



Waterman's LTA2 GI Spine Road West (SRW)

Interpretative Report

August 2021

Waterman Infrastructure & Environment Limited

5th Floor, One Cornwall Street, Birmingham, B3 2DX
www.watermangroup.com

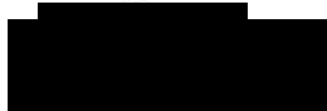


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This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
First	August 2021	Tom Bonsall Graduate Engineer	Andrew Tomlinson Senior Engineer	Darryl Pearson Associate Director



Comments

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Executive Summary

Objectives

Waterman Infrastructure & Environment Ltd was instructed by Graven Hill Village Development Company Limited to undertake a Ground Investigation Report for the proposed redevelopment of the Spine Road West and Anniversary Avenue area of the Graven Hill Site.

Site Setting

Current Use The Site currently comprises of the Northern Extent of Anniversary Avenue and unnamed access roads around the “E” Sector of the Former MOD Bicester Site.

Environmental Assessment

When screened against assessment criteria for a commercial/non-residential end use, no exceedances of heavy metals or TPH fractions were recorded. Exceedances of individual PAH's were recorded at two locations within asphalt and Made Ground.

No asbestos fibres were recorded in any of the samples screened.

Due to the proposed end use, the recorded chemical concentrations are not considered to represent a risk human health (end users) however the risk to construction workers must be considered.

Widespread contamination has not been recorded at the Site which would represent a significant risk to construction workers. However, when compared to the most sensitive end use GAC, elevations of heavy metals, TPHs and PAHs were recorded within asphalt and former roadstone in 12 of 45 samples.

Locations recording elevated levels of PAHs are within the current Anniversary Avenue roadway which is proposed to be replaced as part of the redevelopment of the Site. Construction workers must adhere to good practices hygiene during works. Any soils intended for re-use on Site or disposal must be assessed for their suitability.

Given the nature of the current site use, and that asbestos has been encountered in other areas of the Site, all personnel must have asbestos awareness training.

As elevated carbon dioxide has been recorded in other areas of the Site, care and consideration must be given to the potential requirement for RPE within excavations.

As part of protection against the potential risk posed by contamination in near surface soils and potential asbestos, the mandatory use of PPE and RPE when operating within areas of known contamination and when within excavations should be adhered to at all times and provisions should be made for appropriate Site hygiene and welfare facilities and dedicated food preparation and eating areas.

The recorded concentrations are not considered to represent a risk to controlled waters receptors.

Geotechnical Assessment

The Site is underlain by a thin layer of bituminous surfacing, Roadstone, Made Ground and topsoil.

The Made Ground and road construction are underlain by firm and stiff Oxford Clays.

The Existing Anniversary Avenue and unnamed access roads comprises of 3 different construction make ups:

Typically 100mm to 300mm of bituminous surface over 200mm to 300mm of roadstone is recorded.

Unnamed access roads: typically, 150mm to 200mm of bituminous surface over 200mm to 550mm of roadstone is recorded.

Hardstanding along proposed alignment: typically, 300mm over 200mm of granular Made Ground

Oxford Clay has been shown to have medium to high plasticity and volume change potential. A Plasticity Index of 50% should be adopted for the Oxford Clay at this location. Considerable care should be taken when accounting for differential settlement across the course of the proposed roadway in this area of the Site. Oxford Clays underlying former buildings are likely to heave to a significant extent, whereas those underlying open ground will be anticipated to settle under loading from the proposed road surface.

Buried concrete should be designed in accordance with:

Concrete in contact with the existing roadstone: DS1 AC1

Concrete in contact with Oxford Clay: DS3 AC2

Whilst compaction testing was not undertaken at the locations investigated as part of this area of the Site, compaction testing undertaken in other areas of the Graven Hill Site indicate that Clays underlying the site may be significantly wet of optimum.

Testing should be undertaken prior to any excavated clays being used as earthworks material. It may be necessary for clays to be allowed to dry or are treated to reduce the moisture content (i.e. lime stabilisation).

In-situ CBR values of the stiff clays immediately below the existing roadstone recorded values of between 6.6 and 29%. CBR testing undertaken in Cohesive Made Ground and Topsoil along the proposed alignment returned values of between 6.7 to 37% and 6 to 16% respectively. In view of the high plasticity of the clays and their susceptibility to rapid softening, it is recommended that design value of 3% be adopted for firm clays and a value of 5% for stiff clays.

During construction, the in-situ CBR value must be checked against the Design CBR value, to confirm design requirements are being met.

Groundwater levels were monitored in a borehole along the line of the proposed Spine Road West (SRW) and adjacent to the Anniversary Avenue and unnamed access roads.

Seepage recorded at 0.80m bgl in BH312, 1.50m and 2.00m bgl in TP317 and at 2.80m bgl in TP324.

No fast inflow is recorded.

No other groundwater strikes are recorded.

This is anticipated to be perched water.

Based on observations made during fieldwork, shallow excavations (<1.2m) likely to be stable in the short term.

Where seepage is recorded or encountered, it is anticipated that this could be controlled by simple sump pumping techniques.

Where large depths of Made Ground are encountered, where significant inflow is encountered, or where excavations are left exposed for some time with shallow groundwater it may be necessary to form excavations with safe batters and dewatering.

In addition:

Any trenches should be excavated in accordance with CIRIA Report 97 'Trenching Practice';

In line with BS6031, all excavations should be examined daily by a competent person to ensure that they remain safe. Where the sides cannot be sloped back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. Vertical or steep faces should be provided with support unless instructed otherwise by a competent person.

Consideration should be given to the re-use of arisings from foundation trenches / drainage runs etc. Where contamination has been encountered, it may be possible to reuse foundation arisings subject to risk assessment; however, certainty of use and volume should be confirmed in accordance with the requirements of CLAIRE guidance.

1. Introduction

1.1 Objectives and Brief

Waterman Infrastructure & Environment Limited ("Waterman") was instructed by Graven Hill Village Development Company Ltd ("GHVDC") to prepare an Interpretative Report of the proposed Spine Road West at Graven Hill, Bicester. The main objectives of the report are to:

- Investigate the current pavement construction of unnamed access roads within the proposed Spine Road West (SRW) alignment;
- Investigate current ground conditions outside of current roadways along the proposed SRW alignment;
- From this information, provide design parameters for the SRW;
- Derive representative geotechnical parameters in general accordance with Eurocode 7 and characterise the ground for the purposes of geotechnical design;
- Provide an investigation of ground contamination as defined by BS10175;
- Assess the suitability of potential materials arising from earthworks activities for re-use on site or disposal.

This assessment has been undertaken in general accordance with the Model Procedures for Management of Land Contamination (LCRM) 2020 (Environment Agency), and forms a decision record in relation to the assessment of the site. The report also provides a refined conceptual based on the findings of the ground investigation, an evaluation of potential risks and recommendations relating to any necessary remediation.

The assessment was undertaken in accordance with the scope agreed between Waterman and GHVDC and with Waterman's standard Terms of Appointment. The benefit of this report is made to GHVDC.

1.2 The Proposed Development

The proposed layout is included in Appendix A and comprises of the construction of a two-lane roadway with associated embankments and junctions along the chainage of the proposed road.

1.3 Limitations

The information contained in this report is based on the findings of a ground investigation carried out under the supervision of Waterman, including observations made on site, exploratory hole records, laboratory test results, groundwater monitoring and ground gas monitoring.

The ground conditions reported relate only to the point of excavation and do not necessarily guarantee a continuation of the ground conditions throughout the non-inspected area of the site. Whilst such exploratory holes would usually provide a reasonable indication as to the general ground conditions, these cannot be determined with complete certainty.

Waterman has endeavoured to assess all information provided to them during this investigation but makes no guarantees or warranties as to the accuracy or completeness of this information.

The scope of this site investigation includes an assessment of the presence of asbestos containing materials in the ground at the site but not within buildings or structures or below ground structures (basements, buried service ducts and the like).

The conclusions resulting from this study are not necessarily indicative of future conditions or operating



practices at or adjacent to the site.

2. Methodology

The intrusive investigation was undertaken in general accordance with Eurocode 7, the Code of Practice for Ground Investigation BS 5930 (2015+A1:2020) and the Code of Practice for the Investigation of Potentially Contaminated Sites and its Investigation BS 10175 (2011+A2:2017).

The objectives of the investigation were to characterise the ground conditions, identify any potentially hazardous sources, pathways and receptors and to reduce uncertainties associated with the proposed redevelopment.

2.1 Design of Investigation

The location of exploratory holes and in particular, in-situ geotechnical testing, was chosen so as to assess the quality of ground for the proposed highway construction works.

Soil samples were carefully selected in order to characterise the ground conditions and to target, as far as possible, potential areas of contamination.

2.2 Quality Control

A Waterman Geo-Environmental Engineer monitored the performance, quality of work and health and safety compliance of the specialist contractor, Geotechnics Limited. Appropriate chemical and geotechnical samples were obtained for subsequent testing at a UKAS accredited laboratory.

All contractors, including laboratories, used during this project have been approved by Waterman as a part of in-house Integrated Management System (BS ISO 9001, BS ISO 14001) procedure. This requires all third parties to demonstrate competence and a high standard of work during a regular audit scheme.

2.3 Health and Safety

All work carried out on site was in accordance with Geotechnics Ltd's Health & Safety Plan.

3. Fieldwork

Fieldwork was carried out as part of a larger investigation at the Site. For the purpose of this report, only exploratory holes relevant to the proposed road are considered.

The locations of the exploratory holes excavated, as per Geotechnics Final Factual report (ref: *PC207899 Graven Hill, Bicester, Land Transfer Area 2 (LTA2) Factual Report*), are shown on the Drawing (*WIE11386-147-87-100- Spine Road West GI Locations-SHEET1 to SHEET 5*) presented in Appendix A.

3.1 Ground Investigation

The Site was investigated as part of a larger Ground Investigation programme at Graven Hill. Any description hereafter, unless explicitly specified, refers to the section of the Geotechnics Ltd Ground Investigation within the Spine Road West Site Boundary, and its immediate surroundings.

The works comprised the following:

- 4 no. cable percussive boreholes were drilled to depths of between 6.45m and 6.60m below ground level (bgl). Inspection pits were excavated at each location to confirm the absence of buried services at depths of up to 1.2m bgl. Standard Penetration Tests (SPT) were carried out at regular intervals to assess the relative density of granular deposits and the consistency of cohesive strata. Monitoring wells were installed in selected exploratory holes.
- 11 No. trial pits were excavated to an average depth of 4.50m bgl using a wheeled mechanical excavator with a backactor. Upon completion, excavations were backfilled as far as possible with arisings. Engineering fill was placed and compacted within the excavations in areas of hardstanding and in well trafficked areas to minimise settlement. The surface of the excavation was reinstated to the original conditions.
- Hand shear vane tests were carried out where possible in the trial pits.
- Soakaway Testing was testing in one location (TP335).
- 2 No. Road Cores were undertaken to a maximum depth of 1.20m bgl.

All exploratory holes were logged and sampled by Geotechnics Ltd under the direction of the Waterman Engineer. Exploratory hole logs that provide a record of the strata encountered, provided by Geotechnics Ltd, are presented in Appendix B.

3.2 Soil Sampling

During excavation, samples for chemical analysis were placed on plastic sheeting to prevent cross-contamination of soil. Representative soil samples were obtained from the exposed strata and sealed in one litre plastic tubs with airtight lids, phials and glass jars containing preservatives, as appropriate. The soil samples taken were subject to screening by a photo ionisation detector (PID).

Disturbed and undisturbed samples were taken at regular intervals and retained for geotechnical and geo-environmental testing and logging.

3.3 Monitoring Wells

On completion of drilling, a 50mm diameter slotted HDPE standpipe with gas tap and bung was installed within BH305 to enable future ground gas and groundwater monitoring and sampling. The response zone of the well was within the Made Ground and natural strata.

4. Results

Detailed logs of the strata encountered, together with records of the samples taken during both trial pitting and borehole installation and PID readings, are provided in Appendix B. A summary of the geological strata and manmade underground structures encountered is presented below.

4.1 Geological Strata

The strata encountered in the investigation were generally consistent with the anticipated geology; however, in some locations variances in Made Ground and buried anthropogenic horizons were encountered. Several strata were encountered which were not anticipated.

A summary of the geological strata encountered is shown in Table 1.

Table 1: Geological strata encountered

Soil Type	Depth of Top of Stratum (mbgl)	Thickness (m)	Typical Description
Surface Made Ground 1 / Asphalt	0.00	0.10 – 0.20	Asphalt
Surface Made Ground 2 / Topsoil	0.00	0.15	Grass over firm dark brown slightly sandy slightly gravelly clay with many rootlets. Gravel is angular to subangular fine to coarse sandstone.
Surface Made Ground 3 / Concrete	0.00	0.30	Recorded in TP305 Concrete.
Made Ground 1 / Compact road Subbase	0.10	0.20	Compact Road Subbase, typically described as sandy GRAVEL. Gravel is angular to subangular limestone, sandstone and brick.
Made Ground 2 / Silty Gravel	0.30	0.40 – 0.50	Grey and brown sandy silty gravel. Gravel is angular to subangular fine to coarse clay and concrete. Occasional brick, concrete and ash.
Made Ground 3 / Gravelly Clay	0.70	0.80	Firm grey mottled brown slightly sandy slightly gravelly clay with occasional pockets (up to 5mm in size) of soft dark grey organic clay and a moderate organic odour. Gravel is angular to subangular fine to coarse limestone and clinker.
Made Ground 4 / Silty Sand	0.45 – 0.50	0.10 – 0.20	Black very gravelly silty sand. Gravel is angular to subangular fine to coarse slag, ash and clinker. Occasionally recorded as sandy clay with coarse slate and brick.
CLAY	0.15 - 0.90	>6.00	Firm to stiff mottled orangish brown and grey CLAY with occasional pockets of soft dark brown organic clay and rare gypsum crystals. Moderate organic odour below 2.80m. Occasionally silty and/or sandy.

Hardstanding covers approximately 65% of the site, primarily along the course of the current Anniversary

Avenue and several unnamed access roads. Loading bays for the former warehouses are located near the proposed alignment with the remaining 35% of the site covered by open fields, hedgerows, and drainage ditches.

4.2 Underground Structures and Obstructions

No underground structures or obstructions were recorded as part of the intrusive investigation.

4.3 Potential Sources of Contamination

Field observations made in exploratory holes targeted at specific point sources of contamination.

4.4 Trench Stability

All trenches, hand pits and rotary cores are recorded as stable.

4.5 Geotechnical and Chemical Analysis

The relevant laboratory test results are presented in Appendix C and D.

4.6 Asbestos

No asbestos was recorded during the intrusive investigation or as part of laboratory testing.

4.7 Visual and Olfactory Evidence of Contamination

No hydrocarbon odours or sheen on flush was recorded.

Mild to moderate organic odour was recorded within Clays at BH305 and BH313 and within Made Ground 3 / Gravelly Clay within TP330.

4.8 Groundwater Levels

Groundwater was encountered during intrusive investigation as seepage between 0.80m and 2.80m bgl although ground levels were not recorded on logs and so it is not possible to record groundwater levels as elevation (m AOD). These are interpreted to be perched groundwater and not representative of the wider groundwater regime below the site.

4.9 Groundwater and Gas Monitoring

The installation within BH305 was monitored on five occasions between the 12th August and the 29th September 2020. Groundwater was recorded during the monitoring period between 0.99m and 1.14m bgl.

Barometric pressure during monitoring visits varied between 996mbar and 1014mbar.

The results of monitoring are summarised below in Table 2.

Table 2: Ground gas monitoring summary

Monitoring Point / Date	Peak Gas Concentration (%)			Steady Gas Concentration (%)		
	CH ₄	CO ₂	O ₂	CH ₄	CO ₂	O ₂
BH305 / 12.08.20	<0.1	3.5	20.7	<0.1	2.1	18.4
BH305 / 19.08.20	<0.1	0.8	20.2	<0.1	0.8	19.9
BH305 / 03.09.20	<0.1	0.3	20.7	<0.1	0.1	20.7
BH305 / 16.09.20	<0.1	0.5	20.9	<0.1	0.1	20.9
BH305 / 29.09.20	<0.1	0.7	20.9	<0.1	0.6	20.4

A flow rate of <0.1l/hr was recorded across all monitoring visits

5. Geotechnical Testing

5.1 In-Situ Standard Penetration Testing (SPTs)

Standard Penetration Tests (SPT's) were undertaken at regular intervals within the boreholes to provide 'N' values for empirical assessment of strength and density parameters. Detailed results of the SPT tests and blow counts are included on the borehole logs included in Appendix B, graphically in Figure 1 within Appendix F, and a summary is presented in Table 3 below:

Table 3: Standard penetration test results

Stratum / Geological Origin	Range of SPT 'N' Values	Number of Tests	Comments	Derived Values Range of ϕ' or c_u
Made Ground 3 / Gravelly Clay	9	1	Low Strength	$C_u = 35\text{kPa}$
Firm CLAY	8 - 9	2	Low Strength	$C_u = 38\text{kPa} - 43\text{kPa}$
Stiff CLAY	8 – 25	7	Medium to High Strength	$C_u = 38\text{kPa} - 120\text{kPa}$

5.2 In-Situ Hand Vane Tests

Hand Shear Vane Tests were undertaken within cohesive deposits in trial pits where possible. The results are summarised below in Table 4 and are presented in full on the logs and records of intrusive investigations included within Appendix B.

Table 4: Hand Shear Vane Testing

Stratum / Geological Origin	Range of Shear Vane Values (kPa)	Number of Tests
Made Ground 3 / Gravelly Clay	97 - 123	2
Made Ground 4 / Silty Sand	44 - 82	3
Soft CLAY	40 - 49	7
Firm CLAY	48 - 81	17
Stiff CLAY	78 - 120	8

5.3 Field Based CBR Testing

Field based CBR tests were undertaken within RC303, located along an unnamed access road along the proposed SRW alignment. The results of CBR testing is included as part of the Geotechnical Testing Results in Appendix D, presented graphically in Figure 2 in Appendix F and summarised in Table 5 below:

Table 5: In-situ CBR test results

Stratum / Geological Origin	Type of Test	Range of CBR Values (%)	Characteristic CBR Value (%)	Comments
Surface Made Ground 2 / Topsoil	TRL DCP	6 -16	6	High values could be the result of cobbles and gravel with the Made Ground. Unlikely to be representative.
Made Ground 3 / Gravelly Clay	TRL DCP	6.7 - 37	5	High values could be the result of cobbles and gravel with the Made Ground. Unlikely to be representative.
Stiff CLAY	TRL DCP	6.6 – 55	7	Oxford clay is typically recorded as a firm to stiff clay and hence suggest restricting Characteristic Value to 7%

In addition to the above assessment of near surface subgrade, consideration should also be given to materials at deeper levels which will have a more significant effect on the long-term settlement of the pavement. Particular consideration should be given to the potential impact tree removal will have on the shrink/swell characteristics of the underlying Oxford Clay.

5.4. Laboratory Testing

Representative soil samples were scheduled for:

- Natural moisture content and plasticity index;
- pH value and water soluble sulphate (SD1 Suite);
- Undrained Shear Strength Triaxial Tests and Laboratory vane tests;
- One dimensional consolidation tests;
- Particle Size Distribution (PSD) testing; and
- Compaction Testing.

The results are summarised below and presented in Appendix D.

5.5 Natural Moisture Content and Plasticity Index

Samples of natural cohesive material were taken for moisture content and plasticity index determinations. The test results are included in Appendix D and are summarised in Table 6 below. The modified plasticity index can be used as an indicator of volume change potential of the soil and is calculated as the plasticity index of the soil multiplied by the fraction of particles less than 425µm.

Table 6: Volume change potential

Stratum / Geological Origin	Range of Plasticity Indices % (Modified)	Volume Change Potential
Made Ground 3 / Gravelly Clay	26	Medium
Soft CLAY	38 - 45	Medium – High
Firm CLAY	33 - 53	Medium - High
Stiff CLAY	26 - 68	Medium - High

5.6 pH Value and Water-Soluble Sulphate (SD1 Suite)

The Aggressive Chemical Environment for Concrete classifications for the soil types identified at the site have been determined in accordance with BRE Special Digest 1:2005 (SD1). SD1 requires that sites are first identified as being in one of four categories based on natural ground / 'Brownfield' conditions and pyrite content. The site has been categorised as: Brownfield -pyrite.

The results of laboratory testing are included in Appendix D and summarised in Table 7 below:

Table 7: Summary of SD1 suite analysis

Stratum / Geological Origin	Characteristic Water Soluble Sulphate Value (mg/l SO ₄)	Characteristic pH Value
Made Ground	290 (240 – 290)	6.4 (6.4 – 11.4)
CLAY	1750 (55 – 1800)	4.5 (4.2 – 7.3)

As the characteristic value of sulphate occurring within Made Ground is less than 3000mg/l and the characteristic pH is greater than 5.5, the concentrations of magnesium, nitrate and chloride are not considered significant in determining the design sulphate class.

The characteristic value of sulphate occurring within firm to stiff Clays is less than 3000mg/l and the characteristic pH is not greater than 5.5; as such the concentrations of magnesium, nitrate and chloride are not considered significant in determining the sulphate class.

5.7 Undrained Triaxial & Laboratory Shear Vane Testing

Shear strength of the natural superficial strata was determined by quick undrained triaxial tests (multi-stage) on single 100mm diameter specimens at a series of confining pressures. The results of these tests are presented in Appendix D, and are summarised in Table 8 below:

Table 8: Triaxial and Lab Vane test results

Location ID (depth mbgl) / Geological Origin	Apparent Cohesion Values – Quick Triaxial Tests (kN/m ²)	Undrained Shear Strength	Comments
BH305 (2.30 – 2.75) / CLAY		43kPa	Medium Strength
BH305 (4.50 – 4.95) / CLAY		33kPa	Low Strength
BH311 (1.20 – 1.65) / CLAY		47kPa	Medium Strength
BH311 (3.00 – 3.45) / CLAY		74kPa	Medium/High
BH314 (2.40 – 2.85) / CLAY		85kPa	High Strength
BH314 (4.50 – 4.95) / CLAY		112kPa	High Strength

6. Generic Environmental Assessment Criteria

The information requirements for generic quantitative risk assessment will depend on:

- The substance being assessed;
- The receptors being considered;
- The pathways being considered; and
- The complexity of the site.

The outline conceptual model developed for the site has identified 2 potential contaminant linkages. These potential contaminant linkages have been investigated and the results assessed against generic assessment criteria. The generic assessment criteria selected for each potential contaminant linkage are summarised in Table 9 below:

Table 9: Generic assessment criteria

Source	Pathway	Receptor	Generic Assessment Criteria
Contaminated Soils	Direct contact, inhalation	Future users of the proposed Development	Category 4 Screening Levels (C4SLs), LQM/CIEH S4ULs (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3060. All rights reserved), CL:AIRE (2009) PAH assessment using Benzo(a)pyrene surrogate marker assessment
Mobile contaminants associated with historical uses of the Site	Leaching migration through preferential pathways/existing drainage ditches	Adjacent watercourses	Water Regulations Advisory Scheme Information and Guidance Note Category 4 Screening Levels (C4SLs), LQM/CIEH S4ULs (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3060. All rights reserved), CL:AIRE (2009) PAH assessment using Benzo(a)pyrene surrogate marker assessment

The generic assessment criteria used in this report are included in Appendix H.

7. Quantitative Environmental Risk Assessment – Risk Estimation

7.1 Regulatory Context

This assessment has been undertaken in general accordance with the Land Contamination Risk Management (LCRM) regulations (Environment Agency, 2020). The environmental risk assessment includes the following:

- outline Conceptual Model for the Site;
- results of Intrusive Ground Investigation;
- confirmation of Generic Assessment Criteria used to assess risks;
- assessment of results against Generic Assessment Criteria;
- formulation of a new Conceptual Model for the Site;
- identification of potentially unacceptable risks; and
- recommendations for further action.

This report forms a decision record for the contaminant linkages identified, the generic assessment criteria used to assess risks, the unacceptable risks identified and the proposed next steps in relation to the site. The report also provides an explanation of the refinement of the outline conceptual model following the ground investigation, the selection of criteria and assumptions, the evaluation of potential risks and the basis for the decision on what happens next.

The assessment is in respect of the construction of a new roadway, with additional walkways and junctions to minor unnamed access roads.

In order to assess the contamination status of the Site, with respect to the proposed end use, it is necessary to assess whether the Site could potentially be classified as “Contaminated Land”, as defined in Part IIA of the Environmental Protection Act 1990 and Contaminated Land Statutory Guidance 2012. This is assessed by the identification and assessment of potential contaminant linkages. The linkage between the potential sources and potential receptors identified needs to be established and evaluated.

To fall within this definition, it is necessary that, as a result of the condition of the land, substances may be present in, on or under the land such that:

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) significant pollution of controlled waters is being caused, or there is significant possibility of such pollution being caused.

It should be noted that DEFRA has advised (Ref. Section 4, DEFRA Contaminated Land Statutory Guidance 2012) Local Authorities that land should not be designated as “Contaminated Land” where:

- a) the relevant substance(s) are already present in controlled waters;
- b) entry into controlled waters of the substance(s) from land has ceased; and
- c) it is not likely that that further entry will take place.

These exclusions do not necessarily preclude regulatory action under the Environmental Permitting (England and Wales) Regulations 2016, which make it a criminal offence to cause or knowingly permit a water discharge of any poisonous, noxious or polluting matter to controlled waters. In England and Wales,

under The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009, a works notice may be served by the regulator requiring appropriate investigation and clean-up.

The potential contaminant linkages identified in Section 6 have been evaluated using the Generic Assessment Criteria described in Section 6 and Appendix H. The results of this evaluation are reported below:

7.2 Risk to Human Health

The following chemical contamination testing was carried out:

Road Surfacing

- 1 no. samples for heavy metals
- 7 no. samples for speciated PAHs
- 6 no. samples for phenols

Road subbase

- 3 no. samples for heavy metals and speciated PAHs
- 2 no. samples for phenols
- 2 no. samples for speciated TPHs and BTEX
- 4 no. samples for asbestos screening

Made Ground

- 5 no. samples for heavy metals and speciated PAHs
- 3 no. samples for phenols
- 2 no. samples for pH testing
- 2 no. samples for BRE SD1 (Short)
- 3 no. sample for asbestos screening

Natural Ground

- 9 no. sample for heavy metals and speciated PAHs
- 5 no. samples for pH testing
- 6 no. sample for BRE SD1 Suite (Full)
- 2 no. sample for BRE SD1 Suite (Short)
- 4 no. asbestos screening.

Exceedances against a commercial end use, in line with the proposed end use for the Site are shown on Watermans Drawing ref: *WIE11386-147-87-101-Spine Road West - Contamination Exceedances-Sheet1 to Sheet 3*, included in Appendix E.

It is understood that material excavated during construction of Spine Road West may be re-used as engineered fill below proposed residential plots. As such, when compared against the most sensitive end use (residential with plant uptake), the following exceedances were recorded:

Table 10: Summary of soil chemistry exceedances against a Residential with plant uptake GAC

Location ID/ Stratum	Depth (m bgl)	Determinand	Concentration (mg/kg)	Generic Assessment Criteria (mg/kg)
BH305 / Made Ground 1 – Compact Road Subbase	0.10	Aromatic C21-35	1,800.00	1,100.00
BH305 / Stiff CLAY	1.00	Beryllium	2.60	1.70
		Benzo(a)pyrene	3.50	2.20
		Di-Benzo(a.h.)anthracene	0.30	0.24
BH313 / Made Ground 1 – Compact Road Subbase	0.30	Benzo(b)fluoranthene	3.90	2.60
		Benzo(a)pyrene	5.20	2.20
		Di-benzo(a.h.)anthracene	0.70	0.24
BH314 / Asphalt	0.10	Beryllium	3.90	1.70
TP304 / Asphalt	0.10	Benzo(b)fluoranthene	4.60	2.60
		Benzo(a)pyrene	6.40	2.20
		Di-benzo(a.h.)anthracene	1.40	0.24
TP304 / Made Ground 3 – Silty Sand	0.50	Beryllium	3.50	1.70
TP305 / Made Ground 3 – Silty Sand	0.40	Benzo(a)anthracene	42.00	7.20
		Chrysene	47.00	15.00
		Benzo(b)fluoranthene	31.00	2.60
		Benzo(a)pyrene	34.00	2.20
		Di-benzo(a.h.)anthracene	4.10	0.24
TP323 / Made Ground 2 – Silty Gravel	0.20 – 0.30	Beryllium	11.00	1.70
		Benzo(b)fluoranthene	6.40	2.60
		Benzo(a)pyrene	5.90	2.20
		Di-benzo(a.h.)anthracene	0.77	0.24
TP324 / Made Ground 2 – Silty Gravel	0.10	Benzo(b)fluoranthene	2.70	2.60
		Benzo(a)pyrene	4.20	2.20
		Di-benzo(a.h.)anthracene	0.30	0.24
TP334 / Made Ground 3 – Gravelly Clay	1.00	Beryllium	2.00	1.70
TP335 / Asphalt	0.10	Naphthalene	54.00	2.30
		Phenanthrene	430.00	95.00
		Fluoranthene	380.00	280.00
		Benzo(a)anthracene	100.00	7.20
		Chrysene	90.00	15.00
		Benzo(b)fluoranthene	100.00	2.60
		Benzo(a)pyrene	100.00	2.20
		Indeno(1,2,3-cd)pyrene	33.00	27.00
		Di-benzo(a.h.)anthracene	7.90	0.24

Location ID/ Stratum	Depth (m bgl)	Determinand	Concentration (mg/kg)	Generic Assessment Criteria (mg/kg)
TP335 / Made Ground 2 – Silty Gravel	0.30	Beryllium	4.50	1.70

No asbestos was recorded in soils below the Spine Road West site; however, isolated occurrences of asbestos have been recorded across the wider site. When isolated detections are recorded on a site, Waterman notes that drawing conclusions regarding the distribution and assessing the associated risks can be difficult, due to the following issues:

- Asbestos does not always conform to a normal special distribution in comparison with chemical contaminants where concentrations generally diminish with distance from a central source area;
- In standard soil sampling, asbestos is either present or not in a given soil sample; however, non-detection in one location does not preclude it from being in a location immediately adjacent;
- While statistical assessment is suitable for a population of quantified contamination results, it is inadvisable to apply statistical assessment to a dataset of asbestos in soil results, again due to its tendency to not follow a normal special distribution as discussed above; and
- Contemporary guidance is based on the premise that there is no “safe” exposure level, as any exposure would increase the receptor’s lifetime cancer risk. Consequently, a more conservative risk assessment approach is required.

7.3 Risk to Controlled Waters

7 No. samples of sediment were taken from surface swales along and near to the proposed alignment of the SRW. At the time of sampling, the surface swales were dry. No exceedances were recorded when the results of chemical analysis were compared against a commercial end-use generic assessment criteria (GAC).

The surface swales are to be diverted as part of the current proposals, as such the sediment within them may be re-used below proposed residential plots. When compared against GAC for the more sensitive residential end use with plant uptake, the following exceedances were recorded:

Table 11: Summary of soil chemistry exceedances against a Residential with plant uptake GAC

Location ID	Depth (m bgl)	Determinand	Concentration (mg/kg)	Generic Assessment Criteria (mg/kg)
SSC302	0.10	Beryllium	2.90	1.70
SSC302	0.25 – 0.40	Zinc	4,200.00	3,700.00

7.4 Risk to Construction Workers

Construction workers have a much shorter exposure time and as such the screening criteria used to assess the long-term exposure risk to end-users are considered unnecessarily conservative, particularly with due consideration of standard best practice health and safety measures adopted on construction sites that will minimise day-to-day exposure. The slightly elevated concentrations of contaminants recorded in site soils are therefore considered to represent a low risk to construction workers and is not considered further in this assessment.

Construction workers shall adhere to good practices for maintaining hygiene during works. Provision of appropriate facilities for good welfare must be provided. Furthermore, personal protective equipment (PPE) should be used to protect from contact with contaminated soils.

7.5 Ground Gas

Data obtained from Public Health England (ukradon.org) indicates that the Site is not anticipated to be at risk from radon. Furthermore, as the proposed development is the construction of highways, it is not anticipated that radon poses a risk.

Ground Gas Characterization and Hazard Assessment

An empirical, semi-quantitative approach has been used to characterize the ground gas risk for the site. This approach derives an appropriate gas screening value (GSV), or several GSVs if the site is zoned. The GSV is then used to select an appropriate Characteristic Situation (CS) for design and selection of the choice of protective measures.

