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investigate design resolve

PHASE 2 – GROUND INVESTIGATION REPORT

FOR A PROPOSED COMMERCIAL DEVELOPMENT

AT

GREENWOOD CENTRE, GREENWOOD PLACE, CAMDEN, LONDON. NW5 1LB

Prepared For

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1. INTRODUCTION

Geosphere Environmental Ltd was commissioned by the Client, Kier Construction Ltd, to undertake a Phase 2 Ground Investigation for a proposed commercial development at the Greenwood Centre, Greenwood Place, Camden, NW5 1LB.

The primary objective of this ground investigation are to:

- Assess the ground conditions at the site for use in the design of the proposed development.

These are to be achieved by:

- Undertaking an intrusive investigation of the site based on proposals provided by Campbell Reith;
- Logging, sampling and in-situ testing of the soils encountered;
- Environmental and geotechnical laboratory analysis of selected samples;
- Subsequent monitoring and sampling of ground gas and ground water levels.

A Proposed Development Plan drawn by PCKO, Drawing ref. 1213 PL 002 Rev B, was provided by the Client, and is presented within Appendix 8.

It was understood that the proposed development will comprise of the demolition of the existing structures at the site, and the construction of a new four storey community centre, including a basement, which will cover an overall approximate area of 3600m^2. A new access way, cycle parking and associated soft landscaped areas are also proposed.

2. SITE SETTINGS

2.1 Site Description

The subject site was situated in Camden, London, approximately 0.2 km to the north west of the Kentish Town Station, and may be located by National Grid Reference, (NGR), TQ 28816 85385.

A Site Location Plan, Drawing ref. 1655,GI 001/Rev 0 is included in Appendix 8 at the back of the report, and in Figure 1 below:

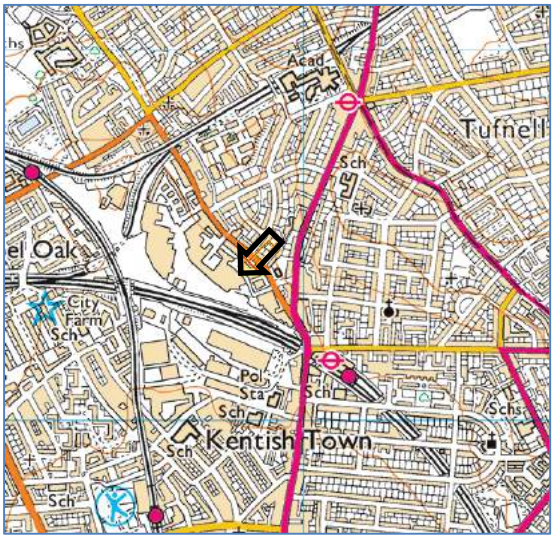

Figure 1 – Site Location Plan

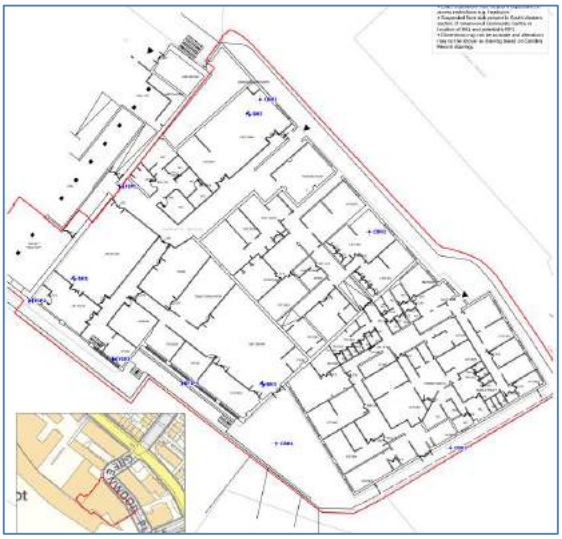

Figure 2 – Site Plan

The subject site comprised of an irregularly shaped former community centre, previously known as the Greenwood Community Centre. At the time of the investigation, the building was derelict and comprised of two adjoining single storey structures.

The former Greenwood Community Centre was of brick construction, and as mentioned above, comprised of two adjoining structures. A basement was present in the south west of the building, and a small garden area and pathway existed in the south of the site.

Ground levels were found to decrease toward the south west of the site, falling from approximately 40mAOD in the north, to approximately 34mAOD in the south.

The neighbouring building of Deane House bounded the site to the north west, and Greenwood Place ran adjacent to the eastern boundary of the site. A compound owned by Murphy and unspecified buildings bounded the site to the south and south west respectively.

A site plan Drawing ref. GIS001 – A, is presented in Figure 2 above, and within Appendix 8 of this report.

3. SITE WORKS

3.1 Methodology

This ground investigation was carried out on the basis of the practices set out in BS 10175: 2011+A1:2013, (ref. **R.1**), and BS 5930: 2015, (ref. **R.2**).

A geoenvironmental engineer from Geosphere Environmental Ltd, supervised the intrusive works and ensured safe methods of working at all times.

3.2 Scope of Investigation

Site works were carried out over a period of five weeks, between 14 March and 21 April 2016, and comprised of the following:

- The formation of two cable percussive boreholes, (BH01 and BH02), to an approximate depth of 25.0m bgl;
- The formation of two windowless sampler boreholes, (WS101 and WS102), to an approximate depth of 6.0m bgl;
- The extension of a windowless sampler borehole, WS102, by dynamic probing to an approximate depth of 12.0m bgl;
- The excavation of four hand dug or vacuum excavated foundation pits, (FIP1-FIP4), to varying depths;
- The excavation of two hand dug trial pits, (CBR3 and CBR4), and the subsequent CBR testing of encountered soils by in-situ methods with a TRL probe;
- In-situ soil logging, sampling and testing within each exploratory hole location;
- The installation of three ground gas and groundwater monitoring wells within cable percussive and windowless sampler boreholes, (BH1, BH2 and WS102) to depths of 10.0m and 6.0m bgl respectively;
- Subsequent return visits to site in order to monitor ground gas and groundwater levels;
- Installation of ground gas sampling equipment within the monitoring wells during monitoring visit 2 and the subsequent uninstallation during monitoring visit 3;
- Low flow monitoring of groundwater, where present, and subsequent sampling from monitoring wells installed during this investigation as well as the previous investigation.

3.3 Exploratory Holes

The locations and depths of the exploratory holes were defined by the consulting engineer, Campbell Reith. The positions of exploratory holes are presented on the exploratory hole location plan provided within Appendix 8 of this report, Drawing ref. 1655,GI 002/Rev 0.

The details of the methods used are provided within the following sections.

3.3.1 Cable Percussive Boreholes

Two cable percussive boreholes, (BH01 and BH02), were drilled within the existing structure using a track mounted cut down cable percussive rig to a required depth of 25.0m bgl. The original scope of the investigation included the formation of three cable percussive boreholes, however, due to restricted headroom, BH03 could not be undertaken.

Representative disturbed and undisturbed samples were collected at regular intervals throughout the boreholes. These samples included undisturbed thin wall samples, (UT100s), within clay soils, nominal disturbed, (D), samples and SPT samples. Environmental samples were of the Made Ground, and natural soils were also collected at each position.

Standard Penetration Tests, (SPTs), were undertaken at regular intervals throughout the depth of the boreholes using a split spoon sampler.

Following completion of drilling, the boreholes were backfilled to a depth of 10.0m bgl, and 50mm diameter combined ground gas and groundwater monitoring wells were installed with a gravel surround and a bentonite seal.

As the third cable percussive borehole could not be commenced, the intended BH03 position was relocated to outside of the existing structure, within the small garden area in the south of the site. Due to further access constraints, this borehole could not be commenced using cable percussive techniques, and windowless sampling and dynamic probing methods were used instead.

3.3.2 Windowless Sampling and Dynamic Probing

As mentioned above, windowless sampling and dynamic probing methods were used within the south of the site, within vicinity of the original BH03 position. A windowless sampler borehole, WS102, was drilled to 6.0m depth and disturbed samples for environmental and geotechnical purposes were collected throughout the depth of the borehole. SPTs were also undertaken every metre.

In order to achieve sufficient depth, the windowless sampling was ceased at 6.0m bgl, and dynamic probing methods were used to extend the borehole to 12.0m bgl where refusal was encountered.

Following the completion of WS102, a 50mm diameter combined ground gas and groundwater monitoring well was installed to a depth of 5.0m bgl.

A windowless sampler borehole, (WS101), was also undertaken in the proposed position of CBR1, to a depth of 6.0m bgl. Windowless sampling was undertaken in this position, as hand-digging was not possible due to the presence of a block and beam suspended floor. Disturbed samples were collected and SPTs were undertaken at regular intervals.

3.3.3 Hand-dug Pits for California Bearing Ratio Testing

Four hand pit positions, (CBR1-CBR4), were defined by the Client, for the purpose of undertaking in-situ California Bearing Ratio, (CBR), testing. Each position required surface break out, which was completed prior to undertaking the in-situ CBR tests. Block and beam suspended floors were encountered within positions CBR1 and CBR2, and therefore hand excavation and in-situ testing were deemed to be unsuitable.

Hand pits were excavated within the positions of CBR3 and CBR4, to depths of 0.60m and 0.85m bgl respectively, for the purpose of undertaking in-situ CBR tests. A CBR test by TRL Probe methods was undertaken in each pit, and the results of these tests are presented within Appendix 7 of this report.

Representative environmental samples were also collected within these pits to ensure appropriate coverage of the site.

3.3.4 Foundation Inspection Pits

Four hand dug pits were excavated at the site, in order to determine the depth and type of existing foundations.

Foundation inspection pits FIP2, FIP3 and FIP4, were hand dug to various depths to expose the top of the foundations. Hand auger methods were then used to extend the pits, in order to determine an approximate depth of the underside of the foundations. Representative samples for environmental and geotechnical purposes were collected from these pits.

Due to the nature of the ground conditions encountered within FIP1, hand excavation was not possible and vacuum excavation methods were used. A concrete obstruction, presumed to be the underlying concrete slab of the suspended floor, was encountered at a depth of 1.1m bgl, and therefore excavation was ceased.

Foundation profile sketches were produced for each foundation inspection pits, these are provided within Appendix 4 of this report.

3.4 Ground Conditions Encountered

The sequence of the strata encountered during the investigation generally confirms the anticipated geology as interpreted from the British Geological Survey (BGS) map, Sheet Number 256, Solid Edition, 1:50,000 scale, published, 2001 as well as the BGS digital mapping geology viewer, at a scale of 1:50,000.

The sequence and indicative thickness of strata are provided below:

Table 1 - Ground Conditions

Strata	Depth Encountered (mgl)		Strata Thickness (m)	Location and Composition
	From	To		
Surface Materials	0.00 - 0.20	0.10 - 0.30	0.10 to 0.30	**BH01, BH02, WS101, FIP1, FIP3, FIP2, FIP4, CBR4** - Concrete **WS102, CBR4** - Wooden decking **FIP4, CBR4** - Flexible Surfacing
Made Ground	0.10 - 0.45	2.00 - 5.00	1.90 to 4.90	Numerous layers of Made Ground of varying consistency were recorded. **FIP1, BH01, BH02:** Coarse granular Made Ground within the sub-floor void space recorded to comprise a dark red

				brown, grey and brown sand and gravel with angular to subangular brick, concrete, glass and wood fragments. **BH01, WS102, WS102, FIP2, FIP3, CBR3:** Dark brown, orange brown and grey clayey sand and gravel with brick, clinker, charcoal fragments and flint. **BH01, BH02, WS101, WS102, FIP3, FIP4, CBR4:** Dark brown and orange brown mottled silty clay with brick, concrete, clinker fragments and flint and varying sand content.
Weathered London Clay	2.00 - 5.00	10.50 - 13.00	7.50 to 8.00	**FIP4, BH01, BH02, WS101, WS102:** Orange brown and blue grey mottled fissured clay
London Clay Formation	10.50 - 13.00	>25.00	Base not proven	**BH01 and BH02:** Dark grey silty clay with occasional white fossils and occasional claystone bands

3.5 Groundwater

Groundwater seepage was recorded in FIP3 and FIP4, at a depth of 1.70 mbgl and 1.35 mbgl respectively. No groundwater was encountered in any of the other exploratory holes.

During subsequent visits to site to monitor groundwater levels, it was found that water had accumulated within monitoring wells DSC1, DSCBH2 (otherwise known as OBH2), and DSC4, (installed during the previous investigation), as well as WS102. The depths at which water was recorded is presented within section 5.2 of this report.

3.6 Visual and Olfactory Evidence of Contamination

Significant thicknesses of Made Ground were recorded during the intrusive investigation. Fragments of brick, concrete, clinker and charcoal were recorded within the Made Ground soils, and a natural organic odour with associated discolouration was noted within FIP2.

A suspected volatile odour was recorded within the Weathered London Clay in BH01 and WS101, at depths of 5.00m and 5.30m bgl respectively.

During surface break-out of the concrete slab at positions BH02 and FIP1, suspected asbestos containing materials were encountered.

4. LABORATORY TESTING

4.1 Methodology

Representative disturbed and undisturbed samples were taken at the depths shown on the exploratory hole records and dispatched to the laboratory. The exploratory hole logs are included in Appendix 4.

Numerous samples were collected for environmental purposes in amber glass jars and bulk bags and kept in a cool box with cooling aid. Geotechnical samples were recovered in plastic bulk bags, plastic tubs and undisturbed thin walled UT100 liners.

Water samples were collected from the monitoring wells during subsequent monitoring visits to site in glass bottles and vials, and kept in a cool box with cooling aid.

Ground gas samples were collected using Tenax Tubes and dispatched to the environmental laboratory. The Tenax tubes were installed into the monitoring wells during the second monitoring visit, and removed during the third monitoring visit.

All analyses of the soil samples took place in the laboratory.

4.2 Environmental Testing Suite

4.2.1 Quality Control

The environmental laboratories used, (Envirolab Ltd and Gradko International Ltd), were accredited laboratories by the United Kingdom Accreditation Service, (UKAS), and at least 50% of individual parameters are from methods pending accreditation to the Environment Agency Monitoring Certification Scheme, (MCERTS), for the range of analyses undertaken as part of this investigation. The MCERTS performance standard for the chemical testing of soil is an application of ISO 17025: 2000 specifically for the chemical testing of soil.

4.2.2 Environmental Testing Suite – Soils

The suite of chemical analyses was defined by Campbell Reith, and carried out on a number of samples. The nature of the analyses is detailed below:

- Metals screen - arsenic, cadmium, chromium, lead, mercury, selenium, boron, (water soluble), beryllium, copper, nickel, vanadium and zinc;
- Organic screen - total petroleum hydrocarbons, (TPH) – with specific carbon banding; benzene, toluene, ethylbenzene and xylenes, (BTEX); polyaromatic hydrocarbons, (PAH) – USEPA 16 suite; monohydric phenols;
- Inorganics screen – cyanide, (total), sulphate, (water soluble);
- Others - pH, organic matter, asbestos;
- Volatile Organic Compounds, (VOC) - including: benzene, toluene, ethylbenzene and xylenes, (BTEX), and chlorinated solvents;
- Semi-Volatile Organic Compounds, (SVOC) - including: phenols and polyaromatic hydrocarbons, (PAH).

A copy of the laboratory test results is included in Appendix 6 toward the end of this report.

4.2.3 Environmental Testing Suite – Water

The suite of chemical analyses was defined by Campbell Reith, and carried out on three samples. The nature of the analyses is detailed below:

- Metals screen - arsenic, cadmium, chromium, hexavalent chromium, lead, mercury, selenium, boron, (water soluble), copper, nickel, and zinc;
- Organic screen - total petroleum hydrocarbons, (TPH), polyaromatic hydrocarbons, (PAH) – USEPA 16 suite; phenol, (total);
- Inorganics screen – cyanide, (total and free), sulphate, (water soluble), sulphur and sulphide;
- Others - pH;
- Volatile Organic Compounds, (VOC);
- Semi-Volatile Organic Compounds, (SVOC).

A copy of the laboratory test results is included in Appendix 6 toward the end of this report.

4.2.4 Environmental Testing Suite – Ground Gas

The suite of chemical analyses undertaken on the ground gas samples was defined by Campbell Reith, and is detailed below:

- Top 15 VOC suite.

A copy of the laboratory test results is included in Appendix 6 toward the end of this report.

4.3 Geotechnical Testing Suite

The geotechnical testing schedule was also defined by Campbell Reith, and undertaken in accordance with BS 1377 at a UKAS accredited laboratory. The following tests were undertaken:

- Moisture content determination;
- Plasticity testing;
- pH and soluble sulphate testing;
- Total sulphur content;
- Organic content (dichromate) testing;
- Particle size distribution testing;
- Determination of undrained shear strength.

A copy of the laboratory test results is included in Appendix 7 toward the end of this report.

5. MONITORING

Ground gas and groundwater monitoring wells were installed within three exploratory holes excavated during the intrusive investigation, (BH01, BH02 and WS102). Subsequent return visits were undertaken in order to monitor ground gas and groundwater levels which had accumulated within these wells. Monitoring wells installed during the previous investigation, (DSC1, DSC4 and DSCBH2), were also monitored during these visits. The results are presented within the following sections and within Appendix 5 of this report.

5.1 Ground Gas

Ground gas monitoring was undertaken by a suitably qualified environmental consultant, using a GA2000 landfill gas analyser. The main determinants recorded were methane, (CH_4), carbon dioxide, (CO_2), oxygen, (O_2), as well as flow and groundwater levels. Levels of hydrogen sulphide, (H_2S), carbon monoxide, (CO), and volatile organic compounds, (VOC), were recorded using a Photoionization Detector, (PID).

Ground gas monitoring was carried out in accordance with current guidance, (ref. **R.3**). Three consecutive monitoring visits were undertaken over a period of four weeks and included a monitoring visit during low barometric pressure conditions.

The results and dates of the monitoring visits are presented in Tables 2 and 3 below. Graphical representation of these results are presented within Appendix 5 of this report.

Table 2 - Ground Gas Monitoring Results

Monitoring Well	Monitoring Date	Atmospheric Pressure (mb)	Flow Rate (l/hr)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)
BH01	27-04-16	1009	-0.2	<0.1	0.1	20.9
	12-05-16	996	-0.4	<0.1	0.2	19.6
	19-05-16	1004	+0.5	<0.1	0.3	20.0
BH02	27-04-16	1009	-0.2	<0.1	0.1	20.9
	12-05-16	996	-0.5	<0.1	0.1	20.9
	19-05-16	1004	+0.5	<0.1	0.1	21.2
WS102	27-04-16	1009	-0.2	<0.1	0.9	20.9
	12-05-16	996	-0.3	0.1	0.7	20.7
	19-05-16	1005	+0.5	<0.1	1.0	20.7
DCS1	27-04-16	1010	-0.1	<0.1	4.9	8.8
	12-05-16	996	-0.5	<0.1	3.7	15.8
	19-05-16	1004	+0.5	0.1	5.3	15.0
DCSBH2	27-04-16	1010	-0.1	<0.1	2.7	18.3
	12-05-16	996	-0.3	<0.1	5.2	15.3
	19-05-16	1004	+0.4	0.1	5.3	12.3
DCS4	27-04-16	nm	nm	nm	nm	nm

	12-05-16	996	-0.3	<0.1	1.0	20.2
	19-05-16	1005	+0.5	<0.1	0.9	20.6

Table 3 - Ground Gas Monitoring Results by PID

Monitoring Well	Monitoring Date	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	VOC (ppm)
BH01	27-04-16	56.0	<0.1	241.0
	12-05-16	38.0	0.1	326.0
	19-05-16	35.0	<0.1	406.0
BH02	27-04-16	1.0	<0.1	9.0
	12-05-16	<0.1	<0.1	19.0
	19-05-16	<0.1	<0.1	12.0
WS102	27-04-16	<0.1	<0.1	15.0
	12-05-16	4.0	<0.1	28.0
	19-05-16	<0.1	<0.1	<0.1
DCS1	27-04-16	<0.1	<0.1	3.0
	12-05-16	<0.1	<0.1	5.0
	19-05-16	<0.1	<0.1	3.0
DCSBH2	27-04-16	<0.1	<0.1	1.0
	12-05-16	<0.1	<0.1	3.0
	19-05-16	45.0	<0.1	23.0
DCS4	27-04-16	nm	nm	nm
	12-05-16	<0.1	<0.1	<0.1
	19-05-16	<0.1	<0.1	<0.1

5.2 Groundwater

The groundwater levels were also monitored during the monitoring visits, over a period of four weeks. The water levels and dates of monitoring are presented in the table below:

Table 4 - Groundwater Monitoring Results

Monitoring Well	Depth of Monitoring Well (mbgl)	Groundwater Encountered at (mbgl)		
		Visit 1 27/04/16	Visit 2 12/05/16	Visit 3 19/05/16
BH01	9.95	Dry	Dry	Dry
BH02	10.00	Dry	Dry	Dry
WS102	5.00	Dry	2.30	2.00
DSC1	4.10	1.43	1.40	1.75
DSCBH2	2.20	1.66	1.65	1.40
DSC4	2.15	1.97	Dry	Dry

Notes:
Dry - no groundwater encountered
n/m – not measured
0 - well filled with water

As mentioned previously, groundwater samples were collected during the second monitoring visit and dispatched to the environmental laboratory for analysis. Prior to collecting the samples, low flow monitoring was undertaken, whereby conductivity, dissolved oxygen, pH and redox potential values of the groundwater were measured. The results of this monitoring are presented in the table overleaf.

Table 5 - Low Flow Groundwater Monitoring

Monitoring Well	Depth of Monitoring Well (mbgl)	Time (mins)	Parameter			
			Dissolved Oxygen (%)	Electrical Conductivity (µs/cm)	pH	Redox Potential (mV)
WS102	5.00	0	52.3	5757	7.62	254
		5	12.5	5681	7.59	256
		10	11.3	5534	7.57	240
		15	10.7	5528	7.58	238
		20	10.0	5521	7.57	236
		25	10.1	5522	7.58	237
		30	10.0	5520	7.58	237
DSC1	4.10	0	36.5	1379	7.17	261
		5	15.0	1334	7.13	259
		10	12.6	1295	7.11	247
		15	8.9	1232	7.12	246
		20	8.7	1159	7.12	243
		25	8.8	1132	7.11	242
		30	8.8	1120	7.12	241
DSCBH2	2.20	0	21.0	1259	7.56	369
		5	4.6	1187	7.58	321
		10	10.8	1065	7.33	297
		15	11.6	1066	7.34	291
		20	9.9	899	7.32	250
		25	9.5	789	7.34	246
		30	9.8	890	7.31	245

Notes:
Dry - no groundwater encountered
n/m – not measured
0 - well filled with water

6. CONCLUSIONS

Geosphere Environmental Ltd was commissioned by the Client, Kier Construction Ltd, to undertake a Phase 2 Ground Investigation for a proposed commercial development at the Greenwood Centre, Greenwood Place, Camden.

A ground investigation was undertaken at the former Greenwood Centre, Greenwood Place, Camden. The investigation comprised of the formation of cable percussive boreholes, windowless sampler boreholes and the excavation of a number of hand dug or vacuum excavated pits to varying depths. Monitoring wells were installed within three boreholes and three subsequent monitoring visits were undertaken after the intrusive works, in order to monitor ground gas and groundwater levels and collect samples of ground gas and groundwater.

The ground conditions beneath the site were found to comprise of varying thicknesses of surface materials and Made Ground overlying cohesive deposits of the London Clay Formation. A number of samples were collected during the ground investigation, for environmental and geotechnical purposes, and dispatched to the relevant laboratories for testing.

Whilst this report provides a detailed account of the intrusive investigation and the subsequent monitoring and laboratory testing undertaken, the interpretation of the laboratory results and the ground conditions encountered is the responsibility of the consulting engineers instructed by the Client.

ADDITIONAL INFORMATION

A. CONSULTATION

During the development of a contaminated site, consultation may be required for a number of reasons with a number of Regulatory Authorities. The following provides an indication as to the most likely Authorities with which consultation may be required. The remediation strategy would have to be agreed with the following:

- Local Authority. Consultation is likely to be required with a designated Contaminated Land Officer within the Environmental Health Department, as part of the planning process. The Local Authority is generally concerned with human health risks. Some Authorities now require 'Completion Certificates' to be signed off following remediation works;
- Environment Agency. Where a site is within a groundwater protection zone or has been designated as a special site, the Environment Agency is likely to be involved to ensure that controlled waters are protected.

In addition to which, the following may also be involved in the consultation process:

National House Building Council, NHBC. Section 4.1 of the NHBC Standards requires land management to be addressed.

- Water Authorities. They are likely to impose constraints on the nature of water supply pipes that are to be laid in contaminated land. Guidance on the selection of materials for water pipes is provided by the Water Regulations Advisory Scheme, (ref. **R.4**).

Based upon the results of any consultation, there may be specific remediation requirements imposed by one or more of the aforementioned Authorities.

B. SHORT-TERM MITIGATION MEASURES

During site preparatory works of any potential development/construction works, some short-term mitigation measures will be required to protect the site workers, neighbouring sites users and the environment from the potential effects of exposure to potentially contaminated materials and soils. The majority of the proposed measures represent good practice for the construction industry and include:

- Briefing all of the site workers of the identified contamination on site, and ensuring they are aware of the potential health effects from exposure;
- Where appropriate, workers who are at potentially risk due to their working in areas of identified contamination will be provided with suitable PPE;
- Ensuring good hygiene is enforced on site and washing facilities are maintained on the site. Workers are discouraged from smoking, eating or drinking without washing their hands first;
- Ensuring site personnel report any unusual complaints, such as skin rashes, nausea, light-headedness etc. which may be attributable to the contamination on the site;
- Ensuring that dust suppression measures are put into practice where contamination is becoming airborne;

- Site drainage should be prevented from entering the adjacent watercourse;
- Where necessary contamination will be prevented from dirtying adjacent highways, a wheel-wash or other method for cleaning vehicles may be required.

Where contaminated materials are being removed from the site they should be disposed of at a suitably licensed landfill, with a 'duty of care' system in place and maintained throughout the disposal operations. The classification of contaminated soils for disposal is dependent upon the individual landfill operator, which is in term dependent upon the operator's license.

C. DISCOVERY STRATEGY

There is the possibility that other sources of contamination may be present on the site which were not detected during the investigation. Should such contamination be identified or suspected during the site clearance or ground works, these should be dealt with accordingly. A number of options are available for handling this material, which include:

- The removal from site and disposal to a suitably licensed tip of all material suspected of being contaminated;
- Short-term storage of the suspected material while undertaking verification testing for suspected contamination. The storage area should be a contained area to ensure that contamination does not migrate and affect other areas of the site. Depending upon the amounts of material under consideration, this could be either a skip or a lined area;
- Treatment of the identified contamination in accordance with the site-specific Remediation Method Statement;
- Having a suitably experienced Environmental Engineer either on-call or with a watching brief for the visual and olfactory assessment of the material, and sampling for verification purposes.

Should any anomalous materials be identified within the soils, the Regulatory Authorities should be informed and where necessary the remedial strategy agreed.

APPENDICES

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APPENDIX 1 – ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
ACM	Asbestos containing material
ADE	Average daily exposure
ASPT	Average score per Taxon
BOD	Biochemical oxygen demand
BH	Borehole
BRE	Building Research Establishment
BS	British Standard
BTEX	Benzene, Toluene, Ethyl benzene and Xylenes
CIRIA	Construction Industry Research and Information Association
CLEA	Contaminated Land Exposure Assessment
CLR	Contaminated Land Research reports
DEFRA	Department of the Environment, Food and Rural Affairs (formerly the DoE and DETR)
DETR	Department of the Environment, Transport and the Regions (formerly the DoE and now Defra)
DO	Dissolved oxygen
DoE	Department of the Environment (then DETR and later Defra)
DQRA	Detailed quantitative risk assessment (Tier 2)
EA	Environment Agency
EPH	Extractable petroleum hydrocarbons
EQI	Environmental Quality Index
EQS	Environmental Quality Standards
GQRA	Generic quantitative risk assessment (Tier 1)
mAOD	Metres above ordnance datum
mbgl	Metres below ground level
NGR	National grid reference
NHBC	National House Building Council
NRA	National Rivers Authority (now the Environment Agency)
PACM	Potentially asbestos containing material

APPENDIX 2 – REPORT LIMITATIONS AND CONDITIONS

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

The comments given in this report, and the opinions expressed herein, are based upon the readily available information collated for the report and an assessment based upon the current UK guidance, primarily the Contaminated Land Research (CLR) Reports, and most importantly CLR Report 3, (ref. **R.5**).

This report has been prepared for the sole use of the Client for the purposes described and no extended duty of care to any third party is implied or offered. Third parties using any information contained within this report do so at their own risk.

This report is prepared and written for the use stated herein; it should not be used for any other purposes without reference to Geosphere Environmental Limited. The report has been prepared in relation to the proposed end-use should another end-use been intended a further re-assessment may be required. It is likely that over time practises will improve and the relevant guidance and legislation be amended or superseded, which may necessitate a re-assessment of the site.

The report is limited to those aspects of land contamination specifically reported on and is necessarily qualified accordingly, no liability shall be accepted for other aspects which may be the result of gradual or sudden pollution incidents, past or present unrecorded land uses both on~ and off~ site and the potential for associated contaminant migration. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief.

The accuracy of any map extracts cannot be guaranteed. It is possible that different conditions existed on site, between and subsequent to the various map surveys appended.

Whilst the report may express an opinion on possible configurations of strata between or beyond exploratory holes discussed or on the possible presence of features based on visual, verbal or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

The conceptual model is based on the information available at the time of conducting this assessment and is an interpretative assessment of the conditions at the site. It should be noted that the redevelopment and/or further investigation of the site may reveal additional information and therefore alter the conceptual model and the conclusion of this report.

APPENDIX 3 – REFERENCES

R.1. British Standards Institute: BS 10175 'Code of practice for the investigation of potentially contaminated sites', BSI 2011+A1:2013.

R.2. British Standards Institute: BS 5930 'Code of practice for ground investigations', 2015.

R.3. CIRIA Report C665, 'Assessing risks posed by hazardous ground gases to buildings', 2007.

R.4. Water Regulations Advisory Scheme, Information and Guidance Note, October 2002, 'The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land'.

R.5. CLR 3, 'Documentary research on industrial sites', Report by RPS Consultants Ltd, DoE 1994.

APPENDIX 4 – EXPLORATORY HOLE LOGS

Borehole Logs

(BH01 and BH02)

Windowless Sample Hole Logs

(WS101 and WS102)

CBR Pits

(CBR3 and CBR4)

Foundation Inspection Pit Logs

(FIP1 to FIP4)

Hand Auger Logs

(HA1)

Dynamic Probe Logs

(BH01, WS102)

CLIENT: Kier Construction Ltd

PROJECT: Greenwood Centre

GROUND LEVEL m

HOLE No. BH01

LOGGED BY: LF
FIELDWORK BY: DRILLT
TEMPLATE REF: GEL AGS BH BETA

CHECKED BY: SG
DATE:

EXCAVATION METHOD: Cable Percussion (shell and auger)
Uncased to 25.5 m

GRID REFERENCE

DATES -

SHEET 1 OF 3

PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	r Mg/m³	Cu kN/m²	Additional Tests and Notes
				CONCRETE			0.00		0											No groundwater encountered during drilling
				MADE GROUND (Brown, grey and red cobbly sand and gravel of brick, concrete, clinker and flint)			0.10													
				CONCRETE			1.10		1											
				MADE GROUND (Dark brown clayey sand and gravel of angular to subangular fine to coarse brick, flint, concrete and clinker)			1.30													
									2.00	J+D	1									
				MADE GROUND (Dark brown and orange brown mottled slightly sandy slightly gravelly clay. Gravel of angular to subangular fine to medium flint and occasional brick and charcoal)			3.00		3.00	J+D	2									
				MADE GROUND (Brown, orange brown and blue grey mottled slightly gravelly fissured clay. Gravel of subangular to subrounded fine to coarse flint and occassional brick)			4.00		4.00	J+D	3									BRE SD1 suite, soil organic matter, moisture content, Atterberg limit, triaxial
				Firm brown and blue grey mottled fissured CLAY with suspected volatile odour (LONDON CLAY FORMATION)			5.00		5.00	J+D	4									BRE SD1 suite and moisture content
									6.00	J+D	5	2 3 4 4 4 6	18							Moisture content and Atterberg limit
									7.00	J+D	6									Moisture content
				Stiff brown fissured CLAY with occasional selenite crystals (LONDON CLAY FORMATION)			7.50		7.50-7.95	UT100	1									Triaxial
									8.00	J+D	7									BRE SD1 suite and moisture content
									9.00	J+D	8	2 4 5 4 6 7	22							
									10											

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH01 | SHEET 1 OF 3 | PROJECT No 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3 1.GDT 23/6/16

CLIENT: Kier Construction Ltd	PROJECT: Greenwood Centre	GROUND LEVEL m	HOLE No. BH01
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Cable Percussion (shell and auger) Uncased to 25.5 m	GRID REFERENCE DATES -	SHEET 2 OF 3 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	r Mg/m³	Cu kN/m²	Additional Tests and Notes
				Stiff brown fissured CLAY with occasional selenite crystals (LONDON CLAY FORMATION) *(continued)*					10.00	J+D	9									
									10.50-10.95	UT100	2									Triaxial
									11.00	J+D	10									
				12.00 Becoming dark brown with depth					12.00	D	11	2 3 4 5 6 8	23							
				Stiff dark grey fissured CLAY with occasional white fine fossil fragments (LONDON CLAY FORMATION)			13.00		13.00	D	12									
									13.50-13.95	UT100	3									Triaxial
									14.00	D	13									pH & sulphate
									15.00	J+D	11	2 5 5 7 6 7	25							
									16.00	J+D	12									
									16.50-16.95	UT100	4									Triaxial
									17.00	J+D D	13 18									
									18.00	D	19	2 5 6 7 10 10	33							
									19.00-19.45	UT100	5									Triaxial

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH01 | SHEET 2 OF 3 | PROJECT No. 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

CLIENT: Kier Construction Ltd	PROJECT: Greenwood Centre	GROUND LEVEL m	HOLE No. BH01
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Cable Percussion (shell and auger) Uncased to 25.5 m	GRID REFERENCE DATES -	SHEET 3 OF 3 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Stiff dark grey fissured CLAY with occasional white fine fossil fragments (LONDON CLAY FORMATION) *(continued)*					20.00	D	19									
									21.00	D	20	2 4 8 8 9 12	37							
									22.00	D	21									
									22.50-22.95	UT100	6									Triaxial
									23.00	D	22									
									24.00	D	23	2 4 7 8 9 9	33							
									25.00-25.45	UT100	7									Triaxial
							25.45													Borehole completed at 25.45m depth

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal, Response zone, Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH01 | SHEET 3 OF 3 | PROJECT No. 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

