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UNIVERSITY OF CHICHESTER, BOGNOR REGIS

GROUND INVESTIGATION REPORT

CONFIDENTIAL

FEBRUARY 2015

WSP | PARSONS BRINCKERHOFF

ARUN DISTRICT COUNCIL BR/72/22/PL

UNIVERSITY OF CHICHESTER, BOGNOR REGIS

GROUND INVESTIGATION REPORT

Kier Construction Ltd.

Confidential

Project no: 70013264
Date: February 2016

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Chemical Laboratory Analysis	I2 Analytical Ltd.

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1 EXECUTIVE SUMMARY

WSP | Parsons Brinckerhoff UK Ltd. (WSP) was instructed by the University of Chichester (UoC) to undertake a Ground Investigation to inform designs for a proposed Engineering and Digital Technology Park at the University of Chichester, Bognor Regis Campus. The site is located on Upper Bognor Rd, Bognor Regis, West Sussex, PO21 1HR.

This report fulfils the requirements for a Ground Investigation Report (GIR) to BS EN 1997-1:2004 +A2:2013 *Eurocode 7: Geotechnical Design* (Eurocode 7) and generally follows the format of HD 22/08 *Managing Geotechnical Risk*.

It is understood that University of Chichester has an overall development masterplan for its Bognor Regis Campus, which includes developing land currently occupied by sports fields and scrubland. The University proposes to construct a four/five storey building on the southern part of this area. It is anticipated that the building will be operational by September 2017.

The site is adjacent to Chichester University buildings fronting on to Upper Bognor Road, which forms the southern boundary of the Site. Adjacent to the eastern boundary of the site is Felpham Way. An unnamed watercourse borders the northern boundary of the Site, with recreational fields situated beyond. To the west of the Site are residential properties backing on to Brooks Lane. In addition, three Grade II listed buildings lie within the southern section of the site, including properties 67, 69 and 71 of Upper Bognor Road. The majority of the site is currently a private field, however University buildings are situated within the south west of the site and another unnamed building is located within the western portion of the site boundary. It is also noted that the site is prone to flooding and does not have any flood defences.

There are no areas of environmentally sensitive designations influencing the site and thus requires no specific or precautionary measures to be undertaken on site. The highest risks are considered to be associated with Made Ground deposits encountered under the proposed new school building footprint as well as the existing school grounds.

An intrusive ground investigation was undertaken between the dates of 2nd and 20th of November 2015 and comprised eleven dynamic sampled holes to depths of 22.20m, seven rotary cored boreholes to a maximum depth of 35m, and seven machine-excavated trial pits to depths of 3.20mbgl to 4.0mbgl. Insitu testing was undertaken during the intrusive investigation which consisted of SPT tests and Hand Shear Vane tests. Soil and groundwater samples were recovered for laboratory analysis. In general, ground conditions were found to comprise Topsoil of approximately 0.25m thickness or Made Ground from surface with thickness of 0.20m to 1.3m. Groundwater strike was encountered during drilling within four boreholes, this has been mentioned in Section 5. Furthermore, subsequent groundwater monitoring has recorded levels between 0.55mbgl (0.81m OD) and 2.54mbgl (-1.18m OD).

In order to appropriately manage the contamination constraints identified the following recommendations are made:

- A detailed review of the development design and a cost benefit analysis should be undertaken to establish whether the contaminated Made Ground can be retained / re-used on site;
- A delineation / detailed material classification assessment should be completed within areas of proposed cut to provide greater certainty and refinement of the indicative budget cost estimates and constraints to the programme from the Made Ground (landfill material);

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- A Material Management Plan; and / or an Environmental Permit will be required if contaminated materials are to be re-used or treated on-site;
- An allowances should be made for the management of contamination during and post construction, including risks from asbestos which will require management in accordance with the Control of Asbestos Regulations (CAR) 2012 and dewatering of excavations;

Given the history of the site and limited access in some areas, the potential for encountering unidentified contamination during construction should be recognised.

General limitations of the assessment are included in **Appendix A**.

2 PROJECT BACKGROUND

2.1 SCOPE AND AIMS OF REPORT

WSP | Parsons Brinckerhoff Ltd. (WSP) was instructed by University of Chichester (UoC) to undertake a Ground Investigation for a proposed development of an Engineering and Digital Technology Park Project at the University of Chichester, Bognor Regis Campus, Upper Bognor Rd, Bognor Regis, West Sussex PO21 1HR. The site layout and its location are presented in **Figure 1** and **Figure 2**.

This report fulfils the requirement for a Ground Investigation Report (GIR) to BS EN 1997-1:2004 +A2:2013 *Eurocode 7: Geotechnical Design* **(Reference 1)** and generally follows the format of Design Manual for Roads and Bridges - Managing Geotechnical Risk HD 22/08 (**Reference 2**). Soil profiles and descriptions in the report reflect the results of the current ground investigation.

The aims of this report are to:

- characterise the ground in terms of the soil composition and groundwater regime which could be used to inform design;
- identify possible geotechnical constraints in relation to the ground conditions encountered; and
- assess potential ground contamination and identify possible constraints to the proposed scheme.

In addition, a ground contamination assessment has been prepared as a separate report as a Generic Quantitative Risk Assessment (GQRA) which will be appended to this Ground Investigation Report (GIR).

This assessment was undertaken in accordance with the scope agreed between WSP | Parsons Brinckerhoff and the University of Chichester.

2.2 DESCRIPTION OF THE PROJECT

The University of Chichester wishes to develop an Engineering and Digital Technology Park, located to the north of Upper Bognor Road, adjacent to the current University Bognor campus. The Engineering and Digital Technology Park will consist of multi-storey buildings, access roads, car parks and associated infrastructure. An intrusive ground investigation is required in order to assess the ground conditions to inform the foundation design, pavement design, screen for land contaminants and also to establish the hydrogeological regime to support the drainage and Sustainable Drainage (SUDS) design.

The following ground investigation was specified by WSP in order to characterise the entire development site as shown on the Stride Treglown drawing SK_007 included in **Appendix B**.

The development site is approximately 2.2ha and located in an area of dense scrubland and on a flood plain to the north of Upper Bognor Road and west of Felpham Way at National Grid Reference 494414 099634. This is immediately east of the current University Campus. The northern extent of the proposed site is marked by Ladybrook Community Orchard. The maximum level of the site is in the west (approximately 4m Above Ordnance Datum (mOD)) and the site slopes down toward the minimum level in the southeast corner of the site (approximately 1mOD).

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The properties immediately surrounding the University campus comprise semi-detached houses. The main University buildings are located to the west of the proposed site, with halls of residence beyond the western boundary. There are recreational/sports fields covering most of the northern half of the site and a derelict field (Donkey Field) in the south region of the site (**Figure 1**).

Appendix B provides an existing site layout plan (**Figure 1**), a site location plan (**Figure 2**), an exploratory hole location plan (**Figure 3**) and a geological map of the site (**Figure 4**), as well as drawings provided by the client that show the proposed site layout and a topographical survey.

2.3 GEOTECHNICAL CATEGORY OF PROJECT

This scheme has been classified as a Geotechnical Category 2 scheme, as described within Eurocode 7. Geotechnical Category 2 projects include conventional structures and foundation forms, such as those likely to be proposed for this development, with no exceptional risk, difficult ground conditions or difficult loading conditions.

2.4 PREVIOUS REPORTS

There has been no previous ground investigation works undertaken on this site before and therefore no previous reports have been provided.

2.5 CONFIDENTIALITY STATEMENT AND LIMITATIONS

This report has been prepared for the University of Chichester in accordance with our proposal 2015 and the terms and conditions as set out therein. It has further been prepared based on the site conditions encountered at the time of the intrusive site investigations as presented. The scope of WSP's investigation and assessment is limited to that defined in our original proposals as confirmed or amended (where relevant and appropriate) within this report. Consequently this report should not be used in a different context without the express written consent of WSP.

Where relevant, any interpretation within this report refers to the condition of the site at the time of the investigation and is based on WSP's understanding of any development proposals as described. Possible future changes in the condition of the site which may occur, or alterations in any proposed development layout / design will require further assessment.

It is further noted that whilst site conditions have been recorded at the investigation locations, variations may occur in the actual conditions present in other, un-investigated areas of the site. New or amended legislation may necessitate re-assessment of the site conditions and the associated risks and liabilities.

This report is addressed to and may be relied upon by the University of Chichester. It may not be relied upon or transferred to any other parties without the express written authorisation of WSP. The report should be read and used in full. No responsibility will be accepted where this report is used, either in its entirety or in part, by any other party.

Third party information used in the production of this report has been taken in good faith as being accurate. WSP cannot and will not accept any liability for errors and / or omissions in data provided by others and WSP cannot warrant the work of others.

General limitations of the assessment are included in **Appendix A**.

This report contains British Geological Survey materials ©NERC 2015 and Environment Agency information ©Environment Agency and database right.

3 EXISTING INFORMATION

3.1 TOPOGRAPHICAL MAPS

A topographical survey of the site was undertaken by Shaw Colegate Land and Building Surveyors for the UoC in May 2015. The survey shown on the drawing enclosed in **Appendix B,** 05515_TOPO_REV_A, dated May 2015, indicates that the local topography is close to sea level across the site. The northern part of the site is generally lower with an elevation varying locally from approximately 1.14 to 1.45mOD with increasing site levels in the south of the site which varies locally from approximately 1.50 to 3.14mOD. Within the southern part of the site there is an earth bund, which runs from west to east, with a crest height of approximately 3.30mOD. The bund has been recorded within the historical maps within the Landmark Envirocheck report since 1879 as an embankment running from west to southeast outside the site boundary.

3.2 GEOLOGICAL AND HYDROGEOLOGICAL MAPS

The 1:50,000 series geology map of Chichester and Bognor (Sheet 317/332) (**Reference 3**) published by the British Geological Survey (BGS), together with information available on the BGS on-line Geology of Britain Viewer (**Reference 4**), indicate that the entire site is underlain by superficial deposits noted to comprise Raised Beach Deposits, Marine Beach Deposits and River Terrace Deposits. Lambeth Clay Formation is present within the south of the site and the White Chalk Subgroup Formation (White Chalk Subgroup) is present at depth over the entire site.

The Superficial Deposits are indicated to comprise shingle, sand, silt and clay and vary in thickness locally. The composition is dependent on the upslope source and distance from source. The Raised Beach Deposits may be bedded or chaotic and the beach deposits may be in the form of sand dunes, sheets or banks. The Raised Beach Deposits are designated as a Secondary A aquifer strata by the Environment Agency (**Reference 5**).

The Lambeth Clay Formation which comprise primarily clay, some silty or sandy, with some sands and gravel beds. The thickness can be up to approximately 39m in the west of the London Basin where Bognor Regis is inclusive of this area.

The Lambeth Clay is underlain by White Chalk Subgroup Formation (White Chalk Subgroup) which is composed of hard to very hard nodular chalks and hardgrounds with interbedded soft to medium hard chalks (some grainy). The softer chalks become more abundant towards the top of the Formation. Nodular chalks are typically lumpy and iron-stained.

Both the Lambeth Clay Formation and The White Chalk Subgroup are designated as Secondary A and Principal Aquifer respectively by the Environment Agency (EA) (**Reference 5**). The EA reports that the site is not within a Source Protection Zone or a Drinking Water Safeguard Zone. No groundwater abstractions are recorded within 1km of the site.

3.3 RECORDS OF MINES AND MINERAL DEPOSITS

On the basis of database information accessed through Envirocheck, there is no record of mining or mineral deposits within a 1km area of the site.

3.4 ARCHAEOLOGICAL AND HISTORICAL INVESTIGATIONS

On the basis of database information accessed through Envirocheck, it is identified that the main changes in land use within the site boundary have been:

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- 1879 to 1967, embankment running from west to the south east continuing beyond the site boundary.
- 1932 to 1967, buildings established in the south western part of the site.
- 1975 to 2006, tress established along the eastern boundary of the site.
- 1990 to present, man-made drainage feature located mid-site running east to west.

3.5 EXISTING GROUND INVESTIGATIONS

WSP | PB are not currently aware of any previous investigation for development on the site.

3.6 CONSULTATION WITH STATUTORY BODIES AND AGENCIES

Environmental database information has been accessed through Envirocheck; no consultation was undertaken prior to any ground investigation works.

3.7 FLOOD RECORDS

With reference to the EA website (**Reference 5**), it indicates that the site is within an area of low to medium risk of flooding from surface water, however, within the Land Mark Envirocheck report, it states that the area is subject to extreme flooding from rivers or seas without defence.

3.8 GROUND CONTAMINATION

The EA website indicates that there are no sites within 500m (the subject site included) which are designated as contaminated land under Part 2A of the Environmental Protection Act 1990 (**Reference 6**). Within the Landmark Envirocheck report shows low levels of concentration of any ground contamination.

3.9 SURFACE WATER

A man-made drainage feature, which permits groundwater drainage, flows through the middle of the site from east to east.

The nearest named surface water feature is the Aldingbourne Rife River which flows to the east of the site, approximately a minimum distance of 50m from the boundary. The Environment Agency has identified that river is susceptible to flooding during heavy periods of rain mostly likely to occur during the winter months. There is also a water body (The English Channel) located approximately 500m south from the site.

3.10 UNEXPLODED ORDNANCE

As part of a Desk Study prior to the ground investigation works the site was identified by Zetica (**Reference 7**) as an area at risk of unexploded ordnance (UXO). This concluded that the site lies within an area considered to be at moderate risk of UXO due to Bognor Regis being targeted for bombing during the Second World War. The report suggested that mitigation measures should be required during development works and that an unexploded ordnance engineer should be present during intrusive works.

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4 FIELD AND LABORATORY STUDIES

4.1 WALKOVER SURVEY

A site walkover was undertaken on 20th October 2015 by a WSP representative, prior to site works commencing. During the site walkover the following features were identified and recorded:

- Evidence of below ground services/utilities whilst on site there was no immediate evidence of underground services however, there were occasional manholes which are for water drainage.
- Areas of soft ground within the playing fields there were no signs of soft ground however, if there was to be a high amount of rainfall the ground would be subject to softening.
- Site topography was generally flat with a gentle sloping toward the south.
- Potential on-site sources of contamination, there was no immediate evidence for contamination directly on site.
- Accessibility to the proposed borehole locations, access to the borehole locations was easy, however there was some vegetation clearance required before entering the south part of the site (Donkey field).
- No signs of standing water present on site; and
- Overhead services/obstructions were located on the east of the site boundary between the road and the vegetation.

It was noted that the site has one access point which means tracking distances for the drill rigs are increased over what is typically ideal. Consequently, it was noted that there could be disturbance and damage to the ground and if the weather conditions are poor then the likelihood is increased.

A charged sewerage drain was noted and, in order to avoid damage to the drain, further identification and location prior to undertaking any exploratory holes was required. Due to proximity with further underground services, a number of proposed boreholes required relocation approximately 10m away from any known services.

4.2 GEOMORPHOLOGICAL/GEOLOGICAL MAPPING

No geological mapping was carried out due to the absence of outcrops across the area of investigation.

4.3 GROUND INVESTIGATION

DESCRIPTION OF FIELDWORK

WSP designed the joint geotechnical and ground contamination investigation. The objective of the geotechnical investigation was to obtain information on the ground and groundwater conditions and obtain Eurocode 7 compliant samples in order to derive information for use in design of the building for the proposed Engineering & Technology Park development.

The fieldwork was undertaken between 2nd and 20th November 2015. The investigatory boreholes were undertaken by CC Ground Investigations Ltd with the trial pitting supervised by WSP. WSP monitored the entire investigation on a full time basis to check technical compliance with the ground investigation specification. A UXO engineer from Fellows International Ltd. was present on

site on a full time basis to assess the presence of potential buried UXO during the ground investigation.

To avoid contact with existing below ground services/utilities, in advance of any intrusive works each exploratory hole location was scanned and cleared using a Cable Avoidance Tool (CAT) and Generator. In addition, inspection pits were hand dug to a depth of 1.2m bgl by CC Ground Investigations at all borehole locations prior to drilling.

Table 4-1 provides a summary of the exploratory holes completed as part of the ground investigation, along with the rationale for utilising the selected techniques. An exploratory hole location plan is provided in **Figure 3, Appendix B**.

Table 4-1: Exploratory Hole Rationale

Element of Investigation	Details	Rationale
Rotary cored boreholes	BH101 to BH111	⁍ To allow inspection of soils and to allow the retrieval of samples for geotechnical and chemical laboratory testing. ⁍ To derive the ground model. ⁍ To assign material properties and to aid the derivation of geotechnical parameters for design purposes.
Trial pits	TP101 to TP107	⁍ To allow the inspection of soils and to retrieve samples for geotechnical and chemical laboratory testing. ⁍ To derive the ground model. ⁍ Insitu infiltration tests were undertaken in Trial Pits TP101 and TP103 to provide information for drainage design.
Insitu testing	Standard Penetration Tests (SPTs) were undertaken at 1.5m intervals up to the surface of the chalk and at 3.0m intervals thereafter in all boreholes. TRL probes were taken up to 2.0m bgl	⁍ In order to assign material properties and to aid the derivation of geotechnical parameters for design purposes. ⁍ Assess ground conditions for pavement design.
Installation of groundwater and gas monitoring wells	Installed in BH101 to BH111.	⁍ To provide information to characterise the groundwater conditions and quality including standing groundwater conditions and variations over a period of time post installation. ⁍ To undertake ground gas monitoring to determine potential constraints to the development from soil gas generation.
Geotechnical laboratory testing	Selected soil samples were sent by CC Ground Investigations Ltd., to Professional Soils Laboratory (PSL) a UKAS accredited laboratory, for geotechnical testing	⁍ To obtain material properties and to aid the derivation of geotechnical parameters for use in design.
Chemical laboratory testing	Selected soil samples were sent by CC Ground Investigations Ltd., to I2 Analytical Ltd a UKAS and	⁍ To determine any potential contamination within the ground where the newly proposed buildings are to be developed.

	MCERTS accredited laboratory, for chemical testing	

The boreholes were positioned primarily within the vicinity of the proposed building footprint and to depths appropriate for the proposed four to five storey building and likely piled foundation depth requirements. Additional boreholes were located across the whole site and around the proposed car park and access roads to provide general site coverage and identify any prevalent constraints to subsequent phases of the overall development. All boreholes were commenced with a Fraste ML multipurpose drill rig utilising dynamic sampling and were extended, where possible, with rotary core boring to depths ranging from 10mbgl (BH104, BH105, BH110 and BH111) to (BH101 to BH103, and BH106 to BH109) to 35mbgl. In some instances dynamic window sampling was undertaken to termination depth due to the ground conditions being unsuitable for rotary coring methods and in this instance Class 1 sub samples could not be obtained. This is in accordance with BS EN ISO 22475-1-2006 (**Reference 8**) for sampling methods during the ground investigation.

Trial pits were located within the areas of proposed car park and roads. These were excavated using a backhoe excavator to depths ranging between 3.2 and 4.0m bgl.

Soil samples were collected for chemical laboratory testing by I2 Analytical Laboratories Ltd. All samples were taken with due regard to industry good practice and procedures were designed to minimise the potential for cross-contamination. Samples were collected into labelled containers provided by the laboratory and chain of custody documentation was completed. The samples were suitably preserved and submitted to I2 Analytical Laboratories Ltd, a UKAS and MCERTS accredited laboratory, for analysis.

GROUND INVESTIGATION REPORT

The ground conditions encountered are presented in the borehole logs and the trial pit logs which were prepared by CC Ground Investigations Ltd. The logs are included in **Appendix C** and the ground conditions are summarised in **Section 5**.

RESULTS OF IN SITU TESTS

Standard Penetration Tests (SPTs) were carried out in all the dynamic sample boreholes, BH101 to BH111. The results are shown on the borehole log sheets in the Factual Report and summary plots are included in Section 6 of this report. A calibration certificate for the hammer used for the Standard Penetration Tests is provided in **Appendix C**.

4.4 DRAINAGE STUDIES

Soil infiltration tests were undertaken in accordance with BRE 365 (**Reference 9**) within two trial pits (TP101 and TP103) to inform the proposed drainage strategy for the site. At the test locations, the trial pits encountered primarily cohesive material immediately below Topsoil level and, due to the low infiltration rate, failed to provide sufficient drainage in order to calculate permeability rates.

4.5 PILE TESTS

None undertaken.

4.6 GROUNDWATER MONITORING

Groundwater monitoring has been undertaken on three separate visits (02/12/2015, 07/12/2015 and 14/12/2015). The results are presented within the Generic Quantitative Risk Assessment Report (GQRA) which is in **Reference 10.**

4.7 SOIL GAS MONITORING

Ground gas monitoring has been undertaken on three separate visits (01/12/2015, 07/12/2015 and 14/12/2015). The results are presented within the Generic Quantitative Risk Assessment Report (GQRA) **Reference 10** and in **Appendix D.**

4.8 LABORATORY ANALYSIS

DESCRIPTION OF TESTS

The laboratory testing programme instructed by WSP was based on the soil types encountered and the relevant proposed design. Selected soil samples were submitted to a UKAS accredited laboratory for geotechnical and chemical testing in order to inform the strength and composition of the ground. The testing regime included the following:

- Soil classification tests comprising Bulk Density, Natural Moisture Content, Atterberg Limits and Particle Size Distribution;
- Saturation Moisture Content of chalk;
- Intact Dry Density (IDD) of chalk;
- Uniaxial Compressive Strength (ISRM);
- Point Load Strength testing;
- Chalk Crushing Value (CCV);
- Quick undrained triaxial testing;
- Compaction testing using 2.5 kg dynamic compaction method; and
- Chemical testing to determine acid and water soluble sulphate contents, pH, total sulphur, total potential sulphate and oxidisable sulphide.

Screening for soil contamination was undertaken on samples which are presented in the Generic Quantitative Risk Assessment Report **Reference 10** and in **Appendix D.**

TEST RESULTS

Full sets of laboratory test certificates are included together with summary tables in **Appendix E.** The data are discussed in **Section 7**.

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5 GROUND SUMMARY

5.1 GENERAL

The ground conditions encountered in the exploratory holes are generally consistent with the geological sequence as detailed on the regional BGS mapping for the site and the ground conditions are described below. Exploratory hole logs for the investigation and an interpretative ground model in the form of a long section through the site, alongside the detailed geological logs for each exploratory hole are provided in **Appendix C** and **Appendix F**.

5.2 TOPSOIL

Topsoil was encountered where maintained grassed and other soft landscaped areas are present at the site. This includes the fields in the north and south. Topsoil was generally brown, slightly sandy, slightly gravelly Clay or Silt with rootlets, approximately 0.30 m in thickness and underlain typically by River Terrace Deposit or Made Ground where present.

5.3 MADE GROUND

Made Ground was encountered at twelve exploratory hole locations and generally between 0.20m and 1.3m in terms of thickness. The Made Ground included, in varying proportions across the site, fragments of brick and clinker. The matrix of the Made Ground was also found to vary across the site. In the area of the northern fields the matrix generally comprised slightly sandy slightly gravelly Clay.

Within the footprint of the proposed four to five storey building, the depth of Made Ground was between 0.3m bgl and 1.30m bgl. This contained fragments of brick flint, concrete, siliceous material, steel tubing, rare ash, clay tile fragments, porcelain fragments, and clay pipes in a matrix of slightly sandy slightly gravelly Clay.

5.4 SUPERFICIAL DEPOSITS

Superficial Deposits were encountered beneath the Made Ground or Topsoil in seventeen of the exploratory hole locations.

The Superficial Deposits comprise of three strata and vary across and near to the site, in accordance with the BGS geology map;

- Raised Marine Deposits – north of the site and within the south;
- Raised Beach Deposits – central of the site, to the south of the stream;
- Raised Terrace Deposits – south of the site, not located within site boundary.

The Superficial Deposits all comprise of firm light brown and greyish brown locally off-white slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded fine to medium of chalk and flint with rare organic material.

Note that there is some organic material with Superficial Deposits which is varies locally.

The site can be generally characterised between the north and south. The typical thickness of the Superficial Deposits within the north half of the site was between 3.20mbgl and 15.90mbgl.

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In the southern part of the site the typical thickness of the Superficial Deposit was between 0.60mbgl and 3.50mbgl. This is due to the Lambeth Clay formation being present within the southern area of the site.

5.5 LAMBETH CLAY

Lambeth Clay was encountered beneath the Superficial Deposits in seven of the exploratory hole locations, and was found only within the southern area of the site where the geological boundary is located, near to the drainage outlet. The depth of the Lambeth Clay was proven to a maximum depth of 8.50mbgl, with a typical thickness of 4.30mbgl, varying locally across the site.

5.6 WHITE CHALK SUBGROUP FORMATION

White Chalk Subgroup Formation was encountered within eleven exploratory borehole locations (BH101 to BH111) due to the scheduled depth for these holes.

The Chalk can be considered to have two horizons; Structureless Chalk (weathered) and Structured Chalk (intact). The Structured Chalk was encountered beneath the structureless chalk within borehole locations BH101 to BH104, BH106 to BH109 and BH111. The structureless chalk varied in depth ranging from between 6.50mbgl to 18.90mbgl as well as the thickness which varied across the site from between 0.15mbgl to 4.80mbgl.

The structureless chalk encountered within the building footprint (BH101 to BH103) was relatively consistent in depth ranging from between 8.00mbgl to 11.30mbgl as well as thickness being consistent across the building footprint from between 0.60m to 1.40m. The structureless chalk typically comprised white stained orangish brown and yellowish brown chalk composed of slightly sandy silty gravel. Gravel is sub-angular to sub-rounded fine to coarse low density chalk. Typical grading for the structureless chalk was of Dc, this in accordance with the CIRIA C574 Chalk Grading system (**Reference 12**).

The structured chalk was encountered in BH101 to BH104, BH106 to BH109 and BH111, the thickness was not proven for this stratum; however the depth ranged between 8.90mbgl and 11.10mbgl. The structured chalk comprised very weak to weak medium density white mottled orangish brown Chalk. Discontinuities are very closely to medium spaced with minimum infill of off white comminuted chalk. The chalk typically graded a B3 chalk with strength and grade generally increased with depth.

A summary table (Table 5-1) of the thicknesses of each stratum is given below. Note the structured chalk has not been included as the thickness was not proven.

Table 5-1: Summary of Stratum Thickness

Stratum	Topsoil/Made Ground	Superficial Deposits	Lambeth Clay	Structureless Chalk
Exploratory Hole	Thickness (m)	Thickness (m)	Thickness (m)	Thickness (m)
[1]BH101	0.3	1.3	5.8	0.6
[1]BH102	0.3	1.4	6.9	0.7
[1]BH103	0.8	0.6	8.5	1.4
BH104	0.3	6.9	*	4.8
BH105	0.3	12.4	*	2
BH106	0.4	1.1	4.2	0.8
BH107	0.4	3.5	1.7	1.9
BH108	0.1	8.3	*	2

BH109	0.7	15.9	*	2.3
BH110	0.8	6.25	*	0.15
BH111	0.2	5.4	*	4.2
TP101	1.3	*	1.9	*
TP102	0.3	1.9	1.3	*
TP103	0.2	3.8	*	*
TP104	0.3	3.7	*	*
TP105	0.3	3.4	*	*
TP106	0.4	3.2	*	*
TP107	0.4	3.2	*	*

*Strata not encountered
[1]Exploratory hole within building footprint

A summary table (Table 5-2) of the typical surface levels for each stratum is given below.

Table 5-2: Summary of Surface Levels for Stratum

Location	Typical surface levels (mOD)	Topsoil/Made Ground	Superficial Deposit	Lambeth Clay	Structureless Chalk
		Level To (m AOD)	Level To (m AOD)	Level To (m AOD)	Level To (m AOD)
North	Average	1.01	-5.58	*	-10.78
South	Average	1.81	0.22	-3.91	-6.18

*Stratum not encountered.

5.7 ENCOUNTERED GROUNDWATER

Groundwater was encountered during the ground investigations as follows:

- BH107 2015: groundwater strike at 1.50mbgl rising and settling to 1.30mbgl after five minutes;
- BH108 2015: groundwater seepage at 1.20mbgl, no rise recorded;
- BH110 2015: groundwater strike at 1.00mbgl and remaining at 1.00mbgl after twenty minutes;
- BH111 2015: Groundwater strike at 1.50mbgl rising to 1.30mbgl after twenty minutes.

5.8 GROUNDWATER LEVEL MONITORING

Groundwater level monitoring data are presented in Table 5-3 of this report and further detailed results will be presented in a separate Generic Quantitative Risk Assessment Report (GQRA). These four wells were monitored on three occasions (2nd, 7th and 14th December 2015) for the 2015 ground investigation.

Table 5-3: Groundwater level monitoring results

Exploratory Hole	Level From (m OD)	Visit 1 (m bgl) (mOD)	Visit 2 (m bgl) (mOD)	Visit 3 (m bgl) (mOD)
BH101*	2.44	1.73 (0.71)	2.12 (0.32)	1.75 (0.69)
BH102*	2.18	1.78 (0.4)	1.72 (0.46)	1.31 (0.87)
BH103*	2.91	2.54 (0.37)	2.37 (0.54)	1.96 (0.95)
BH104	1.53	0.93 (0.6)	0.93 (0.6)	0.81 (0.72)

BH105	1.39	0.88 (0.51)	0.9 (0.49)	0.75 (0.64)
BH106*	2.24	1.60 (0.64)	1.48 (0.76)	1.44 (0.81)
BH107*	1.91	1.34 (0.57)	1.35 (0.56)	1.01 (0.9)
BH108*	1.36	0.78 (0.58)	0.8 (0.56)	0.55 (0.81)
BH109*	1.18	1.43 (-0.25)	1.16 (0.02)	0.69 (0.49)
BH110	1.42	0.78 (0.78)	0.78 (0.64)	0.62 (0.8)
BH111	1.44	0.77 (0.67)	0.79 (0.65)	0.71 (0.73)

*Boreholes within the building footprint.

5.9 GROUND GAS MONITORING

The results of the ground gas monitoring will be presented in a separate Generic Quantitative Risk Assessment Report (GQRA) (**Reference 10**) and in **Appendix D**.

6 GROUND CONDITIONS AND MATERIAL PROPERTIES

6.1 INTRODUCTION

The following chapter summarises the results of the insitu testing and laboratory testing for individual soil types encountered across the site and selects characteristic parameters. No previous ground investigations have been undertaken on this site and therefore only the information obtained from the recent (2015) ground investigation results will be used to determine the ground conditions.

This report is intended to meet the EC7 requirements for a GIR. Test data is presented and interpreted using published correlations to produce derived values. Mean and lower quartile trend lines are presented where applicable to guide the user. The selection of suitable characteristic and design values will depend on the particular location and extent of the structure and the design calculation being undertaken and as such will be selected and presented in the GDR.

6.2 TOPSOIL

Where Topsoil was present across the field areas and typically comprised grass over brown silt with low gravel content. No geotechnical assessment has been made of this material.

6.3 MADE GROUND

Made Ground was encountered in twelve of the exploratory holes with a maximum thickness of 1.3m however; typical thickness is approximately 0.46m. Due to the limited amount testing that was undertaken on the material, only Atterberg Limits can be interpreted for geotechnical assessment and it should be assessed on a case by case basis if required.

Two Atterberg Limit tests were undertaken on cohesive samples of Made Ground. The Plasticity Index (PI) of the cohesive material ranges from 30% to 33%. The two test results, when plotted on a Casagrande/A-Line Plot show that cohesive material is classified as high plasticity clay.

6.4 SUPERFICIAL DEPOSITS

Superficial Deposits were encountered below all Made Ground, where present and was predominantly found within the northern area of the site. The surface of the Superficial Deposits was recorded between 0.48mOD to 2.14mOD.

Within the Superficial Deposits numerous laboratory tests were carried out to derive characteristic values for the strata, which are as follows in this section.

Atterberg Limit tests were undertaken on forty samples from the Superficial Deposits. Plastic Limits ranged from 22% to 34% with an average of 27%. Liquid Limit ranged from 45% to 87% with an average of at 63%. Plasticity Index (PI) ranged from 23% to 53% with an average of 36%. Plasticity Index has been plotted against depth in Figure 6-1, and on a moisture content, liquid limit and plastic limit against depth below ground Figure 6-2. This shows that moisture content sits closer to the plastic limit indicating the Lambeth Clay is of a higher strength. A Casagrande/A-Line Chart has been plotted in Figure 6-3. The chart shows the Superficial Deposits to plot above the "A" line and has been classified as an intermediate to very high plasticity clay. The data presented in Figure 6-1 suggests that there is an increase in plasticity with depth, as indicated by the trend line.

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Figure 6-1: Plasticity Index against depth below ground

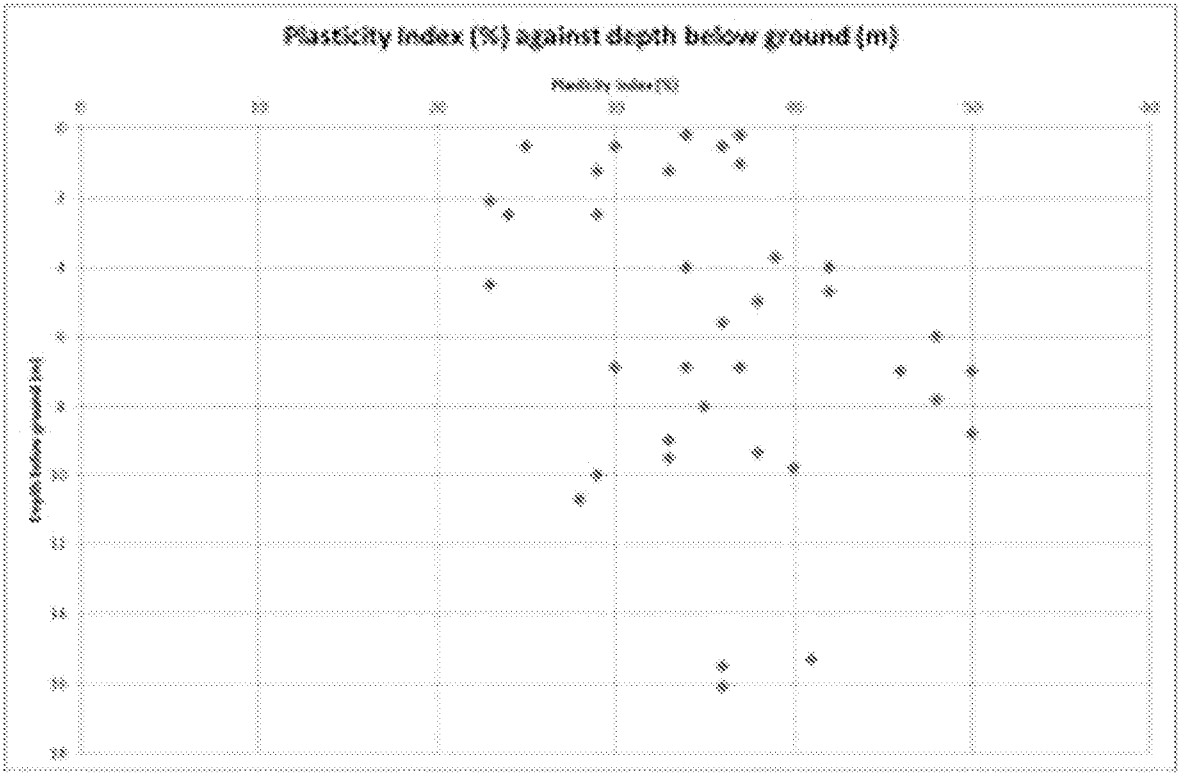


Figure 6-2: Moisture content, liquid limit and plastic limit (%) against depth below ground

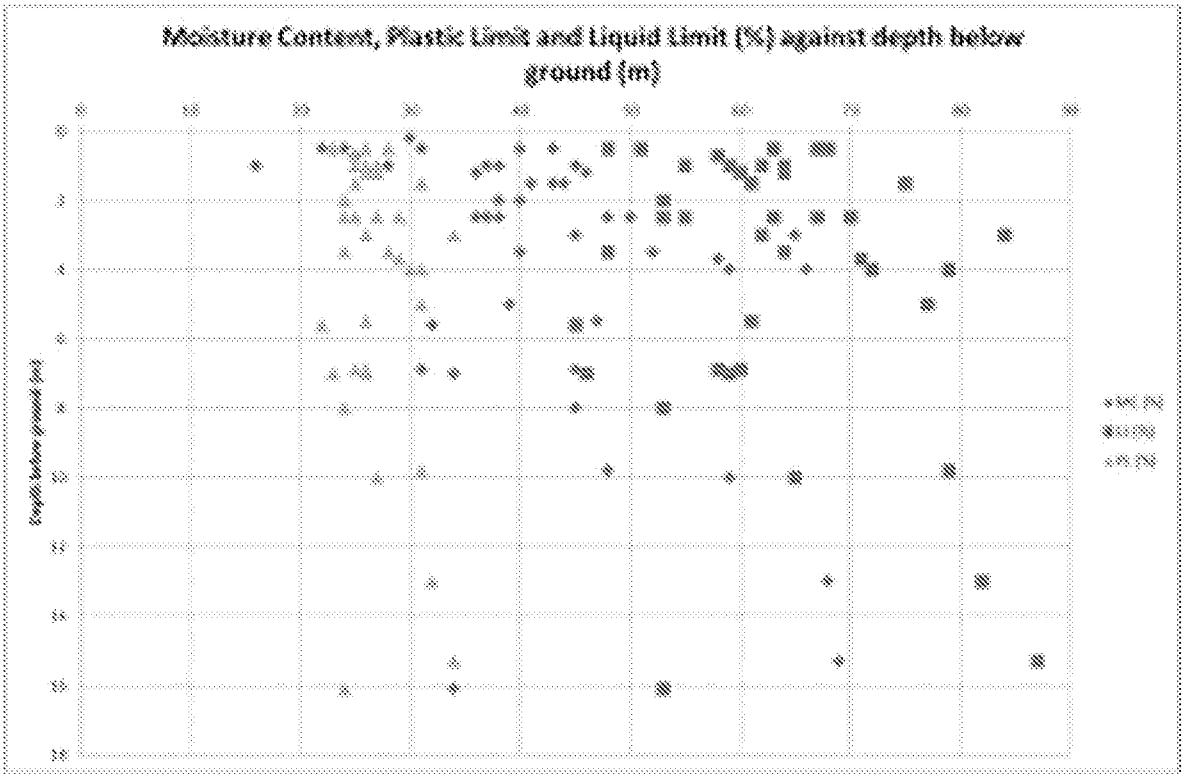
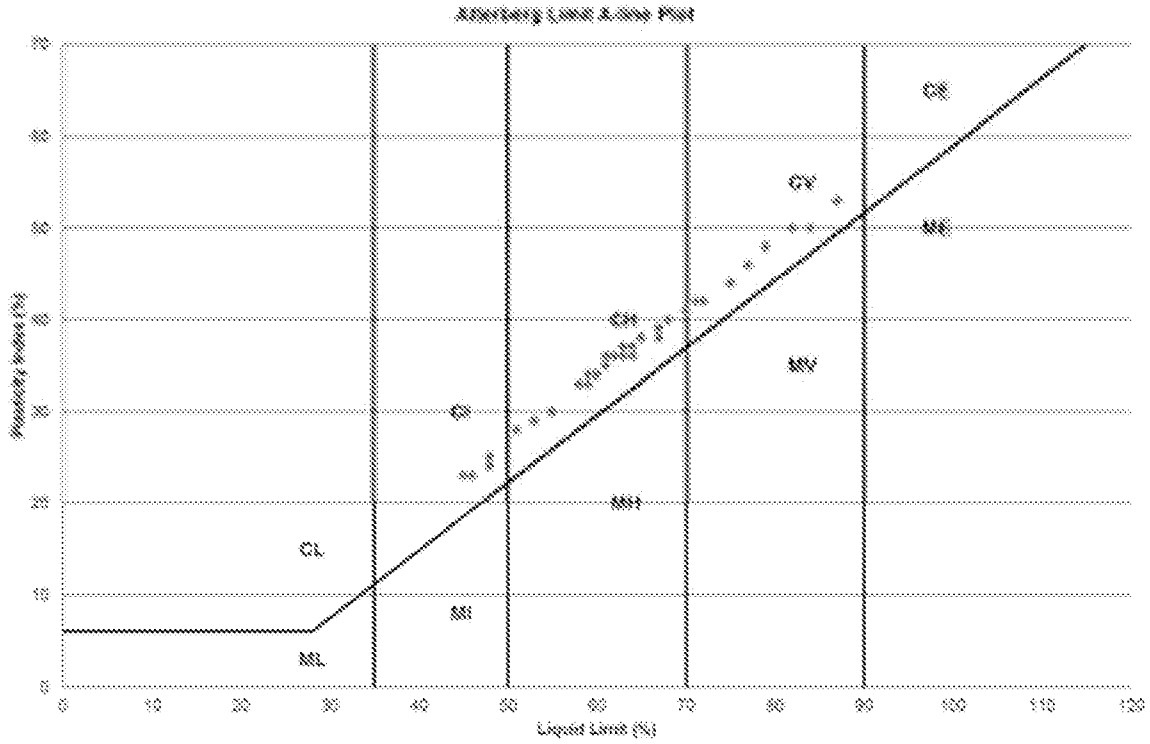


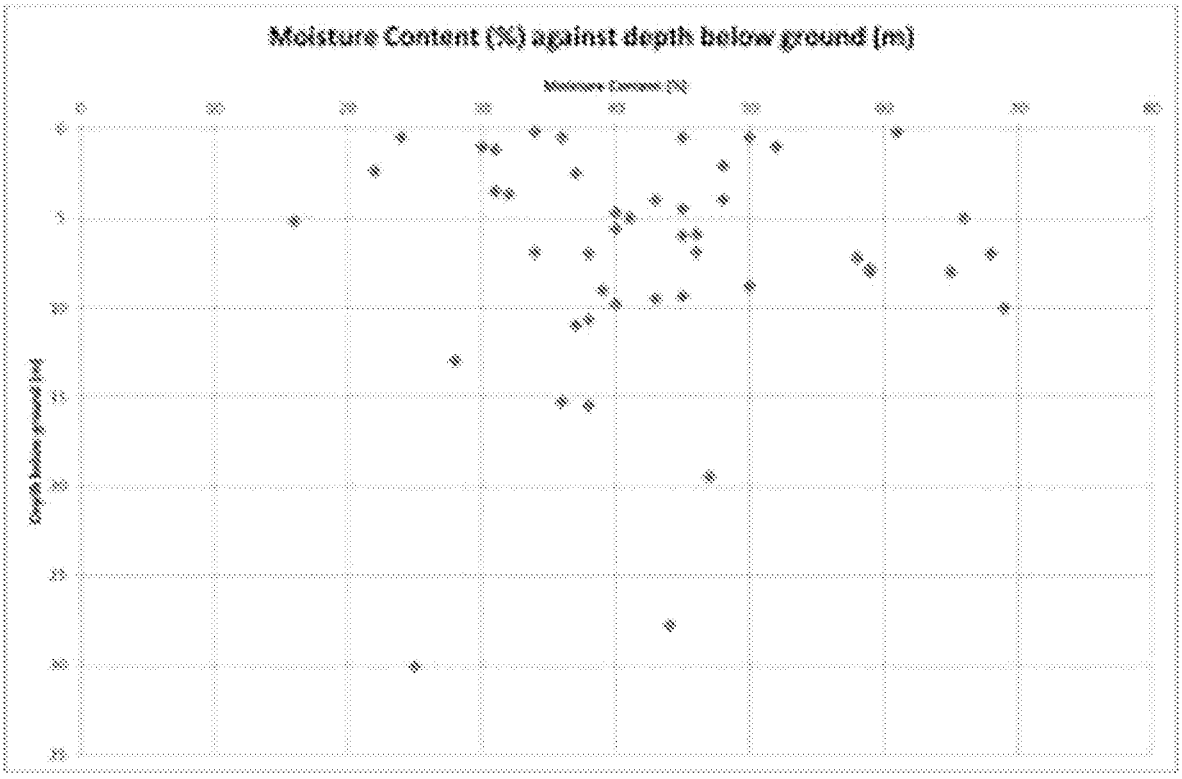
Figure 6-3: Casagrande/A-Line Chart



Moisture content tests were conducted on forty-six samples from the Superficial Deposits, as part of both the Atterberg limit tests and natural moisture content tests. Moisture content ranged from 16% to 69% with an average of 43%. Moisture content is plotted against depth below ground in Figure 6-4. This plot shows that there is some trend in moisture content with depth. Between ground level and 5m bgl the moisture content generally lies between values of 30% and 50%. Between 5m bgl and 10m bgl the data records show that moisture content increase from 40% to 70%.

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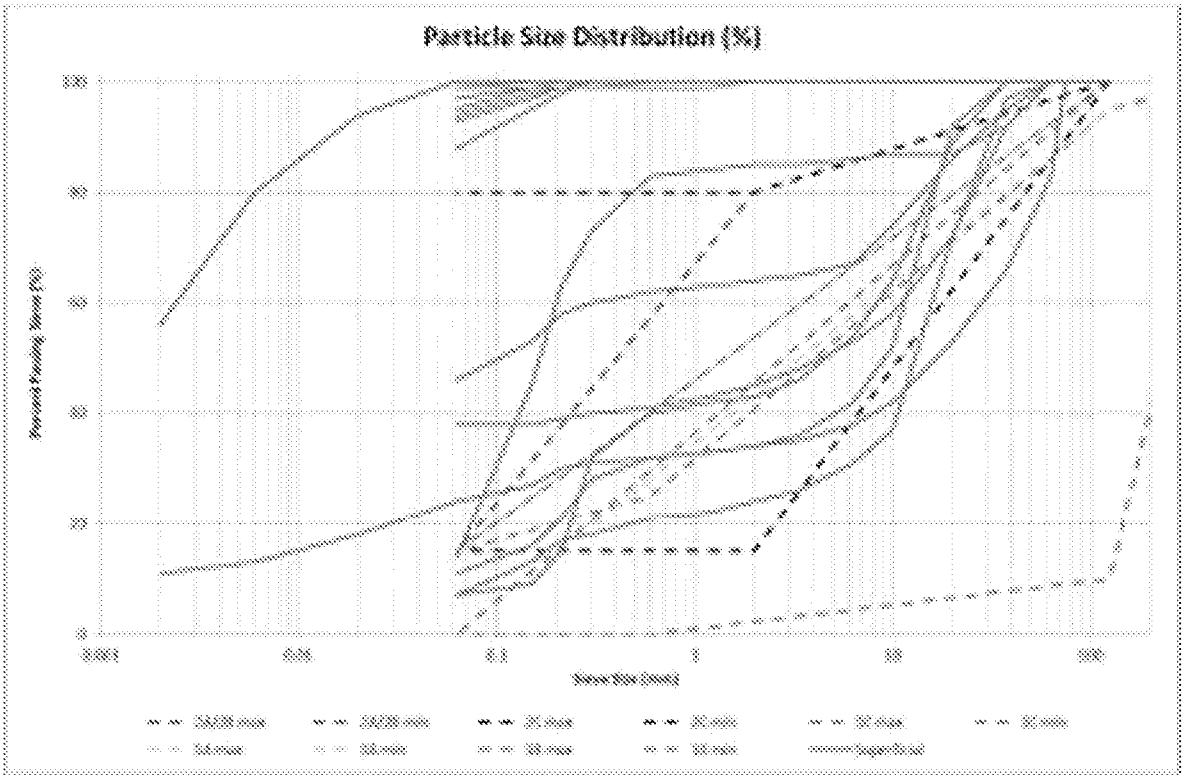
Figure 6-4: Moisture Content against depth below ground



Particle Size Distribution testing was conducted on sixteen samples of Superficial Deposit. The sixteen grading curves are presented in Figure 6-5. Based on the particle sizes this stratum classifies as a Class 2 cohesive material in accordance with the Specification for Highways Works

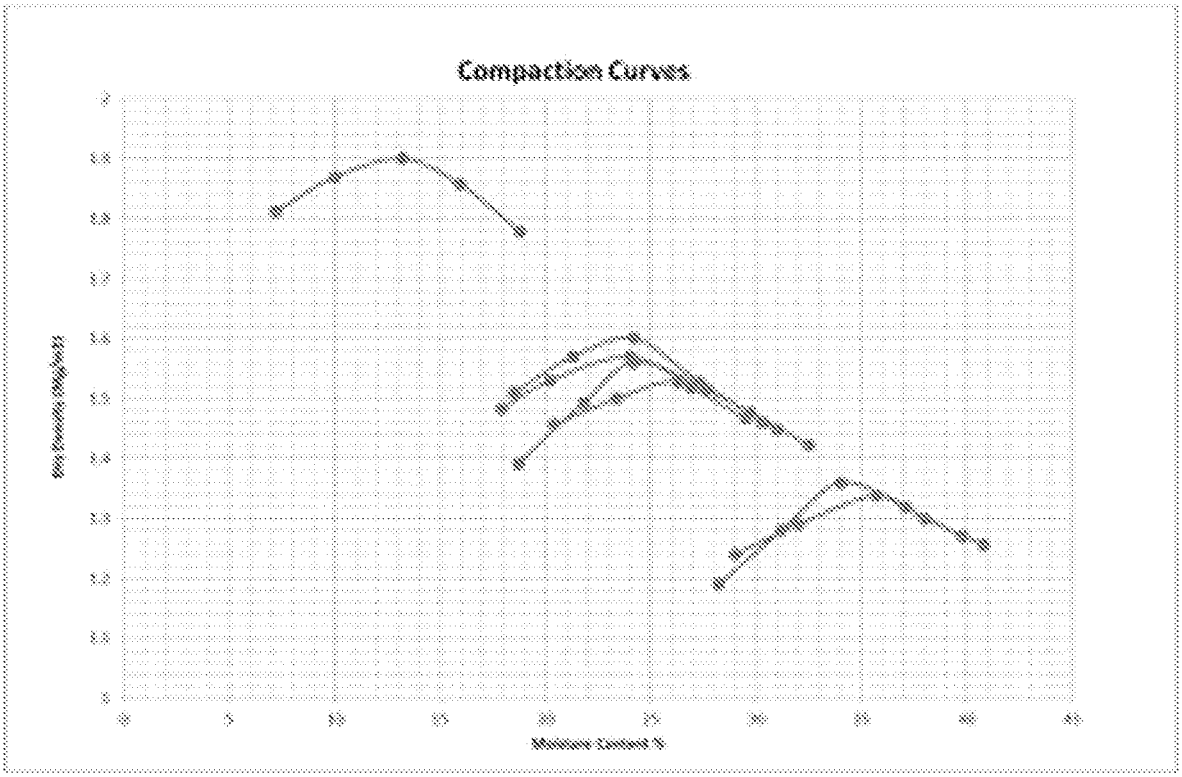
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Figure 6-5: Particle Size Distribution



Compaction testing was undertaken using a 2.5kg proctor on seven samples of Superficial Deposits. The tests reported a maximum dry density range of 1.34Mg/m^3 to 1.90Mg/m^3. The optimum moisture content range is reported as 13.2% to 35.7%. The compaction curves are presented in Figure 6-6.

Figure 6-6: Compaction Curves



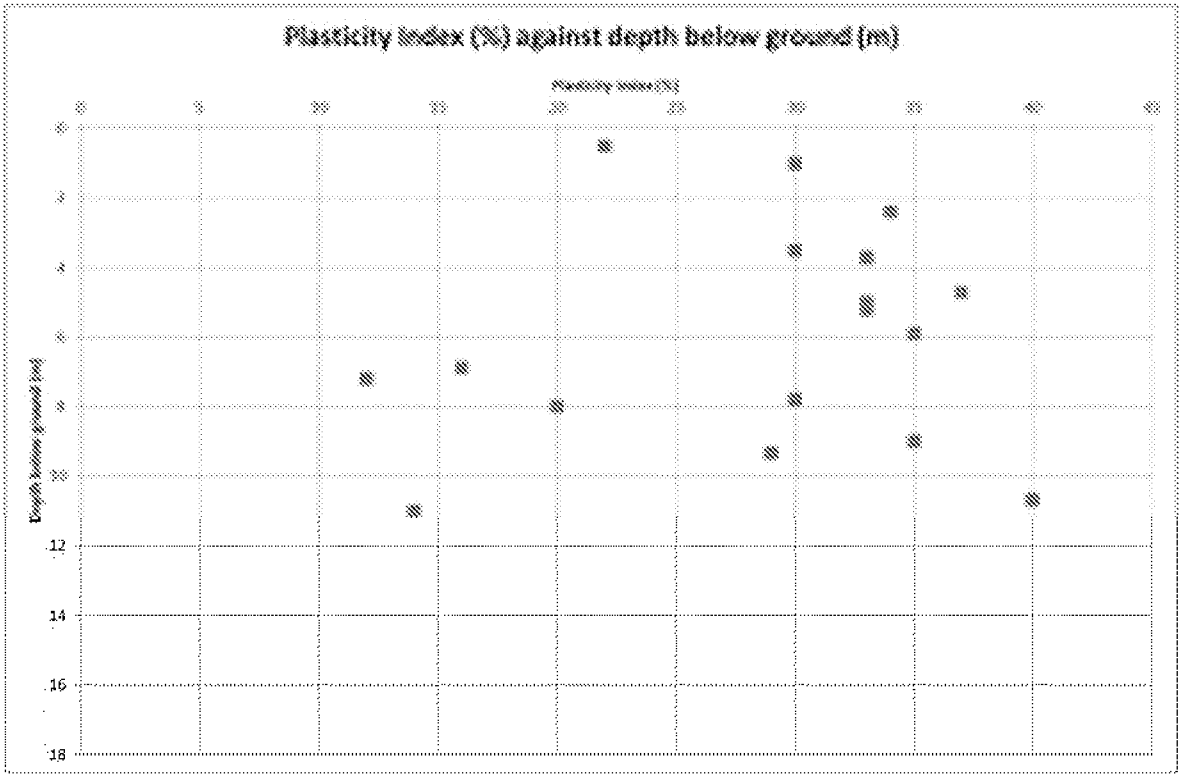
6.5 LAMBETH CLAY

Lambeth Clay was encountered below the Made Ground and Superficial Deposits, respectively, and is generally encountered in the southern part of the site (BH101, BH102, BH103, BH106, BH107, TP101, TP102). The surface of the Lambeth Clay was recorded between 1.51mOD and 1.99mOD.

Within the Lambeth Clay numerous laboratory tests were carried out to derive characteristic values for the strata, which are as follows in this section.

Atterberg Limit tests were undertaken on seventeen samples from the Lambeth Clay. Plastic Limits ranged from 14% to 28% with an average of 23%. Liquid Limit ranged from 26% to 68% with an average of at 51.5%. Plasticity Index (PI) ranged from 12% to 40% with an average of 28%. Plasticity Index has been plotted against depth below ground in Figure 6-7 and moisture content, liquid limit and plastic limit Figure 6-8. This shows that moisture content sits closer to the plastic limit indicating the Lambeth Clay is of a higher strength. A Casagrande/A-Line Chart is presented in Figure 6-9. The chart shows the Lambeth Clay to plot above the "A" line and has been classified as a low to high plasticity clay. The data does not indicate any clear trends in order to determine the division of Lambeth Clay encountered.

Figure 6-7: Plasticity Index of Lambeth Clay.



Plot of Plasticity Index against depth below ground level is presented in Figure 6-7. This indicates no real trend of the Plasticity Index.

Figure 6-8: Moisture content, liquid limit and plastic limit (%)against depth for Lambeth Clay

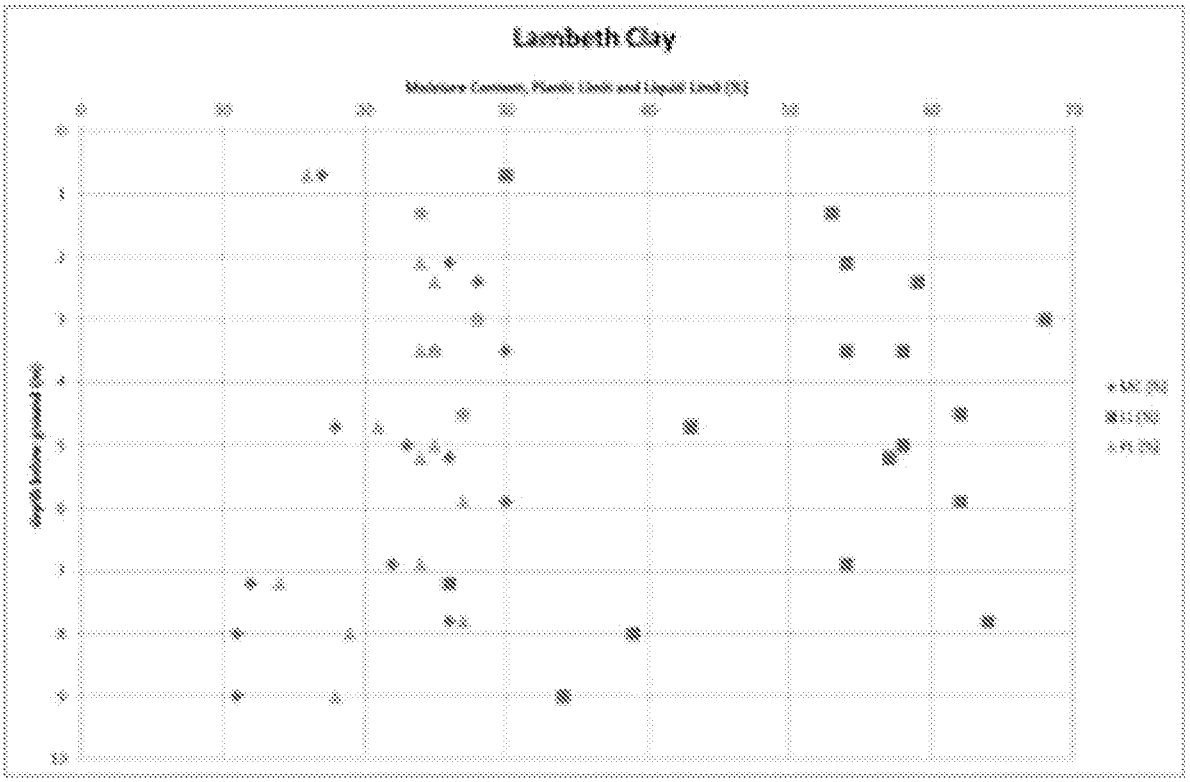
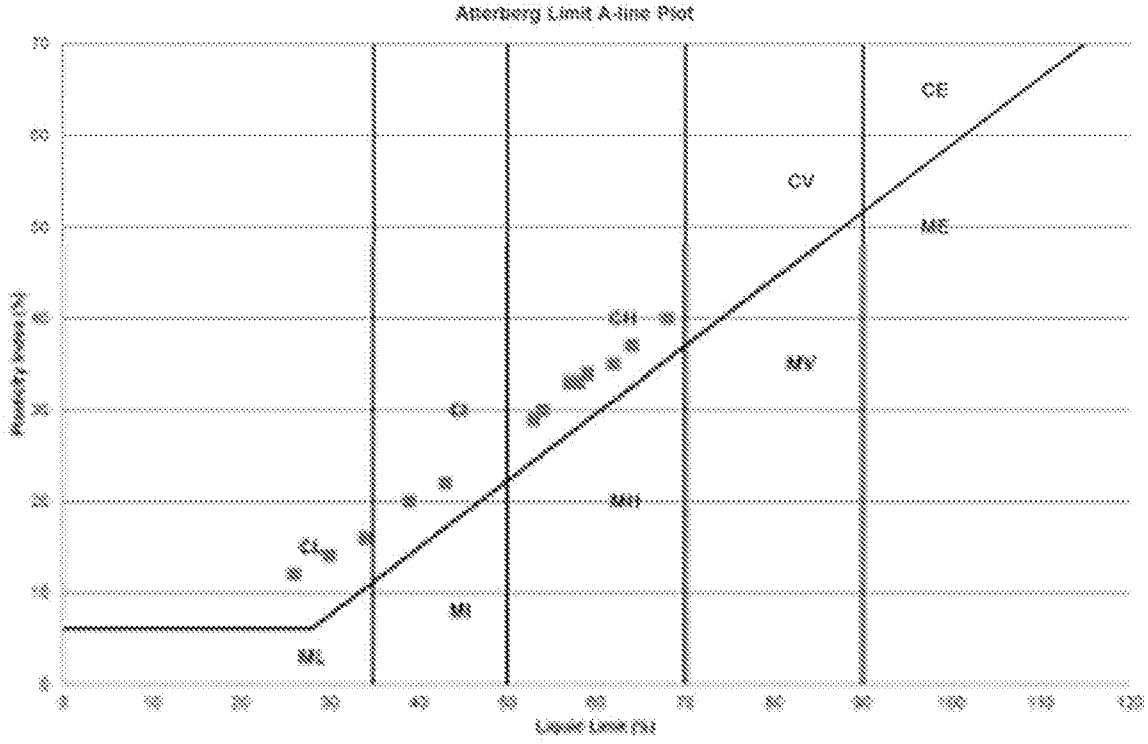
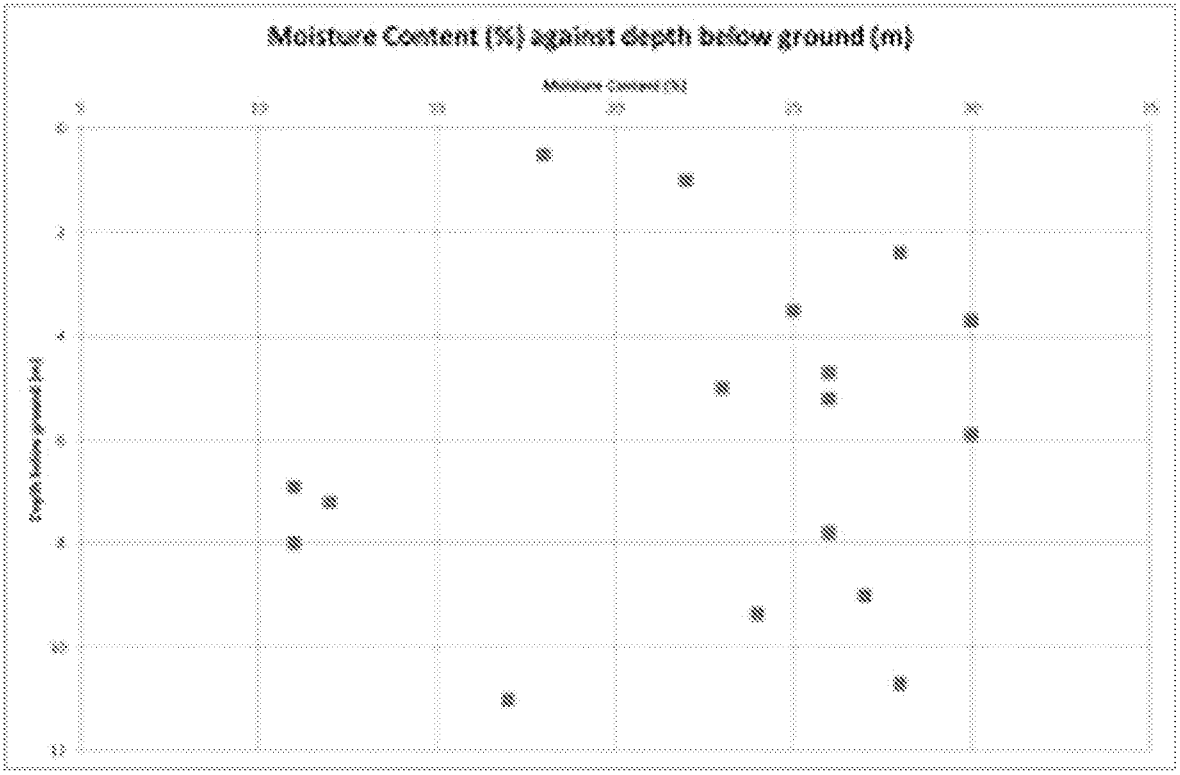


Figure 6-9: Atterberg Limit A-Line plot for Lambeth Clay.



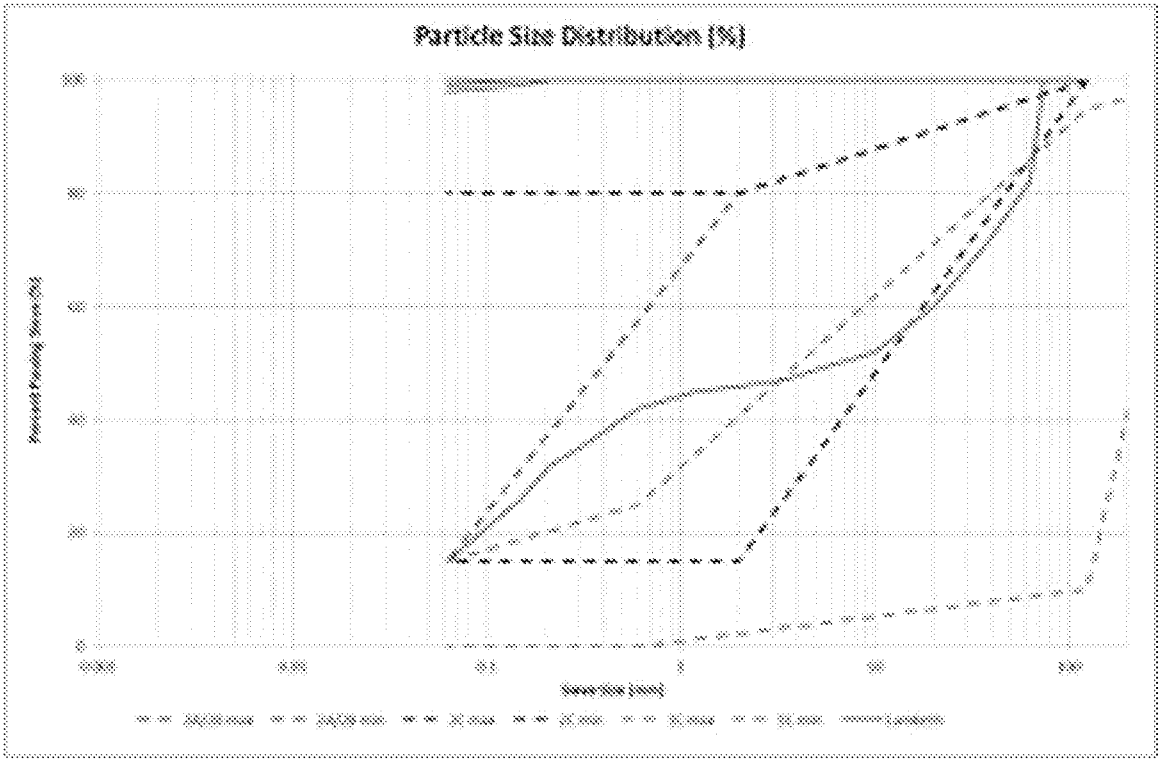
Moisture content tests were conducted on seventeen samples from the Lambeth Clay, as part of both the Atterberg limit tests. Moisture content ranged from 11% to 30% with an average of 23%. Moisture content is plotted against depth below ground in Figure 6-10. This plot shows that there is no trend in moisture content by depth and it continues to vary from around 11% to 30% throughout the depth range.

Figure 6-10: Moisture Content versus depth below ground (m) for Lambeth Clay.



Particle Size Distribution testing was conducted on four samples of Lambeth Clay. However, one of the samples comprised sand and gravel which is likely to come from the Upnor formation within the Lambeth Clay. The Upnor Formation typically is a pebble band with the Lambeth Clay and comprises fine to coarse black flint in fine to medium pale grey sand or clay, which is represented in the plot, Figure 6-11. The material is primarily comprised of silt and clay with no sand and gravel sized content and indicates a class 2A/B material, based on the particle sizes.

Figure 6-11: Particle Size Distribution Curves in Lambeth Clay.

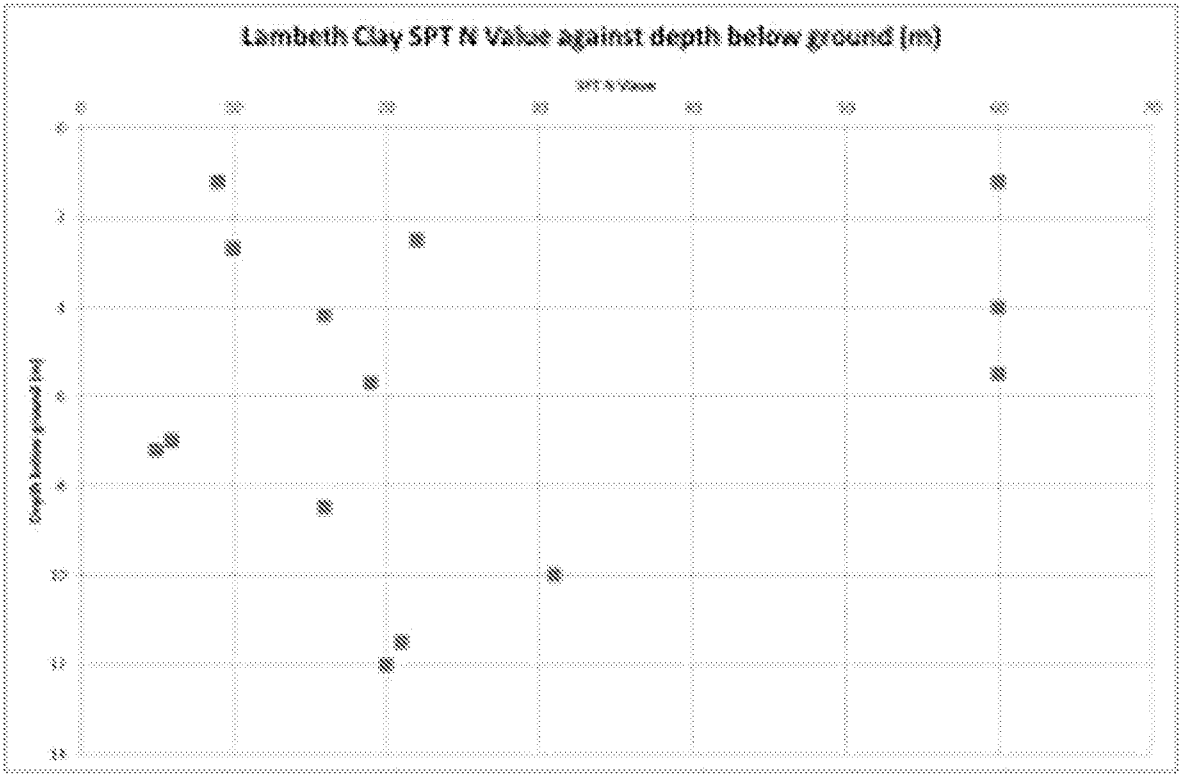


Compaction testing was undertaken on one sample of Lambeth Clay. The tests reported a maximum dry density of 1.58 Mg/m^3. The optimum moisture content is reported as 23.8%.

STRENGTH AND STIFFNESS

Standard Penetration Tests, SPTs were undertaken twenty-one times within the Lambeth Clay. The SPT N values have been limited to a maximum value of 60. The recorded SPT N values have been corrected to N_{60} values and ranged from 5 to 60, with an average of 23. Figure 6-12 presents a plot of recorded SPT N values against depth below ground level and shows an increase in SPT N value with depth. This indicates that the strength and stiffness of the material generally increases with depth which is as expected for Lambeth Clay.

Figure 6-12: SPT N60 against depth below ground level for Lambeth Clay.

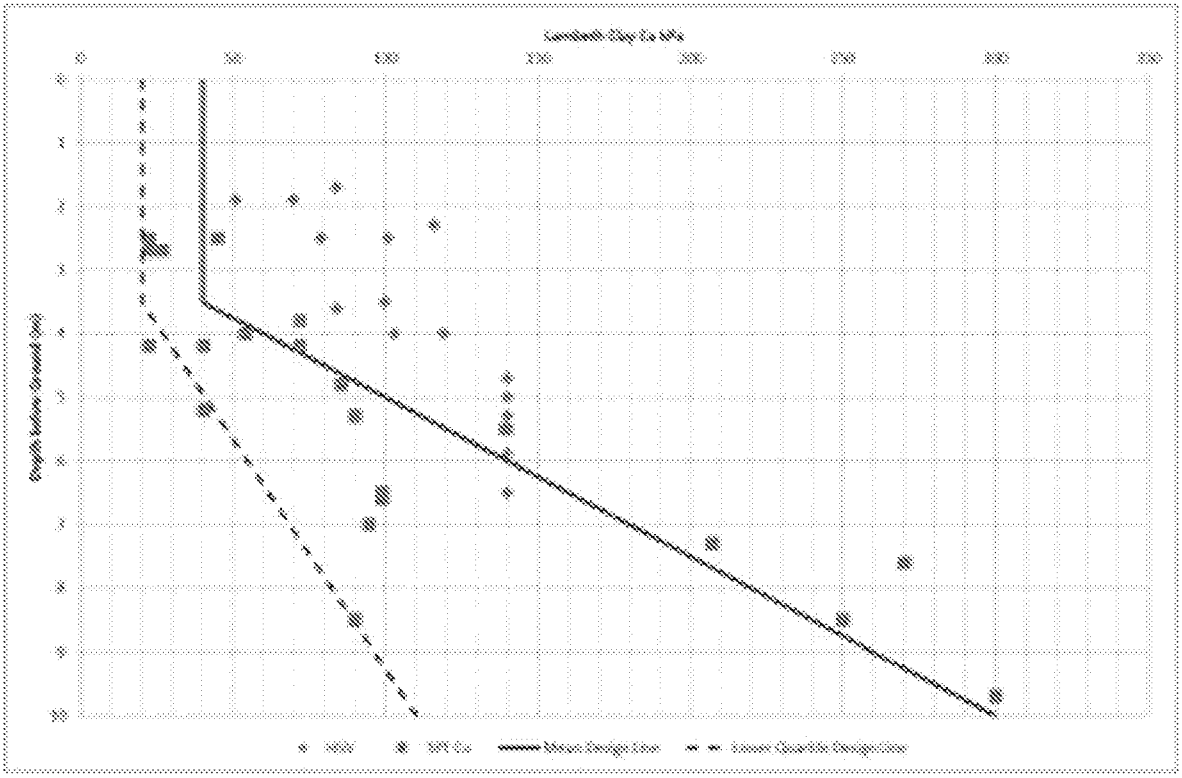


Undrained shear strength (c_u) of the clay in the Lambeth Group has been assessed using correlations with Standard Penetration Tests (Stroud, **Reference 11**). The undrained shear strength derived from the SPT blow counts (using a conversion of c_u/N = 4.2 based on the average PI in the layer of 33%) varies between 22.5kPa and 300kPa (average = 102kPa).

Results from Hand Shear Vane testing undertaken during the logging process on the core, within the liner, were at depths ranging from 1.7m bgl to 6.5m bgl. The results show a trend that strength generally increases with depth. However, results from this testing method are usually disregarded due to the low reliability of the method when undertaken on core samples and the 140kPa limiting maximum value.

The results of both the SPT correlation and HSV testing are plotted against depth below ground surface in Figure 6-12 and show that undrained shear strength generally increases with depth.

Figure 6-13: SPT and HSV correlation against depth below ground.



A mean design line and lower quartile design line are plotted on Figure 6-13 in order to arrive at recommended values for undrained shear strength at various depths. The use of mean values or lower quartile values depends upon the design application being considered and should be selected by the design engineer. The trend lines are summarised below:

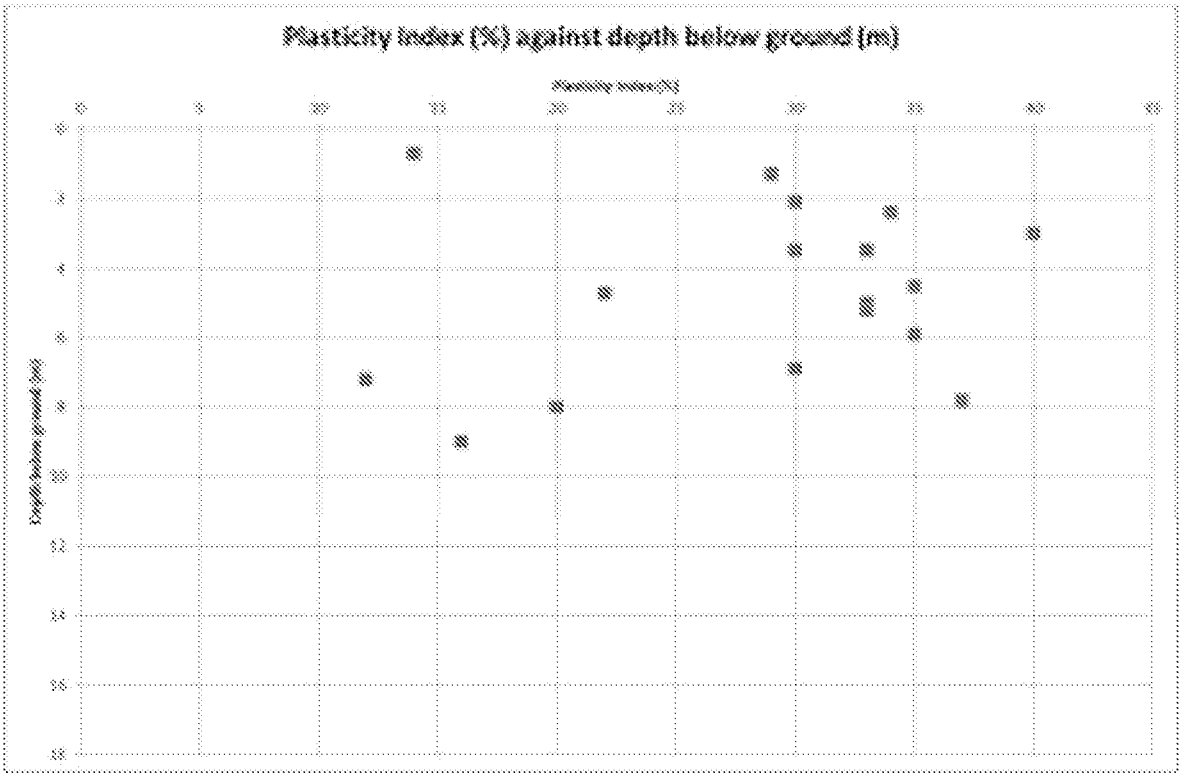
The average design line gives a strength profile of:

→ c_u = 40kPa + 40z, where z is depth below 3.5m bgl.

The lower quartile design line gives a strength profile of:

→ c_u = 20kPa + 13.85z, where z is depth below 3.5m bgl.

Figure 6-14: Undrained Shear Strength (Cu) against depth below surface (m) of Lambeth Clay.



Drained internal angle of friction (ϕ') has been estimated from PI (BS6031:2007). The range of PI is 12% to 40%, corresponding to an internal angle of friction (ϕ') of 23° to 27°. The average PI is 28% corresponding to an average ϕ' of 25°. This is represented in Figure 6-14.

A summary of the in situ field testing and laboratory geotechnical testing undertaken in the Lambeth Clay is provided in Table 6-1.

Table 6-1: Lambeth Clay test results

	Atterberg Limits (%)			Moisture Content (%)	SPT N_{60} Value	c_u correlated from SPT (kPa)
	LL	PL	PI			
No. of tests	17	17	17	17	21	21
Maximum	68	28	40	30	60	300
Minimum	26	14	12	11	5	22.5
Average	51	23	28	23	23	102
Rec' Value	-	-	-	-	-	Lower quartile: 20kPa + 13.85z[1] Mean: 40kPa + 40z[1]

[1] Where z is depth below 3.50m

6.6 WHITE CHALK SUBGROUP

White Chalk Subgroup was encountered below all Superficial Deposits and Lambeth Clay, respectively. The surface of the White Chalk Subgroup was recorded from between -3.46mOD to -17.72mOD and extended beyond the termination of all exploratory holes. There is a clear zone of

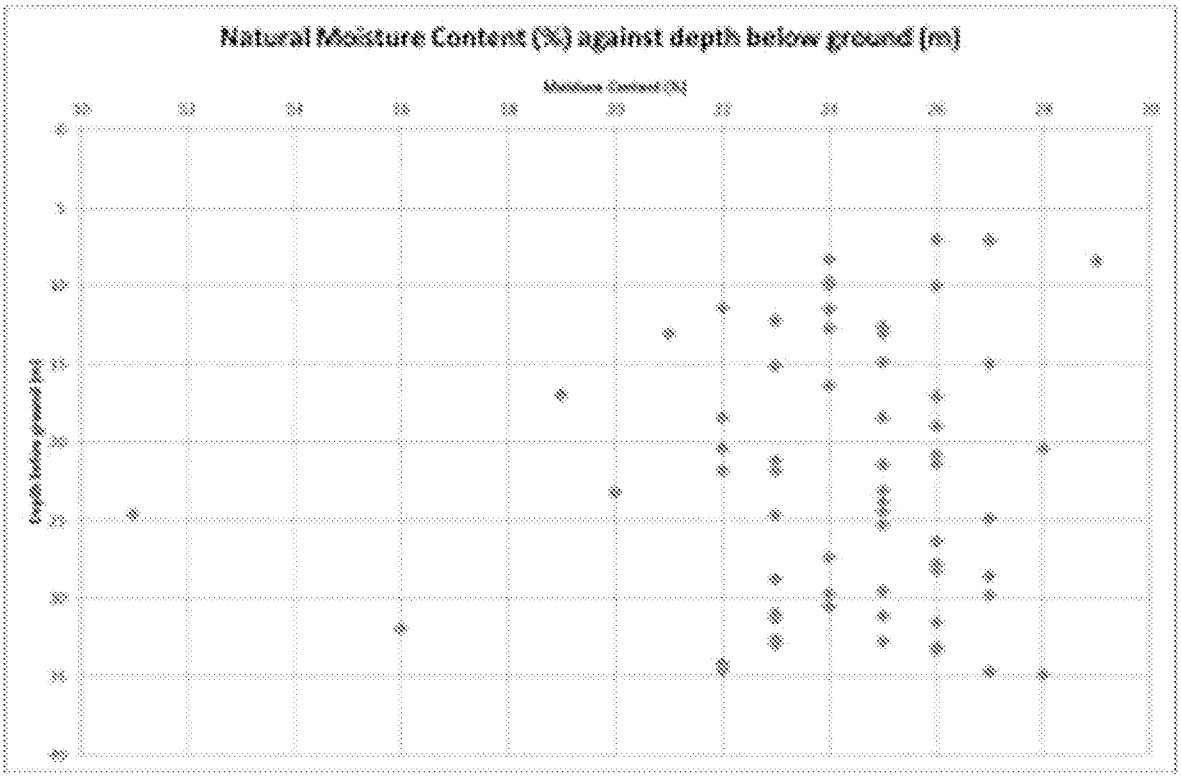
weathered chalk which is present within most boreholes. For the purposes of this report and analysis of parameters, this weathered zone is included.

Within the White Chalk Subgroup numerous laboratory tests were carried out to derive characteristic values for the strata, which are as follows in this section.

Atterberg Limit tests were recorded on three samples of chalk. The Liquid Limit ranges from 36% to 57% and the average is 46%. The Plastic Limit ranges from 21% to 25% and the average is 23.6%. Plasticity Index (PI) ranges from 11% to 32% and the average is 22%.

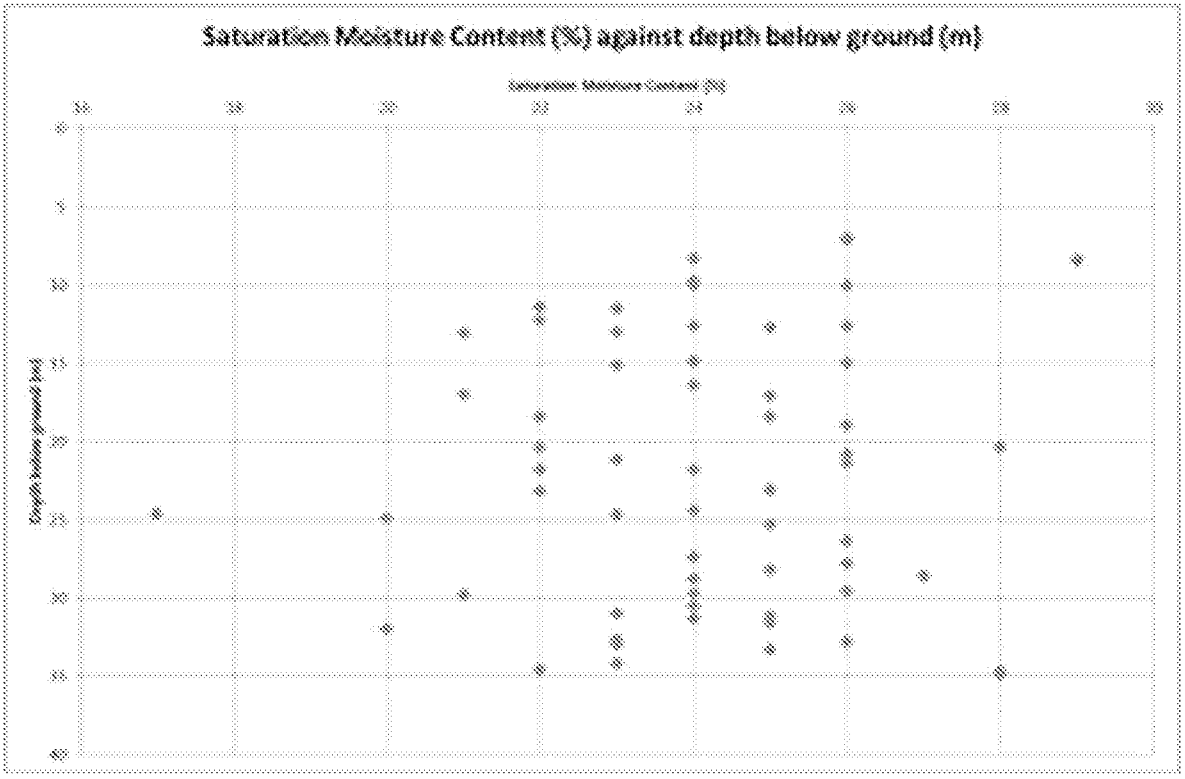
Natural moisture content tests were conducted on sixty-two samples of the White Chalk Subgroup. Results ranged from 11% to 29% with an average of 24%. Natural moisture content is plotted against depth below ground level in Figure 6-15. This plot shows that moisture content generally increases with depth and the majority of values range from between 22% to 26%.

Figure 6-15: Natural Moisture Content against depth below ground level



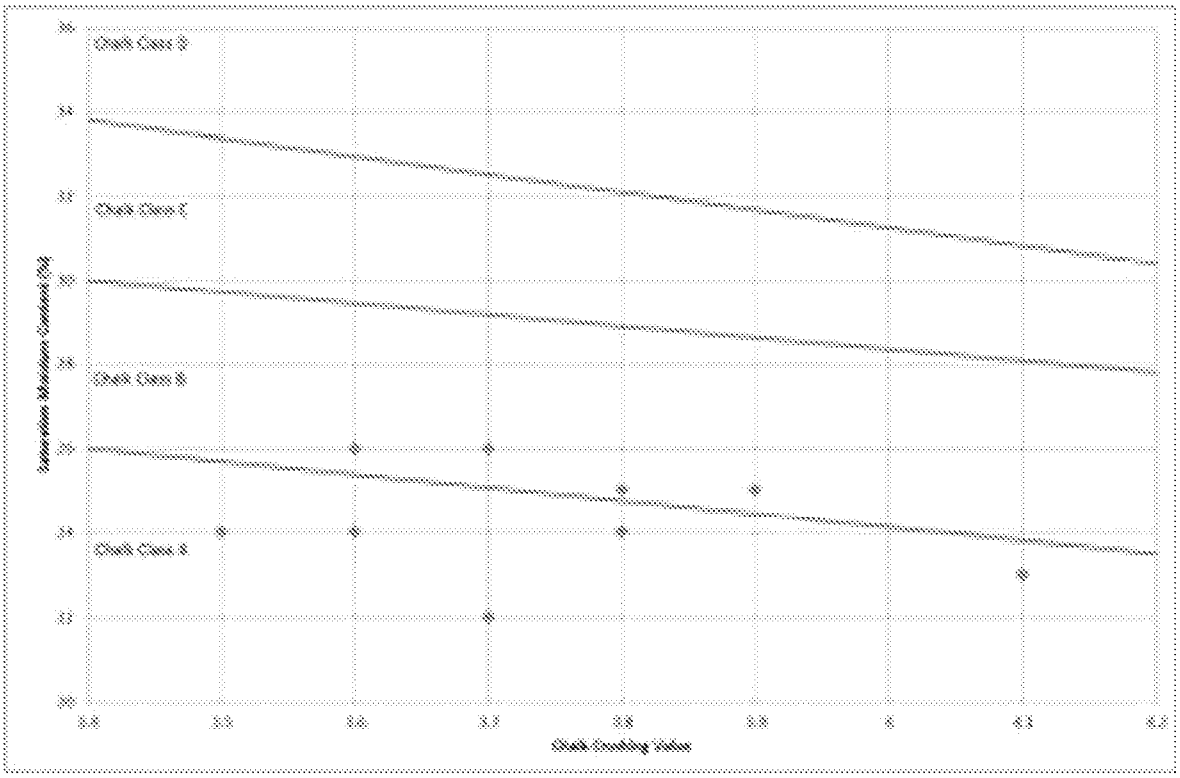
Saturation moisture content (SMC) tests were conducted on sixty-two samples of the structured White Chalk Subgroup. Results ranged from 17% to 29% with an average of 24%. Saturation moisture content is plotted against depth below ground level in Figure 6-16. This plot shows that saturation moisture content ranges between 22% and 26% with some outliers above and below this range.

Figure 6-16: Saturation Moisture Content against depth below ground level



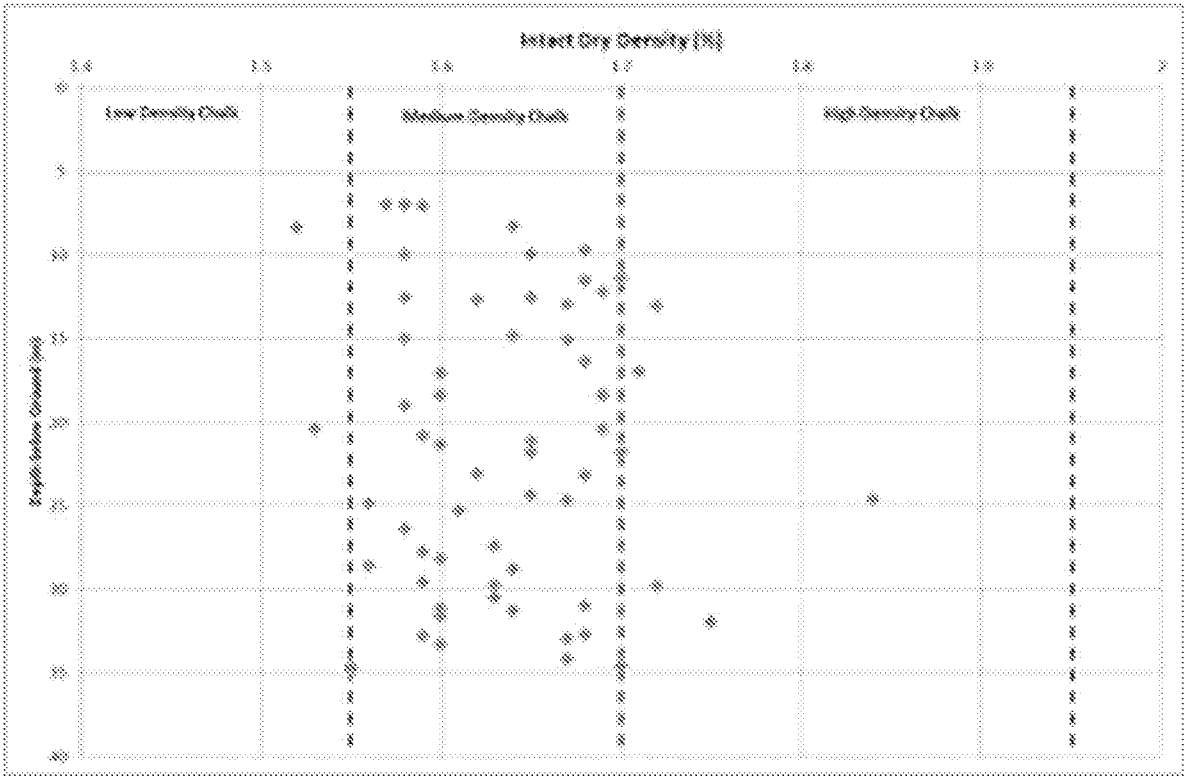
Thirteen chalk crushing value (CCV) samples have been undertaken on the structured chalk and can be used in conjunction with the saturation moisture content to classify the chalk in accordance with CIRIA C574 (**Reference 12**). The CCV ranged between 3.5 and 4.1, and have been plotted against Saturation Moisture Content (SMC) in Figure 6-17, that records the chalk as being a Earthwork Class A/B chalk, in accordance with Figure 5.1(b) Modified chalk classification chart (from Departmental Advice Note HA44/91 DTp 1991), in CIRIA C574.

Figure 6-17: Chalk Earthwork Classification based on Saturation Moisture Content against Chalk Crushing Value



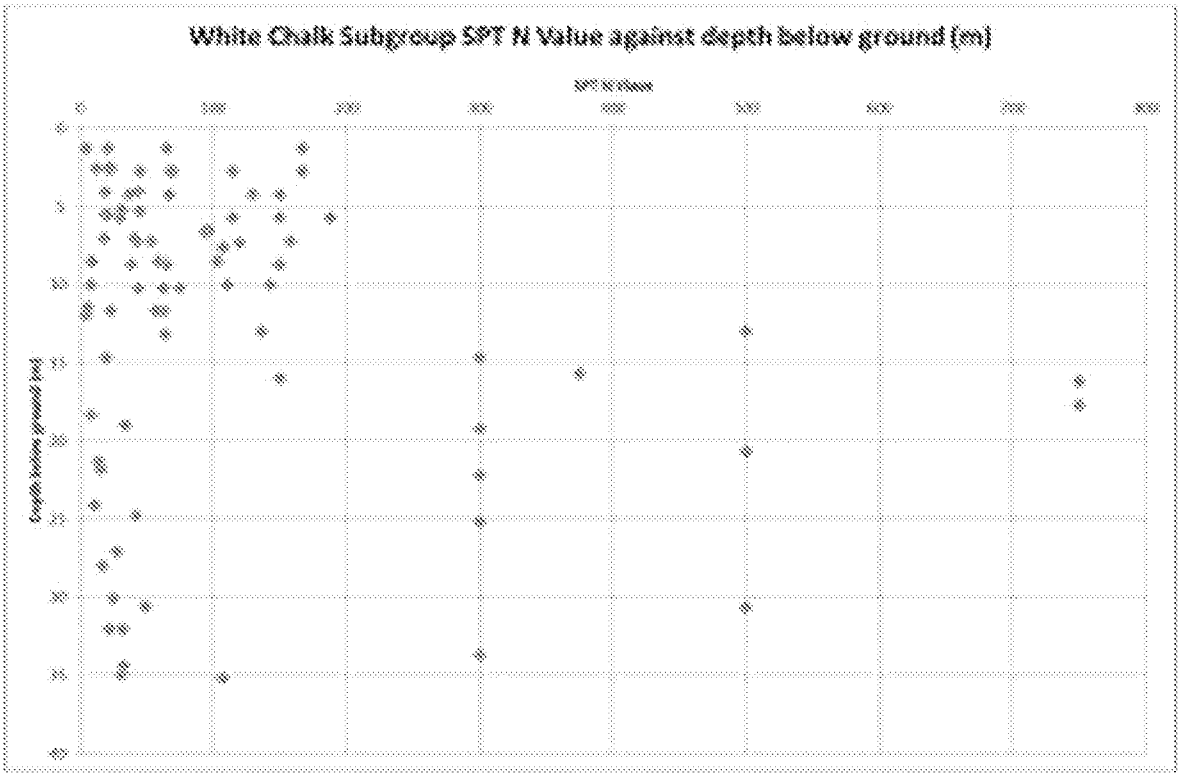
Intact dry density testing was undertaken on sixty-two samples of structured chalk from the ground investigation. Results ranged from 1.52% to 1.84% with an average of 1.63%. These values indicate the chalk is generally classified as a medium density chalk. This correlates with the data from the ground investigation factual report and borehole logs.

Figure 6-18: Intact Dry Density against depth below ground level



Standard Penetration Tests, (SPTs) were undertaken on eighty-three samples within the chalk. The recorded SPT N values have been corrected to N^{60} values which are between 5 and 750 with an average of 114. However, it should be noted that twenty-four tests present high values of 120 to 750; these values have been extrapolated during the in-situ testing. Figure 6-19 presents SPT N Value plotted against depth below ground level.

Figure 6-19: SPT N Value against depth below ground level



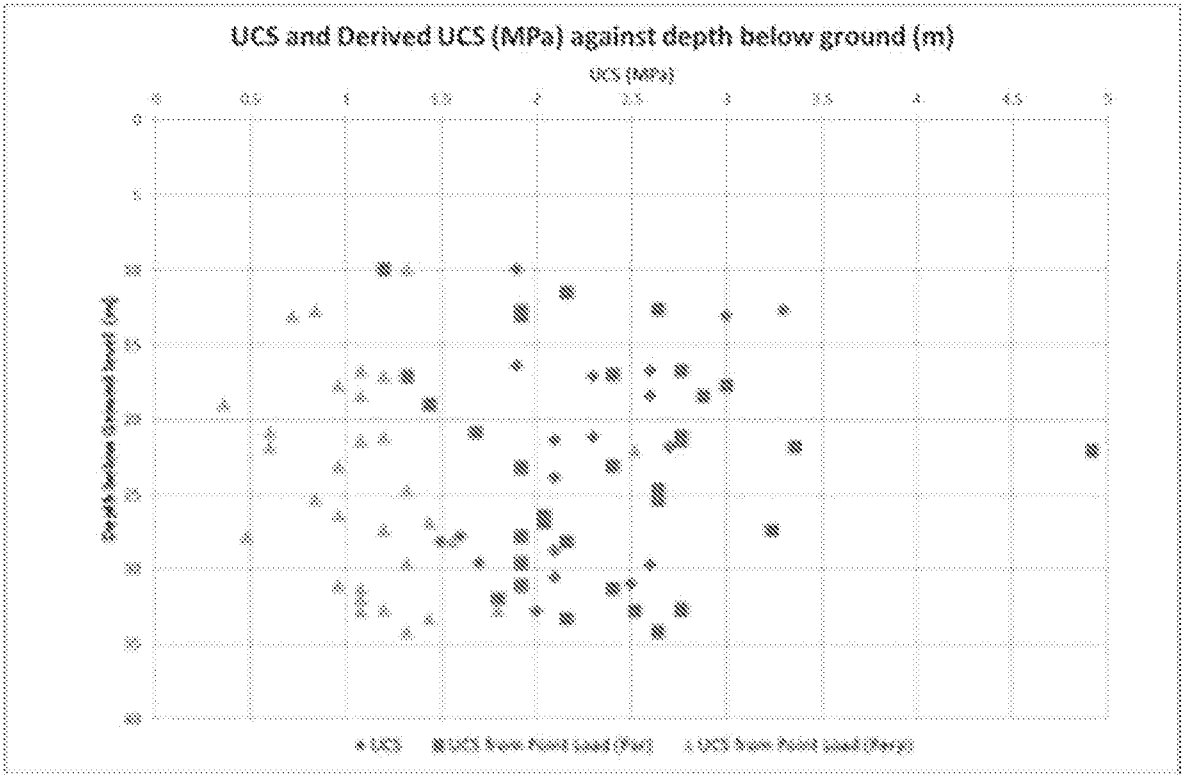
Thirty-two samples of the chalk were subject to a Point Load Strength Index Test which was split between two orientations, parallel and perpendicular, to give sixty-four results and gave an Is_{50} of between 0.05MPa and 0.41MPa, with an average of 0.15MPa. The tests that were in the parallel orientation gave a range of results between 0.10MPa and 0.41MPa with an average of 0.20MPa. The results undertaken in the perpendicular orientation have given a range between 0.03MPa and 0.21MPa with an average of 0.09MPa.

Nineteen Unconfined Compressive Strength (UCS) tests were undertaken recording a range of between 1.5MPa and 3.3MPa, with an average of 2.26MPa. UCS values have been plotted along with UCS derived from Is_{50} results[1], against depth below ground level (m bgl), in Figure 6-20.

[1] UCS can be taken as 10 times (range 16 – 25 times) the Point Load Index (Is_{50}) – David Norbury Limited 2008

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Figure 6-20: UCS and Derived UCS vs Depth below Ground Level



The results of the UCS and Point Load testing provide values typically lower than 3MPa, identifying the chalk as low density (CIRIA C574). This does not agree with the results of the saturation moisture content, intact dry density and chalk crushing value testing which all identify the material as a medium density chalk. A reason for this is that saturation moisture content, intact dry density and chalk crushing value tests require an intact lump of chalk, and often the chalk lump selected represents the best part of the sample (i.e. the only good lump available) thus the results reflect the upper end of the quality for the chalk material. It may therefore be that the UCS better reflects the chalk mass.

A summary of the laboratory geotechnical testing undertaken in the White Chalk Subgroup is provided in Table 6-2.

Table 6-2: White Chalk Subgroup test results

	Atterberg Limits (%)			Moisture Content (%)	Saturation Moisture Content (%)	Chalk Crushing Value (%)	Unconfined Compressive Strength testing (MPa)	Point Load Index I_{s50} (MPa)	Intact Dry Density (Mg/m^3)
	LL	PL	PI						
No. of tests	3	3	3	65	62	13	19	64	62
Maximum	57	25	32	29	29	4.1	3.3	0.41	1.84
Minimum	36	21	11	11	17	3.5	1.5	0.03	1.52
Average	45	23	22	24.2	24	3.8	2.3	0.15	1.63

[1] Where z is depth below surface of White Chalk Subgroup

6.7 GROUNDWATER/CHEMISTRY

GROUNDWATER

Standpipe piezometers were installed in BH101 to BH111; these boreholes were included in a programme of groundwater level monitoring. These eleven wells were monitored on three occasions (2nd, 7th and 14th December 2015). The results are tabulated in Table 5-3.

BURIED CONCRETE

In accordance with the assessment methodology outlined in British Research Establishment (BRE) Special Digest 1: Concrete in Aggressive Ground (**Reference 13**), chemical testing was undertaken on soil samples obtained during the ground investigation. The results have been utilised to determine the Design Sulphate Class of the strata present and the Aggressive Chemical Environment for Concrete (ACEC). This is summarised in Table 6-3 below:

Table 6-3: Summary of Sulphate Calculations

Exploratory Hole	Top depth (m)	Strata [1, 2]	pH	Total sulphur (%)	Water soluble 2:1 (mg/l)	Water soluble 2:1 (g/l)	Total Sulphate Content (%)	Sulphate Class	ACEC Class	Total potential sulphate (%)
BH102	1.9	LMBE	8.8	0.04	350	0.35	0.09	DS5	AC-2	0.38
TP102	2.5	LMBE	7.3	0.05	220	0.22	0.1	DS5	AC-2	0.42
BH106	3.5	LMBE	8.3	0.02	150	0.15	0.06	DS5	AC-2	0.25
BH101	3.9	LMBE	8.2	0.02	120	0.12	0.03	DS5	AC-2	0.13
TP101	3	LMBE	8.4	0.01	120	0.12	0.04	DS5	AC-2	0.17
BH103	5.3	LMBE	8.2	<0.01	83	0.083	0.03	DS5	AC-2	0.13
BH103	1.9	LMBE	8.3	0.02	81	0.081	0.04	DS5	AC-2	0.17
BH107	5	LMBE	8.8	0.02	50	0.05	0.04	DS5	AC-2	0.17
TP101	1.3	LMBE	8.2	0.02	32	0.032	0.02	DS5	AC-2	0.08
BH109	4	SUPD	8.2	0.64	520	0.52	0.21	DS5	AC-2	0.88
BH108	6.3	SUPD	8.8	0.46	520	0.52	0.17	DS5	AC-2	0.71
BH108	1.65	SUPD	8.3	0.39	490	0.49	0.19	DS5	AC-2	0.80
BH109	15.5	SUPD	8	1.8	340	0.34	2.2	DS5	AC-2	9.24
BH104	5.2	SUPD	9	0.21	270	0.27	0.1	DS5	AC-2	0.42
TP104	1.5	SUPD	8.7	0.08	170	0.17	0.08	DS5	AC-2	0.34
TP106	2	SUPD	8.5	0.02	82	0.082	0.04	DS5	AC-2	0.17
TP107	1.5	SUPD	8.2	0.01	32	0.032	0.02	DS5	AC-2	0.08
TP103	1	SUPD	7.4	<0.01	31	0.031	0.02	DS5	AC-2	0.08

[1] LMBE - Lambeth Clay

[2] SUPD - Superficial Deposits

Eighteen samples were obtained for sulphate testing, from both the Superficial Deposits and Lambeth Clay. The mean of the highest 20% of the values recorded provides a characteristic value for the total potential sulphate of 2.91%, water soluble sulphate of 468 mg/l with a pH value of 8.3. These values correspond to a Design Sulphate Class of DS-5.

However, it is anticipated that the proposed building foundations are likely to be piled and therefore there will be no excavation/disturbance of the ground which prohibits oxidation of the

pyrite. This is based on the following extract from (BRE) Special Digest 1: Concrete in Aggressive Ground (**Reference 13**) stating '*Concrete in pyritic ground which is initially low in soluble sulphate does not have to be designed to withstand a high potential sulphate class unless it is exposed to ground which has been disturbed to the extent that contained pyrite might oxidise and the resultant sulphate ions reach the concrete. This may prompt redesign of the structure or change to the construction process to avoid ground disturbance; for example, by using precast or cast-in-situ piles instead of constructing a spread footing within an excavation.*'

Therefore it is suggested that the design sulphate class is reduced to DS-2, taking account of the water soluble sulphate content. This corresponds to concrete class of AC-2.

6.8 GROUND CONDITIONS FOR PROPOSED STRUCTURES

The following sub-sections use the findings of the ground investigation and laboratory testing to provide some general guidance on likely ground engineering solutions for the proposed development.

FOUNDATION SOLUTIONS – MAIN BUILDING

Column loadings for the four- to five-storey building are anticipated to be in the order of 4000kN (unfactored) / 4400kN (factored). It is expected that the bearing resistance of the Superficial Deposits and Lambeth Clay would not be sufficient to accommodate the anticipated column loads. Furthermore, it is also anticipated that potential differential settlements could occur due to the variability in the thickness of the Superficial Deposits. It is therefore likely that a piled foundation solution and a suspended ground floor slab would be required. Provisional pile lengths are provided in Table 6-4 for the anticipated building loads. Note these are indicative, and not to be used for detailed design. It is recommended that a Geotechnical Design Report (GDR) is produced at detailed design stage. It is noted that the pile lengths for the northern area of the site are likely to be significantly longer.

Table 6-4: Preliminary Pile Lengths for building footprint.

EUROCODE 7	PROVISIONAL REQUIRED PILE LENGTH (M)		
Pile Diameter (mm)	4 Pile Grouping	3 Pile Grouping	Single Pile
450	13	16	34
600	11	13	26
750	10	11	22

FOUNDATION EXCAVATIONS

The stability of any foundation trenches will need to be inspected and monitored as the upper materials may be unstable, especially in the presence of groundwater. Where ground is unstable or there is a need to leave steep sided excavations open for longer periods, there may be a need for excavations to be supported.

Groundwater may be encountered in the deeper foundation excavations and an appropriate method of groundwater management, such as draining to a sump and pumping out, may be required.

