ENVIRONMENT
& HEALTH

Reading Borough Council

FAO: Steven Vigar

PHASE 2, STATION HILL, READING
PLANNING PERMISSION REF. 192032

Date 01/10/2021

Ramboll
240 Blackfriars Road
London
SE1 8NW
United Kingdom

T +44 20 7808 1420
www.ramboll.co.uk

Reading Borough Council has granted full Planning Permission for Phase 2 of the proposed development of Station Hill subject to the conditions outlined in Planning Permission Reference 192032. This covering letter summarises the reports that have been prepared and submitted to date to support the discharge of Planning Condition 11.

PROPOSED DEVELOPMENT

Phase 2 comprises part of the wider Station Hill North Site which is to be redeveloped into a mixed residential and commercial town quarter realm that will include approximately 538 new homes and approximately 25,000 sq. ft of commercial and leisure space.

Phase 2 comprises One Station Hill (previously known as Plot G), a seventeen-storey building containing office use and flexible retail, non-residential institution and assembly and leisure uses and a landscaped podium deck providing vehicular access and parking.

No basement excavations are proposed within Phase 2 of the development as the proposed building aligns with existing ground level along the majority of peripheries across the site.

PLANNING CONDITION 11 – GROUND GAS

Condition 11 states:

(PCD) No development (other than demolition above existing ground floor, or existing basement floor, slab level) within the Phase 2 site shall be commenced until ground gas monitoring has been carried out within the Phase 2 site by a

Ramboll UK Limited
240 Blackfriars Road
London
SE1 8NW

suitably qualified person and a risk assessment and scheme showing how the site is to be protected against any landfill gas identified has been submitted to and approved in writing by the Local Planning Authority. No Occupation of any building on the Phase 2 site shall take place until the scheme has been fully implemented as approved (save to the extent that the Local Planning Authority approves any variation(s) to the approved scheme), and those measures shall be retained and maintained at all times thereafter.

The report which satisfies Condition 11 is the Station Hill North Site Ground Investigation Report, SHR-RAM-NB-XX-RP-G-000022, most recent issue (I04) dated 15/07/2020 (provided as Appendix 1).

This report details the findings of Ramboll's ground investigation and subsequent groundwater and gas monitoring. Six ground gas monitoring rounds were undertaken at the site between 28th June and 22nd August 2019 and the results of the ground gas assessment classify the site as CIRIA Characteristic Situation 2 (CS2), meaning the site requires passive, development led basic gas protection measures incorporated into the building design to mitigate the ground gas risks to future users. This is a worst-case scenario calculated using the highest flow rate and the highest carbon dioxide reading throughout the monitoring period.

Summary

The ground gas assessment characterised the site as CS2 (Characteristic Situation 2). CS2 (low risk) requires basic gas protection measures to be included within the proposed building design.

In line with current government legislation (CIRIA Report C665), a typical scope of CS2 protective measures should comprise "a) Reinforced concrete cast *in situ* floor slab (suspended, nonsuspensed or raft) with at least 1200 g DPM2 and underfloor venting. B) Beam and block or pre-cast concrete and 2000 g DPM/reinforced gas membrane and underfloor venting. All joints and penetrations sealed." Where a basement is present for car parking it can be expected that the structure of the basement would require 'tanking' to prevent groundwater ingress where this is shallower than the floor of the basement, similarly the basement could be expected to be vented if used for car parking such that the potential risks from gas ingress could be reduced. Where basements are not planned (such as the Phase 2 area), gas protection measures will be required.

The recommended gas protection measures have been incorporated into the building design of Phase 2 and are considered sufficient and satisfactory given the characteristics of the site. On the bases, Condition 11 should be discharged.

Please do not hesitate to contact me if you have any questions.

Yours sincerely



Siobhán McGeever

Principal Consultant
Environment and Health

M 07525 901114
smcgeever@ramboll.com

APPENDIX 1
GROUND INVESTIGATION REPORT

Intended for
Lincoln MGT

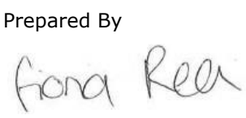
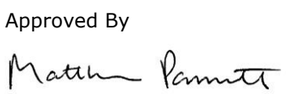
Project no.
1620004716

Date
July 2020

STATION HILL, NORTH SITE, READING

GROUND INVESTIGATION REPORT

Revision	Date	Status	Document Ref.	Comments
I01	19/08/2019	Draft	SHR-RAM-NB-XX-RP-G-000022	Awaiting Final Gas and Groundwater Monitoring Results
I02	30/08/2019	Issue	SHR-RAM-NB-XX-RP-G-000022	First Issue
I03	12/12/2019	Issue	SHR-RAM-NB-XX-RP-G-000022	Development description amended
I04	15/07/2020	Issue	SHR-RAM-NB-XX-RP-G-000022	Additional groundwater sampling results included

Prepared By	Reviewed By	Approved By
		
Fiona Rea	**Siobhán McGeever**	**Matthew Pannett**
Consultant	Senior Consultant	Principal
Prepared By	Reviewed By	Approved By
Federico Capata	**Kalisha Sejpar**	**Maddy Losito**
Graduate Engineer	Senior Engineer	Principal Engineer

Ramboll
240 Blackfriars Road
London
SE1 8NW
United Kingdom

Tel +44 (0)20 7631 5291
london@ramboll.co.uk

CONTENTS

1. Introduction 3
2. Site Description 4
3. Preliminary Conceptual Site Model 6
4. Ground Investigation 7
5. Ground Conditions 10
6. Summary of Geotechnical Parameters 19
7. Generic Quantitative Risk Assesment 20
8. Controlled Waters Risk Assesment 22
9. Built Environment Risk Assessment 24
10. Revised Conceptual Site Model 25
11. Conclusions and Recommendations 27
12. References 29

TABLES

Table 3.1: Preliminary Conceptual Site Model 6
Table 4.1: Summary of Exploratory Boreholes 7
Table 4.2: Summary of Monitoring Installations 8
Table 4.3: Geotechnical Lab Tests Completed 8
Table 4.4: Summary of Analytical Strategy 9
Table 5.1: Summary of Previous Ground Investigation Reports 10
Table 5.2: Summary of Ground Conditions 10
Table 5.3: Summary of Geotechnical Parameters for Made Ground 11
Table 5.4: Stiffness Parameters for Alluvium 12
Table 5.5: Summary of Geotechnical Parameters for Alluvium 12
Table 5.6: Summary of Geotechnical Parameters for Taplow Gravels 13
Table 5.7: Summary of Geotechnical Parameters for Structureless Chalk 14
Table 5.8: Summary of Geotechnical Parameters for Structured Chalk 17
Table 6.1: Summary of Geotechnical Parameters 19
Table 7.1: Asbestos Detected 20
Table 8.1: Groundwater Exceedances 22
Table 10.1: Revised Conceptual Site Model 25
Table 10.2: Qualitative Source-Pathway-Receptor Risk Assessment 26
Table 11.1: Mitigation Measures 28

FIGURES

Figure 1 : Map of Thames Water Sewer, Hoare Lea Thames Water Note.....4
Figure 2 : An aerial view of the North Site (shaded red) prior to demolition (Source: Google).....4
Figure 3: A CGI of the North Site (Source: MGT).....5
Figure 4: Relationship between NSPT value and Angle of internal friction. Taken from CIRIA 143 11
Figure 5: Contour Map showing the level of the Structureless Chalk across the site 13
Figure 6: Relationship between unconfined compressive strength and intact dry density 14
Figure 7: Contour Map showing the level of the Structured Chalk across the site..... 15
Figure 8: Relationship between dry density and porosity to Intact Youngs Modulus (Matthews and Clayton 1993). CIRIA 574..... 16

DRAWINGS

SHRN-RAM-SW-ZZ-DR-S-0070 – Exploratory Hole Location Plan
SHRN-RAM-SW-ZZ-DR-S-0071 – Geological Cross Section
SHRN-RAM-SW-ZZ-DR-S-0072 – Geological Cross Section

APPENDIX

Appendix 1 – Data Plots from SI
Appendix 2 – GEL Factual Report, Ref: 35248

Scope	
Brief	Ramboll was instructed to produce a combined Geotechnical and Geo-Environmental Ground Investigation Report (GIR) for Lincoln MGT (the Client) to support the proposed development at Station Hill, Reading. The Station Hill project is a combined office and residential development, located directly opposite Reading train station, occupying approximately 2.6 hectares. The development site has been split into two; the North Site and the South Site, separated by Garrard Street. This report covers the North Site only. The GIR for the South Site was issued in April 2019. This report contains: a contaminated land risk assessment for the proposed mixed commercial and residential end use; and geotechnical interpretation of the factual data obtained during the recent ground investigation to inform the design and provide Geotechnical Design Parameters required for the proposed foundation design solutions.
Proposed Development	The planning application for the site includes for the demolition of all previous buildings to allow for the construction of a mixed-use, sustainable development, offering new homes, a hotel, flexible high-tech office space, along with central open community space. The North Site master plan currently comprises a site wide podium and five building plots, split into two development phases: • Phase 3 comprises Block A, B and D (residential) and Block C (commercial) in the western part of the site. • Phase 2 comprises Block G in the eastern part of the site (commercial). • Phase 1 of the development is classed as Station Hill South Site and is discussed in a separate report.

Site Information	
Grid Ref	Approximately centred on 471370, 173710.
Current Site Description	The site is located in central Reading, bound by Station Hill and Reading train station to the north and east, Garrard Street and the Station Hill South Site to the south and Greyfriars Road to the west. The site formerly comprised four main buildings: an office building in the west (Xafinity House), a ballroom turned bingo hall and bus station in the centre, Western Tower in the north east, and a multi-storey carpark in the south east. The former ballroom/bingo hall, bus station and Western Tower buildings were demolished prior to the ground investigation. Crushed demolition material from these buildings has been used as ground cover across the former building footprints. The office building, Xafinity House, in the west and the multi-storey carpark are still in situ and are set to be demolished at a later stage. Several services run beneath the site including a Thames Water foul sewer that runs east to west across the centre of the North Site. Substations are present in the north west corner of the site and a substation and a radio mast are located along the southern boundary of the site, adjacent to Garrard Street.
Site History	Historical maps date back to 1879, when the north site was predominantly fields, with a timber yard in the north west corner and terraced housing to the south of this. Livery stables were located in the far north-east of the site and extended further off-site to the east. Railway lines and Reading train station were shown to the north, with an embankment along the northern boundary indicating that the site level was lower than that of the rail land to the north. Mapping from 1900 to 1913 showed a large circular feature potentially a pond or lake covering the majority of the Station Hill North Site, with some buildings in the west along Greyfriars Road. By 1957, a large garage was located in the south east of the North Site. The terraced housing was still present in the south west and a factory in the north west. By 1962, the north of the site was shown to be used for car parking. By 1968, a ballroom had been constructed in the centre of the site, and western tower and associated retail parade in the north east. A bus station was shown in the south west and a furniture factory in the north west. A tank was shown to be present on the north western corner of the garage at this time. By 1973, the garage had been demolished and by 1979, the multi-storey car park had been constructed in its current layout. The terraced housing in the west was also demolished around this time. During the 1990s, the ballroom was classed as a Club and an office building (Xafinity House) was constructed in the west, which is still present today. A site visit undertaken by Watermans in 2013 described the former ballroom / Club as a Mecca Bingo Hall at that time, which Watermans reported contained two tanks and a switch room. By 2019, the former ballroom/bingo hall, Western Tower and the retail parade had been demolished. Xafinity House in the west and the multi-storey carpark in the south east are still present and are set to be demolished at a later stage.

Ground Investigation	
Contract Details	Geotechnical Engineering Limited (GEL) were appointed to undertake a ground investigation on the North Site. The ground investigation was designed and specified by Ramboll and was undertaken between 8th May and 18th June 2019, with part-time supervision by Ramboll. The specification was designed to assess the contamination status of the site, determine and confirm the geological and hydrological regime at site, undertake in situ and laboratory based geotechnical testing of soils to determine Geotechnical Design Parameters for foundation and retaining wall design, and address uncertainty for the mitigation and management of the ground-based risks at the site.
Scope of Works	The ground investigation comprised five deep boreholes, five window sample holes and seven trial pits. In situ testing (SPTs) was carried out and samples were taken from the exploratory holes for subsequent chemical and geotechnical testing. Chemical analysis of soil and groundwater samples were undertaken along with six groundwater and ground gas monitoring visits.
Additional Scope of Works	Two additional groundwater sampling rounds were undertaken on 26th September and 22nd October 2019 by Ramboll to further assess hydrocarbons detected in the groundwater sample taken from BH204 in the southeast corner of the site (adjacent to the NCP carpark). Groundwater samples were taken from BH204, and WS203, which is located to the north west of the NCP carpark (where a former tank was labelled on historical maps) on two additional occasions to assess whether the groundwater contamination was localised and not a wider issue. Hydrocarbons were found to be elevated in BH204 on the subsequent visits but not in WS203 and are therefore considered to be localised.

Ground Conditions	
Geology	The geology comprises Made Ground overlying Alluvium and Taplow Gravels of varying extents, overlying the Upper Chalk formation which comprised Structureless Chalk over Structured Chalk.
Ground Aggressivity	Soil samples were scheduled for chemical analyses to establish the ground aggressivity. Sulphate and pH tests were carried out on soil and groundwater samples. An assessment of the soil data, in accordance with BRE Special Digest 1 (BRE, 2005) suggests a Design Sulphate Class of DS-2 and the Aggressive Chemical Environment for Concrete (ACEC) Classification is AC-2.
Hydrogeology	The Environment Agency classifies the Made Ground as Unproductive Strata, the Alluvium and Taplow Gravel as Secondary 'A' Aquifers and the Upper Chalk Formation is classified as a Principal Aquifer. Groundwater level data collected during groundwater monitoring visits indicates a groundwater level at approximately to 36.2 m AOD. Ground level varies between 38 and 40m AOD.
Hydrology	The nearest surface water feature is a drainage network approximately 315 m north west of the site, associated with the railway line. Followed by the east flowing River Thames which, at its closest point,

	lies 420 m north east of the site. The River Kennet is located approximately 500 m south of the site and flows in an easterly direction.
Generic Quantitive Risk Assessment	
Asbestos	Four samples identified positive results for asbestos in three out of twenty-two Made Ground samples analysed. Two identifications were reported by the laboratory as chrysotile and three amosite (one sample contained both chrysotile and amosite). These were a mixture of loose fibres and loose fibrous debris. The quantifications ranged between <0.001% and 0.024% w/w, which is not unusual for Made Ground and urban areas. All detections are within the top 0.75 m of Made Ground. Due to the shallow identifications of asbestos, it is anticipated that the majority of this material will be removed from site as part of either the earthworks, foundation excavations and local to Phase 3, the basement excavations. Management of the risk from asbestos to construction workers and the local community during the development works must be considered and managed appropriately. This is beyond the scope of this report.
Soils	Chemical analysis of soil samples was undertaken and screened against Ramboll's Generic Assessment Criteria (GAC) for residential use without plant uptake and for commercial use. Elevated concentrations of lead, PAH and hydrocarbons were identified. These elevated concentrations were further considered by Ramboll's risk assessment. The location of the contaminants are predominantly within areas of the site proposed to be excavated for the basement, or in the areas with a proposed commercial use such that risks would be expected to be mitigated. This is because there is not a complete contaminant – pathway – receptor linkage as explained in this report.
Groundwaters	Seven groundwater samples were obtained and scheduled for analysis complimentary to the soil analytical suite. One location, BH204 (south-east corner of the site by the NCP carpark), detected elevated hydrocarbons above relevant criteria. Two additional rounds of groundwater sampling were undertaken in BH204 and WS203 to further characterise hydrocarbon concentrations in groundwater in this area. The results of the sampling recorded consistently elevated concentrations of hydrocarbons in BH204 across all three monitoring rounds. No detectable hydrocarbons were recorded in WS203. Based on the results of this investigation, the hydrocarbons in BH204 are considered to be localised and not indicative of site wide groundwater contamination. Further assessment of the groundwater in this localised area is recommended following the demolition of the multi-storey car park, during the earthworks stage. i.e. When the ground is accessible.
Ground Gas	Six ground gas monitoring visits were undertaken, and the results of the ground gas assessment classify the site as CIRIA Characteristic Situation 2. CS2 requires passive, development led basic gas protection measures to be incorporated into the building design.
Hydrocarbon Vapours	The photo ionisation detector (PID) readings recorded during the ground investigation and subsequent six monitoring visits identified elevated volatile organic compounds (VOCs). The source of the VOCs is considered to be within the soils, predominantly located in the south-east of the site. Potential risks to site users via inhalation of volatiles may be present in the location of BH204, where the contamination is deeper and will not be excavated (up to 4.50 m depth in the top of the structureless chalk). This depth of impact may mitigate the risks, but further assessment should be undertaken post-demolition, during the excavation works in this area.
Conclusions and Recommendations	

- Further geotechnical investigation is recommended in previously inaccessible areas to confirm the level and composition of the Structured Chalk. Cone penetration testing is likely to be the most efficient method of investigation.
- A number of obstructions were encountered during the Ground Investigation. Further investigation into the location and nature of the existing foundations is recommended in order to reduce the risk of encountering obstructions during the construction phase. It is recommended that preliminary pile testing is undertaken to supplement the Ground Investigation in order to provide an improved understanding of the anticipated pile load performance at the site. This will enable refinement of the pile design, and potential cost savings to the substructure.
- Ramboll recommends that a Materials Management Plan (MMP) is prepared prior to the construction works to manage material being removed from site and/or being reused as part of the pile mat and under hardstanding. Careful management of materials should also be considered with possible remedial actions for efficiency. The results of this investigation will need to be considered, including the contaminants detected.
- Further environmental assessment is recommended in previously inaccessible areas to provide further delineation of hydrocarbon contamination, particularly in the area of the multi-storey car park. This can only be undertaken post demolition. It is likely that this can be dealt with during the environmental watching brief, with additional sampling taken where any visual or olfactory evidence of contamination is encountered.
- During the removal of the concrete slabs, earthworks and enabling works, an environmental watching brief should be implemented with a view to confirming the final site condition and assessing unforeseen ground contamination or structures such as underground tanks. If previously unforeseen contamination is identified the risk assessment should be updated accordingly.
- An Environmental Management Plan (EMP) report is recommended to provide protocols for dealing with unforeseen contamination.

1. INTRODUCTION

1.1. Background

Ramboll was instructed to produce a Geotechnical and Geo-Environmental Ground Investigation Report (GIR) for the proposed development at the Station Hill Site in Reading. The site was subsequently split into two phases, the north and south. This report covers the North Site only. The GIR for the South Site was issued in April 2019 and updated in February 2020 (ref. SHR-RAM-SB-XX-RP-G-000016). The report includes a contaminated land risk assessment and recommendations for the Geotechnical Design Parameters that will be adopted for the substructure design for the proposed development.

1.2. Objectives

The objectives of the Ground Investigation were to assess the ground conditions, geological and hydrogeological conditions, and the potential for soil and/or groundwater contamination that could have resulted from current and historical contaminant sources identified within the Phase 1 Desk Study Report (ref. 1620004716-SHR-RAM-GE-002-Desk Study, 2018).

1.3. Scope of Works

The scope of work, undertaken between 8th May and 18th June 2019, for the North Site investigation comprised:

- seven trial pits to maximum depth 4.5m bgl;
- five window sample holes to a maximum depth of 6m bgl;
- five rotary boreholes;
- gas and groundwater monitoring of all exploratory hole locations installed with monitoring wells on six occasions for ground gas and rest groundwater levels;
- groundwater sampling from all installed boreholes;
- geotechnical laboratory testing of soil samples; and,
  submission of selected soil and groundwater samples to a Ramboll approved MCERTs and UKAS accredited laboratory for analysis for a relevant range of determinands.

In the preparation of this report Ramboll has referred to UK regulatory guidance and methodologies, including, but not limited to: CLR 11 Model Procedures for the Management of Land Contamination; BS 5930:2015 Code of Practice for Site Investigation; and BS 10175:2011 + A2:2017 Code of Practice for the Investigation of Potentially Contaminated Sites.

1.4. Additional Scope of Works

The additional scope of works comprised the groundwater monitoring and sampling of WS203 and BH204 on two occasions on the 26th September and 22nd October 2019.

The additional work was carried out following the results of the first groundwater monitoring round which was undertaken in July 2019 by Ground Engineering Limited (GEL). The monitoring identified elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs). As such, additional groundwater sampling was undertaken by Ramboll in September and October 2019 to further characterise the groundwater contamination in this area.

1.5. Previous Relevant Reports

This report should be read in conjunction with the following documentation:

- Ramboll, October 2018, *Geotechnical and Geoenvironmental Desk Study, Station Hill, Reading*, Ref: 1620004761-SHR-RAM-GEB-001-Desk Study;
- *Geotechnical Engineering Limited, February 2019, Factual Report on Ground Investigation, Station Hill, Reading, South Site,* Ref: 34769;
- Ramboll, April 2019, *Ground Investigation Report, Station Hill, Reading, South Site,* Ref: 1620004761-SHR-RAM-SB-XX-RP-G-000016;
- Ramboll, July 2019, *Foundation Works Risk Assessment, Station Hill, Reading, South Site*, Ref: 1620004761-SHR-RAM-SB-XX-RP-ENV-FWRA;
- Ramboll, July 2019, *Environmental Specification, Station Hill, Reading, South Site*, Ref: SHR-RAM-SB-XX-SP-G-000004;
- *Geotechnical Engineering Limited, August 2019, Factual Report on Ground Investigation, Station Hill, Reading*, Ref: 35248;
- Concept, July 2012, *Site Investigation Report, Thames Tower*, Ref: 122460/FR-02; and,
- Waterman, September 2014, *Geo-Environmental and Geotechnical Assessment, Station Hill, Reading,* Ref: EED12350-110-R-3.1.1-RM.

1.6. General Limitations and Reliance

This report has been prepared by Ramboll exclusively for the intended use by the client in accordance with the agreement between Ramboll and the client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

The site investigation works were undertaken during a discrete period of time. The findings and conclusions presented in this report are accordingly factually limited by these circumstances and, unless stated otherwise in the report, are preliminary. The field investigations were restricted to a level of detail necessary to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant period of time has elapsed since the sampling took place. The interpretation of the geological and environmental quality conditions is based on extrapolation from point-source data in a heterogeneous environment. Accordingly, more detailed investigation may be appropriate dependent upon the client objectives.

2. SITE DESCRIPTION

2.1. Site Description

The site is located in central Reading, bound by Station Hill road and Reading train station to the north and east, Garrard Street and the Station Hill South Site to the south and Greyfriars Road to the west. The site is approximately centred around National Grid Reference 471370, 173710. The site formerly comprised four main buildings; an office building in the west, a bingo hall and adjacent bus station in the centre, Western Tower in the north east and a multi-storey carpark in the south east. The former bingo hall, bus station and Western Tower were demolished prior to the investigation and the crushed demolition material covers the site together with a stockpile in its centre. Ramboll understands that McGees, the demolition Contractor, arranged for the removal of the stockpile of building crush shortly after the ground investigation.

The office building in the west (Xafinity House) is vacant but currently being used as McGees temporary site offices and welfare whilst demolition of the buildings on the Station Hill South Site is undertaken. The multi-storey car park in the south east of the site is currently in use and is set to be demolished at a later stage.

Substations are present in the north west corner of the site, to the north of Xafinity House. A substation is also present in the south of the site adjacent to Garrard Street. A temporary radio mast is also present.

A Thames Water 1250 mm diameter brick foul sewer runs west to east beneath the northern section of the site, at a depth of approximately 4 mbgl, with three 225 mm diameter sewers branching off. Several other services are present, as shown on Figure 1 below.

A high density of services are known to exist in and around the site beneath Greyfriars Road, Garrard Street and Friar Street. An unexpected service was encountered running east to west across the centre of the site during the ground investigation, to the north of the foul sewer, at an approximate depth of 2.20 m bgl.

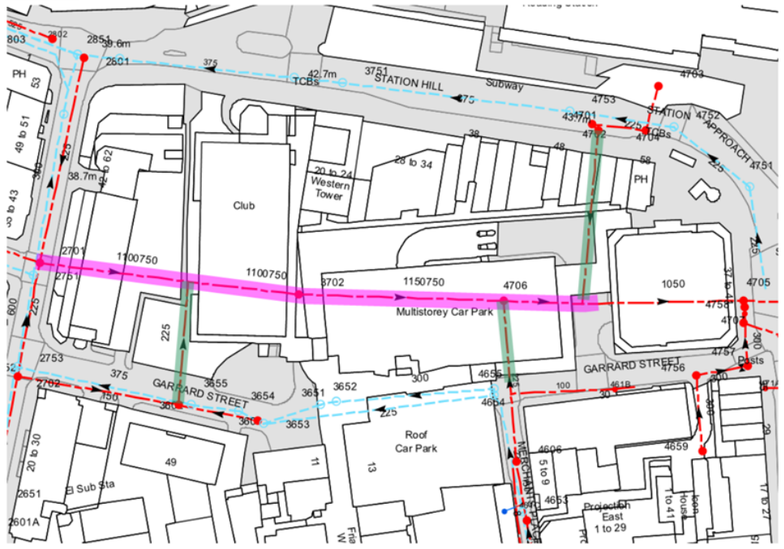


Figure 1 : Map of Thames Water Sewer, Hoare Lea Thames Water Note

2.2. Site History

Historical Ordnance Survey maps were reviewed as part of Ramboll's Phase I Desk Study Report (ref. 1620004716-SHR-RAM-GE-002-Desk Study, 2018) and have been summarised below. An aerial view of the site prior to demolition is shown in Figure 2 below.

Historical maps date back to 1879, when the north site was predominantly fields, with a timber yard in the north west corner and terraced housing to the south of this. Livery stables were located in the far north-east of the site and extending off-site further east. Railway lines and Reading train station were shown to the north, with an embankment along the northern boundary indicating that the site level was lower than that of the rail land to the north.

The 1900 map showed a circular feature potentially a pond or lake covering the centre and majority of the Station Hill north site.

By 1957, a garage was located in the south east of the North Site. The terraced housing was still present in the south west and a factory in the north west. On the 1962 map, the north of the site was shown to be used for car parking. By 1968, a ballroom had been constructed in the centre of the site and western tower and associated retail parade in the north east of the site. A bus station was shown in the south west of the site and a furniture factory in the north west. By 1973, the garage had been demolished and by 1979, the multi-storey car park had been constructed in its place. The terraced housing in the west was also demolished around this time.

During the 1990s, the ballroom was classed as a Club and an office building (Xafinity House) was constructed in the west of the site, which is still present today.

A site visit undertaken by Watermans in 2013 described the former ballroom / Club as a Mecca Bingo Hall at this time, which contained two tanks and a switch room.

By 2019, the former ballroom/bingo hall, Western Tower and the retail parade had been demolished. Xafinity House in the west and the NCP multi-storey car park in the south east are still present on site and are set to be demolished at a later stage.