The borehole flow rate Q_{hg} (in l/h) has been calculated for each monitoring location and each monitoring event (for each hazardous gas) using the following equation:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

Where: -

Q_{hg} is the borehole hazardous gas flow rate
 q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe
 C_{hg} is the measured hazardous gas concentration (in % volume/volume).

Calculation of borehole hazardous gas flow rate – Q_{hg}

As the maximum recorded flow rate is <0.01l/hr (below the monitoring limit, and thus is interpreted as zero) then all hazardous gas flow rates (Q_{hg}) will be calculated as **0.00**.

As the dataset is representative, comprehensive and captures temporal and atmospheric variation, the GSV is taken as the maximum Q_{hg} measured for all the monitoring events, i.e. **0.00l/hr**. Notwithstanding this designation of GSV, a worst case check indicates that when the plausible worst case conditions are calculated for each stratum or zone, a greater hazard is not considered likely hence the above GSV should be adopted to select protective to reflect worst case conditions.

A GSV of 0.00l/hr is consistent with **Characteristic Situation 1, Very Low Hazard Potential**.

Selection of Appropriate Protective Measures

As the proposed development does not feature any buildings, gas protection measures, as defined BS 8485:2018+A1:2019, are not required.

As elevated carbon dioxide has been recorded in other areas of the Site, care and consideration must be given to the potential requirement for RPE within excavations.

8. Geotechnical Assessment

8.1 Proposed Development

This assessment has been prepared on the understanding that the site is to be developed with the introduction of a new highway, junctions and pedestrian walkway, in line with the proposed layout detailed in Drawing ref: WIE11386-LTA2 Spine Road West-90-001 - Red Line Boundary A04, presented in Appendix A. If development proposals change, it may be necessary to revise the conclusions and recommendations made in this report and Waterman IE should be contacted to provide further advice.

8.2 Characteristic Values and Design Bearing Resistance

The results of the intrusive ground investigation in this area of the Site have confirmed that the current roadway is constructed of a mixture of roadstone and gravelly Made Ground, including in some areas ash and slag. Outside the current highways, the site is underlain by Made Ground (topsoil).

All Made Ground is underlain by firm to stiff Oxford Clays, with occasional areas of soft clays.

8.2.1 Shrinkability / Volume Change Potential

Oxford Clay has been shown to have medium to high plasticity and volume change potential. A Plasticity Index of 50% should be adopted for the Oxford Clay at this location. Considerable care should be taken when accounting for differential settlement across the course of the proposed roadway in this area of the Site. Oxford Clays underlying former buildings are likely to heave to a significant extent, whereas those underlying open ground will be anticipated to settle under loading from the proposed road surface.

8.2.2 Design Class for Buried Concrete

Based on the characteristic values derived from BRE SD1 testing and assuming a worst case scenario of mobile groundwater conditions, the Design Sulphate (DS) and Aggressive Chemical Environment for Concrete (ACEC) classifications for buried concrete are considered to be:

- Concrete in contact with existing Made Ground: DS1 AC1
- Concrete in contact with Oxford Clay: DS3 AC2

8.2.3 Earthworks

Whilst compaction testing was not undertaken at the locations investigated as part of this area of the Site, compaction testing undertaken in other areas of the Graven Hill Site, such as those undertaken as part of geotechnical testing for the Employment Access Road (*ref: WIE11386-139-8.1.2-EAR GIR*) and A41 Roundabout (*WIE11386-145-1.1.3-GIR A41 Roundabout*), indicate that Clays underlying the site may be significantly wet of optimum.

Testing should be undertaken prior to any excavated clays being used as earthworks material. It may be necessary for clays to be allowed to dry or are treated to reduce the moisture content (i.e. lime stabilisation).

8.2.4 Pavement Design

The Existing Anniversary Avenue and unnamed access roads comprises of 3 different construction make ups:

- 100mm to 300mm of bituminous surface over 200mm to 300mm of roadstone is recorded.
- Unnamed access roads: 150mm to 200mm of bituminous surface over 200mm to 550mm of roadstone is recorded.
- Hardstanding along proposed alignment: 300mm over 200mm of granular Made Ground.

In all locations bituminous surfacing and Made Ground is underlain by firm (locally soft) to stiff clay.

In-situ CBR values of the stiff clays immediately below the existing roadstone recorded values of between 6.6 and 29%. CBR testing undertaken in Cohesive Made Ground and Topsoil along the proposed alignment returned values of between 6.7 to 37% and 6 to 16% respectively.

In view of the high plasticity of the clays and their susceptibility to rapid softening, it is recommended that design value of 3% be adopted for firm clays and a value of 5% for stiff clays.

During construction the in-situ CBR value must be checked against the Design CBR value, to confirm design requirements are being met.

Capping beneath proposed hardstanding may require geo-grid reinforcement to support construction over untreated low density Made Ground, or the Made Ground would need to be re-engineered or treated to provide a suitable CBR value.

The formation strata for the proposed road and pavements should be inspected and any areas of soft/loose deleterious strata replaced with an appropriately compacted coarse-grained fill. Proof-rolling / compaction of the formation level should be carried out prior to laying new pavement. Similarly, any hard spots should also be removed to guard against reflective cracking in the pavement.

8.2.5 Groundwater / Stability of Excavations

Comments relating to the stability of excavations (i.e. trial pits) and groundwater seepages are included in the logs in Appendix B. The groundwater level measured during fieldwork was in the range 0.80m to 2.80m below ground level.

Based on observations made during fieldwork, shallow excavations (<1.2m) likely to be stable in the short term.

Where seepage is recorded or encountered, it is anticipated that this could be controlled by simple sump pumping techniques.

Where large depths of Made Ground are encountered, where significant inflow is encountered, or where excavations are left exposed for some time with shallow groundwater it may be necessary to form excavations with safe batters and dewatering.

In addition:

- Any trenches should be excavated in accordance with CIRIA Report 97 'Trenching Practice';
- In line with BS6031, all excavations should be examined daily by a competent person to ensure that they remain safe. Where the sides cannot be sloped back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. Vertical or steep

faces should be provided with support unless instructed otherwise by a competent person.

Consideration should be given to the re-use of arisings from foundation trenches / drainage runs etc. Where contamination has been encountered, it may be possible to reuse foundation arisings subject to risk assessment; however, certainty of use and volume should be confirmed in accordance with the requirements of CLAIRE guidance.

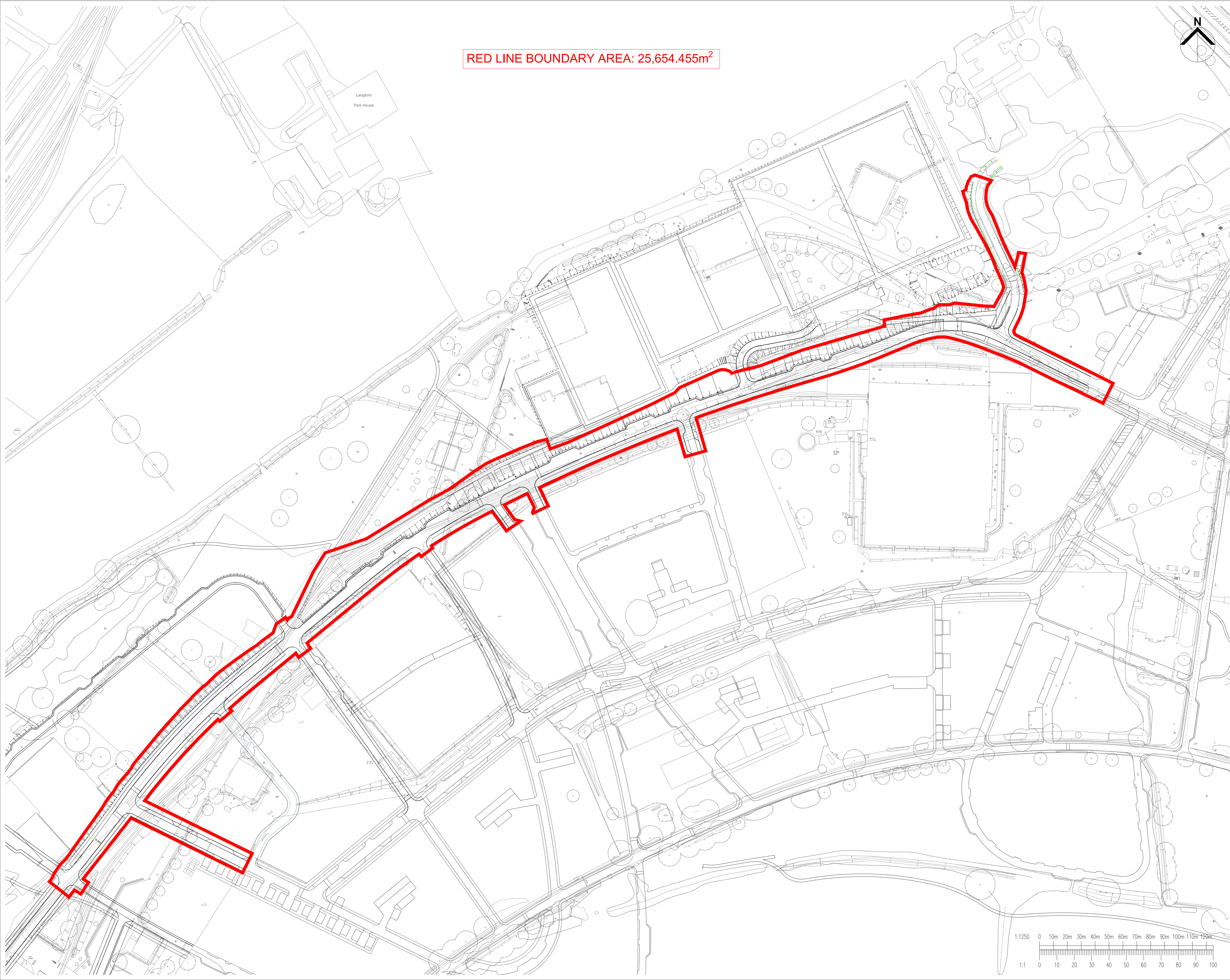
In line with BS6031, all excavations should be examined daily by a competent person to ensure that they remain safe. Where the sides cannot be sloped back to a safe angle, as approved by a competent and experienced person, their continued stability should not be taken for granted. Vertical or steep faces should be provided with support unless instructed otherwise by a competent person.



APPENDICES

A. Site Plans

- **Site Location Plan (WIE11386-LTA2 Spine Road West-90-001 - Red Line Boundary A04)**
- **GI Location Plan (WIE11386-147-87-100- Spine Road West GI Locations-SHEET1 to SHEET5)**



RED LINE BOUNDARY AREA: 25,654.455m²



This drawing should not be scaled. Dimensions to be verified on site. Any discrepancies should be referred to the Engineer prior to work being put in hand.

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6. ROAD LAYOUT AND HIGHWAY WORKS SHALL BE IN ACCORDANCE WITH DMRB AND OXFORD COUNTY COUNCIL (OCC) STANDARDS.

A04	05.07.21	PLANNING COMMENTS INCORPORATED	NYP
A03	20.01.21	AMENDMENTS TO RED LINE BOUNDARY	DP
A02	04.12.20	CHANGES FOLLOWING LAYOUT AMENDMENT	ST
A01	23.11.20	ISSUE	ST

Rev	Date	Description	By
		Amendments	

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Title	LAND TRANSFER AREA 2 WESTERN SPINE ROAD RED LINE BOUNDARY
Client	 Graven Hill Village Development Company Limited

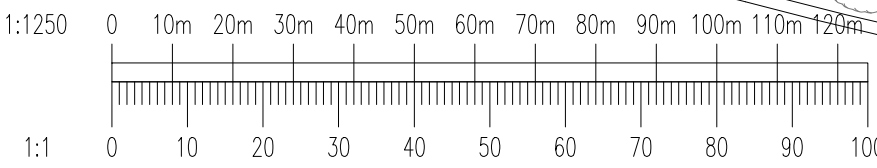


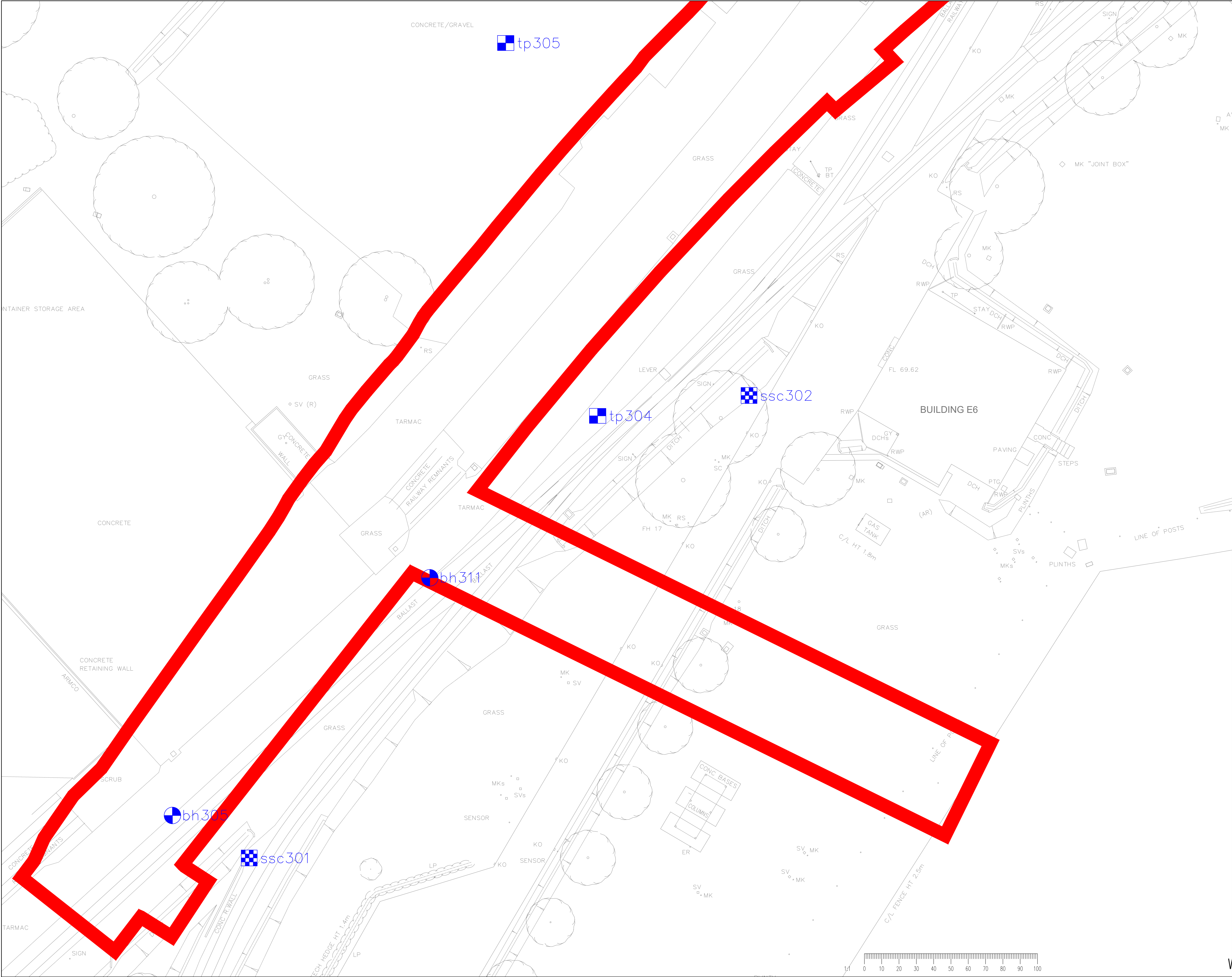
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5th Floor One Cornwell Street Birmingham B3 2DX
t 0121 212 7700
mail@watermangroup.com www.watermangroup.com

Drawing Status	PRELIMINARY			
Designed by	ST	Checked by	DP	Project No
Drawn by	ST	Date	NOV 2020	WIE11386
Scales @ A1 work to figured dimensions only		1:1250		Computer File No
				WIE11386_120_Spin Road Area 02 - Red Line Boundary.dwg
Publisher	Zone	Category	Number	Revision
WIE	LTA2	90	001	A04





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bh314 Borehole Locations

rc303 Road Core Locations

ssc306 Swale Sediment Contamination Locations

tp317 Trial Pit Locations

Rev	Date	Description	By
A01	20.07.21	GI LOCATIONS AMENDED AND ADDED	TB

Amendments

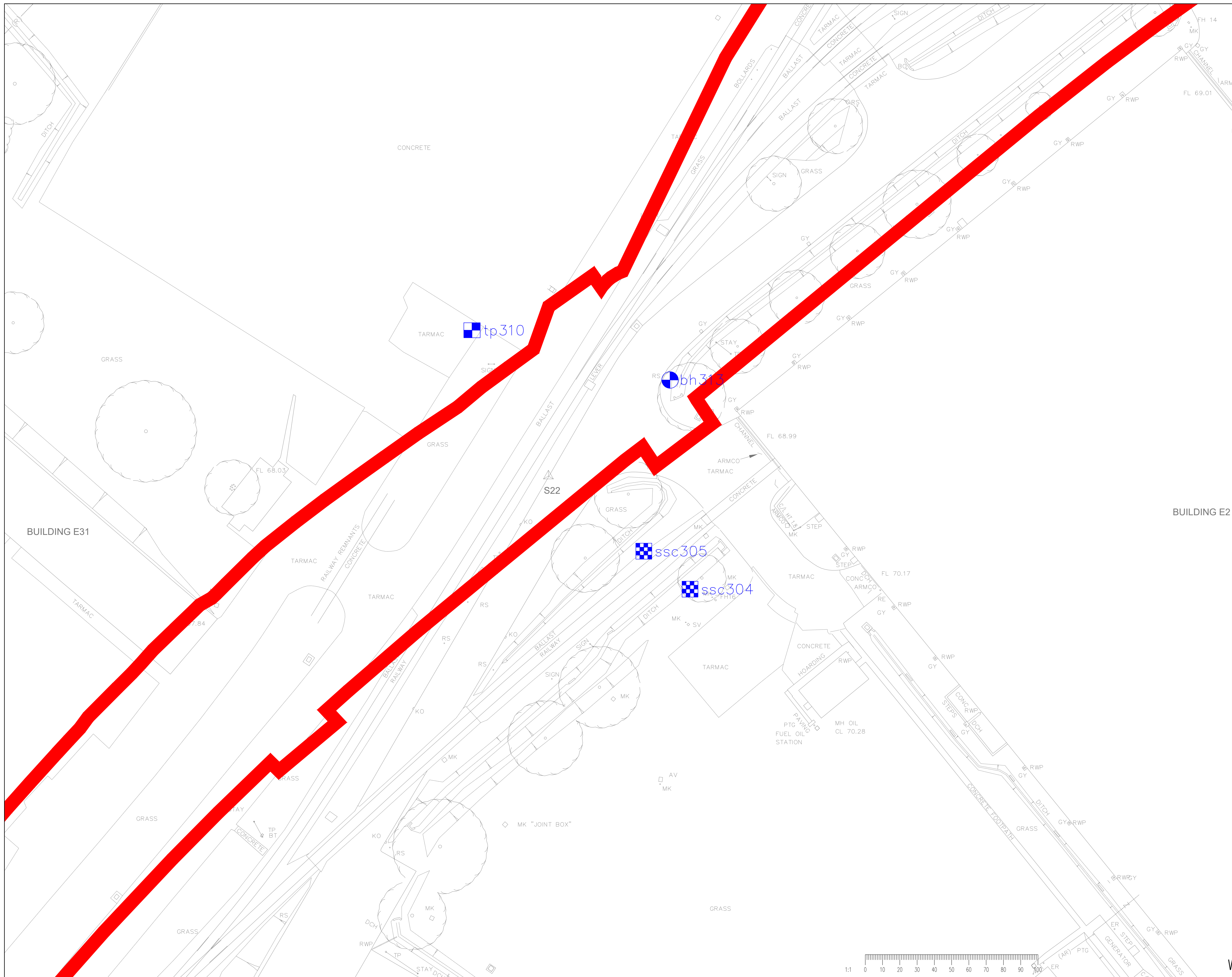
Project
Title
**LAND TRANSFER AREA 2 (LTA 2)
GRAVEN HILL, BICESTER
WESTERN SPINE ROAD
GI LOCATIONS (SHEET 1 OF 5)**

Client

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Office Address
Telephone & Fax numbers
mail@watermangroup.com www.watermangroup.com

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Designed by	TB	Checked by	PE	Project No
Drawn by	TB	Date	20.07.21	WIE11386
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bh314 Borehole Locations



ssc306 Swale Sediment Contamination Locations

 tp317 Trial Pit Locations

BUILDING E2

AD1	20.07.21	GI LOCATIONS AMENDED AND ADDED	TB
Rev	Date	Description	By

Project

Title

LAND TRANSFER AREA 2 (LTA 2)
GRAVEN HILL, BICESTER
WESTERN SPINE ROAD
GI LOCATIONS (SHEET 2 OF 5)

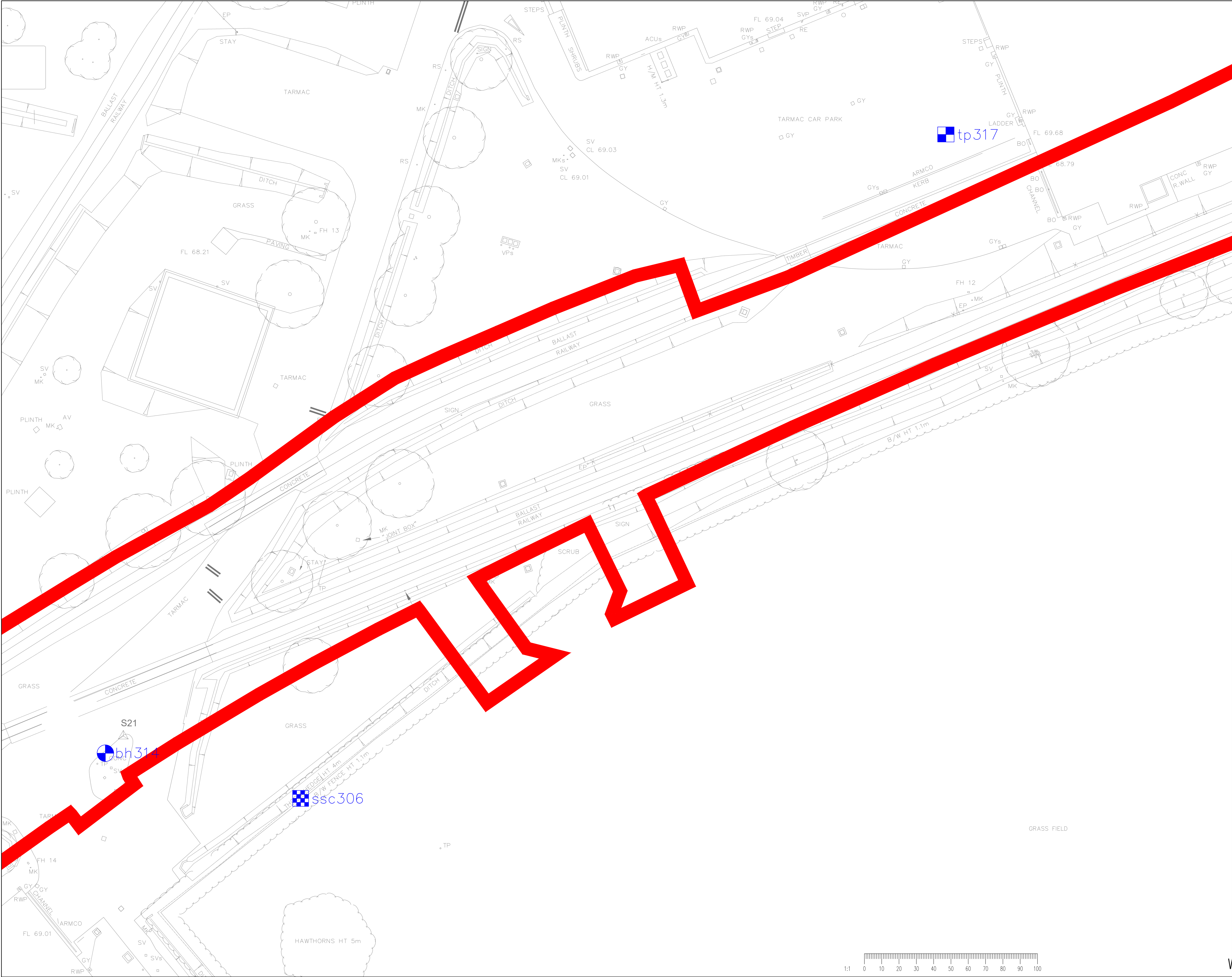
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bh314 Borehole Locations

rc303 Road Core Locations

ssc306 Swale Sediment Contamination Locations

tp317 Trial Pit Locations

Rev	Date	Description	By
A01	20.07.21	GI LOCATIONS AMENDED AND ADDED	TB

Amendments

Project

Title
LAND TRANSFER AREA 2 (LTA 2)
GRAVEN HILL, BICESTER
WESTERN SPINE ROAD
GI LOCATIONS (SHEET 3 OF 5)

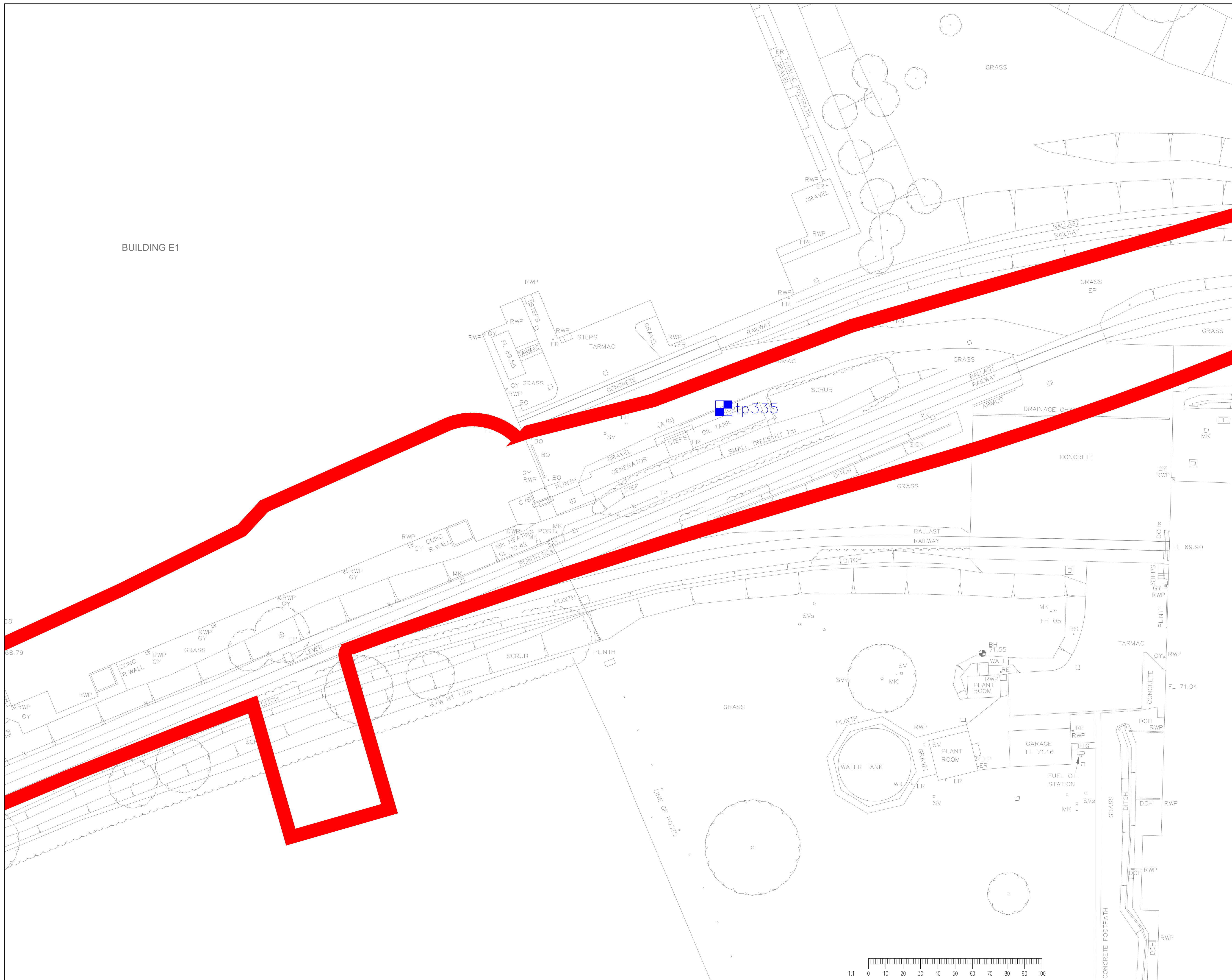
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Office Address
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 **Borehole Locations**

 rc303 Road Core Locations

ssc306 Swale Sediment Contamination Locations

 tp317 Trial Pit Locations

A01	20.07.21	GI LOCATIONS AMENDED AND ADDED	TB
Rev	Date	Description	By

Amendments

Title	LAND TRANSFER AREA 2 (LTA 2) GRAVEN HILL, BICESTER WESTERN SPINE ROAD GI LOCATIONS (SHEET 4 OF 5)
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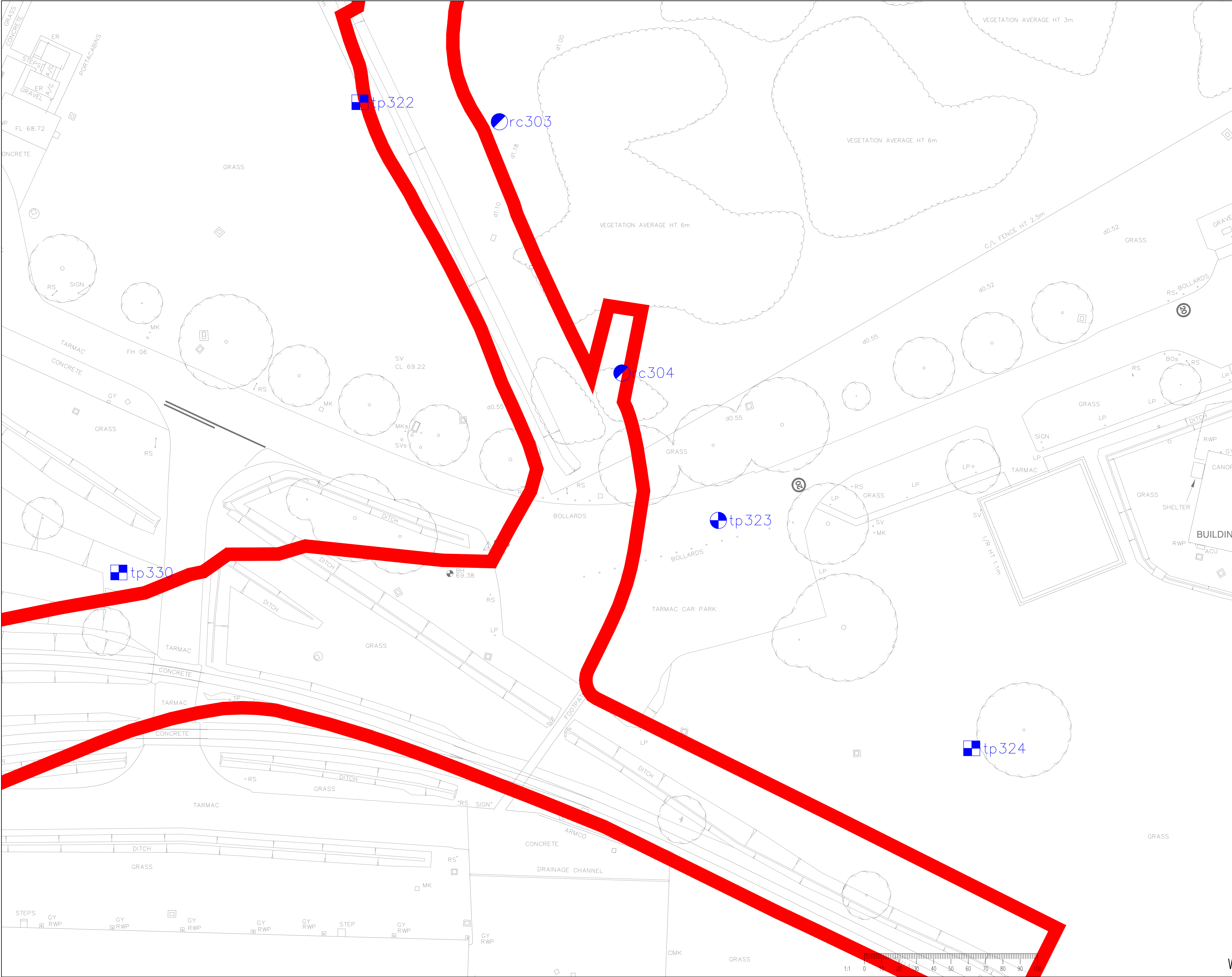
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Designed by	TB	Checked by	PE	Project No WIE11386
Drawn by	TB	Date	20.07.21	

Scales @ A1	Computer File No
work to figured dimensions only	WIE11386-147-87-100- Western Spine Road GI Loca

Publisher	Zone	Category	Number	Revision

VE11386 147	87	100-	A01
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 bh314 Borehole Locations

 rc303 Road Core Locations

 ssc306 Swale Sediment Contamination Locations

 tp317 Trial Pit Locations

Rev	Date	Description	By
A01	20.07.21	GI LOCATIONS AMENDED AND ADDED	TB

Project

Title

LAND TRANSFER AREA 2 (LTA 2)
GRAVEN HILL, BICESTER
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GI LOCATIONS (SHEET 5 OF 5)

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Office Address
Telephone & Fax numbers
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Publisher Zone Category Number Revision

WIE11386 147 87 100- A01

B. Exploratory Hole Records

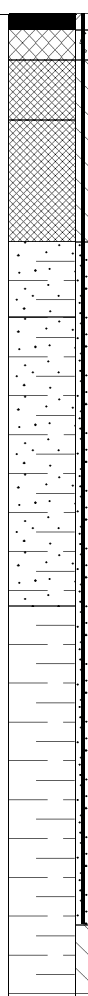
- **Exploratory Hole Records**

BOREHOLE RECORD - Cable Percussion

Preliminary

Project **GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)** Engineer **WATERMAN INFRASTRUCTURE & ENVIRONMENT LIMITED** Borehole Project No **BH305 PC207899**

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED** National Grid Coordinates **458214.1 E 220683.9 N** Ground Level **67.92 m OD**

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD	
0.10	ES	1.20 (DRY)	PID=<0.1		S9	MADE GROUND: Asphalt.**	G.L.		67.92	
0.10						0.10	67.82			
0.30	ES					0.30	67.62			
0.30										
0.50	D					0.70	67.22			
0.50	ES									
0.50										
0.70- 1.20	B									
1.00	ES									
1.00										
1.20- 1.65	D	1.50 (DRY)	PID=<0.1		S14	MADE GROUND: Firm grey mottled brown slightly sandy slightly gravelly clay with occasional pockets (up to 5mm in size) of soft dark grey organic clay and a moderate organic odour. Gravel is angular to subangular fine to coarse limestone and clinker.	1.50	66.42		
1.50- 2.00	B									
1.50	D									
1.50	ES					2.00	65.92			
2.30- 2.75	UT28	1.50 (DRY)				Stiff brown mottled light brown and grey slightly sandy CLAY with occasional pockets (up to 5mm in size) of soft dark grey organic clay, occasional decomposed rootlets, occasional gypsum crystals (up to 2mm in size) and a moderate organic odour.				
2.80	D									
3.40- 3.85	D	1.50 (DRY)								
3.90	D	1.50 (DRY)	PID=<0.1		S25	Stiff grey CLAY.	3.90	64.02		
4.00- 4.50	B									
4.50- 4.95	UT46									
5.10	D									
6.00- 6.45	D	1.50 (DRY)				Below 5.10m, with occasional pockets (up to 2mm in size) of grey silt.				