PRELIMINARY PAVEMENT DESIGN

The California Bearing Ratio (CBR) for pavement design has been estimated using Table 5.1 of IAN 73/06 Rev 1 (2009) (**Reference 14**). This estimates the equilibrium subgrade CBR based on the soil type and Plasticity Index. For this project it is assumed that any Made Ground will be removed and therefore all pavements will be founded upon the Superficial Deposits. The Plasticity

Index of the Superficial Deposits range from 23% to 53%. Taking a conservative preliminary design value corresponds to an equilibrium subgrade CBR of 2%. This assumes thin construction of 300mm from pavement surface to subgrade. To increase the preliminary design value, it is likely capping or a geosynthetic layer will be required to enable a cost effective design.

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7 LAND CONTAMINATION RISK ASSESSMENT

7.1 LAND CONTAMINATION ASSESSMENT

Introduction

It is understood that the Client is proposing to construct an Engineering and Digital Technology Park (comprising teaching facilities) in the south-eastern area of the Bognor Regis Campus and associated student accommodation, access roads, car parking and landscaping adjacent to the north.

A land contamination assessment was undertaken alongside the geotechnical ground investigation, the aims of which were to build upon findings of the WSP 'Phase 1 Land Contamination Assessment, University of Chichester, Bognor Regis Campus, Digital Technology Park', (Ref. 70014375-001, dated August 2015) (**Reference 15**).

This current assessment was carried out in order to further quantify potential ground contamination liabilities associated with historical and current site use; and to advise on potential options for mitigating potential contamination risks associated with the development.

A summary of the contamination assessment undertaken and is provided in the following section. A full Preliminary Land Quality Assessment has been produced under a separate cover (Ref: 70013264-300, February 2016) (**Reference 10**) and should be read in conjunction with this report.

7.2 CONTAMINATION ASSESSMENT APPROACH

The contamination assessment comprised the following elements which are summarised within this section:

- Review of previous Phase 1 Land Contamination Assessment and publicly available information in order to establish potential sources of contamination which required assessment;
- Analysis of soil, groundwater and gas samples to enable a generic quantitative risk assessment to be completed to assess potential risks to human health and controlled water receptors;
- Development of a conceptual site model summarising potential contaminant linkages; and
- Provision of recommendations with respect to the management / mitigation of potential contaminated land development constraints.

7.3 POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination identified from the previous report and publicly available data sources prior to the investigation included the following:

- Electrical substation and pump house within 50m of the site, to the north of Barbara Smith Halls;
- Current embankment (approx. 1m high spanning width of the site) in the south eastern area of the site;
- Felpham Way (A259), Upper Bognor Road and allotments adjacent to the east of the site; and
- Fly tipping to the south of Barbara Smith Halls.

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Based on the above information, the current assessment scope was designed to target the above areas of concerns, whilst also providing general site coverage to enable an assessment of contamination risks to be completed.

The rationale and scope of the contamination assessment is summarised in Table 7-1:

Table 7-1: Exploratory Hole Rationale

Potential Area of Concern (PAOC)	Proposed Location (s)	Rationale
PAOC 1 – Made Ground	All locations	→ HP101 – 102 undertaken in earth bund to determine nature and composition of materials → All further locations to determine possible presence of Made Ground
PAOC 2 – Ground gas assessment	All BHs	→ BH106 installed as a shallow ground gas monitoring well to determine potential shallow ground gas generation → Further monitoring locations installed in superficial deposits and chalk to determine potential gas generation from sources including organic matter and carbonates
PAOC 3 – migration of contaminants from off-site	BH101 – BH103, BH106 – 109, TP102 – TP103 and TP107	→ BH101 – 103, BH106 – 109, TP102 and TP107 located adjacent to eastern and southern boundaries to investigate migration from adjacent road and allotments → BH107 and TP102 – 103 are located on-site adjacent to the pump house and electrical substation
Assessment of the groundwater regime / groundwater quality	All BHs	→ BH109 and BH110 installed as groundwater wells in shallow superficial deposits to determine hydraulic connectivity with underlying chalk aquifer. → BH101 installed as groundwater well in the Lambeth Group bedrock to determine hydraulic connectivity with chalk aquifer beneath → BH102 – BH105, BH107, BH108 and BH111 installed as groundwater wells in chalk bedrock deposits, triangulated to infer flow direction and possible contaminant migration

7.4 CONTAMINATION ASSESSMENT

The following section represents a summary of the Generic Quantitative Risk Assessment (GQRA) (**Reference 10**) for potential risk to human health and controlled water receptors. Details of the full assessment methodology are provided in **Appendix G**.

7.5 HUMAN HEALTH – SOIL

It has been assumed for the basis of the assessment that the land to the south of the on-site drainage ditch will be used for a commercial / teaching building and the land to the north of the ditch will be utilised for high-rise student accommodation flats and car parking. As such the results of the analysis have been compared to WSP Generic Assessment Criteria (GACs) for a residential end use, with no consumption of home grown produce and 1% soil organic matter, which is based on laboratory analysis of soils and represents a conservative approach to the assessment.

Human health receptors considered as part of this assessment are:

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- Future students and teaching/support staff in the teaching building;
- Maintenance workers;
- Residents in student accommodation; and
- Future site visitors.

Construction and maintenance works have been discounted from the assessment, as risks to these will be mitigated by the implementation of good environmental practices and health and safety measures during future construction and maintenance works.

A total of thirty soil samples were submitted for chemical analysis and compared to WSP GACs. The following observations were made:

- Exceedances of the GAC for benzo(a)pyrene (1mg/kg) was recorded in two locations, in BH104 at 0.1m bgl (3.2mg/kg) and BH105 at 0.1m bgl (1.3mg/kg). Both samples were collected from Made Ground and are located immediately to the adjacent to the north of the drainage ditch (BH104) and in the central northern boundary (BH105). No further analytes exceeded their respective screening criteria;
- No Asbestos Containing Materials (ACM) was recorded in all sixteen soil samples screened; and
- No pesticides, herbicides or volatile organic compounds (VOCs) were recorded greater than the laboratory limits of detection.

7.6 CONTROLLED WATERS ASSESSMENT

The controlled waters risk assessment was conducted in accordance with the principles of EA 'Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination' 2006 (EA 2006) and on the 'prevent and limit' approach of the Water Framework Directive (2000/60/EC). Level 1 (leachate) and level 2 (groundwater) assessments were undertaken, which allows a direct comparison of results against appropriate assessment criteria.

Controlled water receptors considered as part of this assessment were:

- The underlying Chalk Principal Aquifer;
- Secondary A Aquifers within the Lambeth Group and River Terrace Deposits;
- The on-site drainage ditch;
- Aldingbourne Rife to the east; and
- The English Channel approximately 300m south of the site.

One surface water abstraction is recorded within 1km of the site, 170m south at Butlins Holiday Village. No groundwater abstractions are recorded within 1km of the site.

Due to the potential for risks to a Principal Aquifer and surface water, contaminant concentrations have been screened against both the UK Drinking Water Quality Standards (DWQS) 2000 (Amended 2004) and the Water Framework Directive (WFD) standards and groundwater threshold values for surface waters and transitional and coastal waters.

Based on groundwater conditions encountered, it is considered that groundwater within the chalk aquifer is flowing in a southern / easterly direction. It is considered that groundwater within the chalk bedrock is in vertical hydraulic continuity with the overlying superficial deposits and Lambeth Group.

7.7 LEVEL 1 ASSESSMENT – LEACHATE

A total of twelve soil samples were submitted for leachate analysis. The following observations were made:

- Copper concentrations within leachate from three soil samples (BH102 at 0.1m bgl, 7.5µg/l; BH107 at 0.2m bgl, 7.1µg/l and TP104 at 0.1m bgl, 6.1µg/l) marginally exceeded the WFD criteria for coastal waters (5µg/l). All samples were collected from Made Ground, except BH102 at 0.1m bgl which comprised Topsoil;
- Lead concentrations within leachate from four soil samples (BH102 at 0.1m bgl, 10µg/l; BH107 at 0.2m bgl, 9.3µg/l; BH109 at 0.5m bgl, 7.4µg/l and BH110 at 0.2m bgl, 8.5µg/l) marginally exceeded the WFD standard for coastal waters (7.2µg/l). All samples were collected from Made Ground except BH102 0.1m bgl which comprised Topsoil; and
- No petroleum hydrocarbons were detected in any samples and PAHs were only detected in low concentrations not exceeding their respective screening criteria in BH102 at 1.3m bgl (Lambeth Group).

7.8 LEVEL 2 ASSESSMENT – GROUNDWATER

A total of ten groundwater samples were collected from all the boreholes with the exception of BH106 (which was dry at the time of sampling) and were submitted for laboratory chemical analysis. The following observations were made:

- No PAHs, petroleum hydrocarbons or VOCs were present above limits of detection;
- Mercury concentrations in all samples (in the range of 0.12 to 0.4µg/l), exceeded the WFD coastal and freshwater standards (0.05µg/l). Samples were taken from the Lambeth Group, chalk bedrock and superficial deposits in the north of the site; and
- Selenium concentrations exceeded the DWS (10µg/l) in four samples (BH101 27µg/l, BH103 16µg/l, BH105 14µg/l and BH107 10µg/l). Of these, BH103, BH105 and BH107 were screened in the chalk bedrock and BH101 was screened in the Lambeth Group.

7.9 GAS ASSESSMENT

Ground gas monitoring was undertaken on three occasions in December 2015. Utilising guidance presented in CIRIA C665 (**Reference 16**) and taking a worst case gas concentration of 3.7% CO_2, 0.5% CH_4 and a maximum flow of 18.0l/hr, a worst case GSV of 0.67 l/hr for carbon dioxide and 0.09 l/hr for methane is calculated.

The results indicate the Site to be classified as Characteristic Gas Situation 2 (CS2). CIRIA C665 states a typical source for CS2 to be 'natural soil, high peat/ organic content', which is typical of the superficial deposits encountered in the northern portion of the site. This should be confirmed with the Local Planning Authority prior to development.

The WSP Phase 1 Land Contamination Assessment indicated that the site is located within an intermediate probability radon area, as between 1 and 3% of homes are above the action level for radon gas.

Full details of the ground gas monitoring and ground gas assessment are provided in **Appendix D**.

7.10 CONTAMINATION CONCLUSIONS & RECOMMENDATIONS

Based on available data to date, it is considered that contamination risks to the proposed development are low. Whilst localised marginal contaminant exceedances were observed in soil,

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leachate and groundwater samples collected during this assessment, they are not considered to represent a potential significant risk to human health or controlled water receptors.

Spatial distribution of analyte exceedances in soil and leachate samples was attributed to the location of Made Ground. Of the two soil samples that exceeded the screening criteria (1mg/kg) for benzo(a)pyrene, BH105 at 0.1m bgl (1.3mg/kg) is situated beneath the proposed car park and it is considered that this will limit exposure of any potential contamination by breaking the direct contact exposure pathways to human health.

The minor exceedance of benzo(a)pyrene in BH104 at 0.1m bgl (3.2mg/kg) is located in an area of soft landscaping adjacent to the south of the proposed student accommodation block. Whilst the risk of significant exposure to human health is considered low, given the sensitive land use (accommodation), it is considered prudent to delineate and install a suitable thickness of clean cover to mitigate the potential risk. If site levels do not allow the installation of a clean cover layer, then impacted material may require excavation and re-use under areas of hard-standing / building footprint. It is understood that the proposed site layout is not confirmed for the northern portion of the site and should the layout change, this may impact on potential remedial options and further assessment may be necessary.

Fly tipping observed to the south of Barbara Smith Halls was discounted as a potential source of contamination, as no soil samples collected from BH103 and TP101 adjacent to the off-site fly tipping indicated soil contamination. Furthermore, no fly tipping was observed in the southern portion of the site following vegetation clearance. Asbestos was discounted as a potential source of contamination, as no visual or laboratory evidence of this was recorded.

Marginal exceedances of copper and lead were recorded in leachates; and selenium and mercury in groundwater from all strata. No discernible soil source or off-site sources of contamination has been identified. Given the marginal exceedances and the development proposals to install areas of hard-standing it is considered that the risks to groundwater are low. However, it is considered prudent to undertake a further round of confirmatory groundwater and surface water sampling.

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8 GEOTECHNICAL RISK REGISTERS

The geotechnical risk registers identify geotechnical hazards / risks associated with the various ground related aspects of the proposed development and associated structures.

Risk is taken as the possibility of adverse consequences such as danger, loss, injury or other arising from a hazard, the hazard being something with the potential to cause harm. The geotechnical risk is assessed as the risk is created by the site ground conditions which can adversely affect the scheme cost, completion time, health and safety, environment and quality of product.

The risk register is intended as a live document and is included on the following pages, Table 8-1.

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Table 8-1: Geotechnical Risk Register

ITEM	DATE RAISED	DESIGN / CONSTRUCTION RISK	CONSEQUENCE	QUALITATIVE RISK LEVEL HIGH / MEDIUM / LOW	POSSIBLE MITIGATION(S)
1	February 2016	Limited groundwater monitoring data.	Incorrect assumptions in groundwater and geotechnical designs.	Low	Assume conservative groundwater profiles.
2	February 2016	Change in ground conditions at depth which will change in strength profile and subject to settlement and over consolidation. If organic material this may cause ground gas.	Structural damage. Cost of repairs. Long term performance. Reputational damage	High	Consider issues in design of temporary and permanent works. Additional monitoring during the construction phase of the development.
3	February 2016	Geological strata encountered at formation are different to design.	Unsuitable construction methods. Cost of redesign. Reputational damage.	Medium	Data gaps to be determined at detail design stage. Carry out additional ground information if necessary.
4	February 2016	Settlement of underlying strata due to consolidation settlement in compressible soils/made ground.	Unacceptable settlement of foundations.	Medium	Design to consider this and site inspections needed to make sure design assumptions met.
5	February 2016	Sulphate attack on buried concrete.	Structural damage. Cost of repairs. Long term performance. Reputational damage.	Low	Use test results from ground investigation to select concrete class from BRE Special Digest 1.
6	February 2016	Unexploded Ordnance.	Risk to human life. Structural damage.	High	Attendance of Unexploded Ordnance Engineer on site to provide a watching brief during construction works and mitigate risk.
7	February 2016	Buried services and utilities.	Structural damage. Health and safety of workforce. Reputational damage. Financial and programme implications.	Medium	Service clearance to be undertaken to identify buried services and utilities prior to any intrusive works. Risk assessments and permit to dig issued before intrusive works. Following these procedures will reduce risk to low.
8	February 2016	Desiccated ground in the Superficial Deposits	Potential for heave also high strength shouldn't be used in design as it will reduce when desiccation reduces/reaches equilibrium	Medium	A shallow foundation solution has not been proposed due to potential heave, and therefore a piled solution is recommended.
9	February 2016	This report constitutes a Ground Investigation Report (GIR) and not a Geotechnical Design report (GDR).	Outline recommendations presented in this report are used for construction and	High	Detailed design should be carried out at the appropriate time with the insitu and laboratory test information presented within this report used as the baseline. The preliminary geotechnical

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ITEM	DATE RAISED	DESIGN / CONSTRUCTION RISK	CONSEQUENCE	QUALITATIVE RISK LEVEL HIGH / MEDIUM / LOW	POSSIBLE MITIGATION(S)
			detailed design not carried out.		foundation recommendations presented within this report should not be solely relied upon and WSP shall not accept liability if designs are carried out on this report alone.

REFERENCES

1 BSI: BS EN 1997-1:2004 Eurocode 7: Geotechnical Design – Part 1: General Rules.

2 Highways Agency: Design Manual for Roads and Bridges, Volume 4, Part 2, HD 22/08, Managing Geotechnical Risk, 2008

3 British Geological Survey: Sheet 317/332, Chichester & Bognor Regis (Solid and Drift edition) 1:50,000 Series, 1996

4 British Geological Survey: Geology of Britain Viewer website, accessed 23/11/2015 http://mapapps.bgs.ac.uk/geologyofbritain/home.html

5 Environment Agency: What's In Your Backyard website accessed 23/11/2015 http://watermaps.environment-agency.gov.uk/

6 Part 2A, Environmental Protection Act 1990

7 Zetica UXO, Regional Unexploded Bomb Risk Map for West Sussex, 2015

8 BSI: BS EN ISO 22475-1:2006 Geotechnical investigation and testing. Sampling methods and groundwater measurements. Technical principles for execution

9 Building Research Establishment: Digest 365 Soakaway Design, 2003

10 WSP, Generic Quantitative Risk Assessment, 2016

11 Stroud, M.A.: The Standard Penetration Test, Its Application and Interpretation. Penetration Testing in the UK, pp. 29-46, 1989

12 CIRIA C574, Engineering in Chalk, London 2002

13 Building Research Establishment: BRE Special Digest 1, Concrete in Aggressive Ground 2005

14 Highways Agency: Interim Advice Note 73/06 Revision 1 Design Guidance for Road Pavement Foundations, 2009

15 WSP 'Phase 1 Land Contamination Assessment, University of Chichester, Bognor Regis Campus, Digital Technology Park', (Ref. 70014375-001, dated August 2015)

16 CIRIA C665, Assessing Risks posed by Hazardous Ground Gases to Buildings, London 2007

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Appendix A

REPORT LIMITATIONS

Appendix B

SITE PLANS & MAPS

Appendix C

EXPLORATORY HOLE LOGS & FACTUAL REPORT

Appendix D

GAS MONITORING RESULTS

Appendix E

LABORATORY RESULTS

Appendix F

GROUND MODEL

Appendix G

HUMAN HEALTH RISK ASSESSMENT

Appendix A

REPORT LIMITATIONS

General Limitations

Limitations for WSP Land Restoration and Ground Engineering Division

General

WSP has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP Standard Terms and Conditions, as included within our proposal to the Client.

Project specific appointment documents may be agreed on a project by project basis, at our discretion. A charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP reserve the right to amend the fee should any changes to the appointment terms create an increase risk to WSP.

The report needs to be considered in the light of the WSP proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report. The report is only valid for its originally intended purpose as set out in either our report or the proposal.

Phase 1 Geo Environmental Preliminary Risk Assessments

The works undertaken to prepare this report comprise a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. It is not standard, due to the timescales, to visit archives and local libraries as part of these works. WSP cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.

The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the Site.

WSP does not warrant work / data undertaken / provided by others.

This section covers reports with the following titles or combination of titles: Phase 1; Desk Top Study; Geo-Environmental Assessment; Development Appraisal; Preliminary Environmental Risk Assessment; Constraints Report; Due Diligence Report; Geotechnical Development Review; Environmental Statement; Environmental Chapter; Geotechnical Development Risk Register or Baseline Environmental Assessment. These limitations associated with preliminary works also apply when they are reported within an intrusive investigation report.

Intrusive Investigation Reports

The investigation has been undertaken to provide information concerning the type and degree of contamination present at the Site in order to allow a generic risk assessment to be undertaken or identification of the soil properties to allow for geotechnical development constraints to be identified.

The objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters. For geotechnical investigations the purpose is to broadly identify the development constraints associated with the physical property of the soils underlying the site.

The amount of exploratory work, soil property and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site

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usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report. For example these include spatial variations in soil properties; the varying thickness and physical nature of the strata identified and changes in groundwater levels or flow rates.

The inspection; testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. WSP has interpreted between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation.

On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 2 became the mandatory baseline standard for geotechnical ground investigations.

In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. A GDR can strictly only be prepared following confirmation of all structural loads and serviceability requirements. The design process requires close co-operation between the geotechnical engineer and the structural engineer and is iterative. Where a GDR is prepared using preliminary or assumed loadings and/or serviceability limits it should only be considered as an interim report and should not be relied upon for the procurement or construction of the works it describes. A GDR will be a standalone specifically entitled report.

During any build programme WSP should be consulted if alternative ground conditions are encountered. It assumes during any site works that the contractor will use their best endeavours to manage and control groundwater and other unforeseen ground conditions. WSP will not be liable for actions taken prior to consultation.

The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated with the WSP risk assessment process have been outlined within the body or associated appendix of the report.

Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must, be confirmed by a qualified quantity surveyor.

The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; geotechnical risk register.

Detailed Quantitative Risk Assessments and Remedial Strategy Reports

These reports either use primary data or build upon previous report versions and associated notes. The scope of the investigation; further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination

concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

The outputs of the Detailed Quantitative Risk Assessments are based upon WSP manipulation of standard risk assessment models. Models are simulations based on the available data set and should not be used as predictions.

Where a remediation strategy is proposed, this is based on our interpretation of the risk assessment criteria and is specific to a particular location and a particular intended land use and configuration / layout. Prior to adoption they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

Monitoring (including Remediation Monitoring reports)

These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.

The data is presented and will be compared with assessment criteria.

Asbestos in soils

Unless explicitly included for in our proposal, our investigation does not include for a formal asbestos assessment and the inspection for asbestos, either as asbestos containing materials (ACMs) lying on the surface or as ACMs and/or as loose asbestos fibres within made ground/stockpiles is excluded. Our report will include only the factual reporting of any laboratory asbestos soil screening results, if completed. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and/or trace loose asbestos fibres within the soil matrix at the site.

Where we indicate in our proposal that we will consider asbestos we will undertake screening of representative soil samples for the presences / absence of loose asbestos fibres. If these are found a further and more detailed specific investigation into asbestos in soils will need to be undertaken, which will include asbestos quantification testing. These investigations are associated with more rigorous monitoring of asbestos and health and safety provisions.

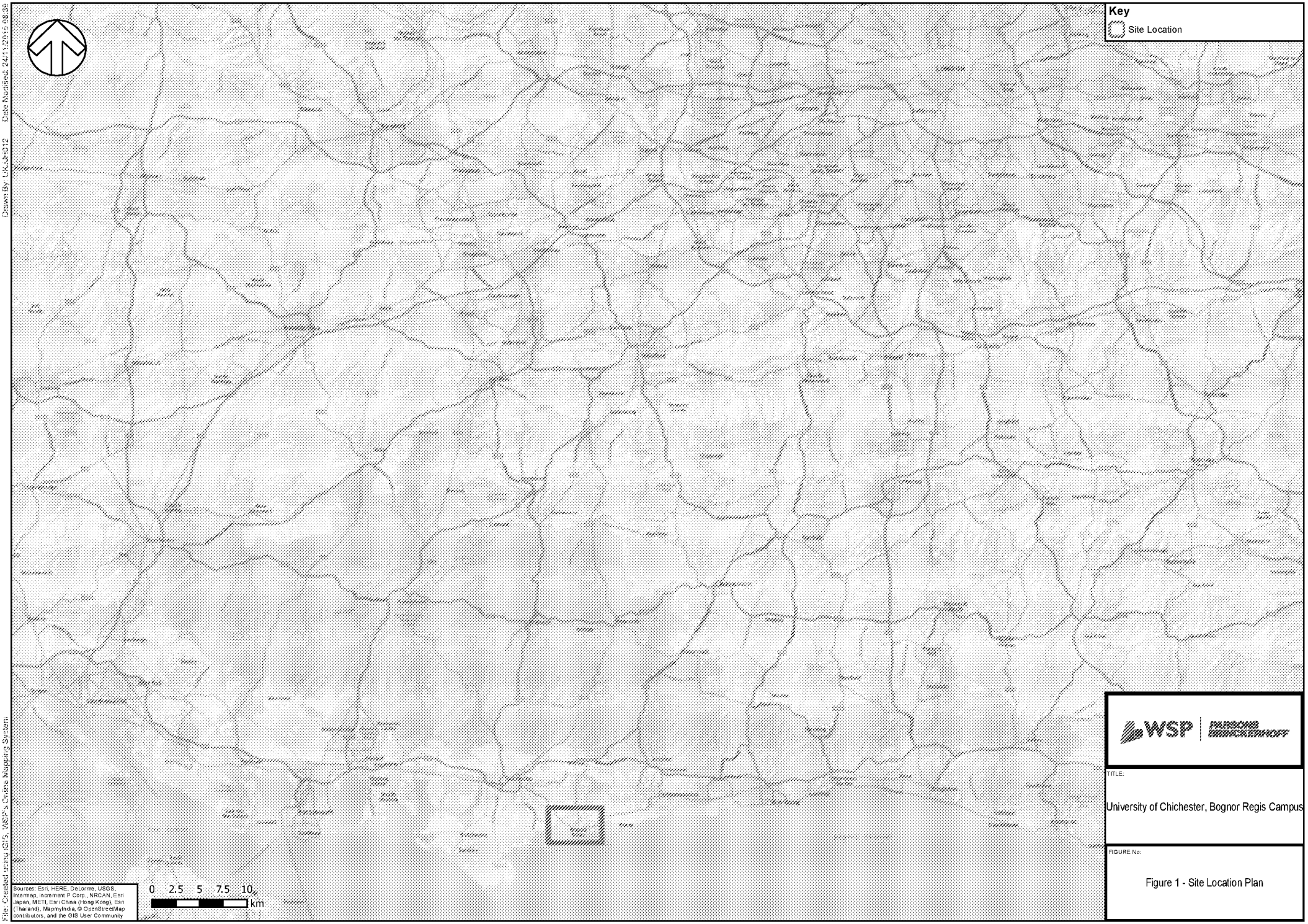
Appendix B

SITE PLANS & MAPS

ARUN DISTRICT COUNCIL BR/72/22/PL

Date Modified: 24/11/2015 08:36

Drawn By: UK-JH-012



WSP | Parsons Brinckerhoff

TITLE:

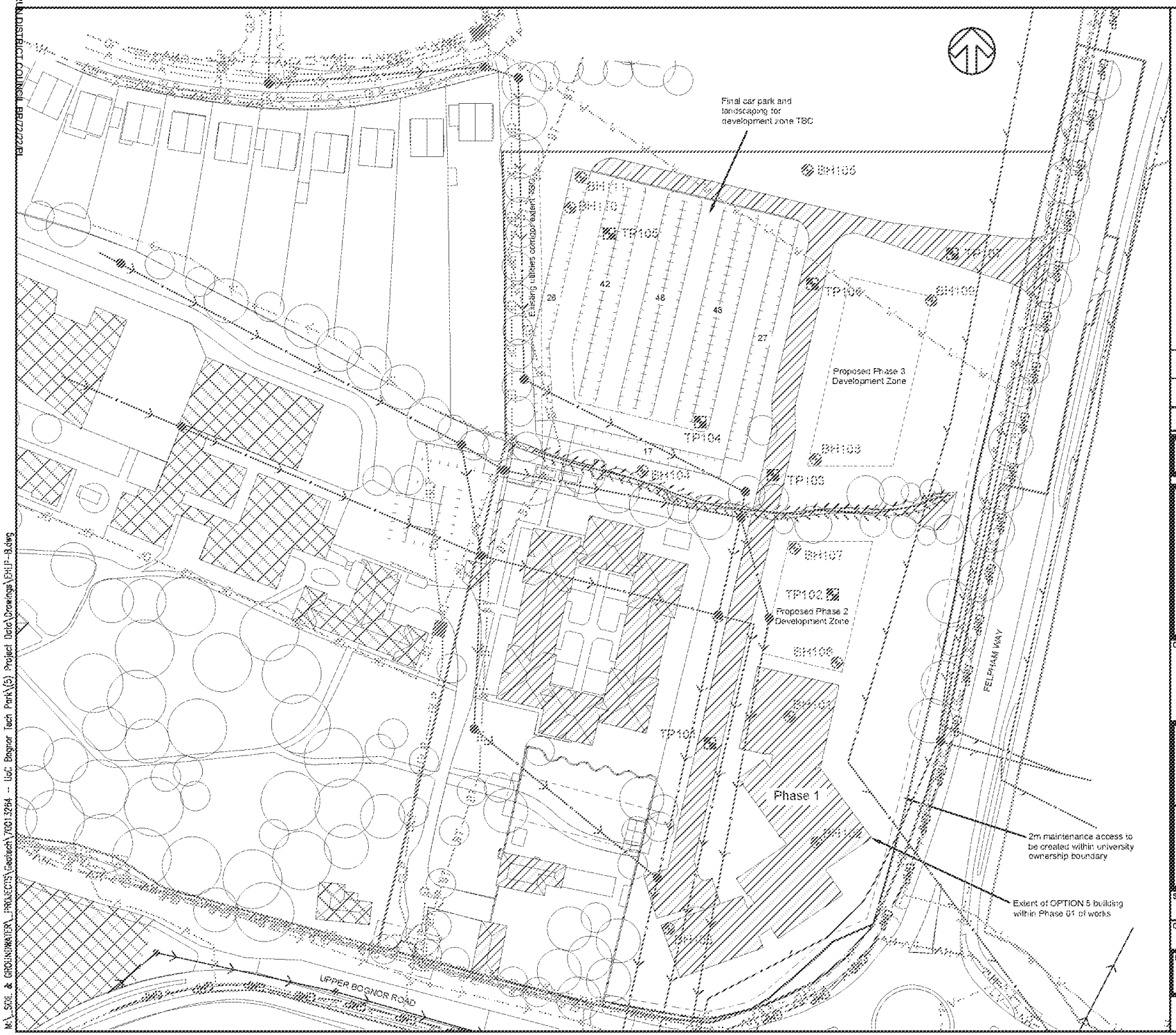
University of Chichester, Bognor Regis Campus

FIGURE No:

Figure 1 - Site Location Plan

File: Created using GIS, WSP's Online Mapping System

ARUN DISTRICT COUNCIL BR/72/22/PL



DO NOT SCALE

REV	DATE	BY	DESCRIPTION	CHK	APD
B	29.10.2015	PRE	UPDATED WITH NEW MASTERPLAN AND SERVICES INFORMATION	JH	PMC
A	24.07.2015	PRE	ISSUED WITH GROUND INVESTIGATION SPECIFICATION	JH	PMC

DRAWING STATUS: FOR INFORMATION ONLY

WSP | PARSONS BRINCKERHOFF
Mountbatten House, Basing View, Basingstoke, Hampshire RG21 4HJ
Tel: +44 (0)1256 318800 Fax: +44 (0)1256 318700
www.wspgroup.com - www.pbworld.com

CLIENT: University Chichester

PROJECT: UNIVERSITY OF CHICHESTER EDT PARK BOGNOR REGIS

TITLE: EXPLORATORY HOLE LOCATION PLAN

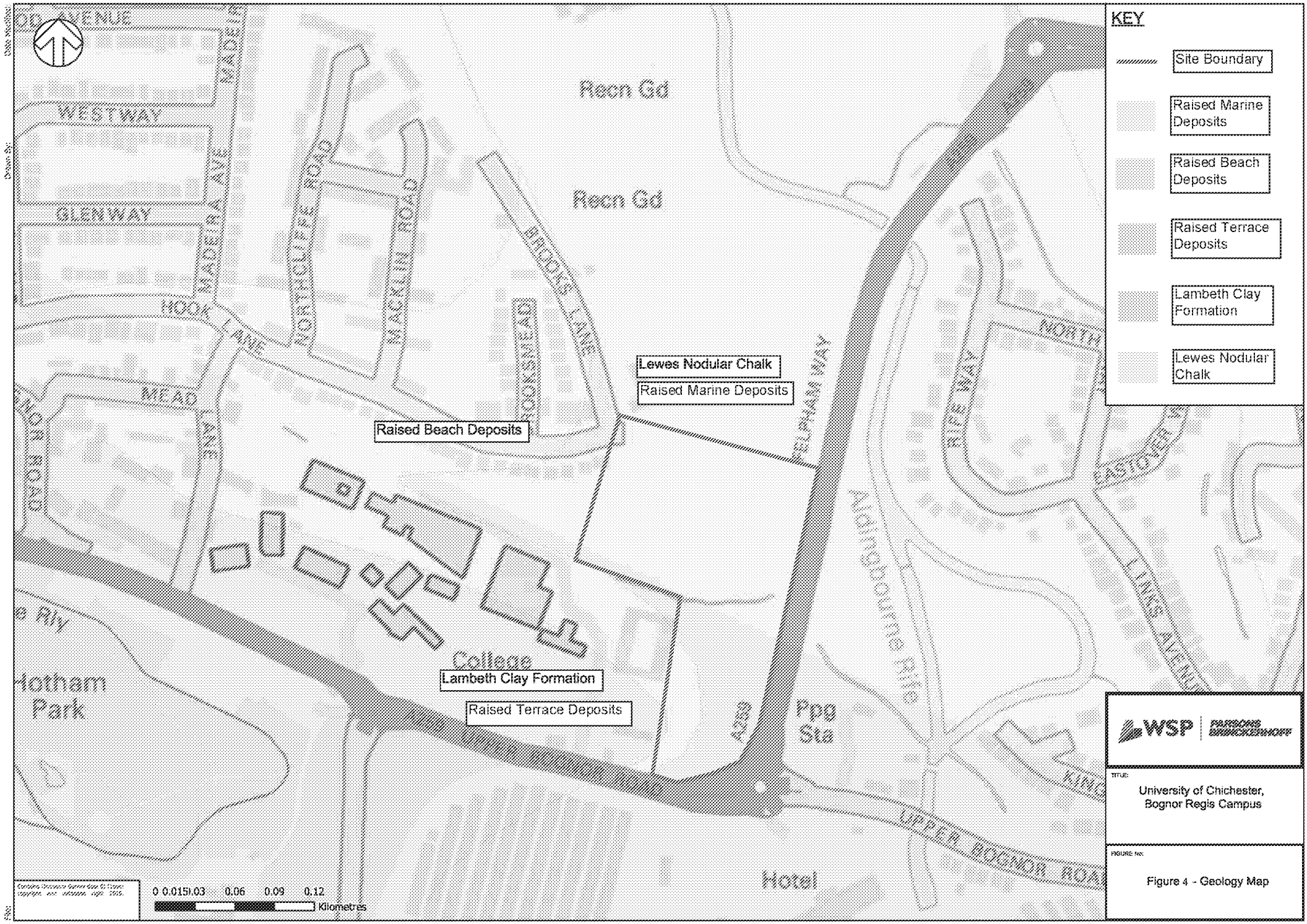
SCALE @ A3:	CHECKED:	APPROVED:
NTS	JH	PC
CAD FILE:	DESIGN DRAWN:	DATE:
EHLP-B.dwg	PRE	24 July 2015

PROJECT No:	DRAWING No:	REV:
70010938	FIGURE 3	B

© WSP Group Ltd

M:_SOIL & GROUNDWATER_PROJECTS\Geotech\70013264 - Uoc Bognor Tech Park\(5) Project Data\Drawings\EHLP-B.dwg
APUN DISTRICT COUNCIL BR/222/PL

ARUN DISTRICT COUNCIL BR/72/22/PL



ARUN DISTRICT COUNCIL BR/72/22/PL



Proposed Site Plan
1 : 500

A1 Original Sheet Size

University Ownership Boundary

Proposed Development Zone
3.25 hectares
8.03 acres

Proposed Phase 1 Development Zone
0.47 hectares
1.16 acres

Conservation Area

Stride Treglown

University of Chichester

Bognor Regis Campus - Engineering and Digital Technology Park

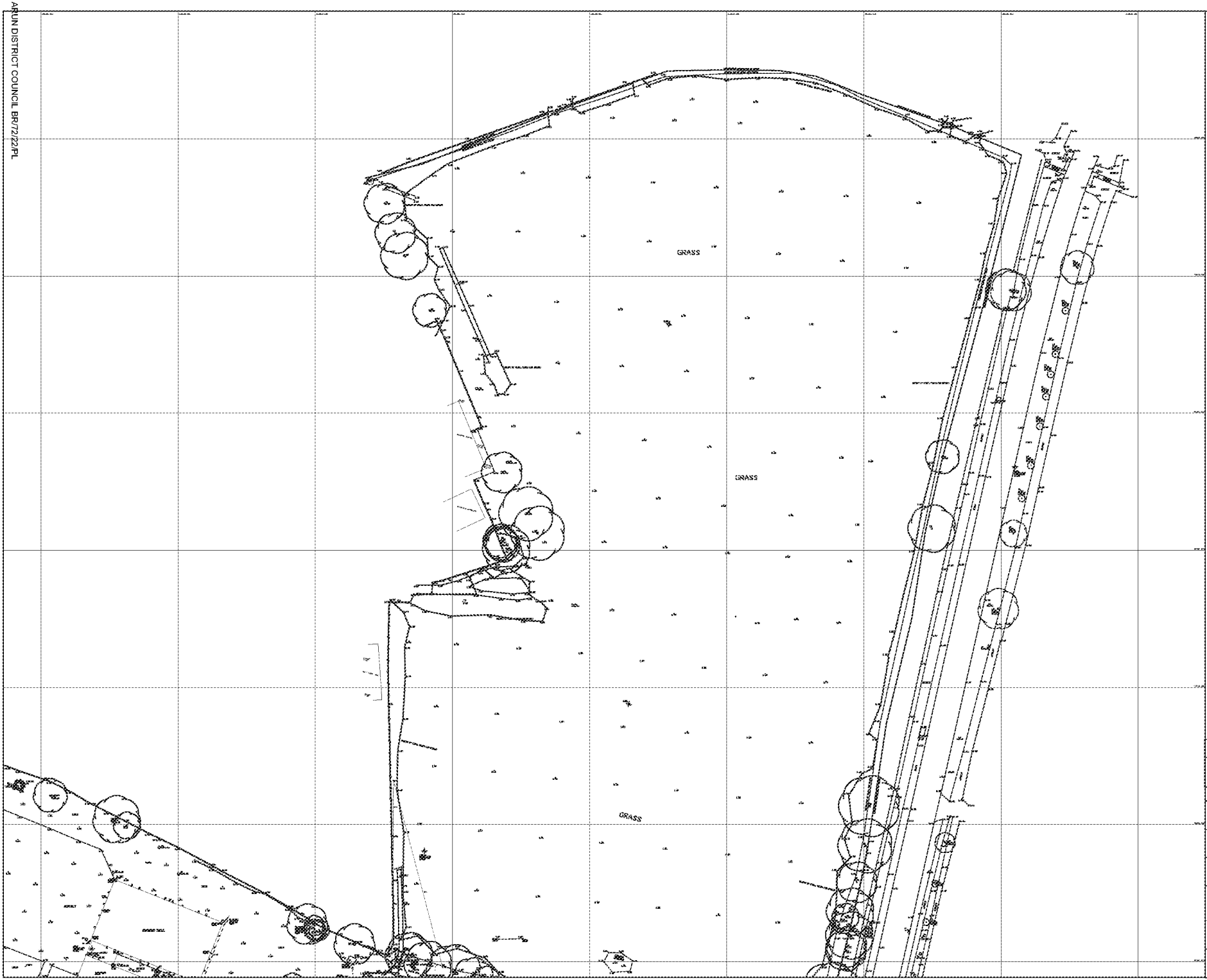
Proposed Site Plan

SK-ETCH

Scale	Date	Drawn	Checked
1 : 500	30/06/15	MM	RC

Project Number	Drawing Number	Revision
50136	SK_007	B

ARUN DISTRICT COUNCIL BR/72/22/PL



NOTES :

ALL LEVELS RELATIVE TO O.S. DATUM (NEWLYN) SPOT
SURVEY GRID (BOGNOR) TO OS (NATIONAL GRID)

WHILE ALL POSSIBLE EFFORT HAS BEEN MADE
TO IDENTIFY SERVICES, WE ARE UNABLE TO
ENTIRE CORRES SHOWN OR RECORDED AT THE
TIME OF SURVEY.

ALL LEVELS AND DIMENSIONS SHOULD BE CHECKED ON SITE
PRIOR TO THE COMMENCEMENT OF WORKS

TREES SHOWN (DIAMETER TO BRT OF SURVEYOR ABILITY, SEE
IDENTIFICATION IF SPECIES CRITICAL

KEY :

BB	- BELOW BENCH	OHW	- OVERHEAD WIRE
BOH	- LITTER BIN	OCH	- OVERHEAD
BL	- BOX LEVEL	POL	- POLLAR
BOLL	- BOLLARD	PL	- PAVEMENT LIGHT
BRK	- BRICK WALL	POT	- TELEPOST
BS	- BAR STOP	RSVE	- RODDING EYE
CWTV	- CABLE TELEVISION	RE	- ROAD SIGN
CL	- COVER LEVEL	RTW	- RETAINING WALL
CONC	- CONCRETE	RWP	- RAIN WATER PIPE
ELEC	- ELECTRIC	SAN	- SANITARY
EP	- ELECTRICITY POLE	SB	- STORM BOARD
FB	- FLOWER BED	SL	- SOIL LEVEL
FFL	- FINISHED FLOOR LEVEL	SV	- SPECIAL VARIOUS
FH	- FIRE HYDRANT	SVP	- SOIL VENT PIPE
FP	- FLAG POLE	TBM	- TEMPORARY BENCH MARK
GI	- GULLY	TCP	- TELEPHONE CALL POST
GL	- GROUND LEVEL	TF	- TOP OF FENCE
GV	- GAS VALVE	TH	- TOP OF HEDGE
HY	- HYDRANT	TL	- TARMAC LOGO
IC	- INSPECTION COVER	TP	- TELEGRAPH POLE
IL	- INVERT LEVEL	TT	- TOP OF TREE
LB	- LETTER BOX	TW	- TOP OF WALL
LP	- LAMP POST	UGP	- UNDERGROUND DUCTING
LT	- LIGHT	UTL	- CABLES TO LOFT
MH	- MANHOLE	WL	- WATER LEVEL
MKR	- MARKER	WV	- WATER VALVE

FENCE TYPES :

BWF	- BARBED WIRE	RR	- RAIL
CH	- CLOSE BOARD	PR	- POST & RAIL
CHL	- CHAIN LINK	PW	- POST & WIRE
CVR	- CHESTNUT PALING		

STN.01 — SURVEY STATION

ABSOLUTE BUILDING

SLOPE INDICATION

GATE

SIDE LEVELS

TREE SPREAD (WITH Diameter/cm SPREAD Radius)

FENCE
WALL
BANK/PATH
OVERHEAD
UNDERGROUND
BOX BOX
LOW WIRE
BOTTOM
KERB
TARMAC
DEEP KERB

DRAINAGE :

FOUL DRAINAGE

STORM DRAINAGE / WATER DRAINAGE

150Ø - 175mm DIAMETER PIPE

N

ISO 9001
REGISTERED FIRM

0m 1 2 3 4 5 6 7 8 9 10m
SCALE BAR

Shaw|Colegate
LAND & BUILDING SURVEYORS

Unit 9B, The Old Flour Mill, Queen Street, Emsworth, Hants. PO10 7BT
Tel : (01243) 371472 Email : mail@shawcolegate.com
Fax: (01243) 376940 Web : www.shawcolegate.com

Title : UNIVERSITY OF CHICHESTER - BOGNOR CAMPUS
TOPOGRAPHIC SURVEY - UPDATED

Job No. : 05515_TOPO_REV A
Original Scale : 1:200
Sheet Size : OVERSIZED

Surveyed By : Various Date : 2009 / 2010 / May 2015
Drawn By : Various Date : 2009 /2010 / May 2015

Client: University of Chichester
Bishop Otter Campus, College Lane, Chichester
West Sussex, PO19 6PE



ARUN DISTRICT COUNCIL 2012 22.PL

NOTES :

ALL LEVELS RELATIVE TO O.S. DATUM (NEWLYN) USING SURVEY CONTROL STATIONS 7010 AND 7011

WHILE ALL POSSIBLE EFFORT HAS BEEN MADE TO IDENTIFY SERVICES, WE ARE UNABLE TO ENTIRE, CERTAIN SERVICES ON SURFACED AT THE TIME OF SURVEY.

ALL LEVELS AND DIMENSIONS SHOULD BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS

THESE DRAWN INFORMATION TO EXT OF SURVEYORS ABILITY. SOME INFORMATION IS SPOTTED POSITION

KEY :

BB	- BELOW BENCH	OHW	- OVERHEAD WIRE
BIN	- LITTER BIN	OCH	- OVERHEAD
BL	- BOX LEVEL	PIL	- PILLAR
BOLL	- BOLLARD	PL	- PAVEMENT LIGHT
BRK	- BRICK WALL	PCT	- POSITION
BS	- BUS STOP	SLEVE	- SLEEVE
CCTV	- CCTV CAMERA	SE	- SOIL PIPE
CL	- COVER LEVEL	SRW	- RETAINING WALL
CONC	- CONCRETE	SWP	- SURF WATER PIPE
ELEC	- ELECTRIC	SW	- SWALE
EP	- ELECTRICITY POLE	SG	- STONE GRASS
FB	- FLOWER BED	TL	- TOP LEVEL
FFL	- FINISHED FLOOR LEVEL	TG	- TRAFFIC GANTRY
FH	- FIRE HYDRANT	TVP	- SOIL VENT PIPE
FP	- FLAG POLE	TBM	- TEMPORARY BENCH MARK
GR	- GRILLE	TCP	- TELEPHONE CALL BOX
GL	- GROUND LEVEL	TF	- TOP OF FENCE
GV	- GAS VALVE	TH	- TOP OF HEDGE
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IC	- INSPECTION COVER	TP	- TELEGRAPH POLE
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LP	- LAMP POST	UGP	- UNDERGROUND PIPELINE
LT	- LIGHT	UTL	- CABLES TO LEFT
MH	- MANHOLE	WL	- WATER LEVEL
MBM	- MARKER	WV	- WATER VALVE

FENCE TYPES :

BWV	- BARBED WIRE	SR	- IRON RAILING
CVN	- CLOSE BOARD	PVR	- POST & RAIL
CHL	- CHAIN LINK	PVW	- POST & WIRE
CVR	- CHESTNUT PALING		

SURVEY STATION
ABSOLUTE BUILDING
SLOPE INDICATION
SPOT LEVELS
TREE SPREAD (WITH Abbreviation) SPECIES Indicated

FENCE
WALL
BANK/PATH
OVERHEAD
MANHOLE/SP
BUS RAIL
LIGHTING
BOTTOM
KERB
TRACK/
DEEP KERB

DRAINAGE :

FOUL DRAINAGE
STORM WATER DRAINAGE
150 - 175mm DIAMETER PIPE

N

ISO 9001 REGISTERED FIRM

SCALE BAR

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Surveyed By : Various Date : 2009 / 2010 / May 2015
Drawn By : Various Date : 2009 /2010 / May 2015

Client : University of Chichester
Bishop Otter Campus, College Lane, Chichester
West Sussex, PO19 6PE

Appendix C

EXPLORATORY HOLE LOGS & FACTUAL REPORT

CC Ground Investigations Ltd

DRAFT

FACTUAL REPORT

SITE:	University of Chichester – Bognor Regis Campus
CLIENT:	University of Chichester
ORDER No:	**3010066 dated 06/10/2015**
DATE:	21 January 2016
REPORT No:	C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

CONTENTS

REPORT

1.		INTRODUCTION	1
2.		SITE DESCRIPTION AND GEOLOGY	3
	2.1	Site Description	3
	2.2	Geology	3
3.		GROUND INVESTIGATION	4
	3.1	Fieldwork	4
	3.2	In Situ Testing	6
	3.3	Logging	7
	3.4	Laboratory Testing	8
4.		REFERENCES	10

APPENDICES

Appendix A – Site Plan

Appendix B – Exploratory Hole Data

Appendix C – Laboratory Test Results

Appendix D – SPT Calibration Data

ARUN DISTRICT COUNCIL BR/72/22/PL

1. INTRODUCTION

This investigation was carried out by CC Ground Investigations Ltd (CCGI) on the instruction and on behalf of The University of Chichester (The Client) under the technical direction of WSP | Parsons Brinckerhoff (the Engineer)

The purpose of the ground investigation was to determine geotechnical properties, ground contamination status and groundwater regime to facilitate the design of access roads, car parks and multi-storey buildings associated with the proposed Engineering and Digital Technology Park at the University of Chichester Bognor Regis Campus

The scope of the ground investigation was defined in the Engineer's specification, reference: Report No 70013264-P01.

This report describes the work carried out by CC Ground Investigations Ltd and presents the findings.

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. There may however be conditions at or adjacent to the site which have not been taken into account, such as unpredictable soil strata and water conditions between or below exploratory holes. A careful watch should be maintained during any future groundworks and the comments of this report reviewed as necessary.

ARUN DISTRICT COUNCIL BR/72/22/PL

This report has been prepared for The University of Chichester and WSP | Parsons Brinckerhoff. This report shall not be relied upon or transferred to other parties without the written consent of CC Ground Investigations Ltd. Should any information contained within this report be used by any unauthorised third party it is done so at their own risk and shall not be the responsibility of CC Ground Investigations Ltd.

ARUN DISTRICT COUNCIL BR/72/22/PL

2. SITE DESCRIPTION AND GEOLOGY

2.1 Site Description

The site is located in an area of dense scrubland and a flood plain to the north of Upper Bognor Road and west of Felpham Way at National Grid Reference 494414 099634. The proposed Engineering and Digital Technology Park will be located east of the current University Campus.

2.2 Geology

Geological Records (British Geological Survey (BGS), England and Wales sheet 332 1:50,000 scale) indicate the site is underlain by superficial geology comprising of raised marine and raised beach deposits (silt, sand and gravel). Underlying solid geology comprising the Lambeth Group and White Chalk Subgroup is recorded.

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3. GROUND INVESTIGATION

3.1 Fieldwork

Eighteen exploratory holes were carried out between 2nd and 20th November 2015. All exploratory hole locations are shown on the site plan (Appendix A). The exploratory hole locations were set out by CCGI as directed by the Client on site.

The fieldwork was carried out in general accordance with BS5930, Amendment 2 (2010).

Eleven boreholes, referenced BH101 to BH111 (Exploratory Hole Data – Appendix B) were formed using a track mounted Comacchio MC300 or Fraste PL(G) multi-purpose rig. Following CAT scanning hand tools were used to excavate an inspection pit to a depth of 1.20m to check for buried services. Bulk and environmental soil samples were taken and retained from the inspection pits. The boreholes were then advanced using percussive sampling techniques to produce continuous disturbed samples of 112mm diameter.

On refusal of percussive sampling the boreholes were continued by rotary core drilling techniques utilising a water flush. A double-tube swivel core barrel with a semi-rigid plastic liner was utilised to recover continuous cores of 123mm diameter.

Soil and rock samples were retained in semi-rigid plastic liners, which were capped on site to prevent moisture loss.

ARUN DISTRICT COUNCIL BR/72/22/PL

Undisturbed samples of 100mm nominal diameter were taken in suitable cohesive material using an open drive sampler (U(T)100). The samples were wax sealed on site to prevent moisture loss.

Boreholes were monitored for groundwater ingress as they were advanced. Upon encountering water, sampling was temporarily stopped to allow the level to stabilise. Water levels were also recorded at the start and finish of each shift and on completion of the borehole. Water levels are presented on the relevant log.

On completion combined gas and water monitoring standpipes were installed in all boreholes. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of limestone free gravel. The installation was sealed above (and below in the case of BH101, BH106, BH107, BH109 and BH110) with a bentonite pellet seal and accessed via a valve assembly. The installations were protected at the surface by a lockable, galvanised steel borehole helmet. Installation details are given on the relevant borehole log.

Following CAT scanning, seven trial pits, referenced TP101 to TP107, (Exploratory Hole Data – Appendix B) were excavated using a JCB 3CX mechanical excavator with a 0.45m wide backactor bucket.

Representative disturbed samples were taken and retained in sealed plastic bags and airtight containers to retain moisture content.

On completion all trial pits were backfilled with arisings. The ground surface was left slightly mounded to accommodate future settlement.

ARUN DISTRICT COUNCIL BR/72/22/PL

Subsequent to fieldwork, all exploratory hole positions were surveyed and National Grid co-ordinates and levels are presented on the relevant log.

On completion of fieldwork all samples were brought to CCGI's office for storage.

3.2 In Situ Testing

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained as small disturbed samples. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. SPT results are summarised as uncorrected N values on the borehole logs. SPT hammer calibration data is presented in Appendix D.

Insitu hand shear vane tests were carried out in accordance with BS1377: Part 9:1990:4.4. Different vane sizes were used depending on the consistency of the soil encountered. The results are presented in on the exploratory hole logs (Appendix B).

Two infiltration tests were carried out in trial pits in accordance with BRE 365. The results and calculated infiltration rate are included in Appendix B following the relevant exploratory hole log.

ARUN DISTRICT COUNCIL BR/72/22/PL

Six TRL DCP tests, referenced DCP-101, DCP-102, DCP-104 to DCP-107, (Exploratory Hole Data – Appendix B), were carried out by driving a 60°; 20mm diameter steel cone into the ground using an 8kg weight dropped 575mm. The rate of penetration of the cone is recorded used to estimate the material CBR value through published empirical relationships.

The number of blows and depth of penetration are recorded throughout the test and are presented graphically. CBR values can be calculated for predetermined increments of penetration (usually 10mm) using the following equation: $\log_{10}(CBR) = 2.48 - 1.057 * \log_{10}(mm/blow)$.

3.3 Logging

Soil and rock samples from the exploratory holes were logged by an Engineering Geologist in general accordance with BS5930, Amendment 2 (2010) and Ciria 574 (2002) Bulk, small disturbed, core and environmental soil samples were taken retained at a range of depths. Environmental soil samples were stored on site in temperature controlled conditions. Soil and rock descriptions are presented in the borehole logs together with details of sampling, in situ testing and relevant comments on drilling techniques.

ARUN DISTRICT COUNCIL BR/72/22/PL

3.4 Laboratory Testing

The following laboratory tests were carried out by Professional Soils Laboratory (UKAS No. 4043) in accordance with BS1377:1990, Parts 1 to 8, unless otherwise stated. The results are presented in Appendix C.

Test Type	No. of Tests	Remarks
Natural Moisture Content	157	The results are shown on the summary of soil classification and chalk tests.
Liquid and Plastic Limits	66	The results are shown on the plasticity chart and summary of soil classification tests.
Particle Size Distribution (wet sieving method)	26	The fine fractions of 3 of these tests were further analysed using the pipette method.
Optimum Moisture Content (compaction test)	9	2.5kg test
Bulk Density	4	Determined using the linear measurement method.
California Bearing Ratio	3	Carried out on remoulded bulk samples
Chalk Crushing value	17	
Intact Dry Density	65	
Saturated Moisture Content	65	
Quick Undrained Triaxial Test	3	Multi stage tests
Uniaxial Compressive Strength	19	ISRM Part 2
Point Load Strength	64	ISRM RTH 325-89 SR12
BRE SD1 chemical testing suite for soil	21	Testing carried out by Chemical Testing Laboratories in accordance with BRE Special Digest 1.

ARUN DISTRICT COUNCIL BR/72/22/PL

A range of chemical tests were carried out on soil and water samples by i2 Analytical (UKAS No. 4041). Testing was carried out in accordance with ISO 17025. The results are tabulated and presented in Appendix C.

CC GROUND INVESTIGATIONS LIMITED

Christopher Scrivens BSc (Hons) FGS Rob Clarke. BSc (Hons) MSc (Eng) FGS
Senior Engineering Geologist **Director**

ARUN DISTRICT COUNCIL BR/72/22/PL

4. REFERENCES

British Geological Society, Solid and Drift Sheet 332, Bognor Regis, 1:50,000 scale

BRE Special Digest 1:2003: Concrete in aggressive ground. Part 1.

BRE Digest 365 (2007), Soakaway Design.

BS 5930+A2:1999 (2010), Code of Practice for Site Investigations

BS 1377: Parts 1 to 9 (1990), Methods of Tests of Soils for Civil Engineering Purposes

BS EN ISO 14688: Part 1: (2002), Identification and description of soil.

BS EN ISO 14688: Part 2: (2004), Principles for a classification of soil.

BS EN ISO 14689: Part 1: (2003), Identification and description.

BS EN ISO 22475: Part 1: (2006), Technical principles for execution.

BS EN ISO 22476: Part 3: (2005), Standard penetration test.

CIRIA 574 (2002): Engineering in Chalk

ISRM (International Society for Rock Mechanics), Part 2, Suggested Methods Uniaxial Compressive Strength of Rock Material.

ISRM RTH 325-89 SR12, Suggested Method for Determining Point Load Strength.

ARUN DISTRICT COUNCIL BR/72/22/PL

APPENDIX A

Appendix A – Site Plan

APPENDIX B

Appendix B – Exploratory Hole Data

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

KEY TO EXPLORATORY HOLE LOGS

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:1999 (Amendment No.2, 2010).

Sample no/type

C	Core run / sample
X	Dynamic sample
D	Small disturbed sample
B	Large disturbed sample
U	Undisturbed sample
UT	Thin walled undisturbed sample
W	Water sample
ES	Environmental
SPT	Standard Penetration Test carried out
CPT	Solid Cone Penetration Test carried out

Water levels

Initial Water Strike

Level after monitoring

3.00m Standing Level

Insitu Tests

S 30	Split spoon sampler (SPT) followed by N Value (EN ISO 22476-3:2005)
C 30	Solid cone (CPT) followed by N Value (EN ISO 22476-3:2005)
*240	Where full test drive not completed, linearly extrapolated N value reported.
**	No effective penetration
H 30	Hand Vane – direct reading in kPa. Re* denotes refusal (i.e. >140 kPa)

Sample range

Undisturbed sample

Core run

U(T)100 Undisturbed sample

Rotary core sub-sample

Installation Details

Porous Tip

Screened Standpipe

Bentonite seal

Plain standpipe

Granular response zone

Concrete

Grout

Arisings backfill

Soils	Rocks		
	Sedimentary	Metamorphic	Igneous
Made ground	Chalk	Coarse-grained	Coarse-grained
Boulders and cobbles	Limestone	Medium-grained	Medium-grained
Gravel	Conglomerate	Fine-grained	Fine-grained
Sand	Breccia		
Silt	Sandstone		
Clay	Siltstone		
Peat	Mudstone		
NOTE: Composite soil types will be signified by combined symbols, e.g.,	Shale		
Silty sand	Coal		
	Pyroclastic (volcanic ash)		
	Gypsum, Rocksalt etc.		

Arenaceous

Rudaceous

Argillaceous

CC GROUND INVESTIGATIONS LTD

ROTARY BOREHOLE LOG

[redacted]

Borehole No. **BH101**

Sheet 1 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		ES	0.10					TOPSOIL: Very soft brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is sub-angular fine and medium flint. (Topsoil)	(0.30)		
		B	0.20						0.30	2.14	
		B	0.50					Soft orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and sub-angular fine to coarse flint. (Superficial Deposits)			
		ES	0.60								
1		B	1.00						(1.30)		1
		SPT	1.20 - 1.65	S 1							
								Firm grey mottled orangish brown, yellowish brown and reddish brown slightly sandy silty CLAY. (Superficial Deposits)	1.60	0.84	
2		D	2.40								2
		ES	2.50	S 5							
		SPT	2.50 - 2.95								
3											3
4		D	3.90						(4.65)		4
		ES	4.00	S 12							
		SPT	4.00 - 4.45								
5								4.90-6.25m: Becoming stiff.			5
		D	5.20								
		SPT	5.30 - 5.75	S 20							
6								5.80-6.25m: Becoming yellowish brown mottled grey and orangish brown.			6

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REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-6.50m. Waterflush rotary core drilled (146mm diam) 6.50-35.00m.
CASING: SW to 8.80m.
GROUNDWATER: None encountered prior to using water flush to advance casing to 5.30m.
INSTALLATION: Bentonite pellet seal: 7.00-35.00m, 50mm ID HDPE slotted pipe with washed gravel response zone: 2.00-7.00m, plain pipe with washed gravel response zone: 1.90-2.00m; and with bentonite pellet seal: 0.20-1.90m, raised borehole helmet set in concrete 0.00-0.20m. Gas valve fitted.
REMARKS: Dynamic sampled (128mm) to recover dropped core: 8.80-10.00m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Borehole No. **BH101**

Sheet 2 of 6

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Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
									6.25	-3.81	
		D	6.40					Stiff grey locally silty CLAY. (Superficial Deposits) 6.35-6.60m: Frequent light yellowish brown silty sand lenses (<50mm).	(0.35)		
		C	6.50 - 7.30	S 22		100%			6.60	-4.16	
		SPT	6.50 - 6.95			0% 0%		Medium dense yellowish brown silty SAND. (Superficial Deposits)	(0.30)		
									6.90	-4.46	
7								Soft grey mottled yellowish brown and orangish brown slightly sandy gravelly CLAY with low cobble content. Gravel is angular to sub-rounded fine to coarse flint. Cobbles are sub-angular to sub-rounded flint. (Superficial Deposits)	(0.50)		7
		D	7.20						7.40	-4.96	
		C	7.30 - 8.80	S 46		99%					
		SPT	7.30 - 7.75			9% 9%		Structureless white stained orangish brown and yellowish brown CHALK composed of slightly sandy silty GRAVEL. Gravel is sub-angular to sub-rounded fine to coarse low density chalk. (White Chalk Subgroup Grade Dc)	(0.60)		
									8.00	-5.56	
8								Very weak and weak medium density white mottled orangish brown CHALK locally structureless. Discontinuities are randomly orientated very closely and closely spaced infilled with comminuted chalk (<12mm) stained orangish brown and grey. (White Chalk Subgroup Grade C4-Dc)			8
		D	8.30								
		C	8.80 - 9.50			79%		8.80-10.00m: Drilling disturbed. Limited recovery. Recovered as slightly sandy silty gravel. 8.80-8.85m: Band of angular to sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			
9						0% 0%			(2.45)		9
		D	9.30								
		C	9.50 - 10.00			70%					
						0% 0%					
10											10
		C	10.00 - 11.50	S 32		100%		10.00-10.45m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
		SPT	10.00 - 10.45			41% 35%			10.45	-8.01	
								Very weak and weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B3)			
11								10.90-11.20m: Drilling disturbed. Recovered as slightly sandy silty gravel. 11.00-11.05m: Band of angular to sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			11
		D	11.40								
		C	11.50 - 13.00			93%		11.50-11.75m: Discontinuities are sub-horizontal to horizontal extremely closely to very closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5] 11.75-13.00m: Discontinuities are sub-horizontal to horizontal closely to medium spaced infilled with comminuted chalk (<1mm). [Grade B2-B3] 12.10-12.20m: Band of angular to sub-angular fine to coarse rinded flint gravel and sub-angular cobble. 12.20-12.40m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
						61% 39%			(3.75)		
12											12
		D	12.60								
		CS	12.70 - 13.00								
13											13
		C	13.00 - 14.50	S 33		89%		13.00-14.20m: Discontinuities are randomly orientated extremely closely and very closely spaced infilled with			
		SPT	13.00 - 13.45			13% 13%					

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
17/11/2015	7.30	5.30	1.10
18/11/2015	7.30	5.30	1.25

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ROTARY BOREHOLE LOG

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Borehole No. **BH101**

Sheet 3 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								comminuted chalk (<3mm). Very weak and weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B3) *(continued from previous sheet)*			
14								13.43-13.45m: Band of angular to sub-angular fine to coarse rinded flint gravel. 13.70-14.10m: Discontinuity is sub-vertical infilled with comminuted chalk (<1mm) stained orangish brown and grey. 14.10-14.15m: Band of angular to sub-angular fine to coarse rinded flint gravel.	14.20	-11.76	
		D	14.30								
		C	14.50 - 16.00			100% 75% 55%					
		D	14.70								
15								Very weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely to medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B3) 14.83-14.87m: Band of angular to sub-angular fine to coarse rinded flint gravel. 15.30-15.35m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
16		C SPT	16.00 - 17.50 16.00 - 16.40	S*65		80% 52% 38%		16.00-16.05m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
17		D	17.00					17.00-17.10m: Flint cobble (cored). 17.10-17.50m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
		C	17.50 - 19.00			73% 35% 33%		17.60-17.62m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
18								18.20-18.35m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
		D	18.50					18.45-19.00m: Discontinuities stained orangish brown.			
19		C SPT	19.00 - 20.30 19.00 - 19.40	S*70		108% 55% 28%		19.00-19.60m: Drilling disturbed. Recovered as slightly sandy silty gravel.	(9.45)		
								19.65-19.70m: Discontinuity is 45° infilled with grey silty clay (<5mm) (possible marl). 19.70-20.30m: Mottled grey and orangish brown.			
20		D C	20.20 20.30 - 21.80			100% 88%		20.24-20.25m: 10mm horizontal band of grey Marl. 20.25-20.30m: Indistinctly thinly laminated.			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2015	20.30	8.80	1.50
19/11/2015	20.30	8.80	1.55

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ROTARY BOREHOLE LOG

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Borehole No. **BH101**

Sheet 4 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
						79%		Very weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely to medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B3) *(continued from previous sheet)*			
21		CS	21.15 - 21.40		C			20.90-20.97m: Discontinuities are very closely spaced.			21
		D	21.70					21.60-21.64m: Discontinuities are extremely closely spaced.			
		C	21.80 - 23.30	S*130		97%					
22		SPT	21.80 - 22.25		C	83% 78%					22
23		D	23.20					23.00-23.20m: Indistinctly thickly laminated, mottled grey.			23
		C	23.30 - 24.80			94% 83% 39%					
								Weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal very closely to medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B2-B4)	23.65	-21.21	
24					C			23.66-23.68m: 20mm band of grey Marl. 24.15-24.65m: Discontinuities are vertical to sub-vertical extremely closely to very closely spaced infilled with comminuted chalk (<1mm).			24
		D	24.70								
		C	24.80 - 26.30	S*115		40%		24.80-26.30m: Drilling disturbed. Recovered as slightly sandy silty gravel locally mottled orangish brown. 24.80-24.82m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
25		SPT	24.80 - 25.00			0% 0%		25.30-25.32m: Band of angular to sub-angular fine to coarse rinded flint gravel.	(3.20)		25
					C						
26		C	26.30 - 28.00			88% 65% 58%		26.30-26.40m: Band of angular to sub-angular fine to coarse rinded flint gravel.			26
								26.85-26.87m: Band of angular to sub-angular fine to coarse rinded flint gravel.	26.85	-24.41	
27					C			Very weak to weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B3)			27
		D	27.30								
		D	27.50								

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

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Borehole No. **BH101**

Sheet 5 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28		CS	27.80 - 28.00					Very weak to weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B3) *(continued from previous sheet)*			28
		C	28.00 - 29.50	S*54		97%					
		SPT	28.00 - 28.43			51%					
						39%					
		D	28.50					26.00-28.40m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
								28.55-28.75m: Drilling disturbed. Recovered as slightly sandy silty gravel mottled orangish brown.	(3.75)		
								28.65-28.75m: Band of angular to sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			
29											29
								29.25-29.30m: Flint cobble (cored).			
								29.35-29.65m: Mottled orangish brown.			
		C	29.50 - 30.60			100%		29.50-30.60m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
						15%					
						0%		29.55-29.65m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
30											30
		D	30.10					30.00-30.30m: Mottled grey.			
		C	30.60 - 32.10	S*65		97%		Very weak to weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal closely to medium spaced. No infill. (White Chalk Subgroup Grade A2-A3)	30.60	-28.16	
		SPT	30.60 - 31.00			55%					
						44%					
31		CS	31.00 - 31.30								31
								31.60-31.70m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
		D	31.70					31.60-31.65m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
32									(2.80)		32
		C	32.10 - 33.60	S*63		100%					
		SPT	32.10 - 32.50			84%					
						79%					
		CS	32.80 - 33.10					32.73-32.77m: Discontinuity is sub-horizontal stained grey. No infill.			
33								32.77-33.15m: Mottled grey.			33
								33.13-33.35m: Drilling disturbed. Recovered as slightly sandy silty gravel.			
								33.15-33.25m: Band of angular to sub-angular fine to coarse rinded flint gravel.	33.40	-30.96	
								33.30-33.35m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
		C	33.60 - 35.00			100%					
						71%					
						49%		Very weak to weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal very closely to closely spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A3-B4)			
34											34
		D	34.40						(2.00)		
								34.50-34.55m: Band of angular to sub-angular fine to coarse rinded flint gravel.			
35		SPT	35.00 - 35.40	S*63							35

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2015	30.60	8.80	1.60
20/11/2015	30.60	8.80	1.65

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ROTARY BOREHOLE LOG

Borehole No. **BH101**

Sheet 6 of 6

[redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494426 N 99580	Hole Type DS+RC
Location: Bognor Regis		Level: 2.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 17/11/2015 End: 20/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Borehole completed at 35.40m	35.40	-32.96	

36 37 38 39 40 41 42

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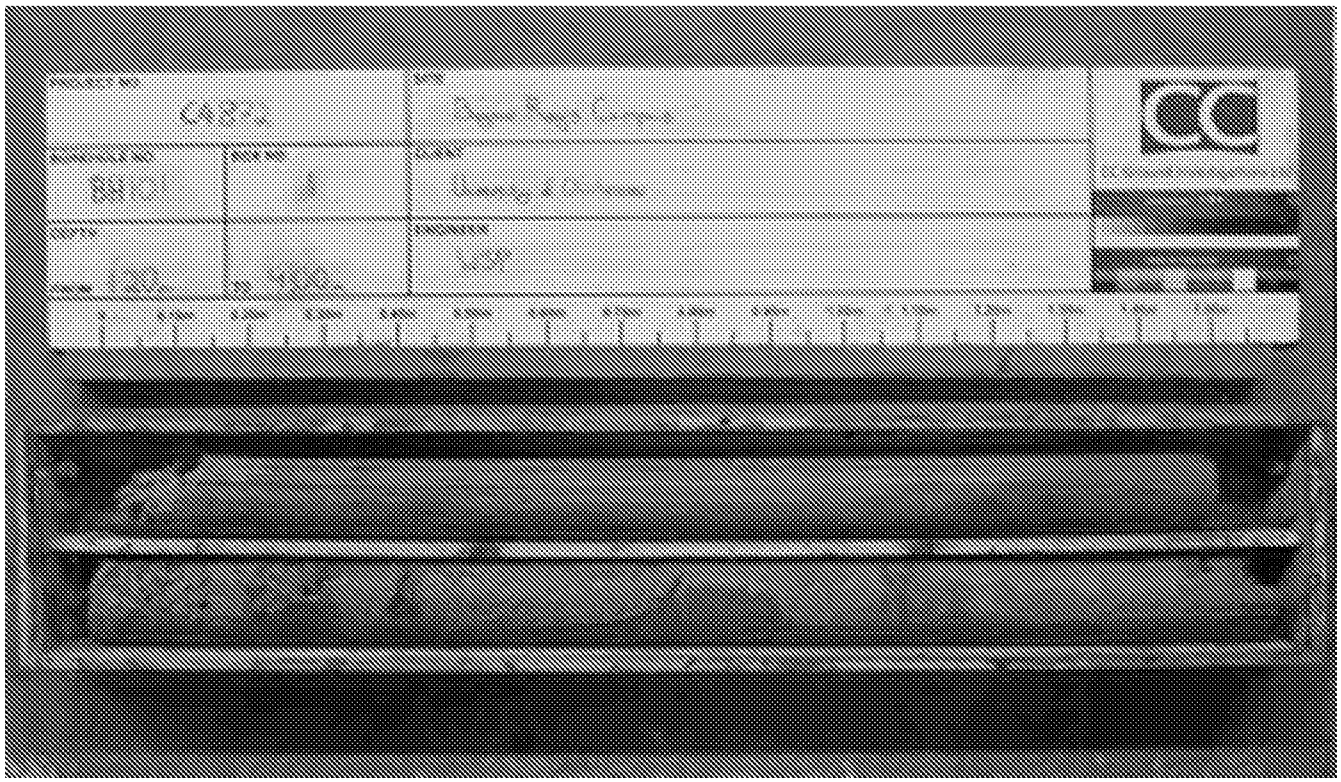
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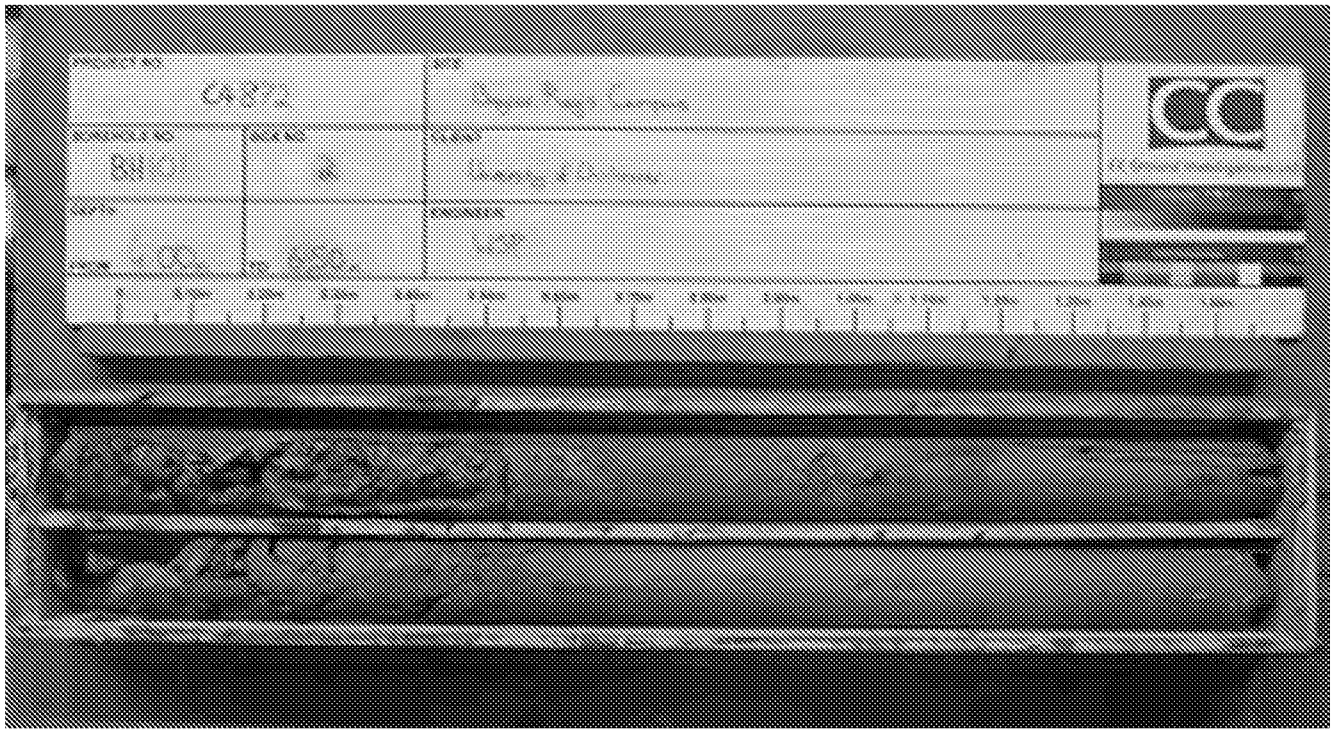
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
20/11/2015	35.40	8.80	1.55

Borehole Photograph



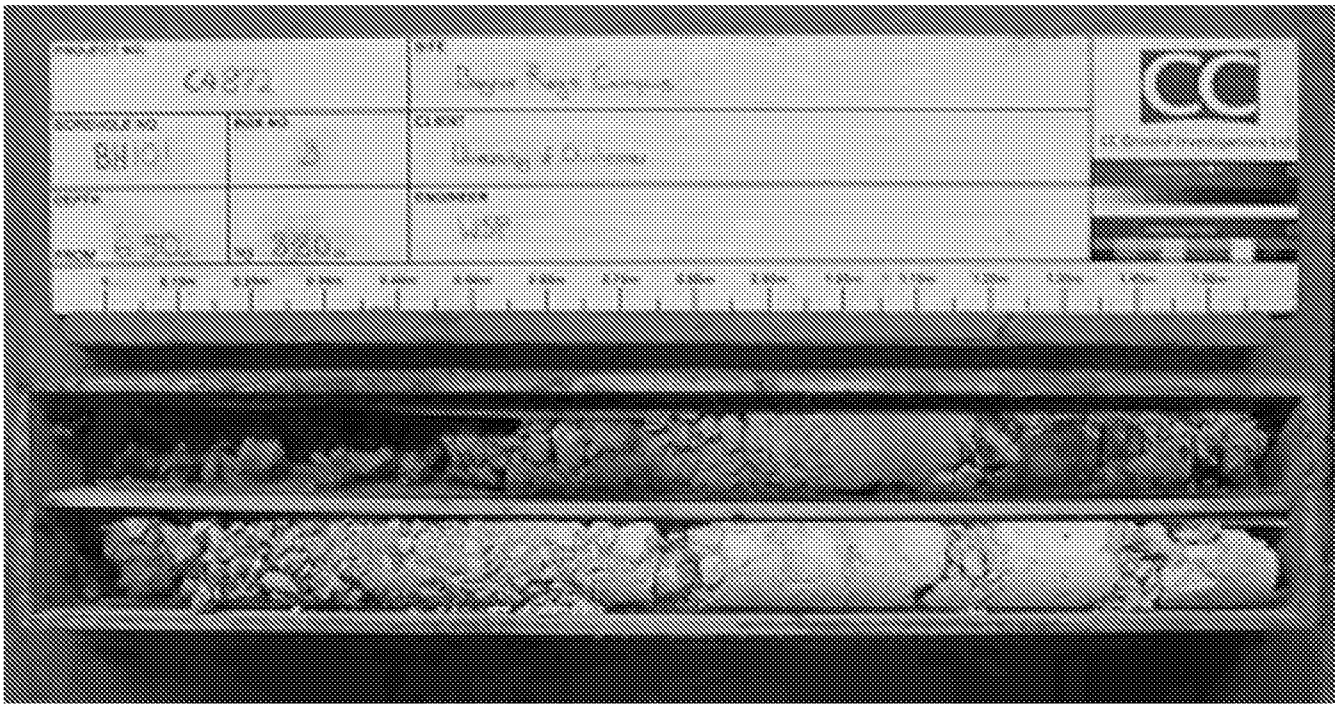


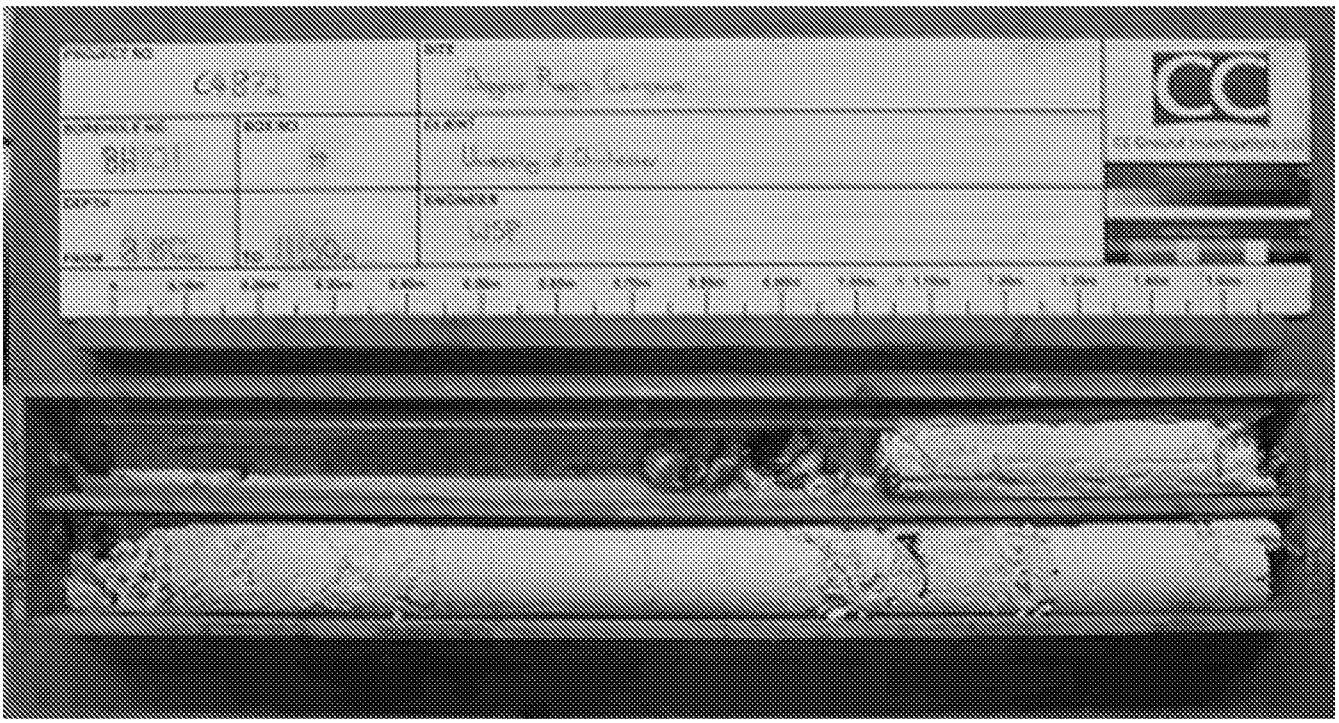
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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH101

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Borehole Photograph



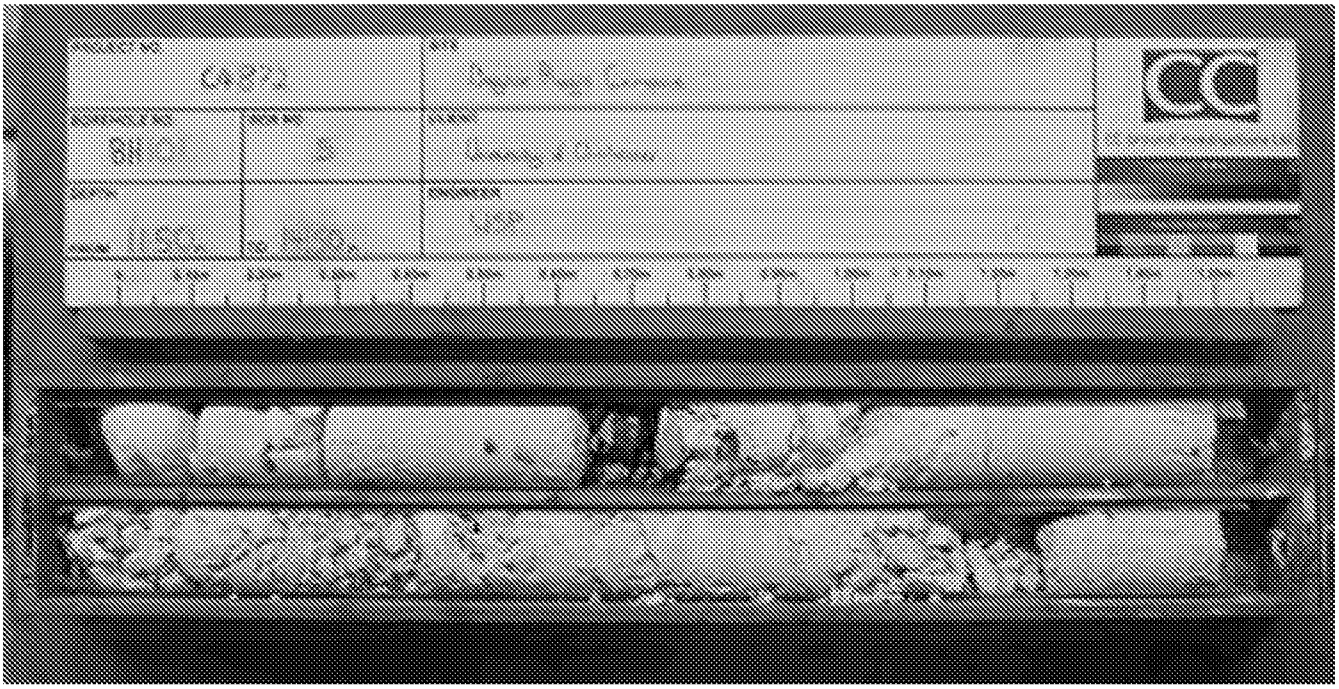


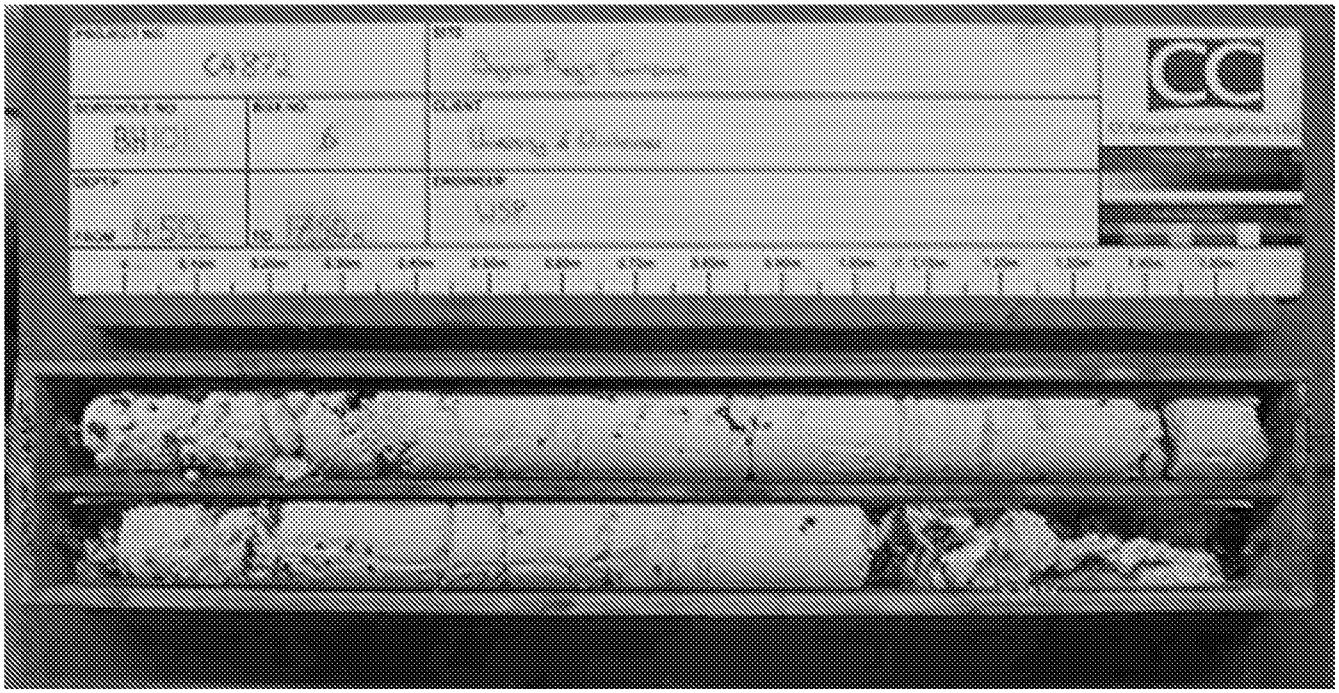
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH101

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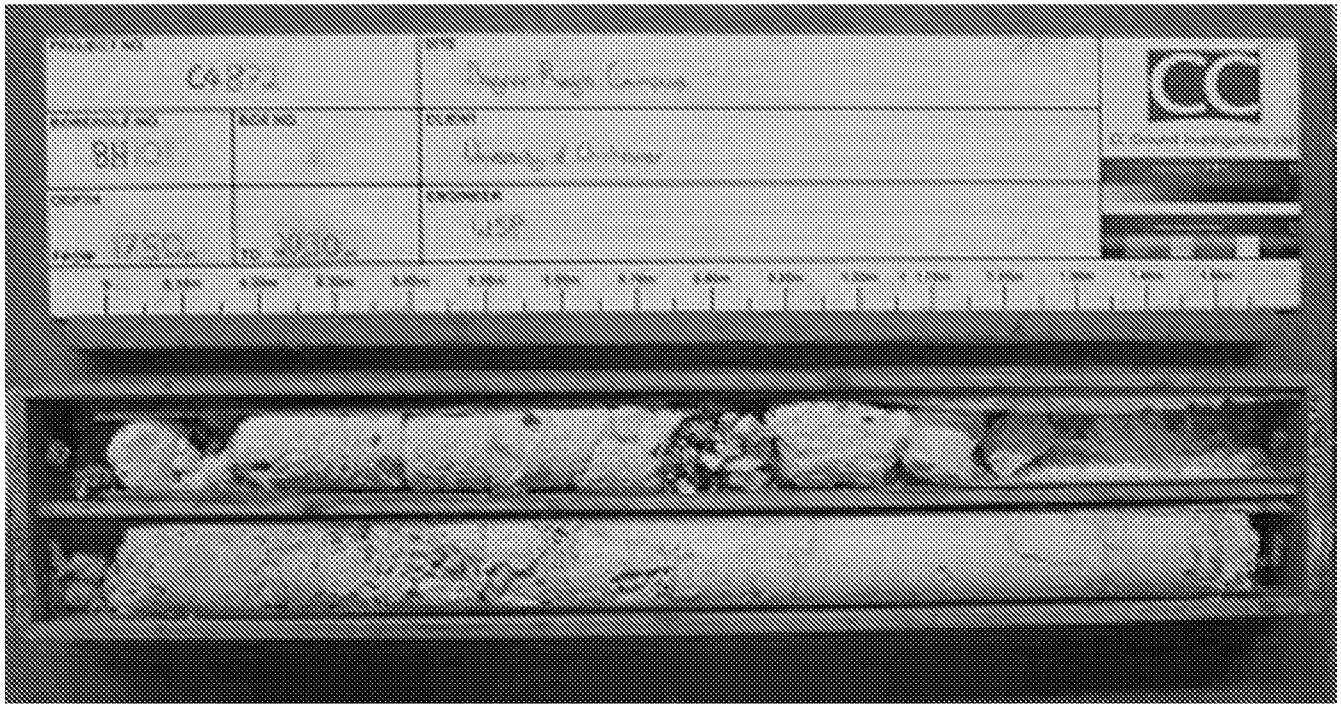
Borehole Photograph

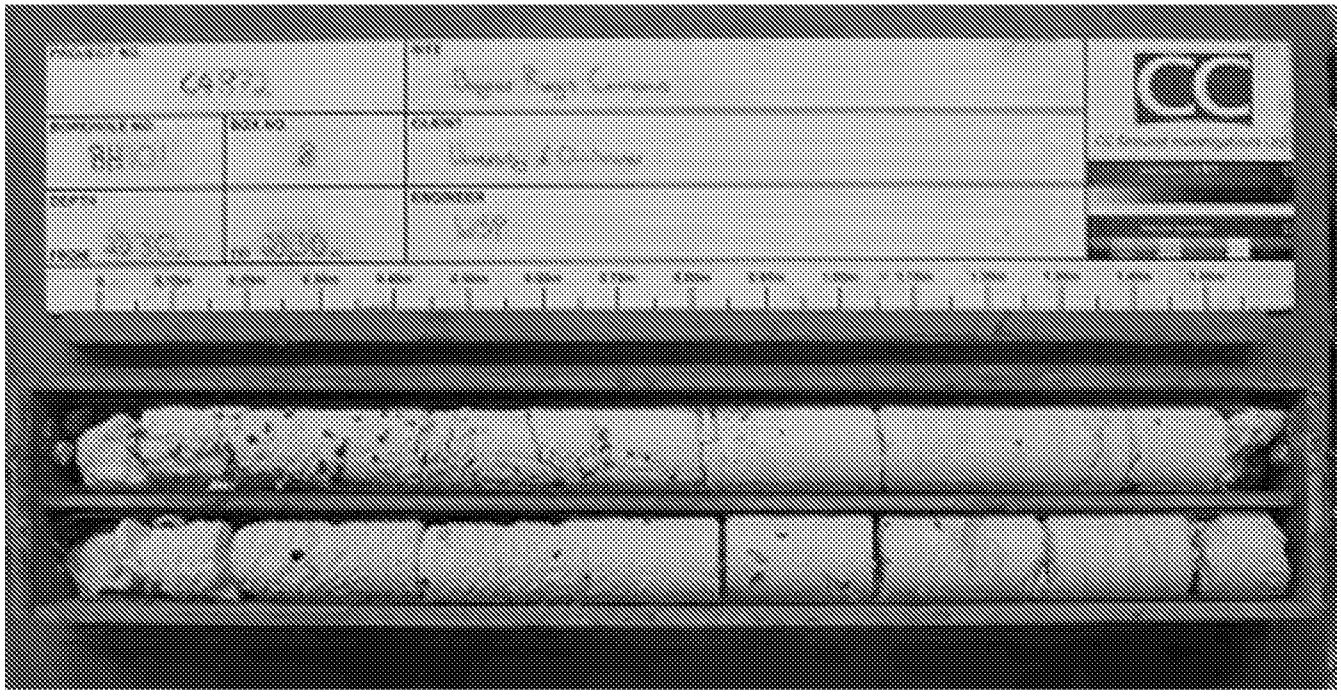




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	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH101

Borehole Photograph



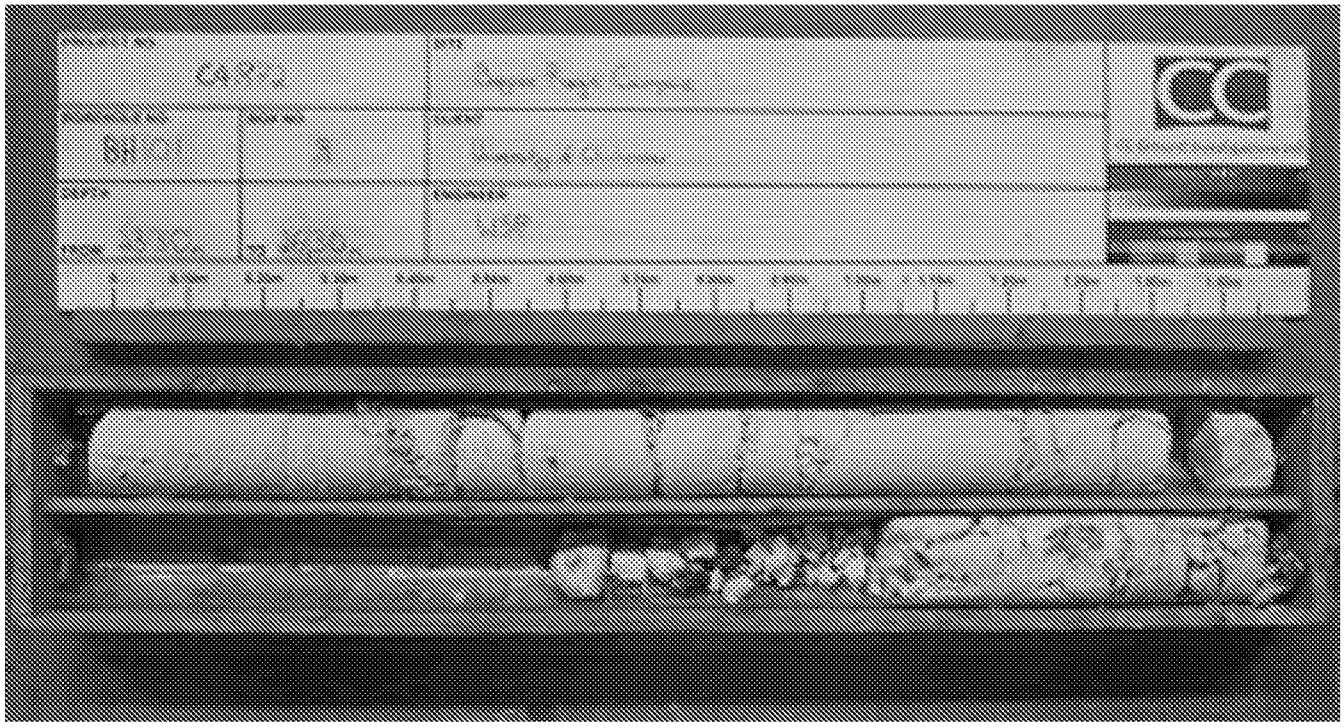


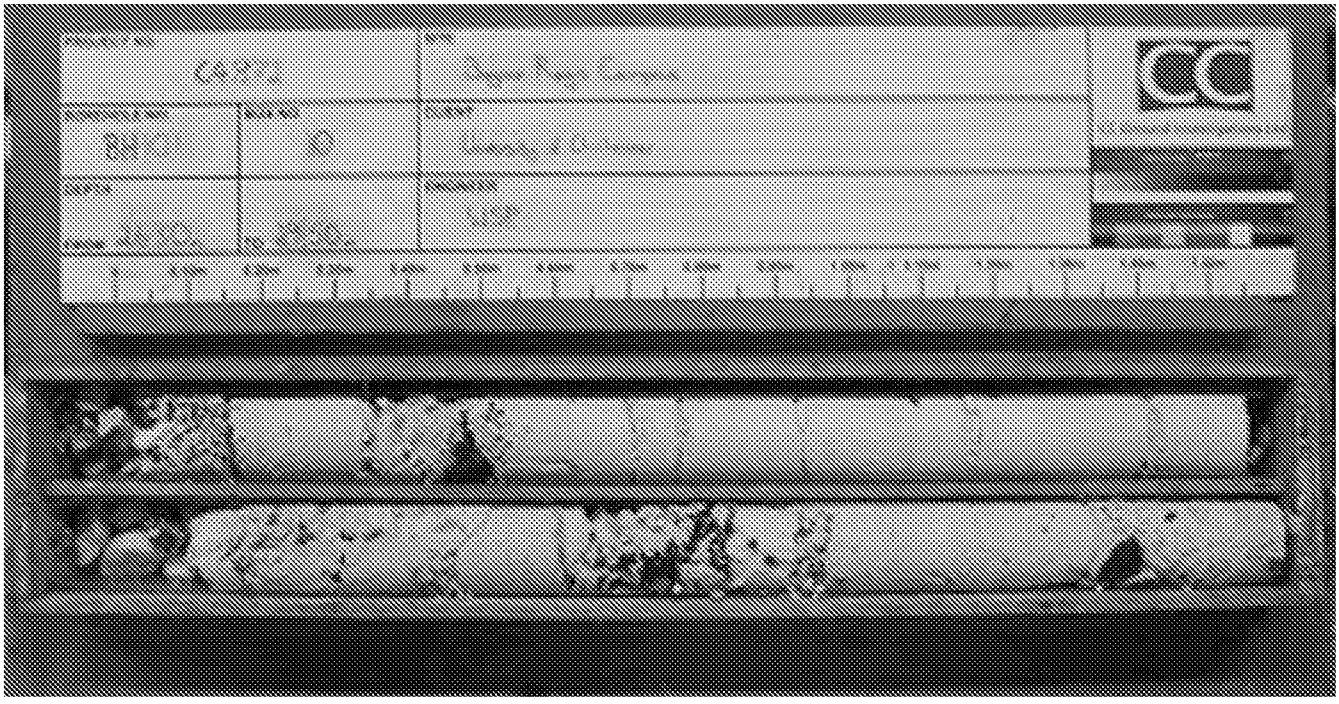
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH101

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ARUN DISTRICT COUNCIL BR/72/22/PL

Borehole Photograph

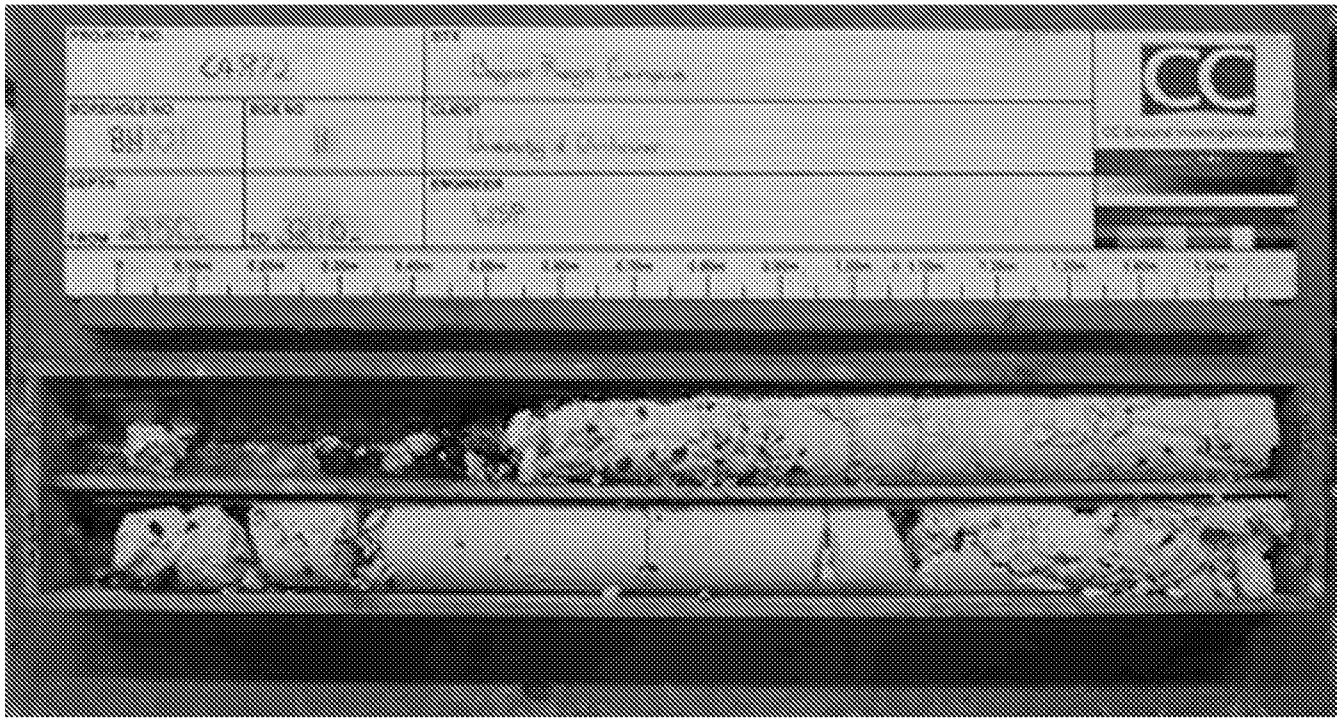


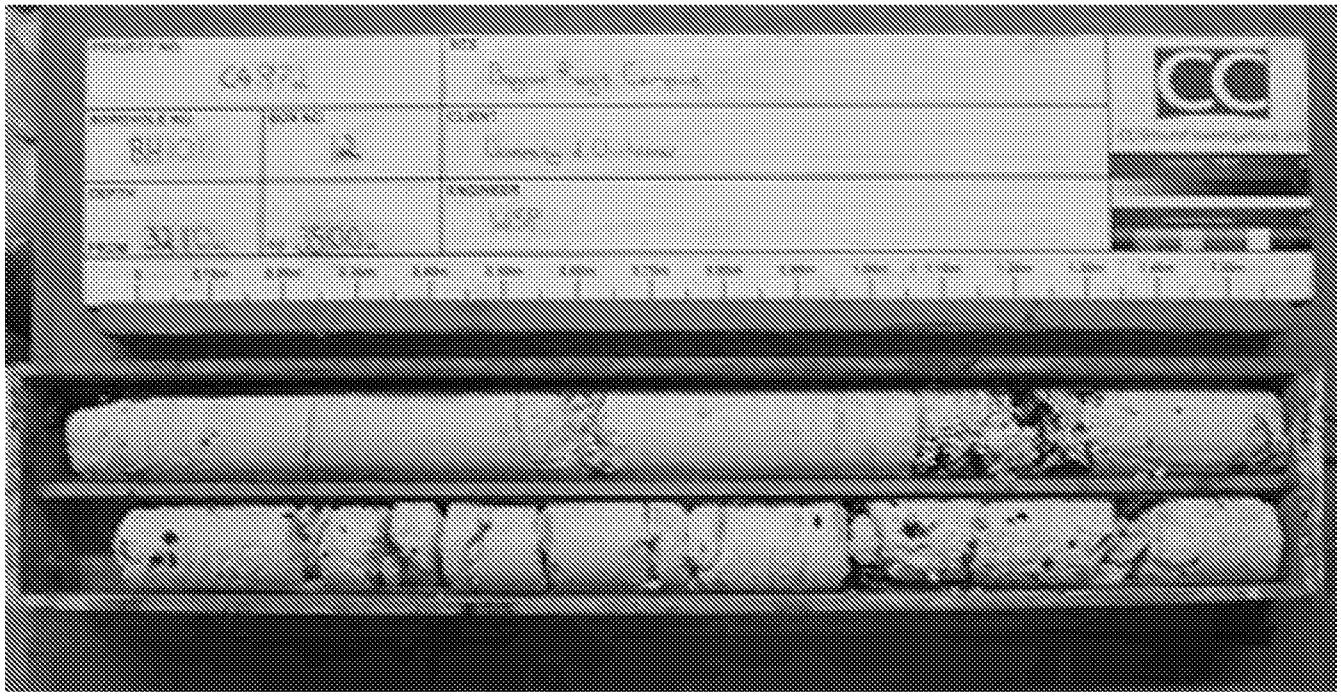


CC Ground Investigations Ltd	Contract Name:	University of Chichester
	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH101

ARUN DISTRICT COUNCIL BR/72/22/PL

Borehole Photograph





CC Ground Investigations Ltd	Contract Name:	University of Chichester
	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH101

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ROTARY BOREHOLE LOG

Borehole No. **BH102**

Sheet 1 of 6

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Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		ES	0.10					TOPSOIL: Very soft brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is subangular fine and medium flint. (Topsoil)	(0.30)		
		B	0.30						0.30	1.88	
		B	0.50					Soft orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine to coarse flint. (Superficial Deposits)			
1		B	1.00						(1.40)		1
		ES	1.20	S 3							
		SPT	1.20 - 1.65								
								Firm orangish brown and light grey mottled reddish brown slightly sandy silty CLAY. (Lambeth Group)	1.70	0.48	
2		D	1.90	H 70					(0.60)		2
		H									
								Stiff reddish brown mottled orangish brown and light grey slightly sandy silty CLAY. (Lambeth Group)	2.30	-0.12	
		D	2.50	H 101							
		H									
		SPT	2.70 - 3.15	S 5							
3									(2.20)		3
		D	3.50	H 100							
		H									
4		D	4.00	H 119				4.00-4.20m: Slightly gravelly. Gravel is sub-rounded fine and medium sandstone.			4
		H									
		SPT	4.20 - 4.65	S 9							
								Stiff and very stiff reddish brown light greenish grey and orangish brown slightly sandy silty CLAY. (Lambeth Group)	4.50	-2.32	
5		D	5.00								5
		SPT	5.20 - 5.65	S 9							
6		D	5.90								6

DRAFT

REMARKS:

EQUIPMENT: Hand digging tools. Fraste ML/PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-7.60m. Waterflush rotary core drilled (146mm diam) 7.60-35.00m.
CASING: SW to 12.00m.
GROUNDWATER: None encountered prior to using water flush to advance casing.
INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 10.50-33.50m, plain pipe with bentonite pellet seal: 0.20-10.50m, raised borehole helmet set in concrete 0.00-0.20m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Borehole No. **BH102**

Sheet 2 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Stiff and very stiff reddish brown light greenish grey and orangish brown slightly sandy silty CLAY. (Lambeth Group) *(continued from previous sheet)*			
		D SPT	6.50 6.60 - 7.05	S 22					(3.90)		
7											7
		D	7.40								
		C SPT	7.60 - 8.50 7.60	S*61		100% 10% 0%		7.50-7.90m: Slightly gravelly. Gravel is sub-angular to sub-rounded fine to medium low density chalk.			
8		D	8.00					7.90-8.30m: Gravelly. Gravel is angular to sub-angular fine to coarse flint.			8
								8.30-8.40m: Yellowish brown calcareous cobble. (possible cored boulder).	8.40	-6.22	
		C CPT	8.50 - 10.00 8.50	C*300		97% 30% 0%		Stiff bluish grey mottled yellowish brown slightly sandy slightly gravelly sandy CLAY. Gravel is angular to sub-rounded fine to medium low density chalk and flint. (Lambeth Group)	8.60	-6.42	
9								Structureless white stained orangish brown and yellowish brown CHALK composed of slightly sandy silty GRAVEL. Gravel is sub-angular to sub-rounded fine to coarse low density chalk. (White Chalk Subgroup Grade Dc)	(0.70)		9
								9.00-9.20m: Locally indistinctly structured. Discontinuities are extremely closely spaced randomly orientated infilled with comminuted chalk (<10mm). [Grade C5]	9.30	-7.12	
		D	9.90					Very weak and weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely and closely spaced infilled with comminuted chalk (<5mm). (White Chalk Subgroup Grade C4-C5)			
10		C	10.00 - 11.50			100% 56% 51%		9.30-10.40m: Discontinuities are sub-vertical and vertical extremely closely and very closely spaced stained orangish brown locally infilled with comminuted chalk (<1mm).			10
								10.00-10.55m: Drilling disturbed. Recovered as slightly sandy silty cobbly gravel. Gravel is sub-angular to sub-rounded fine to coarse. Cobbles are sub-rounded.			
11								10.40-10.42m: Band of angular and sub-angular fine to coarse rinded flint gravel.			11
								10.50-10.55m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-angular cobble.	(3.90)		
		D C CPT	11.40 11.50 - 13.00 11.50	C*300		97% 38% 22%		10.90-11.90m: Discontinuities are sub-vertical and vertical very closely and closely spaced locally infilled with comminuted chalk (<1mm).			
								11.50-11.55m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			
12								11.90-12.30m: Discontinuities are sub-vertical to 45° closely spaced infilled with grey silty clay (<10mm).			12
								12.30-13.80m: Discontinuities are sub-vertical and vertical very closely and closely spaced locally stained orangish brown. No infill.			
								12.50-12.52m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
								12.65-12.67m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
13		D C	12.90 13.00 - 14.50			85% 75% 71%		13.10-13.15: Band of angular and sub-angular fine to	13.20	-11.02	13