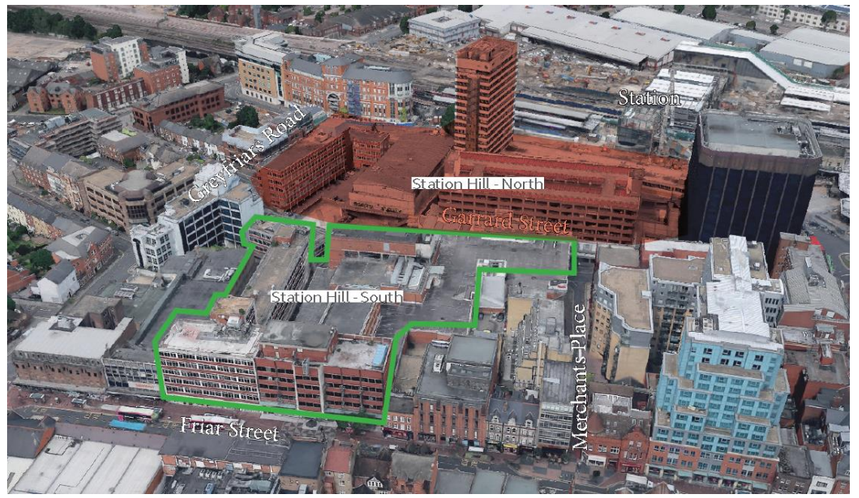


Figure 2 : An aerial view of the North Site (shaded red) prior to demolition (Source: Google)

2.3. Proposed Development

The Station Hill North Site is located directly opposite Reading train station and occupies approximately 2.6 hectares (six and a half acres).

The planning application for the site includes for the demolition of all previous buildings to allow for the construction of a mixed-use, sustainable development, offering new homes, a hotel, flexible high-tech office space, along with central open community space.

The North Site master plan currently comprises a site wide podium and five building plots, split into two development phases:

- Phase 3 comprises Block A, B and D (residential) and Block C (commercial) in the west.
- Phase 2 comprises Block G in the east (commercial).
- Phase 1 of the development is classed as Station Hill South Site and is discussed in a separate report.

Car parking will be provided within the podium with a maximum of 835 spaces provided. The buildings range in height from a minimum of 62m AOD to a maximum of 163m AOD and would rise up from the Plaza level. The Plaza level is the principal area of public realm across the North Site providing level access from Reading train station through to Friar Street. The Plaza level would sit on top of the underlying podium.

A basement for car parking and plant rooms is currently proposed to the north of the Thames Water Main in Phase 3 of the development (the west of the site). The exact design details of the basement are still to be finalised but there are no proposals for basement to be constructed beneath Phase 2 of the development (the east of the site).

The proposed substructure is anticipated to comprise piled foundations and a retaining wall. The retaining wall type is still to be finalised.

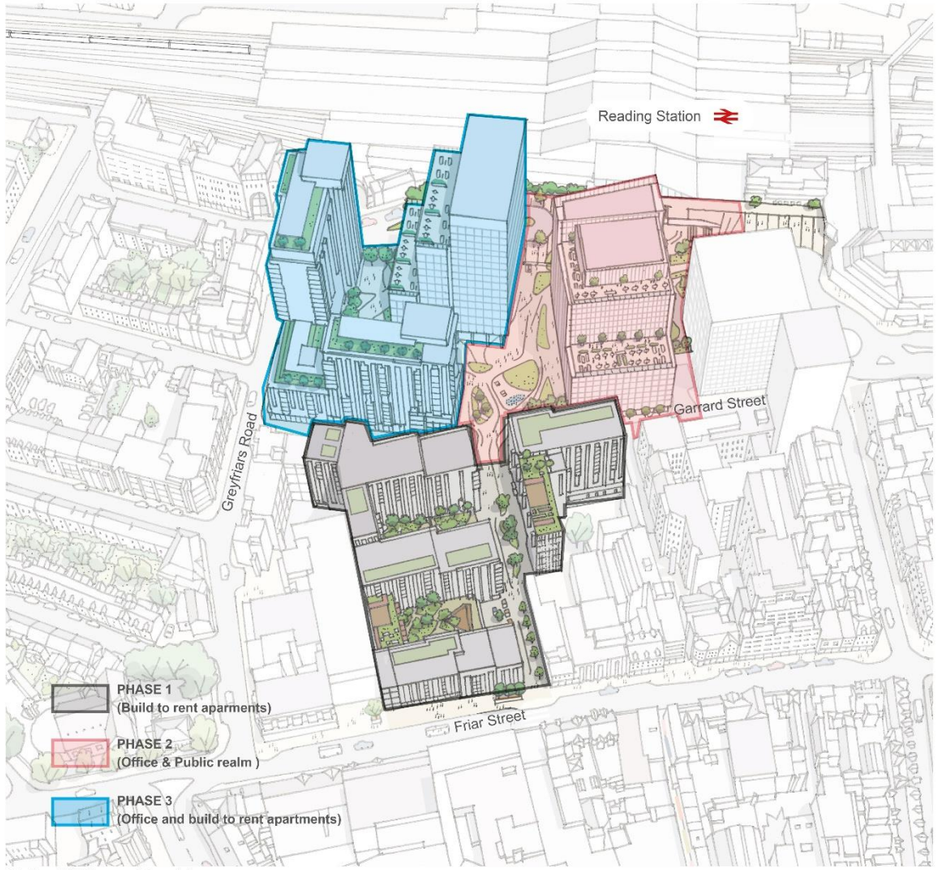


Figure 3*: A Drawing of the Proposed Development (Source: MGT)*

3. PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary Conceptual Site Model (CSM) is a simplified representation of the environmental conditions at the site, and in the vicinity of the site, and is used to identify potentially sensitive receptors and potential pollutant linkages. Information obtained during the ground investigation, described in the following sections of this report, is then used to refine and update this preliminary CSM. The information provided in the preliminary Conceptual Site Model is based on Ramboll's Phase I Desk Study and is summarised in Table 3.1.

Table 3.1: Preliminary Conceptual Site Model

Potential Sources of Contamination

On Site

The desk study report identified a number of sources of potential contamination, including current and former land uses at the site and in the surrounding area.

Historical sources include the former garage in the location of the present-day multi-storey car park, with a tank shown adjacent to the north west corner of the garage on 1968 mapping. The historical data report from Envirocheck identified potentially fuel related tanks on site, in close proximity to the former garage. Underground tanks may also have been present. A timber yard is shown to be present in the north west corner of the site on 1879 mapping. A bus station was constructed in the early 1960s in the centre of the North Site and a furniture factory in the north west.

A site visit undertaken by Watermans in 2013 described the former ballroom / Club as a Mecca Bingo Hall at this time, which reportedly contained two tanks and a switch room.

Three electrical sub-stations were noted during the site walkover, in the north west of the site and one in the south of the site and asbestos is known to be present within the Made Ground on site (from results of a previous ground investigation). Demolition rubble from the recently demolished buildings has been spread across the site and the excess stockpiled in the centre.

Surrounding Area

A review of the surrounding area's history highlighted industrial land use within 100m of the site.

The Great Western Railway runs parallel to the wider site boundary approximately 60m north, since the late 1870s. On the 1879 mapping, a coal yard was present to the south of Garrard Street, within the south site boundary. Garages were situated approximately 90m southwest and 50m southeast of the site by 1957. Engineering works were identified on the historical maps to the northwest and north of the site. Four electrical sub-stations were also identified within approximately 80m of the site.

Historical Building Plans Information identified three underground fuel tanks and oil storage within 100m south of the site.

Geology

The geology comprises Made Ground of varying thicknesses over superficial deposits of Alluvium and the Taplow Gravel Formation, underlain by the Upper Chalk Formation. The upper layers of the Chalk comprise variable and significant thicknesses of Structureless Chalk.

Hydrogeology

Shallow groundwater is anticipated within the Alluvium, Taplow Gravel Formation, and Upper Chalk Formation. Isolated perched groundwater may also be present within the Made Ground.

The Made Ground is classified as an Unproductive Strata, with the Environment Agency classifying the Alluvium and Taplow Gravel Formation as Secondary A Aquifers and the Upper Chalk Formation as a Principal Aquifer. The site is not located within a Source Protection Zone (I, II, III). Groundwater is expected to be in hydraulic continuity with the River Thames and flow direction could be expected broadly to the north-east or east.

There is one groundwater abstraction recorded within 250 m of the site, at approximately 140m south west, associated with Primark and used for drinking, cleaning and washing.

Hydrology

Table 3.1: Preliminary Conceptual Site Model

The nearest surface water feature is a drain approximately 320 m northwest of the site, associated with the railway line. Followed by the easterly flowing River Thames which, at its closest point, lies approximately 420 m northeast of the site. The River Kennet is located approximately 500 m southeast of the site and also flows in an easterly direction.

Potential Receptors to Contamination			**Receptor Present?**
Human Health	On-site	Future site users in a mixed residential and commercial setting.	Yes
	Off-site	The site is surrounded by predominantly commercial properties and railway land.	Yes
Water Environment	On-site	The site is underlain by alluvium and gravels which are classified as Secondary A Aquifers and the underlying Chalk which is a Principal Aquifer.	Yes
	Off-site	The surrounding area is underlain by alluvium and gravels which are classified as Secondary A Aquifers and the underlying Chalk which is a Principal Aquifer.	Yes
		Surface Water: The nearest surface water feature is reportedly a drain approximately 320m northwest of the site, followed by the River Thames at 420 m north east.	Yes
Ecological Receptors	On-site	There are no statutory designated ecologically sensitive sites present on-site.	No
	Off-site	There are no statutory designated ecologically sensitive sites present within 250m of the site.	No
Built Environment	On-site	The intended end-use of the site is mixed commercial and residential.	Yes

Potential Sources	**Pathways**
Made Ground relating to historical development (For example, heavy metals and hydrocarbons relating to the former garage)	• Direct contact, ingestion or inhalation of soil bound contaminants / dust or contaminated groundwater. • Leaching of contaminants. • Migration of impacted perched groundwater.
Potential asbestos in Made Ground	• Inhalation of fibres.
Potential ground gases and vapours	• Inhalation of ground gases. • Migration of ground gases through the ground or service routes. • Build-up of explosive and / or asphyxiating gases / depleted oxygen.
Substations	• Direct contact with soils and groundwater containing PCBs.

The site investigation strategy was designed to assess the geotechnical setting of the site and identify key potential contamination sources identified in the preliminary Conceptual Site Model. The following sections describe the site investigation strategy, the results of laboratory chemical analysis and a qualitative source-pathway-receptor risk assessment; the revised conceptual model is then presented in Section 10 which discusses the identified sources, receptors and any remaining pathway linkages.

4. GROUND INVESTIGATION

4.1. Rationale and Design Philosophy

A ground investigation was designed and specified by Ramboll UK based on the Geotechnical and Geoenvironmental Desk Study (2018). The ground investigation was designed to assess ground conditions, Geotechnical Design Parameters for substructure design and uncertainty with respect to ground based geotechnical risks, and soil and groundwater contamination.

Due to the ground investigation being undertaken prior to demolition of all buildings, the investigation was limited by access restrictions where the multi-storey car park is located on the footprint of the former garage and in the west where Xafinity House is situated. However, Ramboll considers appropriate assessment of these areas has been undertaken to provide a broad understanding of potential significant land contamination risks. As is standard, further assessment is recommended in these areas when access permits. This is likely to be during demolition and when a watching brief can be undertaken.

The locations of the exploratory holes were chosen to provide both representative coverage of the site as far as possible, target potential sources of contamination and assess the ground conditions beneath each of the proposed new buildings.

The ground investigation was undertaken in general accordance with the following codes and standards:

- BS EN 1997-1:2004 Eurocode 7: Geotechnical Design – Part 1: General Rules (BSI, 2004);
- BS EN 1997-2:2007 Eurocode 7: Geotechnical Design – Part 2: Ground Investigation and Testing (BSI, 2007);
- BS 1377-1:2016 Methods of Test for Soils for Civil Engineering Purposes (BSI, 2016)
- BS EN ISO 22475-1:2006 Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1 Technical principles for execution (BSI, 2006); and,
- BS 5930:2015 + Amendment A1: 2015 Code of Practice for Site Investigation (BSI, 2015).

4.2. Summary of Ground Investigation Works

The fieldwork was undertaken between 8th May and 18th June 2019. The fieldwork was completed by Geotechnical Engineering Limited (GEL) and Ramboll carried out regular site visits throughout the works. The exploratory holes were logged and sampled for geotechnical and chemical testing by GEL.

The ground investigation comprised the following scope of works:

- prior to intrusive works, GEL undertook below ground utility service clearance at all exploratory hole locations. Service plans including plans for the Thames Water sewer running beneath the site were provided. A preliminary UXO risk assessment undertaken by 1st Line Defence classified the risk level as 'minimal' therefore no further actions were undertaken with regards with UXO;
- where possible, all exploratory locations were hand-dug to approximately 1.2 m bgl in advance of drilling;
- five rotary boreholes extending into the chalk (BH201-BH205);
- five windowless sample boreholes were undertaken (WS201-WS204, and WS211 which was undertaken in place of trial pit TP211 due to access restrictions);
- seven trial pits were excavated to a maximum depth of 4 m bgl;
- nine 50 mm ground gas and groundwater monitoring standpipes were installed in boreholes and window sample boreholes;
- in situ geotechnical testing within the exploratory holes;
- targeted soil samples were taken from each exploratory hole location and screened on-site using a hand-held PID for the presence of VOCs;
- selected soil samples were analysed for a predetermined suite of contaminants, designed to be reflective of the site's historic uses; and
- six rounds of ground gas monitoring were undertaken on the 28th June, 3rd July, 10th July, 18th/19th July, 26th July and 22nd August using a portable gas analyser from nine locations. These were taken over an approximately three-month period in accordance CIRIA C665. A hand-held PID was also used to measure VOCs in the monitoring wells during the monitoring round.

4.2.1. Exploratory Holes

The five rotary boreholes were excavated to a maximum depth of 40.5 m, as detailed in the Factual Report on Ground Investigation compiled by GEL.

During the ground investigation concrete, at times reinforced, was encountered in various locations, and in particular within areas subjected to previously demolition works. The depth of the concrete obstructions was not proven. Borehole locations were relocated numerous times due to such obstructions.

The borehole and window sample positions and coordinates are shown on the exploratory hole location plan in Drawing SHRN-RAM-SW-ZZ-DR-S-0070. Exploratory hole details are summarised in Table 4.1, specifying the type of boreholes, scheduled depths and achieved depths. Further information regarding the descriptions of strata encountered and comments on the groundwater conditions are given in the borehole records in the GEL Final Factual Report, August 2019.

Table 4.1: Summary of Exploratory Boreholes

Hole ID	Type	Scheduled Depth (m bgl)	Achieved Depth (m bgl)
BH201	RC	35.00	35.50
BH202D	RC	40.00	40.50
BH203	RC	30.00	40.50
BH204	RC	40.00	40.00
BH205C	RC	37.00	38.00
WS201	WS	6.00	1.10
WS202	WS	6.00	6.45
WS203	WS	6.00	5.45
WS204	WS	6.00	0.35
WS211	WS	6.00	1.07
TP202	TP	4.00	1.50
TP203	TP	4.00	4.30
TP204	TP	4.00	0.65
TP205	TP	4.00	3.00
TP206	TP	4.00	2.50
TP208	TP	4.00	2.20
TP209	TP	4.00	2.90

4.2.2. Monitoring Well Installation

Five boreholes and three of the window samples (WS201, WS202 and WS203) were completed as gas and groundwater monitoring wells with 50mm ID diameter HDPE slotted pipe set in a gravel

filter pack with a plain pipe bentonite pellet seal above and below. Table 4.2: Summary of Monitoring Installations

Table 4.2: Summary of Monitoring Installations

Borehole ID	Installation Type	Response Zone (m bgl)	Ground Level (m AOD)	Response Zone (m OD)	Stratum at Response Zone
BH201	50mm Gas/Groundwater Monitoring Standpipe	11.00 - 12.00	38.30	+27.30 – +26.30	Structured Chalk
BH202D	50mm Gas/Groundwater Monitoring Standpipe	6.00 – 7.00	39.20	+33.20 - +32.20	Taplow Gravels
BH203	50mm Gas/Groundwater Monitoring Standpipe	11.00 – 12.00	38.75	+27.75 - +26.75	Structureless Chalk
BH204	50mm Gas/Groundwater Monitoring Standpipe	3.00 - 4.00	39.50	+43.35 - +42.35	Made Ground
BH205C	50mm Gas/Groundwater Monitoring Standpipe	8.10 - 9.10	38.35	+30.25 - +29.25	Taplow Gravels/ Structureless Chalk
WS201	50mm Gas/Groundwater Monitoring Standpipe	0.25 - 1.10	40.80	+40.55 – +39.70	Made Ground
WS202	50mm Gas/Groundwater Monitoring Standpipe	1.80 - 6.45	38.65	+36.85 – +32.20	Alluvium and Taplow Gravels
WS203	50mm Gas/Groundwater Monitoring Standpipe	2.30 - 5.45	39.05	+36.75 - +33.60	Made Ground / Taplow Gravels

4.3. Sampling and in situ Testing

Representative soil samples were recovered from all strata encountered in rotary boreholes for laboratory geotechnical and contamination testing to enable preliminary classification and assessment of the engineering properties of the strata beneath the site.

Standard penetration tests (SPTs) were carried out in accordance with BS EN ISO 22476-3 (2005) at regular intervals through the depth of all boreholes.

4.4. Geotechnical Laboratory Testing

The samples collected from the exploratory holes were scheduled by Ramboll for geotechnical and chemical testing. The testing was carried out in accordance with BS 1377 (1990/2018) unless otherwise stated and is summarised in Table 4.3.

Table 4.3: Geotechnical Lab Tests Completed

Test Method	Quantity	Accredited Test
Water Content	34	Yes
Liquid & Plastic Limits	16	Yes
Liquid (Casagrande Method) & Plastic Limits	1	No
Saturation Moisture Content	16	Yes
Linear Shrinkage	4	No
Particle Density - Pycnometer	17	Yes
Particle Size Distribution -Wet Sieve	15	Yes
Particle Size Distribution -Pipette	6	Yes
Water Content of Rock (Subcontracted)	18	Yes
Uniaxial Compressive Strength of Rock	2	Yes
Point Load Strength Test	115	Yes
pH (Subcontracted)	21	Yes
Organic Matter Content (Subcontracted)	16	Yes

4.5. Geo-Environmental Sampling and Monitoring

4.5.1. Soil Samples

Soil samples were taken from each of the exploratory locations, across all strata in general accordance with BS 10175:2011+A1:2013 and were stored within appropriate sample containers and forwarded to an independent MCERTS accredited analytical laboratory by GEL. Selected soil samples were tested on-site for the presence of volatile organic compounds (VOCs) using a photo-ionisation detector (PID). The PID screens for a wide range of VOCs but does not indicate a specific compound; therefore, the results of the PID screening provide a semi-quantitative indication of the concentration of VOCs present in soil pore spaces.

4.5.2. Groundwater Monitoring and Sampling

Six groundwater samples (BH201, BH202D, BH203, BH204, BH205C and WS203) were taken on 4th July 2019 and an additional sample (WS202) was taken on 10th July. All groundwater samples were scheduled for chemical analysis to compliment the soils suite.

Following the first groundwater sampling round, two additional rounds were undertaken in September and October 2019 at WS203 and BH204 only. The sampling was undertaken to further characterise the groundwater regime at these locations and is discussed in Section 8. The samples were scheduled for Total Petroleum Hydrocarbon (TPH) and Polycyclic Aromatic Hydrocarbons (PAHs) analysis only, as detailed in Table 4.4 below.

4.5.3. Ground Gas Monitoring

Ground gas monitoring was completed using a calibrated GFM 435 instrument with reference to CIRIA C665 and BS 8576:2013 Guidance on Investigations for Ground Gas. The following parameters were monitored:

- Methane (% by volume)
- Carbon dioxide (% by volume)
- Oxygen (% by volume)
- Flow rate (litres/hour)

A PID was also used to measure VOCs (in parts per million by volume) in the installed monitoring wells. The results of the ground gas monitoring are discussed in further detail in Section 9.

4.6. Geo-Environmental Laboratory Analysis

4.6.1. Analytical Rationale

Table 4.4 summarises the analytical schedule for soil and groundwater samples together with the rationale for analysis.

Table 4.4: Summary of Analytical Strategy

Analytical Suite	Rationale	No. of soil samples scheduled	No. groundwater samples scheduled	No. additional groundwater samples[1]
Metals (arsenic, boron, cadmium, trivalent chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc)	Typically associated with brownfield sites historically used for industrial purposes.	50	7	-
Phenols	Typically associated with industrial site uses.	50	7	-
Cyanide	Typically associated with historical industrial sites and brownfield land.	50	7	-
Polycyclic Aromatic Hydrocarbons (PAHs)	Typically associated with fuels and oils, combustion products and heavy end hydrocarbons such as tars.	50	7	4
Total Petroleum Hydrocarbons Carbon Working Group (TPH CWG) including MTBE and BTEX	Typically associated with fuels and oils.	50	7	4
Volatile Organic Compounds (VOCs)	Typically associated with solvents and	14	2	-
Semi-Volatile Organic Compounds (SVOCs)	sometimes with fuels and oils.	14	2	-
Polychlorinated biphenyls (PCBs)	Typically associated with older electrical equipment.	13	2	-
Asbestos	Typically associated with brownfield sites / Made Ground.	24	-	-

Notes:

[1] Samples obtained during additional scope of works in September and October 2019.

4.6.2. Data Quality Assurance

The laboratory selected by GEL to perform the analysis is accredited by UKAS to ISO 17025 and MCerts standards. Internal quality assurance checks are carried out by the laboratory data prior to the laboratory certificates being issued.

5. GROUND CONDITIONS

5.1. General

The ground conditions encountered beneath the site based on the previous Ground Investigations and the exploratory holes undertaken during the 2019 GEL Ground Investigation is presented in this chapter. A summary of the previous investigations that have been undertaken on or surrounding the site are listed in Table 5.1.

Table 5.1: Summary of Previous Ground Investigation Reports

Project	Site Investigation Contractor	Date
Station Hill, South Site	Geotechnical Engineering Limited	February 2019
Station Hill, Reading	ST Consult	May 2014
Thames Tower	Concept	July 2012

The relevant information from these reports was reviewed as part of the Geotechnical and Geoenvironmental Desk Study and has been used to supplement the information obtained from the recent Ground Investigation to inform this report.

Ground levels vary between approximately 38 m AOD at Garrard Street in the south and generally 40 m AOD at Station Hill in the north. The stratigraphic succession identified during the recent investigation confirms the general ground profile indicated from the previous borehole records.

A summary of the general succession of strata encountered during the investigation is presented in Table 5.2.

Table 5.2: Summary of Ground Conditions

Stratum	Level at Top of Stratum (m OD)		Thickness (m)		Exploratory Holes where Stratum Encountered
	Range	Average	Range	Average	
Made Ground	+38.05 - +40.6	+39.55	1 – 5.6	3.3	ALL
Alluvium	+32.75 - +36.9	+34.825	0.6 – 1.9	1.25	BH201, BH202D, BH203, WS202
Taplow Gravels	+32.15 - +36.20	+34.175	0.4 – 4.9	2.65	BH201, BH202D, BH203, BH205C, WS202 and WS203
Upper Chalk (Structureless)	+30.20 - +35.2	+32.7	0.35 – 11.2	9.26	BH201, BH202, BH203, BH204 and BH205
Upper Chalk (Structured)	+21.2 - +30.95	+26.075	>21.2 (Unproven)	(Unproven)	BH201, BH202, BH203, BH204 and BH205

An exploratory hole location plan and geological cross-sections are provided in Drawings SHRN-RAM-SW-ZZ-DR-S-0070 to SHRN-RAM-SW-ZZ-DR-S-0072.

5.2. Surfacing

The surfacing across the site comprises predominantly asphalt around the multi-storey car park and Xafinity House in the west. The maximum thickness of asphalt is recorded as 0.2m in several locations.

A layer of "crush" from the previously demolished buildings covered the majority of the centre of the site. A 4m high stockpile of this crushed material was also present in the centre of the site at the time of the ground investigation.

5.3. Made Ground

Made Ground was encountered within all exploratory holes across the north site. The Made Ground was found to be highly variable in nature, reference should be made to the fieldwork records for detailed descriptions of the materials encountered.

The Made Ground generally comprises 'crushed material' from the demolished ballroom/bingo hall, described as light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone gravel. Concrete slabs were encountered beneath the crushed material in several locations. The maximum thickness of concrete is recorded as 0.3m in BH205C, within BH204 a concrete slab 50mm thick below a tarmacadam layer was encountered. A 50mm concrete slab was also encountered below a tarmacadam layer within BH204, and an additional 200mm layer of concrete at 0.4m depth.

WS203 was excavated in the location of the former tank shown on historical mapping. It is not known whether this was a below or above ground storage tank (associated with the former garage). No evidence of a UST (underground storage tank) was encountered and no significant visual or olfactory evidence of contamination was noted.

5.3.1. Classification

8no. particle size distribution tests were carried out on Made Ground samples, as given in Data Plot A1.1. The results indicate that the samples contained quite uniform composition of particles, with generally a large portion attributed to gravel (32-80%), a smaller portion of sand (16-47%) and little silt / clay content (2-17%).

Atterberg limit tests were conducted on 5no. samples taken from cohesive portions of the Made Ground in BH201, BH203, BH205C and WS203 and revealed an average plastic limit of 23%, a liquid limit of 40.6% and the plasticity index is 14%. As illustrated in Data Plot A1.2, the result indicates that the material comprises clay of low plasticity. The variation in plasticity index and liquid limit suggest a low volume change potential in accordance with the NHBC Standards.

The bulk density has been assumed on the basis of the material types encountered, typical published values for such materials provided in guidance BS8002:2015 and based on Ramboll's experience of similar materials. A value of 19kN/m^3 is recommended for design.

5.3.2. *In situ* Testing

20no. Standard Penetration Tests (SPTs) were carried out within the Made Ground, with the uncorrected SPT N values obtained ranging between 3 and 56. The results of the SPTs are plotted in Data Plot A1.3, where the uncorrected N values greater than 50 were extrapolated using the technique recommended in CIRIA Report 143. Two tests were excluded which were influenced by encountering concrete giving a very high extrapolated value. The corrected N60 values, taking account of the hammer energy ratio, range between 3 and 58 with an average of 20. The (N1)60 values range between 3 and 71, with an average of 23. The corrected SPT values are plotted in Data Plot A1.4. A conservative characteristic value of 10 is recommended.

5.3.3. Drained Shear Strength Parameters

The SPT $(N_1)_{60}$ results can be used to estimate the internal angle of shearing resistance and the stiffness of the Made Ground. Subject to empirical relationships between the corrected SPT N value and angle of shearing resistance for granular material (Wolff, 1989), the angle of shearing resistance, Ø', using a conservative characteristic SPT $(N_1)_{60}$ value of 10 for granular material is approximately 30°. However, the variability and inconsistency of the Made Ground, means that this should not be relied upon to provide significant support to foundations without benefit of prior improvement. Due to this it is recommended that the Made Ground be removed or improved if it is to be used as a founding material.

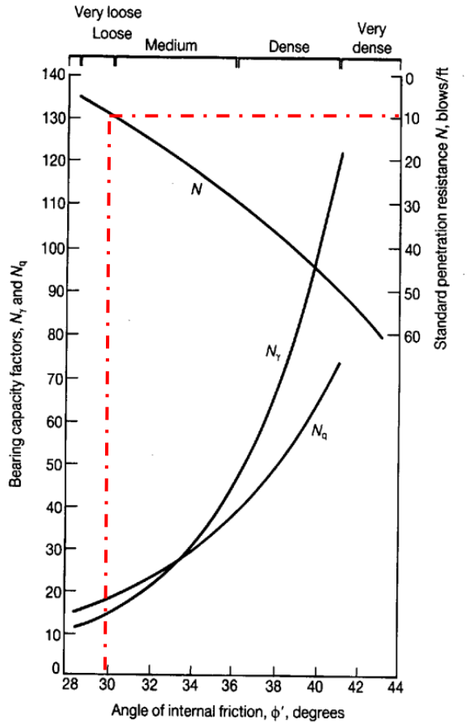


Figure 4: Relationship between NSPT value and Angle of internal friction. Taken from CIRIA 143

5.3.4. Stiffness

The stiffness properties of the Made Ground have been estimated according to Stroud (1989) (as reported in CIRIA 143). Stroud (1989) suggests that for normally consolidated granular deposits a reasonable approximation can be made to estimate the vertical drained stiffness E' from *in situ* SPT N tests using the relationship E'/N=1MN/m^2. Therefore, for a corrected SPT N=10, it is recommended that;

$$E' \text{ (MPa)} = 10\text{MN/m}^2$$

5.3.5. Summary of Parameters for Made Ground

The range of measured and characteristic soil parameters for the Made Ground are summarised in Table 5.3.