CLIENT: Kier Construction Ltd	**PROJECT: Greenwood Centre**	**GROUND LEVEL m**	**HOLE No. BH02**
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Cable Percussion (shell and auger) Uncased to 25.0 m	GRID REFERENCE DATES -	SHEET 1 OF 3 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	r Mg/m³	Cu kN/m²	Additional Tests and Notes
				CONCRETE			0.00		0.00	B	1									
				MADE GROUND (Dark red brown silty sand and gravel. Gravel of angular to subangular fine to coarse brick, concrete, wood, glass and fragments of potential asbestos containing materials)			0.10		0.30	J	1									Metals, cyanide, pH, TPH, PAH and asbestos screen
									0.50	J	2									Metals, cyanide, pH, TPH, PAH and asbestos screen
				CONCRETE			1.20													
				MADE GROUND (Orange brown and dark brown mottled gravelly silty clay. Gravel of angular to subrounded fine to coarse brick, charcoal and concrete)			1.30		1.70	J	3									Metals, cyanide, pH, TPH, PAH and asbestos screen
				Firm brown and orange brown mottled fissured CLAY (LONDON CLAY FORMATION)			2.00		2.00-2.45	D J	4	1 3 2 2	8							Moisture content, Atterberg limit, metals, cyanide, pH, TPH, PAH and asbestos screen
				2.50 Becoming gravelly with depth with subangular to subrounded fine to coarse flint					2.00 2.50	D	2	2 2			19	24	69			
				Firm orange brown and blue grey mottled fissured CLAY (LONDON CLAY FORMATION)			3.10		3.00-3.45	U100 D	3				30			1.98	80	Triaxial
									3.00 3.45-3.60	D	4				31					Moisture content
				4.00 Becoming silty and sheared with depth					4.00	D	5	1 1 2 3 4 4	13		28	26	65			Moisture content, Atterberg limit, pH & sulphate and sulphur content
				4.50 Selenite crystals present with depth					5.00-5.45	UT100 D	6				30			1.96	127	Triaxial
									5.00											
									6.00	D	7									
									6.50-6.95	D		1 3 3 4 5 5	17							
									7.00	D										
									8.00	D					27			1.98	133	Triaxial
									8.00-8.45	UT100 D	8									
									8.45											
									9.00	D	9				28					Moisture content, pH & sulphate and sulphur content
									9.50-9.95	D		2 3 5 5 7 7	24							

*WATER ▼ Standing water level; ▽ Water strikes

PIEZOMETER: Upper seal; Response zone; Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample; B Bulk disturbed sample; U Undisturbed sample; P Piston sample; J Disturbed jar sample; ES Environmental soil sample; W Water Sample

S Standard penetration test; C Cone penetration test; K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count

SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating

<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH02 | SHEET 1 OF 3 | PROJECT No. 1655,GI

CLIENT: Kier Construction Ltd	PROJECT: Greenwood Centre	GROUND LEVEL m	HOLE No. BH02
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Cable Percussion (shell and auger) Uncased to 25.0 m	GRID REFERENCE DATES -	SHEET 2 OF 3 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	r Mg/m³	Cu kN/m²	Additional Tests and Notes
									10.00	D	10									
							10.50		10.50	D	11									
				Stiff dark grey silty CLAY with occasional fine white fossil fragments and bands of claystone (LONDON CLAY FORMATION)					11.00-11.45	U100	12				27	29	76	2.02	290	Atterberg limit and triaxial
									11.00	D										
									12.00	D	13									
									12.50-12.95	D										
				13.20 - 13.60 Claystone band					13.00	D										
									14.00-14.45	D		2 3 4 5 6 7	22							pH & sulphate
									15.00	D										
									15.50-15.95	U100					30			1.98	132	Triaxial
									15.95-16.00	D										
									17.00-17.45	D		3 6 7 7 7 10	31							
									18.00	D										
									18.50-18.95	U100					28			2.00	175	Triaxial
									18.95-19.00	D										
									20											

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal / Response zone / Lower seal

SAMPLE AND TEST KEY
D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH02 | SHEET 2 OF 3 | PROJECT No. 1655,GI

CLIENT: Kier Construction Ltd	PROJECT: Greenwood Centre	GROUND LEVEL m	HOLE No. BH02
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Cable Percussion (shell and auger) Uncased to 25.0 m	GRID REFERENCE DATES -	SHEET 3 OF 3 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				Stiff dark grey silty CLAY with occasional fine white fossil fragments and bands of claystone (LONDON CLAY FORMATION) *(continued)*					20.00-20.45	D		3 7 7 8 9 9	33							
									21.00	D										
									21.50-21.95	U100					26			0.02	349	Triaxial
									21.95-22.00	D										
									23.00-23.45	D		5 7 8 11 12 15	46							
									24.00	D										
									24.50-24.95	U100					25			2.05	219	Triaxial, pH & sulphate and sulphur content
							25.00		24.95-25.00	D										

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal / Response zone / Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. BH02 | SHEET 3 OF 3 | PROJECT No. 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

CLIENT: Kier Construction Ltd	PROJECT: Greenwood Centre	GROUND LEVEL m	HOLE No. WS101
LOGGED BY: LF FIELDWORK BY: DRILLT TEMPLATE REF: GEL AGS BH BETA CHECKED BY: SG DATE:	EXCAVATION METHOD: Windowless sampler Uncased to 6.0 m	GRID REFERENCE DATES 20/04/2016 - 20/04/2016	SHEET 1 OF 1 PROJECT NO. 1655,GI

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				CONCRETE			0.00													
				SUB FLOOR VOID			0.05													
				CONCRETE			1.20													
				MADE GROUND (Grey brown slightly clayey sand and gravel. Gravel of angular to subangular fine to coarse brick, concrete and flint)			1.30		1.30	J	1									
							1.50		1.50	J	2									
				MADE GROUND (Orange brown and blue grey mottled clay. Gravel of angular to subrounded fine to coarse flint, occasional fine brick and charcoal fragments)					1.60	D	1									
									1.80	J	3									
				Firm orange brown and blue grey mottled fissured CLAY (LONDON CLAY FORMATION)			2.10		2.00	D C	2	0 0 1 2 2 2	7							
									2.50	J	4									
				3.50 Becoming silty and sheared with depth					3.00	D J C	3 5	1 1 1 2 3 3	9							
				3.80 Fine selenite crystals present with depth					4.00	D C	4	1 2 1 3 3 3	10							
				Firm becoming stiff dark brown fissured CLAY with blue grey veining. (LONDON CLAY FORMATION)			5.00		5.00	D C	5	2 2 2 3 4 4	13							
				5.30 Moderate suspected volatile odour with depth					5.30	J	6									
									5.70	J	7									
									5.80-6.00	D	6									
							6.00			C		20 23 31								

*WATER ▼ Standing water level ▽ Water strikes

PIEZOMETER Upper seal / Response zone / Lower seal

SAMPLE AND TEST KEY

D Small disturbed sample
B Bulk disturbed sample
U Undisturbed sample
P Piston sample
J Disturbed jar sample
ES Environmental soil sample
W Water Sample
S Standard penetration test
C Cone penetration test
K Permeability test

Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count
SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating
<425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. WS101 | SHEET 1 OF 1 | PROJECT No. 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3 1.GDT 23/6/16

CLIENT: Kier Construction Ltd | **PROJECT: Greenwood Centre** | **GROUND LEVEL m** | **HOLE No. WS102**

LOGGED BY: LF | CHECKED BY: SG | EXCAVATION METHOD: Windowless sampler | GRID REFERENCE | SHEET 1 OF 1

FIELDWORK BY: DRILLT | DATE: | Uncased to 6.0 m | DATES 21/04/2016 - 21/04/2016 | PROJECT NO. 1655,GI

TEMPLATE REF: GEL AGS BH BETA

Date/Time and Depth	Depth of Casing	Depth* of Water	Piez.	Description of Strata	Strata: Leg	Strata: Reduced Level	Strata: Depth	Graphical Representation: SPT 'N' Value (0 10 20 30 40)	Sampling/In-Situ Testing: Depths	Type	No.	Blows	SPT N	Laboratory Testing: <425 %	WC %	PL %	LL %	ρ Mg/m³	Cu kN/m²	Additional Tests and Notes
				WOODEN FENCING			0.00		0											
				VOID			0.03													
				FLEXIBLE SURFACING			0.20													
				CONCRETE			0.22													
				BRICK			0.45		0.50	J	1									
				MADE GROUND (Dark brown slightly clayey sand and gravel. Gravel of angular to subangular fine to coarse brick, clinker, charcoal and flint)			0.50		0.65	J	2									
							0.65		0.90	D	1									
				MADE GROUND (Dark brown and orange brown clayey sand and gravel. Gravel of angular to subangular fine to coarse brick, clinker, glass, porcelain and flint)			0.85		1	C		1 0	0							
									1.10	J	3	0 0								
				MADE GROUND (Dark brown sandy gravelly silty clay with moderate natural organic odour. Gravel of angular to subrounded fine to coarse brick, charcoal, clinker and flint)			1.40		1.40	J	4	0 0								
				MADE GROUND (Orange brown sandy gravelly clay. Gravel of angular to subrounded fine to medium brick, flint, charcoal and glass)			1.50		1.80	J	5									
				MADE GROUND (Pale orange brown and brown mottled clay with occasional fine to coarse flint and fine brick and charcoal fragments)					1.90	D	2									
									2	C		1 1	6							
									2.20	J	6	2 2								
												1 1								
				POTENTIAL MADE GROUND (Firm orange brown and pale grey mottled slightly sandy clay with black speckling and occasional flint)			2.70		2.70	J	7									
									2.90	D	3									
									3	C		1 1	11							
												2 3								
												3 3								
				Firm brown and blue grey mottled fissured CLAY (LONDON CLAY FORMATION)			3.40		3.50	J	8									
									4.00	D	4	2 3	17							
									4	C		3 4								
												5 5								
				Firm to stiff brown fissured CLAY with blue veining and occasional selenite crystals (LONDON CLAY FORMATION)			5.00		5.00	D	5	3 3	19							
									5	C		4 4								
												6 5								
									5.80	D	6									
							6.00		6	C		3 4	18							
												4 5								
												5 4								

*WATER ▼ Standing water level ▽ Water strikes | PIEZOMETER Upper seal, Response zone, Lower seal | SAMPLE AND TEST KEY: D Small disturbed sample; B Bulk disturbed sample; U Undisturbed sample; P Piston sample; J Disturbed jar sample; ES Environmental soil sample; W Water Sample; S Standard penetration test; C Cone penetration test; K Permeability test | Blows SPT blows for each 75mm increment (35) Undisturbed sample blow count | SPT N N = SPT N value (blows after seating) N*120 = Total blows/penetration including seating | <425 Sample % passing 425 micron sieve

DEPTH All depths, level and thicknesses in metres

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HOLE No. WS102 | SHEET 1 OF 1 | PROJECT No. 1655,GI

GEL AGS BH BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

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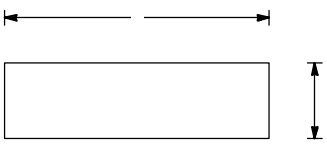
TRIAL PIT LOG

Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**CBR 3**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI			

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.10	FLEXIBLE SURFACING				
0.10-0.60	MADE GROUND (Yellow brown silty very gravelly fine to coarse sand. Gravel of brick, clinker, concrete and flint).		0.40	1J	Metals, cyanide, pH, TPH, PAH and asbestos screen
					Metals, cyanide, pH, TPH and PAH



Shoring/Support:
Stability:

All dimensions in metres Scale 1:8.33333333333333	Method Hand Method	Plant Used HAND	Checked By SG

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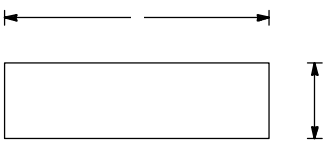
TRIAL PIT LOG

Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**CBR 4**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI			

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.20	PATIO				
0.20-0.30	CONCRETE				
0.30-0.85	MADE GROUND (Dark brown very sandy very gravelly clay with bricks, wood, glass and fragments of flexible surfacing).				Metals, cyanide, pH, TPH, PAH and asbestos screen
			0.80	1J	Metals, cyanide, pH, TPH and PAH



Shoring/Support:
Stability:

All dimensions in metres Scale 1:8.33333333333333	Method Hand Method	Plant Used HAND	Checked By SG

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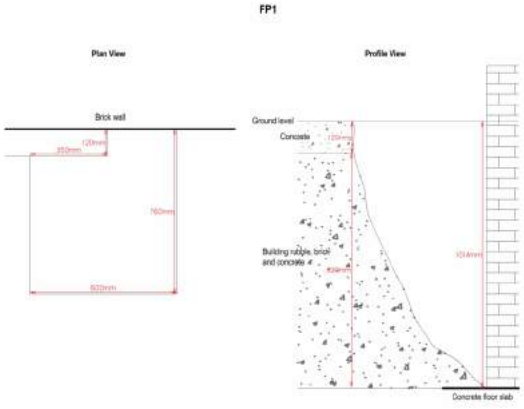
TRIAL PIT LOG

Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**FIP1**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI	01-04-16 01-04-16		

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.12	CONCRETE				
0.12-1.10	MADE GROUND (Red/brown/grey silty sand & gravel with bricks and cobbles of concrete. Gravel of angular to subangular fine to coarse brick, concrete and clinker)		0.50	1J	Metals, cyanide, pH, TPH, PAH and asbestos screen
					Hand pit completed at 1.1m due to concrete obstruction



0.76

0.6

Shoring/Support: None
Stability: Stable

All dimensions in metres Scale 1:18.3333333333333	Method Foundation Pit	Plant Used HAND	Checked By SG

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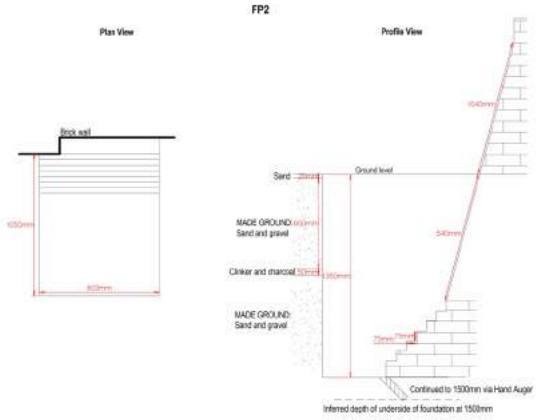
TRIAL PIT LOG

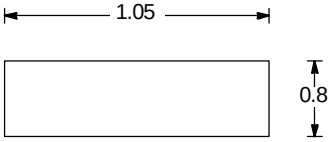
Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**FIP2**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI	01-04-16 01-04-16		

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.10	MADE GROUND (Patio slab)				
0.10-0.80	MADE GROUND (Orange brown slightly clayey sand & gravel. Gravel of angular to subrounded fine to coarse flint and brick)		0.30	1J	Metals, cyanide, pH, TPH, PAH and asbestos screen
0.80-0.86	MADE GROUND (Black clinker and charcoal)		0.80	2J	Metals, cyanide, pH, TPH, PAH and asbestos screen
0.86-1.00	MADE GROUND (Orange brown slightly clayey sand & gravel. Gravel of angular to subrounded fine to coarse flint and brick)				
1.00-1.40	MADE GROUND (Black/orange brown sand & gravel. Gravel of angular to subangular fine to coarse flint and clinker)		1.30	2D	
1.40-1.50	Dark grey/brown CLAY with occasional gravel of flint and moderate natural organic odour		1.40	1D	Hand pit extended to 1.5m via hand auger





Shoring/Support: None
Stability: Stable

All dimensions in metres Scale 1:18.3333333333333	Method Foundation Pit	Plant Used HAND	Checked By SG

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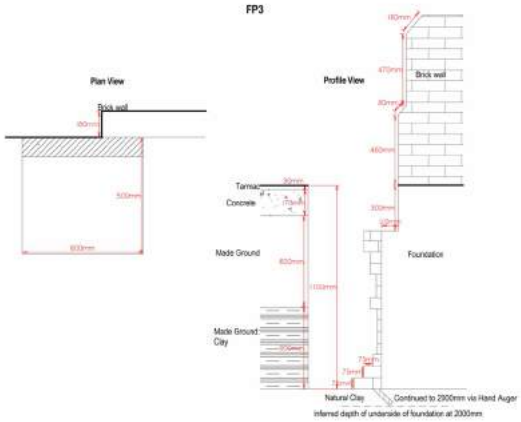
TRIAL PIT LOG

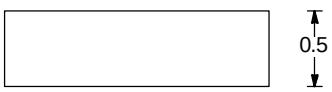
Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**FIP3**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI	01-04-16 01-04-16		

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.03	MADE GROUND (Flexible surfacing)				
0.03-0.20	CONCRETE				
0.20-1.20	MADE GROUND (Dark brown very gravelly silty fine to coarse sand. Gravel of angular to subangular fine to coarse brick, clinker and flint)		0.20	1D	Fraction organic carbon
			0.20	3J	
			0.40	1J	Metals, cyanide, pH, TPH, PAH and asbestos screen
			0.80	2J	
1.20-1.70	MADE GROUND (Orange brown/blue grey mottled gravelly sandy clay. Gravel of angular to subangular fine to medium brick and clinker)		1.20	4J	Metals, cyanide, pH, TPH and PAH
1.70-2.00	Soft to firm orange brown/blue grey mottled CLAY		1.70	3D	Seepage inflow of water at 1.7 m
					Hand pit extended to 2.0m via hand auger





Shoring/Support: None
Stability: Stable

All dimensions in metres Scale 1:18.3333333333333	Method Foundation Pit	Plant Used HAND	Checked By SG

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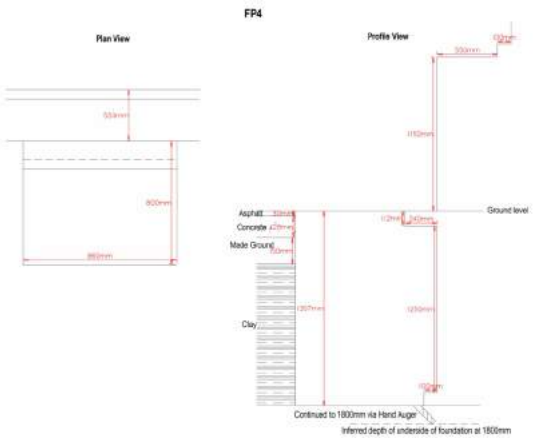
TRIAL PIT LOG

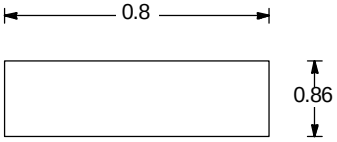
Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**FIP4**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI	01-04-16 01-04-16		

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.03	MADE GROUND (Flexible surfacing)				
0.03-0.15	CONCRETE				
0.15-0.30	Orange brown sandy CLAY with occasional gravel of flint and brick				
0.30-1.80	Orange brown/pale grey mottled CLAY with occasional gravel of flint		0.30	4D	
			0.40	3J	
			0.50-0.70	1J	Metals, cyanide, pH, TPH, PAH and asbestos screen
			0.90	1D	
			1.20	2D	
					Seepage inflow of water at 1.35 m
			1.80	3D	Hand pit extended to 1.8m via hand auger





Shoring/Support: None
Stability: Stable

All dimensions in metres Scale 1:18.3333333333333	Method Foundation Pit	Plant Used HAND	Checked By SG

GEL AGS TP BETA 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

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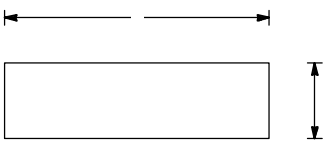
TRIAL PIT LOG

Project	Client	TRIAL PIT No
Greenwood Centre	Kier Construction Ltd	**HA1**

Job No	Date	Ground Level (m)	Grid Reference ()
1655,GI	20-04-16 20-04-16		

Fieldwork By	Logged By	Sheet
DRILLT	LF	1 of 1

Depth	DESCRIPTION	Legend	Depth	No	Remarks/Tests
0.00-0.10	PATIO SLAB				
0.10-1.40	MADE GROUND (Orange brown and black slightly clayey sand and gravel. Gravel of angular to subrounded fine to coarse flint, charcoal and brick)				
1.40-1.50	Dark grey and brown CLAY with occassional gravel of flint and moderate natural organic odour		1.40	1J	



Shoring/Support:
Stability:

All dimensions in metres Scale 1:16.6666666666667	Method Hand Auger	Plant Used HAND	Checked By SG

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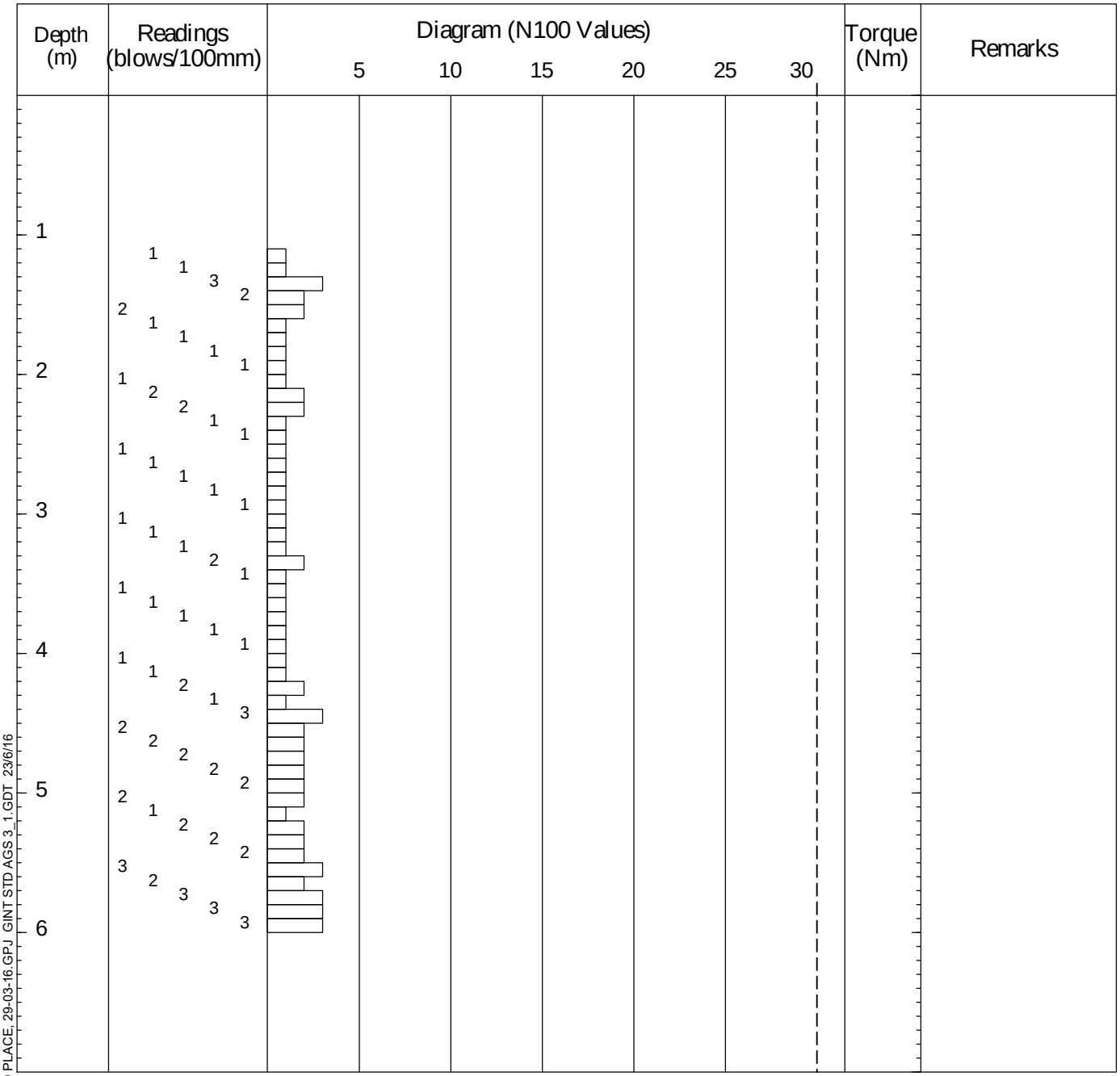
DYNAMIC PROBE LOG

Project				PROBE No
Greenwood Centre				**DP1 (BH01)**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
1655,GI	06-04-16 06-04-16			
Contractor				Sheet
Geosphere Environmental Limited				1 of 1



Hammer Wt (kg)	63.5
Hammer Drop (mm)	760
Cone Dia (mm)	50
Cone Type	DPH
Damper	None

GENERAL REMARKS

All dimensions in metres Scale 1:43.75	Client Kier Construction Ltd	Method/ Plant Used Dynamic Probe sampling	Logged By PS

AGS3 DYNAMIC PROBE 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

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Fax: 01603 298 075

DYNAMIC PROBE LOG

Project				PROBE No
Greenwood Centre				**DP2 (WS102)**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
1655,GI	21-04-16 21-04-16			
Contractor				Sheet
Geosphere Environmental Limited				1 of 2

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values) 5 10 15 20 25 30	Torque (Nm)	Remarks
1	1			
2	1 2			
3	2			
4	2			
5				
6				

Hammer Wt (kg)	63.5
Hammer Drop (mm)	760
Cone Dia (mm)	50
Cone Type	
Damper	None

GENERAL REMARKS

All dimensions in metres Scale 1:43.75	Client Kier Construction Ltd	Method/ Plant Used Dynamic Probe sampling	Logged By LF

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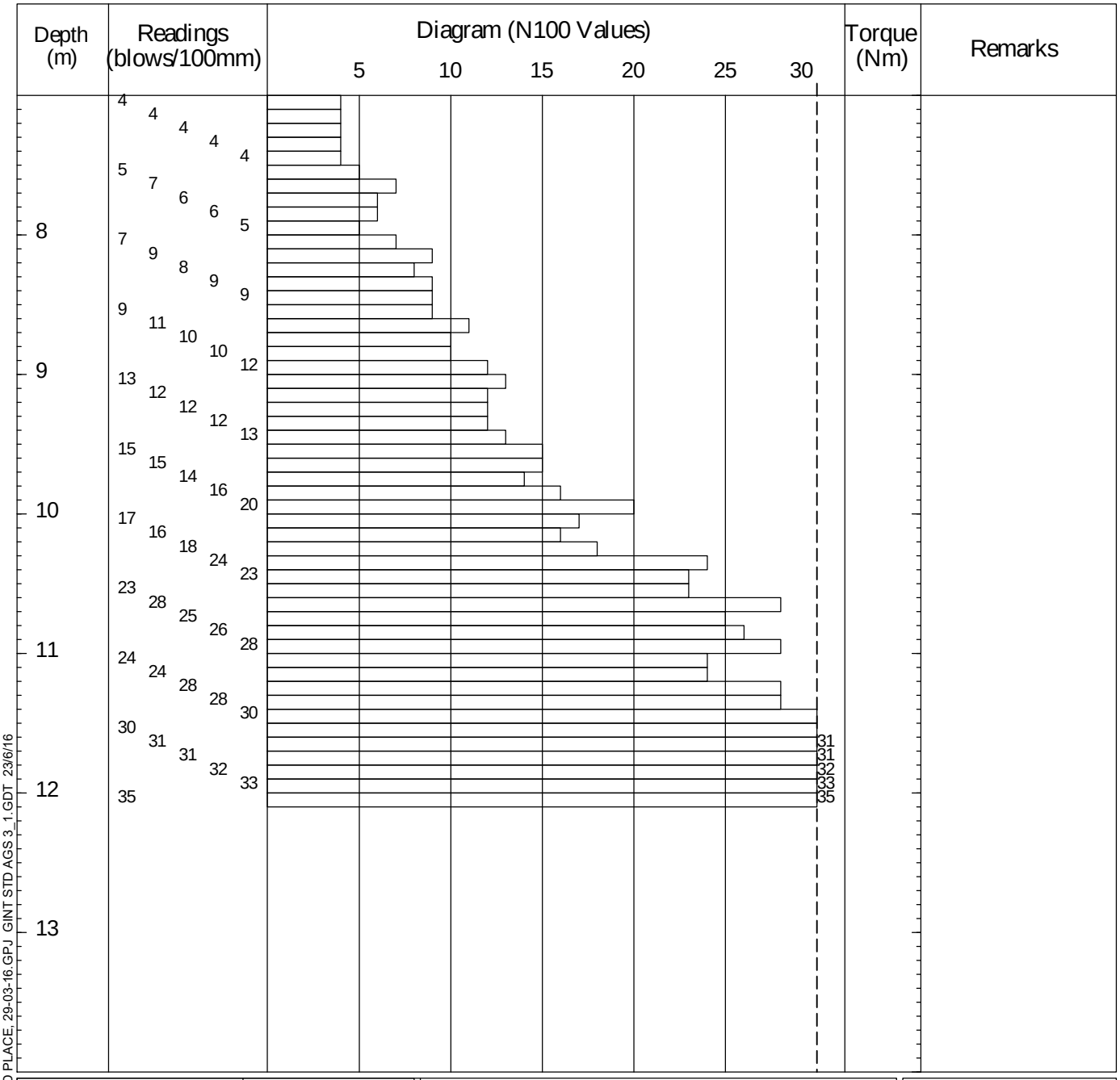
DYNAMIC PROBE LOG

Project				PROBE No
Greenwood Centre				**DP2 (WS102)**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
1655,GI	21-04-16 21-04-16			
Contractor				Sheet
Geosphere Environmental Limited				2 of 2



Hammer Wt (kg)	63.5
Hammer Drop (mm)	760
Cone Dia (mm)	50
Cone Type	
Damper	None

GENERAL REMARKS

All dimensions in metres Scale 1:43.75	Client Kier Construction Ltd	Method/ Plant Used Dynamic Probe sampling	Logged By LF

AGS3 DYNAMIC PROBE 1655,GI - GREENWOOD PLACE, 29-03-16.GPJ GINT STD AGS 3_1.GDT 23/6/16

APPENDIX 5 – GAS AND GROUNDWATER MONITORING DATA

GROUND GAS AND GROUNDWATER MONITORING DATA

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Exploratory Hole Location BH1 **Date of Installation**

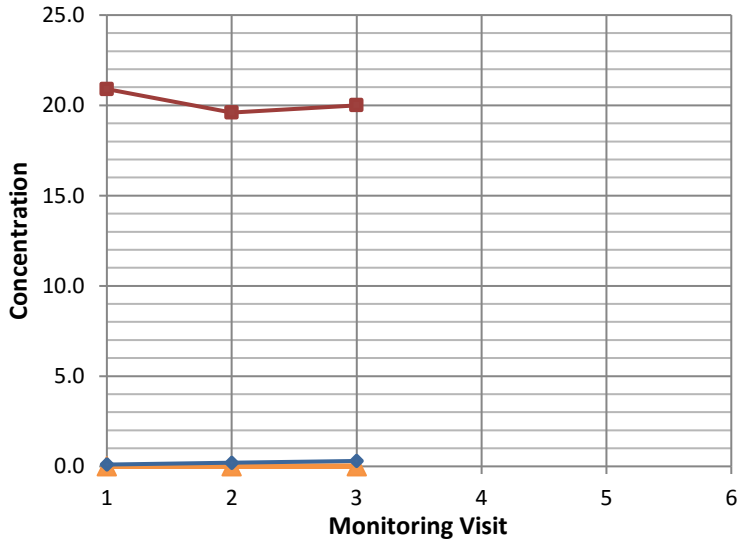
Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1009	<0.1	<2	0.1	20.9	-0.2	241.0	<0.1	56	Dry	Cold, sunny, dry and breezy
2	12/05/2016	996	<0.1	<2	0.2	19.6	-0.4	326.0	1.0	38	Dry	Cool, sunny, dry and calm
3	19/05/2016	1004	<0.1	<2	0.3	20.0	+0.5	406.0	<0.1	35	Dry	Cool, overcast, damp and calm

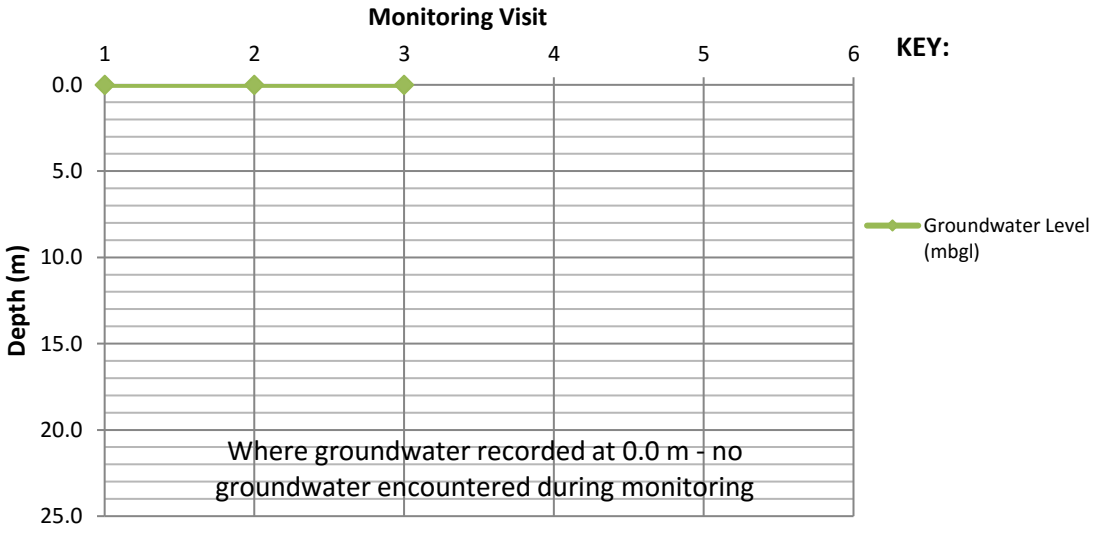
Instrument Used: GA2000 gas analyser **NOTE:**

REMARKS:

n/a Not applicable

nm Not measured





SITE
Greenwood Centre, Greenwood Place, Camden

REPORT
1655,GI

DATE
20/06/2016

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GROUND GAS AND GROUNDWATER MONITORING DATA

geosphere environmental ltd

Exploratory Hole Location BH2 **Date of Installation**

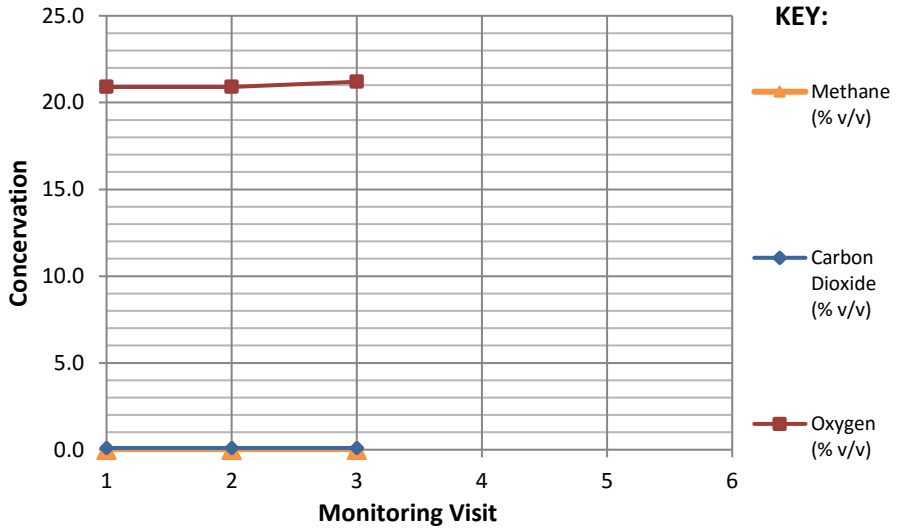
Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1009	<0.1	<2	0.1	20.9	-0.2	9.0	<0.1	1.0	Dry	Cold, sunny, dry and breezy
2	12/05/2016	996	<0.1	<2	0.1	20.9	-0.5	19.0	<0.1	<0.1	Dry	Cool, sunny, dry and calm
3	19/05/2016	1004	<0.1	<2	0.1	21.2	+0.5	12.0	<0.1	<0.1	Dry	Cool, overcast, damp and calm