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
16/11/2015	7.60	4.20	0.80
17/11/2015	7.60	4.20	2.30

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ROTARY BOREHOLE LOG

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Borehole No. **BH102**

Sheet 3 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								coarse rinded flint gravel and sub-angular cobble (<100mm). Weak medium density white locally mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal closely to medium spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B3-A2) *(continued from previous sheet)*	(1.60)		
14		D CS	13.80 13.86 - 14.30						14.80	-12.62	14
		C CPT	14.50 - 16.00 14.50	C*750		100% 21% 21%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely and closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B4-B5) 15.10-15.12m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
15		D	14.90						(1.90)		15
								15.65-15.70m: Band of angular and sub-angular fine to coarse rinded flint gravel. 15.80-15.82m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
16		C	16.00 - 17.50			100% 77% 61%					16
								16.40-16.45m: Band of angular and sub-angular fine to coarse rinded flint gravel.	16.70	-14.52	
		CS	16.75 - 17.15					Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B2)			
17		D	17.40								17
		C CPT	17.50 - 19.00 17.50	C*750		68% 55% 40%		17.50-17.55m: Band of angular and sub-angular fine to coarse rinded flint gravel. 17.55-17.80m: Drilling disturbed. Recovered as slightly sandy silty gravel. 17.65-17.70m: Band of angular and sub-angular fine to coarse rinded flint gravel. 17.90-18.20m: Mottled grey. 18.10-18.12m: Band of angular and sub-angular fine to coarse rinded flint gravel. 18.12-18.25m: Discontinuities are sub-horizontal to horizontal very closely and closely spaced infilled with comminuted chalk (<1mm). [Grade B3-B4]			
18		D	18.50								18
19		C	19.00 - 20.50			93% 86% 73%		19.15-19.20m: Band of angular and sub-angular fine to coarse rinded flint gravel. 19.27-19.30m: Band of angular and sub-angular fine to coarse rinded flint gravel.			19
		CS	19.50 - 19.85					19.82-19.85m: Discontinuity infilled with comminuted chalk stained brown (30mm).			
20		D	20.40					20.10-20.25m: Indistinctly thinly laminated mottled grey.			20

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
17/11/2015	19.00	4.20	0.80
18/11/2015	19.00	4.20	1.20

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ROTARY BOREHOLE LOG

Borehole No. **BH102**

Sheet 4 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
21		C CPT	20.50 - 22.00 20.50	C*300		99% 85% 81%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B2) *(continued from previous sheet)* 20.87-20.90m: Discontinuity infilled with comminuted chalk stained grey (30mm).	(8.30)		21
		CS	21.40 - 21.77								
22		D C	21.90 22.00 - 23.50			100% 73% 68%		22.10-22.15m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-angular cobble. 22.40-22.60m: Drilling disturbed. Recovered as angular to sub-angular fine to coarse rinded flint and chalk gravel and sub-angular cobble.			22
23		CS	22.85 - 23.25								23
		D C CPT	23.40 23.50 - 25.00 23.50	C*500		93% 80% 61%		23.50-23.55m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
24		CS	23.93 - 24.20					24.15-24.50m: Indistinctly thinly laminated mottled grey. 24.30-24.50m: Discontinuity is sub-vertical and vertical stained grey infilled with comminuted chalk (<5mm).			24
25		D C	24.90 25.00 - 26.50			85% 51% 36%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely and closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B3-B4) 25.30-25.32m: Band of angular and sub-angular fine to coarse rinded flint gravel.	25.00 (0.80)	-22.82	25
26		D C CPT	26.40 26.50 - 28.00 26.50	C*300		99% 65% 55%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely and closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B4-B5) 25.80-25.82m: Band of angular and sub-angular fine to coarse rinded flint gravel. 26.00-26.10m: Drilling disturbed. Recovered as sub-angular slightly sandy silty gravel. 26.05-26.07m: Band of angular and sub-angular fine to coarse rinded flint gravel.	25.80 (1.00)	-23.62	26
27		CS	26.90 - 27.22					Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B3) 27.60-27.64m: Flint cobble (cored).	26.80	-24.62	27

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2015	23.50	12.00	0.80
19/11/2015	23.50	12.00	1.40

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ROTARY BOREHOLE LOG

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Borehole No. **BH102**

Sheet 5 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28		D C	27.90 28.00 - 29.50			91% 51% 37%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B3) *(continued from previous sheet)* 26.30-28.45m: Drilling disturbed. Recovered as slightly sandy silty gravel and cobbles.			28
									(3.85)		
29								28.90-29.25m: Drilling disturbed. Recovered as slightly sandy silty gravel.			29
		D C CPT CS	29.40 29.50 - 31.00 29.50 29.80 - 30.15	C*300		100% 63% 63%		29.50-29.60m: Flint cobble (cored). 29.60-29.80m: Drilling disturbed. Recovered as slightly sandy silty gravel and cobbles.			
30								30.15-30.35m: Drilling disturbed. Recovered as slightly sandy silty gravel and cobbles. 30.35-30.37m: Band of angular and sub-angular fine to coarse rinded flint gravel. 30.60-30.65m: Drilling disturbed. Recovered as sub-angular slightly sandy silty gravel.	30.65	-28.47	30
31		D C	30.90 31.00 - 32.50			100% 81% 68%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced. No infill. (White Chalk Subgroup Grade A2-A3) 31.10-31.15m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			31
									(2.10)		
32		D C CPT CS	32.40 32.50 - 34.00 32.50 32.75 - 33.29	C*500		97% 83% 66%		32.40-32.60m: Discontinuities are sub-vertical and vertical very closely and extremely closely spaced locally infilled with comminuted chalk (<1mm). 32.55-32.57m: Band of angular and sub-angular fine to coarse rinded flint gravel.	32.75	-30.57	32
33								Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal medium spaced. No infill. (White Chalk Subgroup Grade A2)	(0.55) 33.30	-31.12	33
34		D C	33.90 34.00 - 35.00			80% 45% 41%		Weak medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal closely to medium spaced locally infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A2-B3) 33.40-33.45m: Flint cobble (cored).			34
									(1.78)		
35		D CPT	34.90 35.00 - 35.08	C*300				34.35-34.45m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-angular cobble.			35

Borehole completed at 35.08m

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2015	35.08	12.00	0.80

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ROTARY BOREHOLE LOG

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Borehole No. **BH102**

Sheet 6 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494421 N 99543	Hole Type DS+RC
Location: Bognor Regis		Level: 2.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 16/11/2015 End: 19/11/2015	Logged By RS/SM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
									35.08	-32.90	

36 37 38 39 40 41 42

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

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Borehole No. **BH103**

Sheet 1 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B ES	0.50					MADE GROUND: Soft and firm greyish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is sub-angular fine to coarse brick flint and concrete. 0.25m: Concrete boulder.	(0.80)		
									0.80	2.11	
1		B ES	1.00					Firm orangish brown mottled white and grey slightly sandy gravelly CLAY. Gravel is sub-angular and sub-rounded fine to coarse flint. (Lambeth Group)	(0.40)		1
		SPT	1.20 - 1.65	S 1					1.20	1.71	
		ES	1.30					Soft light grey mottled orangish brown slightly sandy silty CLAY. (Lambeth Group)	1.40	1.51	
								Firm light grey mottled orangish brown and reddish brown slightly sandy silty CLAY. (Lambeth Group)	(0.90)		
2		D H	1.90	H 51							2
									2.30	0.61	
		D H	2.50	H 79				Stiff light grey, orangish brown and reddish brown slightly sandy silty CLAY. (Lambeth Group)			
		SPT	2.70 - 3.15	S 6							
3											3
		D H	3.60	H 84					(2.70)		
4		D H	4.00	H 103							4
		ES	4.20	S 16							
		SPT	4.20 - 4.65								
		D	4.70								
5									5.00	-2.09	5
								Very stiff light grey reddish brown and orangish brown slightly sandy silty CLAY. (Lambeth Group)			
		D	5.30								
		C SPT	5.50 - 7.00 5.50 - 5.95	S 31		100% 0% 0%					
6											6

REMARKS:

EQUIPMENT: Hand digging tools. Comacchio MC300 multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (128mm diam) 1.20-5.50m. Waterflush rotary core drilled (146mm diam) 5.50-35.00m.
CASING: SW to 5.50m.
GROUNDWATER: None encountered prior to using water flush to advance casing.
INSTALLATION: Arisings: 30.00-35.00m. 50mm ID HDPE slotted pipe with washed gravel response zone and geosock: 30.00-13.00m. Plain 50mm ID HDPE pipe with gravel surround: 12.80-13.00m and bentonite pellet seal: 0.20-12.80m. Raised 150mm steel cover set in concrete: 0.00-0.20m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
13/11/2015	5.00	4.20	3.20
16/11/2015	5.00	4.20	2.20

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ROTARY BOREHOLE LOG

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Borehole No. **BH103**

Sheet 2 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		D	6.20					Very stiff light grey reddish brown and orangish brown slightly sandy silty CLAY. (Lambeth Group) *(continued from previous sheet)*	(2.50)		
7		D C SPT	6.90 7.00 - 8.50 7.00 - 7.45	S 21	C	100% 0% 0%			7.50	-4.59	7
		D	7.80					Hard friable reddish brown locally light grey and orangish brown slightly sandy slightly gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine and medium sandstone. (Lambeth Group)	(1.50)		
8		C SPT	8.50 - 9.70 8.50 - 8.95	S 20	C	100% 0% 0%			9.00	-6.09	8
9		B	9.00 - 9.35		C			Hard light grey mottled orangish brown slightly gravelly sandy CLAY. Gravel is sub-angular fine to coarse flint. Locally tending to gravelly very clayey fine and medium sand. (Lambeth Group)	(0.35)		
		B	9.35 - 9.70					Orangish brown and grey clayey very sandy GRAVEL. Gravel is angular to sub-rounded fine to coarse flint. Low cobble content of angular flint. (Lambeth Group)	9.35	-6.44	9
		C CPT ES	9.70 - 11.20 9.70 - 9.91 9.70	C*250		97% 45% 26%			(0.55)		
10		ES	10.50		C			Strong white LIMESTONE with sub-horizontal very closely and closely spaced undulating rough discontinuities with a little brown staining on discontinuity surfaces. (Lambeth Group)	9.90	-6.99	10
		B	10.70						(1.40)		
11		D	11.00					10.90-11.10m: Sub-vertical undulating rough discontinuity.			11
		C D	11.20 - 12.60 11.40		C	100% 59% 23%		Very weak and weak medium density white with occasional orangish brown staining CHALK. Discontinuities are extremely and very closely spaced (20/40/60) locally infilled with (0/0/1) white comminuted chalk, moderately orangish brown stained. (White Chalk Subgroup Grade B4-5)	11.30 (0.35) 11.65	-8.39 -8.74	
12		B	12.20					Very weak medium and high density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (50/200/430) locally infilled with (0/0/1) white comminuted chalk, slightly orangish brown stained. (White Chalk Subgroup Grade A2-3) 12.20-12.47m: Sub-vertical undulating rough discontinuity with orangish brown staining on discontinuity surface.			12
		D C CPT	12.50 12.60 - 13.90 12.60 - 12.89	C*107	C	98% 68% 51%					
13		CS	13.08 - 13.31								13

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
16/11/2015	11.20	5.50	1.80
17/11/2015	11.20	5.50	2.40

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ROTARY BOREHOLE LOG

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Borehole No. **BH103**

Sheet 3 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B	13.50					Very weak medium and high density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (50/200/430) locally infilled with (0/0/1) white comminuted chalk, slightly orangish brown stained. (White Chalk Subgroup Grade A2-3) *(continued from previous sheet)*	(3.75)		
		D	13.80								
14		C	13.90 - 15.20			96% 81% 15%		13.70-13.80m: Band of angular and sub-angular fine to coarse rinded flint gravel.			14
		CS	14.25 - 14.64					14.20-14.23m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
15		D	15.00								15
		B	15.10								
		C	15.20 - 16.60	C*115		100% 39% 20%					
		CPT	15.20 - 15.48						15.40	-12.49	
								Weak low and medium density white locally orangish brown stained CHALK. Discontinuities are extremely closely and very closely spaced (10/30/60) and sub-vertical closely spaced locally infilled with (1/2/3) white comminuted chalk, slightly orangish brown stained (White Chalk Subgroup Grade B4/B5)	(0.30)		
									15.70	-12.79	
16								Weak medium density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (50/200/430) locally infilled with (0/0/1) white comminuted chalk, slightly orangish brown stained. (White Chalk Subgroup Grade A2-3)			16
		D	16.40								
		C	16.60 - 18.00			100% 41% 37%		15.70-16.00m: Sub-vertical undulating rough discontinuity with orangish brown staining on fracture surface.			
17		B	17.02					16.00-18.00m: 2 no. parallel very closely spaced sub-vertical undulating rough discontinuities with orangish brown staining on fracture surface.			17
								16.00-16.18m: 60° undulating rough discontinuity.			
		D	17.47					16.50-16.92m: Sub-vertical undulating rough discontinuity with orangish brown staining on discontinuity surface.			
								16.80-16.85m: Band of sub-angular coarse rinded flint gravel.			
								16.93-17.02m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
18		C	18.00 - 19.50	C*150		92% 69% 54%		17.02-17.45m: Sub-vertical undulating rough discontinuity with orangish brown staining on discontinuity surface.			18
		CPT	18.00 - 18.25								
		CS	18.40 - 18.65					17.45-17.47m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
								17.47-18.60m: Sub-vertical and randomly orientated extremely and very closely spaced intersecting discontinuities.			
19		D	19.00					18.00-18.40m: Sub-vertical undulating rough discontinuity with orangish brown staining on discontinuity surface.			19
								18.65-18.95m: Sub-horizontal and randomly orientated extremely closely and very closely spaced intersecting discontinuities.			
		C	19.50 - 20.80			100% 38% 0%					
		CS	19.70 - 19.95								
20											20
								20.22-20.35m: Band of angular and sub-angular coarse rinded flint gravel and cobbles.			
								20.40-20.45m: Band of angular and sub-angular fine to			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Borehole No. **BH103**

Sheet 4 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								coarse rinded flint gravel. Weak medium density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (50/200/430) locally infilled with (0/0/1) white comminuted chalk, slightly orangish brown stained. (White Chalk Subgroup Grade A2-3) *(continued from previous sheet)* 20.56-20.61m: Band of angular and sub-angular fine to coarse rinded flint gravel. 21.35-21.47m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles.			
21		C CPT	20.80 - 22.20 20.80 - 21.04	C*167		100% 72% 63%					21
		CS	21.80 - 22.10								
22		D	22.00								22
		C	22.20 - 23.60			89% 85% 73%		22.40-22.65m: Mottled grey. 22.49-22.51m: Discontinuity is sub-horizontal infilled with comminuted chalk (possible Marl).			
23		D C CPT	23.50 23.60 - 25.00 23.60 - 23.84	C*167		100% 81% 51%					23
24								23.95-24.10m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles. 24.05-24.65m: Discontinuities are vertical and sub-vertical extremely closely and very closely spaced infilled with comminuted chalk (<1mm) locally stained orangish brown. 24.39-24.40m: Discontinuity is subhorizontal infilled with grey sandy clay (10mm) (possible Marl). 24.80-27.00m: Mottled grey.			24
		D CS	24.60 24.68 - 25.00								
25		C	25.00 - 26.40			100% 68% 54%			(19.30)		25
								25.65-25.83m: Indistinctly thinly laminated mottled grey (probable Marl).			
26											26
		D C CPT	26.30 26.40 - 27.40 26.40 - 26.65	C*150		100% 74% 61%					
27		D CS	27.10 27.13 - 27.40								27
		C	27.40 - 28.90			95% 71% 53%		27.55-27.60m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles.			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
17/11/2015	26.40	5.50	2.30
18/11/2015	26.40	5.50	2.40

CC ROTARY LOG C4872.GPJ GINT STD AGS 3_1.GDT 21/1/16

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ROTARY BOREHOLE LOG

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Borehole No. **BH103**

Sheet 5 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28								27.70-27.72m: Band of angular and sub-angular fine to coarse rinded flint gravel. 27.80-27.95m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles. Weak medium density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (50/200/430) locally infilled with (0/0/1) white comminuted chalk, slightly orangish brown stained. (White Chalk Subgroup Grade A2-3) *(continued from previous sheet)*			28
		D	28.80					28.20-28.90m: Discontinuity is vertical and sub-vertical infilled with comminuted chalk (<1mm) locally stained orangish brown.			
29		C CPT	28.90 - 29.40 28.90 - 29.13	C*188		60% 60% 46%		28.50-28.55m: Band of angular and sub-angular fine to coarse rinded flint gravel. 28.70-28.90m: Chalk recovered non-intact as silty gravel.			29
		C	29.40 - 30.90			98% 79% 62%		29.14-29.22m: Rinded flint cobble or boulder (cored through). 29.22-29.40m: Drilling disturbed. Recovered as sub-angular rinded flint and chalk gravel. 29.60-32.40m: Discontinuities are sub-horizontal and horizontal closely to medium spaced locally infilled with comminuted chalk (<5mm). [Grade A2-B3]			
30											30
		D B	30.40 30.50					30.63-30.72m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles.			
31		C CPT	30.90 - 32.30 30.90 - 31.15	C*158		96% 74% 51%					31
								31.65-31.72m: Band of angular and sub-angular fine to coarse rinded flint gravel and sub-rounded cobbles.			
32											32
		D C	32.20 32.30 - 33.80			97% 86% 88%		32.15-32.23m: Sub-angular to sub-rounded rinded flint cobble. 32.40-35.00m: Discontinuities are sub-horizontal to horizontal medium spaced locally closely spaced with no infill. [Grade A2-A3] 32.40-34.70m: Mottled grey.			
33											33
		D CS	33.20 33.30 - 33.65								
34		C CPT	33.80 - 35.00 33.80 - 34.05	C*150		100% 80% 54%		33.80-33.90m: Band of angular and sub-angular fine to coarse rinded flint gravel.			34
								34.70-34.72m: Band of angular and sub-angular fine to coarse rinded flint gravel.			
35		D	34.90					34.80-34.85m: Band of angular and sub-angular fine to	35.00	-32.09	35

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2015	35.00	5.50	2.80

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ROTARY BOREHOLE LOG

Borehole No.
BH103
Sheet 6 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494386 N 99532	Hole Type DS+RC
Location: Bognor Regis		Level: 2.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 13/11/2015 End: 18/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								coarse rinded flint gravel.			
								Borehole completed at 35.00m			

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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BOREHOLE LOG

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Borehole No. **BH104**

Sheet 1 of 2

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494380 N 99657	Hole Type DS
Location: Bognor Regis		Level: 1.53mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 10/11/2015 End: 10/11/2015	Logged By SM

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		ES	0.10				MADE GROUND: Very soft dark brown mottled black and yellowish brown slightly gravelly silty CLAY with frequent roots and rootlets (<3mm). Gravel is angular to sub-angular fine to medium brick.	(0.30)		
		B	0.20					0.30	1.23	
		B	0.50				Soft grey mottled orangish brown, yellowish brown and brown slightly sandy silty CLAY. (Superficial Deposits)			
							0.70-1.80m: Tending to orangish brown mottled grey.			
1		B	1.00					(1.50)		1
		ES								
		SPT	1.20 - 1.65	S 1						
								1.80	-0.27	
2							Very soft grey slightly sandy silty CLAY locally tending to clayey silt with frequent orangish brown stained root traces and occasional part decomposed plant remains (<3mm). (Superficial Deposits)			2
		D	2.20							
		H	2.40	H 11						
		SPT	2.50 - 2.95	S<1						
3		H	3.00	H 11			3.00-7.20m: Locally with black mottling.			3
		H	3.50	H 12						
		D	3.70							
4		SPT	4.00 - 4.45	S<1						4
								(5.00)		
5		H	5.00	H 7						5
		D	5.20							
		SPT	5.50 - 5.95	S 5						
6							5.90-6.80m: Slightly gravelly. Gravel is angular to sub-rounded			6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-12.00m.
GROUNDWATER: None encountered prior to using water flush to advance casing to 5.50m.
CASING: SW to 8.50m.
INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 9.00-12.00m. 50mm ID HDPE plain pipe with washed gravel response zone: 8.90-9.00m, and bentonite pellet seal: 0.30-8.90m, and flush 150mm steel cover set in concrete: 0.00-0.30m Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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BOREHOLE LOG

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Borehole No. **BH104**

Sheet 2 of 2

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494380 N 99657	Hole Type DS
Location: Bognor Regis		Level: 1.53mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 10/11/2015 End: 10/11/2015	Logged By SM

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
							fine to medium flint. Very soft grey slightly sandy silty CLAY locally tending to clayey silt with frequent orangish brown stained root traces and occasional part decomposed plant remains (<3mm). (Superficial Deposits) *(continued from previous sheet)*			
							Yellowish grey and light grey slightly sandy very gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse chalk. (Superficial Deposits)	6.80 (0.40)	-5.27	
7		D SPT	6.90 7.00 - 7.45	S 5			Structureless CHALK composed of white mottled grey slightly sandy silty GRAVEL. Gravel is sub-angular to rounded fine to coarse medium density chalk and flint. (White Chalk Subgroup Grade Dc)	7.20	-5.67	7
8							8.20-8.50m: Locally tending to structured chalk [Grade C5].			8
		D SPT	8.40 8.50 - 8.95	S 12			8.50-11.50m: Limited recovery of structureless chalk [Grade Dm].			
9		D	9.10							9
								(5.25)		
10		SPT	10.00 - 10.45	S 19			10.00-10.10m: Sub-angular to sub-rounded rinded flint cobble (~130mm).			10
		D	10.70							
11										11
		SPT	11.50 - 11.95	S 19			11.50-12.00m: Locally tending to structured chalk [Grade C4-C5].			
12		D SPT	11.95 12.00 - 12.45	S 18						12
							Borehole completed at 12.45m	12.45	-10.92	
13										13

Groundwater:

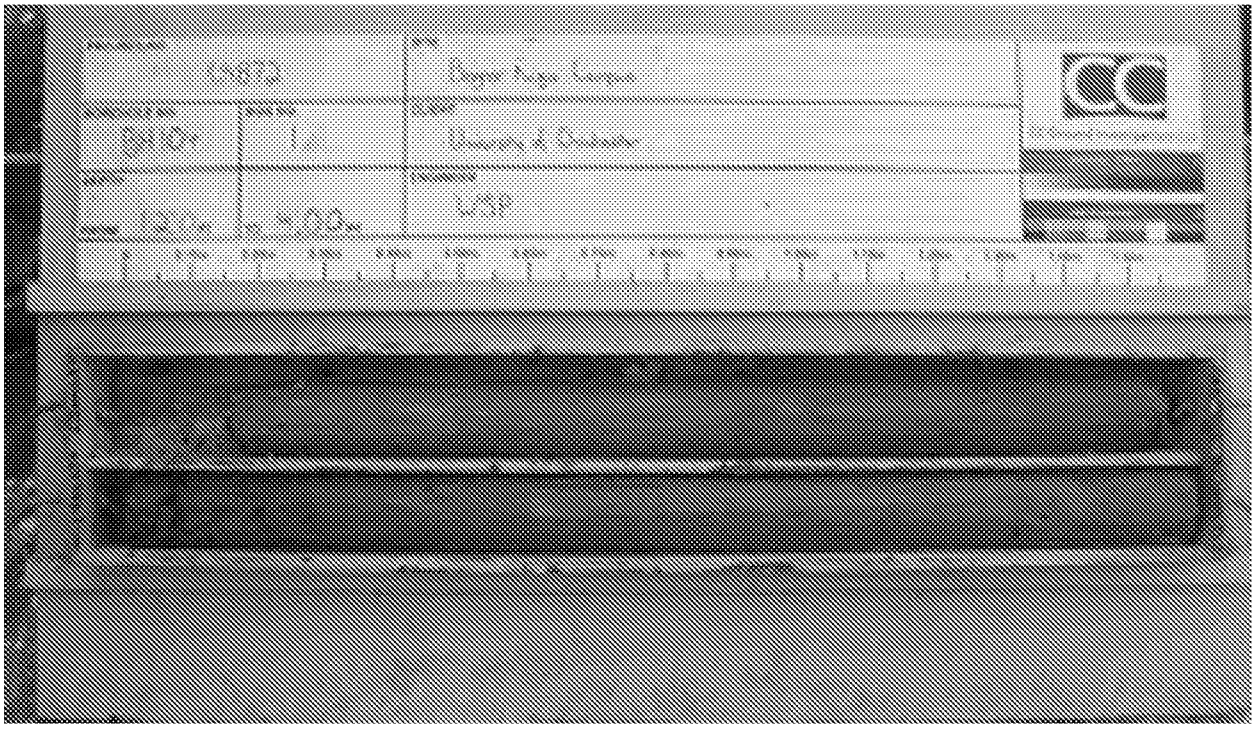
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

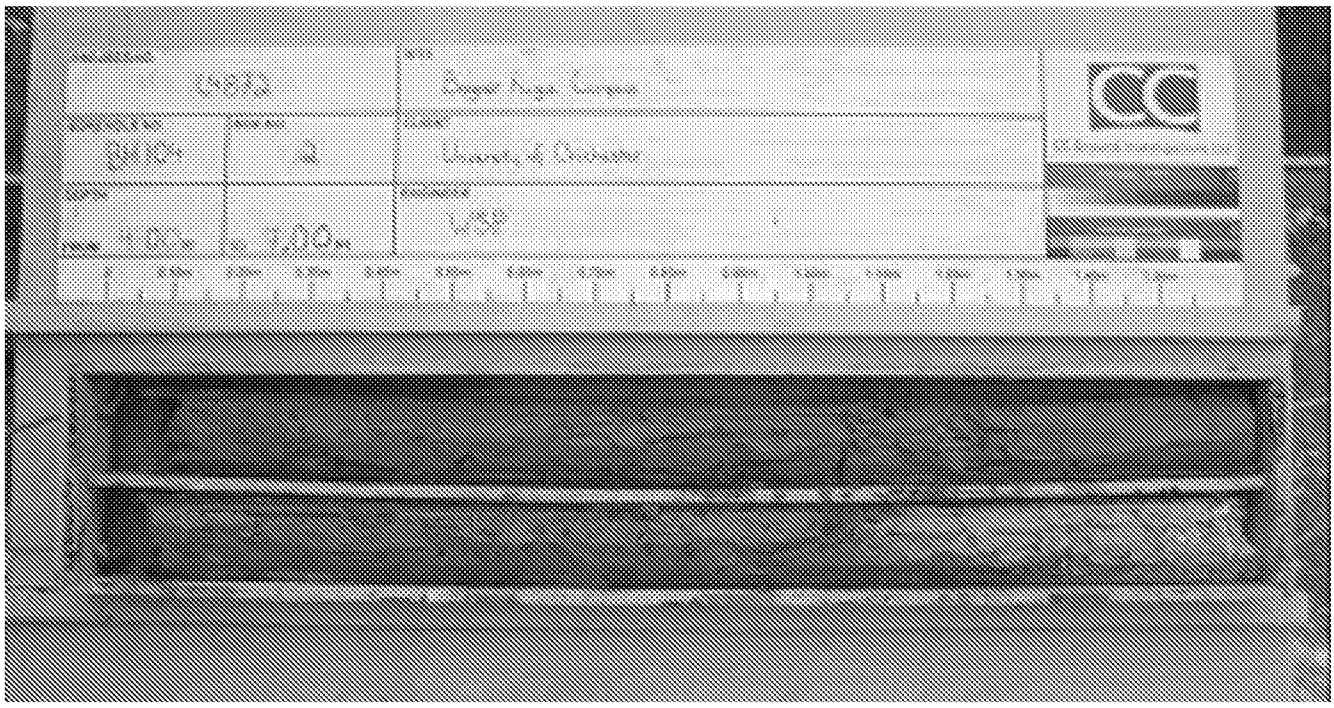
Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
10/11/2015	12.45	8.50	1.00

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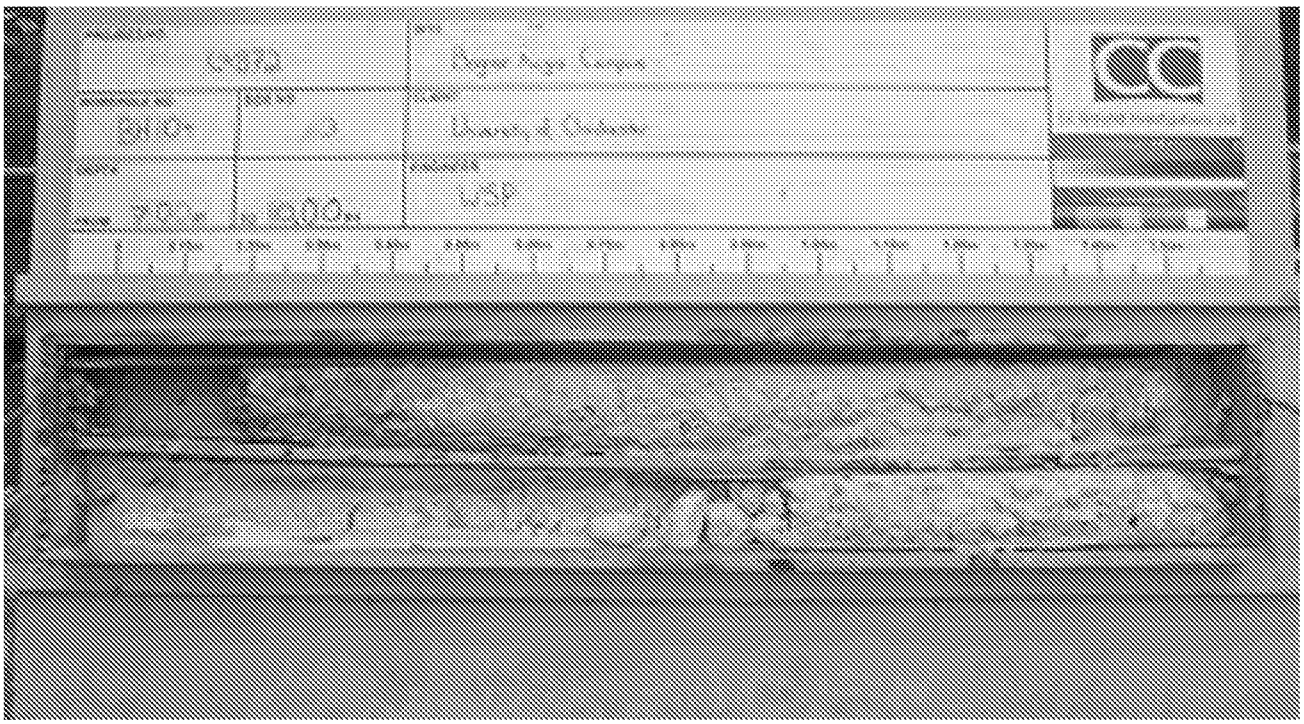
Borehole Photograph

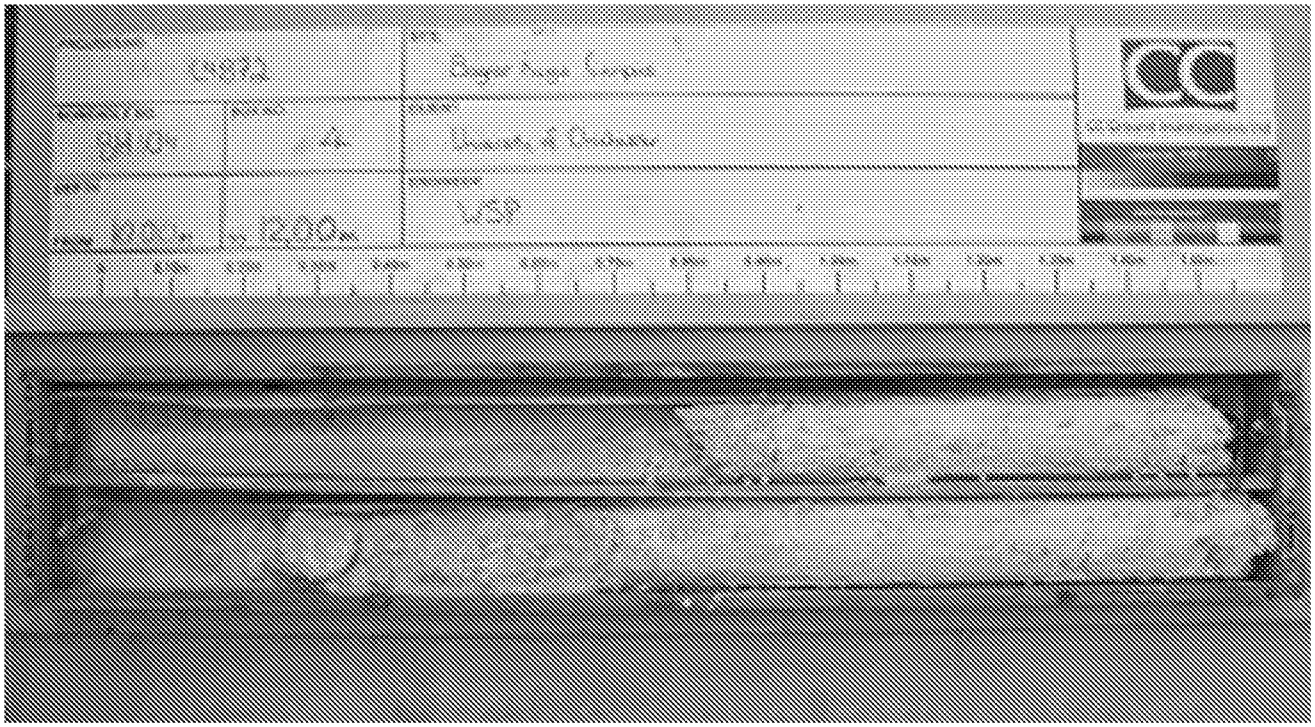




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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH104

Borehole Photograph





CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH104

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BOREHOLE LOG

Tele: [redacted]

Borehole No. **BH105**

Sheet 1 of 3

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494427 N 99736	Hole Type DS
Location: Bognor Regis		Level: 1.39mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 04/11/2015 End: 05/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		B	0.30				MADE GROUND: Stiff friable orangish brown mottled dark grey and reddish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine and medium brick.	0.20	1.19	
		B	0.50				MADE GROUND: Stiff orangish brown mottled reddish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is sub-angular fine brick.	(0.60)		
								0.80	0.59	
1		B	1.00				Firm orangish brown slightly sandy silty CLAY. (Superficial Deposits)	(0.30)		1
		SPT	1.20 - 1.65	S<1			Very soft light grey and orangish brown silty CLAY. (Superficial Deposits)	1.10	0.29	
		D	1.70					(1.10)		
2		H	2.00	H 17						2
							Very soft light grey silty CLAY with frequent 1mm diameter vertical dead rootlets. (Superficial Deposits)	2.20	-0.81	
		D H	2.50	H 16				(0.50)		
		SPT	2.70 - 3.15	S<1			Very soft grey silty CLAY with rare sub-angular fine gravel sized and 1mm diameter partially decomposed organic fragments and dead rootlets. (Superficial Deposits)	2.70	-1.31	
3										3
		H	3.40	H 12				(2.10)		
4		D H	4.00	H 16						4
		SPT	4.20 - 4.65	S 1						
							Very soft grey silty CLAY. (Superficial Deposits)	4.80	-3.41	
5										5
		D H	5.50	H 13				(1.60)		
		SPT	5.70 - 6.15	S 1						
6										6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-14.70m.
GROUNDWATER: None encountered prior to use of water flush to advance casing to 4.20m..
CASING: 160mm diam casing to 14.70m.
INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 13.20-14.70m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-13.20m and flush 150mm steel cover set in concrete: 0.00-0.20m Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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BOREHOLE LOG

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Borehole No. **BH105**

Sheet 2 of 3

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494427 N 99736	Hole Type DS
Location: Bognor Regis		Level: 1.39mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 04/11/2015 End: 05/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
							Very soft grey silty CLAY. (Superficial Deposits) *(continued from previous sheet)*			
		H	6.40	H 9				6.40	-5.01	
							Very soft indistinctly thinly laminated dark grey slightly sandy silty CLAY. (Superficial Deposits)			
7		D	7.00	H 9						7
		H								
		SPT	7.20 - 7.65	S 2				(2.00)		
8										8
							Very soft grey silty CLAY. (Superficial Deposits)	8.40	-7.01	
		D	8.50	H 10						
		H								
		SPT	8.70 - 9.15	S 2						
9										9
10		D	10.00	H 12						10
		H								
		SPT	10.20 - 10.65	S 4						
								(4.30)		
11										11
		SPT	11.70 - 12.15	S 12						
12										12
							Structureless CHALK composed of white gravelly SILT. Gravel is extremely weak and very weak low and medium density white fine to coarse with occasional black specks. (White Chalk Subgroup Grade Dm)	12.70	-11.31	
								(0.30)		
13		D	13.00					13.00	-11.61	13
							(continued on next sheet)			

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
04/11/2015	11.70	10.20	0.60
05/11/2015	11.70	10.20	2.60

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BOREHOLE LOG

Borehole No. **BH105**

Sheet 3 of 3

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494427 N 99736	Hole Type DS
Location: Bognor Regis		Level: 1.39mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 04/11/2015 End: 05/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		SPT	13.20 - 13.65	S 9			Structureless CHALK composed of silty angular and sub-angular fine to coarse GRAVEL. Clasts are very weak, low and medium density white with occasional black specks. (White Chalk Subgroup Grade Dc) *(continued from previous sheet)*			
14								(2.15)		
		D	14.50							
		SPT	14.70 - 15.15	S 8						
15								15.15	-13.76	
							Borehole completed at 15.15m			
16										
17										
18										
19										
20										

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
05/11/2015	15.15	14.70	0.60

Borehole Photograph



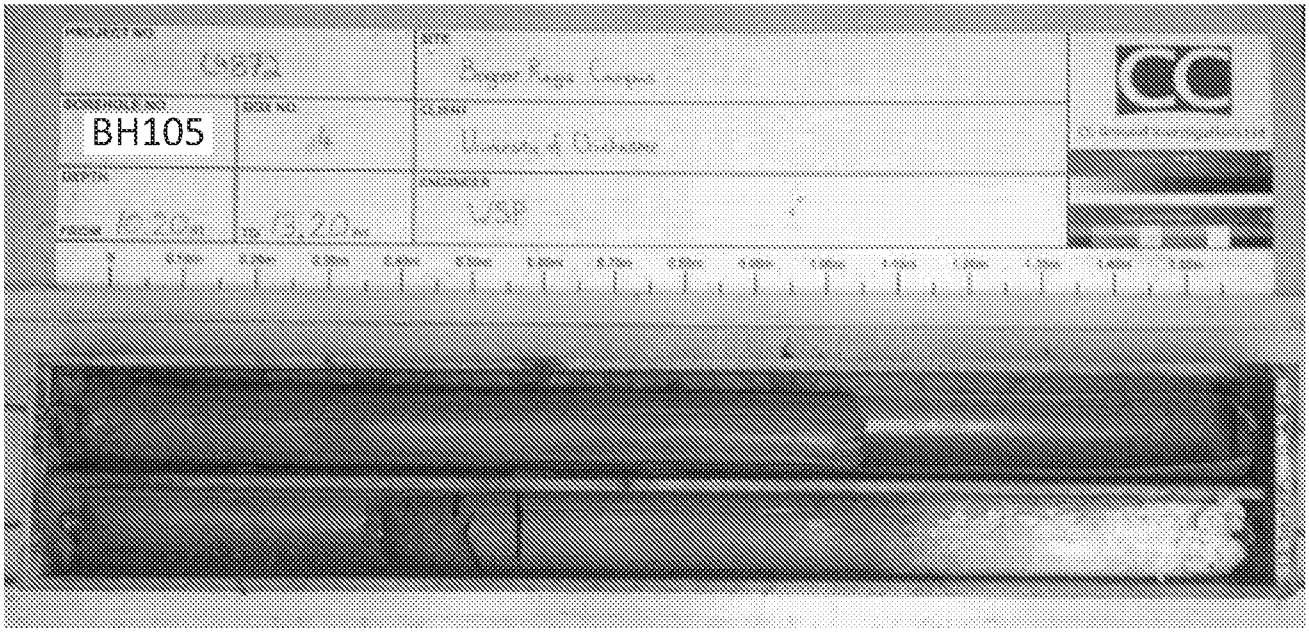


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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH105

Borehole Photograph

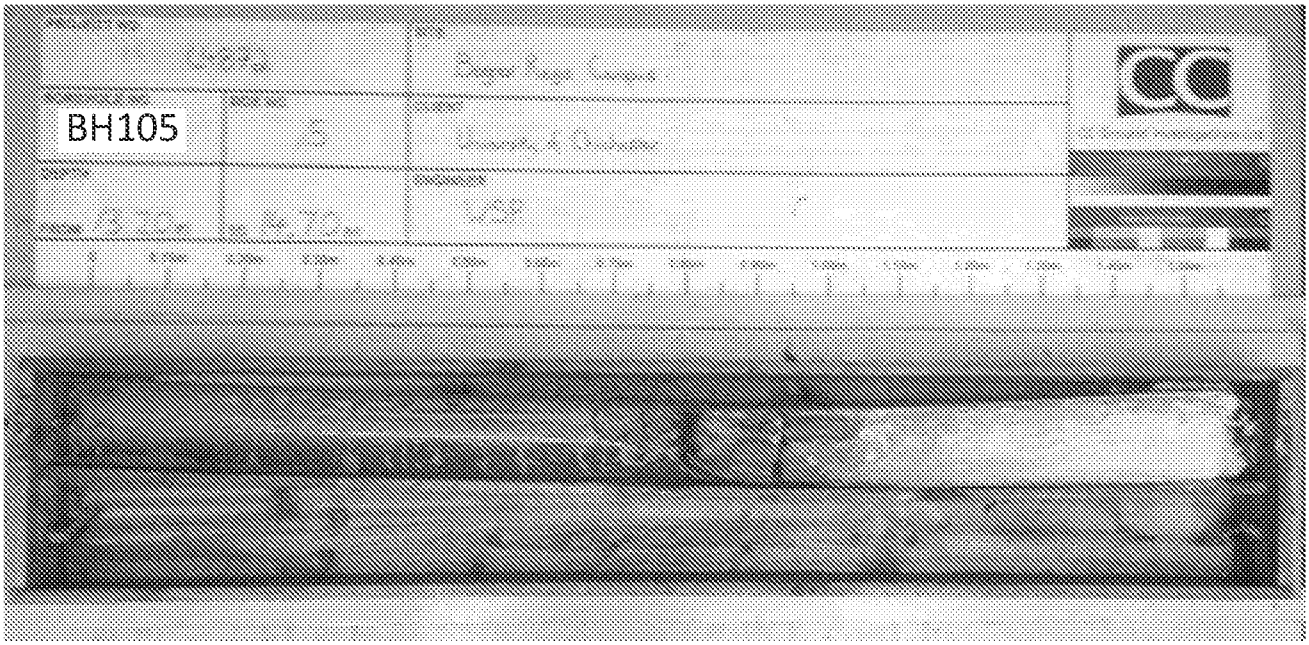




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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH105

Borehole Photograph



CC Ground Investigations Ltd	Contract Name:	University of Chichester
	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH105

ARUN DISTRICT COUNCIL BR/72/22/PL

CC GROUND INVESTIGATIONS LTD

ROTARY BOREHOLE LOG

Borehole No. **BH106**

Sheet 1 of 6

T [redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B	0.20					MADE GROUND: Rough vegetation over very soft brown slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets (<5mm). Gravel is angular to sub-rounded fine to coarse brick, sandstone, flint and siliceous material.	(0.40)		
									0.40	1.84	
		B	0.50					Soft yellowish brown mottled orangish brown and grey slightly sandy silty CLAY. (Lambeth Group)	(0.30)		
									0.70	1.54	
1		B	1.00					Soft yellowish brown mottled grey, orangish brown and reddish brown slightly sandy slightly gravelly silty CLAY with frequent orangish brown stained root traces and occasional partially decomposed roots and rootlets (<2mm). Gravel is sub-rounded to rounded fine to coarse flint and siliceous material. (Lambeth Group)	(0.80)		1
		SPT	1.20 - 1.65	S 4							
									1.50	0.74	
		H	1.70	H 84				Firm locally becoming stiff indistinctly thinly laminated slightly sandy silty CLAY with frequent orangish brown stained root traces. (Lambeth Group) 1.50-5.60m: Firm locally tending to stiff. Indistinctly laminated. Gravel absent.			
2		D	2.10								2
		H	2.30	H 116							
		ES	2.40								
		SPT	2.50 - 2.95	S 10							
3											3
		D	3.50						(4.10)		
		SPT	3.80 - 4.25	S 16							
4								4.00-5.60m: Occasional silty sand lenses (<30mm). 4.05-4.80m: Locally slightly gravelly. Gravel is sub-rounded to rounded fine to coarse chalk and flint.			4
		D	4.50								
		SPT	4.80 - 5.25	S 19							
5											5
									5.60	-3.36	
								Firm grey silty CLAY. (Lambeth Group)	5.70	-3.46	
		D	5.80					*(continued on next sheet)*			
6											6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (128mm diam) 1.20-15.70m. Waterflush rotary core drilled (146mm diam) 15.70-34.40m.
GROUNDWATER: None encountered prior to using water flush to advance casing.
CASING: SW casing to 6.00m.
INSTALLATION: Bentonite pellet backfill: 1.60-35.00m. 50mm ID HDPE slotted pipe with washed gravel response zone: 0.60-1.60m, plain pipe with washed gravel response zone: 0.50-0.60m, and bentonite pellet seal: 0.20-0.50m, raised borehole helmet set in concrete 0.00-0.20m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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CC GROUND INVESTIGATIONS LTD

ROTARY BOREHOLE LOG

[redacted]

Borehole No. **BH106**

Sheet 2 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		C SPT	6.00 - 7.50 6.00 - 6.28	S*75		100% 0% 0%		Structureless CHALK composed of yellowish brown mottled grey and orangish brown slightly sandy slightly gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse extremely weak and very weak low density chalk and rinded flint. (White Chalk Subgroup Grade Dm) *(continued from previous sheet)* 6.25-6.45m: Sub-angular flint cobbles (<110mm). 6.45-6.50m: Weak medium density sub-rounded chalk cobble.	(0.80)		
									6.50	-4.26	
7		D	7.30					Extremely weak and very weak low to medium density white mottled grey CHALK. Discontinuities are sub-horizontal and horizontal locally randomly orientated extremely closely spaced infilled with comminuted chalk (<30mm) locally stained orangish brown. (White Chalk Subgroup Grade C5-Dc) 7.00-7.60m: White mottled orangish brown.	(1.10)		7
		C	7.50 - 9.00			97% 77% 0%			7.60	-5.36	
8								Extremely weak and very weak low to medium density white mottled orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely to closely spaced infilled with comminuted chalk (<3mm). (White Chalk Subgroup Grade B3-B4) 8.35-12.80m: Widely spaced thin beds of rinded flint cobbles and gravel (<130mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			8
		D	8.80								
9		C SPT	9.00 - 10.50 9.00 - 9.45	S 23		82% 38% 26%					9
10		CS	9.95 - 10.25					9.80-10.10m: Discontinuities are horizontal extremely closely and very closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5]	(5.25)		10
		D	10.30								
		C	10.50 - 12.00			92% 43% 13%					
11								11.00-11.20m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<5mm). Possibly drilling disturbed. [Grade C5-Dc] 11.40-11.50m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<5mm). Possibly drilling disturbed. [Grade C5-Dc] 11.50-12.00m: Discontinuities are horizontal closely spaced infilled with comminuted chalk (<1mm). [Grade B3]			11
		D	11.80								
12		C SPT	12.00 - 12.50 12.00 - 12.45	S 21		100% 16% 0%		11.80-11.85m: Indistinctly thinly laminated, mottled grey. 12.00-12.85m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<5mm). Possibly drilling disturbed. [Grade C5-Dc]			12
		C	12.50 - 14.00			99% 52% 31%					
13								*(continued on next sheet)*	12.85	-10.61	13

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
11/11/2015	12.00	6.00	1.80
12/11/2015	12.00	6.00	1.50

CC ROTARY LOG C4872.GPJ GINT STD AGS 3_1.GDT 21/1/16

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ROTARY BOREHOLE LOG

Borehole No. **BH106**

Sheet 3 of 6

T [redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		D	13.50					Very weak low to medium density white locally mottled brown and orangish brown CHALK. Discontinuities are sub-horizontal to horizontal very closely to closely spaced infilled with comminuted chalk (<1mm) stained orangish brown. (White Chalk Subgroup Grade B3-B3) *(continued from previous sheet)*			
14		C SPT	14.00 - 14.30 14.00 - 14.45	S 23		83% 50% 0%		13.30-14.20m: Closely to medium spaced thin beds of rinded flint cobbles and gravel (<70mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			14
		C	14.30 - 15.80			89% 50% 8%		13.50-13.60m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<3mm). Possibly drilling disturbed. [Grade B5-Dc] 13.80-13.85m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<3mm) stained orangish brown and yellowish brown. Possibly drilling disturbed. [Grade B5-Dc] 13.85-14.30m: Discontinuity is sub-vertical, clean stained orangish brown. 14.30-15.70m: Discontinuities are sub-vertical and sub-horizontal extremely closely and very closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5]			
15		D	15.00								15
		C	15.80 - 17.30			88% 37% 29%		15.95-23.70m: Medium to widely spaced thin beds of rinded flint cobbles and gravel (<100mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			
16		D	16.50					16.60-16.70m: Discontinuities are sub-horizontal extremely closely spaced infilled with comminuted chalk (<3mm). [Grade B5]	(7.20)		16
17								16.70-17.90m: Discontinuities are vertical to sub-vertical very closely spaced infilled with comminuted chalk (<1mm).			17
		C SPT	17.30 - 18.80 17.30 - 17.75	S 44		100% 43% 33%		17.30-17.60m: Locally with brown mottling.			
18		D	18.00					18.00-19.20m: Discontinuities are sub-horizontal and horizontal closely to medium spaced infilled with comminuted chalk (<1mm). [Grade B2-B3]			18
		CS	18.40 - 18.64					18.10-18.50m: Indistinctly thinly laminated locally mottled grey.			
		C	18.80 - 20.30			99% 42% 33%					
19								18.90-19.20m: Discontinuity is sub-vertical to 45°, with infill of comminuted chalk (<1mm) locally stained orangish brown.			19
		D	19.50					19.50-19.75m: Discontinuities are vertical to sub-vertical extremely closely and very closely spaced infilled with comminuted chalk (<1mm) stained yellowish brown.			
20								19.90-20.10m: Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<1mm) stained orangish brown and yellowish brown. Possibly drilling disturbed. [Grade B5-Dc]	20.05	-17.81	20
		C SPT	20.30 - 21.80 20.30 - 20.75	S 45		100% 67%		*(continued on next sheet)*			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

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Borehole No. **BH106**

Sheet 4 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
21		D	20.90			44%		Very weak to weak medium density white locally mottled orangish brown CHALK. Discontinuities are sub-horizontal and horizontal closely spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B3) *(continued from previous sheet)* 20.40-20.65m: Very closely spaced thin beds of rinded flint cobbles and gravel (<140mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded. 21.00-21.80m: Discontinuities are sub-horizontal to horizontal medium spaced infilled with comminuted chalk (<3mm). [Grade B2]	(2.05)		
		CS	21.35 - 21.70								
		C	21.80 - 23.30			100% 81% 76%					
22		CS	22.05 - 22.45						22.10	-19.86	
								Weak medium density white locally mottled orangish brown CHALK. Discontinuities are sub-horizontal and horizontal medium spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B2-B3) 22.40-22.50m: Mottled grey. 22.50-22.60m: Discontinuities infilled with very soft indistinctly thinly laminated grey clayey silt. [Marl] 22.54m: Sub-horizontal discontinuity infilled with yellowish brown sand (<2mm). 22.87m: Sub-horizontal discontinuity infilled with yellowish brown sand (<5mm).			
23		D	23.20								
		C	23.30 - 24.60	S*97		71% 6% 6%		23.30-23.70m: Drilling disturbed.			
		SPT	23.30 - 23.65								
								23.70-23.80m: Locally mottled orangish brown and reddish brown.	(3.20)		
24								24.00-24.20m: Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<3mm). [Grade B4-Dc] 24.05-25.35m: Closely spaced thin beds of rinded flint cobbles and gravel (<100mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			
		D	24.40								
		C	24.60 - 26.10								
25						107% 53% 28%					
								Very weak to weak medium density white locally mottled orangish brown CHALK. Discontinuities are sub-horizontal and horizontal closely spaced to medium spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B2-B3) 25.75-26.10m: Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm). 26.10-28.95m: Very closely to closely spaced thin beds of rinded flint cobbles and gravel (<100mm) locally mottled orangish brown. Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.	25.30	-23.06	
26		D	26.00								
		C	26.10 - 27.60			86% 51% 41%					
27											
		CS	27.40 - 27.60								
		C	27.60 - 28.70	S*120		95% 27%		27.60-27.75m: Drilling disturbed recovered as slightly gravelly silty sand. Gravel is angular to sub-angular fine			
		D	27.60								

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
12/11/2015	23.30	6.00	1.60
13/11/2015	23.30	6.00	1.55

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ROTARY BOREHOLE LOG

Borehole No. **BH106**

Sheet 5 of 6

[redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28		SPT	27.60 - 27.85			18%		to medium chalk and flint. Very weak to weak medium density white locally mottled orangish brown CHALK. Discontinuities are sub-horizontal and horizontal closely spaced to medium spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B2-B3) *(continued from previous sheet)*			
		D	28.60					27.90-28.20m: Discontinuity is sub-vertical infilled with comminuted chalk (<1mm).			
		C	28.70 - 30.20			97% 66% 27%		28.10-28.20m: 1no. sub-rounded rinded flint cobble (<140mm).			
29								28.90-31.50m: Closely to medium spaced thin beds of rinded flint cobbles and gravel (<140mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			
30		D	30.10								
		C	30.20 - 31.70	S*111		100% 73% 65%			(9.85)		
		SPT	30.20 - 30.46								
		CS	30.55 - 30.85								
31											
		D	31.60								
		C	31.70 - 33.20			97% 91% 83%					
32		CS	32.00 - 32.25					32.20-34.70m: Closely to medium spaced thin beds of rinded flint gravel. Gravel is sub-angular to rounded fine to coarse.			
								32.65-32.70m: Discontinuity is sub-horizontal infilled with comminuted chalk (50mm). Discontinuity surfaces mottled grey.			
33		D	33.10								
		C	33.20 - 34.70	S*136		100% 35% 32%					
		SPT	33.20 - 33.37								
34											
		D	34.60								
		C	34.70 - 35.00			0% 0% 0%					
35		SPT	35.00 - 35.15	S*150							

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
13/11/2015	33.20	6.00	1.60
17/11/2015	33.20	6.00	1.65

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ROTARY BOREHOLE LOG

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Borehole No. **BH106**

Sheet 6 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494433 N 99598	Hole Type DS+RC
Location: Bognor Regis		Level: 2.24mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 11/11/2015 End: 17/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Borehole completed at 35.15m	35.15	-32.91	

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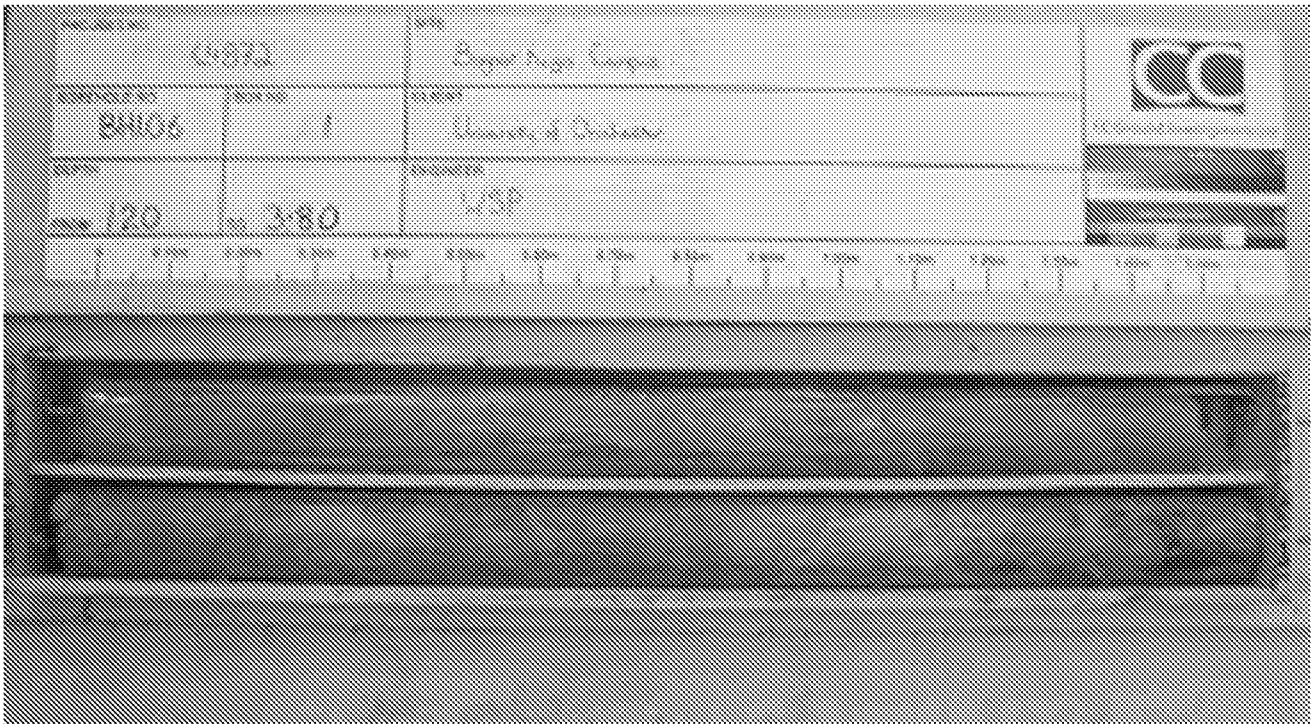
Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
17/11/2015	35.15	6.00	1.70

Borehole Photograph





CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH106

ARUN DISTRICT COUNCIL BR/72/22/PL

Borehole Photograph

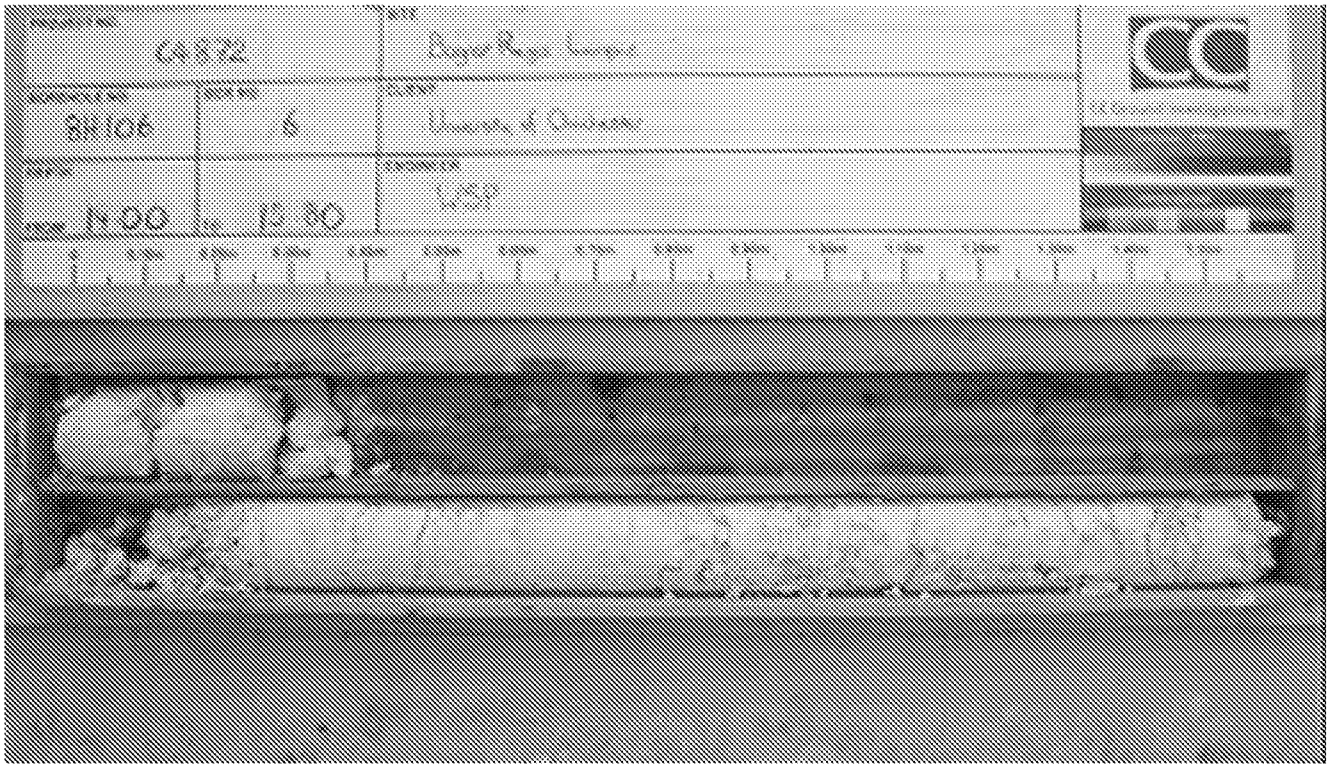




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH106

Borehole Photograph





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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH106

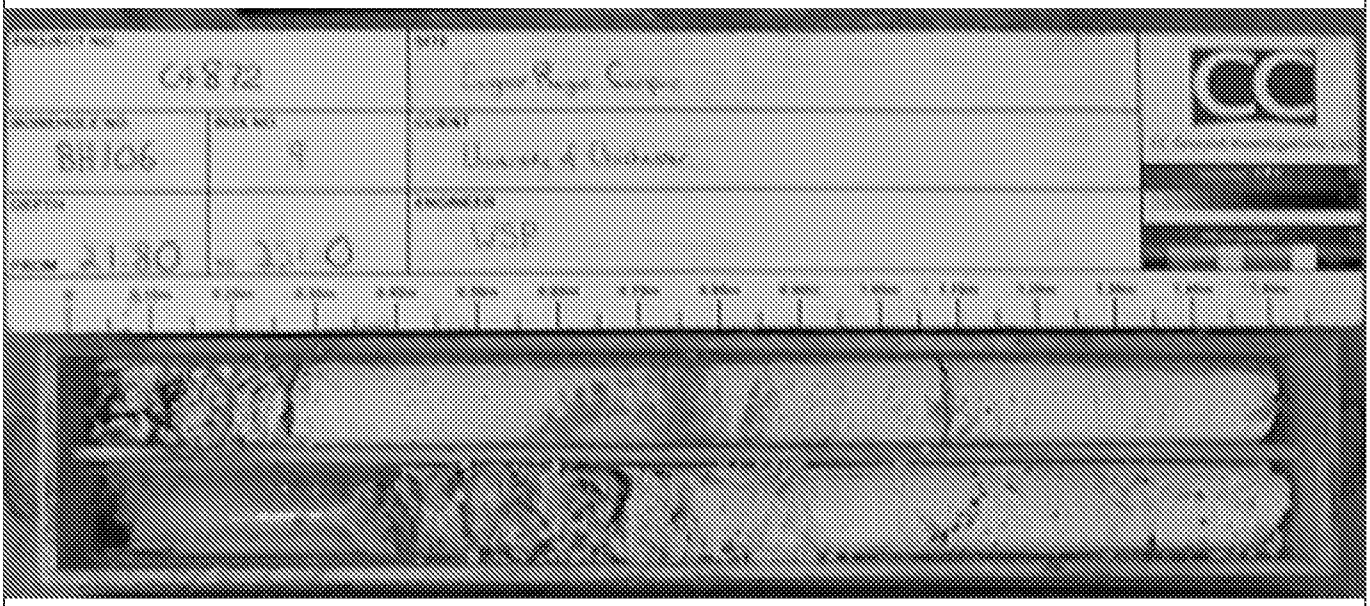
Borehole Photograph

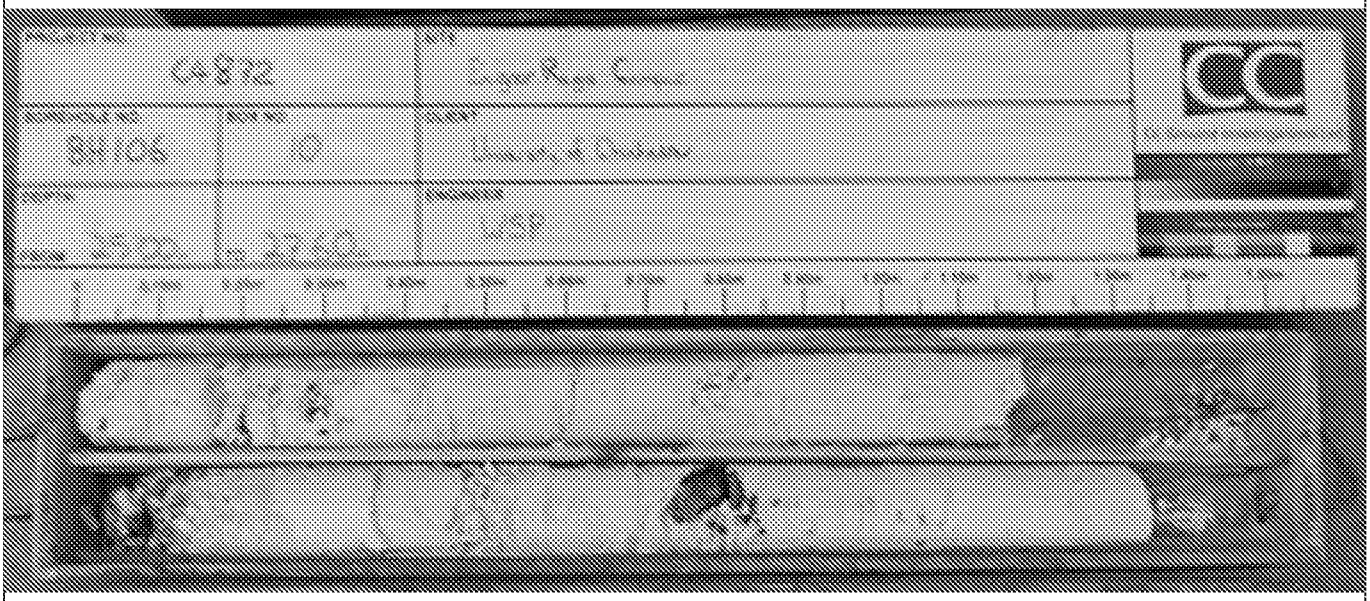




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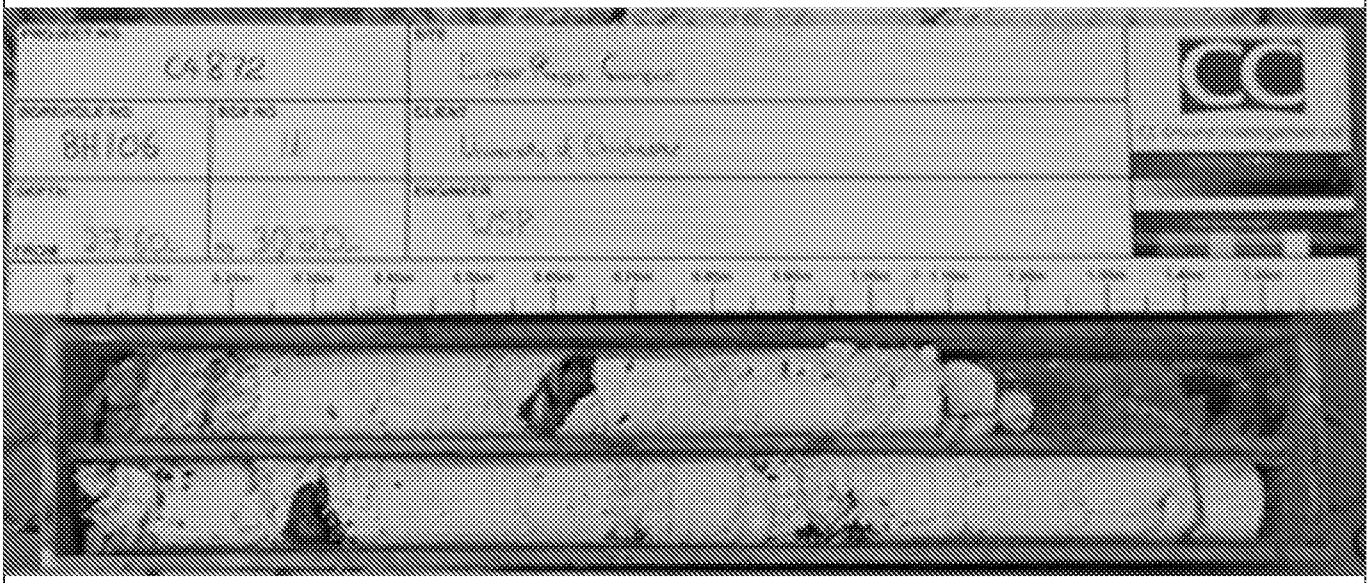
Borehole Photograph

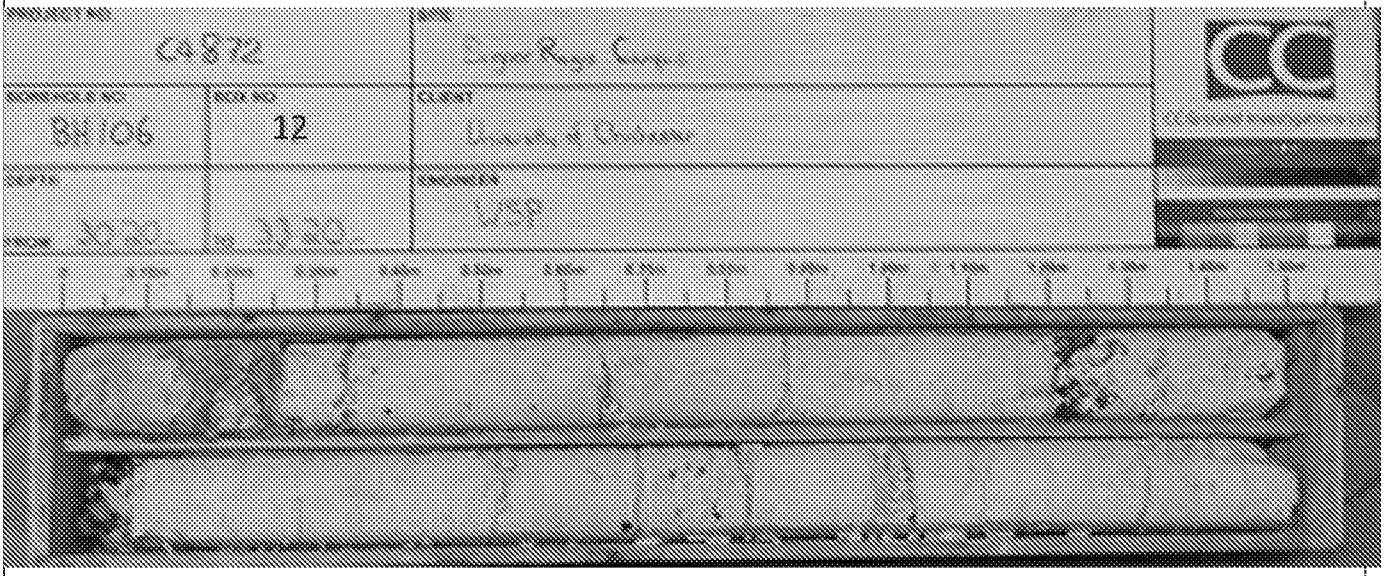




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
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Borehole Photograph



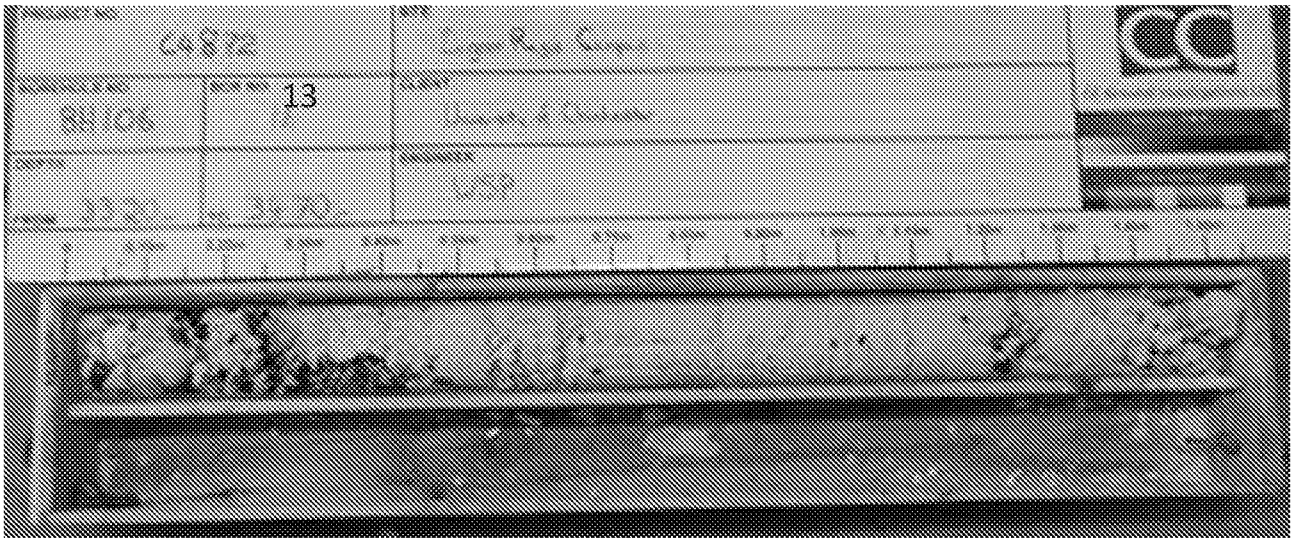


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Contract Name:	University of Chichester
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ARUN DISTRICT COUNCIL BR/72/22/PL

Borehole Photograph



CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH106

ARUN DISTRICT COUNCIL BR/72/22/PL

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ROTARY BOREHOLE LOG

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Borehole No. **BH107**

Sheet 1 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494418 N 99623	Hole Type DS+RC
Location: Bognor Regis		Level: 1.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 09/11/2015 End: 12/11/2015	Logged By DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B	0.20					MADE GROUND: Grass over soft brown mottled orangish brown slightly sandy slightly gravelly silty CLAY with frequent rootlets (<1mm). Gravel is angular to sub-rounded fine to medium brick, sandstone, mudstone and siliceous material.	(0.40)		
		ES							0.40	1.51	
		B	0.50					Soft grey mottled yellowish brown and orangish brown slightly sandy silty CLAY. (Superficial Deposits)	(0.50)		
		ES	0.60						0.90	1.01	
1		B	1.00					Grey mottled orangish brown clayey sandy GRAVEL with occasional pockets of clay (<10mm). Gravel is sub-rounded to rounded fine to coarse flint. (Superficial Deposits)	(0.30)		1
		ES	1.10						1.20	0.71	
	1	B	1.20 - 2.20	S 18				Medium dense brown and reddish brown slightly silty slightly sandy GRAVEL. Gravel is sub-rounded to rounded fine to coarse of flint. (Superficial Deposits)			
	1	SPT	1.20 - 1.65						(1.00)		
2									2.20	-0.29	2
		B	2.20 - 2.50					Light greenish grey silty gravelly SAND. Gravel is sub-angular to sub-rounded fine to coarse of flint (Superficial Deposits)	(0.30)		
									2.50	-0.59	
		SPT	2.70 - 3.15	S 35				Dense brown, reddish brown and light greenish grey silty sandy GRAVEL. Gravel is sub-rounded to rounded fine to coarse of flint. (Superficial Deposits)			
3		B	3.00 - 3.50						(1.00)		3
		D	3.50 - 3.55					Orange brown silty slightly gravelly SAND. Gravel is sub-rounded to rounded fine to coarse of flint. (Superficial Deposits)	3.50	-1.59	
		D	3.55 - 3.60						3.55	-1.64	
		B	3.60 - 3.90						3.60	-1.69	
		D	3.90 - 4.10					Light bluish grey sandy slightly gravelly clayey SILT with rootlets (Superficial Deposits)	(0.55)		
4		H	4.10	H 45				Brown, reddish brown and light greenish grey silty very sandy GRAVEL. Gravel is sub-rounded to rounded fine to coarse of flint. (Superficial Deposits)	3.90	-1.99	4
		SPT	4.20 - 4.65	S 5							
		H	4.50	H 65				Soft to firm dark reddish brown CLAY. (Lambeth Group)	(1.10)		
		H	4.80	H 40				4.70m: Becoming mottled reddish brown. 4.80m: Becoming grey.			
		H	4.90	H 60							
5		D	5.00 - 5.15					Stiff orangish brown mottled grey and brown slightly sandy slightly gravelly silty CLAY. Gravel is sub-rounded to rounded fine to coarse of flint. (Lambeth Group)	5.00	-3.09	5
		SPT	5.20 - 6.15	S 34					5.15	-3.24	
								Orangish brown, reddish brown and white slightly sandy gravelly to gravelly CLAY with occasional cobbles. Gravel is sub-angular to sub-rounded fine to coarse of chalk and flint. Cobbles are sub-angular to sub-rounded of chalk.	(0.45)		
		D	5.65						5.60	-3.69	
								(continued on next sheet)	(0.60)		
6											6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (128mm diam) 1.20-15.50m. Water flush rotary coring using T6-146 coring barrel: 15.50-35.00m.
GROUNDWATER: Standing at 1.50m following sample run 1.20-2.70m. Rising and settling at 1.30m following five minute monitoring period.
CASING: 160mm diameter casing to 16.00m.
INSTALLATION: Bentonite pellet seal: 34.75-35.00m. 50mm ID HDPE slotted pipe with washed gravel response zone: 6.75-34.75m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-6.75m. Flush 150mm steel cover set in concrete 0.00-0.20m Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
09/11/15	1.50	Nil	1.30

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
09/11/2015	5.10	4.20	2.20
10/11/2015	5.10	4.20	1.50

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ROTARY BOREHOLE LOG

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Borehole No. **BH107**

Sheet 2 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494418 N 99623	Hole Type DS+RC
Location: Bognor Regis		Level: 1.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 09/11/2015 End: 12/11/2015	Logged By DM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Structureless CHALK composed of firm to stiff white mottled light orange brown slightly sandy slightly gravelly to gravelly SILT. Clasts are extremely weak low density. (White Chalk Subgroup Grade Dm) *(continued from previous sheet)*	6.20	-4.29	
7		D	7.00					Structureless CHALK composed of white mottled light yellow and light orangish brown silty to very silty very sandy angular to sub-angular fine to coarse GRAVEL with occasional sub-angular cobbles. Flints are dark brown to very dark brown sub-rounded to rounded coarse gravel size nodular (White Chalk Subgroup Grade Dc)	(1.30)		7
		SPT	7.20 - 7.65	S 16							
									7.50	-5.59	
8		D	8.40					Extremely weak low density locally very weak low to medium density white CHALK. Discontinuities are randomly orientated extremely closely spaced rough undulating and stepped tight to moderately wide with comminuted silt infill within open to moderately wide discontinuities. Flints are very dark brown coarse gravel size nodular medium to widely spaced. (White Chalk Subgroup Grade C4/5) 7.70m: Light orangish brown staining with slight sand smear along discontinuity. 8.15m: Soft light brown clayey silt (<5mm) around very dark brown with light grey rinded nodular flint.			8
		SPT	8.60 - 9.05	S 42							
9											9
		D	9.70					9.70m: <10mm comminuted silt infill around very dark brown / black nodular flint. 9.80m: <10mm comminuted silt infill around very dark brown / black nodular flint.			
10		SPT	9.90 - 10.35	S 17				10.20m: Light grey marl lens and some orange brown discolouration along discontinuity.			10
11		D	11.10								11
		SPT	11.30 - 11.75	S 49				11.50-11.70m: Very closely to closely spaced coarse gravel size very dark brown / black nodular flints.	(6.00)		
12								12.20m: Very dark brown / black with light grey / white rinded coarse gravel size flint. 12.20m: Flints becoming very widely spaced.			12
		D	12.60								
13		SPT	12.70 - 13.15	S 22							13

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Borehole No. **BH107**

Sheet 3 of 5

Telephone [redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494418 N 99623	Hole Type DS+RC
Location: Bognor Regis		Level: 1.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 09/11/2015 End: 12/11/2015	Logged By DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
14		D SPT	14.00 14.10 - 14.55	S 31				Extremely weak low density locally very weak low to medium density white CHALK. Discontinuities are randomly orientated extremely closely spaced rough undulating and stepped tight to moderately wide with comminuted silt infill within open to moderately wide discontinuities. Flints are very dark brown coarse gravel size nodular medium to widely spaced. (White Chalk Subgroup Grade C4/5) *(continued from previous sheet)*			
15		D C SPT	15.40 15.50 - 17.00 15.50 - 15.74	S*167		100% 57% 42%		15.40m: Very dark brown / black nodular flint (recovered as fine to coarse gravel size fragments - drilling induced fracturing).	15.50	-13.59	
16		C CS	16.20 - 17.00 16.40 - 16.59		C C			Very weak medium density white CHALK with medium spaced flints. Bedding discontinuities are sub-horizontal closely to medium spaced (110/210/380) rough undulating tight to partly open predominantly clean with occasional silt smear. Flints are very dark brown with light grey rind coarse gravel size to cobble size nodular. (White Chalk Subgroup Grade B2/3). 15.50-15.95m: Non-intact. Disturbed by SPT. 16.10-16.22m: Locally discontinuities are extremely to very closely spaced rough stepped and undulating with comminuted silt infill >3mm around coarse gravel size flint. (Locally Grade C5) 16.35m: Light brown discolouration along 30° discontinuity. 16.85m: Light grey brown discolouration along sub-horizontal discontinuity.	(1.98)		
17		D C	16.95 - 17.00 17.00 - 18.50			100% 68% 27%		17.00-17.10m: Locally extremely weak low density with extremely closely spaced thin marl laminations of light grey marl. 17.00m-17.48m: Sub-vertical to 80° rough undulating and stepped closed discontinuity. From 17.30m: Discontinuity becoming tight with light brown discolouration along surface. 17.30m-17.35m: White calcite mineralisation (<2mm thick) along discontinuity.	17.48	-15.57	
18		CS D	17.70 - 17.90 18.19 - 18.26		C C				17.70	-15.79	
19		C CPT CS	18.50 - 20.00 18.50 - 18.87 18.97 - 19.14	S*68		93% 21% 7%		Extremely weak to very weak low to medium density white CHALK with extremely closely spaced thin light grey marl laminations and very closely spaced fossil shell fragments. Discontinuities are sub-horizontal very closely spaced (50/150) rough undulating tight to moderately wide with light grey silt infill (degraded marl) <10mm. (White Chalk Subgroup Grade C3/4) 17.48m: White calcite mineralisation (<2mm thick) along sub-horizontal discontinuity.	(2.82)		
20		D C	19.80 - 19.85 20.00 - 21.50		C	100% 43% 7%		Very weak medium density white CHALK with very closely spaced very light grey marly lenses. Bedding discontinuities are sub-horizontal closely to medium spaced (80/210/380) rough undulating predominantly tight clean with occasional silt smear. Flints are very dark brown with white rind nodular recovered as medium to coarse gravel size and cobble size fragments. (White Chalk Subgroup Grade B2/3) 17.90-18.00m: Discontinuities are sub-horizontal to sub-vertical very closely spaced (30/40/50) rough stepped tight clean (probably drilling induced). 18.20-19.65m: Sub-vertical rough undulating closed to			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
10/11/2015	15.50	15.10	1.50
11/11/2015	15.50	15.10	1.50

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ROTARY BOREHOLE LOG

Borehole No. **BH107**

Sheet 4 of 5

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Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494418 N 99623	Hole Type DS+RC
Location: Bognor Regis		Level: 1.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 09/11/2015 End: 12/11/2015	Logged By DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		CS	20.52 - 20.67					tight discontinuity with light brown and dark brown mottled discolouration along joint surface. 18.50-18.95m: Non-intact. Disturbed by SPT. 18.85-19.00m: Locally extremely weak low density with comminuted infill (<10mm) around flint cobble. 19.40-19.70m: Locally very weak with extremely closely to very closely spaced randomly orientated discontinuities with some comminuted silt infill (10mm) around flint cobble. (Locally grade C4/5) 19.80-20.00m: Light yellow brown discolouration along sub-horizontal discontinuities. 20.00-20.15m: Locally extremely weak to very weak around coarse gravel size fragments of flint. Discontinuities are randomly orientated extremely closely to very closely spaced tight with silt smear and occasional dark brown discolouration. 20.25-20.52m: 70° rough to smooth undulating discontinuity with light grey and dark brown surface discolouration. 20.40m: Orange brown discolouration along sub-horizontal discontinuity. 20.51-20.52m: Orange brown discolouration along sub-horizontal discontinuity.	20.52	-18.61	
21									(1.28)		21
		D	21.45 - 21.50	S*67					21.80	-19.89	
		C	21.50 - 23.00			100%					
		CPT	21.50 - 21.88			39%					
		CS	21.80 - 22.10			26%					
22											22
		D	22.30								
23		C	23.00 - 24.50			100%		Very weak medium density locally extremely weak to very weak low to medium density preferentially along bedding discontinuities white CHALK with close to medium spaced thin marl laminations. Bedding discontinuities are sub-horizontal closely spaced (90/120/200) rough undulating tight to partly open with some comminuted infill (<3mm). (White Chalk Subgroup Grade B3) *(continued from previous sheet)* 20.68-21.10m: Sub-vertical to 80° rough undulating discontinuity with light brown staining. 21.00-21.10m: 45° rough striated discontinuity with light grey and dark brown staining. 21.20-21.35m: Locally extremely weak low density with extremely closely spaced thin marl laminations. Discontinuities are randomly orientated extremely closely spaced. 21.35m: Dark orangish brown staining. 21.50-21.80m: Non-intact. Disturbed by SPT.			23
		CS	23.10 - 23.30			65%			(2.85)		
						25%					
		D	23.40								
24											24
		D	24.40								
		C	24.50 - 26.00	S.31		87%			24.65	-22.74	
		CPT	24.50 - 24.95			8%					
						0%					
25		D	25.00					Very weak medium density white CHALK with closely spaced very light grey thin to thick marl lenses and medium spaced flints. Bedding discontinuities are sub-horizontal predominantly closely spaced (60/120/150) rough undulating partly open with silt smear. Flints are very dark brown with white rind <50mm thick nodular. (White Chalk Subgroup Grade B3) 21.80-22.15m: Medium spaced discontinuities. 22.65-23.00m: Sub-vertical rough undulating and stepped discontinuity with slight silt smear. Preferentially very weak with extremely closely to very closely spaced discontinuities along joint. 23.30-23.75m: Closely spaced very dark brown flint bands (<30mm thick). 24.15m: Extremely closely spaced discontinuities around flint. 24.65-25.00m: Non-intact. Disturbed by SPT.	(1.35)		25
		D	25.95 - 26.00			100%			26.00	-24.09	
26		C	26.00 - 27.50			75%					26
						54%					
		CS	26.40 - 26.71								
								Very weak medium density white CHALK with closely spaced very light grey thin to thick marl lenses and medium spaced flints. Bedding discontinuities are sub-horizontal predominantly closely spaced (60/100/200) rough undulating. (White Chalk Subgroup Probable Grade B3) 25.40-25.90m: Sub-vertical rough undulating discontinuity with extremely closely spaced dark brown specs.	(1.50)		
27											27
		C	27.50 - 29.00	S*94		97%			27.50	-25.59	
		CPT	27.50 - 27.81			45%					
						21%		Very weak medium density white CHALK with very closely to closely spaced thin light grey laminations and			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
11/11/2015	27.50	16.00	3.40
12/11/2015	27.50	16.00	1.50

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ROTARY BOREHOLE LOG

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Borehole No. **BH107**

Sheet 5 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494418 N 99623	Hole Type DS+RC
Location: Bognor Regis		Level: 1.91mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 09/11/2015 End: 12/11/2015	Logged By DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								lenses. Discontinuities are closely to medium spaced (65/280/350) rough undulating wide (<40mm) infilled with slightly silty slightly sandy angular to sub-angular fine to coarse gravel of chalk and flint. (White Chalk Subgroup GradeC2/3)	(0.67)		
28									28.17	-26.26	28
					C			26.00-26.10m: Non-intact. Recovered as slightly silty sandy fine to coarse gravel of chalk and flint (probable drilling induced disturbance).			
		B	28.70					26.50-26.75m: 45° rough undulating discontinuity with very pale brown silt smear. Preferentially fractured (extremely closely spaced) around joint.	(1.09)		
		D	28.90					26.80m: Becoming Grade A2/3. Discontinuities becoming tight to partly open clean.			
29		C	29.00 - 30.50			100% 97% 75%		27.50-27.58m: Drilling disturbed; chalk cobble recovered.	29.26	-27.35	29
								27.58-27.76m: Band of sub-angular and sub-rounded fine to coarse gravel and cobbles of flint.			
								Very weak medium density white with occasional orangish brown staining CHALK. Discontinuities are very closely and closely spaced spaced (20/40/80) infilled with (1/2/5) white comminuted chalk, lightly orangish brown stained. (White Chalk Subgroup Grade C4-5) *(continued from previous sheet)*			
		CS	29.75 - 30.10		C			28.12-28.17m: Band of structureless grade Dc chalk.			
30											30
		C	30.50 - 32.00	S*107		97% 73% 58%		Weak medium density white CHALK. Discontinuities are very closely and closely spaced (NI/60/130) locally infilled (0/3/20) with white comminuted chalk. (White Chalk Subgroup Grade B2-3)			
		CPT	30.50 - 30.79					28.38-28.40m: Band of sub-angular coarse flint gravel.			
								Very weak medium density white CHALK. Discontinuities are closely and medium spaced locally extremely closely and very closely spaced (10/120/340) rarely locally infilled (0/0/2) with white comminuted chalk. (White Chalk Subgroup Grade A2-3)			
31		D	30.90					30.22-30.35m: Band of sub-rounded fine and medium flint gravel.			31
		CS	31.30 - 31.56		C			30.50-30.55m: Band of sub-rounded fine and medium flint gravel.			
		B	31.56					30.60-30.80m: sub-vertical to 60° undulating rough fracture.			
								31.18-31.30m: Band of low and medium density grade B4-5 chalk.			
32		C	32.00 - 33.50			87% 67% 39%		31.60-31.80m: With occasional sub-angular and sub-rounded fine to coarse gravel sized light grey staining.	(5.74)		32
		D	32.50		C			31.85-31.90m: Band of sub-angular and sub-rounded medium and coarse flint gravel.			
								32.10-32.20m: Band of sub-angular and sub-rounded fine to coarse flint gravel.			
								32.68-32.75m: Drilling disturbed; recovered non intact as sub-angular fine to coarse gravel sized fragments.			
33		CS	32.97 - 33.15								33
		B	33.18					33.20-33.25m: Band of angular and sub-angular fine to coarse flint gravel.			
		C	33.50 - 35.00	S*103		92% 57% 51%		33.38-33.50m: Band of angular and sub-angular fine to coarse flint gravel.			
		CPT	33.50 - 33.79					33.55-33.60m: Band of sub-angular and sub-rounded fine to coarse flint gravel.			
								33.75-33.80m: Band of sub-angular and sub-rounded fine to coarse flint gravel.			
34											34
		CS	34.20 - 34.53		C			34.12-34.21m: Band of medium density grade B5 chalk.			
		B	34.67					34.62-34.66m: sub-rounded coarse gravel sized flint nodule.			
		D	34.90					34.82-35.00m: 2 no. sub-vertical very closely spaced parallel undulating rough Discontinuities.	35.00	-33.09	
35											35

Borehole completed at 35.00m

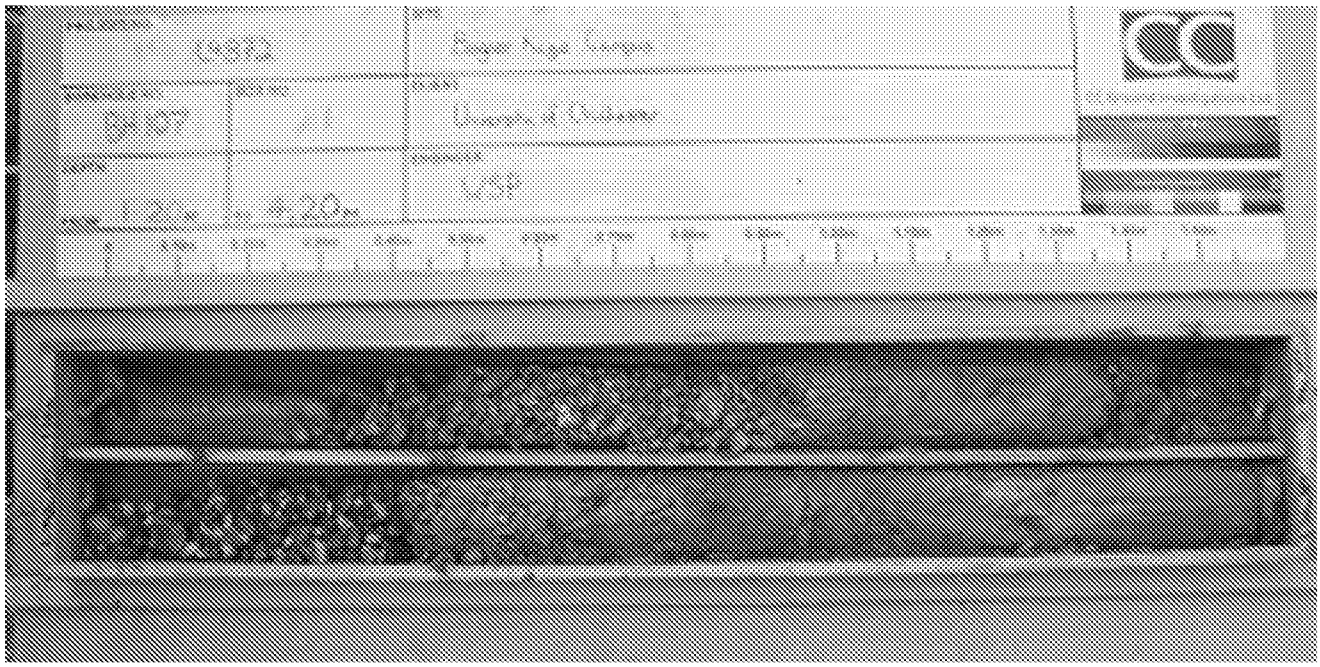
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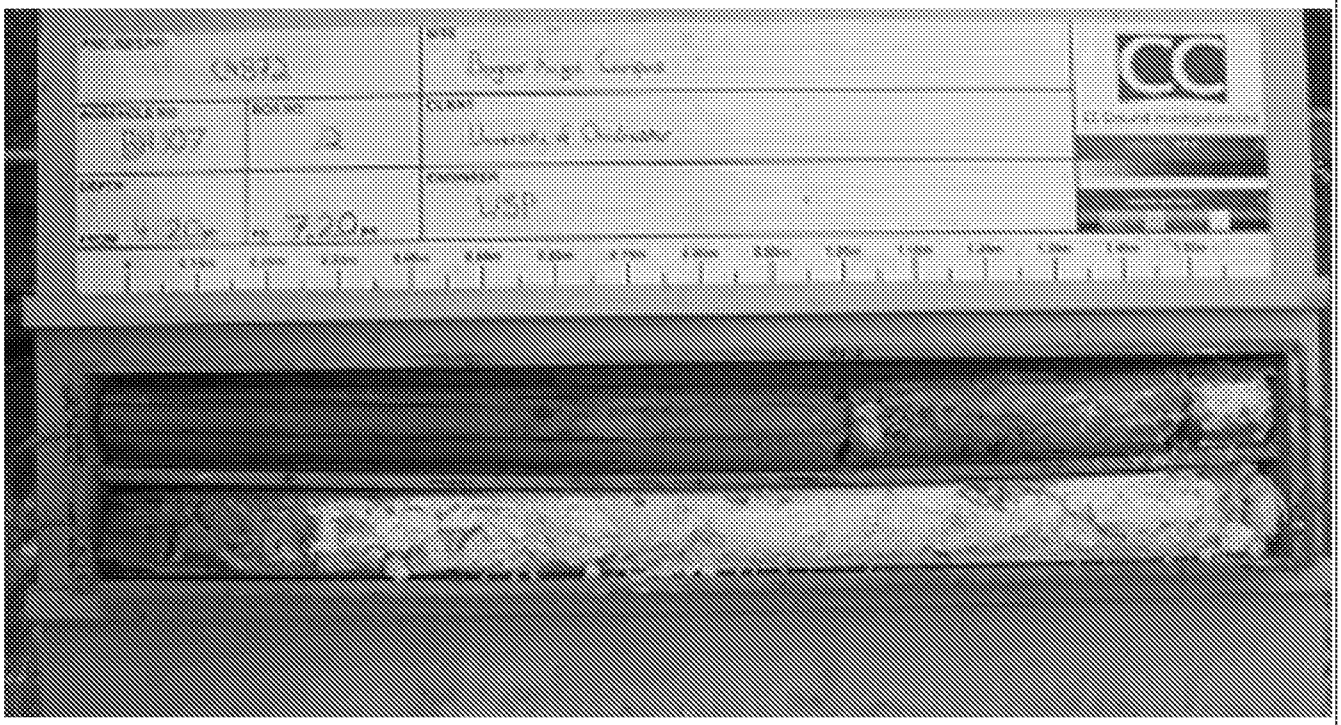
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
12/11/2015	35.00	16.00	3.70

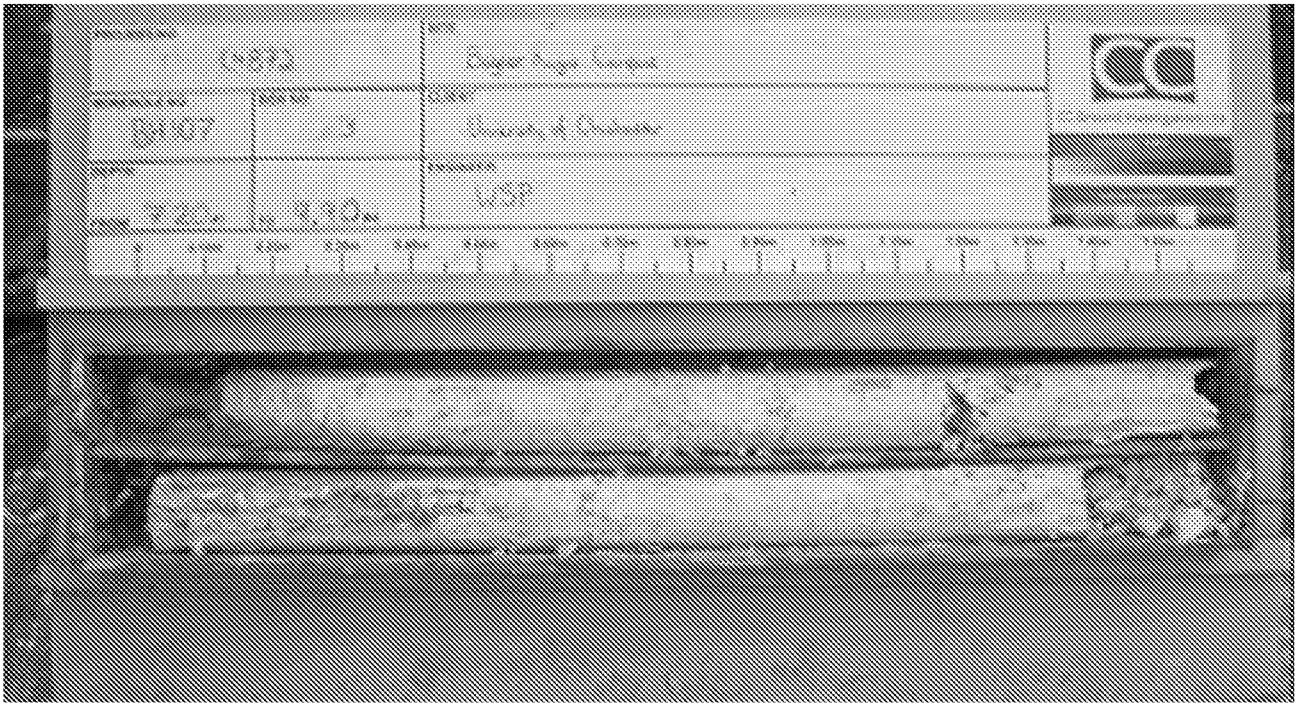
Borehole Photograph





CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH107

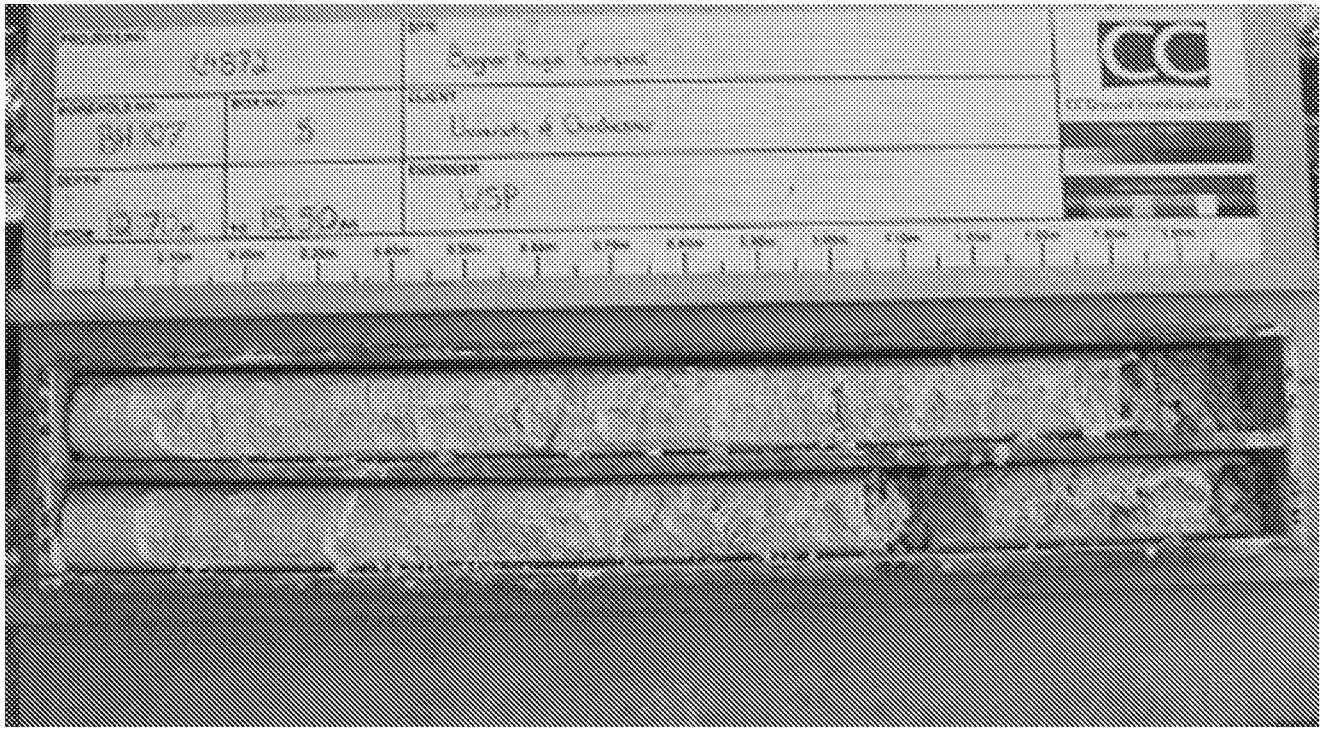
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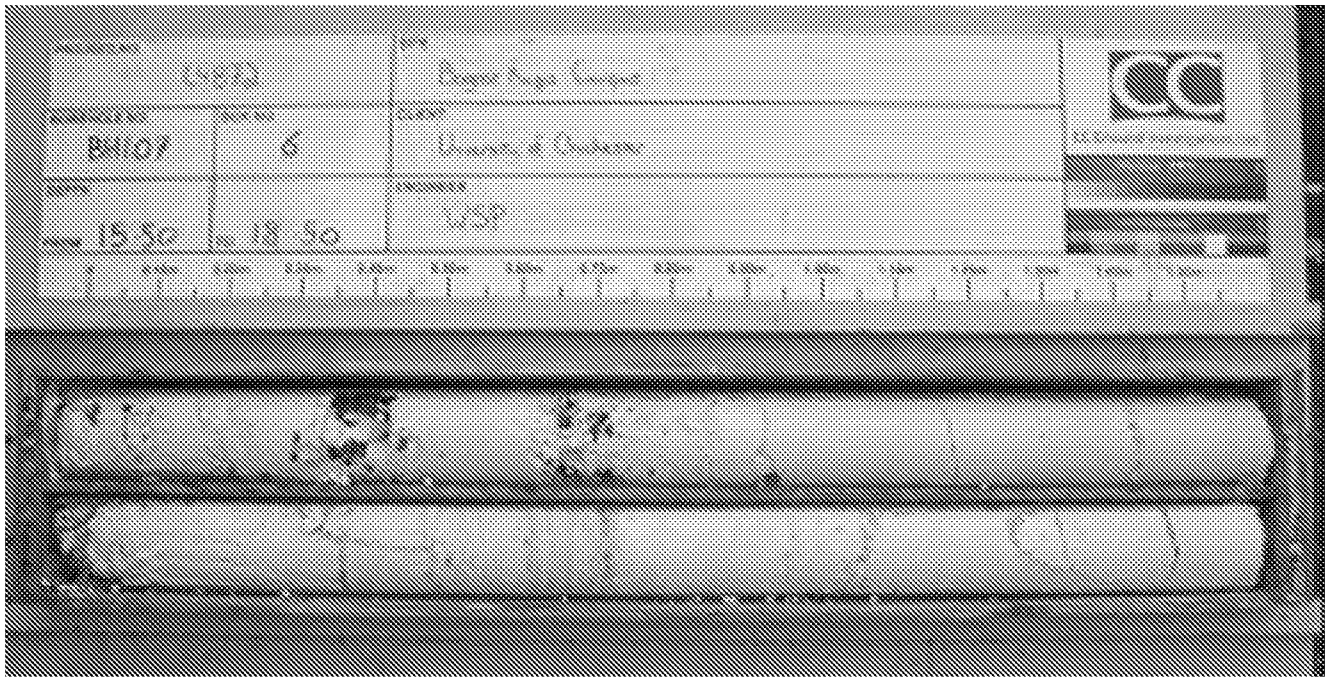