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	KR/JT	G.L.			06/08/20	08:00						None encountered during boring.
6.45	0.15	Cable Percussion	KR/JT	6.45	1.50	DRY	06/08/20	18:00						

Remarks **Inspection pit hand excavated to 1.20m depth and no services were found.** Logged by **MM**

ES sample = 2 x vial, 1 x plastic jar and 2 amber jar Figure **1 of 2**

Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected. 20/08/2020

**** Drillers description.**

A 50mm standpipe was installed to 6.00m with a geowrapped slotted section from 1.50m to 6.00m with flush lockable protective cover. Backfill details from base of hole: bentonite up to 6.00m, gravel filter up to 1.50m, bentonite up to 0.30m, concrete up to 0.10m, asphalt up to 0.10m.

geotechnics

All dimensions are in metres. Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Preliminary

Project **GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)** Engineer **WATERMAN INFRASTRUCTURE & ENVIRONMENT LIMITED** Borehole Project No **BH305 PC207899**

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED** National Grid Coordinates **458214.1 E 220683.9 N** Ground Level **67.92 m OD**

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks  to ground level.Logged by **MM**

Symbols and abbreviations are explained on the accompanying key sheet.

Figure **2 of 2**
20/08/2020

All dimensions are in metres.

Logged in accordance with BS5930:2015

geotechnics

BOREHOLE RECORD - Cable Percussion

Preliminary

Project **GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)** Engineer **WATERMAN INFRASTRUCTURE & ENVIRONMENT LIMITED** Borehole Project No **BH311 PC207899**

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED** National Grid Coordinates **458252.9 E 220719.6 N** Ground Level **68.12 m OD**

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD	
0.10	ES		PID=<0.1			MADE GROUND: Asphalt**	G.L.		68.12	
0.10										
0.30	ES		PID=<0.1			MADE GROUND: Compact orangish brown subbase.**	0.30		67.82	
0.30										
0.50	ES		PID=<0.1			Soft becoming firm orangish brown mottled grey slightly sandy CLAY.	0.60		67.52	
0.50										
0.60- 1.00	B									
0.60	D									
1.00	ES		PID=<0.1							
1.00										
1.20- 1.65	UT26	1.20 (DRY)	PID=<0.1			Firm dark brown mottled grey mottled yellowish brown slightly sandy CLAY with occasional pockets (up to 20mm in size) of soft brown organic clay and occasional gypsum crystals (up to 20mm in size).	1.50		66.62	
1.50	ES									
1.50										
1.70	D									
2.00- 2.45	D									
2.00- 2.45		1.50 (DRY)			S12					
2.20- 2.65	D									
2.50	D									
3.00- 3.45	UT37	1.50 (DRY)				Stiff dark grey CLAY.	2.80		65.32	
3.50- 4.00	B									
3.50	D									
4.00- 4.45	D	1.50 (DRY)			S23					
5.00	UT31	1.50 (DRY)								
5.45- 5.60	D					Below 5.45m, with many shell fragments (up to 30mm in size).				
6.00	D									
6.50- 6.95	D	1.50 (DRY)			S34					
7.20	D									
8.00	UT49	1.50 (DRY)								
8.45- 8.60	D									
9.00	D									
9.50- 9.95	D	1.50 (DRY)			S40					
End of Borehole							9.95		58.17	

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	KR/JT	G.L.	1.50	DRY	06/08/20	08:00						None encountered during boring.
10.00		Cable Percussion	KR/JT	10.00			06/08/20	18:00						

Remarks **AS** Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar
 Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.
 Water was added to assist boring between 4.00 and 10.00m.
 ** Drillers description.
 Backfill details from base of hole: bentonite up to 0.50m, concrete up to 0.30m, asphalt up to ground level.

Logged by **MM**
 Figure **1 of 1**
 20/08/2020

geotechnics

BOREHOLE RECORD - Cable Percussion

Preliminary

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2) Engineer WATERMAN INFRASTRUCTURE & ENVIRONMENT LIMITED Borehole Project No BH314 PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend			
0.10	ES					MADE GROUND: Asphalt.	6.L.				
0.10			PID<0.1				0.20				
0.20- 0.60	B					MADE GROUND: Light brown slightly sandy gravel. Gravel is angular to subangular fine to coarse limestone, sandstone and brick.	0.60				
0.30	D		PID<0.1				0.90				
0.30	ES					MADE GROUND: Dark grey and black slightly sandy clayey gravel with a low cobble content of subangular fine to coarse brick. Gravel is angular to subangular fine to coarse brick, concrete, sandstone and clinker.					
0.60- 0.90	B		PID<0.1								
0.60	D		PID<0.1								
0.60	ES		PID<0.1								
1.00	ES		PID<0.1								
1.00											
1.20- 2.40	B	1.20 (DRY)			S9	Firm light orangish brown and grey slightly sandy CLAY with occasional pockets (up to 2mm in size) of grey silt and occasional gypsum crystals (up to 63mm in size).					
1.20- 1.65	D										
2.00	D		PID<0.1								
2.00	ES										
2.00											
2.40- 2.85	UT14	1.20 (DRY)									
2.70- 3.50	B						2.70				
2.85- 3.00	D					Stiff dark greenish grey slightly sandy CLAY with occasional shell fragments (up to 20mm in size).					
3.00	D										
3.50- 3.95	D	1.20 (DRY)			S19						
4.00	D										
4.50	UT37	1.20 (DRY)									
4.95- 5.10	D										
5.50	D										
6.00- 6.45	D	1.20 (DRY)			S23						
							6.45				
						End of Borehole					

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	MR/SS	6.L.	1.20	DRY	23/07/20	08:00						None encountered during boring.
6.45		Cable Percussion	MR/SS	6.45			23/07/20	18:00						

Remarks  Inspection pit hand excavated to 1.20m depth and no services were found.
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar
Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.
Water was added to assist boring between 1.20 and 6.00 m.
Backfill details from base of hole: bentonite up to 0.20m, asphalt up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by SI

Figure 1 of 1
11/08/2020



Project	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Engineer
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**WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITED**

Trial Pit
Project No

TP304
PC207899

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED**

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.10 0.10	ES		PID=<0.1	MADE GROUND: Asphalt.	G.L. 0.20		
0.50 0.50 0.70	ES HV		PID=<0.1 Av=81kPa	MADE GROUND: Light brown sandy slightly silty gravel with a high cobble content of angular to subangular limestone. Gravel is angular to subangular fine to coarse limestone.	0.45 0.55	 	
1.00 1.00 1.00 1.00 1.50 1.50	B D ES D HV		PID=<0.1 Av=65kPa	MADE GROUND: Black very gravelly silty sand. Gravel is angular to subangular fine to coarse slag, ash and clinker. Firm grey mottled orangish brown slightly sandy CLAY. Below 1.60m, becoming sandy with many gypsum crystals (up to 4mm in size). Below 1.80m, becomes dark grey.	1.90		
2.00 2.00 2.00 2.00 2.50 2.50	B D ES D HV		PID=<0.1 Av=77kPa	Firm dark greyish brown mottled orangish brown slightly sandy CLAY with many gypsum crystals (up to 15mm in size).	3.40		
3.00 3.00	D HV		Av=81kPa				
3.50 3.50 3.50	B D HV		Av=78kPa	Stiff grey slightly sandy CLAY with occasional shell fragments (up to 100mm in size)			
4.00	D						
4.50	D			End of Excavation	4.50		

Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	23/07/2020	Length (C)	2.50			
Shoring	None.	Orientation	224 deg			None encountered during excavation.
Stability	Stable during excavation.					

Remarks	ES sample = 2 x vial, 1 x plastic jar and 2 amber jar	Logged by	MJ
	Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.	Figure	1 of 1
Symbols and abbreviations are explained on the accompanying key sheet.	Backfill details from base of hole: arisings up to ground level.		30/07/2020
All dimensions are in metres.	geotechnics		

BS5930:2015

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP305
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata	Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend
0.10 0.10	ES		PID=<0.1	MADE GROUND: Concrete.	G.L.	
0.40 0.40 0.70 0.70	D D B D			MADE GROUND: Black gravelly very silty sand. Gravel is angular to subangular fine to coarse brick, clinker, ash, slag and concrete.	0.30 0.50	
0.75 1.00 1.00 1.00	HV B D ES		Av=77kPa	POSSIBLE MADE GROUND: Soft to firm greenish grey mottled brown slightly sandy CLAY.	0.85	
1.40 1.60 1.60 1.60	HV B D HV		PID=<0.1 Av=48kPa	Soft orangish brown mottled grey slightly sandy CLAY with occasional pockets (up to 30mm in size) of orangish brown silty sand.	1.50	
2.00 2.00 2.50	D ES HV		Av=67kPa	Firm dark brown mottled orangish brown slightly sandy CLAY with many gypsum crystals (up to 15mm in size) and occasional pockets (up to 4mm in size) of light grey silt.		
3.00 3.00	D HV		Av=65kPa			
3.50 3.50 3.50	B D HV		Av=93kPa	Stiff grey slightly sandy CLAY with occasional shell fragments (up to 150mm in size).	3.30	
4.00	D					
4.50	D			End of Excavation	4.50	
Excavation				Groundwater		
Plant JCB 3CX		Width (B) 0.60		Depth Observed	Depth of Pit	Details
Date 23/07/2020		Length (C) 2.60				
Shoring None.		Orientation 126 deg		None encountered during excavation.		
Stability Stable during excavation.		Date Backfilled 23/07/2020				
Remarks				Logged by MJ		
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar				Figure 1 of 1		
Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.				30/07/2020		
Backfill details from base of hole: arisings up to ground level.				geotechnics		
Symbols and abbreviations are explained on the accompanying key sheet.						
All dimensions are in metres.				Logged in accordance with BS5930:2015		

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP310
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata	Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend
0.10	ES		PID=<0.1	MADE GROUND: Asphalt.	G.L.	1
0.10					0.15	2
0.40	B		Av=49kPa	MADE GROUND: Dark brown very sandy slightly silty gravel. Gravel is angular to subangular fine to coarse limestone and granite.	0.25	3
0.60	HV				0.55	
1.00	B		Av=47kPa	MADE GROUND: Dark brown and grey very gravelly silty sand with a high cobble content of angular to subangular limestone. Gravel is angular to subangular fine to coarse limestone.		4
1.00	D		PID=<0.1			
1.00	HV					
1.00			Av=40kPa	Soft light grey mottled light orangish brown slightly sandy CLAY.		
1.50	D					
1.50	HV			Below 1.50m, becomes dark brownish grey.	1.85	
2.00	B		PID=<0.1	Soft dark greyish brown mottled orangish brown slightly sandy CLAY with many gypsum crystals (up to 4mm in size).		5
2.00	D					
2.00	ES			Below 2.70m, becomes brownish grey.	2.80	
3.00	B		Av=98kPa	Stiff grey slightly sandy CLAY with many shell fragments (up to 150mm in size).		
3.00	D					
3.00	HV			Between 2.80-3.50m, becomes mottled grey.		6
3.50	D			Below 3.50m, gypsum crystals absent.		
4.00	D					
4.50	D			End of Excavation	4.50	

Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	23/07/2020	Length (C)	2.80			
Shoring	None.	Orientation	212 deg			None encountered during excavation.
Stability	Stable during excavation.	Date Backfilled	23/07/2020			

Remarks		Logged by
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar		MJ
Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.		
Backfill details from base of hole: arisings up to ground level.		

Figure 1 of 1
30/07/2020

geotechnics

All dimensions are in metres. Logged in accordance with BS5930:2015

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP317
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.10	ES		PID=<0.1	MADE GROUND: Asphalt.	G.L.		
0.10					0.15		
0.50	B			MADE GROUND: Dark reddish brown silty sand and gravel. Gravel is angular to subangular fine to coarse quartzite and granite.			
0.50	D						
0.50	ES		PID=<0.1		0.70		
0.50				MADE GROUND: Firm dark brownish grey mottled yellowish brown slightly sandy CLAY with occasional pockets (up to 3mm in size) of light grey sandy silt and many gypsum crystals (up to 2mm in size).			
1.00	B						
1.00	D						
1.00	ES		Av=53kPa PID=<0.1				
1.00	HV						
1.50	D				1.70		
1.50	HV		Av=70kPa	Stiff brownish grey slightly sandy CLAY.			
2.00	B				2.00		
2.00	D			End of Excavation			
2.00	HV		Av=86kPa				

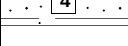
Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	22/07/2020	Length (C)	2.50	1.50	1.50	Seepage.
Shoring	None.	Orientation	250 deg	2.00	2.00	Seepage.
Stability	Stable during excavation.					
		Date Backfilled	22/07/2020			

Remarks	ES sample = 2 x vial, 1 x plastic jar and 2 amber jar Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected. Backfill details from base of hole: arisings up to ground level.	Logged by	MJ
Symbols and abbreviations are explained on the accompanying key sheet.		Figure	1 of 1 30/07/2020
All dimensions are in metres.	Logged in accordance with BS5930:2015		

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP322
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.10	D			MADE GROUND: Firm dark brown slightly sandy slightly gravelly clay with many rootlets. Gravel is angular to subangular fine to coarse brick and quartzite.	G.L.		
0.10	ES				0.25		
0.10			PID=<0.1 Av=73kPa		0.50		
0.50	HV			MADE GROUND: Firm light orangish brown slightly sandy clay.	0.70		
0.70	B			MADE GROUND: Firm dark greyish brown mottled orangish brown occasionally black sandy clay. Gravel is angular to subangular fine to coarse slate and brick.	1.00		
0.70	D						
0.70	ES		PID=<0.1				
0.70	B						
0.90	B						
0.90	D			Firm light orangish brown mottled grey slightly sandy CLAY.			
				End of Excavation			

Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	22/07/2020	Length (C)	1.20			
Shoring	None.	Orientation	220 deg			None encountered during excavation.
Stability	Stable during excavation.	Date Backfilled	22/07/2020			

Remarks		Logged by
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar		MJ
Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.		
Backfill details from base of hole: arisings up to ground level.		

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Figure 1 of 1
30/07/2020

geotechnics

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP324
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata	Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend
0.10	ES			MADE GROUND: Asphalt.	G.L.	1
0.10			PID=<0.1		0.10	2
0.25	B			MADE GROUND: Brown slightly silty sand and gravel. Gravel is angular to subangular fine to coarse limestone, granite and occasional brick.	0.35	3
0.25	D				0.55	4
0.40	D		Av=44kPa		0.80	
0.50	HV			PROBABLE MADE GROUND: Firm grey mottled orangish brown slightly sandy clay.		
0.60	B					
0.60	D			POSSIBLE MADE GROUND: Soft dark grey mottled orangish brown sandy CLAY.		
0.60	ES		PID=<0.1			
1.00	B			Firm light grey mottled orangish brown slightly sandy CLAY.		5
1.00	D					
1.00	ES					
1.00	HV		Av=78kPa			
1.50	D		PID=<0.1	Below 1.40m, with many gypsum crystals (up to 4mm in size) and occasional pockets (up to 55mm in size) of orangish brown silty sand.		
1.50	HV		Av=62kPa			
2.00	D			Below 2.00m, becomes soft.	2.60	
2.00	HV		Av=48kPa			
2.50	D			Below 2.30m, becomes dark grey.		6
2.50	HV		Av=48kPa			
2.70	B				3.00	
2.70	D			Firm dark greyish brown mottled yellowish brown slightly sandy CLAY with many gypsum crystals (up to 5mm in size).		
2.70	ES		PID=<0.1			
2.70			Av=63kPa			
3.00	HV			End of Excavation		

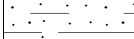
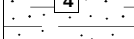
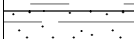
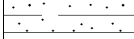
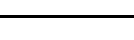
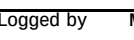
Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	23/07/2020	Length (C)	1.80	2.80	2.80	Seepage.
Shoring	None.	Orientation	014 deg			
Stability	Stable during excavation.					
		Date Backfilled	23/07/2020			

Remarks	ES sample = 2 x vial, 1 x plastic jar and 2 amber jar Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected. Backfill details from base of hole: arisings up to ground level.	Logged by	MJ
Symbols and abbreviations are explained on the accompanying key sheet.		Figure	1 of 1 30/07/2020
All dimensions are in metres.	Logged in accordance with BS5930:2015		

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP330
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.00- 0.20	B			MADE GROUND: Grass over firm dark greyish brown slightly sandy slightly gravelly clay with many rootlets. Gravel is angular to subrounded fine to coarse concrete, limestone and brick.	G.L.		
0.10	D				0.20		
0.10	ES		PID=<0.1	MADE GROUND: Stiff brown mottled grey slightly sandy slightly gravelly clay with occasional rootlets. Gravel is angular to subrounded fine to medium brick, limestone and flint.			
0.30			PID=<0.1				
0.50	D			MADE GROUND: Stiff greenish grey slightly sandy slightly gravelly clay with a moderate organic odour, occasional pockets (up to 15mm in size) of dark grey organic clay and occasional decomposed rootlets. Gravel is angular to subangular fine to coarse brick. Below 2.00m, gravel absent.			
0.50	HV		Av=123kPa		1.00		
0.60	ES		PID=<0.1	Firm grey mottled orangish brown slightly sandy CLAY with occasional pockets (up to 80mm in size) of orangish brown sandy clay and rare gypsum crystals (up to 3mm in size).			
1.00- 1.50	B				2.60		
1.50	D			Stiff thickly laminated brown mottled yellowish brown slightly sandy CLAY with rare gypsum crystals (up to 2mm in size).			
1.50	HV		Av=82kPa				
1.60	ES		PID=<0.1	End of Excavation	3.80		
1.60					4.50		
2.50- 3.00	B			Stiff thickly laminated brown mottled yellowish brown slightly sandy CLAY with rare gypsum crystals (up to 2mm in size).			
2.50	D						
2.80	ES		PID=<0.1	Stiff thickly laminated brown mottled yellowish brown slightly sandy CLAY with rare gypsum crystals (up to 2mm in size).			
2.80	D		Av=58kPa				
3.00	HV			End of Excavation			
3.50	D						
3.60	ES		PID=<0.1	End of Excavation			
3.60							
3.80- 4.20	B			End of Excavation			
4.00	D						
4.40	D			End of Excavation			
				End of Excavation			
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Project	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Engineer
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**WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITED**

Trial Pit
Project No

TP331
PC207899

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED**

[illegible]

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoTP334
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.20	B			MADE GROUND: Soft dark brown slightly sandy slightly gravelly clay with many rootlets and occasional roots (up to 5mm in size). Gravel is angular to subangular fine to medium brick and quartzite.	G.L.	1	
0.20	D				0.30	2	
0.20	ES		PID=<0.1				
0.20							
0.60	B			MADE GROUND: Stiff to very stiff brown mottled grey slightly sandy clay.	1.00	3	
0.60	D						
0.70	HV		Av=109kPa				
1.00	D			MADE GROUND: Firm brown mottled grey slightly sandy slightly gravelly clay. Gravel is angular to subangular fine to medium brick.	1.50	4	
1.00	ES						
1.00	HV		Av=88kPa				
1.00			PID=<0.1	Below 1.45m, becomes soft.			
1.50	HV		Av=53kPa				
1.60	B			MADE GROUND: Soft dark greyish brown slightly sandy slightly gravelly clay with occasional decomposed organic matter (up to 10mm in size) and many rootlets. Gravel is angular to subangular fine to medium brick, quartzite and limestone.	2.30	5	
1.60	D						
1.60	ES						
1.60			PID=<0.1				
2.00	D						
2.00	HV		Av=67kPa				
2.40	B			Firm to stiff light grey mottled light orangish brown sandy CLAY.	3.10	6	
2.40	D						
2.50	HV		Av=83kPa				
				Below 2.50m, becomes slightly sandy.			
3.00	D						
3.00	ES						
3.00	HV		Av=86kPa	Firm dark grey mottled orangish brown slightly sandy CLAY with many gypsum crystals (up to 5mm in size).			
3.00			PID=<0.1				
3.20	B			Between 3.10-4.10m, becomes mottled yellowish brown.			
3.20	D						
				Below 3.50m, becomes stiff.			
4.00	B				4.50		
4.00	D						
				End of Excavation			

Excavation				Groundwater		
Plant	JCB 3CX	Width (B)	0.60	Depth Observed	Depth of Pit	Details
Date	22/07/2020	Length (C)	2.70			
Shoring	None.	Orientation	038 deg			None encountered during excavation.
Stability	Stable during excavation.	Date Backfilled	22/07/2020			

Remarks		Logged by
ES sample = 2 x vial, 1 x plastic jar and 2 amber jar		MJ
Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected.		
Backfill details from base of hole: arisings up to ground level.		

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Figure 1 of 1
30/07/2020

geotechnics

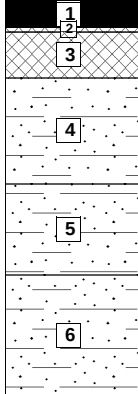
Project	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Engineer
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**WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITED**

Trial Pit
Project No

TP335
PC207899

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED**

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.10 0.10 0.20- 0.30 0.30 0.40 0.50- 0.60 0.70 0.70 1.00 1.20- 1.50 1.50 1.50 2.00- 2.00 2.20 2.50	ES B ES D B HV ES D B D HV B D HV D		PID=<0.1 PID=<0.1 Av=120kPa PID=<0.1 Av=98kPa PID=<0.1 Av=82kPa	MADE GROUND: Asphalt. MADE GROUND: Yellowish brown gravelly sand. Gravel is angular to subangular fine to medium limestone. MADE GROUND: Yellowish brown slightly sandy slightly clayey gravel with a high cobble content of angular to subangular limestone. Stiff locally thickly laminated brown mottled yellowish brown slightly sandy CLAY. Stiff grey mottled yellowish brown slightly sandy CLAY with rare gypsum crystals (up to 2mm in size) and occasional pockets (up to 30mm in size) of orangish brown sandy clay. Stiff grey thickly laminated slightly sandy CLAY with rare gypsum crystals (up to 2mm in size). End of Excavation	G.L. 0.17 0.20 0.50 1.20 1.80 2.60		
Excavation				Groundwater			
Plant JCB 3CX		Width (B) 0.60		Depth Observed	Depth of Pit	Details	
Date 22/07/2020		Length (C) 2.50					
Shoring None.		Orientation 045 deg				None encountered during excavation.	
Stability Stable during excavation.		Date Backfilled 22/07/2020					
Remarks AGS ES sample = 2 x vial, 1 x plastic jar and 2 amber jar Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected. Backfill details from base of hole: arisings up to ground level.				Logged by MM Figure 1 of 1 24/07/2020 			

Form INS009 Rev 7

Trial Pit	TP335
Test No	I
Project No	PC207899
Date	22/07/2020

The diagram shows a cross-section of a trial pit soakaway. On the left, a vertical wall is shown with a horizontal line indicating the water level (WL) inside the pit. A vertical double-headed arrow labeled "Total depth" spans from the ground level (GL) to the bottom of the pit. On the right, another vertical wall is shown, also with a horizontal line indicating the water level (WL). A vertical double-headed arrow labeled "Effective depth" spans from the ground level (GL) to the bottom of the pit. The ground level (GL) is indicated by a hatched line at the top of both walls. The water level (WL) is indicated by a horizontal line with a small inverted triangle above it. The bottom of the pit is indicated by a horizontal line with a small inverted triangle below it.

Trial pit length	=	2.500 m
Trial pit width	=	0.600 m
Trial pit depth	=	2.600 m
Effective depth (Head of Water)	=	0.870 m

Sheet 1

GEOTECHNICS

INSITU TESTING - Soakaway Test

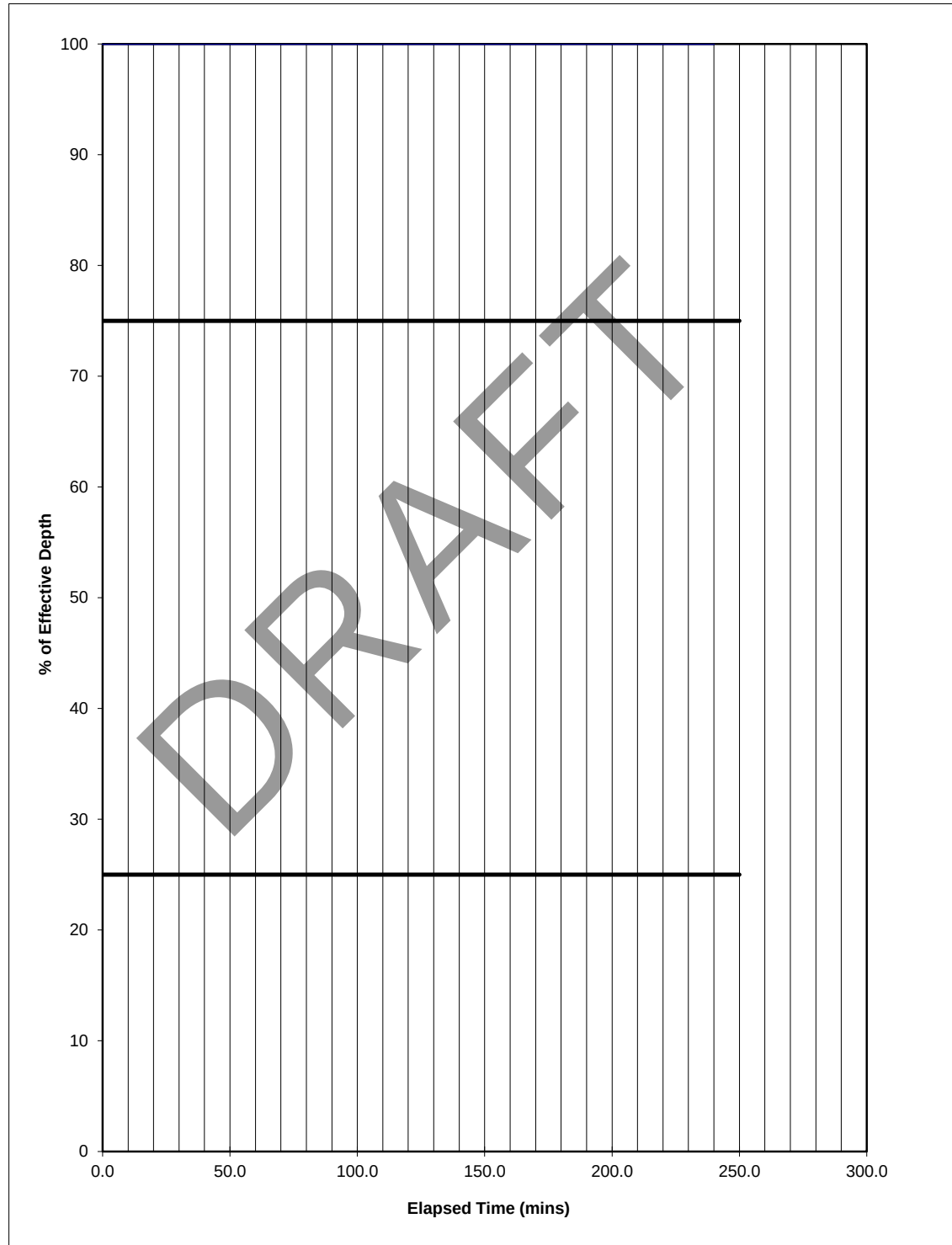
Form INS009 Rev 7

Project Ground Investigation for Graven Hill, Bicester, Land Transfer Area 2 (LTA2)

Trial Pit
Test No
Project No
Date

TP335
I
PC207899
22/07/2020

Client Graven Hill Village Development Company Limited



tp75	=
tp25	=

Remarks

Sheet 2

Project **GRAVEN HILL, BICESTER, LAND TRANSFER** Engineer
AREA 2 (LTA2)

**WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITED**

Trial Pit
Project No

RC303
PC207899

Client **GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED**

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.20 0.20 0.20 0.40 0.40 0.40 0.70 1.00 1.00	B ES B D ES HV B D		PID=<0.1 PID=<0.1 Av=97kPa	MADE GROUND: Brown slightly sandy slightly gravelly silt with many rootlets. Gravel is angular to subangular fine to coarse plastic, granite, brick and sandstone. MADE GROUND: Stiff brown mottled grey slightly sandy slightly gravelly clay with occasional rootlets and roots (up to 10mm in size) Gravel is angular to subrounded fine to coarse quartzite, brick and pottery. MADE GROUND: Stiff brown mottled grey slightly sandy slightly gravelly clay. Gravel is angular to subrounded fine to medium brick and sandstone. End of Excavation	G.L. 0.30 0.55 1.20	1 2 3	
Excavation				Groundwater			
Plant Hand Tools		Width (B) 0.30		Depth Observed	Depth of Pit	Details	
Date 30/07/2020		Length (C) 0.30				None encountered during excavation.	
Shoring None.		Date Backfilled 30/07/2020					
Stability Stable during excavation.							
Remarks				Logged by EPS			
AGS Inspection pit hand excavated to 1.20m depth and no services were found.				Figure 1 of 1			
Symbols and abbreviations are explained on the accompanying key sheet.				07/08/2020			
All dimensions are in metres.				geotechnics			
Logged in accordance with BS5930:2015							

Project GRAVEN HILL, BICESTER, LAND TRANSFER Engineer

WATERMAN INFRASTRUCTURE &
ENVIRONMENT LIMITEDTrial Pit
Project NoRC304
PC207899

Client GRAVEN HILL VILLAGE DEVELOPMENT COMPANY LIMITED

Samples and Tests				Strata		Scale 1:50	
Depth	Type	Stratum No	Results	Description	Depth	Legend	
0.10	B			Brown slightly sandy slightly gravelly SILT with occasional rootlets. Gravel is angular to subrounded fine to coarse granite, quartzite and sandstone. [TOPSOIL]	G.L.		
0.10	D				0.20		
0.10	ES		PID=<0.1				
0.60	B			Stiff brown mottled grey slightly sandy slightly gravelly CLAY with rare rootlets and occasional pockets (up to 60mm in size) of light brown sand. Gravel is subangular fine to coarse quartzite and sandstone.	0.70		
0.60	D						
0.60	ES		PID=<0.1 Av=92kPa				
1.00	HV			Stiff brown mottled orangish brown slightly sandy CLAY with rare pockets (up to 30mm in size) of light brown sand.	1.20		
1.10	B						
1.10	D						
				End of Excavation			

Excavation				Groundwater		
Plant	Hand Tools	Width (B)	0.30	Depth Observed	Depth of Pit	Details
Date	30/07/2020	Length (C)	0.30			
Shoring	None.	Date Backfilled	30/07/2020	None encountered during excavation.		
Stability	Stable during excavation.					

