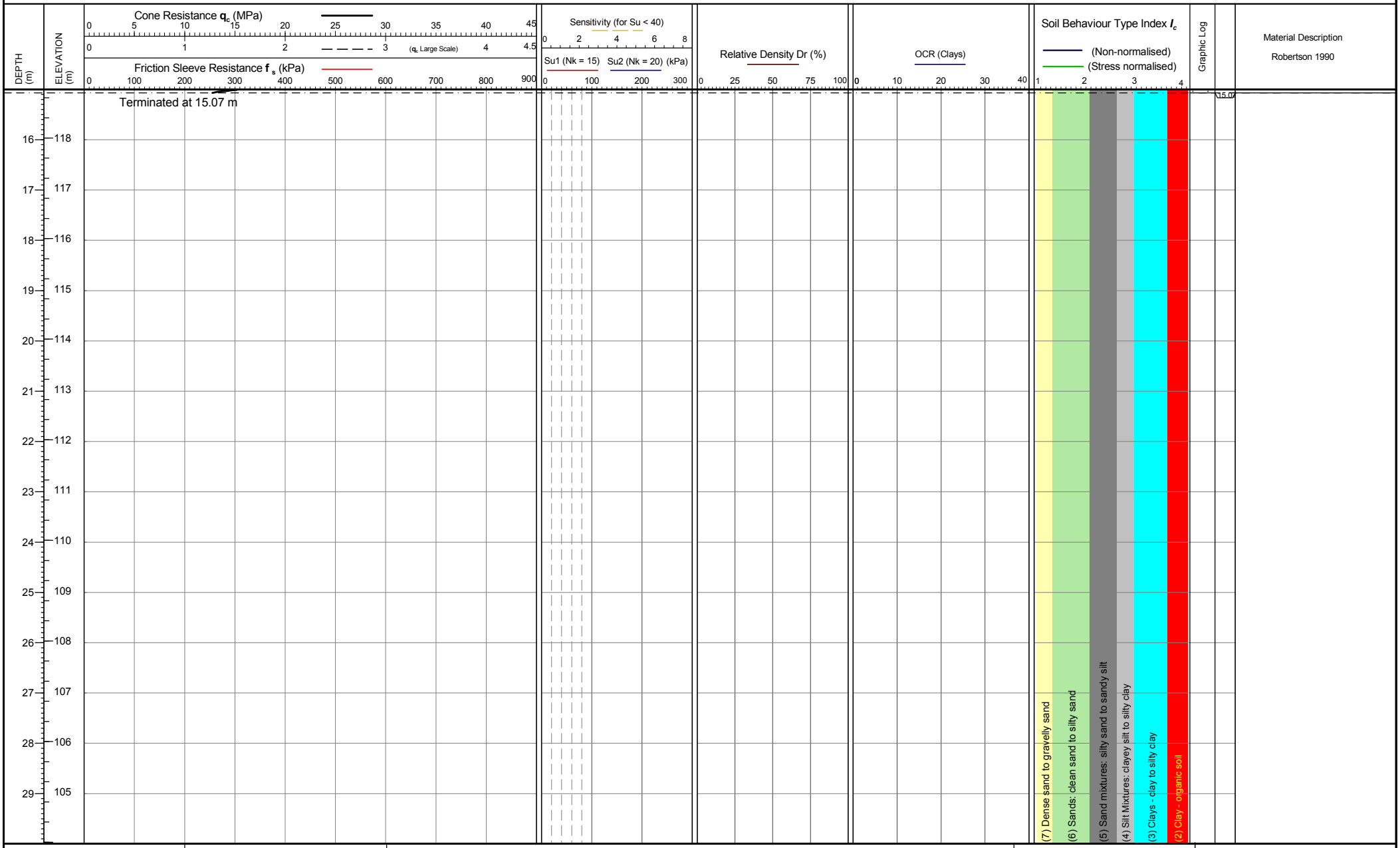
Checked by: Josh Zon

TEST ID: CCL05

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 14:38:09

Location: Hemel Hempstead, UK

Coordinates: 508387.668, 207752.494

Elevation: 133.965

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

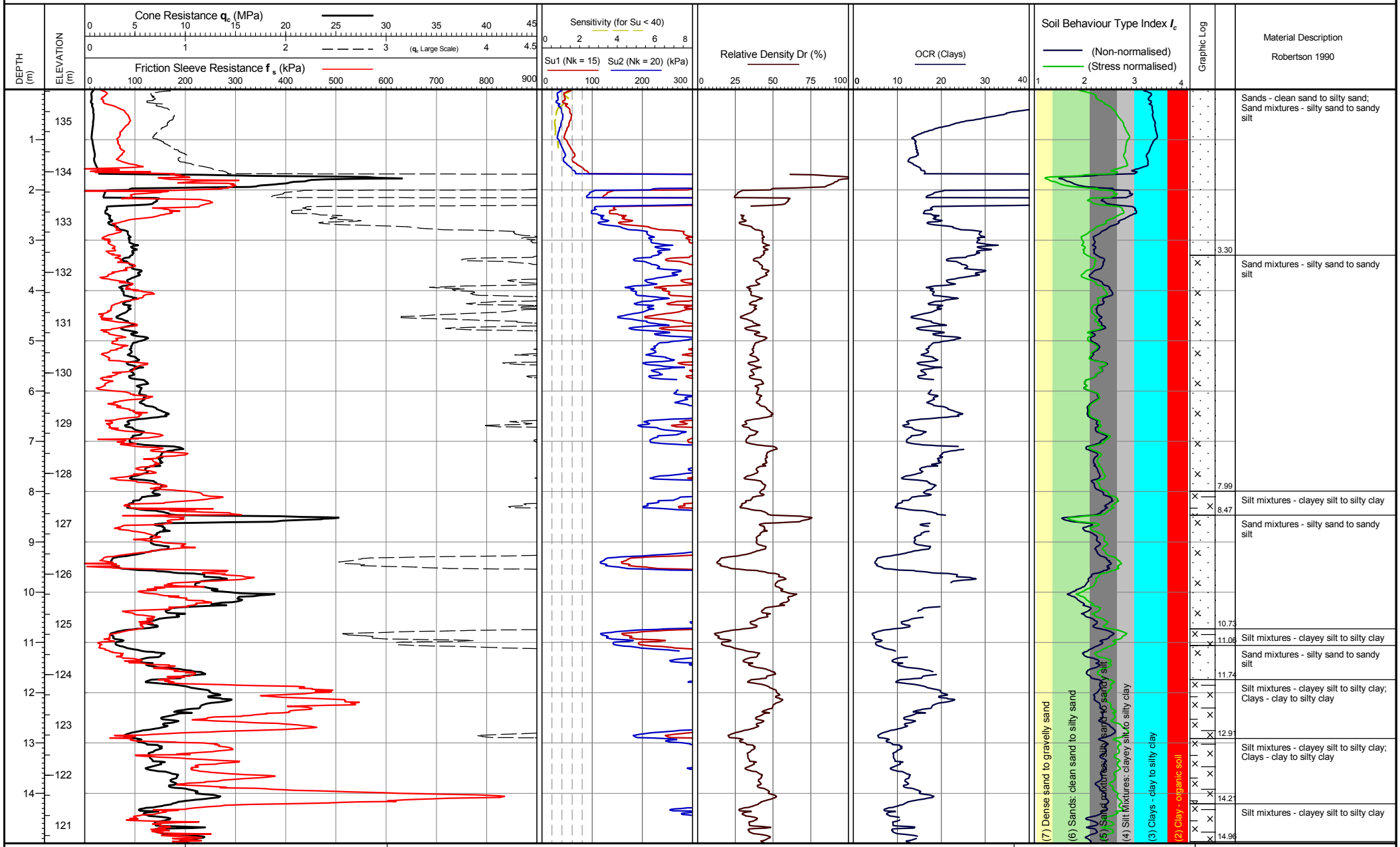
Checked by:
Josh Zon

TEST ID: CCL05

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:15:34

Location: Hemel Hempstead, UK

Coordinates: 508435.35, 207823.331

Elevation: 135.64

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

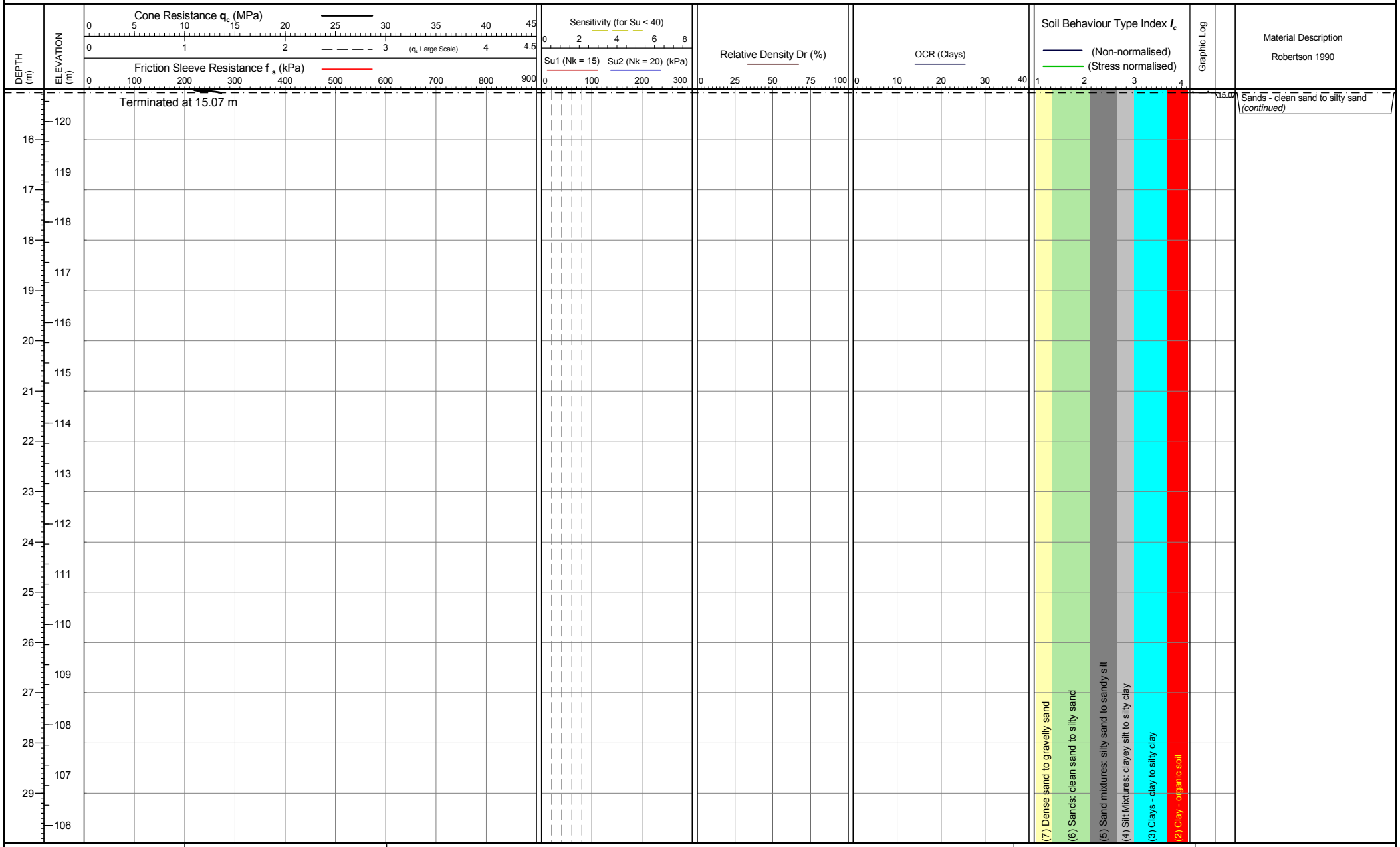
Checked by: Josh Zon

TEST ID: CCL06

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:15:34

Location: Hemel Hempstead, UK

Coordinates: 508435.35, 207823.331

Elevation: 135.64

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

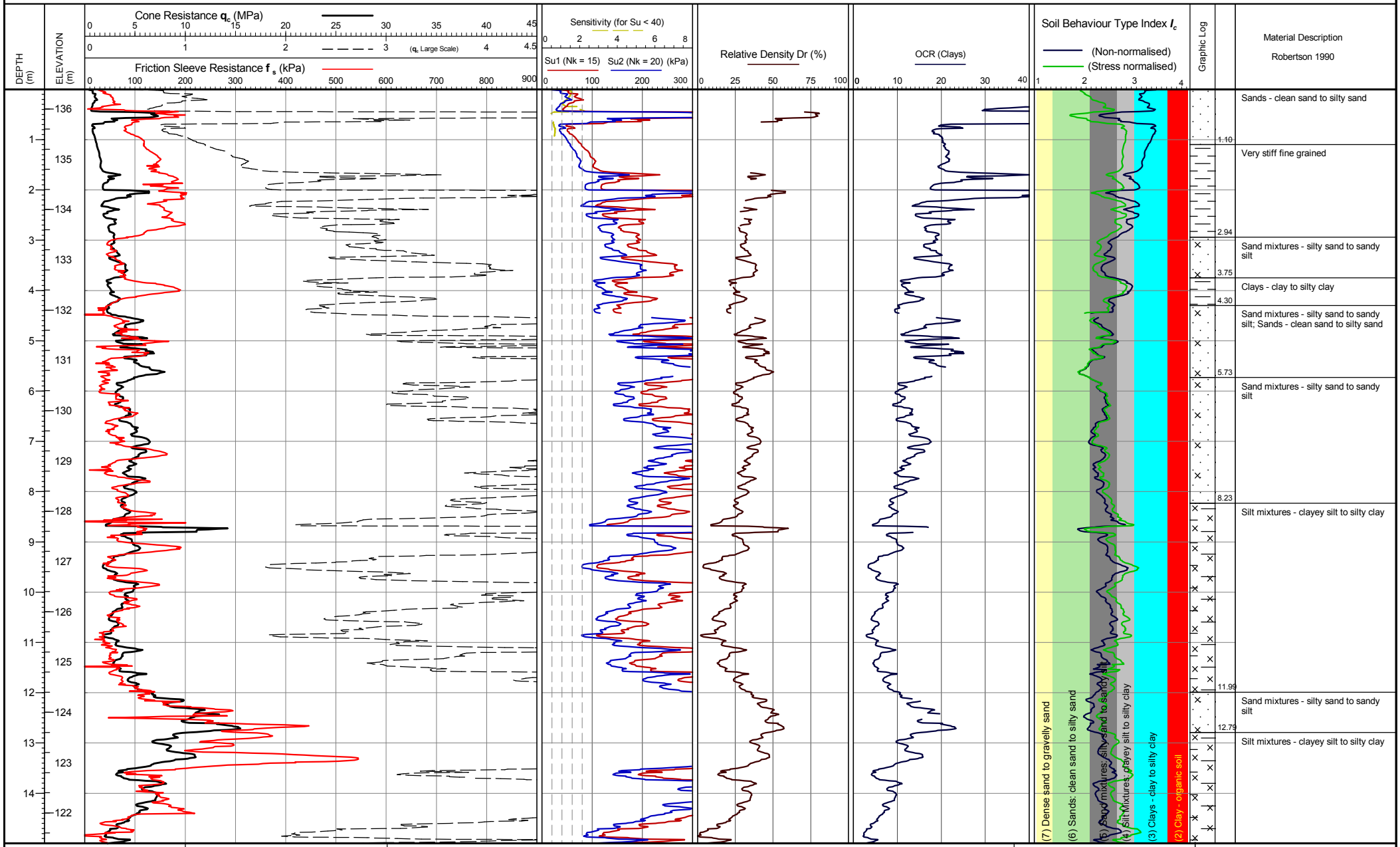
Checked by: Josh Zon

TEST ID: CCL06

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:49:02

Location: Hemel Hempstead, UK

Coordinates: 508476.989, 207823.511

Elevation: 136.39

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

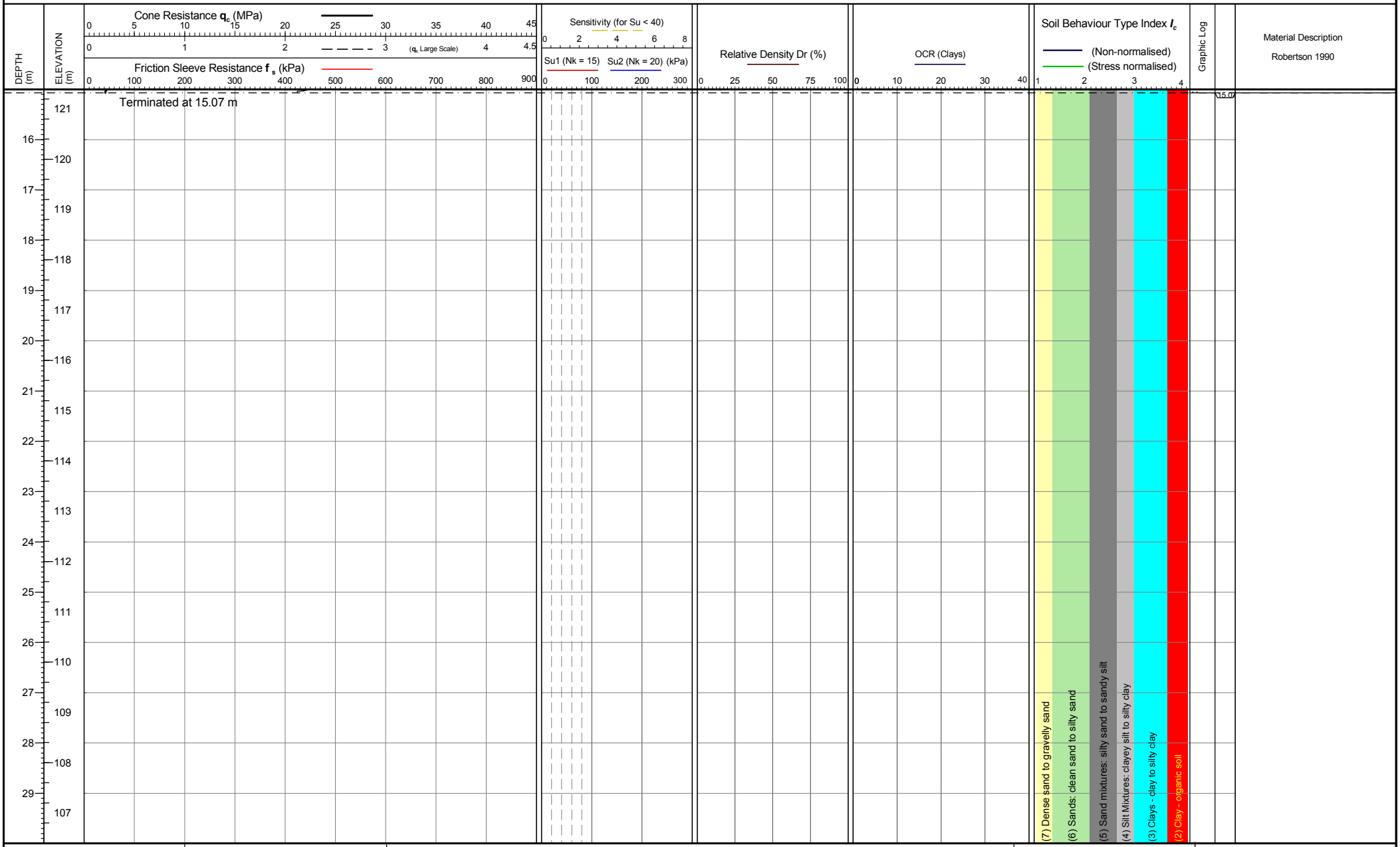
Checked by: Josh Zon

TEST ID: CCL07

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:49:02

Location: Hemel Hempstead, UK

Coordinates: 508476.989, 207823.511

Elevation: 136.39

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

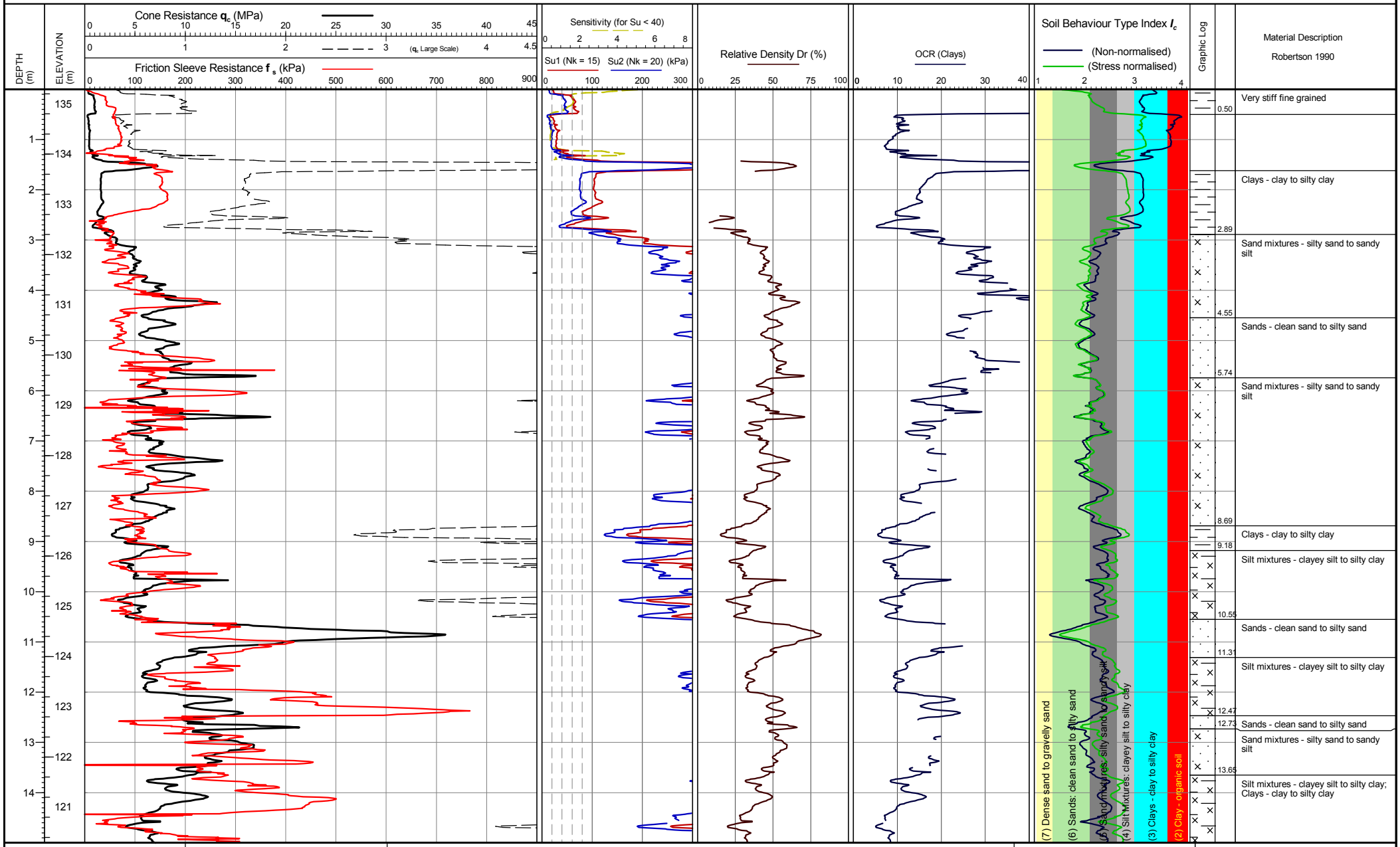
Checked by:
Josh Zon

TEST ID: CCL07

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:48:33

Location: Hemel Hempstead, UK

Coordinates: 508433.827, 207788.124

Elevation: 135.29

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

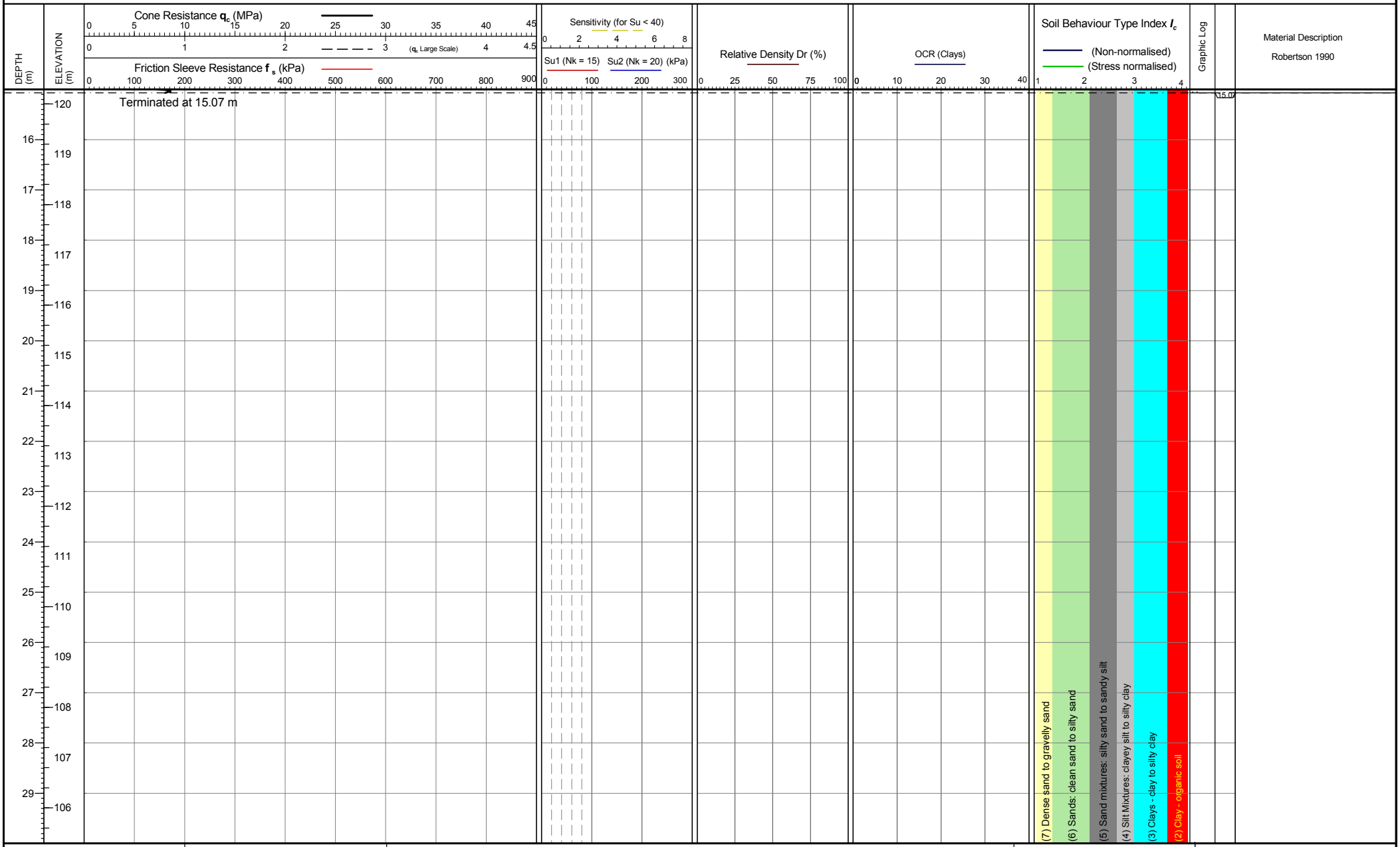
Checked by:
Josh Zon

TEST ID: CCL08

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 11:48:33

Location: Hemel Hempstead, UK

Coordinates: 508433.827, 207788.124

Elevation: 135.29

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

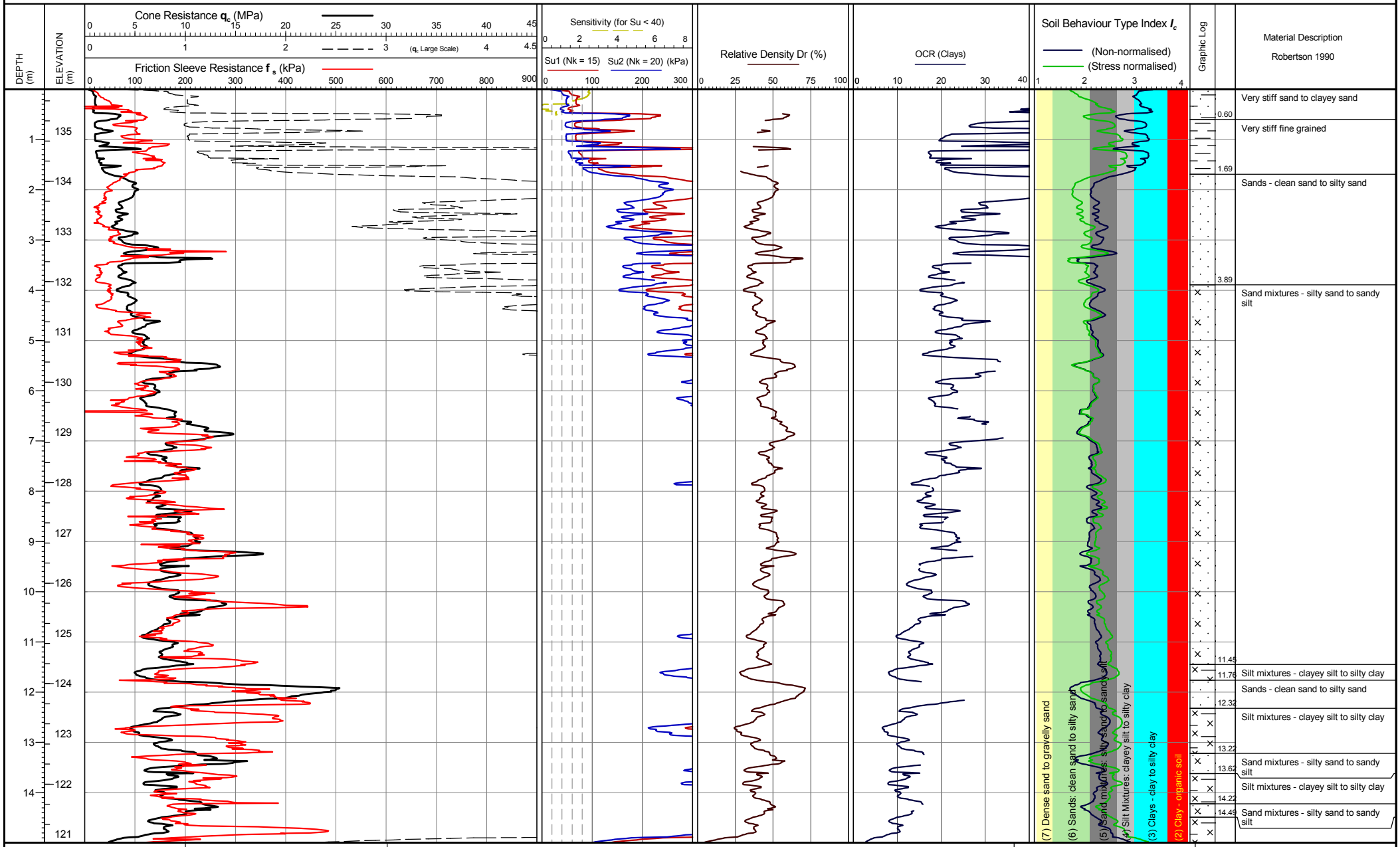
Checked by:
Josh Zon

TEST ID: CCL08

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:17:33

Location: Hemel Hempstead, UK

Coordinates: 508484.1, 207767.453

Elevation: 135.83

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

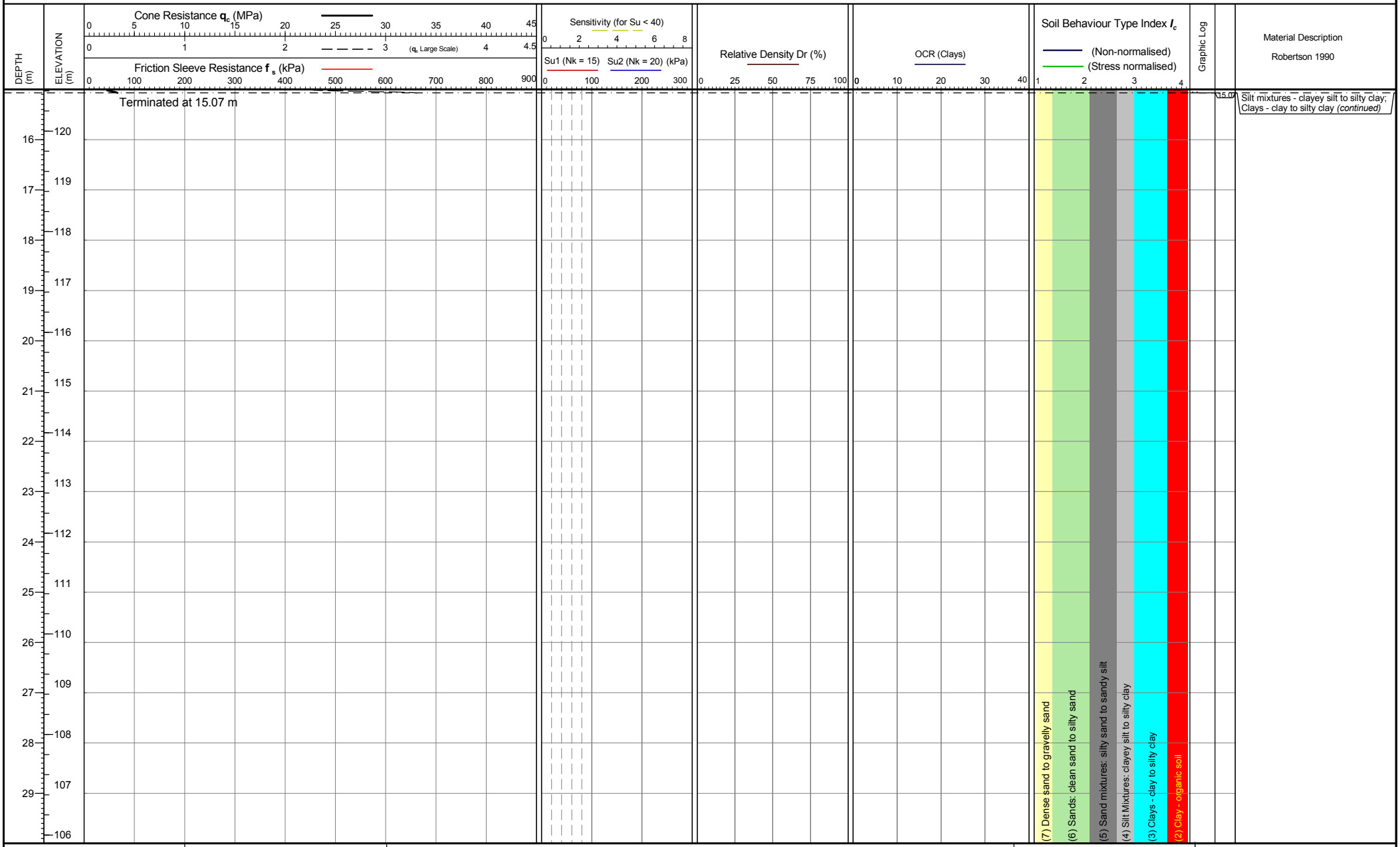
Checked by:
Josh Zon

TEST ID: CCL09

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 13:17:33

Location: Hemel Hempstead, UK

Coordinates: 508484.1, 207767.453

Elevation: 135.83

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

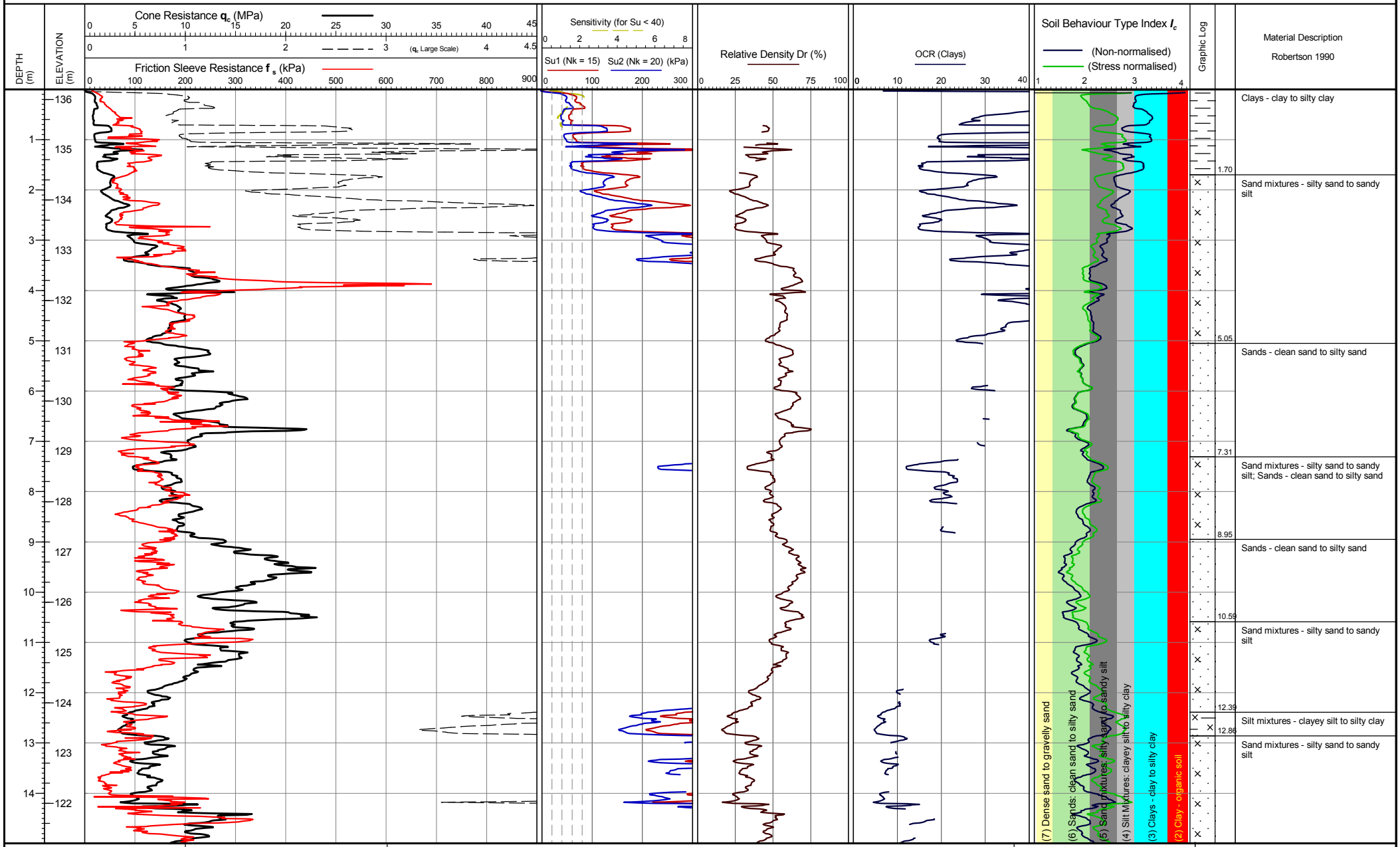
Checked by: Josh Zon

TEST ID: CCL09

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:45:47

Location: Hemel Hempstead, UK

Coordinates: 508527.61, 207754.884

Elevation: 136.2

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

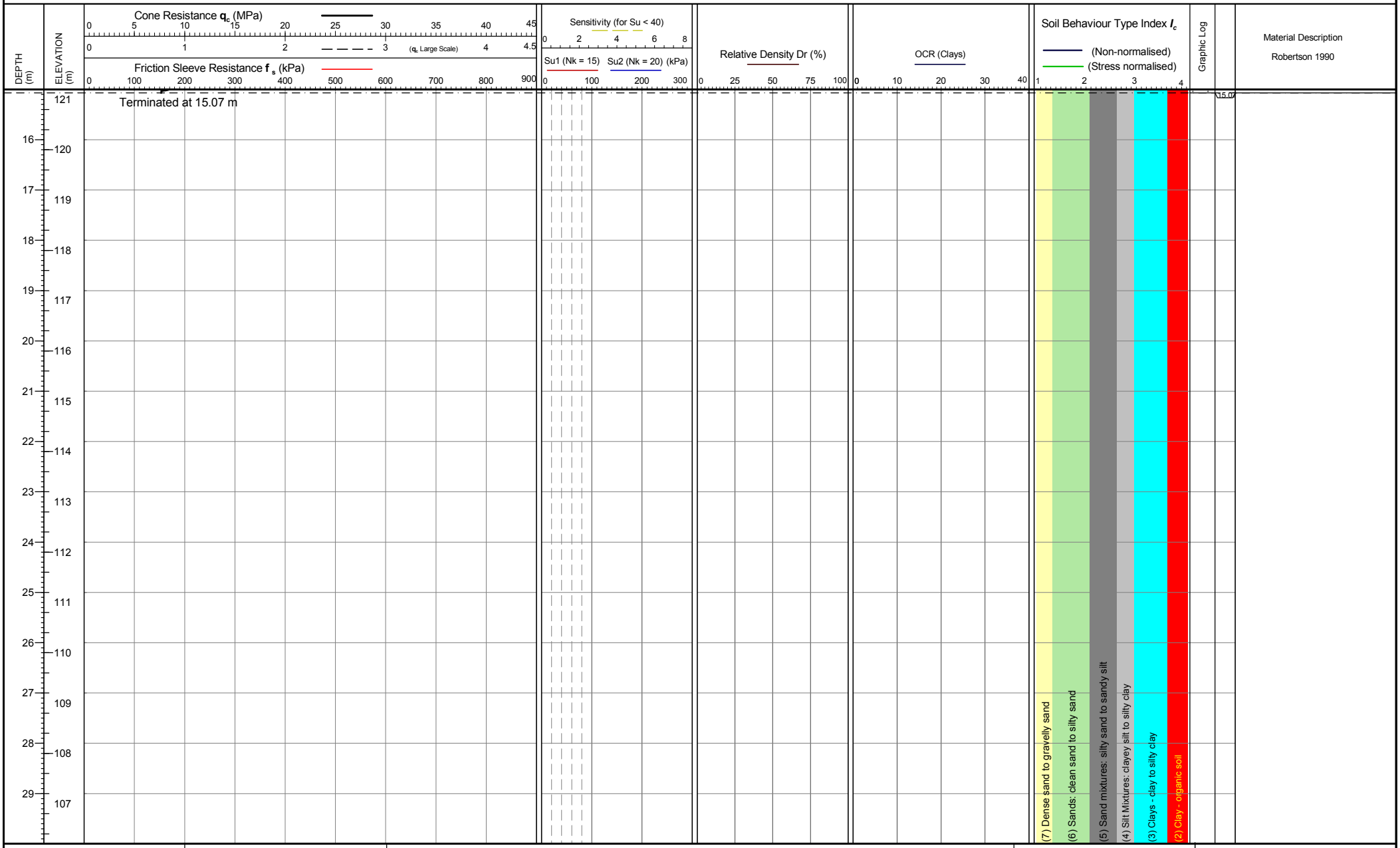
Checked by:
Josh Zon

TEST ID: CCL10

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:45:47

Location: Hemel Hempstead, UK

Coordinates: 508527.61, 207754.884