CC Ground Investigations Ltd	Contract Name:	University of Chichester
	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH107

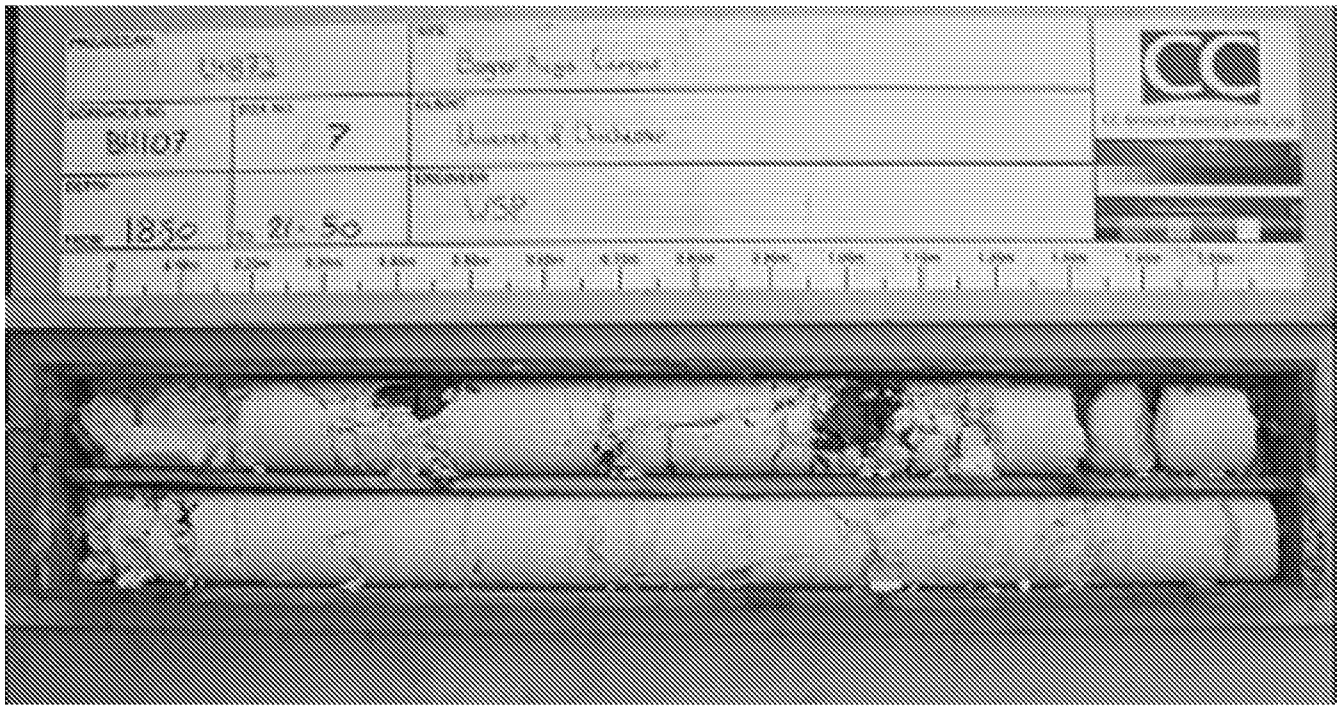
Borehole Photograph





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Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH107

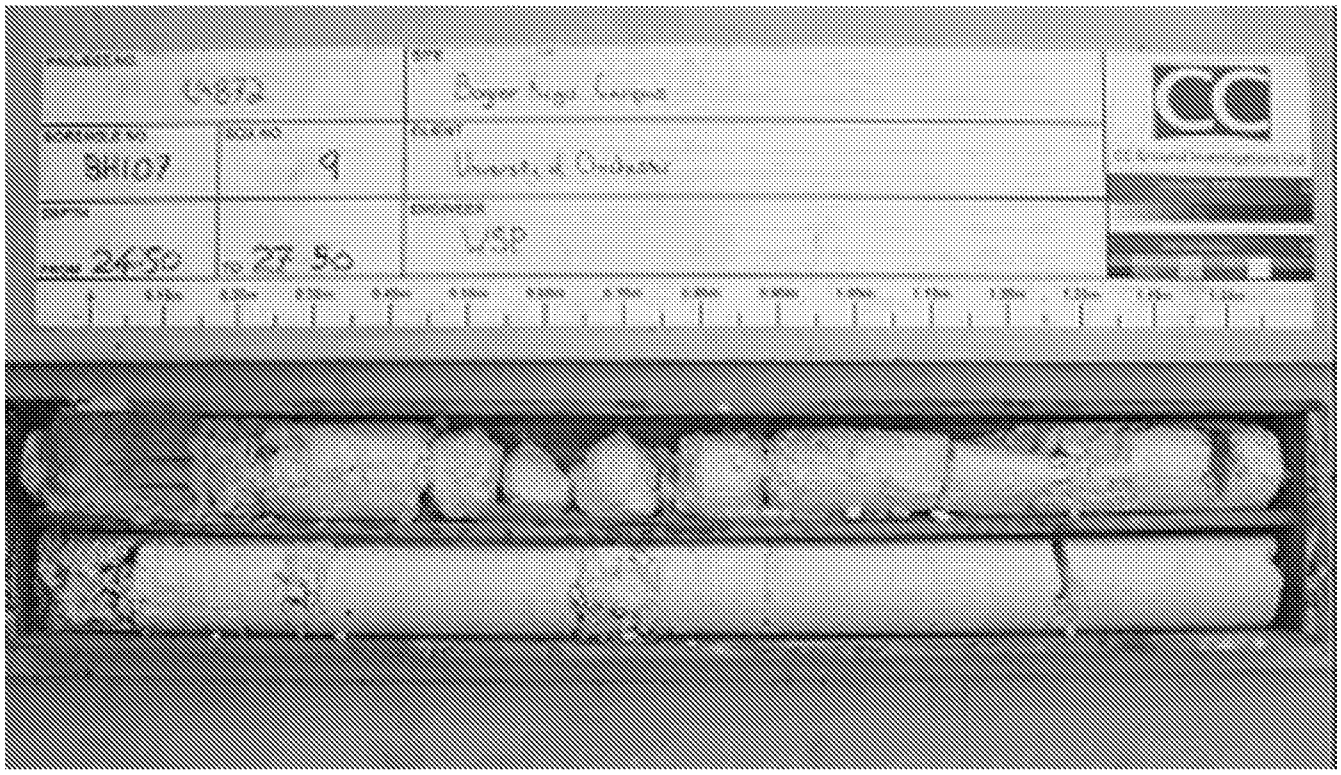
Borehole Photograph

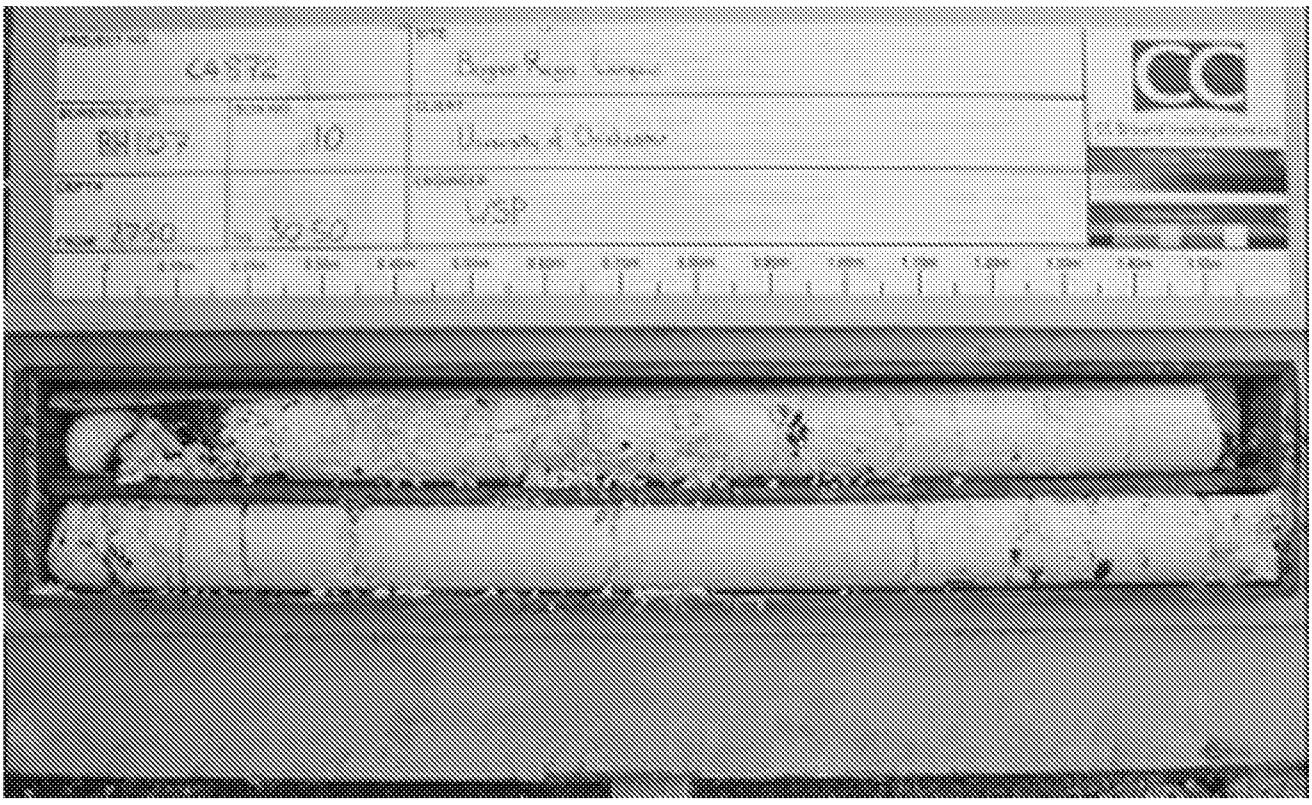




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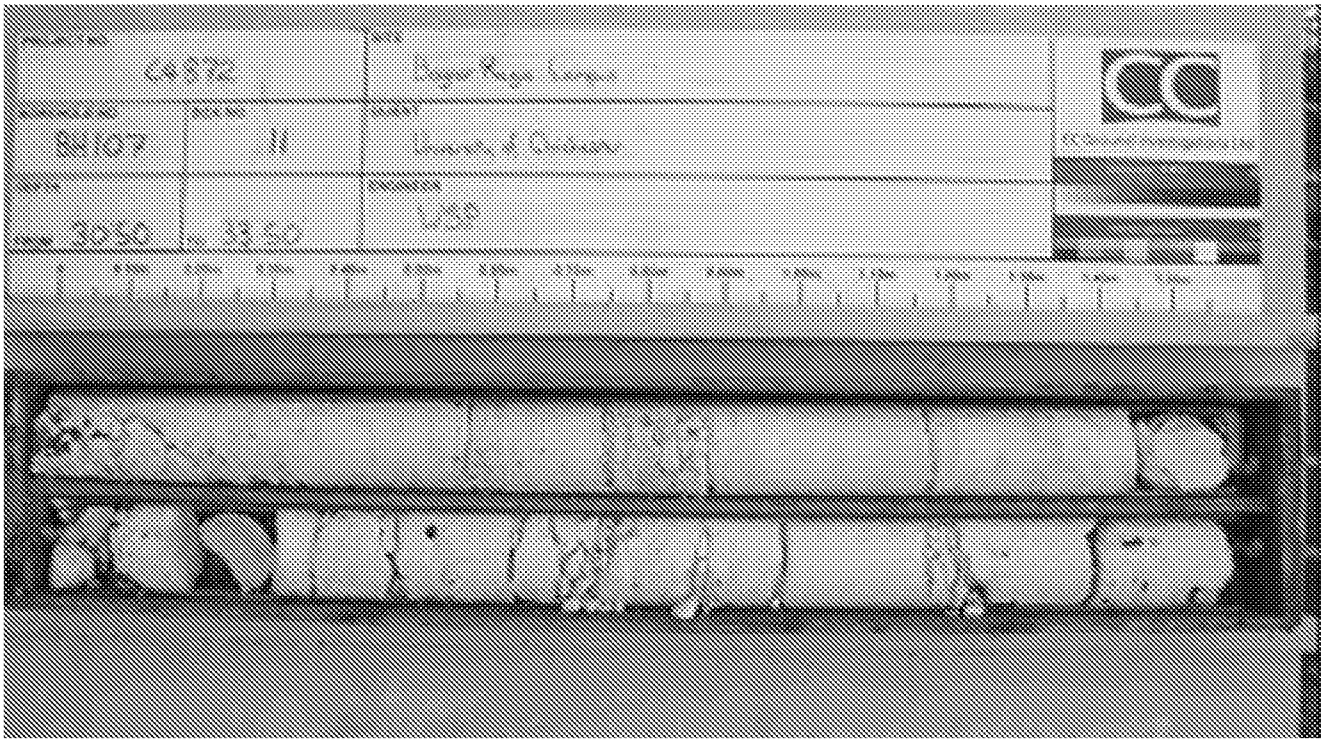
Borehole Photograph

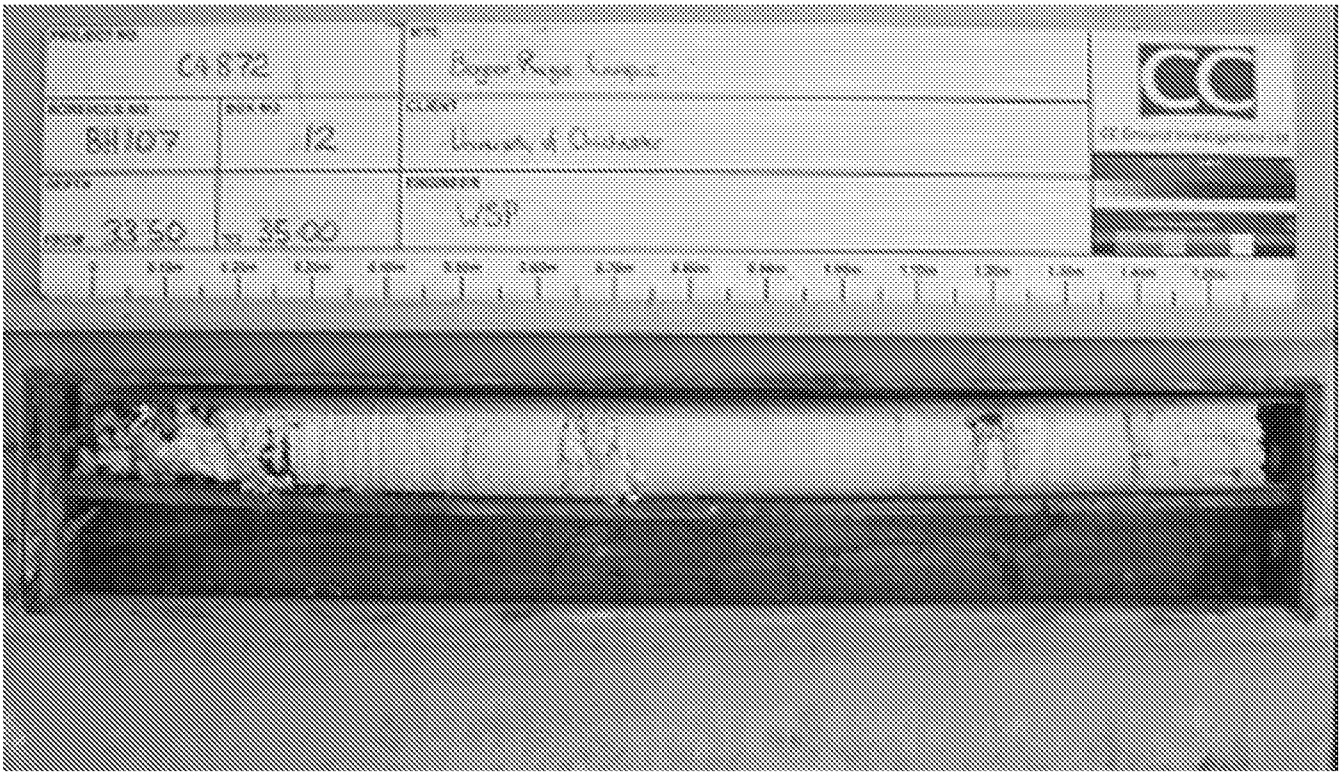




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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH107

Borehole Photograph





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Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH107

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ROTARY BOREHOLE LOG

Telephone [redacted]

Borehole No. **BH108**

Sheet 1 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494417 N 99666	Hole Type DS+RC
Location: Bognor Regis		Level: 1.36mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 09/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B	0.20					MADE GROUND: Grass over soft brown mottled yellowish brown, orangish brown and grey slightly sandy slightly gravelly silty CLAY with frequent rootlets (<1mm). Gravel is angular to sub-rounded fine to coarse brick and siliceous material.	0.10	1.26	
		ES	0.40						(0.30)		
		B	0.50						0.40	0.96	
1	1.1	B	1.00					Soft becoming firm yellowish brown mottled orangish brown and grey slightly gravelly silty CLAY with occasional rootlets (<1mm). Gravel is angular to sub-rounded fine to coarse siliceous material. (Superficial Deposits)			1
		UT100	1.20 - 1.65					Soft grey mottled orangish brown and yellowish brown slightly sandy silty CLAY. (Superficial Deposits) 0.40-1.00m: Locally firm.	(1.35)		
		D	1.65 - 1.75						1.75	-0.39	
2		D	2.00	H 14				Very soft grey mottled black slightly sandy silty CLAY. (Superficial Deposits) 1.90-4.00m: Sand absent.			2
		H						2.20-2.70m: Frequent black partially decomposed roots and rootlets (<3mm).			
		SPT	2.50 - 2.95	S 1							
3									(2.25)		3
		D	3.50	H 12							
		H									
4		UT100	4.00 - 4.45						4.00	-2.64	4
		D	4.45 - 4.55					Very soft to soft grey slightly sandy locally sandy silty CLAY. (Superficial Deposits)			
								4.80-6.40m: Occasional shell fragments (<50mm).			
5		D	5.00	H 13							5
		H									
		SPT	5.50 - 5.95	S 5							
6											6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (128mm diam) 1.20-15.70m. Waterflush rotary core drilled (146mm diam) 15.70-34.40m.
GROUNDWATER: Water seepage at 1.20m. No rise recorded.
CASING: SW casing to 15.70m.
INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 10.00-34.40m, plain pipe with washed gravel response zone: 9.90-10.00m, and bentonite pellet seal: 0.30-9.90m, flush 150mm steel cover set in concrete 0.00-0.30m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
03/11/15	1.20		1.20

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Telephone: 014[redacted]

Borehole No. **BH108**

Sheet 2 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494417 N 99666	Hole Type DS+RC
Location: Bognor Regis		Level: 1.36mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 09/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Very soft to soft grey slightly sandy locally sandy silty CLAY. (Superficial Deposits) *(continued from previous sheet)*	(4.40)		
		D	6.30					6.40-7.00m: Limited recovery.			
7		SPT	7.00 - 7.45	S 2							7
								7.40-7.80m: Occasional wood fragments (<20mm).			
								7.80-8.40m: Frequent wood fragments (<50mm).			
8		D	8.00								8
								8.20-8.40m: Slightly gravelly. Gravel is angular to sub-rounded fine to coarse flint and charcoal.	8.40	-7.04	
		SPT	8.50 - 8.95	S 6				Structureless CHALK composed of yellowish brown mottled grey and white slightly sandy gravelly SILT. Gravel is sub-angular to sub-rounded fine to coarse, very weak, low density chalk. (White Chalk Subgroup Grade Dm)	(0.40)		
									8.80	-7.44	
9								Structureless CHALK composed of white mottled grey slightly sandy silty GRAVEL with a strong sulphurous odour. Gravel is sub-angular to sub-rounded fine to coarse, very weak, low density chalk. (White Chalk Subgroup Grade Dc)	(0.30)		9
									9.10	-7.74	
		D	9.50					Structureless locally indistinctly structured CHALK composed of white mottled grey slightly sandy silty GRAVEL with slight sulphurous odour. Gravel is sub-angular to sub-rounded fine to coarse, very weak, low density chalk. (White Chalk Subgroup Grade Dc locally tending to C5)	(1.30)		
10		SPT	10.00 - 10.45	S 5							10
									10.40	-9.04	
		D	10.70					Extremely weak to very weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal extremely closely and very closely spaced infilled with comminuted chalk (<20mm). (White Chalk Subgroup Grade C4-C5)			
11								10.90-13.90m: Widely spaced very thin to thin beds of rinded flint gravel and cobbles. Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			11
								11.00-11.30m: Structureless. Recovered as slightly sandy gravelly silt. Possibly drilling disturbed.			
12											12
								12.25-12.40m: Discontinuity surfaces locally stained orangish brown.			
		D	12.50								
		B	12.60 - 13.00								
13		SPT	13.00 - 13.45	S 21				12.90-13.30m: Discontinuity surfaces locally stained orangish brown.			13

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
04/11/2015	11.50	11.50	1.10

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ROTARY BOREHOLE LOG

Telephone [redacted]

Borehole No. **BH108**

Sheet 3 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494417 N 99666	Hole Type DS+RC
Location: Bognor Regis		Level: 1.36mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 09/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
14		D	14.00					Extremely weak to very weak medium density white CHALK. Discontinuities are sub-horizontal and horizontal extremely closely and very closely spaced infilled with comminuted chalk (<20mm). (White Chalk Subgroup Grade C4-C5) *(continued from previous sheet)* 13.60-15.10m: Extremely weak low to medium density chalk. 14.00-15.10m: Discontinuities are sub-horizontal to horizontal very closely spaced stained orangish brown infilled with comminuted chalk (<15mm). [Grade C4] 14.20-14.50m: Limited recovery. 14.50-14.80m: Structureless. Recovered as slightly sandy silty gravel. Possibly drilling disturbed.	(6.30)		
15		C SPT	15.70 - 16.80 15.70 - 16.15	S 45		100% 6% 0%		15.10-15.40m: Locally mottled orangish brown and grey. 15.40-15.60m: Discontinuities are sub-horizontal to horizontal extremely closely spaced stained grey infilled with comminuted chalk (<5mm). [Grade C5] 15.85-15.90m: Mottled grey. 16.10-16.15m: Mottled orangish brown.			
16		D	16.50					16.50-16.65m: Rinded flint gravel and cobbles (<70mm). Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.	16.70	-15.34	
17		C CS	16.80 - 18.30 17.10 - 17.35			100% 43% 26%		Extremely weak to very weak medium density white locally mottled grey and orangish brown CHALK. Discontinuities are sub-vertical to sub-horizontal very closely to closely spaced clean or infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade A3-B4) 16.80-17.45m: Closely to medium spaced very thin to thin beds of rinded flint gravel and cobbles. Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded. 17.00-17.08m: Possibly drilling disturbed. 17.30-17.45m: Possibly drilling disturbed.	(1.30)		
18		CS C SPT	18.10 - 18.30 18.30 - 19.80 18.30 - 18.75	S 37		100% 51% 35%		Extremely weak to very weak medium density white locally mottled orangish brown and grey CHALK. Discontinuities are 45° to sub-horizontal closely spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B3) 18.65-18.70m: Possibly drilling disturbed.	18.00	-16.64	
19		CS D	18.80 - 19.10 19.50					18.80-19.10m: Discontinuities are sub-horizontal medium spaced (300mm) with smear of comminuted chalk (<1mm). [Grade B2] 19.10-21.30m: Discontinuities are sub-horizontal and horizontal closely and very closely spaced locally infilled with comminuted chalk (<1mm). [Grade A3-B4]			
20		C	19.80 - 21.30			100% 52% 24%		19.80-21.50m: Closely to medium spaced very thin to thin beds of rinded flint gravel and cobbles. Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

Telephone [redacted]

Borehole No. **BH108**

Sheet 4 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494417 N 99666	Hole Type DS+RC
Location: Bognor Regis		Level: 1.36mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 09/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
21		CS	20.82 - 21.00		C			Extremely weak to very weak medium density white locally mottled orangish brown and grey CHALK. Discontinuities are 45° to sub-horizontal closely spaced infilled with comminuted chalk (<1mm). (White Chalk Subgroup Grade B3) *(continued from previous sheet)*	(6.30)		21
		C SPT	21.30 - 22.80 21.30 - 21.75	S 30		96% 53% 21%					
22					C			21.90-22.80m: Discontinuities are sub-horizontal and horizontal closely spaced infilled with comminuted chalk (<1mm). [Grade B3]			22
		D	22.30					22.30-22.85m: Closely to medium spaced very thin to thin beds of rinded flint gravel and cobbles. Gravel is sub-angular to rounded fine to coarse. Cobbles are sub-rounded.			
		CS	22.60 - 22.80								
		C	22.80 - 24.10			98% 39% 31%		22.85-23.50m: Discontinuities are randomly orientated very closely and extremely closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5]			
23		D	23.40		C			23.50-24.30m: Discontinuities are sub-horizontal and horizontal medium and closely spaced locally infilled with comminuted chalk (<1mm). [Grade B2-B3]			23
		CS	23.85 - 24.10								
24		C SPT	24.10 - 25.60 24.10 - 24.55	S 43		100% 43% 29%		24.25-24.75m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm) with occasional sub-angular to sub-rounded fine to coarse flint gravel. [Grade C4-C5]	24.30	-22.94	24
					C			Very weak to weak medium density white mottled yellowish brown and orangish brown CHALK. Discontinuities are sub-horizontal closely spaced locally infilled with comminuted chalk (<1mm). Very widely and widely spaced rinded flints recovered as angular to sub-rounded gravel and cobbles (<300mm). (White Chalk Subgroup Grade B3-A3)			
25		D	25.10					24.75-25.00m: Discontinuities are sub-vertical to sub-horizontal closely spaced infilled with comminuted chalk (<1mm). [Grade B3]			25
		CS	25.30 - 25.50					25.00-25.15m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm). [Grade C4-C5]			
		C	25.60 - 27.10			100% 85% 67%		25.25-25.30m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm). [Grade C4-C5]			
26					C			25.30-31.60m: Discontinuities are sub-horizontal to horizontal closely to medium spaced with smear of comminuted chalk (<1mm). [Grade B2-B3]			26
		D	26.60					25.85-26.20m: Discontinuity is sub-vertical to 45° clean.			
		CS	26.85 - 27.10					26.30-26.40m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm). [Grade C4-C5]			
27		C SPT	27.10 - 28.60 27.10 - 27.55	S 39		100% 97% 97%		27.60-31.40m: Occasional grey mottling.			27
					C						

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
04/11/2015	24.10	15.70	1.00
05/11/2015	24.10	15.70	1.10

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ROTARY BOREHOLE LOG

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Borehole No. **BH108**

Sheet 5 of 5

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494417 N 99666	Hole Type DS+RC
Location: Bognor Regis		Level: 1.36mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 09/11/2015	Logged By SM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28		D	27.80					Very weak to weak medium density white mottled yellowish brown and orangish brown CHALK. Discontinuities are sub-horizontal closely spaced locally infilled with comminuted chalk (<1mm). Very widely and widely spaced rinded flints recovered as angular to sub-rounded gravel and cobbles (<300mm). (White Chalk Subgroup Grade B3-A3) *(continued from previous sheet)*			
		CS	28.30 - 28.60		C						
		C	28.60 - 30.10			95% 81% 63%					
		CS	28.80 - 29.20								
29					C			29.20-29.25m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<5mm). [Grade C4-C5]	(10.50)		
								29.70-29.80m: Possibly drilling disturbed. Discontinuities are sub-horizontal extremely closely and very closely spaced infilled with comminuted chalk (<3mm). [Grade B4-B5]			
30		D	30.00								
		C	30.10 - 30.60	S 44		98%					
		SPT	30.10 - 30.55			94%					
		D	30.20		C	60%					
		C	30.60 - 32.10			100% 67% 47%					
31								31.15-31.60m: Possibly drilling disturbed. Discontinuities are sub-horizontal to horizontal locally randomly orientated extremely closely and very closely spaced infilled with comminuted chalk (<3mm). [GradeB4-B5] 31.30-31.35m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5] 31.60-31.70m: Possibly drilling disturbed. Discontinuities are randomly orientated extremely closely spaced infilled with comminuted chalk (<1mm). [Grade B4-B5]			
		CS	31.30 - 31.50		C						
32		D	31.90					32.10-32.30m: Discontinuity is sub-vertical to 45° clean, striated and mottled grey. 32.30-34.40m: Indistinctly thinly laminated.			
		C	32.10 - 33.60	S*57		85% 57% 49%					
		SPT	32.10 - 32.50								
		CS	32.70 - 33.00		C						
33		D	33.00								
		C	33.60 - 34.40			100% 66% 41%					
34					C			33.90-34.20m: Discontinuities are sub-vertical to 45° very closely to closely spaced infilled with comminuted chalk (<1mm), striated and mottled grey.			
		D	34.20								
		SPT	34.40 - 34.80	S*64							
35								Borehole completed at 34.80m	34.80	-33.44	

Groundwater:

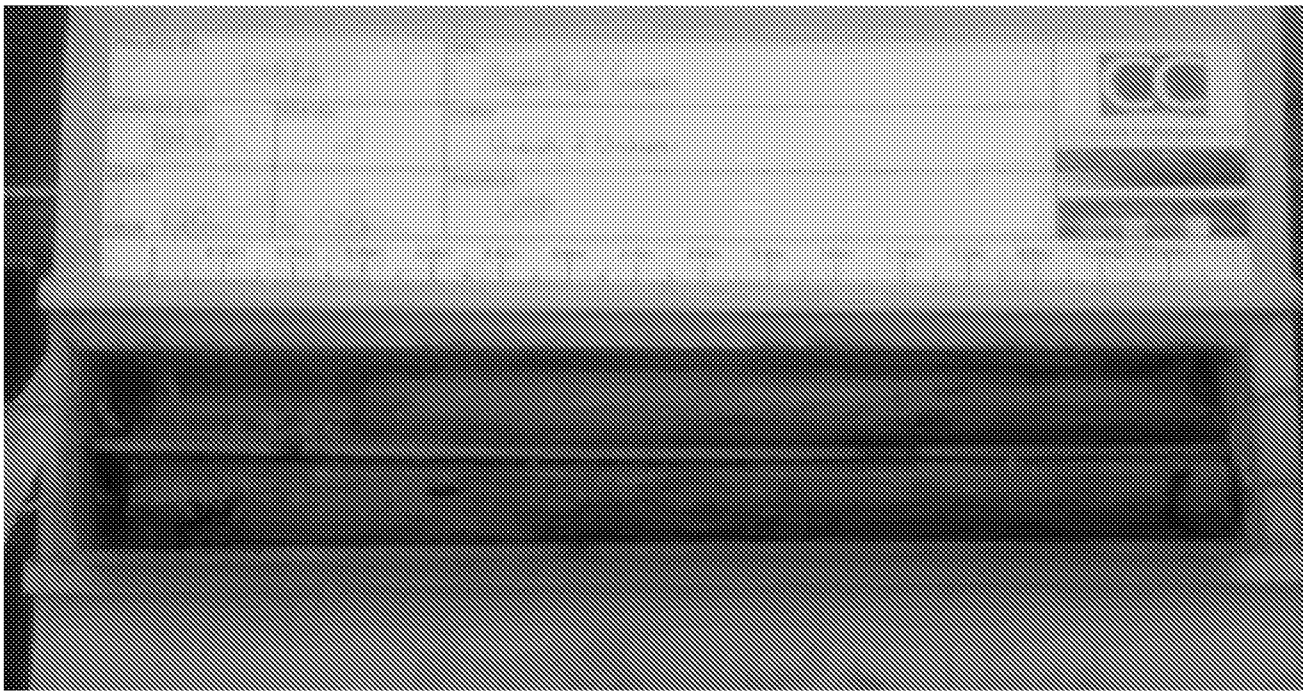
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

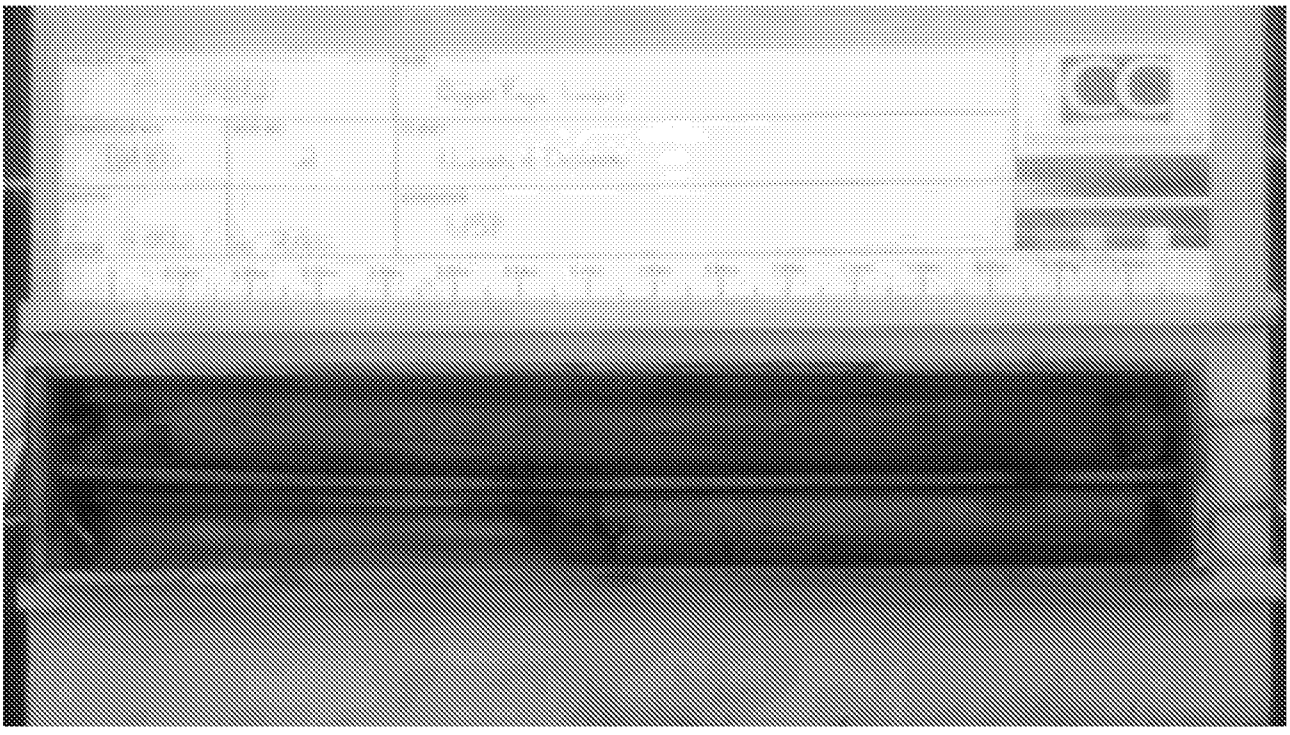
Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
05/11/2015	34.80	15.70	1.00

CC ROTARY LOG C4872.GPJ GINT STD AGS 3_1.GDT 21/1/16

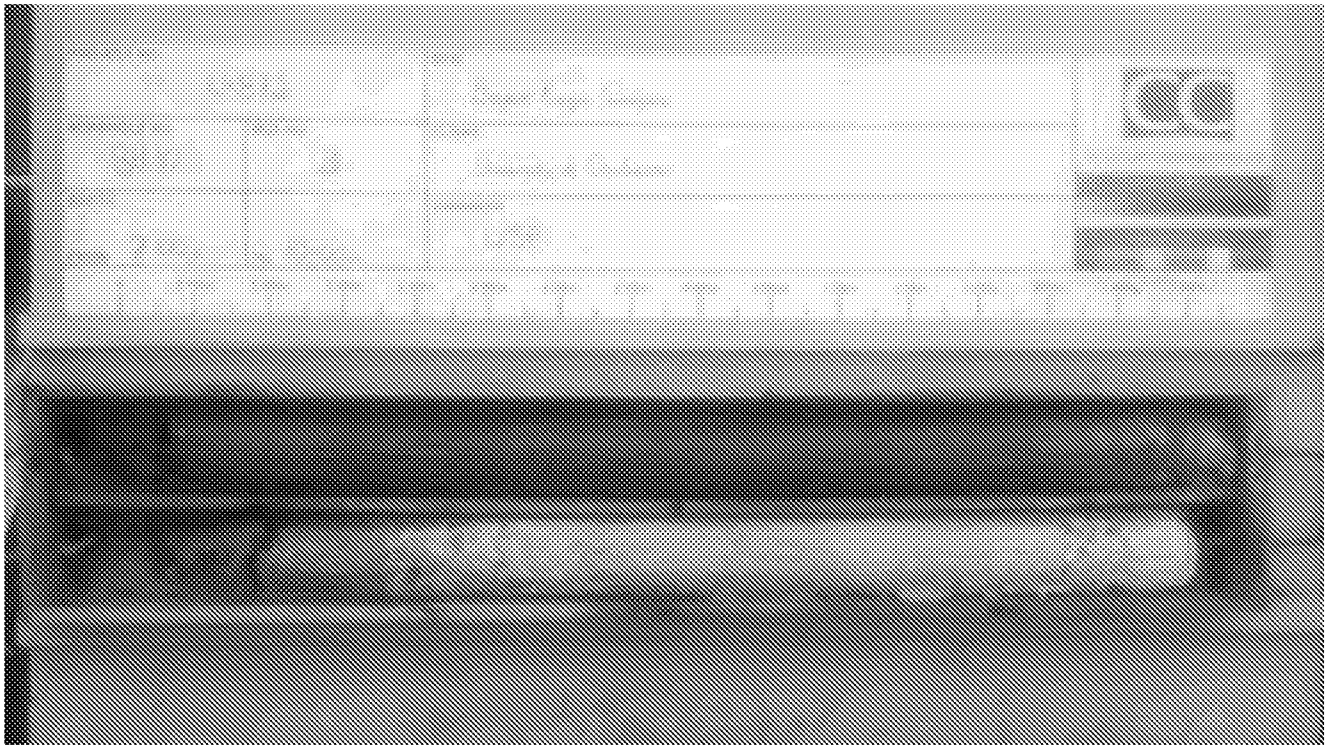
Borehole Photograph

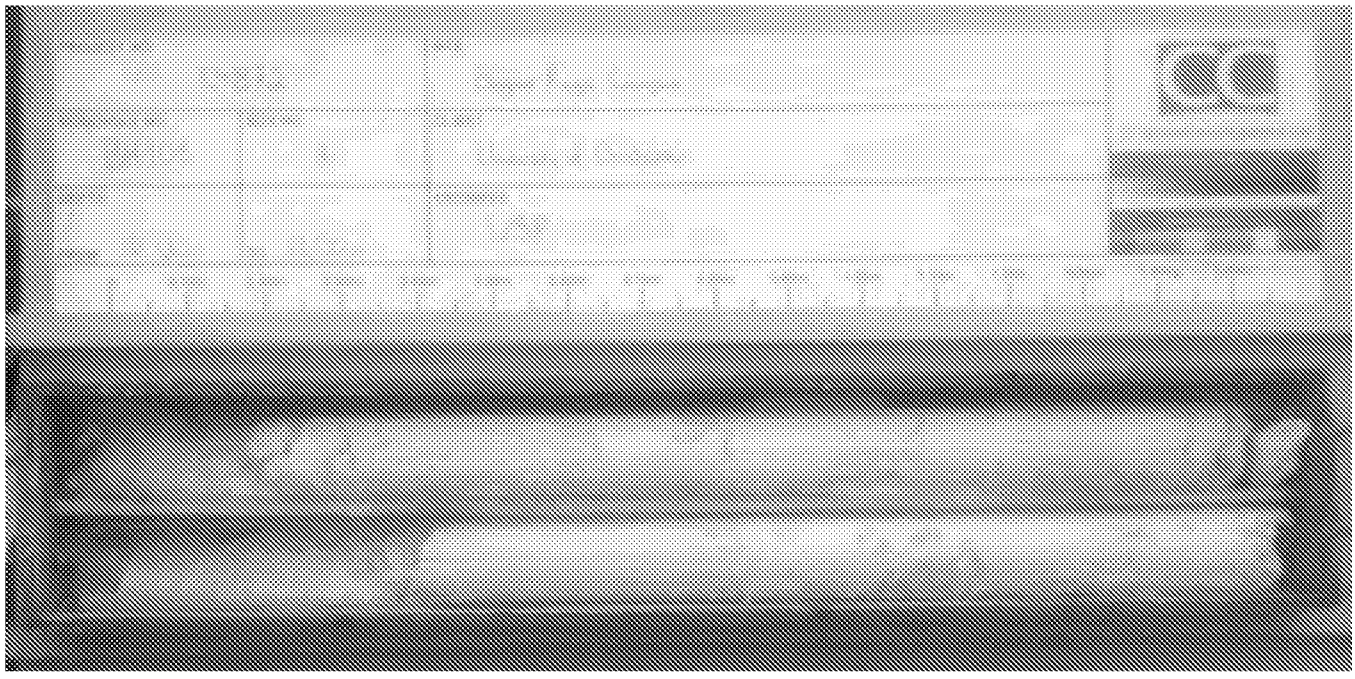




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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

Borehole Photograph

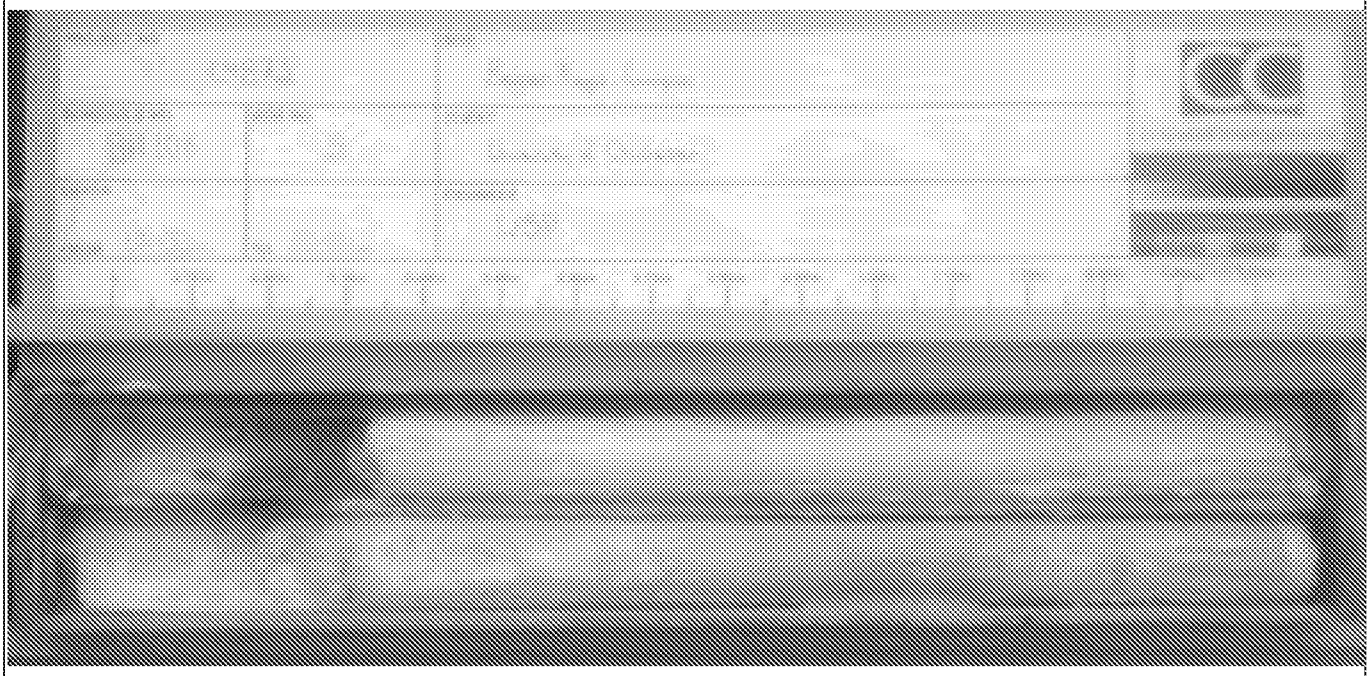


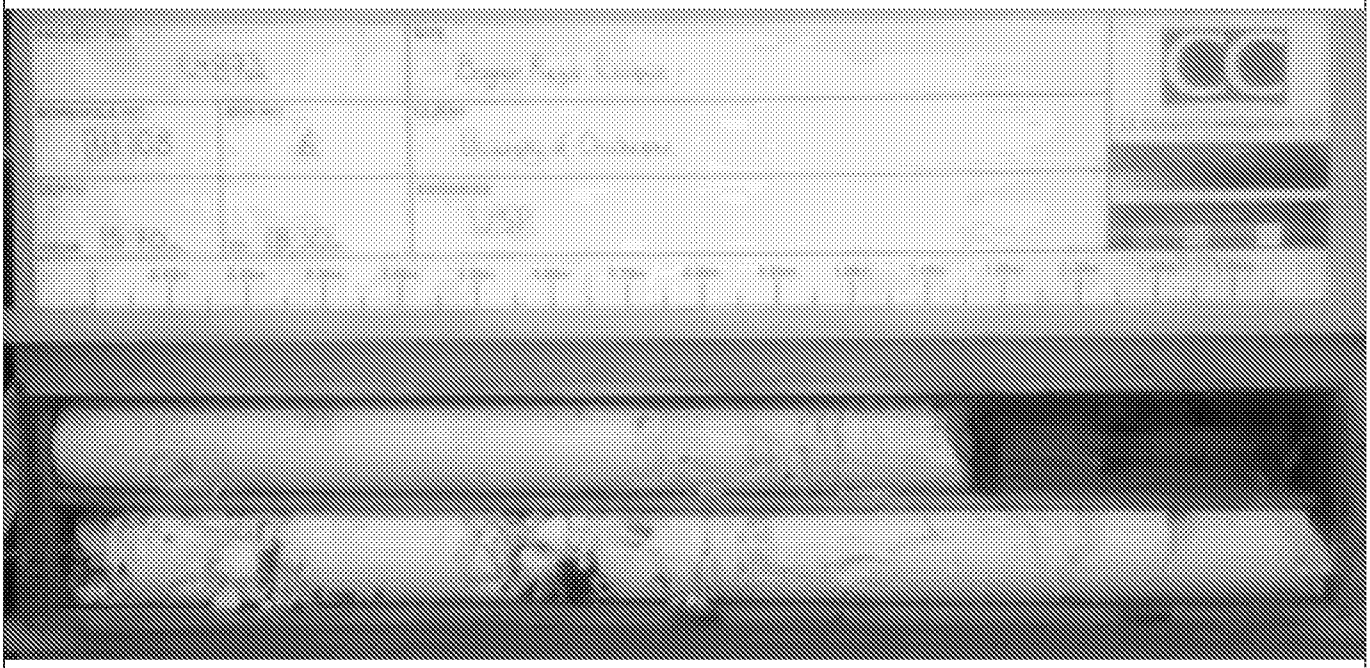


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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

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Borehole Photograph





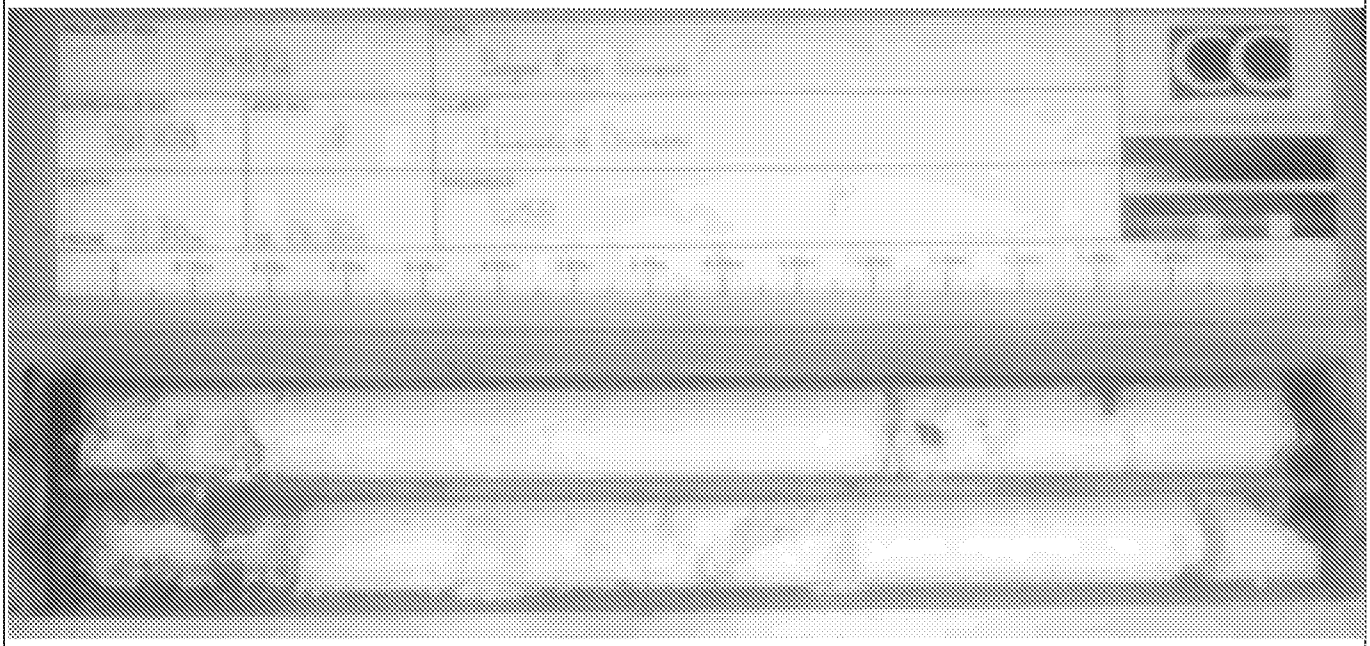
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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

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Borehole Photograph



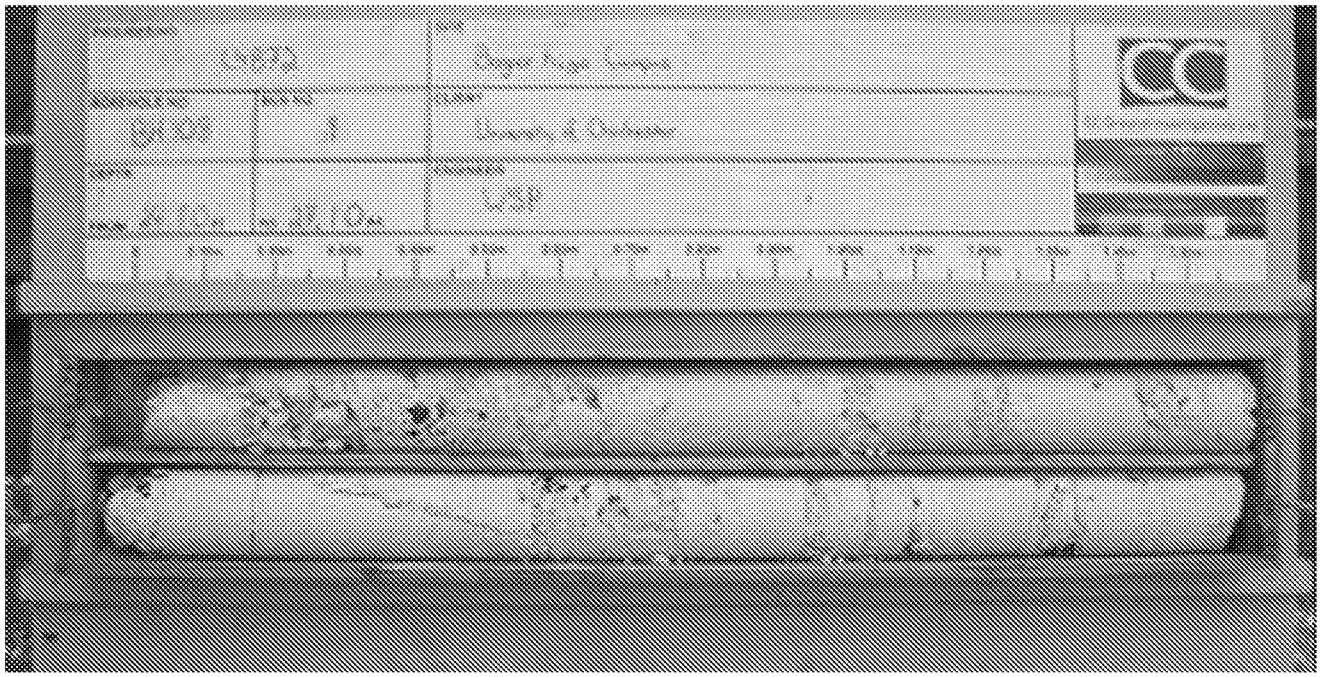


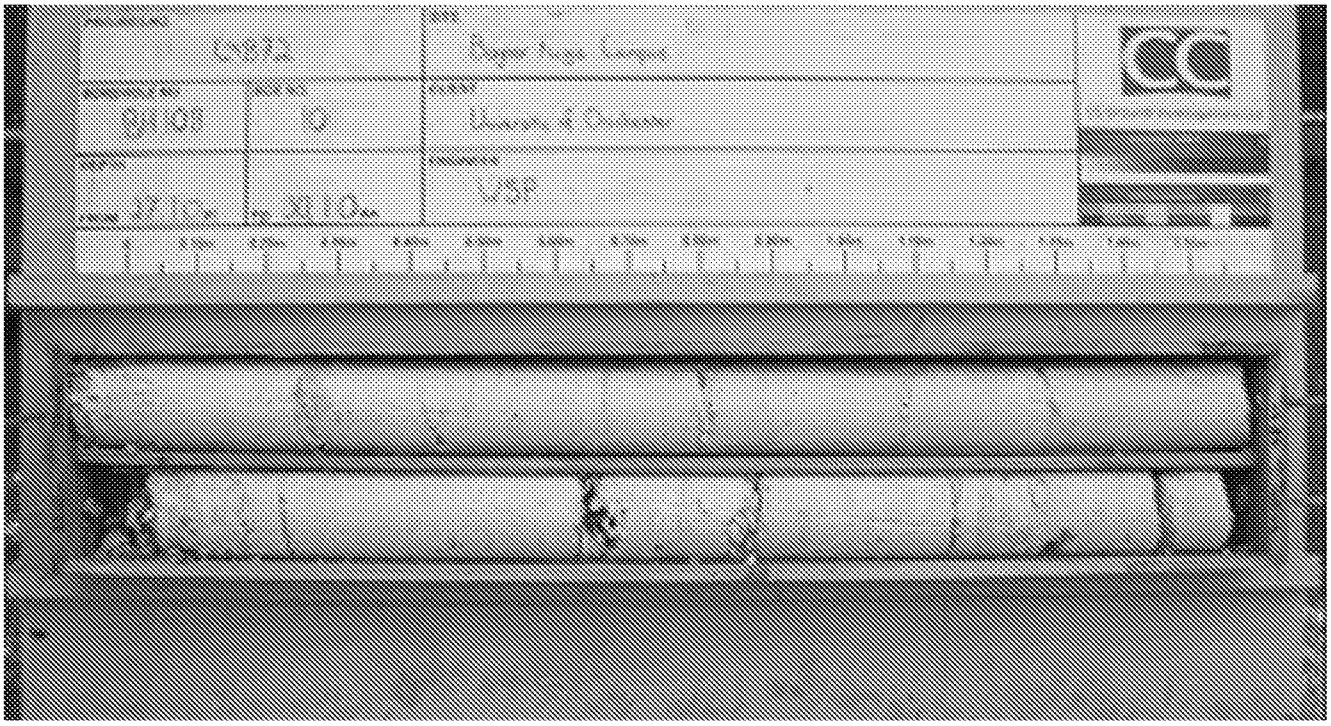
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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

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Borehole Photograph





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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

Borehole Photograph





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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH108

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ROTARY BOREHOLE LOG

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Borehole No. **BH109**

Sheet 1 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		B	0.20					MADE GROUND: Firm friable brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is sub-angular fine and medium brick.	(0.30)		
								0.20m: 1 No. 120mm x 25mm diameter steel tube.	0.30	0.88	
		B	0.50	H 80				MADE GROUND: Stiff friable orangish brown mottled reddish brown slightly sandy slightly gravelly silty CLAY with occasional rootlets. Gravel is sub-angular fine and medium brick.	(0.40)		
		ES							0.70	0.48	
		H							(0.50)		
1		B	1.00	H 45				Firm orangish brown mottled light grey slightly sandy silty CLAY. (Superficial Deposits)			1
		H							1.20	-0.02	
		ES	1.20	S<1				Very soft orangish brown and light grey silty CLAY. (Superficial Deposits)			
		SPT	1.20 - 1.65						(0.80)		
2		D	1.90	H 32							2
		H						Very soft grey mottled orangish brown silty CLAY. (Superficial Deposits)	2.00	-0.82	
		ES	2.10								
		D	2.50	H 19							
		H									
		SPT	2.70 - 3.15	S 2							
3											3
									(3.10)		
4		D	4.00	H 9							4
		H									
		SPT	4.20 - 4.65	S 2							
5								Very soft grey slightly sandy silty CLAY. (Superficial Deposits)	5.10	-3.92	5
		H	5.35	H 10							
									(0.90)		
		D	5.60								
		SPT	5.70 - 6.15	S 1							
6											6

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REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-22.20m. Water flush rotary coring using T6-146 coring barrel: 22.20-35.20m.
GROUNDWATER: None encountered prior to use of water flush to advance casing to 4.20m..
CASING: 160mm diameter casing to 27.50m.
INSTALLATION: Bentonite pellet seal: 3.00-35.20m, 50mm ID HDPE slotted pipe with washed gravel response zone: 1.00-3.00m, plain pipe with bentonite pellet seal: 0.20-1.00m, flush 150mm steel cover set in concrete 0.00-0.20m. Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
05/11/2015	5.70	5.70	0.80
06/11/2015	5.70	5.70	2.30

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ROTARY BOREHOLE LOG

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Borehole No. **BH109**

Sheet 2 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
								Very soft grey slightly sandy clayey SILT. (Superficial Deposits)	6.00	-4.82	
		H	6.80	H 8							
7		D	7.00								7
		SPT	7.20 - 7.65	S<1					(2.30)		
8		H	8.10	H 10							8
		D	8.50					Very soft grey slightly sandy silty CLAY. (Superficial Deposits)	8.30	-7.12	
		SPT	8.70 - 9.15	S<1							
9											9
		H	9.70	H 12							
		D	9.80								
10											10
		SPT	10.20 - 10.65	S 2							
11											11
		H	11.20	H 14					(6.00)		
		D	11.50								
		SPT	11.70 - 12.15	S 2							
12											12
		H	12.60	H 16							
13		D	13.00								13

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Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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ROTARY BOREHOLE LOG

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Borehole No. **BH109**

Sheet 3 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		SPT	13.20 - 13.65	S 4				Very soft grey slightly sandy silty CLAY. (Superficial Deposits) *(continued from previous sheet)*			
14		H	14.20	H 16							14
								Soft to firm grey slightly sandy silty CLAY with occasional brown and dark brown pseudo-fibrous to fibrous plant remains/rootlets. (Superficial Deposits)	14.30	-13.12	
		SPT	14.70 - 15.15	S 9					(1.10)		
15											15
		D	15.30						15.40	-14.22	
		D	15.50					Firm plastic dark brown slightly sandy slightly gravelly amorphous PEAT. Gravel is sub-angular to sub-rounded fine to coarse of chalk and flint. (Superficial Deposits)	(0.35)		
								Firm to stiff dark greyish green slightly sandy gravelly silty CLAY with occasional dark brown rootlets. Gravel is sub-angular to rounded fine to coarse of chalk and occasional flint. (Superficial Deposits)	15.75	-14.57	
16		D	16.10						(0.85)		16
		SPT	16.20 - 16.65	S 20							
								Structureless CHALK composed of slightly silty slightly sandy to sandy angular to sub-rounded fine to coarse GRAVEL with low cobble content and occasional flints. Clasts are very weak to weak medium to high density white. Matrix is soft to firm white. Flints are dark grey medium to coarse gravel size nodular. (White Chalk Subgroup Grade Dc)	16.60	-15.42	
17		D	17.20								17
		SPT	17.70 - 18.15	S 20					(2.30)		
18											18
								Extremely weak to very weak low to medium density white CHALK with closely to medium spaced dark brown nodular flints. Discontinuities are sub-horizontal to sub-vertical extremely closely to very closely spaced rough undulating and stepped with comminuted slightly sandy silt infill (<10mm). (White Chalk Subgroup Grade C4/5)	18.90	-17.72	
19		D	19.10						(0.75)		19
		SPT	19.20 - 19.65	S 21				19.15m: Light grey staining along sub-horizontal discontinuity.	19.65	-18.47	
								(continued on next sheet)			
20									(1.05)		20
		D	20.40								

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
06/11/2015	14.70	14.70	0.00
09/11/2015	14.70	14.70	0.00

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ROTARY BOREHOLE LOG

Borehole No. **BH109**

Sheet 4 of 6

Telephone [redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
21		SPT	20.70 - 21.08	S 21				Very weak to weak medium to high density locally extremely weak low density along discontinuities white CHALK with occasional light grey thin marl laminations and medium spaced dark brown nodular flints. Discontinuities are sub-horizontal very closely to closely spaced rough undulating with partly open to wide open (<60mm) infilled with comminuted slightly sandy gravelly silt with some light brown discolouration. Sub-vertical discontinuities are extremely closely to very closely spaced rough undulating and stepped tight to partly open occasionally with light brown sand smear. Flints are medium to coarse gravel size. (White Chalk Subgroup Grade C3/5) *(continued from previous sheet)*	20.70	-19.52	21
									(1.00)		
22		D	22.00						21.70	-20.52	22
		C	22.20 - 23.70	S 41		100%		Structureless CHALK composed of white slightly gravelly SILT. Gravel is very weak low density white sub-angular fine to coarse with occasional black specks and occasional orangish brown staining. (White Chalk Subgroup Grade Dm Possibly drilling disturbed)	(0.90)		
		SPT	22.20 - 22.58			8% 5%					
23		D	23.20					Structureless CHALK composed of silty sub-angular fine to coarse GRAVEL. Clasts are extremely weak and very weak low and medium density white with occasional black specks. Matrix is white. (White Chalk Subgroup Grade Dc) 22.05-22.10m: Band of sub-angular coarse flint gravel. 22.20-22.30m: Flint cobble. 22.30-22.48m: Band of sub-angular coarse flint gravel. 22.48-22.60m: Flint boulder? (solid core).	22.60	-21.42	23
		C	23.70 - 25.20			80% 5% 0%		Very weak and weak medium density white with occasional orangish brown staining CHALK. Discontinuities are extremely and very closely spaced (10/40/60) infilled with (1/2/5) white comminuted chalk, moderately orangish brown stained. (White Chalk Subgroup Grade C4-5) 23.70-24.35m: Band of sub-angular fine to coarse gravel and cobbles of flint.			
24		B	24.60 - 24.67					24.60-24.67m: Band of medium density grade B3 chalk.			24
								24.75-24.90m: Band of angular and sub-angular fine to coarse flint gravel.			
25		D	25.00								25
		C	25.20 - 26.70	S*59		77%			(5.40)		
		SPT	25.20 - 25.61			0% 0%					
								25.65-25.75m: Band of sub-angular coarse flint gravel.			
26								25.82-25.90m: Band of sub-angular coarse flint gravel.			26
								26.12-26.26m: Band of sub-angular coarse flint gravel.			
		D	26.50								
		C	26.70 - 28.20			80%		26.70-27.30m: Band of structureless grade Dc chalk.			
27						7% 7%		26.90-27.18m: Band of structureless grade Dc chalk.			27
								27.30-27.70m: Band of flint cobbles.			

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
09/11/2015	20.70	17.70	0.00
10/11/2015	20.70	17.70	0.80
10/11/2015	22.20	21.00	0.90
11/11/2015	22.20	21.00	0.80

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ROTARY BOREHOLE LOG

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Borehole No. **BH109**

Sheet 5 of 6

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing: No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
28								27.85-27.95m: Band of sub-angular fine to coarse gravel and cobbles of flint.	28.00	-26.82	28
		C	28.20 - 29.20			100%		Very weak medium density white CHALK. Discontinuities are closely and medium spaced locally very closely spaced (30/100/300) rarely locally infilled (0/0/1) with white comminuted chalk. (White Chalk Subgroup Grade B2-3)			
		CS	28.20 - 28.45			73% 68%		28.48-28.56m: Drilling disturbed; Band of sub-angular fine and medium chalk gravel with sub-angular fine to coarse flint gravel.			
29		D	29.00					28.87-29.00m: Sub-vertical undulating rough fracture with greyish brown staining of fracture surface.			29
		C	29.20 - 30.70			77% 62% 59%		29.20-29.50m: No recovery.			
		CS	29.60 - 29.63					29.50-29.60m: Band of angular and sub-angular fine to coarse flint gravel.			
		B	29.84 - 30.08								
30								30.25-30.30m: Band of sub-angular and sub-rounded fine to coarse gravel and cobbles of flint.			30
		D	30.50								
		C	30.70 - 32.20	C^143		100%					
		CPT	30.70 - 30.91			60% 33%		30.89-30.96m: Band of angular and sub-angular fine to coarse flint gravel.			
31		B	31.13 - 31.32					31.12-31.32m: Sub-vertical undulating rough fracture.			31
								31.35-31.42m: Band of angular and sub-angular fine to coarse flint gravel.			
								31.73-31.80m: Band of sub-angular coarse flint gravel.	(7.35)		
								31.80-32.15m: Non intact zone with parallel very closely spaced sub-vertical stepped rough discontinuities intersecting closely spaced sub-horizontal to 20° undulating rough discontinuities.			
32		D	32.00								32
		C	32.20 - 33.70			83% 40% 21%		32.40-32.50m: Flint cobble.			
								32.80-32.84m: Band of angular and sub-angular fine to coarse flint gravel.			
33								33.06-33.20m: Drilling disturbed; recovered as silty gravel.			33
		D	33.50								
		C	33.70 - 35.20	C^500		100%		33.70-33.75m: Band of sub-angular coarse flint gravel.			
		CPT	33.70 - 33.84			62% 32%					
34								34.05-34.15m: Band of silty sub-angular fine to coarse chalk gravel. Possibly drilling disturbed.			34
								34.15-34.25m: 80° undulating smooth brown stained fracture.			
								34.72-34.90m: Non intact zone with parallel very closely spaced sub-vertical stepped rough discontinuities intersecting very closely spaced sub-horizontal			
35		D	34.90								35

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
11/11/2015	28.20	25.50	0.80
12/11/2015	28.20	25.50	0.80

CC ROTARY LOG C4872.GPJ GINT STD AGS 3_1.GDT 21/1/16

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ROTARY BOREHOLE LOG

Borehole No. **BH109**

Sheet 6 of 6

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Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494446 N 99713	Hole Type DS+RC
Location: Bognor Regis		Level: 1.18mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 05/11/2015 End: 05/11/2015	Logged By RS/DM

(m)	Water Levels	Core Run, Samples & Testing No/Type	Depth (m)	Result	Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		CPT	35.20 - 35.35	C*375	C			undulating rough discontinuities.			
								Borehole completed at 35.35m	35.35	-34.17	

36 37 38 39 40 41 42

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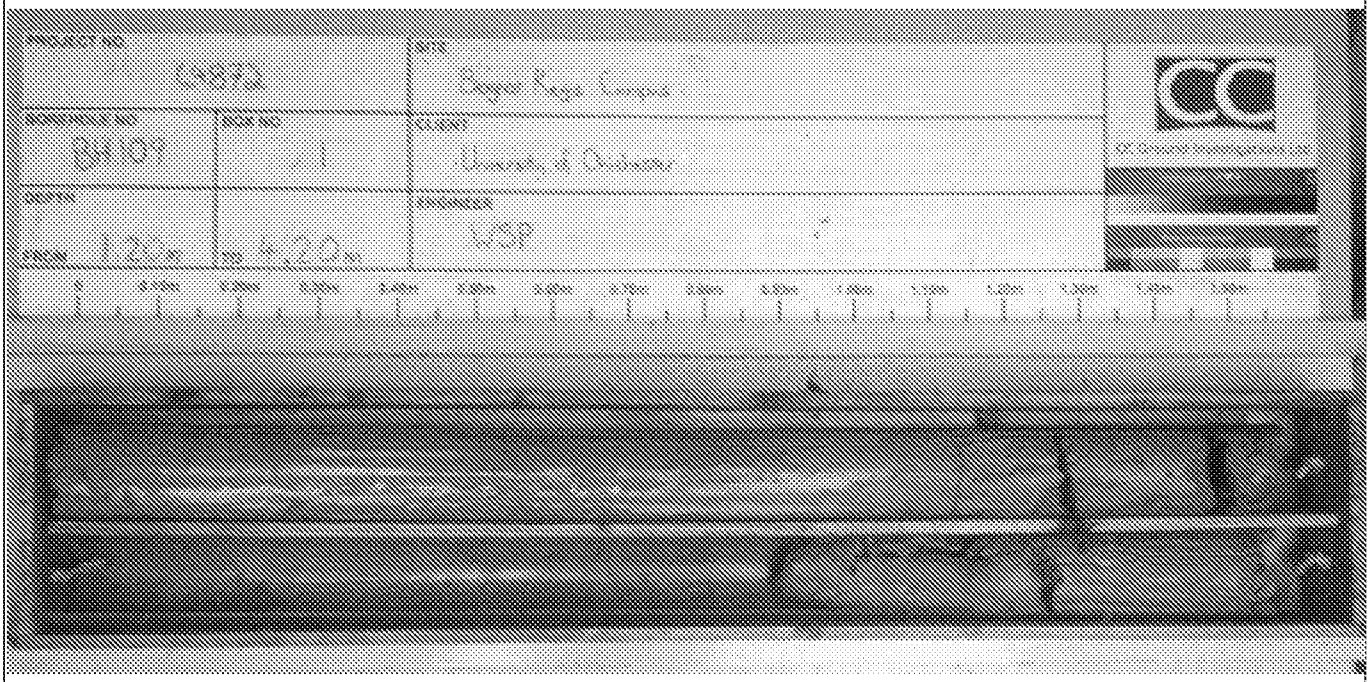
Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
12/11/2015	35.35	27.50	0.40

Borehole Photograph

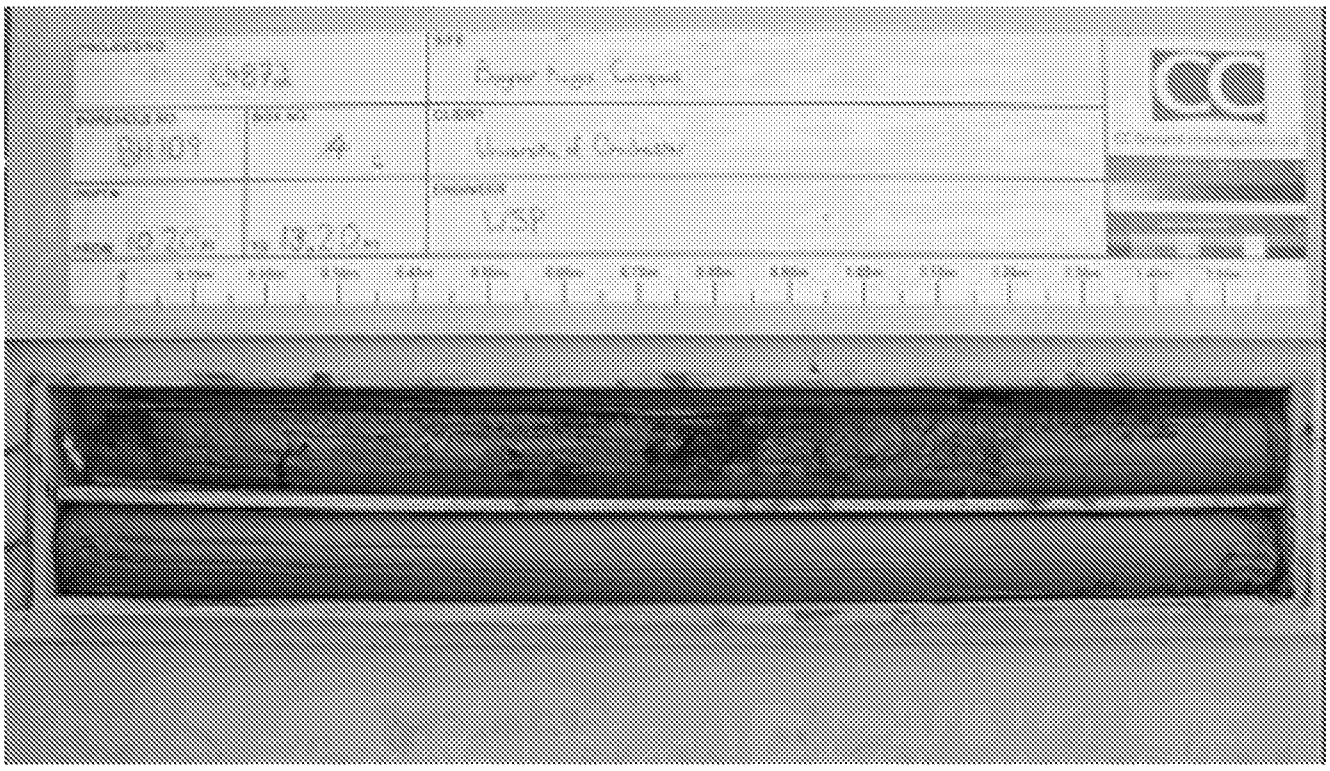




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

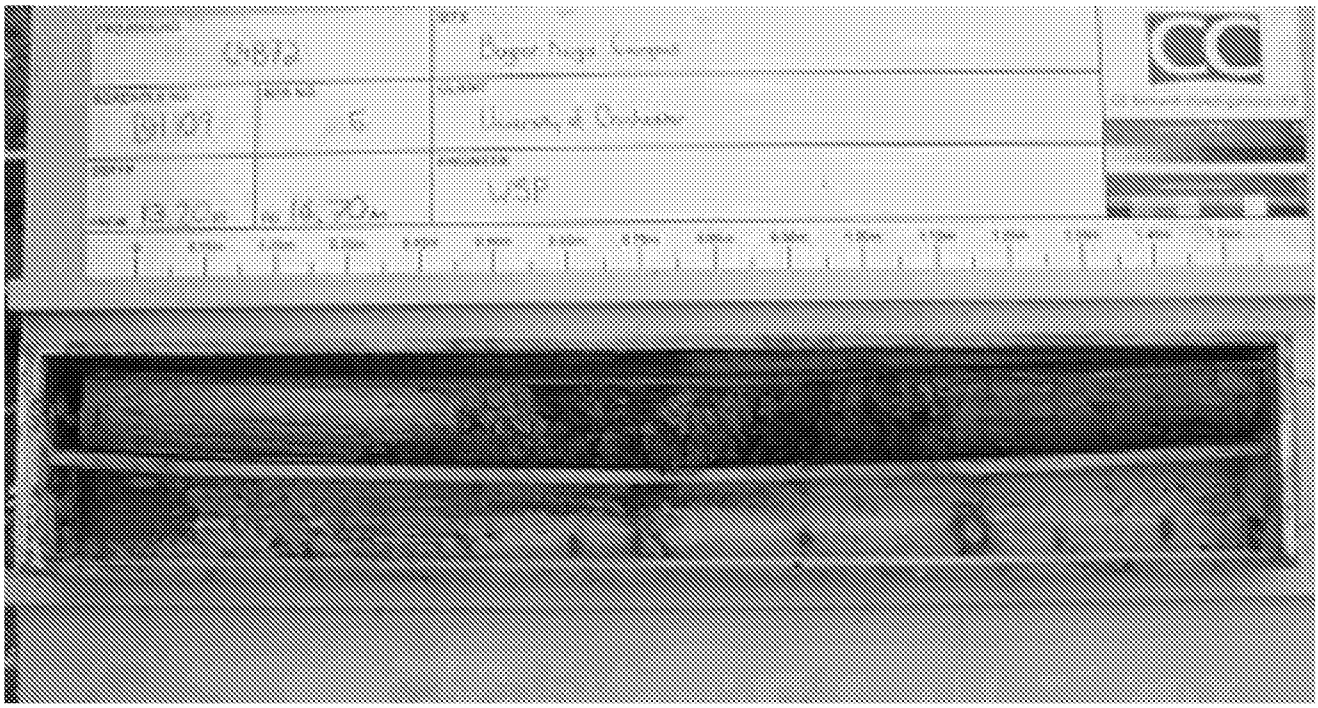
Borehole Photograph

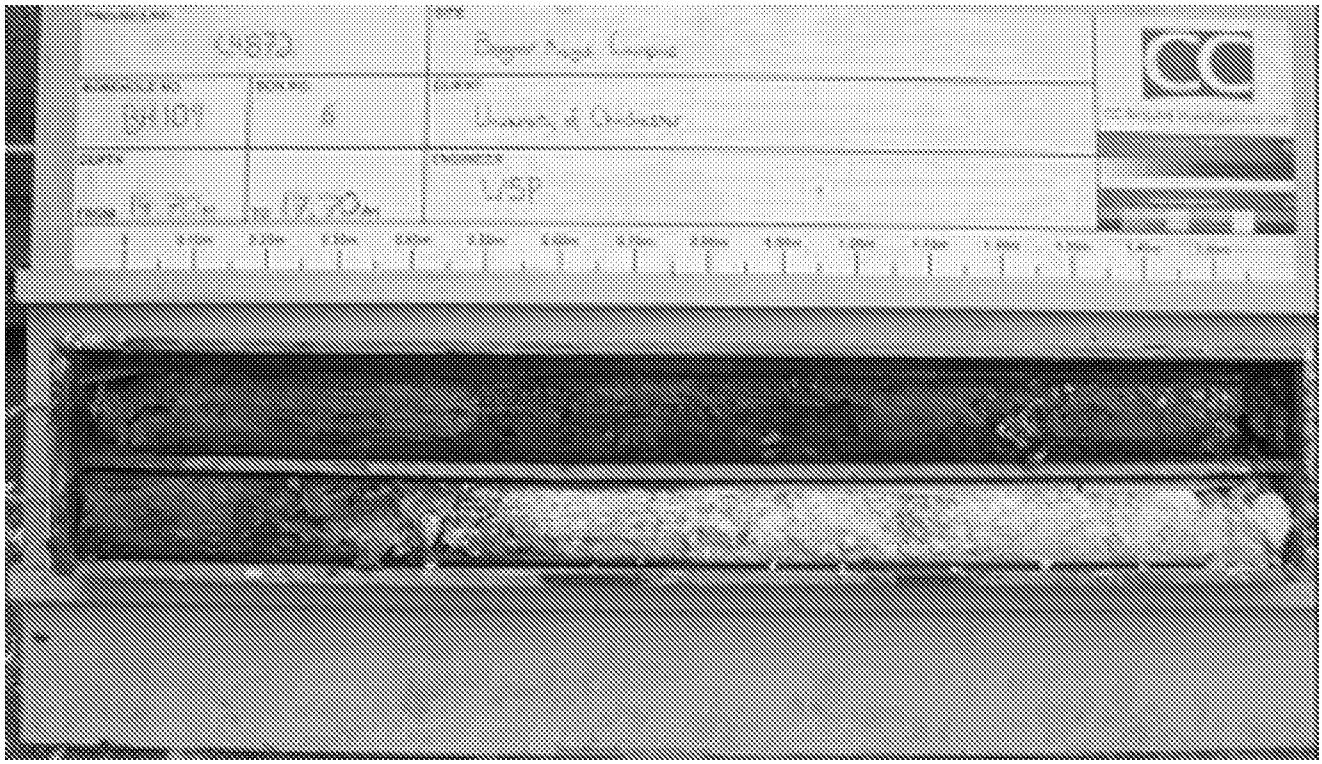




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

Borehole Photograph

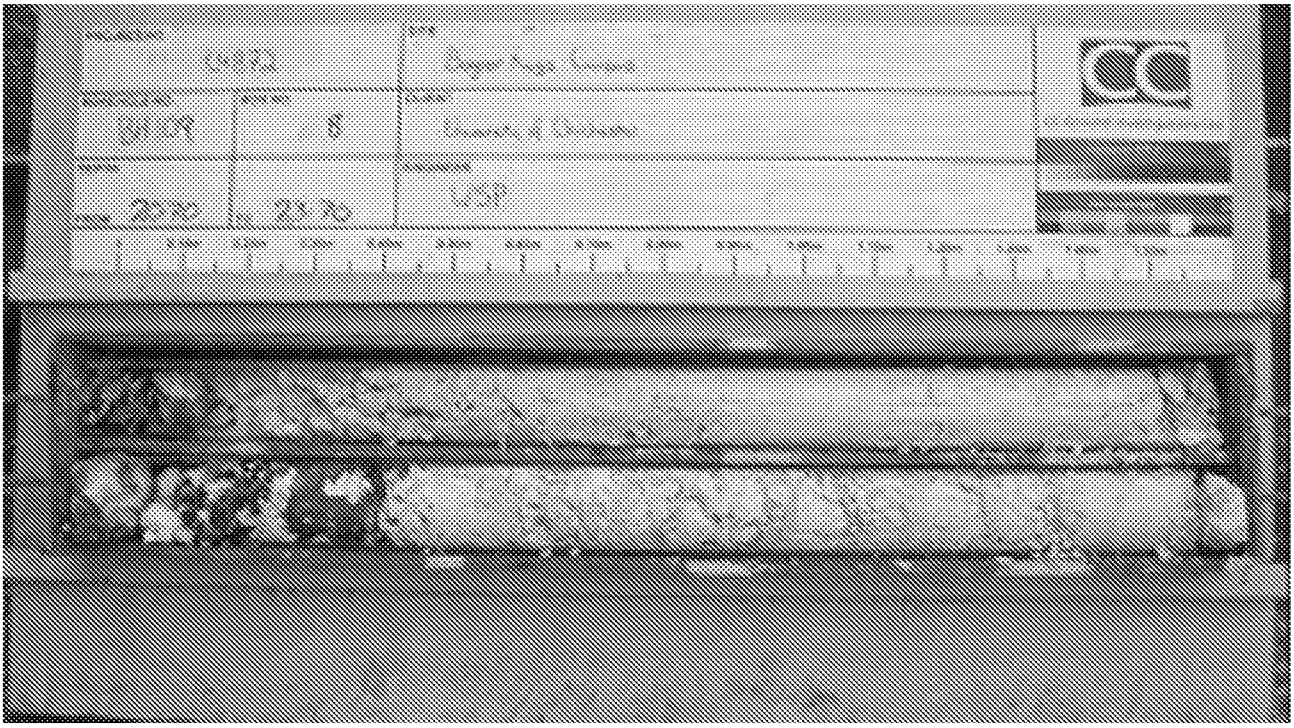




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

Borehole Photograph

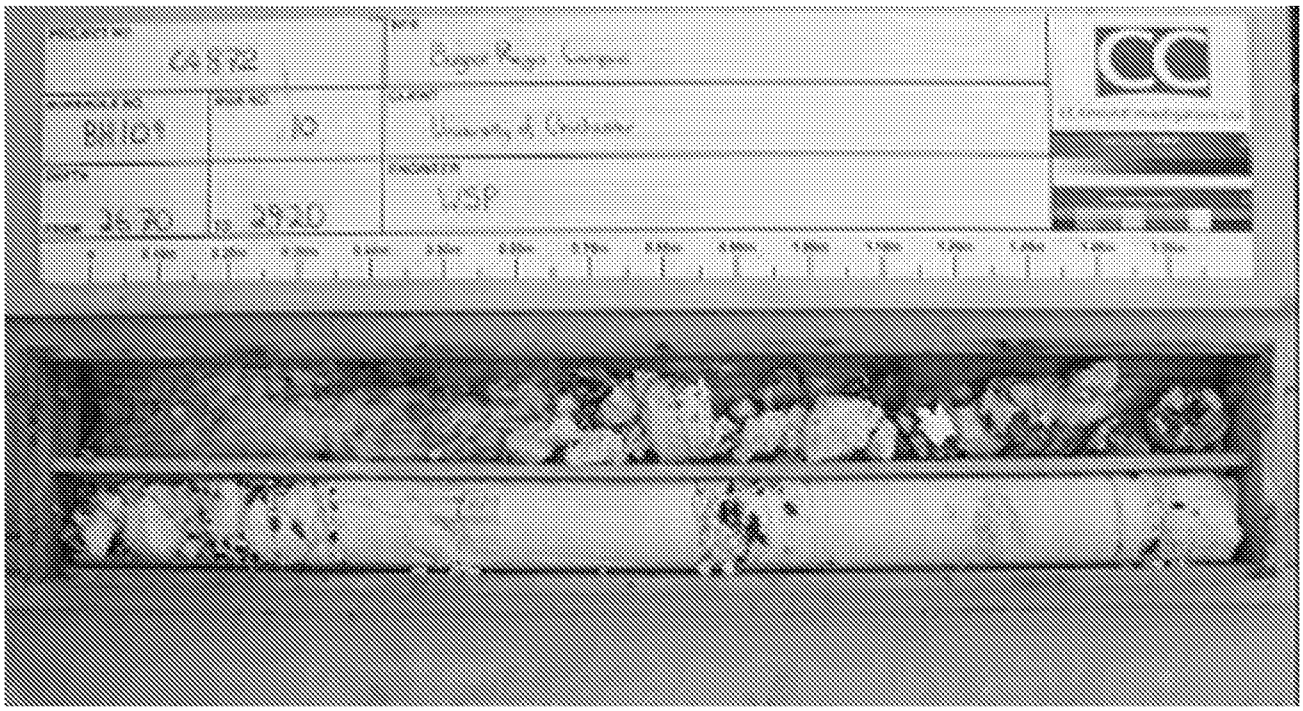




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

Borehole Photograph



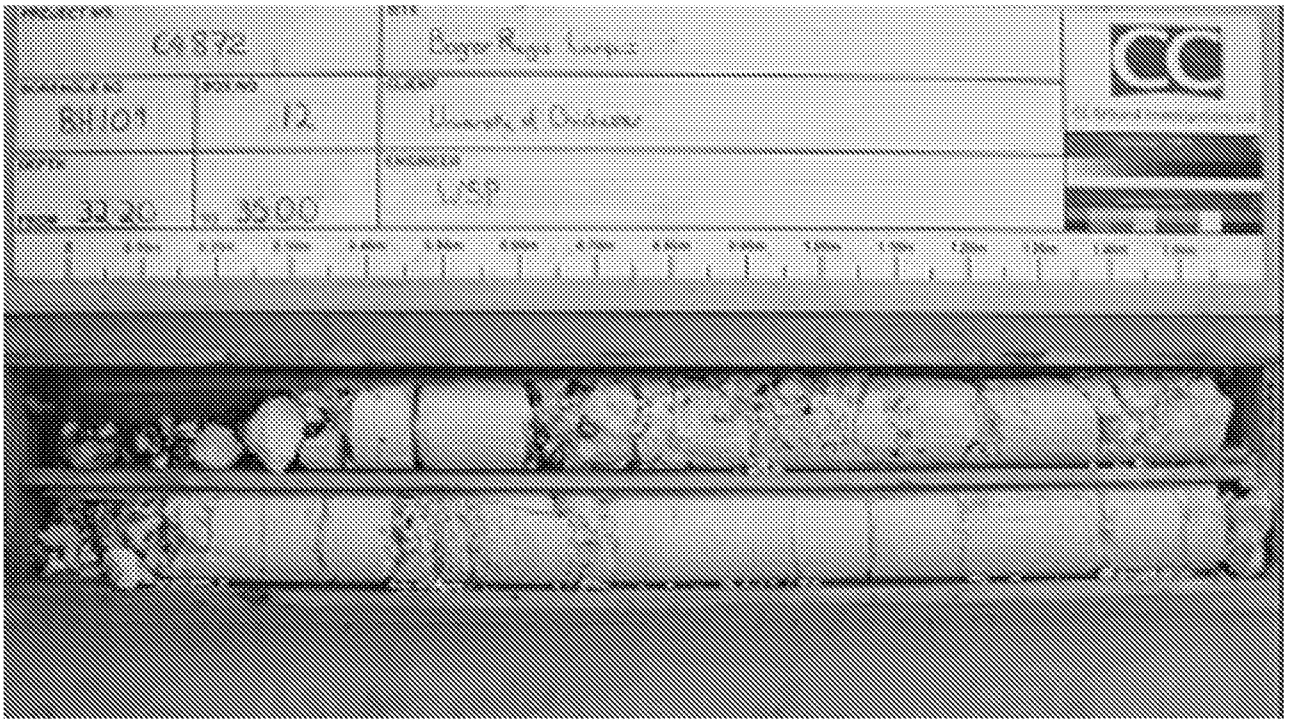


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Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

Borehole Photograph





CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH109

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BOREHOLE LOG

Borehole No. **BH110**

Sheet 1 of 2

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Proj [redacted] C4872

Co-ords: E 494365 N 99726

Hole Type DS

Location: Bognor Regis

Level: 1.42mAOD

Scale 1 : 37.50

Client: University of Chichester

Dates: Start: 03/11/2015
End: 04/11/2015

Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
		ES	0.20				MADE GROUND: Stiff friable orangish brown mottled dark grey and reddish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine to medium brick with rare ash.	0.20	1.22	
		B	0.30							
		B	0.50	H 88			MADE GROUND: Stiff orangish brown mottled reddish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is sub-angular fine to coarse of brick.	(0.60)		
		H						0.80	0.62	
1							Firm to stiff orangish brown slightly sandy silty CLAY. (Superficial Deposits)	(0.30)		1
		B	1.00	H 77				1.10	0.32	
		ES					Very soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)			
		H	1.20							
		B	1.20 - 1.65							
		UT100						(0.95)		
		D	1.80	H 9						
2		H						2.05	-0.63	2
							Very soft to soft grey mottled orangish brown and black silty CLAY with occasional fine gravel sized partially decomposed organic fragments. (Superficial Deposits) 2.05-2.10m: With occasional fine gravel sized partially decomposed wood fragments.			
		D	2.50	H 17						
		H								
		ES	2.70	S<1						
		SPT	2.70 - 3.15							
3							3.20-3.60m: Orangish brown locally light grey mottled black.			3
								(2.85)		
		H	3.80	H 8						
4		D	4.00							4
		UT100	4.20 - 4.65							
							Very soft grey mottled black silty CLAY with occasional fine gravel sized partially decomposed organic fragments. (Superficial Deposits)	4.90	-3.48	
5										5
		D	5.50	H 7						
		H								
		SPT	5.70 - 6.15	S 7						
6										6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-7.20m.
GROUNDWATER: Water strike at 1.00m remained at 1.00m after 20 minutes monitoring period.
CASING: 160mm diam casing to 7.20m.
INSTALLATION: Bentonite pellet seal: 5.00-7.20m. 50mm ID HDPE slotted pipe with washed gravel response zone: 0.50-5.00m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-0.50m. Flush 150mm steel cover set in concrete 0.00-0.20m Gas valve fitted.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
03/11/15	1.00	Nil	1.00

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

CC BH LOG C4872.GPJ GINT STD AGS 3_1.GDT 21/1/16

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BOREHOLE LOG

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Borehole No. **BH110**

Sheet 2 of 2

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494365 N 99726	Hole Type DS
Location: Bognor Regis		Level: 1.42mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 03/11/2015 End: 04/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
							Very soft grey mottled black silty CLAY with occasional fine gravel sized partially decomposed organic fragments. (Superficial Deposits) *(continued from previous sheet)*	(2.15)		
7		H	6.80	H 9						
		D	6.90							
		D	7.10				Structureless CHALK composed of silty angular to sub-angular fine to coarse GRAVEL. Clasts are very weak, low and medium density white occasionally speckled black. (White Chalk Subgroup Grade Dc)	7.05	-5.63	
							Borehole completed at 7.20m	7.20	-5.78	
8										
9										
10										
11										
12										
13										

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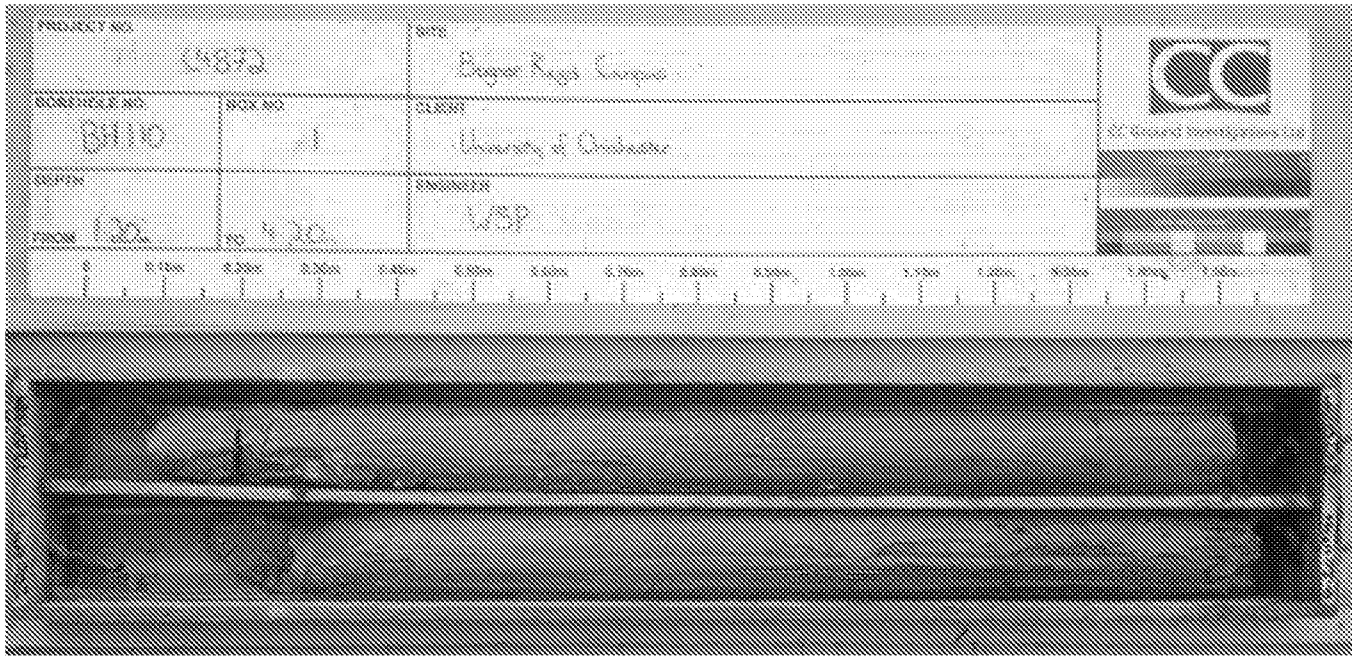
Groundwater:

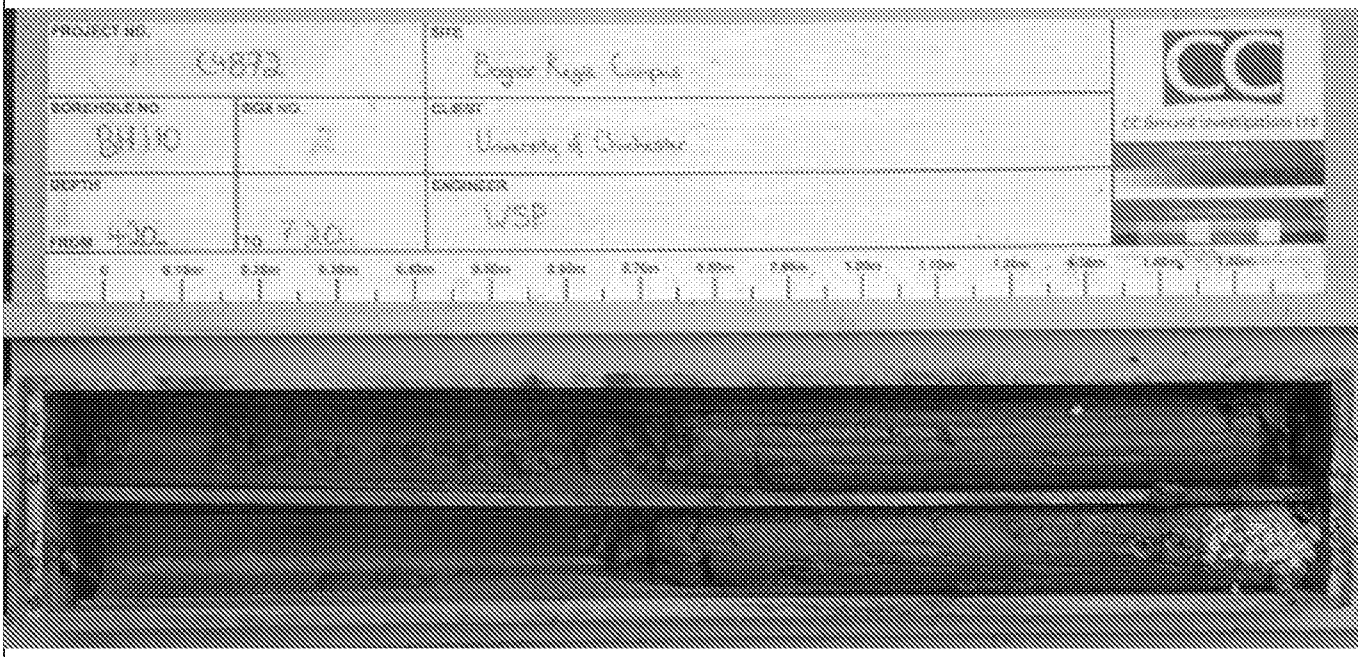
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
03/11/2015	7.20	7.20	1.10
04/11/2015	7.20	7.20	0.80
04/11/2015	7.20	7.20	0.80

Borehole Photograph





CC Ground Investigations Ltd	Contract Name:	University of Chichester
	Contract ID:	C4872
	Client:	University of Chichester
	Hole ID:	BH110

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BOREHOLE LOG

Telephone: [redacted]

Borehole No. **BH111**

Sheet 1 of 2

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494371 N 99734	Hole Type DS
Location: Bognor Regis		Level: 1.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 03/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
							Stiff light brown slightly sandy CLAY with frequent rootlets.			
		B	0.30				Stiff orangish brown mottled light grey slightly sandy silty CLAY. (Superficial Deposits)	0.20	1.24	
		B	0.50	H 96				(0.40)		
		ES						0.60	0.84	
		H					Firm light brown mottled light grey slightly sandy silty CLAY. (Superficial Deposits)	(0.40)		
1		B	1.00	H 49				1.00	0.44	1
		H					Very soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)			
		B	1.20	S<1						
		SPT	1.20 - 1.65							
		D	1.50					(1.30)		
2		H	2.00	H 20						2
							Very soft grey mottled orangish brown and black silty CLAY with occasional fine gravel sized partially decomposed organic fragments. (Superficial Deposits)	2.30	-0.86	
		D	2.50	H 17						
		H								
		SPT	2.70 - 3.15	S<1						
3								(1.90)		3
4		D	4.00							4
		SPT	4.20 - 4.65	S<1			Very soft grey mottled black silty CLAY with occasional fine gravel sized partially decomposed organic fragments. (Superficial Deposits)	4.20	-2.76	
5								(1.40)		5
		H	5.30	H 9			5.35-5.55m: With frequent medium to coarse gravel sized partially decomposed wood fragments.			
		D	5.50					5.60	-4.16	
		SPT	5.70 - 6.15	S 6			*(continued on next sheet)*			
6										6

REMARKS:

EQUIPMENT: Hand digging tools. Fraste PL multi purpose track mounted rig.
METHOD: Hand dug inspection pit: 0.00-1.20m. Continuous dynamic sampled (126mm diam) 1.20-11.70m.
GROUNDWATER: Groundwater struck at 1.50m rose to 1.30m after 20 minutes monitoring period.
CASING: SW to 10.20m.
INSTALLATION: 50mm ID HDPE slotted pipe with washed gravel response zone: 7.40-11.70m. 50mm ID HDPE plain pipe with bentonite pellet seal: 0.20-7.40m, and flush 150mm steel cover set in concrete: 0.00-0.20m Gas valve fitted.
REMARKS: Borehole scanned by UXO engineer at surface and at 5.70m.

Groundwater:

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
02/11/15	1.50	Nil	1.30

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)

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BOREHOLE LOG

Telephone: [redacted]

Borehole No. **BH111**

Sheet 2 of 2

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494371 N 99734	Hole Type DS
Location: Bognor Regis		Level: 1.44mAOD	Scale 1 : 37.50
Client: University of Chichester		Dates: Start: 02/11/2015 End: 03/11/2015	Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Sample	Install	Description	Depth (m)	Level (mAD)	Legend
							Structureless CHALK composed of silty angular and sub-angular fine to coarse GRAVEL. Clasts are very weak low and medium density white with occasional black speckling. (White Chalk Subgroup Grade Dc). *(continued from previous sheet)*			
7		D	7.00					(2.50)		7
		SPT	7.20 - 7.65	S 14						
8							Structureless CHALK composed of white gravelly SILT. Gravel is extremely weak and very weak low density white fine to coarse with occasional black speckling. (White Chalk Subgroup Grade Dm).	8.10	-6.66	8
								(0.40)		
		D	8.50				Structureless CHALK composed of slightly sandy silty sub-angular medium to coarse GRAVEL. Clasts are extremely to very weak, low to medium density white with occasional black speckling. (White Chalk Subgroup Grade Dc)	8.50	-7.06	
		SPT	8.70 - 9.15	S 11						
9								(1.30)		9
							9.73-9.75m: Coarse gravel sized flint.	9.80	-8.36	
10		D	10.00				Very weak low to medium density white occasionally speckled black CHALK. Discontinuities are extremely to very closely spaced (10/20/40), clean and infilled (0/1/2) with off-white comminuted chalk. (White Chalk Subgroup Grade C4-5)			10
		SPT	10.20 - 10.65	S 28				(1.10)		
11							Structureless CHALK composed of slightly sandy silty sub-angular medium to coarse GRAVEL. Clasts are extremely to very weak, low to medium density white occasionally speckled black. (White Chalk Subgroup Grade Dc)	10.90	-9.46	11
		B	11.00					(0.30)		
								11.20	-9.76	
		D	11.50				Very weak low to medium density white occasionally speckled black CHALK. Discontinuities are extremely to closely spaced (10/20/40), clean and infilled (0/1/2) with off-white comminuted chalk. (White Chalk Subgroup Grade C4-5)			
		SPT	11.70 - 12.15	S 25				(0.95)		
12										12
							Borehole completed at 12.15m	12.15	-10.71	
13										13

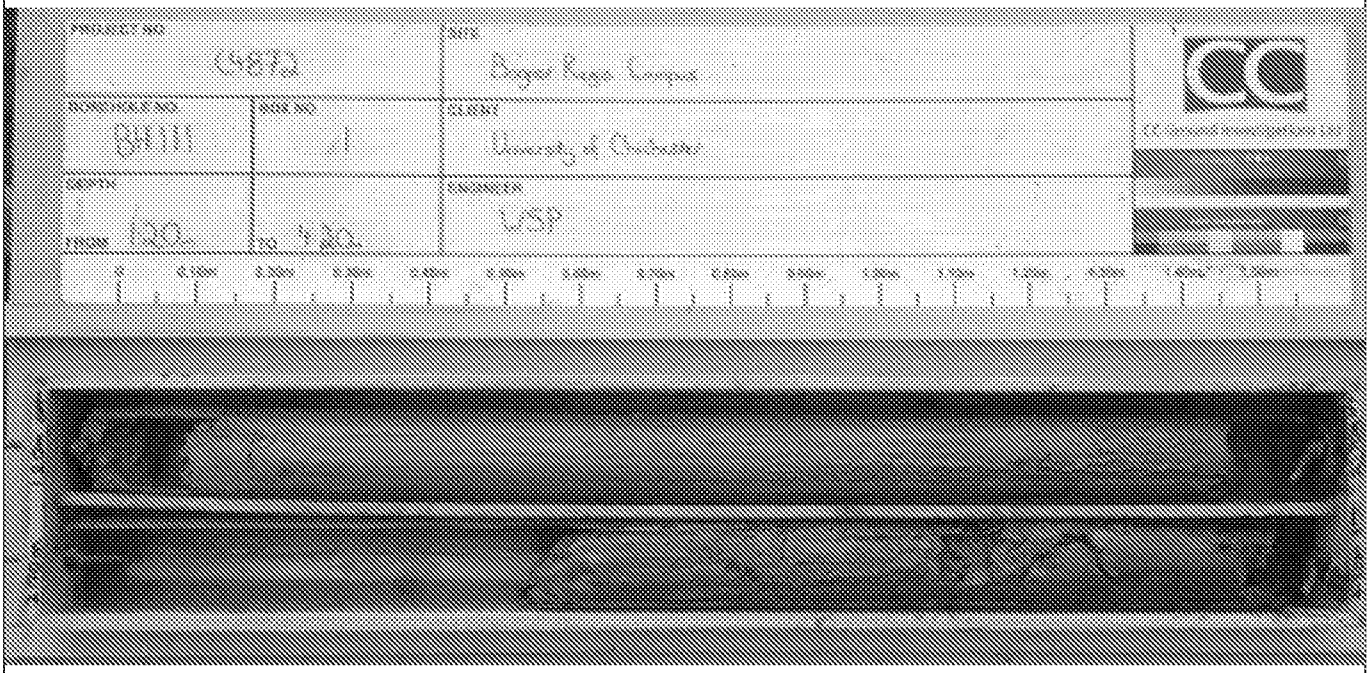
Groundwater:

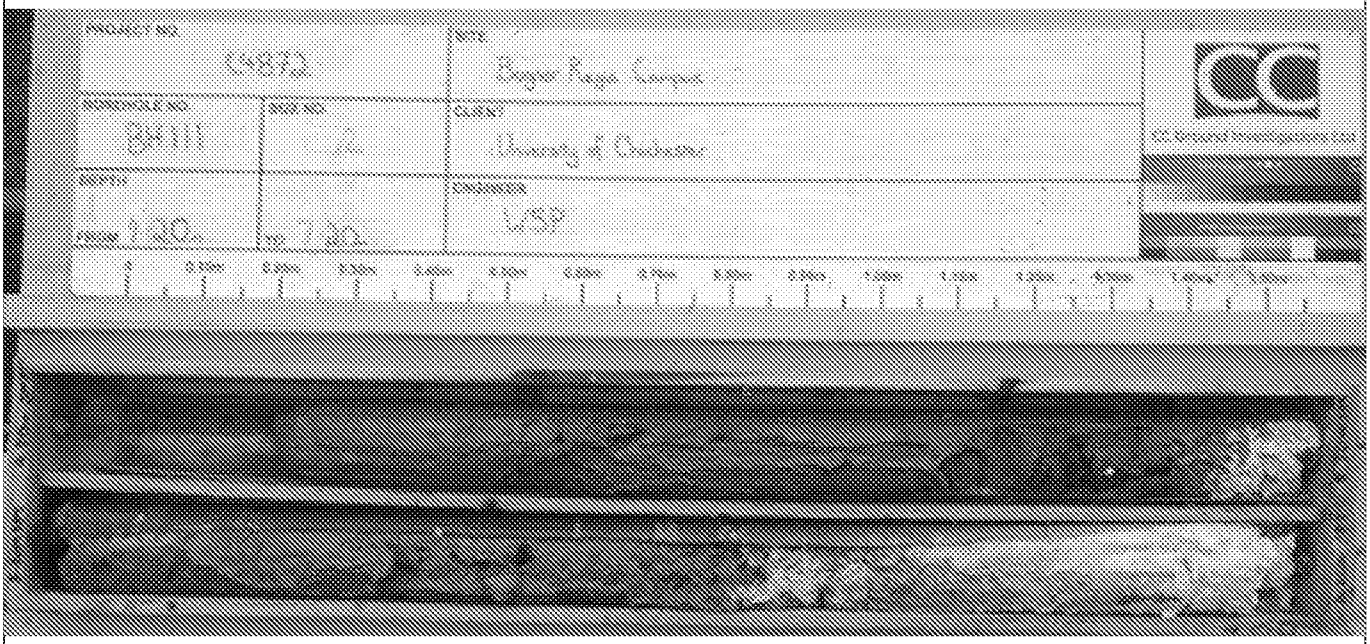
Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

Hole Progress:

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
02/11/2015	10.20	10.20	1.50
03/11/2015	10.20	10.20	1.00
03/11/2015	12.15	10.20	0.60

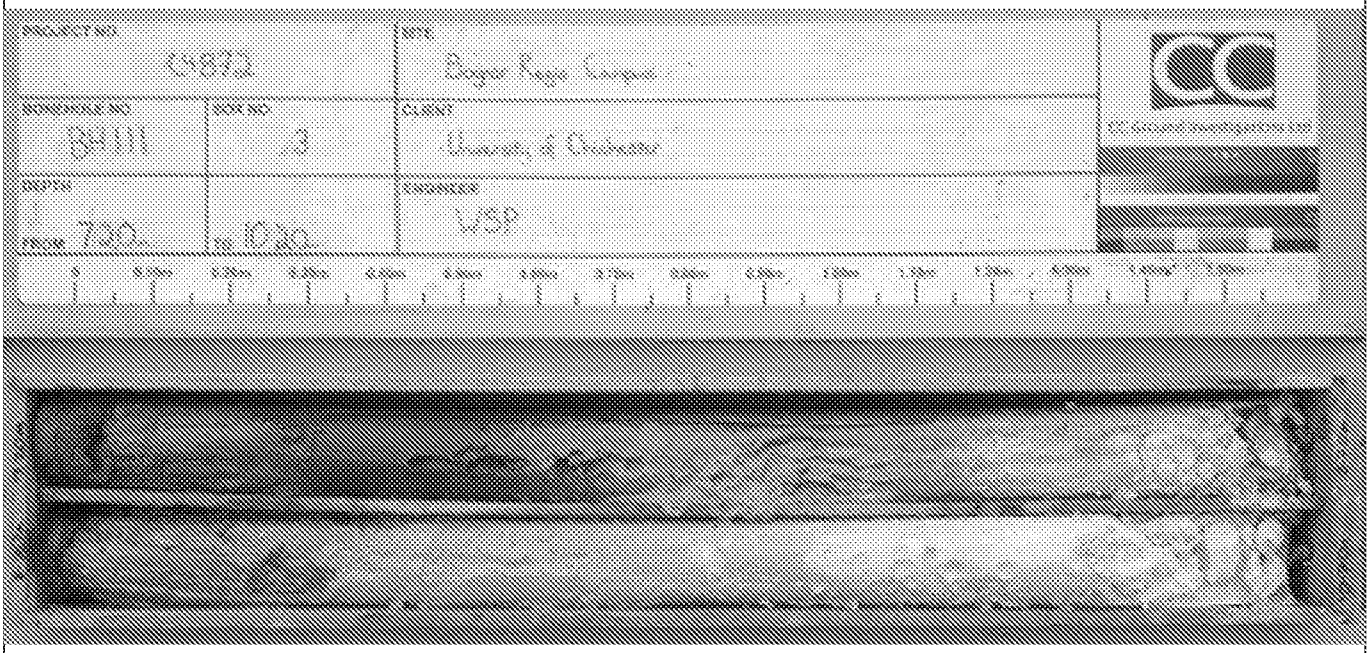
Borehole Photograph

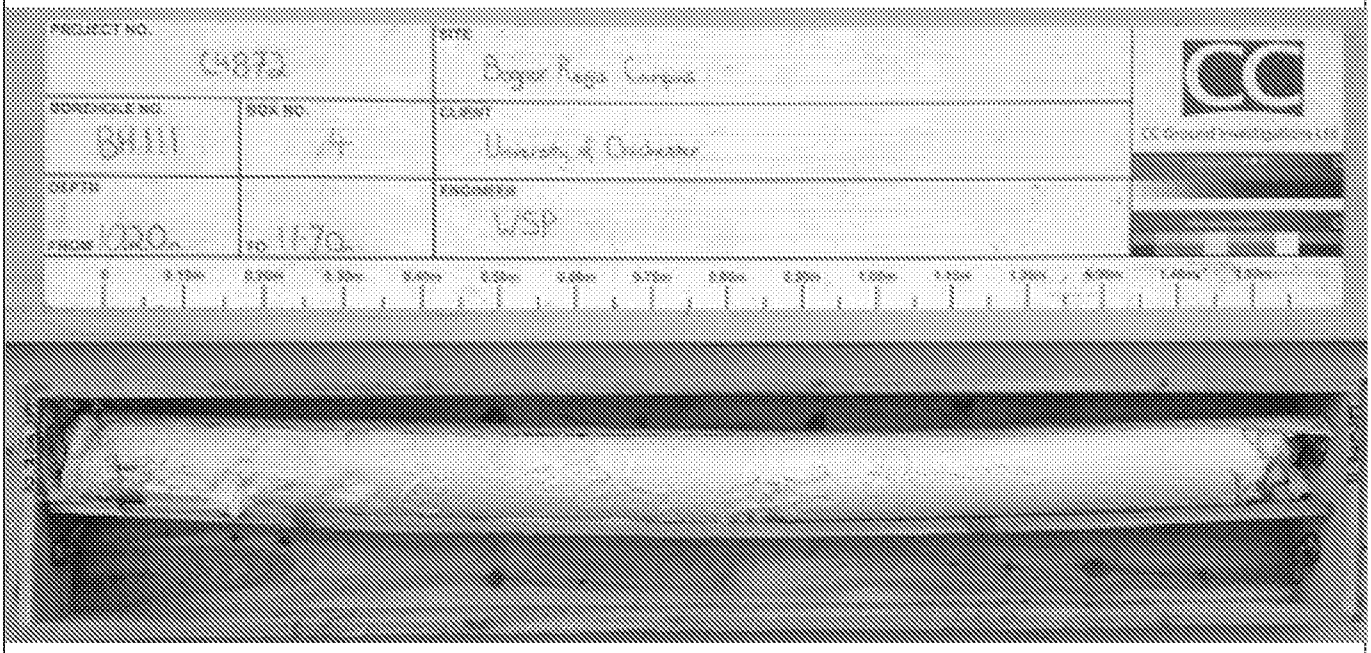




CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH111

Borehole Photograph





CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	BH111

ARUN DISTRICT COUNCIL BR/72/22/PL

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

Telephone: 01[redacted]

Pit No **TP101**

Sheet 1 of 1

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494394 N 99578 Level: 2.89mAOD	Date 11/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 3.20m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
		B	0.10		MADE GROUND: Soft brown mottled orangish brown, grey and white slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine and medium brick, chalk and clay tile fragments.	0.25	2.64	
		B D	0.40		MADE GROUND: Soft orangish brown locally light grey and brown slightly sandy slightly gravelly CLAY with rare rootlets. Gravel is sub-angular fine clay tile fragments, rare ash and flint.	(1.05)		
1		B D H	1.30	H 47	Firm orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is sub-angular and sub-rounded fine to coarse flint. (Lambeth Group)	1.30	1.59	
					Firm and stiff light grey mottled orangish brown, reddish brown and dark grey slightly sandy silty CLAY. (Lambeth Group)	1.50	1.39	
2		B D H	2.00	H 72		(1.00)		
					Stiff locally very stiff light grey mottled orangish brown and reddish brown silty CLAY. (Lambeth Group)	2.50	0.39	
						(0.70)		
3	Dry	B D H	3.00	H 100				
					Trial pit completed at 3.20m	3.20	-0.31	
4								
5								
6								

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Groundwater not encountered.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Soakaway test carried out at 1.60m depth. Trial pit refused at 3.20m terminated.