Table 5.3: Summary of Geotechnical Parameters for Made Ground

Soil Parameters	Unit	Range	Characteristic Value	Reference
Level at Top of Stratum	m AOD	+38.05 – +40.6	+38.5	Exploratory hole logs from all GIs
Thickness	m	1 – 5.6	2.5	Exploratory hole logs from all GIs
Bulk Density	kN/m^3	-	19	Assumed
SPT $(N_1)_{60}$ value	-	3 - 71	10	Corrected *in situ* tests
Angle of Shearing Resistance	degrees	-	25	Based on Ramboll's experience and considering inherent variability of this stratum
Drained Stiffness	MN/m^2	2 – 60+	10	Correlation with CIRIA C143 and considering inherent variability of this stratum

5.4. Alluvium and Taplow Gravels

The Alluvium and Taplow Gravels are discontinuous across the north site with the Alluvium as shown in Table 5.2.

The Alluvium is generally described as stiff light greenish grey slightly sandy silty clay, with the gravel being subangular and subrounded with fine and medium chalk and flint gravel.

The Taplow Gravel is described as orangish brown clayey gravelly sand or sandy gravel. Gravel comprises subangular and subrounded fine to coarse flint and chalk gravel.

Photograph 1: Alluvium and Taplow Gravel in BH202D (Source: GEL Factual Report 35248)



5.4.1. Classification

4no. particle size distribution tests were carried out on the Taplow Gravel as given in Data Plot A1.5. The results indicate that the samples contained predominately gravel (65-82%), a smaller portion of sand (10-30%) and a minor portion of silt/ clay (1 to 5%).

The average Natural Moisture Content measured of 5no. Alluvium and Taplow Gravels was 19.5% and 17% for the Alluvium and Taplow Gravel respectively.

The Atterberg limit tests on the Alluvium recorded an average plastic limit of 18%, and an average liquid limit of 39%, resulting in an average plasticity index of 21%. As illustrated in Data Plot A1.6, the results indicate that the sample comprises clay of low plasticity. As can be seen, the moisture content and plastic limit are recorded to be very similar and so the Alluvium may be seen occasionally to be at or near the limit of its plasticity.

The Atterberg limit tests on the more cohesive layers of the Taplow Gravel recorded an average plastic limit of 18.5%, and a liquid limit ranging between 23% and 30%. Resulting in a plasticity index of 8%. As illustrated in Data Plot A1.6, the results indicate that the sample comprises material of very low plasticity.

Organic matter tests were undertaken on 1no. sample from the Alluvium Strata, indicating 0.55% organic matter.

No density tests were undertaken on this stratum, typical published values for such materials provided in guidance BS8002:1994 and based on Ramboll's experience of similar materials have been considered. A value of 20kN/m^3 is recommended for design.

5.4.2. *In situ* Testing

3no. SPTs were carried out within the Alluvium, with the uncorrected SPT N values obtained ranging between 5 and 27. The results of the SPTs are plotted in Data Plot A1.7. The corrected N60 values taking account of the hammer energy ratio range between 5.3 and 27.5 and are plotted in Data Plot A1.8. A design N60 value of 18 is recommended.

17no SPTs were carried out in the Taplow Gravels with uncorrected N values ranging between 4 and 116. The corrected $(N_1)_{60\ values}$ range between 7 and 146. Taking account of the variability of the results a conservative design value of 26 is recommended.

5.4.3. Shear Strength Parameters

Alluvium

The undrained shear strength of the Alluvium can be estimated from the *in situ* SPT testing carried out. The shear strength can be calculated from uncorrected SPT N results using the relationship suggested by Stroud (1989) (as reported in CIRIA 143, 1995) as follows;

$Cu = f_1 \times N$ (kN/m^2)

Where f_1 is a correlation factor that depends on the plasticity of the material, and N is the number of total blows from the *in situ* SPT test. For an average Plasticity Index of 21%, the correlation factor f_1 can be taken to be 5.0 (CIRIA 143, 1995). However, in Ramboll's experience the plasticity index of Alluvium is significantly higher as such an f_1 factor of 4 has been used.

For design purposes the following undrained shear strength profile can therefore be estimated as:

Cu = 72 kN/m^2 (over depth of Alluvium)

Taplow Gravels

The SPT $(N_1)_{60}$ results can be used to estimate the internal angle of shearing resistance and the stiffness of the Taplow Gravels. Subject to empirical relationships between the corrected SPT N value and angle of shearing resistance for granular material (Peck & Stroud, 1989) as seen in Figure 4, the angle of shearing resistance, Ø', using a conservative characteristic SPT $(N_1)_{60}$ value of 26 for granular material is approximately 35°. However, the limited number of tests and the large variability of the results means that this should not be relied upon to provide significant support to foundations without benefit of prior improvement, if it is to be considered as a material to be founded upon/ potential backfill material.

5.4.4. Stiffness

Alluvium

The stiffness response of Alluvium varies according to the direction of stress changes (vertical or horizontal); the period of response (short term - undrained or long term - drained) and the strain level.

Based on literature, case studies and experience of the response of foundations on Alluvium, the following relationships between Young's modulus and undrained shear strength are recommended for foundation design. These factors can be applied to the undrained shear strength design profile detailed in Section 5.4.3.

Table 5.4: Stiffness Parameters for Alluvium

Stiffness	
$E_u = 400C_u$	E_u = 29 MPa
$E' = 0.75E_u$	E' = 22 MPa

Taplow Gravels

Using the relationship described in Section 0 and an $(N_1)_{60\ value}$ of 26 an E' value of 26 MPa is recommended for foundation design.

5.4.5. Summary of parameters for Alluvium and Taplow Gravel

The range of measured and characteristic soil parameters for the soil stratum are summarised in Table 5.5.

Table 5.5: Summary of Geotechnical Parameters for Alluvium

Soil Parameters	Unit	Range	Characteristic Value	Reference
Level at Top of Stratum	m OD	+32.75 - +36.9	+36.0	Exploratory hole logs from all GIs
Thickness	m	0.6 – 1.9	1.0	Exploratory hole logs from all GIs
Bulk Density	kN/m^3	-	20	Assumed
SPT N60 Value	-	5.3 – 27.5	18	*In situ* tests
Undrained Shear Strength	kN/m^2	-	72	*In situ* test results and correlation with CIRIA C143
Stiffness (Foundations)	MN/m^2	-	E_u = 29	Correlations recommended in Foundation Design and construction, *Tomlinson* 2001
		-	E' = 22	

Table 5.6: Summary of Geotechnical Parameters for Taplow Gravels

Soil Parameters	Unit	Range	Characteristic Value	Reference
Level at Top of Stratum	m OD	+32.15 - +36.20	+35.0	Exploratory hole logs from all GIs
Thickness	m	0.4 – 4.9	4.0	Exploratory hole logs from all GIs
Bulk Density	kN/m^3	-	20	Assumed
SPT $(N_1)_{60}$ Value	-	7 – 146	26	*In situ* tests
Angle of shearing Resistance	°	-	35	*In situ* test results and correlation with CIRIA C143
Drained Stiffness	MN/m^2	-	26	Assumed as a linear relationship

5.5. Structureless Chalk

The Structureless Chalk was encountered across the north site in all completed exploratory holes at levels ranging between +30.2m AOD to +35.2m mOD. The Structureless Chalk was encountered at the shallowest level within BH201 and BH202D. The thickness of the unit varied significantly between 0.35 (BH201) and 11.2m (BH204).

The Structureless Chalk has a CIRIA grade of Dm or Dc. The typical description comprises Structureless Chalk composed of white slightly gravelly silt. Gravel is subangular and rounded fine to coarse very weak low to medium density white with frequent black specks chalk, rarely angular fine to coarse flint.

Photograph 2: Structureless Chalk in BH204 (Source: GEL Factual Report 35248)



A contour map of the top of stratum level for the Structureless Chalk is shown in **Figure 5**. In this contour map, both north and south sites are presented, A number of other boreholes are presented in the map including boreholes and window samples from previous ground investigations conducted by GEL in 2018, SI Consult in 2014, and Concept in 2012. These boreholes support the findings of the recent investigation, and as shown, the top of level for the Structureless Chalk varies between +28.9m AOD and +44.92m AOD across the entire Station Hill site.

The Thames Tower boreholes BH01, BH02 and BH03 (undertaken by Concept in 2012) present significant uncertainties regarding the thickness of the layer and the transition towards the more competent Structured Chalk. The descriptions in the borehole logs show layers of Structureless Chalk interbedded with Structured Chalk, as shown in Drawing SHRN-RAM-SW-ZZ-DR-S-0072. The discontinuities encountered may indicate the presence of a dissolution feature; however, the boreholes also show low RQD and generally poor recovery, therefore it may be a function of the drilling.

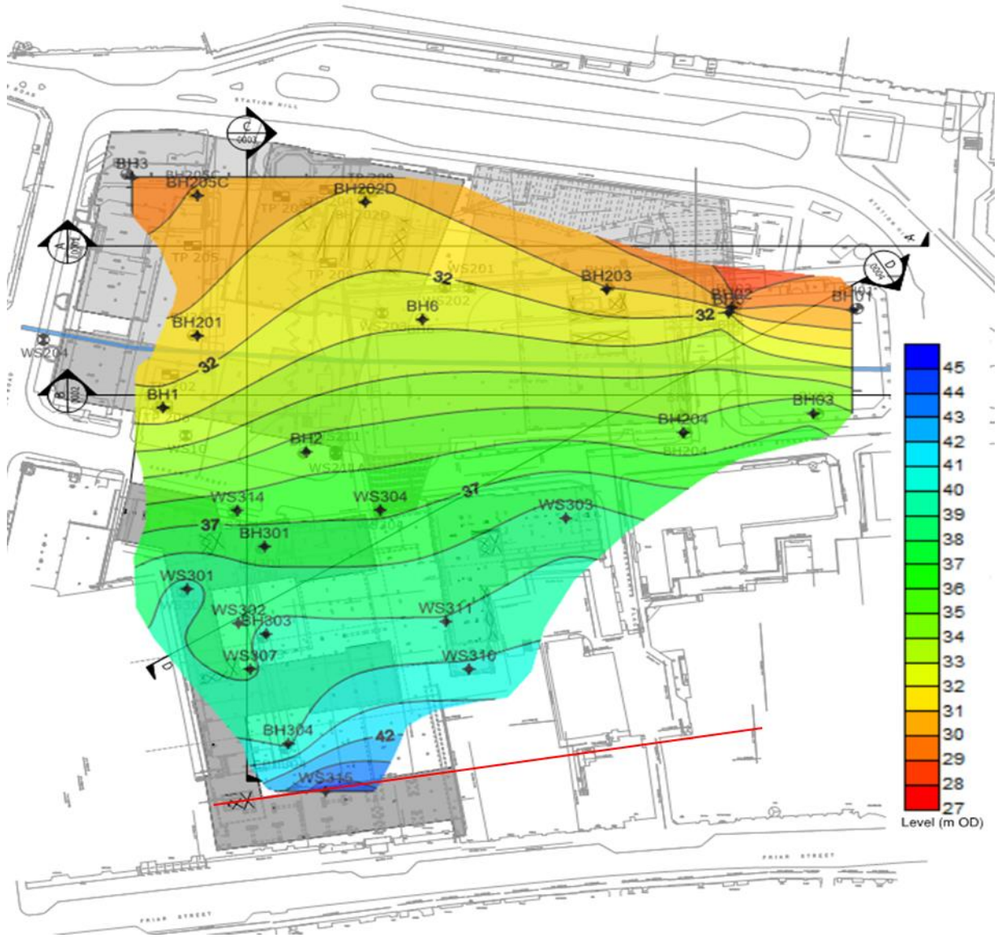


Figure 5: Contour Map showing the level of the Structureless Chalk across the site

5.5.1. Classification

Only 1no. particle size distribution tests was carried out across the Station Hill North site on a sample from the Structureless Chalk as shown in Data Plot A1.9. The results indicate a composition of 48% gravel and sand, and the remaining silt and clay. This has been compared to the PSDs results obtained across the Station Hill South site, and they were found to be similar.

The Natural Moisture Content of the Structureless Chalk was measured 13no. times in a combination of Atterberg Limits tests (8), Saturation Moisture Content tests (4), Water content of Rock (1). The results of which range between 21.7% and 38% with an average value of 27.2%. The results are shown in Data Plot A1.10.

The results of Atterberg limit tests revealed a plastic limit ranging between 22% to 26%, and the liquid limit from 29% to 33%. The plasticity index ranged from 7% to 8%. As illustrated in Data Plot A1.11, the results indicate that the sample comprises, material of very low plasticity. As can be seen, the moisture contents and plastic limits are recorded to be similar and so the Structureless Chalk may be seen occasionally to be at the, or near the, limit of its plasticity.

The bulk density was measured using the Caliper / Buoyancy method and the Saturation Moisture Content tests on 5 no. samples of Structureless Chalk. The results of these tests range between 1.53Mg/m^3 and 2Mg/m^3 with an average of 1.91 Mg/m^3, this can be seen in Data Plot A1.12. 5 No. dry density tests were undertaken between same samples on the Structureless Chalk resulting in a maximum value of 1.62Mg/m^3 and minimum value of 1.52 Mg/m^3 with an average of 1.57 Mg/m^3.

Organic matter tests were undertaken on 1 No. samples from the Structureless Chalk, with result indicating an organic content of 2.9%.

5.5.2. *In situ* Testing

14no. SPTs were carried out within the Structureless Chalk, with the uncorrected SPT N values obtained generally ranging between 13 and 37. The results of the SPTs are plotted in Data Plot A1.13. The corrected N60 values taking account of the hammer energy ratio generally range between 14 and 39 with an average of 26 as shown in Data Plot A1.14. A design N60 value of 25 is recommended.

5.5.3. Unconfined Compressive Strength

Stroud (1989) (as reported in CIRIA 143) suggests that for chalk the unconfined compressive strength can be estimated using the following relationship:

$$\sigma_c = 50\ N_{60.}$$

Using an N60 value of 25 this would equate to an σ_c value of 1.25 Mpa.

Matthews and Clayton (1993) (as reported in CIRIA 574) suggested the relationship proposed in Figure 6 relating dry density and porosity to the unconfined compressive strength.

Using an average dry density value of 1.57 Mg/m3 a Uniaxial Compressive Strength Tests (UCS) of approximately 3 MPa can be observed. This correlates well with the results obtained from the 2no. UCS tests undertaken.

2 No. point load tests were undertaken on samples from the Structureless Chalk strata, applying a correlation factor of 24 as described in Bieniawski (1975) to the point load index value a UCS value can be obtained. This results in a range between 1.92 MPa and 2.64 MPa with an average value of 2.28 MPa.

2no UCS Tests were completed on samples from the Structureless Chalk. These gave UCS values of 3.14MPa and 3.09MPa.

Considering the methods described plotted in Data Plot A1.15 a design UCS value of 2.0 MPa is considered suitable for the chalk fragments which make up the structureless chalk. For the structureless chalk rock mass CIRIA 574 recommends using the following strength parameters:

C′ = 0

Φ′ = 32°

5.5.4. Stiffness

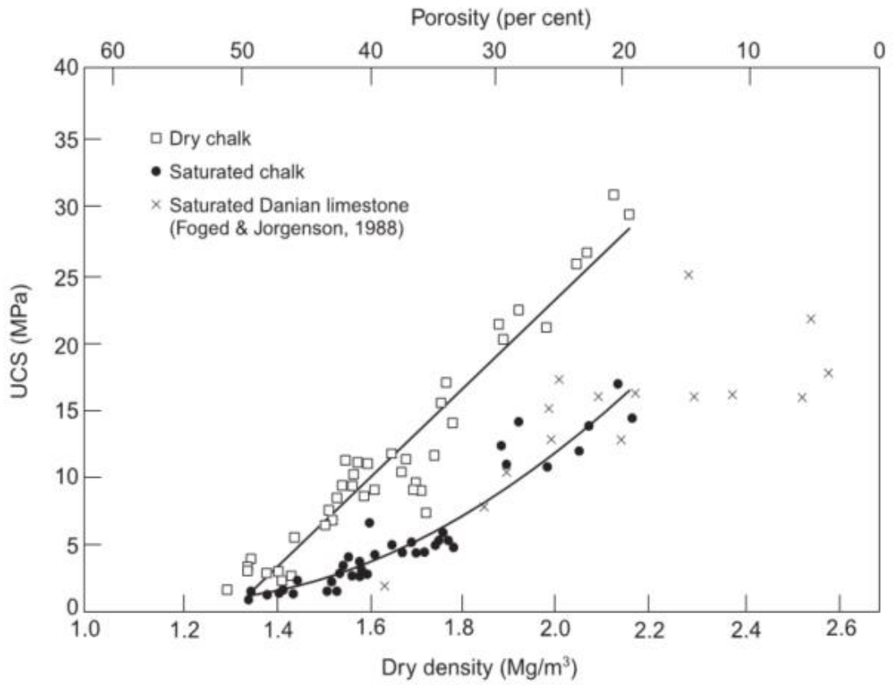


Figure 6: Relationship between unconfined compressive strength and intact dry density

Stroud (1989) (as reported in CIRIA 143) suggests that for chalk deposits a conservative approximation can be made to estimate the drained stiffness E′ for settlement calculations from *in situ* SPT N tests using the relationship E′/N_{60} =5MPa. The results are plotted in Data Plot A1.15, for a corrected SPT N=25 it is recommended that;

$$E' = 125 MN/m^2$$

5.5.5. Summary of Parameters for Structureless Chalk

The range of measured and characteristic soil parameters for the soil stratum are summarised in Table 5.7.

Table 5.7: Summary of Geotechnical Parameters for Structureless Chalk

Soil Parameters	Unit	Range	Characteristic Value	Reference
Level at Top of Stratum	m OD	+30.20 - +35.2	+31.0	Exploratory hole logs from all GIs
Thickness	m	0.35 – 11.2	7.0	Exploratory hole logs from all GIs
Bulk Density	kN/m^3	18.6 – 20.2	18.5	Lab test results
SPT N_{60} value	-	14 – 39	26	Corrected in situ tests
C′	kN/m^2	-	0	CIRIA 574

Soil Parameters	Unit	Range	Characteristic Value	Reference
Effective angle of friction	°	-	32	CIRIA 574
E'	MN/m^2	27 – 471	125	Correlation with CIRIA C143

5.6. Structured Chalk

The Structured Chalk was encountered within all the boreholes, with a top of stratum level ranging between 30.95m mOD and 21.2m mOD. The thickness was unproven. The CIRIA grade present in the structured chalk which comes from a grading scheme based on typical discontinuity spacing is B5, B4, B3, C4, C3, A5. Two fracture sets are present with one predominantly subhorizontal to 20°, and the second set predominately between 45° and 70°. Medium to widely space bands of cobbled sized black nodular flint were encountered.

The typical description consists of very weak medium density white CHALK with frequent black specks and yellowish orange staining.

Photograph 3: Structured Chalk in BH201 (Source: GEL Factual Report 35248)



A contour map of the top of stratum level for the Structured Chalk is shown in **Figure 7**. In this contour map, both north and south sites are presented. A number of other exploratory holes are presented in the map including boreholes and window samples from the previous ground investigations conducted by GEL in 2018, SI Consult in 2014, and Concept in 2012.

The map shows that limited information is available across the site regarding the level of the Structured Chalk. This is due to the ground investigation being undertaken prior to and/or during demolition of the existing buildings, and hence access was therefore limited to certain areas of the site. In particular, the centre of the north site was inaccessible due to the presence of the NCP car park and large stockpile up to approximately 4m in height (and approximately 50m by 20m in plan). Further site investigation is recommended within the centre of the North site and in the South site across Block F to provide further coverage and confirm the level and composition of the Structured Chalk.

As described in Section 5.5, the Thames Tower boreholes (BH01 to BH03 to the east of the North site) show poor recovery resulting in uncertainty regarding the transition between the Structureless and Structured Chalk in this area. The levels of the top of stratum have been interpreted from the SPT values and also from the core photographs and the borehole descriptions, comparing to the neighbouring boreholes from the recent investigation where appropriate. For BH01, the core recovery is generally between 70 - 100%; however, some cores comprise as little as 20% recovery or no recovery. SPT values above 25 are reported from 16m bgl and values greater than 45 from 25m bgl. Recovery in BH02 is reported to be generally above 70%, but this is not consistent with the visual photographs where evidence of poor drilling is apparent. SPT values above 25 are noted below 14.60m bgl and SPT refusals below 22m bgl. The recovery is reported to be between 75-100% in BH03, with a few core runs with lower recovery. SPT's are above 25 below 18m bgl with some refusals below 22.30m bgl. Based on this information and the neighbouring boreholes, interpreted levels have been presented in the contour map. The discontinuities encountered in these boreholes may indicate the presence of a dissolution feature; however, the boreholes show low RQD and generally poor recovery, therefore it may be a function of the drilling.

There is significant uncertainty in the level of the Structured Chalk in this area and the validity of the logs. It is therefore recommended that further investigation is carried out to assess the Chalk at the eastern end of the North site and evaluate the risk of the presence of any potential solution features or variation in geology.

As stated, in the centre of the North site, and on the South site where Block F is planned to be constructed, no boreholes were able to be undertaken due to site constraints. Further site investigation is therefore recommended to confirm the stratigraphy and level of the top of Structured Chalk. Cone penetration testing is likely to be the most efficient method of investigation.

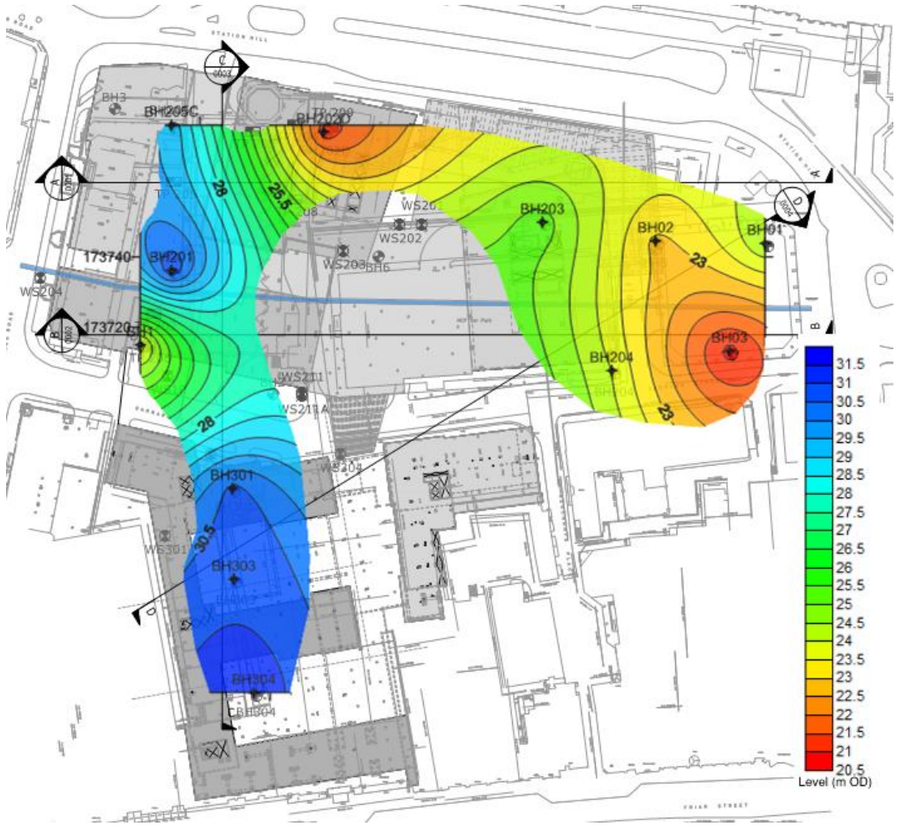


Figure 7: Contour Map showing the level of the Structured Chalk across the site

5.6.1. Classification

No Particle Size distribution tests were undertaken on samples from Structured Chalk; however, 1 no. PSD test was conducted during the south site investigation carried out by GEL in 2018. The results indicated that the sample comprised predominantly gravel (84%) with a 7% sand fraction and 9% silt sized fraction.

The moisture content of the Structured Chalk was measured 57 times in a combination of Atterberg limit tests (4), Saturation Moisture Content tests (15), Rock Water Content tests (18), Caliper / Buoyancy techniques (18) and UCS (2) tests. The results of which ranged from 18% to 29% with an average value of 23.5%, the results are plotted in Data Plot A1.17. The low plasticity of the samples are shown in Data Plot A1.18, with the liquid limit ranging between 28% to 32% and the plastic limit between 21% and 23% leading to a plastic index of 8%.

The bulk density was measured as part of the Uniaxial Compressive Strength test on 2 no. samples of Structured Chalk. It was also measured as part of measuring the saturation moisture content of 15 No. samples. The results of these tests range between 19kN/m^3 and 20.2kN/m^3 with an average of 19.6 kN/m^3, this can be seen in Data Plot A1.19. 17 No. dry density tests were undertaken on the structured chalk resulting in a maximum value of 1.79Mg/m^3 and minimum value of 1.46 Mg/m^3 with an average of 1.63 Mg/m^3.

11no. Loss on ignition tests were undertaken on the Structured Chalk strata and the resultant organic matter ranges between 7 and 22%.

5.6.2. In situ Testing

85 No. SPT's were carried out in the Structured Chalk with the uncorrected SPT N values obtained ranging between 13 and 375 when extrapolated. The results of the SPTs are plotted in Data Plot A1.20. The corrected N60 values taking account of the hammer energy ratio range between 20 and 413 and are plotted in Data Plot A1.20. The following N60 design line is recommended:

N = 45+8z (where z is depth below +24 mOD)

N = 200 (below +4 mOD)

5.6.3. Strength Parameters

Using the NSPT relationship from Stroud (1989) the unconfined compressive strength for the Structured Chalk can be estimated to be:

UCS (MPa) = 2.25 +0.4z (where z is depth below +24 mOD)

UCS (MPa) = 10 (below +4 mOD)

Using the relationship proposed by Matthews and Clayton (1993) using an average dry density of 1.57 kN/m^3 a UCS of approximately 3 MPa can be assessed.

85 No. point load tests were undertaken on samples from the Structured Chalk strata applying a correlation factor of 24 as described in Bieniawski (1975) to the point load index value. A UCS value can be obtained. This results range between 0.48 MPa and 11.04 MPa with an average value of 5.7 MPa. There is no observable trend with depth for the point load tests.

2no Uniaxial Compressive Strength Tests were completed on samples from the Structured Chalk. These gave UCS values of 2.1MPa and 2.85 MPa.

The UCS test results and derived UCS values using different methodologies are plotted in Data Plot A1.21. Considering the methods described a design UCS value of 2.5 MPa is considered suitable.