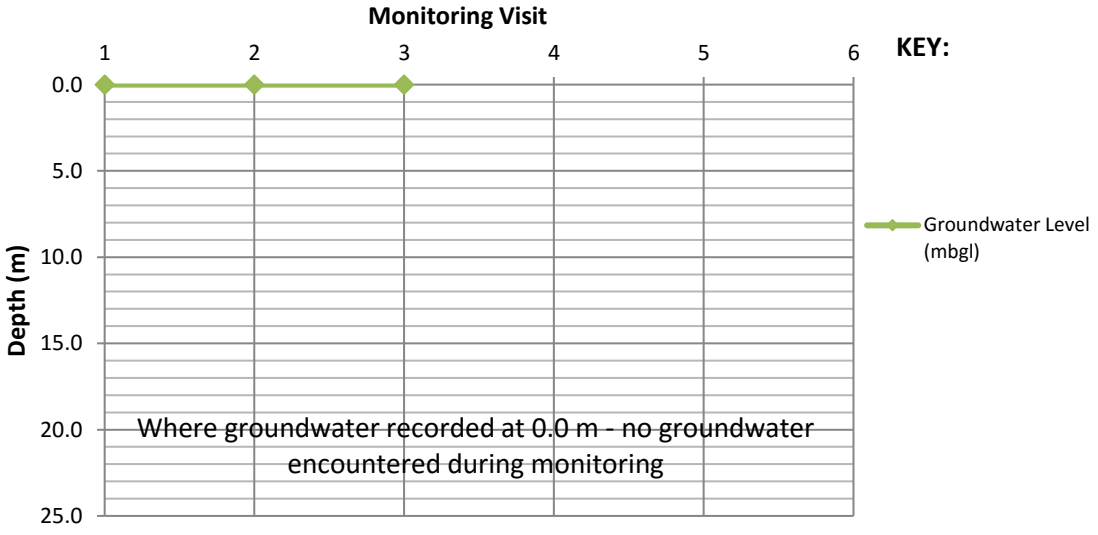
Instrument Used: GA2000 gas analyser **NOTE:**

REMARKS:

n/a Not applicable

nm Not measured





SITE
Greenwood Centre, Greenwood Place, Camden

REPORT
1655,GI

DATE
20/06/2016

GROUND GAS AND GROUNDWATER MONITORING DATA

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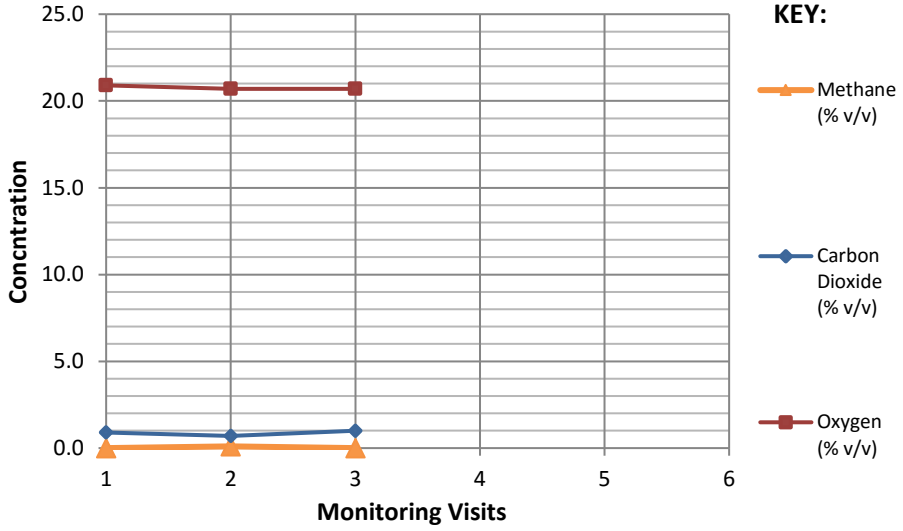
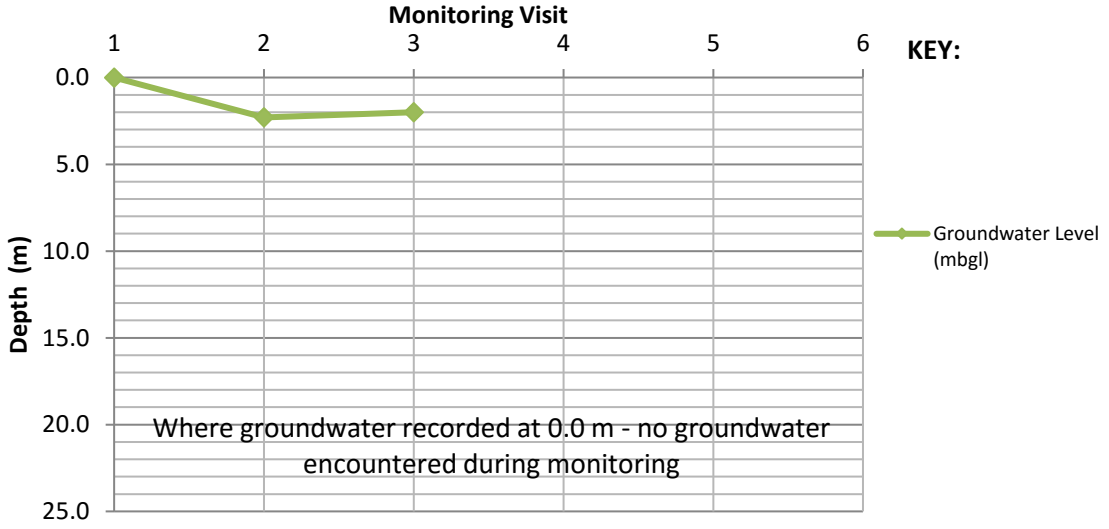
Exploratory Hole Location WS102 **Date of Installation**

Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1009	<0.1	<2	0.9	20.9	-0.2	15.0	<0.1	<0.1	Dry	Cold, sunny, dry and breezy
2	12/05/2016	996	0.1	1	0.7	20.7	-0.3	28.0	<0.1	4.0	2.30	Cool, sunny, dry and calm
3	19/05/2016	1005	<0.1	<2	1.0	20.7	+0.5	<0.1	<0.1	<0.1	2.00	Cool, overcast, damp and calm

Instrument Used: GA2000 gas analyser **NOTE:** **n/a** Not applicable

REMARKS **nm** Not measured





SITE
Greenwood Centre, Greenwood Place, Camden

REPORT 1655,GI

DATE 20/06/2016

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GROUND GAS AND GROUNDWATER MONITORING DATA

geosphere environmental ltd

Exploratory Hole Location DCS1 **Date of Installation**

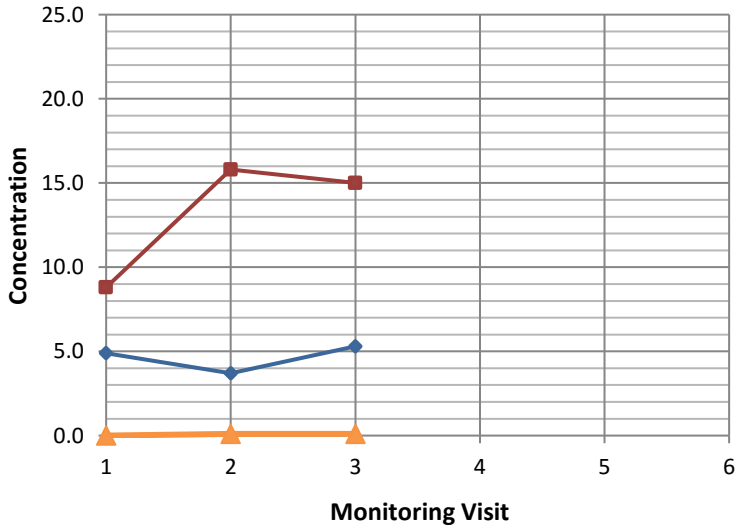
Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1010	<0.1	<2	4.9	8.8	-0.1	3.0	<0.1	<0.1	1.43	Cold, sunny, dry and breezy
2	12/05/2016	996	0.1	1	3.7	15.8	-0.5	5.0	<0.1	<0.1	1.40	Cool, sunny, dry and calm
3	19/05/2016	1004	0.1	1	5.3	15.0	+0.5	3.0	<0.1	<0.1	1.75	Cool, overcast, damp and calm

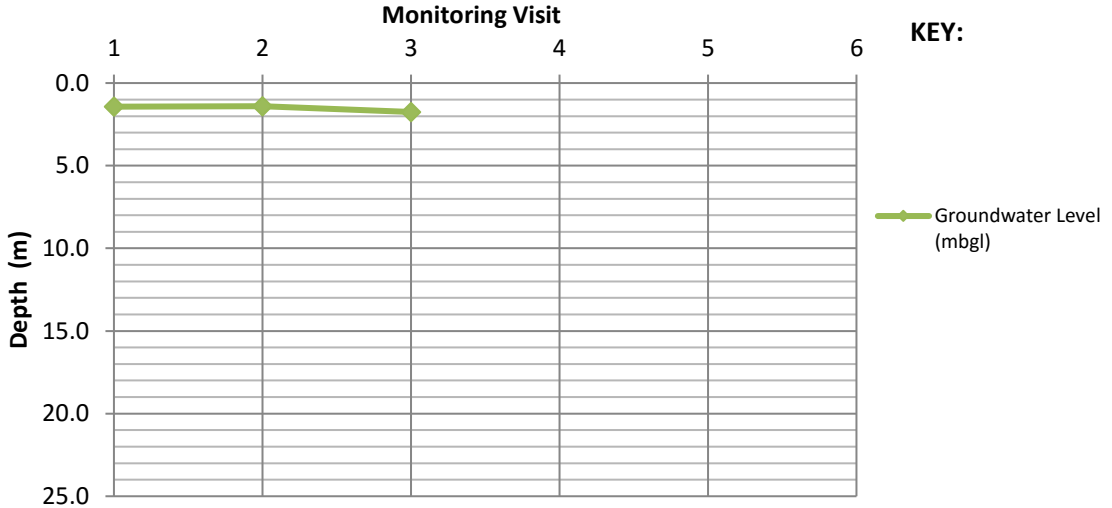
Instrument Used: GA2000 gas analyser **NOTE:**

REMARKS

n/a Not applicable

nm Not measured





SITE

Greenwood Centre, Greenwood Place, Camden

REPORT 1655,GI

DATE 20/06/2016

GROUND GAS AND GROUNDWATER MONITORING DATA

geosphere environmental ltd

Exploratory Hole Location DCSBH2 **Date of Installation**

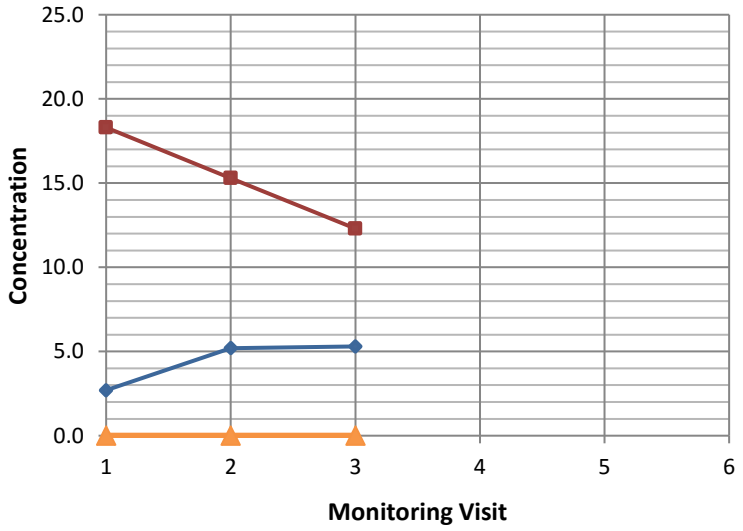
Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1010	<0.1	<2	2.7	18.3	-0.1	1.0	<0.1	<0.1	1.66	Cold, sunny, dry and breezy
2	12/05/2016	996	<0.1	<2	5.2	15.3	-0.3	3.0	<0.1	<0.1	1.65	Cool, sunny, dry and calm
3	19/05/2016	1004	<0.1	3	5.3	12.3	+0.4	23.0	<0.1	45.0	1.40	Cool, overcast, damp and calm

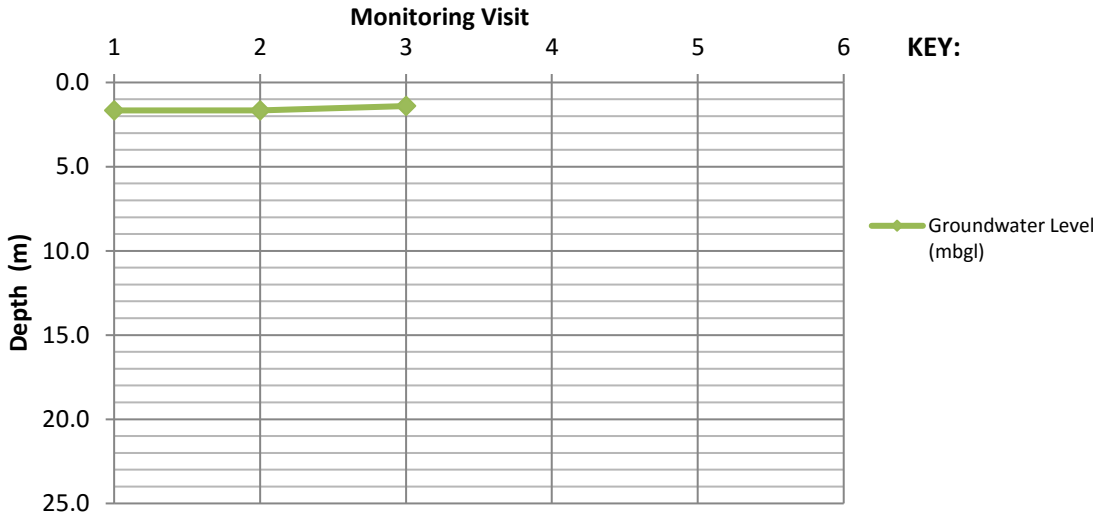
Instrument Used: GA2000 gas analyser **NOTE:**

REMARKS

n/a Not applicable

nm Not measured





SITE

Greenwood Centre, Greenwood Place, Camden

REPORT 1655,GI

DATE 20/06/2016

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GROUND GAS AND GROUNDWATER MONITORING DATA

geosphere environmental ltd

Exploratory Hole Location DCS4 **Date of Installation**

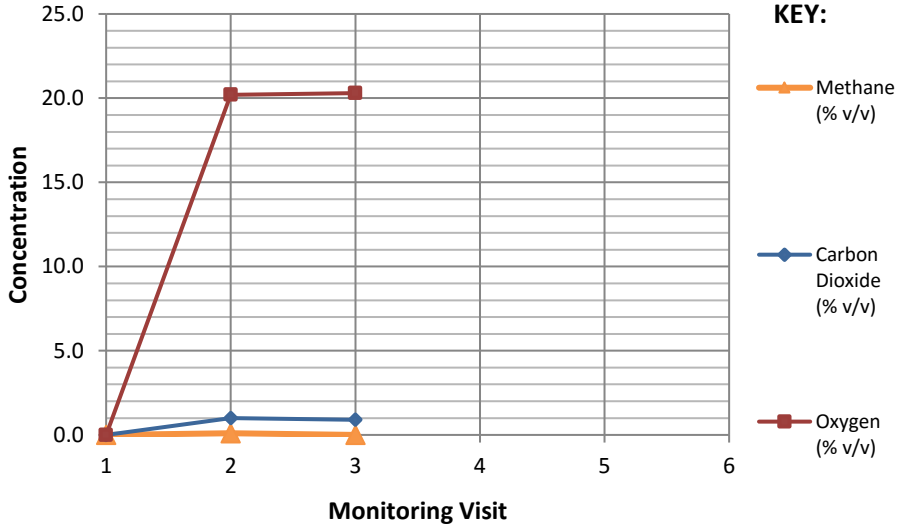
Return Visit #	Monitoring Date	Atmospheric Pressure (mb)	Methane Content (% v/v)	Methane Content (% LEL)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow Rate (l/hr)	VOC (ppm)	H2S (ppm)	CO (ppm)	Water Level (mbgl)	Comments
1	27/04/2016	1010	-	-	-	-	-	-	-	-	1.43	Cold, sunny, dry and breezy
2	12/05/2016	996	0.1	1	1.0	20.2	-0.3	<0.1	<0.1	<0.1	Dry	Cool, sunny, dry and calm
3	19/05/2016	1004	<0.1	1	0.9	20.3	+0.5	<0.1	<0.1	<0.1	Dry	Cool, overcast, damp and calm

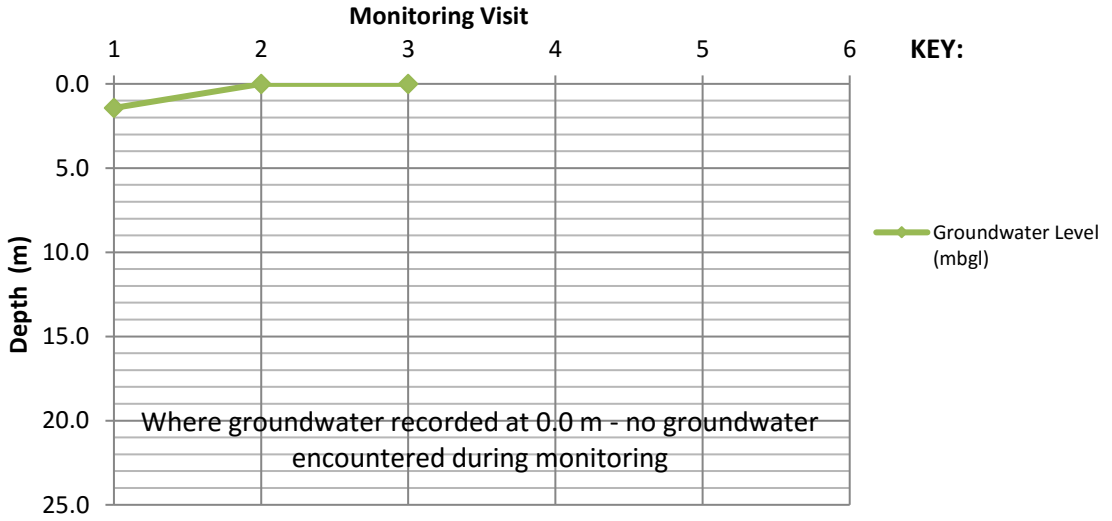
Instrument Used: GA2000 gas analyser **NOTE:**

REMARKS

n/a Not applicable

nm Not measured





SITE
Greenwood Centre, Greenwood Place, Camden

REPORT
1655,GI

DATE
20/06/2016

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APPENDIX 6 – ENVIRONMENTAL LABORATORY TEST RESULTS

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/02271
Issue Number: 1 **Date:** 25 April, 2016

Client:
Geosphere Environmental Ltd
Unit 11
Brightwell Barns
Ipswich Road
Brightwell
Ipswich
Suffolk
IP10 0BJ

Project Manager: Lianne Fountain
Project Name: Greenwood Place Resource Centre
Project Ref: 1655, GI
Order No: 1655GI
Date Samples Received: 19/04/16
Date Instructions Received: 19/04/16
Date Analysis Completed: 25/04/16

Prepared by:

Kate Ellison
Administrative Assistant

Approved by:

Lianne Bromiley
Senior Client Manager

Envirolab Job Number: 16/02271

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
% Moisture$_A$	10.6	-	14.1	18.5	18.8				% w/w	A-T-044
% Stones >10mm$_A^{\#}$	<0.1	24.8	9.6	<0.1	<0.1				% w/w	A-T-044
pH$_D^{M\#}$	11.61	-	8.92	8.02	7.85				pH	A-T-031s
Sulphate (acid soluble)$_D^{M\#}$	4400	-	5800	5600	11000				mg/kg	A-T-028s
Cyanide (total)$_A^{M\#}$	<1	-	<1	1	<1				mg/kg	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.2	-	<0.2	<0.2	<0.2				mg/kg	A-T-050s
Sulphide$_A$	<15	-	<15	<15	<15				mg/kg	A-T-S2-s
Total Organic Carbon$_D^{M\#}$	-	0.74	-	-	-				% w/w	A-T-032s
Arsenic$_D^{M\#}$	7	-	7	3	4				mg/kg	A-T-024s
Cadmium$_D^{M\#}$	0.7	-	0.7	1.0	1.0				mg/kg	A-T-024s
Copper$_D^{M\#}$	35	-	15	17	16				mg/kg	A-T-024s
Chromium$_D^{M\#}$	21	-	26	40	33				mg/kg	A-T-024s
Chromium (hexavalent)$_D$	<1	-	-	<1	-				mg/kg	A-T-040s
Lead$_D^{M\#}$	54	-	42	12	11				mg/kg	A-T-024s
Mercury$_D$	1.28	-	0.23	<0.17	0.33				mg/kg	A-T-024s
Nickel$_D^{M\#}$	16	-	21	31	31				mg/kg	A-T-024s
Selenium$_D$	<1	-	<1	<1	2				mg/kg	A-T-024s
Vanadium$_D^{M\#}$	27	-	-	56	-				mg/kg	A-T-024s
Zinc$_D^{M\#}$	43	-	41	55	52				mg/kg	A-T-024s

Envirolab Job Number: 16/02271

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	Chrysotile	NAD	-	-	-					A-T-045
Asbestos Matrix (microscope)$_A$	Loose Fibres	-	-	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	-	-	-					Gravimetry

Envirolab Job Number: 16/02271

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	-	<0.01	<0.01	<0.01				mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	-	<0.01	<0.01	<0.01				mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	-	<0.02	<0.02	<0.02				mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	-	<0.04	<0.04	<0.04				mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	-	<0.04	<0.04	<0.04				mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	-	<0.05	<0.05	<0.05				mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	-	<0.05	<0.05	<0.05				mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	-	<0.07	<0.07	<0.07				mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	-	<0.06	<0.06	<0.06				mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	-	<0.04	<0.04	<0.04				mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	-	<0.08	<0.08	<0.08				mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	-	<0.01	<0.01	<0.01				mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	-	<0.03	<0.03	<0.03				mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	-	<0.03	<0.03	<0.03				mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.07	-	<0.03	<0.03	<0.03				mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	-	<0.07	<0.07	<0.07				mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	<0.08	-	<0.08	<0.08	<0.08				mg/kg	A-T-019s
TPH Banded 1										
>C6-C8$_A^{\#}$	<10	-	<10	<10	<10				mg/kg	A-T-007s
>C8-C10$_A^{\#}$	<10	-	<10	<10	<10				mg/kg	A-T-007s
>C10-C12$_A^{\#}$	<10	-	<10	<10	<10				mg/kg	A-T-007s
>C12-C16$_A^{\#}$	<10	-	<10	<10	<10				mg/kg	A-T-007s
>C16-C21$_A^{\#}$	<10	-	<10	<10	<10				mg/kg	A-T-007s
>C21-C40$_A$	23	-	<10	<10	<10				mg/kg	A-T-007s
TPH Total (sum of bands) (>C6-C40)$_A$	23	-	<10	<10	<10				mg/kg	A-T-007s

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
SVOC										
Hexachlorobenzene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Diethyl phthalate$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Dimethyl phthalate$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Dibenzofuran$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Carbazole$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Butylbenzyl phthalate $_A$	-	-	-	<100	-				µg/kg	A-T-052s
Bis(2-ethylhexyl)phthalate$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Bis(2-chloroethoxy)methane$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Bis(2-chloroethyl)ether$_A$	-	-	-	<100	-				µg/kg	A-T-052s
4-Nitrophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
4-Methylphenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
4-Chloro-3-methylphenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2-Nitrophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2-Methylphenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2-Chlorophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,6-Dinitrotoluene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,4-Dinitrotoluene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,4-Dimethylphenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,4-Dichlorophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,4,6-Trichlorophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2,4,5-Trichlorophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2-Chloronaphthalene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
2-Methylnaphthalene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Bis(2-chloroisopropyl)ether$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Phenol $_A$	-	-	-	<100	-				µg/kg	A-T-052s
Pentachlorophenol$_A$	-	-	-	<100	-				µg/kg	A-T-052s
n-Nitroso-n-dipropylamine$_A$	-	-	-	<100	-				µg/kg	A-T-052s
n-Dioctylphthalate$_A$	-	-	-	<100	-				µg/kg	A-T-052s
n-Dibutylphthalate$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Nitrobenzene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Isophorone$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Hexachloroethane$_A$	-	-	-	<100	-				µg/kg	A-T-052s

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
Hexachlorocyclopentadiene$_A$	-	-	-	<100	-				µg/kg	A-T-052s
Perylene$_A$	-	-	-	<100	-				µg/kg	A-T-052s

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
VOC										
Dichlorodifluoromethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Chloromethane$_A^\#$	-	-	-	<10	-				µg/kg	A-T-006s
Vinyl Chloride$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Bromomethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Chloroethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Trichlorofluoromethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,1-Dichloroethene$_A^\#$	-	-	-	12	-				µg/kg	A-T-006s
Carbon Disulphide$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Dichloromethane $_A$	-	-	-	21	-				µg/kg	A-T-006s
trans 1,2-Dichloroethene$_A^\#$	-	-	-	4	-				µg/kg	A-T-006s
1,1-Dichloroethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
cis 1,2-Dichloroethene$_A^\#$	-	-	-	15	-				µg/kg	A-T-006s
2,2-Dichloropropane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Bromochloromethane$_A^\#$	-	-	-	<5	-				µg/kg	A-T-006s
Chloroform$_A^\#$	-	-	-	85	-				µg/kg	A-T-006s
1,1,1-Trichloroethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,1-Dichloropropene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Carbon Tetrachloride$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,2-Dichloroethane$_A^\#$	-	-	-	29	-				µg/kg	A-T-006s
Benzene $_A^\#$	-	-	-	4	-				µg/kg	A-T-006s
Trichloroethene$_A^\#$	-	-	-	*21100*	-				µg/kg	A-T-006s
1,2-Dichloropropane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Dibromomethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Bromodichloromethane$_A^\#$	-	-	-	<10	-				µg/kg	A-T-006s
cis 1,3-Dichloropropene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Toluene $_A^\#$	-	-	-	10	-				µg/kg	A-T-006s
trans 1,3-Dichloropropene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,1,2-Trichloroethane$_A^\#$	-	-	-	243	-				µg/kg	A-T-006s
1,3-Dichloropropane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Tetrachloroethene$_A^\#$	-	-	-	*3690*	-				µg/kg	A-T-006s
Dibromochloromethane$_A^\#$	-	-	-	<3	-				µg/kg	A-T-006s
1,2-Dibromoethane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
Chlorobenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,1,1,2-Tetrachloroethane$_A$	-	-	-	6	-				µg/kg	A-T-006s
Ethylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
m & p Xylene$_A^\#$	-	-	-	4	-				µg/kg	A-T-006s
o-Xylene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Styrene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Bromoform$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Isopropylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,1,2,2-Tetrachloroethane$_A$	-	-	-	2	-				µg/kg	A-T-006s
1,2,3-Trichloropropane$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
Bromobenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
n-Propylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
2-Chlorotoluene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,3,5-Trimethylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
4-Chlorotoluene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
tert-Butylbenzene$_A^\#$	-	-	-	<2	-				µg/kg	A-T-006s
1,2,4-Trimethylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
sec-Butylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
4-Isopropyltoluene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,3-Dichlorobenzene$_A$	-	-	-	<1	-				µg/kg	A-T-006s
1,4-Dichlorobenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
n-Butylbenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,2-Dichlorobenzene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,2-Dibromo-3-chloropropane$_A$	-	-	-	<2	-				µg/kg	A-T-006s
1,2,4-Trichlorobenzene$_A$	-	-	-	<3	-				µg/kg	A-T-006s
Hexachlorobutadiene$_A^\#$	-	-	-	<1	-				µg/kg	A-T-006s
1,2,3-Trichlorobenzene$_A$	-	-	-	<3	-				µg/kg	A-T-006s

Envirolab Job Number: 16/02271

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02271/1	16/02271/2	16/02271/3	16/02271/4	16/02271/5				Units	Method ref
Client Sample No	J1	J2	J3	J4	J5					
Client Sample ID	BH01	BH01	BH01	BH01	BH01					
Depth to Top	2.00	3.00	4.00	5.00	6.00					
Depth To Bottom										
Date Sampled	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16	12-Apr-16					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	5A	3	3					
TPH UKCWG										
Ali >C5-C6$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Ali >C6-C8$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Ali >C8-C10$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Ali >C10-C12$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Ali >C12-C16$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Ali >C16-C21$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Ali >C21-C35$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Ali >C35-C44$_A$	-	-	-	<0.1	-				mg/kg	A-T-023s
Total Aliphatics$_A$	-	-	-	<0.1	-				mg/kg	A-T-023s
Aro >C5-C7$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Aro >C7-C8$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Aro >C8-C9$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Aro >C9-C10$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
Aro >C10-C12$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Aro >C12-C16$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Aro >C16-C21$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Aro >C21-C35$_A^{\#}$	-	-	-	<0.1	-				mg/kg	A-T-023s
Aro >C35-C44$_A$	-	-	-	<0.1	-				mg/kg	A-T-023s
Total Aromatics$_A$	-	-	-	<0.1	-				mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	-	-	-	<0.1	-				mg/kg	A-T-023s
BTEX - Benzene$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
BTEX - Toluene$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
BTEX - o Xylene$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s
MTBE$_A^{\#}$	-	-	-	<0.01	-				mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

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All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.
All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supercedes any "D" subscripts.
Superscript "M" indicates method accredited to MCERTS.
If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 16/02115
Issue Number: 1 **Date:** 15 April, 2016

Client: Geosphere Environmental Ltd
Unit 11
Brightwell Barns
Ipswich Road
Brightwell
Ipswich
Suffolk
IP10 0BJ

Project Manager: Lianne Fountain
Project Name: Greenwood Place Resource Centre
Project Ref: 1655, GI
Order No: 1655, GI
Date Samples Received: 08/04/16
Date Instructions Received: 11/04/16
Date Analysis Completed: 15/04/16

Prepared by:

Danielle Brierley
Administrative Assistant

Approved by:

John Gustafson
Director

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UKAS TESTING 1247

Envirolab Job Number: 16/02115

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02115/1	16/02115/2	16/02115/3						Units	Method ref
Client Sample No	J1	J3	J4							
Client Sample ID	FIP1	FIP3	FIP3							
Depth to Top	0.50	0.20	1.20							
Depth To Bottom										
Date Sampled	01-Apr-16	06-Apr-16	06-Apr-16							
Sample Type	Solid	Soil - ES	Soil - ES							
Sample Matrix Code	7	5AB	5AB							
% Stones >10mm$_A^{\#}$	<0.1	29.2	10.4						% w/w	A-T-044
pH$_D^{M\#}$	12.22	-	8.76						pH	A-T-031s
Cyanide (total)$_A^{M\#}$	<1	-	<1						mg/kg	A-T-042sTCN
Fraction of organic carbon$_D^{\#}$	-	0.0110	-						N/A	A-T-032 FOC
Arsenic$_D^{M\#}$	5	-	6						mg/kg	A-T-024s
Cadmium$_D^{M\#}$	0.5	-	1.0						mg/kg	A-T-024s
Copper$_D^{M\#}$	6	-	29						mg/kg	A-T-024s
Chromium$_D^{M\#}$	21	-	44						mg/kg	A-T-024s
Lead$_D^{M\#}$	14	-	38						mg/kg	A-T-024s
Mercury$_D$	0.41	-	<0.17						mg/kg	A-T-024s
Nickel$_D^{M\#}$	14	-	31						mg/kg	A-T-024s
Selenium$_D$	2	-	<1						mg/kg	A-T-024s
Zinc$_D^{M\#}$	28	-	84						mg/kg	A-T-024s
TPH total (>C6-C40)$_A$	<10	-	<10						mg/kg	A-T-007s

Envirolab Job Number: 16/02115

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02115/1	16/02115/2	16/02115/3						Units	Method ref
Client Sample No	J1	J3	J4							
Client Sample ID	FIP1	FIP3	FIP3							
Depth to Top	0.50	0.20	1.20							
Depth To Bottom										
Date Sampled	01-Apr-16	06-Apr-16	06-Apr-16							
Sample Type	Solid	Soil - ES	Soil - ES							
Sample Matrix Code	7	5AB	5AB							
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	-	-							A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	-	-							Gravimetry

Envirolab Job Number: 16/02115

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/02115/1	16/02115/2	16/02115/3						Units	Method ref
Client Sample No	J1	J3	J4							
Client Sample ID	FIP1	FIP3	FIP3							
Depth to Top	0.50	0.20	1.20							
Depth To Bottom										
Date Sampled	01-Apr-16	06-Apr-16	06-Apr-16							
Sample Type	Solid	Soil - ES	Soil - ES							
Sample Matrix Code	7	5AB	5AB							
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	-	<0.01						mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	-	<0.01						mg/kg	A-T-019s
Anthracene$_A^{M\#}$	0.03	-	<0.02						mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.07	-	<0.04						mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.05	-	<0.04						mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.07	-	<0.05						mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	-	<0.05						mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	-	<0.07						mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.07	-	<0.06						mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	-	<0.04						mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	0.17	-	<0.08						mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	-	<0.01						mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.04	-	<0.03						mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	-	<0.03						mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.09	-	<0.03						mg/kg	A-T-019s
Pyrene$_A^{M\#}$	0.12	-	<0.07						mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	0.75	-	<0.08						mg/kg	A-T-019s

REPORT NOTES

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A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil
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Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

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Please contact us if you need any further information.