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP101

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP101

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP101

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP101

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP101

ARUN DISTRICT COUNCIL BR/72/22/PL

CC GROUND INVESTIGATIONS LTD

SOAKAWAY TEST

Telephone: 0[redacted]

Pit No **TP101**

Sheet 1 of 1

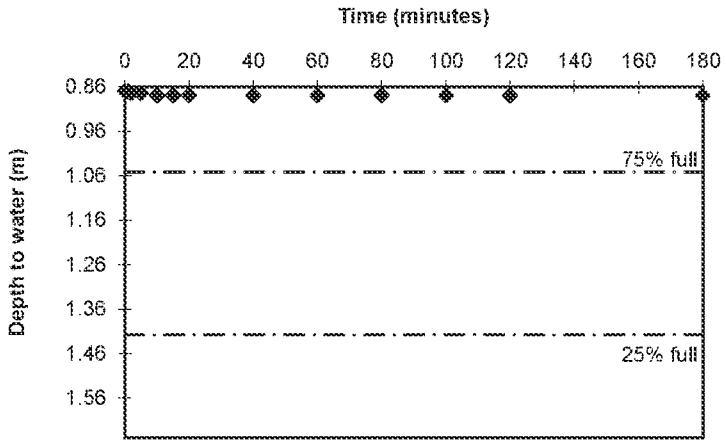
Project Name: University of Chichester Bognor Regis Campus	Project No: C4872	Co-ords: E N Level: mAD	11/11/2015
Location: Bognor Regis			Logged By DM
Client: WSP Remediation			Checked By MA

TEST 1:

LENGTH	1.60	m
BREADTH	0.45	m
DEPTH	1.60	m
WATER LEVEL	Dry	m
FILL LEVEL	0.87	m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

Insufficient soakaway to calculate infiltration rate



TEST 3:

LENGTH		m
BREADTH		m
DEPTH		m
WATER LEVEL		m
FILL LEVEL		m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

TEST 3:

LENGTH		m
BREADTH		m
DEPTH		m
WATER LEVEL		m
FILL LEVEL		m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

REMARKS:

Test carried out in general accordance with BRE 365 (2007).

CC Ground Investigations Ltd

DYNAMIC CONE PENETROMETER TESTING

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

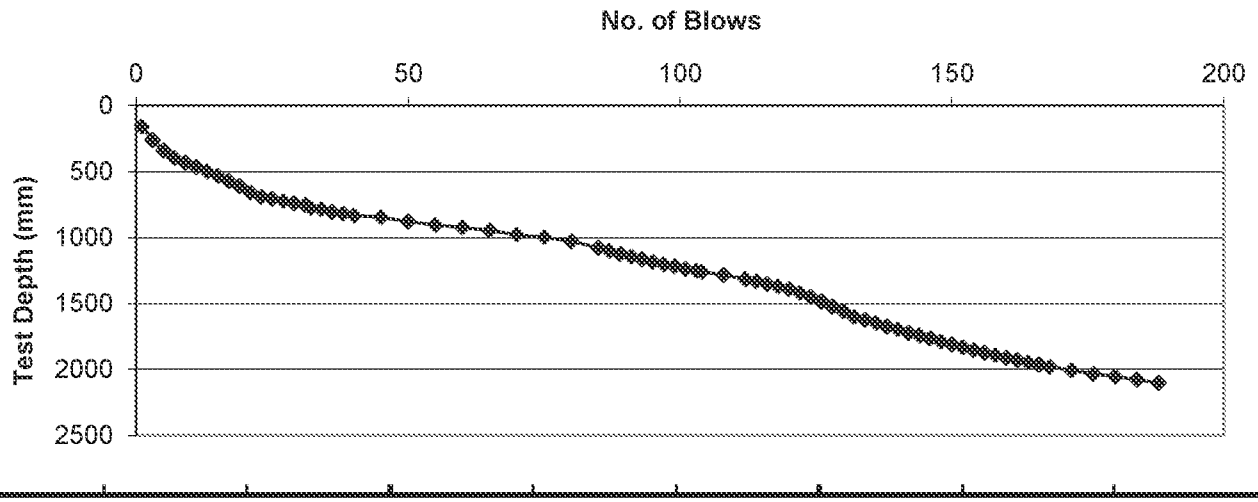
Test No. **DCP - 101**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 2.1

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
2	1	158	5	75	999	2	138	1674
2	3	260	5	80	1030	2	140	1697
2	5	340	5	85	1079	2	142	1722
2	7	397	2	87	1103	2	144	1743
2	9	433	2	89	1124	2	146	1765
2	11	467	2	91	1144	2	148	1788
2	13	500	2	93	1165	2	150	1810
2	15	533	2	95	1184	2	152	1832
2	17	570	2	97	1203	2	154	1853
2	19	610	2	99	1219	2	156	1873
2	21	658	2	101	1237	2	158	1893
2	23	692	2	103	1253	2	160	1912
2	25	706	1	104	1260	2	162	1930
2	27	725	4	108	1284	2	164	1947
2	29	741	4	112	1315	2	166	1964
2	31	754	2	114	1333	2	168	1979
1	32	774	2	116	1351	4	172	2007
2	34	788	2	118	1371	4	176	2033
2	36	806	2	120	1391	4	180	2053
2	38	819	2	122	1419	4	184	2078
2	40	832	2	124	1450	4	188	2101
5	45	848	2	126	1485			
5	50	879	2	128	1523			
5	55	905	2	130	1558			
5	60	924	2	132	1603			
5	65	947	2	134	1623			
5	70	979	2	136	1648			



Remarks:

Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

CONTRACT
C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Univeristy of Chichester

SITE University of Chichester - Bognor Regis Campus

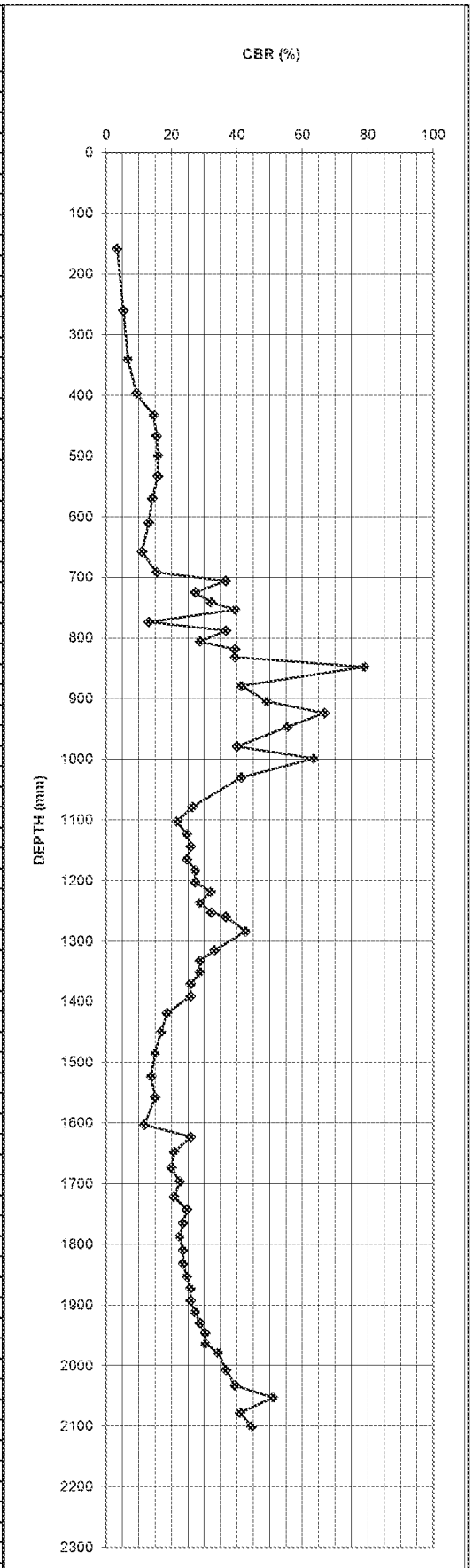
Test No. DCP - 101

Date: 18/11/2015

Initial scale reading (mm) 60

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
2	218	158	79	3.4
2	320	260	51	5.2
2	400	340	40	6.6
2	457	397	29	9.3
2	493	433	18	14.5
2	527	467	17	15.4
2	560	500	17	15.8
2	593	533	17	15.8
2	630	570	19	14.2
2	670	610	20	13.1
2	718	658	24	11.0
2	752	692	17	15.4
2	766	706	7	36.7
2	785	725	10	27.2
2	801	741	8	32.2
2	814	754	7	39.4
1	834	774	20	13.1
2	848	788	7	36.7
2	866	806	9	28.7
2	879	819	7	39.4
2	892	832	7	39.4
5	908	848	3	79.0
5	939	879	6	41.3
5	965	905	5	49.1
5	984	924	4	66.8
5	1007	947	5	55.4
5	1039	979	6	40.1
5	1059	999	4	63.5
5	1090	1030	6	41.3
5	1139	1079	10	26.4
2	1163	1103	12	21.6
2	1184	1124	11	24.7
2	1204	1144	10	25.9
2	1225	1165	11	24.7
2	1244	1184	10	27.2
2	1263	1203	10	27.2
2	1279	1219	8	32.2
2	1297	1237	9	28.7
2	1313	1253	8	32.2
1	1320	1260	7	36.7
4	1344	1284	6	42.7
4	1375	1315	8	33.2
2	1393	1333	9	28.7
2	1411	1351	9	28.7
2	1431	1371	10	25.9
2	1451	1391	10	25.9
2	1479	1419	14	18.6
2	1510	1450	16	16.8
2	1545	1485	18	14.9
2	1583	1523	19	13.8
2	1618	1558	18	14.9
2	1663	1603	23	11.7
2	1683	1623	10	25.9
2	1708	1648	13	20.8
2	1734	1674	13	20.0
2	1757	1697	12	22.6
2	1782	1722	13	20.8
2	1803	1743	11	24.7
2	1825	1765	11	23.6
2	1848	1788	12	22.6
2	1870	1810	11	23.6
2	1892	1832	11	23.6
2	1913	1853	11	24.7
2	1933	1873	10	25.9
2	1953	1893	10	25.9
2	1972	1912	10	27.2
2	1990	1930	9	28.7
2	2007	1947	9	30.3
2	2024	1964	9	30.3
2	2039	1979	8	34.3
4	2067	2007	7	36.7
4	2093	2033	7	39.4
4	2113	2053	5	51.0
4	2138	2078	6	41.0
4	2161	2101	6	44.5



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = 247DCP$^{-0.95}$

CONTRACT

C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

[redacted]

Project Name: University of Chichester	Project No: C4872	Co-ords: E 494436 N 99611 Level: 1.93mAOD	Pit No TP102 Sheet 1 of 1 Date 11/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 3.50m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
					Soft light grey mottled orangish brown silty CLAY with frequent rootlets. (Topsoil)	(0.30)		
		B	0.40		Grey mottled orangish brown slightly sandy very clayey GRAVEL. Gravel is sub-angular and sub-rounded fine and medium flint. (Superficial Deposits)	0.30 0.50	1.63 1.43	
		B D H	0.70	H 58	Firm orangish brown and light grey slightly sandy slightly gravelly silty CLAY. Gravel is sub-angular and sub-rounded fine to coarse flint. (Superficial Deposits)			
1					1.00-1.50m: Stiff.	(1.00)		1
		B D	1.70		Soft light grey and orangish brown slightly sandy gravelly CLAY with rare 2mm thick sand lenses. Gravel is sub-angular and sub-rounded fine to coarse flint. Medium cobble content of flint. (Superficial Deposits)	1.50 (0.70)	0.43	
2								2
		B D H	2.50	H 90	Stiff light grey mottled orangish brown and reddish brown slightly sandy silty CLAY with occasional 2mm thick sand lenses. (Superficial Deposits)	2.20 (0.60)	-0.27	
	Seepage					2.80	-0.87	
3		B D H	3.00	H 60	Firm light grey silty CLAY with occasional vertical decomposed organic fragments up to 50mm long x 2mm diameter (Superficial Deposits)	(0.70)		3
		D	3.50		Trial pit completed at 3.50m	3.50	-1.57	
4								4
5								5
6								6

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Seepage noted at 2.80m.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Trial pit terminated at 3.50m.

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP102

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP102

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP102

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP102

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP102

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

DCP - TRL Probe

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

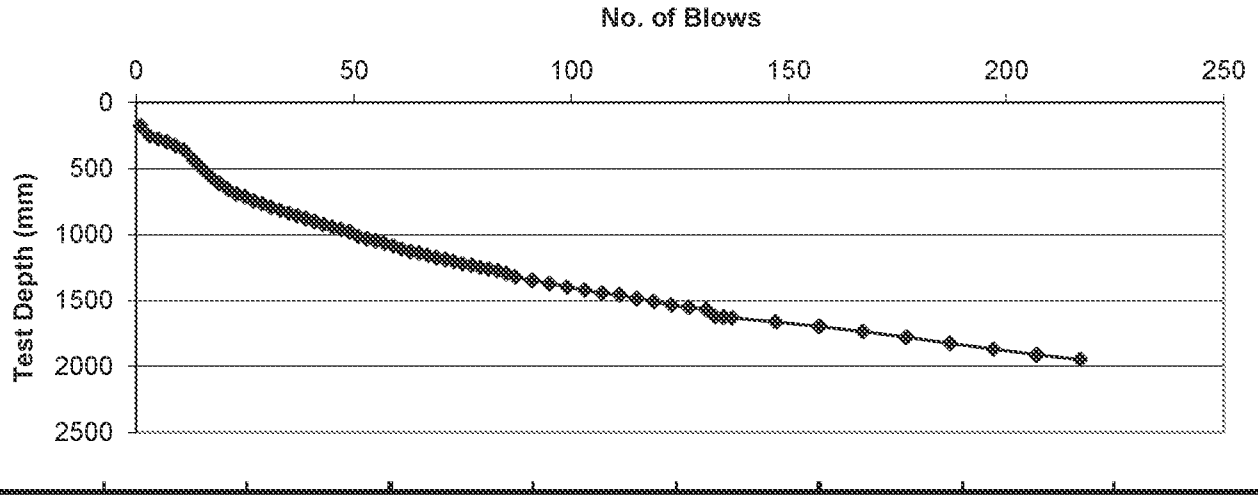
Test No. **DCP - 102**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 0

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
2	1	175	2	55	1050	4	131	1568
2	3	250	2	57	1067	2	133	1621
2	5	275	2	59	1085	2	135	1627
2	7	298	2	61	1109	2	137	1632
2	9	325	2	63	1128	10	147	1663
2	11	360	2	65	1141	10	157	1697
2	13	432	2	67	1158	10	167	1736
2	15	499	2	69	1174	10	177	1778
2	17	559	2	71	1190	10	187	1825
2	19	609	2	73	1205	10	197	1868
2	21	655	2	75	1220	10	207	1911
2	23	695	2	77	1234	10	217	1947
2	25	715	2	79	1249			
2	27	745	2	81	1261			
2	29	767	2	83	1275			
2	31	794	2	85	1295			
2	33	815	2	87	1321			
2	35	837	4	91	1348			
2	37	858	4	95	1371			
2	39	880	4	99	1397			
2	41	901	4	103	1421			
2	43	925	4	107	1444			
2	45	944	4	111	1456			
2	47	962	4	115	1486			
2	49	979	4	119	1507			
2	51	1014	4	123	1535			
2	53	1031	4	127	1551			



Remarks:

Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

CONTRACT
C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Universty of Chichester

SITE University of Chichester - Bognor Regis Campus

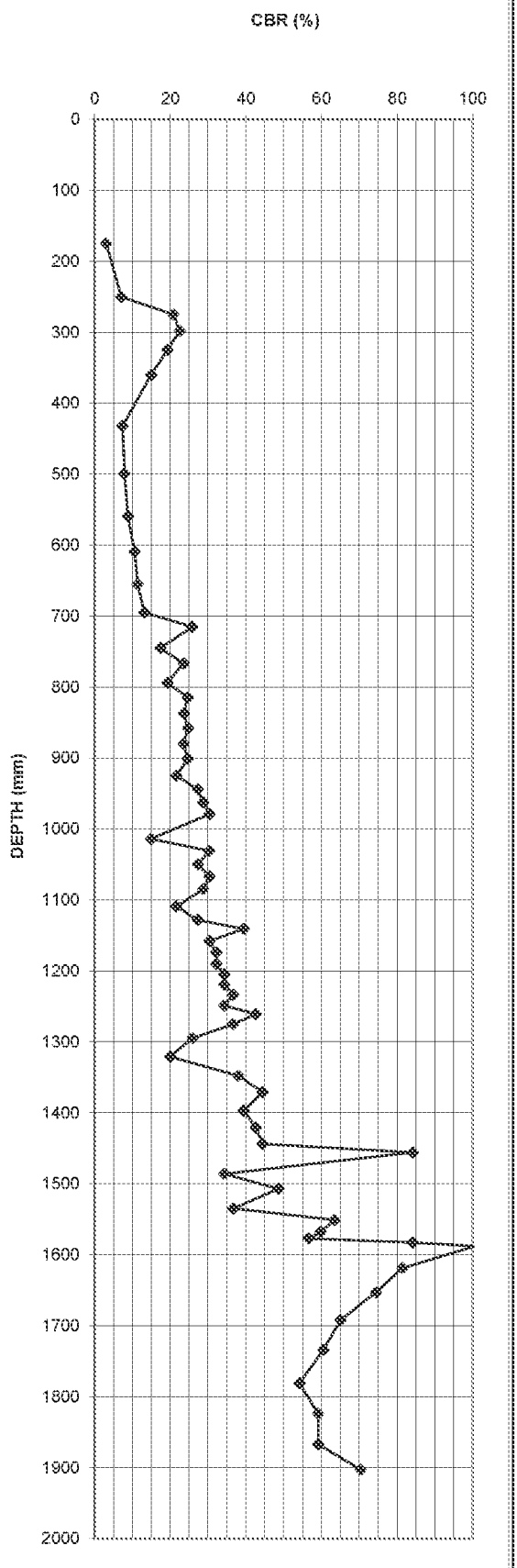
Test No. **DCP - 102**

Date: 18/11/2015

Initial scale reading (mm) 155

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
2	330	175	88	3.1
2	405	250	38	7.1
2	430	275	13	20.8
2	453	298	12	22.6
2	480	325	14	19.3
2	515	360	18	14.9
2	587	432	36	7.4
2	654	499	34	7.9
2	714	559	30	8.8
2	764	609	25	10.5
2	810	655	23	11.4
2	850	695	20	13.1
2	870	715	10	25.9
2	900	745	15	17.4
2	922	767	11	23.6
2	949	794	14	19.3
2	970	815	11	24.7
2	992	837	11	23.6
2	1013	858	11	24.7
2	1035	880	11	23.6
2	1056	901	11	24.7
2	1080	925	12	21.6
2	1099	944	10	27.2
2	1117	962	9	28.7
2	1134	979	9	30.3
2	1169	1014	18	14.9
2	1186	1031	9	30.3
2	1205	1050	10	27.2
2	1222	1067	9	30.3
2	1240	1085	9	28.7
2	1264	1109	12	21.6
2	1283	1128	10	27.2
2	1296	1141	7	39.4
2	1313	1158	9	30.3
2	1329	1174	8	32.2
2	1345	1190	8	32.2
2	1360	1205	8	34.3
2	1375	1220	8	34.3
2	1389	1234	7	36.7
2	1404	1249	8	34.3
2	1416	1261	6	42.7
2	1430	1275	7	36.7
2	1450	1295	10	25.9
2	1476	1321	13	20.0
4	1503	1348	7	38.0
4	1526	1371	6	44.5
4	1552	1397	7	39.4
4	1576	1421	6	42.7
4	1599	1444	6	44.5
4	1611	1456	3	84.2
4	1641	1486	8	34.3
4	1662	1507	5	48.6
4	1690	1535	7	36.7
4	1706	1551	4	63.5
4	1723	1568	4	59.8
2	1732	1577	5	56.6
2	1738	1583	3	84.2
2	1743	1588	3	100.6
10	1774	1619	3	81.5
10	1808	1653	3	74.4
10	1847	1692	4	65.1
10	1889	1734	4	60.5
10	1936	1781	5	54.2
10	1979	1824	4	59.1
10	2022	1867	4	59.1
10	2058	1903	4	70.4



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = $247DCP^{-0.88}$

CONTRACT

C4872

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

[redacted]

Project Name: University of Chichester	Project No: C4872	Co-ords: E 494411 N 99653 Level: 1.41mAOD	Pit No TP103 Sheet 1 of 1 Date 10/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 4.00m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
		ES	0.05		MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine clay tile fragments.	0.20	1.21	
		B D ES	0.30		Stiff orangish brown mottled light grey slightly sandy silty CLAY with occasional rootlets. (Superficial Deposits)	(0.30)		
		B D H	0.70	H 10	Firm and stiff orangish brown and light grey silty CLAY. (Superficial Deposits)	0.50	0.91	
1		B D H S	1.00	H 14	Soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)	(0.30) 0.80	0.61	1
		B D ES H	1.50	H 61	Very soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)	(0.60) 1.40	0.01	
2		B D H	2.00	H 10	Firm grey mottled orangish brown silty CLAY. (Superficial Deposits)	1.55	-0.14	2
					Very soft grey mottled black slightly sandy silty CLAY with occasional decomposed organic fragments. (Superficial Deposits)	(0.65) 2.20	-0.79	
3		B D H	3.00	H 15		(1.80)		3
4	Dry	H	4.00	H 15	Trial pit completed at 4.00m	4.00	-2.59	4
5								5
6								6

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Groundwater not encountered.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Soakaway test carried out at 1.55m depth. Trial pit terminated at 4.00m.

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP103

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP103

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP103

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP103

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP103

ARUN DISTRICT COUNCIL BR/72/22/PL

CC GROUND INVESTIGATIONS LTD

SOAKAWAY TEST

T [redacted]

Pit No **TP103**

Sheet 1 of 1

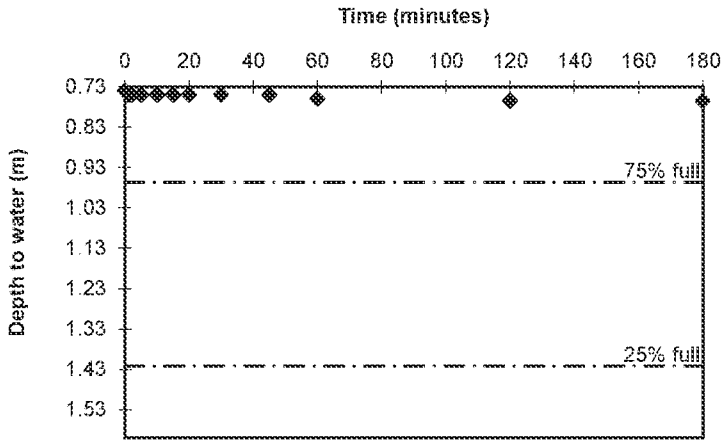
Project Name: University of Chichester Bognor Regis Campus	Project No: C4872	Co-ords: E N Level: mAD	11/11/2015
Location: Bognor Regis			Logged By DM
Client: WSP Remediation			Checked By MA

TEST 1:

LENGTH	1.60	m
BREADTH	0.45	m
DEPTH	1.65	m
WATER LEVEL	Dry	m
FILL LEVEL	0.74	m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

Insufficient soakaway to calculate infiltration rate



TEST 2:

LENGTH		m
BREADTH		m
DEPTH		m
WATER LEVEL		m
FILL LEVEL		m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

TEST 3:

LENGTH		m
BREADTH		m
DEPTH		m
WATER LEVEL		m
FILL LEVEL		m
v_{p75-25}		m^3
a_{p50}		m^2
t_{p75-25}		min

soil infiltration rate, *f* ms^{-1}

REMARKS:

Test carried out in general accordance with BRE 365 (2007).

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

[redacted]

Pit No **TP104**

Sheet 1 of 1

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494398 N 99676 Level: 1.36mAOD	Date 10/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 4.00m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
					MADE GROUND: Firm friable brown slightly sandy CLAY with frequent rootlets and rare gravel sized blue and white porcelain fragments.	(0.30)		
					Firm orangish brown mottled light grey silty CLAY. (Superficial Deposits)	0.30	1.06	
		B D H	0.50	H 60		(0.50)		
					Soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)	0.80	0.56	
1		B D H	1.00	H 28		(0.50)		1
					Very soft grey mottled orangish brown and black silty CLAY. (Superficial Deposits)	1.30	0.06	
		B D H	1.50	H 16				
2						(1.20)		2
					Very soft grey mottled black silty CLAY. (Superficial Deposits)	2.50	-1.14	
3		B D H	3.00	H 12		(1.50)		3
4	Dry				Trial pit completed at 4.00m	4.00	-2.64	4
5								5
6								6

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Groundwater not encountered.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Trial pit terminated at 4.00m.

Trial Pit Photograph



CC Ground Investigations Ltd	
Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP104

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph

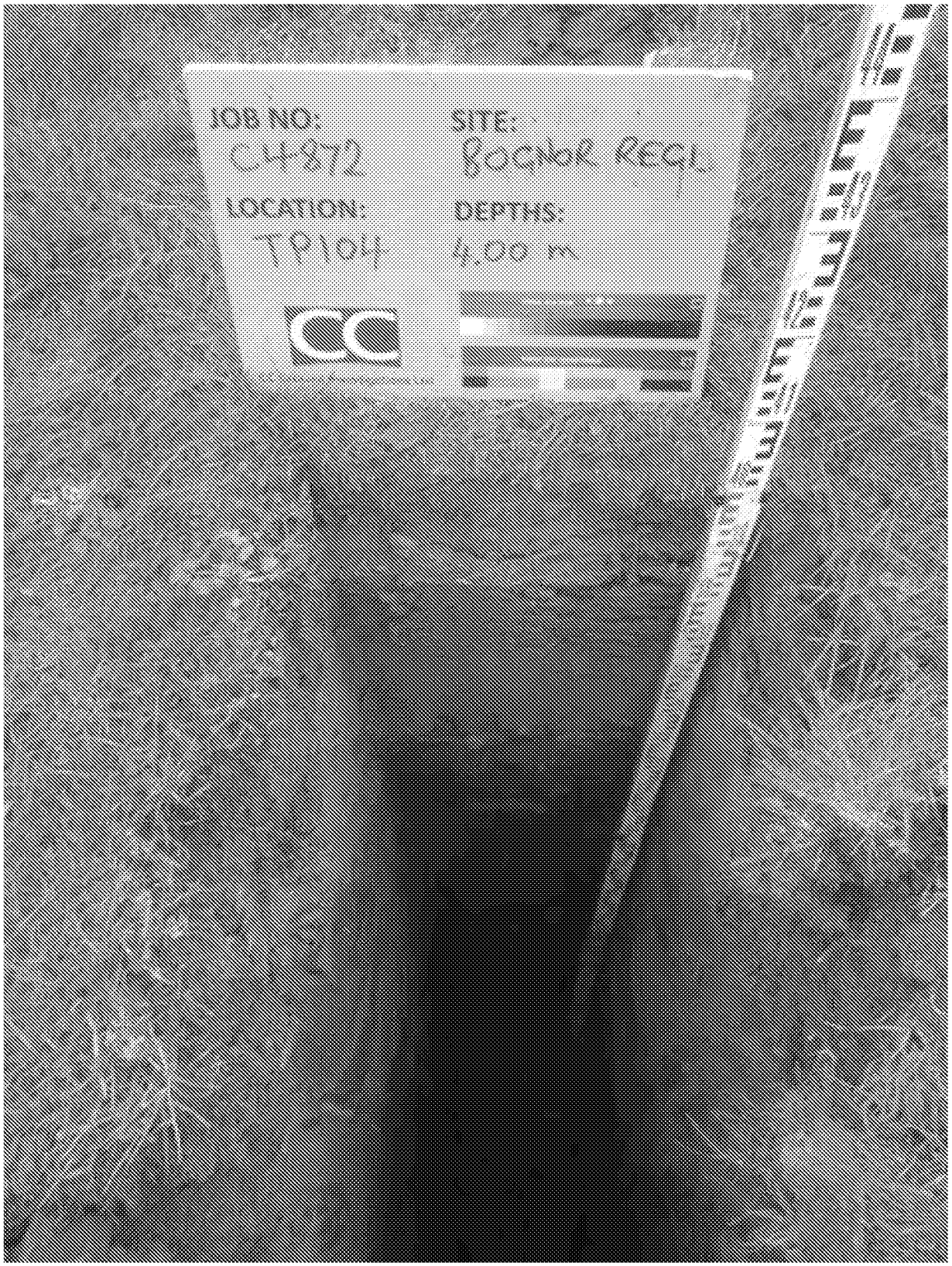


CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP104

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP104

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph

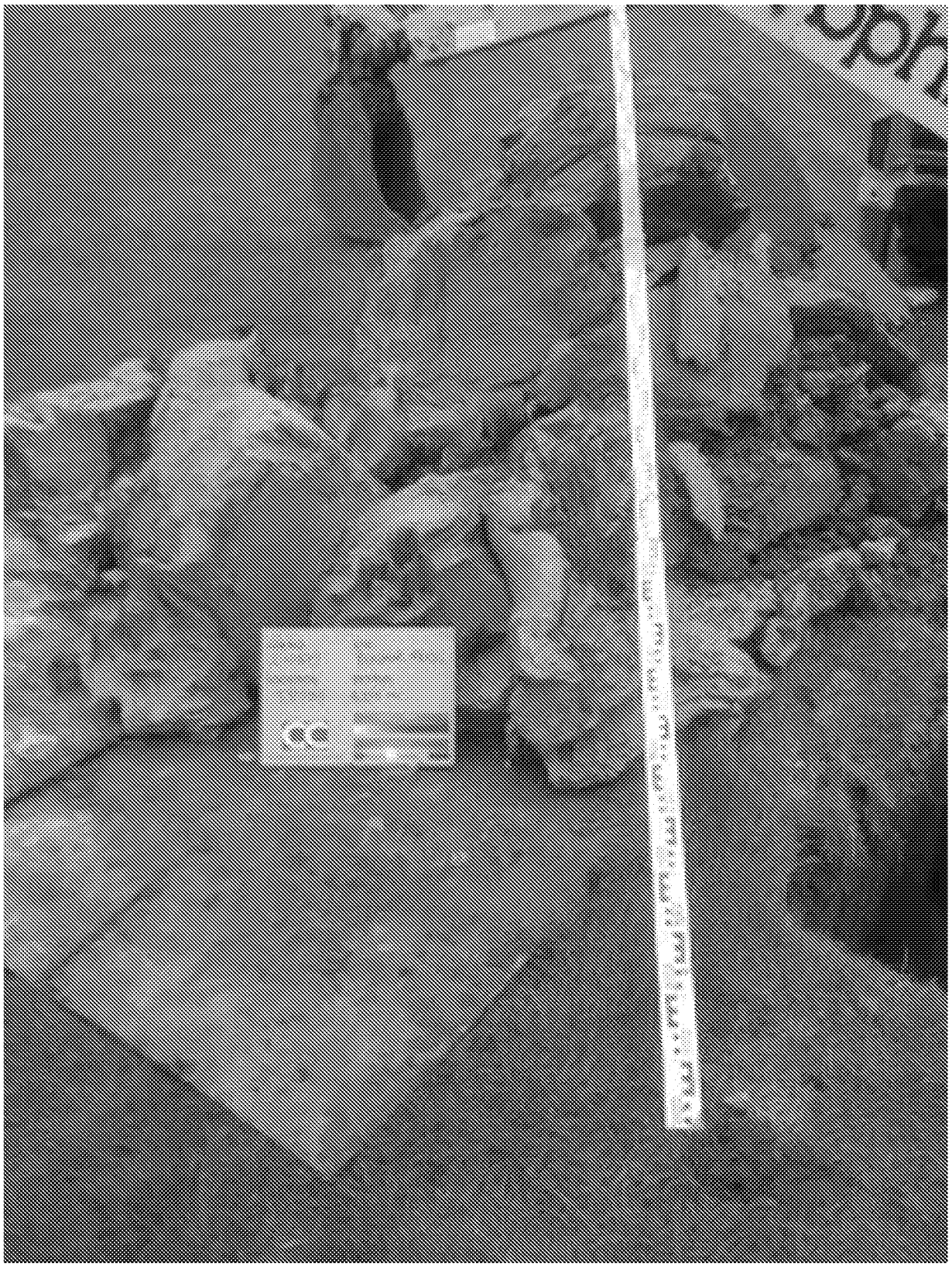


CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP104

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP104

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

DYNAMIC CONE PENETROMETER TESTING

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

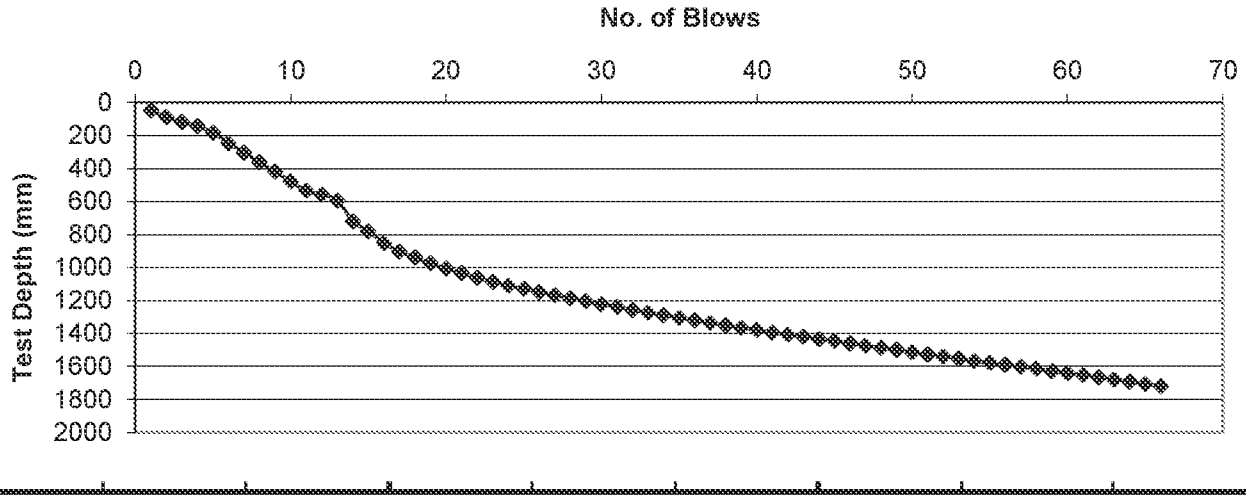
Test No. **DCP - 104**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 1.87

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
1	1	48	1	28	1186	1	55	1578
1	2	88	1	29	1204	1	56	1590
1	3	118	1	30	1223	1	57	1602
1	4	143	1	31	1238	1	58	1614
1	5	184	1	32	1258	1	59	1628
1	6	248	1	33	1273	1	60	1641
1	7	304	1	34	1289	1	61	1652
1	8	362	1	35	1305	1	62	1665
1	9	418	1	36	1320	1	63	1679
1	10	478	1	37	1336	1	64	1693
1	11	535	1	38	1351	1	65	1706
1	12	558	1	39	1364	1	66	1720
1	13	594	1	40	1378	1	67	1734
1	14	720	1	41	1393	1	68	1748
1	15	780	1	42	1408	1	69	1762
1	16	853	1	43	1420	1	70	1776
1	17	903	1	44	1434	2	72	1804
1	18	938	1	45	1445	2	74	1833
1	19	973	1	46	1460	2	76	1859
1	20	1006	1	47	1473	2	78	1888
1	21	1033	1	48	1487	2	80	1927
1	22	1063	1	49	1499	2	82	1951
1	23	1088	1	50	1514	2	84	1974
1	24	1110	1	51	1528	2	86	1997
1	25	1129	1	52	1540	2	88	2019
1	26	1149	1	53	1553	2	90	2041
1	27	1166	1	54	1566	2	92	2065



Remarks:

Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

CONTRACT
C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Univeristy of Chichester

SITE University of Chichester - Bognor Regis Campus

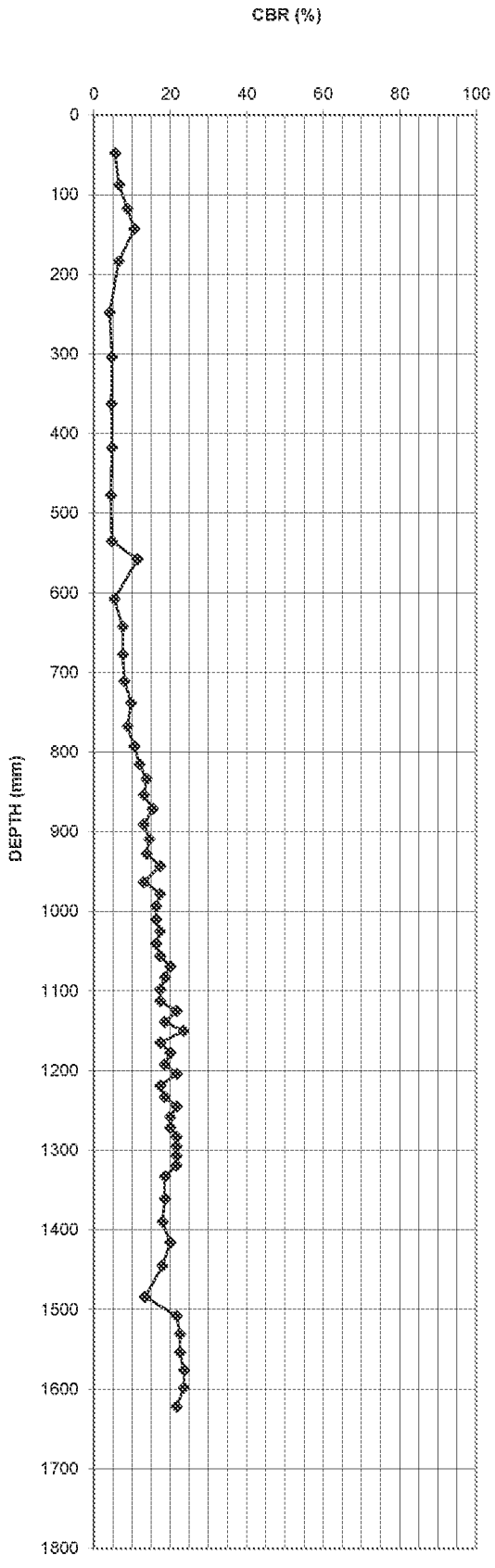
Test No. **DCP - 104**

Date: 18/11/2015

Initial scale reading (mm) 2

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
1	50	48	48	5.6
1	90	88	40	6.6
1	120	118	30	8.8
1	145	143	25	10.5
1	186	184	41	6.5
1	250	248	64	4.2
1	306	304	56	4.8
1	364	362	58	4.6
1	420	418	56	4.8
1	480	478	60	4.5
1	537	535	57	4.7
1	560	558	23	11.4
1	610	608	50	5.3
1	645	643	35	7.6
1	680	678	35	7.6
1	713	711	33	8.0
1	740	738	27	9.8
1	770	768	30	8.8
1	795	793	25	10.5
1	817	815	22	11.9
1	836	834	19	13.8
1	856	854	20	13.1
1	873	871	17	15.4
1	893	891	20	13.1
1	911	909	18	14.5
1	930	928	19	13.8
1	945	943	15	17.4
1	965	963	20	13.1
1	980	978	15	17.4
1	996	994	16	16.3
1	1012	1010	16	16.3
1	1027	1025	15	17.4
1	1043	1041	16	16.3
1	1058	1056	15	17.4
1	1071	1069	13	20.0
1	1085	1083	14	18.6
1	1100	1098	15	17.4
1	1115	1113	15	17.4
1	1127	1125	12	21.6
1	1141	1139	14	18.6
1	1152	1150	11	23.6
1	1167	1165	15	17.4
1	1180	1178	13	20.0
1	1194	1192	14	18.6
1	1206	1204	12	21.6
1	1221	1219	15	17.4
1	1235	1233	14	18.6
1	1247	1245	12	21.6
1	1260	1258	13	20.0
1	1273	1271	13	20.0
1	1285	1283	12	21.6
1	1297	1295	12	21.6
1	1309	1307	12	21.6
1	1321	1319	12	21.6
1	1335	1333	14	18.6
2	1363	1361	14	18.6
2	1392	1390	15	18.0
2	1418	1416	13	20.0
2	1447	1445	15	18.0
2	1486	1484	20	13.4
2	1510	1508	12	21.6
2	1533	1531	12	22.6
2	1556	1554	12	22.6
2	1578	1576	11	23.6
2	1600	1598	11	23.6
2	1624	1622	12	21.6



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = $247DCP^{-0.88}$

CONTRACT

C4872

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

Telephone [redacted]

Pit No **TP105**

Sheet 1 of 1

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494375 N 99720 Level: 1.40mAOD	Date 11/11/2015
Location: Bognor Regis		Dimensions: 1.90m Depth 3.70m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
					MADE GROUND: Firm friable brown mottled reddish brown and grey slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine brick and flint.	(0.30)		
					Firm light grey mottled orangish brown silty CLAY. (Superficial Deposits)	0.30	1.10	
		B D H	0.50	H 52		(0.90)		
1	Seepage							
					Very soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)	1.20	0.20	
		B D H	1.50	H 16		(0.90)		
2								
					Very soft grey mottled black slightly sandy silty CLAY with occasional decomposed organic fragments. (Superficial Deposits)	2.10	-0.70	
	Seepage	B D H	2.50	H 14		(1.60)		
3								
		B D H	3.50	H 13				
					Trial pit completed at 3.70m	3.70	-2.30	
4								
5								
6								

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Seepage noted at 1.00m and 2.50m.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Trial pit terminated at 3.70m.

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP105

ARUN DISTRICT COUNCIL BR/72/22/PL

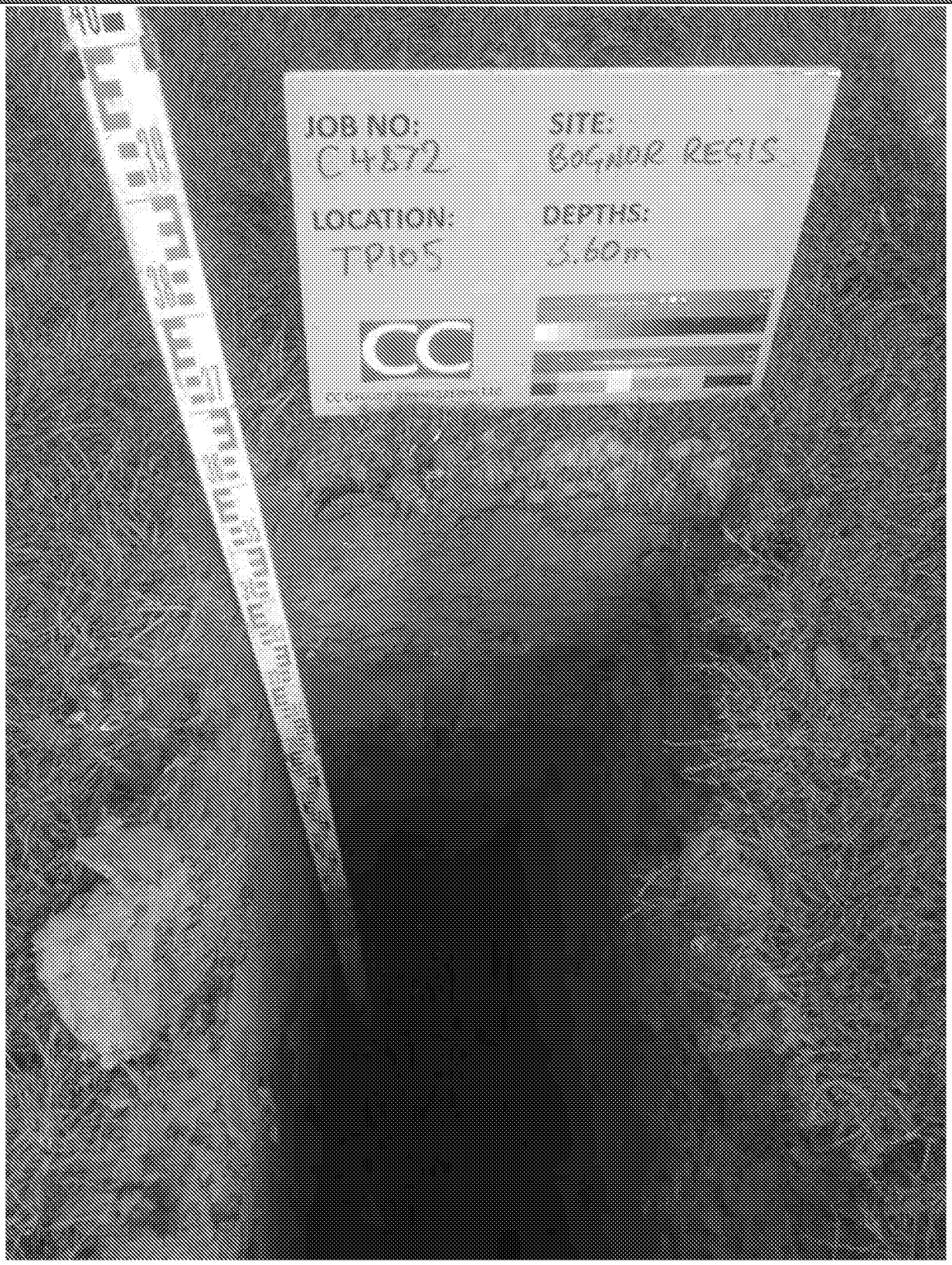
Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP105

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP105

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP105

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP105

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

DYNAMIC CONE PENETROMETER TESTING

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

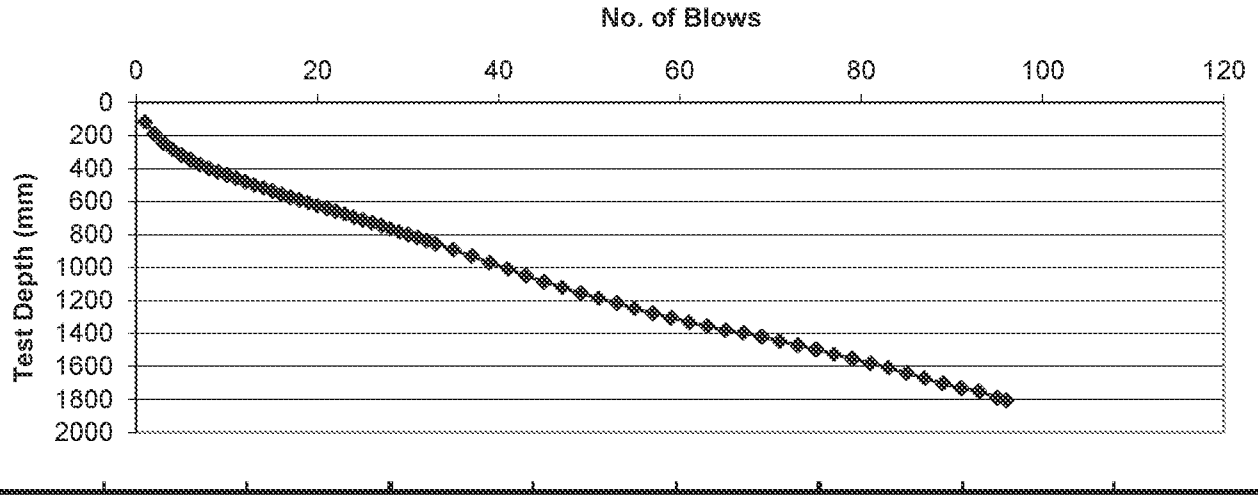
Test No. **DCP - 105**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 1.81

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
1	1	117	1	28	765	2	77	1526
1	2	190	1	29	785	2	79	1553
1	3	245	1	30	800	2	81	1581
1	4	285	1	31	817	2	83	1608
1	5	320	1	32	837	2	85	1641
1	6	347	1	33	856	2	87	1671
1	7	375	2	35	891	2	89	1703
1	8	398	2	37	931	2	91	1732
1	9	420	2	39	971	2	93	1751
1	10	440	2	41	1008	2	95	1789
1	11	459	2	43	1049	1	96	1806
1	12	480	2	45	1087			
1	13	500	2	47	1121			
1	14	517	2	49	1156			
1	15	536	2	51	1186			
1	16	555	2	53	1216			
1	17	575	2	55	1249			
1	18	591	2	57	1278			
1	19	607	2	59	1304			
1	20	625	2	61	1331			
1	21	642	2	63	1356			
1	22	659	2	65	1381			
1	23	676	2	67	1396			
1	24	695	2	69	1420			
1	25	712	2	71	1446			
1	26	729	2	73	1471			
1	27	745	2	75	1496			



Remarks:

Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

CONTRACT
C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Univeristy of Chichester

SITE University of Chichester - Bognor Regis Campus

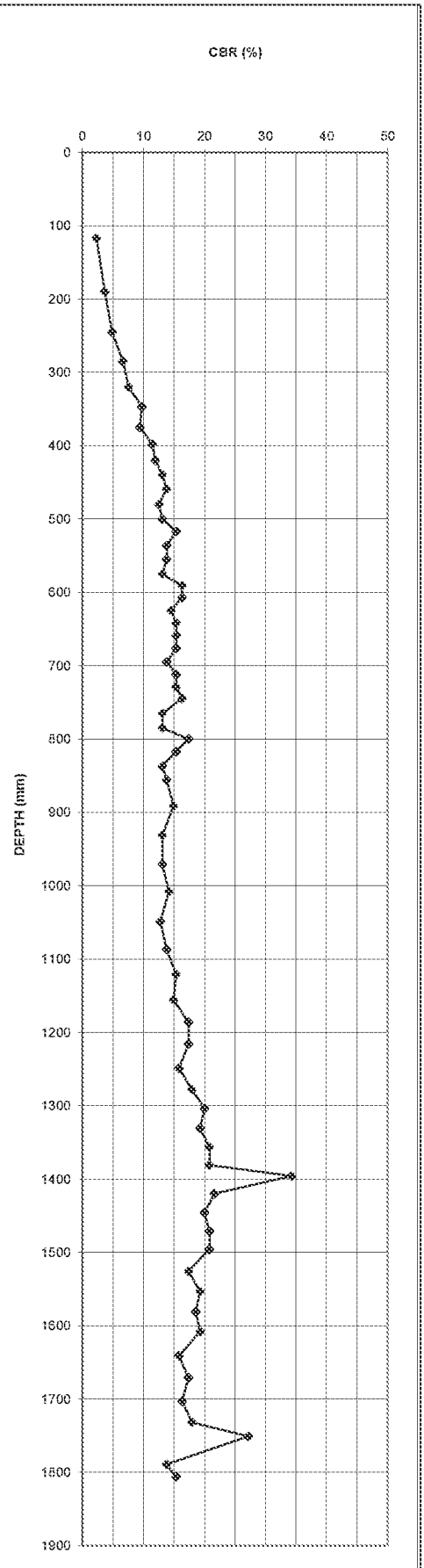
Test No. DCP - 105

Date: 18/11/2015

Initial scale reading (mm) 5

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
1	122	117	117	2.3
1	195	190	73	3.7
1	250	245	55	4.9
1	290	285	40	6.6
1	325	320	35	7.6
1	352	347	27	9.8
1	380	375	28	9.4
1	403	398	23	11.4
1	425	420	22	11.9
1	445	440	20	13.1
1	464	459	19	13.8
1	485	480	21	12.5
1	505	500	20	13.1
1	522	517	17	15.4
1	541	536	19	13.8
1	560	555	19	13.8
1	580	575	20	13.1
1	596	591	16	16.3
1	612	607	16	16.3
1	630	625	18	14.5
1	647	642	17	15.4
1	664	659	17	15.4
1	681	676	17	15.4
1	700	695	19	13.8
1	717	712	17	15.4
1	734	729	17	15.4
1	750	745	16	16.3
1	770	765	20	13.1
1	790	785	20	13.1
1	805	800	15	17.4
1	822	817	17	15.4
1	842	837	20	13.1
1	861	856	19	13.8
2	896	891	18	14.9
2	936	931	20	13.1
2	976	971	20	13.1
2	1013	1008	19	14.2
2	1054	1049	21	12.8
2	1092	1087	19	13.8
2	1126	1121	17	15.4
2	1161	1156	18	14.9
2	1191	1186	15	17.4
2	1221	1216	15	17.4
2	1254	1249	17	15.8
2	1283	1278	15	18.0
2	1309	1304	13	20.0
2	1336	1331	14	19.3
2	1361	1356	13	20.8
2	1386	1381	13	20.8
2	1401	1396	8	34.3
2	1425	1420	12	21.6
2	1451	1446	13	20.0
2	1476	1471	13	20.8
2	1501	1496	13	20.8
2	1531	1526	15	17.4
2	1558	1553	14	19.3
2	1586	1581	14	18.6
2	1613	1608	14	19.3
2	1646	1641	17	15.8
2	1676	1671	15	17.4
2	1708	1703	16	16.3
2	1737	1732	15	18.0
2	1756	1751	10	27.2
2	1794	1789	19	13.8
1	1811	1806	17	15.4



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = $247DCP^{-0.98}$

CONTRACT

C4872

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

Telephon [redacted]

Project Name: University of Chichester	Project No: C4872	Co-ords: E 494419 N 99699 Level: 1.28mAOD	Pit No TP106 Sheet 1 of 1 Date 10/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 3.60m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
		ES	0.10		MADE GROUND: Stiff friable brown mottled light grey slightly sandy slightly gravelly CLAY. Gravel is sub-angular fine and medium flint.	(0.40)		
		B D ES	0.50		Stiff light grey and orangish brown slightly sandy silty CLAY with occasional rootlets. (Superficial Deposits)	0.40 (0.30)	0.88	
					Firm orangish brown and light grey silty CLAY. (Superficial Deposits)	0.70	0.58	
1		B D H	1.00	H 50		(0.50)		1
		B D H	1.50	H 32	Soft light grey mottled orangish brown silty CLAY. (Superficial Deposits)	1.20 (0.60)	0.08	
					Very soft light grey mottled orangish brown slightly sandy silty CLAY. (Superficial Deposits)	1.80	-0.52	
2	Seepage	B D H ES	2.00 2.30	H 15		(0.40)		2
		B D H	2.50	H 17	Very soft dark grey slightly sandy silty CLAY. (Superficial Deposits)	2.20	-0.92	
3						(1.40)		3
		B D H	3.50	H 11				
					Trial pit completed at 3.60m	3.60	-2.32	
4								4
5								5
6								6

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Groundwater seepage noted at 2.00m.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Trial pit terminated at 3.60m.

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP106

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

DYNAMIC CONE PENETROMETER TESTING

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

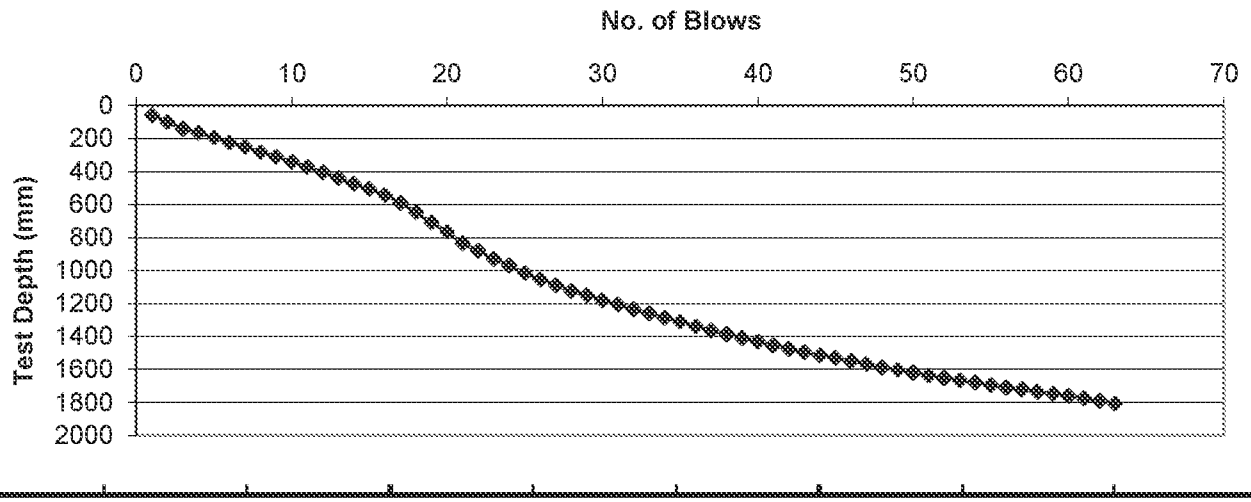
Test No. **DCP - 106**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 1.81

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
1	1	60	1	28	1125	1	55	1695
1	2	100	1	29	1150	1	56	1710
1	3	140	1	30	1180	1	57	1720
1	4	165	1	31	1205	1	58	1735
1	5	195	1	32	1235	1	59	1747
1	6	225	1	33	1260	1	60	1760
1	7	250	1	34	1288	1	61	1775
1	8	282	1	35	1310	1	62	1789
1	9	310	1	36	1338	1	63	1807
1	10	340	1	37	1363			
1	11	372	1	38	1387			
1	12	405	1	39	1410			
1	13	440	1	40	1430			
1	14	475	1	41	1455			
1	15	505	1	42	1475			
1	16	543	1	43	1495			
1	17	590	1	44	1515			
1	18	647	1	45	1530			
1	19	710	1	46	1550			
1	20	765	1	47	1567			
1	21	835	1	48	1587			
1	22	880	1	49	1602			
1	23	930	1	50	1619			
1	24	970	1	51	1636			
1	25	1015	1	52	1651			
1	26	1055	1	53	1666			
1	27	1090	1	54	1680			



Remarks:

Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

CONTRACT
C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Univeristy of Chichester

SITE University of Chichester - Bognor Regis Campus

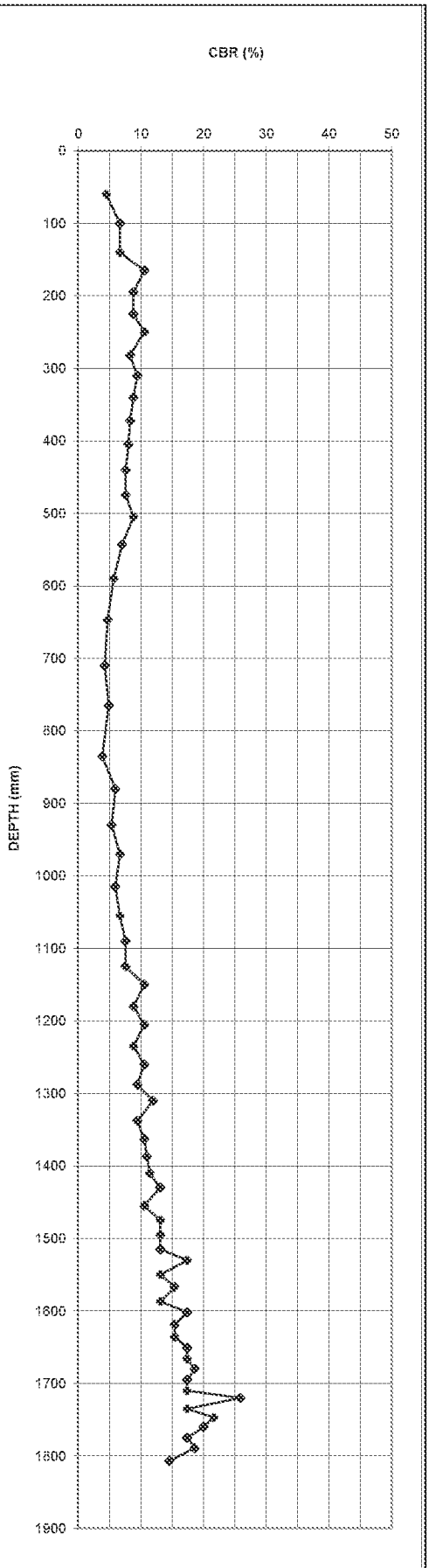
Test No. DCP - 106

Date: 18/11/2015

Initial scale reading (mm) 10

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
1	70	60	60	4.5
1	110	100	40	6.6
1	150	140	40	6.6
1	175	165	25	10.5
1	205	195	30	8.8
1	235	225	30	8.8
1	260	250	25	10.5
1	292	282	32	8.3
1	320	310	28	9.4
1	350	340	30	8.8
1	382	372	32	8.3
1	415	405	33	8.0
1	450	440	35	7.6
1	485	475	35	7.6
1	515	505	30	8.8
1	553	543	38	7.0
1	600	590	47	5.7
1	657	647	57	4.7
1	720	710	63	4.3
1	775	765	55	4.9
1	845	835	70	3.8
1	890	880	45	5.9
1	940	930	50	5.3
1	980	970	40	6.6
1	1025	1015	45	5.9
1	1065	1055	40	6.6
1	1100	1090	35	7.6
1	1135	1125	35	7.6
1	1160	1150	25	10.5
1	1190	1180	30	8.8
1	1215	1205	25	10.5
1	1245	1235	30	8.8
1	1270	1260	25	10.5
1	1298	1288	28	9.4
1	1320	1310	22	11.9
1	1348	1338	28	9.4
1	1373	1363	25	10.5
1	1397	1387	24	11.0
1	1420	1410	23	11.4
1	1440	1430	20	13.1
1	1465	1455	25	10.5
1	1485	1475	20	13.1
1	1505	1495	20	13.1
1	1525	1515	20	13.1
1	1540	1530	15	17.4
1	1560	1550	20	13.1
1	1577	1567	17	15.4
1	1597	1587	20	13.1
1	1612	1602	15	17.4
1	1629	1619	17	15.4
1	1646	1636	17	15.4
1	1661	1651	15	17.4
1	1676	1666	15	17.4
1	1690	1680	14	18.6
1	1705	1695	15	17.4
1	1720	1710	15	17.4
1	1730	1720	10	25.9
1	1745	1735	15	17.4
1	1757	1747	12	21.6
1	1770	1760	13	20.0
1	1785	1775	15	17.4
1	1799	1789	14	18.6
1	1817	1807	18	14.5



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = $247DCP^{-0.98}$

CONTRACT

C4872

CC GROUND INVESTIGATIONS LTD

TRIAL PIT LOG

Pit No **TP107**

Sheet 1 of 1

Telephone [redacted]

Project Name: University of Chichester	Project No: **C4872**	Co-ords: E 494445 N 99727 Level: 1.31mAOD	Date 10/11/2015
Location: Bognor Regis		Dimensions: 2.00m Depth 3.60m 0.45m	Scale 1 : 37.5
Client: University of Chichester			Logged By RS

(m)	Water Levels	Samples & In Situ Testing No/Type	Depth (m)	Result	Description	Depth (m)	Level (mAD)	Legend
					MADE GROUND: Firm friable brown locally mottled reddish brown and white slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is sub-angular fine clay pipe fragments and chalk.	(0.40)		
		B D	0.50		Firm orangish brown mottled light grey slightly sandy silty CLAY with rare rootlets. (Superficial Deposits)	0.40	0.91	
						(0.40)		
					Firm light grey mottled orangish brown slightly sandy silty CLAY. (Superficial Deposits)	0.80	0.51	
1		B D H	1.00	H 65		(0.40)		1
					Soft light grey mottled orangish brown slightly sandy silty CLAY. (Superficial Deposits)	1.20	0.11	
		B D H	1.50	H 25		(0.80)		
2					Very soft grey mottled orangish brown silty CLAY. (Superficial Deposits)	2.00	-0.69	2
		B D H	2.50	H 13		(1.00)		
3					Very soft grey mottled black silty CLAY. (Superficial Deposits)	3.00	-1.69	3
	Dry					(0.60)		
		B D H	3.50	H 17		3.60	-2.29	
					Trial pit completed at 3.60m			
4								4
5								5
6								6

DRAFT

REMARKS:

EQUIPMENT: JCB 3CX.

METHOD: Machine excavated using 0.45m toothless bucket.

GROUNDWATER: Groundwater not encountered.

BACKFILL: On completion, trial pit backfilled with arisings compacted in layers with the machine bucket.

REMARKS: Trial pit terminated at 3.60m.

Trial Pit Photograph

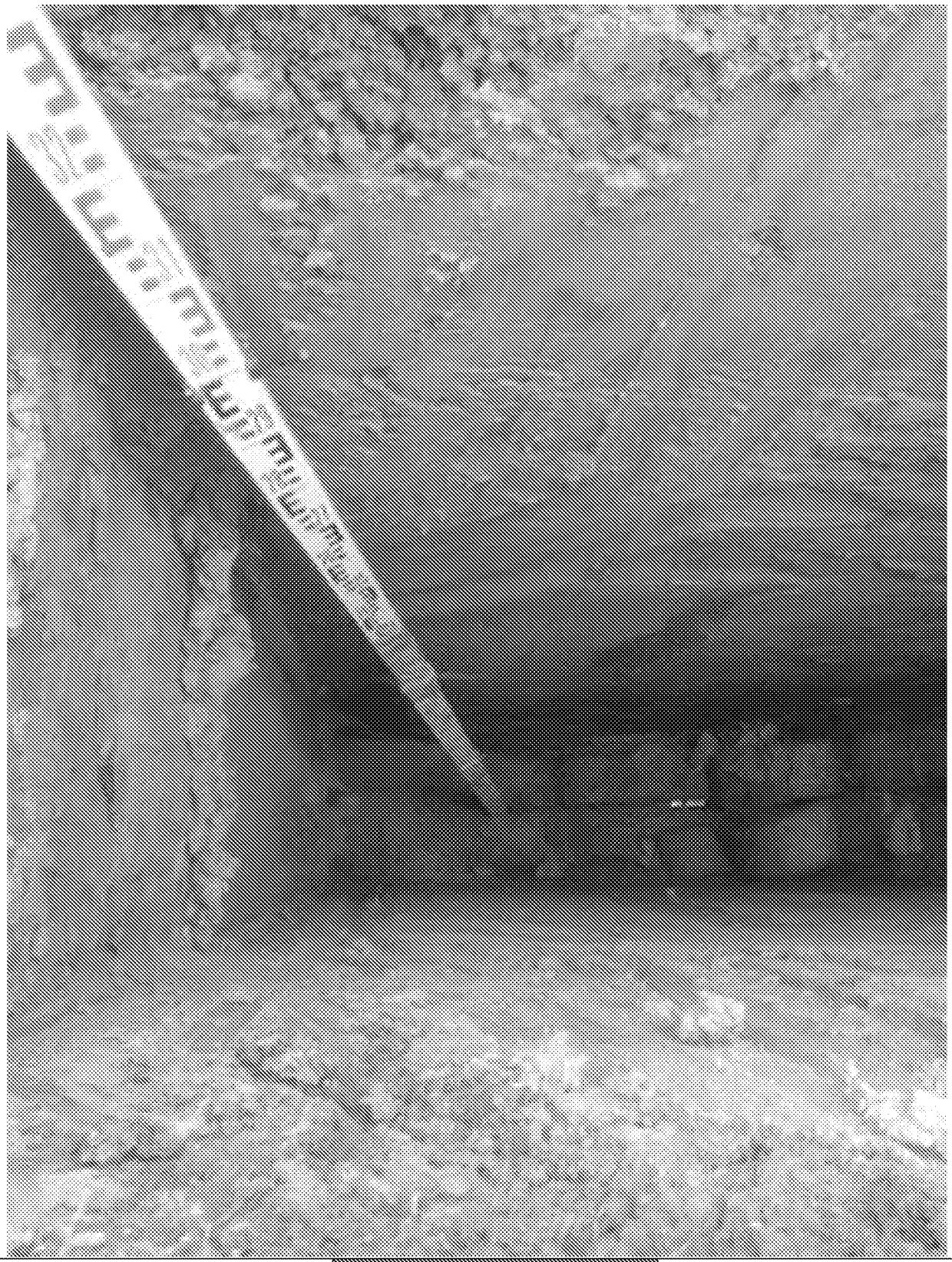


CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP107

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP107

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP107

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph

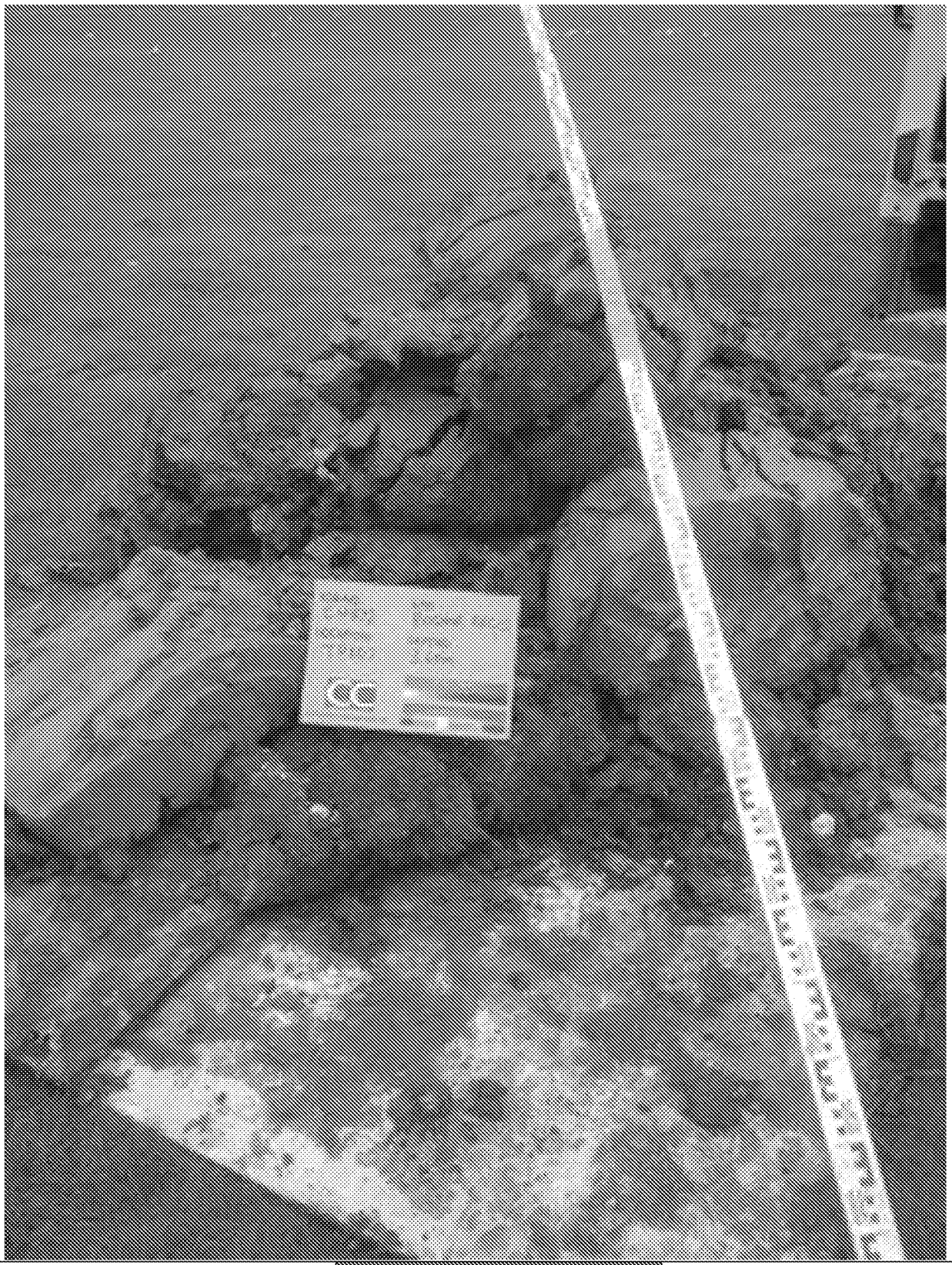


CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP107

ARUN DISTRICT COUNCIL BR/72/22/PL

Trial Pit Photograph



CC Ground Investigations Ltd

Contract Name:	University of Chichester
Contract ID:	C4872
Client:	University of Chichester
Hole ID:	TP107

ARUN DISTRICT COUNCIL BR/72/22/PL

CC Ground Investigations Ltd

DYNAMIC CONE PENETROMETER TESTING

CLIENT: Univeristy of Chichester

SITE: University of Chichester - Bognor Regis Campus

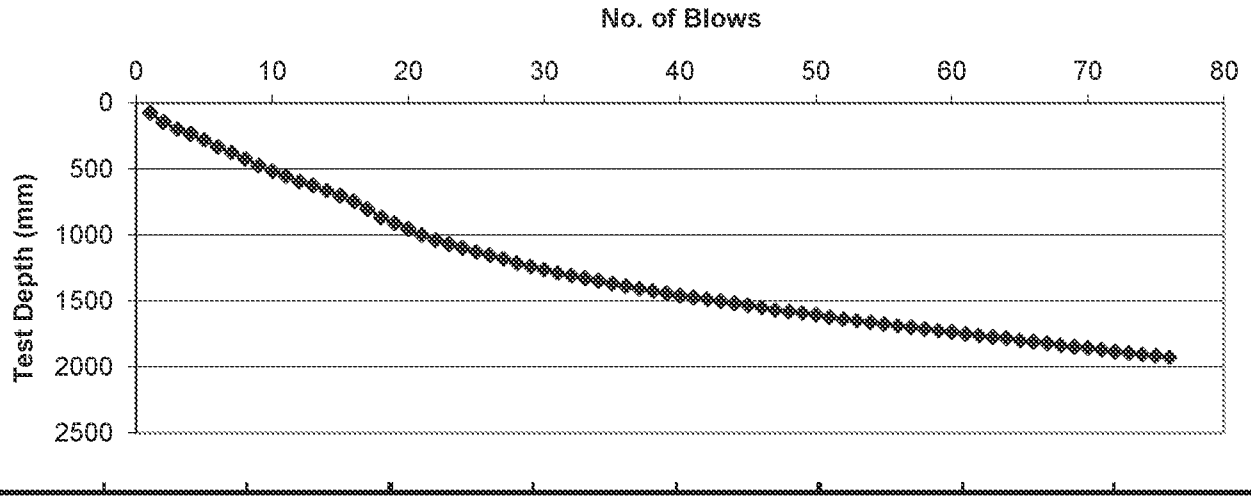
Test No. **DCP - 107**

Date: 18/11/2015

DCP Start Depth: (m) 0.00

DCP Completion Depth: (m) 1.96

No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm	No Blows	Total Blows	Reading mm
1	1	75	1	28	1213	1	55	1674
1	2	145	1	29	1239	1	56	1687
1	3	197	1	30	1263	1	57	1698
1	4	235	1	31	1288	1	58	1713
1	5	280	1	32	1309	1	59	1725
1	6	333	1	33	1328	1	60	1734
1	7	375	1	34	1348	1	61	1750
1	8	423	1	35	1369	1	62	1762
1	9	473	1	36	1388	1	63	1773
1	10	515	1	37	1408	1	64	1784
1	11	555	1	38	1425	1	65	1798
1	12	595	1	39	1442	1	66	1809
1	13	625	1	40	1459	1	67	1820
1	14	664	1	41	1474	1	68	1835
1	15	702	1	42	1488	1	69	1847
1	16	745	1	43	1503	1	70	1857
1	17	803	1	44	1517	1	71	1869
1	18	867	1	45	1533	1	72	1882
1	19	910	1	46	1549	1	73	1895
1	20	955	1	47	1567	1	74	1904
1	21	1001	1	48	1579	1	75	1915
1	22	1038	1	49	1593	1	76	1927
1	23	1068	1	50	1605	1	77	1938
1	24	1098	1	51	1623	1	78	1948
1	25	1128	1	52	1637	1	79	1962
1	26	1153	1	53	1648			
1	27	1180	1	54	1663			



Instrument used : Transport Research Laboratory Dynamic Cone Penetrometer (TRL-DCP)

Instrument used : TRL Probe

CONTRACT

C4872

CC GROUND INVESTIGATIONS LIMITED

DYNAMIC CONE PENETROMETER TESTING

CLIENT Univeristy of Chichester

SITE University of Chichester - Bognor Regis Campus

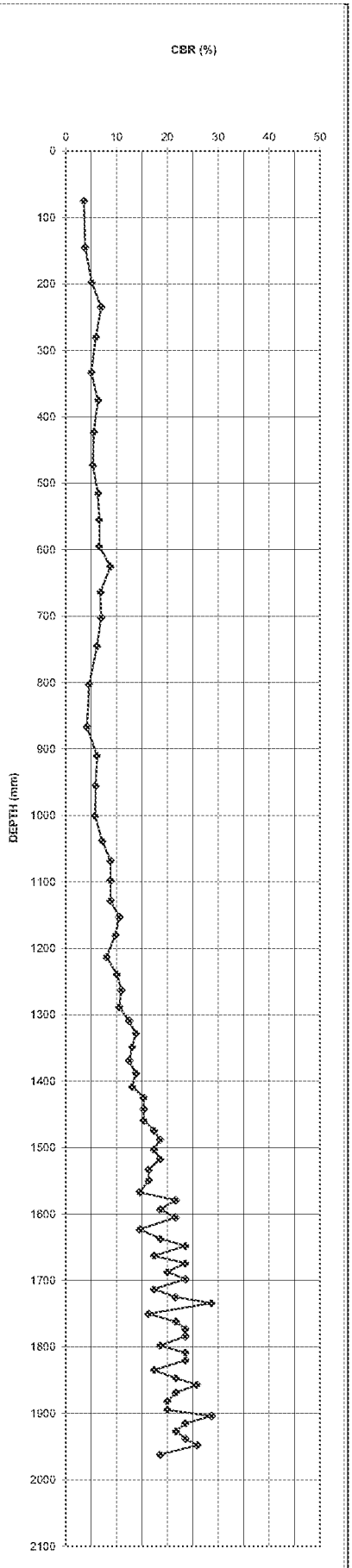
Test No. DCP - 107

Date: 18/11/2015

Initial scale reading (mm) 70

Datum - below ground level (bgl) (mm) 0

no. of Blows	scale reading (mm)	penetration - bgl (mm)	DCP (mm/blow)	CBR (%)
1	145	75	75	3.6
1	215	145	70	3.8
1	267	197	52	5.1
1	305	235	38	7.0
1	350	280	45	5.9
1	403	333	53	5.0
1	445	375	42	6.3
1	493	423	48	5.6
1	543	473	50	5.3
1	585	515	42	6.3
1	625	555	40	6.6
1	665	595	40	6.6
1	695	625	30	8.8
1	734	664	39	6.8
1	772	702	38	7.0
1	815	745	43	6.2
1	873	803	58	4.6
1	937	867	64	4.2
1	980	910	43	6.2
1	1025	955	45	5.9
1	1071	1001	46	5.8
1	1108	1038	37	7.2
1	1138	1068	30	8.8
1	1168	1098	30	8.8
1	1198	1128	30	8.8
1	1223	1153	25	10.5
1	1250	1180	27	9.8
1	1283	1213	33	8.0
1	1309	1239	26	10.1
1	1333	1263	24	11.0
1	1358	1288	25	10.5
1	1379	1309	21	12.5
1	1398	1328	19	13.8
1	1418	1348	20	13.1
1	1439	1369	21	12.5
1	1458	1388	19	13.8
1	1478	1408	20	13.1
1	1495	1425	17	15.4
1	1512	1442	17	15.4
1	1529	1459	17	15.4
1	1544	1474	15	17.4
1	1558	1488	14	18.6
1	1573	1503	15	17.4
1	1587	1517	14	18.6
1	1603	1533	16	16.3
1	1619	1549	16	16.3
1	1637	1567	18	14.5
1	1649	1579	12	21.6
1	1663	1593	14	18.6
1	1675	1605	12	21.6
1	1693	1623	18	14.5
1	1707	1637	14	18.6
1	1718	1648	11	23.6
1	1733	1663	15	17.4
1	1744	1674	11	23.6
1	1757	1687	13	20.0
1	1768	1698	11	23.6
1	1783	1713	15	17.4
1	1795	1725	12	21.6
1	1804	1734	9	28.7
1	1820	1750	16	16.3
1	1832	1762	12	21.6
1	1843	1773	11	23.6
1	1854	1784	11	23.6
1	1868	1798	14	18.6
1	1879	1809	11	23.6
1	1890	1820	11	23.6
1	1905	1835	15	17.4
1	1917	1847	12	21.6
1	1927	1857	10	25.9
1	1939	1869	12	21.6
1	1952	1882	13	20.0
1	1965	1895	13	20.0
1	1974	1904	9	28.7
1	1985	1915	11	23.6
1	1997	1927	12	21.6
1	2008	1938	11	23.6
1	2018	1948	10	25.9
1	2032	1962	14	18.6



REMARKS: CBR correlation based on correlation from Figure 4 of TRL Report TRL587 (2003) CBR = $247DCP^{-0.96}$

CONTRACT

C4872

APPENDIX C

Appendix C – Laboratory Test Results

APPENDIX D

Appendix D – SPT Calibration Data

SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer	SPT HAMMER
Client	C C GROUND INVESTIGATIONS
Test No.	SCI1371
Test Depth (m)	11.11
Date of Test	01 May 2018
Valid until	31 Oct 2019
Hammer ID	PCM

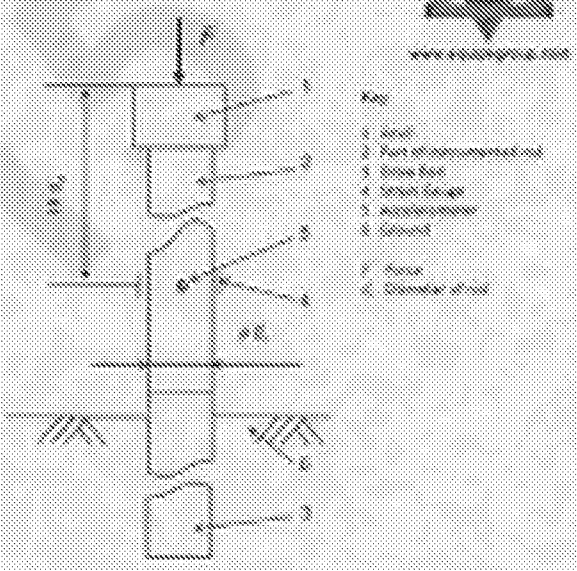
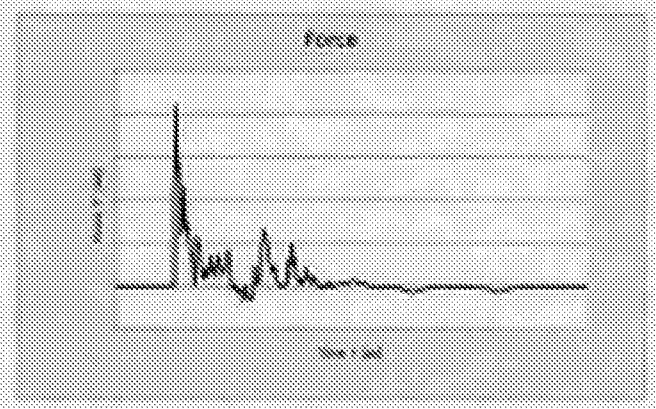


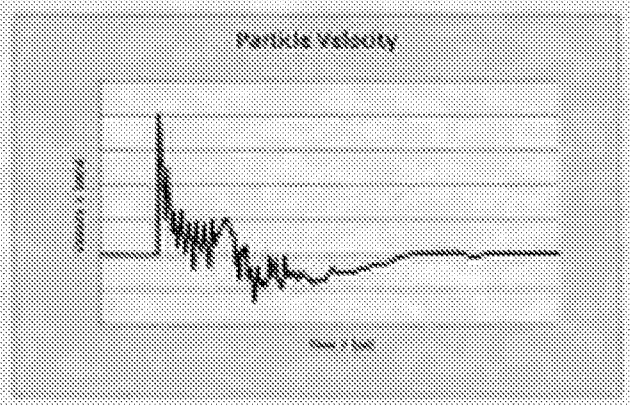
Fig 8.1 and 8.2 BS EN ISO 22476-3: 2005 +A1: 2011

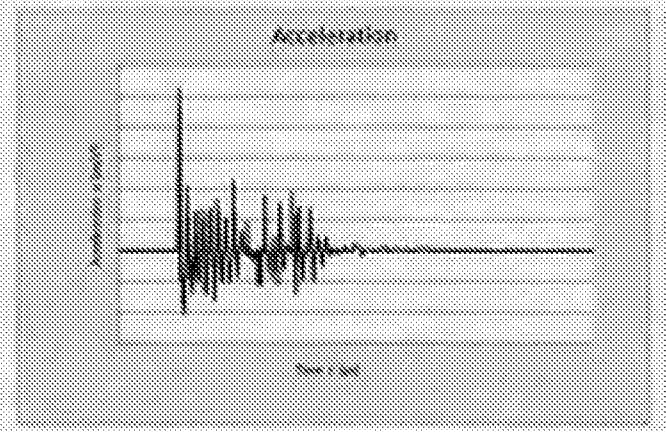
Mass of the hammer	m =	63.5kg
Falling height	h =	0.76m
E_{max} =	$m \times g \times h$ =	473J

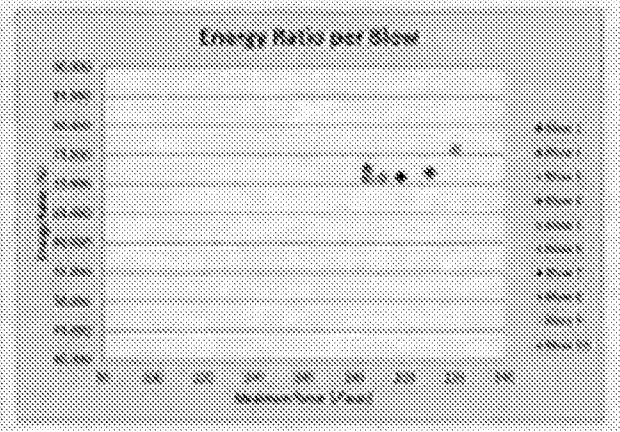
Characteristics of the instrumented rod

Diameter	d_r =	0.060 m
Length of the instrumented rod		6.558 m
Area	A =	11.61 cm²
Modulus	E_a =	205943 MPa









Observations:

E_{mean} =	0.340 kN·m
E_{blow} =	0.473 kN·m
Energy Ratio = $\frac{E_{mean}}{E_{max}}$ =	71.85%

Equipe SPT Analyser Operator: [redacted]

Prepared by:	[redacted]	Checked by:	[redacted]
		Date	12/05/2018

Equipe House, The Paddocks, Hoveton Road, Wroxham, Norwich, Norfolk, NR12 8UH
Tel: 01603 783500 Fax: 01603 782501 Email: info@equipe.co.uk

SPT Calibration Report

Hammer Energy Measurement Report

Type of Hammer	SPT HAMMER
Client	C C GROUND INVESTIGATIONS
Test No	SCI/1370
Test Depth (m)	11.66
Date of Test	01 May 2015
Valid until	31 April 2016
Hammer ID	807

Mass of the hammer	m =	63.5kg
Falling height	h =	0.760m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of the instrumented rod		0.388 m
Area	A =	11.81 cm²
Modulus	E_r =	206842 MPa

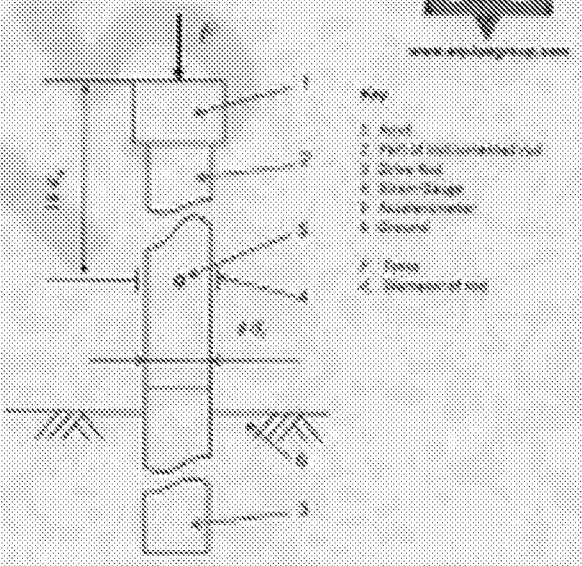
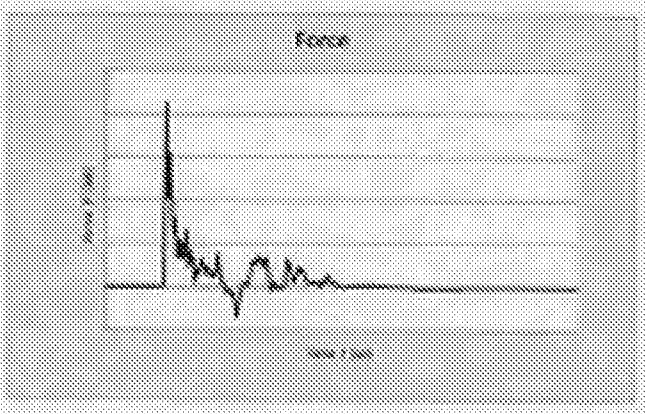
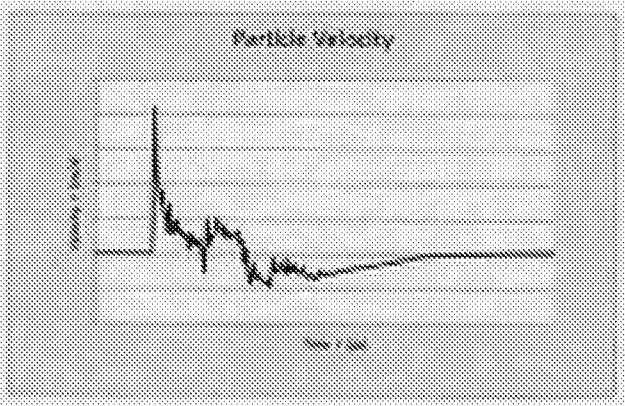
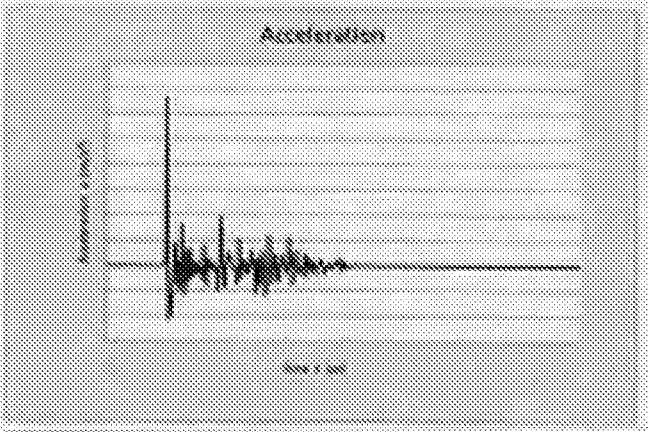
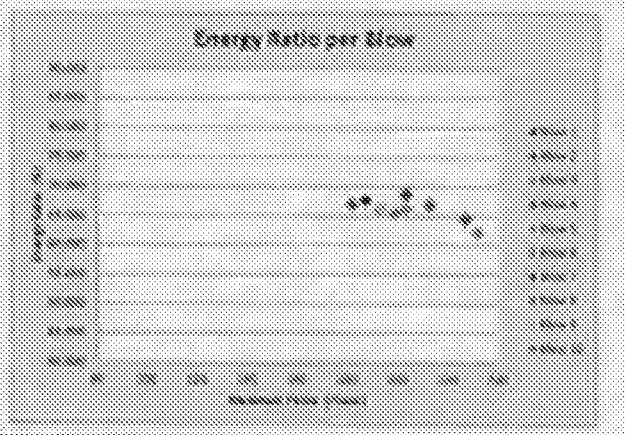


Fig 8.1 and 8.2 ASTM D4633-10 Standard Test Method









Observations:

E_{theor} =	0.312 kN-m
E_{Hmmr} =	0.473 kN-m

Energy Ratio = $\frac{E_{Hmmr}}{E_{theor}}$ = 66.65%

Equipe SPT Analyser Operated by: JMK

Prepared by: [redacted] Checked by: [redacted] Date 13/05/2015

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Tel: 01462 476000 Fax: 01462 476001 Email: info@equipe.com

Hammer Energy Test Report

In accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
6-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref: DW27
Test Date: 09/04/2015
Report Date:
File Name: DW27.spt
Test Operator: TP

DATE ISSUED 10.4.15
JOB NUMBER 115

[redacted]

Instrumented Rod Data

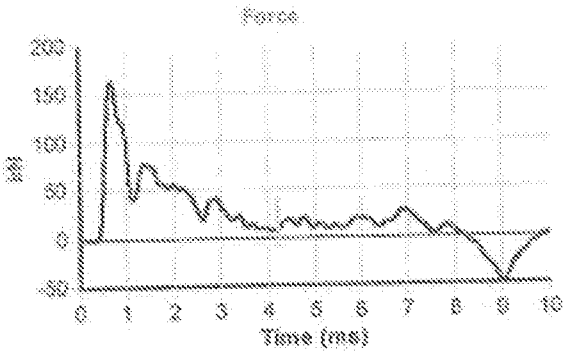
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.9
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	6455
Accelerometer No.2:	6457

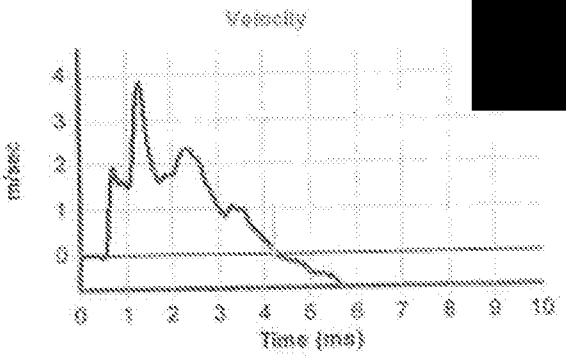
Hammer Information

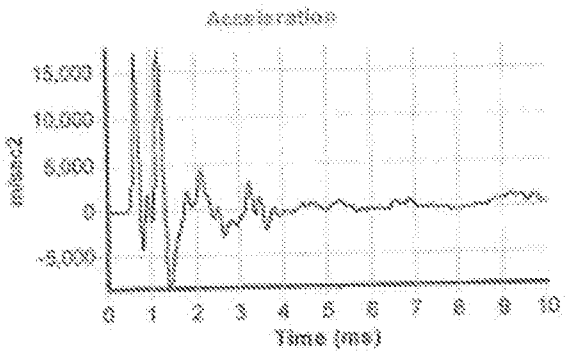
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

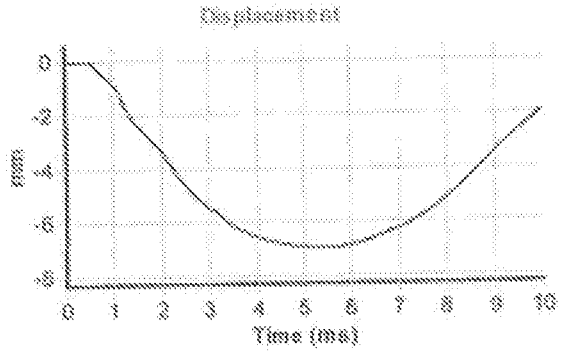
Comments / Location

Hammer tested at Dynamic samplings yard.









Calculations

Area of Rod A (mm2):	1021
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	358

Energy Ratio E_r (%): 76

[redacted]

Sig[redacted]
Title: Manager

The recommended calibration interval is 12 months

SPTAnalyser Hammer Energy ver. 1.83 All rights reserved. Testconsult ©2010

ARUN DISTRICT COUNCIL BR/72/22/PL

Appendix D

GAS MONITORING RESULTS

ARUN DISTRICT COUNCIL BR/72/22/PL

Groundwater and Ground Gas Monitoring Form

VISIT 1

Site Name	UOC Bognor Teck Park
Client	University of Chichester
Job No.	7001364-300
Date	02/12/2015
Start Time	07.50 am
End Time	09.42 am

Operator	F. Siemers
Pressure at Start mB	1024
Pressure at End mB	1024
Weather Conditions	Scattered clouds / light rain showers
Temperature oC	12

Equipment	Serial No.	Calibrated
Gas Analyser	GA5000	Yes
Dipmeter		Yes
Interface Probe		
PID	Phocheck Tiger	Yes

	Borehole	Response Zone (m)		Gas Flow (l/hr)		Borehole Pressure	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Other Gasses (ppmV)			Depth to Water	Depth to Base	Thickness of product	Sampled?
		Top	Bottom	Initial	Steady	(mB)	Initial	Steady	Initial	Steady	Initial	Steady	PID	H2S	CO	(m)	(m)	(mm)	(Y/N)
1	BH111	7.5	11.7	-1.5	0.5	1024	0.0	0.0	0.6	0.1	20.9	20.9	-	0	-	0.77	11.57	-	No
2	BH110	0.5	5.0	0.1	5.1	1024	0.0	0.0	0.5	0.5	21.0	20.8	-	0	-	0.78	5.31	-	No
3	BH104	9.0	12.0	-9.9	-7.4	1023	0.0	0.0	0.3	0.3	20.1	21.3	-	0	-	0.93	11.10	-	No
4	BH108	10.0	34.4	1.8	6.9	1024	0.0	0.0	0.3	0.4	20.6	19.8	-	3	-	0.78	34.22	-	No
5	BH107	6.7	34.5	2.9	6.4	1024	0.0	0.0	0.1	0.2	20.9	20.8	-	0	-	1.34	34.50	-	No
6	BH106	0.6	1.6	-16.1	-12.6	1024	0.0	0.0	2.6	2.7	19.7	17.2	-	0	-	1.6	1.66	-	No
7	BH102	10.5	33.5	-2.0	5.9	1024	0.0	0.0	0.4	0.4	20.6	20.2	-	0	-	1.78	31.01	-	No
8	BH101	2.0	7.0	5.5	18.0	1024	0.0	0.0	0.4	0.4	20.8	20.3	-	0	-	1.73	7.00	-	No
9	BH103	13.0	30.0	0.0	4.0	1024	0.0	0.0	0.2	0.2	20.8	20.7	-	0	-	2.54	27.42	-	No
10	BH109	1.0	3.0	-12.5	-7.6	1023	0.1	0.0	2.5	2.7	19.2	12.0	-	0	-	1.43	3.12	-	No
11	BH105	13.2	14.7	-13.6	-11.4	1024	0.0	0.0	0.3	0.4	20.6	20.5	-	0	-	0.88	14.45	-	No
12																			
13																			
14																			
15																			
16																			

COMMENTS & GROUND CONDITIONS:

ARUN DISTRICT COUNCIL BR/72/22/PL

Groundwater and Ground Gas Monitoring Form

VISIT 2

Site Name	UoC Bognor Tech Park
Client	University of Chichester
Job No.	7001364-300
Date	07/12/2015
Start Time	12:00:00
End Time	14:20:00

Operator	F. Siemers
Pressure at Start mB	1023
Pressure at End mB	1024
Weather Conditions	Partly cloudy
Temperature oC	12

Equipment	Serial No.	Calibrated
Gas Analyser	GA5000	Yes
Dipmeter		Yes
Interface Probe		N/A
PID	Phocheck Tiger	Yes

	Borehole	Response Zone (m)		Gas Flow (l/hr)		Borehole Pressure	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Other Gasses (ppmV)			Depth to Water	Depth to Base	Thickness of product	Sampled?
		Top	Bottom	Initial	Steady	(mB)	Initial	Steady	Initial	Steady	Initial	Steady	PID	H2S	CO	(m)	(m)	(mm)	(Y/N)
1	BH111	7.5	11.7	2.0	5.5	1023	0.0	0.0	1.9	1.5	20.6	20.0	-	0	-	0.79	11.57	-	No
2	BH110	0.5	5.0	0.1	6.4	1025	0.0	0.0	1.9	1.9	20.2	19.6	0.2	0	-	0.78	5.31	-	No
3	BH104	9.0	12.0	-0.1	5.8	1024	0.0	0.0	1.0	1.1	20.4	20.0	0.2	0	-	0.93	11.10	-	No
4	BH107	6.7	34.5	0.1	6.5	1024	0.0	0.0	1.0	1.1	19.7	18.2	0.5	0	-	1.35	34.50	-	No
5	BH106	0.6	1.6	2.0	9.3	1024	0.0	0.0	3.2	3.2	18.0	15.9	0.1	1	-	1.485	1.66	-	No
6	BH101	2.0	7.0	0.1	0.3	1025	0.0	0.0	0.5	0.3	20.7	20.7	0.3	0	-	2.12	7.00	-	No
7	BH102	10.5	33.5	-0.1	2.7	1024	0.0	0.0	0.4	0.4	20.8	20.7	0.6	0	-	1.72	31.01	-	No
8	BH103	13.0	30.0	-0.2	5.1	1025	0.0	0.0	0.4	0.4	20.9	20.9	0.7	0	-	2.375	27.42	-	No
9	BH108	10.0	34.4	-0.3	4.9	1024	0.0	0.0	1.3	1.4	19.7	19.0	0.4	7	-	0.8	34.22	-	No
10	BH109	1.0	3.0	-	-	-	-	-	-	-	-	-	-	-	-	1.16	3.12	-	No
11	BH105	13.2	14.7	2.2	6.6	1024	0.3	0.2	1.2	1.1	20.0	19.6	0.0	0	-	0.9	14.45	-	No
12																			
13																			
14																			
15																			
16																			

COMMENTS & GROUND CONDITIONS: Area around BH109 flooded. BH bung submerged. GW reading not accurate, as limited water went down hole. BH111 bung too large for PID.