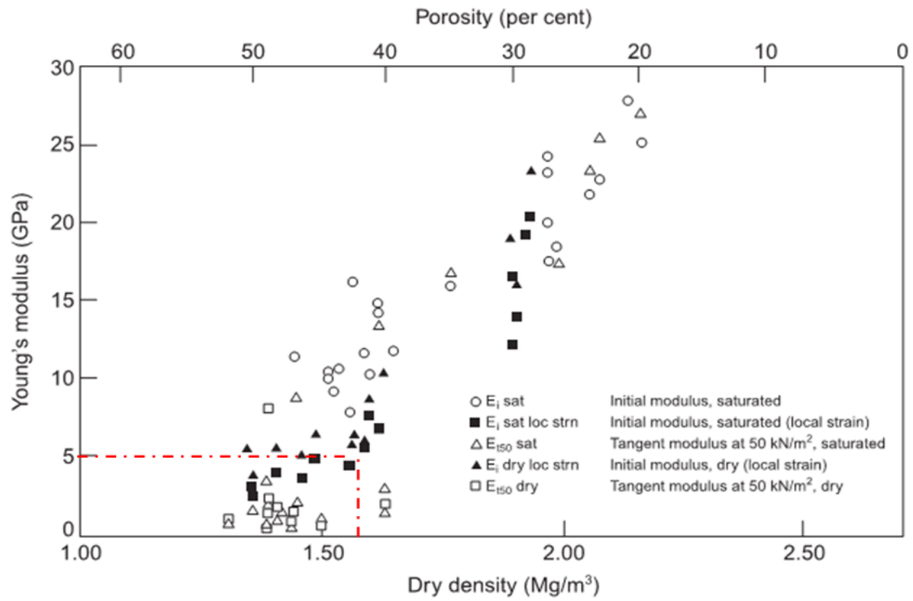


Figure 8: Relationship between dry density and porosity to Intact Youngs Modulus (Matthews and Clayton 1993). CIRIA 574.

5.6.4. Stiffness

Stroud (1989) suggests that for chalk deposits a conservative approximation can be made to estimate the drained stiffness (E') for settlement calculations from in situ SPT N tests using the relationship.

E'/N60 =5MPa.

Therefore, using the design line suggested in Section 5.6.2 it is recommended that;

E' (MPa) = 225+40z (where z is depth below +24 mOD).

E' (MPa) = 1000 (below +4 mOD).

A relationship relating porosity and dry density to the intact Youngs Modulus is detailed in Matthews and Clayton (1993) and replicated in Figure 8. Using an average dry density of 1.63Mg/m^3 an intact Youngs Modulus of approximately 5 GPa can be observed.

CIRIA 574 recommends the following parameters for structured chalk depending on the type of the analysis to be conducted:

Moderately conservative

C' =20 kN/m^2

Φ' = 39^o

Worst Credible

C' =0 kN/m^2

Φ' = 34^o

5.6.5. Summary of Parameters for Structured Chalk

The range of measured and characteristic soil parameters for the soil stratum are summarised in Table 5.8 below.

Table 5.8: Summary of Geotechnical Parameters for Structured Chalk

Soil Parameters	Unit	Range	Characteristic Value	Reference
Level at Top of Stratum	m OD	+21.2 - +30.95	+24.0	Exploratory hole logs from all GIs
Thickness	m	>21.2	Unproven	Exploratory hole logs from all GIs
Bulk Density	kN/m^3	19 – 20.2	19.6	Lab test results
SPT N60 value	-	13 – 375	45+8z (from +24 mOD) 200 (below +4mOD)	In situ tests
Undrained compressive strength	MN/m^2	-	2.5	Lab test results and correlation with CIRIA C143
C′	kN/m^2	-	20 (mod conservative) 0 (worst credible)	CIRIA 574
Effective angle of friction	°	-	39 (mod conservative) 34 (worst credible)	CIRIA 574
Drained Stiffness	MN/m^2	-	225+40z (from +24 mOD) 1000 (below +4mOD)	Assumed as a linear relationship
Intact Stiffness	GPa		5	Correlation with CIRIA C574

5.7. Groundwater

The Environment Agency classification reports the Made Ground as an Unproductive Strata, the Alluvium and Taplow Gravel as a Secondary A aquifer, and the Upper chalk formation as a Principal Aquifer.

Water strikes were encountered in 2no. exploratory holes summarised in Table 5.9 below.

Table 5.9: Ground Investigation Water Strikes

Exploratory Hole	Strike Level (mAOD)	Rise (mAOD)	Time to Rise (Minutes)	Stratum
WS202	34.41	35.81	20	Structureless Chalk
WS203	34.84	35.74	20	Structureless Chalk

A summary of the ground water monitoring installations is provided in Table 4.2. Six rounds of groundwater monitoring were undertaken on the 28thJune, 3rd/4th July, 10th July, 18th/19th July, 26th July and 22nd August. The final round of monitoring was undertaken out of sequence with the original monitoring schedule due to events on site in early August 2019. The highest water level measured was +36.2m AOD and the lowest water level measured was +36.0 m AOD. Based on this a design water level of +36.2m AOD is recommended.

A water level of +39.73m AOD was recorded in WS201; however, this is interpreted to be perched groundwater within the Made Ground.

It is important to note that with respect to water strikes and groundwater level observations made during drilling, that levels given in the borehole records may not reflect true equilibrium conditions for a number of reasons. For example, water has been added to assist drilling, and where strikes were encountered, the water may not have reached an equilibrium level within the duration of the test observations, typically 20mins. Additionally, groundwater levels and pressures can increase from those recorded during the monitoring period subject to seasonal change. It is recommended that further monitoring is undertaken during the winter months to capture any variations in the groundwater level.

Table 5.10: Ground Water Monitoring Results

Ground Water Monitoring Results	Ground Water Level (mAOD)					
	28/06/19	*3-4/07/19*	*10/07/19*	*18-19/07/19*	*26/07/2019*	*22/08/2019*
BH201	36.13	36.06	36.07	36.05	36.07	36.08
BH202D	36.14	36.1	36.1	36.06	36.07	36.10
BH203	36.2	36.06	36.07	36.02	36.05	35.05
BH204	36.1	36.06	36.01	35.91	36.0	36.0
BH205C	36.15	36.1	36.11	36.11	36.08	36.06
WS201	-	Dry	Dry	Dry	39.73	39.84
WS202	-	36.07	36.01	35.98	35.99	36.01
WS203	-	36.08	36.07	36.03	36.05	36.04

5.8. Ground Aggressivity

Sulphates and acids which occur naturally in the ground can be destructive to concrete through expansion and softening of the latter (BRE, 2005). Therefore, as part of the chemical testing programme, soil samples were tested for water soluble sulphate and pH to assess the potential chemical attack on the concrete structures. Water soluble sulphate and pH tests were carried out on 21 No. sample within the Made Ground, 3 No. sample within the Alluvium, 6 No. sample within the Taplow Gravels, and 3 No. within the Structureless Chalk. 12 No. groundwater samples were also taken. The data was assessed, with reference to the BRE Special Digest 1 – Concrete Aggressive Ground (BRE, 2005) to determine the appropriate concrete classification.

The assessment for the proposed works has considered ‘brownfield location’ and ‘mobile groundwater’ (conservative) conditions. A summary of the test results for the assessment of the Design Sulphate class and Aggressive Chemical Environment for Concrete (ACEC) classification is presented in Table 5.11.

Table 5.11: Results from testing for Aggressive Ground Conditions

	Made Ground	Alluvium	Taplow Gravels	Chalk	Groundwater
Water-soluble Sulphate (SO_4 mg/kg)	580	524	20	29	445
pH in 2.5:1 water/soil extract	7.7	7.1	8.5	8.7	7.4
Design Sulphate Class	DS-2	DS-2	DS-1	DS-1	DS-2
ACEC Class	AC-2	AC-2	AC-1	AC-1	AC-2

Therefore, in accordance with the BRE guidance, the Design Sulphate Class for the site can be classified as DS-2; the Aggressive Chemical Environment for Concrete (ACEC) can be inferred to be AC-2 to depth across the site.

6. SUMMARY OF GEOTECHNICAL PARAMETERS

Section 5 of the report presented a review of the Ground Investigation Factual Report for Station Hill North Site and interpretation of the Geotechnical Design Parameters. For each stratum, the geotechnical parameters recommended for foundation design are summarised in Table 6.1.

The stratigraphy varies significantly across the site and therefore it is recommended that the ground model adopted in design is assessed for each individual building.

Table 6.1: Summary of Geotechnical Parameters

Parameter	Unit	Range	Characteristic Value
Made Ground			
Level at Top of Stratum	m AOD	+38.05 to +40.6	+38.5
Thickness	m	1 to 5.6	2.5
Bulk Density	kN/m3	-	19
SPT (N1)60 value	-	3 - 85	10
Angle of Shearing Resistance	degrees	-	25
Drained Stiffness	MN/m2	2 – 60+	10
Alluvium			
Level at Top of Stratum	m OD	+32.75 to +36.9	+36
Thickness	m	0.6 – 1.9	1
Bulk Density	kN/m^3	-	20
SPT N60 Value	-	5.3 – 27.5	18
Undrained Shear Strength	kN/m^2	-	72
Stiffness (Foundations)	MN/m^2	-	E_u = 29
		-	E′ = 22
Taplow Gravels			
Level at Top of Stratum	m OD	+32.15 to +36.20	+35
Thickness	m	0.4 – 4.9	4
Bulk Density	kN/m^3	-	20
SPT $(N_1)_{60}$ Value	-	7 – 146	26
Angle of shearing Resistance	°	-	35
Drained Stiffness	MN/m^2	-	26
Structureless Chalk			
Level at Top of Stratum	m OD	+30.20 to +35.2	+31
Thickness	m	0.35 – 11.2	7
Bulk Density	kN/m^3	18.6 – 20.2	18.5
SPT N_{60} value	-	14 – 39	26
C′	kN/m^2	-	0
Effective angle of friction	°	-	32
E'	MN/m^2	27 –471	125
Structured Chalk			
Level at Top of Stratum	m OD	+21.2 - +30.95	+24
Thickness	m	>21.2	Unproven
Bulk Density	kN/m^3	19 – 20.2	19.6
SPT N60 value	-	13 – 375	45+8z (from +24mOD) 200 (below +4mOD)
Undrained compressive strength	MN/m^2	-	2.5
C′	kN/m^2	-	20 (mod conservative) 0 (worst credible)
Effective angle of friction	°	-	39 (mod conservative) 34 (worst credible)
Drained Stiffness	MN/m^2	-	225+40z (from +24 mOD) 1000 (below +4mOD)
Intact Stiffness	GPa		5

7. GENERIC QUANTITATIVE RISK ASSESMENT

7.1. Assessment Approach

The main environmental legislation relating to contaminated land in the UK is Part 2A of the Environmental Protection Act 1990. The philosophy behind Part 2A is the contaminant-pathway-receptor linkage; for land to be contaminated all three aspects of this linkage must be present (i.e. a contaminant must be present and able to move along a pathway and impact a receptor).

Ramboll has derived generic assessment criteria (GAC) for the interpretation of soil and groundwater chemical analyses. The GAC are threshold-based screening criteria, below which a significant risk is not considered to be present.

It should be noted that contaminants at concentrations that exceed the Ramboll GAC do not infer that an unacceptable risk is present; rather that further assessment is required to more fully understand potential contamination risks. The outcome of the screening is assessed further in the context of a qualitative contaminant-pathway-receptor risk assessment presented in the revised conceptual site model in Section 10.

The analytical results of the soil samples have been screened against the Ramboll GACs for a residential without plant uptake scenario and also against the commercial GACs. The east of the site has a proposed commercial end use. The south and west of the site are proposed for residential buildings. The majority of the ground floor level of the residential buildings is proposed to be a combination of retail, amenity space, bicycle parking, with limited residential apartments at ground level. A basement carpark is also proposed in the north of the site (north of the Thames Water Foul Sewer) in the west as part of Phase 3.

Construction Workers

This report and the generic assessment criteria (GAC) consider long term and chronic risk to humans based on defined exposure scenarios set out in the Contaminated Land Exposure Assessment (CLEA) model. In some cases, contaminants may also pose acute hazards to workers at a site, or a worker's exposure scenario may differ from the scenarios considered when deriving the GAC.

As exposure times for construction workers are generally short term, risks from site contamination are generally addressed through the use of appropriate working procedures and the use of personal protective equipment (PPE) in line with the Management of Health and Safety at Work Regulations (1999), Construction (Design and Management) Regulations (2015) for some sites and the Control of Substances Hazardous to Health Regulations (2002). This potential source-pathway-receptor linkage is considered further in Section 10. Field Evidence of Contamination

Potentially Natural Organic Odours

A strong (natural, plant based) organic odour was noted in several locations, predominantly in the north/centre of the site and typically associated with a soft clay strata with occasional gravel and relict rootlets at the base of the Made Ground and Alluvium.

A strong organic (natural, plant based) odour was noted in BH202D between 2.30m and 2.40m in a greyish green mottled dark brown clay with flint gravel and rare relict rootlets. TP205 also recorded a similar soft black and dark green gravelly clay with strong organic odour and frequent decomposing wood from 2.30m with the base of the trial pit at 3m. TP203 recorded a similar strong (plant based) organic odour associated with a very soft dark green speckled black slightly gravelly clay with relict rootlets at 2.50 m bgl to 2.90 m bgl. WS202 recorded a similar strata as soft greyish green mottled brown clay with faint organic odour at 2.20 m bgl to 3.30m bgl. BH205C had a faint organic odour at 4.00 to 4.20 m in the Taplow Gravels.

Former Tank Location / Former Garage Location (Hydrocarbons)

Hydrocarbon odours and visible contamination were noted in BH204 (south-east corner of the site) as a strong hydrocarbon odour between 2.80 m in the Made Ground to 4.50 m bgl at the top of the structureless chalk. Between 4.30 m bgl and 4.50 m bgl, at the top of the structureless chalk, a light grey discoloration was also noted along with the strong hydrocarbon odour. Elevated PID readings were also detected in BH204 during the monitoring with an elevated PID reading of 405.5ppm (refer to Section 9). BH204 coincides with the south-eastern edge of the historic garage.

The maximum reading recorded on site during the monitoring was 412.8ppm in WS203, which was drilled to the north west corner of the car park and was concurrent with a slight hydrocarbon odour. WS203 is broadly located in the location of the former tank shown on historical mapping. It is not known whether the former tank was a below or above ground storage tank (associated with the former garage). No evidence of a UST (underground storage tank) was encountered.

7.2. Asbestos

Twenty-four samples taken from the Made Ground were submitted for asbestos screening. Asbestos was detected in four samples and 'quantification' was scheduled for all positive asbestos identifications. The asbestos results are summarised in Table 7.1.

Table 7.1: Asbestos Detected

Exploratory Hole Location	Depth (m bgl)	Asbestos Type	Form	Quantification (%)
WS202	0.1-0.3	Chrysotile	Loose fibrous debris	0.002
		Amosite	Loose fibres	0.002
WS202	0.5-0.7	Amosite	Loose fibrous debris	0.024
WS203	0.55-0.75	Chrysotile	Loose fibres	<0.001
TP208	0.5-0.7	Amosite	Loose fibres	<0.001

All asbestos detections are within the top 0.75 m bgl of Made Ground. It is likely that the material containing the asbestos will be excavated as part of the basement excavation in the west, which will exceed depths of 0.75 m bgl where the asbestos has been identified and otherwise from shallow groundworks and foundation excavations in the east. Risks from asbestos to construction workers and the local community will need to be considered by the Principal Contractor as part of the development and a watching brief is recommended. Management of asbestos during the development works is beyond the remit of this report.

Future potential exposure pathways in relation to remaining soil containing asbestos can be expected to be 'broken' where asbestos is capped by buildings, hardstanding or an engineered landscaped layer. This is a standard remedial technique.

In Ramboll's experience, the asbestos found is not uncommon for urban areas or Made Ground and additional asbestos can be expected to be present in the soil elsewhere. Typically, a competent contractor should be able to manage the asbestos identified.

7.3. Soil Chemical Analysis Results

7.3.1. Heavy Metals

Arsenic concentrations exceeded the residential without plant uptake GAC of 40 mg/kg at 2 m bgl in TP203, recording a concentration of 44 mg/kg. Ramboll considers this to be a marginal exceedance and has not assessed this further.

Lead exceeded the residential without plant uptake GAC in WS203 (0.55 m), WS211 (0.5 and 0.95 m), BH204 (1.5 m) and TP203 (2 m). The highest concentration detected was 1,100 mg/kg at WS203 (0.55m); however, the elevated results are located in proximity to proposed Block C (commercial end use) or Block G (Phase 2 commercial use) and do not exceed the commercial end use GAC (2,300 mg/kg). As such the lead encountered is not considered to be a significant risk or warrant further action in terms of the proposed end development.

No other heavy metal results exceed the relevant GAC for residential or commercial end use.

7.3.2. Polycyclic Aromatic Hydrocarbons (PAHs)

Elevated PAHs were detected in several locations across the site; WS202, WS203, WS211, BH201, BH203, TP203, TP208 and TP209 when compared to residential without plant uptake screening criteria.

Naphthalene was elevated in WS203 (1.1 m) at 7.3 mg/kg and TP208 (1.5 m) at 2.4 mg/kg in the centre of the site when compared to residential screening criteria. These elevated readings are located in an area with a proposed commercial end use and do not exceed the commercial GAC of 110 mg/kg. Therefore, a risk is not considered to be present.

Using benzo(a)pyrene as a surrogate marker compound for PAHs, there are two locations which exceed the commercial C4SL GAC of 76 mg/kg; WS203 at 1.1 m bgl at 270 mg/kg, and TP208 at 1.5 m bgl at 120 mg/kg. TP208 will likely fall within the proposed basement area in Phase 3, and as such, the material containing the elevated PAHs can be expected to be excavated as part of the earthworks.

7.3.3. Total Petroleum Hydrocarbons (TPHs)

Elevated heavy end aromatic hydrocarbons (Aromatic C21-C35) were identified in soils in two locations; WS203 (1.1m) at 2,600 mg/kg and TP208 (0.5m) at 2,900 mg/kg when compared to residential without plant uptake assessment criteria.

Both of these exploratory locations are central to the site where either commercial buildings are proposed in the master plan or will coincide with areas expected to be excavated for basement construction in Phase 3.

No TPH results exceeded the GAC for commercial end use of 29,000 mg/kg, and therefore remediation is not considered necessary.

A watching brief should be undertaken when excavating the basement and other footings particularly in the areas where elevated hydrocarbons have been detected.

7.3.4. VOCs and SVOCs (Volatiles)

No VOCs were detected above Ramboll GACs. PAHs were identified above the GAC within the analytical methods for the SVOC but are not discussed further here; reference should instead be made to Section 7.4.2.

7.4. Human Health Risks from Soils Discussion

A small number of contaminants exceeded the relevant soil GACs in a limited number of samples.

The highest exceedances are predominantly located in centre of the site in TP208 and WS203, these are in areas of commercial development or hardcover and particularly in the case of TP208 are expected to coincide with the Phase 3 basement area such that they would likely be removed. On this basis the soil results are therefore not considered to represent a risk to the future site use or warrant further action, except for a watching brief during earthworks and the basement excavations.

Assessment within the footprint of the multi-storey car park would be prudent following demolition. As explained later, this would most effectively take the form of a watching brief and trial pitting during demolition.

Limited exploratory holes have been undertaken in the area of the proposed residential buildings due to Xafinity House and walls still being present on site. The proposed development comprises predominantly hardstanding with limited soft landscaping and limited residential use at ground level, however additional assessment and a watching brief is recommended in the west of the site following the demolition of Xafinity House and related infrastructure to confirm the final site condition.

8. CONTROLLED WATERS RISK ASSESMENT

Assessment Approach

Seven groundwater samples were obtained in total; six groundwater samples (BH201, BH202D, BH203, BH204, BH205C and WS203) were taken on 4th July and an additional sample (WS202) was taken on 10th July 2019. All groundwater samples were scheduled for chemical analysis to compliment the soils suite.

8.1. Analytical Results

The groundwater exceedances are summarised in Table 8.1 below. Analytical certificates for groundwater are presented in Appendix 2. Exceedance of screening criteria does not infer that an unacceptable risk is present; the outcome of the screening is assessed further in the context of a qualitative source-pathway-receptor risk assessment presented in Section 10.

Table 8.1: Groundwater Exceedances

Determinand	Ramboll GAC (ug/l)	Maximum Concentration (ug/l)	Locations of Exceedance
Sulphate	400,000	445,000	BH204
BaP (and associated PAH compounds)	0.01	3.25	BH204
Fluoranthene (most elevated PAH)	0.1	7.16	BH204
TPH CWG – Aliphatic >C10 - C12	300	390	BH204
TPH CWG – Aromatic >C10 - C12	90	330	BH204
TPH CWG – Aromatic >C12 - C16	90	660	BH204
TPH CWG – Aromatic >C12 - C16	90	190	BH204
Nickel	20	29	BH205C
Tetrachloroethene (PCE)	10	11.1	BH203

The exceedances of nickel in BH205C and tetrachloroethene (PCE) in BH203 are considered to represent a low risk given that the marginal exceedance above conservative guidelines, the isolated occurrence and proposed future site use.

Solvents, such as PCE, may be present at the site given the former garage use; however, none have been identified at significantly elevated concentration in soils and the groundwater exceedance is only one marginal result. The concentration detected in not uncommon for brownfield or urban sites. There is no plausible source of nickel in groundwater (based on the historic uses of the site). No further consideration of these particular results is therefore considered to be warranted.

The hydrocarbon exceedances identified in BH204 likely relate to the historical uses of this area of the site as a garage, however significantly elevated hydrocarbon concentrations were not detected within the soils at this location.

8.2. Additional Scope of Works – Groundwater Monitoring

Two additional rounds of groundwater monitoring were undertaken on 26th September and 22nd October 2019 to further assess the TPH and PAHs in BH204 and WS203.

The groundwater analytical results from the three monitoring rounds are summarised in Table 8.2 below.

	Round 1 (04/07/2019)		Round 2 (26/09/2019)		Round 3 (22/10/2019)	
Contaminant	**WS203**	**BH204**	**WS203**	**BH204**	**WS203**	**BH204**
Polycyclic Aromatic Hydrocarbons						
Naphthalene	<0.01	1.94	<0.01	5.61	<0.01	0.67
Acenaphthylene	<0.01	0.64	<0.01	<0.01	<0.01	0.39
Acenaphthene	<0.01	0.34	<0.01	<0.01	<0.01	<0.01
Fluorene	<0.01	0.68	<0.01	<0.01	<0.01	0.27
Phenanthrene	<0.01	3.33	<0.01	0.33	<0.01	0.74
Anthracene	<0.01	0.69	<0.01	<0.01	<0.01	0.37
Fluoranthene	<0.01	7.16	<0.01	0.4	<0.01	2.62
Pyrene	<0.01	6.12	<0.01	0.38	<0.01	2.40
Benzo(a)anthracene	<0.01	2.90	<0.01	<0.01	<0.01	1.21
Chrysene	<0.01	3.12	<0.01	<0.01	<0.01	1.13
Benzo(b)fluoranthene	<0.01	3.69	<0.01	<0.01	<0.01	1.39
Benzo(k)fluoranthene	<0.01	1.55	<0.01	<0.01	<0.01	0.73
Benzo(a)pyrene	<0.01	3.25	<0.01	<0.01	<0.01	1.11
Indeno(1,2,3-cd)pyrene	<0.01	2.01	<0.01	<0.01	<0.01	0.58
Dibenz(ah)anthracene	<0.01	0.58	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	<0.01	2.33	<0.01	<0.01	<0.01	0.79
Total PAHs	<0.16	40.3	<0.16	6.72	<0.16	14.4
Total Petroleum Hydrocarbons						
Aliphatic C10-C12	<10	390	<10	<10	<10	260
Aliphatic C12-C16	<10	200	<10	<10	<10	1700
Aliphatic C16-C21	<10	350	<10	<10	<10	970
Aliphatic C21-C35	<10	3000	<10	<10	<10	4000
Aromatic C10-C12	<10	330	<10	290	<10	340
Aromatic C12-C16	<10	660	<10	61	<10	330
Aromatic C16-C21	<10	190	<10	<10	<10	100

	Round 1 (04/07/2019)		Round 2 (26/09/2019)		Round 3 (22/10/2019)	
Total TPH Aliphatic (C5-C35)	<10	**3900**	<10	**420**	<10	**6900**
Total TPH Aromatic (C5-C35)	<10	**1200**	<10	**530**	<10	**780**

8.3. Additional Scope of Works – Discussion of Results

Elevated concentrations of PAHs and TPHs were detected within BH204 during the first and third monitoring rounds. All concentrations of contaminants were recorded at significantly lower levels or fell below the laboratory limit of detection with the exception of Naphthalene which increased in concentration from 1.94 µg/l to 5.61 µg/l during the second monitoring round.

In summary, elevated hydrocarbon concentrations have been consistently identified in groundwater at BH204 in the south-east area of the site. This well is installed within the Made Ground and therefore are likely to contain perched, localised groundwater and not relate to the deeper aquifers of the Taplow Gravels or underlying Chalk. The data from WS203 provides confidence that the groundwater contamination in BH204 can be expected to be localised and not indicative of a site wide groundwater contamination plume, and it is understood to be perched within the Made Ground deposits on site.

TPH concentrations were not detected above the laboratory limit of detection in WS203 during the three monitoring rounds. This provides evidence that the TPH detected in BH204 is limited in extent and static.

8.4. Discussion

Significant or widespread groundwater contamination was not identified. A localised hotspot of TPH was found close to a former garage use which was further assessed by undertaking repeat sampling. Given the isolated nature and location of this sample, the TPH and also PAHs detected are not considered to represent a significant risk of pollution or require remediation.

During demolition and earthworks, it is recommended that a watching brief is undertaken to further assess TPH in this area and beneath the current buildings. This could take the form of additional trial pits excavated to the water table, soil and groundwater testing.

9. BUILT ENVIRONMENT RISK ASSESSMENT

9.1. Ground Gas Risk Assessment

Six ground gas monitoring visits were undertaken over a three-month period on; 14th/18th June, 28th June, 3rd/4th July, 10th July, 26th July and 22nd August 2019. The ground gas monitoring results are presented in full in the GEL Factual Report and are summarised as follows:

- Atmospheric pressure recorded during the monitoring visits ranged from 1004 and 1026 millibar (mb).
- The maximum positive flow rate recorded was 3.7 litres per hour (l/h) in BH201, subsequently dropping to 0.0 l/hr after 2 minutes.
- Significant negative flow rates were recorded, with the maximum being -17.3 in BH201 on the final visit, which subsequently rose to 0.0 l/hr after 1 minute.
- The maximum recorded concentration of carbon dioxide recorded was 10 % v/v in WS203 on the final gas monitoring visit.
- No methane was recorded in any location during any of the monitoring rounds.
- The maximum concentration of carbon monoxide detected was 10 ppm in BH201 on one occasion.

Readings from the monitoring have been used to generate a worst-case gas screening value (GSV) for the site based on CIRIA C665 guidance. The GSV (gas screening value) was then calculated using the maximum volume of methane or carbon dioxide gas that could be produced each hour. The GSV for the site has been calculated as 0.37 l/hr, using the maximum positive flow rate of 3.7 and highest carbon dioxide reading of 10% v/v.

Th GSV classifies the site as Characteristic Situation 2 (Low Risk). Characteristic Situation 2 states that basic gas protection measures are required. A typical scope of these protective measures should comprise "a) Reinforced concrete cast *in situ* floor slab (suspended, nonsuspensed or raft) with at least 1200 g DPM2 and underfloor venting. B) Beam and block or pre-cast concrete and 2000 g DPM/reinforced gas membrane and underfloor venting. All joints and penetrations sealed." Where a basement is present for car parking it can be expected that the structure of the basement would require 'tanking' to prevent groundwater ingress where this is shallower than the floor of the basement, similarly the basement could be expected to be vented if used for car parking such that the potential risks from gas ingress could be reduced. Where basements are not planned (such as the Phase 2 area), gas protection measures will be required.