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Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT
SUPPLEMENT TO TEST REPORT 16/01877/1

Envirolab Job Number: 16/01877
Issue Number: 2 **Date:** 15 April, 2016

Client:
Geosphere Environmental Ltd
Unit 11
Brightwell Barns
Ipswich Road
Brightwell
Ipswich
Suffolk
IP10 0BJ

Project Manager: Lianne Fountain
Project Name: Greenwood Place Resource Centre
Project Ref: 1655, GI
Order No: 0872/LF
Date Samples Received: 24/03/16
Date Instructions Received: 04/04/16
Date Analysis Completed: 15/04/16

Prepared by:

Kate Ellison
Administrative Assistant

Approved by:

Lianne Bromiley
Senior Client Manager

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UKAS TESTING 1247

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/1	16/01877/2	16/01877/3	16/01877/4	16/01877/5	16/01877/6	16/01877/7	16/01877/8	Units	Method ref
Client Sample No	J1	J2	J3	J4	J1	J1	J2	J1		
Client Sample ID	BH02	BH02	BH02	BH02	CBR3	CBR4	CBR4	FIP3		
Depth to Top	0.30	0.50	1.70	2.00	0.40	0.60	0.80	0.40		
Depth To Bottom										
Date Sampled	15-Mar-16	15-Mar-16	15-Mar-16	15-Mar-16	18-Mar-16	17-Mar-16	18-Mar-16	21-Mar-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	7	4A	5A	5A	4A	4A	4A	4AB		
% Stones >10mm$_A^{\#}$	<0.1	<0.1	11.8	<0.1	23.2	13.0	24.6	<0.1	% w/w	A-T-044
pH$_D^{M\#}$	10.96	9.92	10.22	8.76	10.13	8.63	7.80	9.64	pH	A-T-031s
Cyanide (total)$_A^{M\#}$	<1	1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-042sTCN
Arsenic$_D^{M\#}$	9	23	8	7	5	75	14	9	mg/kg	A-T-024s
Cadmium$_D^{M\#}$	0.8	1.3	0.6	0.7	0.6	4.9	1.0	0.8	mg/kg	A-T-024s
Copper$_D^{M\#}$	24	48	25	8	17	262	144	24	mg/kg	A-T-024s
Chromium$_D^{M\#}$	25	28	18	19	15	35	16	26	mg/kg	A-T-024s
Lead$_D^{M\#}$	264	580	106	30	45	377	296	73	mg/kg	A-T-024s
Mercury$_D$	0.41	0.78	0.25	<0.17	<0.17	0.42	0.35	<0.17	mg/kg	A-T-024s
Nickel$_D^{M\#}$	15	18	11	8	20	88	18	17	mg/kg	A-T-024s
Selenium$_D$	7	8	3	1	<1	4	<1	3	mg/kg	A-T-024s
Zinc$_D^{M\#}$	174	397	48	30	70	1040	143	61	mg/kg	A-T-024s
TPH total (>C6-C40)$_A$	44	175	45	<10	52	<10	<10	<10	mg/kg	A-T-007s

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/1	16/01877/2	16/01877/3	16/01877/4	16/01877/5	16/01877/6	16/01877/7	16/01877/8	Units	Method ref
Client Sample No	J1	J2	J3	J4	J1	J1	J2	J1		
Client Sample ID	BH02	BH02	BH02	BH02	CBR3	CBR4	CBR4	FIP3		
Depth to Top	0.30	0.50	1.70	2.00	0.40	0.60	0.80	0.40		
Depth To Bottom										
Date Sampled	15-Mar-16	15-Mar-16	15-Mar-16	15-Mar-16	18-Mar-16	17-Mar-16	18-Mar-16	21-Mar-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	7	4A	5A	5A	4A	4A	4A	4AB		
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	Chrysotile & Amosite	Chrysotile & Amosite	NAD	NAD	NAD	NAD	-	Chrysotile		A-T-045
Asbestos Matrix (visual)$_A$	-	Loose Insulation	-	-	-	-	-	-		A-T-045
Asbestos Matrix (microscope)$_A$	Loose Insulation & Loose Fibres	Loose Fibres	-	-	-	-	-	Loose Fibres		A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	-	N/A		Gravimetry
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	0.026	0.073	-	-	-	-	-	<0.001	% w/w	A-T-054

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/1	16/01877/2	16/01877/3	16/01877/4	16/01877/5	16/01877/6	16/01877/7	16/01877/8	Units	Method ref
Client Sample No	J1	J2	J3	J4	J1	J1	J2	J1		
Client Sample ID	BH02	BH02	BH02	BH02	CBR3	CBR4	CBR4	FIP3		
Depth to Top	0.30	0.50	1.70	2.00	0.40	0.60	0.80	0.40		
Depth To Bottom										
Date Sampled	15-Mar-16	15-Mar-16	15-Mar-16	15-Mar-16	18-Mar-16	17-Mar-16	18-Mar-16	21-Mar-16		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES		
Sample Matrix Code	7	4A	5A	5A	4A	4A	4A	4AB		
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	0.02	0.09	0.02	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	0.07	<0.01	<0.01	0.05	0.01	<0.01	<0.01	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	0.15	0.16	0.35	0.06	0.04	<0.02	<0.02	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.18	1.33	0.49	0.07	0.15	0.31	<0.04	0.07	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.09	1.24	0.42	0.06	0.16	0.38	<0.04	<0.04	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.21	1.74	0.55	0.09	0.21	0.50	0.07	0.07	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.08	0.87	0.26	<0.05	0.20	0.26	<0.05	<0.05	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.20	0.50	0.21	<0.07	<0.07	0.17	<0.07	<0.07	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.10	1.45	0.49	0.09	0.17	0.34	<0.06	0.07	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	0.23	0.07	<0.04	<0.04	0.06	<0.04	<0.04	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	0.18	1.65	1.12	0.27	0.34	0.33	0.10	0.18	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	0.02	0.08	0.02	<0.01	<0.01	<0.01	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.08	0.92	0.30	0.04	0.17	0.33	0.05	0.04	mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	<0.03	0.19	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.10	0.68	1.01	0.25	0.12	0.12	0.06	0.08	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	0.17	2.04	0.92	0.24	0.31	0.32	0.09	0.15	mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	1.39	12.9	6.34	1.51	2.03	3.21	0.45	0.66	mg/kg	A-T-019s

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/11	16/01877/12	16/01877/13						Units	Method ref
Client Sample No	J1	J2	J1							
Client Sample ID	FIP2	FIP2	FIP4							
Depth to Top	0.30	0.80	0.50							
Depth To Bottom			0.70							
Date Sampled	23-Mar-16	23-Mar-16	23-Mar-16							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	1A	4A	5A							
% Stones >10mm$_A^{\#}$	48.8	14.2	<0.1						% w/w	A-T-044
pH$_D^{M\#}$	8.54	8.23	7.91						pH	A-T-031s
Cyanide (total)$_A^{M\#}$	<1	<1	4						mg/kg	A-T-042sTCN
Arsenic$_D^{M\#}$	4	23	4						mg/kg	A-T-024s
Cadmium$_D^{M\#}$	<0.5	1.8	0.8						mg/kg	A-T-024s
Copper$_D^{M\#}$	4	353	9						mg/kg	A-T-024s
Chromium$_D^{M\#}$	9	27	35						mg/kg	A-T-024s
Lead$_D^{M\#}$	12	636	19						mg/kg	A-T-024s
Mercury$_D$	<0.17	5.69	2.23						mg/kg	A-T-024s
Nickel$_D^{M\#}$	9	36	13						mg/kg	A-T-024s
Selenium$_D$	<1	<1	3						mg/kg	A-T-024s
Zinc$_D^{M\#}$	21	674	49						mg/kg	A-T-024s
TPH total (>C6-C40)$_A$	<10	25	<10						mg/kg	A-T-007s

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/11	16/01877/12	16/01877/13						Units	Method ref
Client Sample No	J1	J2	J1							
Client Sample ID	FIP2	FIP2	FIP4							
Depth to Top	0.30	0.80	0.50							
Depth To Bottom			0.70							
Date Sampled	23-Mar-16	23-Mar-16	23-Mar-16							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	1A	4A	5A							
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	NAD	-	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	-	N/A							Gravimetry

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/11	16/01877/12	16/01877/13						Units	Method ref
Client Sample No	J1	J2	J1							
Client Sample ID	FIP2	FIP2	FIP4							
Depth to Top	0.30	0.80	0.50							
Depth To Bottom			0.70							
Date Sampled	23-Mar-16	23-Mar-16	23-Mar-16							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	1A	4A	5A							
PAH 16										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01						mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01						mg/kg	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	<0.02						mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04						mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	<0.04	<0.04						mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	0.06	<0.05						mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	<0.05						mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	<0.07						mg/kg	A-T-019s
Chrysene$_A^{M\#}$	<0.06	<0.06	<0.06						mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04						mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	<0.08	<0.08						mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01						mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	0.03	<0.03						mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	<0.03	<0.03	<0.03						mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.04	<0.03	<0.03						mg/kg	A-T-019s
Pyrene$_A^{M\#}$	<0.07	<0.07	<0.07						mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	0.15	0.09	<0.08						mg/kg	A-T-019s

Envirolab Job Number: 16/01877

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655, GI

Lab Sample ID	16/01877/11	16/01877/12	16/01877/13						Units	Method ref
Client Sample No	J1	J2	J1							
Client Sample ID	FIP2	FIP2	FIP4							
Depth to Top	0.30	0.80	0.50							
Depth To Bottom			0.70							
Date Sampled	23-Mar-16	23-Mar-16	23-Mar-16							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	1A	4A	5A							
TPH UKCWG										
Ali >C5-C6$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Ali >C6-C8$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Ali >C8-C10$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Ali >C10-C12$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Ali >C12-C16$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Ali >C16-C21$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Ali >C21-C35$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Ali >C35-C44$_A$	-	<0.1	-						mg/kg	A-T-023s
Total Aliphatics$_A$	-	<0.1	-						mg/kg	A-T-023s
Aro >C5-C7$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Aro >C7-C8$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Aro >C8-C9$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Aro >C9-C10$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
Aro >C10-C12$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Aro >C12-C16$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Aro >C16-C21$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Aro >C21-C35$_A^\#$	-	<0.1	-						mg/kg	A-T-023s
Aro >C35-C44$_A$	-	<0.1	-						mg/kg	A-T-023s
Total Aromatics$_A$	-	<0.1	-						mg/kg	A-T-023s
TPH (Ali & Aro)$_A$	-	<0.1	-						mg/kg	A-T-023s
BTEX - Benzene$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
BTEX - Toluene$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
BTEX - m & p Xylene$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
BTEX - o Xylene$_A^\#$	-	<0.02	-						mg/kg	A-T-022s
MTBE$_A^\#$	-	<0.02	-						mg/kg	A-T-022s

REPORT NOTES

Notes - Soil chemical analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General
This report shall not be reproduced, except in full, without written approval from Envirolab.
Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.
All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.
All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supercedes any "D" subscripts.
Superscript "M" indicates method accredited to MCERTS.
If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT
SUPPLEMENT TO TEST REPORT 16/02405/1

Envirolab Job Number: 16/02405
Issue Number: 2 **Date:** 20 May, 2016

Client:
Geosphere Environmental Ltd
Unit 11
Brightwell Barns
Ipswich Road
Brightwell
Ipswich
Suffolk
IP10 0BJ

Project Manager: Lianne Fountain
Project Name: Greenwood Place Resource Centre
Project Ref: 1655,GI
Order No: 0880/LF
Date Samples Received: 25/04/16
Date Instructions Received: 26/04/16
Date Analysis Completed: 18/05/16

Prepared by:

Kate Ellison
Administrative Assistant

Approved by:

Lianne Bromiley
Senior Client Manager

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
% Moisture$_A$	17.2	16.5	-	15.9	20.3	25.5	17.3		% w/w	A-T-044
% Stones >10mm$_A^{\#}$	24.2	22.7	<0.1	<0.1	<0.1	5.0	<0.1		% w/w	A-T-044
pH$_D^{M\#}$	10.02	8.04	-	7.63	9.60	7.98	7.93		pH	A-T-031s
Sulphate (acid soluble)$_D^{M\#}$	1500	250	-	8300	5000	1200	290		mg/kg	A-T-028s
Cyanide (total)$_A^{M\#}$	<1	<1	-	<1	<1	<1	<1		mg/kg	A-T-042sTCN
Phenols - Total by HPLC$_A$	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2		mg/kg	A-T-050s
Sulphide$_A$	<15	<15	-	<15	<15	<15	<15		mg/kg	A-T-S2-s
Total Organic Carbon$_D^{M\#}$	-	-	-	-	5.81	-	-		% w/w	A-T-032s
Arsenic$_D^{M\#}$	6	9	-	4	53	17	9		mg/kg	A-T-024s
Cadmium$_D^{M\#}$	<0.5	0.8	-	1.0	2.4	0.9	1.1		mg/kg	A-T-024s
Copper$_D^{M\#}$	58	8	-	19	25200	122	28		mg/kg	A-T-024s
Chromium$_D^{M\#}$	20	39	-	52	33	23	45		mg/kg	A-T-024s
Chromium (hexavalent)$_D$	-	-	<1	-	-	-	<1		mg/kg	A-T-040s
Lead$_D^{M\#}$	95	12	-	14	4710	1240	22		mg/kg	A-T-024s
Mercury$_D$	0.39	<0.17	-	<0.17	1.24	1.62	0.51		mg/kg	A-T-024s
Nickel$_D^{M\#}$	13	13	-	40	54	21	36		mg/kg	A-T-024s
Selenium$_D$	2	<1	-	1	2	<1	<1		mg/kg	A-T-024s
Vanadium$_D^{M\#}$	-	-	57	-	-	-	75		mg/kg	A-T-024s
Zinc$_D^{M\#}$	37	35	-	68	5280	173	71		mg/kg	A-T-024s

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_A^{\#}$	-	-	-	-	Chrysotile	-	-			A-T-045
Asbestos Matrix (microscope)$_A$	-	-	-	-	Loose Fibres	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	-	-	-	-	N/A	-	-			Gravimetry
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	-	-	-	-	<0.001	-	-		% w/w	A-T-054

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
PAH 16										
Acenaphthene$_A^{M\#}$	0.05	<0.01	-	<0.01	<0.01	<0.01	<0.01		mg/kg	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01		mg/kg	A-T-019s
Anthracene$_A^{M\#}$	0.05	<0.02	-	<0.02	<0.02	0.04	<0.02		mg/kg	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.24	<0.04	-	<0.04	0.10	0.24	<0.04		mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.23	<0.04	-	<0.04	0.10	0.28	<0.04		mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.27	<0.05	-	<0.05	0.13	0.38	<0.05		mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.14	<0.05	-	<0.05	<0.05	0.18	<0.05		mg/kg	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.11	<0.07	-	<0.07	<0.07	0.14	<0.07		mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.24	<0.06	-	<0.06	0.11	0.33	<0.06		mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04		mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	0.39	<0.08	-	<0.08	0.19	0.56	<0.08		mg/kg	A-T-019s
Fluorene$_A^{M\#}$	0.04	<0.01	-	<0.01	<0.01	<0.01	<0.01		mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.16	<0.03	-	<0.03	0.08	0.20	<0.03		mg/kg	A-T-019s
Naphthalene$_A^{M\#}$	0.12	<0.03	-	<0.03	<0.03	<0.03	<0.03		mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.33	<0.03	-	<0.03	0.08	0.20	<0.03		mg/kg	A-T-019s
Pyrene$_A^{M\#}$	0.34	<0.07	-	<0.07	0.16	0.48	<0.07		mg/kg	A-T-019s
PAH (total 16)$_A^{M\#}$	2.73	<0.08	-	<0.08	0.94	3.03	<0.08		mg/kg	A-T-019s
TPH Banded 1										
>C6-C8$_A^{\#}$	<10	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
>C8-C10$_A^{\#}$	<10	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
>C10-C12$_A^{\#}$	<10	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
>C12-C16$_A^{\#}$	<10	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
>C16-C21$_A^{\#}$	<10	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
>C21-C40$_A$	80	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s
TPH Total (sum of bands) (>C6-C40)$_A$	80	<10	-	<10	<10	<10	<10		mg/kg	A-T-007s

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
SVOC										
Hexachlorobenzene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Diethyl phthalate$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Dimethyl phthalate$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Dibenzofuran$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Carbazole$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Butylbenzyl phthalate $_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Bis(2-ethylhexyl)phthalate$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Bis(2-chloroethoxy)methane$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Bis(2-chloroethyl)ether$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
4-Nitrophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
4-Methylphenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
4-Chloro-3-methylphenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2-Nitrophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2-Methylphenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2-Chlorophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,6-Dinitrotoluene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,4-Dinitrotoluene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,4-Dimethylphenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,4-Dichlorophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,4,6-Trichlorophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2,4,5-Trichlorophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2-Chloronaphthalene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
2-Methylnaphthalene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Acenaphthylene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Acenaphthene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Anthracene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Benzo(a)anthracene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Benzo(b)fluoranthene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Benzo(k)fluoranthene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Benzo(a)pyrene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Benzo(ghi)perylene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Chrysene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
Fluoranthene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Fluorene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Indeno(1,2,3-cd)pyrene$_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Phenanthrene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Pyrene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Naphthalene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Dibenzo(ah)anthracene $_A$	-	-	<100	-	-	-	-		µg/kg	A-T-052s
Bis(2-chloroisopropyl)ether$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Phenol $_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Pentachlorophenol$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
n-Nitroso-n-dipropylamine$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
n-Dioctylphthalate$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
n-Dibutylphthalate$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Nitrobenzene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Isophorone$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Hexachloroethane$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Hexachlorocyclopentadiene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s
Perylene$_A$	-	-	<100	-	-	-	<100		µg/kg	A-T-052s

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
VOC										
Dichlorodifluoromethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Chloromethane$_A^\#$	-	-	<10	-	-	-	<10		µg/kg	A-T-006s
Vinyl Chloride$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Bromomethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Chloroethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Trichlorofluoromethane$_A^\#$	-	-	<1	-	-	-	*<1*		µg/kg	A-T-006s
1,1-Dichloroethene$_A^\#$	-	-	<1	-	-	-	*<1*		µg/kg	A-T-006s
Carbon Disulphide$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Dichloromethane $_A$	-	-	<5	-	-	-	7		µg/kg	A-T-006s
trans 1,2-Dichloroethene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1-Dichloroethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
cis 1,2-Dichloroethene$_A^\#$	-	-	<1	-	-	-	305		µg/kg	A-T-006s
2,2-Dichloropropane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Bromochloromethane$_A^\#$	-	-	<5	-	-	-	<5		µg/kg	A-T-006s
Chloroform$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1,1-Trichloroethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1-Dichloropropene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Carbon Tetrachloride$_A^\#$	-	-	<1	-	-	-	*<1*		µg/kg	A-T-006s
1,2-Dichloroethane$_A^\#$	-	-	<2	-	-	-	<2		µg/kg	A-T-006s
Benzene $_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Trichloroethene$_A^\#$	-	-	1640	-	-	-	1300		µg/kg	A-T-006s
1,2-Dichloropropane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Dibromomethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Bromodichloromethane$_A^\#$	-	-	<10	-	-	-	<10		µg/kg	A-T-006s
cis 1,3-Dichloropropene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Toluene $_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
trans 1,3-Dichloropropene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1,2-Trichloroethane$_A^\#$	-	-	11	-	-	-	4		µg/kg	A-T-006s
1,3-Dichloropropane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Tetrachloroethene$_A^\#$	-	-	486	-	-	-	104		µg/kg	A-T-006s
Dibromochloromethane$_A^\#$	-	-	<3	-	-	-	<3		µg/kg	A-T-006s
1,2-Dibromoethane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s

Envirolab Job Number: 16/02405

Client Project Name: Greenwood Place Resource Centre

Client Project Ref: 1655,GI

Lab Sample ID	16/02405/1	16/02405/3	16/02405/6	16/02405/7	16/02405/8	16/02405/10	16/02405/16		Units	Method ref
Client Sample No	J1	J3	J6	J7	J1	J3	J1			
Client Sample ID	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS101 (CBR1)	WS102 (BH3)	WS102 (BH3)	HA1			
Depth to Top	1.30	1.80	5.30	5.70	0.50	1.10	1.40			
Depth To Bottom										
Date Sampled	20-Apr-16	20-Apr-16	20-Apr-16	20-Apr-16	21-Apr-16	21-Apr-16	20-Apr-16			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	5A	5A	3	5	5AD	5AD	5			
Chlorobenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1,1,2-Tetrachloroethane$_A$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Ethylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
m & p Xylene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
o-Xylene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Styrene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Bromoform$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Isopropylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,1,2,2-Tetrachloroethane$_A$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,2,3-Trichloropropane$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
Bromobenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
n-Propylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
2-Chlorotoluene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,3,5-Trimethylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
4-Chlorotoluene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
tert-Butylbenzene$_A^\#$	-	-	<2	-	-	-	<2		µg/kg	A-T-006s
1,2,4-Trimethylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
sec-Butylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
4-Isopropyltoluene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,3-Dichlorobenzene$_A$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,4-Dichlorobenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
n-Butylbenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,2-Dichlorobenzene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,2-Dibromo-3-chloropropane$_A$	-	-	<2	-	-	-	<2		µg/kg	A-T-006s
1,2,4-Trichlorobenzene$_A$	-	-	<3	-	-	-	<3		µg/kg	A-T-006s
Hexachlorobutadiene$_A^\#$	-	-	<1	-	-	-	<1		µg/kg	A-T-006s
1,2,3-Trichlorobenzene$_A$	-	-	<3	-	-	-	<3		µg/kg	A-T-006s

REPORT NOTES

Notes - Soil chemical analysis
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones and brick and concrete fragments >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General
This report shall not be reproduced, except in full, without written approval from Envirolab.
Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.
All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supersedes any "A" subscripts.
All analysis is performed on the sample as received for soil samples which are positive for asbestos and/or if they are from outside the European Union and this supercedes any "D" subscripts.
Superscript "M" indicates method accredited to MCERTS.
If results are in italic font they are associated with an AQC failure. These are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

TPH analysis of water by method A-T-007
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Asbestos in soil
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if present as discrete fibres/fragments. Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations.

Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

REPORT NUMBER	**AMENDMENT TO REPORT K03210R**
CUSTOMER	**GEOSPHERE ENVIRONMENTAL** **Brightwell Barns, Ipswich Road** **Brightwell** **Suffolk** **IP10 0BJ**
GRADKO LAB REFERENCE	**02K0837-02K0842**
DESPATCH NOTE No.	**30302**
JOB REFERENCE	**1655**
DATE SAMPLES RECEIVED	**26.05.2016**
BOOKING IN REF.	**X5915**

IDENTIFICATION AND ESTIMATION (SEMI-QUANTITATIVE ANALYSIS) OF TOP 15 VOC ON TENAX DIFFUSION TUBES BY GC/MS
Analysis has been carried out in accordance with in-house method GLM 13

Index to UKAS Accreditation Status	
U	Analysis is UKAS accredited under our Fixed Scope
F	Analysis is UKAS accredited under our Flexible Scope
N	Analysis is not UKAS accredited

Tube Number	**GRA 02692**			
Exposure Time(mins)	**10080**			
Sample ID	**OBH2**			
Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Tetrachloroethylene	F	4391	217.79	1428.7
Trichloroethylene	F	3551	176.14	915.92
cis-1,2-Dichloroethylene	F	552.92	27.43	105.32
4,7-Methano-1H-indene, octahydro-	N	122.66	6.08	33.10
Carbon disulfide	F	64.45	3.20	9.72
Cyclopentane, methyl-	N	58.85	2.92	9.81
Cyclohexane, isothiocyanato-	N	55.73	2.76	15.59
Toluene	F	54.08	2.68	9.87
m/p-Xylene	F	46.33	2.30	9.74
trans-1,2-Dichloroethylene	F	42.51	2.11	8.10
Benzene, 1-ethyl-3-methyl-	F	37.30	1.85	8.88
Naphthalene, decahydro-1,2-dimethyl-	N	31.29	1.55	10.30
Pentane, 3-methyl-	F	29.80	1.48	5.08
Decahydro-4,4,8,9,10-pentamethylnaphthalene	N	29.70	1.47	12.26
Naphthalene, decahydro-2,6-dimethyl-	N	28.81	1.43	9.49

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA 04596**
Exposure Time(mins)	**10080**
Sample ID	**DCS1**

Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Tetrachloroethylene	F	17393	862.73	5659.5
Trichloroethylene	F	7612	377.57	1963.4
cis-1,2-Dichloroethylene	F	6768	335.70	1289.1
Dichloroacetaldehyde	N	419.19	20.79	93.15
Benzene, 1-ethyl-3-methyl-	F	147.26	7.30	35.06
m/p-Xylene	F	130.21	6.46	27.38
trans-1,2-Dichloroethylene	F	125.20	6.21	23.85
Toluene	F	107.75	5.34	19.67
Cyclohexadecane	N	87.86	4.36	39.05
Heptane, 2,2,4,6,6-pentamethyl-	N	83.26	4.13	28.08
o-Xylene	F	74.86	3.71	15.74
Benzene, 1,2,4-trimethyl-	F	74.31	3.69	17.69
Cyclohexane, 1-ethyl-2,3-dimethyl-	N	69.91	3.47	19.42
3-Carene	F	69.10	3.43	18.65
Cyclohexane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4.beta.)-	N	61.93	3.07	15.48

Tube Number	**GRA 05727**
Exposure Time(mins)	**10080**
Sample ID	**BH2**

Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Trichloroethylene	F	19886	986.39	5129.3
Tetrachloroethylene	F	7130	353.69	2320.2
Decane	F	3477	172.46	979.57
Decane, 4-methyl-	N	1429	70.87	442.23
Undecane	F	1373	68.09	424.88
Benzene, 1,2,4-trimethyl-	F	1302	64.57	309.95
Benzene, 1-ethyl-3-methyl-	F	1286	63.80	306.22
Octane, 2,6-dimethyl-	N	1264	62.67	355.99
Decane, 2-methyl-	N	1224	60.71	378.85
4,7-Methano-1H-indene, octahydro-	N	1205	59.77	325.15
Cyclohexane, butyl-	N	1107	54.91	307.49
Nonane, 2-methyl-	N	1080	53.58	304.31
sec-Butylbenzene	F	1004	49.79	266.85
Nonane	F	1002	49.70	254.47
Decane, 3-methyl-	N	920.11	45.64	284.79

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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LABORATORY ANALYSIS REPORT

Tube Number	**GRA 06921**
Exposure Time(mins)	**10080**
Sample ID	**BH1**

Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Trichloroethylene	F	40214	1994.7	10373
Tetrachloroethylene	F	39667	1967.6	12907
Decane	F	2824	140.06	795.56
Benzene, 1,2,4-trimethyl-	F	1145	56.79	272.60
Undecane	F	1135	56.28	351.16
Decane, 4-methyl-	N	1117	55.38	345.59
Benzene, 1-ethyl-3-methyl-	F	1038	51.51	247.26
Octane, 2,6-dimethyl-	N	990.92	49.15	279.19
4,7-Methano-1H-indene, octahydro-	N	973.84	48.31	262.78
Decane, 2-methyl-	N	945.92	46.92	292.79
Cyclohexane, butyl-	N	872.01	43.25	242.23
m/p-Xylene	F	839.15	41.62	176.49
Nonane, 2-methyl-	N	822.52	40.80	231.74
sec-Butylbenzene	F	781.78	38.78	207.85
Decane, 3-methyl-	N	740.66	36.74	229.25

Tube Number	**GRA 10132**
Exposure Time(mins)	**10080**
Sample ID	**WS102**

Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Trichloroethylene	F	16644	825.61	4293.2
cis-1,2-Dichloroethylene	F	3133	155.43	596.84
Decane	F	2897	143.69	816.18
Undecane	F	1473	73.08	456.05
Benzene, 1,2,4-trimethyl-	F	1435	71.20	341.77
Benzene, 1-ethyl-3-methyl-	F	1298	64.39	309.09
Decane, 4-methyl-	N	1281	63.54	396.50
Decane, 2-methyl-	N	1149	56.97	355.50
4,7-Methano-1H-indene, octahydro-	N	1142	56.64	308.14
Octane, 2,6-dimethyl-	N	1088	53.98	306.63
m/p-Xylene	F	1007	49.95	211.79
Cyclohexane, butyl-	F	1004	49.82	278.99
Nonane, 2-methyl-	N	936.55	46.46	263.87
sec-Butylbenzene	F	893.23	44.31	237.49
Nonane	F	882.56	43.78	224.14

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

LABORATORY ANALYSIS REPORT

Tube Number	**GRA 02680**
Exposure Time(mins)	**10080**
Sample ID	**DCS4**

Top 15 VOC	**Accreditation Status**	**ng on tube**	**ppb in air***	**µgm^{-3}***
Trichloroethylene	F	8880	440.48	2290.5
Tetrachloroethylene	F	7017	348.06	2283.2
m/p-Xylene	F	291.48	14.46	61.30
Butane, 2-methyl-	N	260.87	12.94	37.27
o-Xylene	F	165.58	8.21	34.82
Benzene, 1,2,4-trimethyl-	F	157.02	7.79	37.39
Toluene	F	140.65	6.98	25.67
Benzene, 1-ethyl-3-methyl-	F	118.32	5.87	28.17
Ethylbenzene	F	101.89	5.05	21.43
alpha-Pinene	F	86.86	4.31	23.44
3-Carene	F	54.66	2.71	14.75
Benzene, 1,2,3-trimethyl-	F	53.05	2.63	12.63
1,2,4-Metheno-1H-indene, octahydro-1,7a-dimethyl-5-(1-methylethyl)-, [1S-(1.alpha.,2.alpha.,3a.beta.,4.alpha.,5.alpha.,7a.beta.,8S*)]-	N	51.68	2.56	20.92
Benzene, 1-ethyl-2-methyl-	F	51.66	2.56	12.30
cis-1,2-Dichloroethylene	F	51.44	2.55	9.80

UPTAKE RATES

All Compounds 2.00ng.ppm^{-1}.min^{-1}

Identification and estimation results for ng on tube are calculated by reference to toluene and toluene-d8 Internal standard.
Results greater than 1000ng are outside of our UKAS accredited calibration range.
Exposure time was calculated from start and finish dates given on the exposure sheet.
Report was amended to add µgm^{-3} at the customer request.

		Date of Analysis	**02.06.2016**
Analysts Name	**Mariella Angelova**	**Date of Amended Report**	**17.06.2016**

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

APPENDIX 7 – GEOTECHNICAL LABORATORY TEST RESULTS

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : 18/03/16 **PAGE 1 of 7 Pages**

Contract Greenwood Road Camden London

Serial No. 16131

UKAS TESTING 0998

CLIENT:

Geosphere Environmental Ltd
Brightwell Barns
Ipswich Road
Brightwell
Suffolk
IP10 0BJ

Soil Property Testing Ltd
Materials Division
15,16 & 18 Halcyon Court,
St Margarets Way,
Stukeley Meadows, Huntingdon,
Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

DCP Tests carried out by our own engineer

APPROVED SIGNATORIES:

- ☑ **J.C.GARNER B.Eng (Hons.) FGS** Technical Director
- ☐ **S.P.TOWNEND FGS** Quality Manager
- ☐ **W.JOHNSTONE** Materials Lab Manager

SAMPLES LABELLED:

-

DATE RECEIVED: 18/03/16

SAMPLES TESTED BETWEEN 18/03/16 **and** 18/03/16

REMARKS: For the attention of Mr Stephen Gilchrist

NOTES:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. (a) UKAS - United Kingdom Accreditation Service.
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT

Soil Property Testing Ltd

Date of Issue: as page 1 | **Page** 2 **of** 7 **Pages**

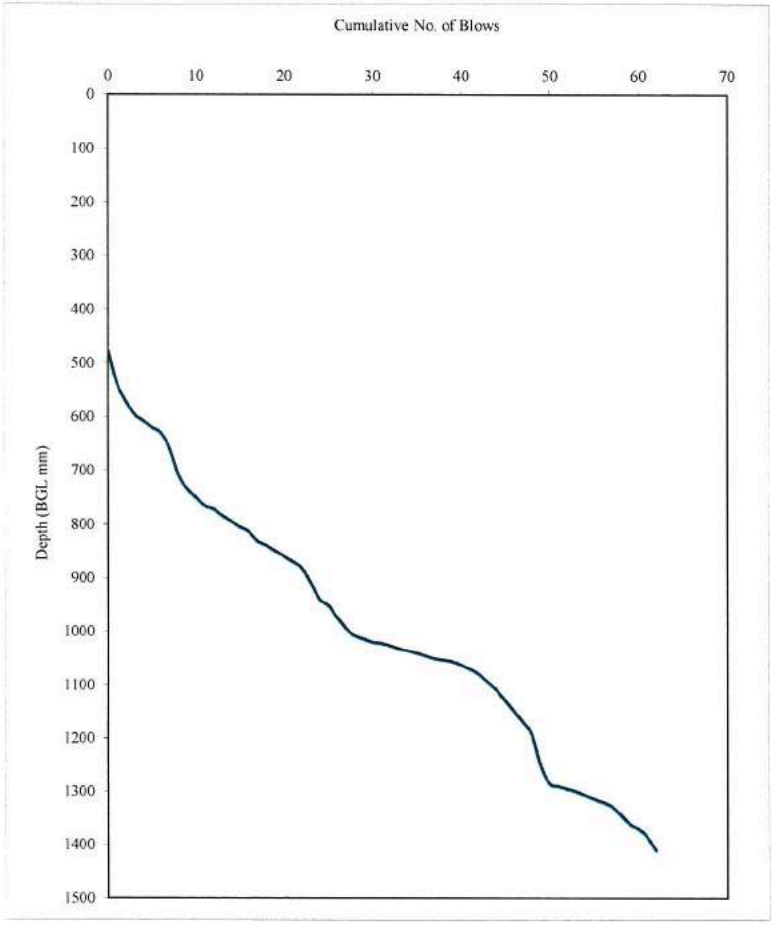
Contract: Greenwood Road Camden London | **Serial No:** 16131

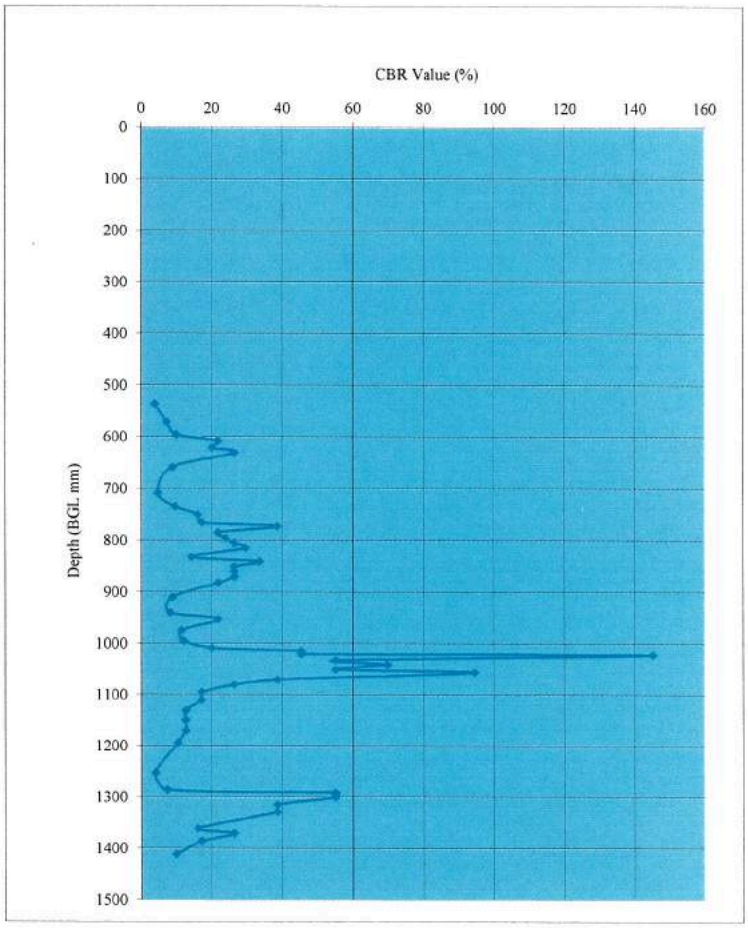
TRL Dynamic Cone Penetrometer - Determination of CBR Value (%)

To TRL Report PR INT 277 04 and CNS Farnell Operating Instructions

Chainage:	0	**Layers Removed:**	0.45m
Test No.:	DCP 1	**Surface Type:**	Dark yellowish brown slighty silty gravelly SAND.
Location:	CBR3	**Surface moisture:**	DRY
Direction:	0	**Easting:**	0
Final Depth (mm BGL):	1410	**Northing:**	0
Date Tested:	18/03/2016	**Existing Level:** m OD	0.000
		Test Level: m OD	0.000

Dynamic Cone Penetrometer Graph





Remarks:	Dark yellowish brown slightly silty gravelly SAND. Gravel is brown white and black fine to coarse sub angular to sub rounded flint with occasional brick fragments.
	Test started at 450mm below Ground Level. Material removed was engineered fill consisting of crushed concrete, brick and asphalt.
	Excessively high or anomalous readings may be the result of cone encountering obstructions such as large gravel fragments.
	See attached sheet for Equivalent CBR values for each penetration

TRL Dynamic Cone Penetrometer - Determination of CBR Value (%)

To TRL Report PR/INT/277/04 and CNS Farnell Operating Instructions

Chainage: 0
Test No.: DCP 1
Location: CBR3
Direction: 0
Final Depth (mm BGL): 1410
Date Tested: 18/03/2016

Layers Removed: 0.45m
Surface Type: Dark yellowish brown slighty silty gravelly SAND.
Surface moisture: DRY
Easting: 0
Northing: 0.000
Existing Level: m OD 0.000
Test Level: m OD 0.000