Elevation: 136.2

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

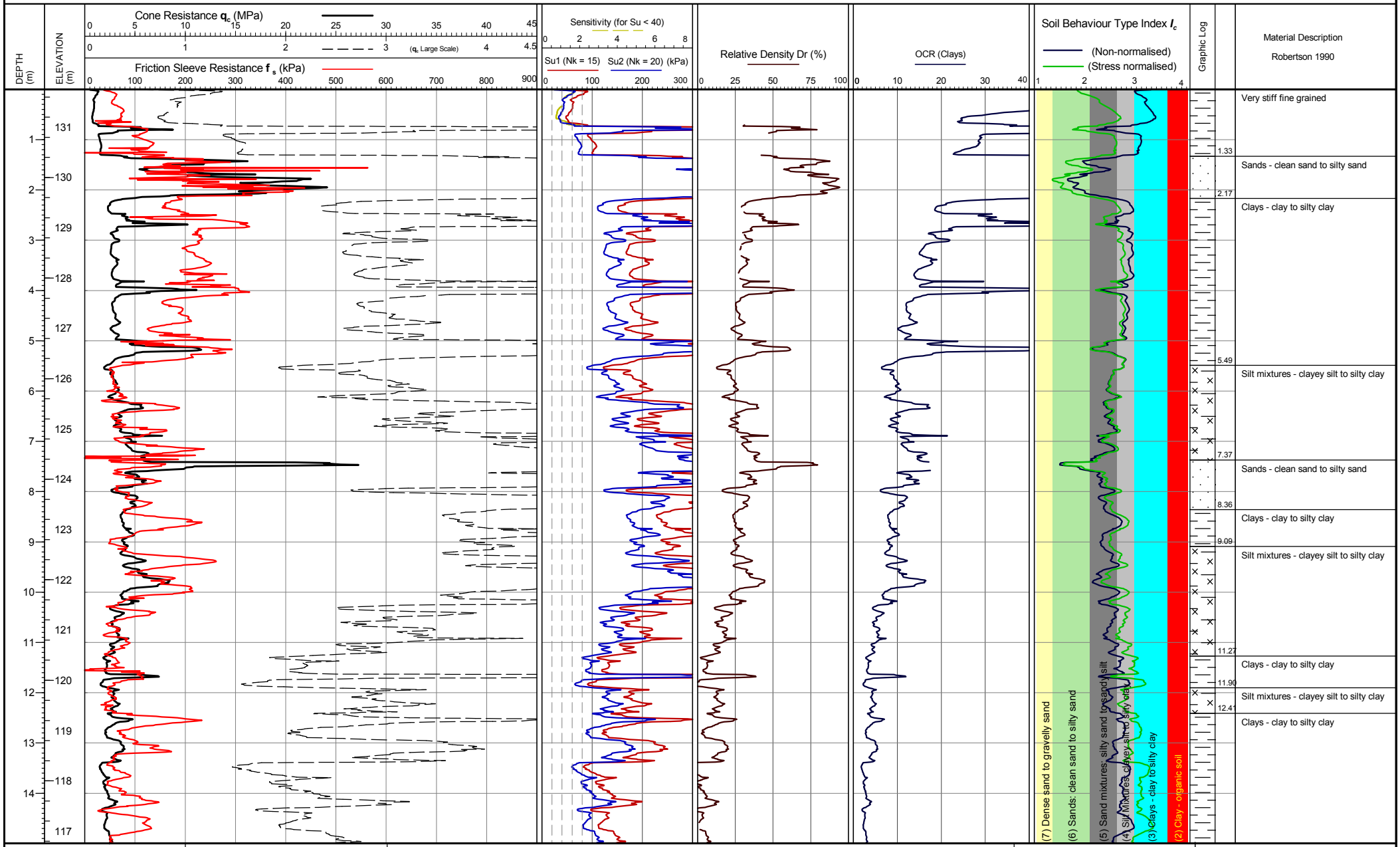
Checked by:
Josh Zon

TEST ID: CCL10

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 14:18:28

Location: Hemel Hempstead, UK

Coordinates: 508171.069, 207731.741

Elevation: 131.753

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

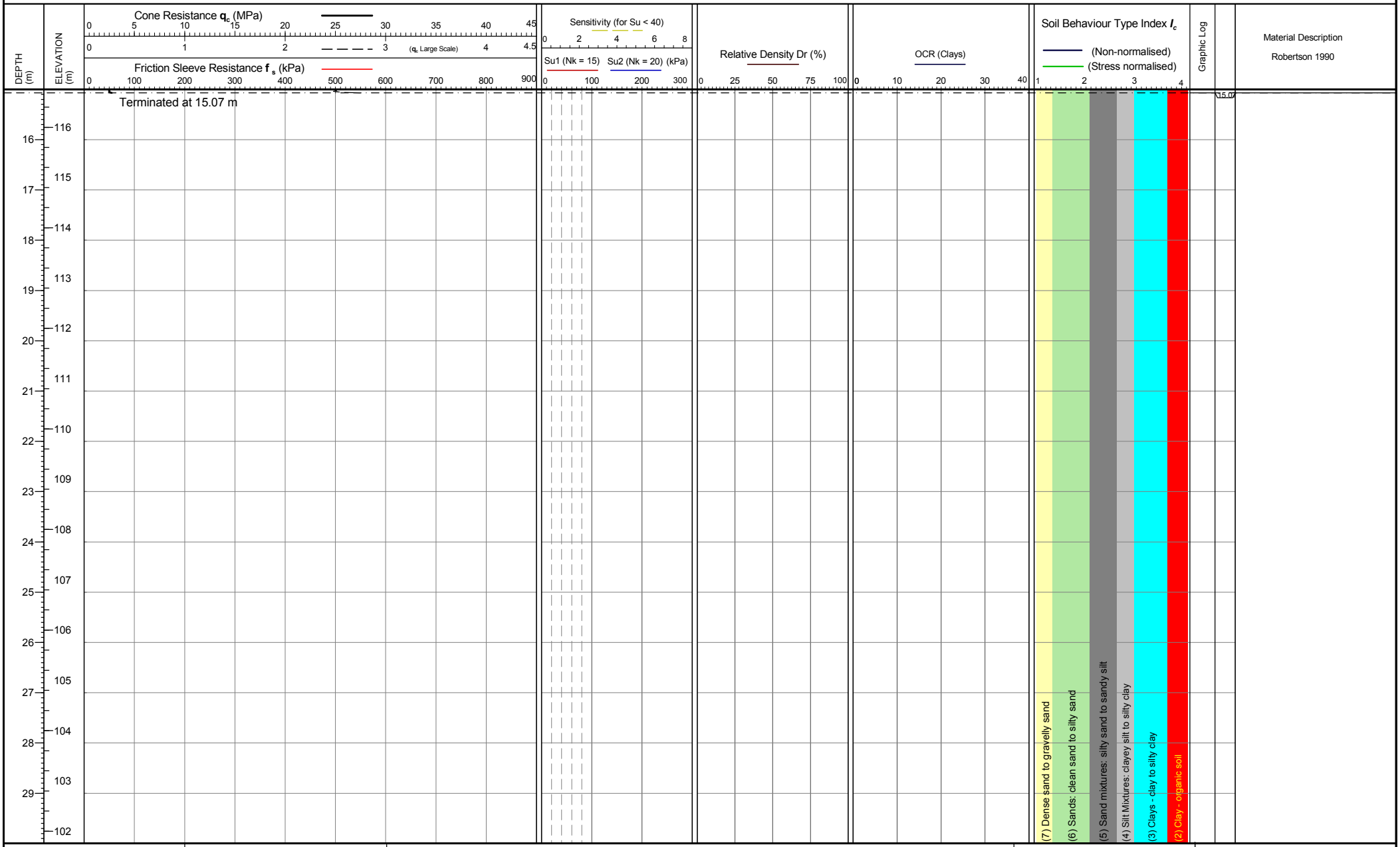
Checked by: Josh Zon

TEST ID: CCL11

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 14:18:28

Location: Hemel Hempstead, UK

Coordinates: 508171.069, 207731.741

Elevation: 131.753

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

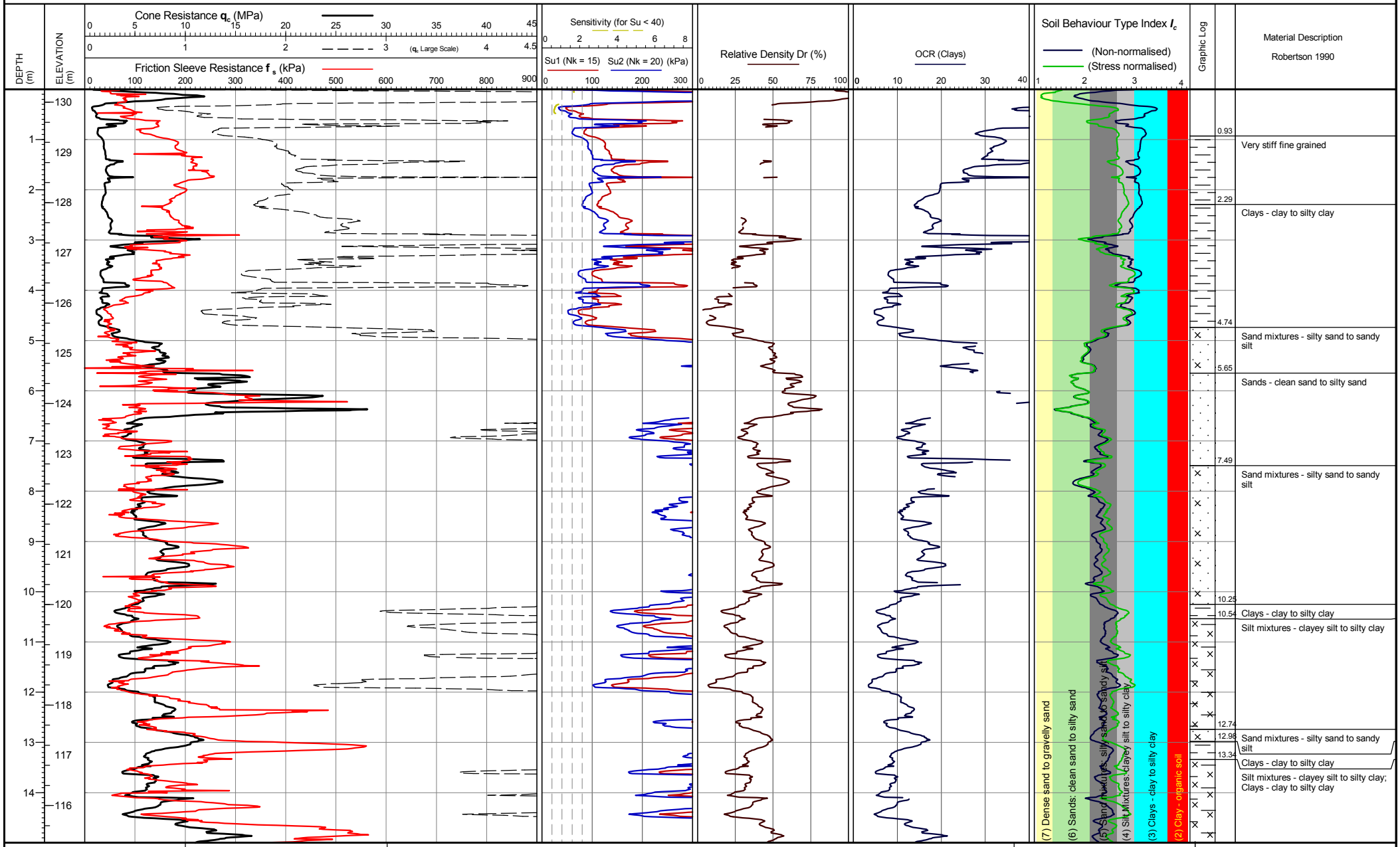
Checked by:
Josh Zon

TEST ID: CCL11

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:05:54

Location: Hemel Hempstead, UK

Coordinates: 508160.863, 207694.942

Elevation: 130.256

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

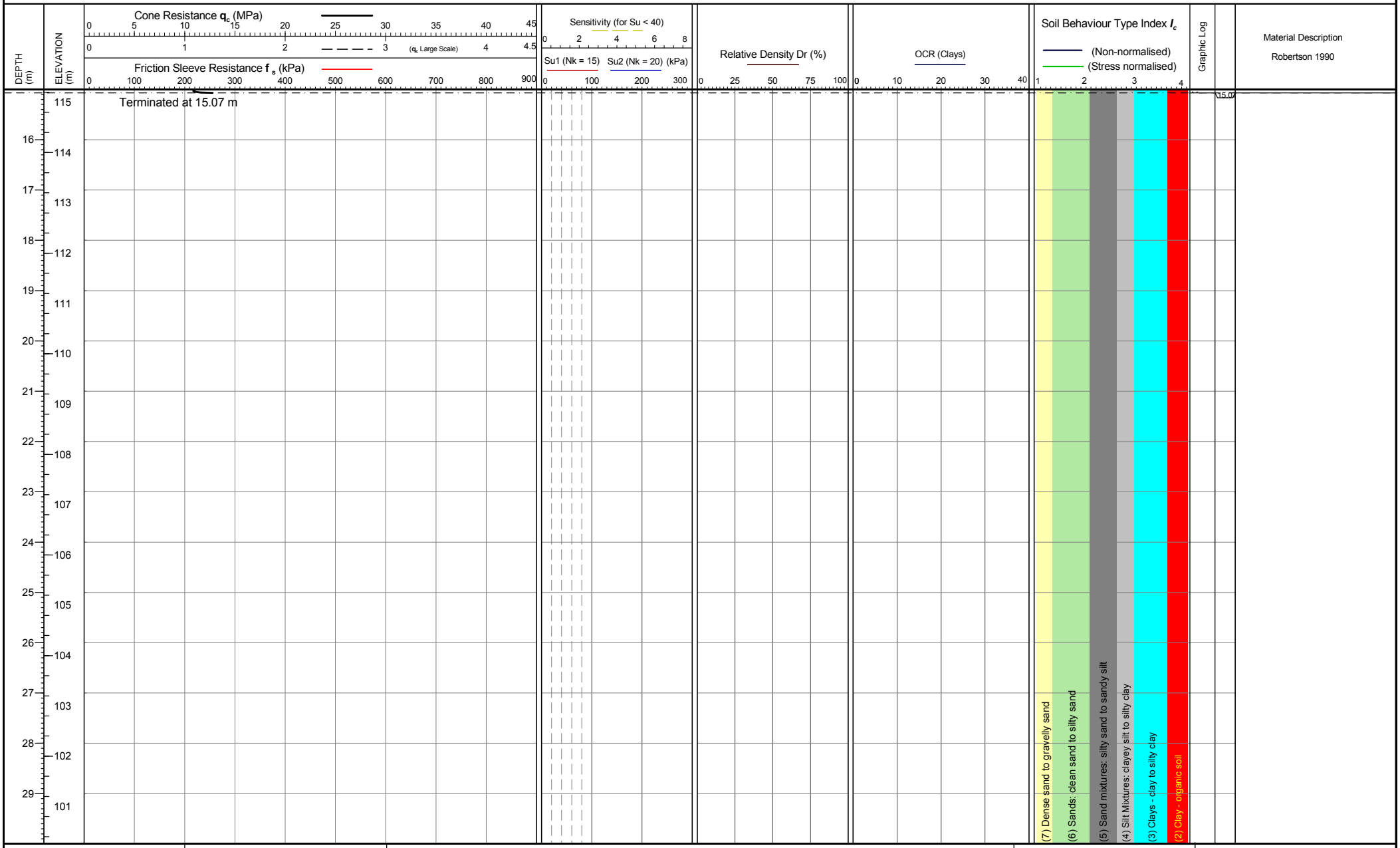
Checked by: Josh Zon

TEST ID: CCL12

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:05:54

Location: Hemel Hempstead, UK

Coordinates: 508160.863, 207694.942

Elevation: 130.256

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

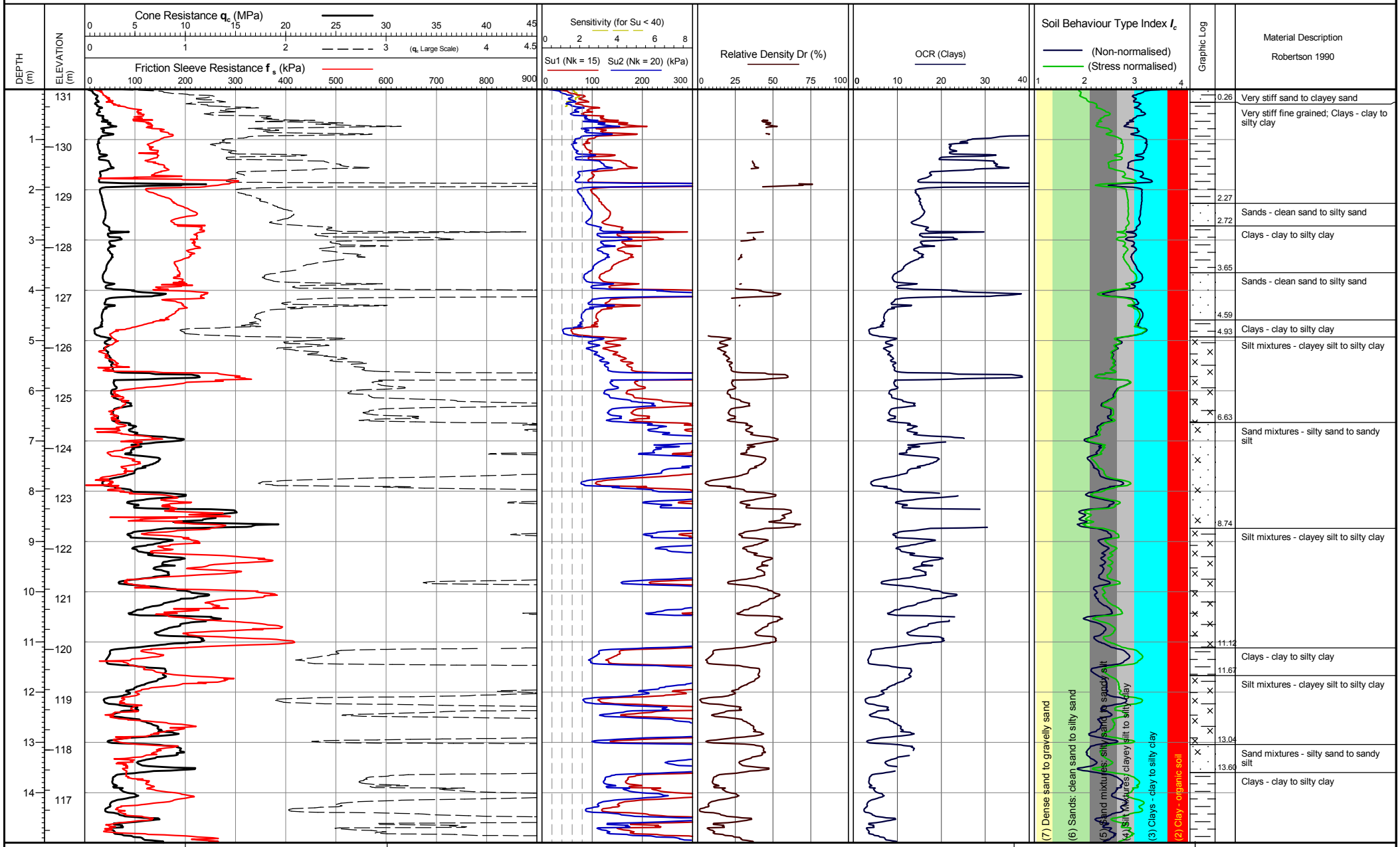
Checked by: Josh Zon

TEST ID: CCL12

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:42:26

Location: Hemel Hempstead, UK

Coordinates: 508209.163, 207728.982

Elevation: 131.15

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

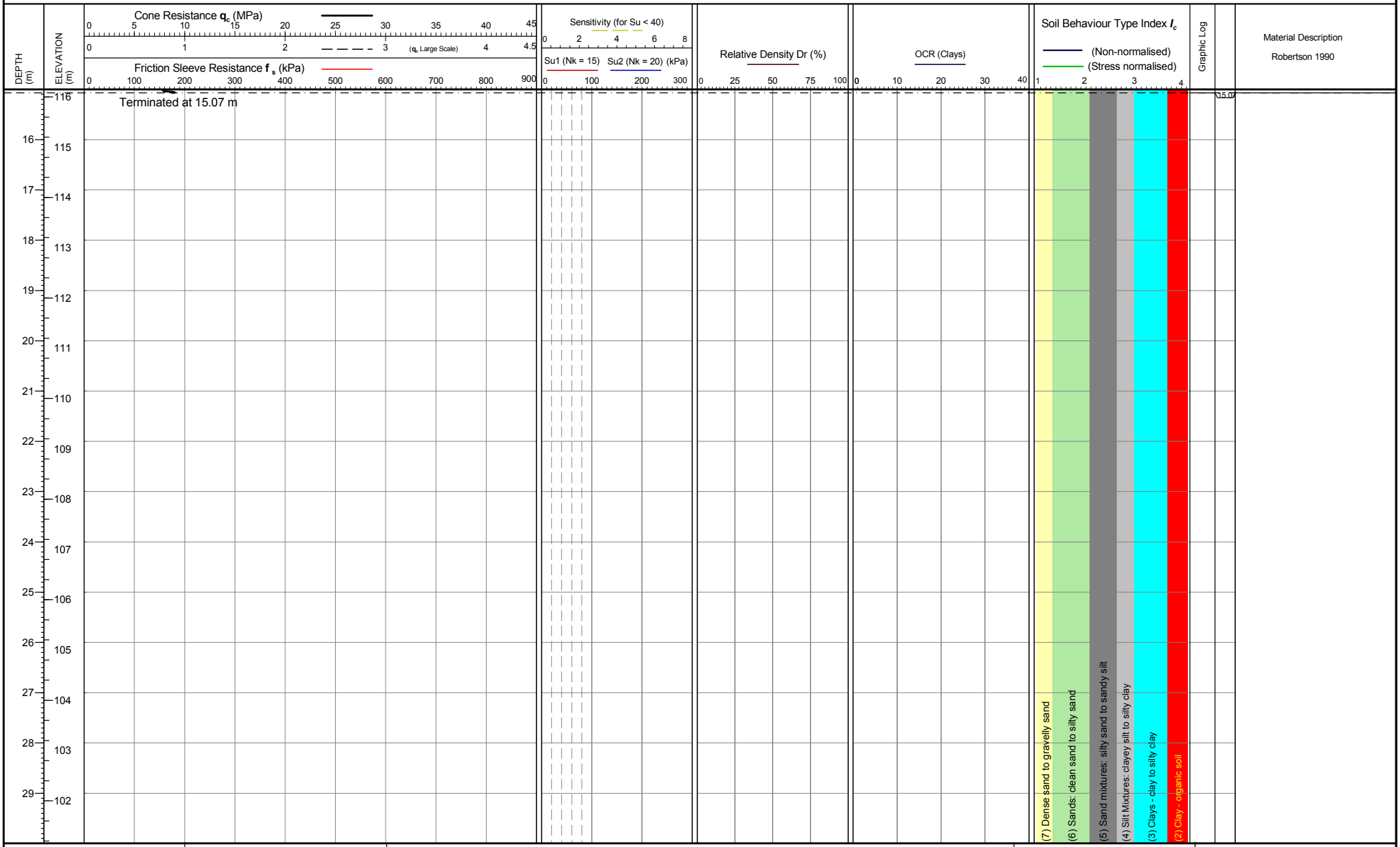
Checked by: Josh Zon

TEST ID: CCL13

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:42:26

Location: Hemel Hempstead, UK

Coordinates: 508209.163, 207728.982

Elevation: 131.15

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

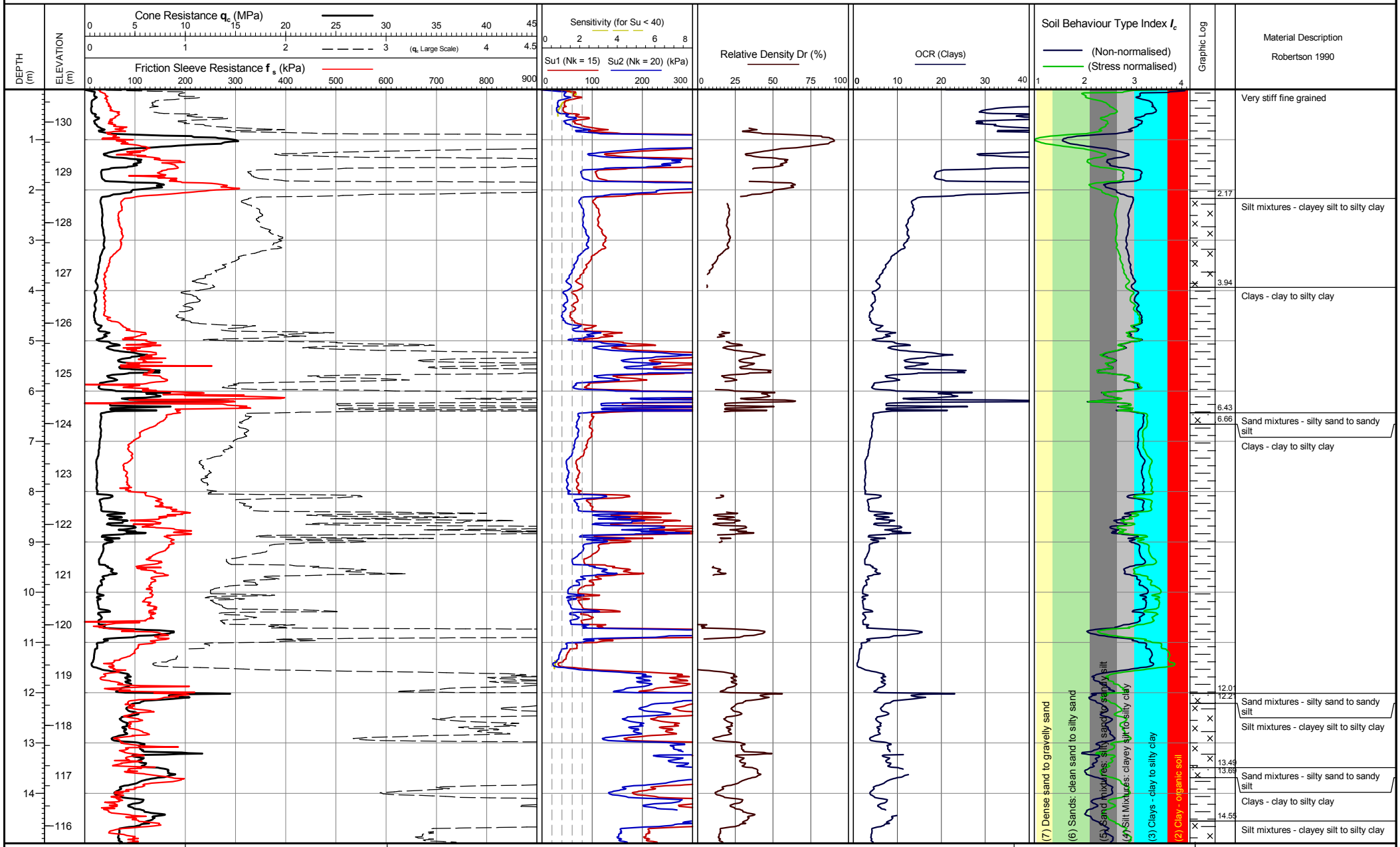
Checked by:
Josh Zon

TEST ID: CCL13

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:09:38

Location: Hemel Hempstead, UK

Coordinates: 508278.581, 207743.837

Elevation: 130.65

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

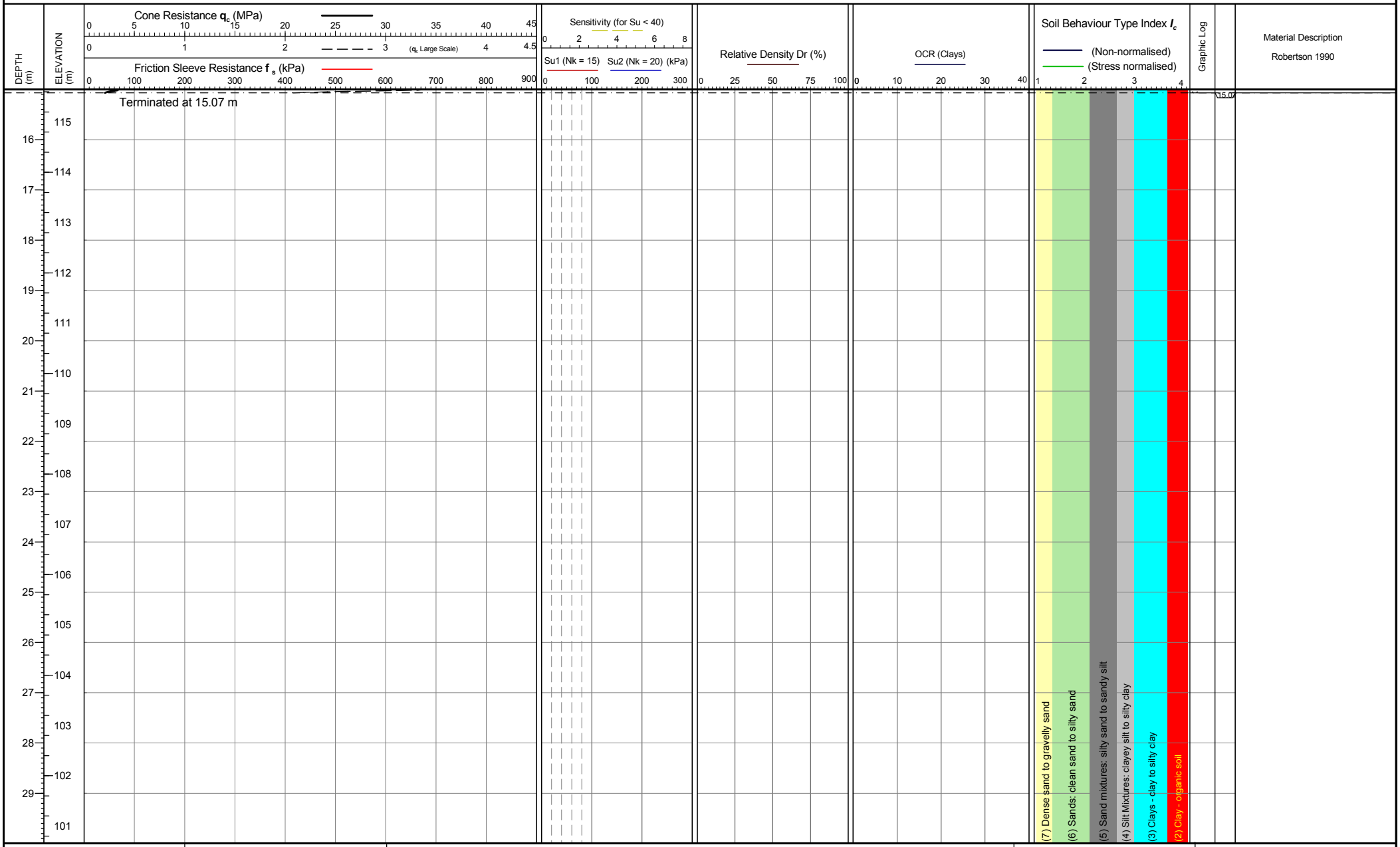
Checked by: Josh Zon

TEST ID: CCL14

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 15:09:38

Location: Hemel Hempstead, UK

Coordinates: 508278.581, 207743.837

Elevation: 130.65

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

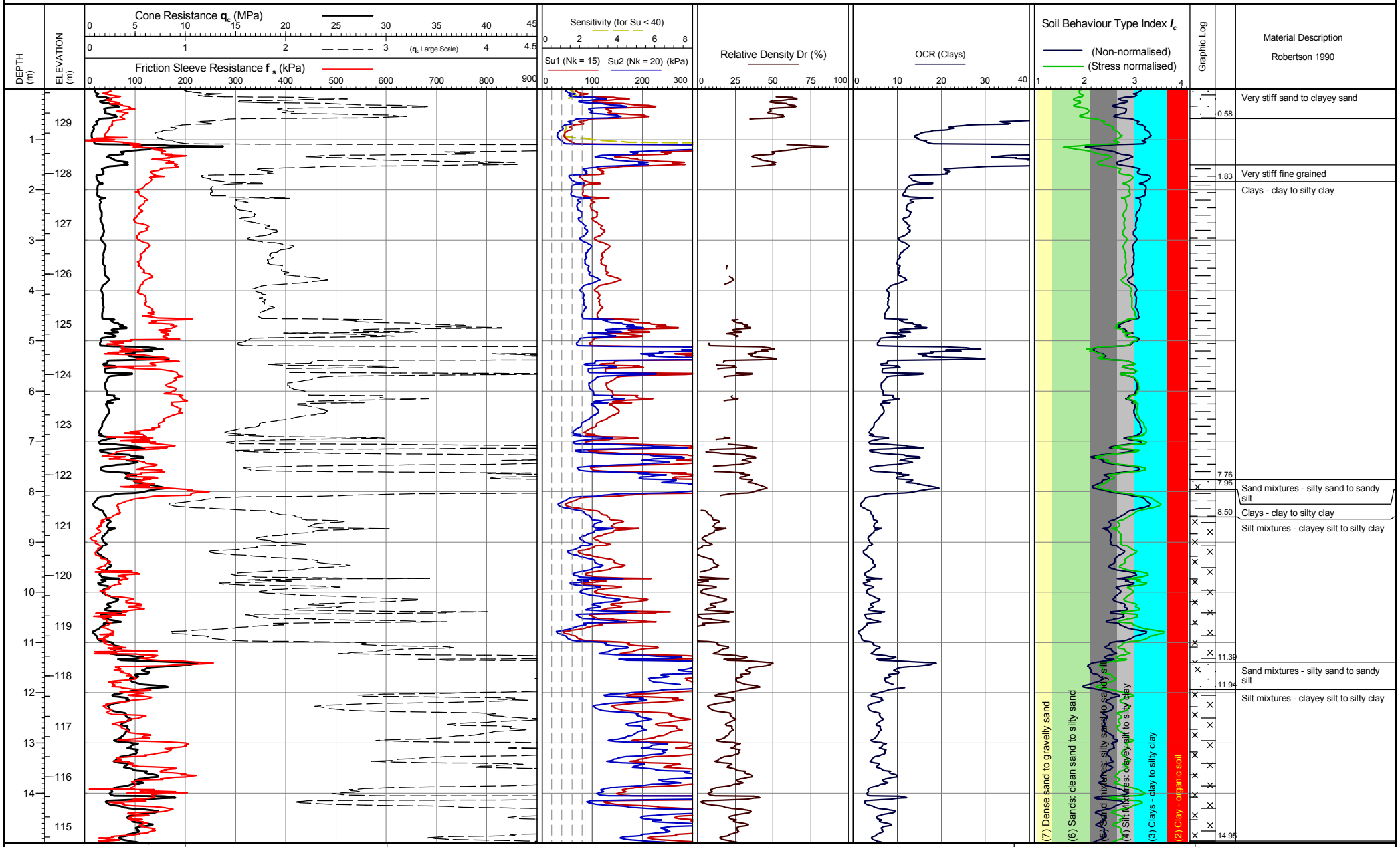
Checked by:
Josh Zon

TEST ID: CCL14

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:15:13

Location: Hemel Hempstead, UK

Coordinates: 508276.337, 207717.285

Elevation: 129.67

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

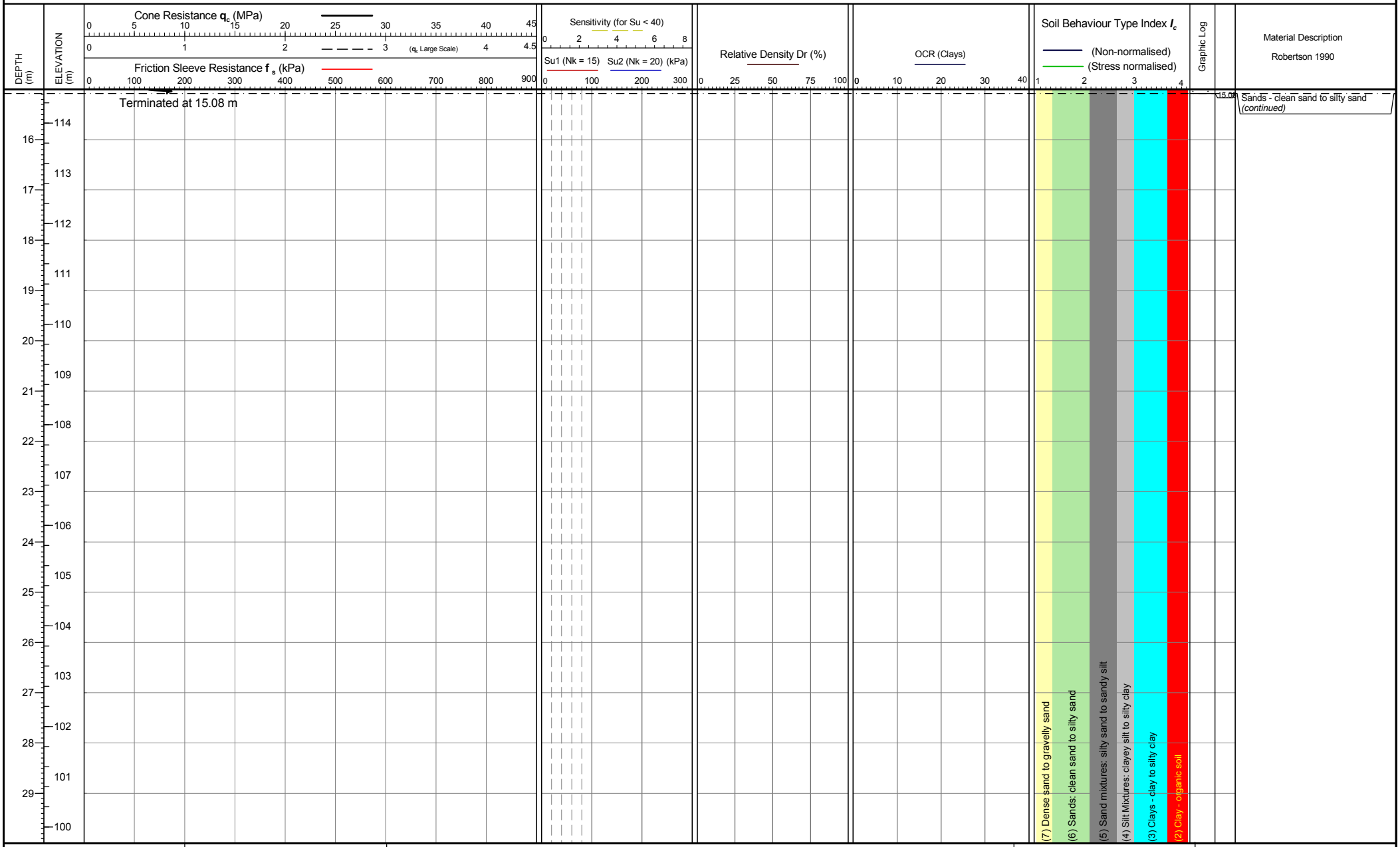
Checked by: Josh Zon

TEST ID: CCL15

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:15:13

Location: Hemel Hempstead, UK

Coordinates: 508276.337, 207717.285

Elevation: 129.67

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

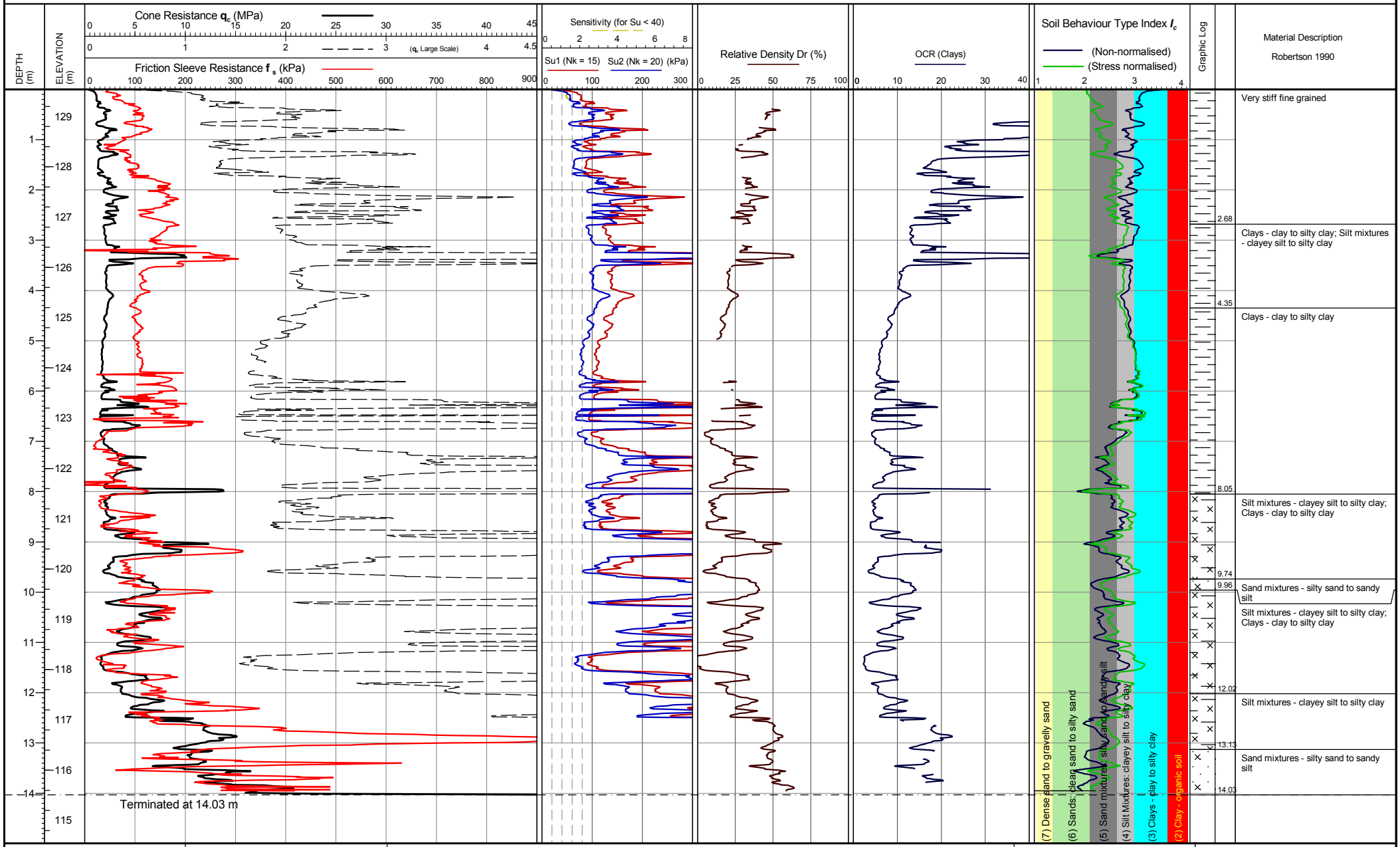
Checked by:
Josh Zon

TEST ID: CCL15

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:22:53