ARUN DISTRICT COUNCIL BR/72/22/PL

Groundwater and Ground Gas Monitoring Form

VISIT 3

Site Name	UoC Bognor Tech Park
Client	University of Chichester
Job No.	7001364-300
Date	14/12/2015
Start Time	11:20:00
End Time	13:15:00

Operator	F. Siemers
Pressure at Start mB	1015
Pressure at End mB	1015
Weather Conditions	Partly cloudy
Temperature oC	9

Equipment	Serial No.	Calibrated
Gas Analyser	GA5000	Yes
Dipmeter		N/A
Interface Probe		Yes
PID	Phocheck Tiger	Yes

	Borehole	Response Zone (m)		Gas Flow (l/hr)		Borehole Pressure	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Other Gasses (ppmV)			Depth to Water	Depth to Base	Thickness of product	Sampled?
		Top	Bottom	Initial	Steady	(mB)	Initial	Steady	Initial	Steady	Initial	Steady	PID	H2S	CO	(m)	(m)	(mm)	(Y/N)
1	BH111	7.5	11.7	0.0	0.3	1015	0.0	0.0	1.8	0.2	20.0	20.8	-	0	-	0.71	11.57	-	No
2	BH110	0.5	5.0	3.2	7.0	1015	0.0	0.0	2.4	2.5	19.4	19.2	0.3	0	-	0.62	5.31	-	No
3	BH104	9.0	12.0	0.1	0.2	1015	0.0	0.0	0.6	0.1	20.7	20.9	0.5	0	-	0.81	11.10	-	No
4	BH107	6.7	34.5	-6.8	-4.7	1015	0.0	0.0	0.5	0.5	20.4	20.2	0.2	0	-	1.01	34.50	-	No
5	BH106	0.6	1.6	-12.5	-9.7	1015	0.0	0.0	3.7	3.7	15.6	15.3	0.1	0	-	1.435	1.66	-	No
6	BH101	2.0	7.0	0.2	0.3	1014	0.0	0.0	0.5	0.4	20.8	20.8	0.2	0	-	1.75	7.00	-	No
7	BH102	10.5	33.5	-4.2	-3.3	1015	0.0	0.0	0.3	0.4	20.8	20.7	0.6	0	-	1.31	31.01	-	No
8	BH103	13.0	30.0	-4.2	-2.9	1015	0.0	0.0	0.8	0.8	20.7	20.5	0.2	0	-	1.96	27.42	-	No
9	BH108	10.0	34.4	-0.3	1.8	1015	0.0	0.0	1.8	1.8	18.6	18.0	0.8	1	-	0.55	34.22	-	No
10	BH109	1.0	3.0	-	-	-	-	-	-	-	-	-	-	0	-	0.69	3.12	-	No
11	BH105	13.2	14.7	-0.2	5.8	1015	0.5	0.5	1.6	1.7	19.2	18.5	0.2	0	-	0.75	14.45	-	No
12																			
13																			
14																			
15																			
16																			

COMMENTS & GROUND CONDITIONS: Area around BH109 flooded. BH bung submerged. GW reading not accurate, as limited water went down hole. GW dips double checked on BH111 and BH110. BH111 bung too large for PID.

Appendix E

LABORATORY RESULTS

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: **Opinions and Interpretations are outside the UKAS Accreditation**

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
[redacted]

M Beastall
(Laboratory Manager)

D Lambe
(Senior Technician)

[redacted]
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT CO

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH101		D	2.40		Reddish brown mottled grey slightly sandy CLAY.
BH101		D	5.20		Reddish brown mottled grey slightly sandy CLAY.
BH101		D	7.20		Brown very gravelly very sandy CLAY.
BH101		D	8.30		CHALK.
BH101		CS	12.70	13.00	CHALK.
BH101		D	17.00		CHALK.
BH101		CS	21.15	21.40	CHALK.
BH101		D	23.20		CHALK.
BH101		CS	27.80	28.00	CHALK.
BH101		CS	31.00	31.30	CHALK.
BH101		CS	32.80	33.10	CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH101		D	2.40		28			59	25	34	100	High plasticity CH.
BH101		D	5.20		26			57	24	33	100	High plasticity CH.
BH101		D	7.20		12			26	14	12	76	Low plasticity CL.

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

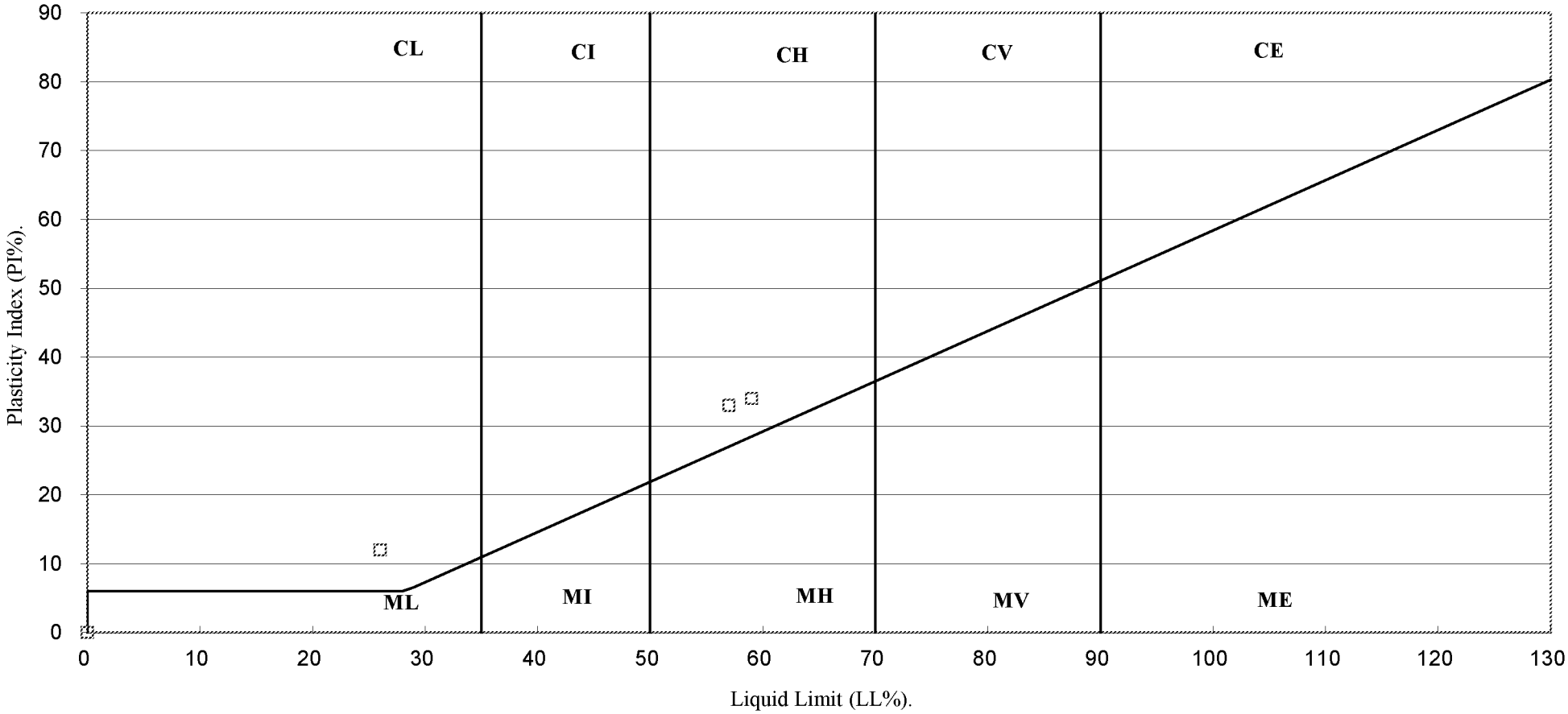
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date: 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH101		D	8.30		24	24	1.64			
BH101		CS	12.70	13.00	24	25	1.62			
BH101		D	17.00		19	21	1.71			
BH101		CS	21.15	21.40	23	23	1.65			
BH101		D	23.20		20	22	1.68			
BH101		CS	27.80	28.00	26	26	1.59			
BH101		CS	31.00	31.30	23	23	1.68			
BH101		CS	32.80	33.10	25	26	1.59			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH101	12.70		A	Par	116	47	2209	6941.70	83.32	0.650	0.87	0.125	1.258	**0.16**	Valid	
BH101	17.00		I	Par	80	48	2304	4889.24	69.92	0.620	0.83	0.169	1.163	**0.20**	Valid	
BH101	21.15		A	Par	116	45	2025	6646.31	81.52	0.920	1.23	0.185	1.246	**0.23**	Valid	
BH101	23.20		I	Par	92	49	2401	5739.76	75.76	0.580	0.77	0.135	1.206	**0.16**	Valid	
BH101	27.80		A	Par	116	35	1225	5169.35	71.90	0.510	0.68	0.132	1.178	**0.16**	Valid	
BH101	32.80		A	Par	116	53	2809	7827.88	88.48	0.930	1.24	0.159	1.293	**0.21**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved	Date 06/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH101	12.70		D	Perp		116	13456	116.00	0.500	0.67	0.050	1.460	**0.07**	Valid	
BH101	21.15		D	Perp		116	13456	116.00	0.660	0.88	0.065	1.460	**0.10**	Valid	
BH101	27.80		D	Perp		116	13456	116.00	0.280	0.37	0.028	1.460	**0.04**	Valid	
BH101	32.80		D	Perp		116	13456	116.00	0.620	0.83	0.062	1.460	**0.09**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
				PSL15/5863
University of Chichester - Bognor Regis Campus				Client Ref:
				C4872

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH101		C	12.70	13.00	116	202	1.7	4074	1.91	24	1.54	34.4	3.3	Brittle	22/12/16	
BH101		C	21.15	21.40	116	195	1.7	4176	2.03	25	1.62	24.7	2.3	Brittle	22/12/16	
BH101		C	27.80	28.00	116	196	1.7	4193	2.02	26	1.61	17.3	1.6	Brittle	22/12/16	
BH101		C	31.00	31.30	116	202	1.7	4246	1.99	23	1.62	26.0	2.5	Brittle	22/12/16	
BH101		C	32.80	33.10	116	203	1.8	4314	2.01	26	1.60	21.1	2.0	Brittle	22/12/16	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)
[redacted]
D Lambe (Senior Technician)
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH102		D	3.50		Reddish brown mottled grey slightly sandy CLAY.
BH102		D	5.00		Reddish brown mottled grey slightly gravelly slightly sandy CLAY.
BH102		D	5.90		Reddish brown mottled grey slightly sandy CLAY.
BH102		D	8.00		Brown very gravelly sandy CLAY.
BH102		D	11.40		CHALK.
BH102		D	14.90		CHALK.
BH102		D	20.40		CHALK.
BH102		CS	21.40	21.77	CHALK.
BH102		D	24.90		CHALK.
BH102		CS	29.80	30.15	CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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				Client Ref:
				C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH102		D	3.50		25			54	24	30	100	High plasticity CH.
BH102		D	5.00		23			58	25	33	98	High plasticity CH.
BH102		D	5.90		30			62	27	35	100	High plasticity CH.
BH102		D	8.00		11			39	19	20	74	Intermediate plasticity CI.

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

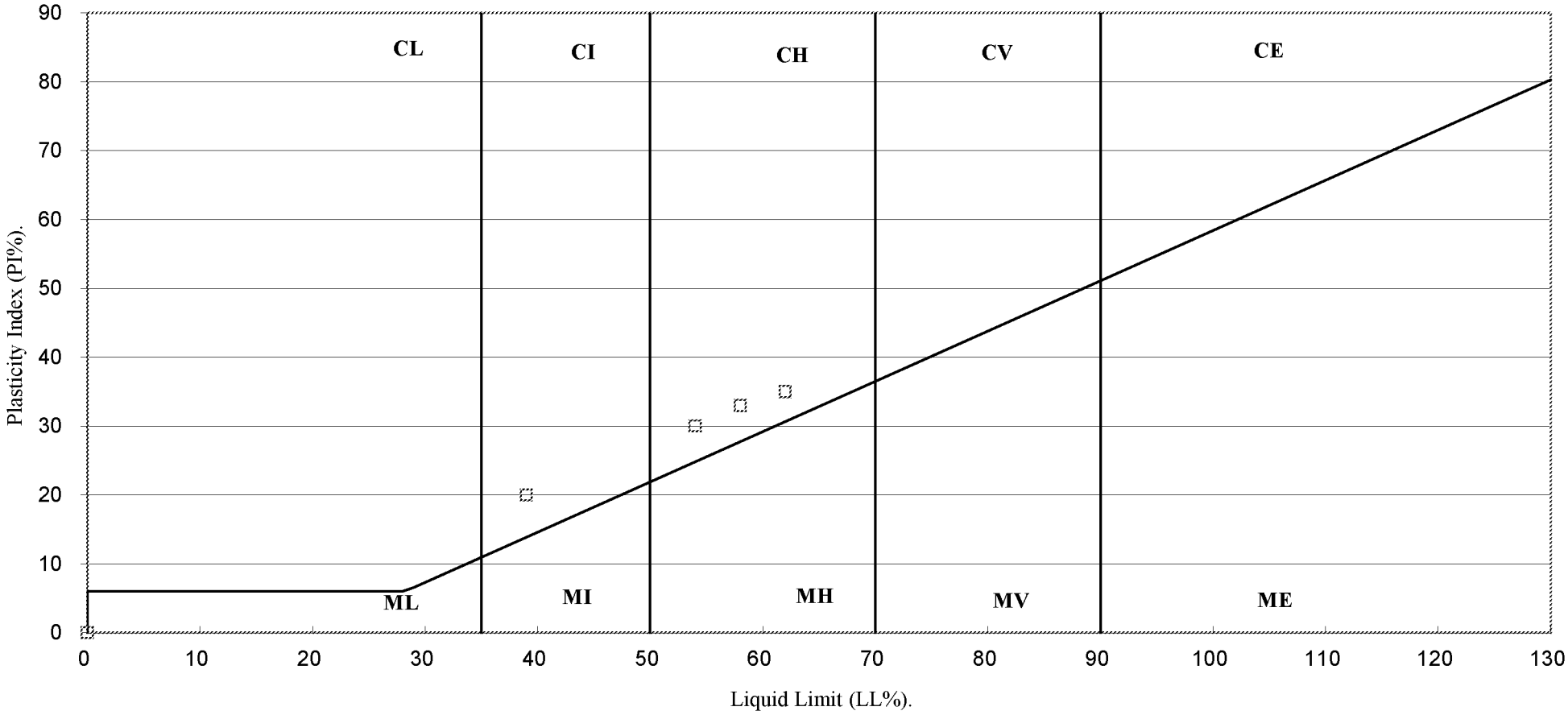
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
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				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH102		D	11.40		22	22	1.70	23	3.6	
BH102		D	14.90		25	24	1.64			
BH102		D	20.40		22	22	1.69			
BH102		CS	21.40	21.77	25			81	3.7	
BH102		D	24.90		27	20	1.56			
BH102		CS	29.80	30.15	27	21	1.72			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH102	16.75		A	Par	116	55	3025	8123.27	90.13	1.060	1.42	0.174	1.304	**0.23**	Valid	
BH102	21.40		A	Par	116	39	1521	5760.14	75.90	0.840	1.12	0.195	1.207	**0.23**	Valid	
BH102	26.90		A	Par	116	69	4761	10191.01	100.95	0.960	1.28	0.126	1.372	**0.17**	Valid	
BH102	32.75		A	Par	116	73	5329	10781.79	103.84	1.330	1.78	0.165	1.389	**0.23**	Valid	

**Note* All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 06/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH102	16.75		D	Perp		116	13456	116.00	0.640	0.85	0.063	1.460	**0.09**	Valid	
BH102	21.40		D	Perp		116	13456	116.00	0.620	0.83	0.062	1.460	**0.09**	Valid	
BH102	26.90		D	Perp		116	13456	116.00	0.810	1.08	0.080	1.460	**0.12**	Valid	
BH102	32.75		D	Perp		116	13456	116.00	1.040	1.39	0.103	1.460	**0.15**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
				PSL15/5863
University of Chichester - Bognor Regis Campus				Client Ref:
				C4872

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH102		C	16.75	17.15	116	196	1.7	4306	2.08	25	1.66	27.4	2.6	Brittle	22/12/16	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
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For the attention of: Chris Scrivens

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A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH103		B	0.50		Brown gravelly sandy CLAY.
BH103		B	1.00		Brown very gravelly sandy CLAY.
BH103		D	4.70		Reddish brown mottled grey sandy CLAY.
BH103		D	6.90		Reddish brown mottled grey slightly sandy CLAY.
BH103		D	7.80		Reddish brown mottled grey slightly sandy CLAY.
BH103		D	9.00	9.35	Brown very gravelly very sandy CLAY.
BH103		B	9.35	9.70	Grey clayey silty SAND & GRAVEL with cobbles.
BH103		B	10.70		CHALK.
BH103		D	11.00		CHALK.
BH103		B	12.20		CHALK.
BH103		CS	13.08	13.31	CHALK.
BH103		B	15.10		CHALK.
BH103		CS	18.40	18.65	CHALK.
BH103		CS	21.80	22.10	CHALK.
BH103		CS	24.68	25.00	CHALK.
BH103		B	30.50		CHALK.
BH103		CS	33.30	33.65	CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH103		B	0.50		22			48	23	25	82	Intermediate plasticity CI.
BH103		B	1.00		16							
BH103		D	4.70		18			43	21	22	100	Intermediate plasticity CI.
BH103		D	6.90		22			54	24	30	100	High plasticity CH.
BH103		D	7.80		26			64	27	37	100	High plasticity CH.
BH103		D	9.00	9.35	11			34	18	16	68	Low plasticity CL.
BH103		B	9.35	9.70	7.9							
BH103		B	10.70		9.9							
BH103		D	11.00		15							

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

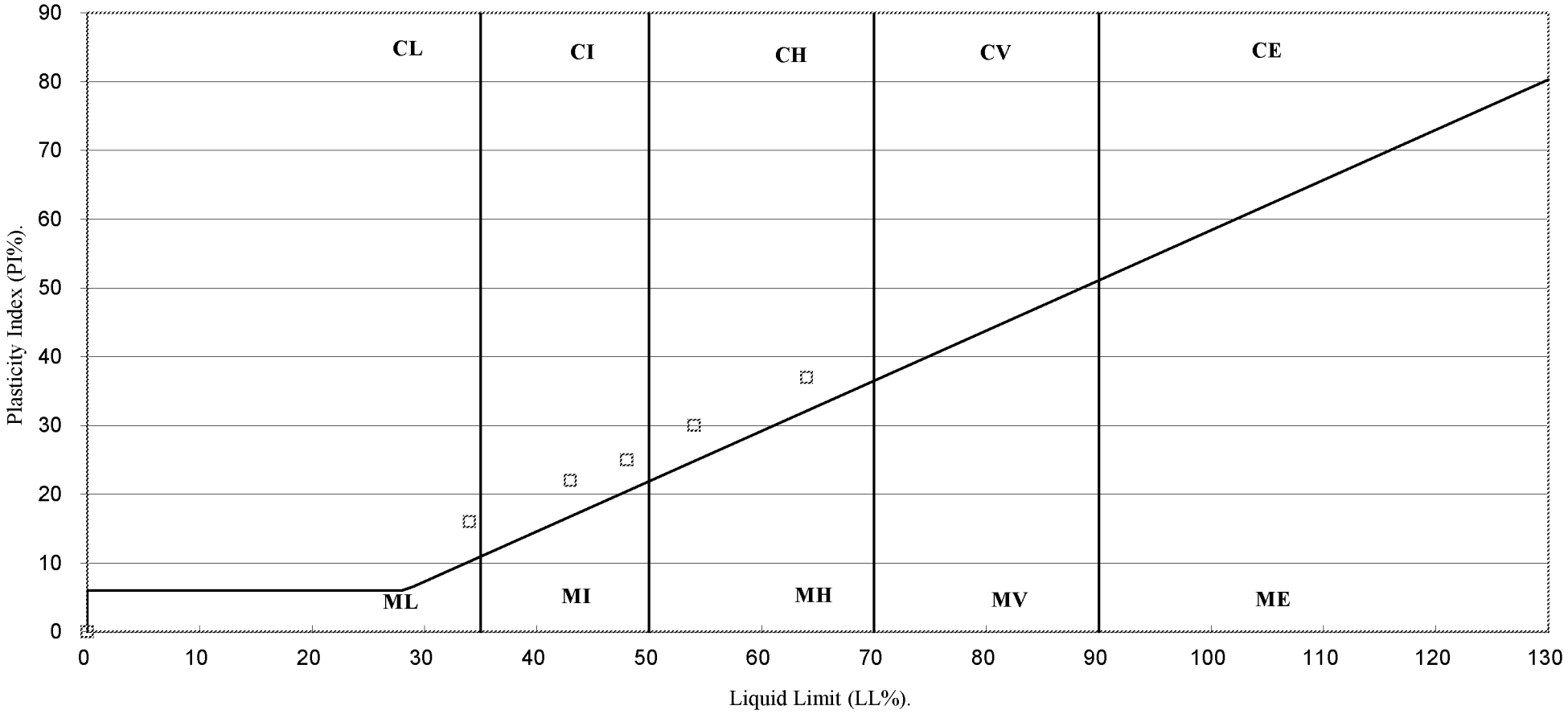
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

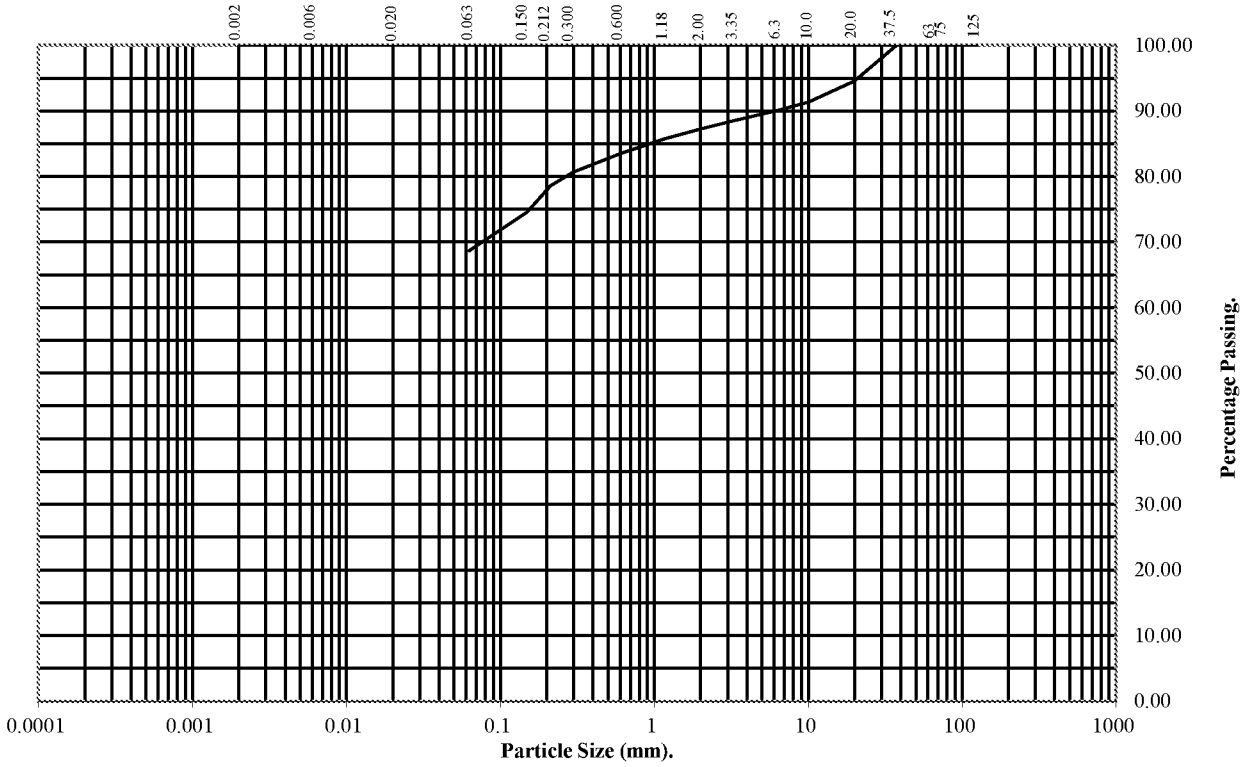
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH103 **Top Depth (m):** 0.50

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	91
6.3	90
3.35	89
2	87
1.18	86
0.6	83
0.3	81
0.212	79
0.15	75
0.063	69

Soil Fraction	Total Percentage
Cobbles	0
Gravel	13
Sand	18
Silt/Clay	69

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

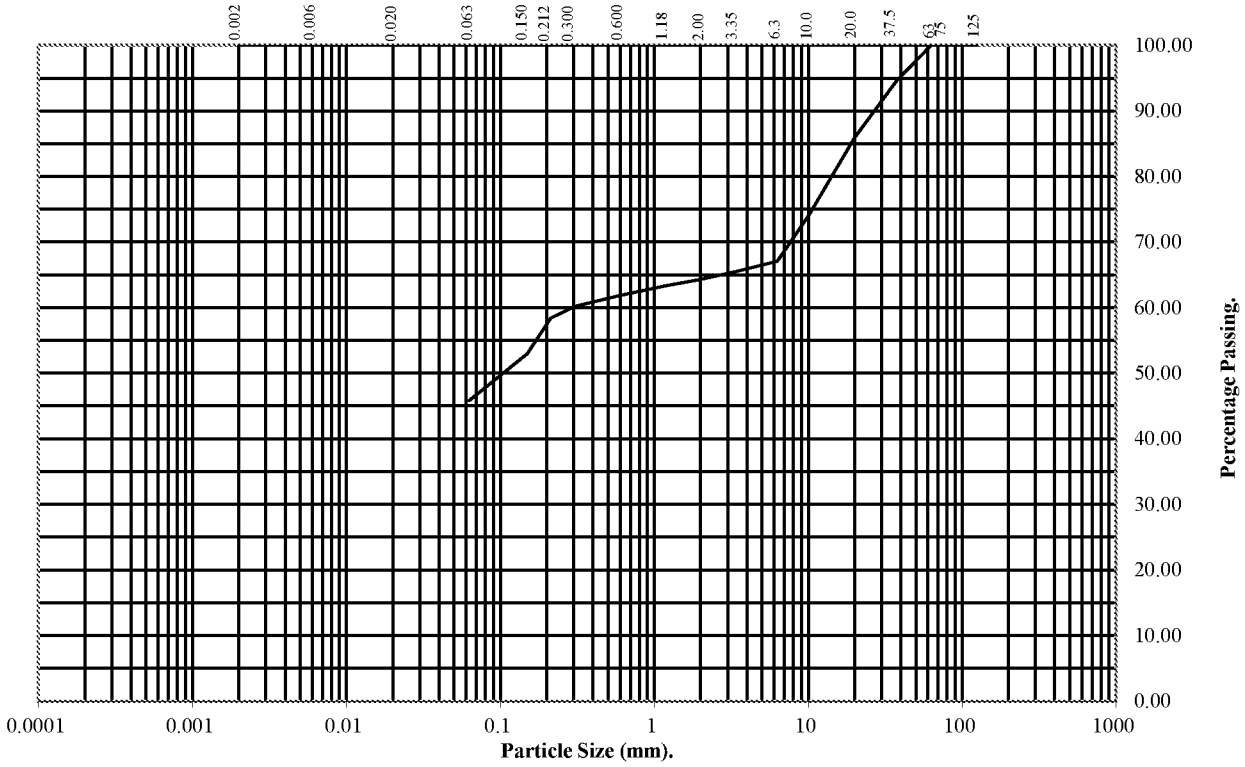
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH103 **Top Depth (m):** 1.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	95
20	86
10	74
6.3	67
3.35	65
2	64
1.18	63
0.6	62
0.3	60
0.212	58
0.15	53
0.063	46

Soil Fraction	Total Percentage
Cobbles	0
Gravel	36
Sand	18
Silt/Clay	46

Remarks:
See summary of soil descriptions.

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		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

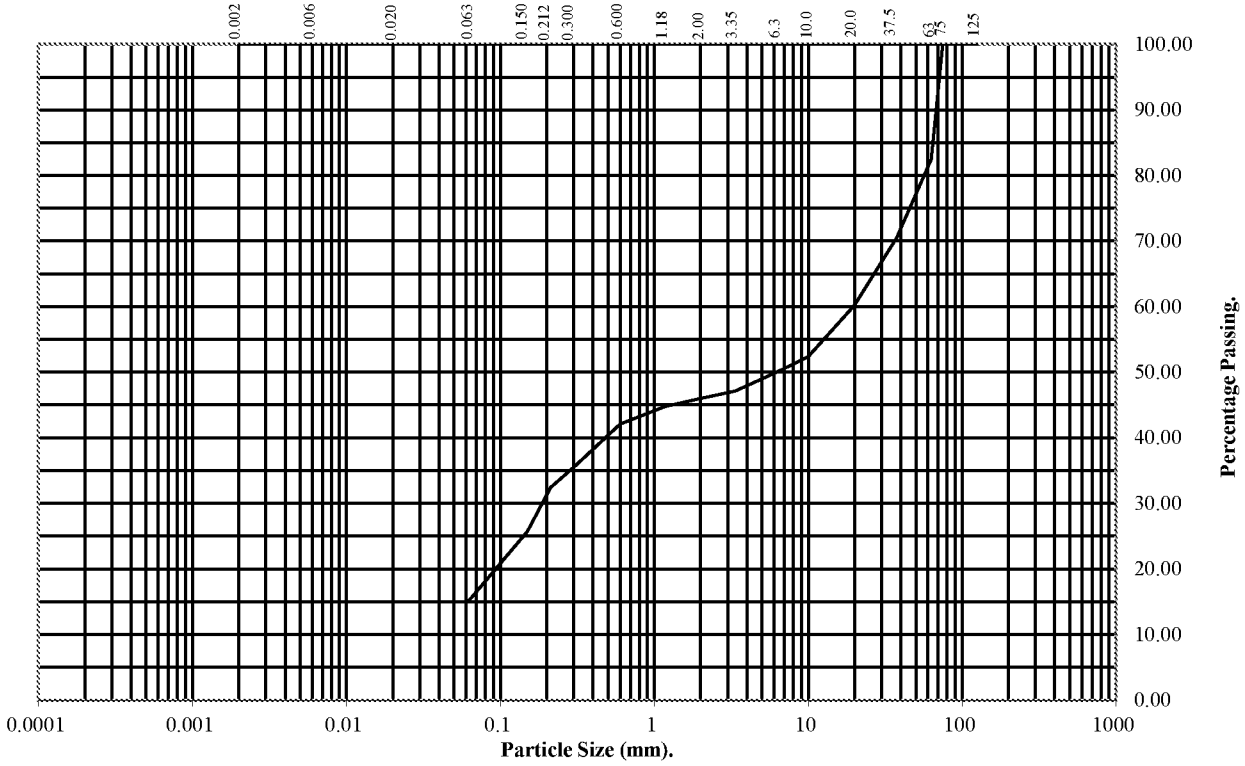
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH103 **Top Depth (m):** 9.35

Sample Number: **Base Depth(m):** 9.70

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	82
37.5	71
20	60
10	52
6.3	50
3.35	47
2	46
1.18	45
0.6	42
0.3	35
0.212	32
0.15	26
0.063	15

Soil Fraction	Total Percentage
Cobbles	18
Gravel	36
Sand	31
Silt/Clay	15

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date	08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH103		B	12.20		23	22	1.69	55	3.9	
BH103		CS	13.08	13.31	21	21	1.72			
BH103		B	15.10		23	23	1.67	24	4.1	
BH103		CS	18.40	18.65	25	25	1.60			
BH103		CS	21.80	22.10	23	24	1.65			
BH103		CS	24.68	25.00	23	23	1.67			
BH103		B	30.50		24	24	1.63			
BH103		CS	33.30	33.65	26	25	1.60			

UKAS TESTING 4043

PSL Professional Soils Laboratory

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				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH103	13.08		A	Par	116	47	2209	6941.70	83.32	0.650	0.87	0.125	1.258	**0.16**	Valid	
BH103	18.40		A	Par	116	44	1936	6498.61	80.61	0.950	1.27	0.195	1.240	**0.24**	Valid	
BH103	24.68		A	Par	116	39	1521	5760.14	75.90	0.800	1.07	0.185	1.207	**0.22**	Valid	
BH103	33.30		A	Par	116	45	2025	6646.31	81.52	0.700	0.93	0.141	1.246	**0.18**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 06/01/16	**Contract No:**
		University of Chichester - Bognor Regis Campus		**PSL15/5863**
				Client Ref:
				C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH103	13.08		D	Perp		116	13456	116.00	0.390	0.52	0.039	1.460	**0.06**	Valid	
BH103	18.40		D	Perp		116	13456	116.00	0.620	0.83	0.062	1.460	**0.09**	Valid	
BH103	24.68		D	Perp		116	13456	116.00	0.760	1.01	0.075	1.460	**0.11**	Valid	
BH103	33.30		D	Perp		116	13456	116.00	0.840	1.12	0.083	1.460	**0.12**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
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University of Chichester - Bognor Regis Campus				Client Ref:
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DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH103		C	13.08	13.31	116	197	1.7	4280	2.06	23	1.67	31.2	3.0	Brittle	22/12/16	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

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[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT CO

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH104		D	3.70		Brown CLAY.
BH104		D	6.90		Grey very gravelly slightly sandy CLAY.
BH104		D	8.40		CHALK.
BH104		D	10.70		CHALK.
BH104		D	11.95		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH104		D	3.70		58			71	29	42	100	Very high plasticity CV.
BH104		D	6.90		31			60	26	34	41	High plasticity CH.

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

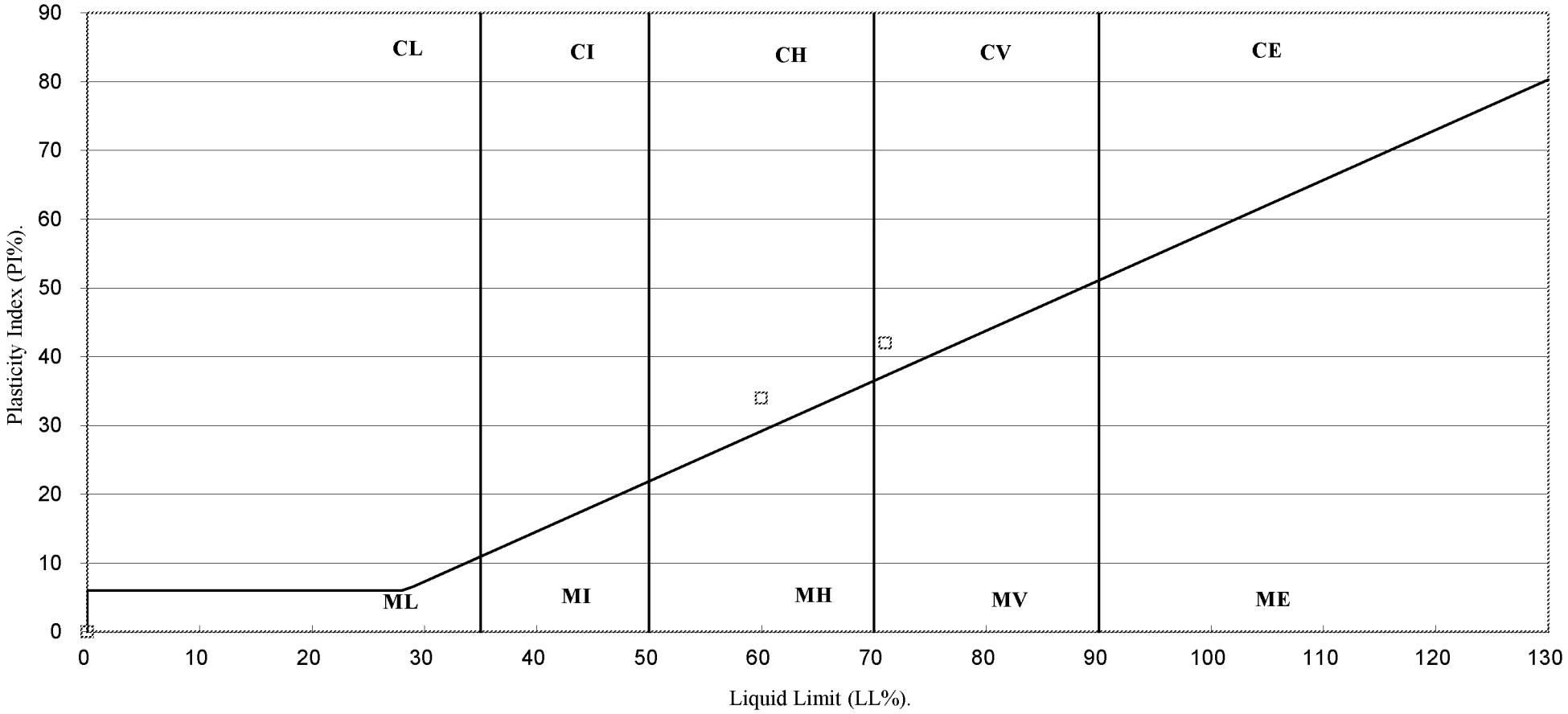
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043 — PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
	University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

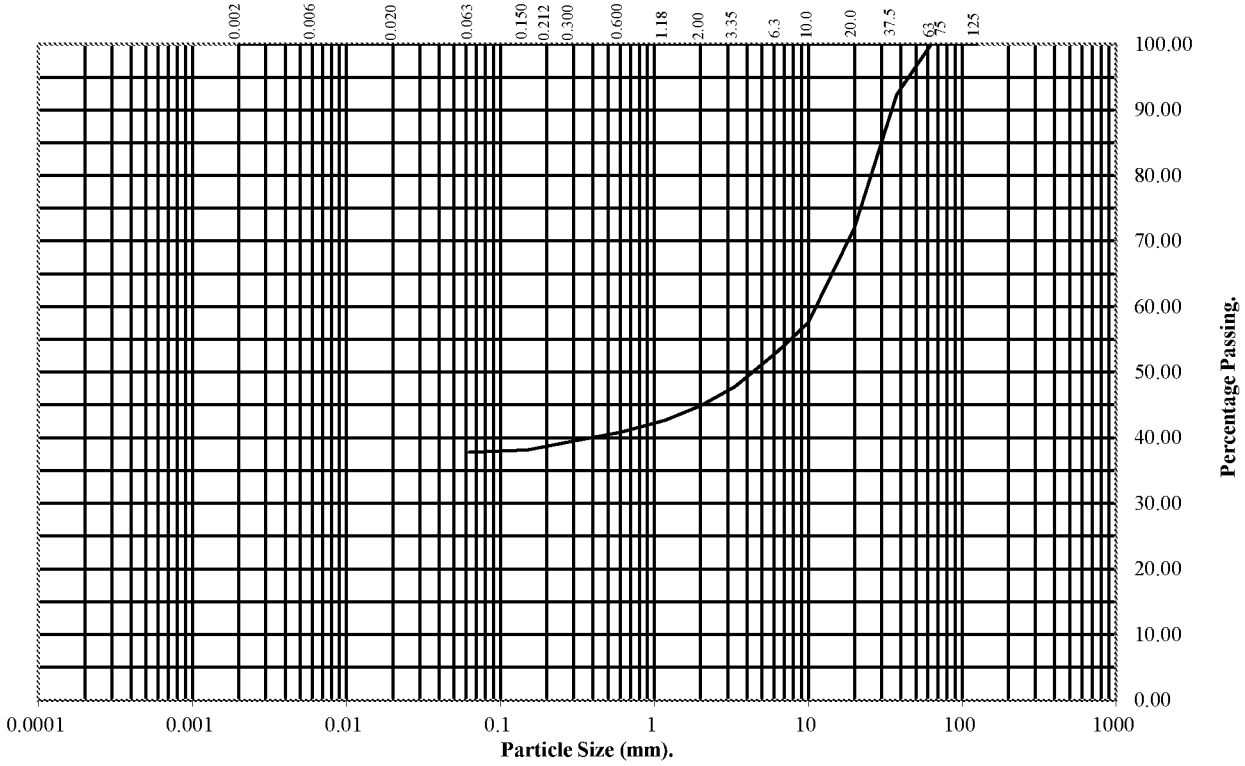
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH104 **Top Depth (m):** 6.90

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	92
20	72
10	58
6.3	53
3.35	48
2	45
1.18	43
0.6	41
0.3	40
0.212	39
0.15	38
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	55
Sand	7
Silt/Clay	38

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approve [redacted] Date 08/01/16		Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH104		D	8.40		26	26	1.58			
BH104		D	10.70	13.31	24	24	1.64			
BH104		D	11.95		26	25	1.61			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH105		D	4.00		Grey mottled brown CLAY.
BH105		D	7.00		Grey mottled brown slightly sandy CLAY.
BH105		D	10.00		Grey mottled brown slightly sandy CLAY.
BH105		D	13.00		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH105		D	4.00		66			79	31	48	100	Very high plasticity CV.
BH105		D	7.00		46			59	26	33	100	High plasticity CH.
BH105		D	10.00		59			65	27	38	100	High plasticity CH.

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

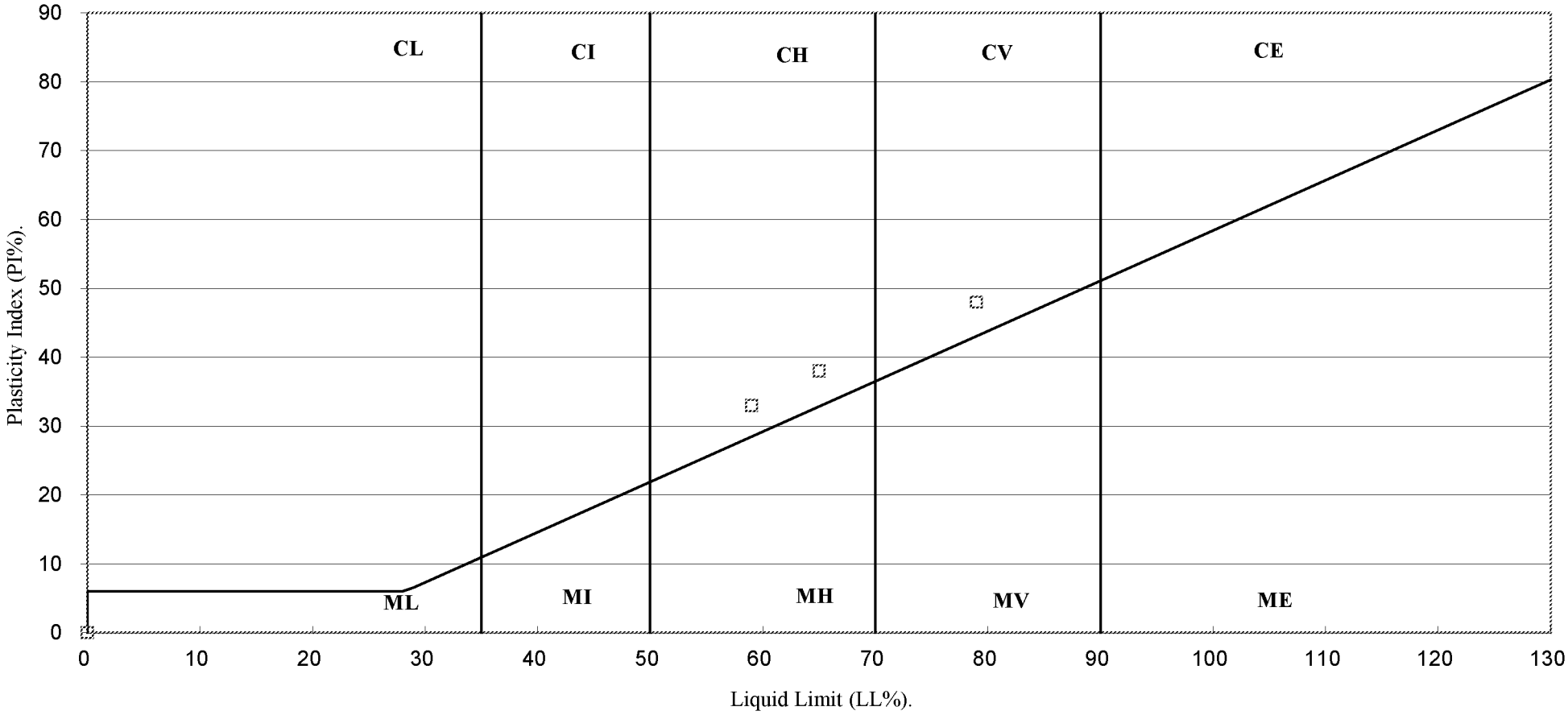
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		

Contract No:
PSL15/5863
Client Ref:
C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH105		D	13.00		25	23	1.67			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT CO

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH106		B	0.20		Brown slightly gravelly slightly sandy CLAY.
BH106		B	0.50		Brown slightly gravelly slightly sandy CLAY.
BH106		D	2.10		Reddish brown mottled grey slightly sandy CLAY.
BH106		D	3.50		Reddish brown mottled grey slightly sandy CLAY.
BH106		D	4.50		Reddish brown mottled grey slightly sandy CLAY.
BH106		SPT	6.00	6.08	Brown mottled grey gravelly sandy CLAY.
BH106		D	8.80		White structureless CHALK.
BH106		CS	9.95	10.25	CHALK.
BH106		D	15.00		CHALK.
BH106		CS	18.40	18.64	CHALK.
BH106		D	19.50		CHALK.
BH106		CS	21.35	21.70	CHALK.
BH106		D	24.40		CHALK.
BH106		CS	27.40	27.60	CHALK.
BH106		D	28.60		CHALK.
BH106		D	30.10		CHALK.
BH106		D	31.60		CHALK.
BH106		CS	32.00	32.25	CHALK.
BH106		D	34.60		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH106		B	0.20		33			55	25	30	92	High plasticity CH.
BH106		B	0.50		24			51	23	28	90	High plasticity CH.
BH106		D	2.10		26			54	24	30	100	High plasticity CH.
BH106		D	4.50		27			62	27	35	100	High plasticity CH.
BH106		SPT	6.00	6.28	19			44	21	23	81	Intermediate plasticity CI.
BH106		D	8.80		25							
BH106		D	19.50		25							
BH106		D	30.10		24							

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

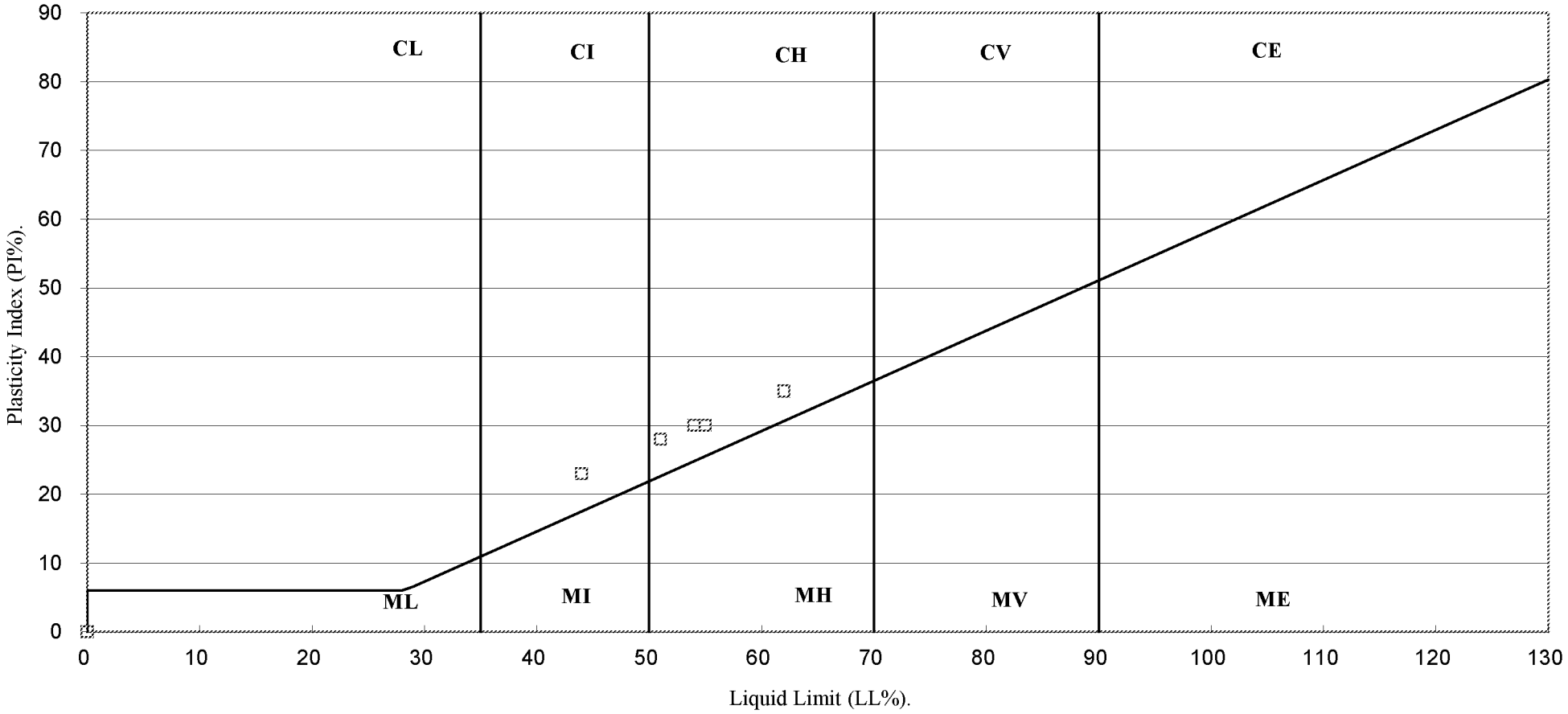
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043 — PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
	University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

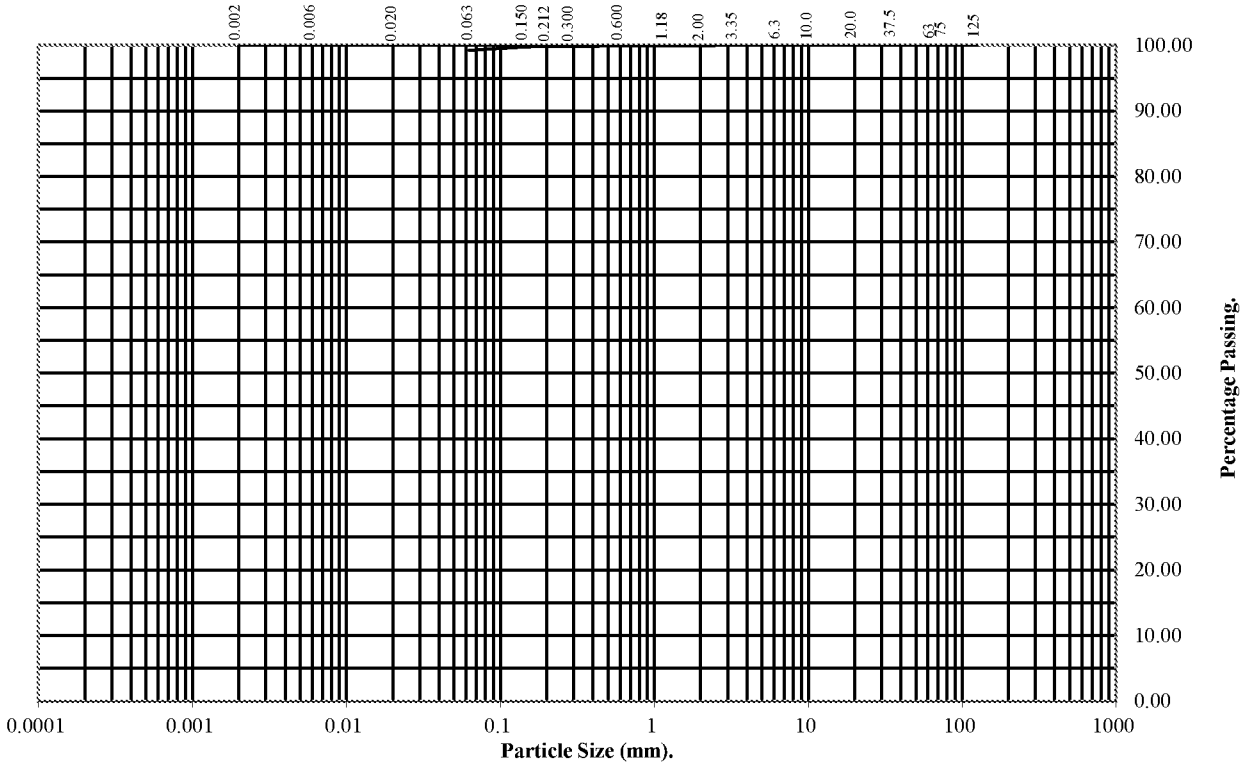
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH106 **Top Depth (m):** 3.50

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt/Clay	99

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH106		CS	9.95	10.25	24	24	1.65			
BH106		D	15.00		27	26	1.58			
BH106		CS	18.40	18.64	22	22	1.69	18	3.7	
BH106		CS	21.35	21.70	26	26	1.60			
BH106		D	24.40		25	24	1.65	14	3.8	
BH106		CS	27.40	27.60	24	24	1.63			
BH106		D	28.60		27	27	1.56			
BH106		D	31.60		26	25	1.60			
BH106		CS	32.00	32.25	16	20	1.75			
BH106		D	34.60		22	22	1.70			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH106	9.95		A	Par	116	56	3136	8270.96	90.94	0.460	0.61	0.074	1.309	**0.10**	Valid	
BH106	22.05		A	Par	116	56	3136	8270.96	90.94	1.920	2.56	0.310	1.309	**0.41**	Valid	
BH106	27.40		A	Par	116	45	2025	6646.31	81.52	1.080	1.44	0.217	1.246	**0.27**	Valid	
BH106	32.00		A	Par	116	40	1600	5907.83	76.86	0.530	0.71	0.120	1.213	**0.15**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

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SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH106	9.95		D	Perp		116	13456	116.00	0.760	1.01	0.075	1.460	**0.11**	Valid	
BH106	22.05		D	Perp		116	13456	116.00	1.480	1.98	0.147	1.460	**0.21**	Valid	
BH106	27.40		D	Perp		116	13456	116.00	0.660	0.88	0.065	1.460	**0.10**	Valid	
BH106	32.00		D	Perp		116	13456	116.00	0.640	0.85	0.063	1.460	**0.09**	Valid	

**Note* All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
				PSL15/5863
University of Chichester - Bognor Regis Campus				Client Ref:
				C4872

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH106		C	9.95	10.25	116	197	1.7	4268	2.05	24	1.65	20.3	1.9	Brittle	22/12/16	
BH106		C	18.40	18.64	116	190	1.6	4199	2.09	23	1.70	27.1	2.6	Brittle	22/12/16	
BH106		C	21.35	21.70	116	181	1.6	3845	2.01	26	1.60	22.3	2.1	Brittle	22/12/16	
BH106		C	30.55	30.85	116	175	1.5	3688	1.99	25	1.60	22.3	2.1	Brittle	22/12/16	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
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GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
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(Director)

A Watkins
(Director)

[redacted]

M Beastall
(Laboratory Manager)

D Lambe
(Senior Technician)

S Royle
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,

[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH107		B	0.50		Brown gravelly sandy CLAY.
BH107		B	1.00		Grey sandy clayey silty GRAVEL.
BH107		B	2.20	2.50	Brown gravelly clayey silty SAND.
BH107		B	3.00	3.50	Brown sandy clayey GRAVEL.
BH107		D	3.55	3.60	Brown very gravelly very sandy CLAY.
BH107		B	3.60	3.90	Brown very sandy clayey GRAVEL.
BH107		D	5.00	5.15	Brown gravelly very sandy CLAY.
BH107		D	7.00		CHALK.
BH107		D	8.40		CHALK.
BH107		D	9.70		CHALK.
BH107		D	12.60		CHALK.
BH107		D	14.00		CHALK.
BH107		CS	16.40	16.59	CHALK.
BH107		CS	17.70	17.90	CHALK.
BH107		CS	18.97	19.14	CHALK.
BH107		CS	21.80	22.10	CHALK.
BH107		CS	23.10	23.30	CHALK.
BH107		CS	26.40	26.71	CHALK.
BH107		CS	29.75	30.10	CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH107		CS	31.30	31.56	CHALK.
BH107		CS	32.97	33.15	CHALK.
BH107		B	33.18		CHALK.
BH107		B	34.67		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved		Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH107		B	0.50		21			45	21	24	81	Intermediate plasticity CI.
BH107		B	2.20	2.50	16							
BH107		B	3.00	3.50	6.7							
BH107		D	3.55	3.60	16			29	16	13	72	Low plasticity CL.
BH107		B	3.60	3.90	10							
BH107		D	5.00	5.15	16			34	18	16	79	Low plasticity CL.
BH107		D	14.00		28							
BH107		CS	17.70	17.90	23							
BH107		CS	18.97	19.14	26							
BH107		CS	23.10	23.30	24							
BH107		CS	31.30	31.56	26							

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

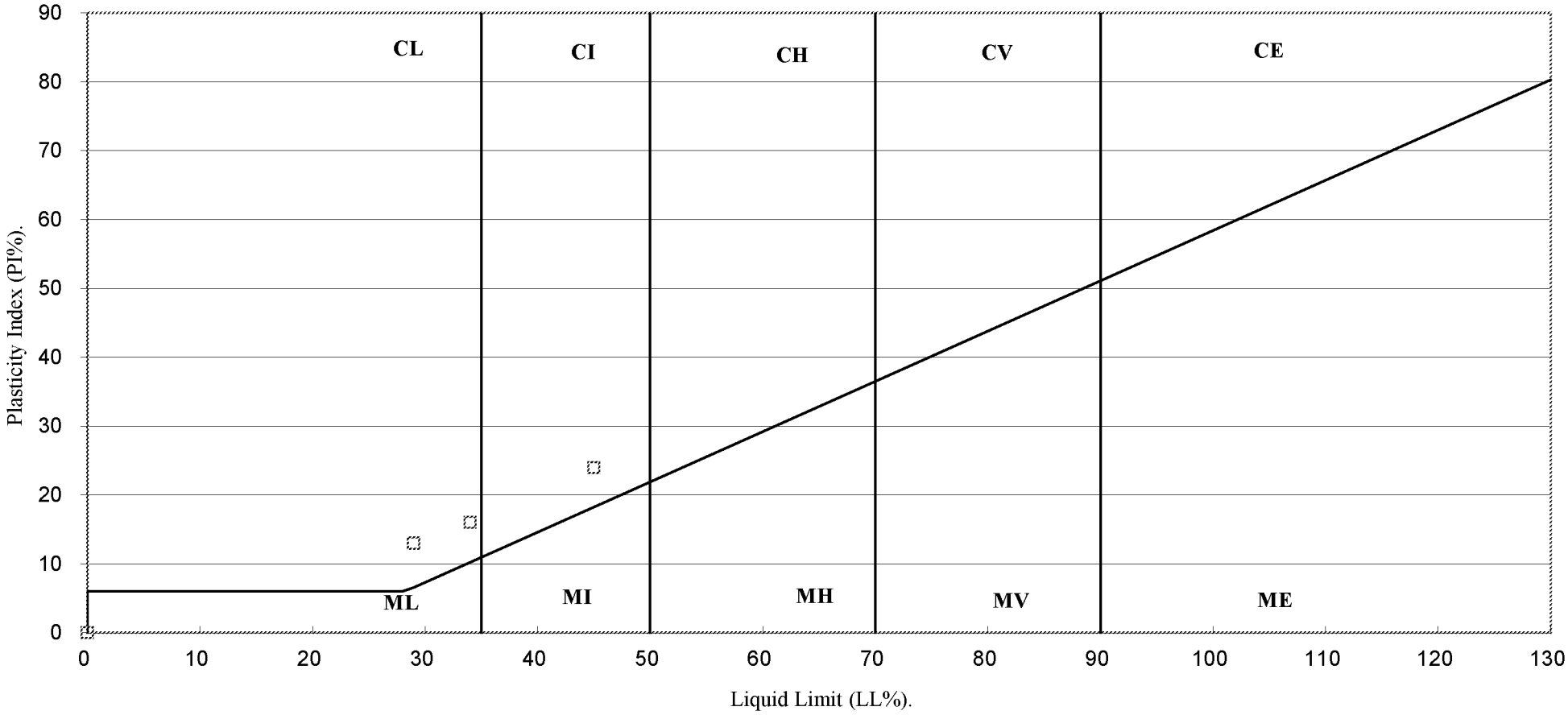
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved [redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus			PSL15/5863
			Client Ref:
			C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		

Contract No:
PSL15/5863
Client Ref:
C4872

PARTICLE SIZE DISTRIBUTION TEST

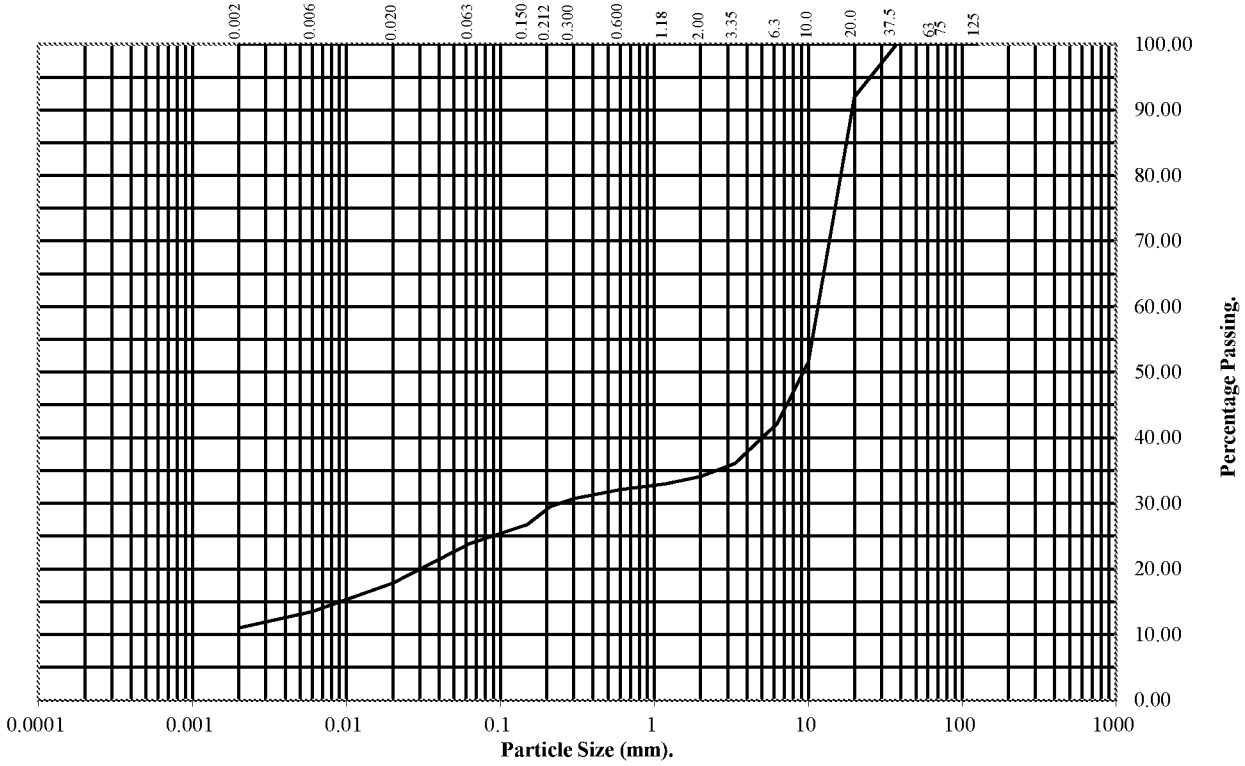
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH107 **Top Depth (m):** 1.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	92
10	52
6.3	42
3.35	36
2	34
1.18	33
0.6	32
0.3	31
0.212	30
0.15	27
0.063	24

Particle Diameter	Percentage Passing
0.02	18
0.006	13
0.002	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	66
Sand	10
Silt	13
Clay	11

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

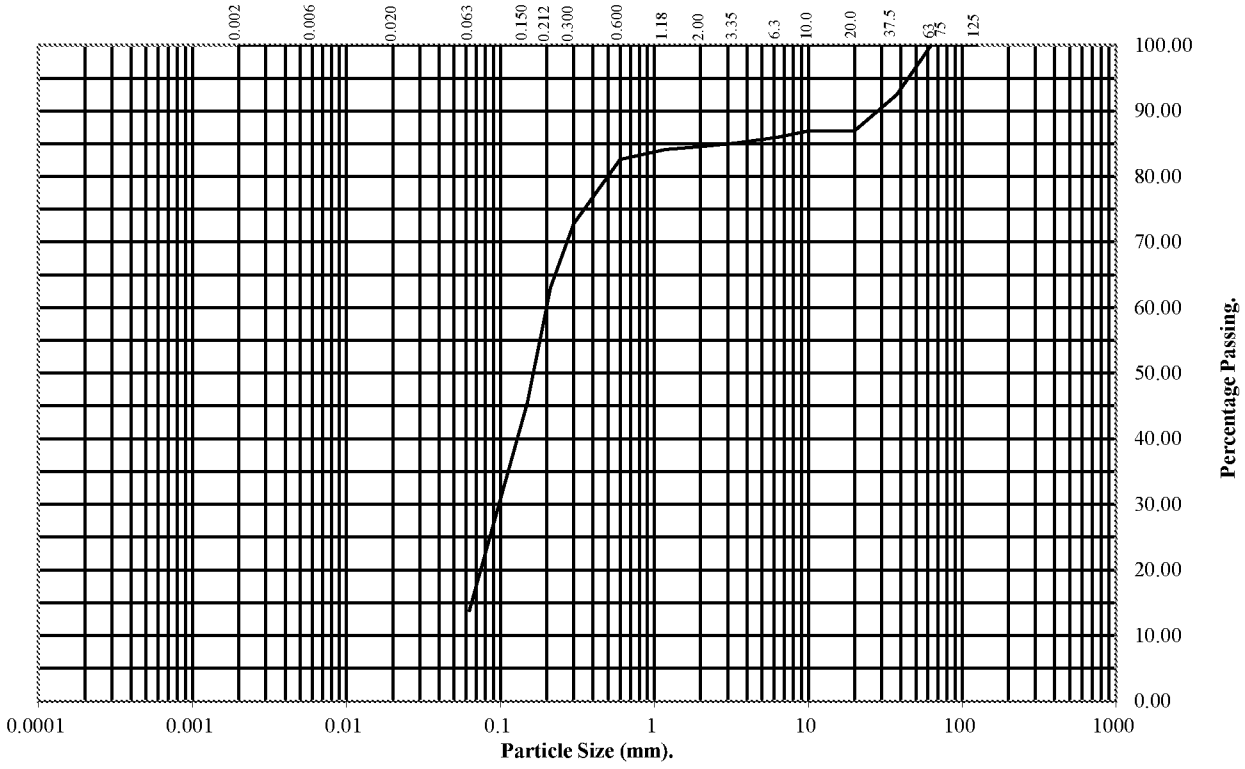
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH107 **Top Depth (m):** 2.20

Sample Number: **Base Depth(m):** 2.50

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	92
20	87
10	87
6.3	86
3.35	85
2	85
1.18	84
0.6	83
0.3	73
0.212	63
0.15	45
0.063	14

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	71
Silt/Clay	14

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

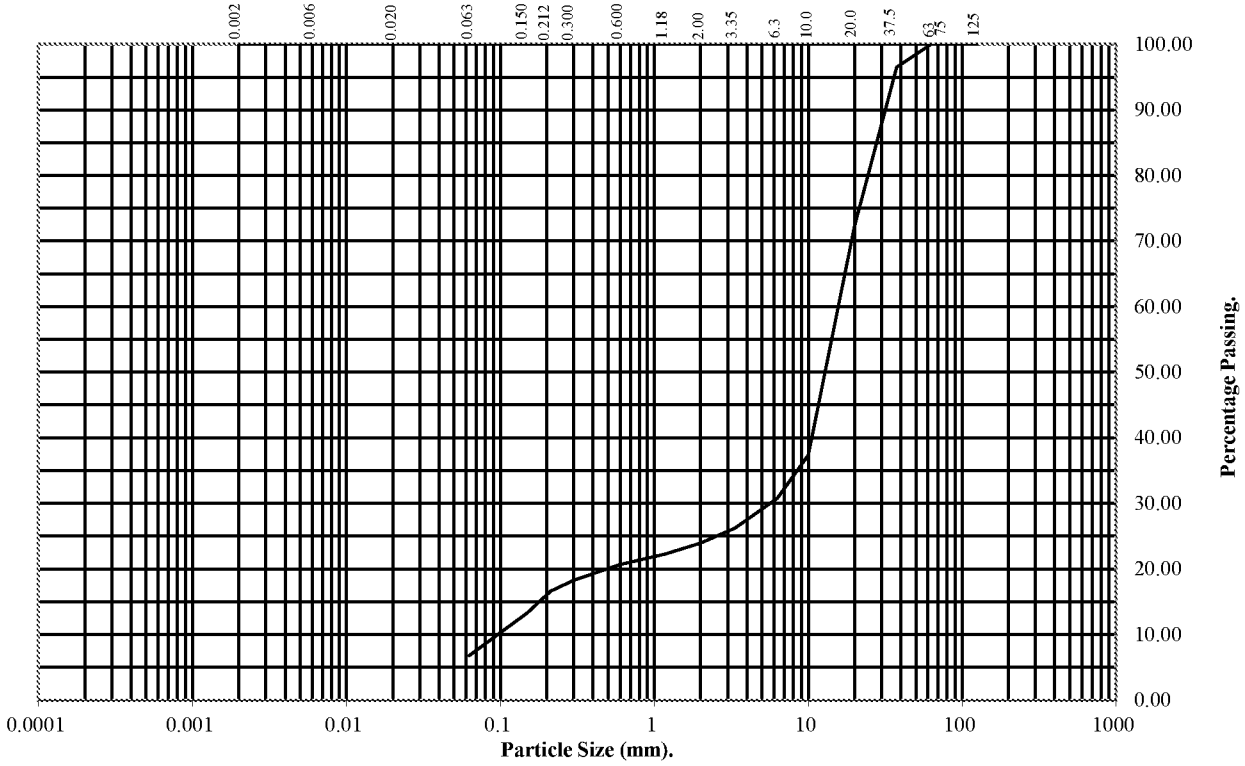
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH107 **Top Depth (m):** 3.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	97
20	72
10	37
6.3	31
3.35	26
2	24
1.18	22
0.6	21
0.3	18
0.212	17
0.15	13
0.063	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	76
Sand	17
Silt/Clay	7

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

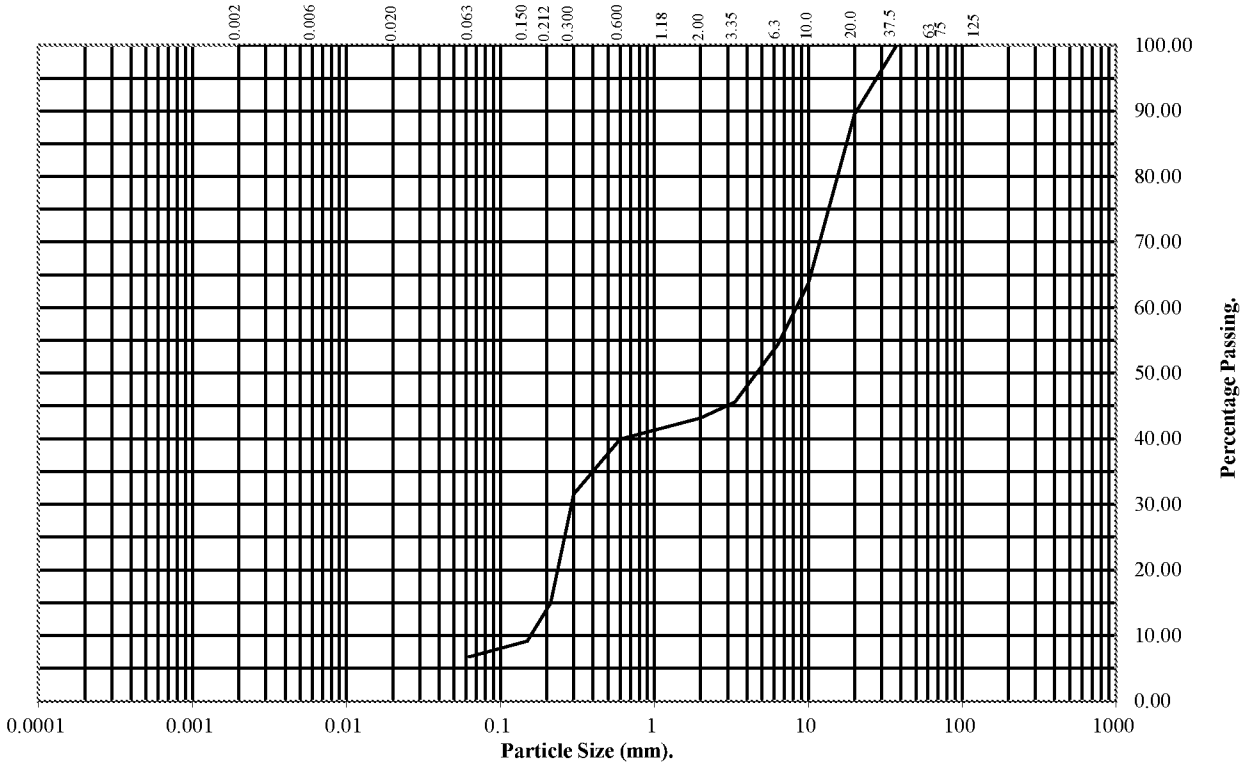
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH107 **Top Depth (m):** 3.60

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	89
10	64
6.3	54
3.35	46
2	43
1.18	42
0.6	40
0.3	32
0.212	15
0.15	9
0.063	7

Soil Fraction	Total Percentage
Cobbles	0
Gravel	57
Sand	36
Silt/Clay	7

Remarks:
See summary of soil descriptions.

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		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

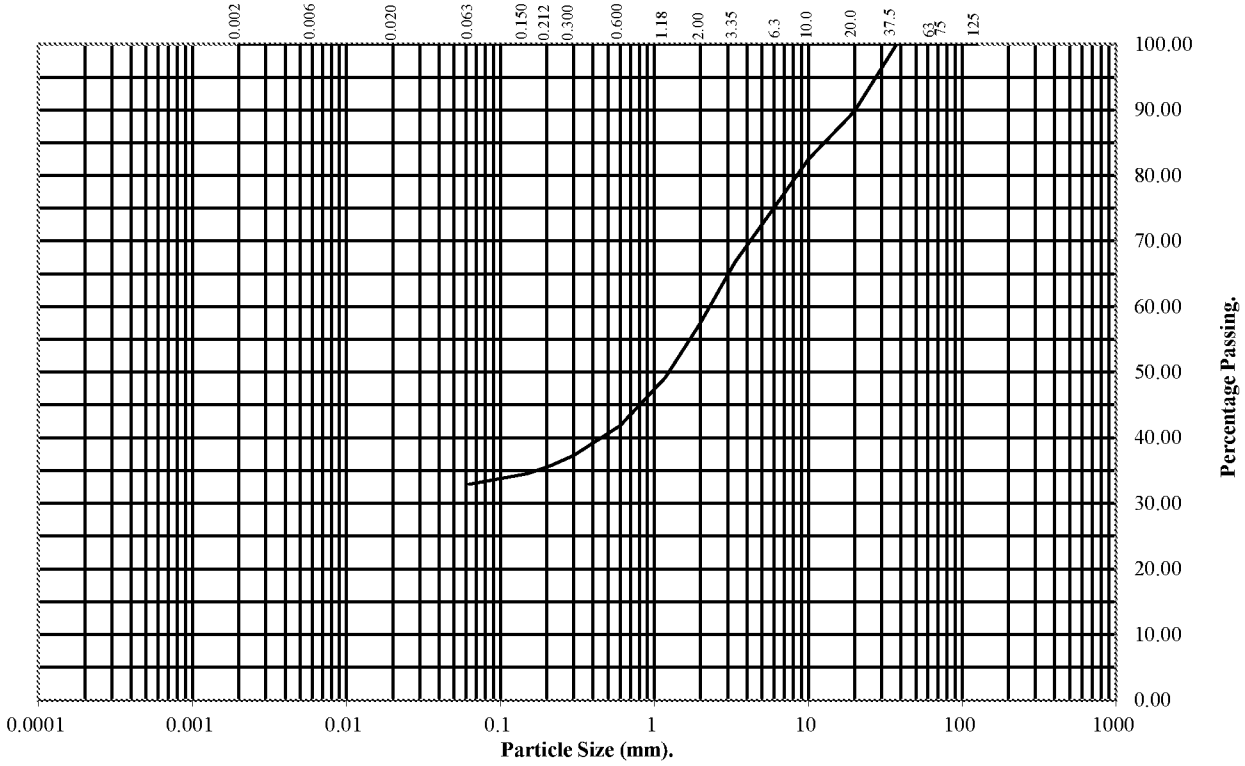
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH107 **Top Depth (m):** 7.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	90
10	82
6.3	76
3.35	67
2	58
1.18	49
0.6	42
0.3	37
0.212	36
0.15	35
0.063	33

Soil Fraction	Total Percentage
Cobbles	0
Gravel	42
Sand	25
Silt/Clay	33

Remarks:
See summary of soil descriptions.

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		University of Chichester - Bognor Regis Campus			Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH107		D	7.00		26	26	1.58			
BH107		D	8.40		29	29	1.52			
BH107		D	9.70		24	24	1.68	17	3.5	
BH107		D	12.60		25	24	1.65	14	3.6	
BH107		CS	16.40	16.59	24	24	1.68			
BH107		CS	18.97	19.14	26	26	1.58	50	3.7	
BH107		CS	21.80	22.10	22	22	1.70			
BH107		CS	23.10	23.30	25	25	1.62	43	3.8	
BH107		CS	26.40	26.71	26	26	1.58			
BH107		CS	29.75	30.10	24	24	1.63			
BH107		CS	31.30	31.56	23	24	1.64	50	3.8	
BH107		CS	32.97	33.15	23	23	1.67			
BH107		B	33.18		26			68	4.0	
BH107		B	34.67		27	28	1.55			

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				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH107	17.70		A	Par	116	44	1936	6498.61	80.61	0.980	1.31	0.201	1.240	**0.25**	Valid	
BH107	18.97		A	Par	116	33	1089	4873.96	69.81	0.370	0.49	0.101	1.162	**0.12**	Valid	
BH107	21.80		A	Par	116	53	2809	7827.88	88.48	1.280	1.71	0.218	1.293	**0.28**	Valid	
BH107	23.10		A	Par	116	41	1681	6055.53	77.82	0.760	1.01	0.168	1.220	**0.20**	Valid	
BH107	26.40		A	Par	116	55	3025	8123.27	90.13	0.810	1.08	0.133	1.304	**0.17**	Valid	
BH107	31.30		A	Par	116	42	1764	6203.22	78.76	0.760	1.01	0.164	1.227	**0.20**	Valid	
BH107	34.20		A	Par	116	53	2809	7827.88	88.48	1.020	1.36	0.174	1.293	**0.22**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 06/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

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SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH107	17.70		D	Perp		116	13456	116.00	0.520	0.69	0.052	1.460	**0.08**	Valid	
BH107	18.97		D	Perp		116	13456	116.00	0.220	0.29	0.022	1.460	**0.03**	Valid	
BH107	21.80		D	Perp		116	13456	116.00	0.370	0.49	0.037	1.460	**0.05**	Valid	
BH107	23.10		D	Perp		116	13456	116.00	0.580	0.77	0.058	1.460	**0.08**	Valid	
BH107	26.40		D	Perp		116	13456	116.00	0.540	0.72	0.054	1.460	**0.08**	Valid	
BH107	31.30		D	Perp		116	13456	116.00	0.640	0.85	0.063	1.460	**0.09**	Valid	
BH107	34.20		D	Perp		116	13456	116.00	0.770	1.03	0.076	1.460	**0.11**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved [redacted] **Date** 06/01/16

University of Chichester - Bognor Regis Campus

Contract No: PSL15/5863

Client Ref: C4872

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH107		C	16.40	16.59	116	202	1.7	4341	2.03	24	1.64	20.5	1.9	Brittle	22/12/16	
BH107		C	21.80	22.10	116	198	1.7	4234	2.02	23	1.64	28.3	2.7	Brittle	22/12/16	
BH107		C	29.75	30.10	116	202	1.7	4304	2.02	24	1.63	28.0	2.6	Brittle	22/12/16	

UKAS TESTING 4043

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University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

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LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)
[redacted]
D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH108		B	0.20		Brown slightly gravelly slightly sandy CLAY.
BH108		B	0.50		Brown slightly sandy CLAY.
BH108		UT100	1.20	1.65	Soft brown CLAY.
BH108		D	1.65	1.75	Brown CLAY.
BH108		UT100	4.00	4.45	Very soft brown CLAY.
BH108		D	5.00		Grey slightly sandy CLAY.
BH108		D	8.00		Grey slightly gravelly slightly sandy CLAY.
BH108		D	9.50		CHALK.
BH108		B	12.60	13.00	CHALK.
BH108		CS	17.10	17.35	CHALK.
BH108		CS	20.82	21.00	CHALK.
BH108		CS	23.85	24.10	CHALK.
BH108		CS	25.30	25.50	CHALK.
BH108		D	27.80		CHALK.
BH108		CS	28.80	29.20	CHALK.
BH108		CS	32.70	33.00	CHALK.
BH108		D	34.20		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

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				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH108		B	0.20		30			67	28	39	96	High plasticity CH.
BH108		B	0.50		40			64	27	37	100	High plasticity CH.
BH108		UT100	1.20	1.65	46			72	30	42	100	Very high plasticity CV.
BH108		UT100	4.00	4.45	59			77	31	46	100	Very high plasticity CV.
BH108		D	5.00		39			53	24	29	100	High plasticity CH.
BH108		D	8.00		45			57	25	32	95	High plasticity CH.
BH108		D	9.50		27			36	25	11	77	Intermediate plasticity MI.
BH108		D	27.80		27							

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

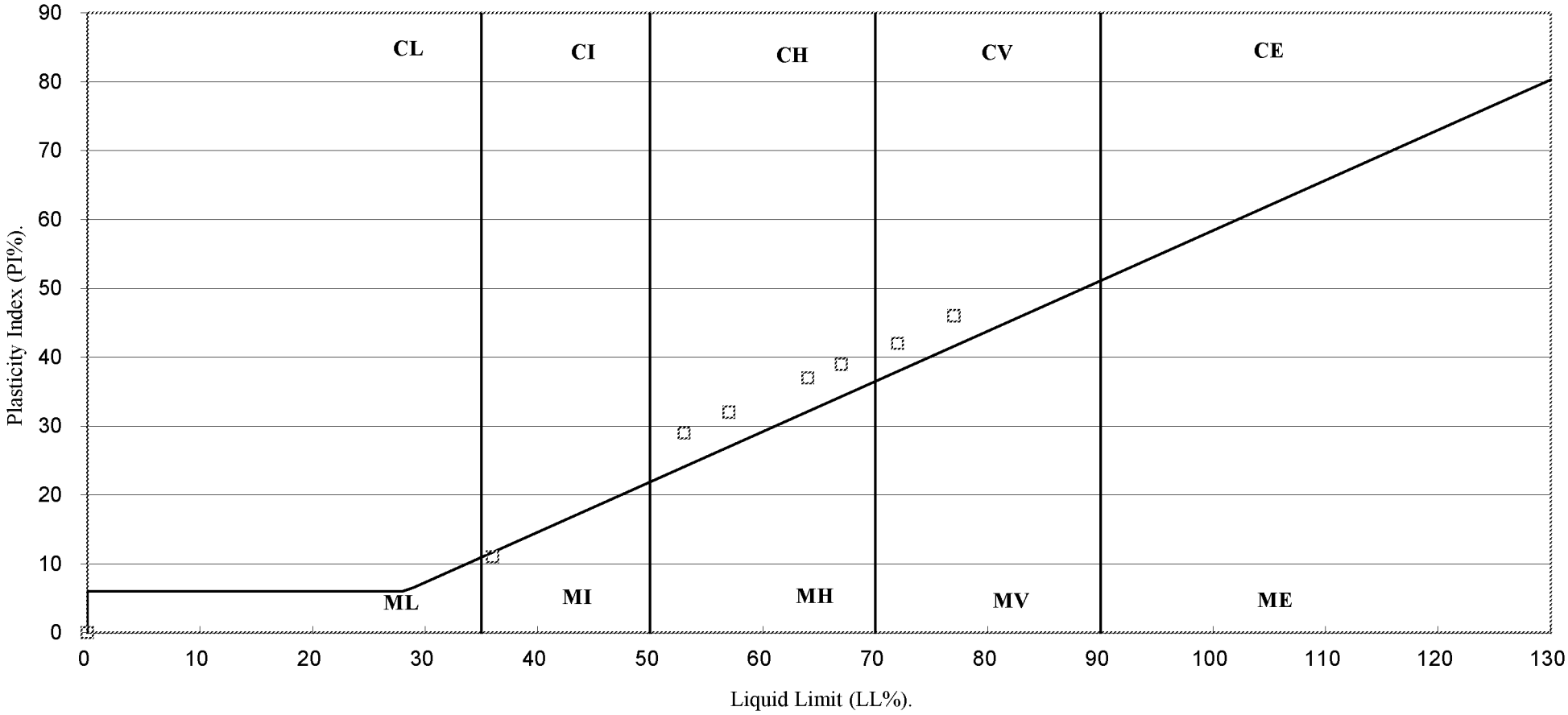
UKAS TESTING 4043

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				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



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	University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

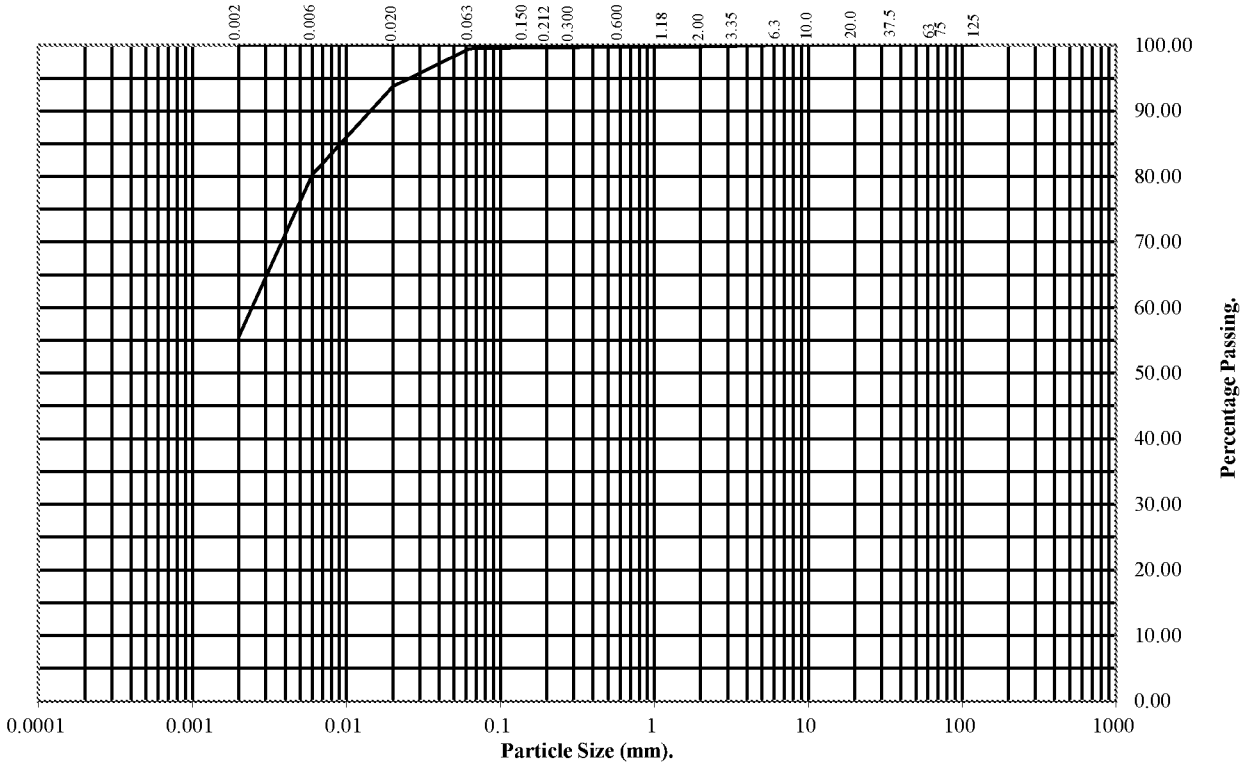
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH108 **Top Depth (m):** 1.65

Sample Number: **Base Depth(m):** 1.75

Sample Type: B



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

Particle Diameter	Percentage Passing
0.02	94
0.006	80
0.002	56

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	0
Silt	44
Clay	56

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

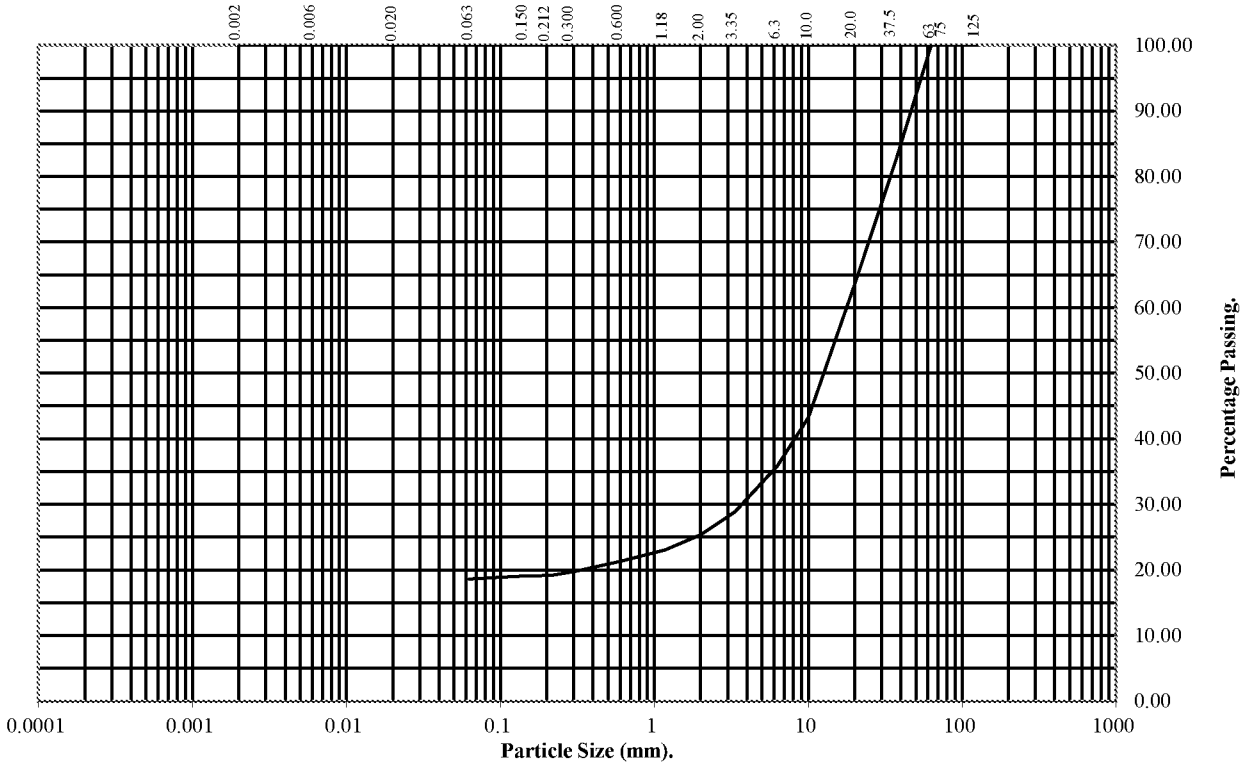
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH108 **Top Depth (m):** 9.50

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	83
20	63
10	43
6.3	36
3.35	29
2	25
1.18	23
0.6	21
0.3	20
0.212	19
0.15	19
0.063	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	75
Sand	6
Silt/Clay	19

Remarks:
See summary of soil descriptions.

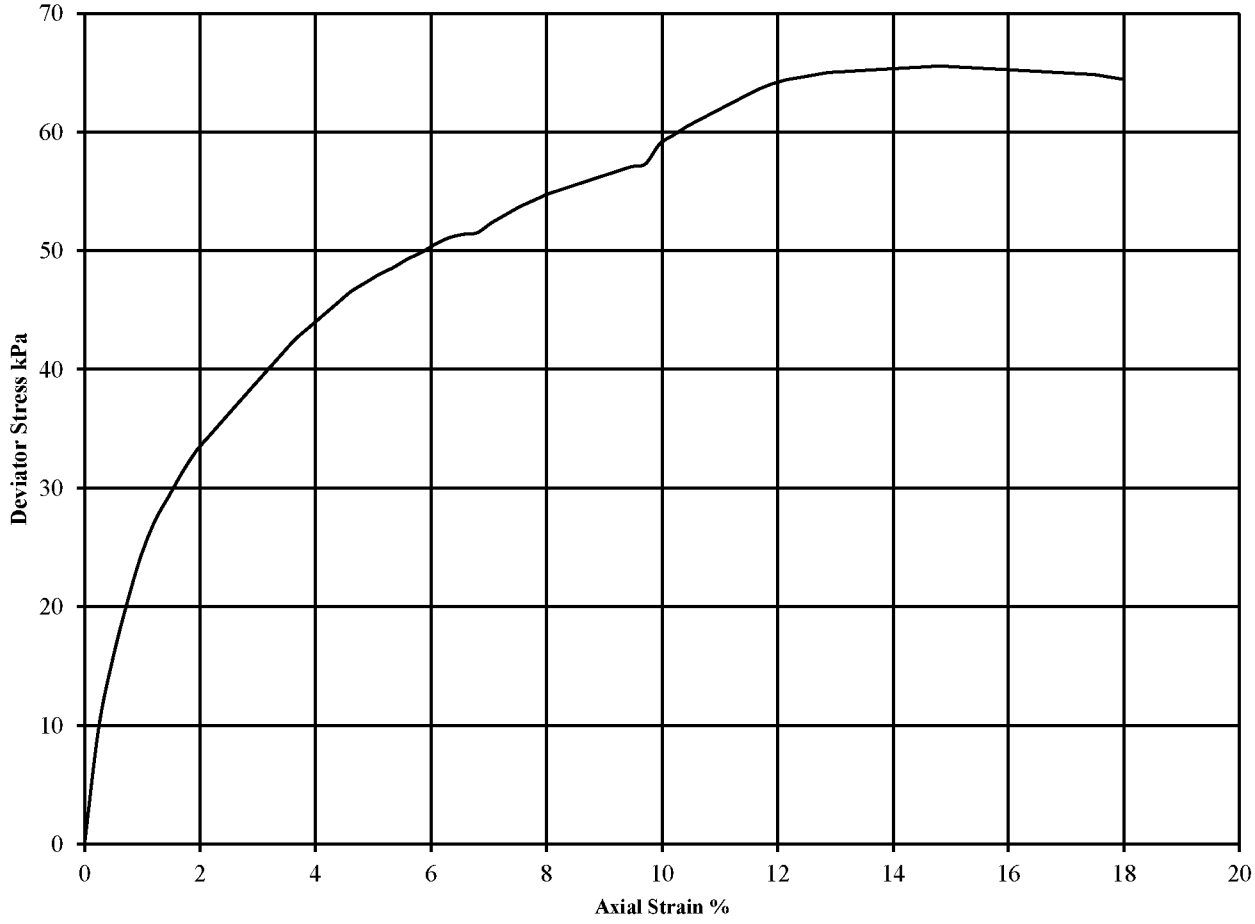
UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**BH108**	**Top Depth (m):**	**1.20**
Sample Number:		**Base Depth (m):**	**1.65**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		210	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.34
1	46	1.66	1.14	17	52	26	6.8		See summary of soil descriptions
				35	57	29	9.7		
				70	66	33	14.8	Plastic	

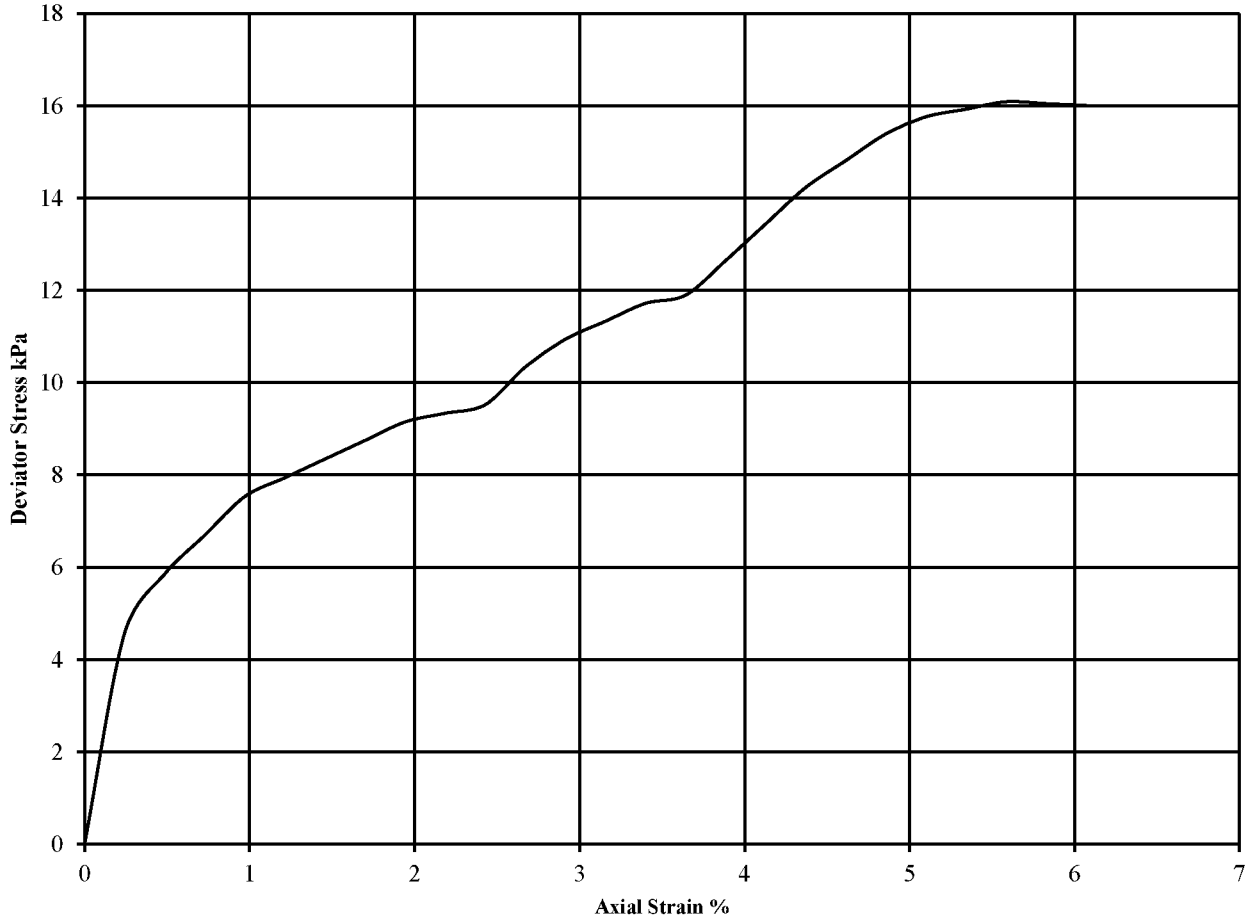
UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**BH108**	**Top Depth (m):**	**4.00**
Sample Number:		**Base Depth (m):**	**4.45**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		210	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.37 0.37 0.36 See summary of soil descriptions
1	59	1.64	1.03	45	9	5	2.2		
				90	12	6	3.6		
				180	16	8	5.6	Plastic	

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 08/01/16	**Contract No:**
		University of Chichester - Bognor Regis Campus		**PSL15/5863**
				Client Ref:
				C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH108		B	12.60	13.00	25	26	1.58	60	3.6	
BH108		CS	17.10	17.35	26	25	1.60			
BH108		CS	20.82	21.00	26	26	1.59			
BH108		CS	23.85	24.10	25			74	3.7	
BH108		CS	25.30	25.50	25	25	1.61			
BH108		CS	28.80	29.20	23	24	1.64			
BH108		CS	32.70	33.00	23	23	1.68			
BH108		D	34.20		22	23	1.67	52	4.1	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

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SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH108	12.60		I	Par	50	45	2025	2864.79	53.52	0.450	0.60	0.210	1.031	**0.22**	Valid	
BH108	17.10		A	Par	116	58	3364	8566.36	92.55	0.520	0.69	0.081	1.319	**0.11**	Valid	
BH108	20.82		A	Par	116	44	1936	6498.61	80.61	0.540	0.72	0.111	1.240	**0.14**	Valid	
BH108	25.30		A	Par	116	40	1600	5907.83	76.86	0.800	1.07	0.181	1.213	**0.22**	Valid	
BH108	32.70		A	Par	116	38	1444	5612.44	74.92	0.820	1.09	0.195	1.200	**0.23**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 06/01/16	**Contract No:**
		University of Chichester - Bognor Regis Campus		**PSL15/5863**
				Client Ref:
				C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH108	17.10		D	Perp		116	13456	116.00	0.680	0.91	0.067	1.460	**0.10**	Valid	
BH108	20.82		D	Perp		116	13456	116.00	0.360	0.48	0.036	1.460	**0.05**	Valid	
BH108	25.30		D	Perp		116	13456	116.00	0.500	0.67	0.050	1.460	**0.07**	Valid	
BH108	32.70		D	Perp		116	13456	116.00	0.710	0.95	0.070	1.460	**0.10**	Valid	

**Note* All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
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ARUN DISTRICT COUNCIL BR/72/22/PL

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH109		B	0.50		Brown slightly gravelly slightly sandy CLAY.
BH109		B	1.00		Brown slightly sandy CLAY.
BH109		D	2.50		Brown mottled grey slightly sandy CLAY.
BH109		D	5.60		Grey mottled brown sandy CLAY.
BH109		D	7.00		Grey mottled brown sandy CLAY.
BH109		D	9.80		Dark grey slightly sandy very silty CLAY with some organic material.
BH109		D	13.00		Dark grey slightly sandy very silty CLAY with some organic material.
BH109		D	15.30		Dark grey slightly sandy very silty CLAY with some organic material.
BH109		D	15.50		Grey gravelly slightly sandy silty CLAY.
BH109		D	16.10		Brown slightly gravelly slightly sandy CLAY.
BH109		D	17.20		CHALK.
BH109		D	20.40		CHALK.
BH109		B	24.60	24.67	CHALK.
BH109		CS	28.20	28.45	CHALK.
BH109		CS	29.60	29.83	CHALK.
BH109		B	31.13	31.32	CHALK.
BH109		D	34.90		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH109		B	0.50		28			59	26	33	96	High plasticity CH.
BH109		B	1.00		38			64	27	37	100	High plasticity CH.
BH109		D	2.50		37			55	25	30	100	High plasticity CH.
BH109		D	5.60		32			45	22	23	100	Intermediate plasticity CI.
BH109		D	7.00		34			46	23	23	100	Intermediate plasticity CI.
BH109		D	9.80		48			79	31	48	100	Very high plasticity CV.
BH109		D	13.00		68			82	32	50	100	Very high plasticity CV.
BH109		D	15.30		69			87	34	53	100	Very high plasticity CV.
BH109		D	15.50		36			67	29	38	81	High plasticity CH.
BH109		D	16.10		34			53	24	29	90	High plasticity CH.
BH109		D	17.20		29							

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

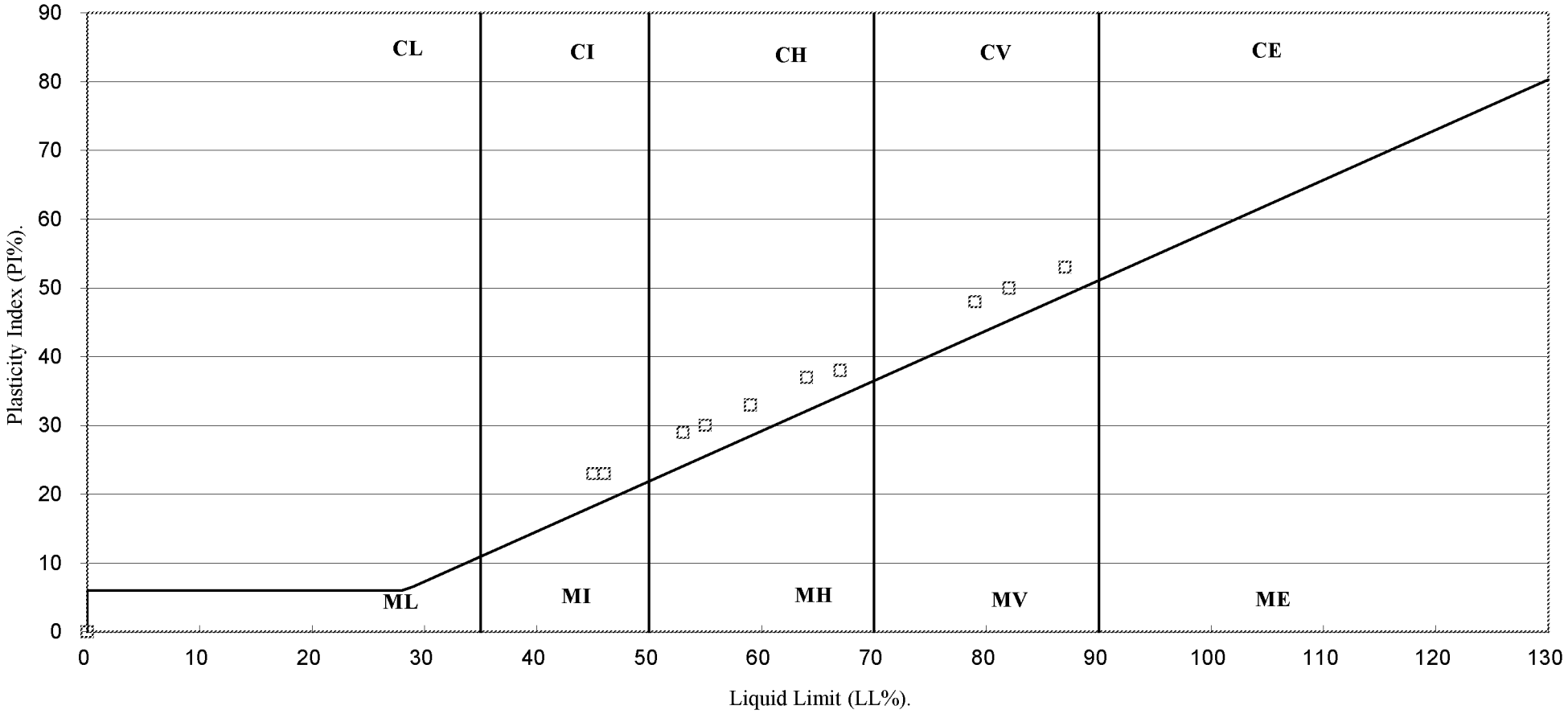
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

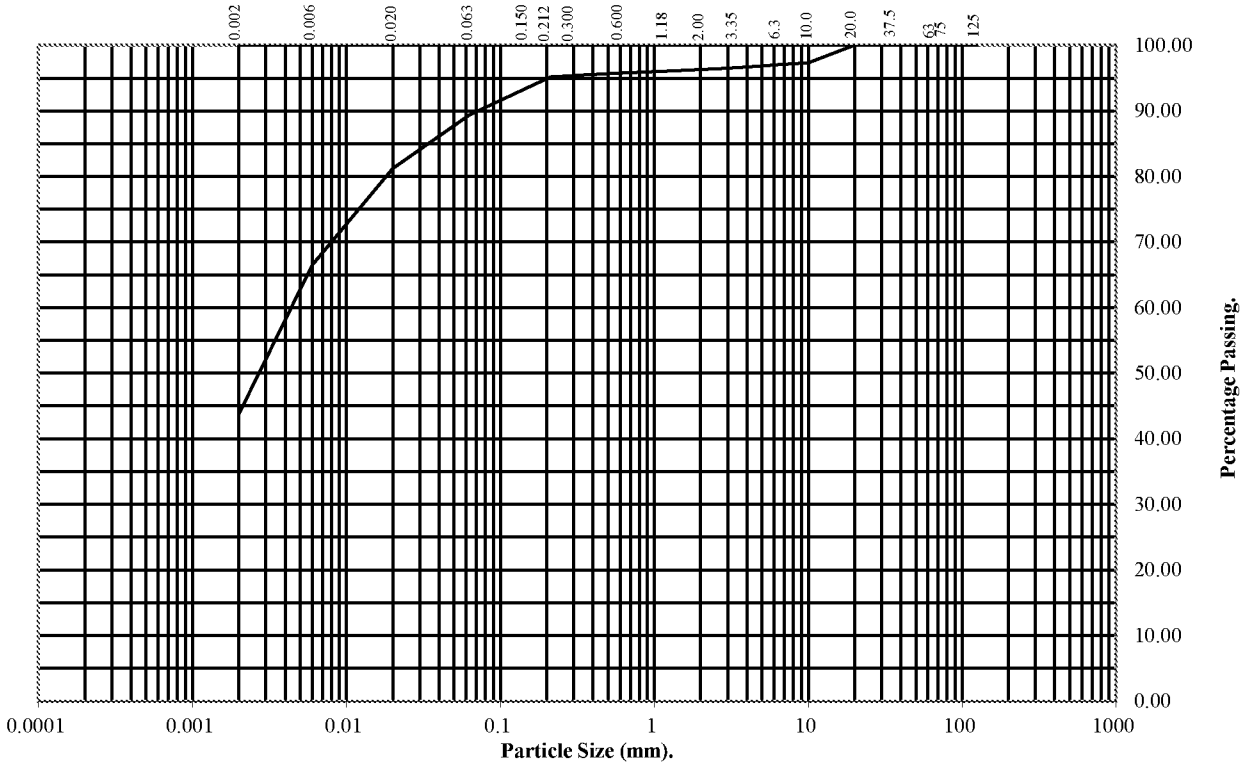
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH109 **Top Depth (m):** 0.50

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	97
3.35	97
2	96
1.18	96
0.6	96
0.3	95
0.212	95
0.15	94
0.063	89

Particle Diameter	Percentage Passing
0.02	81
0.006	66
0.002	44

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	7
Silt	45
Clay	44

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

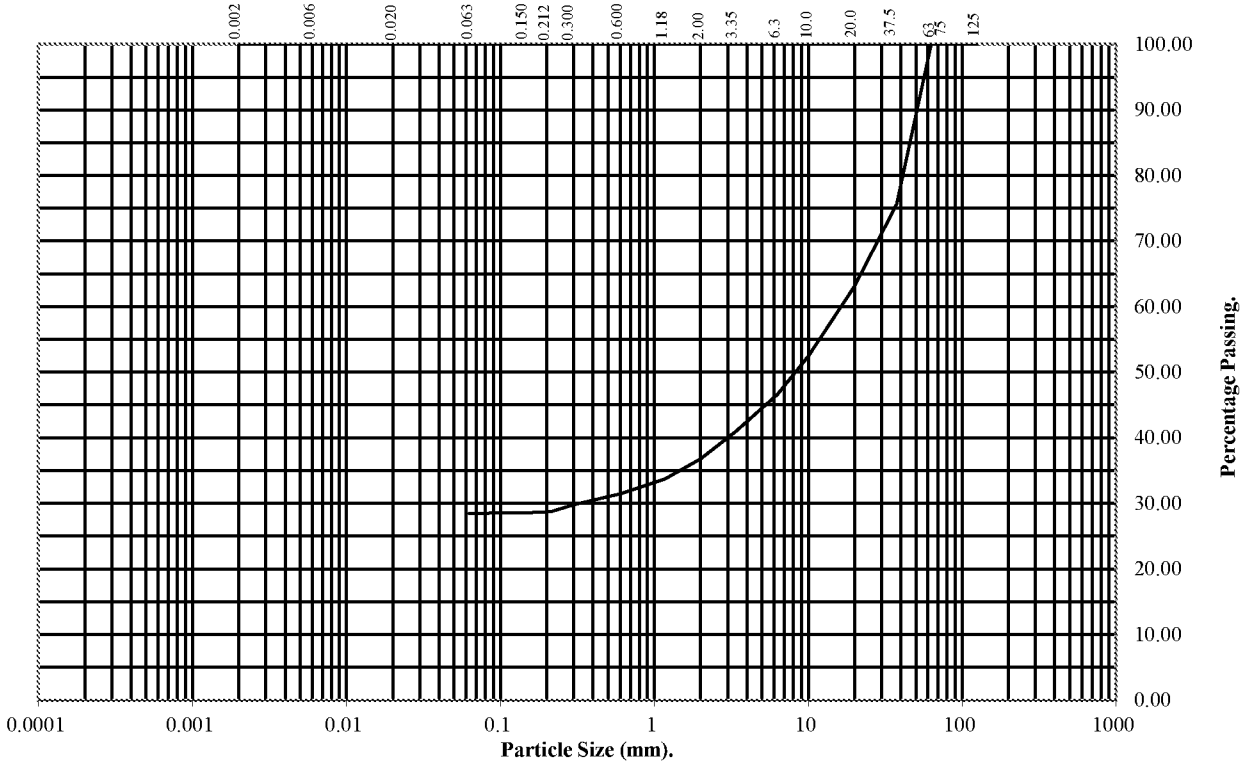
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH109 **Top Depth (m):** 17.20

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	76
20	63
10	52
6.3	47
3.35	41
2	37
1.18	34
0.6	31
0.3	30
0.212	29
0.15	29
0.063	28

Soil Fraction	Total Percentage
Cobbles	0
Gravel	63
Sand	9
Silt/Clay	28

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH109		D	20.40		28	28	1.53			
BH109		B	24.60	24.67	11	17	1.84	50	3.8	
BH109		CS	28.20	28.45	26	25	1.60			
BH109		CS	29.60	29.83	25	26	1.59			
BH109		B	31.13	31.32	25	25	1.60	24	3.9	
BH109		D	34.90		28	28	1.55			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
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ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH109	28.20		A	Par	116	67	4489	9895.62	99.48	1.000	1.34	0.135	1.363	**0.18**	Valid	
BH109	29.60		A	Par	116	87	7569	12849.53	113.36	1.090	1.46	0.113	1.445	**0.16**	Valid	
BH109	31.13		A	Par	116	41	1681	6055.53	77.82	0.600	0.80	0.132	1.220	**0.16**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 06/01/16	**Contract No:**
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				Client Ref:
				C4872

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		D_e^2	D_e	Failure Load		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	L	D		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH109	28.20		D	Perp		116	13456	116.00	0.930	1.24	0.092	1.460	**0.13**	Valid	
BH109	29.60		D	Perp		116	13456	116.00	0.740	0.99	0.073	1.460	**0.11**	Valid	
BH109	31.13		D	Perp		116	13456	116.00	0.520	0.69	0.052	1.460	**0.08**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	06/01/16	Contract No:
				PSL15/5863
University of Chichester - Bognor Regis Campus				Client Ref:
				C4872

DETERMINATION OF UNCONFINED COMPRESSIVE STRENGTH

ISRM Suggested Methods, pp 111 –116, 1981.