Initial Zero reading = **60**

No. of Blows	Total Blows	Measured Depth (mm BGL)	Corrected Depth (mm BGL)	Penetration (mm/blow)	Log 10 CBR	CBR Value (%)
0	**0**	85	**475**	0.00	0.00	0.00
1	**1**	146	**536**	61.00	0.59	3.92
1	**2**	180	**570**	34.00	0.86	7.26
1	**3**	205	**595**	25.00	1.00	10.05
1	**4**	217	**607**	12.00	1.34	21.84
1	**5**	230	**620**	13.00	1.30	20.07
1	**6**	240	**630**	10.00	1.42	26.49
1	**7**	268	**658**	28.00	0.95	8.92
1	**8**	318	**708**	50.00	0.68	4.83
1	**9**	344	**734**	26.00	0.98	9.65
1	**10**	360	**750**	16.00	1.21	16.12
1	**11**	375	**765**	15.00	1.24	17.25
1	**12**	382	**772**	7.00	1.59	38.61
1	**13**	394	**784**	12.00	1.34	21.84
1	**14**	405	**795**	11.00	1.38	23.95
1	**15**	415	**805**	10.00	1.42	26.49
1	**16**	424	**814**	9.00	1.47	29.61
1	**17**	442	**832**	18.00	1.15	14.23
1	**18**	450	**840**	8.00	1.53	33.53
1	**19**	460	**850**	10.00	1.42	26.49
1	**20**	470	**860**	10.00	1.42	26.49
1	**21**	480	**870**	10.00	1.42	26.49
1	**22**	492	**882**	12.00	1.34	21.84
1	**23**	520	**910**	28.00	0.95	8.92
1	**24**	550	**940**	30.00	0.92	8.29
1	**25**	562	**952**	12.00	1.34	21.84
1	**26**	584	**974**	22.00	1.06	11.51
1	**27**	605	**995**	21.00	1.08	12.09
1	**28**	618	**1008**	13.00	1.30	20.07
1	**29**	624	**1014**	6.00	1.66	45.45
1	**30**	630	**1020**	6.00	1.66	45.45
1	**31**	632	**1022**	2.00	2.16	145.15
2	**33**	1032	**1032**	5.00	1.74	55.10
2	**35**	1040	**1040**	4.00	1.84	69.76
2	**37**	1050	**1050**	5.00	1.74	55.10
2	**39**	1056	**1056**	3.00	1.98	94.55
2	**41**	680	**1070**	7.00	1.59	38.61
1	**42**	690	**1080**	10.00	1.42	26.49
1	**43**	705	**1095**	15.00	1.24	17.25
1	**44**	720	**1110**	15.00	1.24	17.25
1	**45**	740	**1130**	20.00	1.10	12.73
1	**46**	760	**1150**	20.00	1.10	12.73
1	**47**	780	**1170**	20.00	1.10	12.73

TEST REPORT

Soil Property Testing Ltd

Date of Issue: as page 1 — Page 4 of 7 Pages
Contract: Greenwood Road Camden London — **Serial No:** 16131

TRL Dynamic Cone Penetrometer - Determination of CBR Value (%)

To TRL Report PR/INT/277/04 and CNS Farnell Operating Instructions

Chainage: 0
Test No.: DCP 1
Location: CBR3
Direction: 0
Final Depth (mm BGL): 1410
Date Tested: 18/03/2016

Layers Removed: 0.45m
Surface Type: Dark yellowish brown slighty silty gravelly SAND.
Surface moisture: DRY
Easting: 0
Northing: 0.000
Existing Level: m OD 0.000
Test Level: m OD 0.000

1	**48**	804	**1194**	24.00	1.02	10.50
1	**49**	862	**1252**	58.00	0.62	4.13
1	**50**	895	**1285**	33.00	0.87	7.50
1	**51**	900	**1290**	5.00	1.74	55.10
1	**52**	905	**1295**	5.00	1.74	55.10
1	**53**	910	**1300**	5.00	1.74	55.10
2	**55**	924	**1314**	7.00	1.59	38.61
2	**57**	938	**1328**	7.00	1.59	38.61
2	**59**	970	**1360**	16.00	1.21	16.12
1	**60**	980	**1370**	10.00	1.42	26.49
1	**61**	995	**1385**	15.00	1.24	17.25
1	**62**	1020	**1410**	25.00	1.00	10.05

TEST REPORT

Soil Property Testing Ltd

Date of Issue: as page 1 **Page** 5 **of** 7 **Pages**

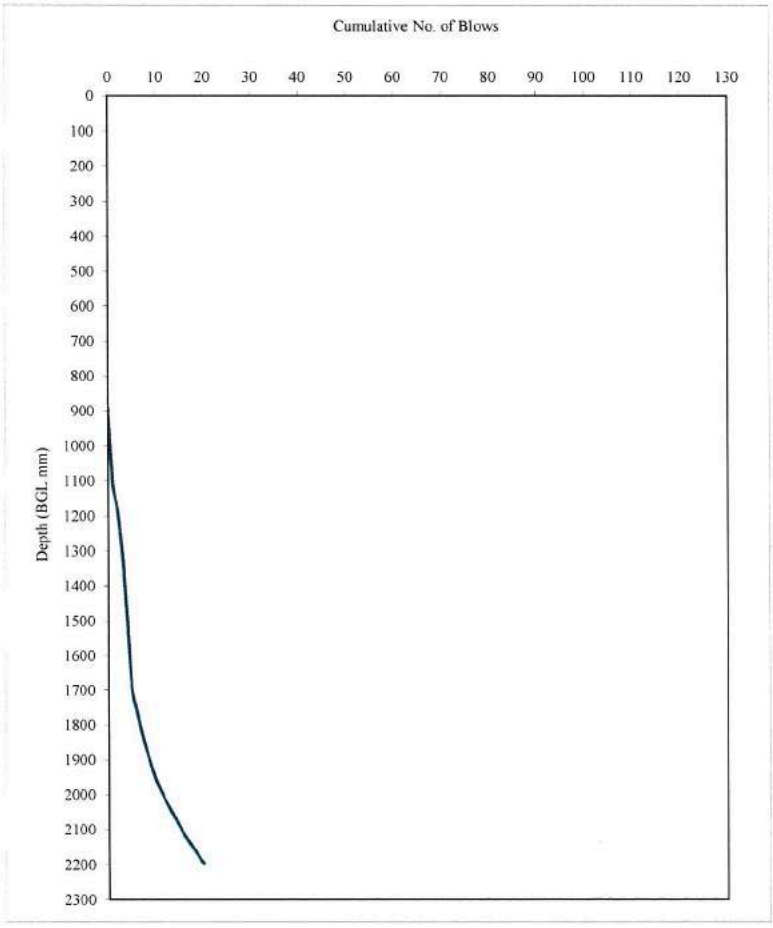
Contract: Greenwood Road Camden London **Serial No:** 16131

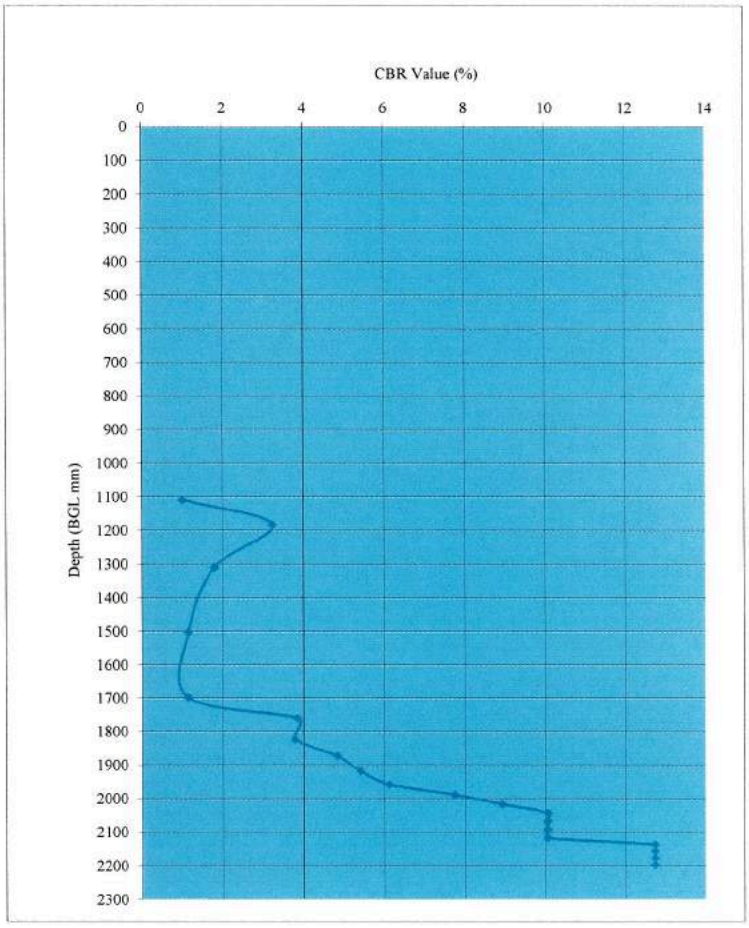
TRL Dynamic Cone Penetrometer - Determination of CBR Value (%)

To TRL Report PR INT 277/04 and CNS Farnell Operating Instructions

Chainage:	0	**Layers Removed:**	0.85m
		Surface Type:	Greyish brown slightly sandy gravelly CLAY.
Test No.:	DCP 2		
Location:	CBR4	**Surface moisture:**	DRY
Direction:	0	**Easting:**	0
Final Depth (mm BGL):	2196	**Northing:**	0
Date Tested:	18/03/2016	**Existing Level:** m OD	0.000
		Test Level: m OD	0.000

Dynamic Cone Penetrometer Graph





Remarks:	Greyish brown slightly sandy gravelly CLAY. Gravel is brown white and black fine to coarse sub angular to sub rounded flint with occasional brick fragments. Rod appeared very wet on retrieval Test started at 850mm below ground level. Material removed was engineered fill consisting of crushed concrete, brick and asphalt. Excessively high or anomalous readings may be the result of cone encountering obstructions such as large gravel fragments. See attached sheet for Equivalent CBR values for each penetration.

TEST REPORT

Soil Property Testing Ltd

TRL Dynamic Cone Penetrometer - Determination of CBR Value (%)

To TRL Report PR/INT/277/04 and CNS Farnell Operating Instructions

Chainage: 0
Test No.: DCP 2
Location: CBR4
Direction: 0
Final Depth (mm BGL): 2196
Date Tested: 18/03/2016

Layers Removed: 0.85m
Surface Type: Greyish brown slightly sandy gravelly CLAY.
Surface moisture: DRY
Easting: 0
Northing: 0.000
Existing Level: m OD 0.000
Test Level: m OD 0.000

Initial Zero reading = **850**

No. of Blows	Total Blows	Measured Depth (mm BGL)	Corrected Depth (mm BGL)	Penetration (mm/blow)	Log 10 CBR	CBR Value (%)
0	**0**	124	**890**	0.00	0.00	0.00
1	**1**	342	**1108**	218.00	0.01	1.02
1	**2**	415	**1181**	73.00	0.51	3.24
1	**3**	542	**1308**	127.00	0.26	1.80
1	**4**	735	**1501**	193.00	0.06	1.16
1	**5**	930	**1696**	195.00	0.06	1.15
1	**6**	992	**1758**	62.00	0.59	3.85
1	**7**	1055	**1821**	63.00	0.58	3.79
1	**8**	1105	**1871**	50.00	0.68	4.83
1	**9**	1150	**1916**	45.00	0.73	5.40
1	**10**	1190	**1956**	40.00	0.79	6.12
1	**11**	1222	**1988**	32.00	0.89	7.75
1	**12**	1250	**2016**	28.00	0.95	8.92
1	**13**	1275	**2041**	25.00	1.00	10.05
1	**14**	1300	**2066**	25.00	1.00	10.05
1	**15**	1325	**2091**	25.00	1.00	10.05
1	**16**	1350	**2116**	25.00	1.00	10.05
1	**17**	1370	**2136**	20.00	1.10	12.73
1	**18**	1390	**2156**	20.00	1.10	12.73
1	**19**	1410	**2176**	20.00	1.10	12.73
1	**20**	1430	**2196**	20.00	1.10	12.73

TEST REPORT.

ISSUED BY : MATERIAL PROPERTY TESTING LTD.

DATE OF ISSUE : 18/03/16 **PAGE** 7 of 7 Pages

Contract **Serial No.**

Greenwood Road Camden London 16131

TRL Dynamic Cone Penetrometer Location Plan

NOT TO SCALE

DATE: 18/3/16

A. Butcher BSc(Hons)

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : 23/04/16 **PAGE 1 of 19 Pages**

Contract Greenwood Centre, Greenwood Place, Camden, London.

Serial No. S29908

UKAS TESTING 0998

CLIENT:

Geosphere Environmental Ltd.
Brightwell Barns
Brightwell
Ipswich
IP10 0BJ

Soil Property Testing Ltd.

15,16 & 18 Halcyon Court, St Margarets Way, Stukeley Meadows, Huntingdon, Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

Geosphere Environmental Ltd.

APPROVED SIGNATORIES:

☐ **J.C.GARNER B.Eng (Hons.) FGS**
Technical Director

☑ **S.P.TOWNEND FGS**
Quality Manager

☐ **W.JOHNSTONE**
Materials Lab Manager

S.P. Townend

SAMPLES LABELLED:

Greenwood Centre, Greenwood Place, Camden, London.

DATE RECEIVED: 30/03/16

SAMPLES TESTED BETWEEN 30/03/16 **and** 23/04/16

REMARKS: For the attention of Lianne Fountain
Your Ref: 1655,GI
Sulphate suite of tests subcontracted to Chemtest - results included as Appendix A of this Test Report

NOTES:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. (a) UKAS - United Kingdom Accreditation Service.
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 2 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)	1:Moisture Content Determination	3:Liquid /Plastic Limit 4 point	5:Wet Sieve Preparation for Lim.	13:Triaxial Test single stage	700:Sulphate Test single stage	704:Acid Soluble Sulphate	718:Soil -Total Sulphur Content	702:ph value of Soil or Water	Remarks
BH2	D2.5	2.00	*	*	*						
	U3.0	3.00				*					
	D3.45	3.45	*								
	D4.0	4.00	*	*			*	*	*	*	
	UT5.0	5.00				*					
	UT8.0	8.00				*					
	D9.0	9.00	*				*	*	*	*	
	UT11.0	11.00		*		*					
	D14.0	14.00					*			*	
	UT15.5	15.50				*					
	UT18.5	18.50				*					
	UT21.5	21.50				*					
	UT24.5	24.50				*	*	*	*	*	
-	-	-	4	3	1	8	4	3	3	4	<— Total Number of Tests ——

Scheduled by: Geosphere Environmental Ltd.

Target Date: 21/04/16

SPTSCHED

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 3 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

UKAS TESTING
0998

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
BH2	2.50	D2.5	19	69	24	45	0.18*	S	41(M)	32	24	Stiff yellowish brown slightly sandy gravelly CLAY. Gravel is brown, black and white fine to coarse angular to subrounded flint	CH
BH2	3.45	D3.45	31	-	-	-						Stiff closely fissured yellowish brown CLAY with occasional bluish grey mottling, recently active and decayed roots and rare selenite crystals	-
BH2	4.00	D4.0	28	65	26	39	0.05	N	0(A)		95	Stiff dark yellowish brown CLAY with rare bluish grey veins, decayed roots and selenite crystals	CH
BH2	9.00	D9.0	28	-	-	-						Stiff dark yellowish brown CLAY with rare orange silt partings and selenite crystals	-
BH2	11.00	UT11	27	76	29	47	-0.04	N	0(A)		75	Very stiff (Very high strength) fissured friable locally thickly laminated dark greyish brown CLAY with occasional dark grey mottling	CV

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2 S = Wet Sieved Specimen N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

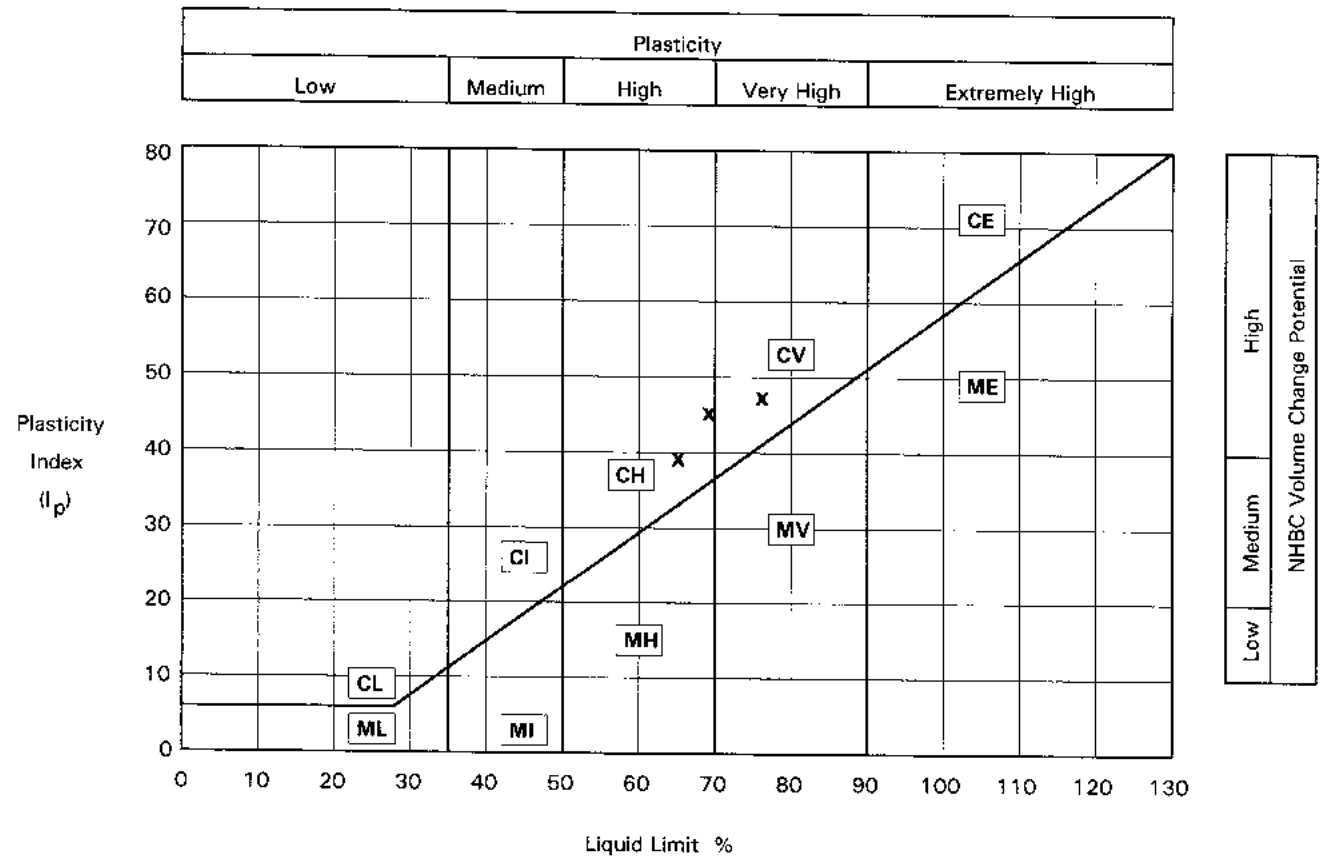
ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 4 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index PLASTICITY CHART BS5930:1999:Figure 18

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 5 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

UKAS TESTING
0998

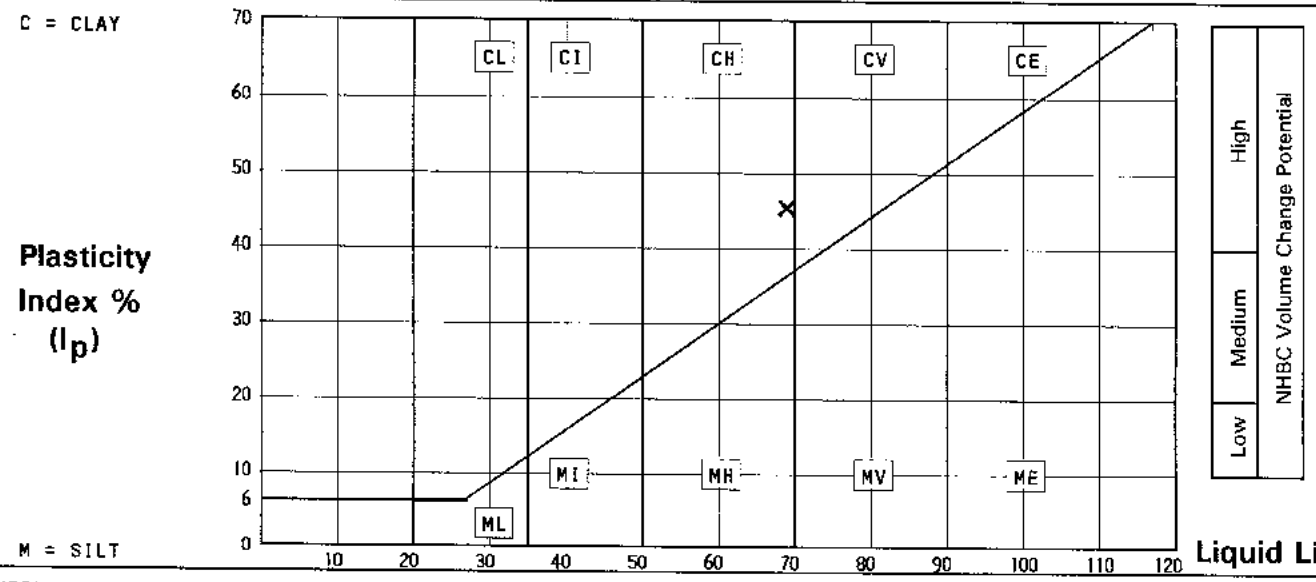
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH2	2.50	D2.5	19	Stiff yellowish brown slightly sandy gravelly CLAY. Gravel is brown, black and white fine to coarse angular to subrounded flint	

PREPARATION

Method of Preparation	Sieved Specimen		
Sample retained 0.425 sieve	(Measured)	41 %	
Corrected moisture content for material passing 0.425mm		32 %	
Curing Time		24 Hours	

Liquid Limit	69 %
Plastic Limit	24 %
Plasticity Index	45 %
Liquidity Index	0.18
Clay Content	Not analysed. %
Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
40% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

TEST REPORT.

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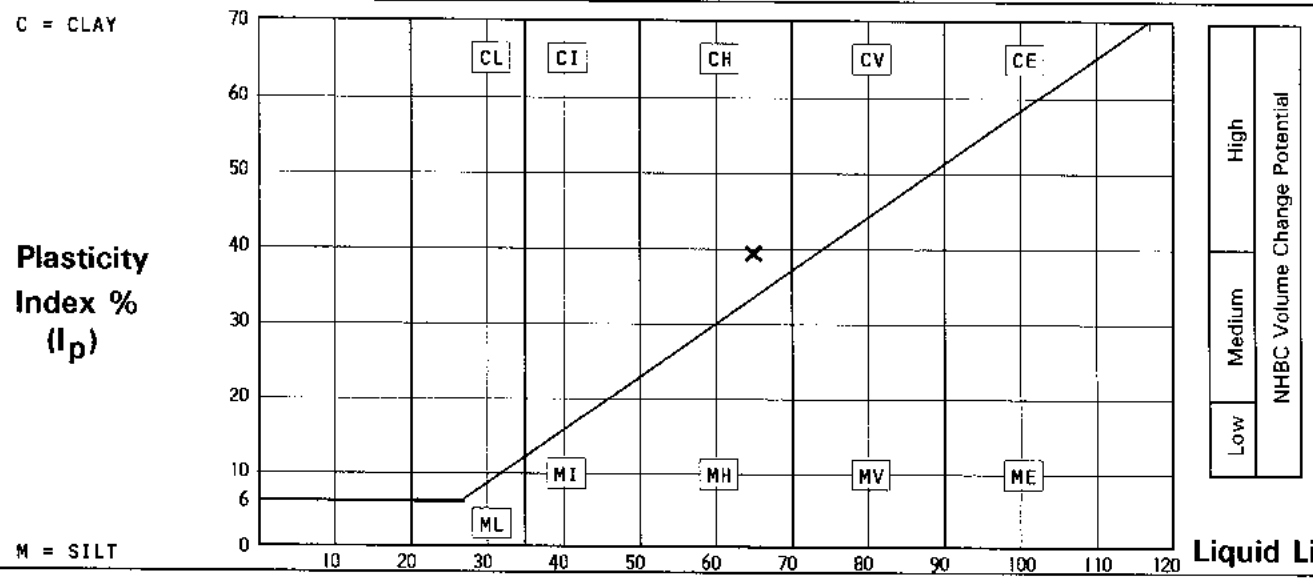
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH2	4.00	D4.0	28	Stiff dark yellowish brown CLAY with rare bluish grey veins, decayed roots and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION

Method of Preparation	Specimen from Natural Soil		
Sample retained 0.425 sieve	(Assumed)	0	%
Corrected moisture content for material passing 0.425mm			%
Curing Time		95 Hours	

Liquid Limit	65	%
Plastic Limit	26	%
Plasticity Index	39	%
Liquidity Index	0.05	
Clay Content	Not analysed.	%
Derived Activity (PI/CC)	Not analysed.	



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3 , 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)

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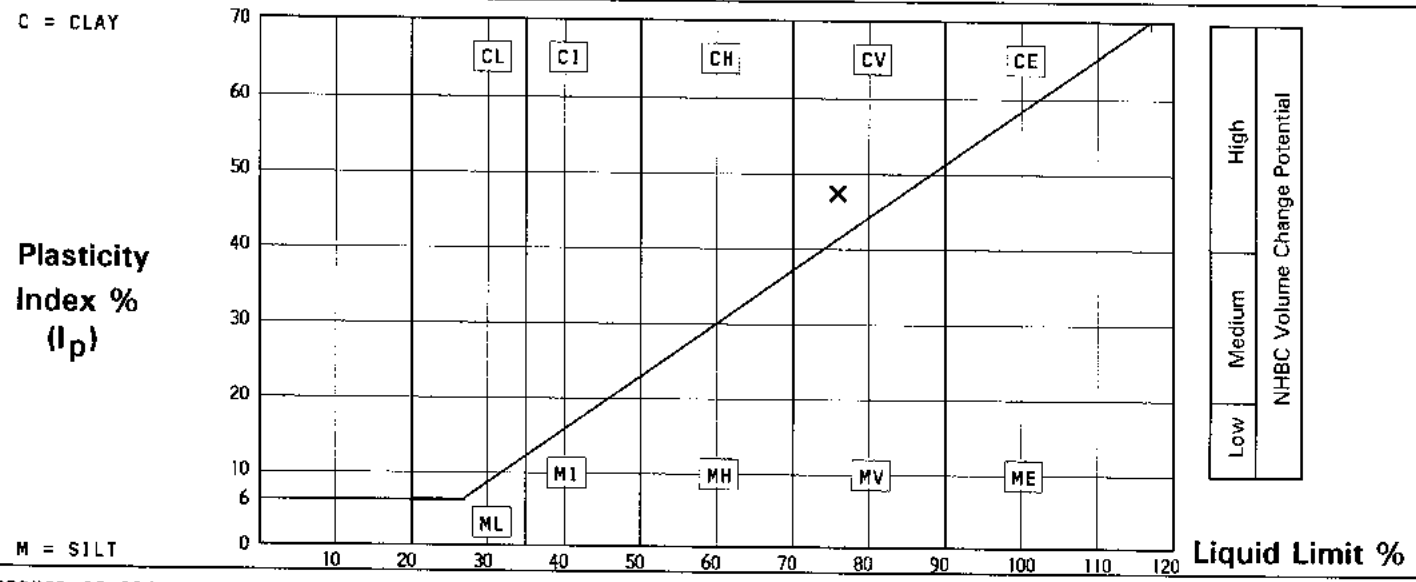
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH2	11.00	UT11	27	Very stiff (Very high strength) fissured friable locally thickly laminated dark greyish brown CLAY with occasional dark grey mottling	

PREPARATION

Method of Preparation	Specimen from Natural Soil
Sample retained 0.425 sieve (Assumed)	0 %
Corrected moisture content for material passing 0.425mm	%
Curing Time	75 Hours

Liquid Limit	76 %
Plastic Limit	29 %
Plasticity Index	47 %
Liquidity Index	-0.04
Clay Content	Not analysed. %
Derived Activity (Pi/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)

TEST REPORT.

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DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Lateral Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)	MOHRS CIRCLE ANALYSIS Cu (kPa)	MOHRS CIRCLE ANALYSIS ∅ (degrees)	Description
BH2	3.00	U3	30	1.98	1.52	64	159	80			Stiff (High strength) fissured yellowish brown CLAY with occasional grey and orangish brown mottling and rare decayed roots
BH2	5.00	UT5	30	1.96	1.51	101	254	127			Stiff (High strength) fissured dark yellowish brown CLAY with occasional grey and orangish brown mottling and selenite crystals
BH2	8.00	UT8	27	1.98	1.56	161	265	133			Stiff (High strength) fissured dark yellowish brown CLAY with occasional grey and orangish brown mottling and selenite crystals
BH2	11.00	UT11	27	2.02	1.59	222	579	290			Very stiff (Very high strength) fissured friable locally thickly laminated dark greyish brown CLAY with occasional dark grey mottling
BH2	15.50	UT15	30	1.98	1.52	310	265	132			Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare fossil fragments
BH2	18.50	UT18	28	2.00	1.56	372	349	175			Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling
BH2	21.50	UT21	26	0.02	0.02	434	698	349			Extremely weak fissured dark greyish brown MUDSTONE with occasional dark grey mottling
BH2	24.50	UT24	25	2.05	1.64	491	439	219			Very stiff (Very high strength) fissured friable dark greyish brown CLAY with occasional dark grey mottling

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4.2 & 8 PART 2:1990:7.2 PART 7:1990:8.3

METHOD OF TEST : BS 1377:PART 2:1990:3 Determination of Moisture Content 1990:7 Determination of Density
:PART 7:1990:8 Undrained Shear Strength 1990:9 Multi-stage test
Note Multi-stage test used when specimen has granular content / behaviour and length of specimen precludes the taking of 3 x 100mm dia by 200mm long specimens.

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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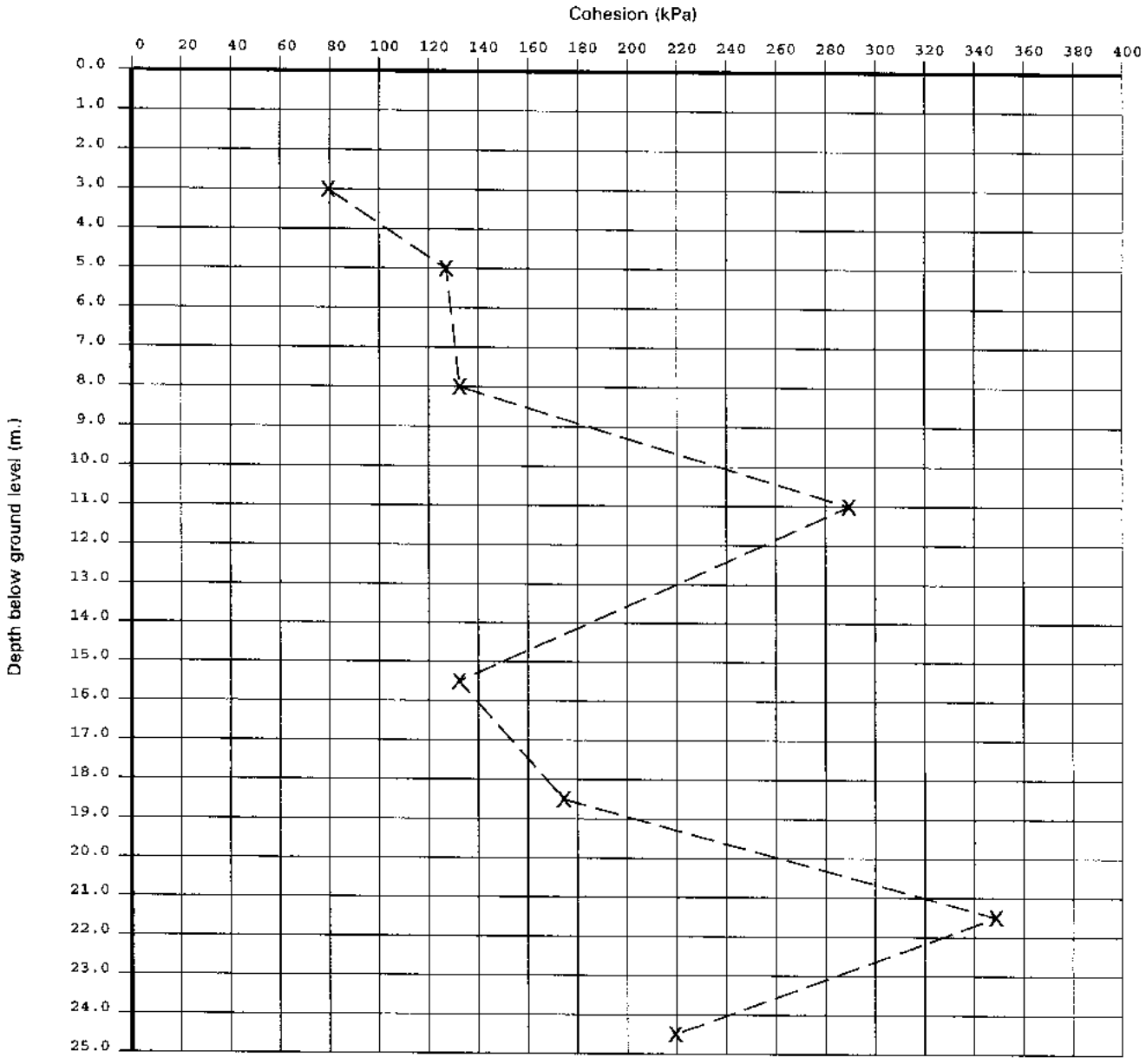
Cohesion (kPa) vs Depth below ground level (m.).