9.2. Vapours Risk Assessment

VOCs were recorded during the monitoring period at a maximum concentration of 72.4 ppm (parts per million by volume) in BH204 on the first four rounds. Possible groundwater contamination and a hydrocarbon odour were noted in the borehole at this location. The fifth monitoring round was undertaken on 26th July after an extended period of hot weather. The monitoring round recorded high VOC readings in most locations. The maximum concentrations being; 412.8ppmv in WS203, 405.5ppmv in BH204, 389.2ppmv in BH205C, 313.8ppmv in WS201, 258ppmv in BH202D, 247.9ppmv in WS202 and 246.6 ppmv in BH201.

Further investigation and consideration of the vapours risk should be undertaken following demolition of Xafinity House in the area of proposed residential development, which currently lacks significant site investigation, and in the area of the multi-storey car park where hydrocarbons were encountered in soils and groundwater.

9.3. Water Supply Pipes

Buried water supply pipes can be at risk from permeation and accelerated deterioration from certain contaminants. A detailed assessment of existing and future pipe materials is outside of the scope of this investigation; however, architects and designers should liaise with the local water supply company and are directed to the following document for guidance:

- Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites; UK Water Industry Research (UK WIR), 2010 (Ref. 10/WM/03/21).

10. REVISED CONCEPTUAL SITE MODEL

10.1. Revised Conceptual Site Model

Using information obtained during this site investigation, the preliminary conceptual site model presented in Section 6 has been refined and is described in Table 10.1 below:

Table 10.1: Revised Conceptual Site Model

Sources of Contamination

Soil:

- Asbestos (Chrysotile and Amosite) was detected in four samples with a maximum depth of 0.75 m bgl and with quantifications between <0.001% and 0.024% w/w.
- Lead exceeded the residential without plant uptake GAC in four locations. None exceed the commercial GAC and it is likely these exceedances will either be excavated as part of the earthworks or be at a suitable depth beneath concrete foundations and hardstanding.
- Hydrocarbons (PAHs and TPH) were detected above the relevant GACs. It is likely that some of these exceedances will be removed as part of the earthworks and basement excavation but that some risks will remain in BH204 and the area in the south east of the site. Further assessment and delineation of hydrocarbons is recommended.
- Visual and olfactory evidence of contamination was noted in BH204 during the ground investigation between 3.8m and 4.5m bgl at the base of the Made Ground and the top of the structureless chalk, as light grey discolouration in the chalk with a strong hydrocarbon odour.
- A strong, natural, organic odour was noted in several locations, predominantly in the north/centre of the site, typically associated with a soft clay strata with occasional gravel and relict rootlets at the base of the Made Ground and Alluvium.

Groundwater:

- Six groundwater samples were taken from all five boreholes and one window sample.
- Elevated TPHs and PAHs were identified in BH204 above the screening criteria for controlled waters.
- Two additional rounds of groundwater sampling were undertaken in BH204 and WS203 and elevated concentrations of TPHs and PAHs were recorded in BH204 on all three occasions.
- Further assessment of hydrocarbons in groundwater in BH204 is recommended following the demolition of the NCP car park which impeded investigation of this area.

Ground Gas:

- The maximum recorded concentration of carbon dioxide was 10 % v/v in WS203
- No methane was detected in any locations during the monitoring.
- The maximum positive flow rate was recorded as 3.7 litres per hour (l/h) in BH202D.
- The maximum negative flow rate recorded was -17.3 in BH201.
- A GSV for the site has been calculated as 0.37 l/h, which lies within CIRIA C665 Characteristic Situation 2.

Vapours

- VOCs were recorded in all locations during the gas monitoring visits. The maximum VOC recorded was 412.8ppm in WS203 and 405.5ppm in BH204. Both of these locations are located adjacent to the former garage and now multi-storey car park and appear related to the presence of hydrocarbon odours identified in soil and groundwater.
- No VOCs exceeded in the soil samples, however SVOCs exceeded in WS202, WS203 and BH204. These locations are in the south east of the site surrounding the former garage and location and correspond to the VOCs detected during monitoring.

Table 10.1: Revised Conceptual Site Model

Geology

The investigation confirmed the anticipated geological sequence at the site. Made Ground was encountered across the site. Beneath this, further superficial deposits of occasional Alluvium and Taplow Gravels were encountered. These in turn were found to overly the solid geology of the Upper Chalk Formation.

Hydrogeology

- The Made Ground is classed as unproductive strata.
- The Alluvium and Taplow Gravel Formation are Secondary A Aquifers.
- The Chalk is a Principal Aquifer.

Hydrology

- The nearest surface water feature is a drainage network 320m northwest of the site, associated with the railway line.
- The River Thames, at its closest point, lies 420m northeast of the site and flows to the east.
- The River Kennet is located approximately 500m southeast of the Site and also flows in an easterly direction.
- Overall the site is considered by Ramboll to be located in an area of low to moderate environmental sensitivity in terms of surface water receptors. The nearest receptors are some distance but groundwater at the site would be expected to be in hydraulic continuity with the surrounding hydrological features.

Potential Contaminant Linkages The following potential pollutant linkages have been identified at the Site and are considered further in the qualitative risk assessment:			**Potential Contaminant Linkage**
Human Health **(Future construction workers and site users)**	On-site	• Dermal contact, ingestion of soil and soil derived dust, principally asbestos • Ingestion and inhalation of soil derived particulates and dust.	PCL1
	On-site	• Inhalation of vapours	PCL2
Water Environment	Off-site	• Migration of contaminants off-site within groundwater, onto third party land and towards off-site abstraction wells or surface water features.	PCL3
Built Environment	On-site	• Migration of ground gases in buildings and structures.	PCL4

10.2. Qualitative Risk Assessment

The principal sources of contamination, receptors and potential pollutant linkages have been assessed using a qualitative source-pathway-receptor approach and are summarised in Table 10.2.

Table 10.2: Qualitative Source-Pathway-Receptor Risk Assessment

Potential Contaminant Linkage	Contaminants	Pathways	Receptors	Discussion	Risk Rating
PCL1	Contaminants in soils	Dermal contact. Ingestion and inhalation of soil derived particulates and dust and asbestos. Inhalation of vapours.	Future site users.	**Current/Future Site Users** The investigation identified elevated lead, PAHs and TPH for a residential without plant uptake end use in several locations, predominately in the central area of the site. Asbestos was detected in three exploratory hole locations, in four samples out of twenty-two Made Ground samples screened. Chrysotile and Amosite were detected. Quantifications were between <0.001% and 0.024% w/w. The proposed development plans include commercial in the north and east of the site, together with the basement located under Phase 3, therefore, risks to end users from soil concentrations measured to date are currently considered to be low and mitigated by the development scheme.	**Low to Moderate**
				Construction Workers There is potential for site maintenance workers to come into contact with contaminated soils, including asbestos during earthworks. The use of appropriate risk assessment and working procedures, such as hygiene measures and PPE, should mitigate risks to workers.	**Low to Moderate**
PLC2	Vapours (VOCs)	Lateral and vertical migration	Future site users. Built environment	Elevated VOCs were detected in most locations during the ground gas monitoring, in particular in WS203 and BH204, the two locations in the south east of the site, closest to the former garage and current multi-storey car park. Protection from vapour risks need to be considered going forwards.	**Moderate**
PCL3	Contaminants in groundwater	Lateral migration of groundwater	Off-site third-party land and its users. Off-site potable abstraction and surface water features.	A hotspot of hydrocarbon contamination in groundwater was identified in BH204 in the area of the former garage (and present-day multi-storey car park). The risks from contamination in groundwater to migrate onto third party land, towards the potable abstraction and towards off-site surface water features is considered low to moderate as the groundwater is known to be perched in BH204. Further assessment will be possible following the demolition of the multi-storey car park in this area, to assess the risks to controlled waters and take remedial action if necessary.	**Low to Moderate**
PCL4	Ground Gas	Lateral and vertical migration	Future site users. Built environment.	The results of the preliminary ground gas risk assessment suggest that the site may be classified as CIRIA Characteristic Situation 2 (CS2, Low Risk). This is a worst-case scenario calculated using the highest flow rate and the highest carbon dioxide reading throughout the monitoring period. Ground gas protection measures are required to be considered as part of the proposed development.	**Low to Moderate**

11. CONCLUSIONS AND RECOMMENDATIONS

11.1. Conclusions

This ground investigation report has been prepared for the proposed development of the Station Hill North Site based on the findings of the ground investigation undertaken by Ground Engineering Ltd during the period 8th May and 18th June 2019. The investigation comprised five deep boreholes, five window sample holes and seven trial pits. The investigation was limited to areas of the site where buildings had already been demolished and several obstructions were encountered in exploratory hole locations across the site. The multi-storey car park and Xafinity House are still present and will be demolished in due course.

In general, only modest soil and groundwater contamination was identified with a hotspot of hydrocarbons detected in groundwater in one location. Based on the investigation results, a significant risk has not been identified to future site users or Controlled Waters. Remediation is not considered necessary; however, a number of best practice measures should be implemented, and an unexpected contamination procedure prepared and validated.

During the investigations concrete was encountered at the top of the Made Ground in all of the exploratory holes varying in thickness. The average confirmed thickness of the concrete was 0.31m. In several locations, the full extent of the concrete was not determined, with second a layer of concrete below the first being encountered, separated by Made Ground. This Made Ground was underlain by Alluvium in three locations and by Taplow Gravels in four locations. The Chalk was encountered in the five boreholes undertaken.

Groundwater was encountered at a depth of between +36.2m AOD and +36m AOD (compared to a site level of between 38m AOD and 40m AOD).

Environmental Conclusions

Four samples identified positive results for asbestos (both chrysotile and amosite). These were a mixture of loose fibres and loose fibrous debris. The quantifications ranged between <0.001% and 0.024% w/w. All detections were reported within the top 0.75 m of Made Ground. Due to the shallow identifications of asbestos, Ramboll expects that the majority of this material will be removed from site as part of the earthworks and basement excavations. Further asbestos is likely to be present as is typical for other brownfield sites.

Analysis of soils samples identified contaminants in excess of Ramboll's generic assessment criteria (GAC) for a residential without plant uptake end use. These were predominately located in the centre of the site (TP208 and WS203) and are at a maximum depth of 1.5 m bgl. Only one benzo(a)pyrene result (in WS203) was found to exceed the commercial GAC. However, this area will be capped and therefore the risk should be mitigated.

Hydrocarbon odours and visible contamination was noted in BH204 log, as a strong hydrocarbon odour between 2.80 m in the Made Ground down to 4.50 m bgl at the top of the structureless chalk and this coincides with the detection of elevated hydrocarbon concentration in groundwater at this same location.

Two additional rounds of groundwater sampling were undertaken in September and October 2019 to further investigate the elevated hydrocarbon concentrations at BH204. Sampling was undertaken in BH204 and WS203 and the results indicate that elevated hydrocarbon concentrations have been consistently identified in groundwater at BH204 in the south east area of the site. The data from WS203 (no detectable hydrocarbon concentrations) provides confidence that the groundwater contamination in BH204 can be expected to be localised and not indicative of a site wide groundwater contamination plume. Analysis of the groundwater samples against human health volatilisation risk did not identify any contaminants above the relevant GAC for the site.

The results of the preliminary ground gas risk assessment suggest that the site may be classified as CIRIA Characteristic Situation 2 (Low Risk). Characteristic Situation 2 requires passive, development led basic gas protection measures to be incorporated into the building design.

11.2. Recommendations

Due to the ground investigation being undertaken prior to and/or during demolition of the existing buildings, access for carrying out exploratory holes was limited to certain areas of the site. As such, further investigation is recommended in the following areas:

Geotechnical Recommendations

- In the area proposed as Block F (South site) to provide further coverage and confirm the level and composition of the Structured Chalk.
- Additional geotechnical investigation is recommended towards the east of the north site (across the NCP car park, and at the interface with Thames Tower) to confirm the level of the Structured Chalk and to assess the potential risk of variation in geology and/or solution features in this area of the site. Cone penetration testing is likely to be the most efficient method of investigation.
- It is recommended that preliminary pile testing is undertaken to supplement the Ground Investigation in order to provide an improved understanding of the anticipated pile load performance at the site. This will enable refinement of the pile design, and potential cost savings to the substructure.
- A number of obstructions were encountered during the Ground Investigation. Further investigation into the location and nature of the existing foundations is recommended in order to reduce the risk of encountering obstructions during the construction phase.

Environmental Recommendations

- Further assessment and consideration of the vapours risk should be undertaken following demolition of Xafinity House in the area of proposed residential development and in the area of the multi-storey car park during earthworks stage where hydrocarbons were encountered in soils and groundwater.
- An environmental watching brief is recommended during the earthworks to assess unexpected contamination. A Validation Report should be produced when the watching brief is completed. The watching brief visits should focus on the areas of identified contamination, and in particular beneath the foundations of the multi-storey car park to further assess potential contamination in this area.
- Future soft landscaped areas and/or planters should be required to use a 600mm cap of imported material (topsoil) that is deemed suitable for use from a contamination perspective. Site-won materials are deemed unsuitable for reuse as subsoil or topsoil in soft landscaped areas. Validation of the soft landscaped areas will be undertaken by the environmental consultant at the end of the build and an addendum to the Validation Report will be issued to sign off the associated Planning Condition.

Based on the current site investigation, assuming that no previously unidentified contamination is encountered during further works, then the following best practice measures are recommended in Table 11.1.

Table 11.1: Mitigation Measures

Category	Description of Recommended Mitigation Measures
Environmental Management Plan	An Environmental Management Plan (EMP) should be prepared and implemented in order to prevent construction work and future operations from giving rise to land contamination. The EMP should include the site specific risk management measures recommended above as well as the following measures: • overview of legislative compliance; • noise and vibration management requirements; • imported soils control and verification requirements; • site welfare; • controls for excavation works; • waste management and materials management requirements; • air quality and dust control provisions; • methods for dealing with unexpected contamination finds and asbestos finds; and • procedures for environmental acidents and emergency situations.
Protective measures during construction	Many of the potentially significant effects on the construction work force can be expected to be mitigated as part of the health and safety precautions required of the Contractor. Risk to construction workers should be dealt with by the Contractor based on the identified hazards. These should also be revised based on the ground conditions encountered during on-site activities. The Contractor will be responsible for site health and safety and will manage the risk through control of suitable Health and Safety measures for example including provision of PPE, education of the workforce and inductions for all site staff and visitors. Asbestos has been detected on site and therefore appropriate RPE and protective measures should be put in place to protect construction workers from being exposed to asbestos. The proposed development is subject to CDM Regulations.
Site Enabling and Clearance works	Obstructions and existing foundations should be considered prior to the enabling and clearnace works. For excavated materials, best practice approaches including bunding of materials should be implemented in order to minimise cross contamination of excavation materials and/or perched water, if encountered in any excavations during the site works. An environmental watching brief is recommended during the earthworks and basement excavation. If any previously unidentified contamination is encountered, validation sampling should be undertaken.
Underground Services	The Thames Water Foul Sewer beneath the site will need to be considered during design stages and managed throughout the earthworks, piling and construction stages. Laying underground services in potentially contaminated Made Ground materials has the potential to establish preferential flow pathways. In addition, certain contaminants e.g. hydrocarbons may penetrate and impact on water supply. Therefore, materials should be used appropriate to the level of contamination identified on site, particularly with regard to underground mains water supply. Heavily contaminated areas of the site have not yet been identified but additional investigation is still required in uninvestigated areas and groundwater is typically deeper than the levels at which services might be installed, however further consideration to service routes should be given once all investigations have been completed.
Waste Management and MMP	Waste disposal should be undertaken in accordance with current legislative requirements. A materials management plan (MMP) is likely to be required to track material movements for the development if material is intended to be re-used on-site.
Soft Landscaping	For any soft landscaped areas, Made Ground soils are not considered suitable for the use in soft landscaped areas. Any topsoil/subsoil imported for use within any soft landscaped areas should be tested and verified against a suitable for use criteria.
Asbestos Management Protocol (can be incorporated into EMP)	Asbestos has been encountered in the shallow Made Ground soils. The Client should therefore ensure that this risk is addressed and mitigated through the preparation and adoption of health and safety risk assessments and method statements, which should be prepared at least in accordance with the Control of Asbestos Regulations 2012, to ensure the health and safety of all construction workers during the excavation of Made Ground. Details of on-site procedures to be adopted in the event that asbestos containing material is suspected and or encountered will be required. Details may include but are not limited to: • monitoring; • watching briefs; • competency of personnel; • licenced contractors; and • HSE notification (if required).
Previously Unidentified Contamination	Due to the potential for previously unidentified contamination to be present in areas which were inaccessible at the time of this investigation, an allowance for additional investigaiton of uninvestigate should be made. Nothwithstanding, an enviornmental watching brief during the earthworks and basement excavation should be implemented. Watching brief visits should focus on areas of identified contamination, where former tanks are noted on historical maps and in areas less well investigated. During the watching brief, if unforeseen contamination is identified, contaminated materials will be segregated and dealt with appropriately and the Local Authority notified if appropriate. An allowance for validation samples should also be made in the event that unidentified contamination is encountered.
Verification Report	In accordance with EA guidance, a Verification and Remediation of Land Contamination Report will need to be produced in order to verify the completion of works and any previously unforeseen contamination encountered during the construction phase of works. The Verification Report is to include the details of the watching brief visit conducted throughout the earthworks to ensure no unacceptable risk remains and if relevant, will determine whether the remedial objectives have been met. The report may include: • summary verification works; • details of watching briefs completed (site works diary); • photographic log; • plan denoting sample locations; • plan showing the location of re-use of site derived materials; • quantities of re-used, imported and disposed material; • Waste Transfer Notes and carrier / receiving facility Licences; • sources, type of import and placement location; details and demonstration of any relevant permits or exemptions required by the Environment Agency for re-using material or importing material, particularly where there is the potential for material being considered waste; • areas of unexpected contamination and subsequent works conducted; • details of any water discharges / off-site removal of groundwater; • laboratory chemical testing results of validation samples, imported material, waste material; and, • details of any liaison and agreements with Regulators.

12. REFERENCES

- Ramboll UK Ltd, October 2018, *Geotechnical and Geoenvironmental Desk Study,* Ref: 1620004716-SHR-RAM-GE-002-Desk Study;
- Ramboll UK Ltd, September 2018, *Site Investigation Specification South Site*, Ref: 1620004761-SHR-RAM-GE-002-Ground Investigation Specification;
- Geotechnical Engineering Limited, February 2019, *Factual Report on Ground Investigation,* Ref: 34769;
- Ramboll UK Ltd, March 2019, *Ground Investigation Report, Station Hill South Site*, report ref: 1620004716);
- Ramboll UK Ltd, March 2019, *Site Investigation Specification North Site*, Ref: 1620004761-SHR-RAM-GE-003-Ground Investigation Specification North Site; and,
- Geotechnical Engineering Limited, August 2019, *Factual Report on Ground Investigation,* Ref: 35248.
- CIRIA (2002). *Engineering in chalk* (C574).
- CIRIA (1995). *The Standard Penetration Test (SPT): Methods and Use (C143)*.
- CIRIA C665 (2007). *Assessing risks posed by hazardous ground gases to buildings.*
- CLR11: *Model Procedures for the Management of Land Contamination* (2004).
- BS 5930:2015 *Code of Practice for Ground Investigations.*
- BS 10175:2011 + A1:2013 *Code of Practice for the Investigation of Potentially Contaminated Sites*.
- Concept (2012), *Site Investigation Report, Thames Tower,* Ref: 122460/FR-02.
- Waterman (2014), *Geo-Environmental and Geotechnical Assessment,* Ref: EED12350-110-R-3.1.1-RM

DRAWINGS

COPYRIGHT RAMBOLL UK LIMITED. ALL RIGHTS RESERVED. THIS DOCUMENT IS ISSUED FOR THE PARTY WHO COMMISSIONED IT AND FOR THE SPECIFIC PURPOSES CONNECTED WITH THE PROJECT ONLY. IT SHOULD NOT BE RELIED UPON BY ANY OTHER PARTY OR USED FOR ANY OTHER PURPOSE. RAMBOLL ACCEPTS NO RESPONSIBILITY OR LIABILITY WHICH MAY ARISE FROM RELIANCE OR USE OF THIS DOCUMENT OR THE DATA CONTAINED HEREIN BY ANY OTHER PARTY OR FOR ANY OTHER PURPOSE.

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. BH01,BH02,AND BH03 CO-ORDINATES HAVE BEEN INFERRED FROM CONCEPT 2012 GROUND INVESTIGATION REPORTING. THEREFORE THEIR RELEVANT POSITIONS SHOULD BE CONSIDERED INDICATIVE ONLY.
6. WS302 - WS303, WS305, WS305A, WS306 - WS3013, WS3015 &WS3016 FROM GEL 2018 GI LOCATIONS ARE ALSO INDICATIVE ONLY.
7. THAMES WATER SEWER LEVELS ARE SHOWN INDICATIVELY, BASED ON HISTORIC CCTV SURVEY REPORTING NOTES.
8. GROUND WATER DESIGN LEVELS ARE INFERRED BASED ON MAXIMUM RECORDED GROUND WATER LEVELS RECORDED DURING MONITORING VISITS UNDERTAKEN BETWEEN 28TH JUNE & 26TH JULY 2019.

LOCATION PLAN KEY:

- BH204 — EXPLORATORY BOREHOLE (GEL 2019)
- WS201 — WINDOWLESS SAMPLE (GEL 2019)
- TP 209 — TRIAL PIT (GEL 2019)
- BH303 — EXPLORATORY BOREHOLE (GEL 2018)
- WS304 — WINDOWLESS SAMPLE (GEL 2018)
- BH1 — EXPLORATORY BOREHOLE (ST CONSULT 2014)
- WS10 — WINDOWLESS SAMPLE (ST CONSULT 2014)
- BH03 — EXPLORATORY BOREHOLE (CONCEPT 2012)
- SECTION MARK
- THAMES WATER SEWER

DEVELOPMENT KEY

- BLOCK A
- BLOCK B-D
- BLOCK C
- BLOCK E
- BLOCK F
- BLOCK G
- PODIUM

Rev	Description	Date	By	Chk	App
I01	FOR INFORMATION	06/08/19	DH	SM	SP

FOR INFORMATION

STATION HILL READING

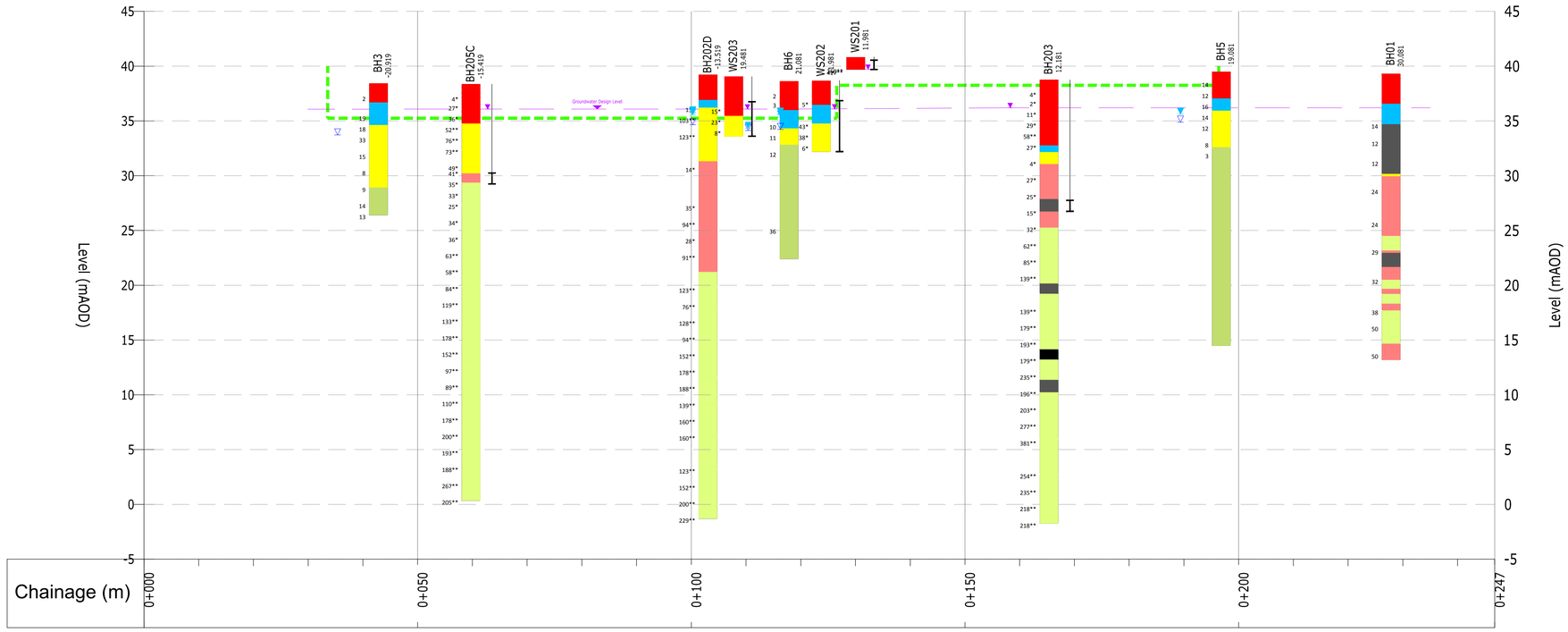
RAMBOLL
tel 020 7631 5291 london@ramboll.co.uk
www.ramboll.co.uk

EXPLORATORY HOLE LOCATION PLAN

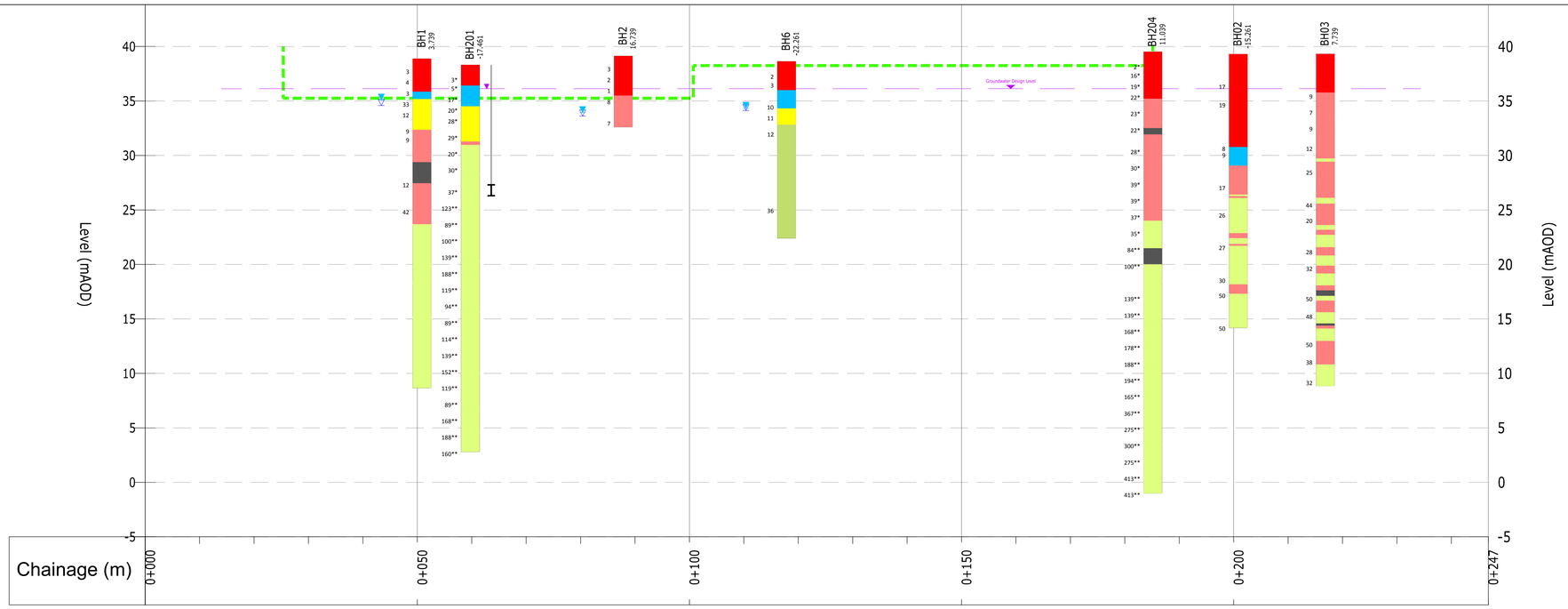
Project No:	Scale (@A1):	Drawn:	Date:
1620004716	1.500	DH	AUG.2019

Drawing No: SHRN-RAM-SW-ZZ-DR-S-0070 Rev: I01

16/08/2019 10:55:55



SECTION A-A
SCALE: H 1:500,V 1:250. DATUM: -5.000



SECTION B-B
SCALE: H 1:500,V 1:250. DATUM: -5.000

COPYRIGHT RAMBOLL UK LIMITED. ALL RIGHTS RESERVED. THIS DOCUMENT IS ISSUED FOR THE PARTY WHO COMMISSIONED IT AND FOR THE SPECIFIC PURPOSES CONNECTED WITH THE PROJECT ONLY. IT SHOULD NOT BE RELIED UPON BY ANY OTHER PARTY OR USED FOR ANY OTHER PURPOSE. RAMBOLL ACCEPTS NO RESPONSIBILITY OR LIABILITY WHICH MAY ARISE FROM RELIANCE OR USE OF THIS DOCUMENT OR THE DATA CONTAINED HEREIN BY ANY OTHER PARTY OR FOR ANY OTHER PURPOSE.