Location: Hemel Hempstead, UK

Coordinates: 508270.137, 207695.723

Elevation: 129.54

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

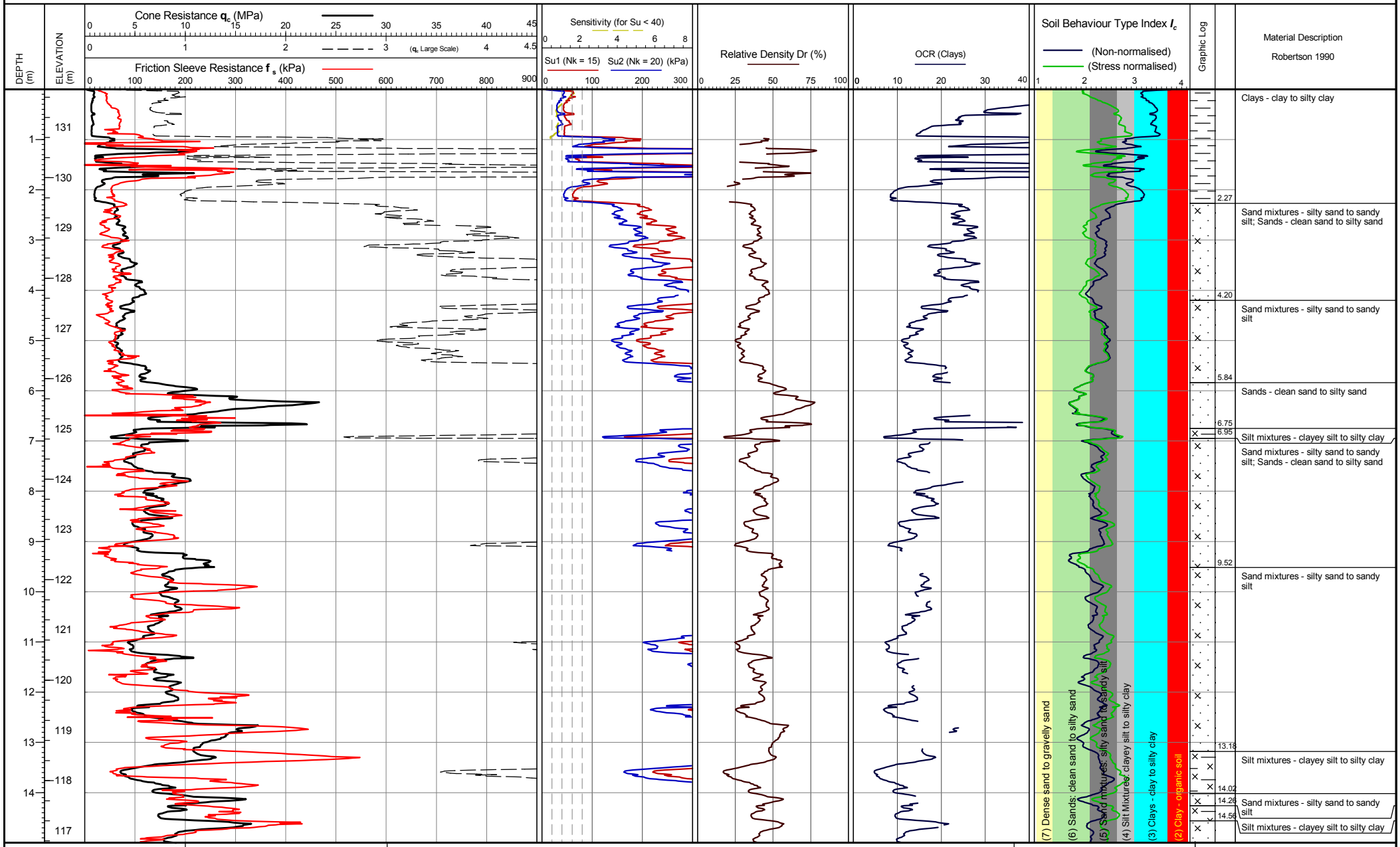
Checked by: Josh Zon

TEST ID: CCL16

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:50:24

Location: Hemel Hempstead, UK

Coordinates: 508339.288, 207714.211

Elevation: 131.76

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

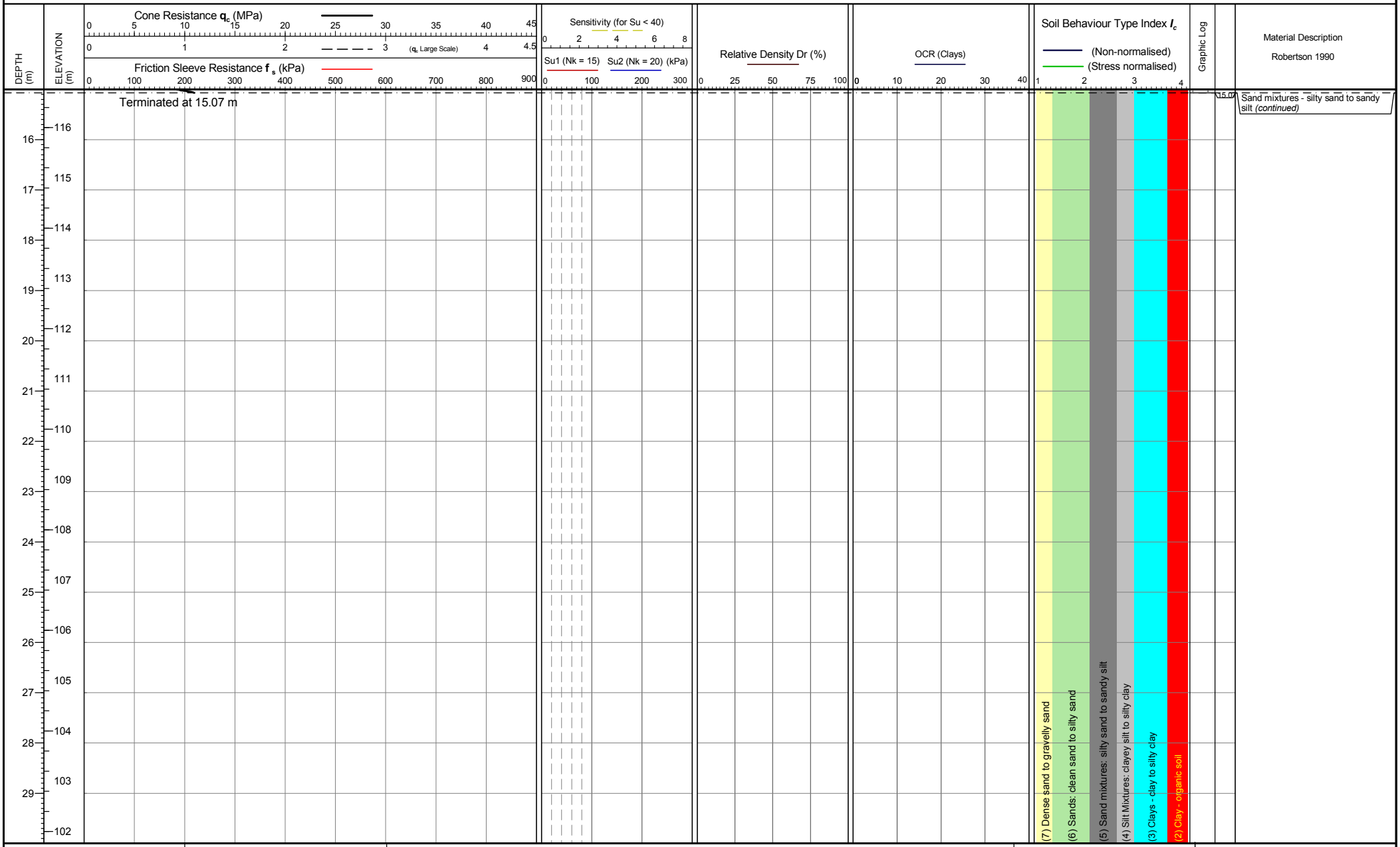
Checked by:
Josh Zon

TEST ID: CCL17

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 16:50:24

Location: Hemel Hempstead, UK

Coordinates: 508339.288, 207714.211

Elevation: 131.76

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

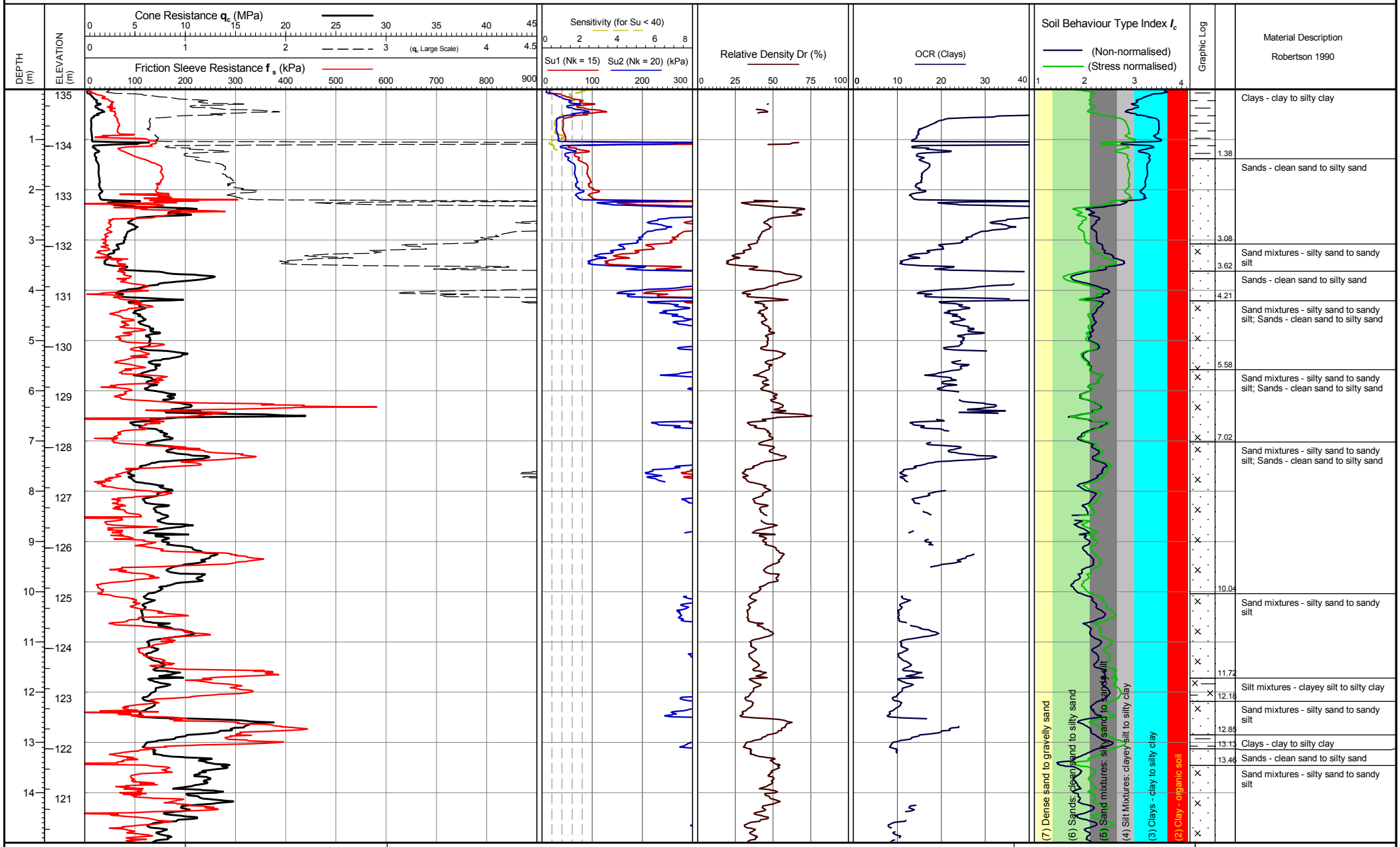
Checked by:
Josh Zon

TEST ID: CCL17

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:18:14

Location: Hemel Hempstead, UK

Coordinates: 508439.759, 207729.16

Elevation: 135.13

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

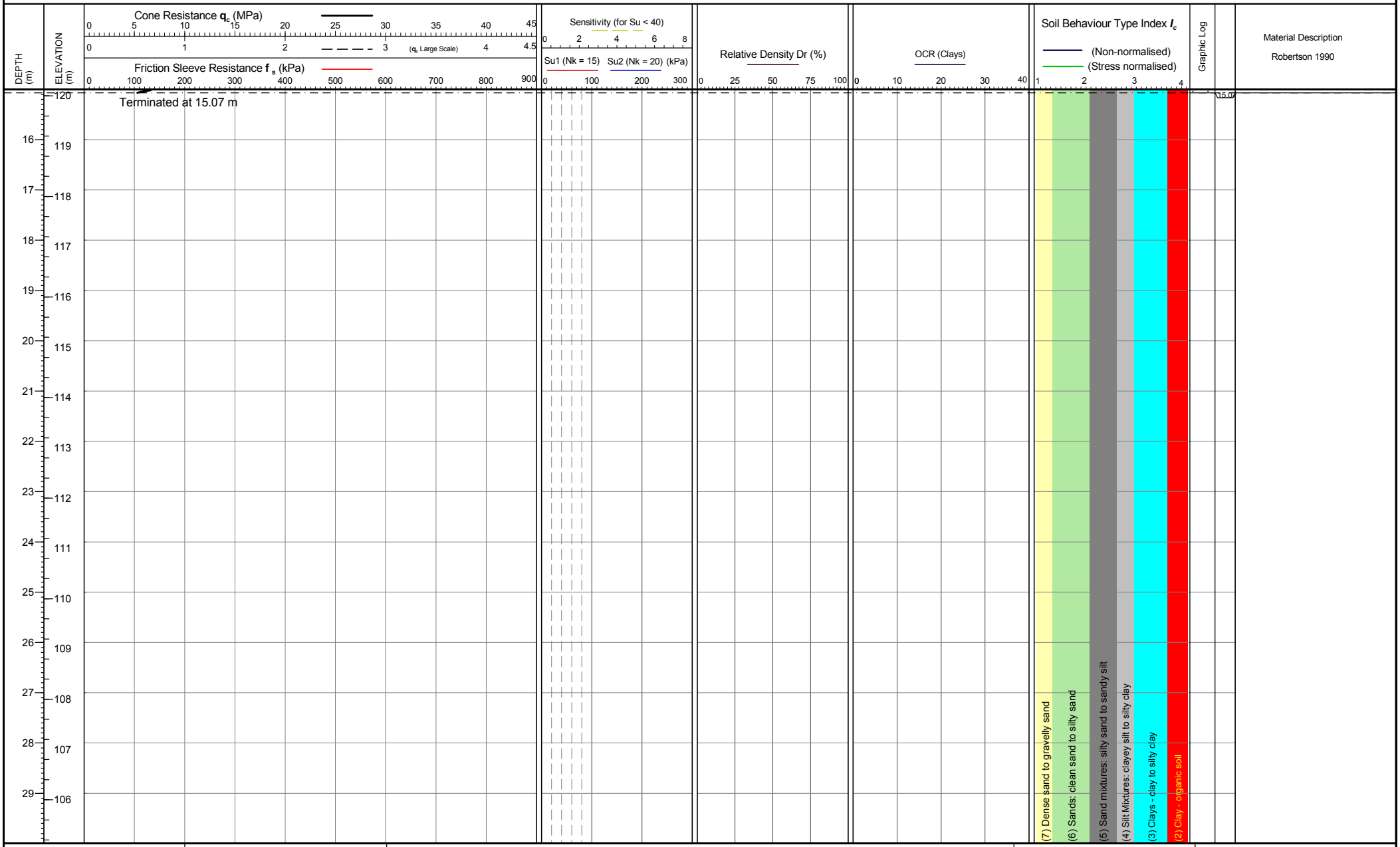
Checked by:
Josh Zon

TEST ID: CCL18

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 27/03/2017 12:18:14

Location: Hemel Hempstead, UK

Coordinates: 508439.759, 207729.16

Elevation: 135.13

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

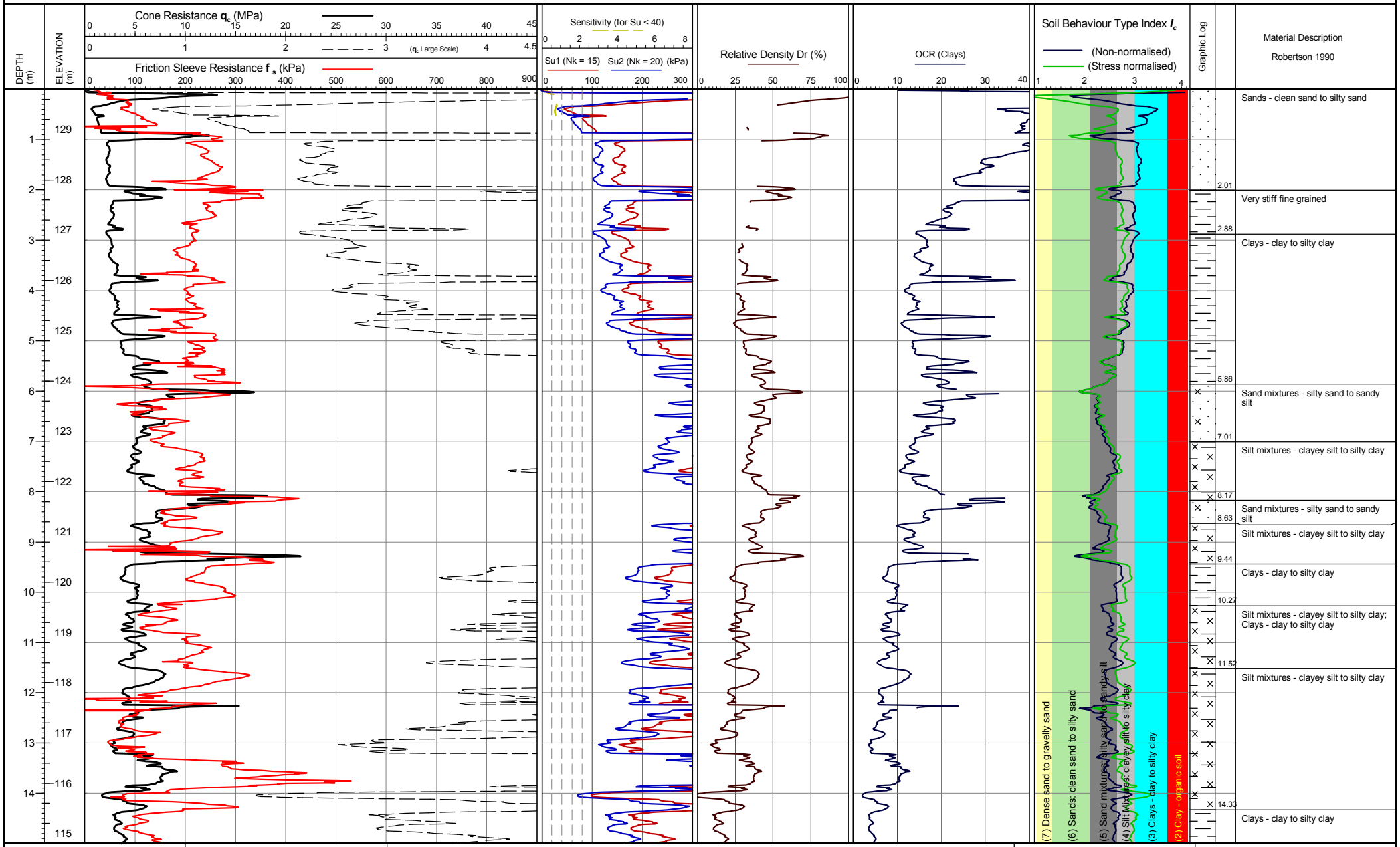
Checked by:
Josh Zon

TEST ID: CCL18

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 12:35:17

Location: Hemel Hempstead, UK

Coordinates: 508164.423, 207630.55

Elevation: 129.8

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

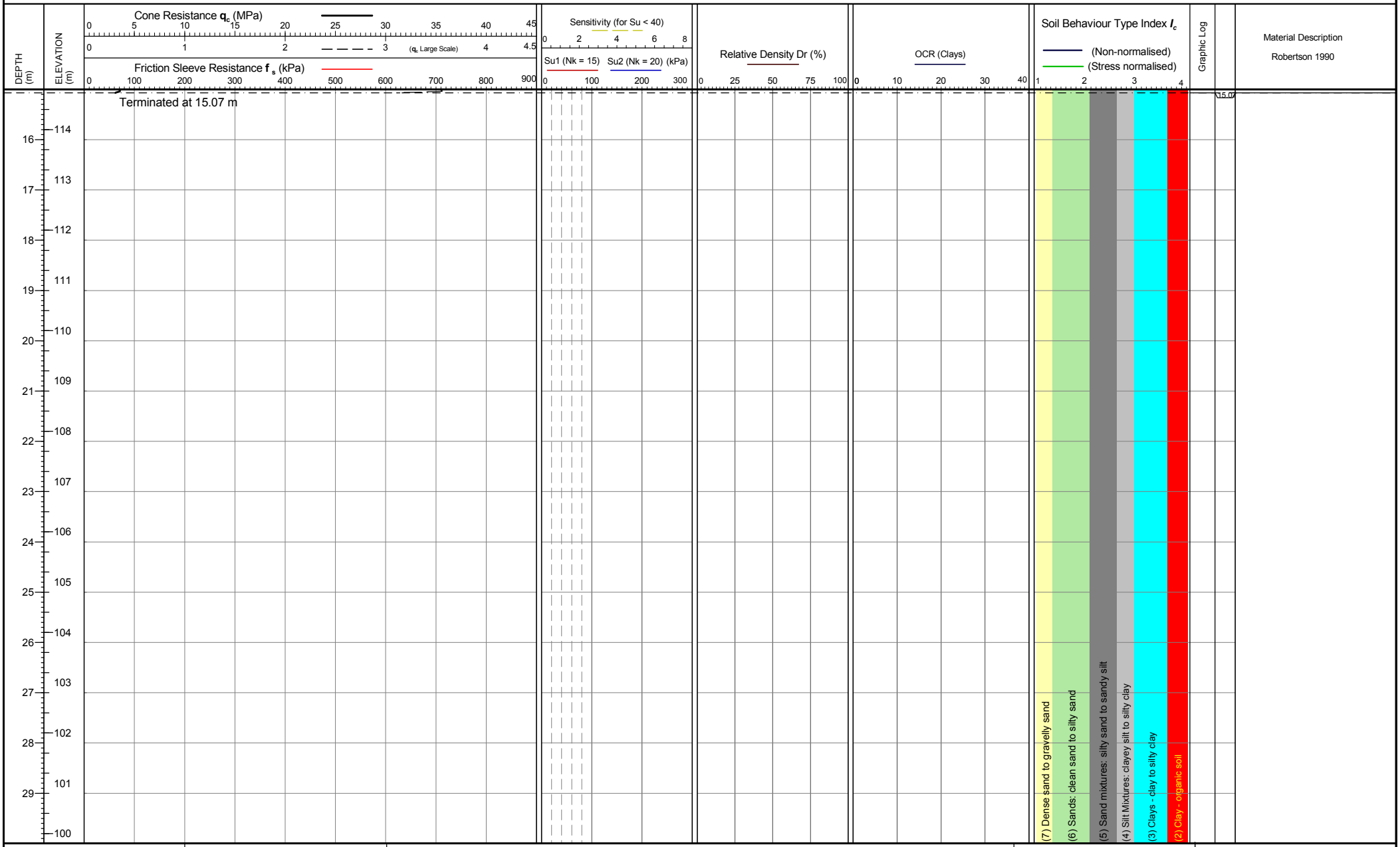
Checked by: Josh Zon

TEST ID: CCL19

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 12:35:17

Location: Hemel Hempstead, UK

Coordinates: 508164.423, 207630.55

Elevation: 129.8

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

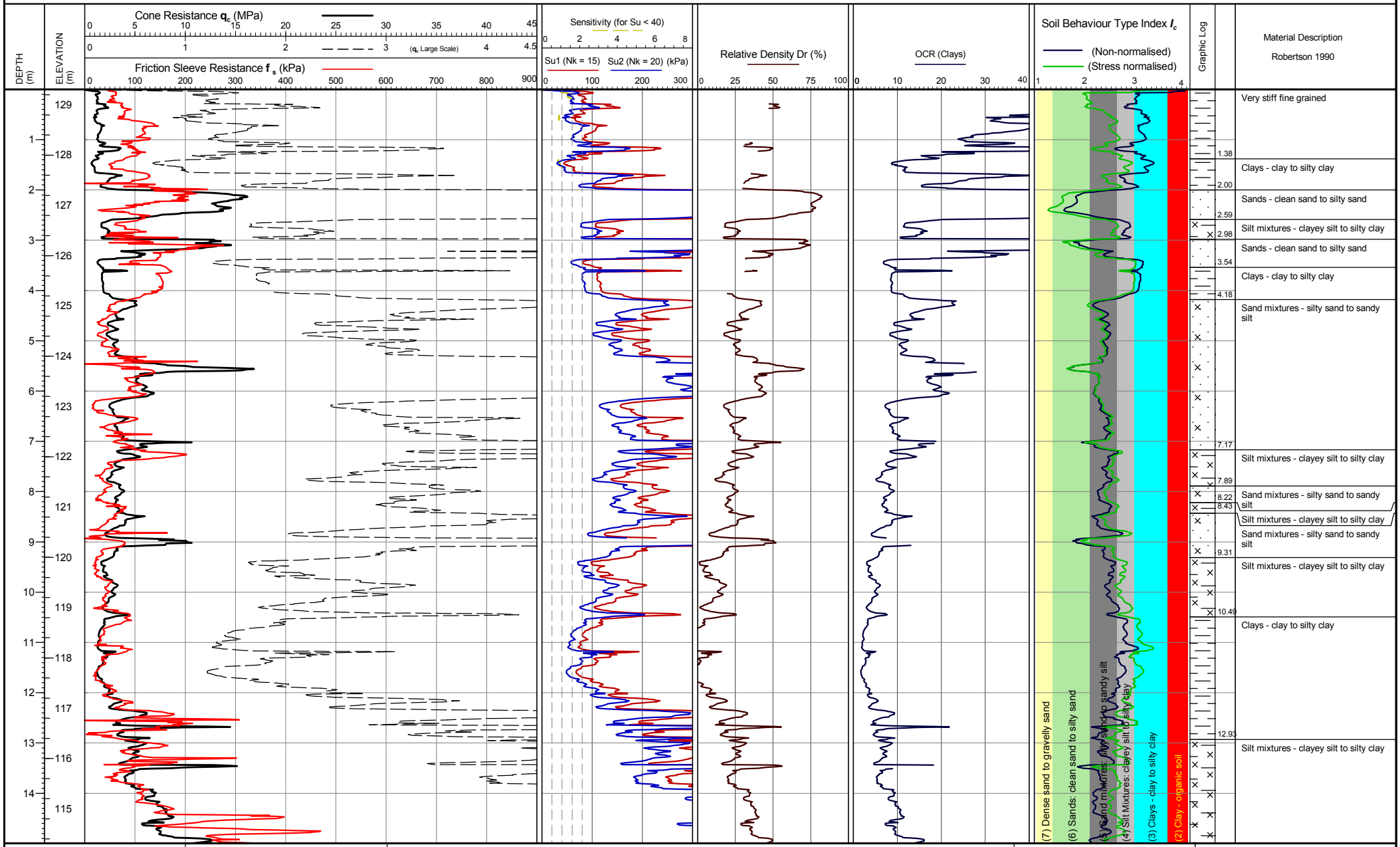
Checked by:
Josh Zon

TEST ID: CCL19

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:55:54

Location: Hemel Hempstead, UK

Coordinates: 508271.205, 207661.637

Elevation: 129.308

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

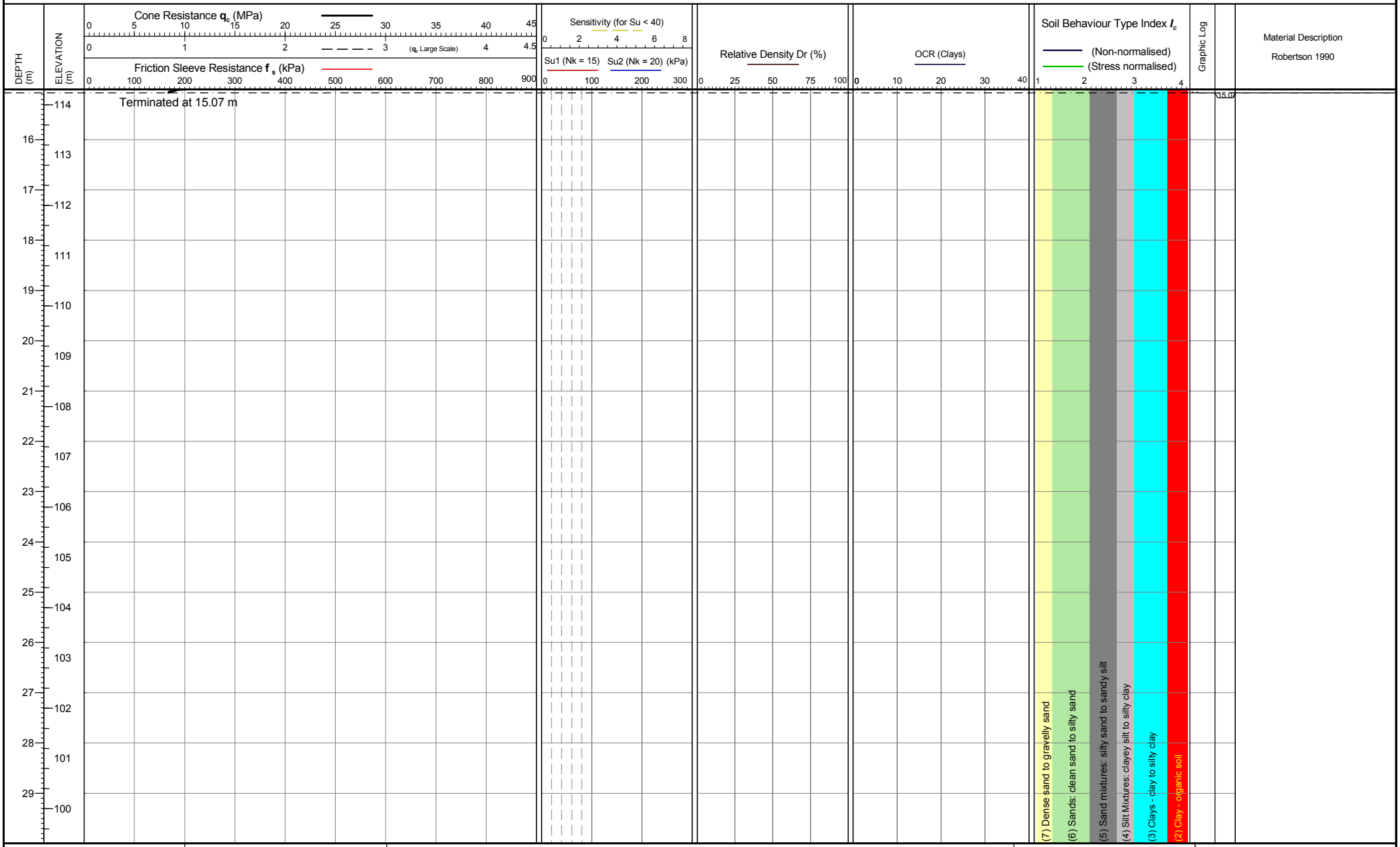
Checked by: Josh Zon

TEST ID: CCL20

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 08:55:54

Location: Hemel Hempstead, UK

Coordinates: 508271.205, 207661.637

Elevation: 129.308

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

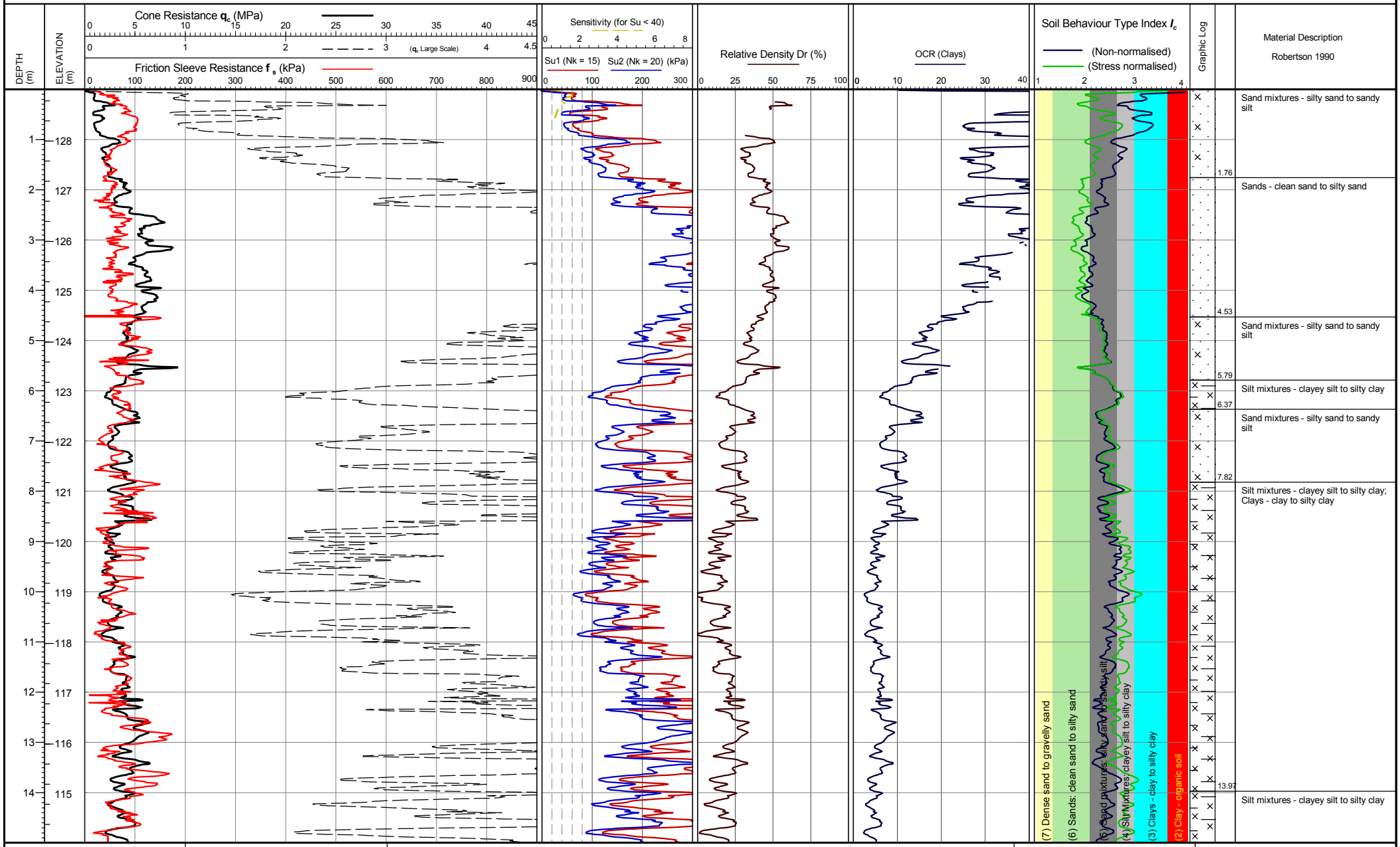
Checked by:
Josh Zon

TEST ID: CCL20

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 09:30:06

Location: Hemel Hempstead, UK

Coordinates: 508323.275, 207634.071

Elevation: 129.03

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

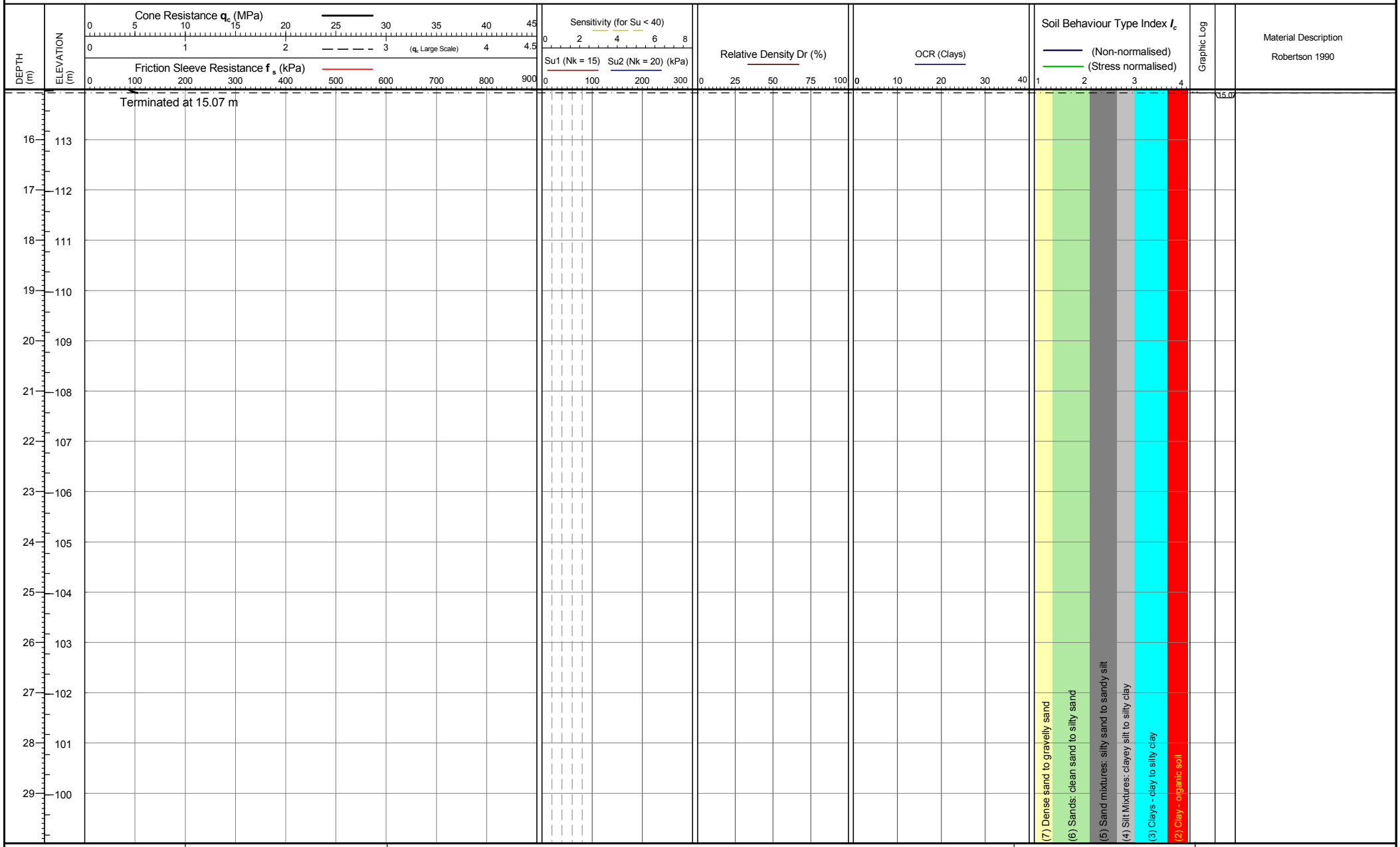
Checked by: Josh Zon

TEST ID: CCL21

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 09:30:06

Location: Hemel Hempstead, UK

Coordinates: 508323.275, 207634.071

Elevation: 129.03

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

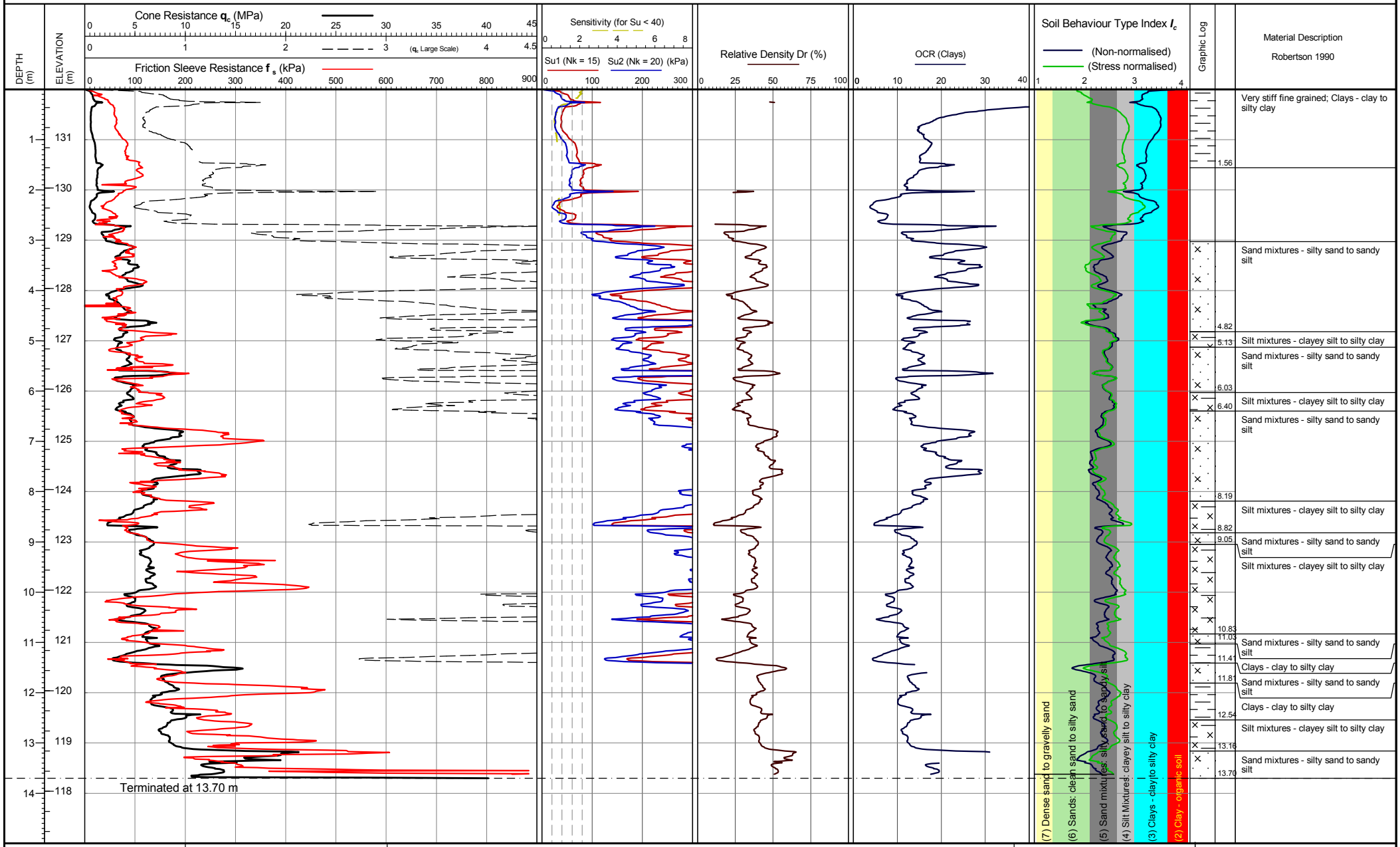