Key to Data Points	X : BH2							

SPTPLOT

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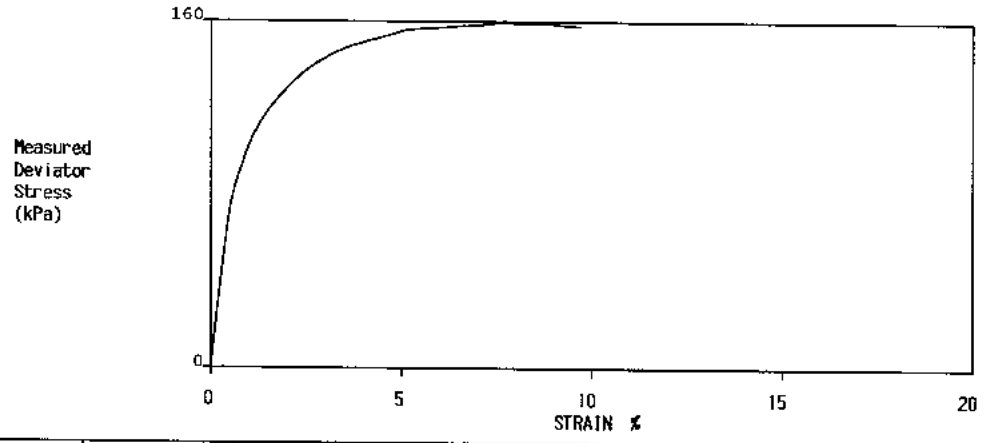
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	3.00	U3	Stiff (High strength) fissured yellowish brown CLAY with occasional grey and orangish brown mottling and rare decayed roots	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 3.05	199.6	102.1	3235	30	1.98	1.52

TEST INFORMATION — Rate of Strain 1.0 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	64	8.7	0.6	/	159	80		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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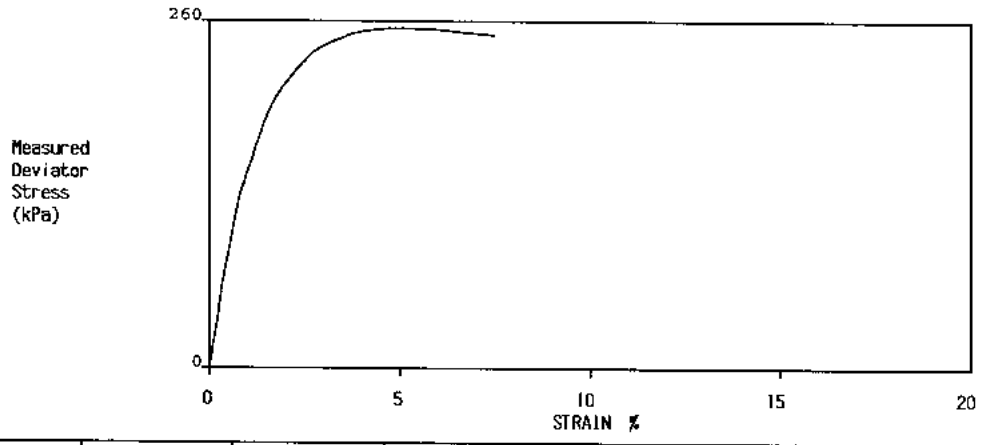
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	5.00	UT5	Stiff (High strength) fissured dark yellowish brown CLAY with occasional grey and orangish brown mottling and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 5.06	199.6	102.8	3252	30	1.96	1.51

TEST INFORMATION — Rate of Strain 1.0 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	101	5.1	0.4	/	254	127		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

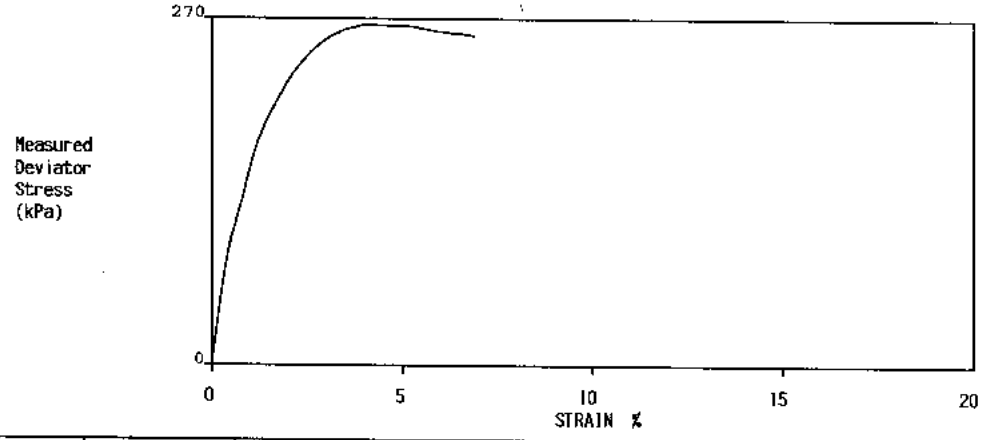
Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	8.00	UT8	Stiff (High strength) fissured dark yellowish brown CLAY with occasional grey and orangish brown mottling and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

Initial Specimen

Depth of Top of Specimen (m): 8.04

Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
184.6	103.4	3069	27	1.98	1.56

TEST INFORMATION — Rate of Strain 1.0 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	161	4.1	0.3	/	265	133		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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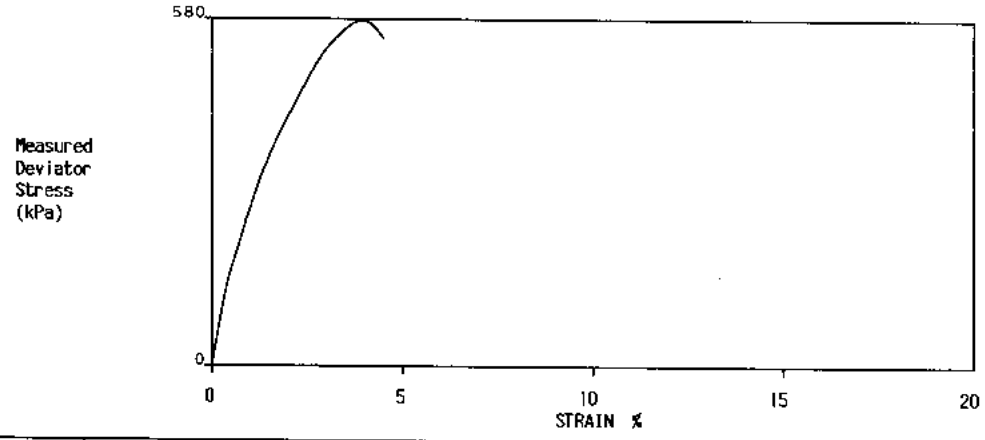
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	11.00	UT11	Very stiff (Very high strength) fissured friable locally thickly laminated dark greyish brown CLAY with occasional dark grey mottling	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 11.05	184.7	103.3	3125	27	2.02	1.59

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	222	4.0	0.3	/	579	290		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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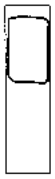
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	15.50	UT15	Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare fossil fragments	Premature failure at 3.1% strain

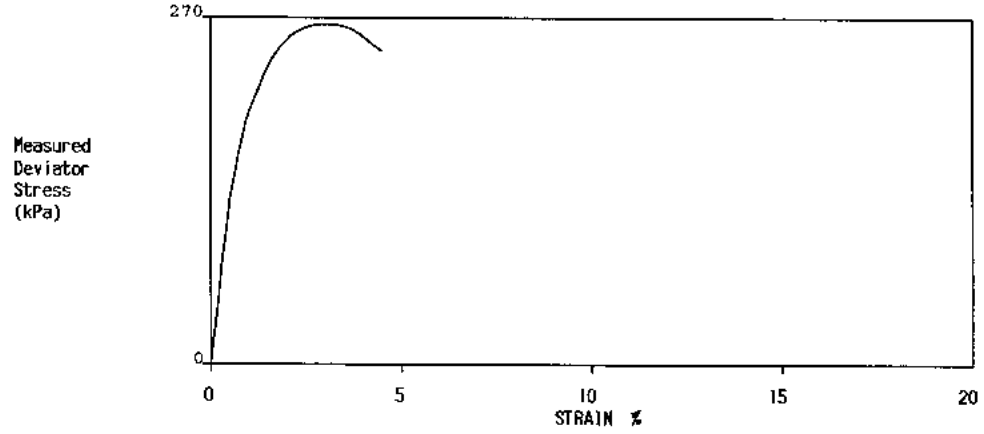
Initial Specimen



Depth of Top of Specimen (m)
15.56

Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
199.5	103.4	3313	30	1.98	1.52

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure σ_3 (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma_1 - \sigma_3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma_1 - \sigma_3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	310	3.1	0.2	/	265	132		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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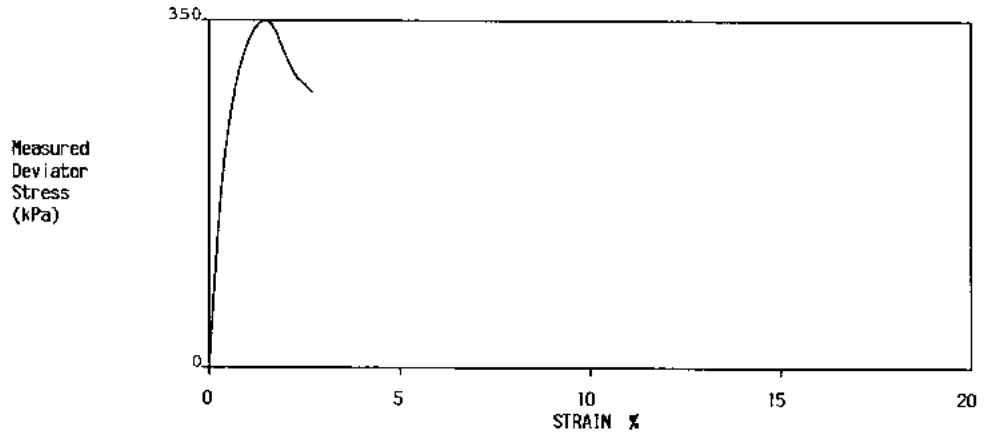
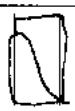
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	18.50	UT18	Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling	Premature failure at 1.5% strain

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 18.53	199.6	103.6	3370	28	2.00	1.56

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI ^{o}
	372	1.5	0.2	/	349	175		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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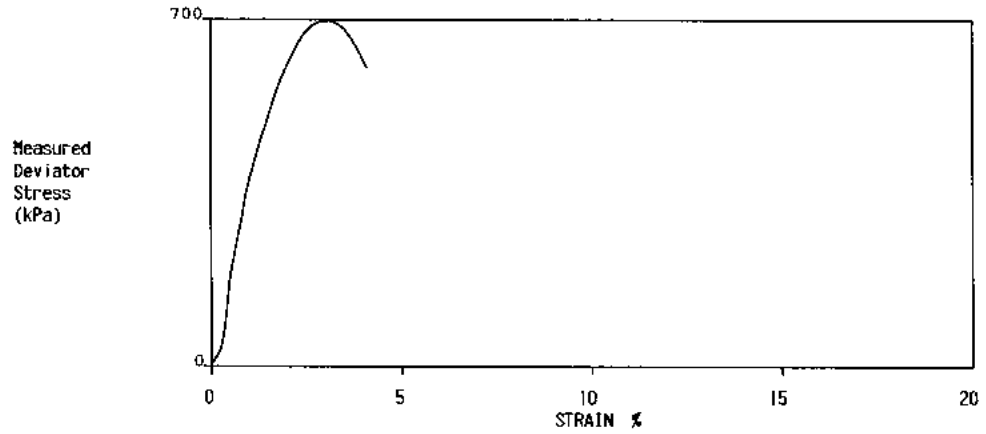
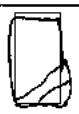
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	21.50	UT21	Extremely weak fissured dark greyish brown MUDSTONE with occasional dark grey mottling	Premature failure at 3.1% strain

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 21.54	199.5	103.3	34	26	0.02	0.02

TEST INFORMATION — Rate of Strain 0.8 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	434	3.1	0.2	/	698	349		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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UKAS TESTING
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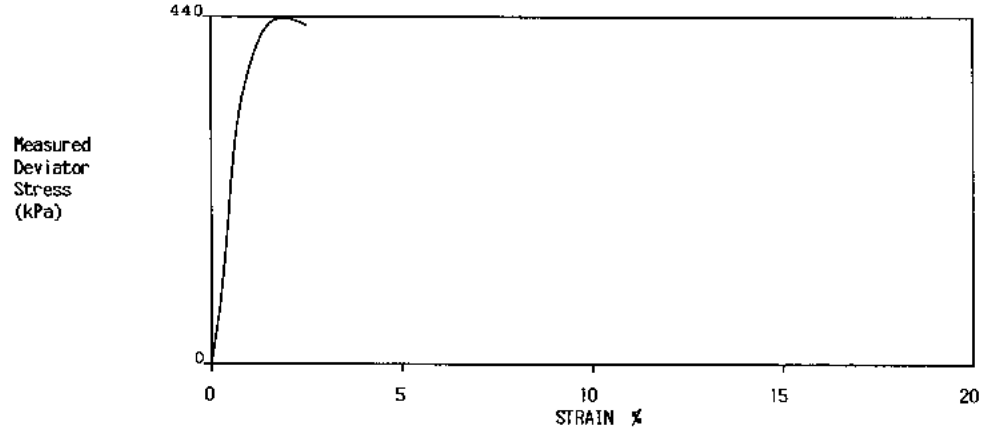
DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH2	24.50	UT24	Very stiff (Very high strength) fissured friable dark greyish brown CLAY with occasional dark grey mottling	Premature failure at 1.9% strain

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 24.54	199.5	103.4	3428	25	2.05	1.64

TEST INFORMATION — Rate of Strain 0.8 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	491	1.9	0.2	/	439	219		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 16 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

DETERMINATION OF THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Pit No.	Depth m.	Sample	Concentration of Soluble Sulphate			% of sample passing 2mm sieve	Description	Remarks
			Soil		Groundwater			
			Acid Soluble SO3 %	Water Soluble 2:1 SO3 g/l	g/l			
BH2	14.00	D14.0		0.72		100	Very stiff fissured dark greyish brown CLAY	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.5 BS1377:PART 3:1990:5.2 Acid Soluble, 5.3 Soil/Water Extract :5.4 Groundwater

METHOD OF TEST : BS 1377:PART 3:1990:5.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 19 of 19

Contract
Greenwood Centre, Greenwood Place, Camden, London.

Serial No.
S29908

DETERMINATION OF THE pH VALUE

Borehole/ Pit No.	Depth m.	Sample	pH Value	Description	Remarks
BH2	14.00	D14.0	8.0	Very stiff fissured dark greyish brown CLAY	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7 BS 1377:PART 3:1990:9.4

METHOD OF TEST : BS 1377:PART 3:1990:9.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

Final Report

Report No.:	16-08730-1
Initial Date of Issue:	20-Apr-2016
Client	Soil Property Testing
Client Address:	18 Halycon Court St Margarets Way Stukeley Meadows Huntingdon Cambridgeshire PE29 6DG
Contact(s):	Jon Garner
Project	S29908 - Greenwood Centre, Greenwood Place, Camden, London

Quotation No.:	Q16-06170	**Date Received:**	15-Apr-2016
Order No.:	S29908	**Date Instructed:**	15-Apr-2016
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	21-Apr-2016
Date Approved:	20-Apr-2016		

Approved By:

Details: Keith Jones, Technical Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: S29908 - Greenwood Centre, Greenwood Place, Camden, London

Client: Soil Property Testing					Chemtest Job No.:	16-08730	16-08730	16-08730
Quotation No.: Q16-06170					Chemtest Sample ID.:	280667	280668	280669
Order No.: S29908					Client Sample Ref.:	BH2	BH2	BH2
					Client Sample ID.:	D4.0	D9.0	UT24.5
					Sample Type:	SOIL	SOIL	SOIL
					Top Depth (m):	4.00	9.00	24.50
Determinand	Accred.	SOP	Units	LOD				
Moisture	N	2030	%	0.020		21	21	20
pH	U	2010		N/A		7.9	7.9	8.7
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		2.1	2.4	0.25
Total Sulphur	U	2175	%	0.010		0.36	1.2	0.50
Sulphate (Acid Soluble)	U	2430	%	0.010		0.88	1.7	0.16

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : 11/05/16 **PAGE 1 of 7 Pages**

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

UKAS TESTING
0998

CLIENT:

Geosphere Environmental Ltd.
Brightwell Barns
Brightwell
Ipswich
IP10 0BJ

Soil Property Testing Ltd.

15,16 & 18 Halcyon Court, St Margarets Way,
Stukeley Meadows, Huntingdon,
Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

Geosphere Environmental Ltd.

APPROVED SIGNATORIES:

☑ **J.C.GARNER B.Eng (Hons.) FGS**
Technical Director

☐ **S.P.TOWNEND FGS**
Quality Manager

☐ **W.JOHNSTONE**
Materials Lab Manager

SAMPLES LABELLED:

Greenwood Centre, Greenwood Place, Camden, London

DATE RECEIVED: 22/04/16

SAMPLES TESTED BETWEEN 22/04/16 **and** 11/05/16

REMARKS: For the attention of Lianne Fountain
Your reference 1655,GI

NOTES:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. (a) UKAS - United Kingdom Accreditation Service.
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 2 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)	700:Sulphate Test (2:1 Water Soil)	702:ph value of Soil or Water	704:Acid Soluble Sulphate	1:Moisture Content Determination	3:Liquid /Plastic Limit 4 point	5:Wet Sieve Preparation for Limit	Remarks
FIP2	D1	1.40	*	*	*	*	*	*	
FIP3	D3	1.70				*	*	*	
FIP4	D1	0.90	*	*	*	*	*	*	
	D3	1.20				*			
	D2	1.80				*			
-	-	-	2	2	2	5	3	3	<— Total Number of Tests —

Scheduled by: Geosphere Environmental Ltd.

Target Date: 10/05/16

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 3 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

UKAS TESTING
0998

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
FIP2	1.40	D1	38	58	22	36	0.69*	S	19(M)	47	73	Very soft yellowish brown slightly sandy slightly gravelly CLAY with occasional greyish brown mottling and coke/coal fragments. Gravel is white, grey, light brown and brown fine and medium subangular and subrounded	CH
FIP3	1.70	D3	39	73	26	47	0.38*	S	11(M)	44	28	Soft yellowish brown slightly sandy slightly gravelly CLAY with occasional grey mottling and brick fragments. Gravel is dark grey and black fine and medium rounded to subangular	CV
FIP4	0.90	D1	25	51	19	32	0.25*	S	7(M)	27	25	Stiff yellowish brown slightly sandy slightly gravelly CLAY with occasional grey and light orangish brown mottling. Gravel is red, white, grey, dark grey and brown fine and medium rounded to subangular	CH
FIP4	1.20	D3	29	-	-	-						Stiff slightly fissured yellowish brown CLAY with occasional grey and light orangish brown mottling and calcareous aggregations and powder	-
FIP4	1.80	D2	27	-	-	-						Stiff slightly fissured yellowish brown CLAY with occasional grey mottling, rare orange staining, calcareous aggregations and powder and decayed roots	-

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2 S = Wet Sieved Specimen N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

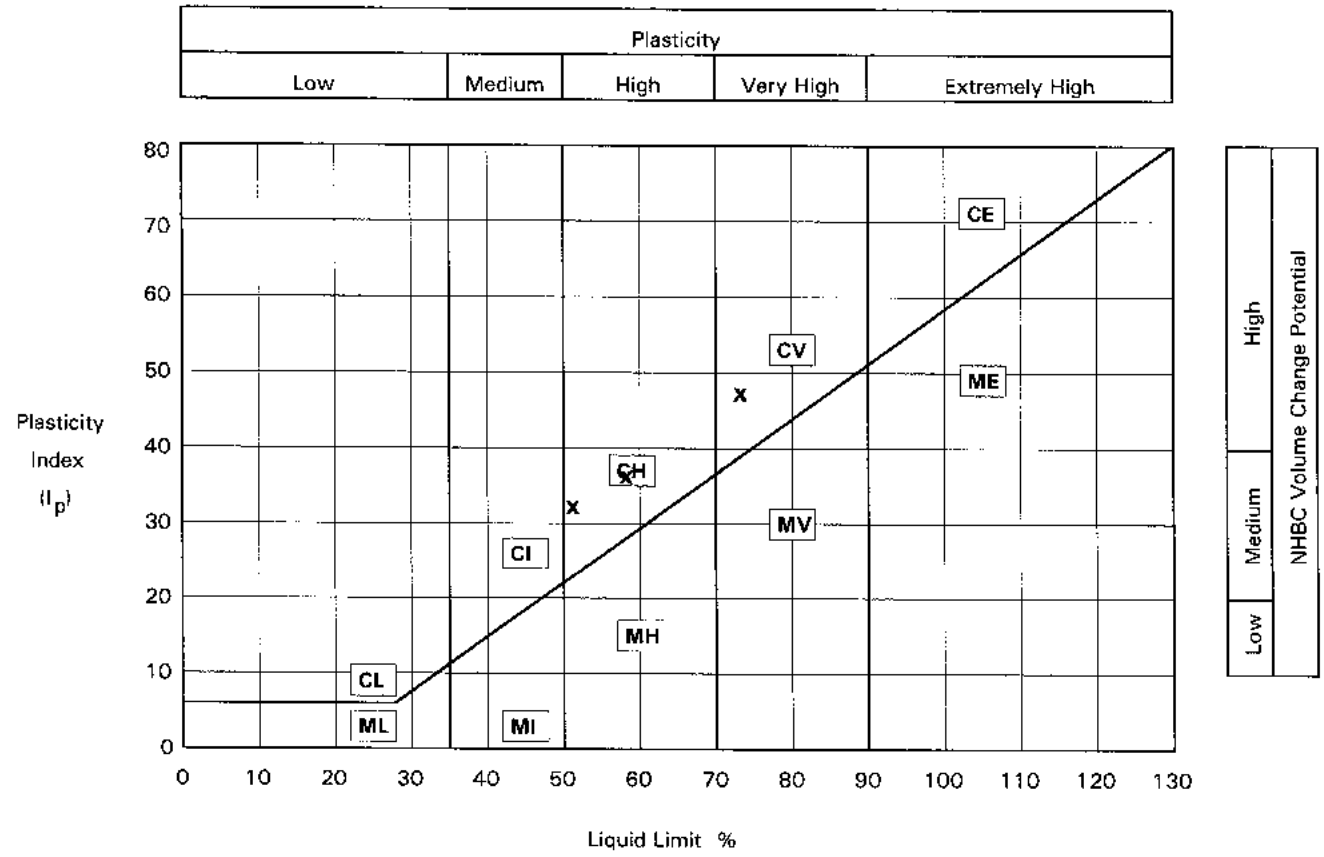
ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 4 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index PLASTICITY CHART BS5930:1999:Figure 18

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 5 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

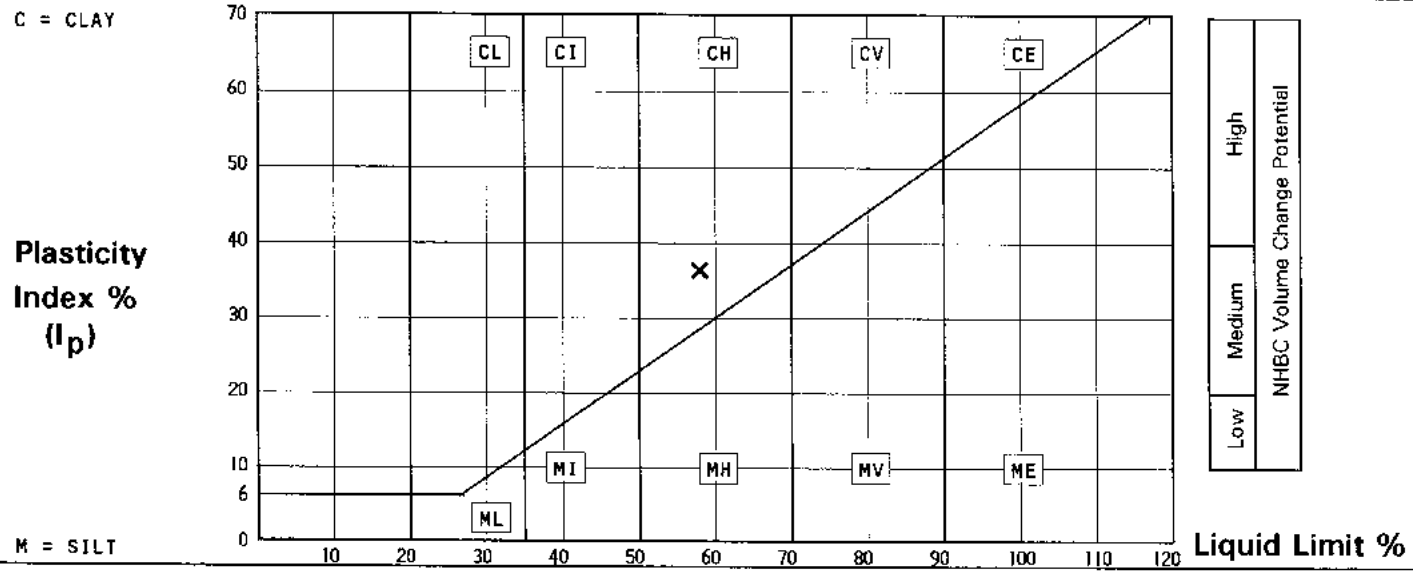
UKAS TESTING
0998

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
FIP2	1.40	D1	38	Very soft yellowish brown slightly sandy slightly gravelly CLAY with occasional greyish brown mottling and coke/coal fragments. Gravel is white, grey, light brown and brown fine and medium subangular and subrounded	

PREPARATION

Method of Preparation	Sieved Specimen	Liquid Limit	58 %
Sample retained 0.425 sieve	(Measured) 19 %	Plastic Limit	22 %
Corrected moisture content for material passing 0.425mm	47 %	Plasticity Index	36 %
Curing Time	73 Hours	Liquidity Index	0.69
		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3 , 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
15% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 6 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

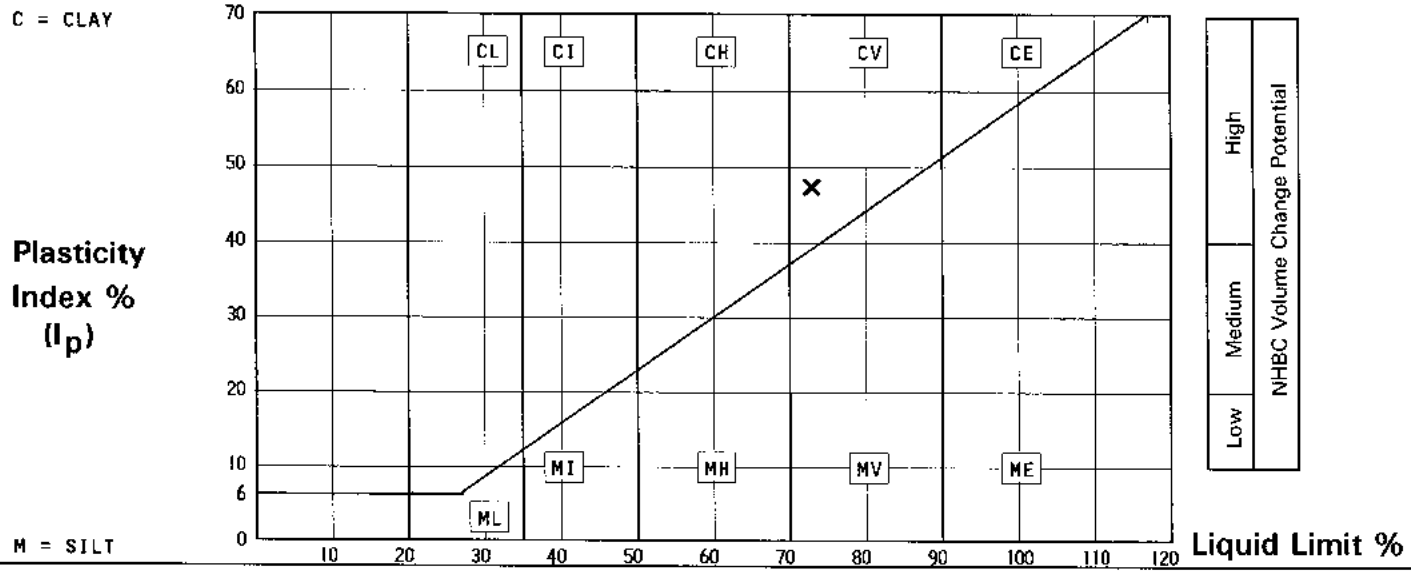
UKAS TESTING
0998

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
FIP3	1.70	D3	39	Soft yellowish brown slightly sandy slightly gravelly CLAY with occasional grey mottling and brick fragments. Gravel is dark grey and black fine and medium rounded to subangular	

PREPARATION

Method of Preparation	Sieved Specimen	Liquid Limit	73 %
Sample retained 0.425 sieve	(Measured) 11 %	Plastic Limit	26 %
Corrected moisture content for material passing 0.425mm	44 %	Plasticity Index	47 %
Curing Time	28 Hours	Liquidity Index	0.38
		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
10% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 7 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-1

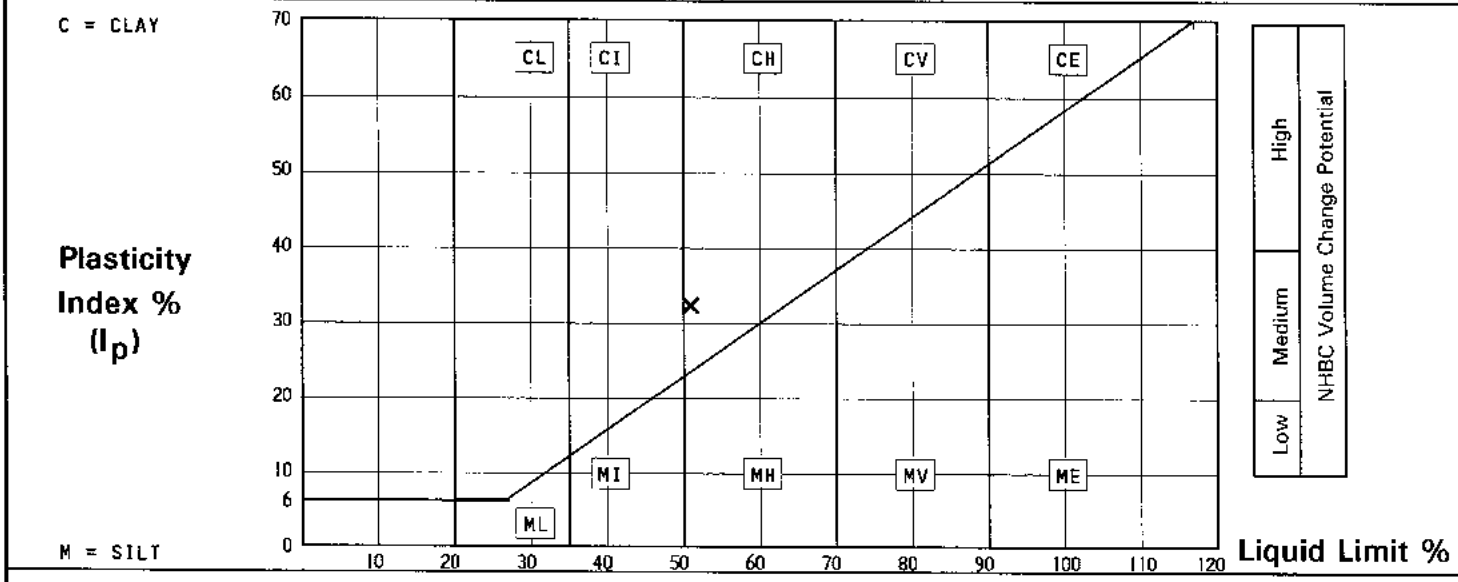
UKAS TESTING
0998

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
FIP4	0.90	D1	25	Stiff yellowish brown slightly sandy slightly gravelly CLAY with occasional grey and light orangish brown mottling. Gravel is red, white, grey, dark grey and brown fine and medium rounded to subangular	Strong odour noted

PREPARATION

Method of Preparation	Sieved Specimen	Liquid Limit	51 %
Sample retained 0.425 sieve	(Measured) 7 %	Plastic Limit	19 %
Corrected moisture content for material passing 0.425mm	27 %	Plasticity Index	32 %
Curing Time	25 Hours	Liquidity Index	0.25
		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
6% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

UKAS TESTING
2183

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

Final Report

Report No.:	16-10385-1
Initial Date of Issue:	11-May-2016
Client	Soil Property Testing
Client Address:	18 Halycon Court St Margarets Way Stukeley Meadows Huntingdon Cambridgeshire PE29 6DG
Contact(s):	Jon Garner
Project	S29994-1 Greenwood Centre, Greenwood Place
Quotation No.:	Q16-06170
Order No.:	S29994-1
No. of Samples:	2
Turnaround (Wkdays):	5
Date Approved:	11-May-2016
Approved By:	

Details:	Keith Jones, Technical Manager

Date Received:	05-May-2016
Date Instructed:	05-May-2016
Results Due:	11-May-2016

Chemtest
The right chemistry to deliver results

Results - Soil

Project: S29994-1 Greenwood Centre, Greenwood Place

Client: Soil Property Testing					Chemtest Job No.:	16-10385	16-10385
Quotation No.: Q16-06170					Chemtest Sample ID.:	289713	289714
Order No.: S29994-1					Client Sample Ref.:	FIP2	FIP4
					Client Sample ID.:	D1	D1
					Sample Type:	SOIL	SOIL
					Top Depth (m):	1.40	0.90
Determinand	Accred.	SOP	Units	LOD			
Moisture	N	2030	%	0.020		26	26
pH	U	2010		N/A		8.3	8.3
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.11	0.12
Total Sulphur	U	2175	%	0.010		0.030	0.050
Sulphate (Acid Soluble)	U	2430	%	0.010		0.079	0.077

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : 13/05/16 **PAGE 1 of 7 Pages**

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

UKAS TESTING 0998

CLIENT:

Geosphere Environmental Ltd.
Brightwell Barns
Brightwell
Ipswich
IP10 0BJ

Soil Property Testing Ltd.

15,16 & 18 Halcyon Court, St Margarets Way,
Stukeley Meadows, Huntingdon,
Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

Geosphere Environmental Ltd.

APPROVED SIGNATORIES:

☑ **J.C.GARNER B.Eng (Hons.) FGS**
Technical Director

☐ **S.P.TOWNEND FGS**
Quality Manager

☐ **W.JOHNSTONE**
Materials Lab Manager

SAMPLES LABELLED:

Greenwood Centre, Greenwood Place, Camden, London

DATE RECEIVED: 27/04/16

SAMPLES TESTED BETWEEN 27/04/16 **and** 13/05/16

REMARKS: For the attention of Lianne Fountain
Your reference 1655,GI
Chemical testing subcontracted to Chemtest - results included as Appendix A to this Test Report

NOTES:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. (a) UKAS - United Kingdom Accreditation Service.
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 2 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)	700:Sulphate Test (2:1 Water Soil)	702:ph value of Soil or Water	705:Organic content (Dichromate)	718:Total Sulphur Content	704:Acid Soluble Sulphate	1:Moisture Content Determination	3:Liquid /Plastic Limit 4 point	5:Wet Sieve Preparation for Lima	Remarks
WS101	D1	1.60	*	*	*	*	*				
WS102	D1	0.90	*	*	*	*	*	*	*	*	
	D2	1.90	*	*				*			
	D3	2.90	*	*	*			*	*		
	D4	4.00	*	*				*			
	D6	5.80	*	*		*	*	*	*		
-	-	-	6	6	3	3	3	5	3	1	<— Total Number of Tests —

Scheduled by: Geosphere Environmental Ltd.