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. BH01,BH02,AND BH03 CO-ORDINATES HAVE BEEN INFERRED FROM CONCEPT 2012 GROUND INVESTIGATION REPORTING. THEREFORE THEIR RELEVANT POSITIONS SHOULD BE CONSIDERED INDICATIVE ONLY.
6. WS302 - WS303, WS305, WS305A, WS306 - WS3013, WS3015 &WS3016 FROM GEL 2018 GI LOCATIONS ARE ALSO INDICATIVE ONLY.
7. THAMES WATER SEWER LEVELS ARE SHOWN INDICATIVELY, BASED ON HISTORIC CCTV SURVEY REPORTING NOTES.
8. GROUND WATER DESIGN LEVELS ARE INFERRED BASED ON MAXIMUM RECORDED GROUND WATER LEVELS RECORDED DURING MONITORING VISITS UNDERTAKEN BETWEEN 28TH JUNE & 26TH JULY 2019.

KEY:

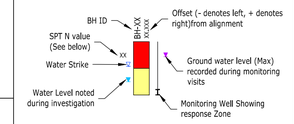
APPROXIMATE BASEMENT SSL LEVEL

GROUNDWATER DESIGN LEVEL

GEOLOGY KEY:

Legend	
	MADE GROUND
	ALLUVIUM
	TAPLOW GRAVEL
	STRUCTURELESS CHALK
	STRUCTURED CHALK
	UNDIFFERENTIAITED CHALK
	NO RECOVERY

BOREHOLE LEGEND:



SPT VALUE KEY:
- XX =SPT N VALUE UNCORRECTED
- XX* =SPT N(60) VALUE
- XX** =SPT N(60) VALUE EXTRAPOLATED

Rev	Description	Date	By	Chk	App
I01	FOR INFORMATION	06/08/19	DH	SM	SP

FOR INFORMATION

STATION HILL
READING

RAMBOLL
tel 020 7631 5291 london@ramboll.co.uk
www.ramboll.co.uk

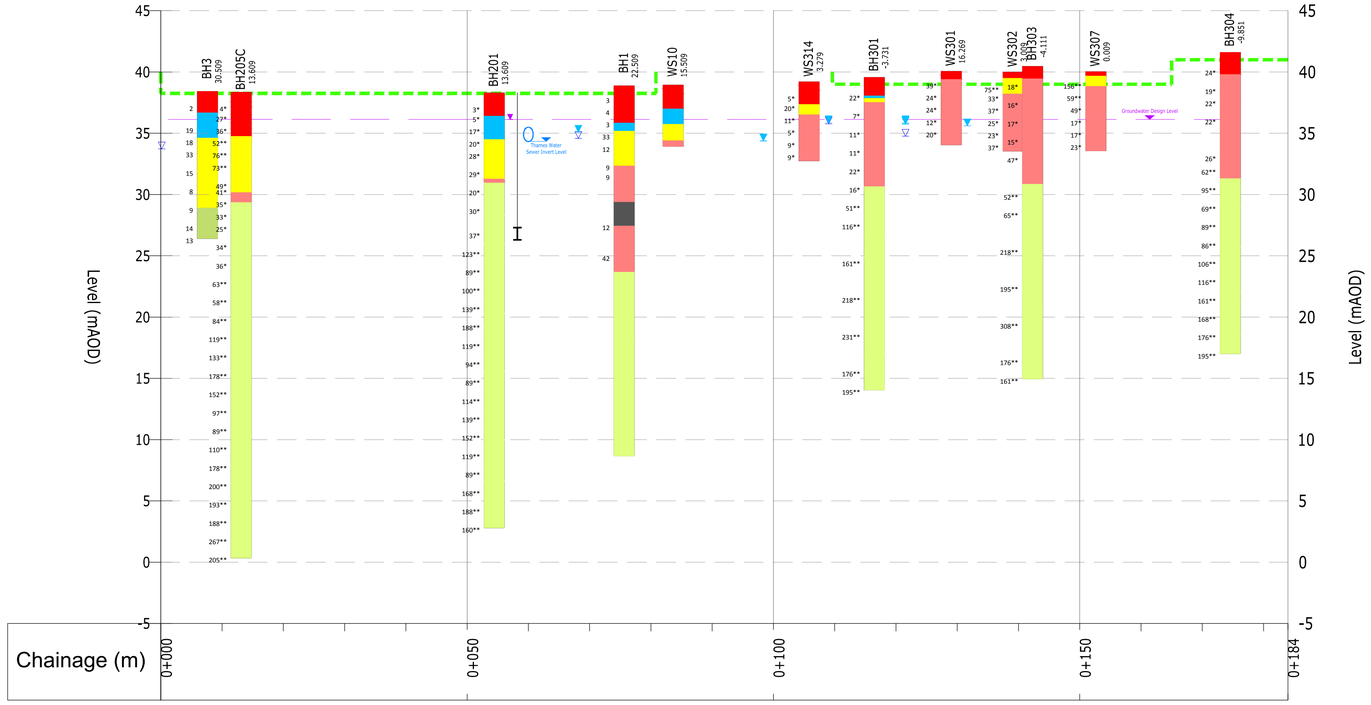
GEOLOGICAL LONG SECTION
SECTION A-A & B-B

Project No:	Scale (@A1):	Drawn:	Date:
1620004716	1.500	DH	AUG.2019

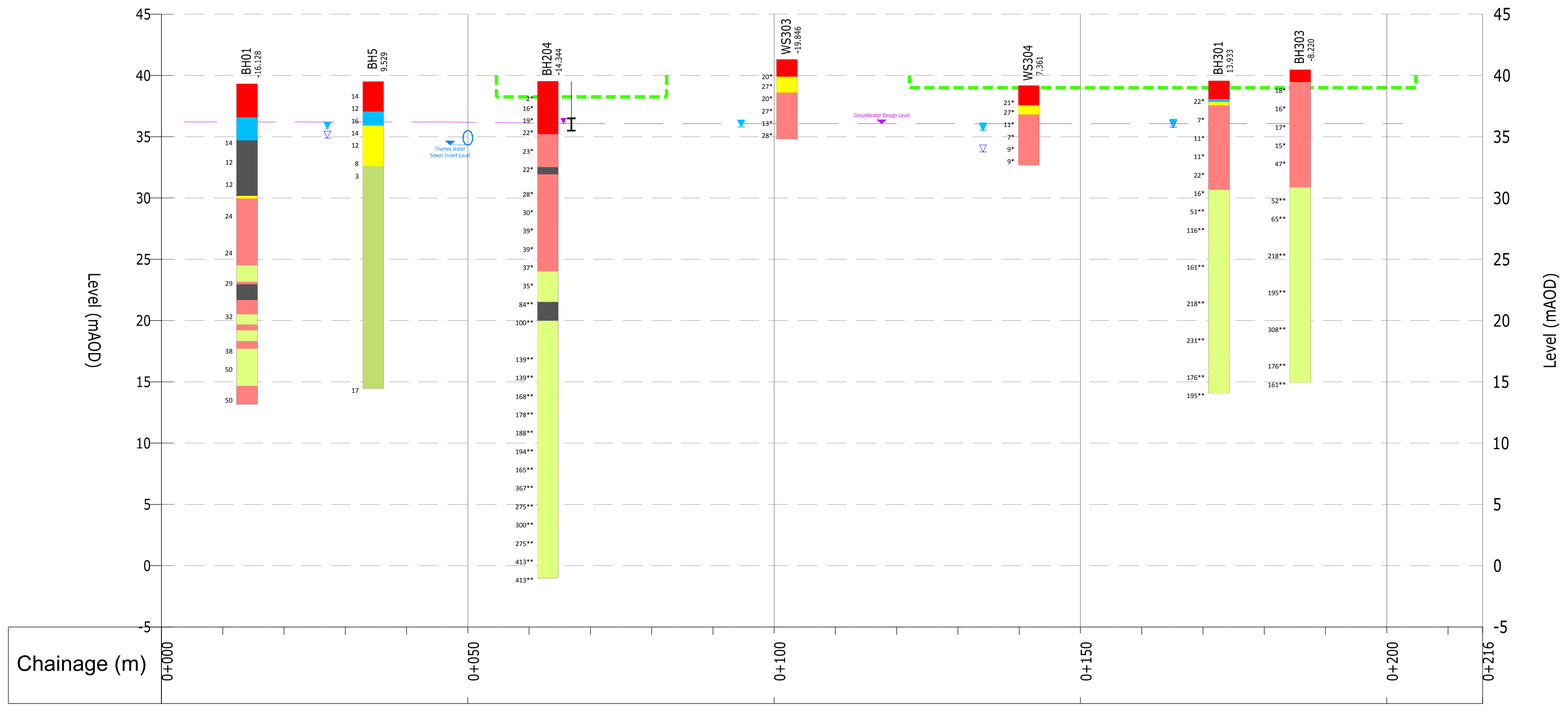
Drawing No: SHRN-RAM-SW-ZZ-DR-S-0070

Rev: I01

16/08/2019 11:42:52



SECTION C-C
SCALE: H 1:500,V 1:250. DATUM: -5.000



SECTION D-D
SCALE: H 1:500,V 1:250. DATUM: -5.000

COPYRIGHT RAMBOLL UK LIMITED. ALL RIGHTS RESERVED. THIS DOCUMENT IS ISSUED FOR THE PARTY WHO COMMISSIONED IT AND FOR THE SPECIFIC PURPOSES CONNECTED WITH THE PROJECT ONLY. IT SHOULD NOT BE RELIED UPON BY ANY OTHER PARTY OR USED FOR ANY OTHER PURPOSE. RAMBOLL ACCEPTS NO RESPONSIBILITY OR LIABILITY WHICH MAY ARISE FROM RELIANCE OR USE OF THIS DOCUMENT OR THE DATA CONTAINED HEREIN BY ANY OTHER PARTY OR FOR ANY OTHER PURPOSE.

Notes

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE MILLIMETRES U.N.O.
3. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. BH01,BH02,AND BH03 CO-ORDINATES HAVE BEEN INFERRED FROM CONCEPT 2012 GROUND INVESTIGATION REPORTING. THEREFORE THEIR RELEVANT POSITIONS SHOULD BE CONSIDERED INDICATIVE ONLY.
6. WS302 - WS303, WS305, WS305A, WS306 - WS3013, WS3015 &WS3016 FROM GEL 2018 GI LOCATIONS ARE ALSO INDICATIVE ONLY.
7. THAMES WATER SEWER LEVELS ARE SHOWN INDICATIVELY, BASED ON HISTORIC CCTV SURVEY REPORTING NOTES.
8. GROUND WATER DESIGN LEVELS ARE INFERRED BASED ON MAXIMUM RECORDED GROUND WATER LEVELS RECORDED DURING MONITORING VISITS UNDERTAKEN BETWEEN 28TH JUNE & 26TH JULY 2019.

KEY:

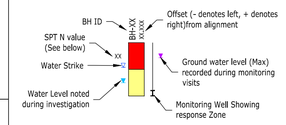
APPROXIMATE BASEMENT SSL LEVEL

GROUNDWATER DESIGN LEVEL

GEOLOGY KEY:

Legend
MADE GROUND
ALLUVIUM
TAPLOW GRAVEL
STRUCTURELESS CHALK
STRUCTURED CHALK
UNDIFFERENTIAITED CHALK
NO RECOVERY

BOREHOLE LEGEND:



SPT VALUE KEY:
- XX =SPT N VALUE UNCORRECTED
- XX* =SPT N(60) VALUE
- XX** =SPT N(60) VALUE EXTRAPOLATED

Rev	Description	Date	By	Chk	App
I01	FOR INFORMATION	06/08/19	DH	SM	SP

FOR INFORMATION

STATION HILL
READING

RAMBOLL

tel 020 7631 5291 london@ramboll.co.uk
www.ramboll.co.uk

GEOLOGICAL LONG SECTION
C-C

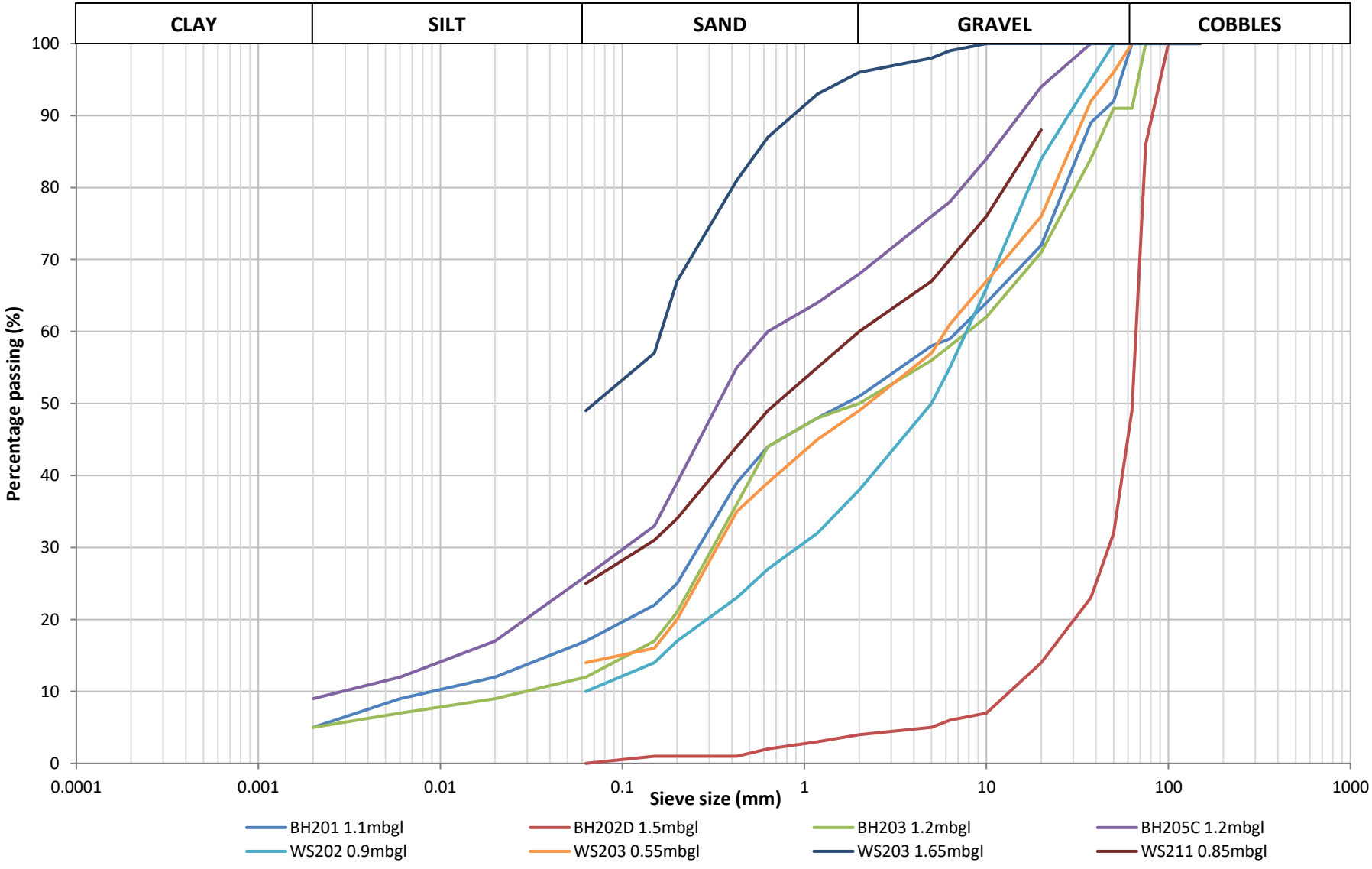
Project No:	Scale (@A1):	Drawn:	Date:
1620004716	1.500	DH	AUG.2019

Drawing No:	Rev:
SHRN-RAM-SW-ZZ-DR-S-0072	I01

16/08/2019 11:43:24

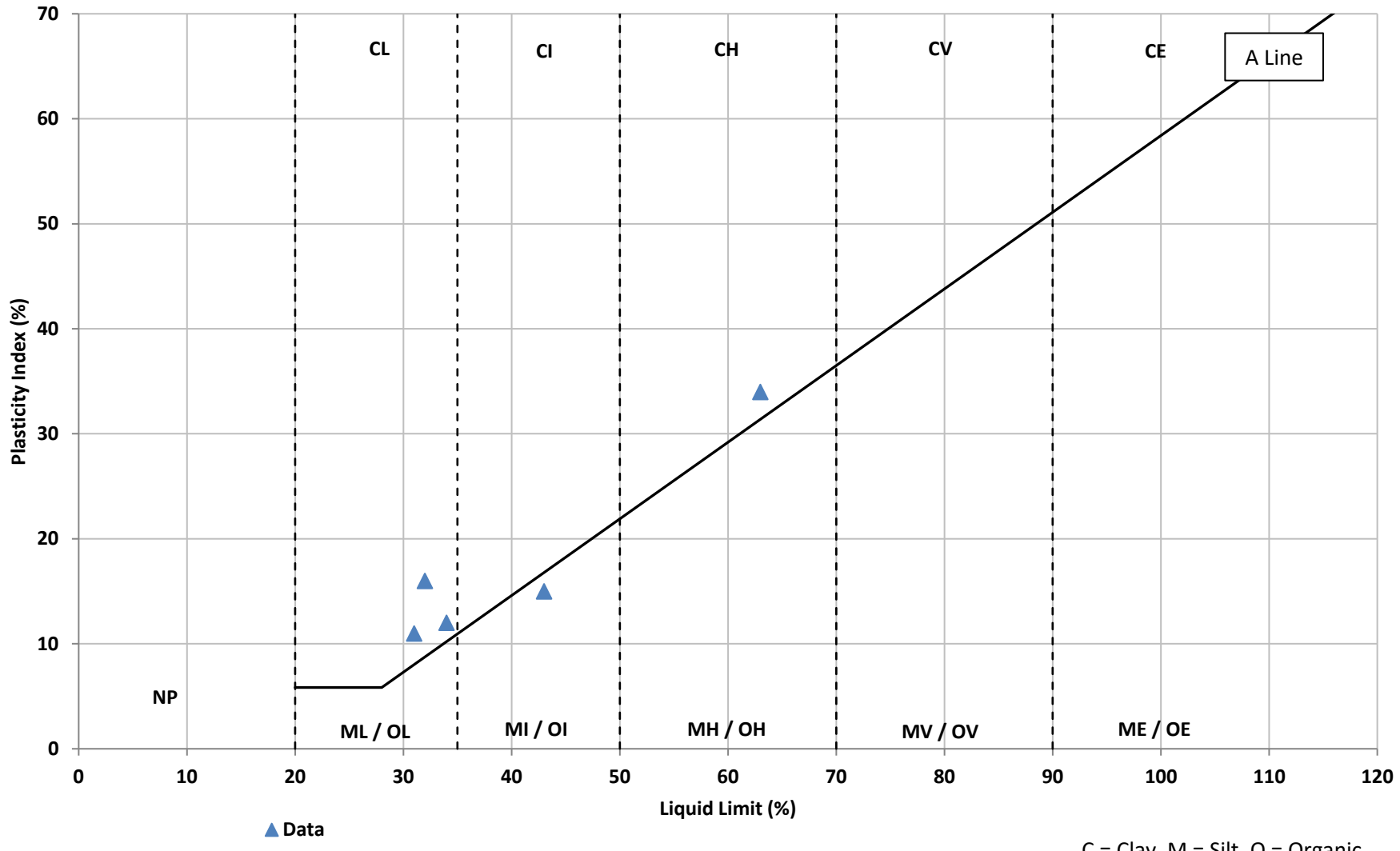
APPENDIX 1

RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: STATION HILL, READING	**Client:** Lincoln	



Title: Particle size distribution (PSD) by Sample for Made Ground	**Data Plot:** A1.1	**Status:**	**Drawn:** FCAPA	**Date:** 13/08/2019
			Checked: KS	**Date:** 16/08/2019

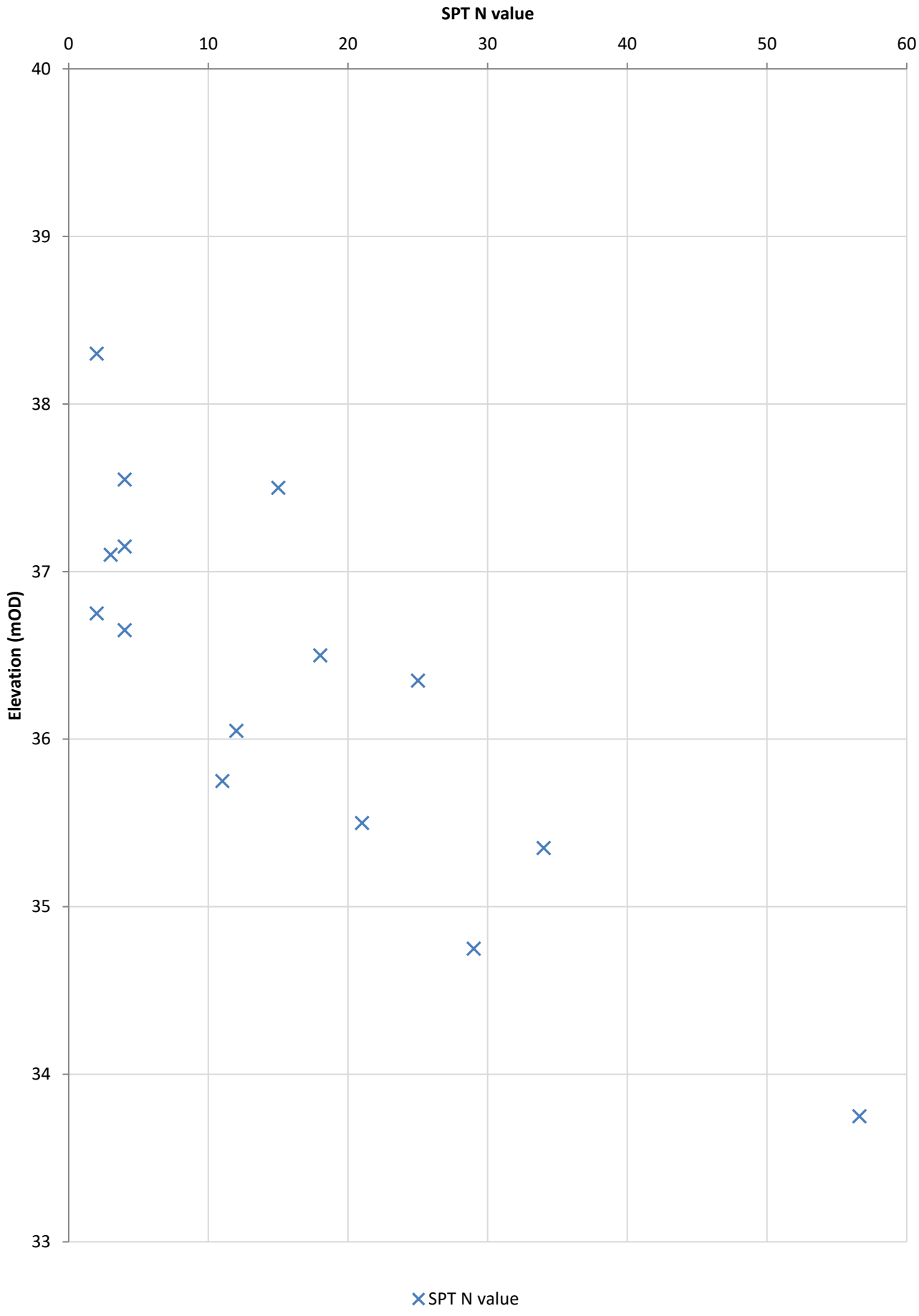
RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: Station Hill Road, Reading	**Client:** Lincoln	