Checked by:
Josh Zon

TEST ID: CCL21

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 12:24:12

Location: Hemel Hempstead, UK

Coordinates: 508521.21, 207657.056

Elevation: 131.96

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

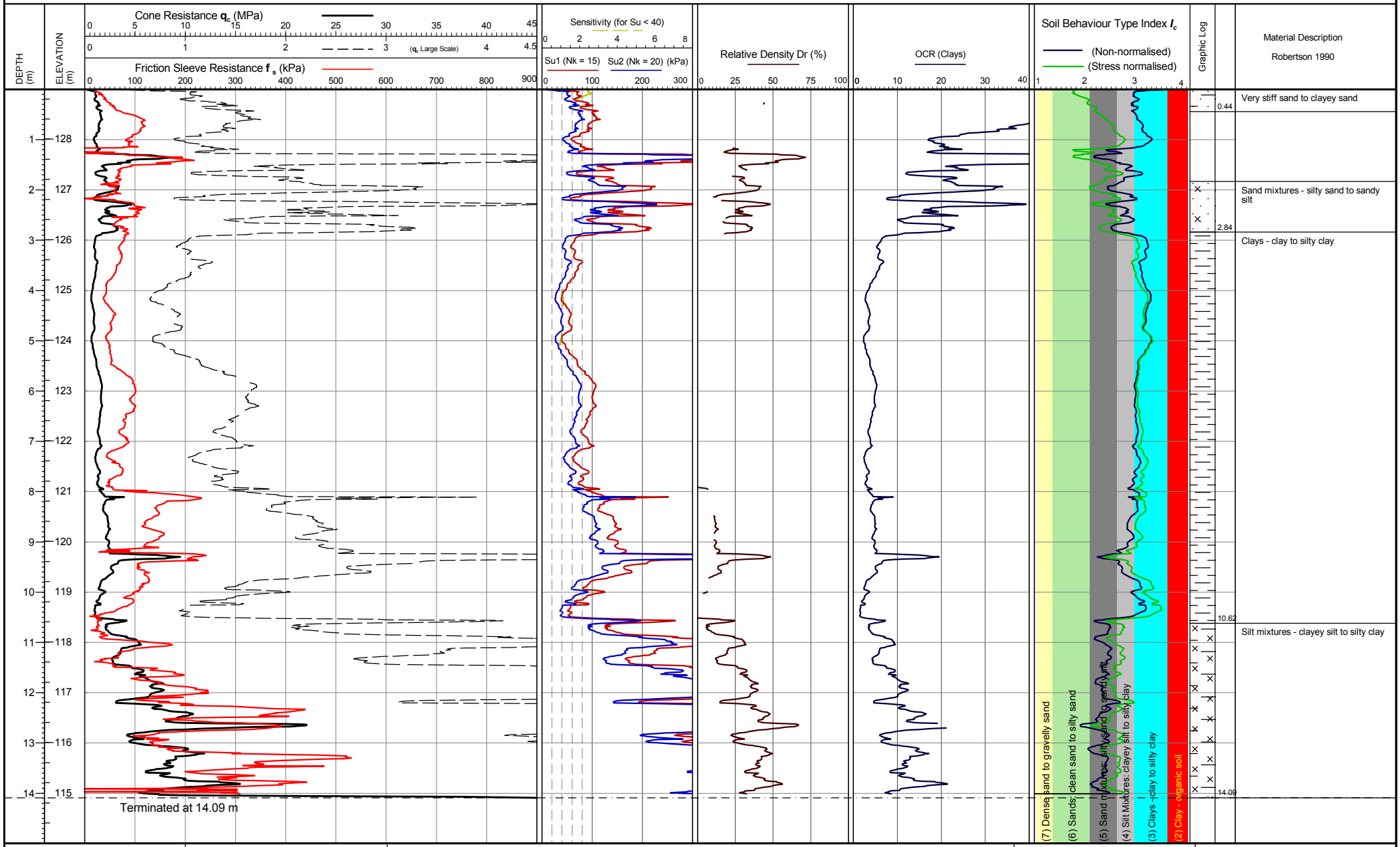
Checked by: Josh Zon

TEST ID: CCL22

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 14:57:40

Location: Hemel Hempstead, UK

Coordinates: 508249.991, 207602.376

Elevation: 128.99

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

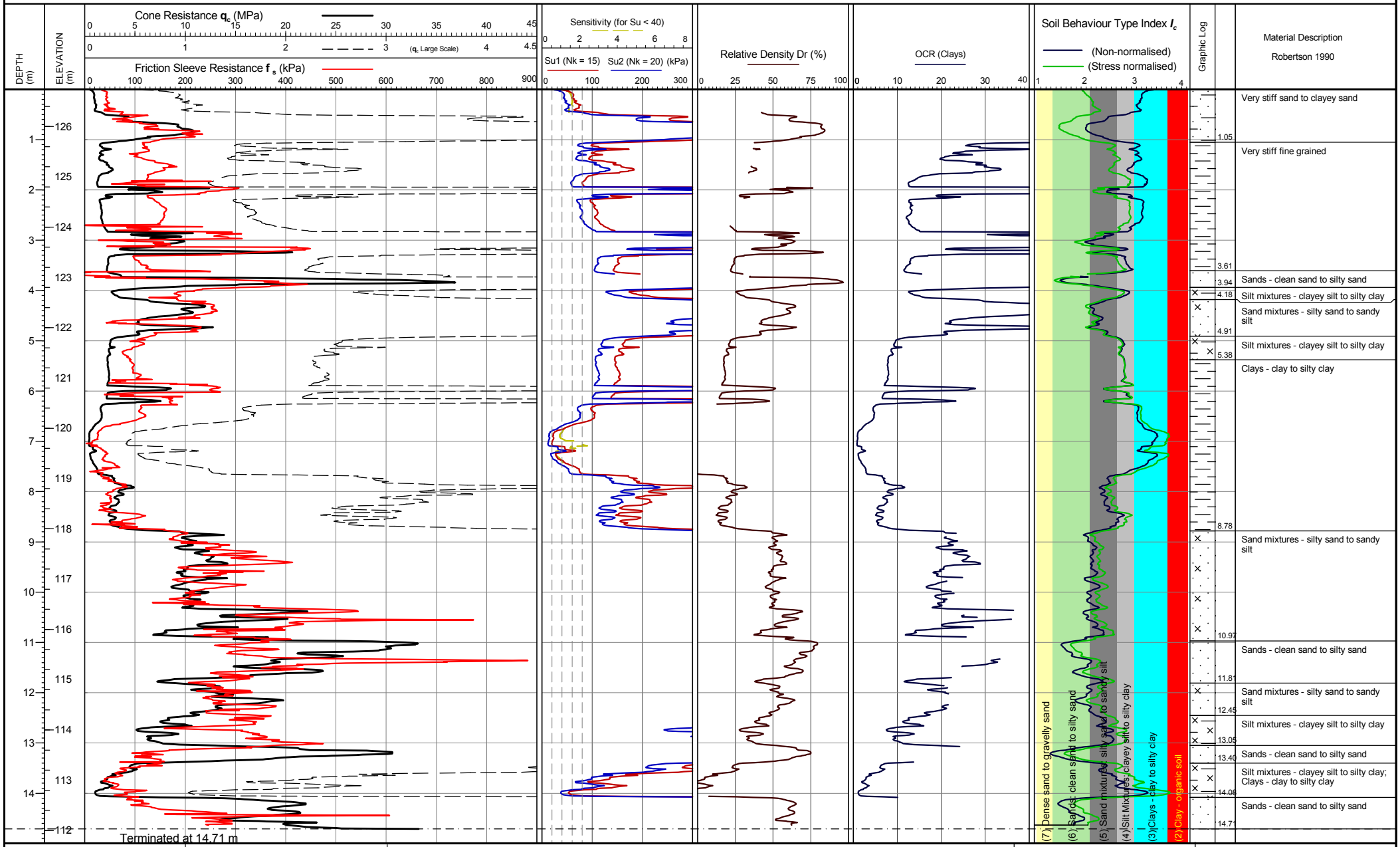
Checked by: Josh Zon

TEST ID: CCL23

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 11:22:49

Location: Hemel Hempstead, UK

Coordinates: 508232.408, 207490.614

Elevation: 126.74

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

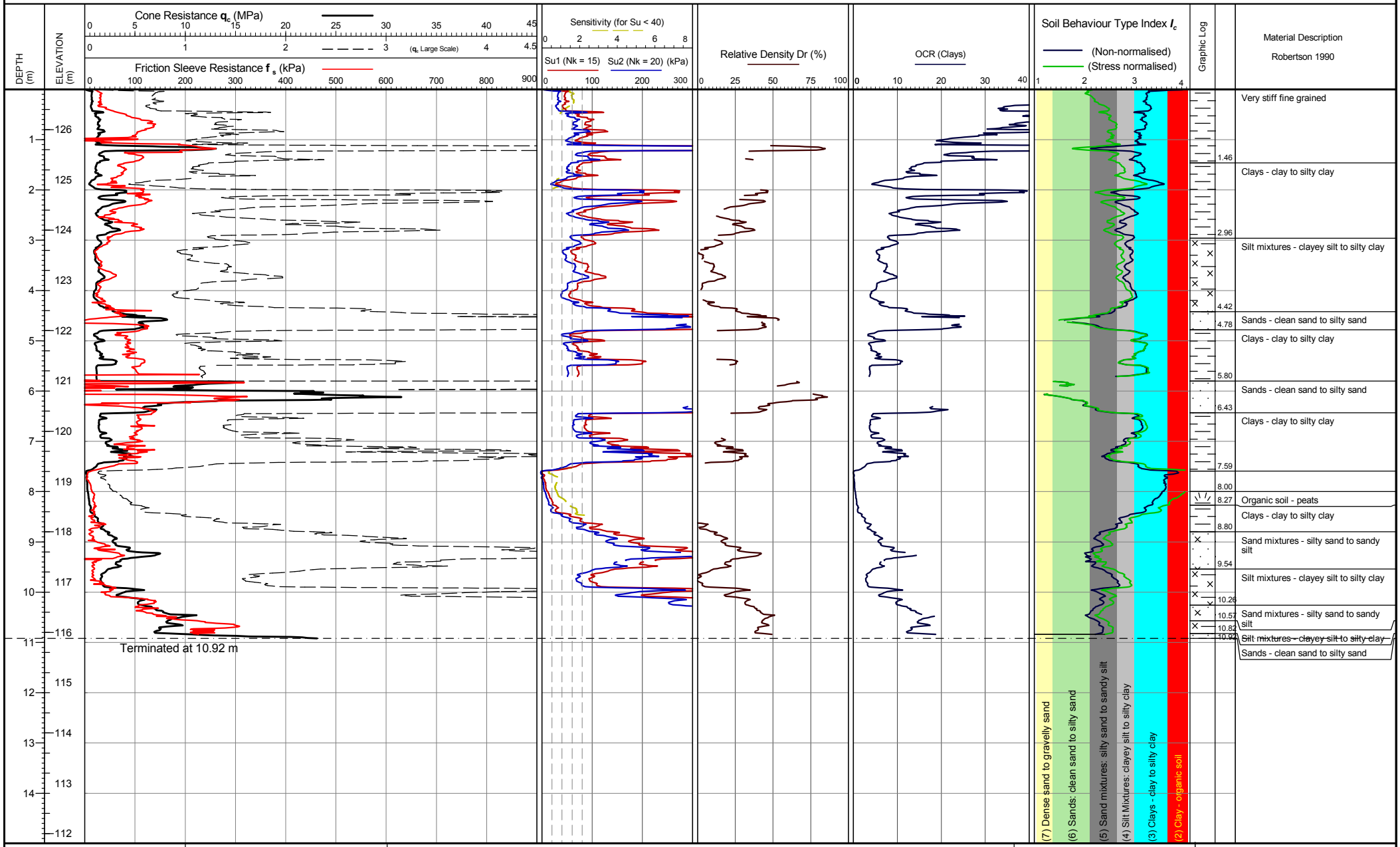
Checked by: Josh Zon

TEST ID: CCL24

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 10:55:42

Location: Hemel Hempstead, UK

Coordinates: 508266.411, 207528.452

Elevation: 126.8

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

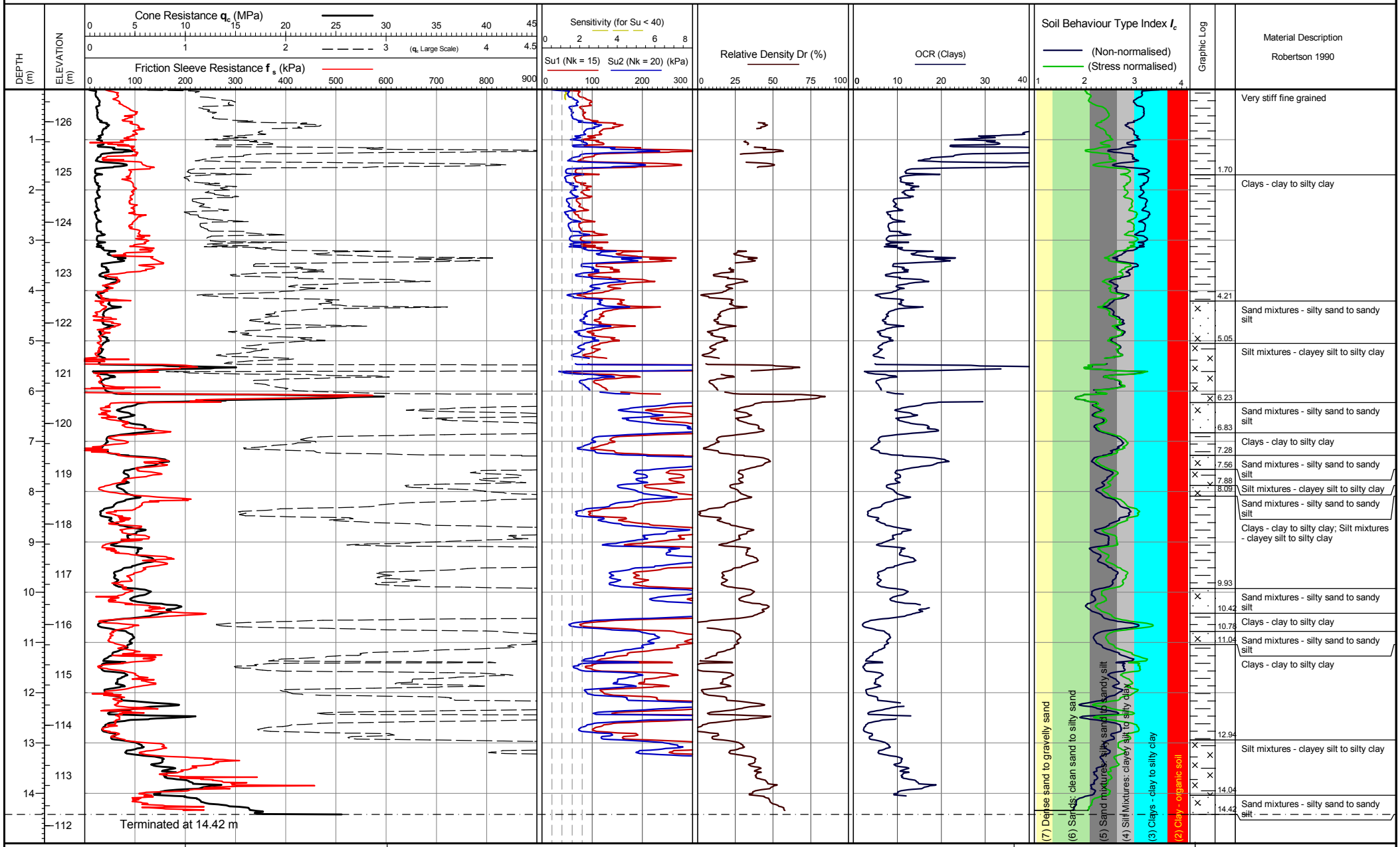
Checked by: Josh Zon

TEST ID: CCL25

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 10:03:43

Location: Hemel Hempstead, UK

Coordinates: 508322.303, 207551.227

Elevation: 126.645

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

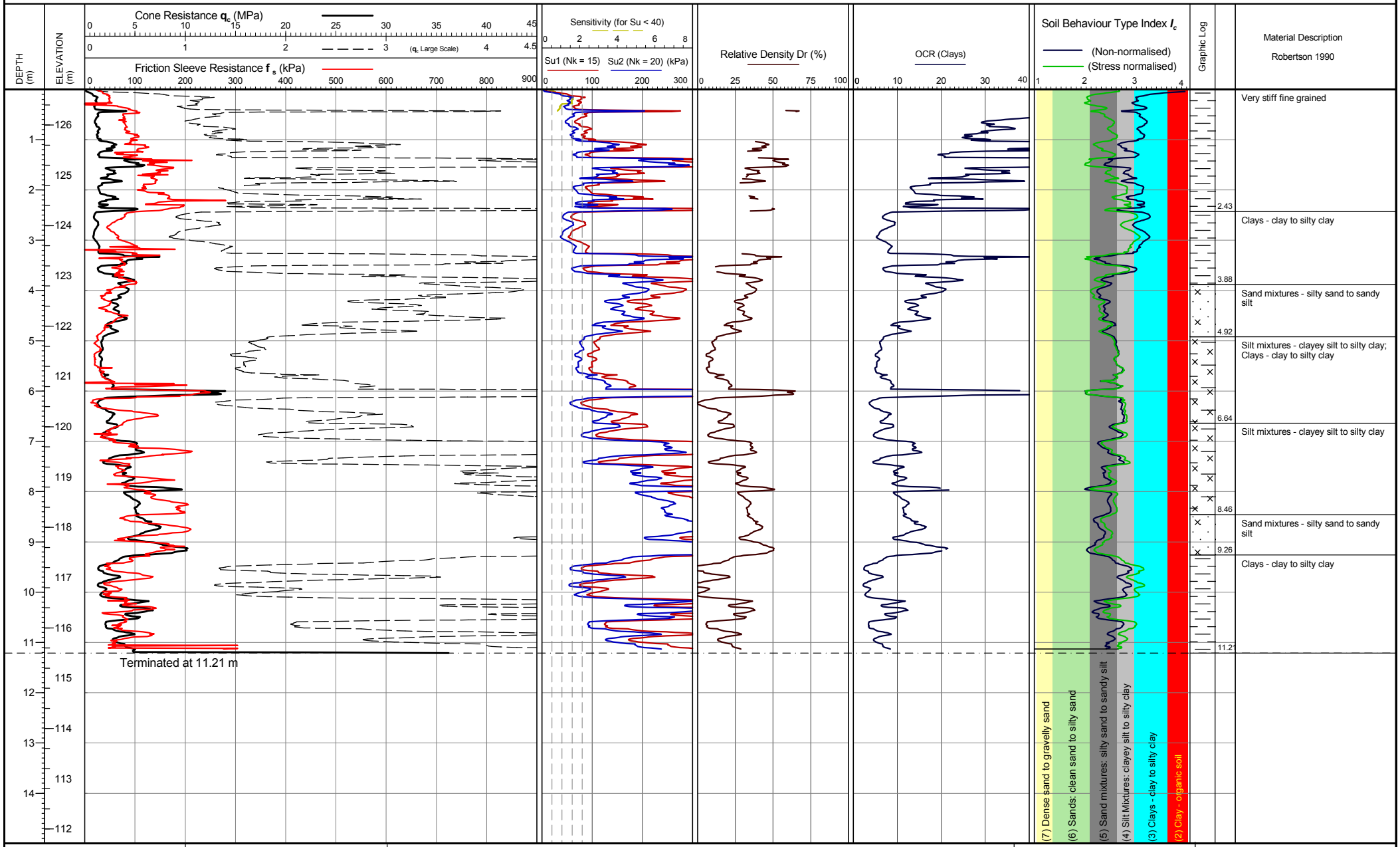
Checked by: Josh Zon

TEST ID: CCL26

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 10:30:54

Location: Hemel Hempstead, UK

Coordinates: 508323.515, 207519.934

Elevation: 126.71

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

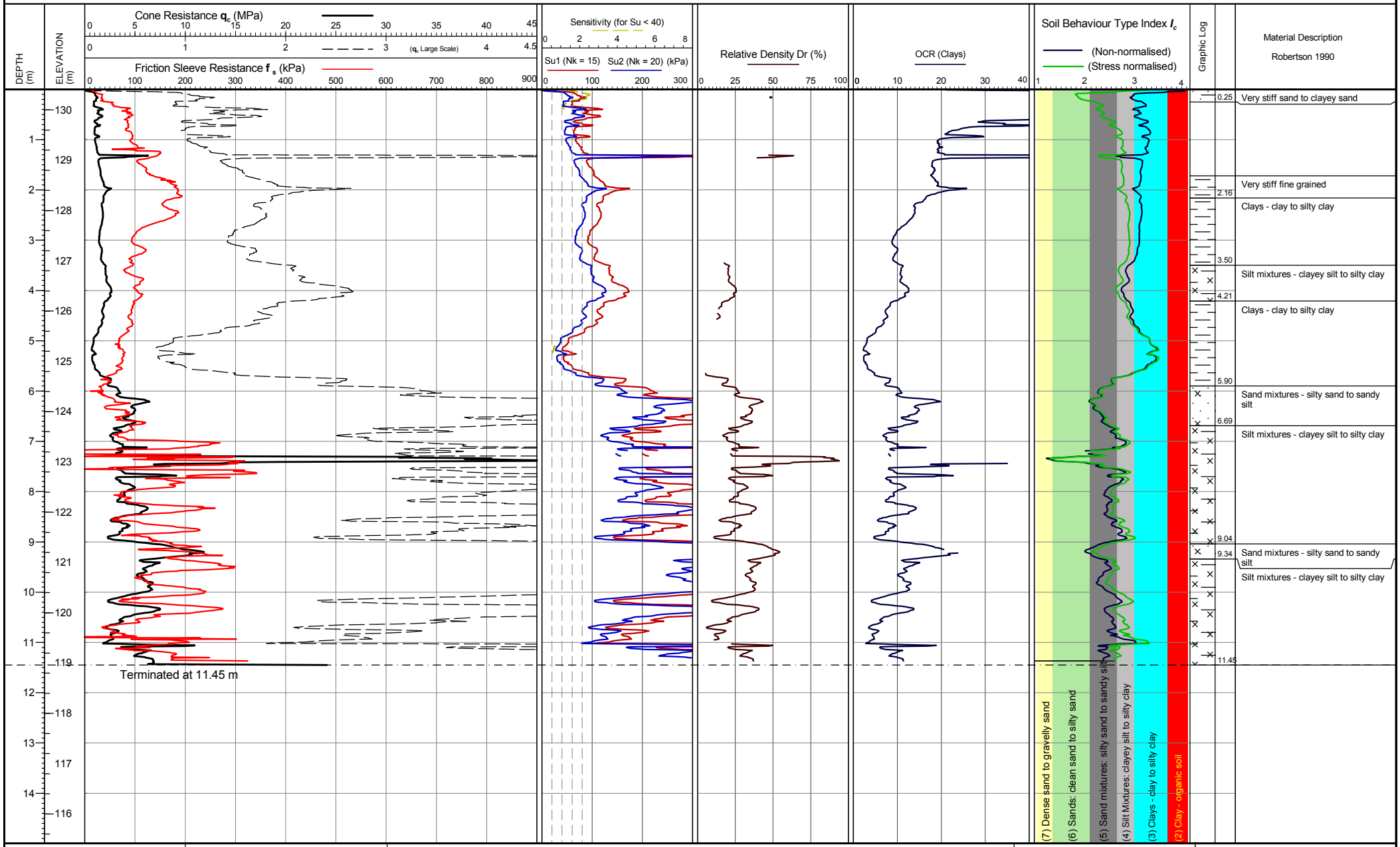
Checked by: Josh Zon

TEST ID: CCL27

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 15:30:48

Location: Hemel Hempstead, UK

Coordinates: 508410.235, 207574.058

Elevation: 130.41

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

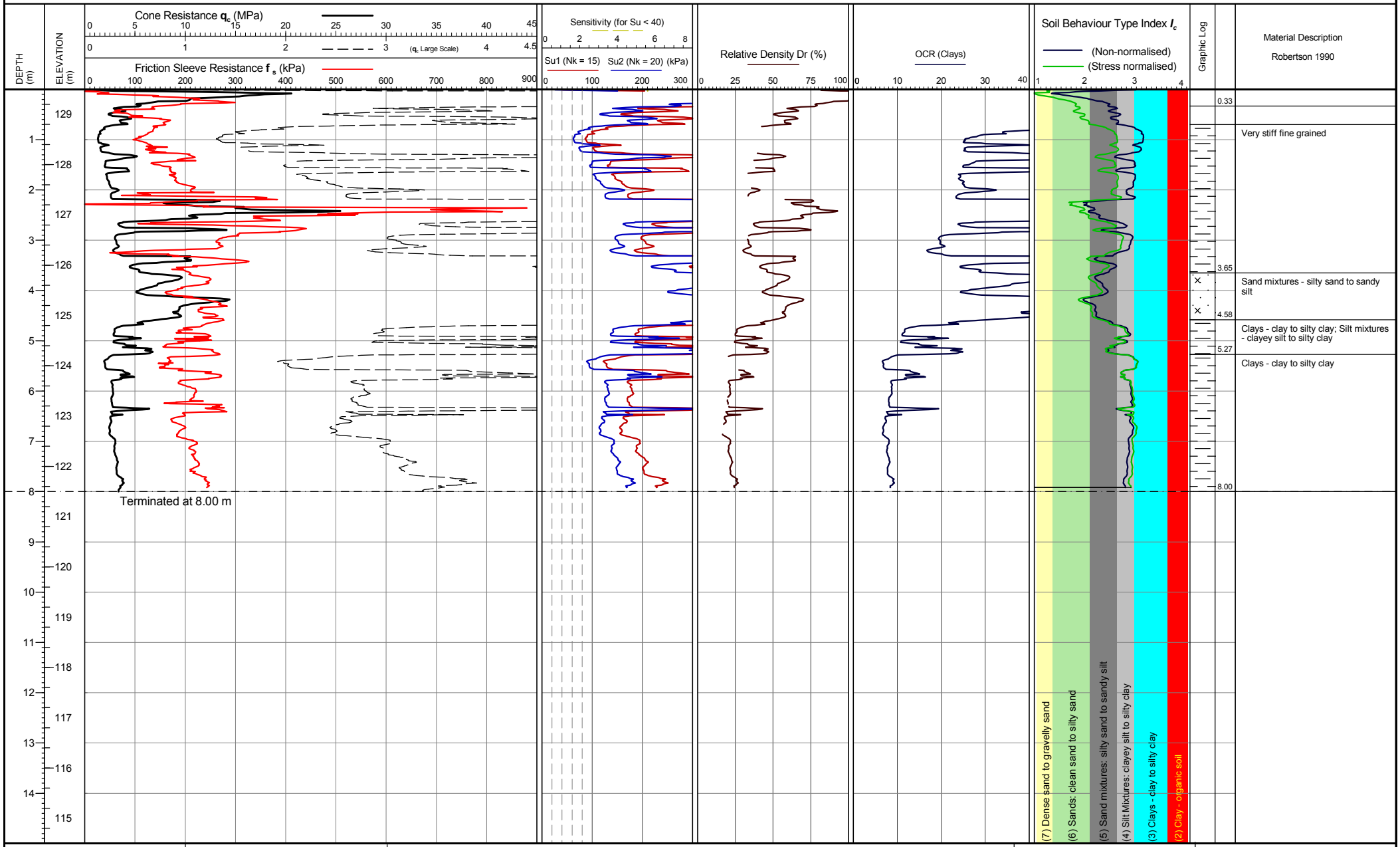
Checked by: Josh Zon

TEST ID: CCL28

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 12:58:09

Location: Hemel Hempstead, UK

Coordinates: 508180.602, 207569.386

Elevation: 129.497

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

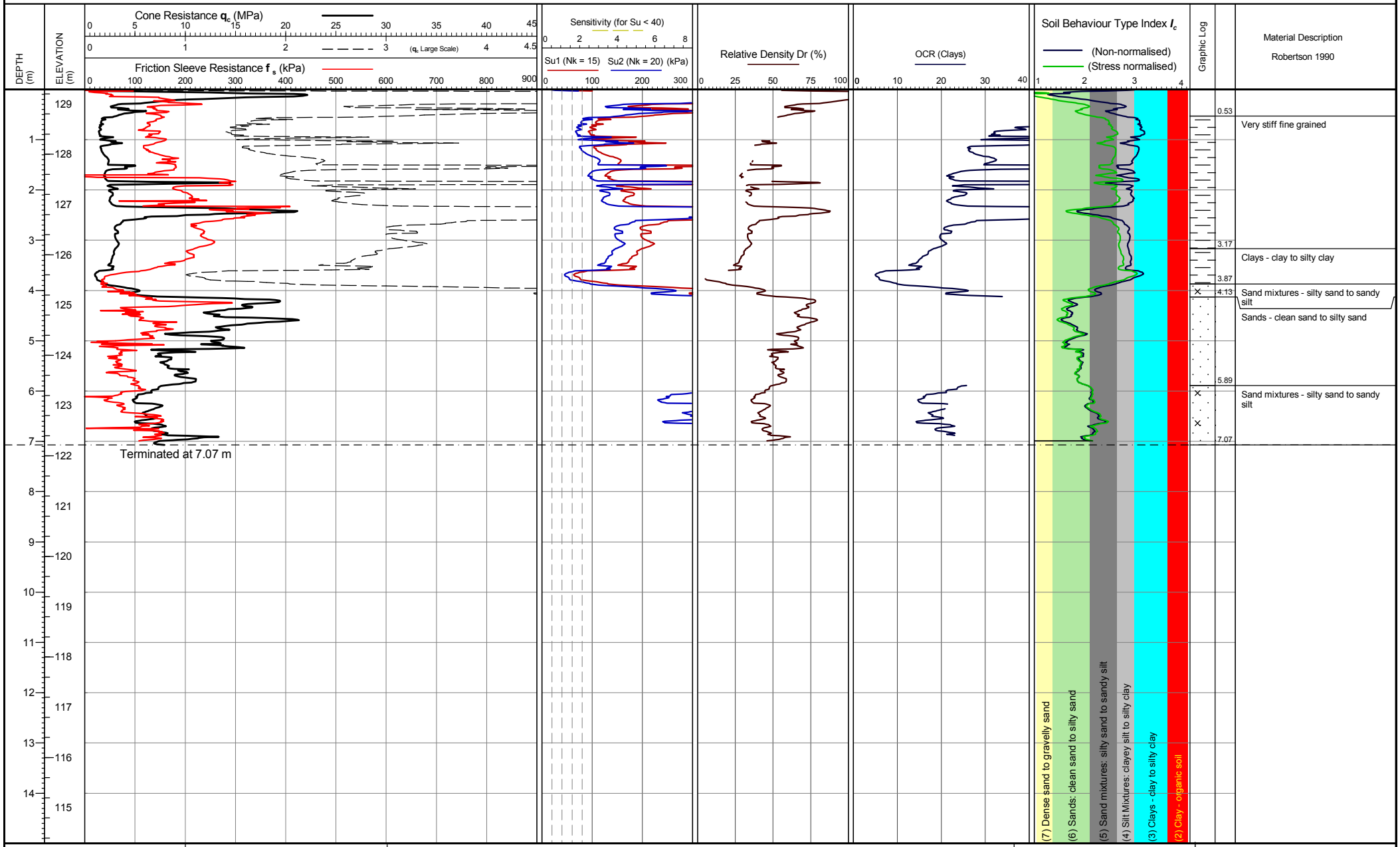
Checked by: Josh Zon

TEST ID: CCL29

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 13:33:27

Location: Hemel Hempstead, UK

Coordinates: 508186.196, 207572.37

Elevation: 129.289

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

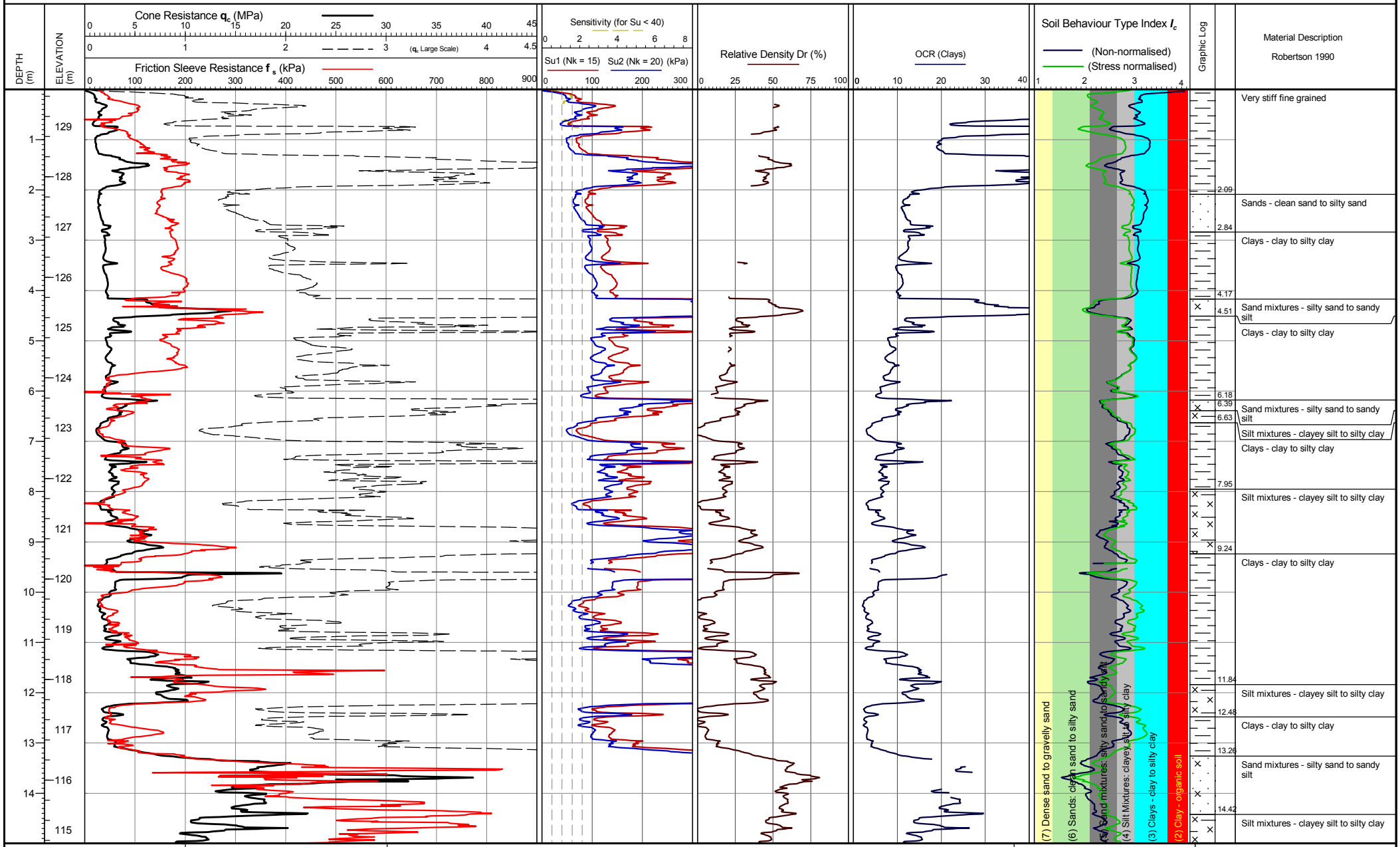
Checked by: Josh Zon

TEST ID: CCL30

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:41:59

Location: Hemel Hempstead, UK

Coordinates: 508212.84, 207662.764

Elevation: 129.738

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

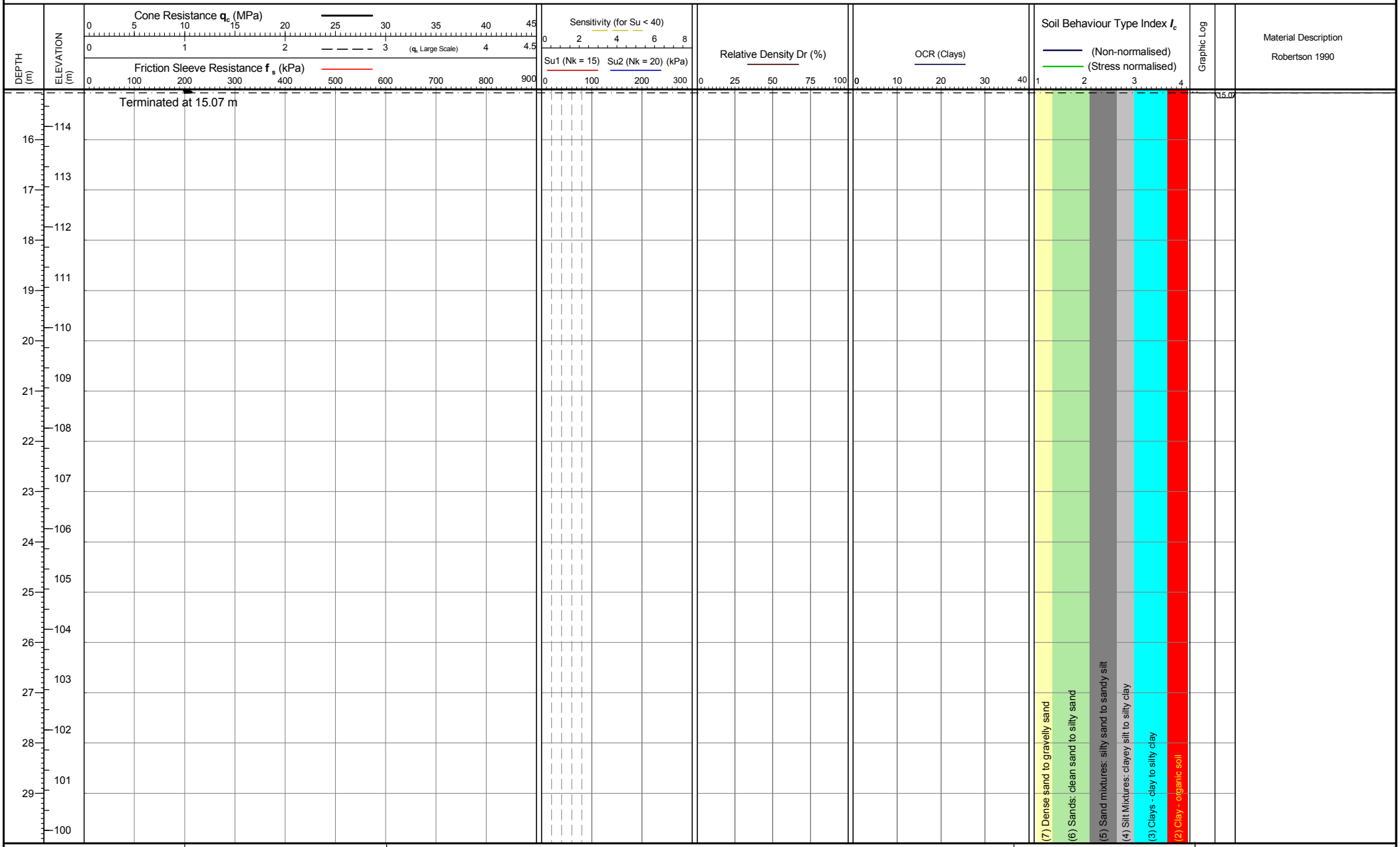
Checked by: Josh Zon

TEST ID: CCL31

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 13:41:59

Location: Hemel Hempstead, UK

Coordinates: 508212.84, 207662.764