Target Date: 12/05/16

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 3 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

UKAS TESTING
0998

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plast-icity Index (%)	Liqu-idity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
WS102	0.90	D1	30	51	30	21	1.05*	S	42(M)	52	24	MADE GROUND comprising dark grey and dark greyish brown slightly organic sandy clay, brick, mortar, concrete and glass fragments, fine and medium subangular and subrounded flint, rare ceramic fragments and decayed roots	MHO
WS102	1.90	D2	25	-	-	-						Soft yellowish brown slightly gravelly CLAY with occasional light brownish grey and light orangish brown mottling. Gravel is white, brown and grey fine and medium angular to subrounded gravel	-
WS102	2.90	D3	22	57	23	34	-0.03	N	0(A)		25	Stiff slightly fissured reddish yellow and dark grey CLAY with occasional grey and light orangish brown mottling	CH
WS102	4.00	D4	28	-	-	-						Stiff slightly fissured brown CLAY with occasional grey and yellowish brown mottling	-
WS102	5.80	D6	28	75	29	46	-0.02	N	0(A)		24	Stiff slightly fissured yellowish brown CLAY with occasional grey mottling and selenite crystals	CV

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2 S = Wet Sieved Specimen
N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

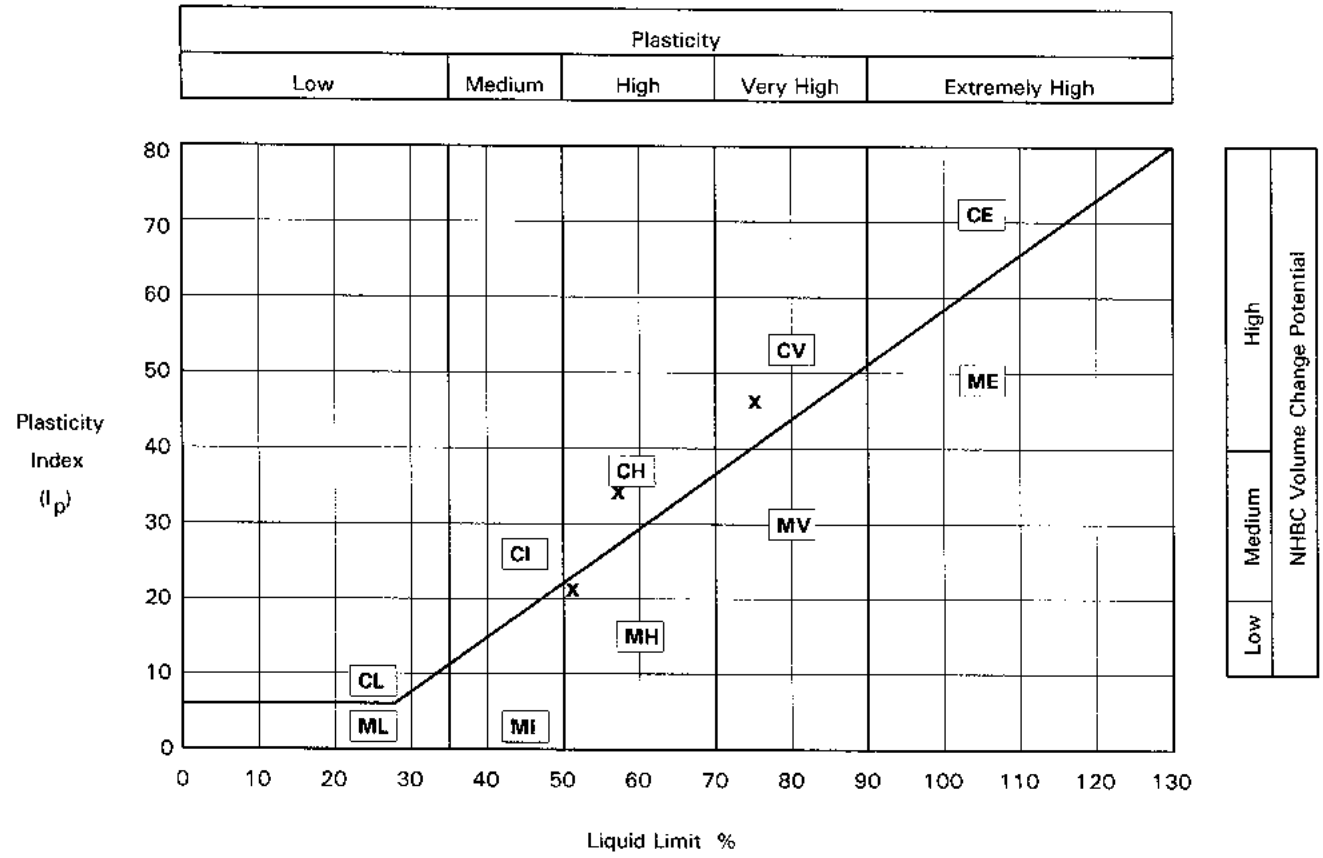
ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 4 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index PLASTICITY CHART BS5930:1999:Figure 18

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 5 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

UKAS TESTING
0998

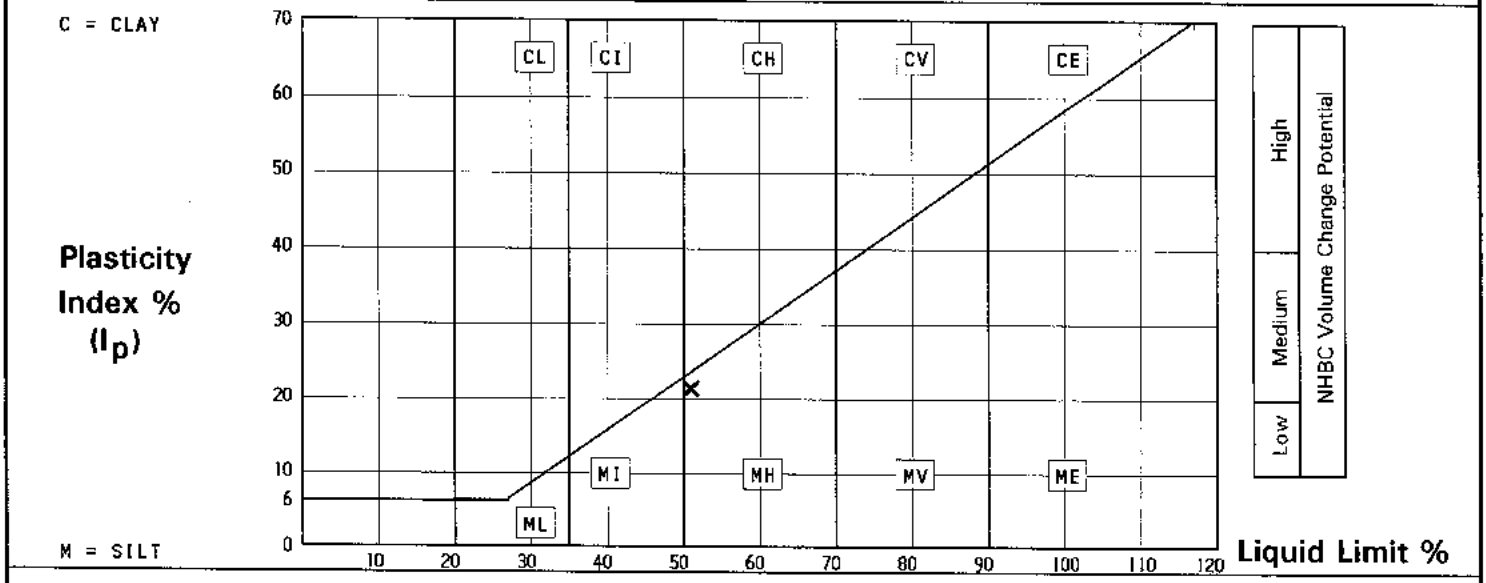
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS102	0.90	D1	30	MADE GROUND comprising dark grey and dark greyish brown slightly organic sandy clay, brick, mortar, concrete and glass fragments, fine and medium subangular and subrounded flint, rare ceramic fragments and decayed roots	

PREPARATION

Method of Preparation	Sieved Specimen		
Sample retained 0.425 sieve	(Measured)	42 %	
Corrected moisture content for material passing 0.425mm		52 %	
Curing Time		24 Hours	

Liquid Limit	51 %
Plastic Limit	30 %
Plasticity Index	21 %
Liquidity Index	1.05
Clay Content	Not analysed. %
Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
29% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 6 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

UKAS TESTING
0998

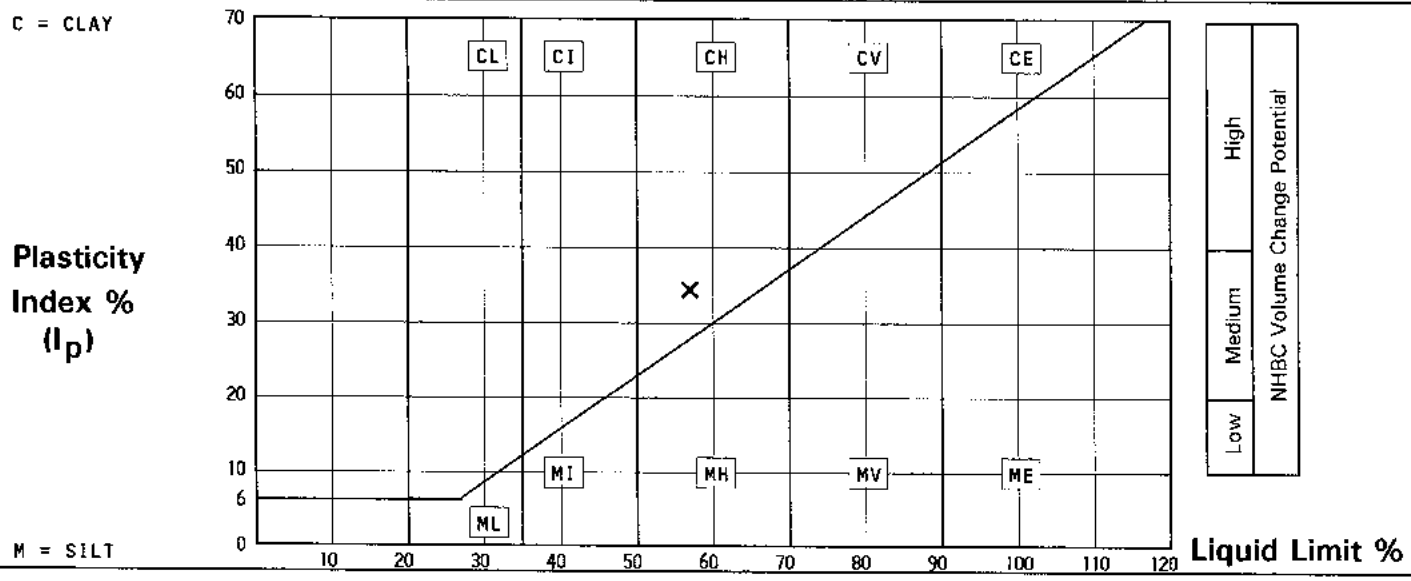
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS102	2.90	D3	22	Stiff slightly fissured reddish yellow and dark grey CLAY with occasional grey and light orangish brown mottling	Rare slightly organic pockets and fine and medium gravel noted - possibly fallen from above during sampling

PREPARATION

Method of Preparation	Specimen from Natural Soil
Sample retained 0.425 sieve (Assumed)	0 %
Corrected moisture content for material passing 0.425mm	%
Curing Time	25 Hours

Liquid Limit	57 %
Plastic Limit	23 %
Plasticity Index	34 %
Liquidity Index	-0.03
Clay Content	Not analysed. %
Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
<1% gravel by dry mass picked out by hand and excluded from limits tests.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 7 of 7

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-2

UKAS TESTING
0998

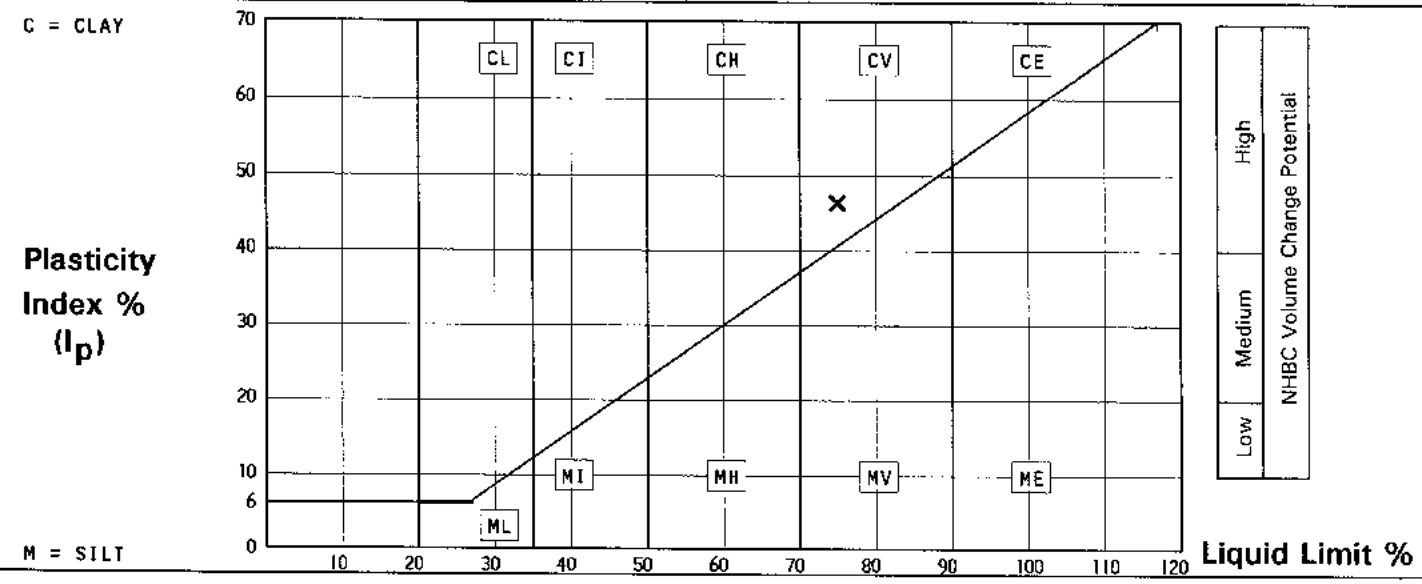
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS102	5.80	D6	28	Stiff slightly fissured yellowish brown CLAY with occasional grey mottling and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION

Method of Preparation	Specimen from Natural Soil		
Sample retained 0.425 sieve	(Assumed)	0	%
Corrected moisture content for material passing 0.425mm			%
Curing Time		24 Hours	

Liquid Limit	75 %
Plastic Limit	29 %
Plasticity Index	46 %
Liquidity Index	-0.02
Clay Content	Not analysed. %
Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

Final Report

Report No.:	16-10366-1
Initial Date of Issue:	11-May-2016
Client	Soil Property Testing
Client Address:	18 Halycon Court St Margarets Way Stukeley Meadows Huntingdon Cambridgeshire PE29 6DG
Contact(s):	Jon Garner
Project	S29994-2 - Greenwood Centre, Greenwood Place, Camden, London

Quotation No.:	Q16-06170	**Date Received:**	05-May-2016
Order No.:	S29994-2	**Date Instructed:**	05-May-2016
No. of Samples:	6		
Turnaround (Wkdays):	5	**Results Due:**	11-May-2016
Date Approved:	11-May-2016		

Approved By:

Details: Keith Jones, Technical Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: S29994-2 - Greenwood Centre, Greenwood Place, Camden, London

Client: Soil Property Testing		Chemtest Job No.:			16-10366	16-10366	16-10366	16-10366	16-10366	16-10366
Quotation No.: Q16-06170		Chemtest Sample ID.:			289638	289639	289640	289641	289642	289643
Order No.: S29994-2		Client Sample Ref.:			WS101	WS102	WS102	WS102	WS102	WS102
		Client Sample ID.:			D1	D1	D2	D3	D4	D6
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			1.60	0.90	1.90	2.90	4.00	5.80
Determinand	Accred.	SOP	Units	LOD						
Moisture	N	2030	%	0.020	20	19	20	18	22	21
pH	U	2010		N/A	8.3	8.5	8.0	8.1	8.3	8.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.065	0.019	< 0.010	0.061	0.34	0.72
Total Sulphur	U	2175	%	0.010	0.020	0.18				0.22
Sulphate (Acid Soluble)	U	2430	%	0.010	0.025	0.15				0.55
Organic Matter BS1377	N	2930	%	0.10	0.90	2.1		0.90		

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : 19/05/16 **PAGE 1 of 17 Pages**

Contract — Greenwood Centre, Greenwood Place, Camden, London

Serial No. S29994-3

UKAS TESTING 0998

CLIENT:

Geosphere Environmental Ltd.
Brightwell Barns
Brightwell
Ipswich
IP10 0BJ

Soil Property Testing Ltd.

15,16 & 18 Halcyon Court, St Margarets Way,
Stukeley Meadows, Huntingdon,
Cambs. PE29 6DG.

Telephone (01480) 455579 Fax (01480) 453619
Email enquiries@soilpropertytesting.com

SAMPLES SUBMITTED BY:

Geosphere Environmental Ltd.

APPROVED SIGNATORIES:

☑ **J.C.GARNER B.Eng (Hons.) FGS**
Technical Director

☐ **S.P.TOWNEND FGS**
Quality Manager

☐ **W.JOHNSTONE**
Materials Lab Manager

SAMPLES LABELLED:

Greenwood Centre, Greenwood Place, Camden, London

DATE RECEIVED: 27/04/16 **SAMPLES TESTED BETWEEN** 27/04/16 **and** 19/05/16

REMARKS: For the attention of Lianne Fountain
Your reference 1655,GI
Chemical tests subcontracted to Chemtest - results included as Appendix A to this Test Report

NOTES:

1. All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
2. (a) UKAS - United Kingdom Accreditation Service.
   (b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
3. Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
4. This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 2 of 17

Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)	700:Sulphate Test (2:1 Water Soil)	702:ph value of Soil or Water	705:Organic Content (Dichromate)	1:Moisture Content Determination	3:Liquid /Plastic Limit 4 point	5:Wet Sieve Preparation for Limit	718:Total Sulphur Content	704:Acid Soluble Sulphate	13:Triaxial Test single stage	Remarks
BH01	D3	4.00	*	*	*	*	*	*	*	*		
	D4	5.00	*	*		*			*	*		
	D5	6.00				*	*					
	D6	7.00				*						
	UT1	7.50									*	
	D7	8.00	*	*		*			*	*		
	UT2	10.50									*	
	UT3	13.50									*	
	D13	14.00	*	*								
	UT4	16.50									*	
	UT5	19.50									*	
	UT6	22.50									*	
	UT7	25.00									*	
-	-	-	4	4	1	5	2	1	3	3	7	<-- Total Number of Tests ---

Scheduled by: Geosphere Environmental Ltd.

Target Date: 12/05/16

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 3 of 17

Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

UKAS TESTING 0998

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	SAMPLE PREPARATION				Description	CLASS
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm	Curing Time (hrs.)		
BH01	4.00	D3	20	62	22	40	0.25*	S	37(M)	32	28	Firm brown slightly sandy slightly gravelly CLAY. Gravel is black, brown and white fine to coarse angular to subrounded	CH
BH01	5.00	D4	30	-	-	-						Stiff dark yellowish brown CLAY with occasional bluish grey mottling, rare selenite crystals and decayed roots.	-
BH01	6.00	D5	30	76	29	47	0.02	N	0(A)		27	Stiff dark yellowish brown CLAY with rare bluish grey mottling, rare decayed roots and selenite crystals	CV
BH01	7.00	D6	29	-	-	-						Stiff dark yellowish brown CLAY with rare bluish grey mottling, selenite crystals and decayed roots.	-
BH01	8.00	D7	30	-	-	-						Stiff fissured dark yellowish brown CLAY	-

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2 S = Wet Sieved Specimen N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

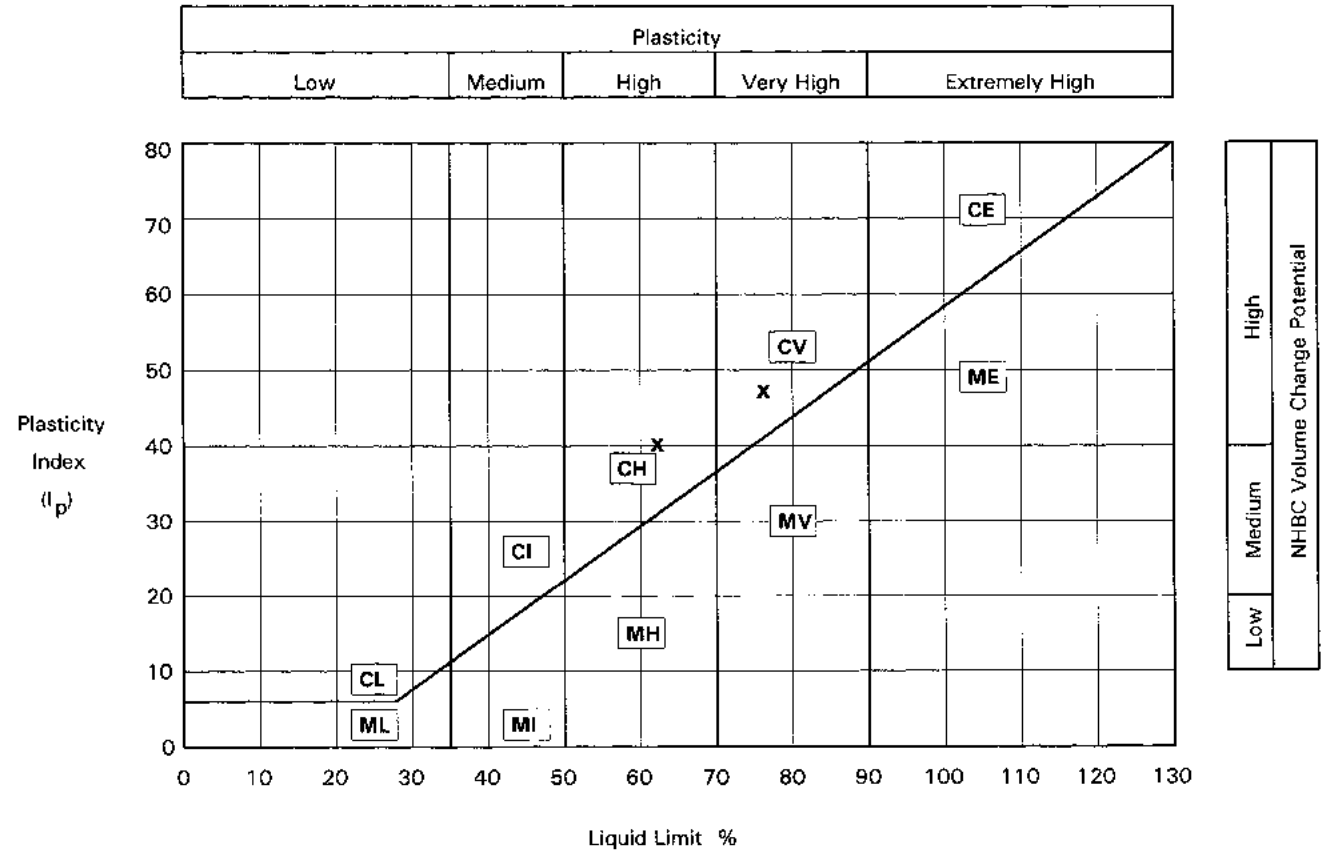
ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 4 **of** 17

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-3

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index PLASTICITY CHART BS5930:1999:Figure 18

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 5 of 17

Contract Greenwood Centre, Greenwood Place, Camden, London

Serial No. S29994-3

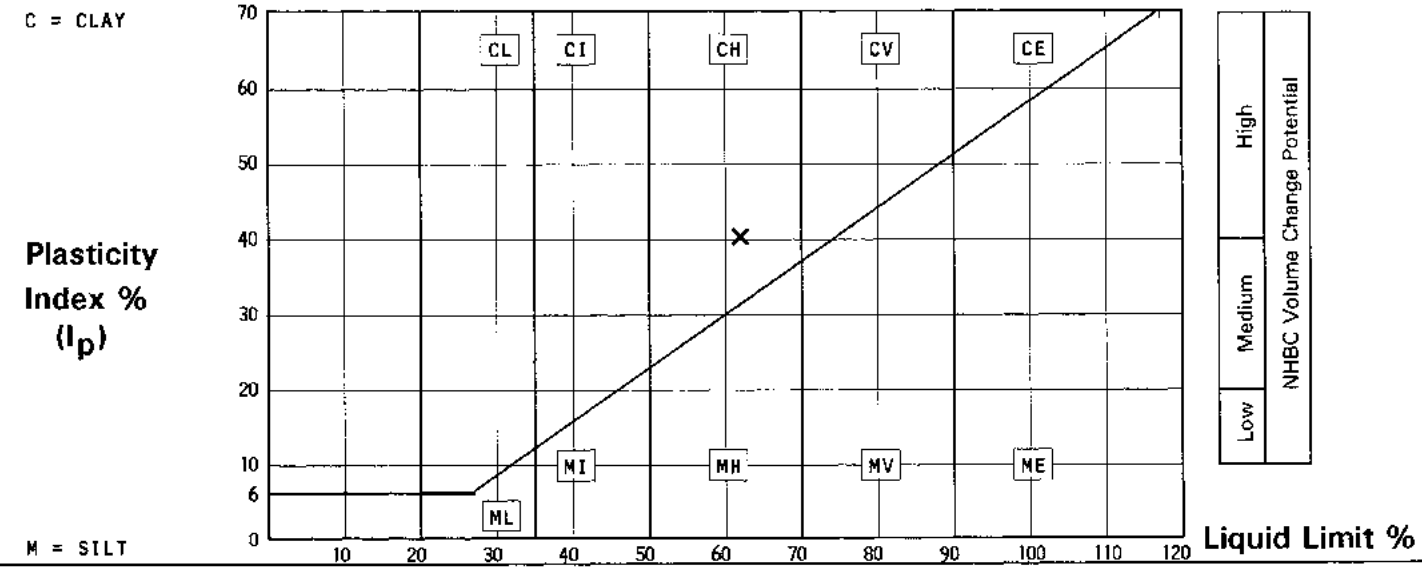
UKAS TESTING 0998

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH01	4.00	D3	20	Firm brown slightly sandy slightly gravelly CLAY. Gravel is black, brown and white fine to coarse angular to subrounded	

PREPARATION

Method of Preparation	Sieved Specimen	Liquid Limit	62 %
Sample retained 0.425 sieve	(Measured) 37 %	Plastic Limit	22 %
Corrected moisture content for material passing 0.425mm	32 %	Plasticity Index	40 %
Curing Time	28 Hours	Liquidity Index	0.25
		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)
31% retained on 2mm sieve.
Corrected moisture content and calculated liquidity index assume material greater than 0.425mm non porous. See BS1377:Part2:1990 Clause 3 Note 1.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 6 of 17

Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

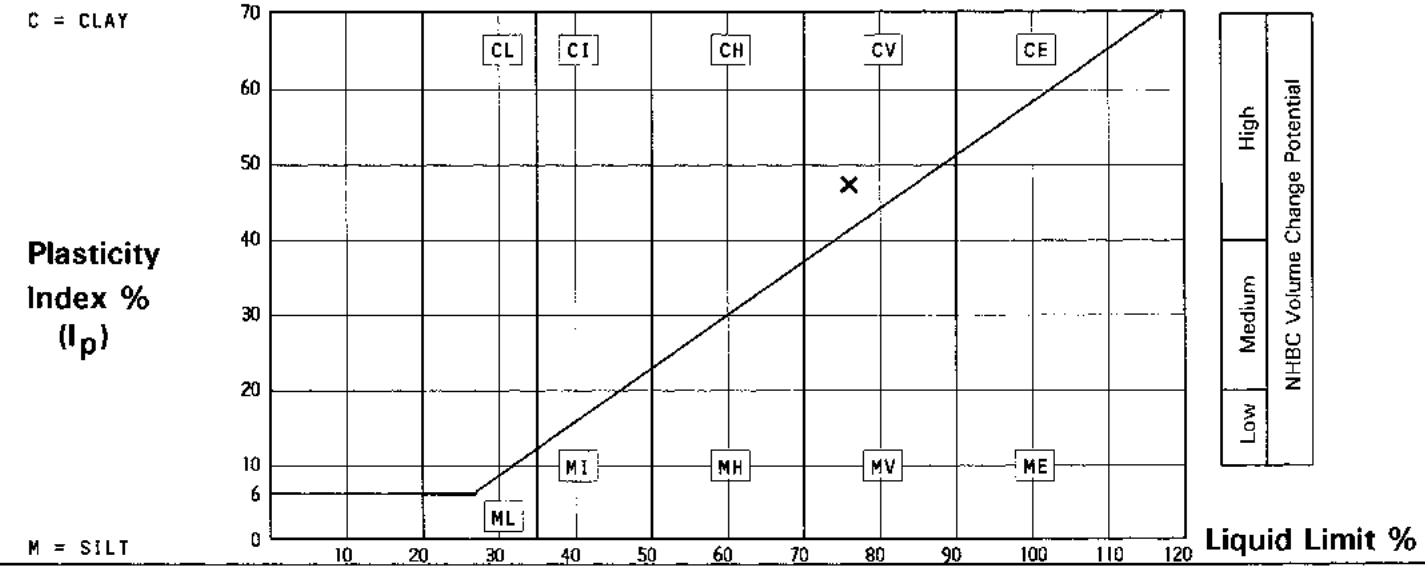
UKAS TESTING 0998

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
BH01	6.00	D5	30	Stiff dark yellowish brown CLAY with rare bluish grey mottling, rare decayed roots and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION

Method of Preparation	Specimen from Natural Soil	Liquid Limit	76 %
Sample retained 0.425 sieve	(Assumed) 0 %	Plastic Limit	29 %
Corrected moisture content for material passing 0.425mm	%	Plasticity Index	47 %
Curing Time	27 Hours	Liquidity Index	0.02
		Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.3 , 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

DATE OF ISSUE : As page 1 **PAGE** 7 **of** 17

Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

UKAS TESTING 0998

DETERMINATION OF DENSITY, MOISTURE CONTENT AND UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Bulk Density (Mg/m^3)	Dry Density (Mg/m^3)	Lateral Pressure (kPa)	Deviator Stress (kPa)	Shear Stress (kPa)	MOHRS CIRCLE ANALYSIS Cu (kPa)	MOHRS CIRCLE ANALYSIS ∅ (degrees)	Description
BH01	7.50	UT1	30	1.97	1.52	149	205	103			Stiff (High strength) fissured yellowish brown CLAY with occasional greyish brown and grey mottling and selenite crystals
BH01	10.50	UT2	28	1.99	1.55	209	287	144			Stiff (High strength) fissured yellowish brown and brown CLAY with occasional dark grey mottling and selenite crystals
BH01	13.50	UT3	29	1.98	1.53	272	291	145			Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare orange staining
BH01	16.50	UT4	29	1.99	1.54	332	249	125			Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling
BH01	19.50	UT5	28	1.98	1.55	392	323	161			Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare shell fragments
BH01	22.50	UT6	28	2.00	1.56	452	522	261			Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling
BH01	25.00	UT7	27	2.00	1.57	500	509	255			Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4.2 & 8 PART 2:1990:7.2 PART 7:1990:8.3

METHOD OF TEST : BS 1377:PART 2:1990:3 Determination of Moisture Content 1990:7 Determination of Density
:PART 7:1990:8 Undrained Shear Strength 1990:9 Multi-stage test
Note Multi-stage test used when specimen has granular content / behaviour and length of specimen precludes the taking of 3 x 100mm dia by 200mm long specimens.

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

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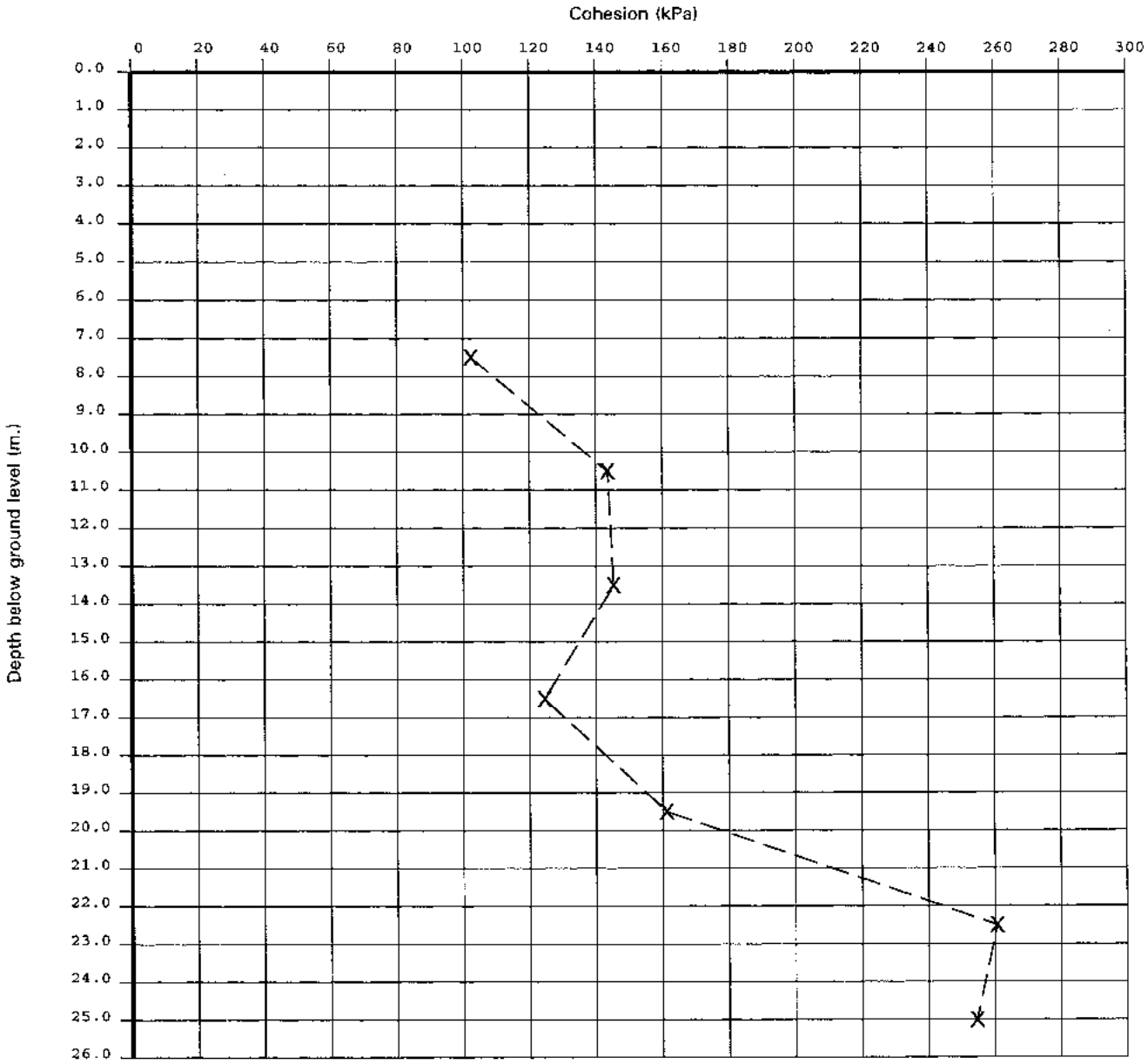
Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-3

Cohesion (kPa) vs Depth below ground level (m.).