Remarks				Logged by	
Inspection pit hand excavated to 1.20m depth and no services were found. ES sample = 2 x vial, 1 x plastic jar and 2 amber jar Radioactive screening at discrete sample depths, using a Thermo Scientific Mini 900E. No activity detected. Backfill details from base of hole: arisings up to 0.80m, bentonite up to 0.20m, arisings up to ground level.				EPS	
Symbols and abbreviations are explained on the accompanying key sheet. All dimensions are in metres.				Figure 1 of 1 07/08/2020	

geotechnics

Logged in accordance with BS5930:2015



C. Geoenvironmental Testing Results

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716993	1716994	1716995	1716996	1716997	1716998
Sample ID	TP822	TP822	TP821	BH312	TP325	TP325
Depth	0.15	1.00	0.40	0.50	0.10-0.20	0.60-0.70
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	31/07/2020	31/07/2020	31/07/2020	24/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg			11	6.9		8.2
Barium	DETSC 2301#	1.5	mg/kg			50	56		290
Beryllium	DETSC 2301#	0.2	mg/kg			1.1	0.5		2.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg			0.9	1.1		1.8
Cadmium	DETSC 2301#	0.1	mg/kg			0.4	< 0.1		0.1
Chromium	DETSC 2301#	0.15	mg/kg			32	13		26
Chromium, Hexavalent	DETSC 2204*	1	mg/kg			< 1.0	< 1.0		< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg			14	3.2		12
Copper	DETSC 2301#	0.2	mg/kg			23	12		39
Iron	DETSC 2301	25	mg/kg			25000	10000		26000
Lead	DETSC 2301#	0.3	mg/kg			28	5.1		11
Mercury	DETSC 2325#	0.05	mg/kg			< 0.05	< 0.05		< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg			1.7	0.4		2.2
Nickel	DETSC 2301#	1	mg/kg			37	7.5		33
Selenium	DETSC 2301#	0.5	mg/kg			< 0.5	< 0.5		< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg			43	31		81
Zinc	DETSC 2301#	1	mg/kg			340	31		60
Inorganics									
Organic matter	DETSC 2002#	0.1	%				1.8		
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	50	< 1.2				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	330	< 1.5				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	930	< 3.4				
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg	220	< 3.4				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	1300	< 10				
Aliphatic C5-C40	DETSC 3072*	10	mg/kg	1500	< 10				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	1.3	< 0.9				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	180	< 0.5				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	1100	< 0.6				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	2000	< 1.4				
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg	560	< 1.4				
Aromatic C5-C35	DETSC 3072*	10	mg/kg	3300	< 10				
Aromatic C5-C40	DETSC 3072*	10	mg/kg	3800	< 10				

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716993	1716994	1716995	1716996	1716997	1716998
Sample ID	TP822	TP822	TP821	BH312	TP325	TP325
Depth	0.15	1.00	0.40	0.50	0.10-0.20	0.60-0.70
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	31/07/2020	31/07/2020	31/07/2020	24/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	4600	< 10				
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01				
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg			< 0.03	0.10		0.07
Fluorene	DETSC 3303	0.03	mg/kg			< 0.03	< 0.03		0.05
Phenanthrene	DETSC 3303#	0.03	mg/kg			0.05	0.69		0.33
Anthracene	DETSC 3303	0.03	mg/kg			< 0.03	0.23		0.11
Fluoranthene	DETSC 3303#	0.03	mg/kg			0.12	2.6		0.59
Pyrene	DETSC 3303#	0.03	mg/kg			0.11	4.0		0.51
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg			0.05	1.5		0.18
Chrysene	DETSC 3303	0.03	mg/kg			0.06	1.4		0.18
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg			0.06	1.9		0.22
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg			< 0.03	0.64		0.08
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg			0.05	1.6		0.17
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg			0.04	0.62		0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg			< 0.03	0.16		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg			0.04	0.73		0.08
Naphthalene	DETSC 3301	0.1	mg/kg	2.5	< 0.1			39	
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 1.0	< 0.1			< 1.0	
Acenaphthene	DETSC 3301	0.1	mg/kg	74	< 0.1			79	
Fluorene	DETSC 3301	0.1	mg/kg	89	< 0.1			67	
Phenanthrene	DETSC 3301	0.1	mg/kg	620	< 0.1			170	
Anthracene	DETSC 3301	0.1	mg/kg	170	< 0.1			57	
Fluoranthene	DETSC 3301	0.1	mg/kg	520	< 0.1			190	
Pyrene	DETSC 3301	0.1	mg/kg	420	< 0.1			170	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	180	< 0.1			51	
Chrysene	DETSC 3301	0.1	mg/kg	180	< 0.1			54	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	120	< 0.1			46	
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	64	< 0.1			23	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	130	< 0.1			52	
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	87	< 0.1			33	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	13	< 0.1			1.9	
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	76	< 0.1			32	
Coronene	DETSC 3301*	0.1	mg/kg			< 0.1	< 0.1	4.8	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg			0.56	16		2.7

Summary of Chemical Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716993	1716994	1716995	1716996	1716997	1716998
Sample ID	TP822	TP822	TP821	BH312	TP325	TP325
Depth	0.15	1.00	0.40	0.50	0.10-0.20	0.60-0.70
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	31/07/2020	31/07/2020	31/07/2020	24/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAH Total	DETSC 3301	1.6	mg/kg	2700	< 1.6			1100	
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg					2.8	
Phenol	DETSC 3451*	0.01	mg/kg					< 0.10	
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg					< 0.10	
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg					< 0.10	
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg					< 0.10	
p-cresol	DETSC 3451*	0.01	mg/kg					< 0.10	
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg					< 0.10	
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg					< 0.10	
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg					< 0.10	

Summary of Asbestos Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1716972	TP809 0.50	SOIL	NAD	none	Steven Lambert
1716973	TP804 0.50	SOIL	Amosite	bundles of Amosite	Steven Lambert
1716974	TP515 0.05	SOIL	NAD	none	Steven Lambert
1716975	TP407 0.20	SOIL	NAD	none	Steven Lambert
1716976	BH602 0.00-0.10	SOIL	NAD	none	Steven Lambert
1716977	BH602 0.50-0.60	SOIL	Chrysotile	bundle of Chrysotile	Steven Lambert
1716978	BH413 1.00	SOIL	NAD	none	Steven Lambert
1716980	BH424 1.00	SOIL	NAD	none	Steven Lambert
1716981	BH410 0.50	SOIL	NAD	none	Steven Lambert
1716982	BH412 0.30	SOIL	NAD	none	Steven Lambert
1716989	TP607 0.10	SOIL	NAD	none	Steven Lambert
1716995	TP821 0.40	SOIL	NAD	none	Steven Lambert
1716996	BH312 0.50	SOIL	NAD	none	Steven Lambert
1716998	TP325 0.60-0.70	SOIL	NAD	none	Steven Lambert
1716999	BH420 0.50	SOIL	NAD	none	Steven Lambert
1717000	TP413 1.30	SOIL	NAD	none	Steven Lambert
1717001	TP413 2.30	SOIL	NAD	none	Steven Lambert
1717002	TP419 0.50	SOIL	NAD	none	Steven Lambert
1717004	TP420 0.30	SOIL	NAD	none	Steven Lambert
1717005	TP703 0.60	SOIL	NAD	none	Steven Lambert
1717006	TP702 0.15	SOIL	NAD	none	Steven Lambert
1717007	TP702 0.60	SOIL	NAD	none	Steven Lambert
1717008	TP427 0.20	SOIL	NAD	none	Steven Lambert
1717010	TP810 0.40	SOIL	NAD	none	Steven Lambert
1717013	TP521 0.05	SOIL	NAD	none	Steven Lambert
1719945	TP523A 0.20	SOIL	NAD	none	Steven Lambert

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-16110
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1716990	RC401 0.40 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1716991	RC403 0.40 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1716992	BH417 0.50 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1716993	TP822 0.15 SOIL	31/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1716994	TP822 1.00 SOIL	31/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1716995	TP821 0.40 SOIL	31/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1716996	BH312 0.50 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days), PAH MS (14 days)	
1716997	TP325 0.10-0.20 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716998	TP325 0.60-0.70 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1716999	BH420 0.50 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1717000	TP413 1.30 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1717001	TP413 2.30 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1717002	TP419 0.50 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1717003	TP419 1.20 WATER	06/08/20		GB 1L, PB 1L	Aliphatics/Aromatics (4 days), BTEX/PRO (14 days), Chromium, Hexavalent (4 days), Kone (4 days), Naphthalene (14 days), PAH MS (14 days)	
1717004	TP420 0.30 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1717005	TP703 0.60 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1717006	TP702 0.15 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1717007	TP702 0.60 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1717008	TP427 0.20 SOIL	06/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1717009	SSC805 0.10 SOIL	05/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1717010	TP810 0.40 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days). PAH FID (14 days)	
1717011	TP810 0.60 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1717012	TP810 1.30 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1717013	TP521 0.05 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1717014	TP524 0.20 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1717015	TP524 0.50 SOIL	03/08/20		GJ 250ml x2, GJ 60ml x2	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719945	TP523A 0.20 SOIL	26/08/20		GJ 250ml x2, GJ 60ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub B-Bottle

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719128	1719129	1719130	1719131	1719132	1719133
Sample ID	RC808	RC808	BH317	BH404	BH512	BH313
Depth	0.10	0.50	0.10	0.30	0.10	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	31/07/2020	31/07/2020	04/08/2020	04/08/2020	04/08/2020	17/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Asbestos Quantification	DETSC 1102	0.001	%					0.001
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	43		10	5.7	16
Barium	DETSC 2301#	1.5	mg/kg	66		100	220	81
Beryllium	DETSC 2301#	0.2	mg/kg	1.2		1.2	3.0	1.2
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	3.2		1.6	0.8	1.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.8		0.8	0.2	0.4
Chromium	DETSC 2301#	0.15	mg/kg	39		58	22	43
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	17		12	4.7	16
Copper	DETSC 2301#	0.2	mg/kg	130		49	26	35
Iron	DETSC 2301	25	mg/kg	55000		34000	12000	41000
Lead	DETSC 2301#	0.3	mg/kg	43		15	9.0	53
Mercury	DETSC 2325#	0.05	mg/kg	0.06		0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	2.8		8.3	0.9	1.6
Nickel	DETSC 2301#	1	mg/kg	60		64	9.9	42
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5		0.7	1.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	60		45	69	60
Zinc	DETSC 2301#	1	mg/kg	230		140	30	130
Inorganics								
Organic matter	DETSC 2002#	0.1	%			1.6		4.6
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg		< 1.5		< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg		< 1.2		8.3	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg		< 1.5		13	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg		< 3.4		38	
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg		< 3.4		< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg		< 10		59	
Aliphatic C5-C40	DETSC 3072*	10	mg/kg		< 10		59	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg		< 0.01		< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg		< 0.9		< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg		< 0.5		52	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg		< 0.6		240	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg		< 1.4		440	
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg		< 1.4		< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg		< 10		740	
Aromatic C5-C40	DETSC 3072*	10	mg/kg		< 10		740	

Summary of Chemical Analysis Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719128	1719129	1719130	1719131	1719132	1719133
Sample ID	RC808	RC808	BH317	BH404	BH512	BH313
Depth	0.10	0.50	0.10	0.30	0.10	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	31/07/2020	31/07/2020	04/08/2020	04/08/2020	04/08/2020	17/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETS 3072*	10	mg/kg		< 10		790		
Benzene	DETS 3321#	0.01	mg/kg		< 0.01		< 0.01		
Ethylbenzene	DETS 3321#	0.01	mg/kg		< 0.01		< 0.01		
Toluene	DETS 3321#	0.01	mg/kg		< 0.01		< 0.01		
Xylene	DETS 3321#	0.01	mg/kg		< 0.01		< 0.01		
MTBE	DETS 3321	0.01	mg/kg		< 0.01		< 0.01		
PAHs									
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	< 1.0	< 0.1	< 1.0
Acenaphthylene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	8.7	< 0.1	< 1.0
Acenaphthene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	31	< 0.1	< 1.0
Fluorene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	26	< 0.1	< 1.0
Phenanthrene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	100	< 0.1	< 1.0
Anthracene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	50	< 0.1	< 1.0
Fluoranthene	DETS 3301	0.1	mg/kg	0.2		< 0.1	210	< 0.1	< 1.0
Pyrene	DETS 3301	0.1	mg/kg	0.2		< 0.1	200	< 0.1	< 1.0
Benzo(a)anthracene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	90	< 0.1	< 1.0
Chrysene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	92	< 0.1	< 1.0
Benzo(b)fluoranthene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	85	< 0.1	< 1.0
Benzo(k)fluoranthene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	44	< 0.1	< 1.0
Benzo(a)pyrene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	110	< 0.1	< 1.0
Indeno(1,2,3-c,d)pyrene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	110	< 0.1	< 1.0
Dibenzo(a,h)anthracene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	3.3	< 0.1	< 1.0
Benzo(g,h,i)perylene	DETS 3301	0.1	mg/kg	< 0.1		< 0.1	88	< 0.1	< 1.0
Coronene	DETS 3301*	0.1	mg/kg	< 0.1		< 0.1	18	< 0.1	
PAH Total	DETS 3301	1.6	mg/kg	< 1.6		< 1.6	1300	< 1.6	< 16.0
Phenols									
Phenol - Monohydric	DETS 2130#	0.3	mg/kg						< 0.3
Phenol	DETS 3451*	0.01	mg/kg						< 0.10
4-Chloro-3-methylphenol	DETS 3451*	0.01	mg/kg						< 0.10
2,4-Dichlorophenol	DETS 3451*	0.01	mg/kg						< 0.10
2,4-Dimethylphenol	DETS 3451*	0.01	mg/kg						< 0.10
p-cresol	DETS 3451*	0.01	mg/kg						< 0.10
2,6-Dimethylphenol	DETS 3451*	0.01	mg/kg						< 0.10
2,6-Dichlorophenol	DETS 3451*	0.01	mg/kg						< 0.10
2,4,6-Trichlorophenol	DETS 3451*	0.01	mg/kg						< 0.10

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719134	1719135	1719136	1719137	1719138	1719139
Sample ID	BH313	BH409	BH414	BHTP415	BHTP417	BHTP417
Depth	0.30	0.50	0.50	0.40	0.40	1.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	17/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%					< 0.001	
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	12	5.2	5.5	7.1	5.4	10
Barium	DETSC 2301#	1.5	mg/kg	45	45	23	32	71	71
Beryllium	DETSC 2301#	0.2	mg/kg	0.9	0.3	0.2	0.2	1.5	1.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	< 0.2	0.4	0.3	0.6	2.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	12	11	8.0	8.5	11	39
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	4.5	19	14	14	4.1	12
Copper	DETSC 2301#	0.2	mg/kg	19	100	53	96	16	24
Iron	DETSC 2301	25	mg/kg	19000	49000	23000	43000	8900	16000
Lead	DETSC 2301#	0.3	mg/kg	9.6	22	11	17	4.3	15
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	1.5	0.5	0.7	0.4	0.9	1.9
Nickel	DETSC 2301#	1	mg/kg	12	5.6	5.3	5.3	5.1	28
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	1.0	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	33	93	46	73	35	50
Zinc	DETSC 2301#	1	mg/kg	36	97	42	71	27	99
Inorganics									
Organic matter	DETSC 2002#	0.1	%						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	77	< 3.4	< 3.4	< 3.4		
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg	60	< 3.4	< 3.4	< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	78	< 10	< 10	< 10		
Aliphatic C5-C40	DETSC 3072*	10	mg/kg	140	< 10	< 10	< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	2.0	< 0.5	< 0.5	< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	21	< 0.6	< 0.6	< 0.6		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	400	< 1.4	< 1.4	< 1.4		
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg	310	< 1.4	< 1.4	< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg	420	< 10	< 10	< 10		
Aromatic C5-C40	DETSC 3072*	10	mg/kg	740	< 10	< 10	< 10		

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719134	1719135	1719136	1719137	1719138	1719139
Sample ID	BH313	BH409	BH414	BHTP415	BHTP417	BHTP417
Depth	0.30	0.50	0.50	0.40	0.40	1.20
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	17/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020	13/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETS 3072*	10	mg/kg	500	< 10	< 10	< 10		
Benzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Ethylbenzene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Toluene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
Xylene	DETS 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
MTBE	DETS 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01		
PAHs									
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETS 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETS 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1	0.4	< 0.1
Fluorene	DETS 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Phenanthrene	DETS 3301	0.1	mg/kg	1.3	< 0.1	< 0.1	< 0.1	0.9	< 0.1
Anthracene	DETS 3301	0.1	mg/kg	1.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1
Fluoranthene	DETS 3301	0.1	mg/kg	7.1	< 0.1	< 0.1	0.1	2.8	0.4
Pyrene	DETS 3301	0.1	mg/kg	7.5	< 0.1	< 0.1	0.2	3.0	0.3
Benzo(a)anthracene	DETS 3301	0.1	mg/kg	3.3	< 0.1	< 0.1	< 0.1	1.2	< 0.1
Chrysene	DETS 3301	0.1	mg/kg	3.3	< 0.1	< 0.1	< 0.1	1.2	< 0.1
Benzo(b)fluoranthene	DETS 3301	0.1	mg/kg	3.9	< 0.1	< 0.1	< 0.1	1.3	< 0.1
Benzo(k)fluoranthene	DETS 3301	0.1	mg/kg	1.9	< 0.1	< 0.1	< 0.1	0.7	< 0.1
Benzo(a)pyrene	DETS 3301	0.1	mg/kg	5.2	< 0.1	< 0.1	< 0.1	2.0	< 0.1
Indeno(1,2,3-c,d)pyrene	DETS 3301	0.1	mg/kg	6.0	< 0.1	< 0.1	< 0.1	1.7	< 0.1
Dibenzo(a,h)anthracene	DETS 3301	0.1	mg/kg	0.7	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(g,h,i)perylene	DETS 3301	0.1	mg/kg	4.2	< 0.1	< 0.1	< 0.1	1.2	< 0.1
Coronene	DETS 3301*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETS 3301	1.6	mg/kg	47	< 1.6	< 1.6	< 1.6	17	< 1.6
Phenols									
Phenol - Monohydric	DETS 2130#	0.3	mg/kg						
Phenol	DETS 3451*	0.01	mg/kg						
4-Chloro-3-methylphenol	DETS 3451*	0.01	mg/kg						
2,4-Dichlorophenol	DETS 3451*	0.01	mg/kg						
2,4-Dimethylphenol	DETS 3451*	0.01	mg/kg						
p-cresol	DETS 3451*	0.01	mg/kg						
2,6-Dimethylphenol	DETS 3451*	0.01	mg/kg						
2,6-Dichlorophenol	DETS 3451*	0.01	mg/kg						
2,4,6-Trichlorophenol	DETS 3451*	0.01	mg/kg						

Information in Support of the Analytical Results

Our Ref 20-16427
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester, Land Transfer Area 2 (LTA2)

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1719119	BH603 0.30 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719120	TP803 0.10 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719121	TP803 0.40 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719122	TP705 0.30 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1719123	BH421 0.60 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719124	BH403 0.10 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mononitrobenzene (14 days)	
1719125	BH403 0.50 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719126	RC807 0.10 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719127	RC807 0.50 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719128	RC808 0.10 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719129	RC808 0.50 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719130	BH317 0.10 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719131	BH404 0.30 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1719132	BH512 0.10 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719133	BH313 0.10 SOIL	17/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719134	BH313 0.30 SOIL	17/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719135	BH409 0.50 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1719136	BH414 0.50 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1719137	BHTP415 0.40 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1719138	BHTP417 0.40 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719139	BHTP417 1.20 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719140	BHTP418 0.50 SOIL	17/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719141	BHTP416 0.50 SOIL	17/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719142	BH415 0.40 SOIL	18/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719143	BH415 0.90 SOIL	18/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719144	BH406 0.30 SOIL	18/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719145	BH406A 0.45 SOIL	18/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719146	BHTP434 1.10 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719147	BHTP434 2.30 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719148	BH416 1.00 SOIL	13/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719149	TP408X 0.70 SOIL	04/08/20	GJ 250ml x2, GJ 60ml x2		

Summary of Chemical Analysis

Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1714164	1714165	1714166	1714167	1714168	1714169
Sample ID	BH314	BH314	RC406	RC406	TP334	TP317
Depth	0.10	0.60	0.30	0.70	1.00	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/07/2020	23/07/2020	21/07/2020	21/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETS 2301#	0.2	mg/kg		12		6.1	10
Barium	DETS 2301#	1.5	mg/kg		240		89	110
Beryllium	DETS 2301#	0.2	mg/kg		3.9		0.3	2.0
Boron, Water Soluble	DETS 2311#	0.2	mg/kg		3.0		0.4	1.9
Cadmium	DETS 2301#	0.1	mg/kg		0.2		0.2	0.2
Chromium	DETS 2301#	0.15	mg/kg		32		7.3	33
Chromium, Hexavalent	DETS 2204*	1	mg/kg		< 1.0		< 1.0	< 1.0
Cobalt	DETS 2301#	0.7	mg/kg		8.9		3.0	13
Copper	DETS 2301#	0.2	mg/kg		41		17	31
Iron	DETS 2301	25	mg/kg		26000		12000	32000
Lead	DETS 2301#	0.3	mg/kg		19		6.9	16
Mercury	DETS 2325#	0.05	mg/kg		< 0.05		< 0.05	< 0.05
Molybdenum	DETS 2301#	0.4	mg/kg		2.4		0.6	2.7
Nickel	DETS 2301#	1	mg/kg		28		6.0	37
Selenium	DETS 2301#	0.5	mg/kg		1.9		< 0.5	0.8
Vanadium	DETS 2301#	0.8	mg/kg		80		25	44
Zinc	DETS 2301#	1	mg/kg		78		37	130
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg			< 1.5	5.9	
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg			< 1.2	34	
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg			< 1.5	31	
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg			< 3.4	340	
Aliphatic C35-C40	DETS 3072*	3.4	mg/kg			< 3.4	160	
Aliphatic C5-C35	DETS 3072*	10	mg/kg			< 10	420	
Aliphatic C5-C40	DETS 3072*	10	mg/kg			< 10	580	
Aromatic C5-C7	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aromatic C7-C8	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aromatic C8-C10	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01	
Aromatic C10-C12	DETS 3072#	0.9	mg/kg			< 0.9	2.3	
Aromatic C12-C16	DETS 3072#	0.5	mg/kg			< 0.5	49	
Aromatic C16-C21	DETS 3072#	0.6	mg/kg			< 0.6	130	
Aromatic C21-C35	DETS 3072#	1.4	mg/kg			< 1.4	1000	
Aromatic C35-C40	DETS 3072*	1.4	mg/kg			< 1.4	350	
Aromatic C5-C35	DETS 3072*	10	mg/kg			< 10	1200	
Aromatic C5-C40	DETS 3072*	10	mg/kg			< 10	1600	
TPH Ali/Aro Total	DETS 3072*	10	mg/kg			< 10	1600	
Benzene	DETS 3321#	0.01	mg/kg			< 0.01	< 0.01	
Ethylbenzene	DETS 3321#	0.01	mg/kg			< 0.01	< 0.01	
Toluene	DETS 3321#	0.01	mg/kg			< 0.01	< 0.01	

Summary of Chemical Analysis

Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1714164	1714165	1714166	1714167	1714168	1714169
Sample ID	BH314	BH314	RC406	RC406	TP334	TP317
Depth	0.10	0.60	0.30	0.70	1.00	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/07/2020	23/07/2020	21/07/2020	21/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Xylene	DETS 3321#	0.01	mg/kg			< 0.01	< 0.01		
MTBE	DETS 3321	0.01	mg/kg			< 0.01	< 0.01		
PAHs									
Naphthalene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		0.04	< 0.03	< 0.03
Acenaphthylene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Acenaphthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		3.3	< 0.03	< 0.03
Fluorene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03		2.1	< 0.03	< 0.03
Phenanthrene	DETS 3303#	0.03	mg/kg	< 0.03	0.04		6.2	< 0.03	< 0.03
Anthracene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03		3.6	< 0.03	< 0.03
Fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	0.06		16	< 0.03	< 0.03
Pyrene	DETS 3303#	0.03	mg/kg	< 0.03	0.04		14	< 0.03	< 0.03
Benzo(a)anthracene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		5.9	< 0.03	< 0.03
Chrysene	DETS 3303	0.03	mg/kg	< 0.03	< 0.03		5.4	< 0.03	< 0.03
Benzo(b)fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		6.7	< 0.03	< 0.03
Benzo(k)fluoranthene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		2.4	< 0.03	< 0.03
Benzo(a)pyrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		6.0	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		2.2	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		0.64	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETS 3303#	0.03	mg/kg	< 0.03	< 0.03		2.4	< 0.03	< 0.03
Coronene	DETS 3301*	0.1	mg/kg	< 0.1	< 0.1		< 2.0	< 0.1	< 0.1
PAH - USEPA 16, Total	DETS 3303	0.1	mg/kg	< 0.10	0.15		76	< 0.10	< 0.10
Phenols									
Phenol - Monohydric	DETS 2130#	0.3	mg/kg	< 0.3					< 0.3
Phenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
4-Chloro-3-methylphenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
2,4-Dichlorophenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
2,4-Dimethylphenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
p-cresol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
2,6-Dimethylphenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
2,6-Dichlorophenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01
2,4,6-Trichlorophenol	DETS 3451*	0.01	mg/kg	< 0.01					< 0.01

Information in Support of the Analytical Results

Our Ref 20-15529
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1714156	TP309 0.10 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714157	BH316 0.15-0.25 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1714158	BH426 0.20 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1714159	BH426 0.50 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714160	BH428 0.10 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days), Phenols MS (14 days), Cyanide/Mono nHoh (14 days)	
1714161	BH428 0.40 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1714162	TP323 0.10-0.20 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days), Phenols MS (14 days), Cyanide/Mono nHoh (14 days)	
1714163	TP323 0.20-0.30 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714164	BH314 0.10 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days), Phenols MS (14 days), Cyanide/Mono nHoh (14 days)	
1714165	BH314 0.60 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714166	RC406 0.30 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1714167	RC406 0.70 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714168	TP334 1.00 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714169	TP317 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days), Phenols MS (14 days), Cyanide/Mono nHoh (14 days)	
1714170	TP317 0.50 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714171	TP317 1.00 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1714172	TP322 0.70 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714173	TP318 0.50 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	
1714174	TP319 0.60 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719071	1719072	1719073	1719074	1719075	1719076
Sample ID	BH305	BH305	BH311	BH311	BH311	BH303
Depth	0.10	1.00	0.10	0.30	1.00	0.30
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	06/08/2020	06/08/2020	06/08/2020	06/08/2020	06/08/2020	06/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg		10			3.1	11
Barium	DETSC 2301#	1.5	mg/kg		120			14	58
Beryllium	DETSC 2301#	0.2	mg/kg		2.6			< 0.2	1.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		1.1			0.3	1.8
Cadmium	DETSC 2301#	0.1	mg/kg		0.2			< 0.1	0.4
Chromium	DETSC 2301#	0.15	mg/kg		24			4.5	45
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0			< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg		9.2			9.7	10
Copper	DETSC 2301#	0.2	mg/kg		26			23	27
Iron	DETSC 2301	25	mg/kg		21000			23000	29000
Lead	DETSC 2301#	0.3	mg/kg		14			4.4	22
Mercury	DETSC 2325#	0.05	mg/kg		< 0.05			< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg		1.7			< 0.4	3.1
Nickel	DETSC 2301#	1	mg/kg		21			5.1	33
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5			< 0.5	0.6
Vanadium	DETSC 2301#	0.8	mg/kg		37			55	56
Zinc	DETSC 2301#	1	mg/kg		63			54	100
Inorganics									
Organic matter	DETSC 2002#	0.1	%					6.2	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5			< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	1.5			< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	11			< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	520			43		
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg	170			< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	530			43		
Aliphatic C5-C40	DETSC 3072*	10	mg/kg	700			43		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9			< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5			< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	17			< 0.6		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	1800			230		
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg	820			< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg	1800			230		
Aromatic C5-C40	DETSC 3072*	10	mg/kg	2600			230		

Summary of Chemical Analysis Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land

Lab No	1719071	1719072	1719073	1719074	1719075	1719076
Sample ID	BH305	BH305	BH311	BH311	BH311	BH303
Depth	0.10	1.00	0.10	0.30	1.00	0.30
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	06/08/2020	06/08/2020	06/08/2020	06/08/2020	06/08/2020	06/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	2300			270		
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01			< 0.01		
MTBE	DETSC 3321	0.01	mg/kg	< 0.01			< 0.01		
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg		< 0.1	< 1.0		< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg		0.6	< 1.0		< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg		1.6	< 1.0		< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg		1.8	< 1.0		< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg		7.0	< 1.0		< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg		2.9	< 1.0		< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg		9.7	< 1.0		< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg		8.2	< 1.0		< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		3.4	< 1.0		< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg		3.5	< 1.0		< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		2.6	< 1.0		< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		1.5	< 1.0		< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		3.5	< 1.0		< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		2.7	< 1.0		< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		0.3	< 1.0		< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		1.6	< 1.0		< 0.1	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg		< 0.1			< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg		51	< 16.0		< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			< 0.3			
Phenol	DETSC 3451*	0.01	mg/kg			< 0.10			
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
p-cresol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			

Summary of Asbestos Analysis

Soil Samples

Our Ref 20-16427

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester, Land Transfer Area 2 (LTA2)