Elevation: 129.738

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

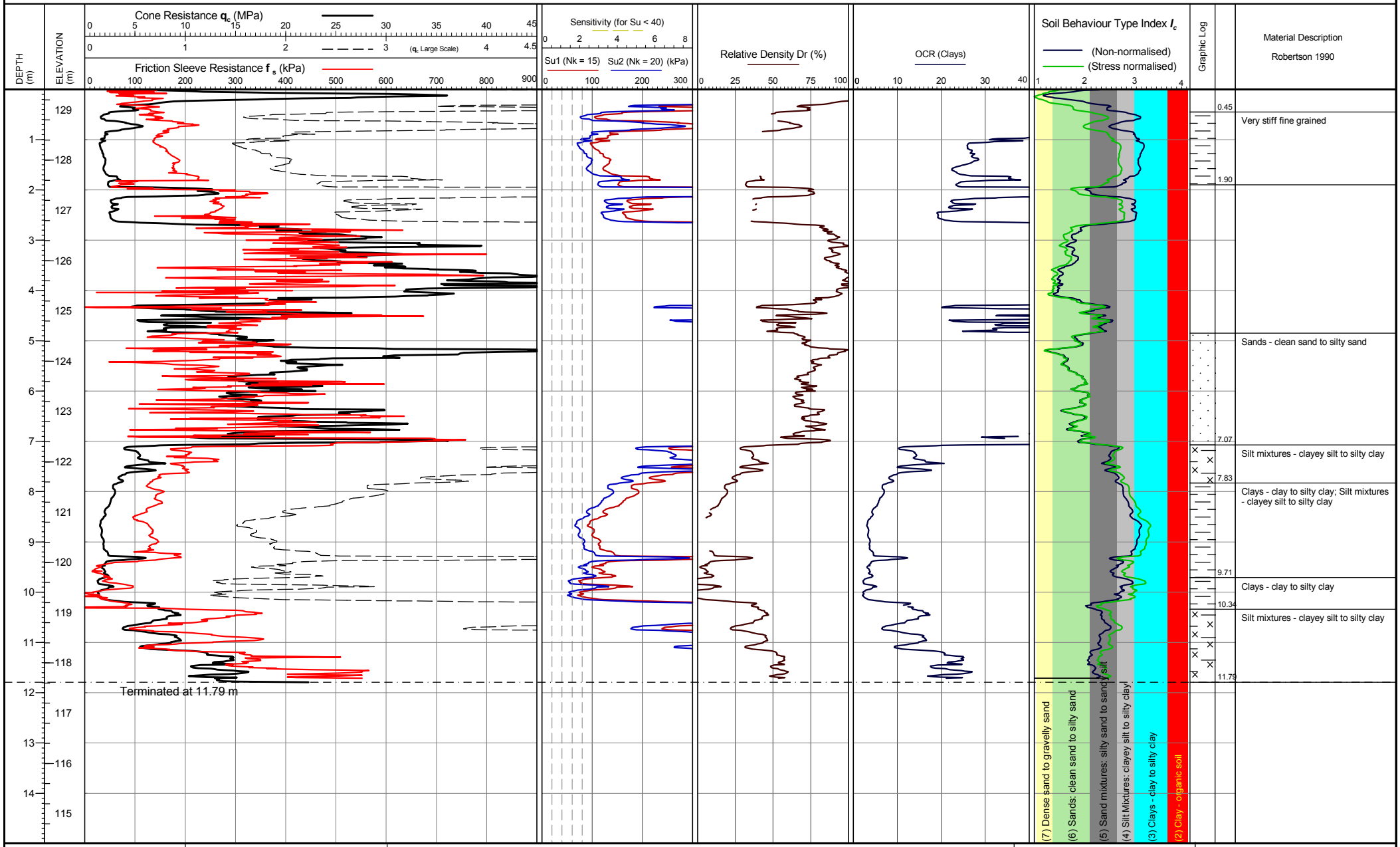
Checked by:
Josh Zon

TEST ID: CCL31

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 28/03/2017 12:01:29

Location: Hemel Hempstead, UK

Coordinates: 508185.313, 207567.38

Elevation: 129.408

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

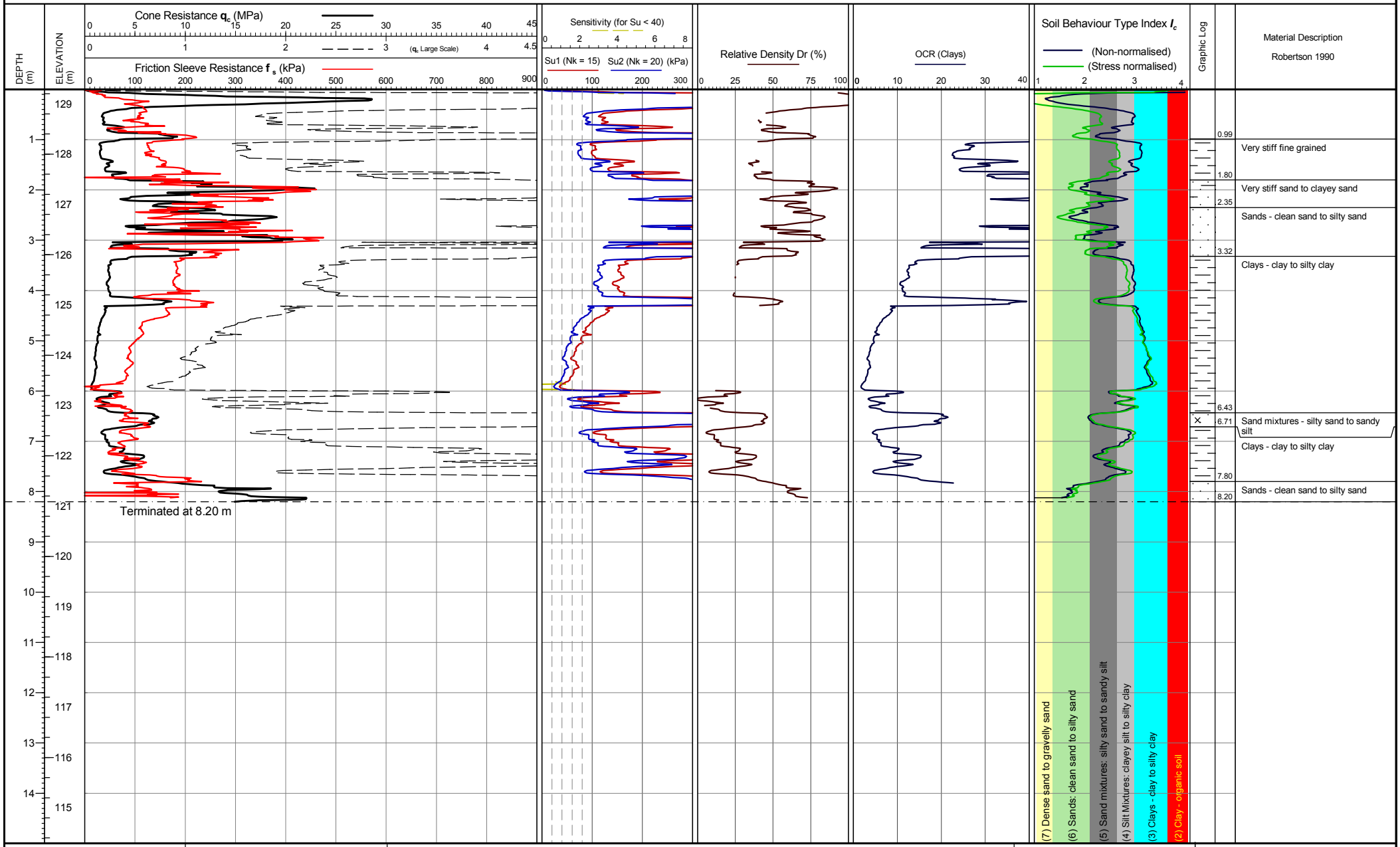
Checked by: Josh Zon

TEST ID: CCL32

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 13:47:49

Location: Hemel Hempstead, UK

Coordinates: 508190.448, 207567.019

Elevation: 129.288

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

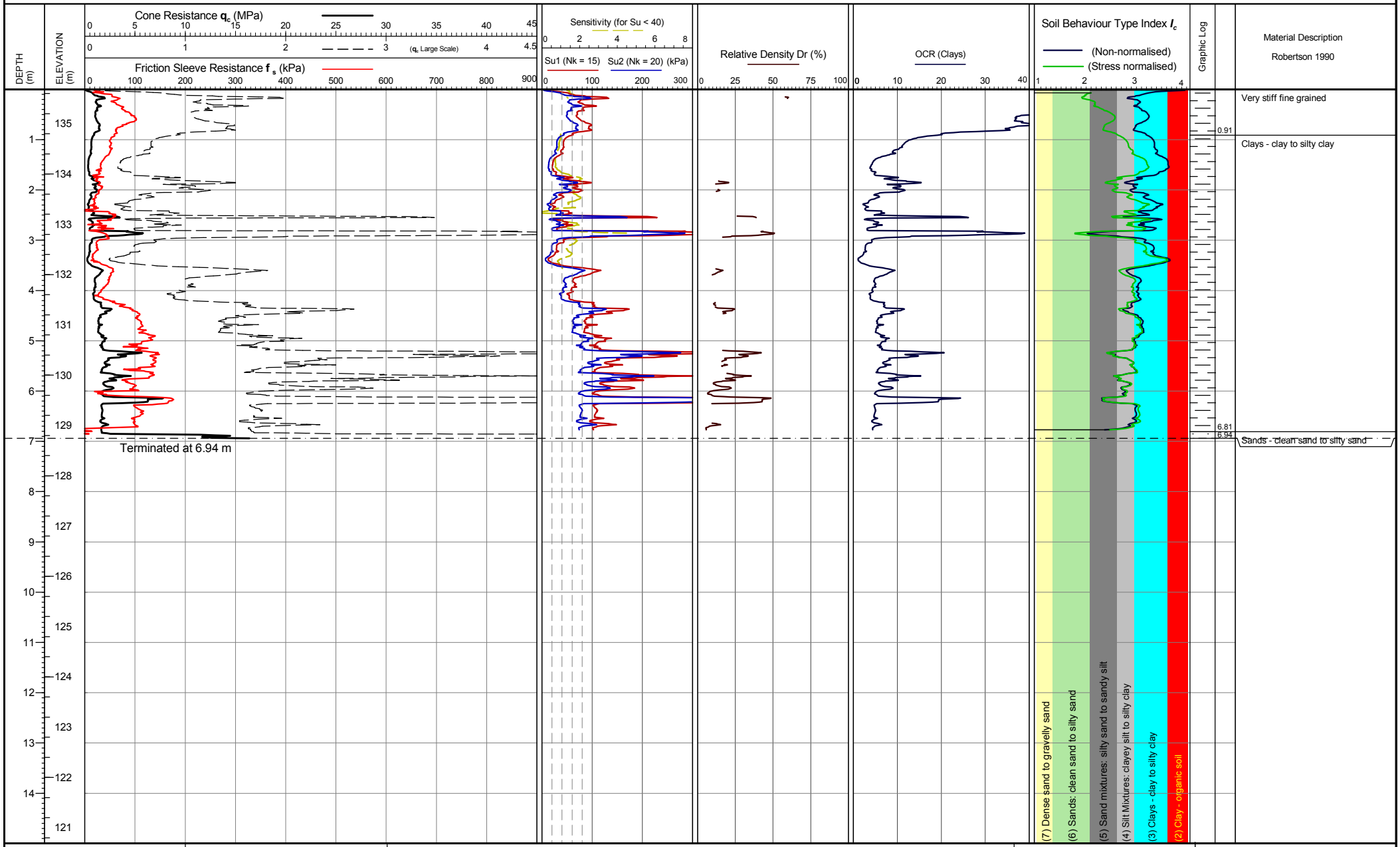
Checked by: Josh Zon

TEST ID: CCL33

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 10:41:57

Location: Hemel Hempstead, UK

Coordinates: 508460.378, 207780.231

Elevation: 135.684

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

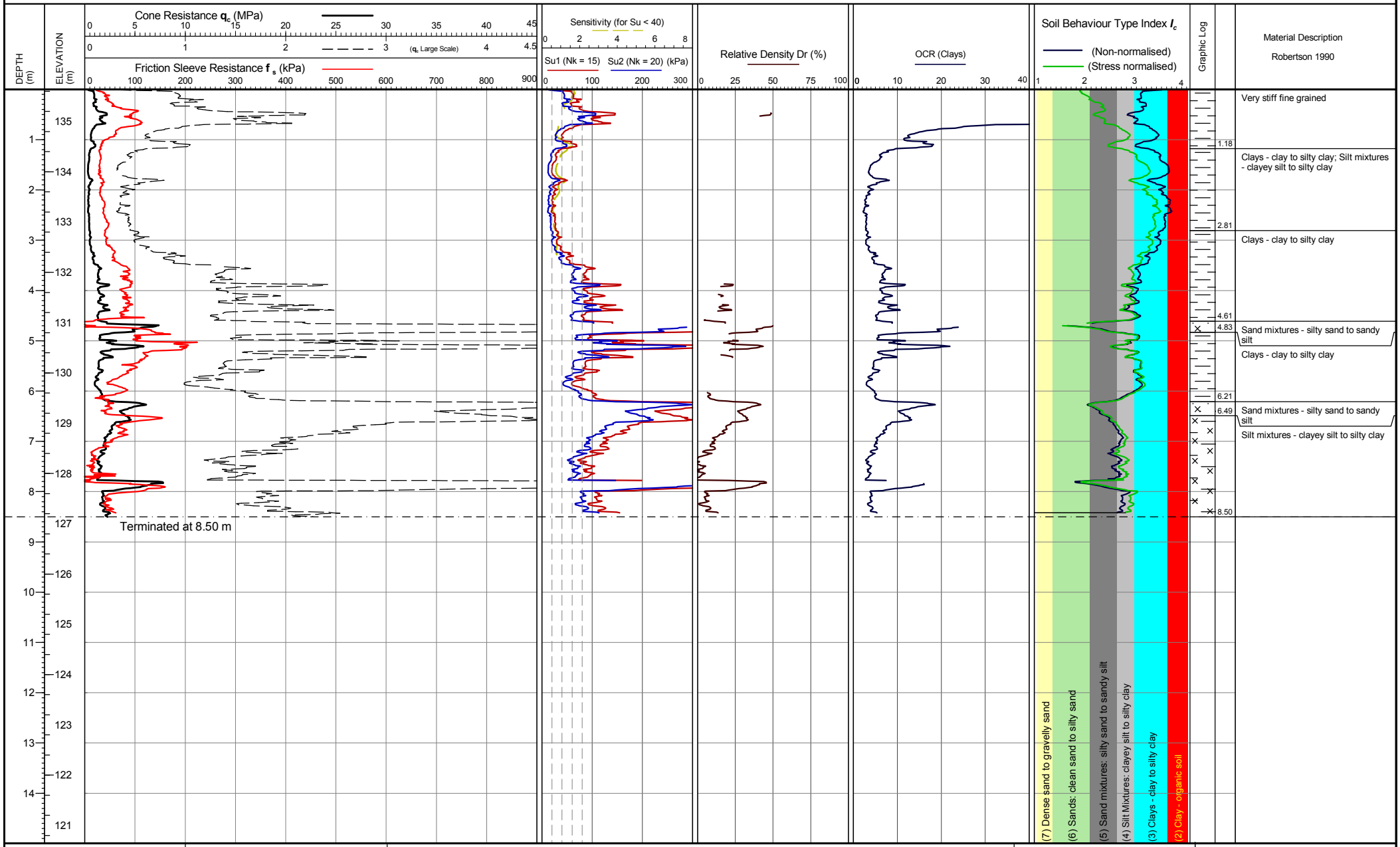
Checked by: Josh Zon

TEST ID: CCL34

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 10:23:14

Location: Hemel Hempstead, UK

Coordinates: 508466.61, 207776.764

Elevation: 135.639

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

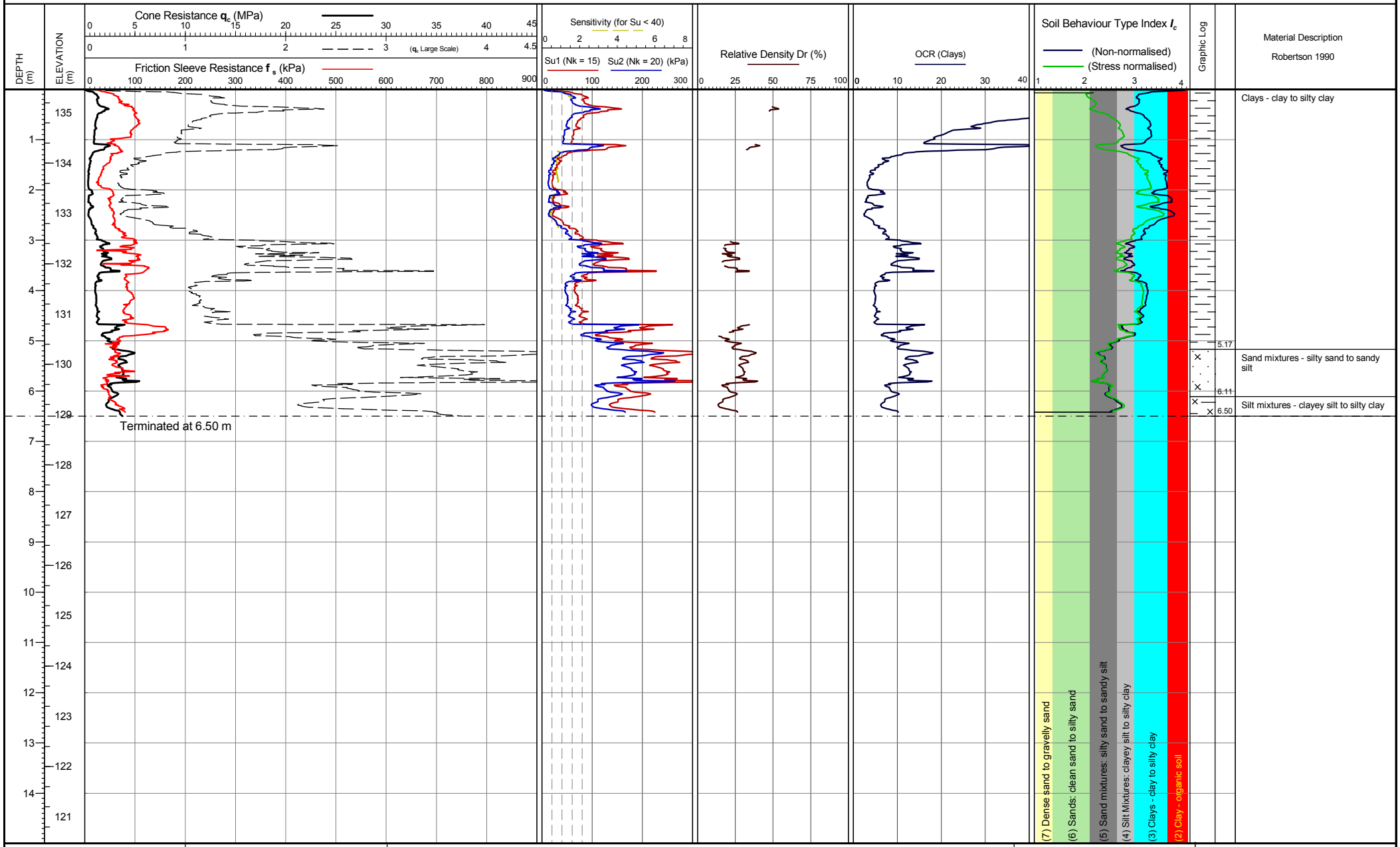
Checked by: Josh Zon

TEST ID: CCL35

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 09:53:03

Location: Hemel Hempstead, UK

Coordinates: 508463.594, 207770.35
Elevation: 135.468

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17
Lankelma Project Ref: P-106628-1

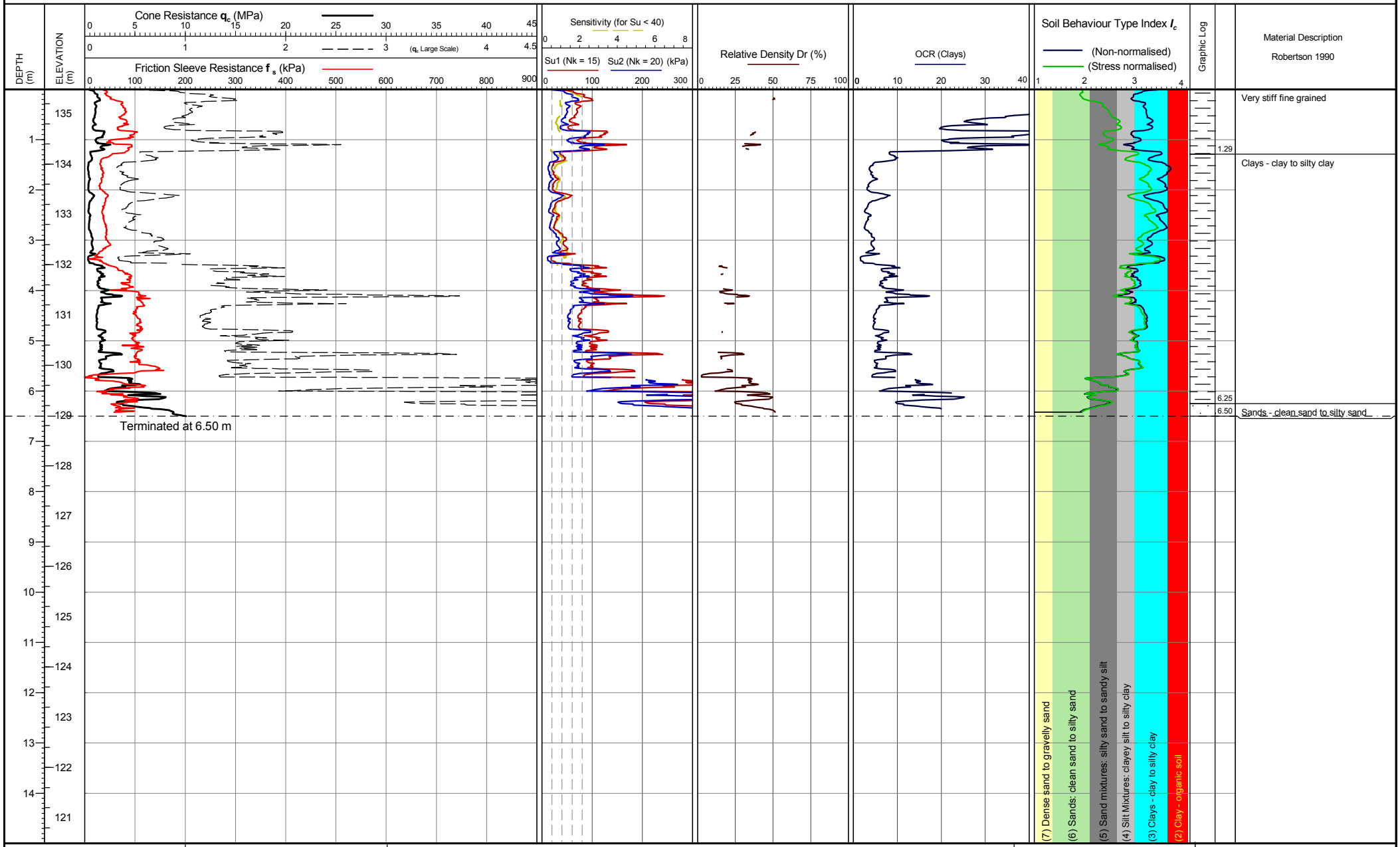
Checked by:
Josh Zon

TEST ID: CCL36

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 10:05:37

Location: Hemel Hempstead, UK

Coordinates: 508456.734, 207773.543

Elevation: 135.486

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17

Lankelma Project Ref: P-106628-1

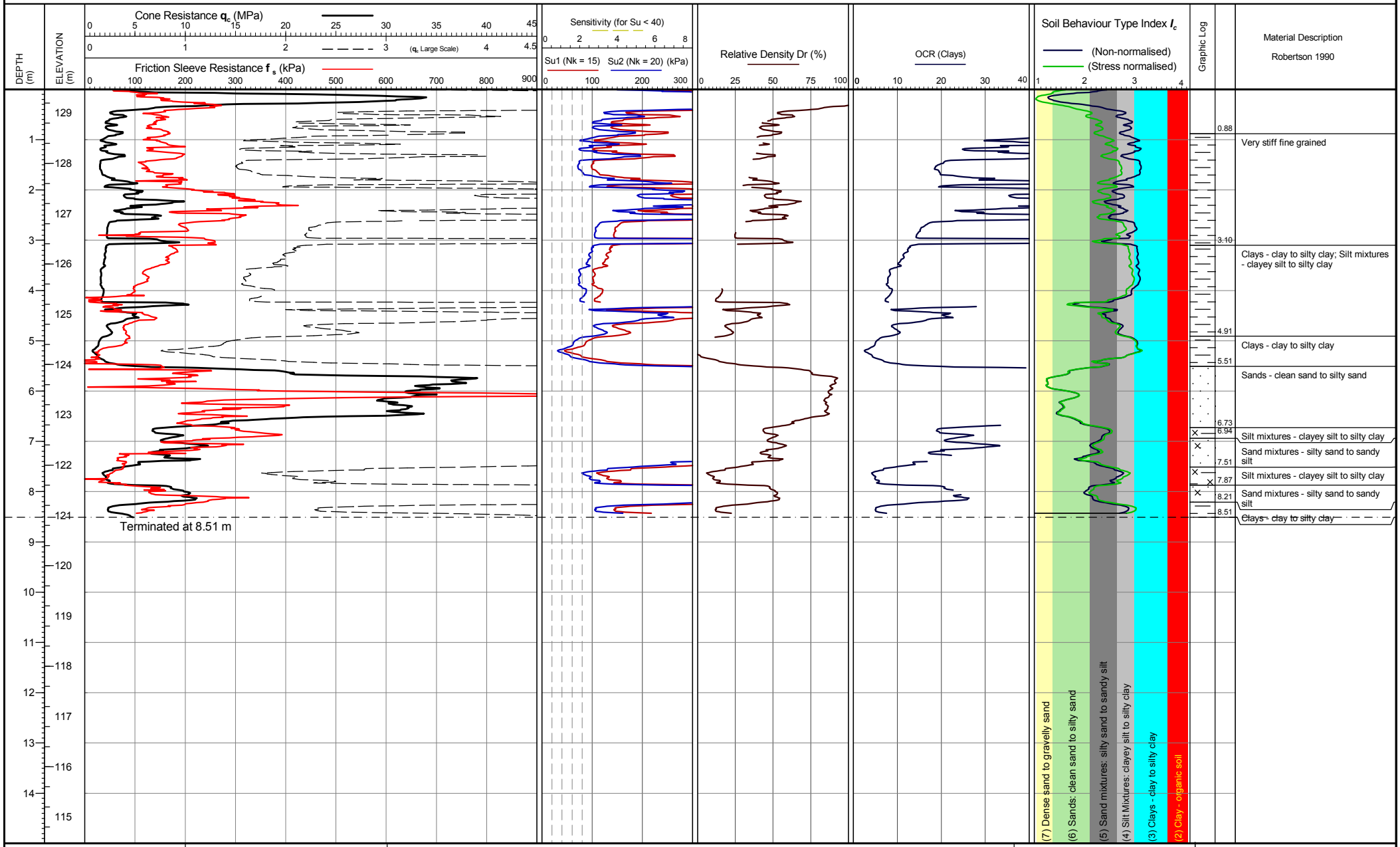
Checked by: Josh Zon

TEST ID: CCL37

Client: CROSSFIELD CONSULTING

Project: MAYLANDS GATEWAY, HEMEL HEMPSTEAD

LANKELMA



Cone area (mm2):1500
ConeID: S15-CFIP.1411
Operator: Ben Ranson
Rig Used: UK15
Date of test: 29/03/2017 13:14:59

Location: Hemel Hempstead, UK

Coordinates: 508185.032, 207562.503
Elevation: 129.472

Remarks:

Termination Remark:
Target depth

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

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

Date of plot: 02-05-17
Lankelma Project Ref: P-106628-1

Checked by:
Josh Zon

TEST ID: CCL38

Caroline Walliss
Crossfield Consulting Ltd
The Granary
White Hall Farm
Leamington Road
Long Itchington
Warwickshire
CV47 9PU

e: cw@crossfield-consulting.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 17-44823

Project / Site name:	Maylands Gateway, Hemel Hempstead	**Samples received on:**	04/04/2017
Your job number:	CCL02935	**Samples instructed on:**	04/04/2017
Your order number:	PO9989	**Analysis completed by:**	13/04/2017
Report Issue Number:	1	**Report issued on:**	13/04/2017
Samples Analysed:	30 soil samples		

Signed: 