Key to Data Points	X : BH01							

SPTPLOT

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 9 of 17

Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-3

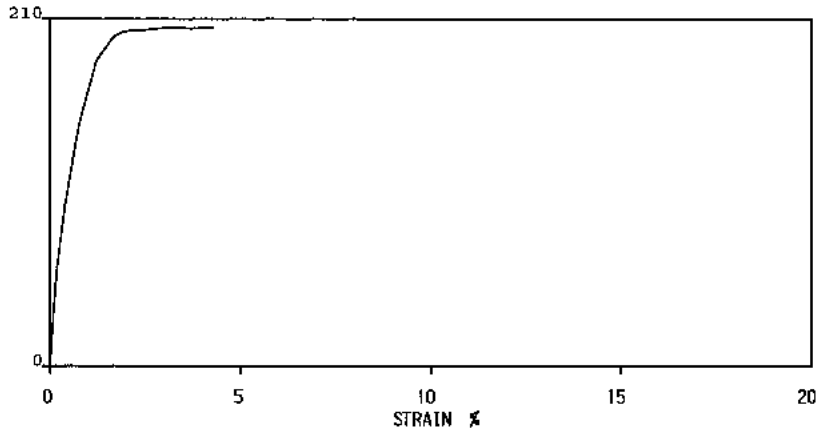
UKAS TESTING
0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	7.50	UT1	Stiff (High strength) fissured yellowish brown CLAY with occasional greyish brown and grey mottling and selenite crystals	Strong solvent/hydrocarbon odour. Oven dried at a maximum of 80°C due to the presence of selenite

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 7.54	199.9	103.6	3317	30	1.97	1.52

TEST INFORMATION — Rate of Strain 1.0 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	149	3.3	0.2	/	205	103		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

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Contract Greenwood Centre, Greenwood Place, Camden, London

Serial No. S29994-3

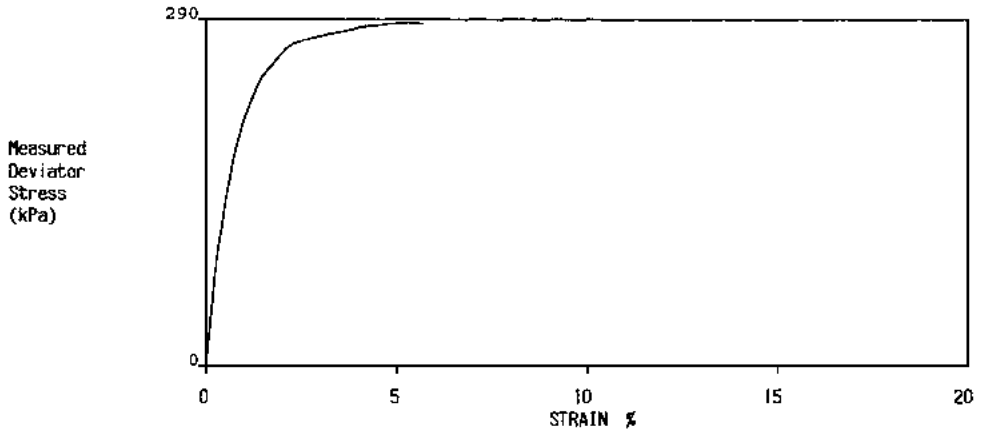
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	10.50	UT2	Stiff (High strength) fissured yellowish brown and brown CLAY with occasional dark grey mottling and selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 10.54	184.6	103.6	3091	28	1.99	1.55

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	209	5.5	0.4	/	287	144		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

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Serial No. S29994-3

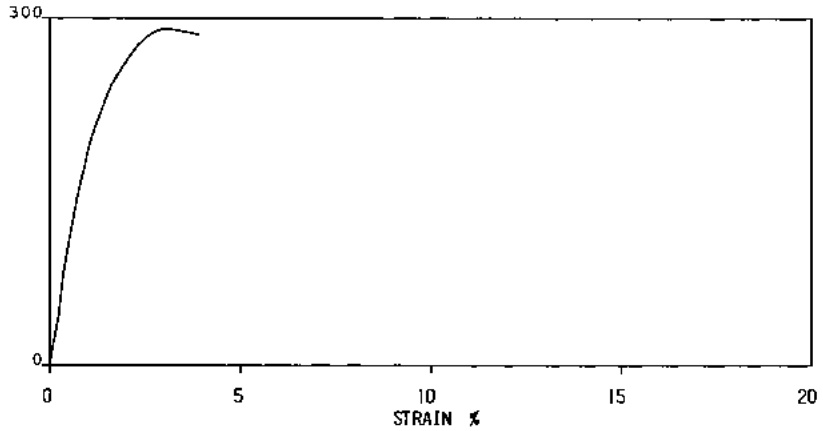
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	13.50	UT3	Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare orange staining	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 13.56	199.9	103.4	3330	29	1.98	1.53

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	272	3.1	0.2	/	291	145		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

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Serial No. S29994-3

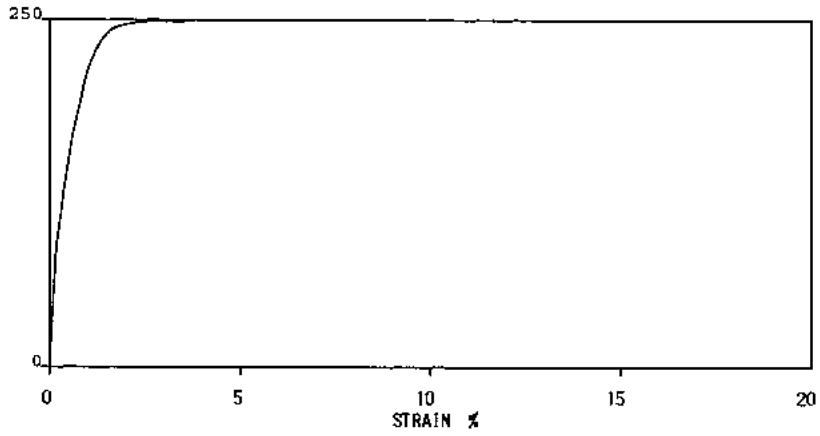
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	16.50	UT4	Stiff (High strength) fissured dark greyish brown CLAY with occasional dark grey mottling	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 16.56	170.2	103.6	2849	29	1.99	1.54

TEST INFORMATION — Rate of Strain 1.0 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	332	2.5	0.2	/	249	125		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 **PAGE** 13 of 17

Contract Greenwood Centre, Greenwood Place, Camden, London

Serial No. S29994-3

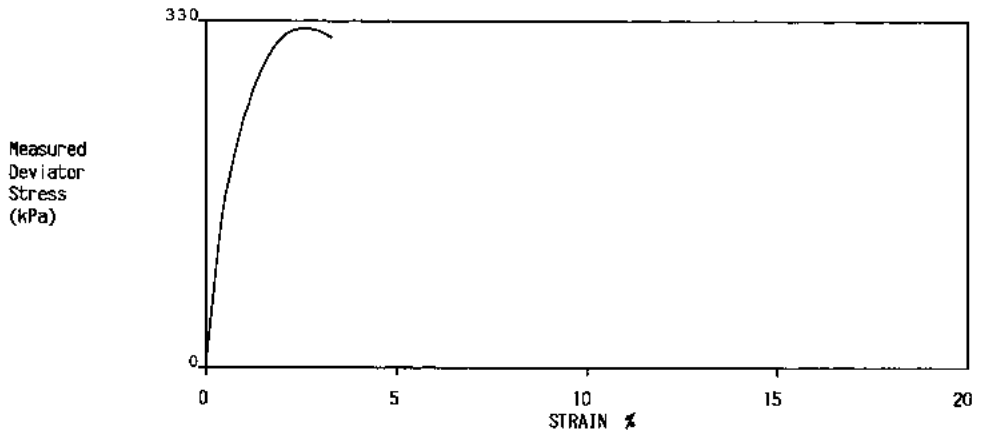
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	19.50	UT5	Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling and rare shell fragments	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 19.56	199.8	103.7	3347	28	1.98	1.55

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	392	2.7	0.2	/	323	161		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

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Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

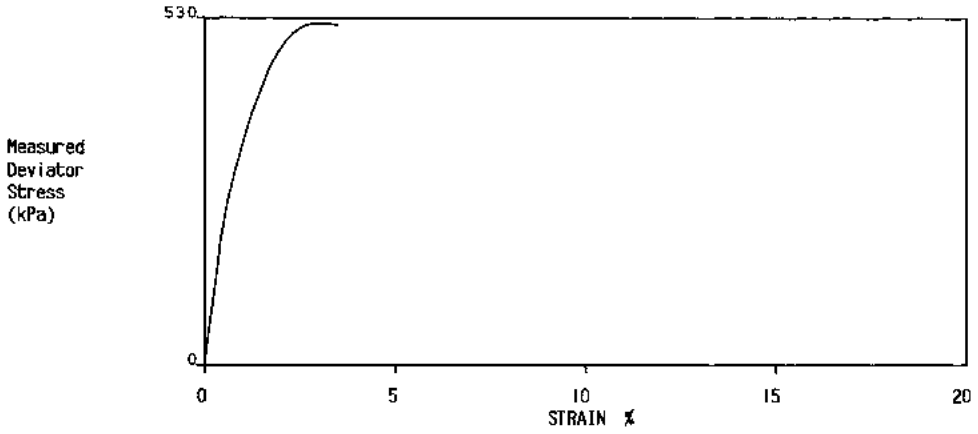
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	22.50	UT6	Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 22.72	155.3	103.6	2618	28	2.00	1.56

TEST INFORMATION — Rate of Strain 0.8 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	452	2.9	0.2	/	522	261		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

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Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-3

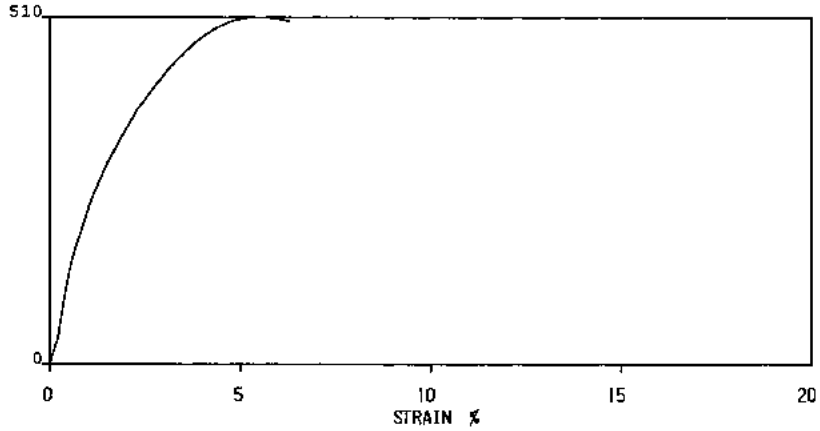
UKAS TESTING 0998

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Borehole/ Pit No.	Depth m.	Sample	Description	Remarks
BH01	25.00	UT7	Very stiff (Very high strength) fissured dark greyish brown CLAY with occasional dark grey mottling	

Initial Specimen	Height mm	Diameter mm	Weight g	Moisture Content %	Wet Density Mg/m^3	Dry Density Mg/m^3
Depth of Top of Specimen (m) 25.02	199.6	103.6	3355	27	2.00	1.57

TEST INFORMATION — Rate of Strain 0.9 % per Min — Rubber Membrane Thickness 0.3 mm



Specimen at Failure	Measured Cell Pressure $\sigma 3$ (kPa)	Strain at Failure (%)	Stress Corrections (kPa)		Corrected Max. Deviator Stress $\sigma 1 - \sigma 3$ (kPa)	Shear Stress Cu $\frac{1}{2}(\sigma 1 - \sigma 3)_f$ (kPa)	Mohrs Circle Analysis	
			Rubber Membrane	Piston Friction			Cu (kPa)	PHI °
	500	5.3	0.4	/	509	255		

METHOD OF PREPARATION: BS 1377:PART 1:1990:

METHOD OF TEST : BS 1377:PART 7:1990:8 Definitive Method. 1990:9 Multi-stage loading

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Tested in Vertical Orientation.
UKAS Calibration - loads from 0.2 to 10kN.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

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DATE OF ISSUE : As page 1 **PAGE** 16 of 17

Contract: Greenwood Centre, Greenwood Place, Camden, London

Serial No.: S29994-3

DETERMINATION OF THE SULPHATE CONTENT OF SOIL AND GROUNDWATER

Borehole/ Pit No.	Depth m.	Sample	Concentration of Soluble Sulphate: Soil: Acid Soluble SO_3 %	Soil: Water Soluble 2:1 SO_3 g/l	Groundwater g/l	% of sample passing 2mm sieve	Description	Remarks
BH01	14.00	D13		0.72		100	Very stiff dark grey CLAY	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.5 BS1377:PART 3:1990:5.2 Acid Soluble, 5.3 Soil/Water Extract :5.4 Groundwater

METHOD OF TEST : BS 1377:PART 3:1990:5.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

TEST REPORT.

ISSUED BY : **SOIL PROPERTY TESTING LTD.**

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Contract
Greenwood Centre, Greenwood Place, Camden, London

Serial No.
S29994-3

DETERMINATION OF THE pH VALUE

Borehole/ Pit No.	Depth m.	Sample	pH Value	Description	Remarks
BH01	14.00	D13	8.0	Very stiff dark grey CLAY	

METHOD OF PREPARATION: BS 1377:PART 1:1990:7 BS 1377:PART 3:1990:9.4

METHOD OF TEST : BS 1377:PART 3:1990:9.5

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : Test not UKAS accredited.

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.co.uk

UKAS TESTING
2183

Final Report

Report No.:	16-10383-1
Initial Date of Issue:	10-May-2016
Client	Soil Property Testing
Client Address:	18 Halycon Court St Margarets Way Stukeley Meadows Huntingdon Cambridgeshire PE29 6DG
Contact(s):	Jon Garner
Project	S29994-3 Greenwood Centre, Greenwood Place

Quotation No.:	Q16-06170	**Date Received:**	05-May-2016
Order No.:	S29994-3	**Date Instructed:**	05-May-2016
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	11-May-2016
Date Approved:	10-May-2016		

Approved By:

Details: Martin Dyer, Laboratory Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: S29994-3 Greenwood Centre, Greenwood Place

Client: Soil Property Testing		Chemtest Job No.:			16-10383	16-10383	16-10383
Quotation No.: Q16-06170		Chemtest Sample ID.:			289700	289701	289702
Order No.: S29994-3		Client Sample Ref.:			BH01	BH01	BH01
		Client Sample ID.:			D3	D4	D7
		Sample Type:			SOIL	SOIL	SOIL
		Top Depth (m):			4.00	5.00	8.00
Determinand	Accred.	SOP	Units	LOD			
Moisture	N	2030	%	0.020	15	22	22
pH	U	2010		N/A	8.2	7.9	8.0
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.35	1.4	0.51
Total Sulphur	U	2175	%	0.010	0.080	0.85	0.060
Sulphate (Acid Soluble)	U	2430	%	0.010	0.24	1.5	0.14
Organic Matter BS1377	N	2930	%	0.10	0.90		

Chemtest
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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at our Coventry laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.co.uk

APPENDIX 8 – DRAWINGS

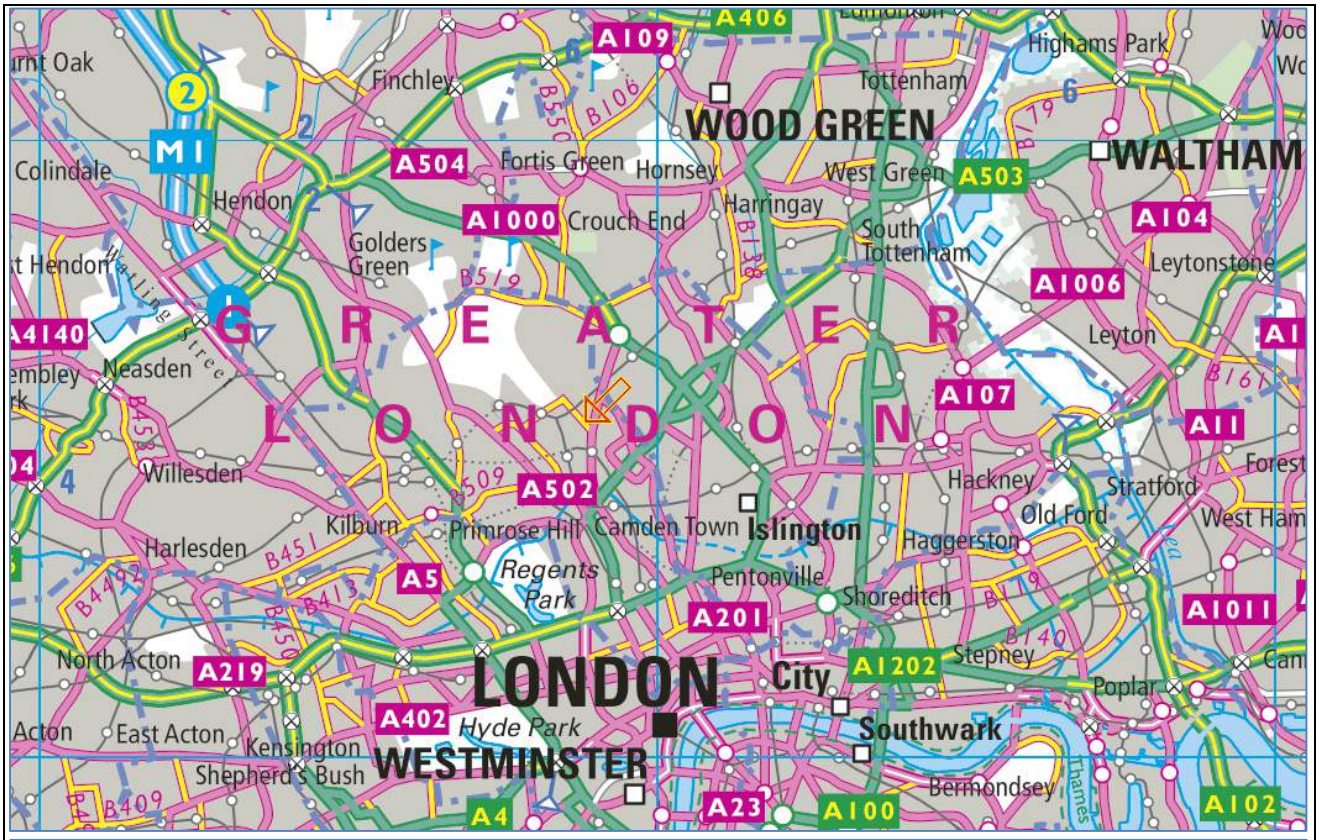
Site Location Plan – Drawing ref. 1655,GI 001/Rev 0

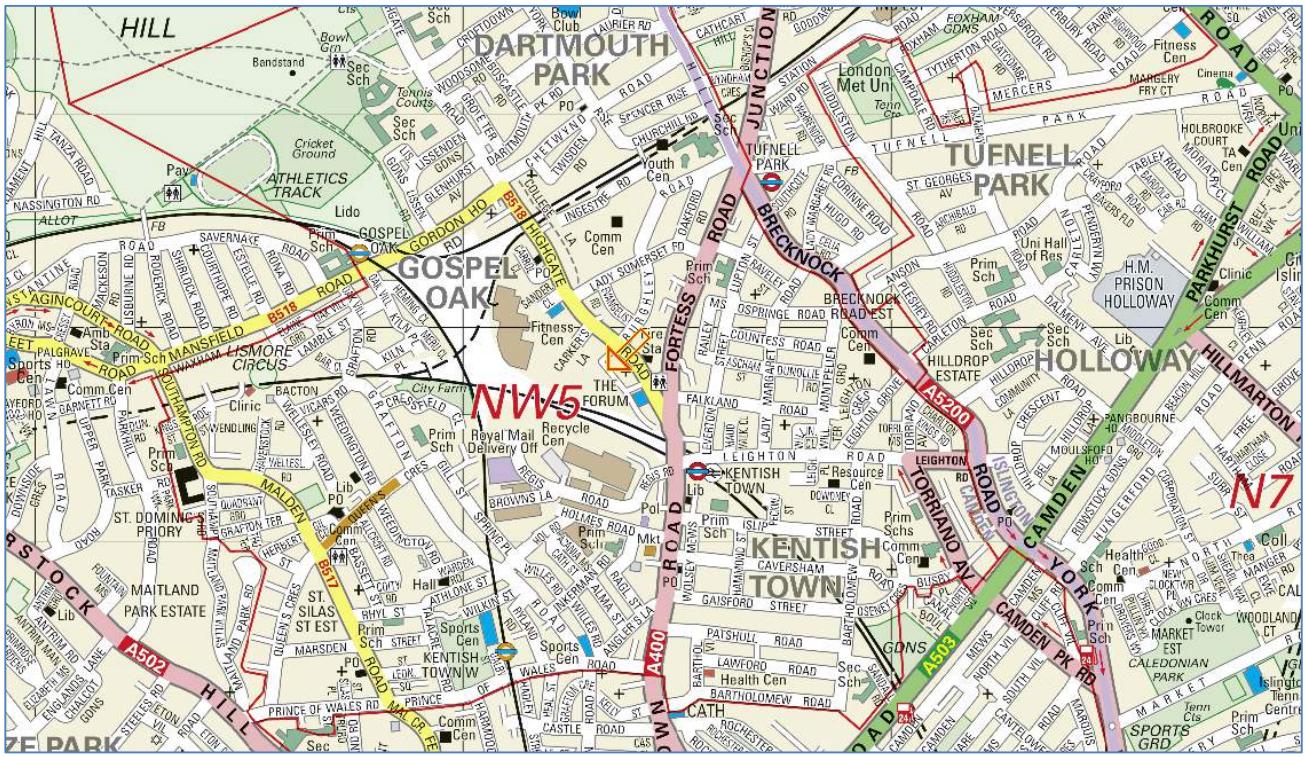
Site Plan – Drawing ref. GIS001 – A

Exploratory Hole Location Plan – Drawing ref. 1655,GI 002/Rev 0

Proposed Development Plan – Drawing ref. 1213 PL 002/Rev B

geosphere environmental ltd Investigate design resolve





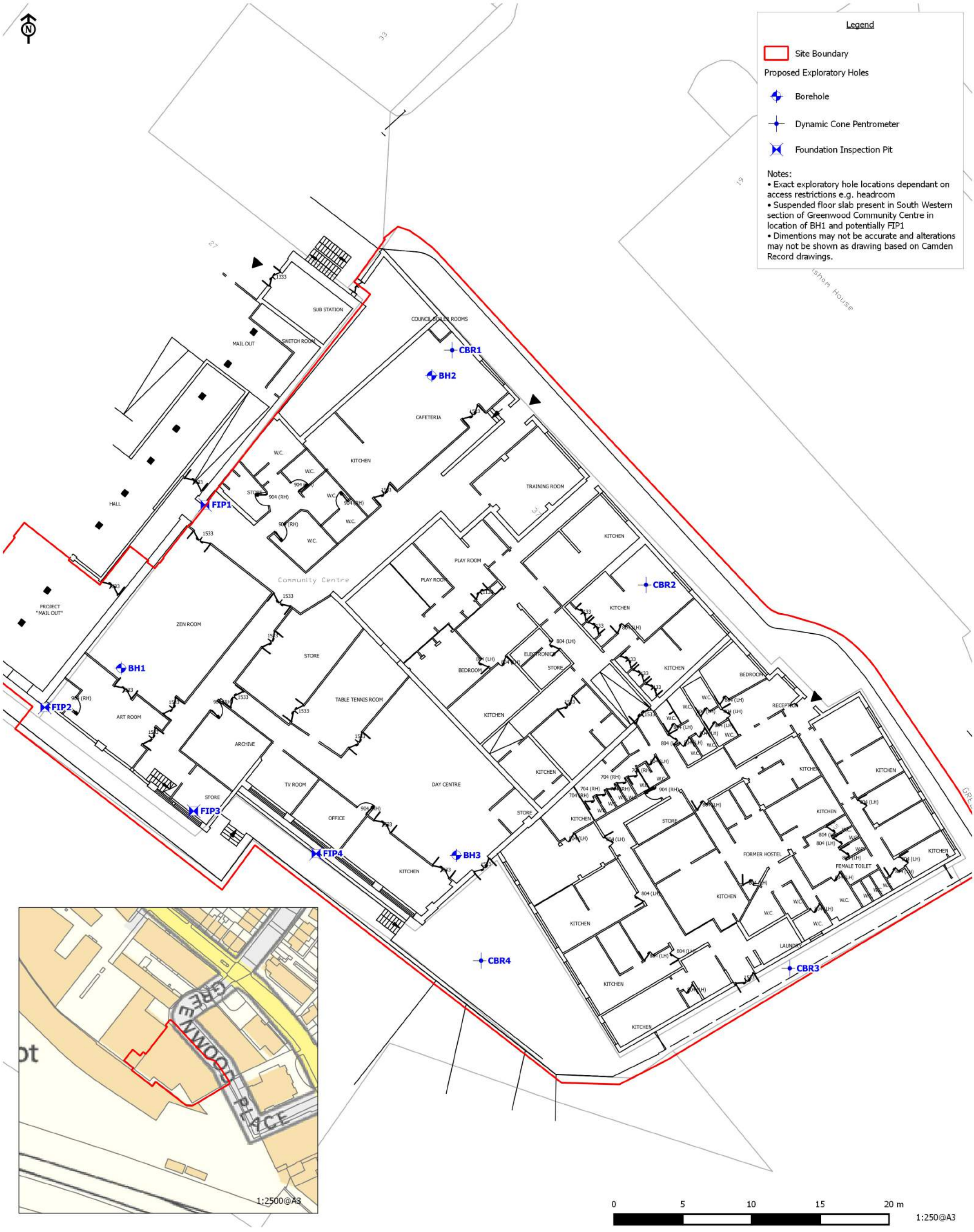
LEGEND:

Site Location — Site boundary

N

geosphere environmental ltd
Brightwell Barn, Ipswich Road, Brightwell, Suffolk, IP10 0BJ
T 01603 298 076 F 01603 289 075
E info@geosphere-environmental.co.uk

SITE	TITLE	REPORT NO.	DRAWING NO.	DATE
Greenwood Centre, Greenwood Place, Camden, London, NW5 1LB	Site Location Plan	1655,GI	001 / Rev 0	June 2016
	CLIENT: Kier Construction Ltd	DRAWN BY: LF	CHECKED: SG	SCALE: Not to scale



Greenwood Place

Client: Greenwood Place, Camden

Figure 4:
Exploratory Hole Location Plan Showing Existing Site Layout

Scale:	1:250@A3, Insert@1:2500
CampbellReith OS Copyright:	© Crown copyright. All rights reserved. Licence number 100020027
Existing Layout plan provided by PCK Architects, drawing number PL 150 (Feb 2013)	
Job Number:	12219
Drawn by - Checked by:	RC - JHC
Drg No - Status/Revision:	GIS001 - A
File location:	N:\12250 - 12274\12291 R - The Greenwood Centre\Project_Workspaces (pdf in Outputs)
Date (Revision History):	06/01/2016 (A, First Issue, 06/01/15, RC)

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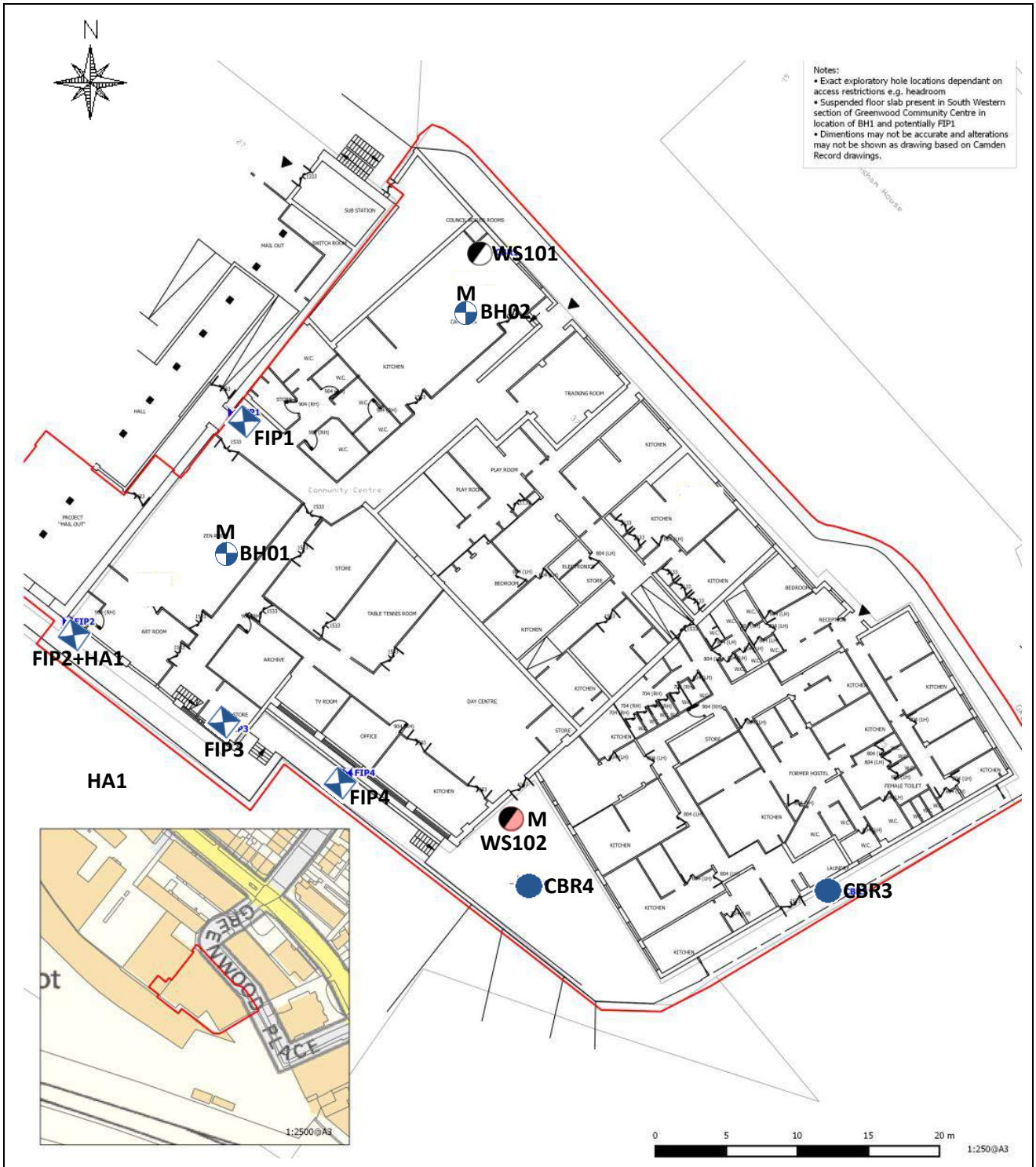
www.campbellreith.com



LEGEND:

- Site boundary
- Window sample location
- Window sample and dynamic probe location
- M Monitoring well
- Foundation pit location
- Hand auger location
- CBR Test pit location
- Borehole location

NOTE: Drawing based upon Campbell Reith drawing, ref. GIS001 - A

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SITE	TITLE	REPORT NO.	DRAWING NO.	DATE
Greenwood Centre, Greenwood Place, Camden, London, NW5 1LB	Exploratory Hole Location Plan **CLIENT** Kier Construction	1655,GI **DRAWN BY** LF	002 / Rev 0 **CHECKED** SG	June 2016 **SCALE** Not to scale

Highgate Road

SOCIAL ENTERPRISE

PROPOSED RESIDENTIAL

AA STORAGE

CHURCH

PROPOSED GREENWOOD CENTRE

DEANE HOUSE

Greenwood Place North

Greenwood Place South

Line of existing pavement

Line of existing pavement

LEGEND

- Blister Tactile Paving
- Non-adopted paving TBC
- ① Improvement to pedestrian crossing
- ② Path widened to increase access to all Greenwood Place
- ③ Crossover upgraded in collaboration with adjacent buildings
- ④ 6 no permit holder parking spaces provided overall
- ⑤ Loading areas for max 5 mobility buses/disabled bays
- ⑥ Turning head for all vehicles using Greenwood Place North
- ⑦ Slot drain for blind and partially sited guidance
- ⑧ Pedestrianised portion of Greenwood Place via TMO
- ⑨ Gates amended subject to detailed design and agreement with owners
- ⑩ Cycle parking sheffield stands
- Line of existing pavement
- Site Boundary

0 10 20 30 40 50

NOTES	DATE	REV	DESCRIPTION	BY	CHECKED
FIGURED DIMENSIONS ARE TAKEN TO STRUCTURE UNLESS INDICATED OTHERWISE. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORK. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER ARCHITECTS DRAWINGS, CONSULTANTS AND SPECIALISTS DRAWINGS, CONSTRUCTION NOTES, SPECIFICATIONS AND EMPLOYER'S REQUIREMENTS WHERE APPLICABLE. ANY DISCREPANCY MUST BE BROUGHT TO THE ATTENTION OF PCKO, IF IN DOUBT, ASK. ANY MODIFICATION TO THE DRAWING MUST BE CARRIED OUT BY PCKO. THIS DRAWING REMAINS UNDER THE COPYRIGHT OF PCKO ARCHITECTS LIMITED. PLEASE OBTAIN PERMISSION BEFORE COPYING. WHERE METHOD OF CONSTRUCTION INCORPORATES TIMBER/LIGHT GAUGE STEEL FRAME ALL ELEMENTS OF FRAME INCLUDING STUD LOCATIONS, NOGGING, DIAGTHING, LEVELS, TRUSSES AND WIND BRACING TO BE TO FRAME MANUFACTURER'S DESIGN, DETAIL AND SPECIFICATION. ALL STRUCTURAL ELEMENTS ARE SHOWN INDICATIVELY - FOR ALL DESIGN, DETAIL AND SPECIFICATION OF ENGINEERS AND SPECIALIST SUB-CONTRACTOR FABRICATORY'S DESIGN, DETAIL AND SPECIFICATION. ALL MECHANICAL AND ELECTRICAL ELEMENTS ARE SHOWN INDICATIVELY, FOR ALL M&E INSTALLATIONS REFER TO BUILDING SERVICES ENGINEER'S AND SPECIALIST SUB-CONTRACTOR'S DESIGN, DETAIL AND SPECIFICATION.	07.05.15	B	General Revision to Greenwood Centre	PH	PH

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ARCHITECTS INTERIOR DESIGNERS MASTER PLANNERS URBAN DESIGNERS

DRAWING TITLE: Site Plan		CLIENT: LB Camden	
		PROJECT: Greenwood Place	
STATUS: PLANNING			
SCALE: 1:250@A1	DRAWN BY: PH	DRAWING NO.: 1213 PL 002	REVISION: B
DATE: 13.03.13	CHECKED BY: PH		

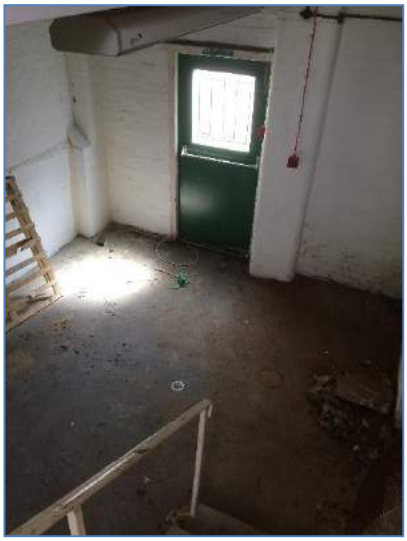
APPENDIX 9 – PHOTOGRAPHS

Photograph 1

Position BH02 within the north of the site

Photograph 2

Garden area within the south of the site, location of CBR4 and WS102

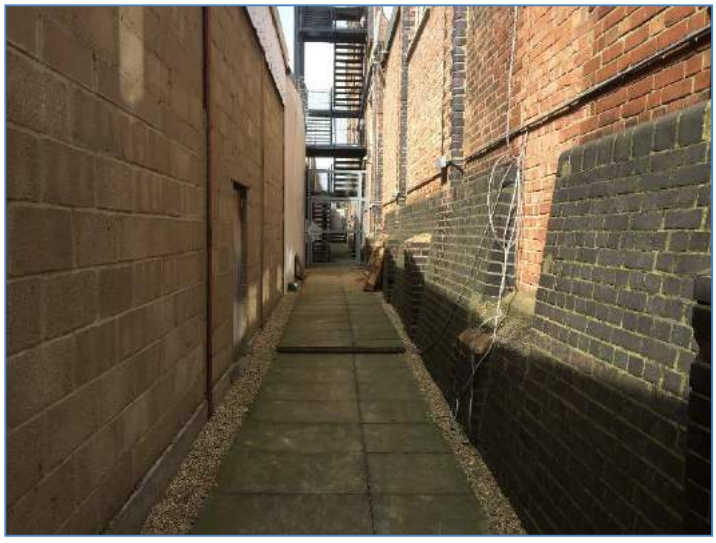


Photograph 3

Basement of the structure, located within the south west of the site

Photograph 4

Back passageway leading from the garden area toward the basement. FIP4 located toward the centre of the photo



Photograph 5

Back passageway leading toward Deane House. FIP2 located closed to metal gate

Photograph 6

Side passageway in the south east of the site. CBR 3 located toward the centre of the photograph

Photograph 7

Ground conditions encountered within WS101 (position CBR1)

Photograph 8

Ground conditions encountered within WS102

Photograph 9

Foundation Inspection Pit 1 (FIP1)

Photograph 10

Ground conditions within FIP1, continued backfill of material encountered

Photograph 11

Foundation Inspection Pit 2 (FIP2)

Photograph 12

Foundation Inspection Pit 3 (FIP3)

Photograph 13

Foundation exposure within FIP3

Photograph 14

Foundation Inspection Pit 4 (FIP4)

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