Hole Number	Sample Number	Sample Type	Top Depth (m)	Base Depth (m)	Sample Diameter (mm)	Sample Length (mm)	Height Ratio	Initial Mass (g)	Bulk Density (Mg/m)	Moisture Content (%)	Dry Density (Mg/m)	Load Failure	UCS (MPa)	Failure Mode	Date Tested	Remarks
BH109		C	28.20	28.45	116	198	1.7	4225	2.02	25	1.62	16.0	1.5	Brittle	22/12/16	
BH109		C	29.60	29.83	116	195	1.7	4092	1.99	26	1.58	18.3	1.7	Brittle	22/12/16	

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
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M Beastall (Laboratory Manager)

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S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH110		UT100	1.20	1.65	Soft brown slightly sandy CLAY.
BH110		D	2.50		Grey slightly sandy CLAY.
BH110		D	6.90		Grey slightly sandy CLAY.
BH110		D	7.10		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH110		UT100	1.20	1.65	36			60	26	34	100	High plasticity CH.
BH110		D	2.50		48			63	27	36	100	High plasticity CH.
BH110		D	6.90		45			58	25	33	100	High plasticity CH.

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

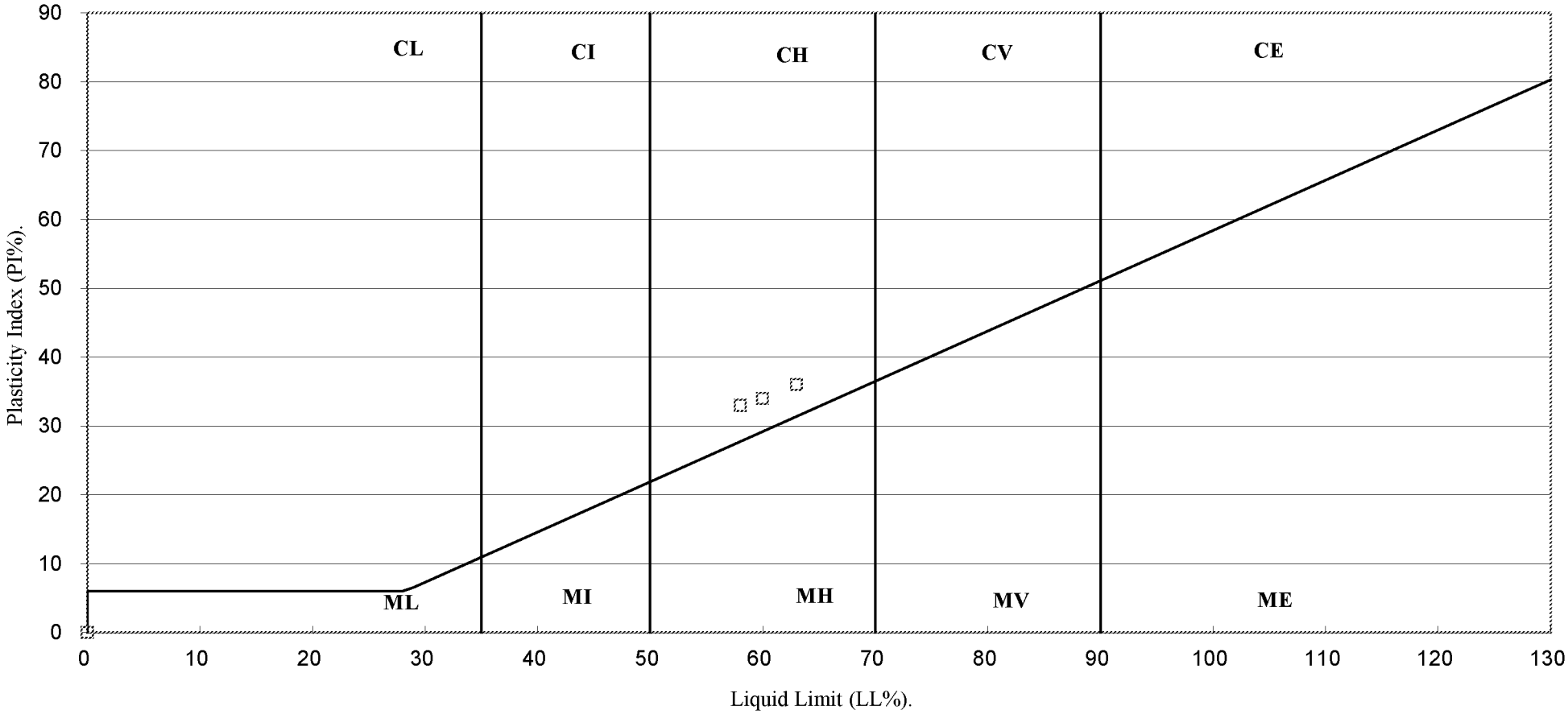
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



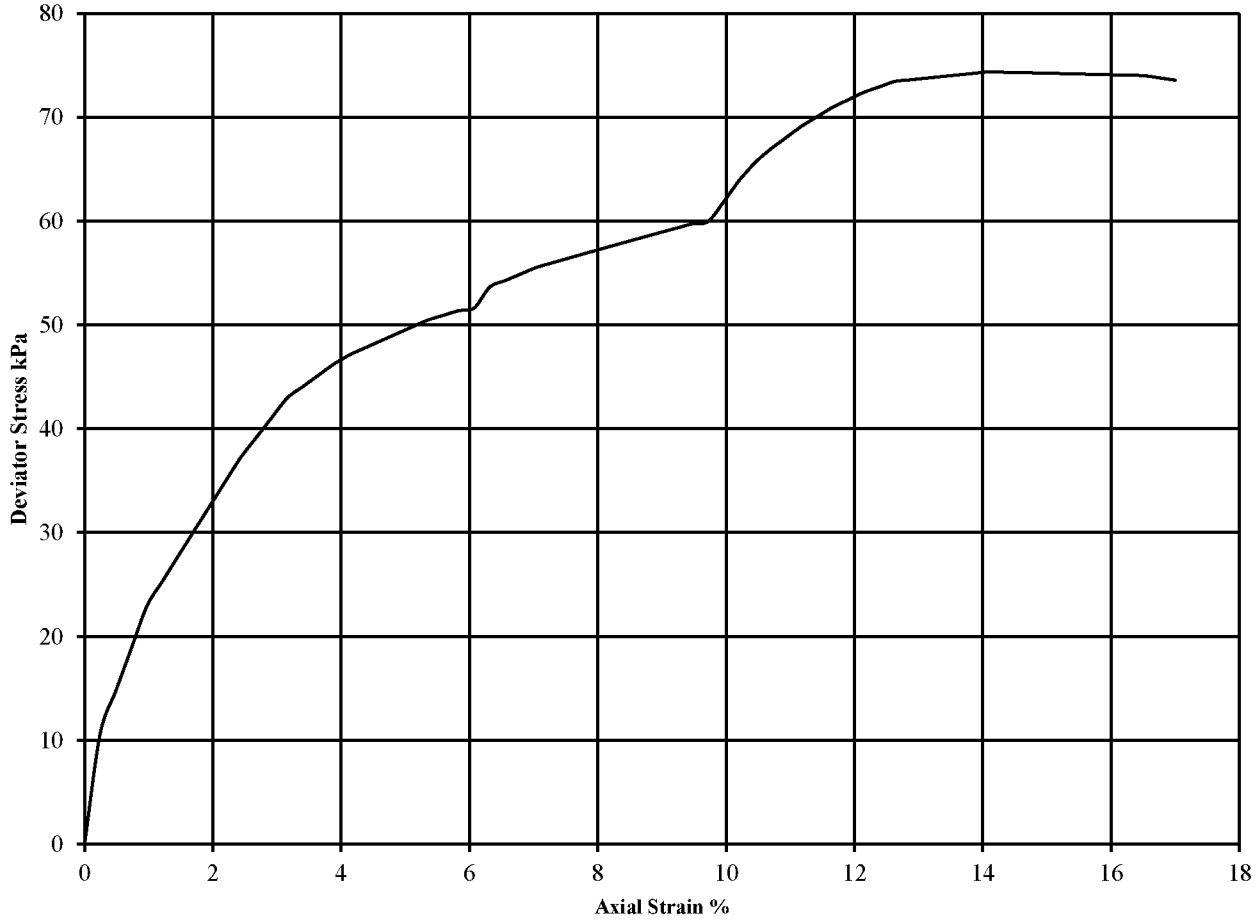
UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number:	**BH110**	**Top Depth (m):**	**1.20**
Sample Number:		**Base Depth (m):**	**1.65**
Sample Type	**U**		



Diameter (mm):		102	Height (mm):		210	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.35
1	36	1.79	1.32	17	52	26	6.1		See summary of soil descriptions
				35	60	30	9.7		
				70	74	37	14.1	Plastic	

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 08/01/16	**Contract No:**	
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				C4872	

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH110		D	7.10		27	26	1.59			

UKAS TESTING 4043

PSL Professional Soils Laboratory

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PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

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Unit A2 Innsworth Technology Park.
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For the attention of: Chris Scrivens

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M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
[redacted] (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH111		B	1.00		Brown slightly sandy CLAY.
BH111		D	2.50		Grey mottled brown slightly sandy CLAY.
BH111		D	5.50		Grey slightly gravelly slightly sandy CLAY.
BH111		D	7.00		CHALK.
BH111		D	10.00		CHALK.
BH111		D	11.50		CHALK.

UKAS TESTING 4043

PSL Professional Soils Laboratory

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				Client Ref:
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SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH111		B	1.00		45			59	25	34	100	High plasticity CH.
BH111		D	2.50		50			67	29	38	100	High plasticity CH.
BH111		D	5.50		47			61	26	35	93	High plasticity CH.

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

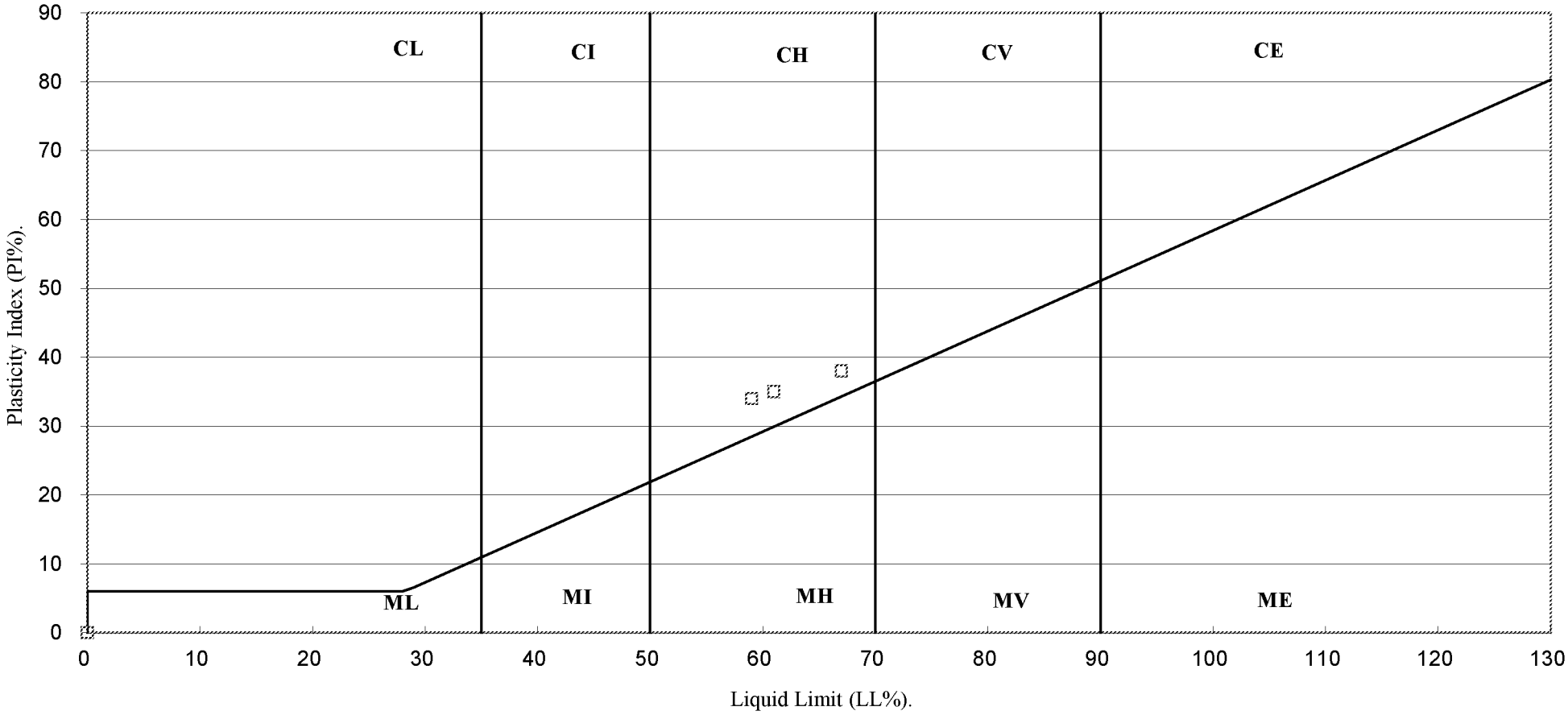
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

SUMMARY OF CHALK TESTS

(BS1377 : PART 2/4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH111		D	7.00		27	26	1.57			
BH111		D	10.00		26	26	1.58			
BH111		D	11.50		24	23	1.68			

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF POINT LOAD TEST RESULTS

ISRM Suggested Methods : 2007

Borehole Number	Depth (m)	Sample Ref	Test Type	Orientation	Dimensions (mm)		Area	D_e^2	D_e	Failure Load (P)		I_s	Corr Fac	I_{s50}	Failure Type	Remarks
				Par / Perp	W	D	(mm2)		(mm)	(Mpa)	(kN)	(MPa)	F	(MPa)		
BH111	11.50		I	Par	49	48	2304	2994.66	54.72	0.390	0.52	0.174	1.041	**0.18**	Valid	

Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

UKAS TESTING 4043	PSL Professional Soils Laboratory	**Checked / Approved** [redacted]	**Date** 06/01/16	**Contract No:**
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				Client Ref:
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PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

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Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP101		B	1.30		Brown gravelly slightly sandy CLAY.
TP101		D	1.30		Brown gravelly slightly sandy CLAY.
TP101		B	3.00		Reddish brown mottled grey CLAY.
TP101		D	3.00		Reddish brown mottled grey CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

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SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP101		D	1.30		24			53	24	29	80	High plasticity CH.
TP101		D	3.00		28			68	28	40	100	High plasticity CH.

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

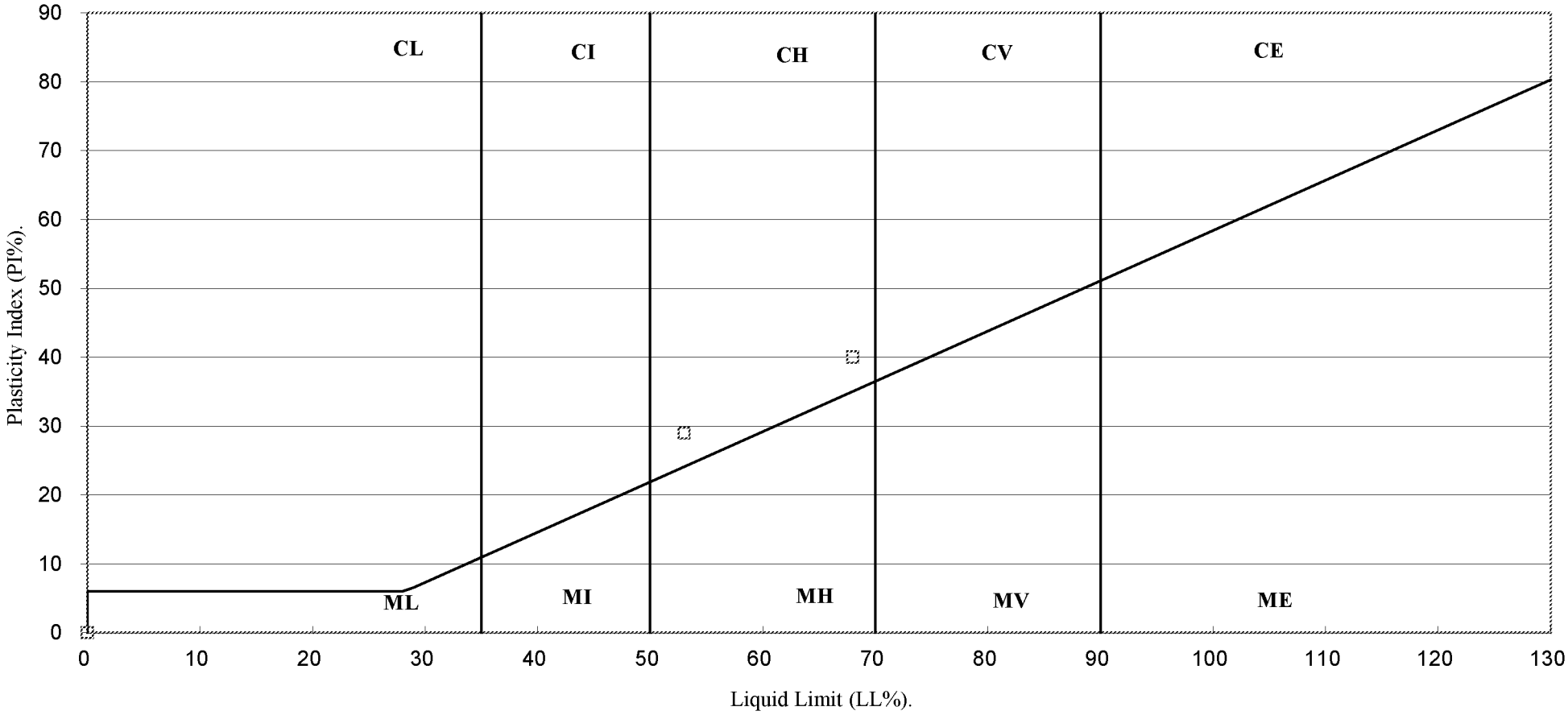
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

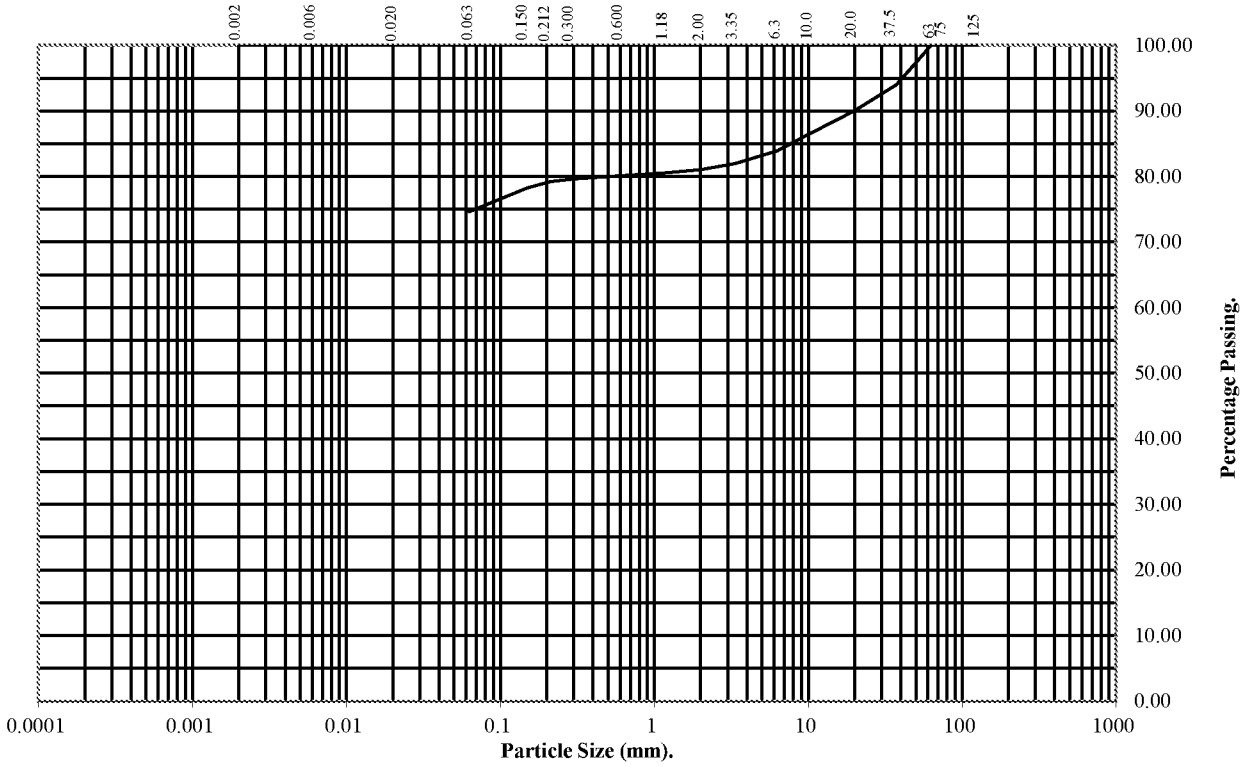
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP101 **Top Depth (m):** 1.30

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	94
20	90
10	86
6.3	84
3.35	82
2	81
1.18	81
0.6	80
0.3	80
0.212	79
0.15	78
0.063	75

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	6
Silt/Clay	75

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date	08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

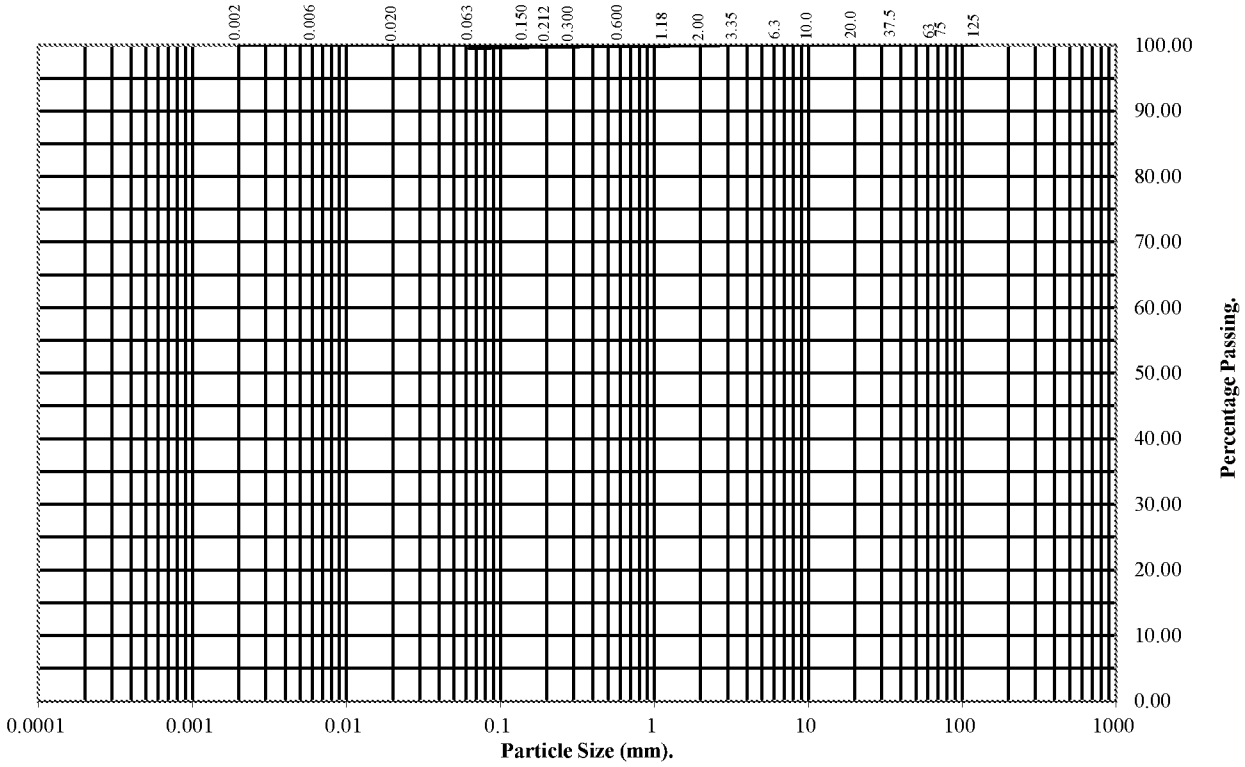
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP101 **Top Depth (m):** 3.00

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	0
Silt/Clay	100

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

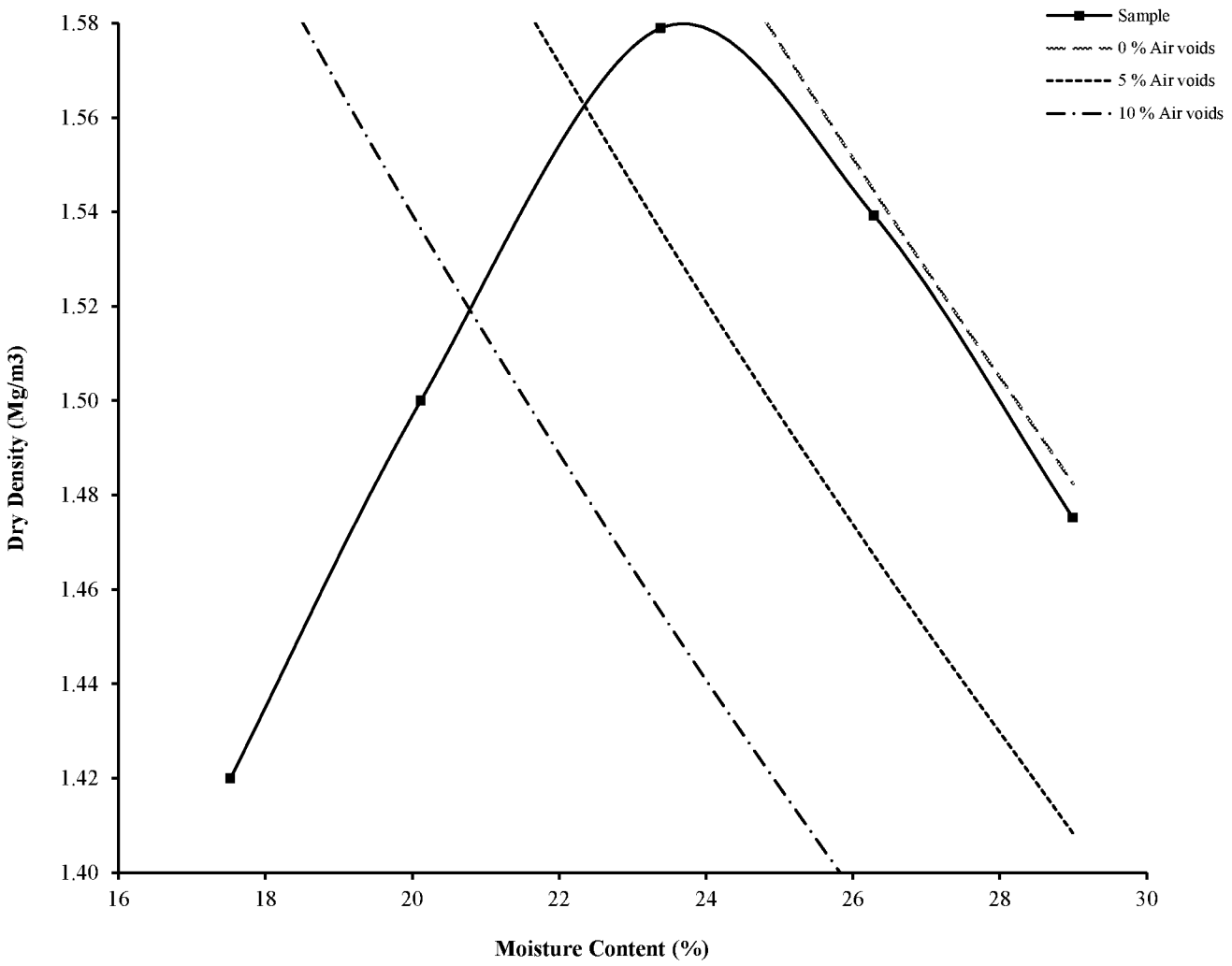
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP101 **Top Depth (m) :** 1.30

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

Sample Type: B



Initial Moisture Content:		26	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		6
Maximum Dry Density (Mg/m3):		1.58	Material Retained on 20.0 mm Test Sieve (%):		4
Optimum Moisture Content (%):		24			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

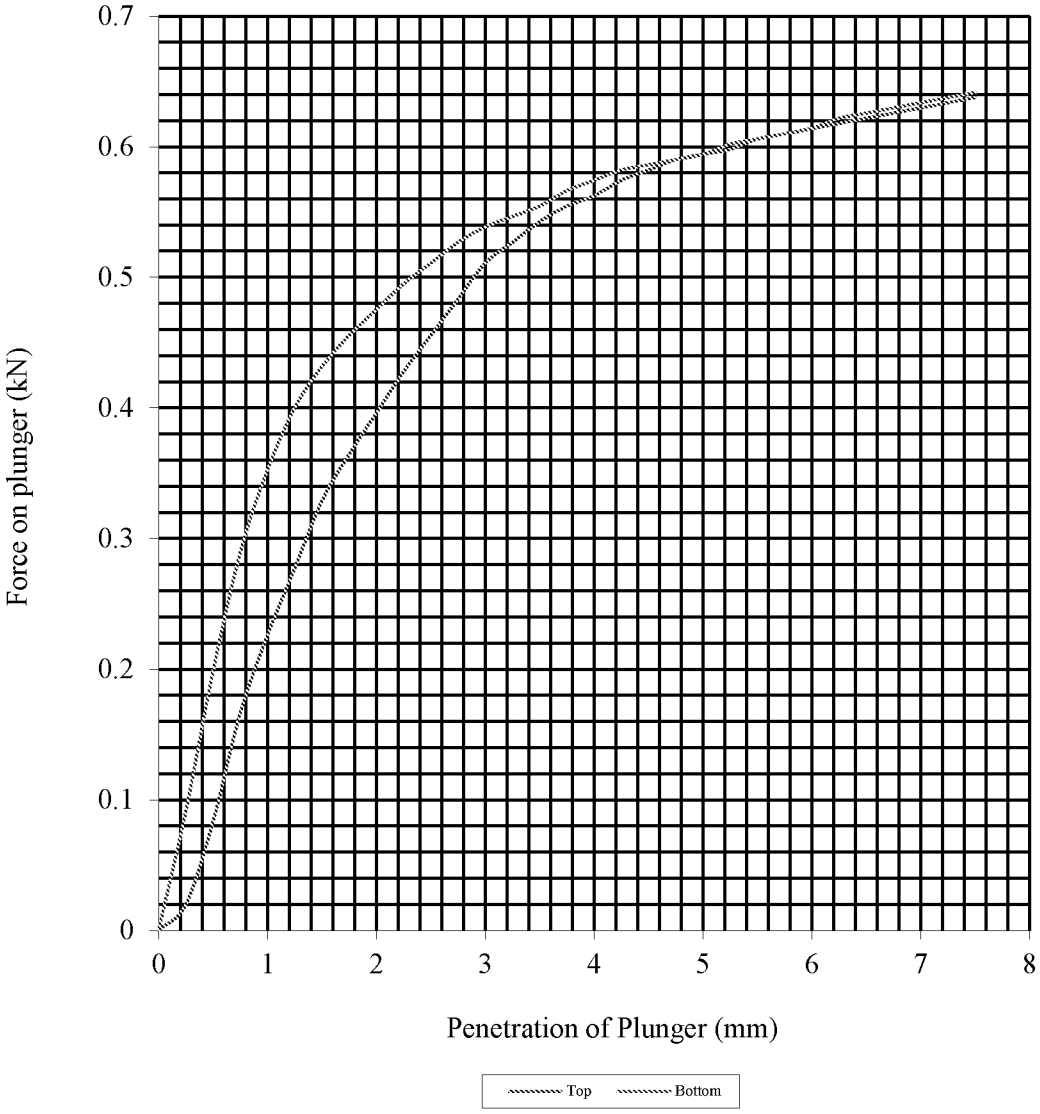
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP101 **Top Depth (m):** 1.30

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

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	26	Surcharge Kg:	4.20	Sample Top	26	Sample Top	3.5
Bulk Density Mg/m3:	1.93	Soaking Time hrs	0	Sample Bottom	26	Sample Bottom	3.9
Dry Density Mg/m3:	1.53	Swelling mm:	0	Remarks: See summary of soil descriptions.			
Percentage retained on 20mm BS test sieve:			10				
Compaction Conditions		2.5kg hammer					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)
[redacted]
D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP102		D	0.70		Brown mottled grey very gravelly very sandy CLAY.
TP102		B	1.70		Brown very sandy clayey GRAVEL with cobbles.
TP102		B	3.00		Brown slightly sandy CLAY.
TP102		D	3.50		Brown slightly gravelly slightly sandy CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP102		D	0.70		17			30	16	14	68	Intermediate plasticity CI.
TP102		D	3.50		30			58	25	33	91	High plasticity CH.

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

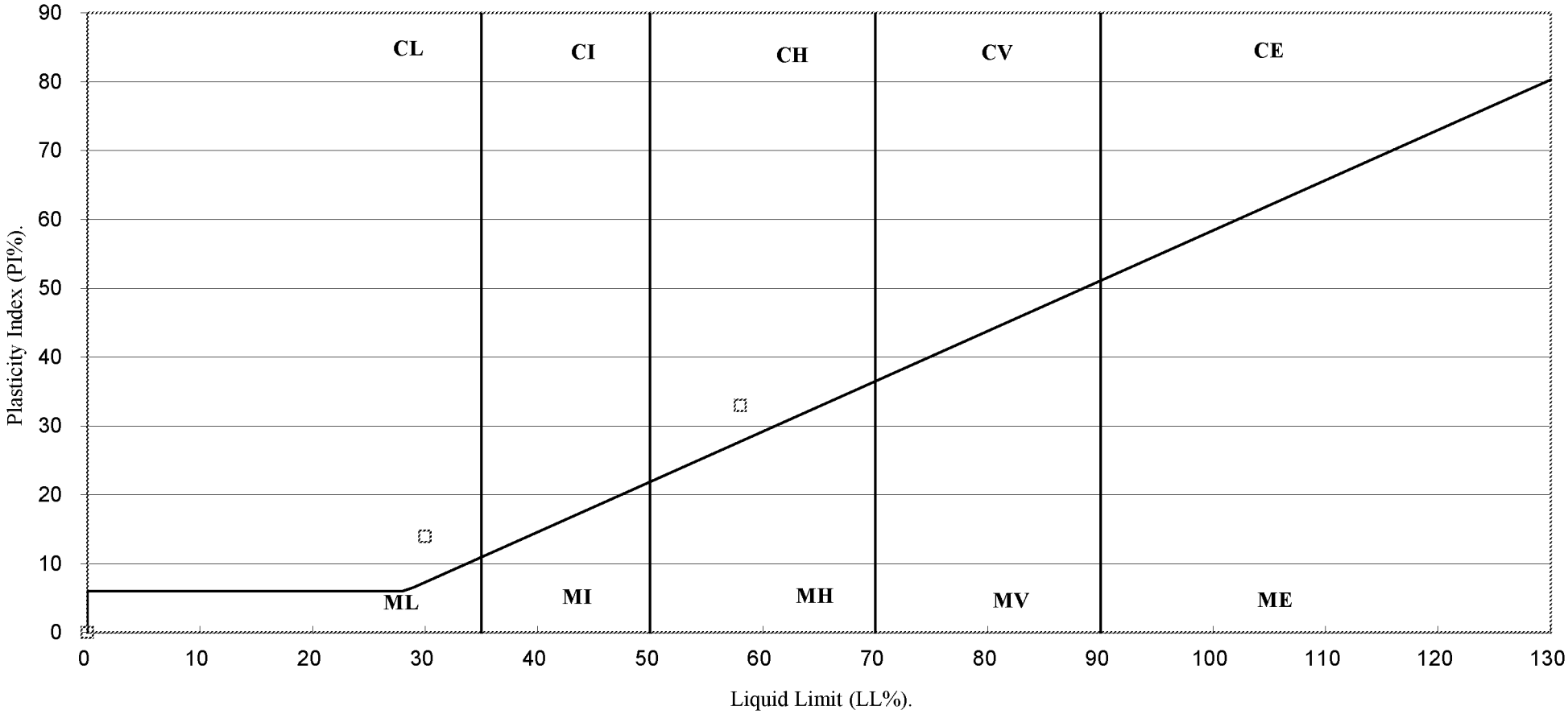
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043 — PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
	University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

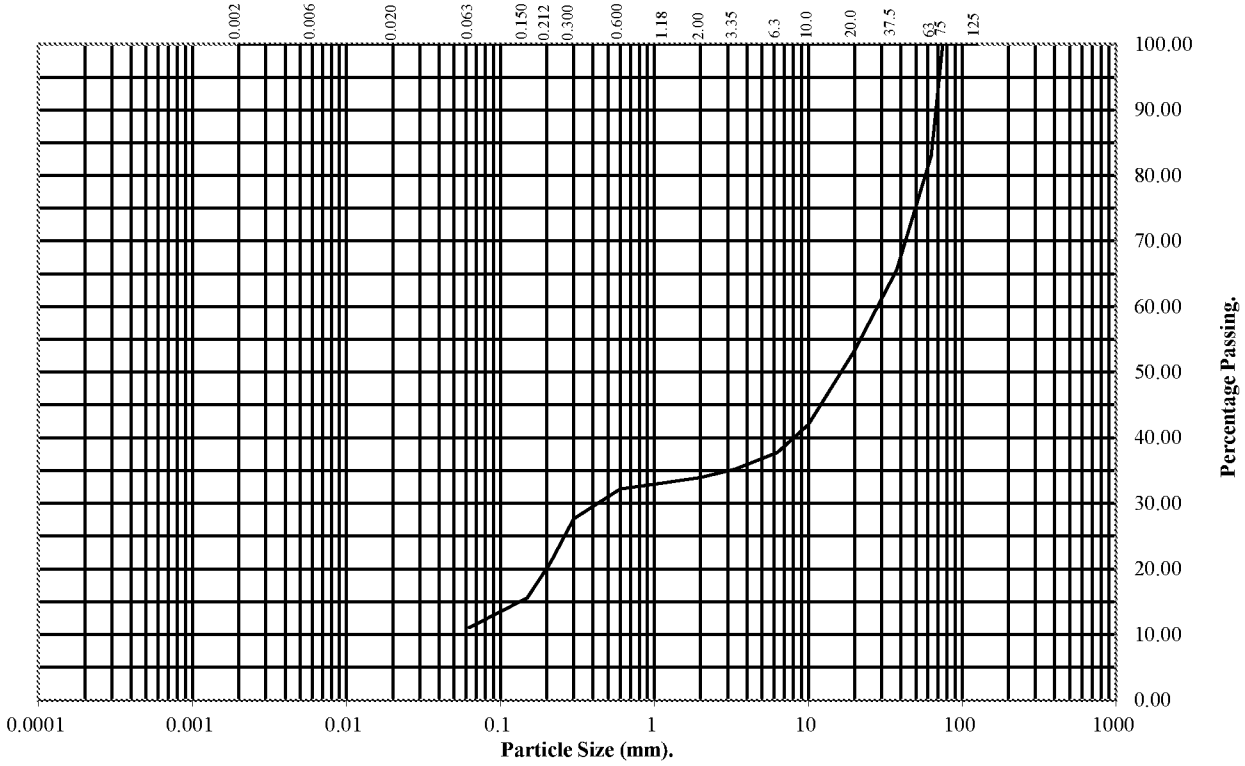
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP102 **Top Depth (m):** 1.70

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	83
37.5	66
20	53
10	42
6.3	38
3.35	35
2	34
1.18	33
0.6	32
0.3	28
0.212	21
0.15	16
0.063	11

Soil Fraction	Total Percentage
Cobbles	17
Gravel	49
Sand	23
Silt/Clay	11

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

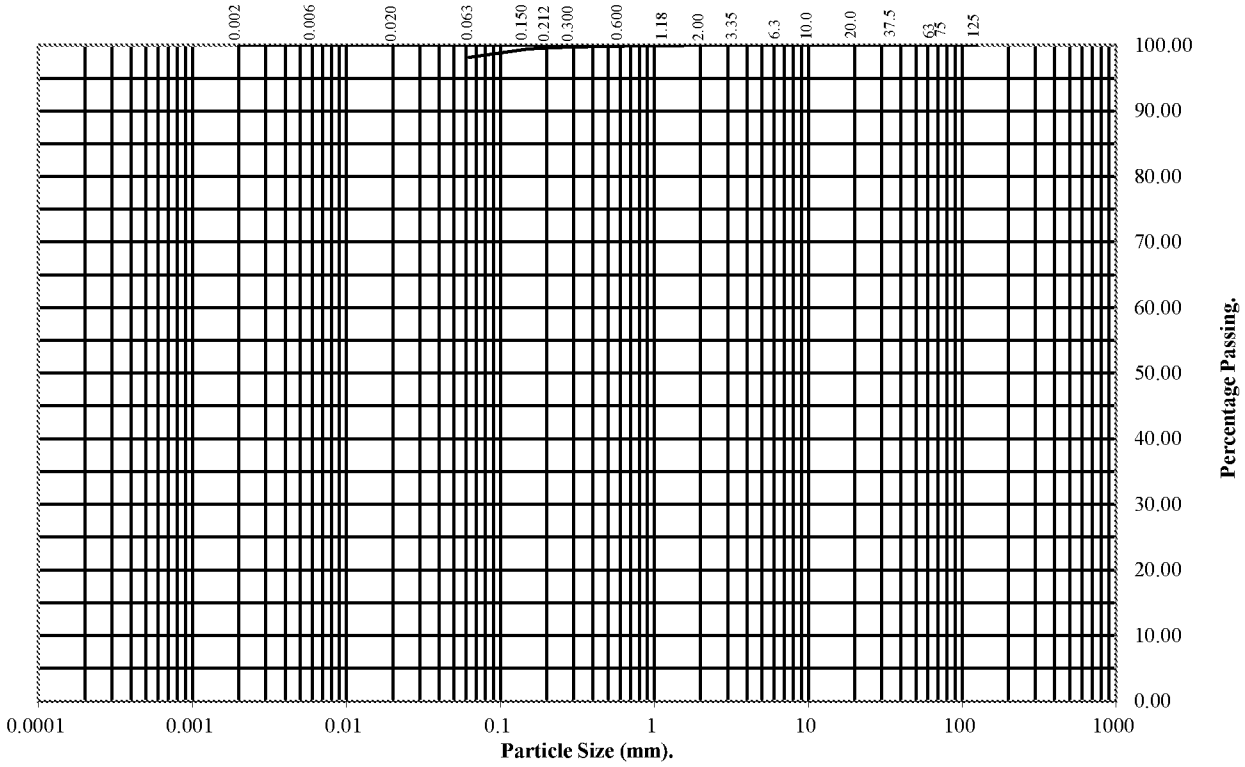
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP102 **Top Depth (m):** 3.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	100
0.15	99
0.063	98

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

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

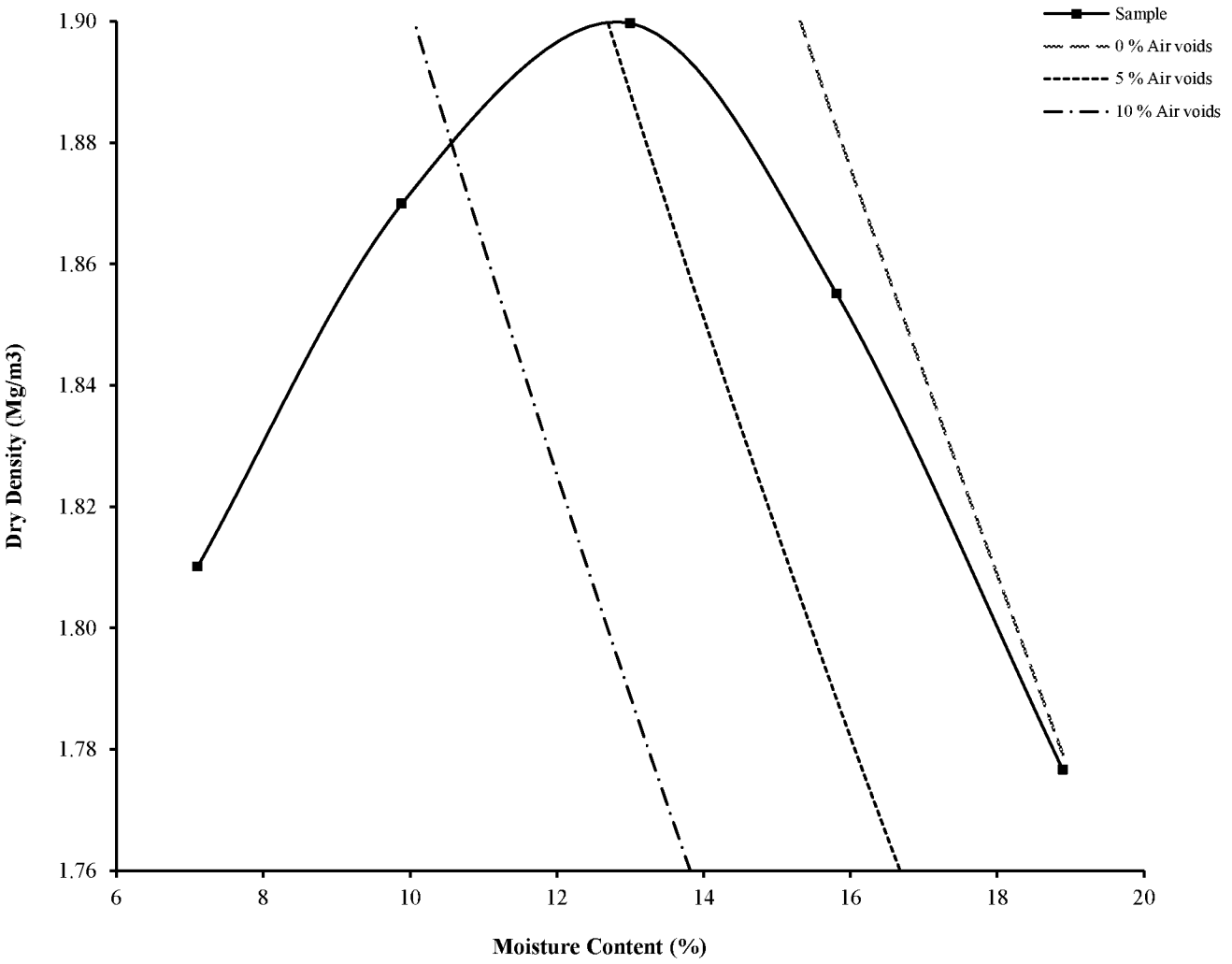
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP102 **Top Depth (m) :** 1.70

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

Sample Type: B



Initial Moisture Content:		16	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.68	Assumed	Material Retained on 37.5 mm Test Sieve (%):		34
Maximum Dry Density (Mg/m3):		1.90	Material Retained on 20.0 mm Test Sieve (%):		13
Optimum Moisture Content (%):		13			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16	University of Chichester - Bognor Regis Campus	Contract No. PSL15/5863
				Client Ref C4872

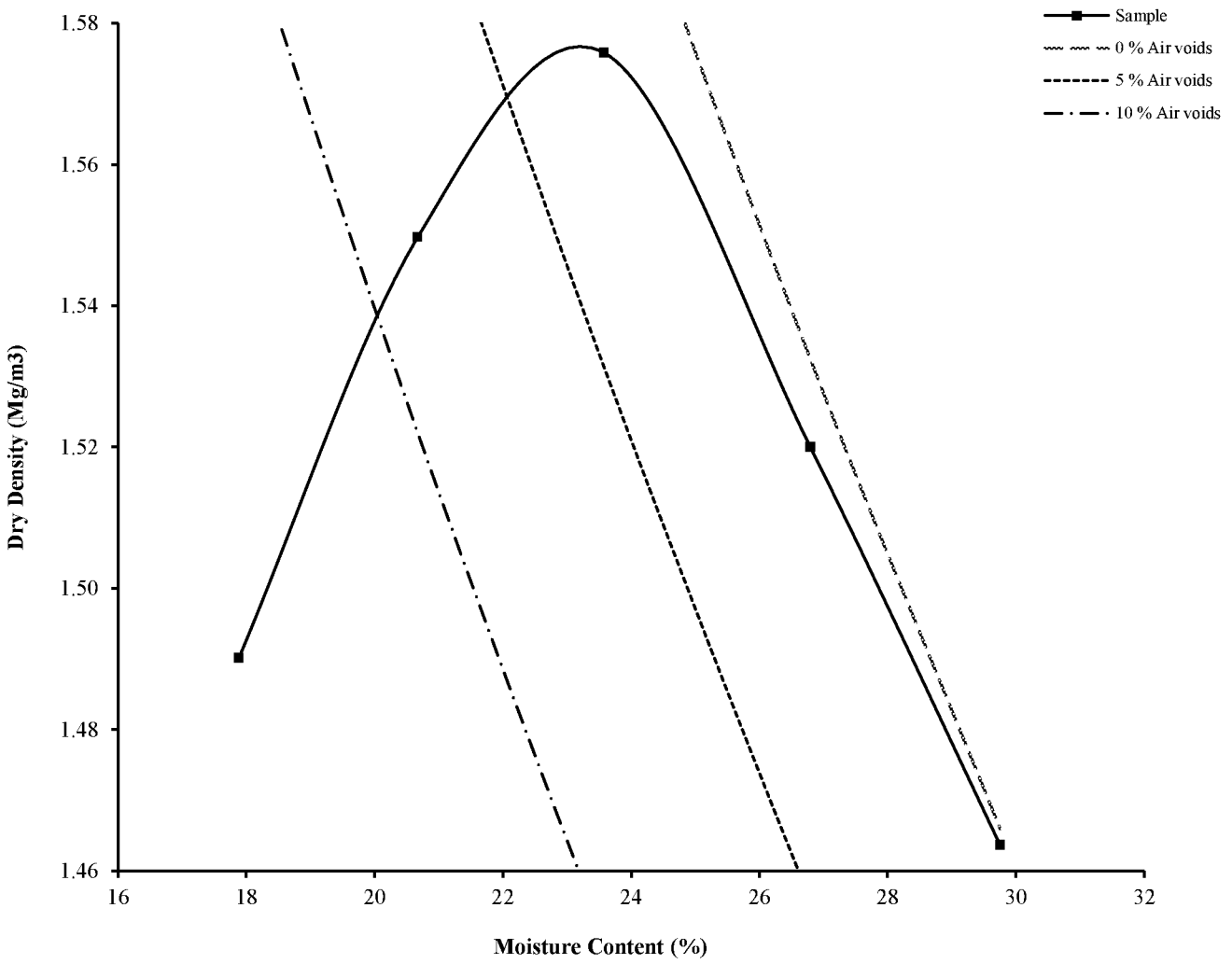
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP102 **Top Depth (m) :** 3.00

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

Sample Type: B



Initial Moisture Content:		30	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.58	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		23			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

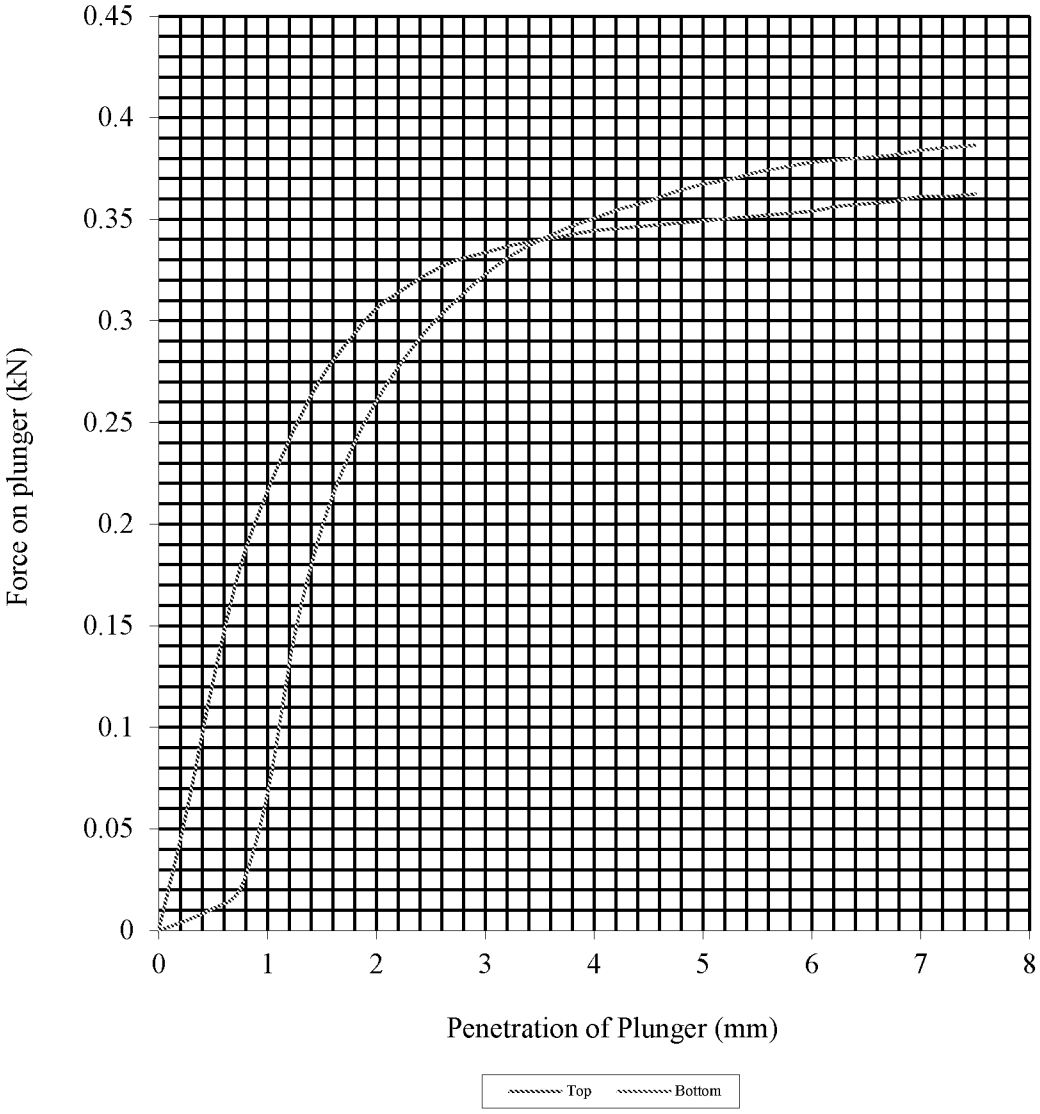
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP102 **Top Depth (m):** 3.00

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

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	30	Surcharge Kg:	4.20	Sample Top	30	Sample Top	2.5
Bulk Density Mg/m3:	1.90	Soaking Time hrs	0	Sample Bottom	30	Sample Bottom	2.3
Dry Density Mg/m3:	1.46	Swelling mm:	0	Remarks: See summary of soil descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg hammer					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)
[redacted]
D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP103		D	0.70		Brown slightly sandy CLAY.
TP103		D	1.50		Grey slightly sandy CLAY with some organic material.
TP103		B	2.00		Grey slightly sandy CLAY with some organic material.
TP103		B	3.00		Brown mottled grey slightly sandy CLAY.
TP103		D	3.00		Brown mottled grey slightly sandy CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP103		D	0.70		25			58	25	33	100	High plasticity CH.
TP103		D	1.50		61			75	31	44	100	Very high plasticity CV.
TP103		D	3.00		45			62	26	36	100	High plasticity CH.

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

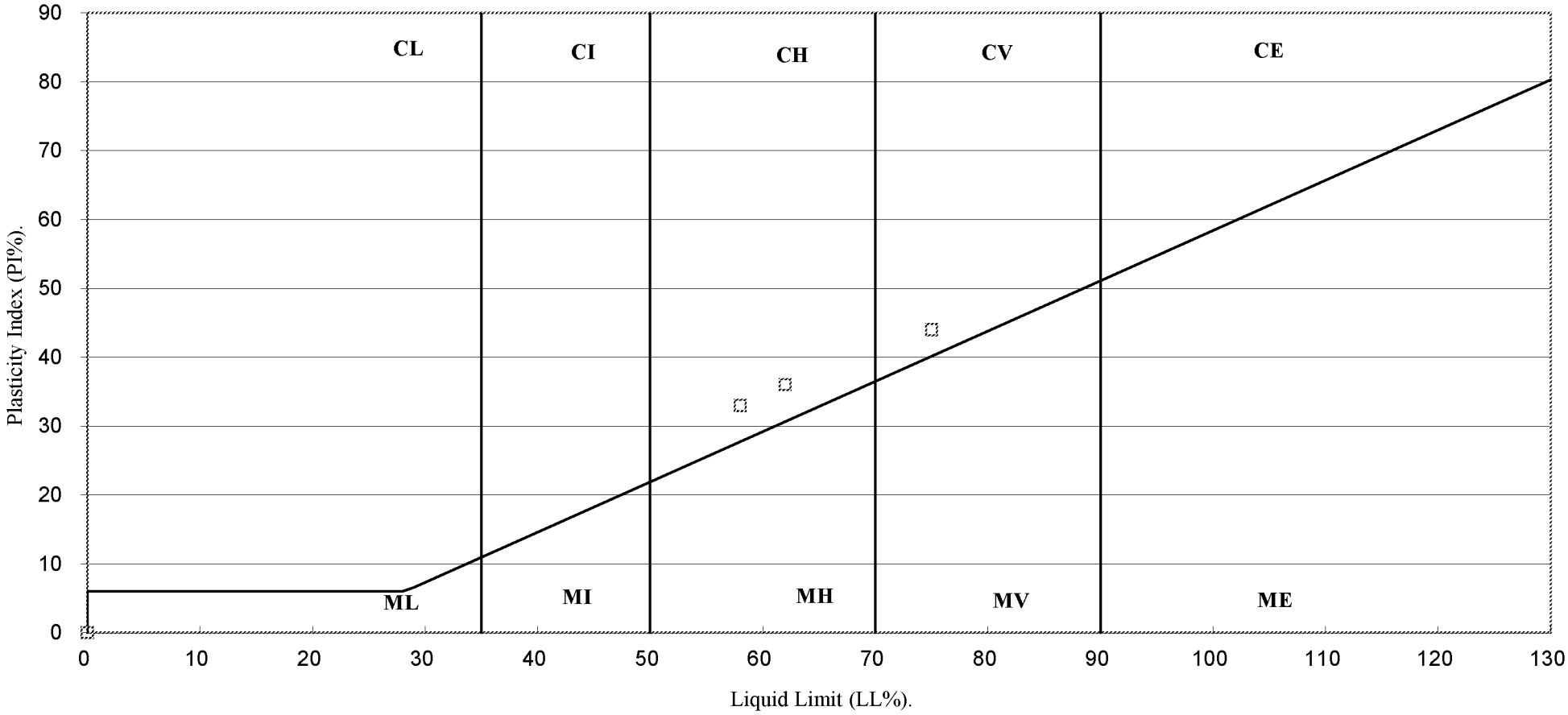
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16
		University of Chichester - Bognor Regis Campus		Contract No: PSL15/5863
				Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

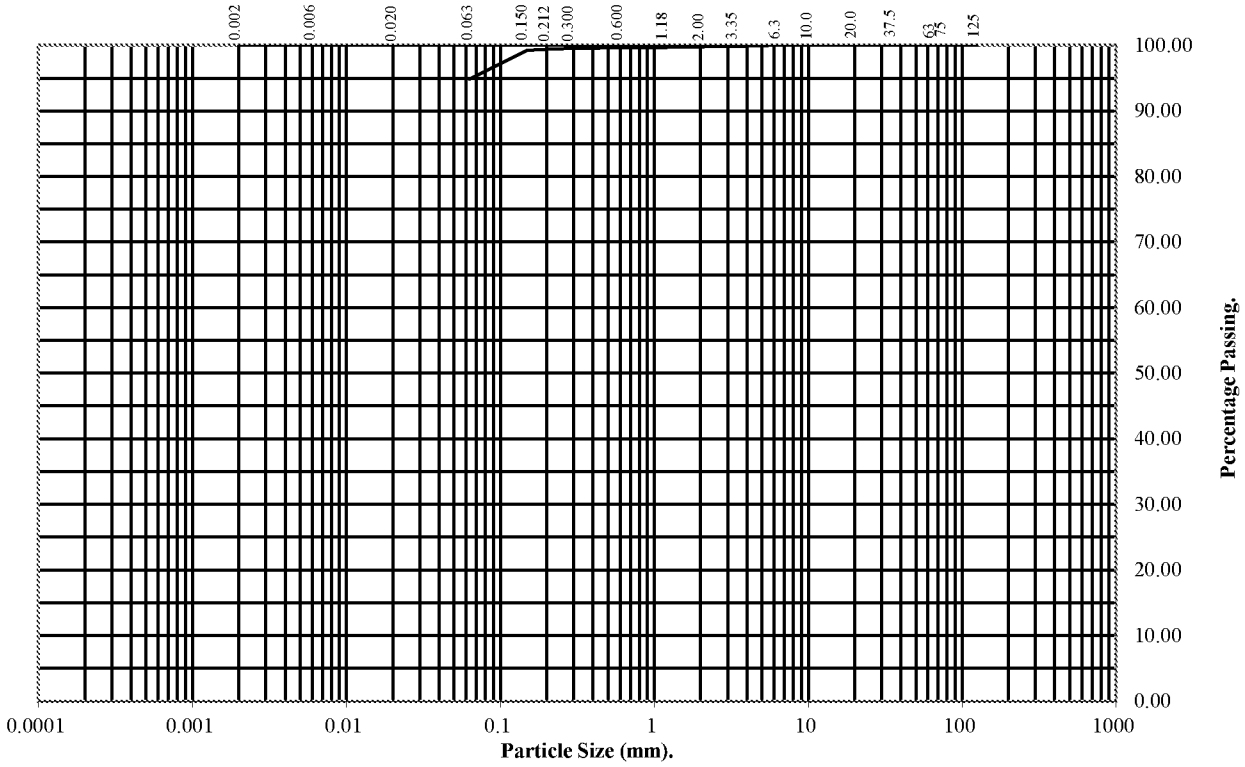
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP103 **Top Depth (m):** 3.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	99
0.15	99
0.063	95

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

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

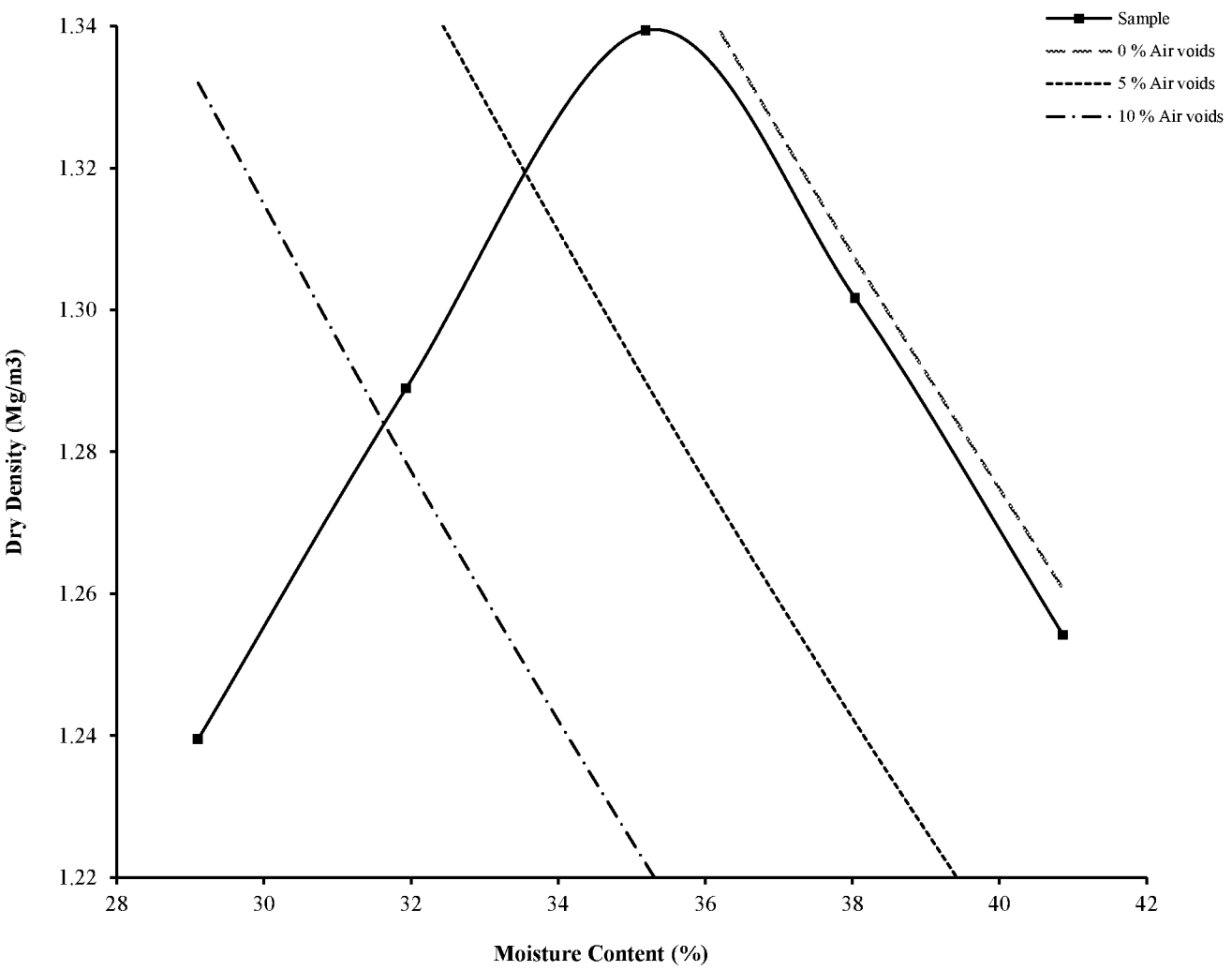
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP103 **Top Depth (m) :** 2.00

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

Sample Type: B



Initial Moisture Content:		66	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.6	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.34	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		35			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

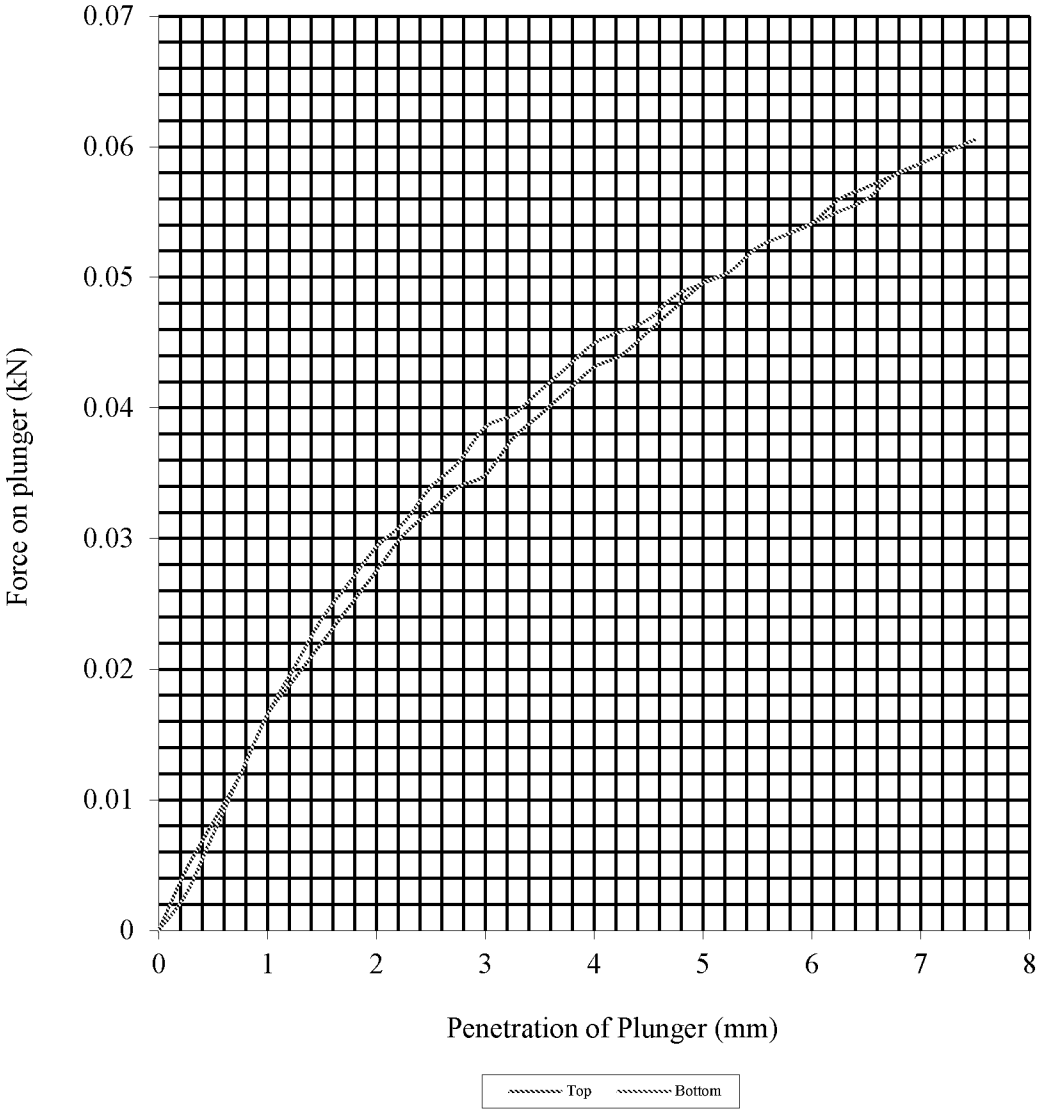
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP103 **Top Depth (m):** 2.00

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

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	66	Surcharge Kg:	4.20	Sample Top	66	Sample Top	0.2
Bulk Density Mg/m3:	1.54	Soaking Time hrs	0	Sample Bottom	66	Sample Bottom	0.3
Dry Density Mg/m3:	0.93	Swelling mm:	0	Remarks: See summary of soil descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg hammer					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)
D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP104		D	0.50		Brown slightly gravelly slightly sandy CLAY.
TP104		B	1.00		Brown slightly sandy CLAY.
TP104		B	1.50		Brown slightly gravelly slightly sandy CLAY.
TP104		D	1.50		Brown slightly gravelly slightly sandy CLAY.
TP104		B	3.00		Grey slightly sandy very silty CLAY with some organic material.
TP104		D	3.00		Grey slightly sandy very silty CLAY with some organic material.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m3 Clause 7.2	Dry Density Mg/m3 Clause 7.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP104		D	0.50		31			63	26	37	98	High plasticity CH.
TP104		B	1.50		43	1.78	1.25					
TP104		D	1.50		41			61	25	36	97	High plasticity CH.
TP104		D	3.00		65			84	34	50	100	Very high plasticity CV.

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

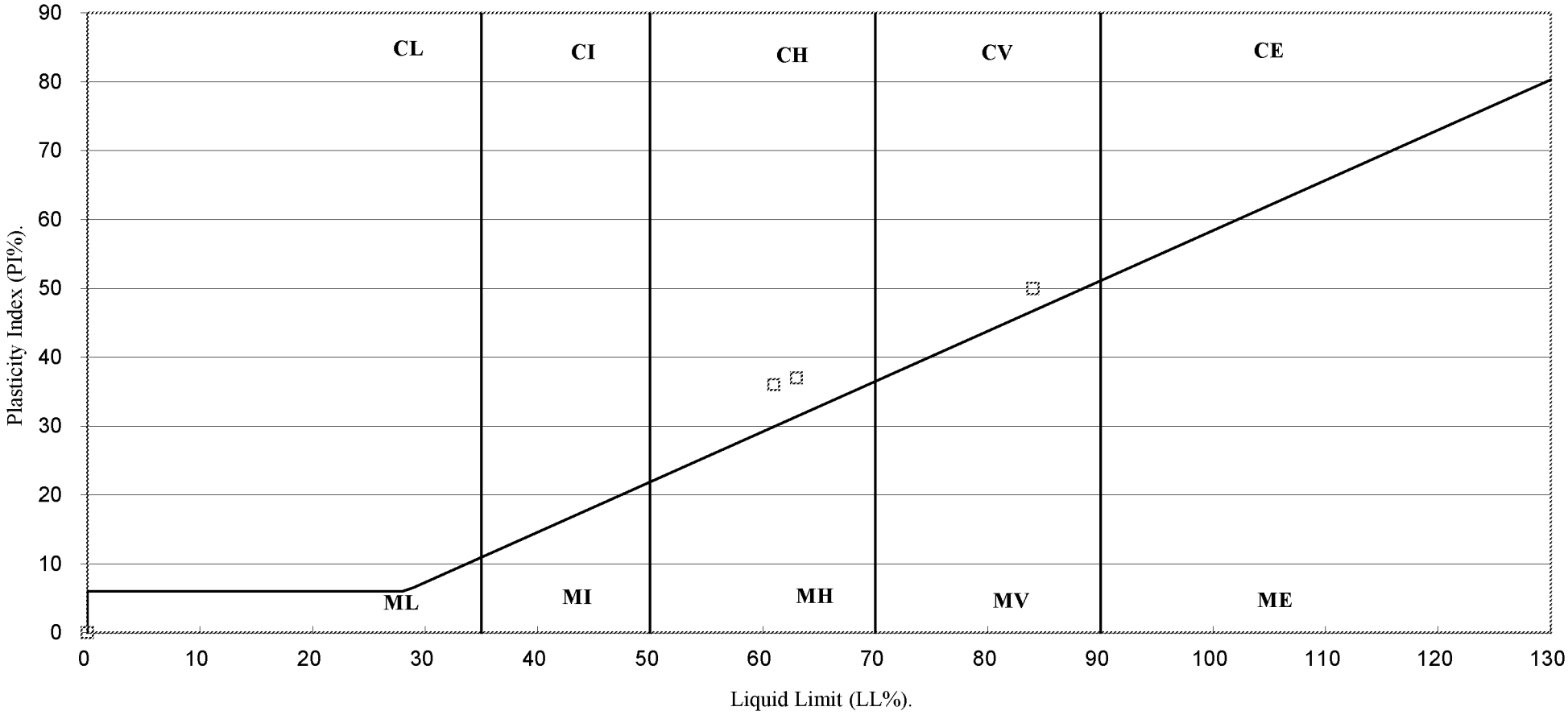
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No:
		University of Chichester - Bognor Regis Campus			PSL15/5863
					Client Ref:
					C4872

PARTICLE SIZE DISTRIBUTION TEST

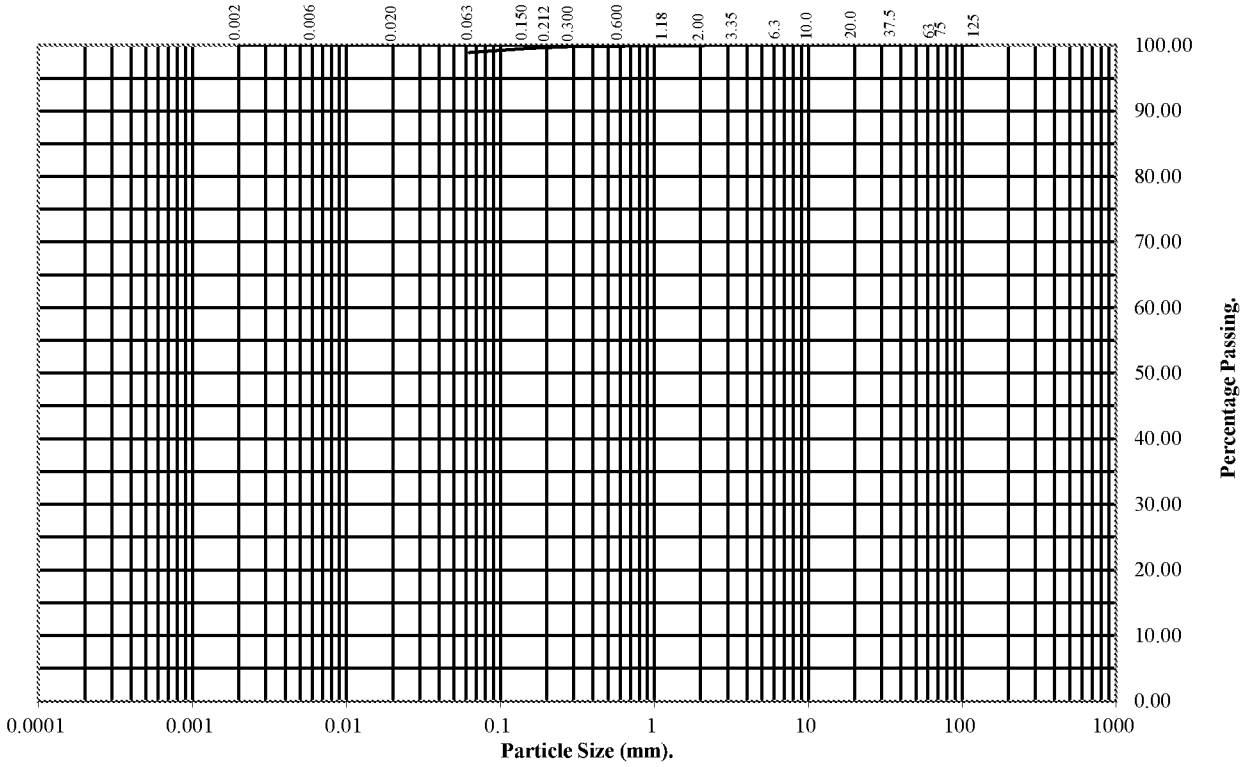
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP104 **Top Depth (m):** 1.00

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt/Clay	99

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

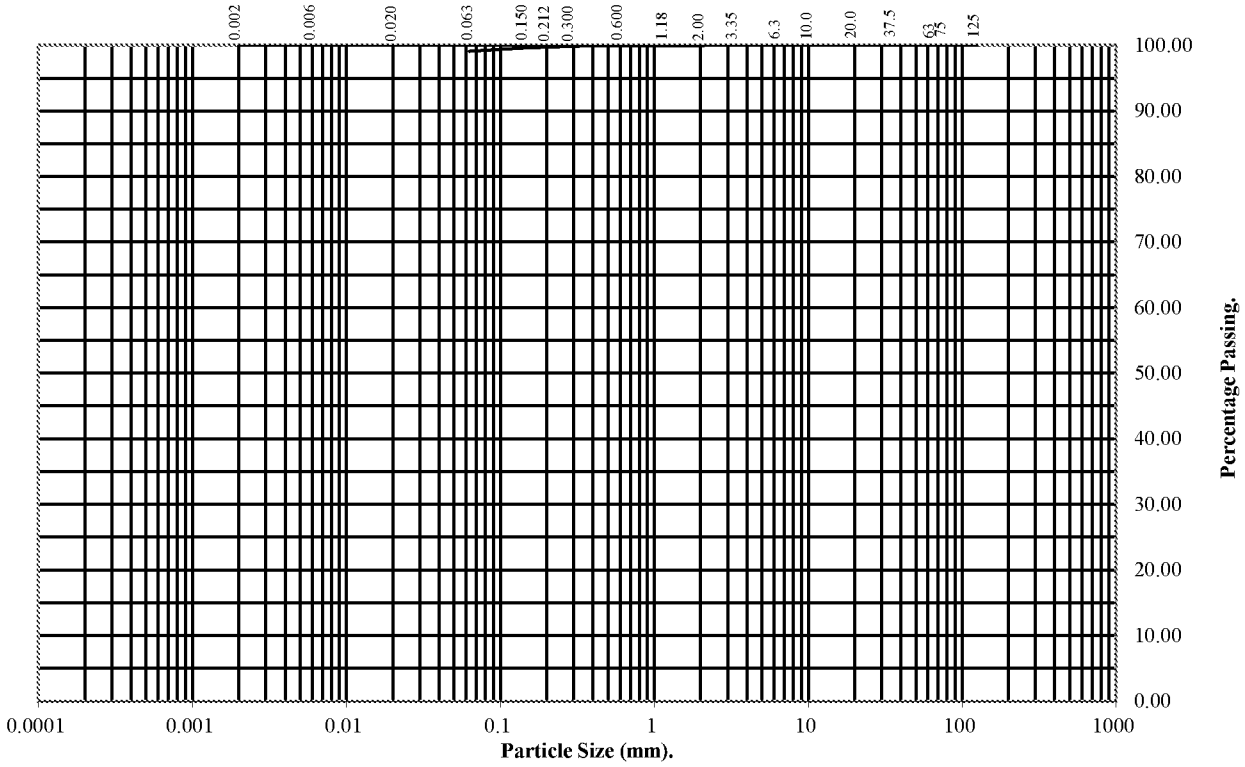
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP104 **Top Depth (m):** 3.00

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt/Clay	99

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

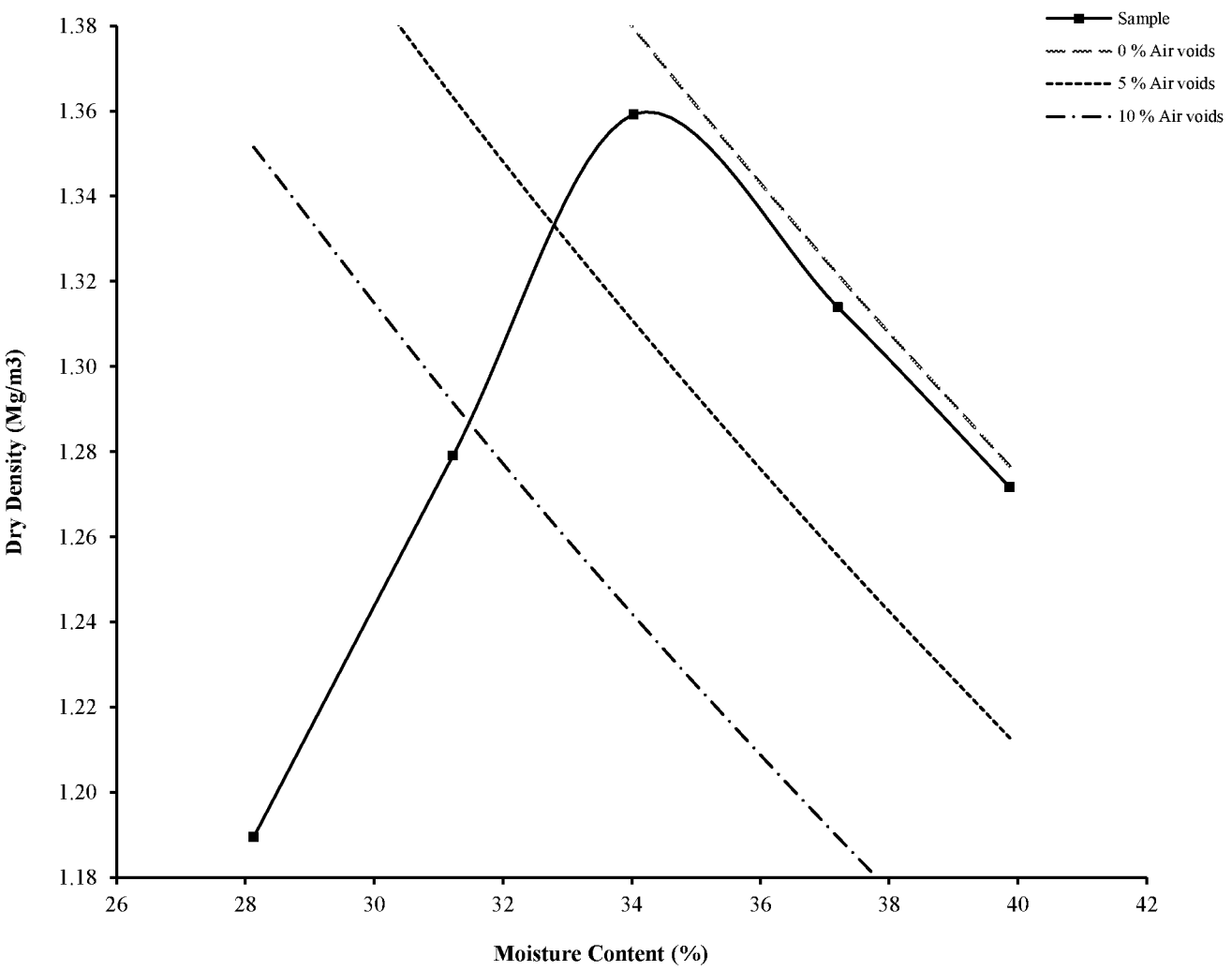
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP104 **Top Depth (m) :** 3.00

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

Sample Type: B



Initial Moisture Content:		68	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.36	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		34			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
Date Completed: 8/1/2016

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP105		D	0.50		Brown slightly gravelly slightly sandy CLAY.
TP105		B	1.50		Brown slightly sandy CLAY.
TP105		D	1.50		Brown slightly sandy CLAY.
TP105		D	2.50		Brown CLAY.
TP105		D	3.50		Grey slightly sandy very silty CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approve [redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus			PSL15/5863
			Client Ref:
			C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m^3 Clause 7.2	Dry Density Mg/m^3 Clause 7.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP105		D	0.50		43			68	28	40	93	High plasticity CH.
TP105		D	1.50		44	1.71	1.19					
TP105		D	2.50		50			70	29	41	100	Very high plasticity CV.
TP105		D	3.50		52			64	28	36	100	High plasticity CH.

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

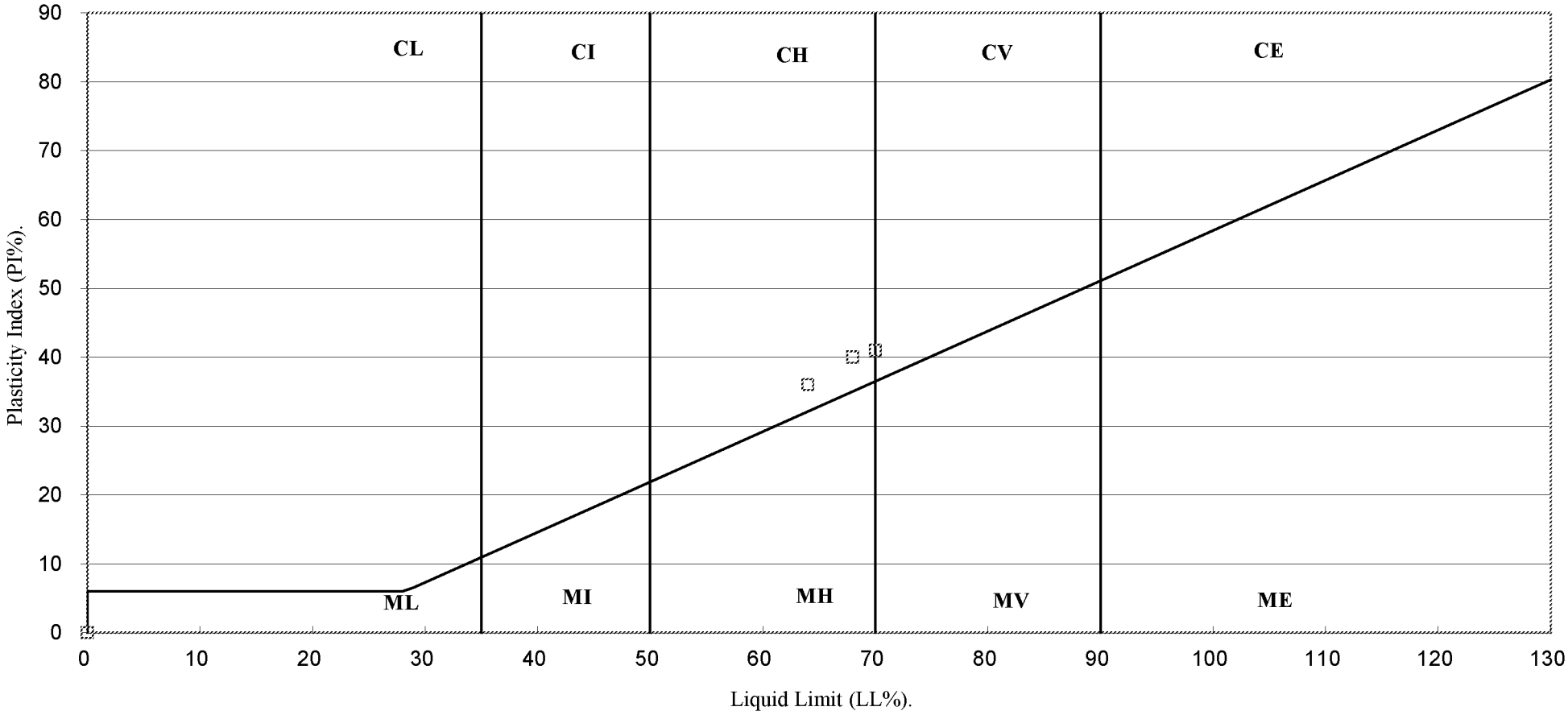
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approve [redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus			PSL15/5863
			Client Ref:
			C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

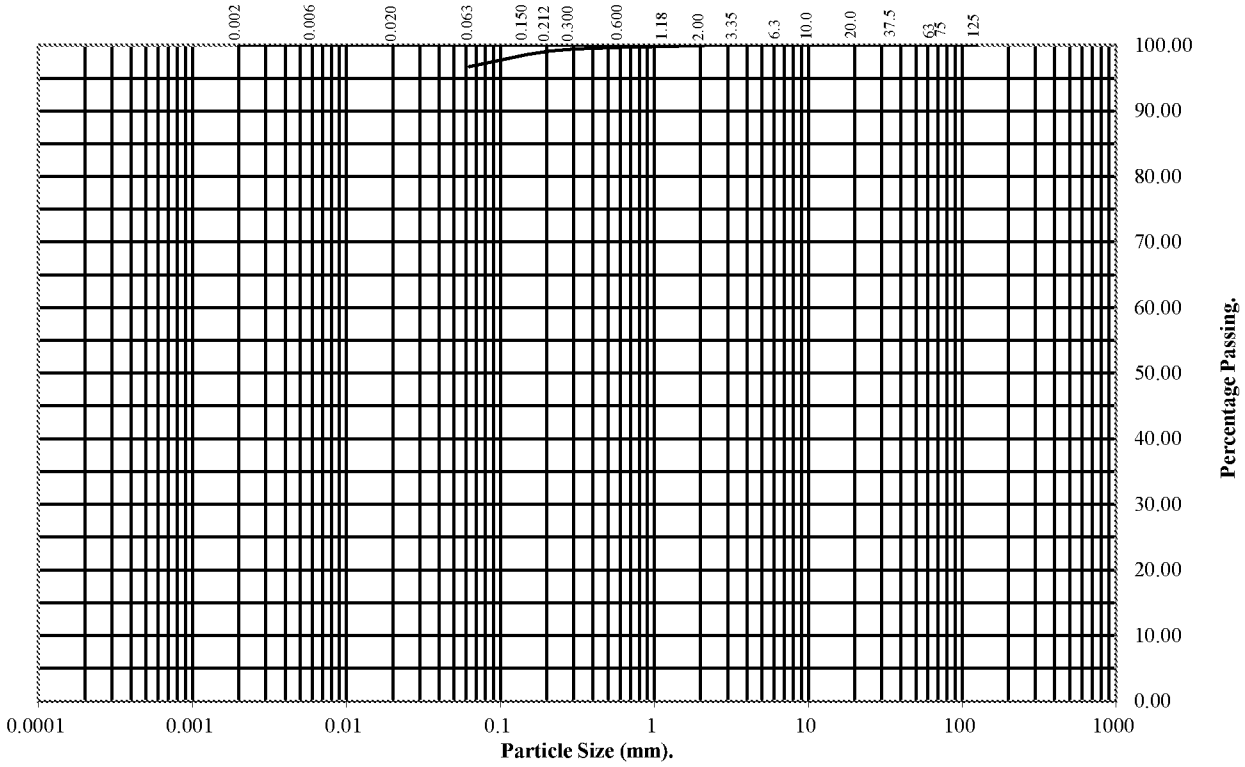
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP105 **Top Depth (m):** 1.50

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	99
0.212	99
0.15	99
0.063	97

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

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date	08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

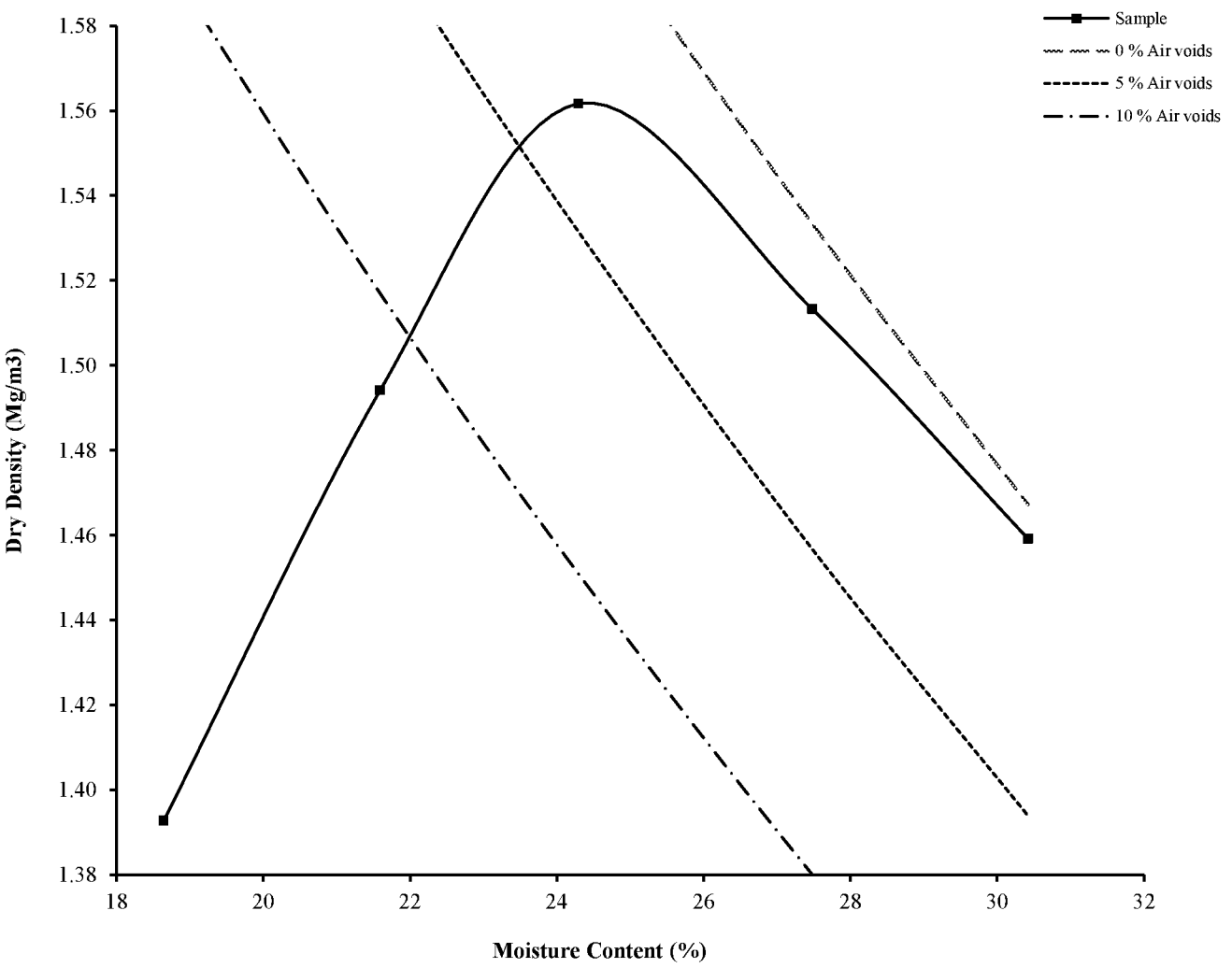
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP105 **Top Depth (m) :** 1.50

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

Sample Type: B



Initial Moisture Content:		44	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.56	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		24			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

Client Name: CC Ground Investigations Ltd
Unit A2 Innsworth Technology Park.
Innsworth Lane
Gloucester
GL3 1DL

For the attention of: Chris Scrivens

Contract Title: University of Chichester - Bognor Regis Campus

Date Received: 3/12/2015
Date Commenced: 3/12/2015
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Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson (Director)
A Watkins (Director)
M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
[redacted]

ARUN DISTRICT COUNCIL BR/72/22/PL

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP106		B	1.00		Brown slightly gravelly slightly sandy CLAY.
TP106		D	1.00		Brown slightly gravelly slightly sandy CLAY.
TP106		B	2.00		Brown slightly sandy CLAY.
TP106		D	2.00		Brown slightly sandy CLAY.
TP106		B	3.50		Brown mottled grey sandy very silty CLAY.
TP106		D	3.50		Brown mottled grey sandy very silty CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m^3 Clause 7.2	Dry Density Mg/m^3 Clause 7.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP106		D	1.00		37			62	26	36	98	High plasticity CH.
TP106		B	2.00		40	1.76	1.27					
TP106		D	2.00		38			53	24	29	100	High plasticity CH.
TP106		D	3.50		40			48	24	24	100	Intermediate plasticity CI.