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729896	729897	729898	729899	729900
Sample Reference				TP CCL01	TP CCL01	TP CCL03	TP CCL03	TP CCL04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10	1.50	0.20-0.70	3.40	0.80
Date Sampled				29/03/2017	29/03/2017	28/03/2017	28/03/2017	29/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	12	14	19	15
Total mass of sample received	kg	0.001	NONE	0.53	0.53	0.70	0.53	0.71
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	-	7.8	8.5	7.4
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	570	-	390	440	280
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.062	-	0.034	0.015	0.021
Sulphide	mg/kg	1	MCERTS	1.1	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	260	-	180	230	110
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.47	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	1.2	< 0.10	-	-	-
Fluorene	mg/kg	0.1	MCERTS	0.94	< 0.10	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	7.0	< 0.10	-	-	-
Anthracene	mg/kg	0.1	MCERTS	2.0	< 0.10	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	8.9	< 0.10	-	-	-
Pyrene	mg/kg	0.1	MCERTS	8.1	< 0.10	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	3.6	< 0.10	-	-	-
Chrysene	mg/kg	0.05	MCERTS	3.5	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	3.5	< 0.10	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	2.3	< 0.10	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	3.4	< 0.10	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	2.0	< 0.10	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	0.48	< 0.10	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.3	< 0.05	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	49.7	< 1.60	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	86	-	-	-	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729896	729897	729898	729899	729900
Sample Reference				TP CCL01	TP CCL01	TP CCL03	TP CCL03	TP CCL04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10	1.50	0.20-0.70	3.40	0.80
Date Sampled				29/03/2017	29/03/2017	28/03/2017	28/03/2017	29/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.0	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	14	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	42	< 8.0	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	60	< 10	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	13	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	69	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	110	< 10	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	190	< 10	-	-	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729901	729902	729903	729904	729905
Sample Reference				TP CCL04	TP CCL05	TP CCL05	TP CCL06	TP CCL06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.30	0.50	1.00	0.50	1.70
Date Sampled				29/03/2017	27/03/2017	27/03/2017	27/03/2017	27/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	26	12	14	19	19
Total mass of sample received	kg	0.001	NONE	1.8	0.58	0.62	0.62	0.46
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.8	7.9	7.6	7.5	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	2100	70	390	130	250
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.61	0.010	0.012	0.0058	0.018
Sulphide	mg/kg	1	MCERTS	24	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	1700	77	150	< 50	88
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.2	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.6	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	52	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.9	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	92	-	-	-	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729901	729902	729903	729904	729905
Sample Reference				TP CCL04	TP CCL05	TP CCL05	TP CCL06	TP CCL06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.30	0.50	1.00	0.50	1.70
Date Sampled				29/03/2017	27/03/2017	27/03/2017	27/03/2017	27/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	34	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	34	-	-	-	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729906	729907	729908	729909	729910
Sample Reference				TP CCL06	TP CCL07	TP CCL08	TP CCL08	TP CCL08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.60	0.50	2.20	3.40
Date Sampled				27/03/2017	27/03/2017	28/03/2017	28/03/2017	28/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	19	14	18	20
Total mass of sample received	kg	0.001	NONE	0.50	0.45	0.43	1.1	1.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	8.4	8.0	7.6	7.5
Total Cyanide	mg/kg	1	MCERTS	-	-	-	< 1	2
Total Sulphate as SO_4	mg/kg	50	MCERTS	420	470	64	480	620
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	< 0.0013	0.0065	0.011	0.18	0.13
Sulphide	mg/kg	1	MCERTS	-	-	-	8.2	3.2
Total Sulphur	mg/kg	50	MCERTS	160	190	55	420	700
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	0.9	1.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	-	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	18	30
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	1.2	3.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	26	50
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	12	170
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	29	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	14	54
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	42	190

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729906	729907	729908	729909	729910
Sample Reference				TP CCL06	TP CCL07	TP CCL08	TP CCL08	TP CCL08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.60	0.50	2.20	3.40
Date Sampled				27/03/2017	27/03/2017	28/03/2017	28/03/2017	28/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	36
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	220
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	800
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	1100
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	11
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	180
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	540
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	730

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729911	729912	729913	729914	729915
Sample Reference				TP CCL09	TP CCL10	TP CCL11	TP CCL12	TP CCL15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.00-0.20	1.00	0.40	2.20
Date Sampled				28/03/2017	30/03/2017	30/03/2017	30/03/2017	28/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	4.3	16	10	18
Total mass of sample received	kg	0.001	NONE	0.64	1.3	0.62	0.61	0.48
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.2	9.5	7.8	7.4	8.6
Total Cyanide	mg/kg	1	MCERTS	-	< 1	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	290	690	240	390	500
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.011	0.14	0.014	0.037	0.025
Sulphide	mg/kg	1	MCERTS	-	13	-	-	-
Total Sulphur	mg/kg	50	MCERTS	170	980	93	220	190
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	3.7	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	0.41	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	0.42	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	0.31	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	2.1	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	1.1	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	8.7	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	8.4	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	4.6	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	3.8	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	4.9	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	4.0	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	5.0	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	3.1	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	0.81	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	3.7	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	51.1	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	9.5	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1.5	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	17	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	40	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	43	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	17	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	64	-	-	-

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Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729911	729912	729913	729914	729915
Sample Reference				TP CCL09	TP CCL10	TP CCL11	TP CCL12	TP CCL15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.00-0.20	1.00	0.40	2.20
Date Sampled				28/03/2017	30/03/2017	30/03/2017	30/03/2017	28/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	7.5	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	30	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	360	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	400	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	6.3	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	60	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	740	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	810	-	-	-

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Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729916	729917	729918	729919	729920
Sample Reference				TP CCL17	TP CCL24	TP CCL30	TP CCL39	TP CCL40
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20-0.30	0.90-1.00	0.00-0.20	2.40-2.50
Date Sampled				30/03/2017	30/03/2017	29/03/2017	31/03/2017	30/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.5	12	20	10	13
Total mass of sample received	kg	0.001	NONE	2.0	1.3	0.69	1.3	0.63
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile & Amosite	-	Crocidolite	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	-	Detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	< 0.001	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.4	6.9	6.5	6.4	5.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-	< 1	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	910	1100	240	450	450
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.22	0.016	0.013	0.023	0.020
Sulphide	mg/kg	1	MCERTS	49	2.4	-	13	-
Total Sulphur	mg/kg	50	MCERTS	1000	730	88	550	200
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.9	1.4	-	1.3	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.26	< 0.05	-	< 0.05	-
Acenaphthylene	mg/kg	0.1	MCERTS	0.92	< 0.10	-	< 0.10	-
Acenaphthene	mg/kg	0.1	MCERTS	1.1	< 0.10	-	< 0.10	-
Fluorene	mg/kg	0.1	MCERTS	1.4	< 0.10	-	< 0.10	-
Phenanthrene	mg/kg	0.1	MCERTS	10	< 0.10	-	0.49	-
Anthracene	mg/kg	0.1	MCERTS	3.9	< 0.10	-	< 0.10	-
Fluoranthene	mg/kg	0.1	MCERTS	22	< 0.10	-	1.1	-
Pyrene	mg/kg	0.1	MCERTS	19	< 0.10	-	1.2	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	13	< 0.10	-	0.52	-
Chrysene	mg/kg	0.05	MCERTS	8.6	< 0.05	-	0.63	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	13	< 0.10	-	0.74	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	7.3	< 0.10	-	0.34	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	12	< 0.10	-	0.56	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	8.2	< 0.10	-	0.49	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	2.4	< 0.10	-	< 0.10	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	9.6	< 0.05	-	0.69	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	133	< 1.60	-	6.84	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	49	-	19	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.9	-	0.8	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	< 4.0	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	36	-	23	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	200	-	150	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	130	-	140	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	84	-	67	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	5.1	< 1.0	-	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	56	160	-	140	-

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Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729916	729917	729918	729919	729920
Sample Reference				TP CCL17	TP CCL24	TP CCL30	TP CCL39	TP CCL40
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20-0.30	0.90-1.00	0.00-0.20	2.40-2.50
Date Sampled				30/03/2017	30/03/2017	29/03/2017	31/03/2017	30/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	14	< 2.0	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	55	< 8.0	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	670	< 8.0	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	740	< 10	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	< 2.0	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	190	< 10	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	2000	< 10	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	2200	< 10	-	< 10	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729921	729922	729923	729924	729925
Sample Reference				TP CCL41	TP CCL41	TP CCL41	TP CCL44	TP CCL45
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.20	0.20-0.40	2.10-2.20	0.50-0.60	0.15-0.70
Date Sampled				30/03/2017	30/03/2017	30/03/2017	29/03/2017	29/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.3	14	13	21	17
Total mass of sample received	kg	0.001	NONE	1.6	0.75	0.74	0.68	0.53
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.6	7.5	7.3	6.7	6.9
Total Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	430	420	200	280	740
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.0089	0.032	0.051	0.11
Sulphide	mg/kg	1	MCERTS	17	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	660	230	80	140	250
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.6	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	0.59	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	1.5	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	1.6	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.83	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	1.0	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.1	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.88	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.1	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.94	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	10.7	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.6	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	230	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	79	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	-	-	-	-

Analytical Report Number: 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Lab Sample Number				729921	729922	729923	729924	729925
Sample Reference				TP CCL41	TP CCL41	TP CCL41	TP CCL44	TP CCL45
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.20	0.20-0.40	2.10-2.20	0.50-0.60	0.15-0.70
Date Sampled				30/03/2017	30/03/2017	30/03/2017	29/03/2017	29/03/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	22	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	26	-	-	-	-

Analytical Report Number: 17-44823
Project / Site name: Maylands Gateway, Hemel Hempstead
Your Order No: PO9989

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
729917	TP CCL24	0.20-0.30	119	Loose Fibres	**Chrysotile & Amosite**	< 0.001	**< 0.001**
729919	TP CCL39	0.00-0.20	122	Loose Fibres	**Crocidolite**	< 0.001	**< 0.001**
729921	TP CCL41	0.00-0.20	132	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
729896	TP CCL01	None Supplied	1.10	Brown clay and loam with gravel and brick.
729897	TP CCL01	None Supplied	1.50	Light brown sandy clay.
729898	TP CCL03	None Supplied	0.20-0.70	Light brown loam and clay with gravel.
729899	TP CCL03	None Supplied	3.40	Beige chalk.**
729900	TP CCL04	None Supplied	0.80	Light brown loam and clay with vegetation.
729901	TP CCL04	None Supplied	2.30	Brown clay and loam with vegetation.
729902	TP CCL05	None Supplied	0.50	Light brown clay and loam with gravel.
729903	TP CCL05	None Supplied	1.00	Light brown clay and loam with gravel.
729904	TP CCL06	None Supplied	0.50	Light brown clay and sand.
729905	TP CCL06	None Supplied	1.70	Light brown clay and sand.
729906	TP CCL06	None Supplied	2.50	Beige chalk.**
729907	TP CCL07	None Supplied	2.60	Beige chalk.**
729908	TP CCL08	None Supplied	0.50	Light brown clay and loam.
729909	TP CCL08	None Supplied	2.20	Brown clay and loam.
729910	TP CCL08	None Supplied	3.40	Grey clay and sand.
729911	TP CCL09	None Supplied	0.30	Light brown loam and clay with vegetation.
729912	TP CCL10	None Supplied	0.00-0.20	Brown loam and sand with gravel.
729913	TP CCL11	None Supplied	1.00	Light brown loam and clay with gravel.
729914	TP CCL12	None Supplied	0.40	Brown loam and clay with gravel and vegetation.
729915	TP CCL15	None Supplied	2.20	Beige chalk.**
729916	TP CCL17	None Supplied	0.00-0.30	Brown loam and sand with gravel.
729917	TP CCL24	None Supplied	0.20-0.30	Brown loam and sand with gravel and vegetation.
729918	TP CCL30	None Supplied	0.90-1.00	Light brown clay and sand.
729919	TP CCL39	None Supplied	0.00-0.20	Brown loam and clay with gravel and vegetation.
729920	TP CCL40	None Supplied	2.40-2.50	Light brown clay and sand with gravel.
729921	TP CCL41	None Supplied	0.00-0.20	Brown loam and clay with gravel and vegetation.
729922	TP CCL41	None Supplied	0.20-0.40	Brown loam and clay with gravel.
729923	TP CCL41	None Supplied	2.10-2.20	Light brown clay and loam with gravel.
729924	TP CCL44	None Supplied	0.50-0.60	Light brown clay.
729925	TP CCL45	None Supplied	0.15-0.70	Light brown clay and sand with vegetation.

**Non MCerts matrix

Analytical Report Number : 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

Analytical Report Number : 17-44823

Project / Site name: Maylands Gateway, Hemel Hempstead

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

The results included within the report are representative of the samples submitted for analysis.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP CCL08		S	17-44823	729909	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP CCL08		S	17-44823	729909	b	Monohydric phenols in soil	L080-PL	b
TP CCL08		S	17-44823	729909	b	Speciated EPA-16 PAHs in soil	L064-PL	b
TP CCL08		S	17-44823	729909	b	TPHCWG (Soil)	L076-PL	b

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

Laboratory Report	CIV/27527	Contract Sample No	C4081/1
Report Date	21 April 2017	Clients Reference	C4081/1

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
UKAS TESTING 4161

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 01 @ 0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	22.7 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27528	Contract Sample No	C4081/2
Report Date	21 April 2017	Clients Reference	C4081/2

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL03@ 0.2-0.7m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	26.3 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	100 %
20 mm	97 %
14 mm	95 %
10 mm	92 %
6.3 mm	91 %
5 mm	90 %
3.35 mm	90 %
2 mm	89 %
1.18 mm	88 %
600 µm	87 %
425 µm	86 %
300 µm	83 %
150 µm	79 %
63 µm	76 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	46 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	18 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	28 %
Material Passing 425 µm test sieve	86 %

Laboratory Report	CIV/27528	Contract Sample No	C4081/2
Report Date	21 April 2017	Clients Reference	C4081/2

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL03@ 0.2-0.7m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
UKAS TESTING 4161

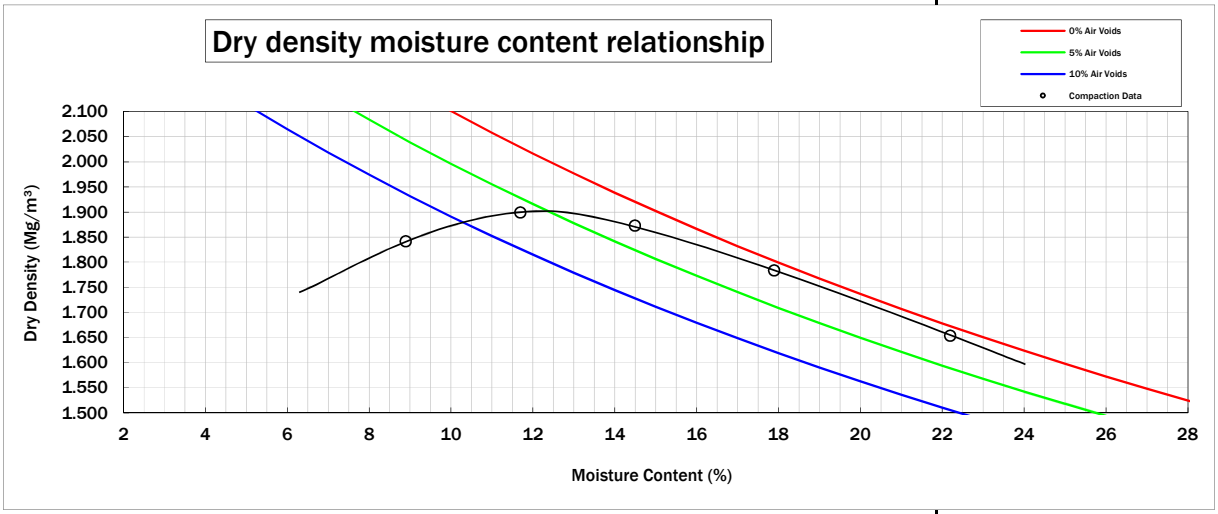
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.66 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	12 %
Maximum Dry Density	1.90 Mg/m³
Material Retained on 20.0 mm test sieve	3 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/2758-27611	Contract Sample No	C4081/2-85
Report Date	21 April 2017	ETS Contract No	C4081/2-85

Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Bootham Lane
Dunscroft
Doncaster
DN7 4JU

Tel: 01302 352652
Fax: 01302 352700
Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Crossfield Consulting Geotechnical Er
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	20/04/2017
Sample Location	See Below
Client Reference	C4081/2-85

Determination of Equivalent Shear Strength

Based on BS1377, Part 9: 1990 & BS 5930: 1999

Operator	MS	Equipment Reference	HSV 17
		Calibration Constant	1.449

Test Location		Shear Vane Readings Divisions)			Average Vane Reading	Equivalent Shear Strength (kPa)
		Test 1	Test 2	Test 3		
C4081/2A	MC @ 8.9DD @ 1.841	Too Stiff				
C4081/2B	MC @ 11.7 DD @ 1.898	Too Stiff				
C4081/2C	MC @ 14.5 DD @ 1.872	Too Stiff				
C4081/2D	MC @ 17.9 DD @ 1.783	Too Stiff				
C4081/2E	MC @ 22.2 DD @ 1.653	77	80	82	80	115
C4081/10A	MC @ 22.4 DD @ 1.660	96	92	94	94	136
C4081/10B	MC @16.7 DD @ 1.765	130	132	130	131	189
C4081/10C	MC @13.8 DD @ 1.795	Too Stiff				
C4081/10D	MC @10.1 DD @ 1.672	Too Stiff				
C4081/10E	MC @7.3 DD @ 1.675	Too Stiff				
C4081/12A	MC @ 28.1 DD @ 1.53	58	60	56	58	84
C4081/12B	MC @ 20.1 DD @ 1.693	120	118	122	120	174
C4081/12C	MC @ 15.6 DD @ 1.630	Too Stiff				
C4081/12D	MC @ 21.9 DD @ 1.657	Too Stiff				
C4081/12E	MC @ 13.6 DD @ 1.573	Too Stiff				
C4081/12A	MC @ 26.7 DD @ 1.529	104	98	100	101	146
C4081/12B	MC @ 23 DD @ 1.607	148	150	146	148	215
C4081/12C	MC @ 21.1 DD @ 1.625	Too Stiff				
C4081/12D	MC @ 18.5 DD @ 1.618	Too Stiff				
C4081/12E	MC @ 9.5 DD @ 1.606	Too Stiff				
C4081/18A	MC @ 37.6 DD @ 1.317	74	76	72	74	107
C4081/18B	MC @ 30.7 DD @ 1.415	140	138	140	139	202
C4081/18C	MC @ 24.2 DD @ 1.517	Too Stiff				
C4081/18D	MC @ 21.7 DD @ 1.515	Too Stiff				

Laboratory Report	CIV/2758-27611	Contract Sample No	C4081/2-85
Report Date	21 April 2017	ETS Contract No	C4081/2-85

Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Bootham Lane
Dunscroft
Doncaster
DN7 4JU

Tel: 01302 352652
Fax: 01302 352700
Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Crossfield Consulting Geotechnical Er
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	20/04/2017
Sample Location	See Below
Client Reference	C4081/2-85

Determination of Equivalent Shear Strength

Based on BS1377, Part 9: 1990 & BS 5930: 1999

C4081/18E	MC @ 21.3 DD @ 1.434	Too Stiff				
C4081/22A	MC @ 22.4 DD @ 1.642	50	48	52	50	72
C4081/22B	MC @ 19.9 DD @ 1.682	134	136	132	134	194
C4081/22C	MC @ 17.4 DD @ 1.687	Too Stiff				
C4081/22D	MC @ 14.1 DD @ 1.665	Too Stiff				
C4081/22E	MC @ 9.0 DD @ 1.659	Too Stiff				
C4081/22A	MC @ 22.2 DD @ 1.655	Too Stiff				
C4081/22B	MC @ 15.3 DD @ 1.740	Too Stiff				
C4081/22C	MC @ 14.4 DD @ 1.734	Too Stiff				
C4081/22D	MC @ 10.4 DD @ 1.724	Too Stiff				
C4081/22E	MC @ 5.5 DD @ 1.634	Too Stiff				
C4081/25A	MC @ 12.1 DD @ 1.886	Too Stiff				
C4081/25B	MC @ 14.2 DD @ 1.890	Too Stiff				
C4081/25C	MC @ 19.2 DD @ 1.766	Too Stiff				
C4081/25D	MC @ 27.5 DD @ 1.536	32	32	34	33	47
C4081/25E	MC @ 8.0 DD @ 1.852	Too Stiff				
C4081/25A	MC @ 26.1 DD @ 1.543	114	120	118	117	170
C4081/25B	MC @ 20.2 DD @ 1.676	Too Stiff				
C4081/25C	MC @ 17.9DD @ 1.695	Too Stiff				
C4081/25D	MC@ 14.9 DD @ 1.689	Too Stiff				
C4081/25E	MC @ 11.3 DD @ 1.673	Too Stiff				
C4081/30A	MC @ 31.4 DD @ 1.422	100	98	102	100	145
C4081/30B	MC @ 23.6 DD @ 1.588	Too Stiff				
C4081/30C	MC @ 20 DD @ 1.604	Too Stiff				
C4081/30D	MC @ 16.2 DD @ 1.563	Too Stiff				
C4081/30E	MC @ 12.2 DD @ 1.556	Too Stiff				
C4081/32A	MC @ 27.3 DD @ 1.540	68	70	66	68	99
C4081/32B	MC @ 21.4 DD @ 1.632	116	120	112	116	168
C4081/32C	MC @ 18.7 DD @ 1.658	Too Stiff				
C4081/32D	MC @ 17.3 DD @ 1.634	Too Stiff				
C4081/32E	MC @ 12.3 DD @ 1.631	Too Stiff				
C4081/32A	MC @ 27.4 DD @ 1.524	Too Stiff				

Laboratory Report	CIV/2758-27611	Contract Sample No	C4081/2-85
Report Date	21 April 2017	ETS Contract No	C4081/2-85

Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Bootham Lane
Dunscroft
Doncaster
DN7 4JU

Tel: 01302 352652
Fax: 01302 352700
Web: www.constructiontesting.co.uk
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Crossfield Consulting Geotechnical Er
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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	20/04/2017
Sample Location	See Below
Client Reference	C4081/2-85

Determination of Equivalent Shear Strength

Based on BS1377, Part 9: 1990 & BS 5930: 1999

C4081/32B	MC @ 23.6 DD @ 1.597	Too Stiff				
C4081/32C	MC @ 20.5 DD @ 1.621	Too Stiff				
C4081/32D	MC @ 16.3 DD @ 1.600	Too Stiff				
C4081/32E	MC @ 12.9 DD @ 1.561	Too Stiff				
C4081/34A	MC @ 27.3 DD @ 1.521	66	70	66	67	98
C4081/34B	MC @ 18.9 DD @ 1.750	Too Stiff				
C4081/34C	MC @ 16.5 DD @ 1.764	Too Stiff				
C4081/34D	MC @ 11.7 DD @ 1.759	Too Stiff				
C4081/34E	MC @ 8.5 DD @ 1.682	Too Stiff				
C4081/46A	MC @ 21.1 DD @ 1.642	64	64	56	61	89
C4081/46B	MC @ 19 DD @ 1.717	Too Stiff				
C4081/46C	MC @ 14.9 DD @ 1.774	Too Stiff				
C4081/46D	MC @ 10.9 DD @ 1.787	Too Stiff				
C4081/46E	MC @ 7.4 DD @ 1.700	Too Stiff				
C4081/46A	MC @ 20.9 DD @ 1.660	140	140	140	140	203
C4081/46B	MC @ 17.2 DD @ 1.683	140	140	140	140	203
C4081/46C	MC @ 14.4 DD @ 1.656	140	140	140	140	203
C4081/46D	MC @ 8.7 DD @ 1.610	140	140	140	140	203
C4081/46E	MC @ 23.9 DD @ 1.574	140	140	140	140	203
C4081/59A	MC @ 26.9 DD @ 1.536	112	126	124	121	175
C4081/59B	MC @ 19.6 DD @ 1.669	Too Stiff				
C4081/59C	MC @ 17.1 DD @ 1.704	Too Stiff				
C4081/59D	MC @ 10.3 DD @ 1.642	Too Stiff				
C4081/59E	MC @ 8.6 DD @ 1.577	Too Stiff				
C4081/65A	MC @ 32.7 DD @ 1.430	70	60	60	63	92
C4081/65B	MC @ 26 DD @ 1.566	140	140	140	140	203
C4081/65C	MC @ 22.6 DD @ 1.630	140	140	140	140	203
C4081/65D	MC @ 17 DD @ 1.666	140	140	140	140	203
C4081/65E	MC @13.5 DD @ 1.571	140	140	140	140	203
C4081/68A	MC @ 34 DD @ 1.391	58	60	62	60	87
C4081/68B	MC @ 29.9 DD @ 1.497	120	122	118	120	174
C4081/68C	MC @ 25.9 DD @ 1.551	Too Stiff				

Laboratory Report	CIV/2758-27611	Contract Sample No	C4081/2-85
Report Date	21 April 2017	ETS Contract No	C4081/2-85

Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Bootham Lane
Dunscroft
Doncaster
DN7 4JU

Tel: 01302 352652
Fax: 01302 352700
Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Crossfield Consulting Geotechnical Er
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	20/04/2017
Sample Location	See Below
Client Reference	C4081/2-85

Determination of Equivalent Shear Strength

Based on BS1377, Part 9: 1990 & BS 5930: 1999

C4081/68D	MC @ 18.9 DD @ 1.590	Too Stiff				
C4081/68E	MC @ 18.4 DD @ 1.535	Too Stiff				
C4081/69A	MC @ 25.4 DD @ 1.566	48	48	46	47	69
C4081/69B	MC @ 19.0 DD @ 1.712	80	82	78	80	116
C4081/69C	MC @ 15.9 DD @ 1.665	Too Stiff				
C4081/69D	MC @ 11.0 DD @ 1.615	Too Stiff				
C4081/69E	MC @ 5.9 DD @ 1.555	Too Stiff				
C4081/74A	MC@ 28.4 DD @ 1.501	118	110	116	115	166
C4081/74B	MC @ 13.2 DD @ 1.509	Too Stiff				
C4081/74C	MC @ 21.4 DD @ 1.629	Too Stiff				
C4081/74D	MC @ 17.7 DD @ 1.637	Too Stiff				
C4081/74E	MC @ 14.2 DD @ 1.592	Too Stiff				
C4081/76A	MC @ 22.2 DD @ 1.651	140	138	144	141	204
C4081/76B	MC @ 15.7 DD @ 1.612	140	140	140	140	203
C4081/76C	MC @ 18.6 DD @ 1.638	Too Stiff				
C4081/76D	MC @ 25.6 DD @ 1.477	44	46	38	43	62
C4081/76E	MC @ 27.9 DD @ 1.457	20	18	16	18	26
C4081/78A	MC @ 19.0 DD @ 1.712	Too Stiff				
C4081/78B	MC @ 22.5 DD @ 1.632	Too Stiff				
C4081/78C	MC @15.4 DD @ 1.760	Too Stiff				
C4081/78D	MC @ 13.0 DD @ 1.716	Too Stiff				
C4081/78E	MC @ 9.6 DD @ 1.706	Too Stiff				
C4081/78A	MC @ 20.5 DD @ 1.665	98	98	100	99	143
C4081/78B	MC @ 17.4 DD @ 1.720	120	128	124	124	180
C4081/78C	MC @ 9.7 DD @ 1.628	Too Stiff				
C4081/78D	MC @ 6.9 DD @ 1.629	Too Stiff				
C4081/78E	MC @ 24.2 DD @ 1.530	28	30	28	29	42
C4081/85A	MC @ 34.7 DD @ 1.358	84	82	82	83	120
C4081/85B	MC @ 19.5 DD @ 1.590	Too Stiff				
C4081/85C	MC @ 23.5 DD @ 1.573	Too Stiff				
C4081/85D	MC @ 15.7 DD @ 1.557	Too Stiff				
C4081/85E	MC @ 11.1 DD @ 1.516	Too Stiff				

Laboratory Report	CIV/2758-27611	Contract Sample No	C4081/2-85
Report Date	21 April 2017	ETS Contract No	C4081/2-85

Construction Testing Solutions Ltd

Bootham Lane Industrial Estate
Bootham Lane
Dunscroft
Doncaster
DN7 4JU

Tel: 01302 352652
Fax: 01302 352700
Web: www.constructiontesting.co.uk
Email: enquiries@constructiontesting.co.uk

Crossfield Consulting Geotechnical Er
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	20/04/2017
Sample Location	See Below
Client Reference	C4081/2-85

Determination of Equivalent Shear Strength

Based on BS1377, Part 9: 1990 & BS 5930: 1999

C4081/88A	MC @ 22.4 DD @ 1.639	102	104	98	101	147
C4081/88B	MC @ 18.9 DD @ 1.713	120	124	118	121	175
C4081/88C	MC @ 15.8 DD @ 1.712	140	140	140	140	203
C4081/88D	MC @ 9.1 DD @ 1.608	Too Stiff				
C4081/85E	MC @ 12.4 DD @ 1.658	Too Stiff				

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27529	Contract Sample No	C4081/3
Report Date	21 April 2017	Clients Reference	C4081/3

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 03 @ 1.3m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27530	Contract Sample No	C4081/4
Report Date	21 April 2017	Clients Reference	C4081/4

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 03 @ 1.8m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	35.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27531	Contract Sample No	C4081/5
Report Date	21 April 2017	Clients Reference	C4081/5

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 03 @ 2.1-2.2m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	25.9 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	78 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	28 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	50 %
Material Passing 425 µm test sieve	68 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27532	Contract Sample No	C4081/6
Report Date	21 April 2017	Clients Reference	C4081/6

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 03 @ 3.4m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	34.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27533	Contract Sample No	C4081/7
Report Date	21 April 2017	Clients Reference	C4081/7

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 04 @ 0.2m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	28.7 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27534	Contract Sample No	C4081/8
Report Date	21 April 2017	Clients Reference	C4081/8

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 04 @ 0.8m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.5 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27535	Contract Sample No	C4081/9
Report Date	21 April 2017	Clients Reference	C4081/9

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 05 @ 0.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	18.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27536	Contract Sample No	C4081/10
Report Date	21 April 2017	Clients Reference	C4081/10

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL05@ 0.4-0.6m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	19.0 %

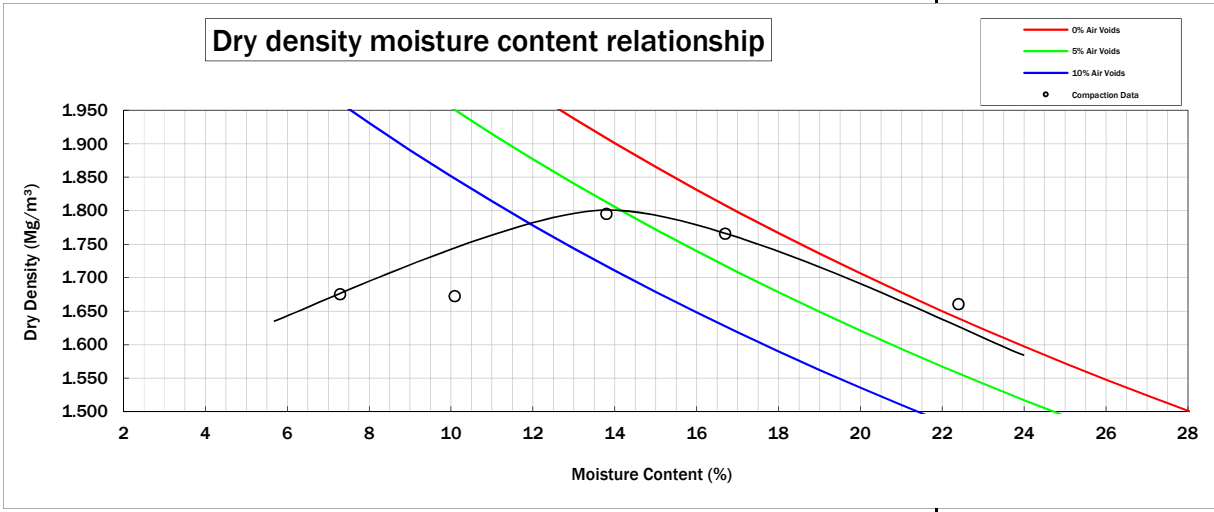
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.59 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	14 %
Maximum Dry Density	1.80 Mg/m³
Material Retained on 20.0 mm test sieve	13 %
Material Retained on 37.5 mm test sieve	13 % *

*Note

Materials which contain more than 10% retained on a 37.5mm test sieve and 30% retained on a 20mm test sieve are not (Zone X - BS1377:Part 4: 1990, figure 2). In this instance only material passing the 37.5mm sieve was tested.

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27537	Contract Sample No	C4081/11
Report Date	21 April 2017	Clients Reference	C4081/11

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
UKAS TESTING 4161

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 06 @ 0.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	27.2 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	57 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	21 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	36 %
Material Passing 425 µm test sieve	81 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27538	Contract Sample No	C4081/12
Report Date	21 April 2017	Clients Reference	C4081/12

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 06 @ 0.5-0.7m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	24.6 %

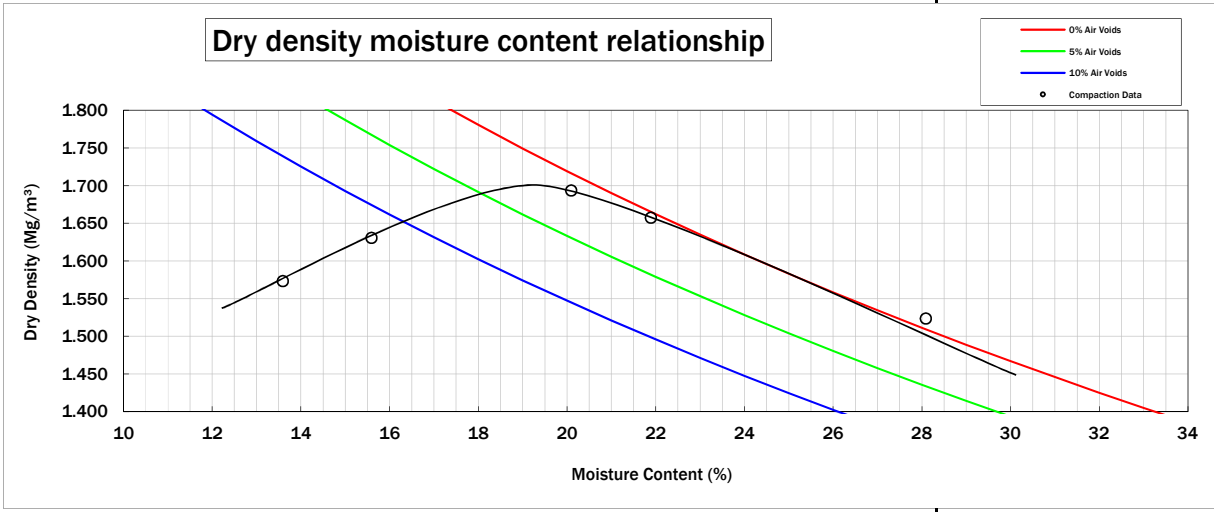
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.62 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	20 %
Maximum Dry Density	1.70 Mg/m³
Material Retained on 20.0 mm test sieve	9 %
Material Retained on 37.5 mm test sieve	5 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27538B	Contract Sample No	C4081/12B
Report Date	21 April 2017	Clients Reference	C4081/12B

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White Hall Farm
Long Itchington
Warwickshire
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Material Description	+ 2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 06 @ 0.5-0.7m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

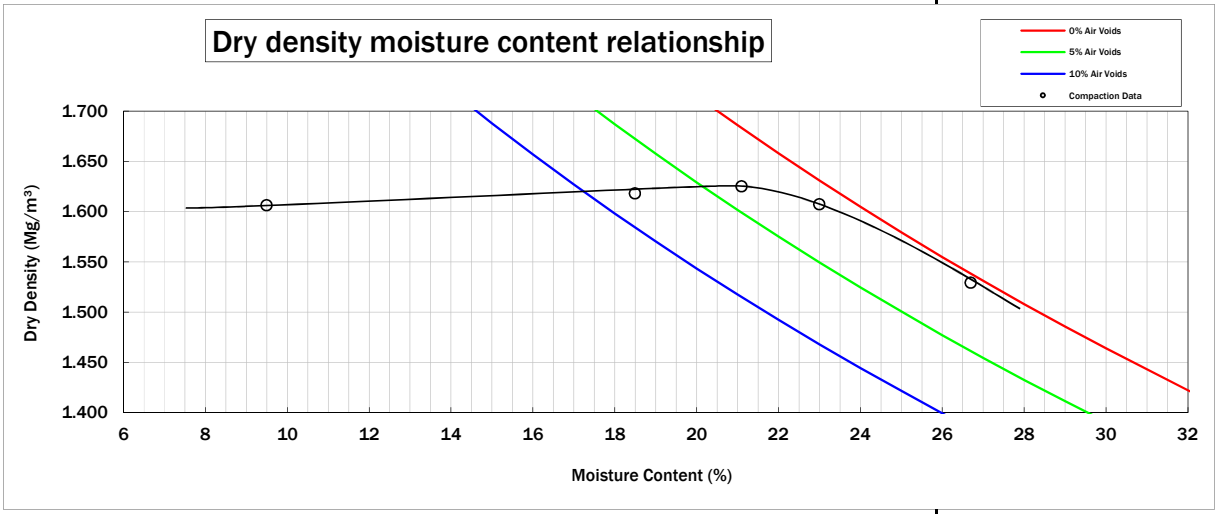
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.54 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	21 %
Maximum Dry Density	1.63 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27539	Contract Sample No	C4081/13
Report Date	21 April 2017	Clients Reference	C4081/13

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk
UKAS TESTING 4161

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 06 @ 1.1m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	39.5 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27540	Contract Sample No	C4081/14
Report Date	21 April 2017	Clients Reference	C4081/14

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 06 @ 1.7m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	33.2 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	77 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	20 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	57 %
Material Passing 425 µm test sieve	77 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27541	Contract Sample No	C4081/15
Report Date	25 April 2017	Clients Reference	C4081/15

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	24/04/2017
Sample Location	TP CCL 06 @ 2.5m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Saturated Moisture Content of Chalk BS 1377 - 2 : 1990*

		Specification
Average Saturation Moisture Content	38 %	
Average In-Tact Dry Density (IDD)	1.33 Mg/m³	

** denotes test is outside the current scope of UKAS Accreditation for the laboratory*

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27542	Contract Sample No	C4081/16
Report Date	21 April 2017	Clients Reference	C4081/16

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 07 @ 0.5m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	38.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27543	Contract Sample No	C4081/17
Report Date	21 April 2017	Clients Reference	C4081/17

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 07 @ 1.0m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	41.9 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27544	Contract Sample No	C4081/18
Report Date	21 April 2017	Clients Reference	C4081/18

Crossfield Consulting Geotechnical Environmental
The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 07 @ 1.0-1.2m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	38.8 %

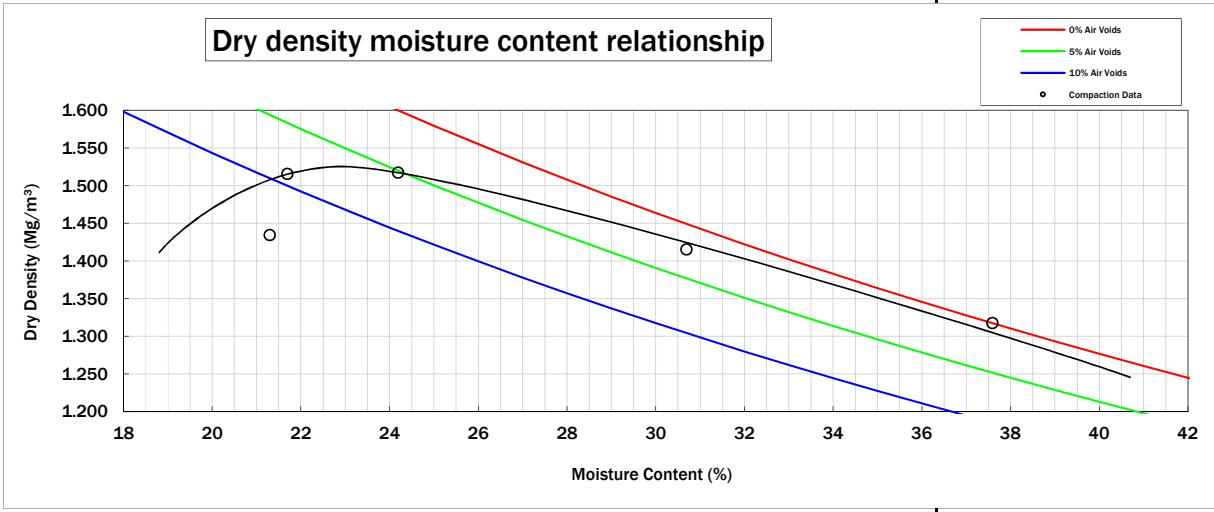
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.61 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	23 %
Maximum Dry Density	1.53 Mg/m³
Material Retained on 20.0 mm test sieve	2 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27545	Contract Sample No	C4081/19
Report Date	21 April 2017	Clients Reference	C4081/19