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1719065	BH418 0.50	SOIL	NAD	none	Steven Lambert
1719067	TP820 0.25	SOIL	NAD	none	Steven Lambert
1719068	TP430 0.20	SOIL	NAD	none	Steven Lambert
1719069	BH425 0.20	SOIL	NAD	none	Steven Lambert
1719071	BH305 0.10	SOIL	NAD	none	Steven Lambert
1719076	BH303 0.30	SOIL	NAD	none	Steven Lambert
1719077	BH303 0.50	SOIL	NAD	none	Steven Lambert
1719079	TP816 0.40	SOIL	NAD	none	Steven Lambert
1719088	BH611 0.30	SOIL	NAD	none	Steven Lambert
1719089	BH611 0.80	SOIL	NAD	none	Steven Lambert
1719090	BH301 0.30	SOIL	NAD	none	Steven Lambert
1719091	TP522A 0.10	SOIL	NAD	none	Steven Lambert
1719093	TP507 0.40	SOIL	NAD	none	Steven Lambert
1719096	TP412 1.00	SOIL	NAD	none	Steven Lambert
1719097	TP412 2.00	SOIL	NAD	none	Steven Lambert
1719102	TP411A 0.40	SOIL	NAD	none	Steven Lambert
1719107	BH508 0.30	SOIL	NAD	none	Steven Lambert
1719111	BH610 0.20	SOIL	NAD	none	Steven Lambert
1719112	BH608 0.20	SOIL	NAD	none	Steven Lambert
1719115	BH601 0.20	SOIL	NAD	none	Steven Lambert
1719120	TP803 0.10	SOIL	NAD	none	Steven Lambert
1719121	TP803 0.40	SOIL	NAD	none	Steven Lambert
1719122	TP705 0.30	SOIL	NAD	none	Steven Lambert
1719125	BH403 0.50	SOIL	NAD	none	Steven Lambert
1719126	RC807 0.10	SOIL	NAD	none	Steven Lambert
1719127	RC807 0.50	SOIL	NAD	none	Steven Lambert
1719128	RC808 0.10	SOIL	NAD	none	Steven Lambert
1719131	BH404 0.30	SOIL	NAD	none	Steven Lambert
1719132	BH512 0.10	SOIL	Chrysotile	bundles of Chrysotile	Steven Lambert
1719134	BH313 0.30	SOIL	NAD	none	Steven Lambert
1719135	BH409 0.50	SOIL	NAD	none	Steven Lambert
1719136	BH414 0.50	SOIL	NAD	none	Steven Lambert
1719137	BHTP415 0.40	SOIL	NAD	none	Steven Lambert
1719138	BHTP417 0.40	SOIL	Chrysotile	Small bundle of Chrysotile	Steven Lambert
1719141	BHTP416 0.50	SOIL	NAD	none	Steven Lambert
1719142	BH415 0.40	SOIL	NAD	none	Steven Lambert
1719143	BH415 0.90	SOIL	NAD	none	Steven Lambert
1719145	BH406A 0.45	SOIL	NAD	none	Steven Lambert
1719149	TP408X 0.70	SOIL	NAD	none	Steven Lambert
1721342	BH815 0.20	SOIL	NAD	none	Steven Lambert

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-16427
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester, Land Transfer Area 2 (LTA2)

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1719065	BH418 0.50 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719066	TP820 0.10 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono nHob (14 days)	
1719067	TP820 0.25 SOIL	31/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719068	TP430 0.20 SOIL	30/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1719069	BH425 0.20 SOIL	03/08/20	PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1719070	BH514 0.50 SOIL	05/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719071	BH305 0.10 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719072	BH305 1.00 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1719073	BH311 0.10 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono nHob (14 days)	
1719074	BH311 0.30 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719075	BH311 1.00 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1719076	BH303 0.30 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2	Naphthalene (14 days), PAH FID (14 days)	
1719077	BH303 0.50 SOIL	06/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L x2		
1719078	BH302 0.20 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719079	TP816 0.40 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719080	TP830 0.05 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719081	TP830 0.46 WATER	07/08/20	PB 1L x2	Aliphatics/Aromatics (4 days), BTEX/PRO (14 days)	Aliphatics/Aromatics, BTEX/PRO
1719082	TP829 0.20 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719083	TP829 0.50 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719084	BH511 0.10 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono nHob (14 days)	
1719085	BH511 1.00 SOIL	07/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719086	BH408 1.00 SOIL	30/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719087	BH408 2.40 SOIL	30/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1719088	BH611 0.30 SOIL	10/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719089	BH611 0.80 SOIL	10/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1719090	BH301 0.30 SOIL	10/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1719091	TP522A 0.10 SOIL	10/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716962	1716963	1716964	1716965	1716966	1716967
Sample ID	TP518	TP508	RC602	RC602	RC303	RC303
Depth	0.40	0.30	0.20	0.45	0.20	0.40
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	29/07/2020	29/07/2020	30/07/2020	30/07/2020	30/07/2020	30/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	13	16		12	11	11
Barium	DETSC 2301#	1.5	mg/kg	64	99		170	61	88
Beryllium	DETSC 2301#	0.2	mg/kg	1.3	1.1		3.6	0.7	0.8
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.3	1.9		1.4	1.3	1.3
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.7		0.3	0.4	0.3
Chromium	DETSC 2301#	0.15	mg/kg	50	33		190	23	30
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	15	11		5.3	7.3	8.0
Copper	DETSC 2301#	0.2	mg/kg	34	32		38	26	22
Iron	DETSC 2301	25	mg/kg	29000	38000		27000	23000	31000
Lead	DETSC 2301#	0.3	mg/kg	19	71		20	26	20
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	2.1	1.6		1.2	1.2	1.4
Nickel	DETSC 2301#	1	mg/kg	49	29		14	21	22
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5		5.2	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	53	51		520	40	49
Zinc	DETSC 2301#	1	mg/kg	160	210		73	100	82
Inorganics									
Organic matter	DETSC 2002#	0.1	%						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aliphatic C5-C40	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg						
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg						
Aromatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C40	DETSC 3072*	10	mg/kg						

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716962	1716963	1716964	1716965	1716966	1716967
Sample ID	TP518	TP508	RC602	RC602	RC303	RC303
Depth	0.40	0.30	0.20	0.45	0.20	0.40
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	29/07/2020	29/07/2020	30/07/2020	30/07/2020	30/07/2020	30/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETS 3072*	10	mg/kg						
Benzene	DETS 3321#	0.01	mg/kg						
Ethylbenzene	DETS 3321#	0.01	mg/kg						
Toluene	DETS 3321#	0.01	mg/kg						
Xylene	DETS 3321#	0.01	mg/kg						
MTBE	DETS 3321	0.01	mg/kg						
PAHs									
Naphthalene	DETS 3303#	0.03	mg/kg						
Acenaphthylene	DETS 3303#	0.03	mg/kg						
Acenaphthene	DETS 3303#	0.03	mg/kg						
Fluorene	DETS 3303	0.03	mg/kg						
Phenanthrene	DETS 3303#	0.03	mg/kg						
Anthracene	DETS 3303	0.03	mg/kg						
Fluoranthene	DETS 3303#	0.03	mg/kg						
Pyrene	DETS 3303#	0.03	mg/kg						
Benzo(a)anthracene	DETS 3303#	0.03	mg/kg						
Chrysene	DETS 3303	0.03	mg/kg						
Benzo(b)fluoranthene	DETS 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETS 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETS 3303#	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETS 3303#	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETS 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETS 3303#	0.03	mg/kg						
Naphthalene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	11	< 0.1	< 0.1	< 0.1
Acenaphthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	37	< 0.1	< 0.1	< 0.1
Fluorene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	31	< 0.1	< 0.1	< 0.1
Phenanthrene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	150	0.2	< 0.1	< 0.1
Anthracene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	57	0.3	< 0.1	< 0.1
Fluoranthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	360	0.5	< 0.1	< 0.1
Pyrene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	350	0.8	< 0.1	< 0.1
Benzo(a)anthracene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	130	0.3	< 0.1	< 0.1
Chrysene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	120	0.4	< 0.1	< 0.1
Benzo(b)fluoranthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	120	0.3	< 0.1	< 0.1
Benzo(k)fluoranthene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	62	0.2	< 0.1	< 0.1
Benzo(a)pyrene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	150	0.4	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	120	0.5	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	8.5	0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETS 3301	0.1	mg/kg	< 0.1	< 0.1	110	0.2	< 0.1	< 0.1
Coronene	DETS 3301*	0.1	mg/kg	< 0.1	< 0.1	42	1.7	< 0.1	< 0.1
PAH - USEPA 16, Total	DETS 3303	0.1	mg/kg						

Summary of Chemical Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716962	1716963	1716964	1716965	1716966	1716967
Sample ID	TP518	TP508	RC602	RC602	RC303	RC303
Depth	0.40	0.30	0.20	0.45	0.20	0.40
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	29/07/2020	29/07/2020	30/07/2020	30/07/2020	30/07/2020	30/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	1900	5.8	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			0.5			
Phenol	DETSC 3451*	0.01	mg/kg			< 0.10			
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
p-cresol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10			

Summary of Asbestos Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1716882	TP324 0.60	SOIL	NAD	none	Steven Lambert
1716884	TP304 0.50	SOIL	NAD	none	Steven Lambert
1716886	TP305 0.40	SOIL	NAD	none	Steven Lambert
1716887	TP332 0.10	SOIL	NAD	none	Steven Lambert
1716888	TP332 1.00	SOIL	NAD	none	Steven Lambert
1716891	RC301 0.50	SOIL	NAD	none	Steven Lambert
1716893	RC302 0.50	SOIL	Chrysotile	bundles of Chrysotile	Steven Lambert
1716895	CC308 0.50	SOIL	NAD	none	Steven Lambert
1716901	RC711 0.31-0.50	SOIL	NAD	none	Steven Lambert
1716902	RC714 0.40-0.60	SOIL	NAD	none	Steven Lambert
1716905	TP612 0.20	SOIL	NAD	none	Steven Lambert
1716906	TP601 0.30	SOIL	NAD	none	Steven Lambert
1716907	TP615 0.50	SOIL	NAD	none	Steven Lambert
1716908	TP404 0.10	SOIL	NAD	none	Steven Lambert
1716909	TP431 0.10	SOIL	NAD	none	Steven Lambert
1716910	BH309 0.10-0.20	SOIL	NAD	none	Steven Lambert
1716911	TP331 0.20	SOIL	NAD	none	Steven Lambert
1716912	TP331 0.80	SOIL	NAD	none	Steven Lambert
1716913	TP302 0.40	SOIL	NAD	none	Steven Lambert
1716914	TP611 1.00	SOIL	NAD	none	Steven Lambert
1716915	TP312 0.50	SOIL	NAD	none	Steven Lambert
1716916	TP311 0.20	SOIL	NAD	none	Steven Lambert
1716917	TP315 0.10	SOIL	NAD	none	Steven Lambert
1716918	TP316 0.10	SOIL	NAD	none	Steven Lambert
1716919	TP313 0.40	SOIL	NAD	none	Steven Lambert
1716920	TP314 0.10	SOIL	NAD	none	Steven Lambert
1716921	TP401 0.35	SOIL	NAD	none	Steven Lambert
1716922	TP402 0.10	SOIL	NAD	none	Steven Lambert
1716923	TP517 0.10	SOIL	NAD	none	Steven Lambert
1716924	TP516 0.10	SOIL	NAD	none	Steven Lambert
1716925	TP833A 0.50	SOIL	NAD	none	Steven Lambert
1716926	TP834 0.75	SOIL	NAD	none	Steven Lambert
1716927	TP836 0.20	SOIL	NAD	none	Steven Lambert
1716928	TP833A 1.00	SOIL	NAD	none	Steven Lambert
1716929	TP832A 1.00	SOIL	NAD	none	Steven Lambert
1716930	TP834A 1.00	SOIL	NAD	none	Steven Lambert
1716961	TP509 0.10	SOIL	NAD	none	Steven Lambert
1716962	TP518 0.40	SOIL	NAD	none	Steven Lambert
1716963	TP508 0.30	SOIL	NAD	none	Steven Lambert
1716965	RC602 0.45	SOIL	NAD	none	Steven Lambert
1716966	RC303 0.20	SOIL	NAD	none	Steven Lambert
1716967	RC303 0.40	SOIL	NAD	none	Steven Lambert
1716968	BH430 0.10-0.30	SOIL	NAD	none	Steven Lambert
1716969	BH402 0.10-0.30	SOIL	NAD	none	Steven Lambert
1716970	TP406 0.30	SOIL	NAD	none	Steven Lambert
1716971	TP511 0.10	SOIL	NAD	none	Steven Lambert

Information in Support of the Analytical Results

Our Ref 20-16110
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1716941	SSC826 0.10 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716942	SSC827 0.10 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716943	SSC501 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716944	SSC502 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716945	SSC508 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716946	SSC509 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716947	SSC701 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716948	SSC702 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716949	SSC703 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716950	SSC506 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716951	SSC507 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716952	SSC804 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716953	SSC806 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716954	SSC807 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716955	SSC808 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716956	SSC809 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716957	SSC813 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716958	SSC814 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716959	SSC816 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716960	SSC822 0.10 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716961	TP509 0.10 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716962	TP518 0.40 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716963	TP508 0.30 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716964	RC602 0.20 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716965	RC602 0.45 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), VOC (7 days)	
1716966	RC303 0.20 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716967	RC303 0.40 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716968	BH430 0.10-0.30 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716969	BH402 0.10-0.30 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716970	TP406 0.30 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716971	TP511 0.10 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716972	TP809 0.50 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716973	TP804 0.50 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716974	TP515 0.05 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716975	TP407 0.20 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716976	BH602 0.00-0.10 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		
1716977	BH602 0.50-0.60 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716978	BH413 1.00 SOIL	30/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716979	BH422 0.50 SOIL	27/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716980	BH424 1.00 SOIL	27/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1716981	BH410 0.50 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716982	BH412 0.30 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716983	BH412 2.40 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716984	BH423 0.50 SOIL	28/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716985	BH411 0.50 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716986	BH411 1.40 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716987	TP426 1.00 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Organic Matter (Manual) (28 days)	
1716988	TP426 1.70 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Organic Matter (Manual) (28 days)	
1716989	TP607 0.10 SOIL	24/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days), PAH MS (14 days)	

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716881	1716882	1716883	1716884	1716885	1716886
Sample ID	TP324	TP324	TP304	TP304	TP304	TP305
Depth	0.10	0.60	0.10	0.50	1.00	0.40
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg		5.4		11	11	9.3
Barium	DETSC 2301#	1.5	mg/kg		120		350	150	95
Beryllium	DETSC 2301#	0.2	mg/kg		1.0		3.5	1.4	1.2
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		3.5		0.5	2.2	0.4
Cadmium	DETSC 2301#	0.1	mg/kg		0.2		0.3	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg		28		28	33	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0		< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg		15		26	18	9.4
Copper	DETSC 2301#	0.2	mg/kg		40		92	30	39
Iron	DETSC 2301	25	mg/kg		62000		44000	39000	20000
Lead	DETSC 2301#	0.3	mg/kg		19		23	21	12
Mercury	DETSC 2325#	0.05	mg/kg		0.07		< 0.05	< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg		1.1		4.5	1.5	1.4
Nickel	DETSC 2301#	1	mg/kg		45		74	54	28
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5		< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg		54		120	39	48
Zinc	DETSC 2301#	1	mg/kg		120		100	130	85
Inorganics									
Organic matter	DETSC 2002#	0.1	%				2.9		2.3
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				< 3.4		
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg				< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				< 10		
Aliphatic C5-C40	DETSC 3072*	10	mg/kg				< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				< 0.6		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				< 1.4		
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg				< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg				< 10		
Aromatic C5-C40	DETSC 3072*	10	mg/kg				< 10		

Summary of Chemical Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716881	1716882	1716883	1716884	1716885	1716886
Sample ID	TP324	TP324	TP304	TP304	TP304	TP305
Depth	0.10	0.60	0.10	0.50	1.00	0.40
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg				< 10		
Benzene	DETSC 3321#	0.01	mg/kg				< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg				< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg				< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg				< 0.01		
MTBE	DETSC 3321	0.01	mg/kg				< 0.01		
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						
Naphthalene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 1.0	< 0.1	< 0.1	0.7
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 1.0	< 0.1	< 0.1	2.9
Acenaphthene	DETSC 3301	0.1	mg/kg	1.0	< 0.1	1.1	0.3	< 0.1	25
Fluorene	DETSC 3301	0.1	mg/kg	0.9	< 0.1	< 1.0	< 0.1	< 0.1	28
Phenanthrene	DETSC 3301	0.1	mg/kg	5.3	< 0.1	5.5	0.6	< 0.1	90
Anthracene	DETSC 3301	0.1	mg/kg	1.7	< 0.1	1.7	0.3	< 0.1	28
Fluoranthene	DETSC 3301	0.1	mg/kg	9.9	< 0.1	14	5.1	< 0.1	130
Pyrene	DETSC 3301	0.1	mg/kg	8.7	< 0.1	14	5.1	< 0.1	110
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	3.5	< 0.1	4.7	1.7	< 0.1	42
Chrysene	DETSC 3301	0.1	mg/kg	4.1	< 0.1	5.3	1.8	< 0.1	47
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	2.7	< 0.1	4.6	1.4	< 0.1	31
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	2.1	< 0.1	2.7	0.9	< 0.1	16
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	4.2	< 0.1	6.4	2.1	< 0.1	34
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	4.5	< 0.1	5.5	1.2	< 0.1	24
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	1.4	< 0.1	< 0.1	4.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	1.6	< 0.1	2.8	1.0	< 0.1	20
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1	4.2	< 0.1	< 0.1	11
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						

Summary of Asbestos Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1716882	TP324 0.60	SOIL	NAD	none	Steven Lambert
1716884	TP304 0.50	SOIL	NAD	none	Steven Lambert
1716886	TP305 0.40	SOIL	NAD	none	Steven Lambert
1716887	TP332 0.10	SOIL	NAD	none	Steven Lambert
1716888	TP332 1.00	SOIL	NAD	none	Steven Lambert
1716891	RC301 0.50	SOIL	NAD	none	Steven Lambert
1716893	RC302 0.50	SOIL	Chrysotile	bundles of Chrysotile	Steven Lambert
1716895	CC308 0.50	SOIL	NAD	none	Steven Lambert
1716901	RC711 0.31-0.50	SOIL	NAD	none	Steven Lambert
1716902	RC714 0.40-0.60	SOIL	NAD	none	Steven Lambert
1716905	TP612 0.20	SOIL	NAD	none	Steven Lambert
1716906	TP601 0.30	SOIL	NAD	none	Steven Lambert
1716907	TP615 0.50	SOIL	NAD	none	Steven Lambert
1716908	TP404 0.10	SOIL	NAD	none	Steven Lambert
1716909	TP431 0.10	SOIL	NAD	none	Steven Lambert
1716910	BH309 0.10-0.20	SOIL	NAD	none	Steven Lambert
1716911	TP331 0.20	SOIL	NAD	none	Steven Lambert
1716912	TP331 0.80	SOIL	NAD	none	Steven Lambert
1716913	TP302 0.40	SOIL	NAD	none	Steven Lambert
1716914	TP611 1.00	SOIL	NAD	none	Steven Lambert
1716915	TP312 0.50	SOIL	NAD	none	Steven Lambert
1716916	TP311 0.20	SOIL	NAD	none	Steven Lambert
1716917	TP315 0.10	SOIL	NAD	none	Steven Lambert
1716918	TP316 0.10	SOIL	NAD	none	Steven Lambert
1716919	TP313 0.40	SOIL	NAD	none	Steven Lambert
1716920	TP314 0.10	SOIL	NAD	none	Steven Lambert
1716921	TP401 0.35	SOIL	NAD	none	Steven Lambert
1716922	TP402 0.10	SOIL	NAD	none	Steven Lambert
1716923	TP517 0.10	SOIL	NAD	none	Steven Lambert
1716924	TP516 0.10	SOIL	NAD	none	Steven Lambert
1716925	TP833A 0.50	SOIL	NAD	none	Steven Lambert
1716926	TP834 0.75	SOIL	NAD	none	Steven Lambert
1716927	TP836 0.20	SOIL	NAD	none	Steven Lambert
1716928	TP833A 1.00	SOIL	NAD	none	Steven Lambert
1716929	TP832A 1.00	SOIL	NAD	none	Steven Lambert
1716930	TP834A 1.00	SOIL	NAD	none	Steven Lambert
1716961	TP509 0.10	SOIL	NAD	none	Steven Lambert
1716962	TP518 0.40	SOIL	NAD	none	Steven Lambert
1716963	TP508 0.30	SOIL	NAD	none	Steven Lambert
1716965	RC602 0.45	SOIL	NAD	none	Steven Lambert
1716966	RC303 0.20	SOIL	NAD	none	Steven Lambert
1716967	RC303 0.40	SOIL	NAD	none	Steven Lambert
1716968	BH430 0.10-0.30	SOIL	NAD	none	Steven Lambert
1716969	BH402 0.10-0.30	SOIL	NAD	none	Steven Lambert
1716970	TP406 0.30	SOIL	NAD	none	Steven Lambert
1716971	TP511 0.10	SOIL	NAD	none	Steven Lambert

Information in Support of the Analytical Results

Our Ref 20-16110
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1716881	TP324 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716882	TP324 0.60 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716883	TP304 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716884	TP304 0.50 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716885	TP304 1.00 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716886	TP305 0.40 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716887	TP332 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716888	TP332 1.00 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716889	TP310 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716890	RC301 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716891	RC301 0.50 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716892	RC302 0.15 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716893	RC302 0.50 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716894	CC308 0.30 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716895	CC308 0.50 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716896	RC404 0.10 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716897	RC404 0.80 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716898	RC601 0.05 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716899	RC601 0.40 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716900	RC601 1.00 SOIL	23/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716901	RC711 0.31-0.50 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716902	RC714 0.40-0.60 SOIL	29/07/20		GJ 250ml x2, GJ 60ml x2, PT 1L		

Summary of Chemical Analysis

Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1714170	1714172	1714173	1714174
Sample ID	TP317	TP322	TP318	TP319
Depth	0.50	0.70	0.50	0.60
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/07/2020	22/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	1.9	9.6	12	12
Barium	DETSC 2301#	1.5	mg/kg	58	52	170	52
Beryllium	DETSC 2301#	0.2	mg/kg	0.9	0.8	1.3	0.7
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	2.9	1.9	0.8	1.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.2	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	9.0	25	15	27
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	3.8	5.1	8.0	6.2
Copper	DETSC 2301#	0.2	mg/kg	13	20	30	21
Iron	DETSC 2301	25	mg/kg	12000	21000	24000	24000
Lead	DETSC 2301#	0.3	mg/kg	3.5	19	13	21
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	< 0.4	1.2	1.6	1.5
Nickel	DETSC 2301#	1	mg/kg	5.6	18	20	20
Selenium	DETSC 2301#	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	36	36	55	40
Zinc	DETSC 2301#	1	mg/kg	36	79	66	81
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				
Aliphatic C5-C40	DETSC 3072*	10	mg/kg				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg				
Aromatic C5-C35	DETSC 3072*	10	mg/kg				
Aromatic C5-C40	DETSC 3072*	10	mg/kg				
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg				
Benzene	DETSC 3321#	0.01	mg/kg				
Ethylbenzene	DETSC 3321#	0.01	mg/kg				
Toluene	DETSC 3321#	0.01	mg/kg				

Summary of Chemical Analysis

Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1714170	1714172	1714173	1714174
Sample ID	TP317	TP322	TP318	TP319
Depth	0.50	0.70	0.50	0.60
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/07/2020	22/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Xylene	DETSC 3321#	0.01	mg/kg				
MTBE	DETSC 3321	0.01	mg/kg				
PAHs							
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.14	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.08	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	2.0	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	1.6	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	8.7	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	2.4	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	14	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	9.8	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	3.6	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	3.4	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	4.4	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	1.3	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	3.3	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	1.4	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.42	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	1.6	< 0.03
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1	< 2.0	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	58	< 0.10
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				
Phenol	DETSC 3451*	0.01	mg/kg				
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg				
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg				
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg				
p-cresol	DETSC 3451*	0.01	mg/kg				
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg				
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg				
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg				

Summary of Asbestos Analysis Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1714156	TP309 0.10	SOIL	NAD	none	Rebecca Burgess
1714157	BH316 0.15-0.25	SOIL	NAD	none	Rebecca Burgess
1714158	BH426 0.20	SOIL	NAD	none	Rebecca Burgess
1714159	BH426 0.50	SOIL	NAD	none	Rebecca Burgess
1714163	TP323 0.20-0.30	SOIL	NAD	none	Rebecca Burgess
1714168	TP334 1.00	SOIL	NAD	none	Rebecca Burgess
1714170	TP317 0.50	SOIL	NAD	none	Rebecca Burgess
1714171	TP317 1.00	SOIL	NAD	none	Rebecca Burgess
1714173	TP318 0.50	SOIL	NAD	none	Rebecca Burgess

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Summary of Chemical Analysis

Soil Samples

Our Ref 20-15529

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1714156	1714159	1714160	1714161	1714162	1714163
Sample ID	TP309	BH426	BH428	BH428	TP323	TP323
Depth	0.10	0.50	0.10	0.40	0.10-0.20	0.20-0.30
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/07/2020	22/07/2020	27/07/2020	27/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	9.4	8.2			9.2
Barium	DETSC 2301#	1.5	mg/kg	55	57			440
Beryllium	DETSC 2301#	0.2	mg/kg	1.0	1.0			11
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.6	0.4			5.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	< 0.1			< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	29	6.4			34
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0			< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	12	3.4			1.8
Copper	DETSC 2301#	0.2	mg/kg	26	12			12
Iron	DETSC 2301	25	mg/kg	24000	9600			10000
Lead	DETSC 2301#	0.3	mg/kg	26	6.7			3.7
Mercury	DETSC 2325#	0.05	mg/kg	0.06	0.06			< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	2.6	0.9			< 0.4
Nickel	DETSC 2301#	1	mg/kg	29	7.5			4.0
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5			5.1
Vanadium	DETSC 2301#	0.8	mg/kg	35	18			88
Zinc	DETSC 2301#	1	mg/kg	100	24			17
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg			< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg			< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg			< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg			< 3.4		
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg			< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg			< 10		
Aliphatic C5-C40	DETSC 3072*	10	mg/kg			< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg			< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg			< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg			< 0.6		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg			< 1.4		
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg			< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg			< 10		
Aromatic C5-C40	DETSC 3072*	10	mg/kg			< 10		
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg			< 10		
Benzene	DETSC 3321#	0.01	mg/kg			< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg			< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg			< 0.01		

Summary of Chemical Analysis

Soil Samples

Our Ref 20-14433

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1708130	1708131	1708132	1708133	1708134	1708135
Sample ID	SSC801	SSC505	SSC504	TP335	TP335	TP330
Depth	0.10	0.10	0.10	0.10	0.30	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	7.9	7.5	9.4		6.9	9.2
Barium	DETSC 2301#	1.5	mg/kg	44	67	51		260	110
Beryllium	DETSC 2301#	0.2	mg/kg	0.6	0.6	1.0		4.5	1.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	4.4	1.1	1.3		0.9	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	2.2	1.1	0.5		0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	26	29	45		13	30
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0		< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	5.7	5.4	7.7		4.3	6.9
Copper	DETSC 2301#	0.2	mg/kg	46	75	38		24	30
Iron	DETSC 2301	25	mg/kg	36000	16000	30000		9200	25000
Lead	DETSC 2301#	0.3	mg/kg	19	28	17		8.7	26
Mercury	DETSC 2325#	0.05	mg/kg	0.07	0.06	< 0.05		< 0.05	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	2.6	2.2	5.2		0.9	1.7
Nickel	DETSC 2301#	1	mg/kg	28	24	28		11	19
Selenium	DETSC 2301#	0.5	mg/kg	1.7	2.0	1.1		1.7	1.0
Vanadium	DETSC 2301#	0.8	mg/kg	32	35	44		39	46
Zinc	DETSC 2301#	1	mg/kg	410	290	230		69	87
Inorganics									
Organic matter	DETSC 2002#	0.1	%						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg						
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg						
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg						
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg						
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg						
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg						
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg						
Aliphatic C5-C35	DETSC 3072*	10	mg/kg						
Aliphatic C5-C40	DETSC 3072*	10	mg/kg						
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg						
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg						
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg						
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg						
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg						
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg						
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg						
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg						
Aromatic C5-C35	DETSC 3072*	10	mg/kg						
Aromatic C5-C40	DETSC 3072*	10	mg/kg						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg						

Summary of Chemical Analysis

Soil Samples

Our Ref 20-14433

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1708130	1708131	1708132	1708133	1708134	1708135
Sample ID	SSC801	SSC505	SSC504	TP335	TP335	TP330
Depth	0.10	0.10	0.10	0.10	0.30	0.10
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020	22/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Benzene	DETSC 3321#	0.01	mg/kg						
Ethylbenzene	DETSC 3321#	0.01	mg/kg						
Toluene	DETSC 3321#	0.01	mg/kg						
Xylene	DETSC 3321#	0.01	mg/kg						
MTBE	DETSC 3321	0.01	mg/kg						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03		54	1.2	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03		2.9	< 0.30	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03		59	3.6	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03		34	1.8	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg		< 0.03		430	15	0.05
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03		98	4.1	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg		0.03		380	22	0.20
Pyrene	DETSC 3303#	0.03	mg/kg		0.03		290	18	0.18
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03		100	8.6	0.07
Chrysene	DETSC 3303	0.03	mg/kg		< 0.03		90	6.6	0.12
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		0.05		100	7.8	0.08
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.03		49	3.2	0.07
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03		100	6.4	0.08
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03		33	3.3	0.07
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03		7.9	0.77	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03		36	3.5	0.07
Coronene	DETSC 3301*	0.1	mg/kg		0.5		2.5	1.1	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		< 0.10		1900	110	0.99
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				6.7		
Phenol	DETSC 3451*	0.01	mg/kg				0.66		
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg				< 0.10		
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg				< 0.10		
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg				4.6		
p-cresol	DETSC 3451*	0.01	mg/kg				3.3		
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg				< 0.10		
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg				< 0.10		
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg				< 0.10		

Information in Support of the Analytical Results

Our Ref 20-14433
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1708105	TP308 0.10 SOIL	23/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708106	CC504 0.20-0.50 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708107	TP409 0.00-0.20 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708108	CC302 0.25-0.40 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708109	RC715 0.30-0.50 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708110	RC715 0.50-0.75 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708111	RC713 0.70-0.90 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708112	SSC 304 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708113	SSC 303 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708114	SSC 302 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708115	SSC 605 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708116	SSC 301 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708117	SSC 306 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708118	SSC 712 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708119	SSC 711 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708120	SSC 710 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708121	SSC 709 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708122	SSC 708 0.10 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708123	TP301 0.20 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708124	TP603 0.20 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708125	TP602 0.60 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708126	TP610 0.35 SOIL	21/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708127	SSC704 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708128	SSC803 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708129	SSC802 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708130	SSC801 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708131	SSC505 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708132	SSC504 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1708133	TP335 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708134	TP335 0.30 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708135	TP330 0.10 SOIL	22/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1708136	BH319 0.00-0.10 SOIL	15/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708137	BH813 0.10-0.20 SOIL	16/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708138	BH804 0.80 SOIL	16/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708139	BH802 0.70 SOIL	16/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH HFD (14 days), PAH MS (14 days)	
1708140	TP428 0.10 SOIL	17/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716907	1716908	1716909	1716910	1716911	1716912
Sample ID	TP615	TP404	TP431	BH309	TP331	TP331
Depth	0.50	0.10	0.10	0.10-0.20	0.20	0.80
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/07/2020	28/07/2020	28/07/2020	27/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	4.0	17	13	13	9.7	7.3
Barium	DETSC 2301#	1.5	mg/kg	170	79	87	76	100	47
Beryllium	DETSC 2301#	0.2	mg/kg	1.6	1.2	1.1	1.1	1.0	1.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.2	1.4	1.6	1.5	1.5	1.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.3	0.3	0.4	0.3	0.1
Chromium	DETSC 2301#	0.15	mg/kg	14	41	31	34	29	44
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cobalt	DETSC 2301#	0.7	mg/kg	3.1	16	12	15	11	13
Copper	DETSC 2301#	0.2	mg/kg	16	33	31	27	30	34
Iron	DETSC 2301	25	mg/kg	12000	38000	28000	31000	24000	28000
Lead	DETSC 2301#	0.3	mg/kg	6.2	42	36	25	31	14
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.05	< 0.05	0.07	< 0.05
Molybdenum	DETSC 2301#	0.4	mg/kg	< 0.4	1.2	1.3	1.6	2.0	2.6
Nickel	DETSC 2301#	1	mg/kg	4.1	42	31	39	28	33
Selenium	DETSC 2301#	0.5	mg/kg	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	40	56	51	46	37	34
Zinc	DETSC 2301#	1	mg/kg	48	130	100	100	120	120
Inorganics									
Organic matter	DETSC 2002#	0.1	%	2.5	6.1	8.2			
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2					
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5					
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4					
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg	< 3.4					
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10					
Aliphatic C5-C40	DETSC 3072*	10	mg/kg	< 10					
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01					
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9					
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5					
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	6.3					
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	89					
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg	< 1.4					
Aromatic C5-C35	DETSC 3072*	10	mg/kg	95					
Aromatic C5-C40	DETSC 3072*	10	mg/kg	95					