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

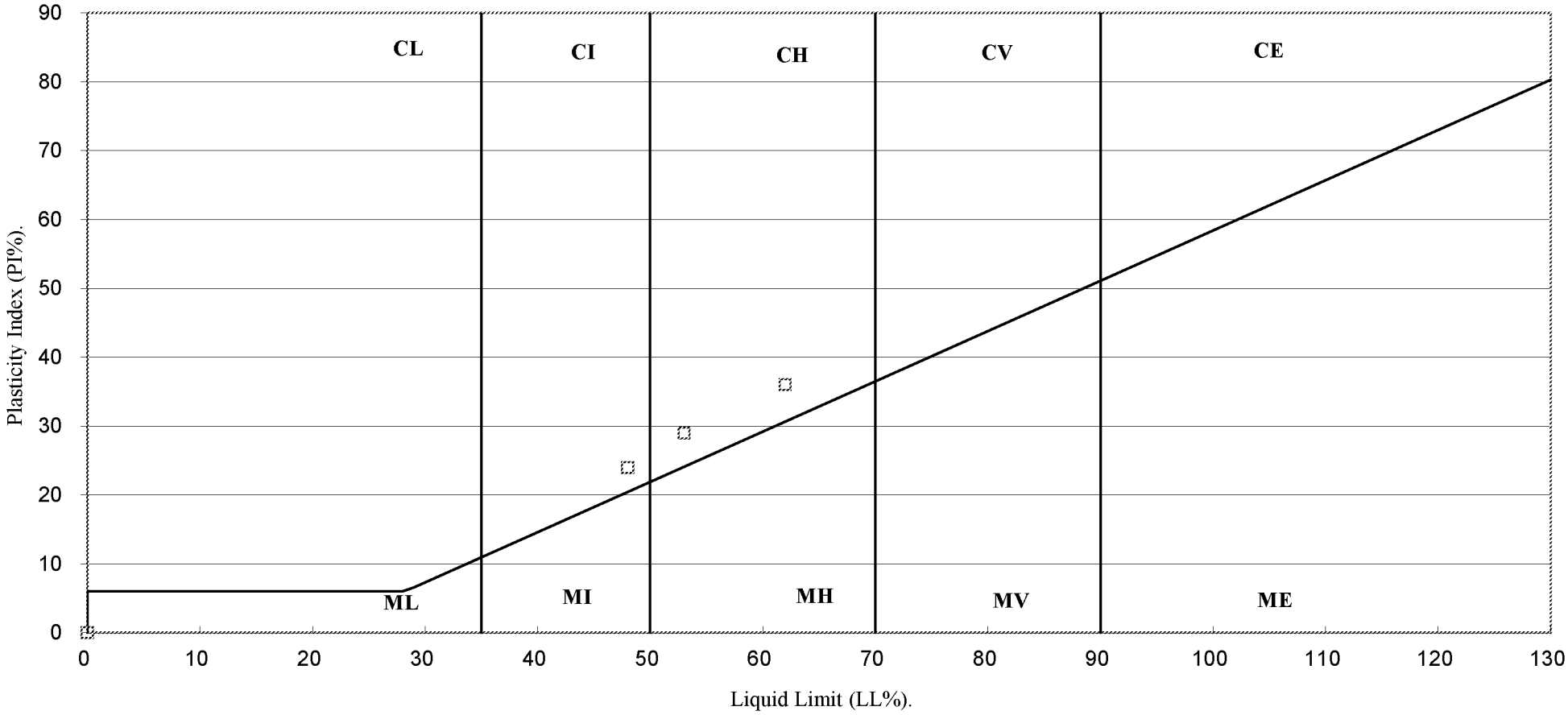
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043 — PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No: PSL15/5863
	University of Chichester - Bognor Regis Campus			Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

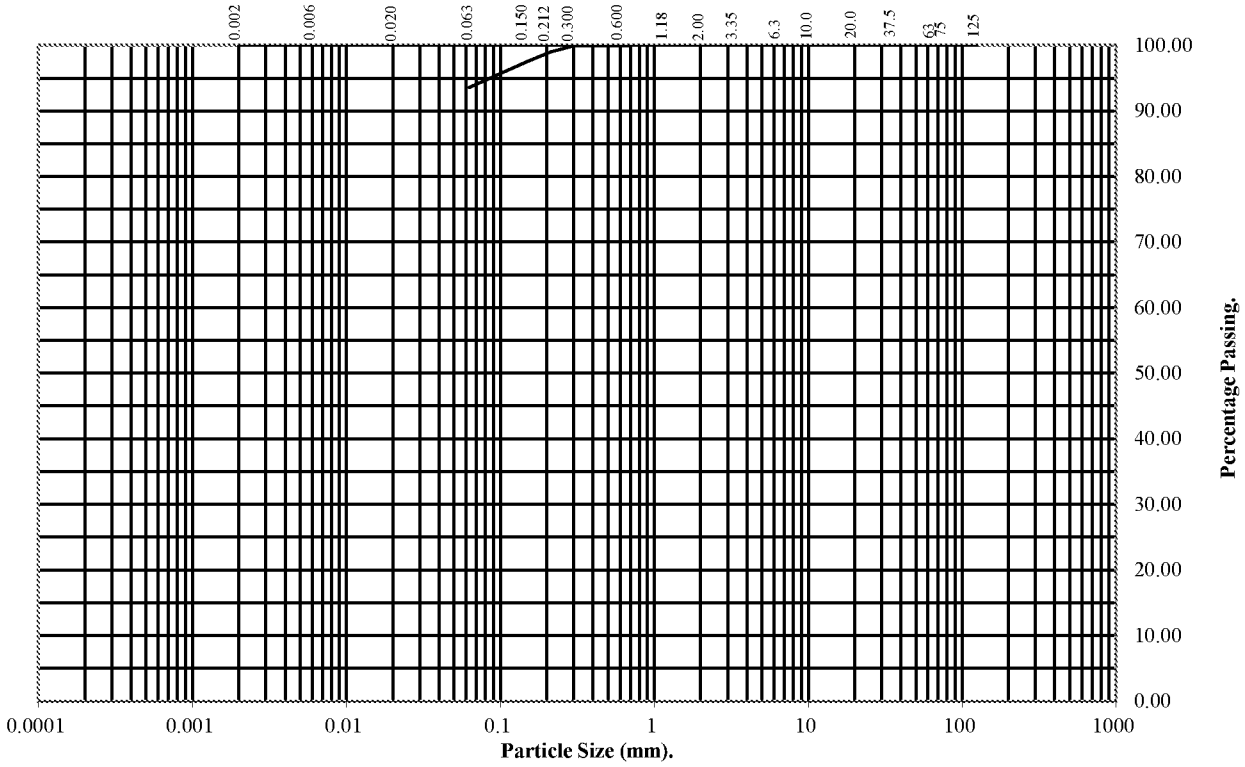
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP106 **Top Depth (m):** 2.00

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	99
0.15	98
0.063	94

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	6
Silt/Clay	94

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

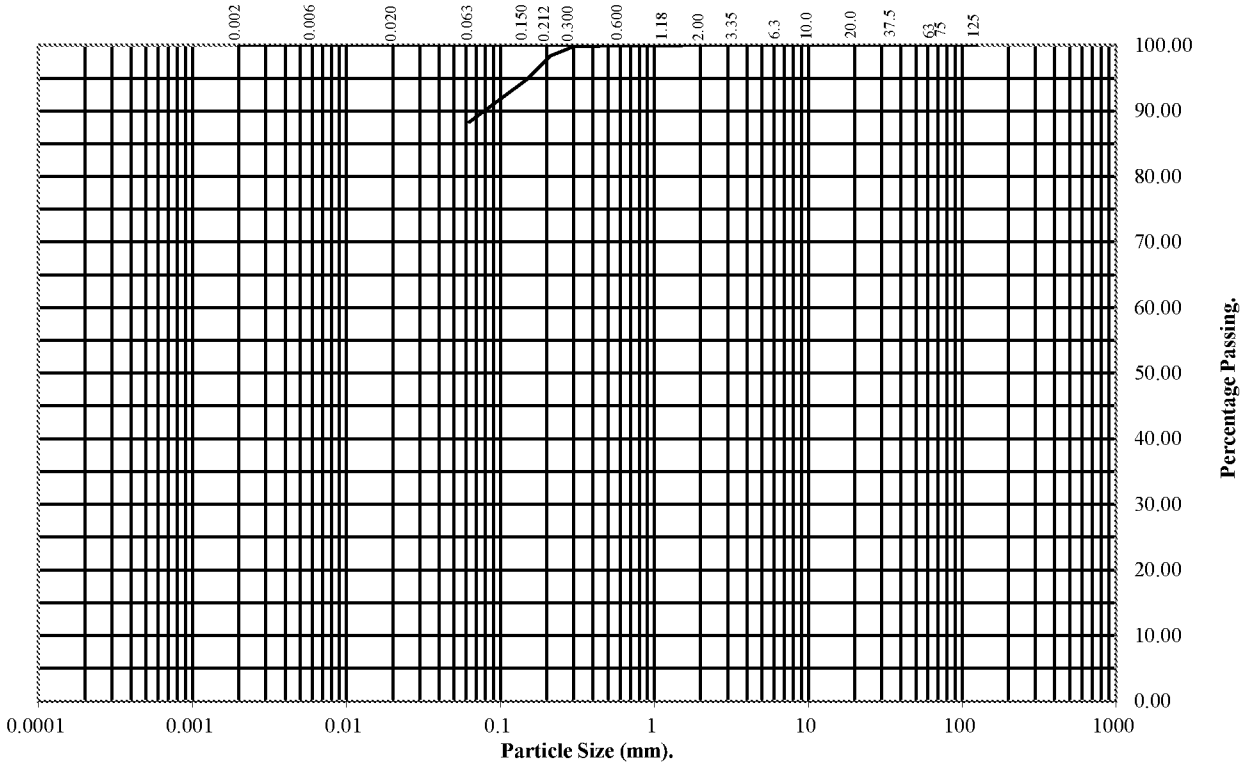
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP106 **Top Depth (m):** 3.50

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

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	100
0.3	100
0.212	98
0.15	95
0.063	88

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	12
Silt/Clay	88

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date	08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus			Client Ref: C4872

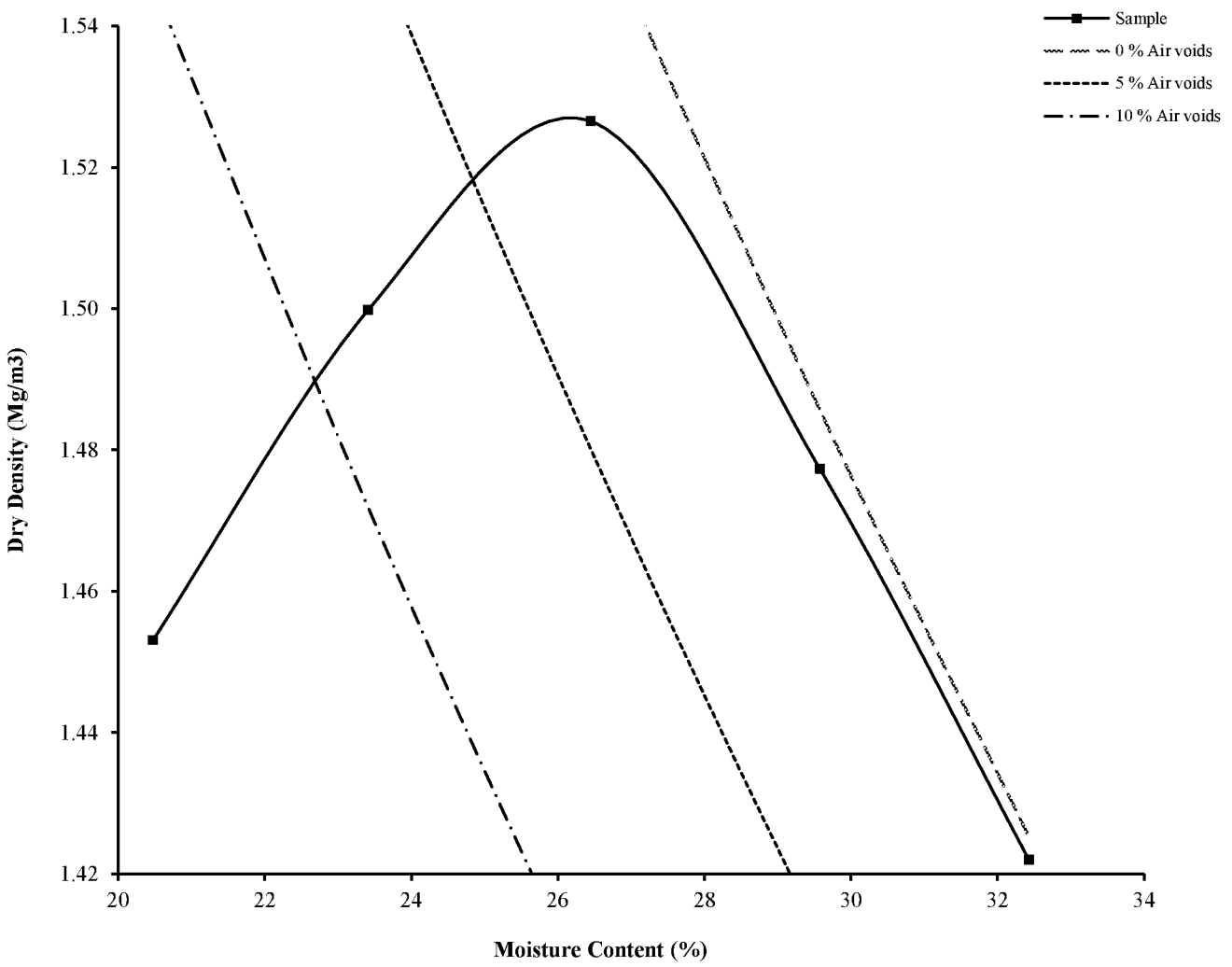
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP106 **Top Depth (m) :** 1.00

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

Sample Type: B



Initial Moisture Content:		35	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.53	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		26			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
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				C4872

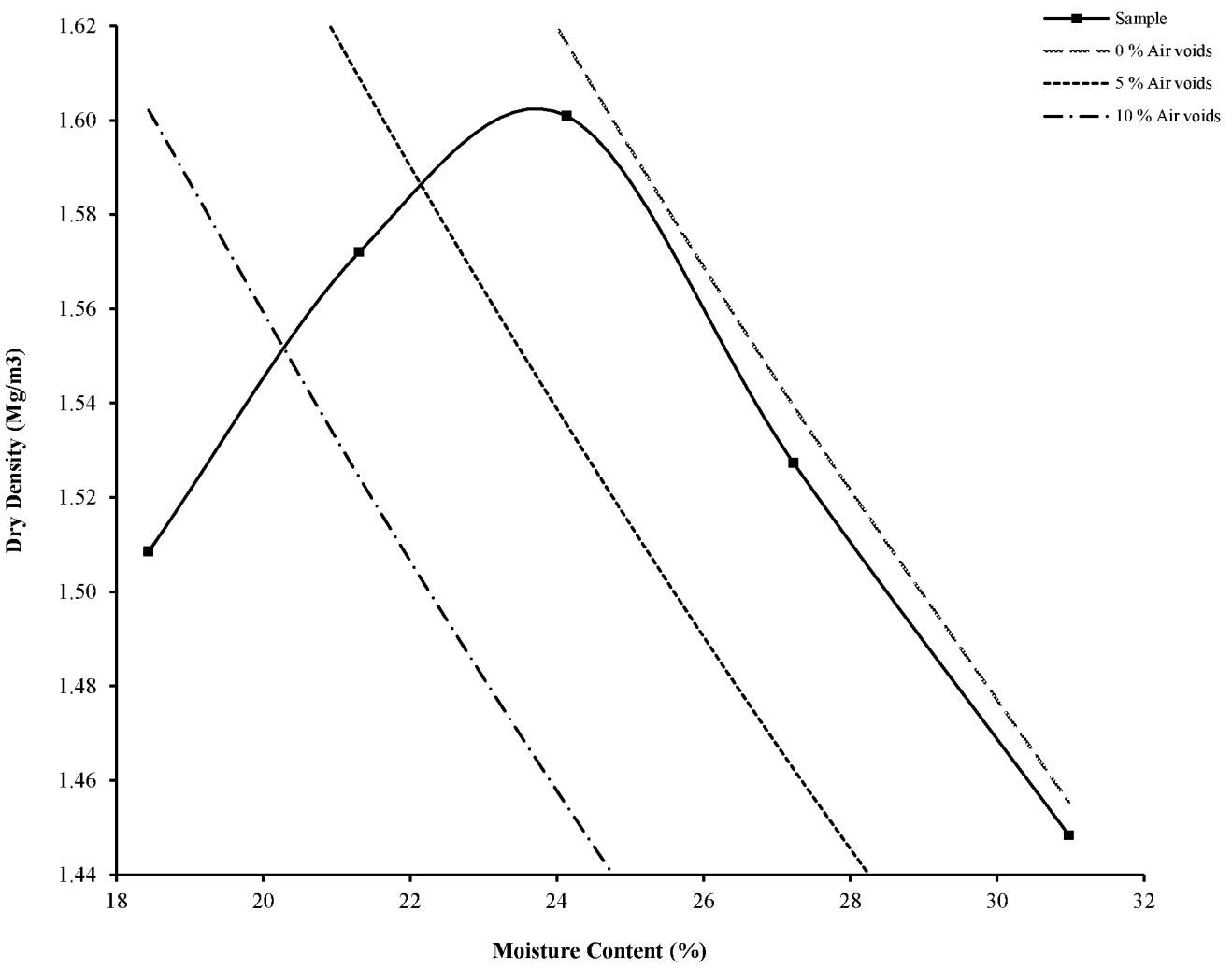
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP106 **Top Depth (m) :** 3.50

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

Sample Type: B



Initial Moisture Content:		40	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.60	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		24			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

PSL
Professional Soils Laboratory

LABORATORY REPORT

UKAS TESTING
4043

Contract Number: PSL15/5863

Report Date: 08 January 2016

Client's Reference: C4872

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Unit A2 Innsworth Technology Park.
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M Beastall (Laboratory Manager)

[redacted]

D Lambe (Senior Technician)
S Royle (Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,

[redacted]

ARUN DISTRICT CO

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP107		B	1.00		Brown slightly sandy CLAY.
TP107		D	1.00		Brown slightly sandy CLAY.
TP107		B	1.50		Brown slightly sandy CLAY.
TP107		B	2.50		Brown mottled grey slightly sandy CLAY.
TP107		D	2.50		Brown mottled grey slightly sandy CLAY.

UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Bulk Density Mg/m^3 Clause 7.2	Dry Density Mg/m^3 Clause 7.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
TP107		D	1.00		28			55	25	30	100	High plasticity CH.
TP107		B	2.50		36	1.85	1.36					
TP107		D	2.50		38			53	24	29	100	High plasticity CH.

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

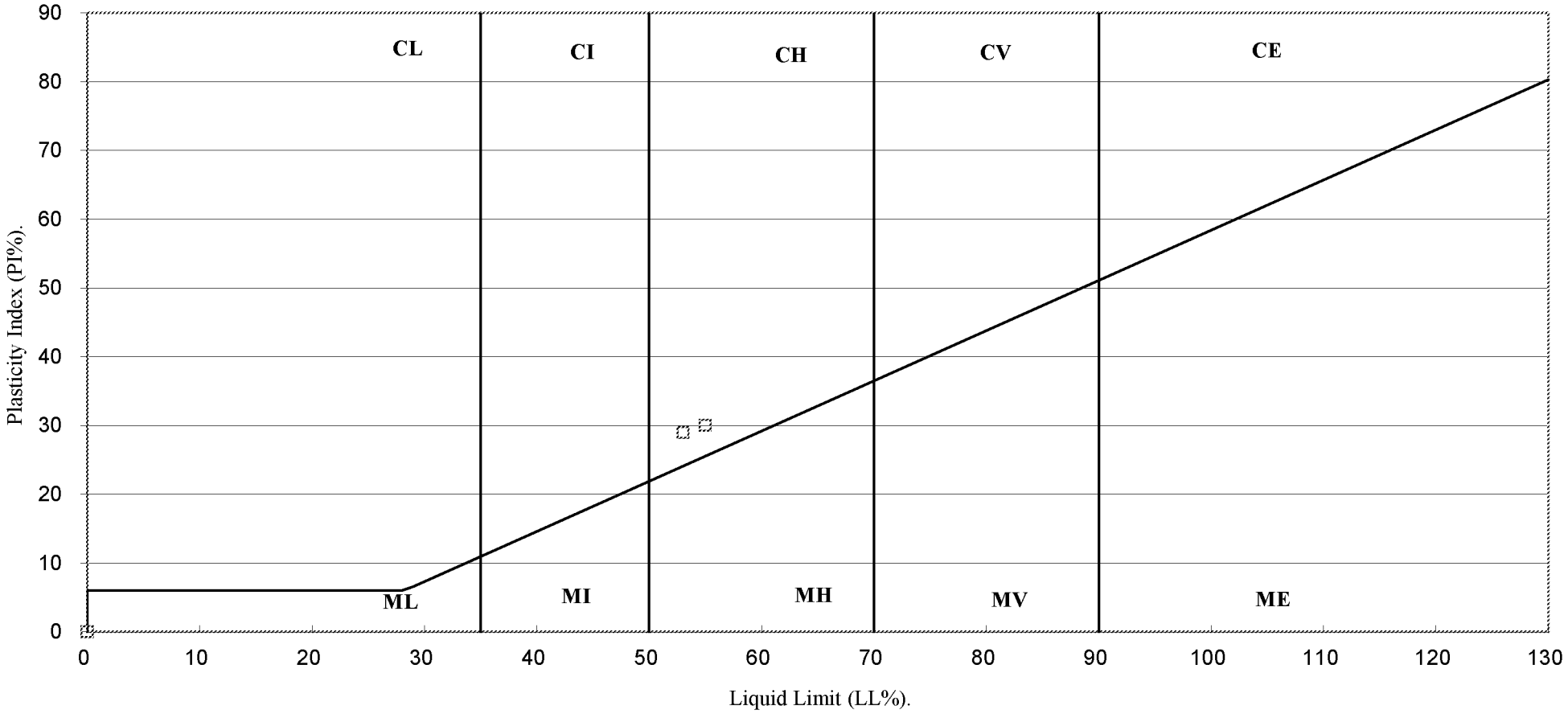
UKAS TESTING 4043

PSL Professional Soils Laboratory

Checked / Approved	[redacted]	Date	08/01/16	Contract No:
University of Chichester - Bognor Regis Campus				PSL15/5863
				Client Ref:
				C4872

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked /Approved	[redacted]	Date 08/01/16	Contract No:
		University of Chichester - Bognor Regis Campus			PSL15/5863
					Client Ref:
					C4872

PARTICLE SIZE DISTRIBUTION TEST

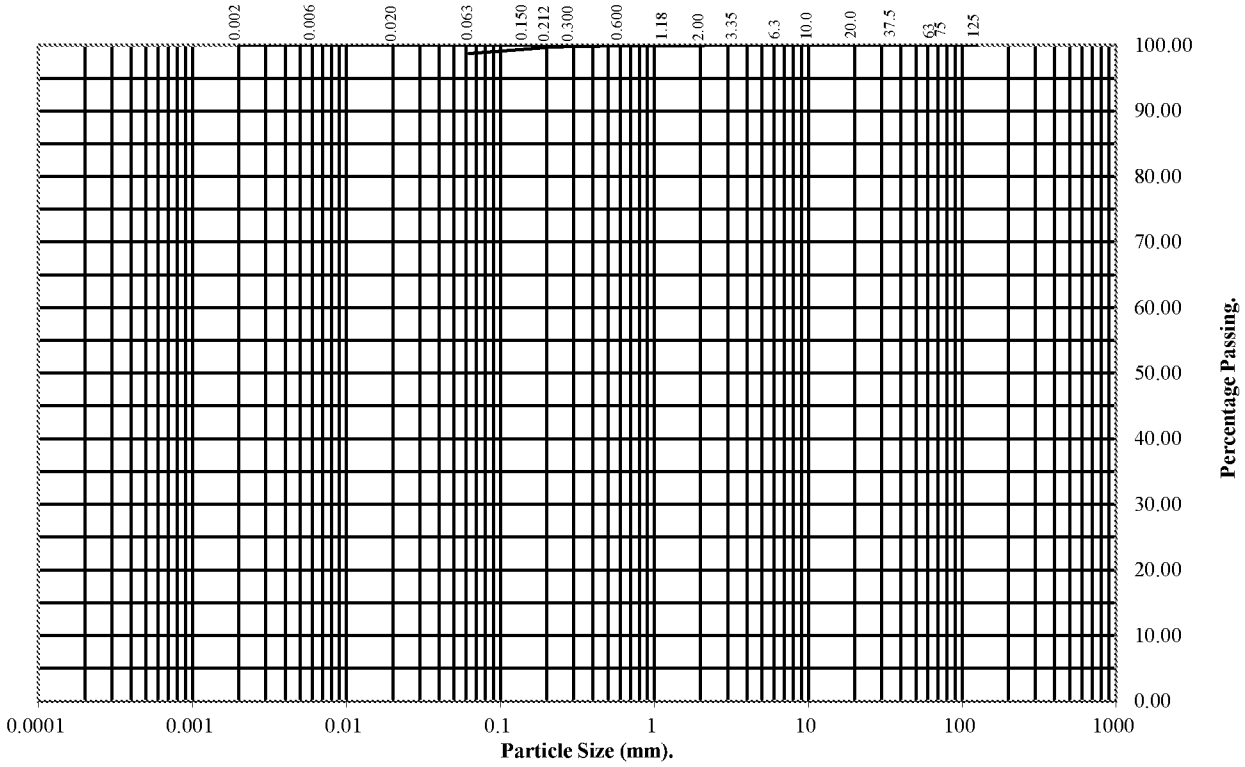
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP107 **Top Depth (m):** 1.00

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt/Clay	99

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

PARTICLE SIZE DISTRIBUTION TEST

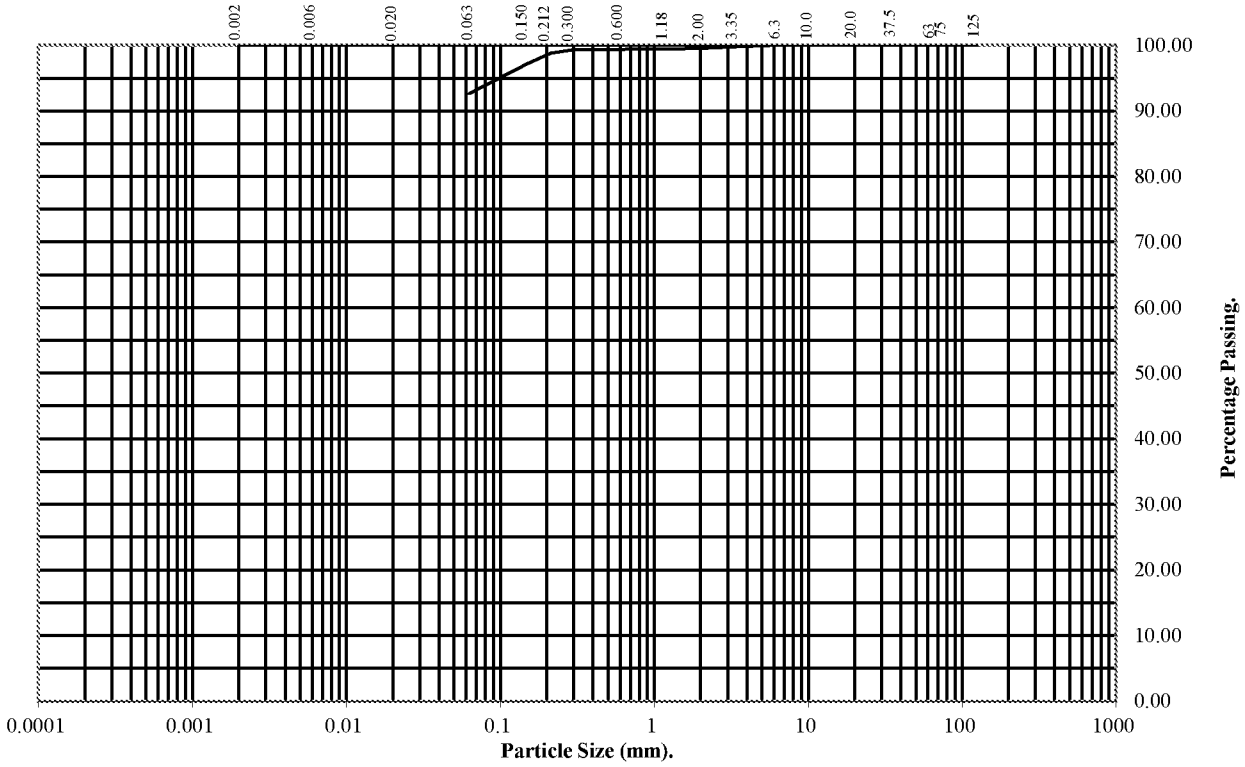
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: TP107 **Top Depth (m):** 1.50

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

Sample Type: B



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

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	7
Silt/Clay	93

Remarks:
See summary of soil descriptions.

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted]	Date 08/01/16	Contract No: PSL15/5863
		University of Chichester - Bognor Regis Campus		Client Ref: C4872

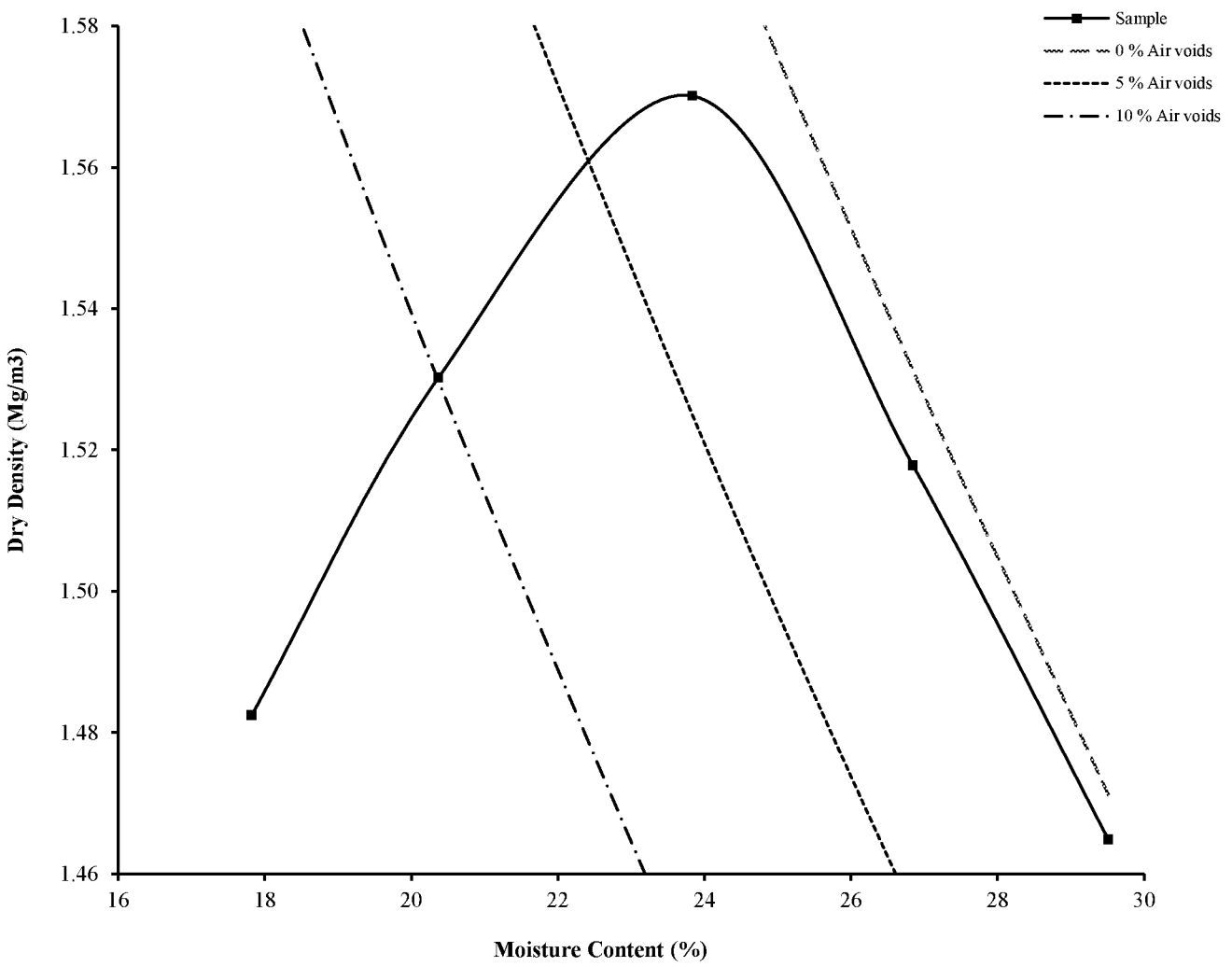
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : 1990

Hole Number: TP107 **Top Depth (m) :** 1.00

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

Sample Type: B



Initial Moisture Content:		27	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.60	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3):		1.57	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		24			
Remarks See summary of soil descriptions					

UKAS TESTING 4043	PSL Professional Soils Laboratory	Checked / Approved [redacted] Date 08/01/16		Contract No.
		University of Chichester - Bognor Regis Campus		PSL15/5863
				Client Ref
				C4872

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53912
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]
Rob Brown
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918346
Sample ID	BH101
Depth	3.90
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	140
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	120
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.03

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

ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918348
Sample ID	BH102
Depth	
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	84
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	40
Total Sulphur as S	DETSC 2320	0.01	%	0.06
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.15

ARUN DISTRICT COUNCIL BR/72/22/PL

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53912
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

UKAS TESTING
2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918347
Sample ID	BH102
Depth	1.90
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.8
Chloride Aqueous Extract	DETSC 2055	1	mg/l	320
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	350
Total Sulphur as S	DETSC 2320	0.01	%	0.04
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.09

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ARUN DISTRICT COUNCIL BR/72/22/PL

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

UKAS TESTING
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ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918350
Sample ID	BH103
Depth	5.30
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.1
Chloride Aqueous Extract	DETSC 2055	1	mg/l	130
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	83
Total Sulphur as S	DETSC 2320	0.01	%	< 0.01
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.03

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]

Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918349
Sample ID	BH103
Depth	1.90
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	24
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	81
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.04

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

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Approved By [redacted]

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918351
Sample ID	BH104
Depth	5.20
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			9.0
Chloride Aqueous Extract	DETSC 2055	1	mg/l	440
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	270
Total Sulphur as S	DETSC 2320	0.01	%	0.21
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.10

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

ARUN DISTRICT COUNCIL BR/72/22/PL

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53912
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]
Business Manager

UKAS TESTING
2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918352
Sample ID	BH106
Depth	3.50
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	140
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	150
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.06

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918353
Sample ID	BH107
Depth	5.00-5.15
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.8
Chloride Aqueous Extract	DETSC 2055	1	mg/l	130
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	50
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.04

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53912
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]

ROB BROWN
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	919314
Sample ID	BH108
Depth	1.65
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	26
Inorganics				
pH	DETSC 2008#			8.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1000
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	3.2
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	490
Total Sulphur as S	DETSC 2320	0.01	%	0.39
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.19

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918354
Sample ID	BH108
Depth	6.30
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	28
Inorganics				
pH	DETSC 2008#			8.8
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1100
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	3.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	520
Total Sulphur as S	DETSC 2320	0.01	%	0.46
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.17

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ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53912

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53912
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]
Rob Brown
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918355
Sample ID	BH109
Depth	4.00
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	33
Inorganics				
pH	DETSC 2008#			8.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	470
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	3.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	520
Total Sulphur as S	DETSC 2320	0.01	%	0.64
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.21

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

ARUN DISTRICT COUNCIL BR/72/22/PL

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53912-1

12-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912-1

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 12-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 15-53912, extra testing.**

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Approved By [redacted]
Business Manager

UKAS TESTING
2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912-1
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918972
Sample ID	BH109
Depth	15.30
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Inorganics				
Organic Matter Content	DETSC 2002#	0.1	%	15

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

ARUN DISTRICT COUNCIL BR/72/22/PL

Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53912-1

12-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53912-1

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 12-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 15-53912, extra testing.**

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Approved By [redacted]

Rob Brown
Business Manager

2139

ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53912-1
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918356
Sample ID	BH109
Depth	15.50
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	87
Inorganics				
pH	DETSC 2008#			8.0
Organic matter	DETSC 2002#	0.1	%	11
Chloride Aqueous Extract	DETSC 2055	1	mg/l	3600
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	340
Total Sulphur as S	DETSC 2320	0.01	%	1.8
Total Sulphate as SO4	DETSC 2321#	0.01	%	2.2

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

ARUN DISTRICT COUNCIL BR/72/22/PL

Certificate of Analysis

Certificate Number 15-53913

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-53913

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 18-Dec-15

Date Started 18-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

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ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53913
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918358
Sample ID	TP101
Depth	3.00
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.4
Chloride Aqueous Extract	DETSC 2055	1	mg/l	63
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	120
Total Sulphur as S	DETSC 2320	0.01	%	0.01
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.04

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Certificate of Analysis

Certificate Number 15-53913

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53913
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

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ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53913
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918357
Sample ID	TP101
Depth	1.30
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	20
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	32
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.02

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Certificate of Analysis

Certificate Number 15-54124

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 15-54124

Client Reference PSL15/5863

Order No (not supplied)

Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Description One Soil sample.

Date Received 22-Dec-15

Date Started 22-Dec-15

Date Completed 08-Jan-16

Test Procedures Identified by prefix DETSn (details on request).

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Approved By [redacted]

Rob Brown
Business Manager

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ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-54124
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	919663
Sample ID	TP102
Depth	2.50
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			7.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	61
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	220
Total Sulphur as S	DETSC 2320	0.01	%	0.05
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.10

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Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-54124

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-54124
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	22-Dec-15
Date Started	22-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]
Business Manager

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Summary of Chemical Analysis

Soil Samples

Our Ref 15-54124
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	919664
Sample ID	TP103
Depth	1.00
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			7.4
Chloride Aqueous Extract	DETSC 2055	1	mg/l	20
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	31
Total Sulphur as S	DETSC 2320	0.01	%	< 0.01
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.02

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Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53913

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53913
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved B [redacted]
Business Manager

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Summary of Chemical Analysis

Soil Samples

Our Ref 15-53913
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918359
Sample ID	TP104
Depth	1.50
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.7
Chloride Aqueous Extract	DETSC 2055	1	mg/l	350
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	170
Total Sulphur as S	DETSC 2320	0.01	%	0.08
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.08

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Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53913

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53913
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By [redacted]
Rob Brown
Business Manager

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Summary of Chemical Analysis

Soil Samples

Our Ref 15-53913
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918360
Sample ID	TP106
Depth	2.00
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	400
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	3.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	82
Total Sulphur as S	DETSC 2320	0.01	%	0.02
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.04

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Derwentside Environmental Testing Services

Certificate of Analysis

Certificate Number 15-53913

08-Jan-16

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference	15-53913
Client Reference	PSL15/5863
Order No	(not supplied)
Contract Title	UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS
Description	One Soil sample.
Date Received	18-Dec-15
Date Started	18-Dec-15
Date Completed	08-Jan-16
Test Procedures	Identified by prefix DETSn (details on request).

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Approved By R[redacted]
Business Manager

UKAS TESTING
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ARUN DISTRICT COUNCIL BR/72/22/PL

Summary of Chemical Analysis

Soil Samples

Our Ref 15-53913
Client Ref PSL15/5863
Contract Title UNIVERSITY OF CHICHESTER - BOGNOR REGIS CAMPUS

Lab No	918361
Sample ID	TP107
Depth	1.50
Other ID	
Sample Type	SOIL
Sampling Date	n/s
Sampling Time	n/s

Test	Method	LOD	Units	
Metals				
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10
Inorganics				
pH	DETSC 2008#			8.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	85
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	32
Total Sulphur as S	DETSC 2320	0.01	%	0.01
Total Sulphate as SO4	DETSC 2321#	0.01	%	0.02

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ARUN DISTRICT COUNCIL BR/72/22/PL

Chris Scrivens
CC Ground Investigation Ltd
Unit A2
Innsworth Tech Park
Innsworth Lane
Gloucester
GL3 1DL
[redacted]

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS
[redacted]

Analytical Report Number : 15-82946

Project / Site name:	University of Chichester -Bognor Regis Campus	Samples received on:	19/11/2015
Your job number:	C4672	Samples instructed on:	20/11/2015
Your order number:		Analysis completed by:	01/12/2015
Report Issue Number:	1	Report issued on:	01/12/2015
Samples Analysed:	12 leachate samples - 30 soil samples		

[redacted]

Signed:

Reecha Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

[redacted]

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pomorska 39, 41-711 Ruda Śląska, Poland

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

ARUN DISTRICT COUNCIL BR/72/22/PL
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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
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	24	19	18	21	29
Total mass of sample received	kg	0.001	NONE	1.9	1.8	1.7	1.7	1.6
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	6.3	8.0	5.6	7.9	6.4
Organic Matter	%	0.1	MCERTS	3.2	0.4	3.0	0.9	5.9
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.8	-	1.7	0.5	3.4
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.28
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.76
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.74
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.64
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.37
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.72
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.38
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	3.89

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.6	16	12	11	7.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	29	19	26	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	11	7.6	24	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	51	11	25	24	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	22	9.5	16	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	34	17	25	34	78
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.28
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.76
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.74
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.64
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	0.37
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.72
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	0.38
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	< 0.05

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	< 0.01	-	-	-	< 0.01
Simazine	mg/kg	0.01	NONE	< 0.01	-	-	-	< 0.01
Trietazine	mg/kg	0.01	NONE	< 0.01	-	-	-	< 0.01
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	< 20	-	-	-	< 20
2,4,5-TP	ug/kg	20	NONE	< 20	-	-	-	< 20
2,4-D	ug/kg	20	NONE	< 20	-	-	-	< 20
2,4-DB	ug/kg	20	NONE	< 20	-	-	-	< 20
Dicamba	ug/kg	20	NONE	< 20	-	-	-	< 20
Dichlorprop	ug/kg	20	NONE	< 20	-	-	-	< 20
Dinoseb	ug/kg	20	NONE	< 20	-	-	-	< 20
MCPA	ug/kg	20	NONE	< 20	-	-	-	< 20
MCPB	ug/kg	20	NONE	< 20	-	-	-	< 20
MCPP (Mecoprop)	ug/kg	20	NONE	< 20	-	-	-	< 20
Picloram	ug/kg	20	NONE	< 20	-	-	-	< 20
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	< 10	-	-	-	< 10
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	< 10	-	-	-	< 10
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	< 10	-	-	-	< 10
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	< 10	-	-	-	< 10
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	< 10	-	-	-	< 10
Dieldrin	µg/kg	10	NONE	< 10	-	-	-	< 10
Endosulphan A	µg/kg	10	NONE	< 10	-	-	-	< 10
Endosulphan B	µg/kg	10	NONE	< 10	-	-	-	< 10
Endrin	µg/kg	10	NONE	< 10	-	-	-	< 10
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	< 10	-	-	-	< 10
HCB (Hexachlorobenzene)	µg/kg	10	NONE	< 10	-	-	-	< 10
Heptachlor	µg/kg	10	NONE	< 10	-	-	-	< 10
Heptachlor Epoxide	µg/kg	10	NONE	< 10	-	-	-	< 10
Isodrin	µg/kg	10	NONE	< 10	-	-	-	< 10
pp-Methoxychlor	µg/kg	10	NONE	< 10	-	-	-	< 10
o,p-DDE	µg/kg	10	NONE	< 10	-	-	-	< 10
o,p-DDT	µg/kg	10	NONE	< 10	-	-	-	< 10
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	< 10	-	-	-	< 10
p,p-DDE	µg/kg	10	NONE	< 10	-	-	-	< 10
p,p-DDT	µg/kg	10	NONE	< 10	-	-	-	< 10
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	< 10	-	-	-	< 10
Trifluralin	µg/kg	10	NONE	< 10	-	-	-	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508949	508950	508951	508952	508953
Sample Reference				BH101	BH101	HP101	HP102	BH102
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.20	0.30	0.10
Date Sampled				16/11/2015	16/11/2015	16/11/2015	16/11/2015	16/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	< 10	-	-	-	< 10
Chlorfenvinphos I (cis)	µg/kg	10	NONE	< 10	-	-	-	< 10
Chlorfenvinphos II (trans)	µg/kg	10	NONE	< 10	-	-	-	< 10
Chlorfenvinphos-methyl	µg/kg	10	NONE	< 10	-	-	-	< 10
Diazinon	µg/kg	10	NONE	< 10	-	-	-	< 10
Dichlorvos	µg/kg	10	NONE	< 10	-	-	-	< 10
Dimethoate	µg/kg	10	NONE	< 10	-	-	-	< 10
E-mevinphos	µg/kg	10	NONE	< 10	-	-	-	< 10
Z-mevinphos	µg/kg	10	NONE	< 10	-	-	-	< 10
Fenitrothion	µg/kg	10	NONE	< 10	-	-	-	< 10
Fenthion	µg/kg	10	NONE	< 10	-	-	-	< 10
Malathion	µg/kg	10	NONE	< 10	-	-	-	< 10
Parathion-ethyl	µg/kg	10	NONE	< 10	-	-	-	< 10
Parathion-methyl	µg/kg	10	NONE	< 10	-	-	-	< 10
Phorate	µg/kg	10	NONE	< 10	-	-	-	< 10
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	< 10	-	-	-	< 10
Chlortoluron	ug/kg	10	NONE	< 10	-	-	-	< 10
Linuron	ug/kg	10	NONE	< 10	-	-	-	< 10
Diuron	ug/kg	10	NONE	< 10	-	-	-	< 10
Diflubenzuron	ug/kg	10	NONE	< 10	-	-	-	< 10
Flumeturon	ug/kg	10	NONE	< 10	-	-	-	< 10
Siduron	ug/kg	10	NONE	< 10	-	-	-	< 10
Terbuthiuron	ug/kg	10	NONE	< 10	-	-	-	< 10
Thidiazuron	ug/kg	10	NONE	< 10	-	-	-	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
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	16	24	24	23	21
Total mass of sample received	kg	0.001	NONE	1.5	0.95	1.4	1.3	0.43
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	8.3	8.4	7.0	5.6	5.7
Organic Matter	%	0.1	MCERTS	0.4	< 0.1	3.1	6.7	1.1
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	1.8	3.9	0.6
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.74	1.3	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.24	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	2.4	2.5	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	2.7	2.1	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	2.2	1.8	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.2	1.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	4.6	2.0	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	2.0	1.0	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	3.2	1.3	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.5	0.57	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.8	0.63	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	23.4	14.5	< 1.60

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	1.5	17	9.1	7.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	36	30	27	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.5	100	18	14	8.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	24	110	70	50
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	15	21	16	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	31	22	78	82	29
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	3.2	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	18	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	31	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	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
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	-	< 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
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	< 1.0

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	-	-	0.74	1.3	< 0.10
Anthracene	mg/kg	0.1	MCERTS	-	-	0.24	< 0.10	< 0.10
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	-	-	2.4	2.5	< 0.10
Pyrene	mg/kg	0.1	MCERTS	-	-	2.7	2.1	< 0.10
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	2.2	1.8	< 0.10
Chrysene	mg/kg	0.05	MCERTS	-	-	2.2	1.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	4.6	2.0	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	2.0	1.0	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	3.2	1.3	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	1.5	0.57	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	1.8	0.63	< 0.05

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	-	-	-	-	-
Simazine	mg/kg	0.01	NONE	-	-	-	-	-
Trietazine	mg/kg	0.01	NONE	-	-	-	-	-
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	-	-	-	-	-
2,4,5-TP	ug/kg	20	NONE	-	-	-	-	-
2,4-D	ug/kg	20	NONE	-	-	-	-	-
2,4-DB	ug/kg	20	NONE	-	-	-	-	-
Dicamba	ug/kg	20	NONE	-	-	-	-	-
Dichlorprop	ug/kg	20	NONE	-	-	-	-	-
Dinoseb	ug/kg	20	NONE	-	-	-	-	-
MCPA	ug/kg	20	NONE	-	-	-	-	-
MCPB	ug/kg	20	NONE	-	-	-	-	-
MCPP (Mecoprop)	ug/kg	20	NONE	-	-	-	-	-
Picloram	ug/kg	20	NONE	-	-	-	-	-
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	-	-	-	-	-
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	-	-	-	-	-
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	-	-	-	-	-
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	-	-	-	-	-
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	-	-	-	-	-
Dieldrin	µg/kg	10	NONE	-	-	-	-	-
Endosulphan A	µg/kg	10	NONE	-	-	-	-	-
Endosulphan B	µg/kg	10	NONE	-	-	-	-	-
Endrin	µg/kg	10	NONE	-	-	-	-	-
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	-	-	-	-	-
HCB (Hexachlorobenzene)	µg/kg	10	NONE	-	-	-	-	-
Heptachlor	µg/kg	10	NONE	-	-	-	-	-
Heptachlor Epoxide	µg/kg	10	NONE	-	-	-	-	-
Isodrin	µg/kg	10	NONE	-	-	-	-	-
pp-Methoxychlor	µg/kg	10	NONE	-	-	-	-	-
o,p-DDE	µg/kg	10	NONE	-	-	-	-	-
o,p-DDT	µg/kg	10	NONE	-	-	-	-	-
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	-	-	-	-	-
p,p-DDE	µg/kg	10	NONE	-	-	-	-	-
p,p-DDT	µg/kg	10	NONE	-	-	-	-	-
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	-	-	-	-	-
Trifluralin	µg/kg	10	NONE	-	-	-	-	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508954	508955	508956	508957	508958
Sample Reference				BH102	BH103	BH104	BH105	BH106
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	0.10	0.10	0.10
Date Sampled				16/11/2015	17/11/2015	09/11/2015	04/11/2015	11/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	-	-	-	-	-
Chlorfenvinphos I (cis)	µg/kg	10	NONE	-	-	-	-	-
Chlorfenvinphos II (trans)	µg/kg	10	NONE	-	-	-	-	-
Chlorfenvinphos-methyl	µg/kg	10	NONE	-	-	-	-	-
Diazinon	µg/kg	10	NONE	-	-	-	-	-
Dichlorvos	µg/kg	10	NONE	-	-	-	-	-
Dimethoate	µg/kg	10	NONE	-	-	-	-	-
E-mevinphos	µg/kg	10	NONE	-	-	-	-	-
Z-mevinphos	µg/kg	10	NONE	-	-	-	-	-
Fenitrothion	µg/kg	10	NONE	-	-	-	-	-
Fenthion	µg/kg	10	NONE	-	-	-	-	-
Malathion	µg/kg	10	NONE	-	-	-	-	-
Parathion-ethyl	µg/kg	10	NONE	-	-	-	-	-
Parathion-methyl	µg/kg	10	NONE	-	-	-	-	-
Phorate	µg/kg	10	NONE	-	-	-	-	-
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	-	-	-	-	-
Chlortoluron	ug/kg	10	NONE	-	-	-	-	-
Linuron	ug/kg	10	NONE	-	-	-	-	-
Diuron	ug/kg	10	NONE	-	-	-	-	-
Diflubenzuron	ug/kg	10	NONE	-	-	-	-	-
Flumeturon	ug/kg	10	NONE	-	-	-	-	-
Siduron	ug/kg	10	NONE	-	-	-	-	-
Terbuthiuron	ug/kg	10	NONE	-	-	-	-	-
Thidiazuron	ug/kg	10	NONE	-	-	-	-	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
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	20	27	17	6.3	18
Total mass of sample received	kg	0.001	NONE	0.43	1.5	1.7	1.7	1.6
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	-	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	6.5	5.2	6.1	7.0	7.3
Organic Matter	%	0.1	MCERTS	1.0	5.4	0.3	0.3	0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	3.1	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	0.26	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.58	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	0.54	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.3	7.4	11	< 1.0	24
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	24	23	18	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.0	15	5.3	7.4	2.8
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	91	11	6.3	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	14	15	18	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	17	55	33	14	55
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	0.26	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	0.58	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	0.54	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	-
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	-	-	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	-	< 0.01	< 0.01	< 0.01	-
Simazine	mg/kg	0.01	NONE	-	< 0.01	< 0.01	< 0.01	-
Trietazine	mg/kg	0.01	NONE	-	< 0.01	< 0.01	< 0.01	-
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	-	< 20	< 20	< 20	-
2,4,5-TP	ug/kg	20	NONE	-	< 20	< 20	< 20	-
2,4-D	ug/kg	20	NONE	-	< 20	< 20	< 20	-
2,4-DB	ug/kg	20	NONE	-	< 20	< 20	< 20	-
Dicamba	ug/kg	20	NONE	-	< 20	< 20	< 20	-
Dichlorprop	ug/kg	20	NONE	-	< 20	< 20	< 20	-
Dinoseb	ug/kg	20	NONE	-	< 20	< 20	< 20	-
MCPA	ug/kg	20	NONE	-	< 20	< 20	< 20	-
MCPB	ug/kg	20	NONE	-	< 20	< 20	< 20	-
MCPP (Mecoprop)	ug/kg	20	NONE	-	< 20	< 20	< 20	-
Picloram	ug/kg	20	NONE	-	< 20	< 20	< 20	-
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Dieldrin	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Endosulphan A	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Endosulphan B	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Endrin	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
HCB (Hexachlorobenzene)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Heptachlor	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Heptachlor Epoxide	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Isodrin	µg/kg	10	NONE	-	< 10	< 10	< 10	-
pp-Methoxychlor	µg/kg	10	NONE	-	< 10	< 10	< 10	-
o,p-DDE	µg/kg	10	NONE	-	< 10	< 10	< 10	-
o,p-DDT	µg/kg	10	NONE	-	< 10	< 10	< 10	-
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
p,p-DDE	µg/kg	10	NONE	-	< 10	< 10	< 10	-
p,p-DDT	µg/kg	10	NONE	-	< 10	< 10	< 10	-
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Trifluralin	µg/kg	10	NONE	-	< 10	< 10	< 10	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508959	508960	508961	508962	508963
Sample Reference				BH106	BH107	BH107	BH107	BH108
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.60	1.10	0.40
Date Sampled				11/11/2015	09/11/2015	09/11/2015	09/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Chlorfenvinphos I (cis)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Chlorfenvinphos II (trans)	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Chlorfenvinphos-methyl	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Diazinon	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Dichlorvos	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Dimethoate	µg/kg	10	NONE	-	< 10	< 10	< 10	-
E-mevinphos	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Z-mevinphos	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Fenitrothion	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Fenthion	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Malathion	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Parathion-ethyl	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Parathion-methyl	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Phorate	µg/kg	10	NONE	-	< 10	< 10	< 10	-
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Chlortoluron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Linuron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Diuron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Diflubenzuron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Flumeturon	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Siduron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Terbuthiuron	ug/kg	10	NONE	-	< 10	< 10	< 10	-
Thidiazuron	ug/kg	10	NONE	-	< 10	< 10	< 10	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
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	19	17	18	18	14
Total mass of sample received	kg	0.001	NONE	1.4	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
General Inorganics								
pH	pH Units	N/A	MCERTS	7.8	8.3	8.4	5.9	8.2
Organic Matter	%	0.1	MCERTS	1.8	< 0.1	0.4	4.9	< 0.1
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.1	-	-	2.8	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.40	< 0.10	< 0.10	0.36	< 0.10
Pyrene	mg/kg	0.1	MCERTS	0.44	< 0.10	< 0.10	0.36	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.53	< 0.10	< 0.10	0.50	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.16	< 0.05	< 0.05	0.23	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.33	< 0.10	< 0.10	0.68	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.18	< 0.10	< 0.10	0.36	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	2.04	< 1.60	< 1.60	2.49	< 1.60

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	21	9.1	12	25
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	31	25	27	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.9	7.0	7.0	13	5.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	12	9.7	62	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	22	16	18	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	54	43	61	53
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Chloroethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Bromodichloromethane	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Tribromomethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Isopropylbenzene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Butylbenzene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	NONE	< 1.0	-	-	< 1.0	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	-
Fluoranthene	mg/kg	0.1	MCERTS	0.40	-	-	0.36	-
Pyrene	mg/kg	0.1	MCERTS	0.44	-	-	0.36	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.53	-	-	0.50	-
Chrysene	mg/kg	0.05	MCERTS	0.16	-	-	0.23	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.33	-	-	0.68	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.18	-	-	0.36	-
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	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Simazine	mg/kg	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trietazine	mg/kg	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
2,4,5-TP	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
2,4-D	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
2,4-DB	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
Dicamba	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
Dichlorprop	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
Dinoseb	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
MCPA	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
MCPB	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
MCPP (Mecoprop)	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
Picloram	ug/kg	20	NONE	< 20	< 20	< 20	< 20	< 20
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Dieldrin	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Endosulphan A	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Endosulphan B	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Endrin	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
HCB (Hexachlorobenzene)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Heptachlor	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Heptachlor Epoxide	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Isodrin	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
pp-Methoxychlor	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
o,p-DDE	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
o,p-DDT	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
p,p-DDE	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
p,p-DDT	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Trifluralin	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508964	508965	508966	508967	508968
Sample Reference				BH109	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	2.10	0.20	1.00
Date Sampled				05/11/2015	06/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Chlorfenvinphos I (cis)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Chlorfenvinphos II (trans)	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Chlorfenvinphos-methyl	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Diazinon	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Dichlorvos	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Dimethoate	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
E-mevinphos	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Z-mevinphos	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Fenitrothion	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Fenthion	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Malathion	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Parathion-ethyl	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Parathion-methyl	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Phorate	µg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Chlortoluron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Linuron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Diuron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Diflubenzuron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Flumeturon	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Siduron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Terbuthiuron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
Thidiazuron	ug/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
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	22	18	10	18	24
Total mass of sample received	kg	0.001	NONE	0.46	0.46	0.40	0.44	0.38
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	8.5	8.0	6.2	7.3	6.1
Organic Matter	%	0.1	MCERTS	3.0	< 0.1	1.1	< 0.1	6.8
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.7	-	0.6	-	3.9
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	0.37	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	1.2	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	1.1	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.3	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.2	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.50	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.33	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	6.82	< 1.60	< 1.60	< 1.60	< 1.60

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	< 1.0	19	15	10
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	27	20	26	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	31	15	7.0	45	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	160	7.5	21	21	84
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	13	18	59	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	84	17	29	110	72
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	27	< 8.0	23	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	35	< 10	23	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Chloroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
1,1-Dichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Cis-1,2-dichloroethene	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
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Bromodichloromethane	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	< 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
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tribromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Isopropylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Butylbenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	< 1.0	-	< 1.0	-	< 1.0

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	0.37	-	< 0.10	-	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	1.2	-	< 0.10	-	< 0.10
Pyrene	mg/kg	0.1	MCERTS	1.1	-	< 0.10	-	< 0.10
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.3	-	< 0.10	-	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.46	-	< 0.05	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.2	-	< 0.10	-	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.50	-	< 0.10	-	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.33	-	< 0.10	-	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	-	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43	-	< 0.05	-	< 0.05

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	< 0.01	< 0.01	-	-	< 0.01
Simazine	mg/kg	0.01	NONE	< 0.01	< 0.01	-	-	< 0.01
Trietazine	mg/kg	0.01	NONE	< 0.01	< 0.01	-	-	< 0.01
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	< 20	< 20	-	-	< 20
2,4,5-TP	ug/kg	20	NONE	< 20	< 20	-	-	< 20
2,4-D	ug/kg	20	NONE	< 20	< 20	-	-	< 20
2,4-DB	ug/kg	20	NONE	< 20	< 20	-	-	< 20
Dicamba	ug/kg	20	NONE	< 20	< 20	-	-	< 20
Dichlorprop	ug/kg	20	NONE	< 20	< 20	-	-	< 20
Dinoseb	ug/kg	20	NONE	< 20	< 20	-	-	< 20
MCPA	ug/kg	20	NONE	< 20	< 20	-	-	< 20
MCPB	ug/kg	20	NONE	< 20	< 20	-	-	< 20
MCPP (Mecoprop)	ug/kg	20	NONE	< 20	< 20	-	-	< 20
Picloram	ug/kg	20	NONE	< 20	< 20	-	-	< 20
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Dieldrin	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Endosulphan A	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Endosulphan B	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Endrin	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
HCB (Hexachlorobenzene)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Heptachlor	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Heptachlor Epoxide	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Isodrin	µg/kg	10	NONE	< 10	< 10	-	-	< 10
pp-Methoxychlor	µg/kg	10	NONE	< 10	< 10	-	-	< 10
o,p-DDE	µg/kg	10	NONE	< 10	< 10	-	-	< 10
o,p-DDT	µg/kg	10	NONE	< 10	< 10	-	-	< 10
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
p,p-DDE	µg/kg	10	NONE	< 10	< 10	-	-	< 10
p,p-DDT	µg/kg	10	NONE	< 10	< 10	-	-	< 10
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Trifluralin	µg/kg	10	NONE	< 10	< 10	-	-	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508969	508970	508971	508972	508973
Sample Reference				TP101	TP101	TP102	TP102	TP104
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.40	0.40	2.40	0.10
Date Sampled				11/11/2015	11/11/2015	11/11/2015	11/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Chlorfenvinphos I (cis)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Chlorfenvinphos II (trans)	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Chlorfenvinphos-methyl	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Diazinon	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Dichlorvos	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Dimethoate	µg/kg	10	NONE	< 10	< 10	-	-	< 10
E-mevinphos	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Z-mevinphos	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Fenitrothion	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Fenthion	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Malathion	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Parathion-ethyl	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Parathion-methyl	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Phorate	µg/kg	10	NONE	< 10	< 10	-	-	< 10
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Chlortoluron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Linuron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Diuron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Diflubenzuron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Flumeturon	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Siduron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Terbuthiuron	ug/kg	10	NONE	< 10	< 10	-	-	< 10
Thidiazuron	ug/kg	10	NONE	< 10	< 10	-	-	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
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	23	17	16	26	24
Total mass of sample received	kg	0.001	NONE	0.39	1.4	1.3	2.0	0.39
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	-	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	8.2	5.7	8.0	9.1	5.7
Organic Matter	%	0.1	MCERTS	0.4	5.3	1.2	0.6	6.4
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	3.1	-	-	3.7
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.43	< 0.10	< 0.10	0.34
Pyrene	mg/kg	0.1	MCERTS	< 0.10	0.49	< 0.10	< 0.10	0.42
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	1.1	< 0.10	< 0.10	0.44
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	0.26
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	1.4	< 0.10	< 0.10	0.50
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.63	< 0.10	< 0.10	0.28
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	4.52	< 1.60	< 1.60	2.24

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	15	12	3.3	13
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	31	37	22	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.3	14	3.4	6.4	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	130	15	10	82
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	18	21	14	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	50	69	56	35	100
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	13	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chloroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Vinyl Chloride	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trichlorofluoromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,1-Dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
2,2-Dichloropropane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-Dichloropropene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Bromodichloromethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Tetrachloroethene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tribromomethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Isopropylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
2-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
4-Chlorotoluene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
tert-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
sec-Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Butylbenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Hexachlorobutadiene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	NONE	-	< 1.0	-	-	< 1.0

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	< 0.10
Anthracene	mg/kg	0.1	MCERTS	-	< 0.10	-	-	< 0.10
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	-	0.43	-	-	0.34
Pyrene	mg/kg	0.1	MCERTS	-	0.49	-	-	0.42
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	1.1	-	-	0.44
Chrysene	mg/kg	0.05	MCERTS	-	0.45	-	-	0.26
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	1.4	-	-	0.50
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	0.63	-	-	0.28
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

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation status					
Organonitrogen Pesticides (ONP)								
Atrazine	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Simazine	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Trietazine	mg/kg	0.01	NONE	< 0.01	-	-	-	-
Environmental Forensics								
Acid Herbicides								
2,4,5-T	ug/kg	20	NONE	< 20	-	-	-	-
2,4,5-TP	ug/kg	20	NONE	< 20	-	-	-	-
2,4-D	ug/kg	20	NONE	< 20	-	-	-	-
2,4-DB	ug/kg	20	NONE	< 20	-	-	-	-
Dicamba	ug/kg	20	NONE	< 20	-	-	-	-
Dichlorprop	ug/kg	20	NONE	< 20	-	-	-	-
Dinoseb	ug/kg	20	NONE	< 20	-	-	-	-
MCPA	ug/kg	20	NONE	< 20	-	-	-	-
MCPB	ug/kg	20	NONE	< 20	-	-	-	-
MCPP (Mecoprop)	ug/kg	20	NONE	< 20	-	-	-	-
Picloram	ug/kg	20	NONE	< 20	-	-	-	-
Organochlorine Pesticides								
Aldrin	µg/kg	10	NONE	< 10	-	-	-	-
Alpha-HCH (Alpha BHC)	µg/kg	10	NONE	< 10	-	-	-	-
Beta-HCH (Beta-BHC)	µg/kg	10	NONE	< 10	-	-	-	-
Chlordane (sum of cis & trans isomers)	µg/kg	10	NONE	< 10	-	-	-	-
Delta-HCH (Delta-BHC)	µg/kg	10	NONE	< 10	-	-	-	-
Dieldrin	µg/kg	10	NONE	< 10	-	-	-	-
Endosulphan A	µg/kg	10	NONE	< 10	-	-	-	-
Endosulphan B	µg/kg	10	NONE	< 10	-	-	-	-
Endrin	µg/kg	10	NONE	< 10	-	-	-	-
Gamma-HCH (Lindane) (Gamma-BHC)	µg/kg	10	NONE	< 10	-	-	-	-
HCB (Hexachlorobenzene)	µg/kg	10	NONE	< 10	-	-	-	-
Heptachlor	µg/kg	10	NONE	< 10	-	-	-	-
Heptachlor Epoxide	µg/kg	10	NONE	< 10	-	-	-	-
Isodrin	µg/kg	10	NONE	< 10	-	-	-	-
pp-Methoxychlor	µg/kg	10	NONE	< 10	-	-	-	-
o,p-DDE	µg/kg	10	NONE	< 10	-	-	-	-
o,p-DDT	µg/kg	10	NONE	< 10	-	-	-	-
o,p-TDE (o,p-DDD)	µg/kg	10	NONE	< 10	-	-	-	-
p,p-DDE	µg/kg	10	NONE	< 10	-	-	-	-
p,p-DDT	µg/kg	10	NONE	< 10	-	-	-	-
p,p-TDE (p,p-DDD)	µg/kg	10	NONE	< 10	-	-	-	-
Trifluralin	µg/kg	10	NONE	< 10	-	-	-	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				508974	508975	508976	508977	508978
Sample Reference				TP104	TP106	TP106	TP106	TP107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.10	0.50	2.30	0.20
Date Sampled				10/11/2015	10/11/2015	10/11/2015	10/11/2015	10/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	units	Limit of detection	Accreditation status					
Organophosphorous pesticides								
Azinphos-methyl	µg/kg	10	NONE	< 10	-	-	-	-
Chlorfenvinphos I (cis)	µg/kg	10	NONE	< 10	-	-	-	-
Chlorfenvinphos II (trans)	µg/kg	10	NONE	< 10	-	-	-	-
Chlorfenvinphos-methyl	µg/kg	10	NONE	< 10	-	-	-	-
Diazinon	µg/kg	10	NONE	< 10	-	-	-	-
Dichlorvos	µg/kg	10	NONE	< 10	-	-	-	-
Dimethoate	µg/kg	10	NONE	< 10	-	-	-	-
E-mevinphos	µg/kg	10	NONE	< 10	-	-	-	-
Z-mevinphos	µg/kg	10	NONE	< 10	-	-	-	-
Fenitrothion	µg/kg	10	NONE	< 10	-	-	-	-
Fenthion	µg/kg	10	NONE	< 10	-	-	-	-
Malathion	µg/kg	10	NONE	< 10	-	-	-	-
Parathion-ethyl	µg/kg	10	NONE	< 10	-	-	-	-
Parathion-methyl	µg/kg	10	NONE	< 10	-	-	-	-
Phorate	µg/kg	10	NONE	< 10	-	-	-	-
Phenylurea herbicides								
Isoproturon	ug/kg	10	NONE	< 10	-	-	-	-
Chlortoluron	ug/kg	10	NONE	< 10	-	-	-	-
Linuron	ug/kg	10	NONE	< 10	-	-	-	-
Diuron	ug/kg	10	NONE	< 10	-	-	-	-
Diflubenzuron	ug/kg	10	NONE	< 10	-	-	-	-
Flumeturon	ug/kg	10	NONE	< 10	-	-	-	-
Siduron	ug/kg	10	NONE	< 10	-	-	-	-
Terbuthiuron	ug/kg	10	NONE	< 10	-	-	-	-
Thidiazuron	ug/kg	10	NONE	< 10	-	-	-	-

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509034	509035	509036	509037	509038
Sample Reference				BH101	BH101	BH102	BH102	BH107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.10	1.30	0.20
Date Sampled				16/11/2015	16/11/2015	16/11/2015	17/11/2015	09/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs								
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	0.10	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	2.2	< 1.1	< 1.1	< 1.1
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	3.3	0.8	2.9	1.2	3.3
Copper (dissolved)	µg/l	0.7	ISO 17025	4.7	1.7	7.5	2.8	7.1
Lead (dissolved)	µg/l	1	ISO 17025	4.7	< 1.0	10	4.3	9.3
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.5	1.2	3.8	1.8	2.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	4.6	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.8	1.9	13	9.6	9.3

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509034	509035	509036	509037	509038
Sample Reference				BH101	BH101	BH102	BH102	BH107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.60	0.10	1.30	0.20
Date Sampled				16/11/2015	16/11/2015	16/11/2015	17/11/2015	09/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509039	509040	509041	509042	509043
Sample Reference				BH107	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	1.20	0.20	1.00
Date Sampled				09/11/2015	05/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs								
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	4.5	< 1.1	< 1.1	< 1.1	< 1.1
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	3.0	3.0	0.5	1.9	1.1
Copper (dissolved)	µg/l	0.7	ISO 17025	2.9	4.4	3.7	4.8	2.5
Lead (dissolved)	µg/l	1	ISO 17025	3.0	7.4	5.6	8.5	4.1
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.7	4.1	2.1	3.2	3.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	7.2	15	4.9	18	9.1

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509039	509040	509041	509042	509043
Sample Reference				BH107	BH109	BH109	BH110	BH110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.50	1.20	0.20	1.00
Date Sampled				09/11/2015	05/11/2015	06/11/2015	03/11/2015	03/11/2015
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509044	509045			
Sample Reference				TP104	TP104			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.50			
Date Sampled				10/11/2015	10/11/2015			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Speciated PAHs								
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	1.9			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0			
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.7	2.5			
Copper (dissolved)	µg/l	0.7	ISO 17025	6.1	1.8			
Lead (dissolved)	µg/l	1	ISO 17025	7.1	4.6			
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	2.8	3.1			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Zinc (dissolved)	µg/l	0.4	ISO 17025	17	17			

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Analytical Report Number: 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

Lab Sample Number				509044	509045			
Sample Reference				TP104	TP104			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.10	0.50			
Date Sampled				10/11/2015	10/11/2015			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/l	1	NONE	< 1.0	< 1.0			
Toluene	µg/l	1	NONE	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	NONE	< 1.0	< 1.0			
p & m-xylene	µg/l	1	NONE	< 1.0	< 1.0			
o-xylene	µg/l	1	NONE	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

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Project / Site name: University of Chichester -Bognor Regis Campus

* 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 *
508949	BH101	None Supplied	0.10	Brown clay and loam with gravel and vegetation.
508950	BH101	None Supplied	0.60	Light brown clay and sand.
508951	HP101	None Supplied	0.20	Brown loam and sand with gravel.
508952	HP102	None Supplied	0.30	Light brown clay and sand.
508953	BH102	None Supplied	0.10	Brown clay and loam with vegetation.
508954	BH102	None Supplied	1.20	Light brown clay and sand with gravel.
508955	BH103	None Supplied	1.30	Light grey clay.
508956	BH104	None Supplied	0.10	Brown clay and loam with vegetation.
508957	BH105	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
508958	BH106	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
508959	BH106	None Supplied	0.50	Brown clay and sand.
508960	BH107	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
508961	BH107	None Supplied	0.60	Brown clay and sand.
508962	BH107	None Supplied	1.10	Light grey gravel.**
508963	BH108	None Supplied	0.40	Brown clay and sand.
508964	BH109	None Supplied	0.50	Brown clay and loam with vegetation.
508965	BH109	None Supplied	1.20	Brown clay and sand.
508966	BH109	None Supplied	2.10	Brown clay and sand.
508967	BH110	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
508968	BH110	None Supplied	1.00	Brown clay and sand.
508969	TP101	None Supplied	0.10	Brown clay and loam with gravel.
508970	TP101	None Supplied	0.40	Light brown clay and sand with gravel.
508971	TP102	None Supplied	0.40	Light brown clay and sand with gravel.
508972	TP102	None Supplied	2.40	Light brown clay and sand with gravel.
508973	TP104	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
508974	TP104	None Supplied	0.50	Light brown clay and sand.
508975	TP106	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
508976	TP106	None Supplied	0.50	Light brown clay and sand with gravel.
508977	TP106	None Supplied	2.30	Grey clay.
508978	TP107	None Supplied	0.20	Brown loam and clay with gravel and vegetation.

**Non MCerts matrix

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Analytical Report Number : 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

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
BTEX and MTBE in leachates	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073W-PL	W	NONE
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
EF - Phenylurea herbicides by LC-MS/MS	Phenylurea herbicides by LC-MS/MS	In-house method		W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
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 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Organonitrogen pesticides in soil	Determination of organonitrogen pesticides in soil by GC-MS	In-house method		W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
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
TO - Acid Herbicides by LC-MS/MS	Determination of Acid herbicides in waters by LC-MS/MS	In-house method		W	NONE

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 15-82946

Project / Site name: University of Chichester -Bognor Regis Campus

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
TO - Organochlorine pesticides in soil	Determination of OCPs by extraction with hexane followed by GC-MS.	In-house method		W	NONE
TO - Organophosphorous pesticides in soil	Determination of OPPs by extraction with DCM followed by GC-MS.	In-house method		W	NONE
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
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS

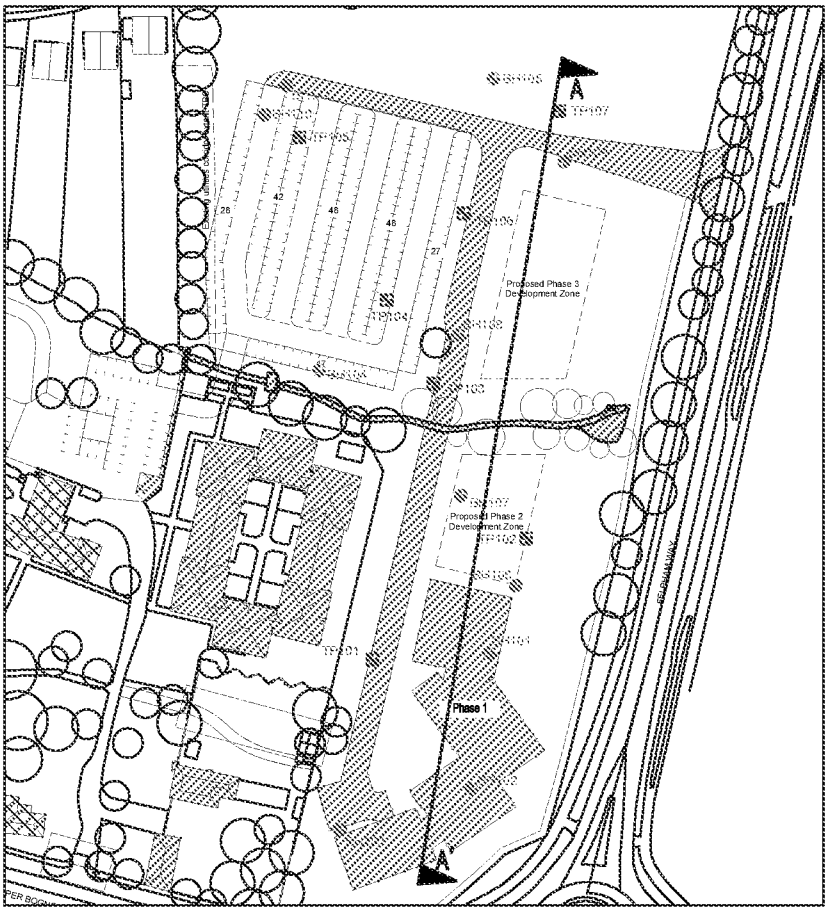
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received 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.

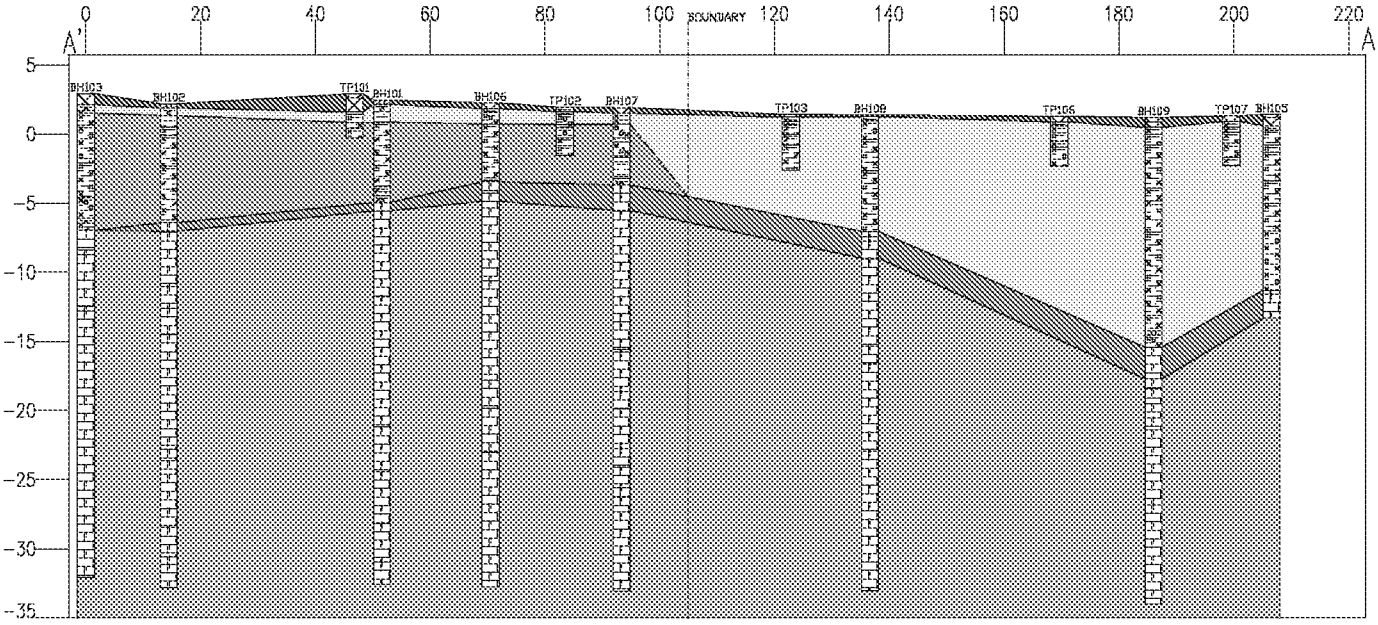
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The results included within the report are representative of the samples submitted for analysis.

Appendix F

GROUND MODEL

DO NOT SCALE





MADE GROUND/TOPSOIL
SUPERFICIAL DEPOSITS
LAMBETH CLAY
STRUCTURELESS CHALK
CHALK
TOPSOIL
SILTY SANDY CLAY
SILTY SAND
CHALK
GRANULAR MADE GROUND
CLAYEY SANDY GRAVEL
SANDY GRAVELLY CLAY
SILTY CLAY
SANDY GRAVELLY COBBLY CLAY
SILTY SANDY GRAVELLY CLAY
LIMESTONE

REV	DATE	BY	DESCRIPTION	CHK	APD
A	NOT ISSUED	XXX	ISSUED FOR		

CAD FILE: 5-1
DESIGN-DRAWN: TCS
DATE: January 2016

DRAWING STATUS:

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CLIENT: University Chichester

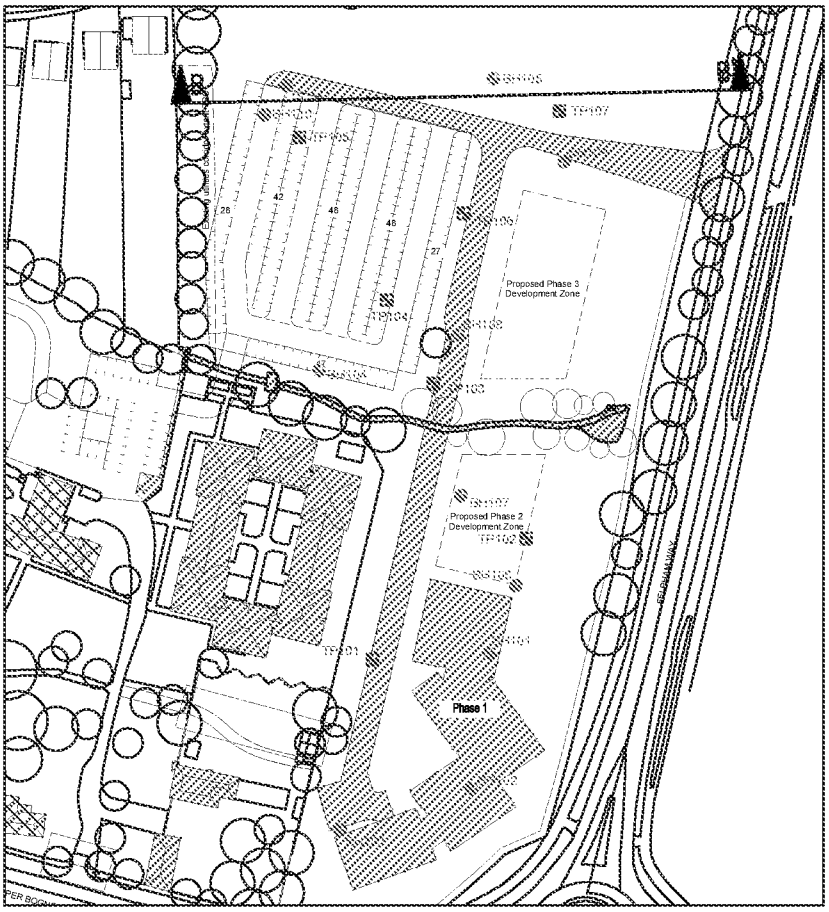
PROJECT: UNIVERSITY OF CHICHESTER
EDT PARK
BOGNOR REGIS

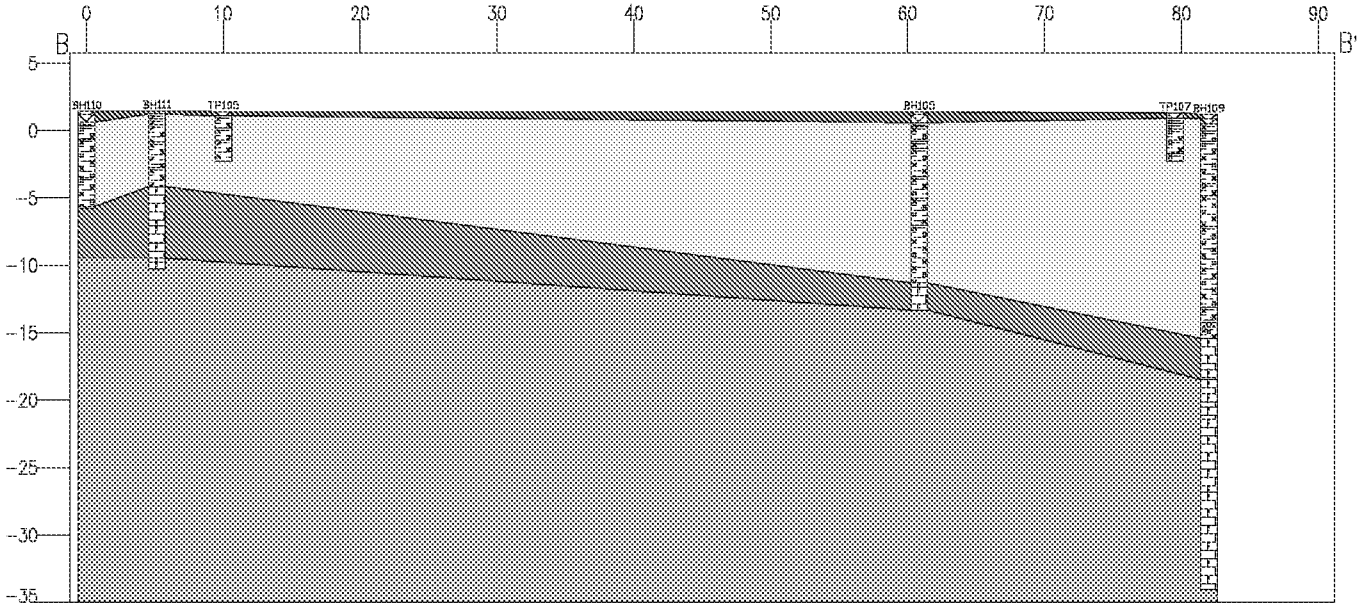
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SCALE @ A3:	CHECKED:	APPROVED:
NTS	JH	PC

PROJECT No:	DRAWING No:	REV:
70010938	5-1	A

DO NOT SCALE





MADE GROUND/TOPSOIL
SUPERFICIAL DEPOSITS
STRUCTURELESS CHALK
CHALK
GRANULAR MADE GROUND
SILTY CLAY
CLAY/SILT
SILTY SANDY GRAVELLY CLAY
SILTY SANDY CLAY
CHALK
PEAT
TOPSOIL

REV	DATE	BY	DESCRIPTION	CHK	APD
A	NOT ISSUED	XXX	ISSUED FOR		

CAD FILE: 5-2
DESIGN-DRAWN: TCS
DATE: January 2016

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CLIENT: University Chichester

PROJECT: UNIVERSITY OF CHICHESTER EDT PARK BOGNOR REGIS

TITLE: CROSS SECTION B-B'

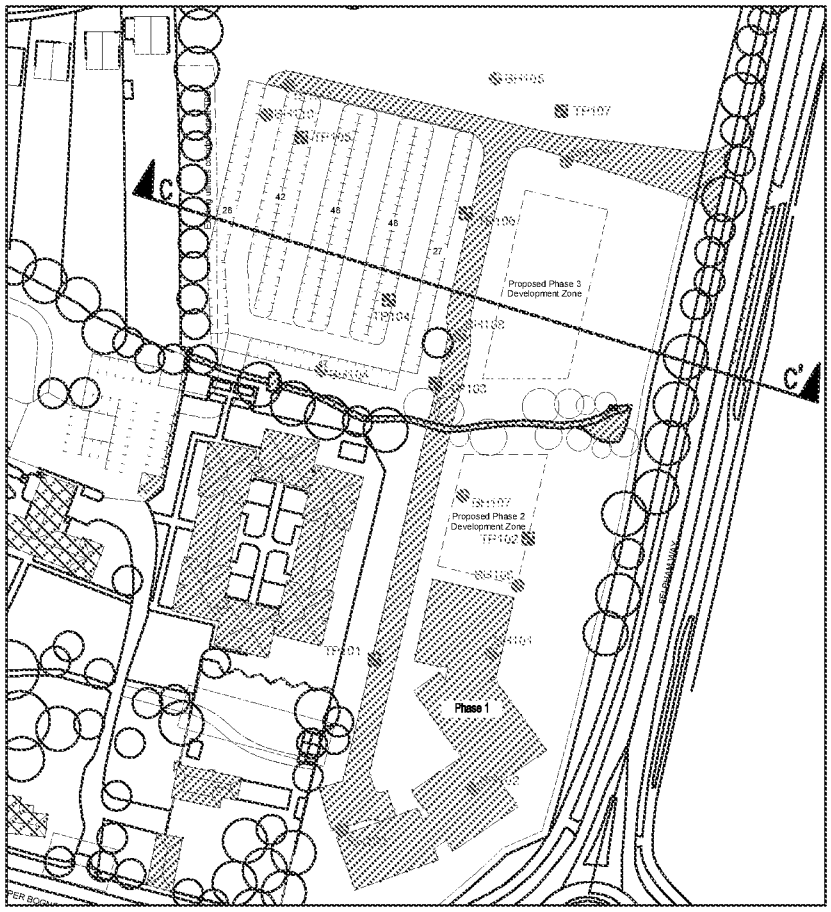
SCALE @ A3:	CHECKED:	APPROVED:
NTS	JH	PC

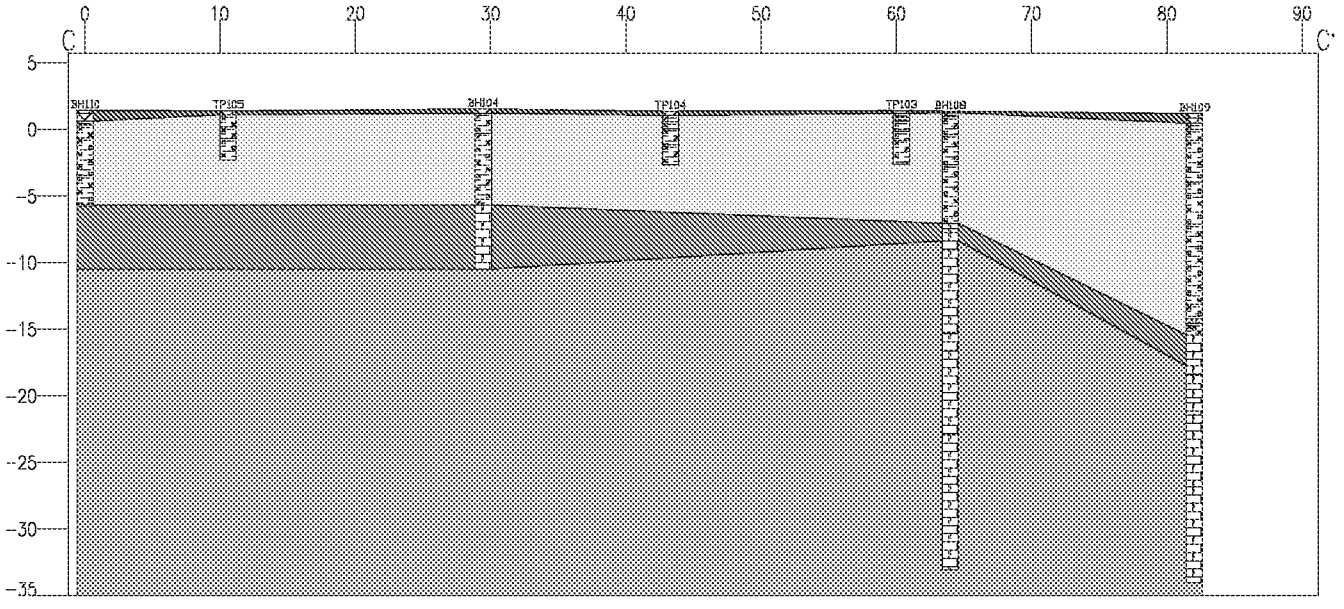
PROJECT No:	DRAWING No:	REV:
70010938	5-2	A

M:_SOIL & GROUNDWATER_PROJECTS\Geotech\70013284 - UoC Bognor Tech Park\GI\ Project Data\Ground Model\Ground cross sections\Cross section B-B' dwg

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DO NOT SCALE





MADE GROUND/TOPSOIL
SUPERFICICIAL DEPOSITS
STRUCTURELESS CHALK
CHALK
GRANULAR MADE GROUND
SANDY GRAVELLY SILT
SILTY GRAVELLY CLAY
CLAY/SILT
SILTY SANDY GRAVELLY CLAY
SILTY SANDY CLAY
CHALK
SILTY CLAY
PEAT

REV	DATE	BY	DESCRIPTION	CHK	APD
A	NOT ISSUED	XXX	ISSUED FOR	⊙	⊙

CAD FILE: 5-3
DESIGN-DRAWN: TCS
DATE: January 2016

DRAWING STATUS:

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CLIENT: University Chichester

PROJECT: UNIVERSITY OF CHICHESTER
EDT PARK
BOGNOR REGIS

TITLE: CROSS SECTION C-C'

SCALE @ A3:	CHECKED:	APPROVED:
NTS	JH	PC

PROJECT No:	DRAWING No:	REV:
70010938	5-3	A


Legend
Holes with SUPERFICIAL DEPOSITS - Depth of strata top Contours
metres
0.1 to 0.26
0.26 to 0.35
0.35 to 0.45
0.45 to 0.57
0.57 to 0.79
Fontwell Ave
Littlehampton Road
Contains Ordnance Survey data © Crown copyright and database right 2010.
00.005.01 0.02 0.03 0.04
Kilometres
Esri, HERE, DeLorme, MapmyIndia, © OpenStreet
Date Modified:
Drawn By:
Site:
ARUN DISTRICT COUNCIL BR/72/22/PL
WSP
PARSONS BRINCKERHOFF
TITLE:
University of Chichester - ETDP
FIGURE No:
FIGURE 4


Legend
Holes with LAMBETH GROUP - Depth of strata top Contours
metres
0.31 to 0.73
0.73 to 1.21
1.21 to 1.85
1.85 to 2.63
2.63 to 3.79
Fitzalan Way
Upper Bognor Road
00.005.01 0.02 0.03 0.04
Kilometres
Esri, HERE, DeLorme, MapmyIndia, © OpenStreet
WSP
PARSONS BRINCKERHOFF
TITLE:
University of Chichester - ETDP
FIGURE No:
FIGURE 3
Date Modified:
Drawn By:
Scale:
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Legend
Holes with WHITE CHALK SUBGROUP - Depth of strata top Contours
metres
5.62 to 7.55
7.55 to 8.97
8.97 to 10.69
10.69 to 12.83
12.83 to 16.56
Fontwell Ave
Littlehampton Road
00.005.01 0.02 0.03 0.04
Kilometres
Esri, HERE, DeLorme, MapmyIndia, © OpenStreet
Contains Ordnance Survey data © Crown copyright and database right 2010.
Date Modified:
Drawn By:
WSP
PARSONS BRINCKERHOFF
TITLE:
University of Chichester - ETDP
FIGURE No:
FIGURE 5
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Appendix G

HUMAN HEALTH RISK ASSESSMENT

DERIVATION OF GENERIC QUANTITATIVE ASSESSMENT CRITERIA FOR HUMAN HEALTH

APPROACH

In order to undertake a GQRA, contaminant concentrations are compared to appropriate generic assessment criteria. Current UK industry practice is to use, as first preference, UK Soil Guideline Values (SGV which are generic assessment criteria (GAC) published by the Environment Agency and derived using the Contaminated Land Exposure Assessment model (CLEA).

The CLEA model provides an approach for the assessment of chronic risks to human health from concentrations of a substance within soil.

The current version of the model (v1.06) was published in September 2009 and, following its publication, a number of SGVs were also produced. The SGVs published to date are limited to a small number of substances. Consequently, where published SGV do not exist, other GACs can be used. These include:

- GACs derived in accordance with the CLEA v1.06 model by authoritative bodies such as Chartered Institute of Environmental Health (CIEH) and Environment Industries Commission (EIC).
- In-house GAC derived in accordance with the CLEA v1.06 model and associated documents by suitably qualified and experienced consultants.

The approach adopted by WSP has been to generate GACs for chronic risks to human health in-house using CLEA v1.06. In generating GAC WSP has followed the approach presented in the following publications:

- Environment Agency (2009a) Human Health Toxicological Assessment of Contaminants in Soil Report SC050021/SR2. January 2009.
- Environment Agency (2009c) Updated Technical Background to the CLEA Model Report SC050021/SR3 January 2009.
- Environment Agency (2009b) CLEA Software (Version 1.04) Handbook (and Software). Report SC050021/SR4, January 2009.

NOTE ON C4SLS

In April 2014, screening levels representative of 'low risk' whilst still being 'strongly precautionary' were published by CL:AIRE for six substances (arsenic, benzene, cadmium, hexavalent chromium, lead and benzo(a)pyrene as a surrogate marker for polyaromatic hydrocarbons). These are known as Category 4 Screening Levels (C4SLs) and have been endorsed for use by Defra.

With the exception of lead (see Chemical Specific Assumptions), WSP's current approach to the assessment of risks to human health is to continue to evaluate minimal risk through the use of SGV and in-house derived GACs, and to use the published C4SLs as a secondary tier of assessment, until such time as additional suitable C4SLs are published and/or in-house values are derived.

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INPUT PARAMETERS

TOXICOLOGICAL DATA

Toxicological data for respective contaminants have been selected following Environment Agency guidance. Where UK guidance is available (i.e. existing published toxicological (TOX) reports) respective Health Criteria Values (HCV) have been adopted. Where no UK TOX reports are available the following references have been used (given in order of preference):

- Published UK toxicity reviews to derive HCV within Nathanial et. al, 2009 and EIC/CL:AIRE 2009;
- Other appropriate UK sources;
- Authoritative European sources;
- International Organisations (e.g. World Health Organisation); or
- Appropriate, authoritative US sources (e.g. USEPA).

FATE AND TRANSPORT DATA

Fate and transport characteristics for the contaminants for which GAC have been derived using the following hierarchy of data sources:

- Environment Agency (2008a), Compilation of Data for Priority Organic Pollutants, Report SC050021/SR7, November 2008.
- Defra/Environment Agency sources (e.g. Environment Agency, Review of the Fate and Transport of Selected Contaminants in the Soil Environment, Draft Technical Report P5- 079/TR1 (Environment Agency 2003a)).
- Published fate and transport reviews to derive HCV within Nathanial et. al, 2009 and EIC/CL:AIRE 2009.
- Other UK Government documents.
- European data sources.
- International data sources; (e.g. World Health Organisation).
- Other international sources (e.g. USEPA).

Where appropriate and where sufficient data is available, values have been adjusted to reflect a UK soil temperature of 10ºC (e.g. Kaw).

LAND USE AND EXPOSURE SCENARIOS

Our default soil type under a GQRA has been established as a Sandy Loam with a default pH of 7 and with Soil Organic Matters of 1%, 3% and 6%.

In generating GAC, the default CLEA assumptions have been applied to a range of likely human health exposure scenarios and associated critical age receptor groups including:

- Residential with Homegrown Produce Consumption
- Residential without Homegrown Produce Consumption
- Allotments
- Commercial/Industrial

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In addition, WSP has derived exposure scenarios for the following commonly encountered land uses:

- Parks
- Open Spaces

Note: These do not currently reflect those exposure scenarios set out in the C4SL report and will be updated in the near future.

OPEN SPACES LAND USE

Prior to the publication of the C4SL report, the CLEA model did not explicitly consider an Open Spaces land use. In many cases a residential end use was applied as a conservative proxy which can often lead to unnecessary remediation due to unrepresentative exposure pathways and characteristics which are not representative of an Open Spaces land use, for example indoor air inhalation of contaminant vapours.

The Open Spaces land use scenario developed by WSP is considered to be appropriate for areas generally larger than local parks which are visited less frequently and are typically a distance from residential areas (e.g. a nature reserve).

WSP has developed a set of Generic Assessment Criteria for Open Spaces end use through the development of a Conceptual Site Model for Open Space which considers the relevant exposure pathways and receptor characteristics. These criteria are considered suitably sensitive to apply to a wide range of Open Space areas. The Conceptual Site Model adopted is as follows:

- The soil ingestion and dermal exposure pathways are active;
- The inhalation of outdoor dusts and vapours pathways are active;
- The soil is a typical sandy loam type;
- The critical receptor is a female child between the ages of 0-6 years (i.e. based on a standard residential receptor) who visits the site on three occasions a fortnight and spends 3 hours on the site on each visit (the exception being during the first year of life when exposure frequency is set at 50% of the number of visits and duration); and
- Fifty per cent of the time spent on site is involved in moderate intensity activity and fifty per cent in passive activity.

A detailed breakdown of the chosen modelling characteristics can be provided on request.

It should be noted that Open Spaces criteria are not considered appropriate for use for a School Playing Fields scenario where formal and regular sports take place or for a Parks land use where visits will tend to be far more frequent.

PARKS LAND USE

As with the Open Spaces land use, prior to the publication of the C4SL report, the CLEA model did not explicitly consider a Parks land use and unncessary remediation may have occurred due to the inappropriate use of a Residential land use scenario as an overly conservative proxy.

The Parks land use scenario developed by WSP is considered to be appropriate for local parks and open areas typically located adjacent to residential housing and more frequently used than in an Open Spaces scenario.

WSP has developed a set of Generic Assessment Criteria for Parks end use through the development of a Conceptual Site Model for Parks which considers the relevant exposure pathways and receptor

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characteristics. These criteria are considered suitably sensitive to apply to a wide range of Open Space areas. The Conceptual Site Model adopted is as follows:

- The soil ingestion and dermal exposure pathways are active;
- The inhalation of outdoor dusts and vapours pathways are active;
- The soil is a typical sandy loam type;
- The critical receptor is a female child between the ages of 0-6 years (i.e. based on a standard residential receptor) who visits the site on five days a week and typically spends 1.5 hours on the site on each visit with two weeks holiday a year; and
- Two-thirds of the time spent on site is involved in moderate intensity activity and one-third in passive activity.

A detailed breakdown of the chosen modelling characteristics can be provided on request. It should be noted that Parks criteria are not considered appropriate for use for a School Playing Fields scenario where formal and regular sports take place.

CHEMICAL SPECIFIC ASSUMPTIONS

ORGANIC SUBSTANCES

GAC for organic substances have not been limited to their theoretical soil saturation although the theoretical soil saturation limit is provided and can be considered by our risk assessors in their assessment. Petroleum hydrocarbon fractions are, where appropriate, addressed based on Hazard Index and so are additionally not limited to soil saturation within their assessment.

CYANIDES

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)).

There is no current UK guidance available for calculating acute risks from free cyanide, therefore an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios. The value is given for Free or Easily Liberatable Cyanide.

LEAD

The SGV for lead was withdrawn by the EA in 2009, and in 2011 it withdrew its published TOX report in light of new scientific evidence. The C4SL for lead has been derived using the latest scientific evidence from a large human dataset. As such, no chemical-specific margin was applied in the derivation of the C4SL for lead. It may be possible for WSP to derive a GAC for lead using the same dataset and applying a chemical-specific margin, but the value is likely to be lower than UK natural background concentrations. Therefore, WSP has adopted the C4SL as its primary generic screening value for lead until such time as an alternative GAC is published by an authoritative body.

INHALATION OF GROUNDWATER-DERIVED VAPOURS

The CLEA model does not explicitly consider the potential for chronic impact to human health from indoor inhalation of concentrations of volatile vapours from dissolved phase contamination. The potential exists for this to be an important exposure route for a limited number of highly volatile contaminants. GAC have been calculated for volatile contaminants for volatilisation from groundwater using an in-house implementation of the Johnson and Ettinger model (WSP In-house Groundwater Model V1.1). The WSP model is based upon the Johnson and Ettinger model described in the CLEA guidance and has been adapted to account for a dissolved phase source through consideration of (a) partitioning from groundwater to soil vapour, and (b) transport through the capillary zone.

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The WSP spreadsheet implementation also includes checks to ensure that values generated do not exceed the pure phase solubility of a substance within water.

The target concentration in air is set based upon the Inhalation TDI or ID determined for the substance either from published Environment Agency or other sources.

TDI or ID values are usually presented in units of µg/kgbw-1 day-1 in which case the values are converted into µgm--3 based on an adult inhaling 20m³ per day and weighing 70kg (Table 3.3 SR2 (EA 2009a)). Where appropriate the TDI is adjusted to take account of the MDI.

In the absence of UK guidelines, our exposure scenario conservatively considers a groundwater source 1.0m below the base of any building i.e. a very shallow aquifer, corresponding with the depth of a soil source as adopted in the generic scenario in the CLEA model. Our default soil type under a GQRA is a Sandy Loam with the characteristics detailed below.

Parameters Used in the Derivation of WSP GAC for Inhalation of Groundwater Derived Vapours

Parameter	Definition (Units)	Value	Source
θ_a	air filled soil porosity (cm^3cm^{-3})	0.2	Environment Agency (2009c), Table 4.4 (Sandy Loam)
θ_w	water filled soil porosity(cm^3cm^{-3})	0.33	Environment Agency (2009c), Table 4.4 (Sandy Loam)
θ_T	total air and water filled soil porosity(cm^3cm^{-3})	0.53	Environment Agency (2009c), Table 4.4 (Sandy Loam)
θ_r	Residual soil water content cm^3/cm^3	0.12	Environment Agency (2009c), Table 4.4 (Sandy Loam)
θ_s	Saturated soil water content cm^3/cm^3	0.387	USEPA (2004), User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Table 4 (Sandy Loam)
α_1	Point of inflection in the water retention curve where d θ_{wc} / d h is maximal, cm^{-1}	0.0689	Environment Agency (2009c), Table 4.4 (Sandy Loam)
N	van Genuchten curve shape parameter, dimensionless	1.4708	Calculated from Equation 4.1 Environment Agency (2009c), Table 4.4 (Sandy Loam)
M	van Genuchten curve shape parameter, dimensionless	0.3201	Environment Agency (2009c), Table 4.4 (Sandy Loam)
R	Mean inter-particle pore radius (cm)	0.006	USEPA (2004), User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Table 4 (Sandy Loam)

Building specific parameters have been considered for all of the generic building types as defined in the CLEA (2009a) report:

Building Parameters

	Units	Small Terraced	Justification (based on Environment Agency 2009c)	Office (pre 1970)	Justification (based on Environment Agency 2009c)
A_B	cm^2	260000	Table 4.21 (No basement)	4240000	Table 4.21 (No basement)
L_T	cm	115	Assumes source is 1 m below the building	115	Assumes source is 1m below the building

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	Units	Small Terraced	Justification (based on Environment Agency 2009c)	Office (pre 1970)	Justification (based on Environment Agency 2009c)
Q_S	$cm^3\ s^{-1}$	25	Section 10.3, p131	150	Section 10.3, p131
L_{crack}	cm	15	Table 4.21	15	Table 4.21
A_{crack}	cm^2	423.3	Table 4.21	1647.3	Table 4.21
H	m	4.8	Table 4.21	9.6	Table 4.21
A_{foot}	m^2	28	Table 4.21	424	Table 4.21
Ex	hr^{-1}	0.5	Table 4.21	1	Table 4.21

The required contaminant specific inputs for each contaminant have been obtained from published Environment Agency sources as detailed in the table below or obtained from a literature review as described in SR7 (EA 2008).

Contaminant Specific Parameter Sources

Parameter	Units	Source/Justification
D_{air}	$m^2\ s^{-1}$	Environment Agency (2008), Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values, Ref. SC050021/SR7
D_{water}	$m^2\ s^{-1}$	Environment Agency (2008), Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values, Ref. SC050021/SR7
K_{ow}	unitless	Environment Agency (2008), Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values, Ref. SC050021/SR7
S	µg/l	Environment Agency (2008), Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values, Ref. SC050021/SR7

NON-AQUEOUS PHASE LIQUIDS

For many contaminants, no risk is calculated at concentrations below the pure phase solubility of the contaminant. Caution is applied when Non-Aqueous Phase Liquids (NAPL) are likely to be present, either where these have been detected during monitoring or where the concentration of a component in a mixture exceeds 10% of its calculated effective solubility. In such cases a separate assessment of the generation of volatile vapours from NAPL via modelling or a soil vapour survey may be required.

STATISTICAL ASSESSMENT

Where considered appropriate, the analytical data can be subject to statistical analysis using the techniques published by CL:AIRE and the Chartered Institute of Environmental Health (CIEH) in the guidance document 'Guidance on Comparing Soil Contamination Data with Critical Concentrations' (CL:AIRE 2008) as part of the package of improved UK guidance highlighted in DEFRA discussion paper 'Assessing risks from contamination – a proportionate approach. Soil Guidance Values: the Way Forward (CLAN 06/2006)'.

In identifying realistic hazards to human health exposure areas are first identified as the area across which a critical receptor is likely to be active. The application of individual or average concentrations within an exposure area, derived from a limited number of samples, may not be representative of actual risk. Consequently, to be representative of uncertainty and risk, an appropriate Confidence

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Limit of the mean for each exposure area should be applied within the assessment of risk in the context of assessment for planning purposes. However, this approach is only appropriate where non-targeted sampling has been undertaken and sufficient samples have been collected from the same population.

Planning investigations assume that the mean concentration of a contaminant in soil at the site significantly exceeds the assessment criteria until proven otherwise.

Based on the CIEH guidance, under Part 2A the key question will usually be "can we confidently say that the level of contamination on the site is high relative to the appropriate measure of risk". Therefore, in Part 2A contaminated land investigations, assume that the mean concentration of a contaminant in soil at the site does not significantly exceed the assessment criteria until proven otherwise.

Under Part 2A therefore the tests applied are required to determine if the 95th Lower Confidence Limit of the true population mean falls above the applied screening criteria. If it is identified that the 95th Lower Confidence Limit of the true mean concentration does not fall above the applied screening criteria then a further test can be applied to determine if the true mean concentration falls below the applied screening criteria on the balance of probabilities. The CIEH guidance emphasizes that "In all cases, the significance tests should be applied only if the regulator is satisfied that all sampling and testing has been carried out according to good technical practice and that the data are representative of the land under scrutiny at an appropriate scale.

In a planning context,analysis of the data is undertaken using ProUCL to determine the type of distribution and most appropriate test to calculate a 95% Upper Confidence Limit (UCL95)Once the data has been analysed ProUCL is used to determine whether the highest value represents an outlier, and, if so this outlier is removed and the statistical tests are re-run to determine the type of distribution and most appropriate test to calculate a UCL95, Once a satisfactory UCL95 has been determined this is compared to the applied GAC to determine the potential significance of the recorded concentrations.

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The following key references have been considered (this list is not exhaustive):

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