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 07 @ 1.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	36.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27546	Contract Sample No	C4081/20
Report Date	21 April 2017	Clients Reference	C4081/20

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 07 @ 2.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27547	Contract Sample No	C4081/21
Report Date	21 April 2017	Clients Reference	C4081/21

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 0.5m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	20.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27548	Contract Sample No	C4081/22
Report Date	21 April 2017	Clients Reference	C4081/22

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 0.7-0.8m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	21.6 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	96 %
20 mm	96 %
14 mm	95 %
10 mm	91 %
6.3 mm	90 %
5 mm	89 %
3.35 mm	88 %
2 mm	87 %
1.18 mm	86 %
600 µm	86 %
425 µm	85 %
300 µm	85 %
150 µm	84 %
63 µm	81 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	54 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	17 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	37 %
Material Passing 425 µm test sieve	85 %

Laboratory Report	CIV/27548	Contract Sample No	C4081/22
Report Date	21 April 2017	Clients Reference	C4081/22

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Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 0.7-0.8m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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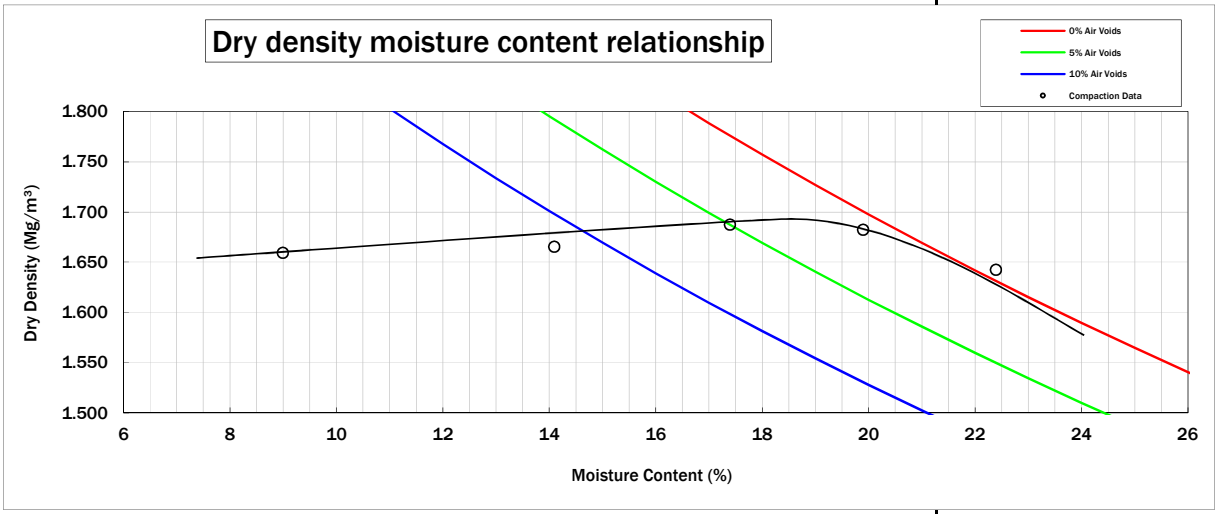
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.57 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	19 %
Maximum Dry Density	1.69 Mg/m³
Material Retained on 20.0 mm test sieve	4 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27548B	Contract Sample No	C4081/22
Report Date	21 April 2017	Clients Reference	C4081/22

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White Hall Farm
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CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	+2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 0.7-0.8m

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T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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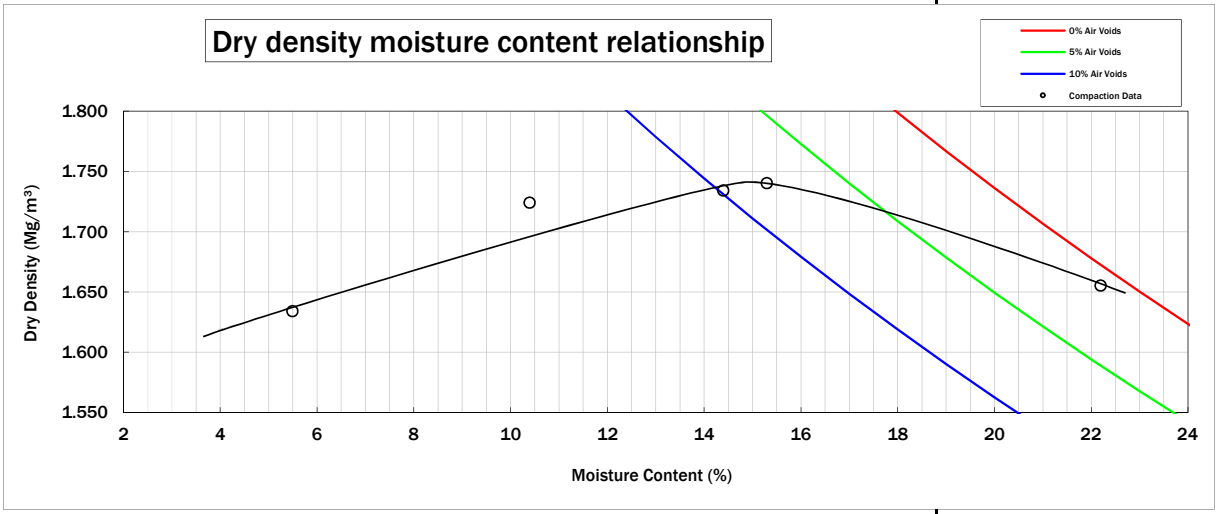
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.66 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	15 %
Maximum Dry Density	1.74 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27549	Contract Sample No	C4081/23
Report Date	21 April 2017	Clients Reference	C4081/23

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 1.0m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	26.0 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27550	Contract Sample No	C4081/24
Report Date	21 April 2017	Clients Reference	C4081/24

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 1.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.9 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27551	Contract Sample No	C4081/25
Report Date	21 April 2017	Clients Reference	C4081/25

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 2.0-2.2m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	26.4 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	100 %
20 mm	96 %
14 mm	94 %
10 mm	91 %
6.3 mm	90 %
5 mm	89 %
3.35 mm	89 %
2 mm	88 %
1.18 mm	87 %
600 µm	87 %
425 µm	86 %
300 µm	85 %
150 µm	83 %
63 µm	79 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	56 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	18 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	38 %
Material Passing 425 µm test sieve	86 %

Laboratory Report	CIV/27551	Contract Sample No	C4081/25
Report Date	21 April 2017	Clients Reference	C4081/25

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Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 2.0-2.2m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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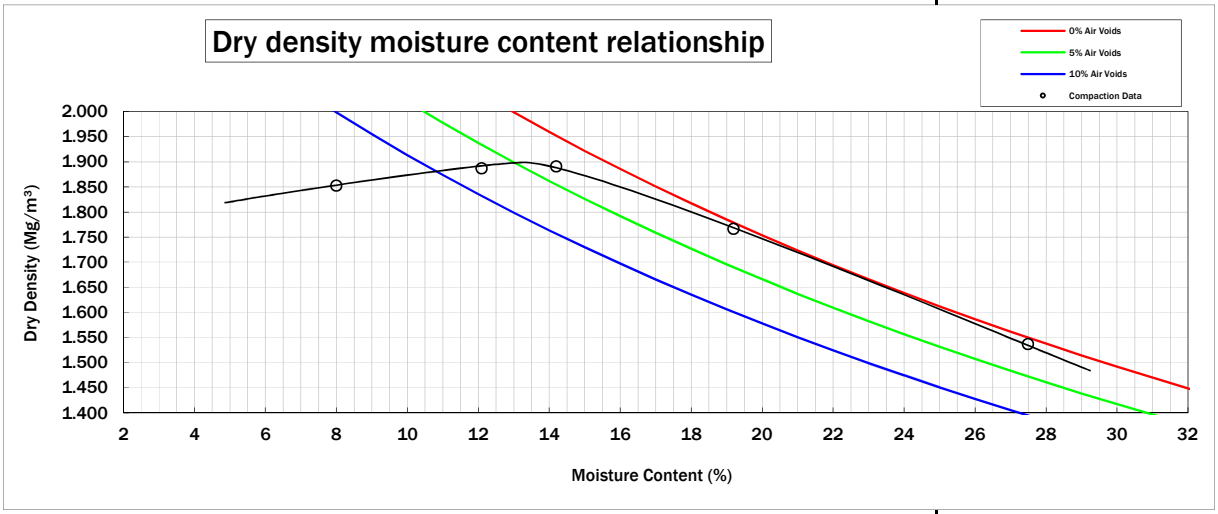
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.70 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	14 %
Maximum Dry Density	1.90 Mg/m³
Material Retained on 20.0 mm test sieve	4 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27551B	Contract Sample No	C4081/25
Report Date	21 April 2017	Clients Reference	C4081/25

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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	+2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 2.0-2.2m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

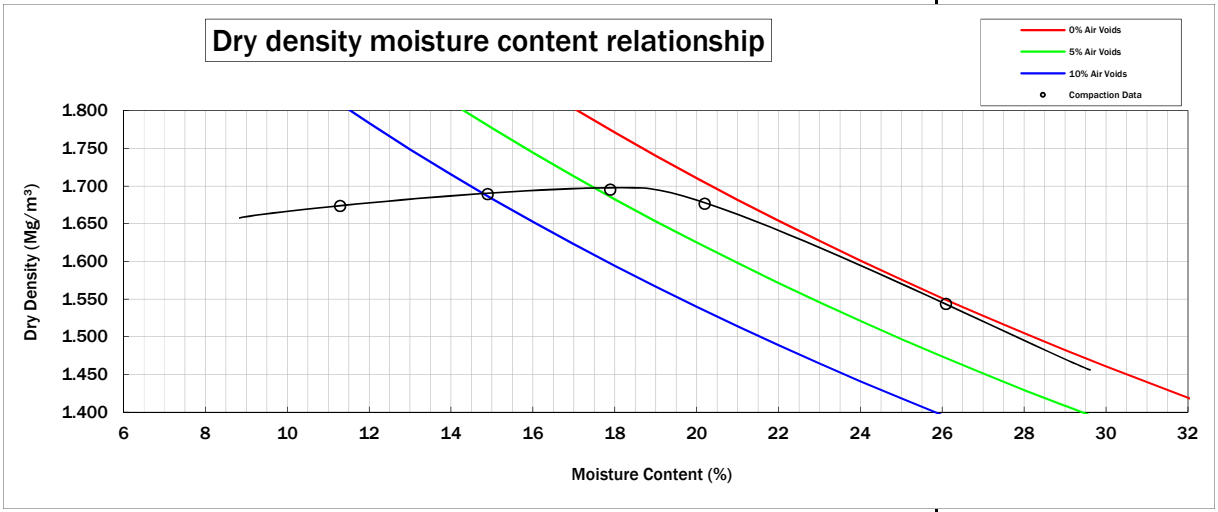
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.60 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	18 %
Maximum Dry Density	1.70 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27552	Contract Sample No	C4081/26
Report Date	21 April 2017	Clients Reference	C4081/26

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 08 @ 2.2m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	21.4 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27554	Contract Sample No	C4081/28
Report Date	21 April 2017	Clients Reference	C4081/28

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T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
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Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 09 @ 0.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	30.1 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	59 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	22 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	37 %
Material Passing 425 µm test sieve	97 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27555	Contract Sample No	C4081/29
Report Date	21 April 2017	Clients Reference	C4081/29

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 09 @ 0.8m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	34.9 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27556	Contract Sample No	C4081/30
Report Date	21 April 2017	Clients Reference	C4081/30

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Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 11 @ 0.5-0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

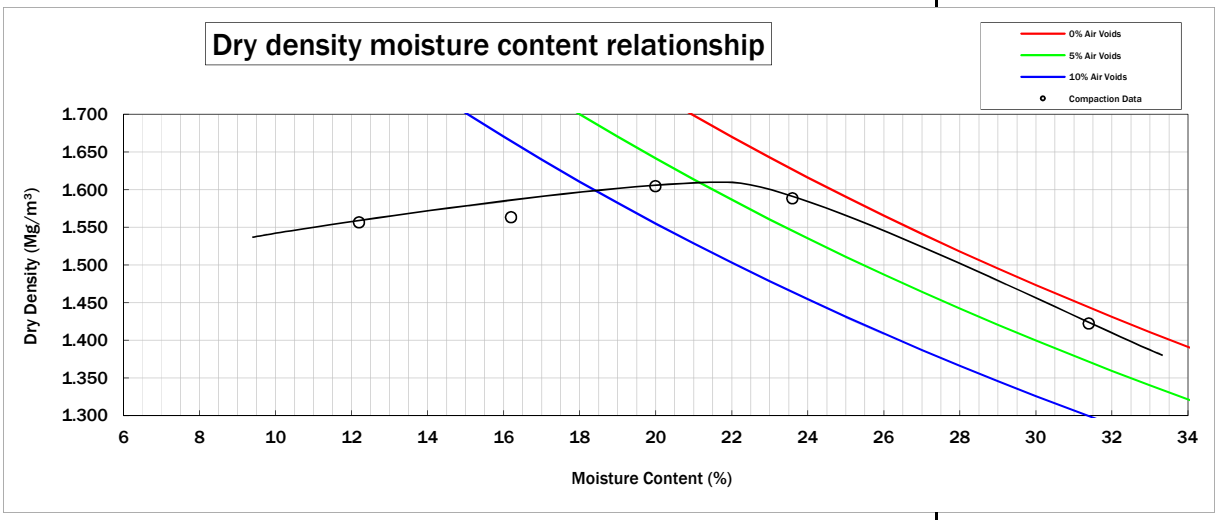
		Specification
Moisture Content	32.6 %	

Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

		Specification
Average Particle Density	2.64 Mg/m³	

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	22 %
Maximum Dry Density	1.61 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27557	Contract Sample No	C4081/31
Report Date	21 April 2017	Clients Reference	C4081/31

Construction Testing Solutions Ltd
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Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 13 @ 0.4m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	14.3 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27558	Contract Sample No	C4081/32
Report Date	21 April 2017	Clients Reference	C4081/32

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Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 13 @ 0.8-0.9m

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Dunscroft I Doncaster I DN7 4JU
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E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	37.1	%

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	86	%
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	21	%
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	65	%
Material Passing 425 µm test sieve	100	%

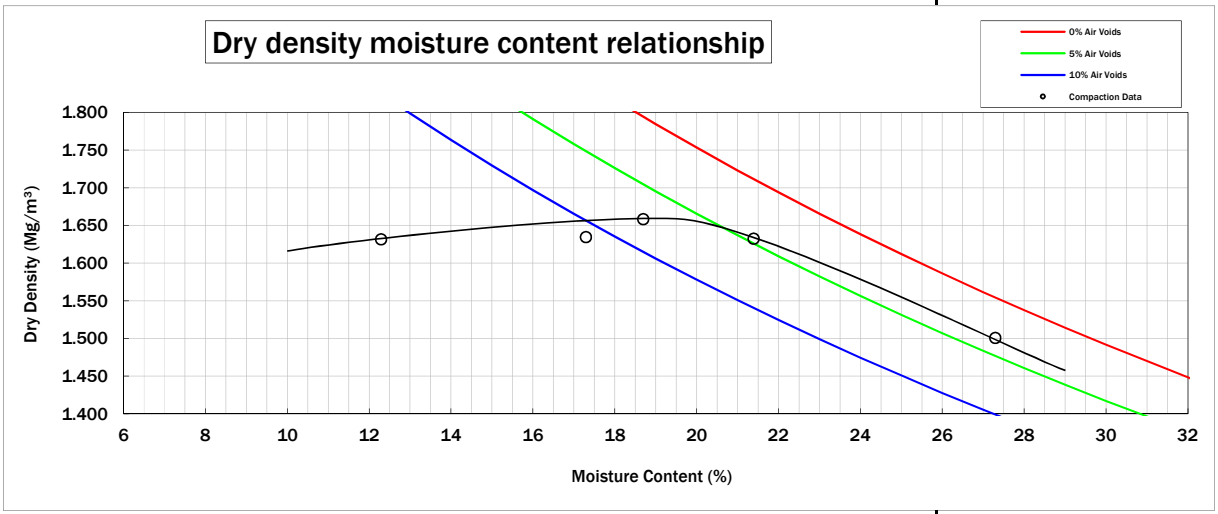
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.70	Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	19	%
Maximum Dry Density	1.66	Mg/m³
Material Retained on 20.0 mm test sieve	0	%
Material Retained on 37.5 mm test sieve	0	%

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27558B	Contract Sample No	C4081/32
Report Date	21 April 2017	Clients Reference	C4081/32

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Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	+2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 13 @ 0.8-0.9m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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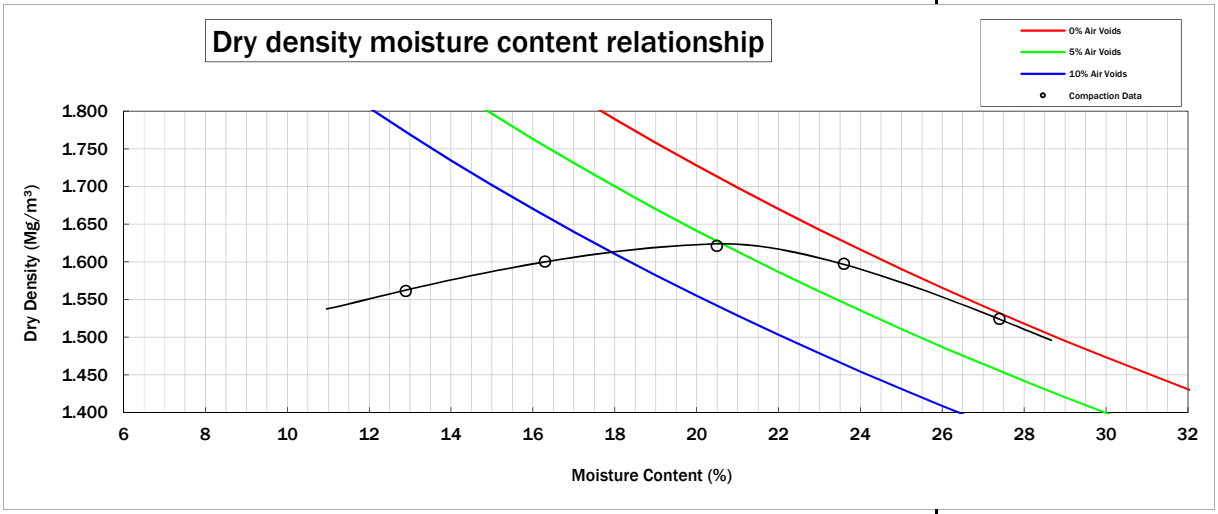
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.64 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	21 %
Maximum Dry Density	1.62 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27559	Contract Sample No	C4081/33
Report Date	21 April 2017	Clients Reference	C4081/33

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White Hall Farm
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CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 14 @ 0.6m

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Dunscroft I Doncaster I DN7 4JU
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	27.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27560	Contract Sample No	C4081/34
Report Date	21 April 2017	Clients Reference	C4081/34

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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 14 @ 0.9-1.1m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	26.5 %

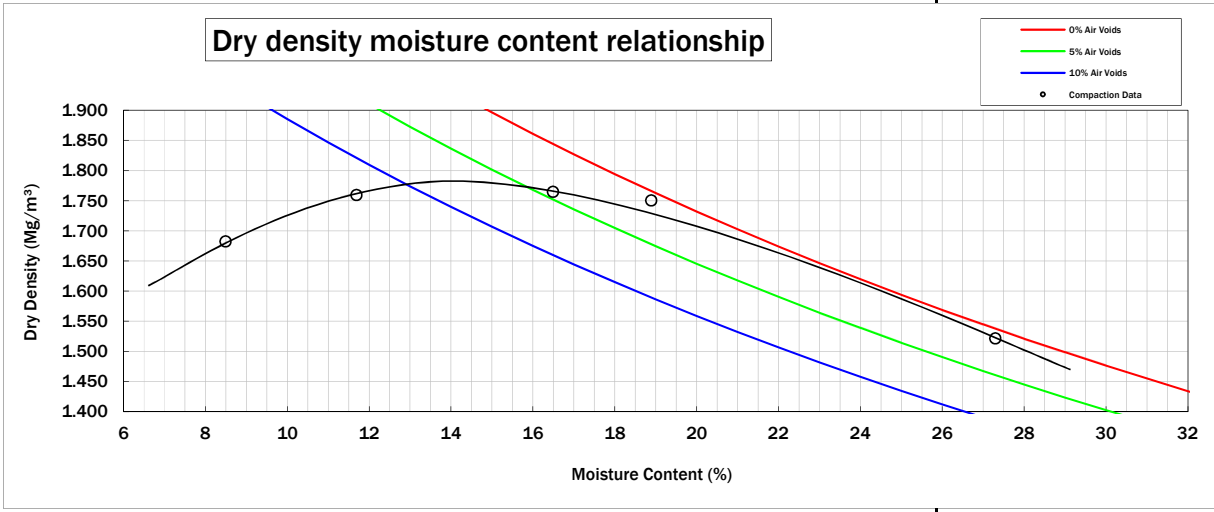
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.65 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	14 %
Maximum Dry Density	1.78 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27561	Contract Sample No	C4081/35
Report Date	21 April 2017	Clients Reference	C4081/35

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White Hall Farm
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Warwickshire
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 14 @ 1.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	46.4 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	61 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	17 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	44 %
Material Passing 425 µm test sieve	100 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27562	Contract Sample No	C4081/36
Report Date	21 April 2017	Clients Reference	C4081/36

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T I (01302) 352652
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The Granary
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Long Itchington
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 15 @ 0.4-0.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27563	Contract Sample No	C4081/37
Report Date	21 April 2017	Clients Reference	C4081/37

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 15 @ 0.9m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	27.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27564	Contract Sample No	C4081/38
Report Date	25 April 2017	Clients Reference	C4081/38

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Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	24/04/2017
Sample Location	TP CCL 15 @ 2.2m

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Saturated Moisture Content of Chalk BS 1377 - 2 : 1990*

		Specification
Average Saturation Moisture Content	39 %	
Average In-Tact Dry Density (IDD)	1.33 Mg/m³	

** denotes test is outside the current scope of UKAS Accreditation for the laboratory*

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27565	Contract Sample No	C4081/39
Report Date	21 April 2017	Clients Reference	C4081/39

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 16 @ 0.5m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	31.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27566	Contract Sample No	C4081/40
Report Date	21 April 2017	Clients Reference	C4081/40

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 16 @ 0.8m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	23.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27567	Contract Sample No	C4081/41
Report Date	21 April 2017	Clients Reference	C4081/41

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 16 @ 1.0-1.2m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	11.3 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27568	Contract Sample No	C4081/42
Report Date	21 April 2017	Clients Reference	C4081/42

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 17 @ 0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	37.1 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27569	Contract Sample No	C4081/43
Report Date	21 April 2017	Clients Reference	C4081/43

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 18@ 0.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	16.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27570	Contract Sample No	C4081/44
Report Date	21 April 2017	Clients Reference	C4081/44

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 18@ 1.0m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	25.7 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27571	Contract Sample No	C4081/45
Report Date	21 April 2017	Clients Reference	C4081/45

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 19@ 0.7m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	26.0 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27572	Contract Sample No	C4081/46
Report Date	21 April 2017	Clients Reference	C4081/46

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 19 @ 1.1-1.2m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	18.7 %

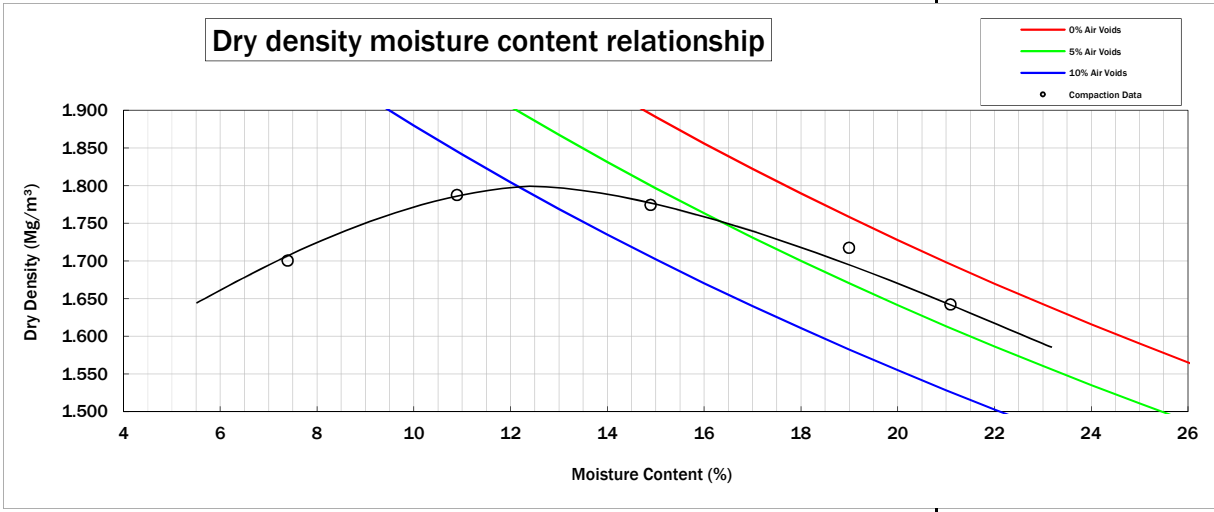
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.64 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	12 %
Maximum Dry Density	1.80 Mg/m³
Material Retained on 20.0 mm test sieve	18 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27572B	Contract Sample No	C4081/46
Report Date	21 April 2017	Clients Reference	C4081/46

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Material Description	+2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 19 @ 1.1-1.2m

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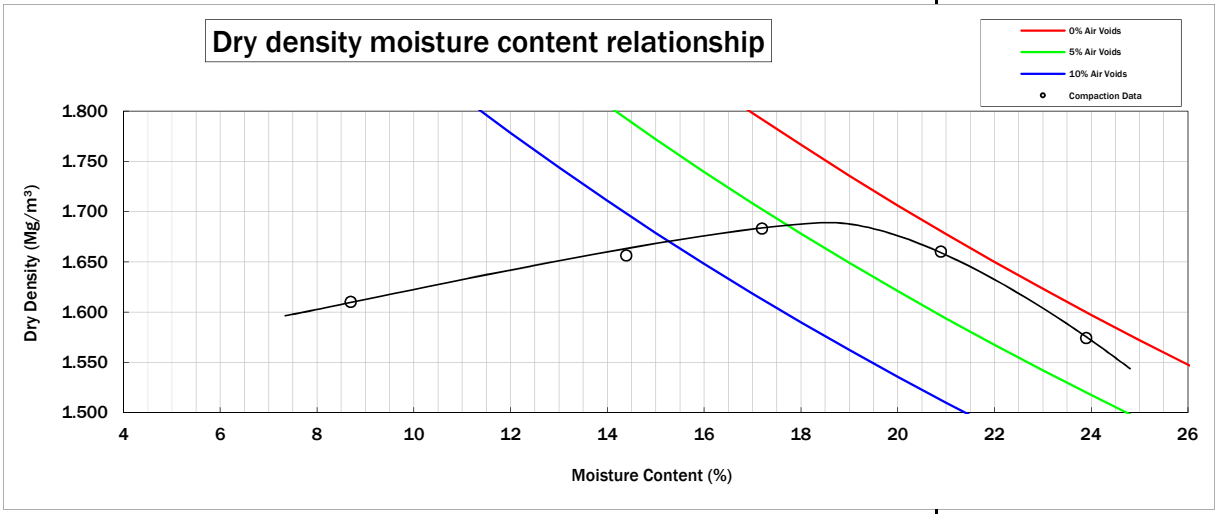
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.59 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	18 %
Maximum Dry Density	1.68 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27573	Contract Sample No	C4081/47
Report Date	21 April 2017	Clients Reference	C4081/47

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 20@ 0.6m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	26.7 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27574	Contract Sample No	C4081/48
Report Date	25 April 2017	Clients Reference	C4081/48

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Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	24/04/2017
Sample Location	TP CCL 20 @ 2.5-2.9m

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Saturated Moisture Content of Chalk BS 1377 - 2 : 1990*

Specification

Average Saturation Moisture Content	33 %
Average In-Tact Dry Density (IDD)	1.43 Mg/m³

** denotes test is outside the current scope of UKAS Accreditation for the laboratory*

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27575	Contract Sample No	C4081/49
Report Date	21 April 2017	Clients Reference	C4081/49

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The Granary
White Hall Farm
Long Itchington
Warwickshire
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 21@ 0.4m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	34.3 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27576	Contract Sample No	C4081/50
Report Date	21 April 2017	Clients Reference	C4081/50

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 21@ 0.9m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	33.3 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27577	Contract Sample No	C4081/51
Report Date	21 April 2017	Clients Reference	C4081/51

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 21@1.2-1.4m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	30.1 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27578	Contract Sample No	C4081/52
Report Date	21 April 2017	Clients Reference	C4081/52

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 21 @ 1.8m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	28.7 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	62 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	19 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	43 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27579	Contract Sample No	C4081/53
Report Date	21 April 2017	Clients Reference	C4081/53

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 22@1.4-1.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	20.4 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	58 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	21 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	37 %
Material Passing 425 µm test sieve	89 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27581	Contract Sample No	C4081/55
Report Date	21 April 2017	Clients Reference	C4081/55

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 23@0.5m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	29.4 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27584	Contract Sample No	C4081/58
Report Date	21 April 2017	Clients Reference	C4081/58

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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 28@1.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	28.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27585	Contract Sample No	C4081/59
Report Date	21 April 2017	Clients Reference	C4081/59

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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 28 @ 1.8-1.9m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	28.0 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	59 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	22 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	37 %

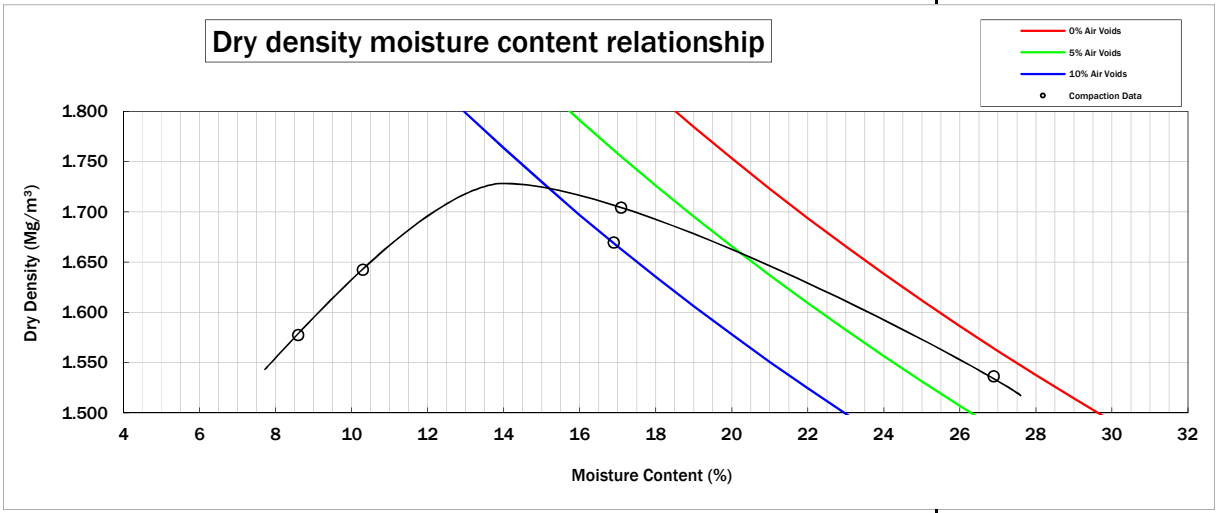
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.70 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	14 %
Maximum Dry Density	1.74 Mg/m³
Material Retained on 20.0 mm test sieve	5 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27586	Contract Sample No	C4081/60
Report Date	21 April 2017	Clients Reference	C4081/60

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 28 @ 2.2m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	31.4 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	68 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	24 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	44 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27587	Contract Sample No	C4081/61
Report Date	21 April 2017	Clients Reference	C4081/61

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 29 @ 0.5m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	33.1 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27588	Contract Sample No	C4081/62
Report Date	21 April 2017	Clients Reference	C4081/62

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 29 @ 1.2-1.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	27.2 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	100 %
20 mm	100 %
14 mm	100 %
10 mm	100 %
6.3 mm	100 %
5 mm	100 %
3.35 mm	100 %
2 mm	100 %
1.18 mm	100 %
600 µm	100 %
425 µm	100 %
300 µm	100 %
150 µm	99 %
63 µm	86 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27589	Contract Sample No	C4081/63
Report Date	25 April 2017	Clients Reference	C4081/63

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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W I www.constructiontesting.co.uk

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The Granary
White Hall Farm
Long Itchington
Warwickshire
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Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	24/04/2017
Sample Location	TP CCL 29 @ 3.2m

Saturated Moisture Content of Chalk BS 1377 - 2 : 1990*

		Specification
Average Saturation Moisture Content	42 %	
Average In-Tact Dry Density (IDD)	1.27 Mg/m³	

** denotes test is outside the current scope of UKAS Accreditation for the laboratory*

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27590	Contract Sample No	C4081/64
Report Date	21 April 2017	Clients Reference	C4081/64

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 30 @ 0.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	24.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27591	Contract Sample No	C4081/65
Report Date	21 April 2017	Clients Reference	C4081/65

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

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The Granary
White Hall Farm
Long Itchington
Warwickshire
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 30 @ 0.9-1.0m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	34.0 %

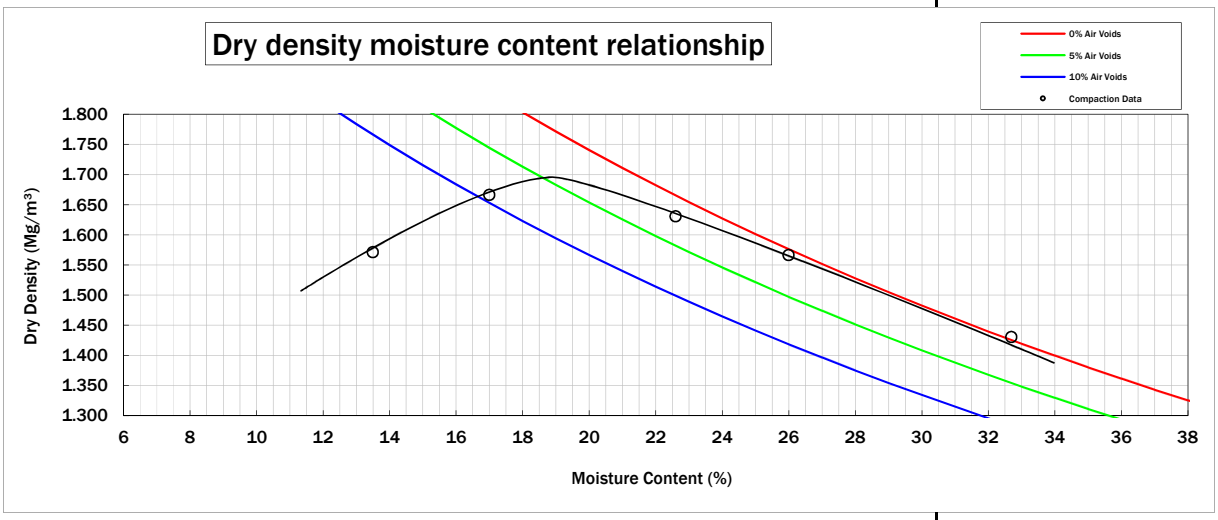
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.67 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	19 %
Maximum Dry Density	1.70 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27592	Contract Sample No	C4081/66
Report Date	21 April 2017	Clients Reference	C4081/66

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 30 @ 1.3m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	27.3 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	58 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	21 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	37 %
Material Passing 425 µm test sieve	100 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27593	Contract Sample No	C4081/67
Report Date	21 April 2017	Clients Reference	C4081/67

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Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 31 @ 0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	40.7 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27594	Contract Sample No	C4081/68
Report Date	21 April 2017	Clients Reference	C4081/68

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 33 @ 0.9-1.0m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	31.6 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	97 %
20 mm	95 %
14 mm	93 %
10 mm	93 %
6.3 mm	93 %
5 mm	93 %
3.35 mm	92 %
2 mm	92 %
1.18 mm	92 %
600 µm	91 %
425 µm	91 %
300 µm	90 %
150 µm	89 %
63 µm	86 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	67 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	24 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	43 %
Material Passing 425 µm test sieve	91 %

Laboratory Report	CIV/27594	Contract Sample No	C4081/68
Report Date	21 April 2017	Clients Reference	C4081/68

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 33 @ 0.9-1.0m

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Dunscroft I Doncaster I DN7 4JU
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E I enquiries@constructiontesting.co.uk
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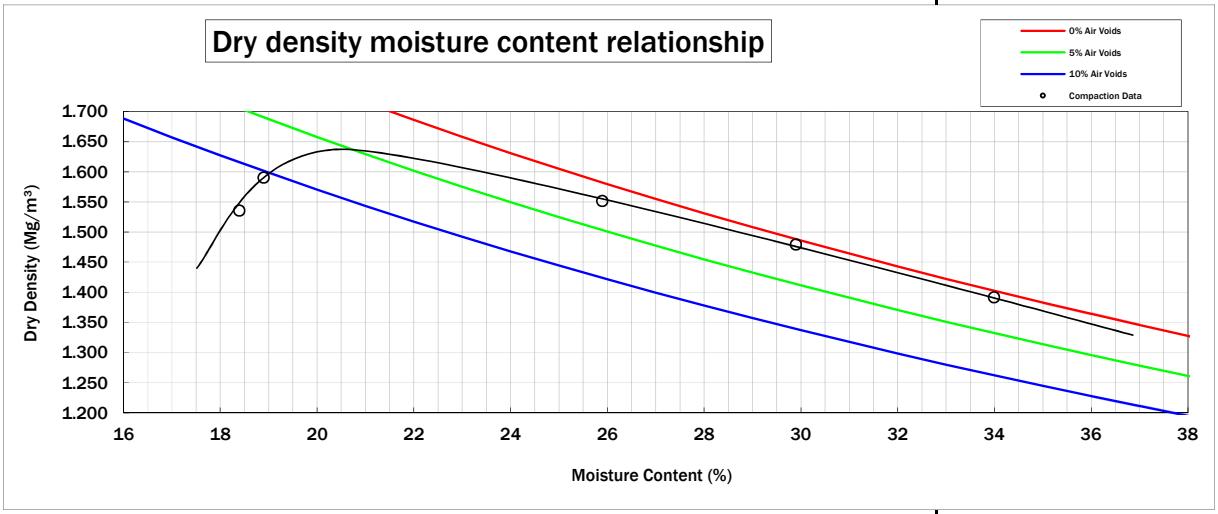
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.68 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	21 %
Maximum Dry Density	1.63 Mg/m³
Material Retained on 20.0 mm test sieve	5 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27595	Contract Sample No	C4081/69
Report Date	21 April 2017	Clients Reference	C4081/69

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 33 @ 2.4-2.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	18.1 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	50 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	19 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	31 %