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716907	1716908	1716909	1716910	1716911	1716912
Sample ID	TP615	TP404	TP431	BH309	TP331	TP331
Depth	0.50	0.10	0.10	0.10-0.20	0.20	0.80
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/07/2020	28/07/2020	28/07/2020	27/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	95					
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01					
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01					
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01					
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	1.3	0.6	0.2	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	1.4	0.8	0.5	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.8	0.5	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	1.0	0.5	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	1.1	0.8	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.8	0.5	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	1.5	1.2	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	1.2	1.0	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	1.1	0.7	< 0.1	< 0.1	< 0.1	< 0.1
Coronene	DETSC 3301*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						

Summary of Chemical Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716907	1716908	1716909	1716910	1716911	1716912
Sample ID	TP615	TP404	TP431	BH309	TP331	TP331
Depth	0.50	0.10	0.10	0.10-0.20	0.20	0.80
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/07/2020	28/07/2020	28/07/2020	27/07/2020	24/07/2020	24/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAH Total	DETS 3301	1.6	mg/kg	11	6.7	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETS 2130#	0.3	mg/kg						
Phenol	DETS 3451*	0.01	mg/kg						
4-Chloro-3-methylphenol	DETS 3451*	0.01	mg/kg						
2,4-Dichlorophenol	DETS 3451*	0.01	mg/kg						
2,4-Dimethylphenol	DETS 3451*	0.01	mg/kg						
p-cresol	DETS 3451*	0.01	mg/kg						
2,6-Dimethylphenol	DETS 3451*	0.01	mg/kg						
2,6-Dichlorophenol	DETS 3451*	0.01	mg/kg						
2,4,6-Trichlorophenol	DETS 3451*	0.01	mg/kg						

Information in Support of the Analytical Results

Our Ref 20-16110
 Client Ref PC207899
 Contract Ground Investigation for Graven Hill, Bicester

Lab No	Sample ID	Date	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled			
1716903	TP616 0.10 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Naphthalene (14 days), PAH FID (14 days), Phenols MS (14 days), Cyanide/Mono pHoh (14 days)	
1716904	TP616 0.90 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Aliphatics/Aromatics (14 days), BTEX (14 days)	
1716905	TP612 0.20 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)		
1716906	TP601 0.30 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716907	TP615 0.50 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716908	TP404 0.10 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716909	TP431 0.10 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716910	BH309 0.10-0.20 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1716911	TP331 0.20 SOIL	24/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716912	TP331 0.80 SOIL	24/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716913	TP302 0.40 SOIL	24/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Mercury (28 days), Kone Cr6 (30 days), Naphthalene (14 days), PAH FID (14 days)	
1716914	TP611 1.00 SOIL	24/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716915	TP312 0.50 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716916	TP311 0.20 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716917	TP315 0.10 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716918	TP316 0.10 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716919	TP313 0.40 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716920	TP314 0.10 SOIL	28/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716921	TP401 0.35 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), Organic Matter (Manual) (28 days), PAH FID (14 days)	
1716922	TP402 0.10 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1716923	TP517 0.10 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1716924	TP516 0.10 SOIL	27/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L, Other (non plastic, non glass)	Mercury (28 days), Naphthalene (14 days), PAH FID (14 days)	
1716925	TP833A 0.50 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716926	TP834 0.75 SOIL	30/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH FID (14 days)	
1716927	TP836 0.20 SOIL	30/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716928	TP833A 1.00 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716929	TP832A 1.00 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716930	TP834A 1.00 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716931	SSC503 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716932	SSC606 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716933	SSC305 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716934	SSC601 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716935	SSC602 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716936	SSC603 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716937	SSC604 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716938	SSC823 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	
1716939	SSC824 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1716940	SSC825 0.10 SOIL	29/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L	Naphthalene (14 days), PAH FID (14 days)	

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716887	1716888	1716889	1716890	1716891	1716892
Sample ID	TP332	TP332	TP310	RC301	RC301	RC302
Depth	0.10	1.00	0.10	0.10	0.50	0.15
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Asbestos Quantification	DETSC 1102	0.001	%						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	15	8.3			11	
Barium	DETSC 2301#	1.5	mg/kg	150	45			320	
Beryllium	DETSC 2301#	0.2	mg/kg	1.7	0.8			9.4	
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.3	1.3			0.4	
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.2			0.1	
Chromium	DETSC 2301#	0.15	mg/kg	18	24			39	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0			< 1.0	
Cobalt	DETSC 2301#	0.7	mg/kg	11	7.9			6.2	
Copper	DETSC 2301#	0.2	mg/kg	41	25			22	
Iron	DETSC 2301	25	mg/kg	26000	19000			15000	
Lead	DETSC 2301#	0.3	mg/kg	34	24			3.8	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.06			< 0.05	
Molybdenum	DETSC 2301#	0.4	mg/kg	2.4	1.7			< 0.4	
Nickel	DETSC 2301#	1	mg/kg	32	19			6.3	
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5			2.4	
Vanadium	DETSC 2301#	0.8	mg/kg	41	34			96	
Zinc	DETSC 2301#	1	mg/kg	110	79			28	
Inorganics									
Organic matter	DETSC 2002#	0.1	%					1.3	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg					< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg					< 3.4	
Aliphatic C35-C40	DETSC 3072*	3.4	mg/kg					< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg					< 10	
Aliphatic C5-C40	DETSC 3072*	10	mg/kg					< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg					< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg					< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg					9.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg					32	
Aromatic C35-C40	DETSC 3072*	1.4	mg/kg					< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg					42	
Aromatic C5-C40	DETSC 3072*	10	mg/kg					42	

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716887	1716888	1716889	1716890	1716891	1716892
Sample ID	TP332	TP332	TP310	RC301	RC301	RC302
Depth	0.10	1.00	0.10	0.10	0.50	0.15
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg					42	
Benzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg					< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg					< 0.01	
MTBE	DETSC 3321	0.01	mg/kg					< 0.01	
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	< 1.0	< 0.1	0.7
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	2.2	< 0.1	2.7
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	15	< 0.1	11
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	9.1	< 0.1	8.4
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	30	0.1	49
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	17	0.1	21
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 1.0	220	1.0	120
Pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 1.0	210	1.2	110
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	75	0.6	44
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	81	0.6	45
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	86	0.8	35
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	42	0.5	21
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	95	1.1	44
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	64	0.8	32
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	7.1	0.1	5.7
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 1.0	58	0.6	33
Coronene	DETSC 3301*	0.1	mg/kg	3.4	< 0.1	< 1.0	< 1.0	< 0.1	9.8
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						

Summary of Chemical Analysis Soil Samples

Our Ref 20-16110

Client Ref PC207899

Contract Title Ground Investigation for Graven Hill, Bicester

Lab No	1716887	1716888	1716889	1716890	1716891	1716892
Sample ID	TP332	TP332	TP310	RC301	RC301	RC302
Depth	0.10	1.00	0.10	0.10	0.50	0.15
Other ID						
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020	23/07/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAH Total	DETSC 3301	1.6	mg/kg	3.9	< 1.6	< 16.0	1000	7.6	590
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			< 0.3	0.5		0.9
Phenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
4-Chloro-3-methylphenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
2,4-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
2,4-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
p-cresol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
2,6-Dimethylphenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
2,6-Dichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10
2,4,6-Trichlorophenol	DETSC 3451*	0.01	mg/kg			< 0.10	< 0.10		< 0.10



D. Geotechnical Testing Results

LABORATORY RESULTS - Classification and Strength

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m ³	σ_3 kN/m ²	$\sigma_1 - \sigma_3$ kN/m ²	C_u kN/m ²	C_{Avg} kN/m ²
BH801	2.30- 2.75 (2.48)	UT	C42359	Orangish brown slightly sandy CLAY.					26.9 <27.1>	SS	1.93	50	133	66	66
BH801	4.50- 4.95 (4.76)	UT	C42358	Dark greenish grey slightly sandy CLAY.					24.5 <24.3>	SS	1.85	90	224	112	112
BH802	1.00 (1.00)	D	C42741	Orangish brown mottled grey slightly sandy CLAY.	CI	27 (93%)	46	19	20.7						
BH802	2.30- 2.75 (2.30)	UT	C42476	Greyish brown slightly sandy CLAY.					33.9 <34.3>	SS	1.85	50	118	59	59
BH803	1.00 (1.00)	D	C42764	Brownish grey CLAY.	CV	47 (7%)	71	24	26.3						
BH803	1.20- 1.65 (1.20)	UT	C42362	Brownish grey CLAY.					28.2 <26.1>	SS	1.97	30	145	72	72
BH803	1.50 (1.50)	D	C42765	Orangish brown mottled grey slightly sandy CLAY.	CH	33 (13%)	57	24	30.3						
BH803	3.40- 3.85 (3.55)	UT	C42361	Grey slightly sandy CLAY.					31.4 <30.4>	SS	1.93	70	177	88	88
BH803	6.00- 6.45 (6.00)	UT	C42360	Grey slightly sandy CLAY.					22.8 <24.0>	SS	1.98	120	274	137	137
BH804	1.50 (1.50)	D	C42753	Orangish brown and grey slightly sandy CLAY.	CH	35 (15%)	60	25	37.2						
BH804	3.50- 3.95 (3.73)	UT	C43515	Dark greenish grey slightly sandy CLAY.					29.9 <29.1>	SS	1.95	70	156	78	78
BH807	1.20 (1.44)	UT	C43518	Brown mottled grey slightly sandy CLAY.					37.9 <34.7>	SS	1.84	30	134	67	67
BH807	3.00 (3.00)	D	C44551	Dark grey slightly sandy CLAY.	CH	39 (7%)	64	25	36.9						
BH807	3.50- 3.95 (3.59)	UT	C43519	Dark grey slightly sandy CLAY.					22.8 <22.2>	SS	2.02	70	198	99	99
BH808	1.80 (1.80)	D	C43358	Dark grey slightly sandy CLAY.	CH	39 (14%)	65	26	35.0						
BH808	4.50- 4.95 (4.50)	UT	C43520	Dark greenish grey slightly sandy CLAY.					23.6 <23.6>	SS	2.00	90	239	120	120

Remarks  NST - Not suitable for Test
 For Standards followed see Laboratory Test Certificate
 $w\%$ - $\wedge$ = Rock water content test; x = Aggregate moisture content test
 QUT Water Contents: <Failure Zone>, [After test]

GEOTECHNICS
 geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH305

Sample Depth 2.30-2.75m

Project No: PC207899

Sample Type UT

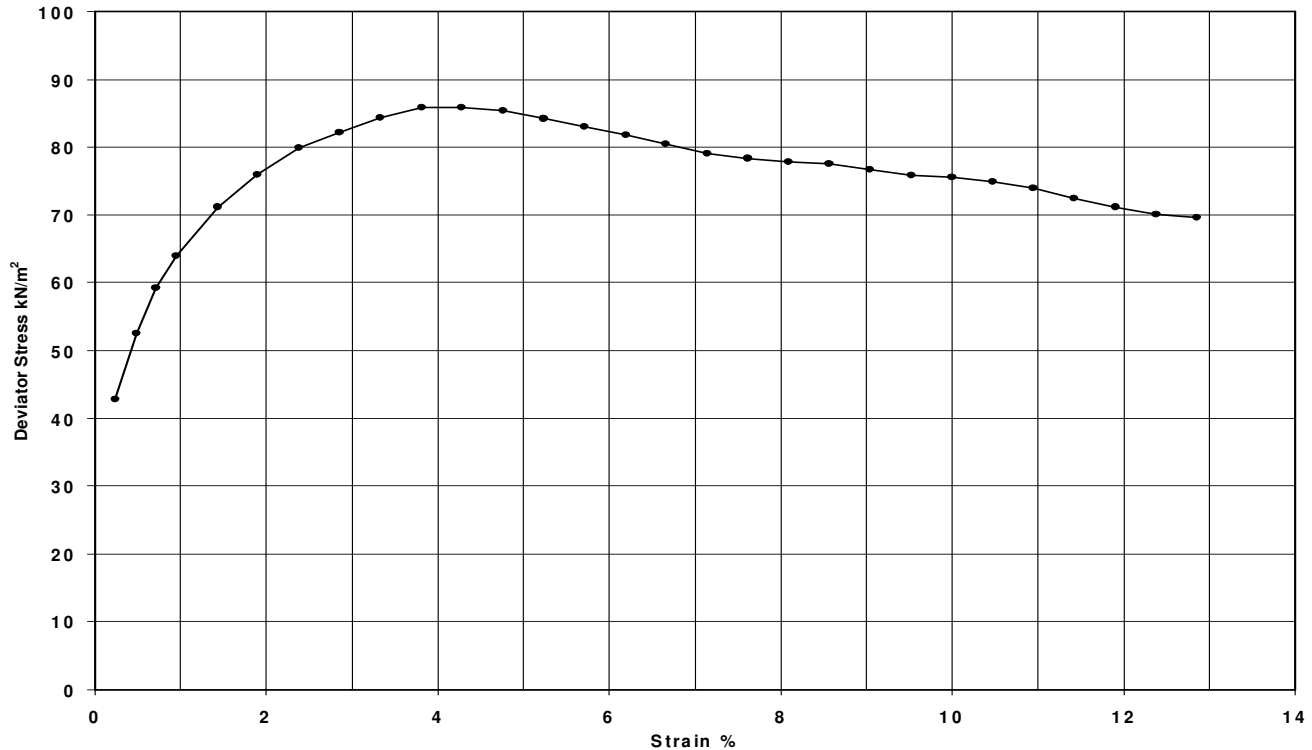
Sample Ref C45669

Sample Description

The following samples were combined to perform this test:

Brown mottled light brown and grey slightly sandy CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	42.8	10.0	75.6
Sample Condition	Undisturbed			0.5	52.5	10.5	74.9
Orientation of sample	Vertical			0.7	59.2	10.9	73.9
Initial Diameter (mm)	100.68			1.0	64.0	11.4	72.4
Initial Length (mm)	210.09			1.4	71.1	11.9	71.2
Initial Water Content (%)	30.3			1.9	76.0	12.4	70.1
Initial Bulk Density (Mg/m ³)	1.89			2.4	79.8	12.9	69.6
Initial Dry Density (Mg/m ³)	1.45			2.9	82.2		
Particle Density (Mg/m ³)	2.65 Assumed			3.3	84.4		
Cell Pressure (kPa)	50			3.8	85.9		
'Specimen Height' at start of Shearing Stage (mm)	210.02			4.3	85.9		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			4.8	85.4		
Rate of Strain (%/min)	1.4			5.2	84.2		
Corrected Deviator Stress (kPa)	86			5.7	83.1		
Undrained Shear Strength (kPa)	43			6.2	81.9		
Strain at Failure (%)	3.8			6.7	80.5		
Failure Zone Water Content (%)	28.8			7.1	79.1		
Water Content (after test) (%)				7.6	78.4		
Mode of Failure	Brittle			8.1	77.9		
				8.6	77.5		
				9.0	76.7		
				9.5	75.8		

Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH305
Sample Depth 2.30-2.75m
Sample Type UT
Sample Ref C45669

Project No: PC207899



Remarks



06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH305

Sample Depth 4.50-4.95m

Project No: PC207899

Sample Type UT

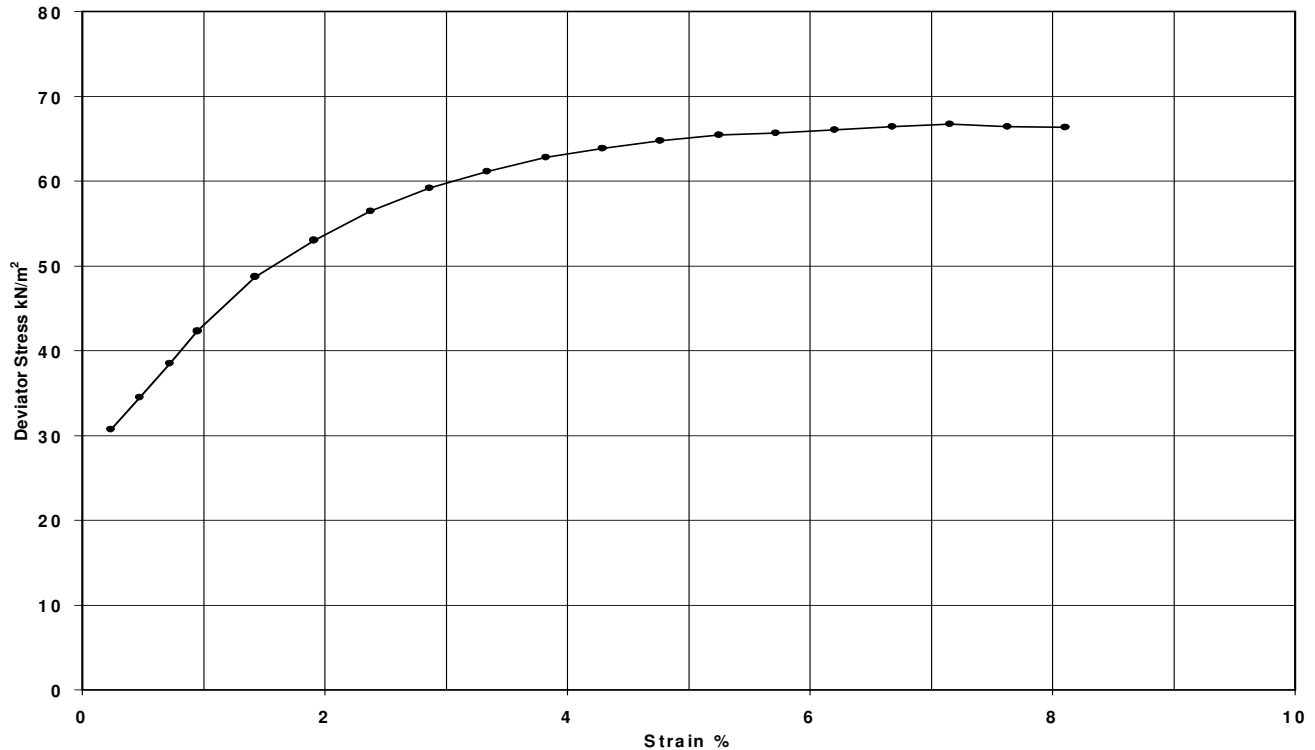
Sample Ref C45670

Sample Description

The following samples were combined to perform this test:

Grey CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	30.7		
Sample Condition	Undisturbed			0.5	34.5		
Orientation of sample	Vertical			0.7	38.5		
Initial Diameter (mm)	96.02			1.0	42.3		
Initial Length (mm)	209.68			1.4	48.7		
Initial Water Content (%)	31.1			1.9	53.0		
Initial Bulk Density (Mg/m ³)	1.88			2.4	56.4		
Initial Dry Density (Mg/m ³)	1.43			2.9	59.2		
Particle Density (Mg/m ³)	2.65 Assumed			3.3	61.2		
Cell Pressure (kPa)	90			3.8	62.8		
'Specimen Height' at start of Shearing Stage (mm)	209.55			4.3	63.9		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			4.8	64.8		
Rate of Strain (%/min)	1.4			5.2	65.4		
Corrected Deviator Stress (kPa)	67			5.7	65.7		
Undrained Shear Strength (kPa)	33			6.2	66.0		
Strain at Failure (%)	7.2			6.7	66.4		
Failure Zone Water Content (%)	31.7			7.2	66.7		
Water Content (after test) (%)				7.6	66.4		
Mode of Failure	Intermediate			8.1	66.4		

Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH305
Sample Depth 4.50-4.95m
Sample Type UT
Sample Ref C45670

Project No: PC207899



Remarks 

06/11/2020

GEOTECHNICS

Summary of Chemical Analysis Soil Samples

Our Ref 20-16825

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	1721224	1721225	1721226	1721227	1721228	1721229	1721230	1721231	1721232	1721233	1721234
Sample ID	BH302	BH302	BH305	BH317	BH418	BH419	BH510	BH512	BH815	BH815	BH815
Depth	0.50	3.00	1.50	1.65-1.80	1.60	1.20-1.65	1.70	0.50	0.50	1.70	3.40-3.85
Other ID											
Sample Type	D	D	D	D	D	D	D	D	D	D	D
Sampling Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Inorganics														
pH	DETSC 2008#		pH	6.4	8.3	5.6	8.0	4.7	8.0	7.2	7.8	6.2	6.6	4.8
Organic matter	DETSC 2002#	0.1	%											
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	72	130	1000	37	240	450	2000	140	530	1600	2100
Sulphur as S, Total	DETSC 2320	0.01	%	0.07	0.02	0.23	0.03	0.19	0.10	1.2	0.04	0.08	0.42	2.0
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.18	0.06	0.61	0.07	0.41	0.34	3.7	0.12	0.21	1.3	5.6

Information in Support of the Analytical Results

Our Ref 20-16825
 Client Ref PC207899
 Contract Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1721224	BH302 0.50 SOIL	01/09/20	PT 1L		
1721225	BH302 3.00 SOIL	01/09/20	PT 1L		
1721226	BH305 1.50 SOIL	01/09/20	PT 1L		
1721227	BH317 1.65-1.80 SOIL	01/09/20	PT 1L		
1721228	BH418 1.60 SOIL	01/09/20	PT 1L		
1721229	BH419 1.20-1.65 SOIL	01/09/20	PT 1L		
1721230	BH510 1.70 SOIL	01/09/20	PT 1L		
1721231	BH512 0.50 SOIL	01/09/20	PT 1L		
1721232	BH815 0.50 SOIL	01/09/20	PT 1L		
1721233	BH815 1.70 SOIL	01/09/20	PT 1L		
1721234	BH815 3.40-3.85 SOIL	01/09/20	PT 1L		
1721235	RC809 1.00 SOIL	01/09/20	PT 1L		
1721236	TP820 1.30 SOIL	01/09/20	PT 1L		
1721237	BH303 1.20-1.65 SOIL	01/09/20	PT 1L		
1721238	BH512 2.00 SOIL	01/09/20	PT 1L		
1721239	BH303 3.30 SOIL	01/09/20	PT 1L		
1721240	BH304 0.50 SOIL	01/09/20	PT 1L		
1721241	BH404 0.30-0.50 SOIL	01/09/20	PT 1L		
1721242	BH418 0.50-1.00 SOIL	01/09/20	PT 1L		
1721243	RC809 0.10 SOIL	01/09/20	PT 1L		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

LABORATORY RESULTS - Classification and Strength

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m ³	σ_3 kN/m ²	$\sigma_1 - \sigma_3$ kN/m ²	C_u kN/m ²	C_{Avg} kN/m ²
BH309	3.20- 3.65 (3.35)	UT	C44105	Dark brownish grey slightly sandy CLAY.					29.0 <22.5>	SS	1.97	70	203	102	102
BH311	1.20- 1.65 (1.41)	UT	C45673	Orangish brown mottled grey slightly sandy CLAY.					27.8 <26.7>	SS	1.99	30	94	47	47
BH311	3.00- 3.45 (3.13)	UT	C45674	Dark grey slightly sandy CLAY.					24.6 <27.0>	SS	1.95	50	149	74	74
BH312	1.50 (1.50)	D	C44574	Light orangish brown slightly sandy CLAY.	CH	33 (8%)	59	26	35.4						
BH313	2.30- 2.75 (2.44)	UT	C46606	Brown mottled orangish brown slightly sandy CLAY.					27.8 <28.8>	SS	1.86	50	74	37	37
BH314	1.20- 1.65 (1.20)	D	C44984	Light orangish brown and grey slightly sandy CLAY.	CH	33 (NAT)	55	22	27.0						
BH314	2.40- 2.85 (2.50)	UT	C43488	Light orangish brown slightly sandy CLAY.					23.6 23.6 23.6	MS	2.03 2.03 2.03	50 100 150	172 170 165	86 85 83	85
BH314	4.50- 4.95 (4.50)	UT	C43487	Dark greenish grey slightly sandy CLAY.					21.1 <23.1>	SS	2.02	90	224	112	112
BH315	1.80 (1.80)	D	C44998	Dark brown slightly sandy CLAY.	CV	44 (NAT)	76	32	36.7						
BH315	3.50- 3.95 (3.72)	UT	C43490	Dark grey slightly sandy CLAY.					25.7 <25.3>	SS	1.94	70	131	65	65
BH316	0.90- 1.00 (0.90)	D	C44580	Light orangish brown slightly sandy CLAY.	CH	42 (1%)	66	24	33.7						
BH316	1.20- 1.65 (1.30)	UT	C43495	Light orangish brown slightly sandy CLAY.					31.9 <31.6>	SS	1.97	30	118	59	59
BH316	3.80- 4.25 (3.80)	UT	C43492	Dark grey slightly sandy CLAY.					27.5 <24.3>	SS	1.96	80	128	64	64
BH316	6.50- 6.95 (6.50)	UT	C43493	Dark greenish grey slightly sandy CLAY.					24.5 <25.6>	SS	1.98	130	211	106	106
BH317	1.20- 1.65 (1.40)	UT	C45361	Dark brown mottled grey slightly sandy CLAY.					29.1 <30.3>	SS	1.85	30	125	62	62
Remarks  NST - Not suitable for Test For Standards followed see Laboratory Test Certificate w% - ^ = Rock water content test; x = Aggregate moisture content test QUT Water Contents: <Failure Zone>, [After test]															

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH311

Sample Depth 1.20-1.65m

Project No: PC207899

Sample Type UT

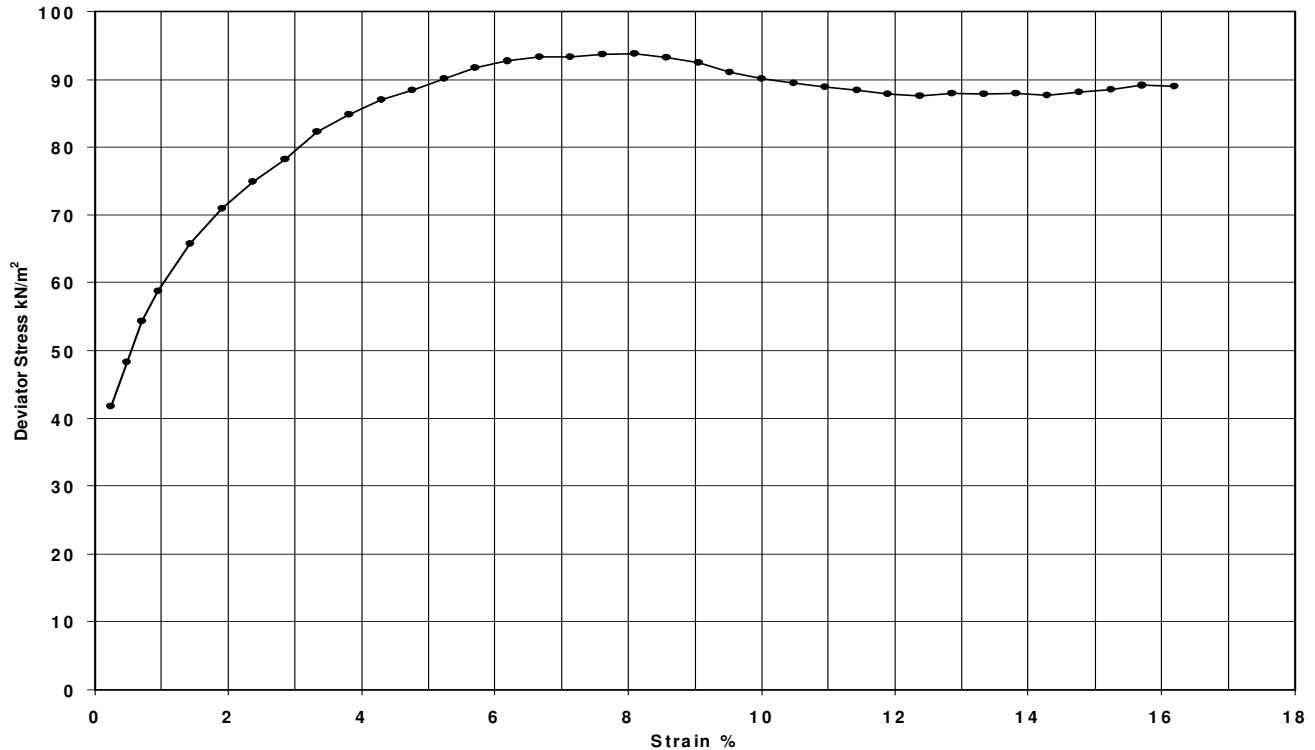
Sample Ref C45673

Sample Description

The following samples were combined to perform this test:

Orangish brown mottled grey slightly sandy CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	41.7	10.0	90.1
Sample Condition	Undisturbed			0.5	48.3	10.5	89.4
Orientation of sample	Vertical			0.7	54.3	11.0	88.9
Initial Diameter (mm)	102.63			1.0	58.8	11.4	88.4
Initial Length (mm)	210.02			1.4	65.8	11.9	87.7
Initial Water Content (%)	27.8			1.9	70.9	12.4	87.6
Initial Bulk Density (Mg/m ³)	1.99			2.4	74.8	12.9	87.9
Initial Dry Density (Mg/m ³)	1.56			2.9	78.3	13.3	87.8
Particle Density (Mg/m ³)	2.65 Assumed			3.3	82.2	13.8	87.9
Cell Pressure (kPa)	30			3.8	84.8	14.3	87.7
'Specimen Height' at start of Shearing Stage (mm)	209.93			4.3	86.9	14.8	88.2
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			4.8	88.4	15.2	88.5
Rate of Strain (%/min)	1.4			5.2	90.0	15.7	89.1
Corrected Deviator Stress (kPa)	94			5.7	91.8	16.2	88.9
Undrained Shear Strength (kPa)	47			6.2	92.7		
Strain at Failure (%)	8.1			6.7	93.3		
Failure Zone Water Content (%)	26.7			7.1	93.3		
Water Content (after test) (%)				7.6	93.6		
Mode of Failure	Intermediate			8.1	93.8		
				8.6	93.2		
				9.0	92.4		
				9.5	91.0		

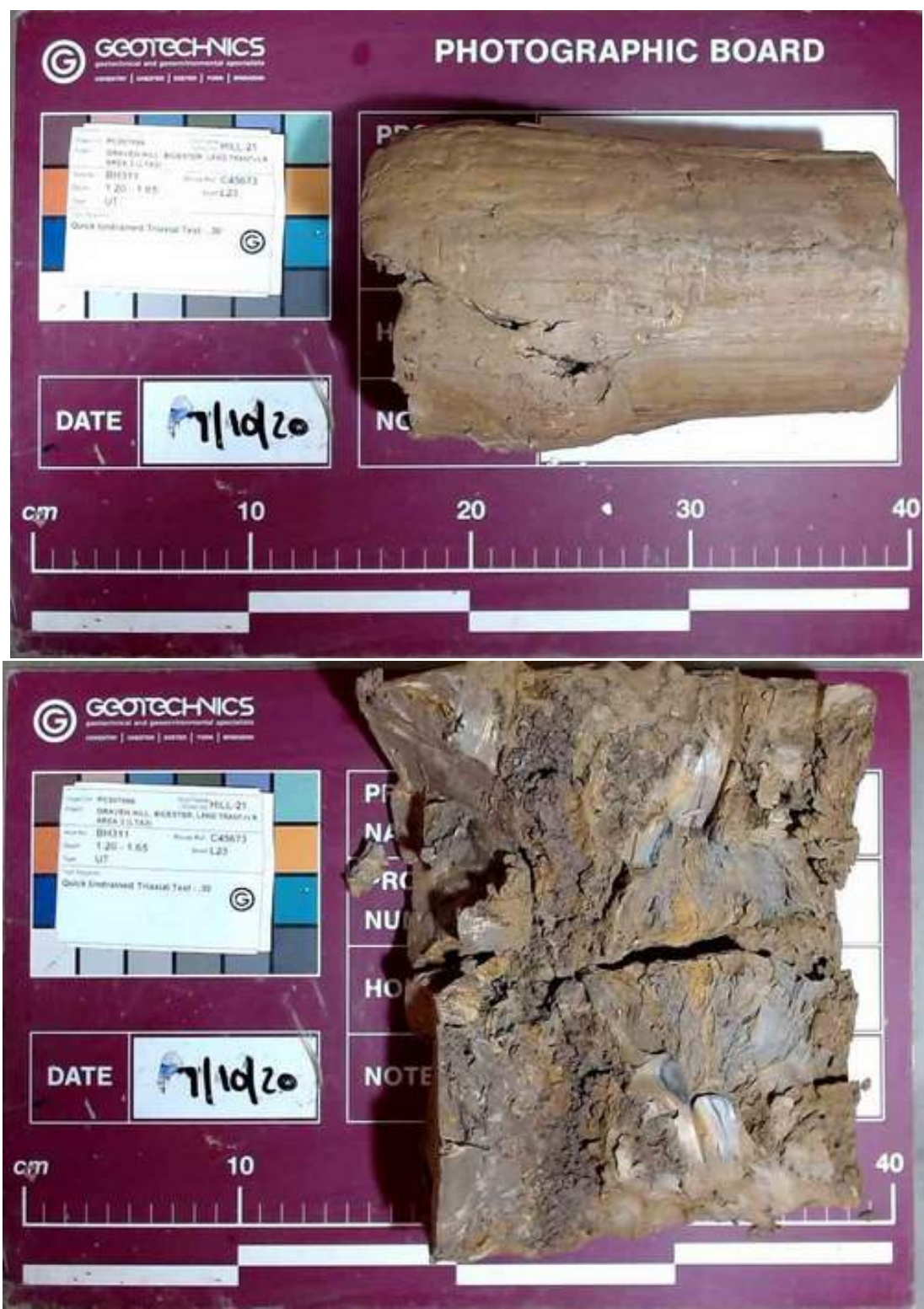
Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project:	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Hole	BH311
		Sample Depth	1.20-1.65m
		Sample Type	UT
Project No:	PC207899	Sample Ref	C45673