C = Clay, M = Silt, O = Organic

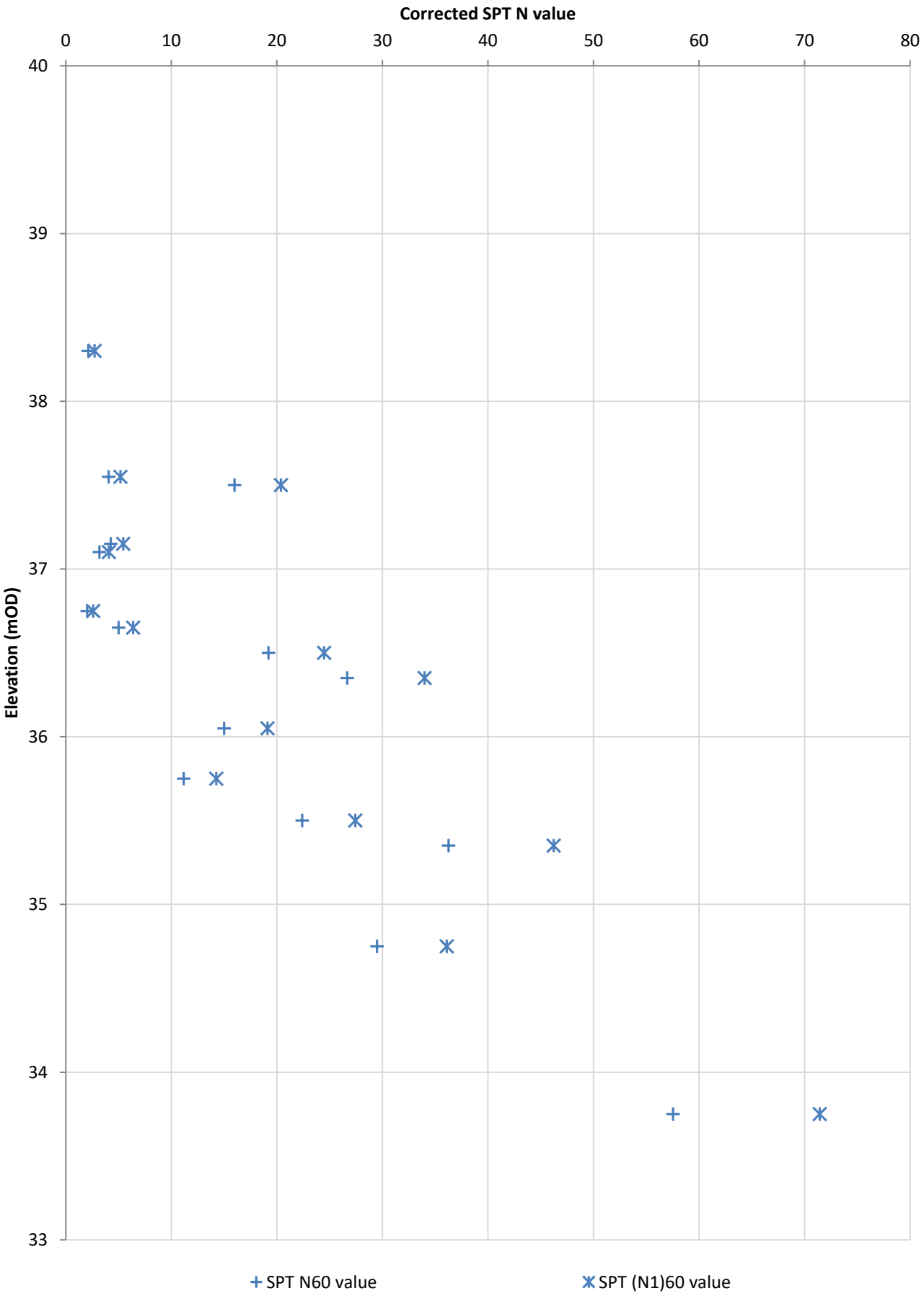
Title: Plasticity Chart for MADE GROUND	**Data Plot:** A1.2	**Status:**	**Drawn:** FCAPA	**Date:** 05/08/2019
			Checked: KS	**Date:** 16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	Lincoln



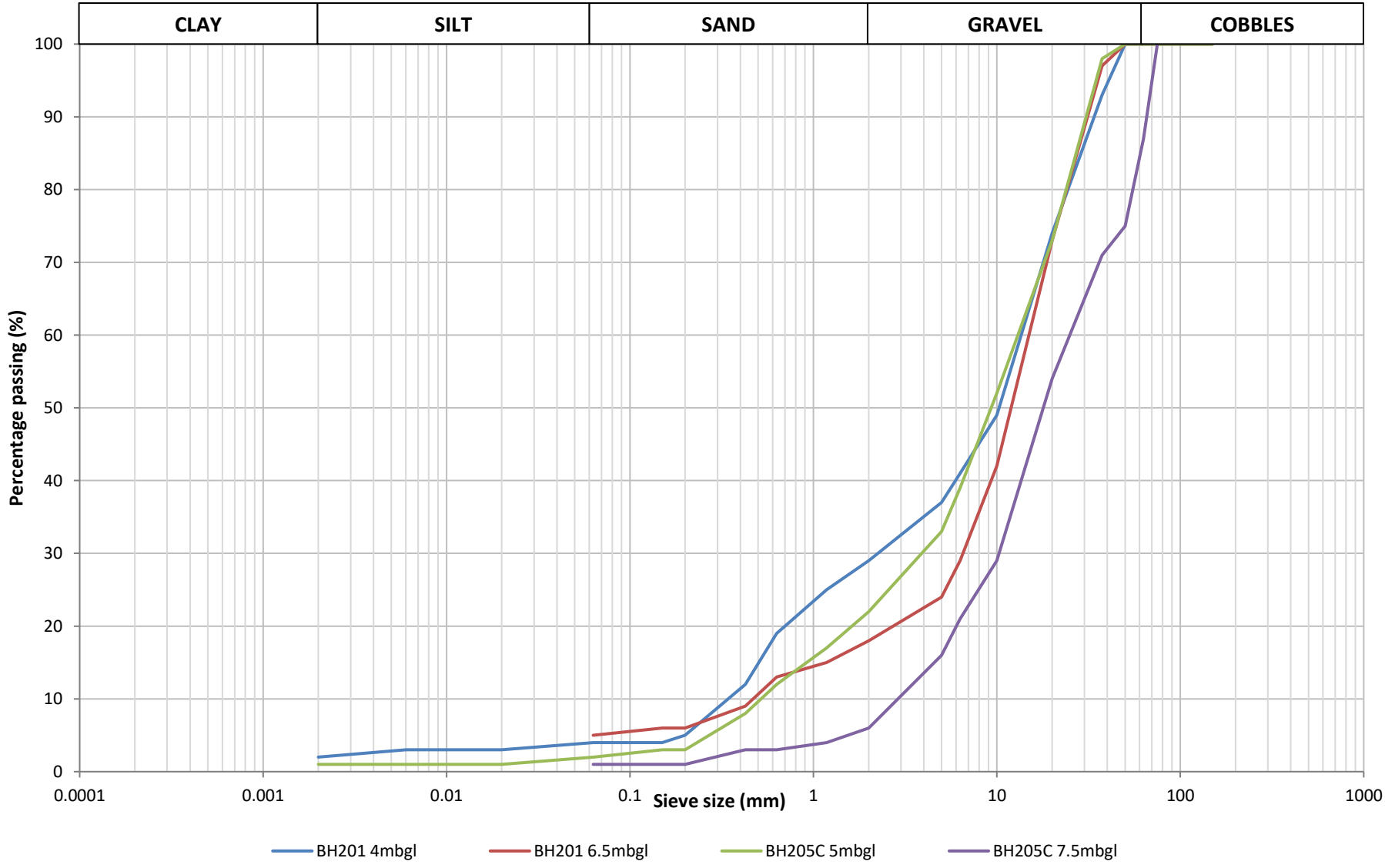
Title:	Uncorrected SPT N value by Elevation for MADE GROUND	Data Plot: A1.3	Drawn: FCAPA	Date: 02/08/2019
		Status:	Checked: KS	Date: 16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	Lincoln



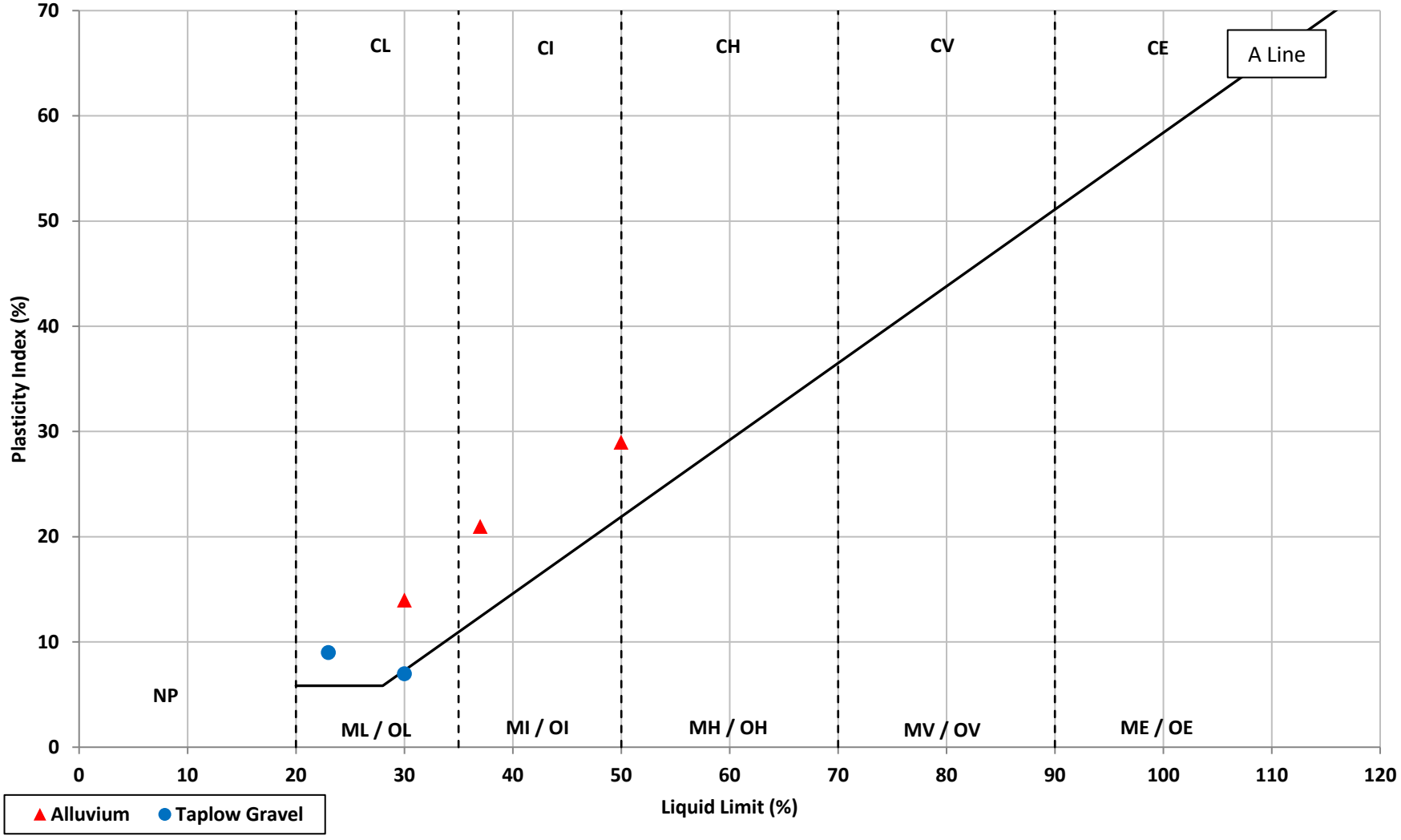
Title:	Corrected SPT N value by Elevation for MADE GROUND	Data Plot: A1.4	Drawn: FCAPA	Date: 02/08/2019
		Status:	Checked:	Date: 16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: STATION HILL, READING	**Client:** Lincoln	



Title: Particle size distribution (PSD) by Sample for Taplow Gravel	**Data Plot:** A1.5	**Status:**	**Drawn:** FCAPA	**Date:** 13/08/2019
			Checked: KS	**Date:** 16/08/2019

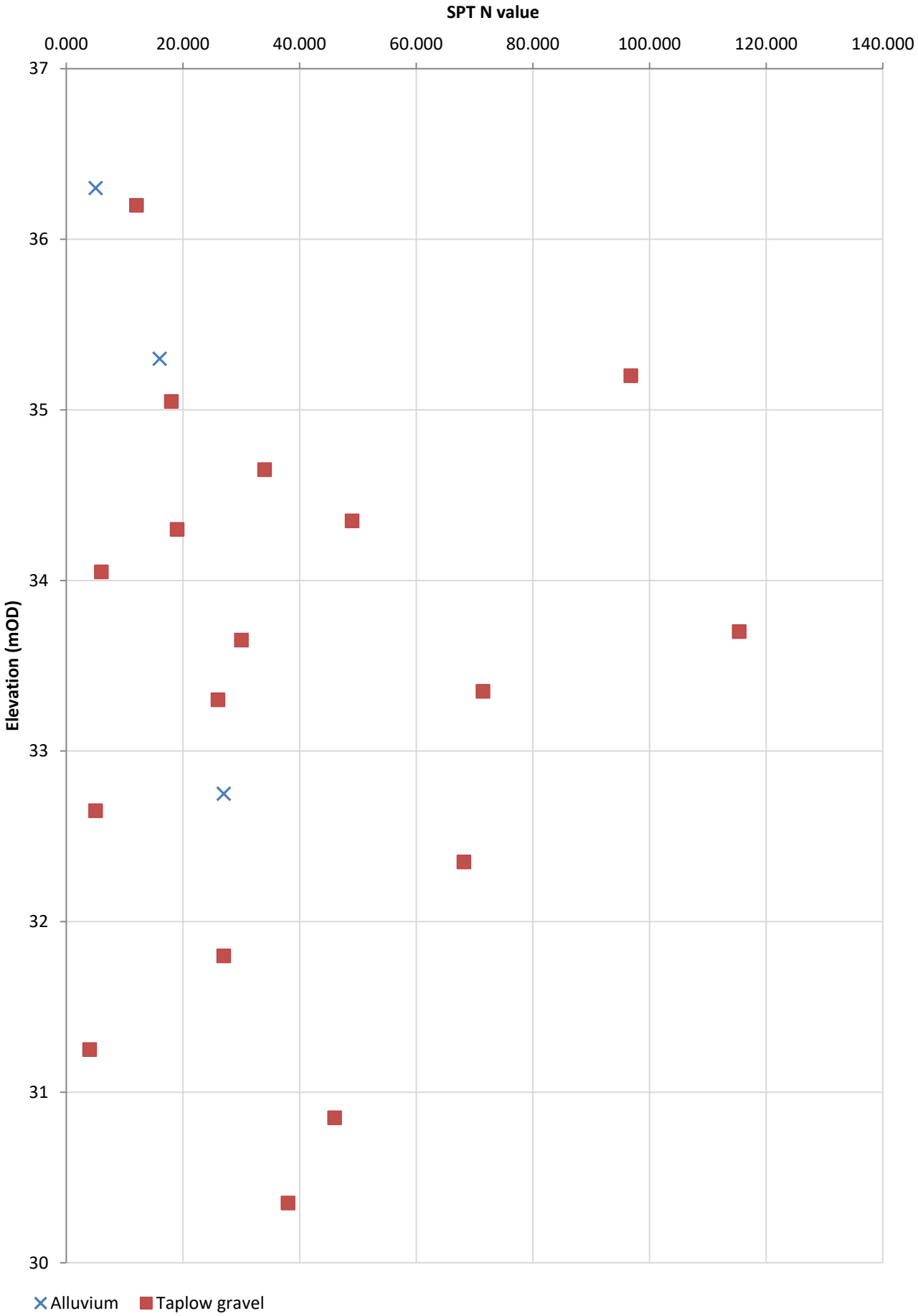
RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: Station Hill Road, Reading	**Client:** Lincoln	



C = Clay, M = Silt, O = Organic

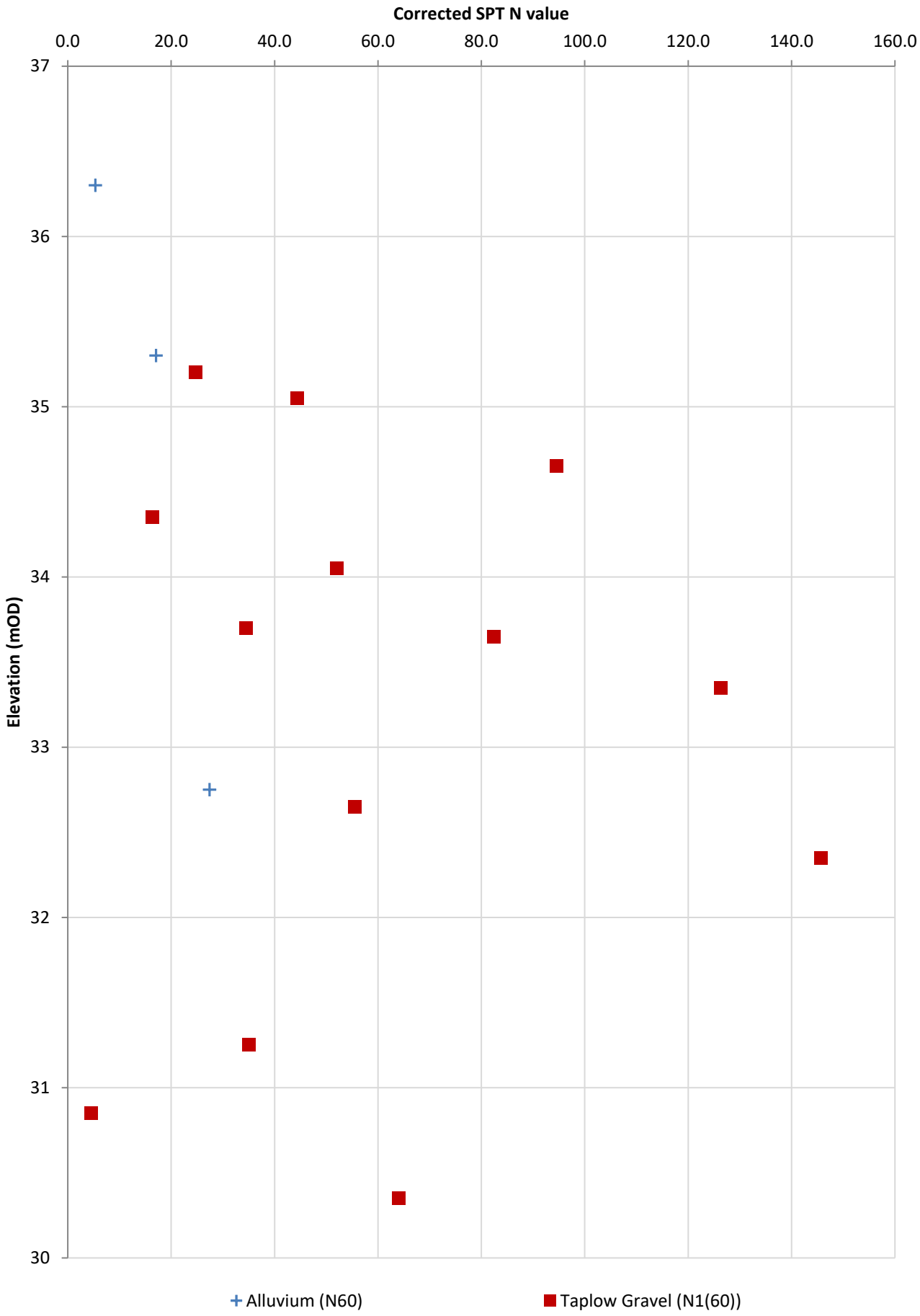
Title: Plasticity Chart for Alluvium and Taplow Gravel	**Data Plot:** A1.6	**Status:**	**Drawn:** FCAPA	**Date:** 05/08/2019
			Checked: KS	**Date:** 16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	Lincoln



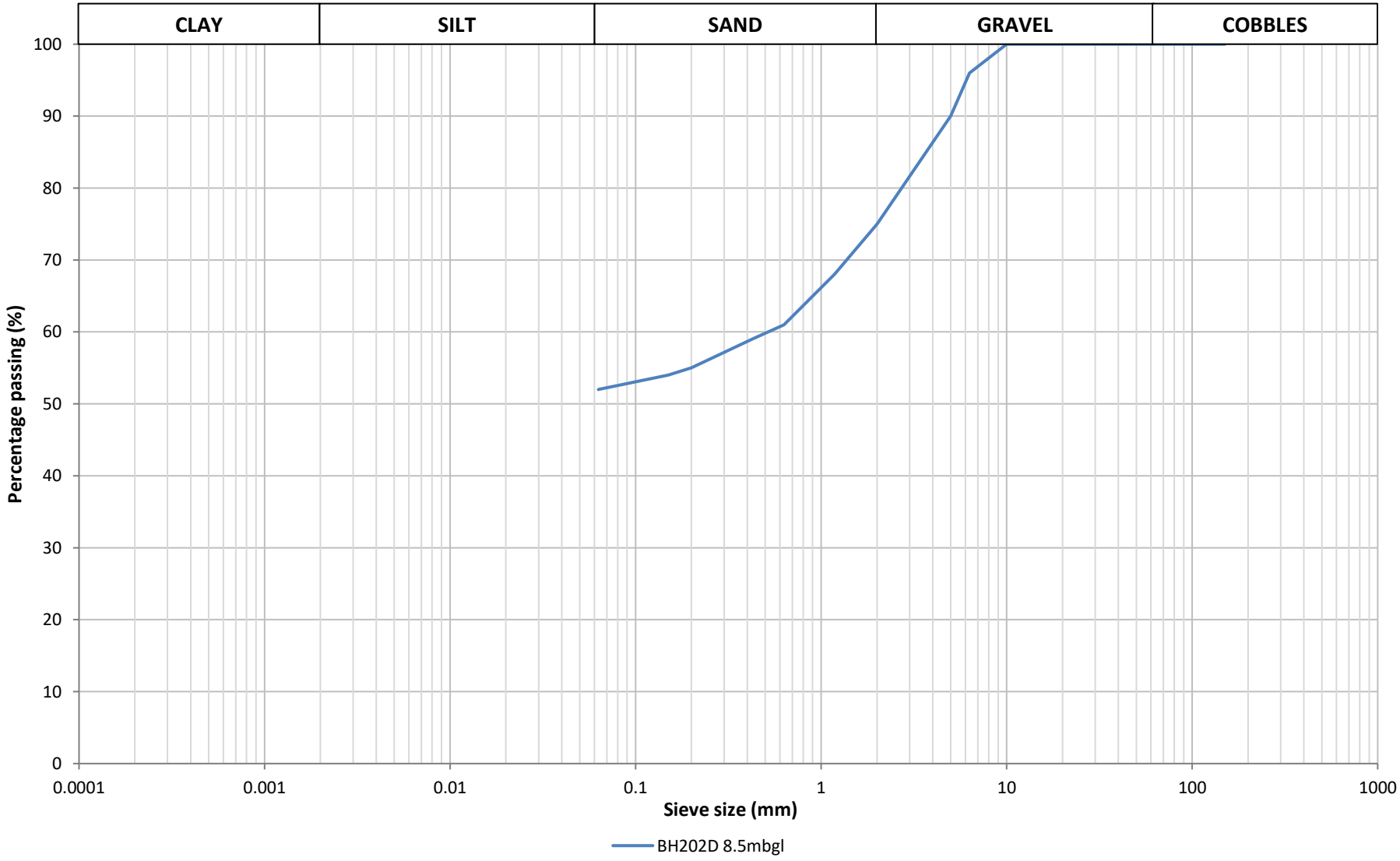
Title:	Uncorrected SPT N value by Elevation for Alluvium and Taplow Gravel	Data Plot:	A1.7	Drawn:	FCAPA	Date:	02/08/2019
		Status:		Checked:	KS	Date:	16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	Lincoln



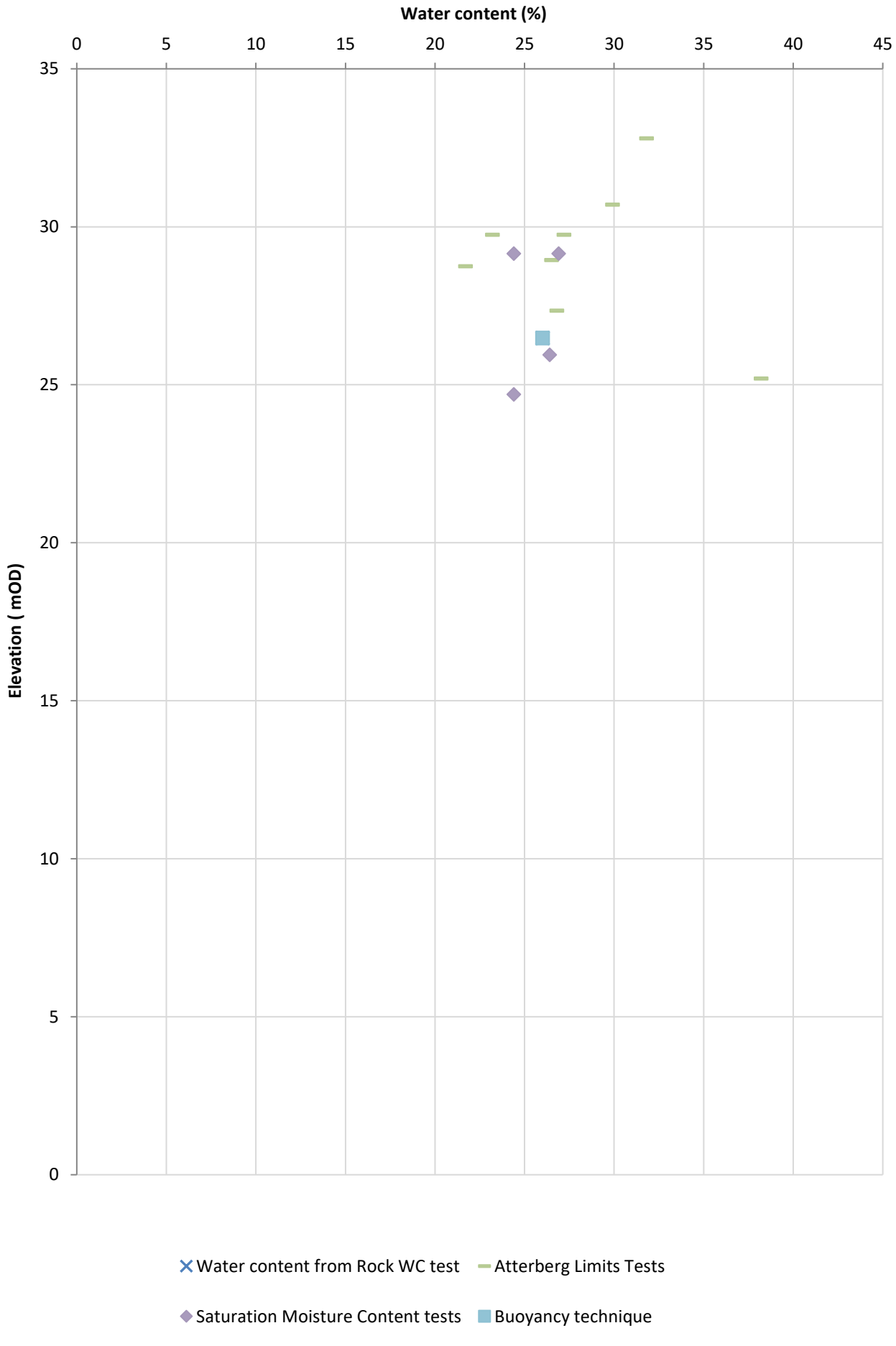
Title:	Corrected SPT N value by Elevation for Alluvium and Taplow Gravel	Data Plot:	A1.8	Drawn:	FCAPA	Date:	02/08/2019
		Status:		Checked:	KS	Date:	16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: STATION HILL, READING	**Client:** Lincoln	