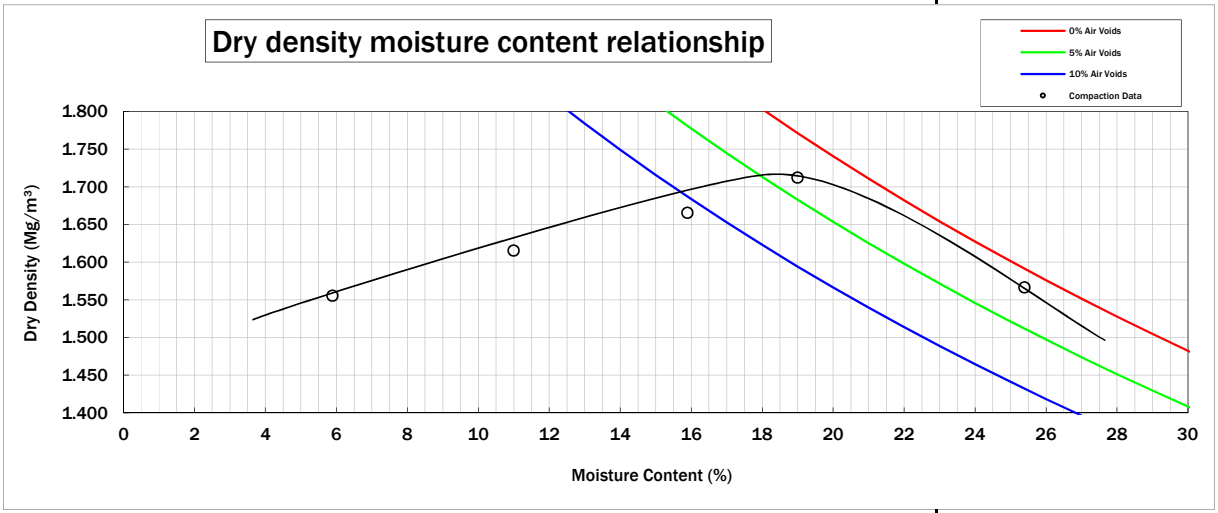
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.67 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	19 %
Maximum Dry Density	1.71 Mg/m³
Material Retained on 20.0 mm test sieve	18 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27596	Contract Sample No	C4081/70
Report Date	21 April 2017	Clients Reference	C4081/70

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The Granary
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Long Itchington
Warwickshire
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 36 @ 0.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	30.2 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27597	Contract Sample No	C4081/71
Report Date	21 April 2017	Clients Reference	C4081/71

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 37 @ 0.6m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	28.1 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27598	Contract Sample No	C4081/72
Report Date	21 April 2017	Clients Reference	C4081/72

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E I enquiries@constructiontesting.co.uk
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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	17.4 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27599	Contract Sample No	C4081/73
Report Date	21 April 2017	Clients Reference	C4081/73

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Long Itchington
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CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 1.0m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	25.1 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27600	Contract Sample No	C4081/74
Report Date	21 April 2017	Clients Reference	C4081/74

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T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
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CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 1.5-1.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	27.5 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	48 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	17 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	31 %

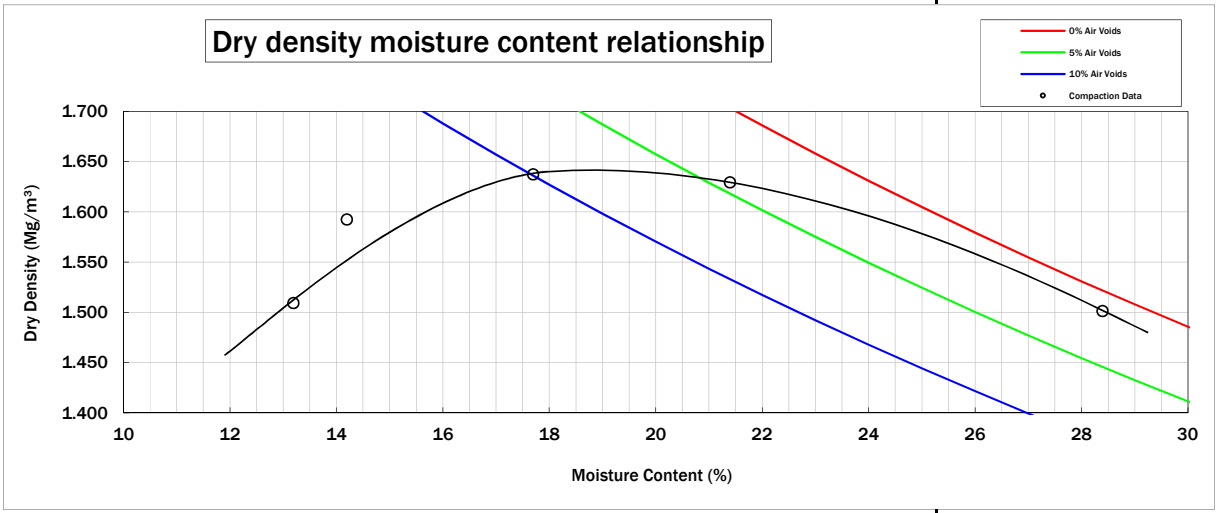
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.68 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	18 %
Maximum Dry Density	1.64 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27601	Contract Sample No	C4081/75
Report Date	21 April 2017	Clients Reference	C4081/75

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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 2.0m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	31.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27602	Contract Sample No	C4081/76
Report Date	21 April 2017	Clients Reference	C4081/76

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 2.4-2.5m

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Dunscroft I Doncaster I DN7 4JU
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E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	23.7 %

Determination of particle size distribution (wet sieving method) - BS 1377: Part 2: 1990 Clause 9.2

Specification

Sample prepared in accordance with BS 1377: Part 1: 1990 clause 7.3.4(a)

BS Sieve Size	Passing BS Sieve
125 mm	100 %
100 mm	100 %
90 mm	100 %
75 mm	100 %
63 mm	100 %
50 mm	100 %
37.5 mm	100 %
28 mm	100 %
20 mm	98 %
14 mm	98 %
10 mm	98 %
6.3 mm	98 %
5 mm	97 %
3.35 mm	97 %
2 mm	97 %
1.18 mm	96 %
600 µm	93 %
425 µm	90 %
300 µm	84 %
150 µm	72 %
63 µm	60 %

Laboratory Report	CIV/27602	Contract Sample No	C4081/76
Report Date	21 April 2017	Clients Reference	C4081/76

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 2.4-2.5m

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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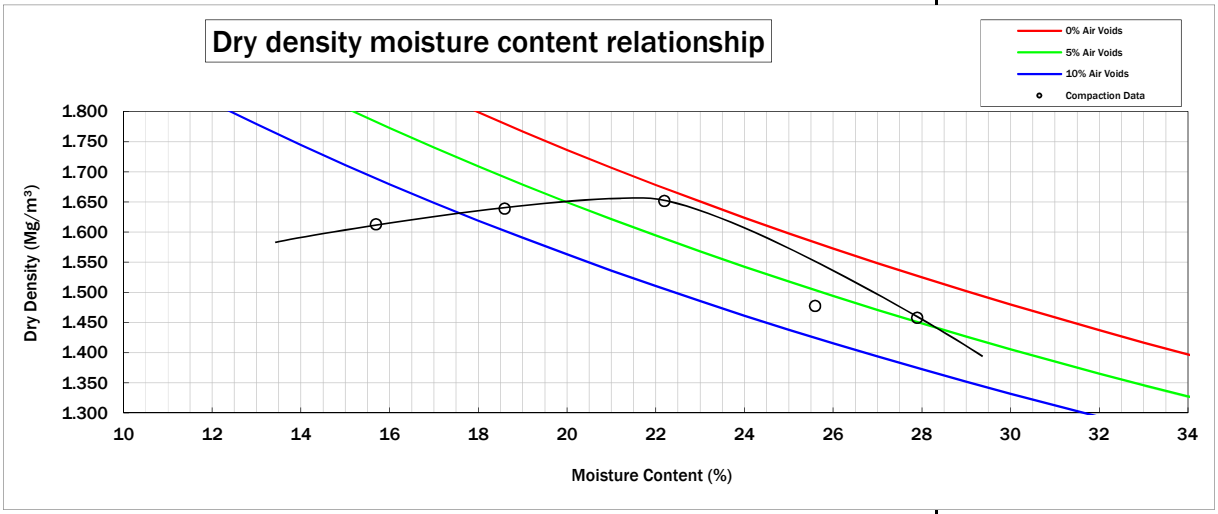
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density 2.66 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	22 %
Maximum Dry Density	1.65 Mg/m³
Material Retained on 20.0 mm test sieve	2 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27603	Contract Sample No	C4081/77
Report Date	21 April 2017	Clients Reference	C4081/77

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 40 @ 2.9m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	22.0 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27604	Contract Sample No	C4081/78
Report Date	21 April 2017	Clients Reference	C4081/78

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 0.2-0.4m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	18.3	%

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	46	%
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	22	%
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	24	%

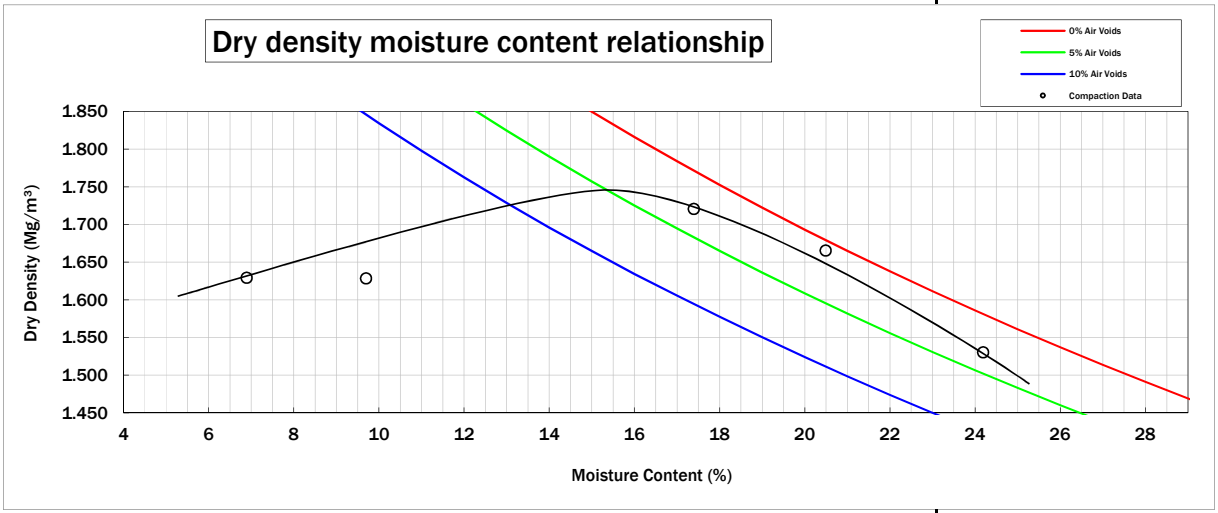
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.56	Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	16	%
Maximum Dry Density	1.75	Mg/m³
Material Retained on 20.0 mm test sieve	7	%
Material Retained on 37.5 mm test sieve	0	%

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27604	Contract Sample No	C4081/78
Report Date	21 April 2017	Clients Reference	C4081/78

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Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	+2% Lime
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 0.2-0.4m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk

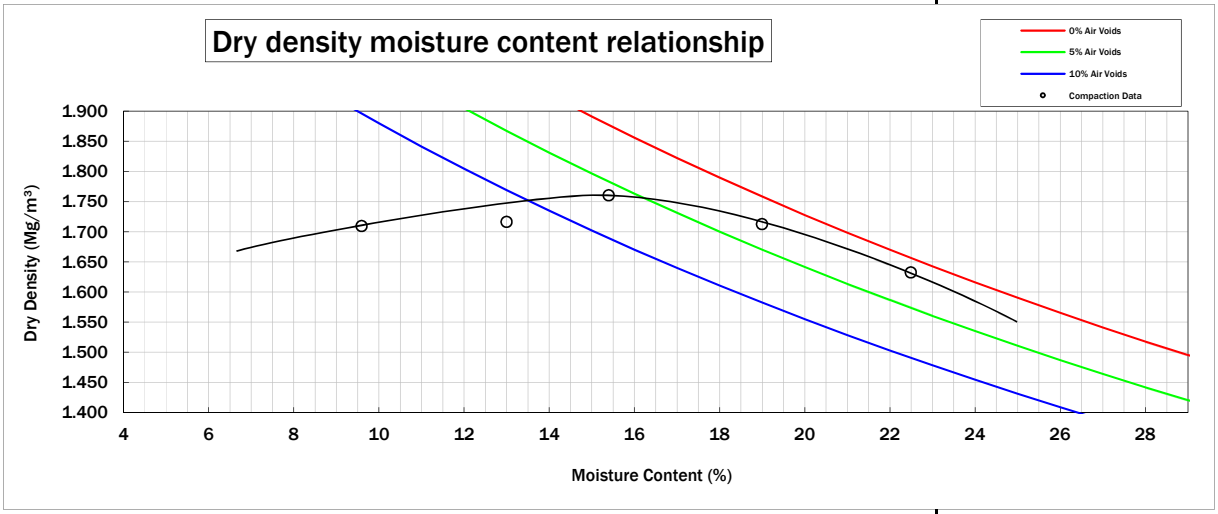
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.64 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	15 %
Maximum Dry Density	1.76 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27605	Contract Sample No	C4081/79
Report Date	21 April 2017	Clients Reference	C4081/79

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 0.8m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	21.9 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27606	Contract Sample No	C4081/80
Report Date	21 April 2017	Clients Reference	C4081/80

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Bootham Lane Industrial Estate
Dunscroft | Doncaster | DN7 4JU
T | (01302) 352652
E | enquiries@constructiontesting.co.uk
W | www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 1.3m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	22.8 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27607	Contract Sample No	C4081/81
Report Date	21 April 2017	Clients Reference	C4081/81

Construction Testing Solutions Ltd
Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 1.9m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	16.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27608	Contract Sample No	C4081/82
Report Date	21 April 2017	Clients Reference	C4081/82

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 2.1-2.2m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	18.6 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	49 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	18 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	31 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27609	Contract Sample No	C4081/83
Report Date	21 April 2017	Clients Reference	C4081/83

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
W I www.constructiontesting.co.uk
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

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Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 41 @ 2.5m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	26.0 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27610	Contract Sample No	C4081/84
Report Date	21 April 2017	Clients Reference	C4081/84

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The Granary
White Hall Farm
Long Itchington
Warwickshire
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Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 42 @ 0.5m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	22.6 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27611	Contract Sample No	C4081/85
Report Date	21 April 2017	Clients Reference	C4081/85

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 44 @ 0.5-0.6m

Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	30.7 %

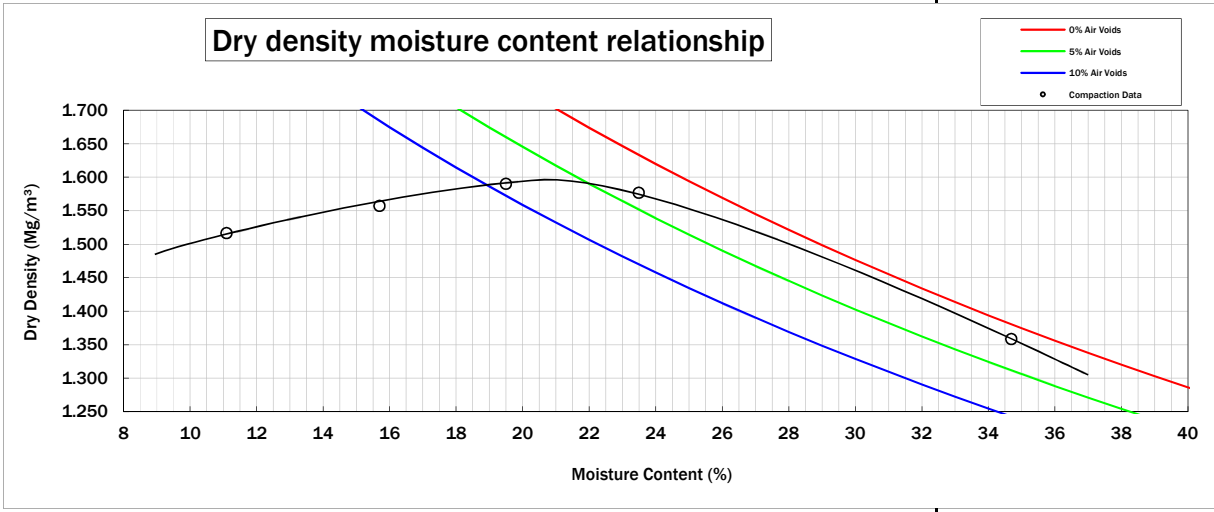
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.65 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)



Optimum Moisture Content	20 %
Maximum Dry Density	1.59 Mg/m³
Material Retained on 20.0 mm test sieve	0 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27612	Contract Sample No	C4081/86
Report Date	21 April 2017	Clients Reference	C4081/86

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 44 @ 1.0m

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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	38.6 %

Determination of Plastic Limit, Liquid Limit and Plasticity Index - BS 1377: Part 2: 1990

Specification

The sample was prepared from a wet sieved specimen and in accordance with BS1377: Part 1: 1990: Clause 7.3.4(b)

Liquid Limit (BS 1377: Part 2: 1990 Clause 4.4)	76 %
Plastic Limit (BS 1377: Part 2: 1990 Clause 5.3)	28 %
Plasticity Index (BS 1377: Part 2: 1990 Clause 5.4)	48 %

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27613	Contract Sample No	C4081/87
Report Date	21 April 2017	Clients Reference	C4081/87

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	Chalk
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL44 @ 1.6m

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Bootham Lane Industrial Estate
Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
E I enquiries@constructiontesting.co.uk
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

		Specification
Moisture Content	34.4 %	

Authorised Signatory

K Tonge - Operations Director

Laboratory Report	CIV/27614	Contract Sample No	C4081/88
Report Date	21 April 2017	Clients Reference	C4081/88

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The Granary
White Hall Farm
Long Itchington
Warwickshire
CV47 9PU

Maylands Gateway, Hemel Hempstead

Material Description	
Source	Not Stated
Supplier	Not Stated
Date Sampled	30/03/2017
Date Received	31/03/2017
Date Completed	21/04/2017
Sample Location	TP CCL 45 @ 0.15-0.7m

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Dunscroft I Doncaster I DN7 4JU
T I (01302) 352652
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Determination of moisture content - BS 1377: Part 2: 1990 Clause 3

Specification

Moisture Content	19.6 %

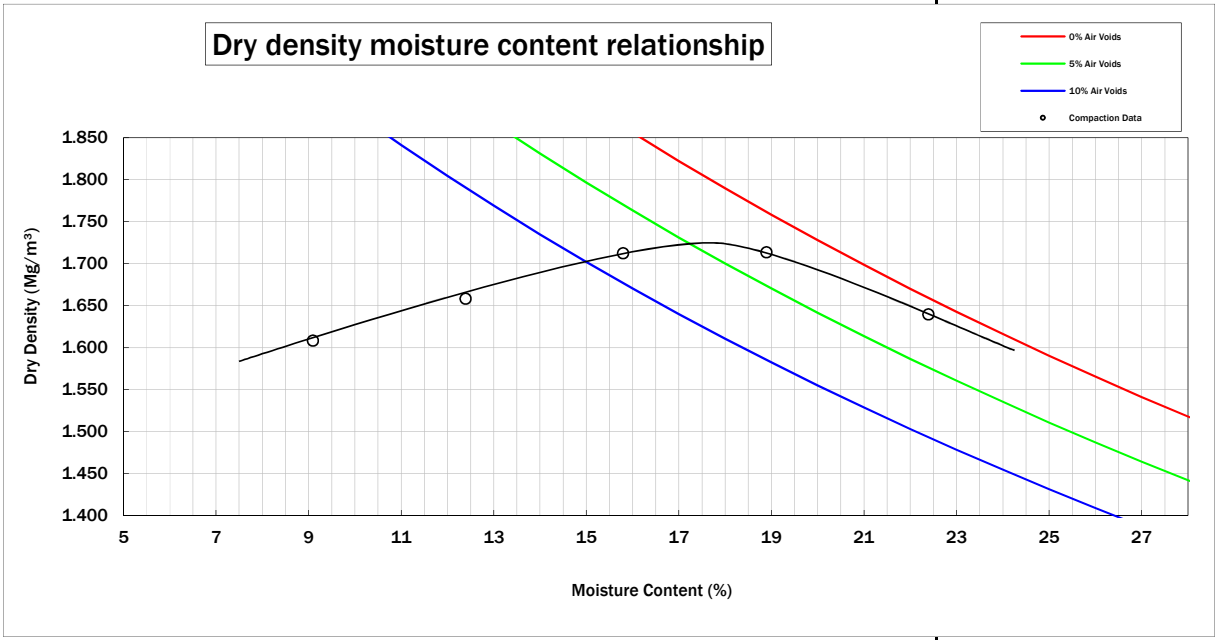
Determination of particle density - BS 1377 Part 2 1990. Clause 8.2 (Gas Jar Method)

Specification

Average Particle Density	2.64 Mg/m³

Determination of dry density / moisture content relationship - BS 1377: Part 4: 1990 Clause 3.5 (4.5kg Rammer, 1 Litre Mould)

The test was carried out using separate samples, each prepared in accordance with BS1377: Part 1: 1990 Clause 7.3.4(b)

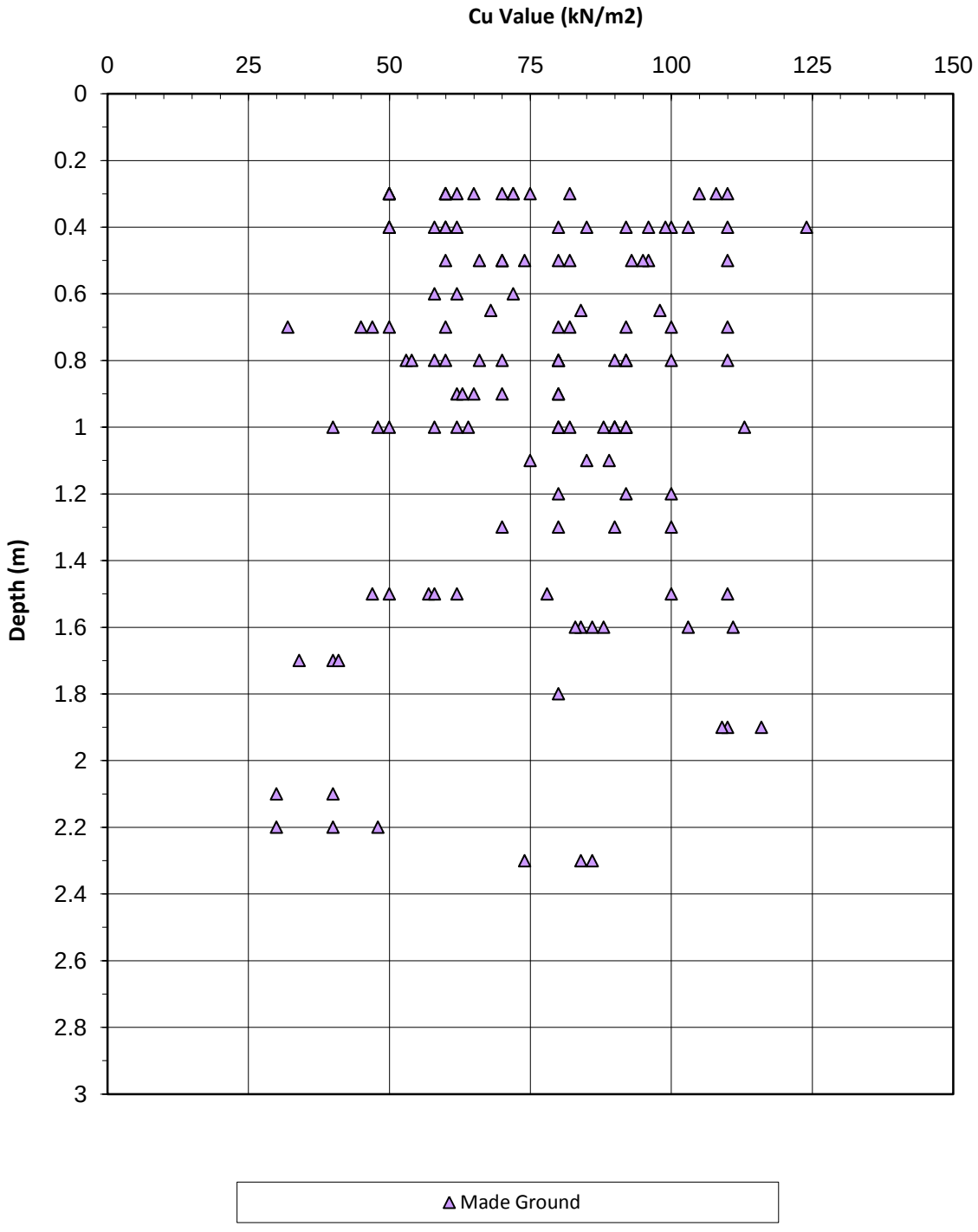


Optimum Moisture Content	19 %
Maximum Dry Density	1.71 Mg/m³
Material Retained on 20.0 mm test sieve	9 %
Material Retained on 37.5 mm test sieve	0 %

Authorised Signatory

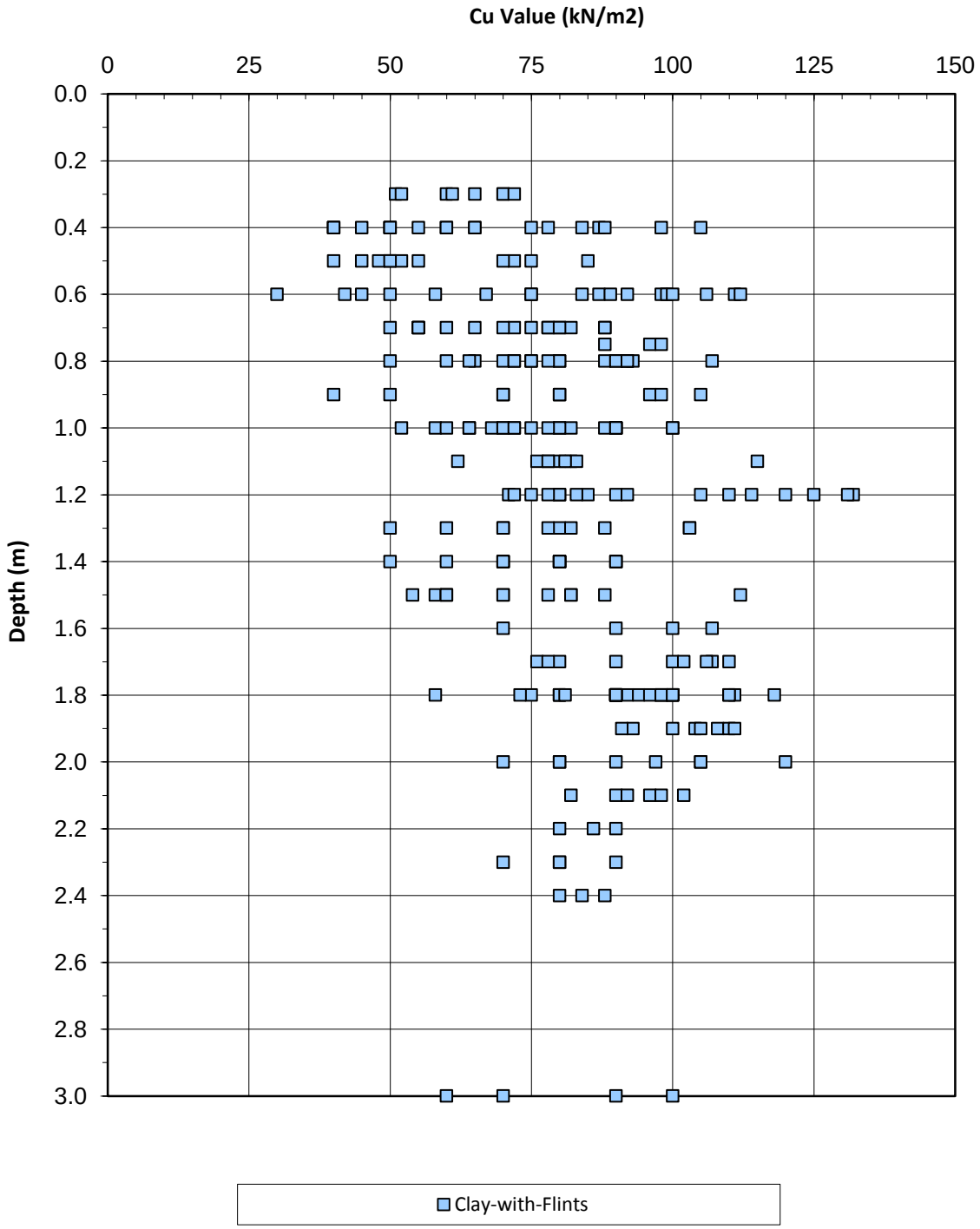
K Tonge - Operations Director

FIGURE II-1



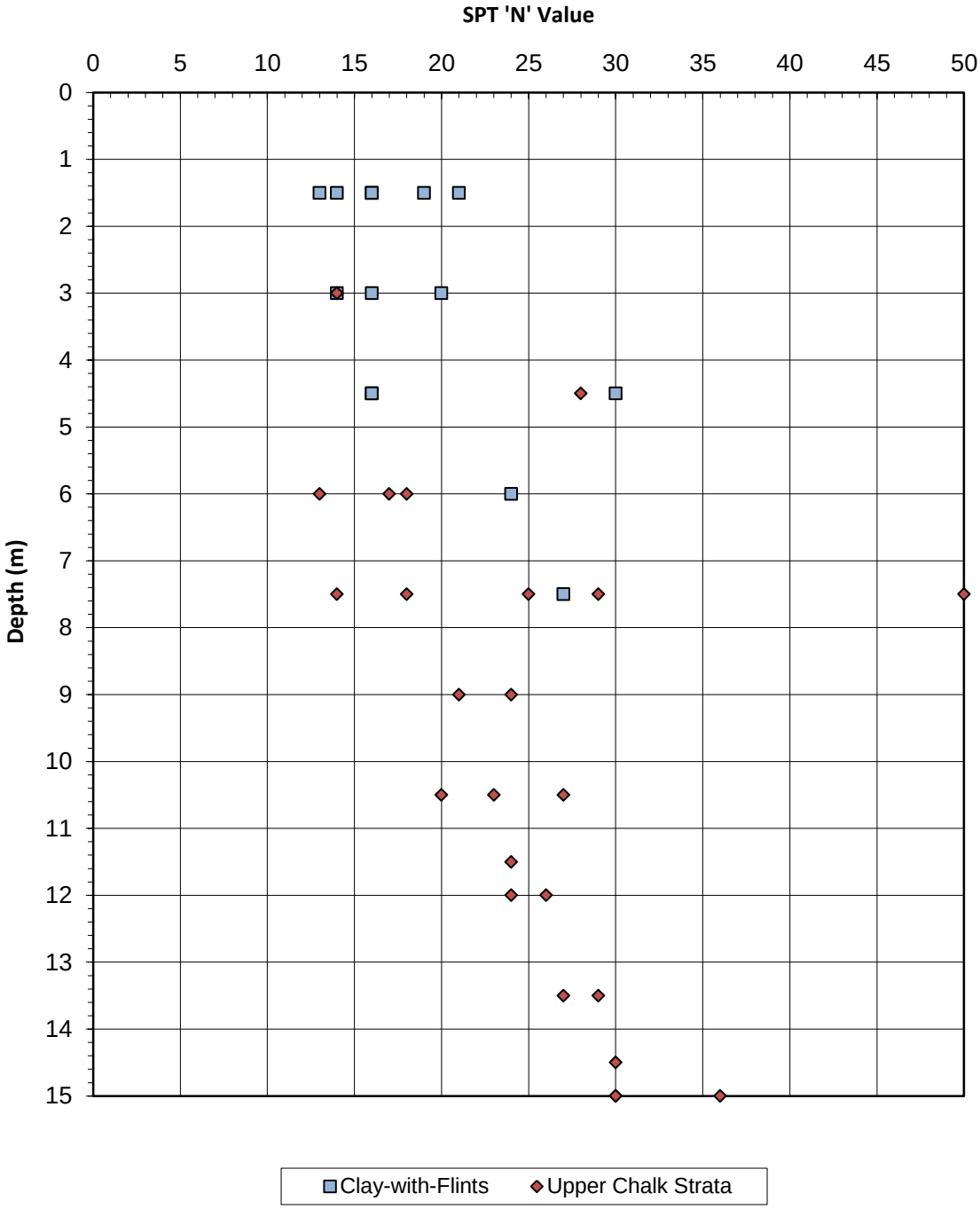
UNDRAINED SHEAR STRENGTH (c_u) PROFILE: MADE GROUND

FIGURE II-2



UNDRAINED SHEAR STRENGTH (c_u) PROFILE: CLAY-WITH-FLINTS

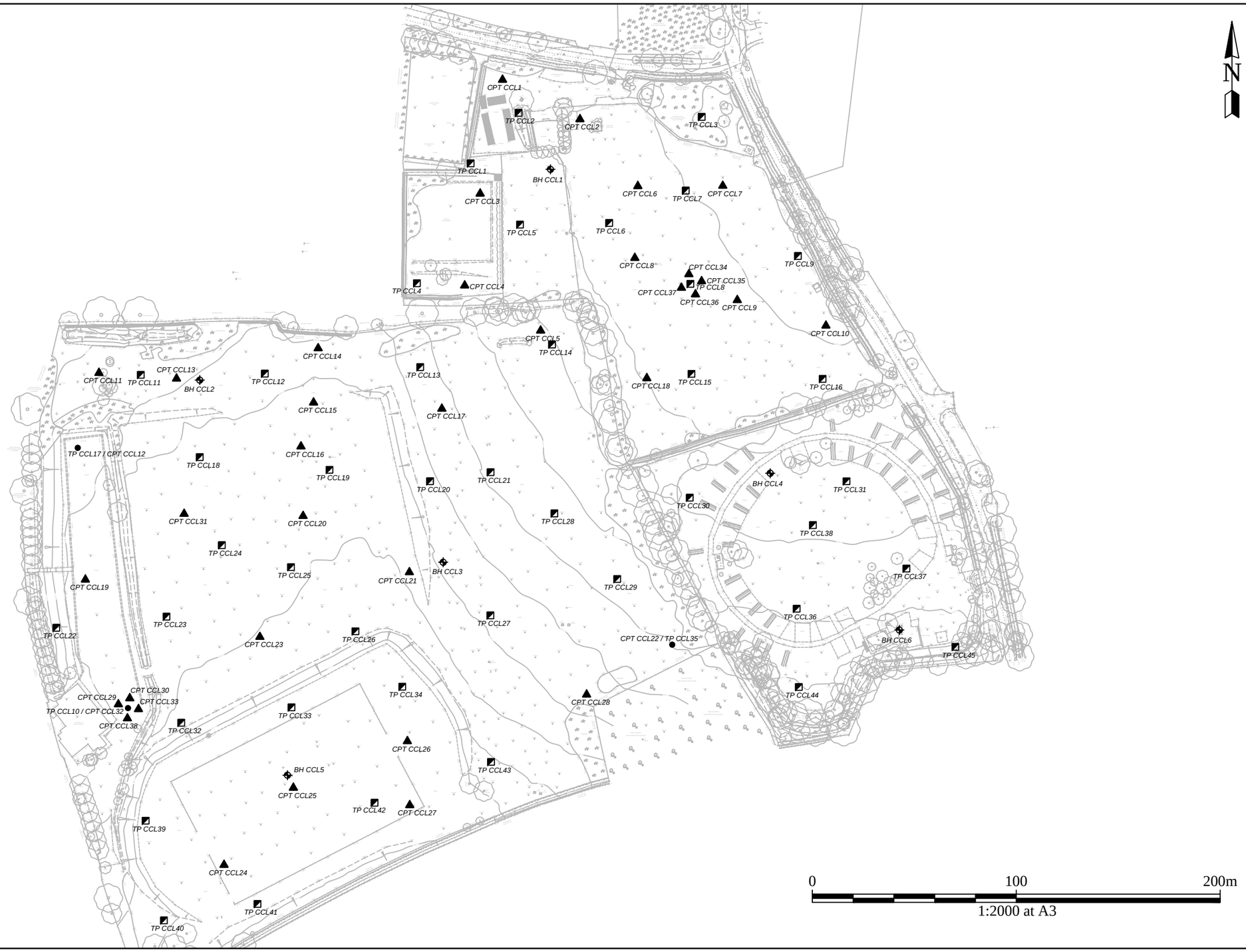
FIGURE II-3



'N' values are uncorrected

SPT 'N' VALUE PROFILE

FIGURE II-4



Plan based on the Topographical Survey drawing by Greenhatch Group, dated January 2016, Drawing No. 22846_T. Rev 1

EXPLORATORY HOLE LOCATION PLAN

APPENDIX III

APPENDIX III – BASIS OF GEOTECHNICAL ASSESSMENT FOR FOUNDATIONS

Geotechnical Design Category of Structure: 2

Design Working Life: Standard building structure (50 years)

Design Approach: 1

1. Geotechnical Model

Following the earthworks recommended in Section 9 of the Report, the following parameters are considered appropriate for foundation design purposes:

General Description of Strata (and classification)	**Parameter**	**Characteristic Value & Units**	**Remarks**
High strength clay (Engineered Fill)	γ c_u ϕ_u	20 kN/m^3 75 kN/m^2 0°	Based on laboratory test results Minimum required strength
High strength, gravelly silty clay (Clay-with-Flints formation)	γ c_u ϕ_u Modified PI	20 kN/m^3 75 kN/m^2 0° 40%	Based on site data Based on site data High volume-change potential NHBC (2017)
Extremely weak, low density, structureless white silty gravelly chalk. (Upper Chalk: Grade Dc)	N γ	15 17 kN/m^3	Based on site data Based on site description

Characteristic Depth to Groundwater (or groundwater level): >15 m

Reference should be made to Sections 8 of the report for an assessment of overall ground stability, seismic risk, combined failure of the structure/ground, excessive settlements and potential soil-volume changes (including heave).

2. Imposed Actions from Proposed Structure

The following are generic values, based on the development proposed, as described in the report. In compliance with BS EN 1997-1:2004, final designs should include consideration of the calculated imposed loads.

Imposed Load on Foundations: Column loads up to 1350 kN

Imposed Load from Floor Slab: up to 50 kN/m^2 (time averaged load of 35 kN/m^2 used for settlement assessments)

Serviceability Limit Values (Columns)

Maximum Total Settlement: 25 mm

Maximum Differential Settlement: 15 mm

Serviceability Limit Values (Floor Slab)

Angular Distortion: 1/500

If loads are significantly different to these stated above, additional assessment will be required.

3. Geometry of Proposed Foundation

Footing Width (assumed for assessment): Up to 3.0 m wide pads

Footing Depth (assumed for assessment): Minimum 1.0 m

4. Shallow Foundations

In assessing the allowable bearing pressures below structural foundations, a number of methods are used, as outlined below.

4.1. Fine Grained Soils

Where the foundations are to be placed on these soils, the ultimate bearing capacity has been estimated using the method proposed by Terzaghi (1943) using total stress parameters. Partial factors have been considered in this assessment, in accordance with BS EN 1997-1:2004 and the relevant National Annex.

The recommended *Nett Allowable Bearing Pressure* is based on a value less than 0.3 times the ultimate bearing capacity and, therefore, the serviceability limit state will be satisfied where imposed serviceability loading is not greater than this value.

4.2. Coarse Grained Soils

Where foundations are to be placed on these soils, the allowable bearing pressure is estimated using the method of Terzaghi and Peck, as modified by Meyerhof (1965). Using this method, total settlements are assumed to be not greater than 25 mm (and a detailed serviceability limit calculation is not necessary).