Remarks



06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH311

Sample Depth 3.00-3.45m

Project No: PC207899

Sample Type UT

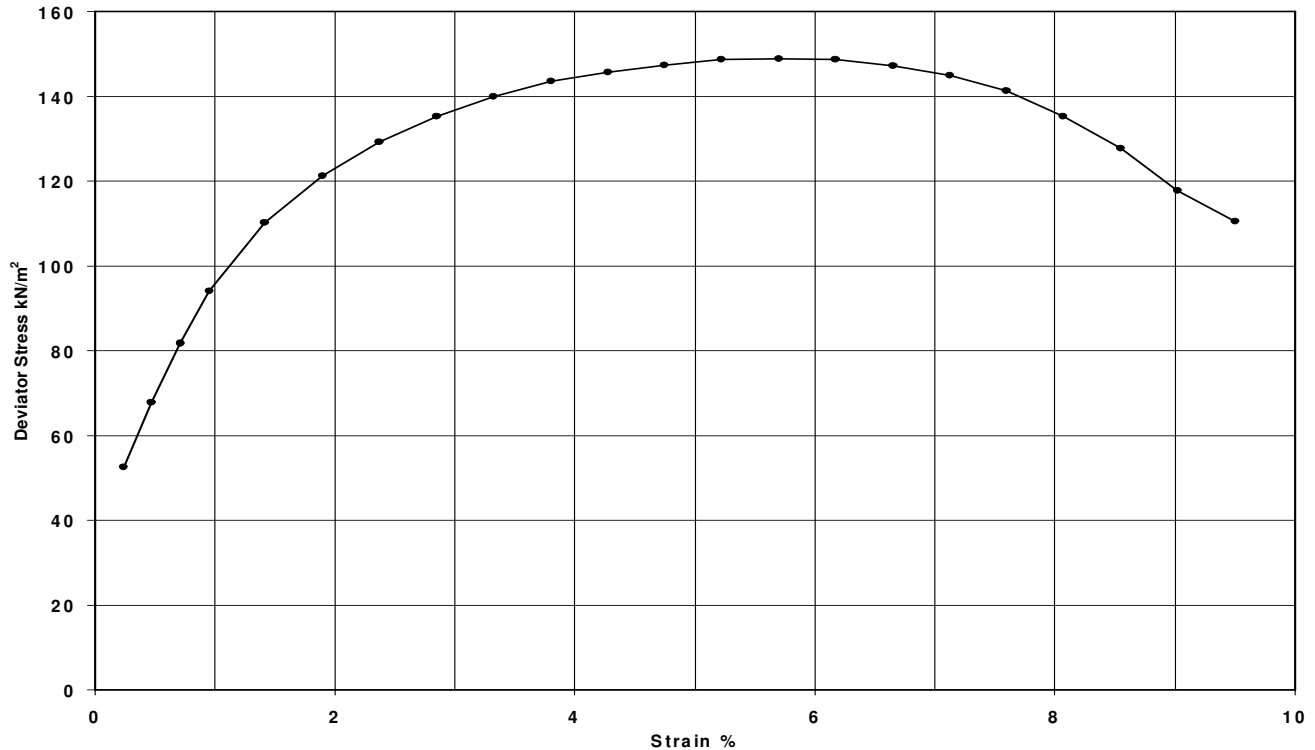
Sample Ref C45674

Sample Description

The following samples were combined to perform this test:

Dark grey slightly sandy CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	52.5		
Sample Condition	Undisturbed			0.5	67.8		
Orientation of sample	Vertical			0.7	81.7		
Initial Diameter (mm)	99.83			0.9	93.9		
Initial Length (mm)	210.54			1.4	110.2		
Initial Water Content (%)	24.6			1.9	121.2		
Initial Bulk Density (Mg/m ³)	1.95			2.4	129.2		
Initial Dry Density (Mg/m ³)	1.57			2.8	135.4		
Particle Density (Mg/m ³)	2.65 Assumed			3.3	139.9		
Cell Pressure (kPa)	50			3.8	143.6		
'Specimen Height' at start of Shearing Stage (mm)	210.45			4.3	145.7		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			4.7	147.4		
Rate of Strain (%/min)	1.4			5.2	148.7		
Corrected Deviator Stress (kPa)	149			5.7	148.9		
Undrained Shear Strength (kPa)	74			6.2	148.6		
Strain at Failure (%)	5.7			6.6	147.2		
Failure Zone Water Content (%)	27.0			7.1	144.8		
Water Content (after test) (%)				7.6	141.3		
Mode of Failure	Intermediate			8.1	135.3		
				8.5	127.6		
				9.0	117.8		
				9.5	110.5		

Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project:	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Hole	BH311
		Sample Depth	3.00-3.45m
		Sample Type	UT
Project No:	PC207899	Sample Ref	C45674



Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH313

Sample Depth 2.30-2.75m

Project No: PC207899

Sample Type UT

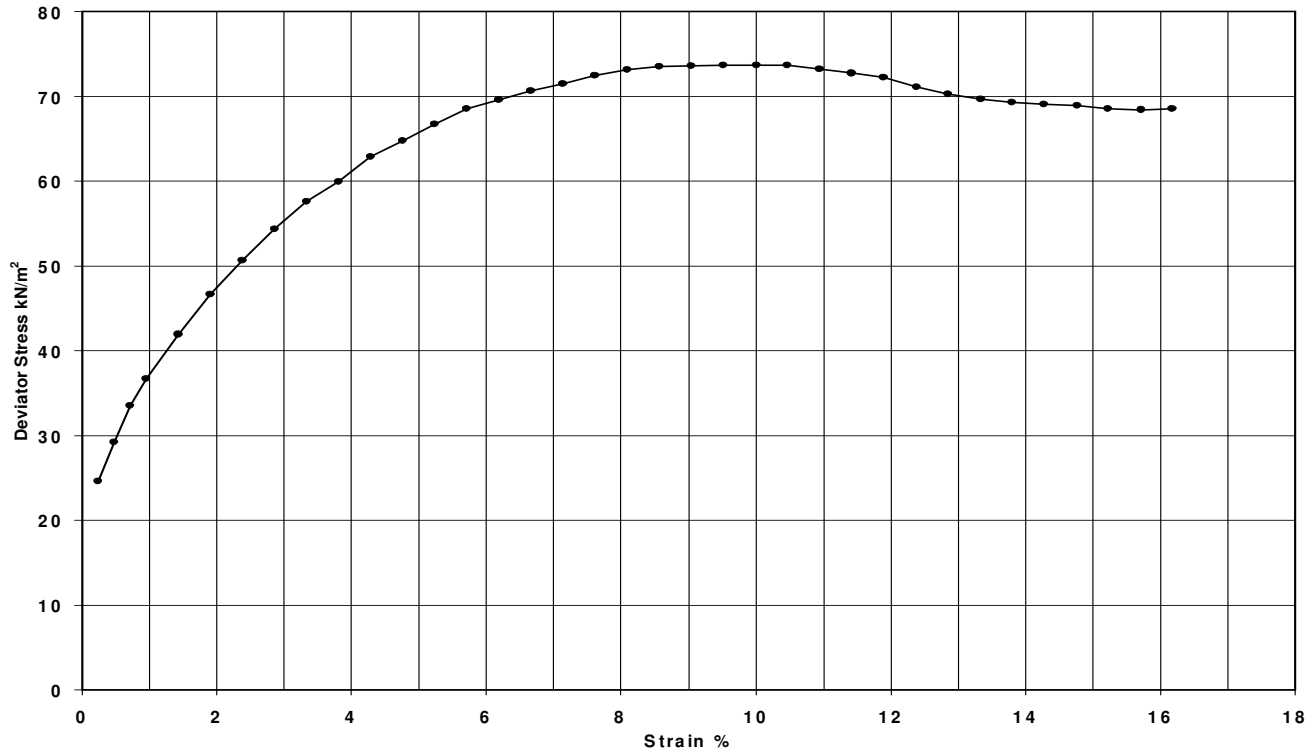
Sample Ref C46606

Sample Description

The following samples were combined to perform this test:

Brown mottled orangish brown slightly sandy CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	24.6	10.0	73.7
Sample Condition	Undisturbed			0.5	29.2	10.5	73.7
Orientation of sample	Vertical			0.7	33.5	10.9	73.2
Initial Diameter (mm)	101.76			1.0	36.6	11.4	72.7
Initial Length (mm)	210.08			1.4	42.0	11.9	72.2
Initial Water Content (%)	27.8			1.9	46.6	12.4	71.1
Initial Bulk Density (Mg/m ³)	1.86			2.4	50.6	12.9	70.2
Initial Dry Density (Mg/m ³)	1.46			2.9	54.4	13.3	69.6
Particle Density (Mg/m ³)	2.65 Assumed			3.3	57.6	13.8	69.3
Cell Pressure (kPa)	50			3.8	60.0	14.3	69.1
'Specimen Height' at start of Shearing Stage (mm)	210.02			4.3	62.9	14.8	68.9
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			4.8	64.8	15.2	68.6
Rate of Strain (%/min)	1.4			5.2	66.7	15.7	68.4
Corrected Deviator Stress (kPa)	74			5.7	68.5	16.2	68.5
Undrained Shear Strength (kPa)	37			6.2	69.6		
Strain at Failure (%)	10.0			6.7	70.6		
Failure Zone Water Content (%)	28.8			7.1	71.5		
Water Content (after test) (%)				7.6	72.5		
Mode of Failure	Intermediate			8.1	73.2		
				8.6	73.5		
				9.0	73.6		
				9.5	73.6		

Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project:	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Hole	BH313
		Sample Depth	2.30-2.75m
		Sample Type	UT
Project No:	PC207899	Sample Ref	C46606



Summary of Chemical Analysis Soil Samples

Our Ref 20-16822

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	1721159	1721160	1721161	1721162	1721163	1721164	1721165	1721166	1721167	1721168	1721169	1723016
Sample ID	BH406	BH409	BH421	BH407	BH427	BH427	BH301	BH421	BH508	BH511	BH416	BH313
Depth	2.00	1.50	3.50	1.20	2.00	3.30	1.00	1.20	0.70	0.60	1.50	1.50
Other ID												
Sample Type	D	D	D	D	D	D	D	D	D	D	D	ES
Sampling Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	17/08/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Inorganics														
pH	DETSC 2008#		pH	7.6	7.4	6.9				9.8	7.5	8.1	8.7	8.9
Organic matter	DETSC 2002#	0.1	%				3.5	2.8	7.6					2.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	2400	1600	880				460	700	130	730	410
Sulphur as S, Total	DETSC 2320	0.01	%	0.13	0.38	0.81								
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.47	0.87	2.0								

Information in Support of the Analytical Results

Our Ref 20-16822
 Client Ref PC207899
 Contract Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1721159	BH406 2.00 SOIL	01/09/20	PT 1L		
1721160	BH409 1.50 SOIL	01/09/20	PT 1L		
1721161	BH421 3.50 SOIL	01/09/20	PT 1L		
1721162	BH407 1.20 SOIL	01/09/20	PT 1L		
1721163	BH427 2.00 SOIL	01/09/20	PT 1L		
1721164	BH427 3.30 SOIL	01/09/20	PT 1L		
1721165	BH301 1.00 SOIL	01/09/20	PT 1L		
1721166	BH421 1.20 SOIL	01/09/20	PT 1L		
1721167	BH508 0.70 SOIL	01/09/20	PT 1L		
1721168	BH511 0.60 SOIL	01/09/20	PT 1L		
1721169	BH416 1.50 SOIL	01/09/20	PT 1L		
1721170	BH406 1.00 SOIL	01/09/20	PT 1L		
1721171	BH508 0.25-0.65 SOIL	01/09/20	PT 1L		
1723016	BH313 1.50 SOIL	17/08/20	GJ 250ml x2, GJ 60ml x2, PT 1L		

Key: P-Plastic T-Tub G-Glass J-Jar

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

LABORATORY RESULTS - Atterberg Limit

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym- bol	p %	>425 sieve µm	w _L %	w _p %
						Cone Pene.	Water % (Factor)					
BH301	2.00 (2.00)	D	C46301	Brown mottled grey CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	34	0%	58	24
BH302	0.50 (0.50)	D	C46314	Brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			MV	37	6%	71	34
BH303	3.30 (3.30)	D	C46334	Dark brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	38	69%	68	30
BH309	1.00- 1.10 (1.00)	D	C44559	Light brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	42	3%	67	25
BH312	1.50 (1.50)	D	C44574	Light orangish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	33	8%	59	26
BH314	1.20- 1.65 (1.20)	D	C44984	Light orangish brown and grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	33	0%	55	22
BH315	1.80 (1.80)	D	C44998	Dark brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	44	0%	76	32
BH316	0.90- 1.00 (0.90)	D	C44580	Light orangish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	42	1%	66	24
BH317	2.00 (2.00)	D	C45876	Orangish brown mottled grey slightly sandy CLAY,	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	29	14%	50	21
BH318	2.40- 2.85 (2.40)	D	C42519	Dark greenish grey CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	42	5%	63	21
BH319	1.00- 1.10 (1.00)	D	C42534	Light brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	32	3%	54	22
BH401	1.00- 1.10 (1.00)	D	C45021	Orangish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	45	2%	68	23

Remarks





geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Atterberg Limit

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym- bol	p %	>425 sieve µm	w _L %	w _p %
						Cone Pene.	Water % (Factor)					
BH402	0.50- 0.60 (0.50)	D	C45465	Light brownish slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	44	2%	69	25
BH404	1.50 (1.50)	D	C47774	Greyish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	38	17%	62	24
BH405	0.90- 1.20 (0.90)	D	C43325	Brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	32	13%	56	24
BH406	1.00 (1.00)	D	C46668	MADE GROUND: Brown slightly sandy gravelly clay with a high cobble content.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	20	92%	41	21
BH411	1.60 (1.60)	D	C45899	Grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	36	6%	60	24
BH415	1.50 (1.50)	D	C46710	Brown mottled grey slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	44	0%	74	30
BH416	1.50 (1.50)	D	C46718	MADE GROUND: Greenish grey slightly sandy slightly gravelly clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CV	46	15%	74	28
BH418	1.60 (1.60)	D	C45911	Orangish brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	40	10%	69	29
BH420	1.50 (1.50)	D	C45931	Orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	37	0%	68	31
BH422	1.50 (1.50)	D	C44602	Orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	39	5%	64	25
BH423	3.40 (3.40)	D	C44620	Dark brownish grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	42	6%	66	24
BH428	1.30 (1.30)	D	C44632	Brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	45	2%	70	25

Remarks




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LABORATORY RESULTS - Particle Size Distribution

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH314

Sample Depth 0.20-0.60m

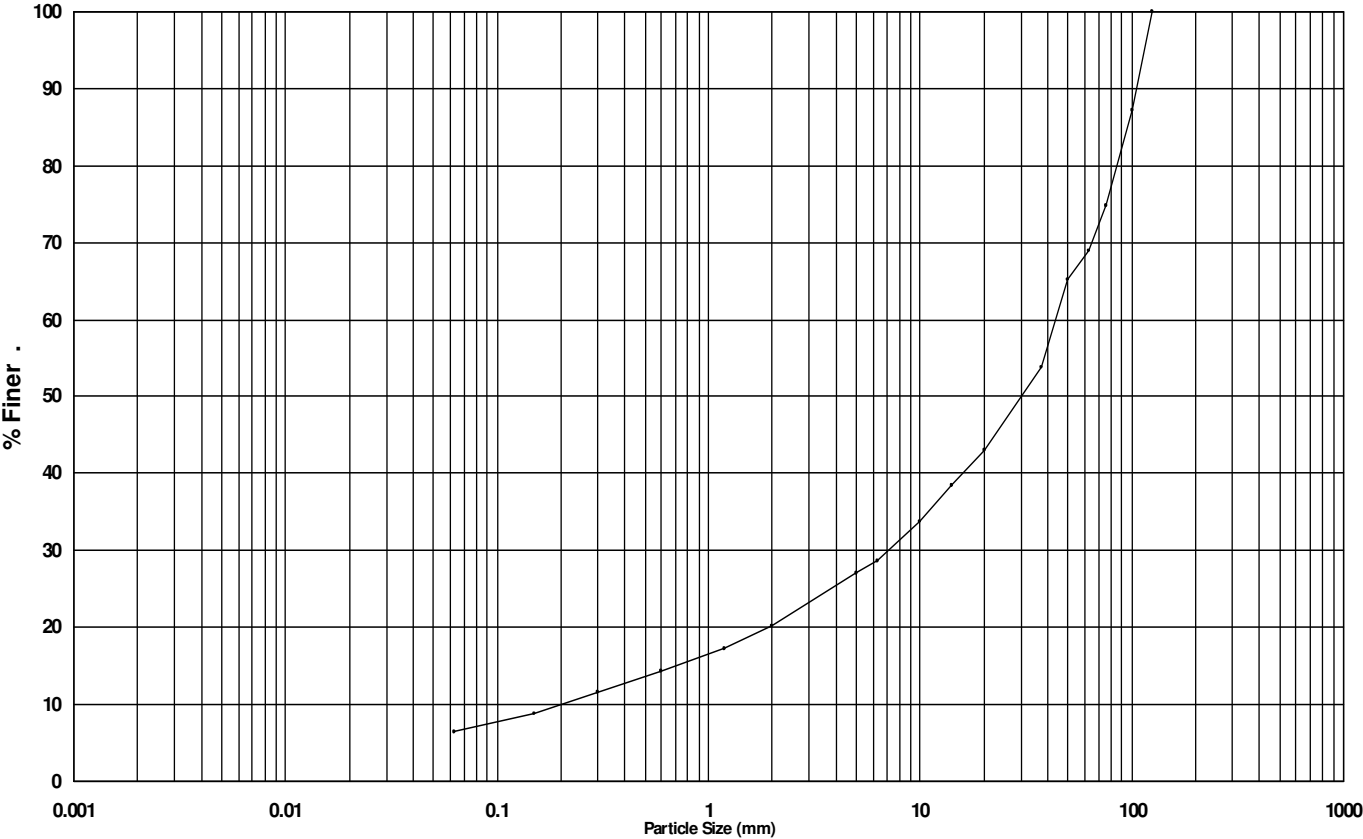
Project No: PC207899

Sample Type B

Sample Ref C43464

Sample Description

MADE GROUND: Light brown sandy clayey gravel with a high cobble content.



Classification	CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulders
		SILT			SAND			Gravel				

Classification	% of each
SILT (including CLAY)	7
SAND	13
GRAVEL	49
COBBLES	31
BOULDERS	0

Size	% Finer
125 mm	100
100 mm	87
75 mm	75
63 mm	69
50 mm	65
37.5 mm	54
20 mm	43
14 mm	38
10 mm	34
6.3 mm	29
5 mm	27
2 mm	20
1.18 mm	17
600 μ m	14
300 μ m	12
150 μ m	9

Size	% Finer
63 μ m	7

Uniformity Coefficient	
220.99	
Sieving Method	
Wet sieve	
Fine Particle Analysis	
Method	
Pre-treated with	
% loss on Pre-treatment	
Particle Density	

Remarks Sieve:-Test performed as "Non Standard" due to sample mass not being in accordance with BS EN ISO 17892-4:2016

06/11/2020

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH314

Sample Depth 2.40-2.85m

Project No: PC207899

Sample Type UT

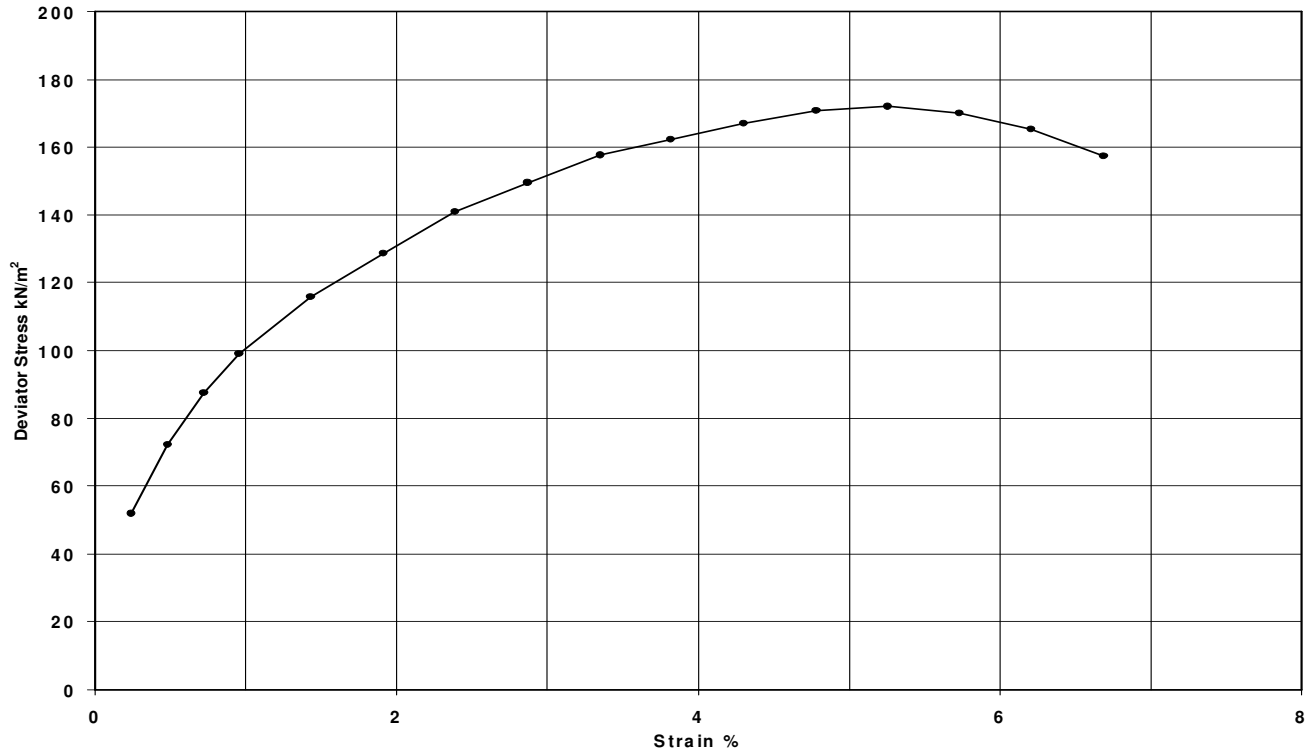
Sample Ref C43488

Sample Description

The following samples were combined to perform this test:

Light orangish brown slightly sandy CLAY.

BS1377 Part 8 1990 : Clause 8.0



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Multi-stage			0.2	51.9		
Sample Condition	Undisturbed			0.5	72.3		
Orientation of sample	Vertical			0.7	87.6		
Initial Diameter (mm)	102.27	102.27	102.27	1.0	99.0		
Initial Length (mm)	209.25	209.25	209.25	1.4	115.7		
Initial Water Content (%)	23.6	23.6	23.6	1.9	128.7		
Initial Bulk Density (Mg/m ³)	2.03	2.03	2.03	2.4	141.0		
Initial Dry Density (Mg/m ³)	1.64			2.9	149.5		
Particle Density (Mg/m ³)				3.3	157.7		
Cell Pressure (kPa)	50	100	150	3.8	162.3		
'Specimen Height' at start of Shearing Stage (mm)				4.3	167.1		
Membrane Thickness/Correction (mm/kPa)	0.30 / 0.39	0.30 / 0.39	0.30 / 0.45	4.8	170.8		
Rate of Strain (%/min)	1.86	1.86	1.86	5.3	171.9		
Corrected Deviator Stress (kPa)	172	170	165	5.7	170.0		
Undrained Shear Strength (kPa)	86	85	83	6.2	165.2		
Strain at Failure (%)	5.3	5.7	6.2	6.7	157.3		
Failure Zone Water Content (%)							
Water Content (after test) (%)							
Mode of Failure	Intermediate						

Remarks

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole BH314

Sample Depth 4.50-4.95m

Project No: PC207899

Sample Type UT

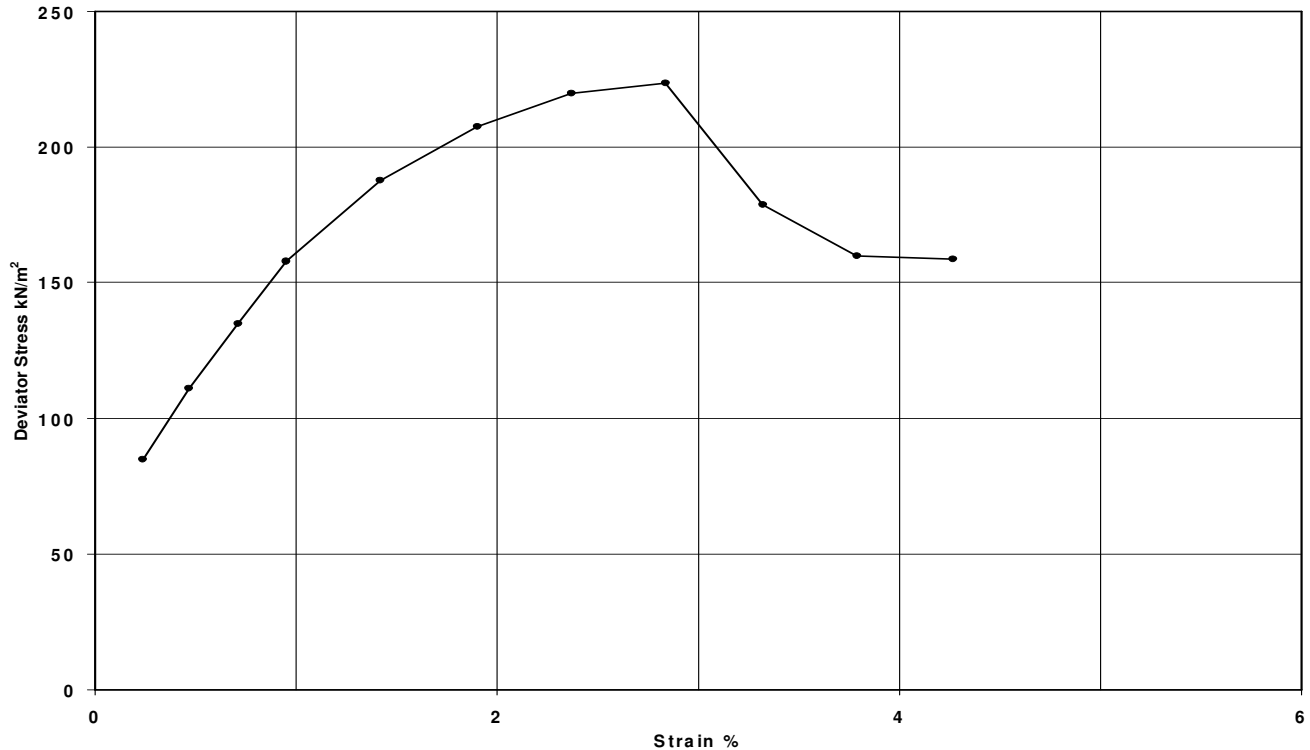
Sample Ref C43487

Sample Description

The following samples were combined to perform this test:

Dark greenish grey slightly sandy CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.2	84.9		
Sample Condition	Undisturbed			0.5	110.9		
Orientation of sample	Vertical			0.7	134.9		
Initial Diameter (mm)	102.58			0.9	158.0		
Initial Length (mm)	210.97			1.4	187.7		
Initial Water Content (%)	21.1			1.9	207.4		
Initial Bulk Density (Mg/m ³)	2.02			2.4	219.8		
Initial Dry Density (Mg/m ³)	1.67			2.8	223.6		
Particle Density (Mg/m ³)	2.65 Assumed			3.3	178.9		
Cell Pressure (kPa)	90			3.8	159.9		
'Specimen Height' at start of Shearing Stage (mm)	211.33			4.3	158.8		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000						
Rate of Strain (%/min)	1.9						
Corrected Deviator Stress (kPa)	224						
Undrained Shear Strength (kPa)	112						
Strain at Failure (%)	2.8						
Failure Zone Water Content (%)	23.1						
Water Content (after test) (%)							
Mode of Failure	Brittle						

Remarks 

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project:	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Hole	BH314
		Sample Depth	4.50-4.95m
		Sample Type	UT
Project No:	PC207899	Sample Ref	C43487



Remarks 

06/11/2020

GEOTECHNICS

Summary of Chemical Analysis Soil Samples

Our Ref 20-16450

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	1719214	1719215	1719216	1719217	1719218	1719219	1719220	1719221	1719222	1719223	1719224
Sample ID	BH602	TP404	TP817	BH314	BH401	BH401	BH411	BH431	BH602	BH604	TP403
Depth	0.10-0.20	0.50	0.30	2.00	0.35-0.45	1.00-1.10	1.60	0.20-0.30	2.10-2.20	1.00-1.10	1.50
Other ID											
Sample Type	D	D	D	D	D	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Inorganics														
pH	DETSC 2008#		pH	7.7	8.2	11.9	4.8	8.5	7.6	7.1	7.9	7.5	6.0	7.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	19	23	40	1700	59	510	1900	440	260	530	1800
Sulphur as S, Total	DETSC 2320	0.01	%				2.6	0.16	0.07	2.9	0.08	0.05	0.10	2.8
Sulphate as SO4, Total	DETSC 2321#	0.01	%				6.6	0.09	0.18	9.2	0.24	0.11	0.24	6.7

Information in Support of the Analytical Results

Our Ref 20-16450
 Client Ref PC207899
 Contract Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1719214	BH602 0.10-0.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1719215	TP404 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1719216	TP817 0.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1719217	BH314 2.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719218	BH401 0.35-0.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719219	BH401 1.00-1.10 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719220	BH411 1.60 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719221	BH431 0.20-0.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719222	BH602 2.10-2.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719223	BH604 1.00-1.10 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719224	TP403 1.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719225	TP404 1.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719226	TP420 1.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719227	TP420 3.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1719228	TP432 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Summary of Asbestos Analysis Soil Samples

Our Ref 20-16455

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1719275	BH314 0.20-0.60	SOIL	NAD	none	Colin Patrick
1719276	BH417 0.40-1.00	SOIL	Crocidolite	bundle of Crocidolite fibres	Colin Patrick
1719277	TP403 1.00	SOIL	NAD	none	Colin Patrick
1719278	TP413 0.50	SOIL	NAD	none	Colin Patrick
1719279	TP413 0.90	SOIL	NAD	none	Colin Patrick
1719280	TP413 1.30	SOIL	NAD	none	Colin Patrick
1719281	TP420 1.00	SOIL	NAD	none	Colin Patrick
1719282	TP615 1.50	SOIL	NAD	none	Colin Patrick
1719283	TP702 0.60	SOIL	NAD	none	Colin Patrick
1719284	TP703 0.60	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-16455
 Client Ref PC207899
 Contract Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1719275	BH314 0.20-0.60 SOIL		PT 1L		
1719276	BH417 0.40-1.00 SOIL		PT 1L		
1719277	TP403 1.00 SOIL		PT 1L		
1719278	TP413 0.50 SOIL		PT 1L		
1719279	TP413 0.90 SOIL		PT 1L		
1719280	TP413 1.30 SOIL		PT 1L		
1719281	TP420 1.00 SOIL		PT 1L		
1719282	TP615 1.50 SOIL		PT 1L		
1719283	TP702 0.60 SOIL		PT 1L		
1719284	TP703 0.60 SOIL		PT 1L		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16363

Client Ref PC207899

Contract Title Graven Hill, Bicester, Land

Lab No	1718521	1718522	1718523	1718524	1718525	1718526	1718527	1718528	1718529	1718530	1718531	1718532
Sample ID	TP317	TP334	BH808	BH808	BH818	BH818	BH819	TP304	TP310	TP319	TP322	TP324
Depth	1.00	0.60	0.50	3.30	2.70-2.80	3.65-3.70	1.20-1.30	2.00	1.00	0.60	0.70	1.00
Other ID												
Sample Type	B	D	D	D	D	D	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units												
Inorganics															
pH	DETSC 2008#		pH	6.9	7.1	7.1	6.4	6.8	6.7	7.6	4.2	6.8	6.8	6.9	7.3
Organic matter	DETSC 2002#	0.1	%												
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	790	100	92	2000	1700	2100	820	1800	420	720	55	82
Sulphur as S, Total	DETSC 2320	0.01	%			0.03	1.6	1.7	1.1	0.09	5.5	0.08	0.12	0.05	0.03
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.08	3.6	3.9	2.5	0.28	21	0.18	0.32	0.11	0.06

Information in Support of the Analytical Results

Our Ref 20-16363
 Client Ref PC207899
 Contract Graven Hill, Bicester, Land

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1718528	TP304 2.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718529	TP310 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718530	TP319 0.60 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718531	TP322 0.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718532	TP324 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

LABORATORY RESULTS - Classification and Strength

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m ³	σ_3 kN/m ²	$\sigma_1 - \sigma_3$ kN/m ²	C_u kN/m ²	C_{Avg} kN/m ²
RC304	0.60 (0.60)	B	C44364	Brown mottled grey slightly sandy slightly gravelly CLAY.					14.2						
RC304	0.60 (0.60)	D	C45631	Brown mottled grey slightly sandy slightly gravelly CLAY.	CI	25 (6%)	45	20	15.4						
RC407	1.10 (1.10)	ES	C46458	Dark greenish grey slightly sandy CLAY.					56.4						
RC504	1.00 (1.00)	B	C42053	PROBABLE MADE GROUND: Brown mottled grey slightly sandy slightly gravelly clay.	CH	39 (5%)	63	24	28.7						
RC504	1.00 (1.00)	D	C42137	PROBABLE MADE GROUND: Brown mottled grey slightly sandy slightly gravelly clay.	CH	37 (4%)	65	28	28.5						
RC506	0.60 (0.60)	D	C42142	PROBABLE MADE GROUND: Greenish grey slightly sandy slightly gravelly clay.	CH	37 (2%)	59	22	28.0						
RC506	1.00 (1.00)	D	C42143	PROBABLE MADE GROUND: Brown mottled grey slightly sandy slightly gravelly clay.	CH	41 (2%)	66	25	29.3						
RC507	0.70 (0.70)	D	C42489	PROBABLE MADE GROUND: Greenish grey slightly sandy slightly gravelly clay.	CH	46 (1%)	70	24	29.2						
RC702	1.00 (1.00)	D	C42496	Greenish grey slightly sandy CLAY.	CH	34 (13%)	61	27	40.9						
RC705	1.00 (1.00)	D	C42503	Brown mottled grey slightly sandy CLAY.	CH	41 (9%)	62	21	29.6						
RC708	1.00 (1.00)	D	C42724	Greenish brown slightly sandy CLAY.	CH	33 (4%)	60	27	23.8						
RC710	1.00 (1.00)	D	C42728	Greenish grey slightly sandy slightly gravelly CLAY.	CH	37 (31%)	62	25	26.4						
RC805	0.90 (0.90)	D	C42150	Greenish grey slightly sandy CLAY.	CH	35 (4%)	61	26	31.0						
RC807	1.00 (1.00)	D	C45243	Grey and brown slightly sandy CLAY.	CV	44 (2%)	73	29	30.0						
RC809	0.50 (0.50)	D	C45248	Brown mottled grey slightly sandy CLAY.	CV	50 (NAT)	74	24	25.3						
TP301	1.00 (1.00)	D	C43051	Brown mottled grey sandy SILT.		(7%)	25	NP	15.9						
TP303	1.00 (1.00)	D	C43859	Light grey slightly sandy CLAY.	CI	27 (12%)	45	18	34.2						
TP305	1.00 (1.00)	D	C43876	Orangish brown mottled grey slightly sandy CLAY.	CH	38 (NAT)	66	28	45.0						
TP307	0.20- 0.80 (0.20)	B	C43644	MADE GROUND: Brown slightly sandy clay.					27.5						
Remarks  NST - Not suitable for Test For Standards followed see Laboratory Test Certificate w% - ^ = Rock water content test; x = Aggregate moisture content test QUT Water Contents: <Failure Zone>, [After test]															

LABORATORY RESULTS - Atterberg Limit

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym- bol	p %	>425 sieve µm	w _L %	w _p %
						Cone Pene.	Water % (Factor)					
RC809	0.50 (0.50)	D	C45248	Brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	50	0%	74	24
TP301	1.00 (1.00)	D	C43051	Brown mottled grey sandy SILT.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					7%	25	NP
TP303	1.00 (1.00)	D	C43859	Light grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	27	12%	45	18
TP305	1.00 (1.00)	D	C43876	Orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	38	0%	66	28
TP308	1.50 (1.50)	D	C43895	Grey mottled orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CV	45	6%	71	26
TP309	1.50 (1.50)	D	C43903	MADE GROUND: Grey mottled brown slightly sandy clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	50	0%	75	25
TP310	1.50 (1.50)	D	C43910	Light grey mottled orange brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	45	0%	67	22
TP320	0.80- 1.50 (0.80)	B	C43155	MADE GROUND: Dark brown mottled grey slightly sandy slightly gravelly clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	32	7%	58	26
TP321	0.50 (0.50)	B	C43158	MADE GROUND: Brown slightly sandy slightly gravelly clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	26	2%	41	15
TP324	1.50 (1.50)	D	C43920	Light grey mottled orangish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	53	0%	75	22
TP327	1.00 (1.00)	D	C42623	POSSIBLE MADE GROUND: Light grey slightly sandy clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	40	5%	67	27
TP330	1.50 (1.50)	D	C43287	MADE GROUND: Greenish grey slightly sandy slightly gravelly clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	26	3%	46	20

Remarks




geotechnical and geoenvironmental specialists

Summary of Chemical Analysis

Soil Samples

Our Ref 20-16363

Client Ref PC207899

Contract Title Graven Hill, Bicester, Land

Lab No	1718508	1718509	1718510	1718511	1718512	1718513	1718514	1718515	1718516	1718517	1718518	1718519	1718520
Sample ID	TP334	TP307	TP307	BH702	BH705	BH814	BH818	BH819	RC711	RC714	TP305	TP305	TP307
Depth	1.60	3.00	4.00	0.70	0.20-0.30	0.20-0.30	0.25-0.40	0.40-0.50	0.50-0.90	0.65-0.85	0.40	0.70	0.50
Other ID													
Sample Type	D	D	D	D	D	D	D	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units													
Inorganics																
pH	DETSC 2008#		pH	6.0			10.3	10.3	7.7	8.0	7.3	8.1	8.1	11.5	7.2	7.6
Organic matter	DETSC 2002#	0.1	%	5.3	4.9	5.7										
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	390			2200	2200	150	170	670	1300	270	240	250	74
Sulphur as S, Total	DETSC 2320	0.01	%													
Sulphate as SO4, Total	DETSC 2321#	0.01	%													

Information in Support of the Analytical Results

Our Ref 20-16363
 Client Ref PC207899
 Contract Graven Hill, Bicester, Land

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1718508	TP334 1.60 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Organic Matter (Manual) (28 days), pH + Conductivity (7 days)	
1718509	TP307 3.00 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1718510	TP307 4.00 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1718511	BH702 0.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718512	BH705 0.20-0.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718513	BH814 0.20-0.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718514	BH818 0.25-0.40 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718515	BH819 0.40-0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718516	RC711 0.50-0.90 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718517	RC714 0.65-0.85 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718518	TP305 0.40 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718519	TP305 0.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718520	TP307 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718521	TP317 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718522	TP334 0.60 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718523	BH808 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718524	BH808 3.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718525	BH818 2.70-2.80 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718526	BH818 3.65-3.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718527	BH819 1.20-1.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

LABORATORY RESULTS - Classification and Strength

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Classification					Strength					
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Symbol	I_p (>425) %	w_L %	w_p %	w (p_d) %	Test	γ_b (γ_d) Mg/m ³	σ_3 kN/m ²	$\sigma_1 - \sigma_3$ kN/m ²	C_u kN/m ²	C_{Avg} kN/m ²
TP308	1.50 (1.50)	D	C43895	Grey mottled orangish brown mottled grey slightly sandy CLAY.	CV	45 (6%)	71	26	23.8						
TP309	0.70- 1.20 (0.70)	B	C43675	MADE GROUND: Grey mottled brown slightly sandy clay.					23.0						
TP309	1.50 (1.50)	D	C43903	MADE GROUND: Grey mottled brown slightly sandy clay.	CV	50 (NAT)	75	25	33.4						
TP310	1.50 (1.50)	D	C43910	Light grey mottled orange brown slightly sandy CLAY.	CH	45 (NAT)	67	22	37.7						
TP320	0.80- 1.50 (0.80)	B	C43155	MADE GROUND: Dark brown mottled grey slightly sandy slightly gravelly clay.	CH	32 (7%)	58	26	21.4						
TP321	0.50 (0.50)	B	C43158	MADE GROUND: Brown slightly sandy slightly gravelly clay.	CI	26 (2%)	41	15	17.4						
TP323	1.20- 1.65 (1.40)	UT	C43525	Light brown mottled grey slightly sandy slightly gravelly CLAY.					35.6 <33.1>	SS	1.84	30	48	24	24
TP324	1.50 (1.50)	D	C43920	Light grey mottled orangish brown slightly sandy CLAY.	CV	53 (NAT)	75	22	29.3						
TP325	1.20- 1.65 (1.20)	UT	C43741	Orangish brown mottled grey slightly sandy CLAY.					29.5 <28.8>	SS	1.96	30	156	78	78
TP325	3.20- 3.65 (3.20)	UT	C43742	Dark greenish grey slightly sandy CLAY.					24.5 <24.6>	SS	2.02	60	249	124	124
TP327	1.00 (1.00)	D	C42623	POSSIBLE MADE GROUND: Light grey slightly sandy clay.	CH	40 (5%)	67	27	28.6						
TP329	0.10 (0.10)	B	C42372	MADE GROUND: Dark grey slightly sandy slightly gravelly clay.					36.0						
TP330	1.50 (1.50)	D	C43287	MADE GROUND: Greenish grey slightly sandy slightly gravelly clay.	CI	26 (3%)	46	20	24.6						
TP331	1.30 (1.30)	D	C43927	Light grey slightly sandy CLAY.	CH	40 (NAT)	69	29	37.4						
TP331	2.00 (2.00)	D	C43929	Dark greyish brown slightly sandy CLAY.	CH	28 (6%)	55	27	38.0						
TP332	1.40 (1.40)	D	C43936	Light grey slightly sandy CLAY.	CH	42 (NAT)	67	25	38.9						
TP335	1.00 (1.00)	D	C43303	Brown mottled yellowish brown slightly sandy CLAY.	CH	26 (9%)	52	26	25.7						
TP401	0.70- 1.20 (0.70)	B	C43757	Grey mottled brown slightly sandy CLAY.					25.2						
Remarks  NST - Not suitable for Test For Standards followed see Laboratory Test Certificate w% - ^ = Rock water content test; x = Aggregate moisture content test QUT Water Contents: <Failure Zone>, [After test]															

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Hole TP323

Sample Depth 1.20-1.65m

Project No: PC207899

Sample Type UT

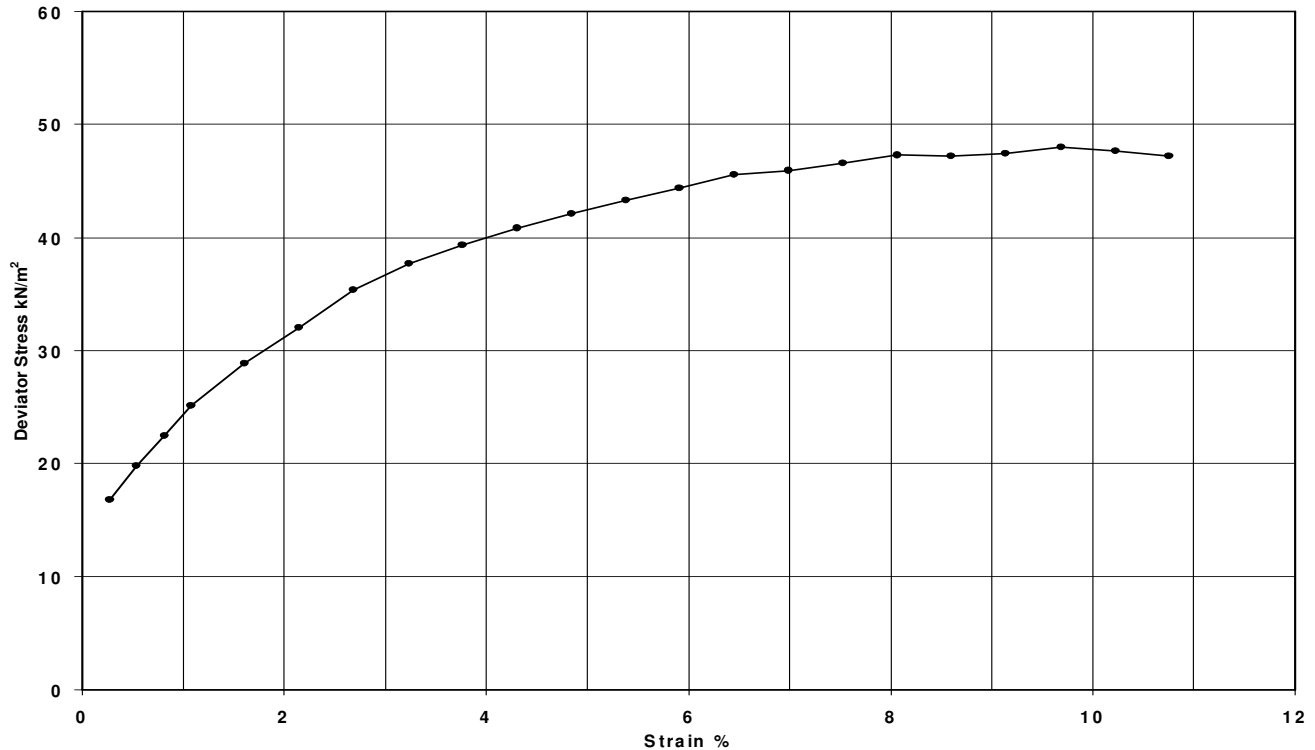
Sample Ref C43525

Sample Description

The following samples were combined to perform this test:

Light brown mottled grey slightly sandy slightly gravelly CLAY.

BS EN ISO 17892-8:2018



	Stage 1	Stage 2	Stage 3	Strain %	Corrected Deviator Stress kN/m ²	Strain %	Corrected Deviator Stress kN/m ²
Test Type	Single Stage			0.3	16.8		
Sample Condition	Undisturbed			0.5	19.8		
Orientation of sample	Vertical			0.8	22.5		
Initial Diameter (mm)	103.14			1.1	25.1		
Initial Length (mm)	185.97			1.6	28.9		
Initial Water Content (%)	35.6			2.2	32.0		
Initial Bulk Density (Mg/m ³)	1.84			2.7	35.4		
Initial Dry Density (Mg/m ³)	1.36			3.2	37.7		
Particle Density (Mg/m ³)	2.65 Assumed			3.8	39.3		
Cell Pressure (kPa)	30			4.3	40.8		
'Specimen Height' at start of Shearing Stage (mm)	185.71			4.8	42.1		
Membrane Thickness/Correction (mm/kPa)	100 / 0.0000			5.4	43.3		
Rate of Strain (%/min)	1.4			5.9	44.4		
Corrected Deviator Stress (kPa)	48			6.5	45.6		
Undrained Shear Strength (kPa)	24			7.0	45.9		
Strain at Failure (%)	9.7			7.5	46.6		
Failure Zone Water Content (%)	33.1			8.1	47.3		
Water Content (after test) (%)				8.6	47.2		
Mode of Failure	Intermediate			9.1	47.4		
				9.7	48.0		
				10.2	47.6		
				10.8	47.2		

Remarks

06/11/2020

GEOTECHNICS

LABORATORY RESULTS - Unconsolidated Undrained Triaxial Test

Project:	GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)	Hole	TP323
		Sample Depth	1.20-1.65m
		Sample Type	UT
Project No:	PC207899	Sample Ref	C43525



Remarks 

06/11/2020

GEOTECHNICS

Summary of Chemical Analysis Soil Samples

Our Ref 20-16358

Client Ref PC207899

Contract Title Graven Hill, Bicester, Land

Lab No	1718477	1718478	1718479	1718480	1718481	1718482	1718483	1718484	1718485	1718486	1718487
Sample ID	TP426	TP426	CC308	RC301	RC402	RC405	TP303	TP303	TP323	TP331	TP331
Depth	1.00	1.50	0.50	0.50	0.50	0.40	0.70	2.00	0.70-0.80	1.50	2.50
Other ID											
Sample Type	D	D	D	D	B	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Inorganics														
pH	DETSC 2008#		pH			8.3	11.0	11.0	9.2	8.0	5.9	8.2	4.5	4.0
Organic matter	DETSC 2002#	0.1	%	1.8	4.0									
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l			160	770	150	68	62	140	160	110	1900
Sulphur as S, Total	DETSC 2320	0.01	%							0.03	0.42	0.08	0.35	2.7
Sulphate as SO4, Total	DETSC 2321#	0.01	%							0.07	1.3	0.16	0.94	8.1

Information in Support of the Analytical Results

Our Ref 20-16358
 Client Ref PC207899
 Contract Graven Hill, Bicester, Land

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1718477	TP426 1.00 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1718478	TP426 1.50 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	
1718479	CC308 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718480	RC301 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718481	RC402 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718482	RC405 0.40 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1718483	TP303 0.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718484	TP303 2.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718485	TP323 0.70-0.80 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718486	TP331 1.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718487	TP331 2.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718488	TP607 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1718489	TP611 0.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Summary of Chemical Analysis Soil Samples

Our Ref 20-14588

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	1709241	1709242	1709243	1709244	1709245	1709246	1709247	1709248	1709249	1709257	1709258
Sample ID	TP421	TP424	TP502	TP330	TP421	TP502	TP504	TP330	TP504	RC407	TP610
Depth	1.90	2.00	4.00	3.00	0.60	2.00	3.70	1.50	1.20	1.10	1.10
Other ID											
Sample Type	D	D	D	D	D	D	D	D	D	ES	D
Sampling Date	20/07/2020	n/s	n/s	22/07/2020	20/07/2020	20/07/2020	n/s	n/s	n/s	20/07/2020	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units										
Inorganics													
pH	DETS 2008#		pH	4.4	4.6	6.8	5.8	7.0	6.7	7.3	6.4	6.8	
Organic matter	DETS 2002#	0.1	%	3.9								9.2	0.4
Sulphate Aqueous Extract as SO4	DETS 2076#	10	mg/l	1800	380	1700	1600	1100	1300	280	340	1800	
Sulphur as S, Total	DETS 2320	0.01	%	1.8	0.06	2.3							
Sulphate as SO4, Total	DETS 2321#	0.01	%	3.9	0.18	5.4							

Summary of Asbestos Analysis Soil Samples

Our Ref 20-14588

Client Ref PC207899

Contract Title Graven Hill, Bicester

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1709248	TP330 1.50	SOIL	NAD	none	Colin Patrick
1709249	TP504 1.20	SOIL	NAD	none	Colin Patrick
1709250	RC710 0.40	SOIL	NAD	none	Colin Patrick
1709251	TP320 0.20-0.80	SOIL	NAD	none	Colin Patrick
1709252	TP320 0.80-1.50	SOIL	NAD	none	Colin Patrick
1709253	TP421 1.80	SOIL	NAD	none	Colin Patrick
1709254	TP503 0.30	SOIL	NAD	none	Colin Patrick
1709255	TP504 0.70	SOIL	NAD	none	Colin Patrick
1709256	TP504 0.70	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 20-14588
Client Ref PC207899
Contract Graven Hill, Bicester

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1709241	TP421 1.90 SOIL	20/07/20	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
1709242	TP424 2.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1709243	TP502 4.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), Total Sulphur ICP (7 days), Total Sulphate ICP (30 days), Metals ICP Prep (182 days), pH + Conductivity (7 days)	
1709244	TP330 3.00 SOIL	22/07/20	PT 1L	pH + Conductivity (7 days)	
1709245	TP421 0.60 SOIL	20/07/20	PT 1L	pH + Conductivity (7 days)	
1709246	TP502 2.00 SOIL	20/07/20	PT 1L	pH + Conductivity (7 days)	
1709247	TP504 3.70 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1709248	TP330 1.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1709249	TP504 1.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH + Conductivity (7 days)	
1709250	RC710 0.40 SOIL		PT 1L		
1709251	TP320 0.20-0.80 SOIL		PT 1L		
1709252	TP320 0.80-1.50 SOIL		PT 1L		
1709253	TP421 1.80 SOIL		PT 1L		
1709254	TP503 0.30 SOIL		PT 1L		
1709255	TP504 0.70 SOIL		PT 1L		
1709256	TP504 0.70 SOIL		PT 1L		
1709257	RC407 1.10 SOIL	20/07/20	GJ 250ml x2, GJ 60ml x2, PT 1L		
1709258	TP610 1.10 SOIL		PT 1L	Sample date not supplied, Organic Matter (Manual) (28 days)	

Key: P-Plastic T-Tub G-Glass J-Jar

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

LABORATORY RESULTS - Atterberg Limit

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym- bol	p %	>425 sieve µm	w _L %	w _p %
						Cone Pene.	Water % (Factor)					
TP331	1.30 (1.30)	D	C43927	Light grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	40	0%	69	29
TP331	2.00 (2.00)	D	C43929	Dark greyish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	28	6%	55	27
TP332	1.40 (1.40)	D	C43936	Light grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	42	0%	67	25
TP335	1.00 (1.00)	D	C43303	Brown mottled yellowish brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	26	9%	52	26
TP401	1.00 (1.00)	D	C43991	Grey mottled brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	41	7%	66	25
TP402	0.50 (0.50)	D	C43995	MADE GROUND: Brown slightly sandy slightly gravelly clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	38	2%	62	24
TP403	1.00 (1.00)	D	C44003	Light grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	38	16%	63	25
TP404	1.50 (1.50)	D	C44427	Grey mottled brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CH	43	0%	67	24
TP405	0.50 (0.50)	D	C45974	Brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	38	0%	60	22
TP406	1.50 (1.50)	D	C45088	Orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	25	7%	42	17
TP407	1.50 (1.50)	D	C44732	Light brown mottled light grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	48	0%	71	23
TP408	1.00 (1.00)	D	C45101	Brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, natural			CV	56	0%	82	26

Remarks





geotechnical and geoenvironmental specialists

LABORATORY RESULTS - Atterberg Limit

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					Results							
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	Test Type	Point Data		Sym- bol	p %	>425 sieve µm	w _L %	w _p %
						Cone Pene.	Water % (Factor)					
BH809	3.50- 3.95 (3.50)	D	C44553	Dark greenish grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	31	3%	60	29
BH813	0.70- 0.80 (0.70)	D	C42790	Orangish brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	37	5%	59	22
BH815	3.90 (3.90)	D	C46453	Dark greyish brown CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	35	12%	62	27
BH818	1.00- 1.10 (1.00)	D	C43621	Dark brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	33	3%	53	20
BHTP417	1.20- 1.65 (1.20)	D	C46279	Grey mottled brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	37	1%	57	20
CC301	2.00- 2.20 (2.00)	D	C43020	Brown mottled grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	40	1%	64	24
CC501	2.00- 2.20 (2.00)	D	C43027	Dark grey slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	43	1%	68	25
CC504	1.10- 1.20 (1.10)	D	C43036	MADE GROUND: Grey and brown slightly sandy clay.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CV	48	0%	73	25
CC504	2.00- 2.20 (2.00)	D	C43038	Grey mottled orangish brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	34	1%	63	29
CC504	3.00- 3.20 (3.00)	D	C43040	Grey mottled brown slightly sandy CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CH	33	5%	65	32
RC304	0.60 (0.60)	D	C45631	Brown mottled grey slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CI	25	6%	45	20

Remarks





 geotechnical and geoenvironmental specialists

LABORATORY RESULTS - MCV, Compaction, CBR

Project GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LTA2)

Project No: PC207899

Sample					MCV		Compaction					CBR				
Hole	Depth (Specimen Depth) m	Type	Sample Ref	Description	MCV	w	Type	w (Opt) %	ρ_d Mg/m ³	γ_b Mg/m ³	γ_d (Max) Mg/m ³	Type	Top		Bottom	
						%							CBR %	w %	CBR %	w %
BH430	0.50- 0.70 (0.50- 0.70)	B	C44341	Dark brown slightly sandy CLAY.			4.5kg	(17.0) 27.5* 7.7 12.3 18.2 21.9	2.70a	*1.96 1.75 1.90 2.05 2.07	(1.75) *1.54 1.63 1.70 1.73 1.70					
BH812	0.10- 0.50 (0.10- 0.50)	B	C42456	Brownish grey slightly sandy slightly gravelly CLAY.			4.5kg	(10.5) 19.9* 22.7 3.4 7.7 14.2	2.65a	*2.04 2.00 1.75 1.93 2.04	(1.82) *1.70 1.63 1.70 1.79 1.78					
RC304	0.60 (0.60)	B	C44364	Brown mottled grey slightly sandy slightly gravelly CLAY.						1.86	1.59	4.5kg	39	17.5	55	17.3
TP307	0.20- 0.80 (0.20- 0.80)	B	C43644	MADE GROUND: Brown slightly sandy clay.			4.5kg	(14.0) 24.6* 6.8 11.3 13.6 20.0 17.4	2.65a	*1.96 1.78 1.94 2.03 2.04 2.04	(1.79) *1.58 1.67 1.74 1.79 1.70 1.74					
TP309	0.70- 1.20 (0.70- 1.20)	B	C43675	MADE GROUND: Grey mottled brown slightly sandy clay.			4.5kg	(15.5) 31.3* 18.5 27.4 13.0 22.5 9.9	2.65a	*1.91 2.06 1.96 1.92 2.02 1.78	(1.77) *1.45 1.74 1.54 1.70 1.65 1.62					
TP320	0.80- 1.50 (0.80- 1.50)	B	C43155	MADE GROUND: Dark brown mottled grey slightly sandy slightly gravelly clay.			4.5kg	(12.5) 22.2* 7.3 10.1 14.9 6.7	2.65a	*2.02 1.88 1.98 2.06 1.84	(1.82) *1.65 1.75 1.79 1.79 1.72					
TP321	0.50 (0.50)	B	C43158	MADE GROUND: Brown slightly sandy slightly gravelly clay.			4.5kg	(15.5) 22.2* 12.3 15.9 19.8 24.6 14.2	2.65a	*2.03 1.95 2.07 2.05 1.99 2.02	(1.80) *1.66 1.73 1.79 1.71 1.60 1.77					
TP329	0.10 (0.10)	B	C42372	MADE GROUND: Dark grey slightly sandy slightly gravelly clay.			4.5kg	(15.0) 35.2* 2.7 8.8 15.5 26.4 19.7	2.65a	*1.79 1.61 1.78 1.94 4.13 1.91	(1.69) *1.32 1.57 1.64 1.68 3.27 1.60					

Remarks

Particle Density - a=assumed, m=measured
w% - * = at natural moisture content; x = aggregate moisture content
= stabilised, see relevant test plot for details
NST = Not suitable for Test
For Standards followed see Laboratory Test Certificate

LABORATORY RESULTS - CBR Force Penetration

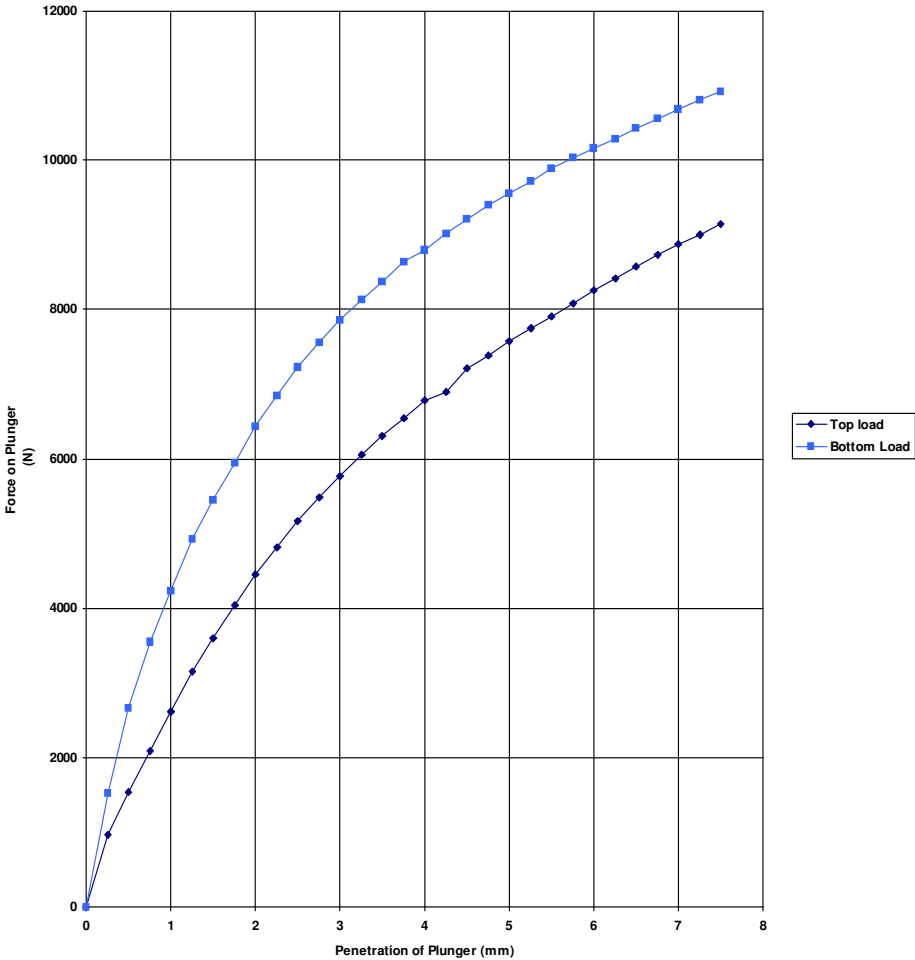
Project: GRAVEN HILL, BICESTER, LAND TRANSFER AREA 2 (LT2)

Project No: PC207899

Hole RC304
Sample Depth 0.60m
Sample Type B
Sample Ref C44364

Sample Description

Brown mottled grey slightly sandy slightly gravelly CLAY.



Penetration	Top (N)	Bottom (N)
0.25mm	974	1516
0.50mm	1530	2664
0.75mm	2092	3546
1.00mm	2614	4235
1.25mm	3161	4928
1.50mm	3599	5446
1.75mm	4042	5948
2.00mm	4450	6442
2.25mm	4821	6856
2.50mm	5168	7235
2.75mm	5479	7566
3.00mm	5772	7866
3.25mm	6052	8128
3.50mm	6302	8366
3.75mm	6548	8640

Penetration	Top (N)	Bottom (N)
4.00mm	6778	8803
4.25mm	6893	9016
4.50mm	7209	9214
4.75mm	7390	9398
5.00mm	7579	9566
5.25mm	7748	9724
5.50mm	7918	9886
5.75mm	8092	10027
6.00mm	8265	10157
6.25mm	8420	10291
6.50mm	8574	10426
6.75mm	8733	10559
7.00mm	8874	10679
7.25mm	9011	10813
7.50mm	9144	10916

Test Type	4.5kg	
Method	BS1377 Part 4 1990 : Clause 7.0	
Surcharge	13.60	kg
	1.0	%
Bulk Density (Mg/m³)	1.86	
Dry Density (Mg/m³)	1.59	
Hand Calculation	No	

CBR	Top	Bottom
Value	39	55
w%	17.5	17.3

Remarks AGS

06/11/2020



E. Soil Exceedance Drawings