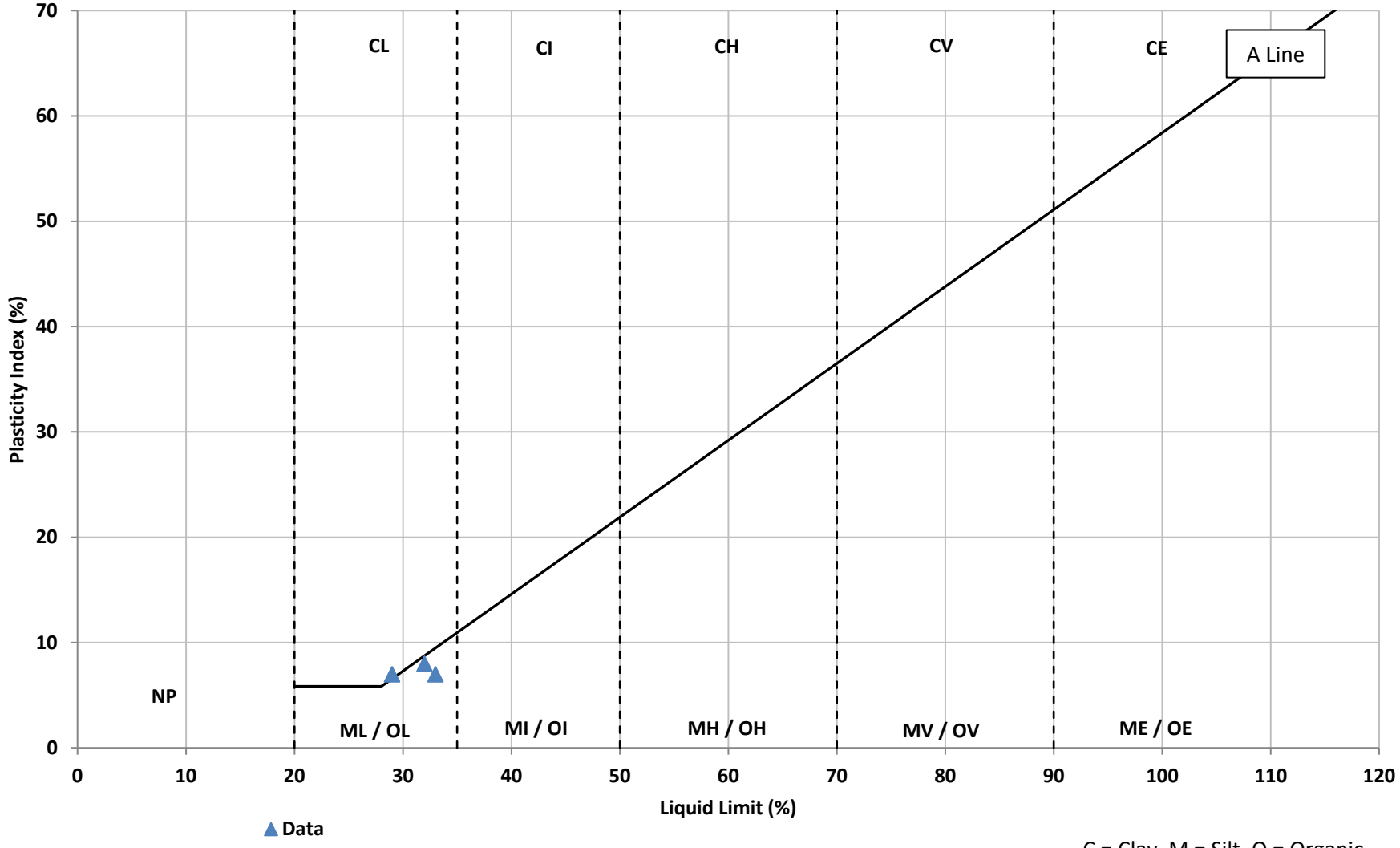
Title:	Particle size distribution (PSD) by Sample for STRUCTURELESS CHALK	**Data Plot:** A1.9	**Status:**	**Drawn:** FCAPA	**Date:** 13/08/2019
				Checked: KS	**Date:** 16/08/2019

RAMBOLL	Project: STATION HILL, READING	Job No: 1620004716
	Location: STATION HILL, READING	Client: Lincoln



Title:	Dry and bulk density by Elevation for Structureless Chalk	Data Plot: A1.10	Drawn: FCAPA	Date: 05/08/2019
		Revision:	Checked: KS	Date: 16/08/2019

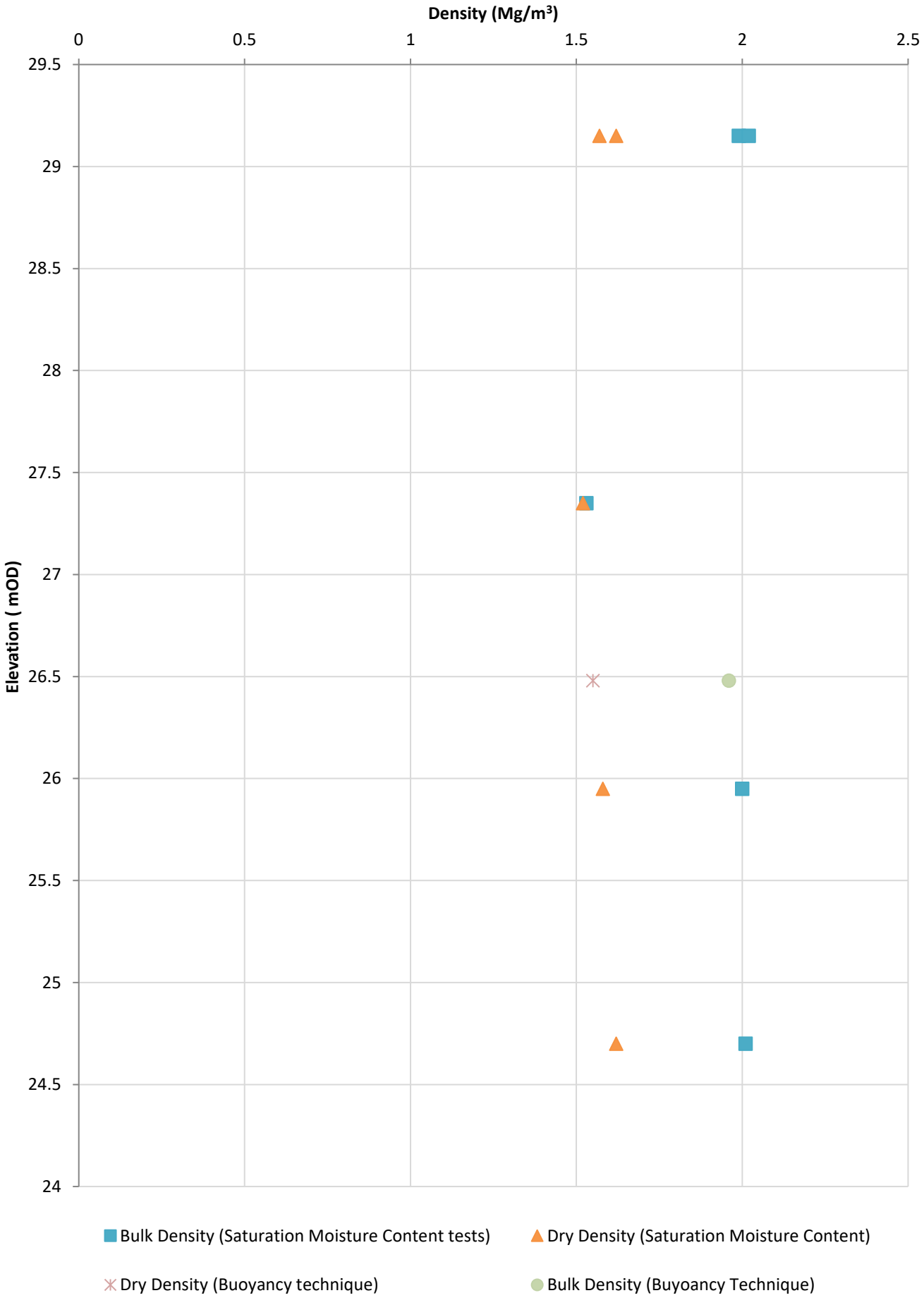
RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: Station Hill Road, Reading	**Client:** Lincoln	



C = Clay, M = Silt, O = Organic

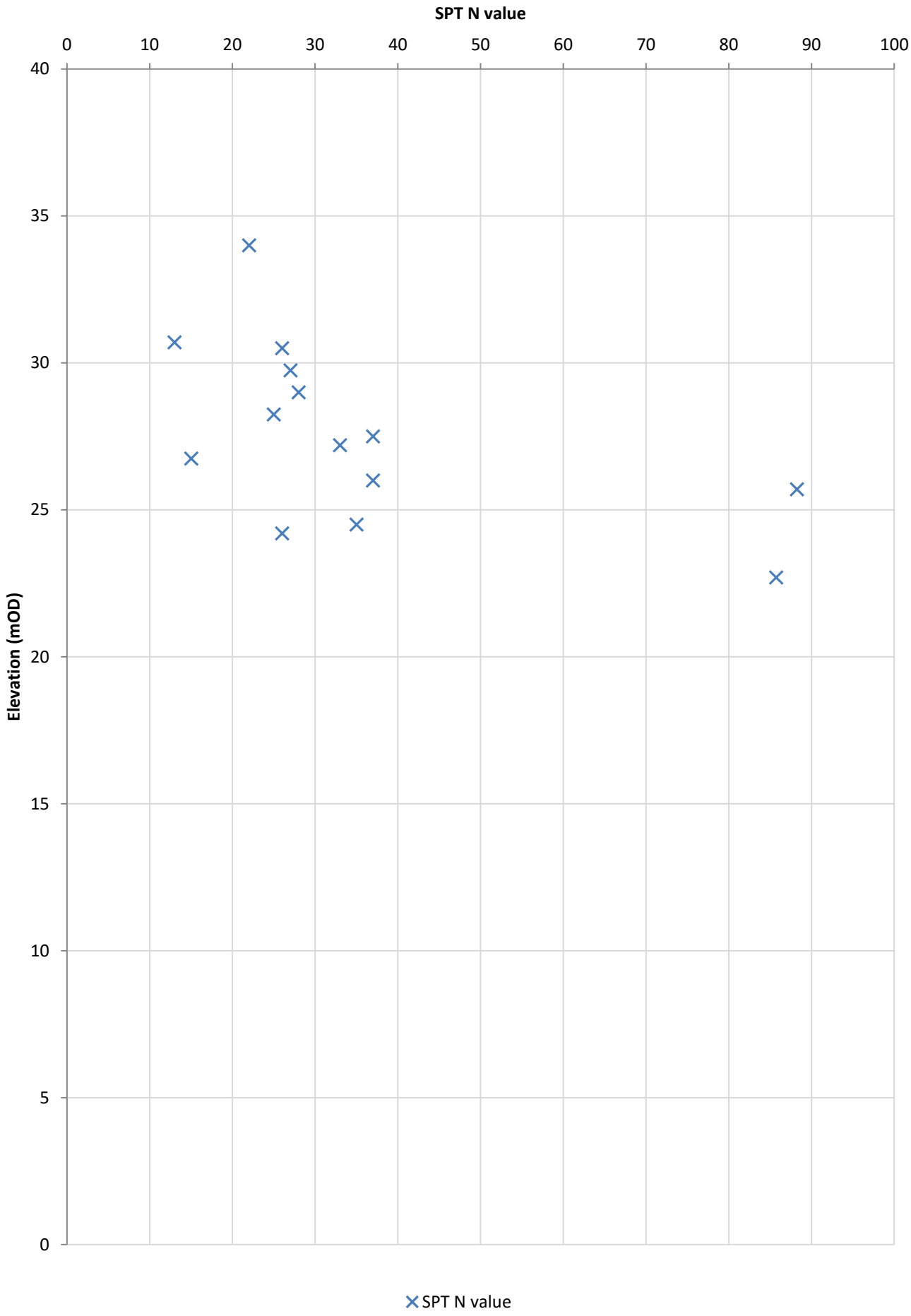
Title: Plasticity Chart for STRUCTURELESS CHALK	**Data Plot:** A1.11	**Status:**	**Drawn:** FCAPA	**Date:** 05/08/2019
			Checked: KS	**Date:** 16/08/2019

RAMBOLL	Project: STATION HILL, READING	Job No: 1620004716
	Location: STATION HILL, READING	Client: Lincoln



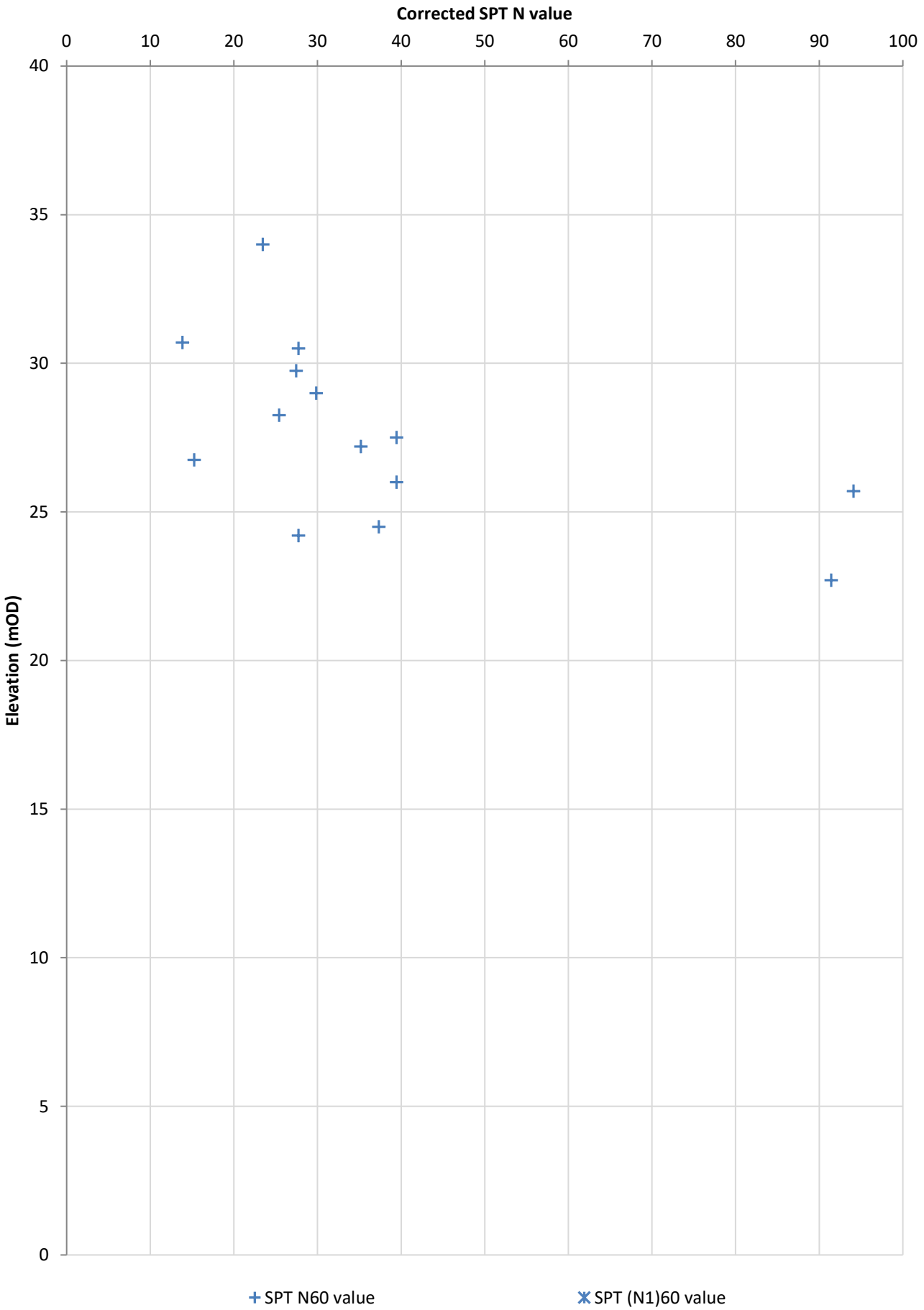
Title:	Dry and bulk density by Elevation for Structureless Chalk	Data Plot: A1.12	Drawn: FCAPA	Date: 05/08/2019
		Revision:	Checked: KS	Date: 16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:**	1620004716
	Location: STATION HILL, READING	**Client:**	SH READING MASTER LLP



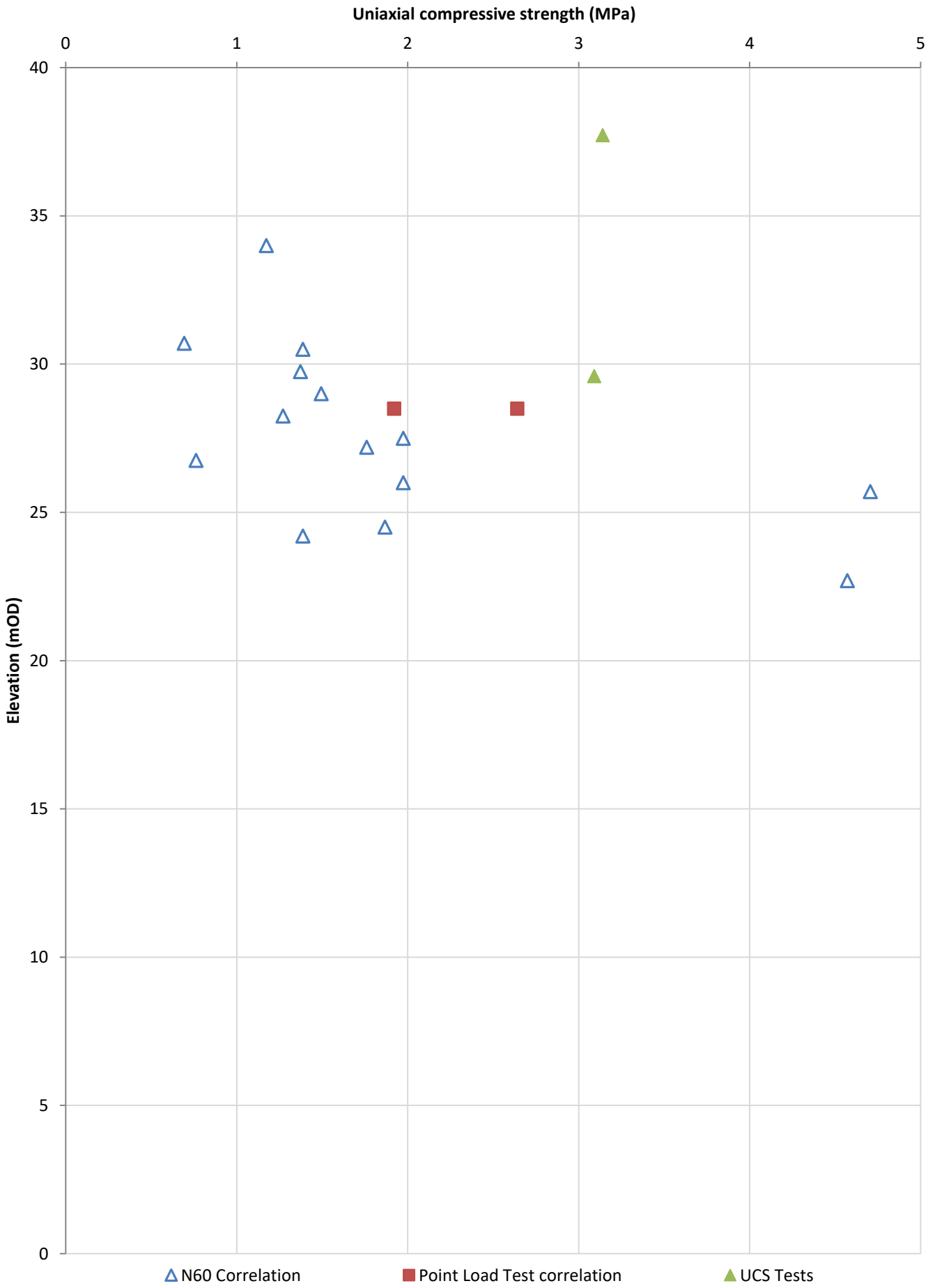
Title:	Uncorrected SPT N value by Elevation for STRUCTURELESS CHALK	**Data Plot:**	A1.13	**Drawn:**	FCAPA	**Date:**	05/08/2019
		Status:		**Checked:**	KS	**Date:**	16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:**	1620004716
	Location: STATION HILL, READING	**Client:**	SH READING MASTER LLP



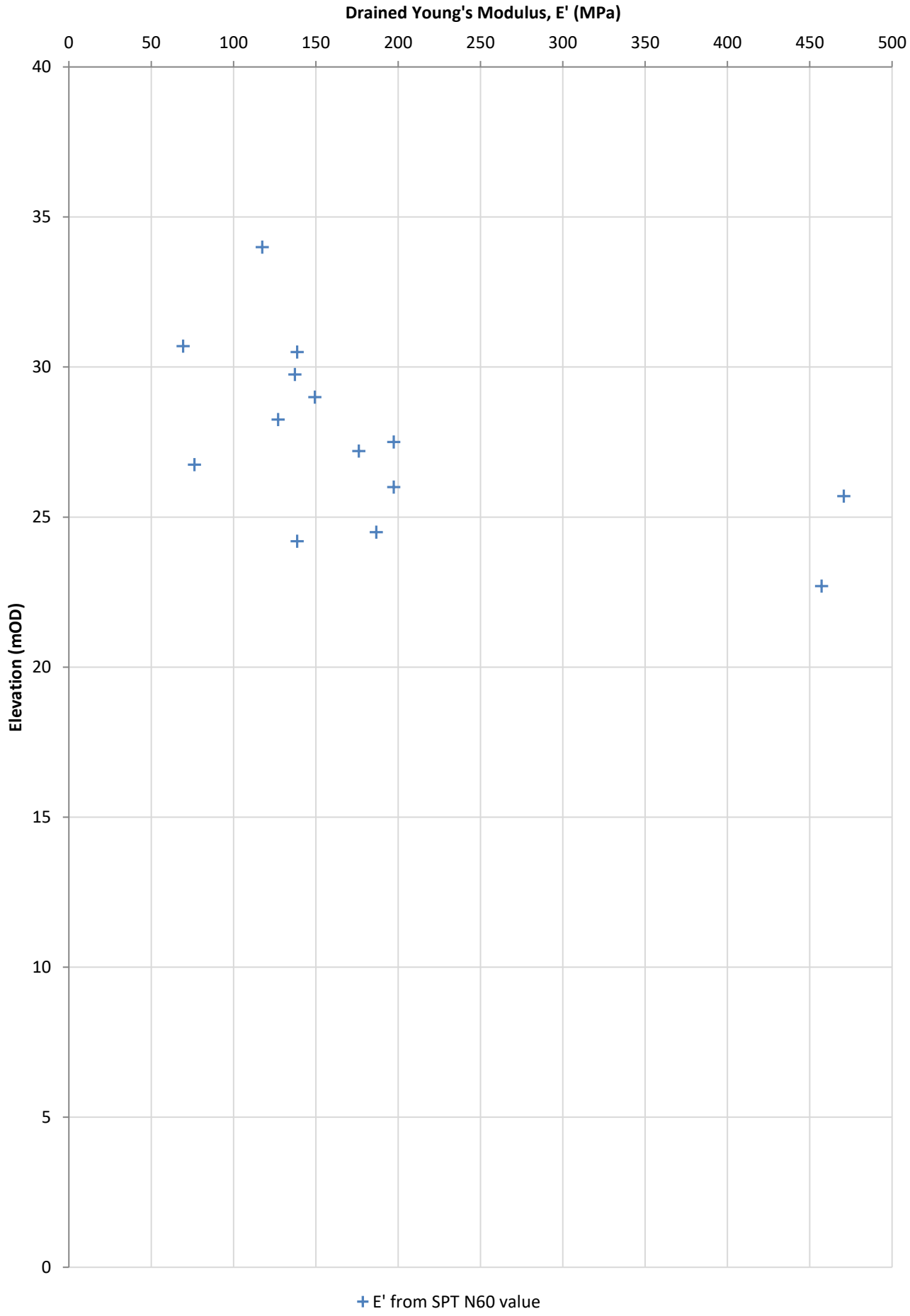
Title:	Corrected SPT N value by Elevation for STRUCTURELESS CHALK	**Data Plot:**	A1.14	**Drawn:**	FCAPA	**Date:**	05/08/2019
		Status:		**Checked:**	KS	**Date:**	16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:**	1620004716
	Location: STATION HILL, READING	**Client:**	SH READING MASTER LLP



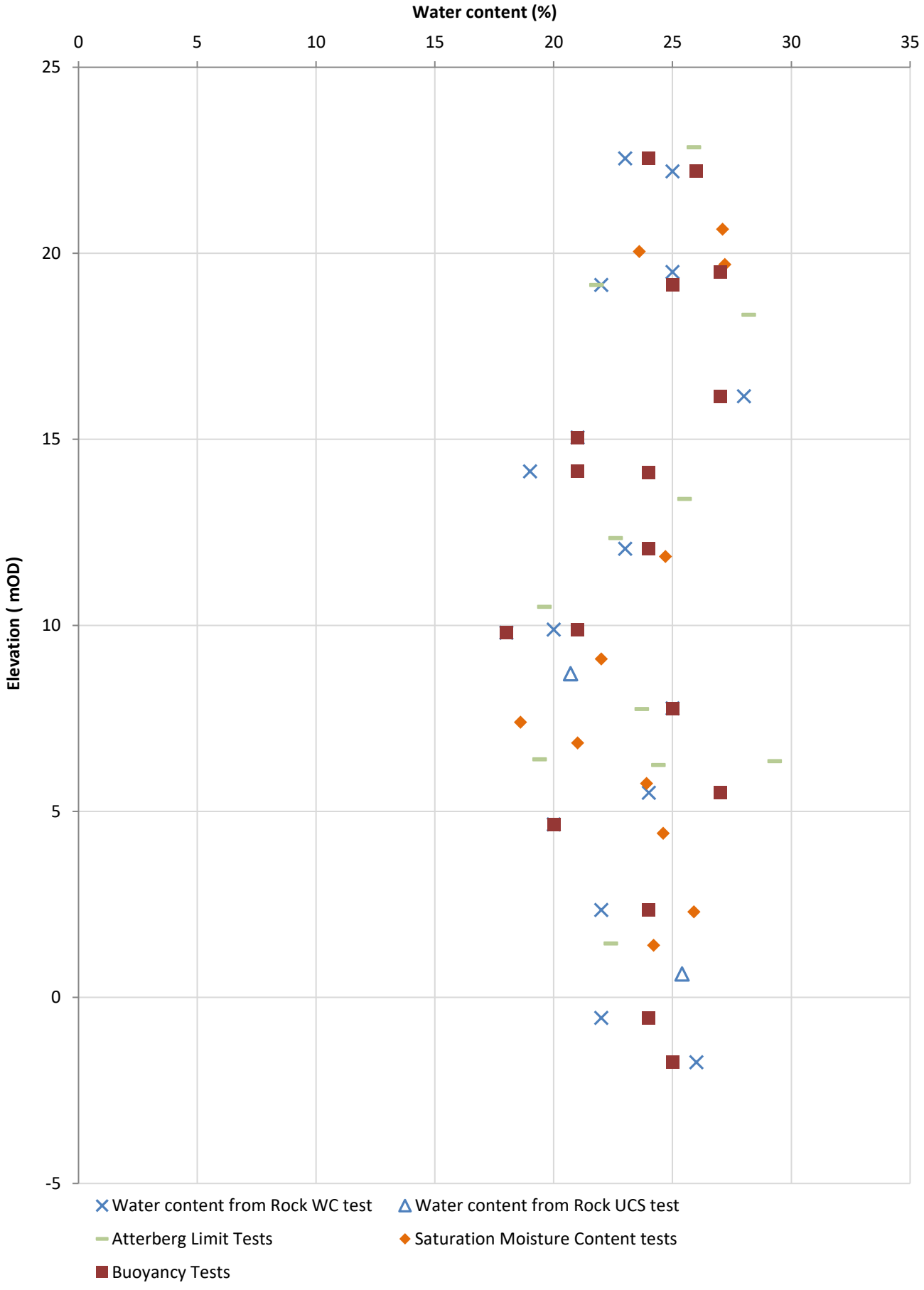
Title:	Uniaxial Comrpessive Strength results for Structureless Chalk	**Data Plot:**	A1.15	**Drawn:**	FCAPA	**Date:**	05/08/2019
		Status:		**Checked:**	KS	**Date:**	16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	SH READING MASTER LLP



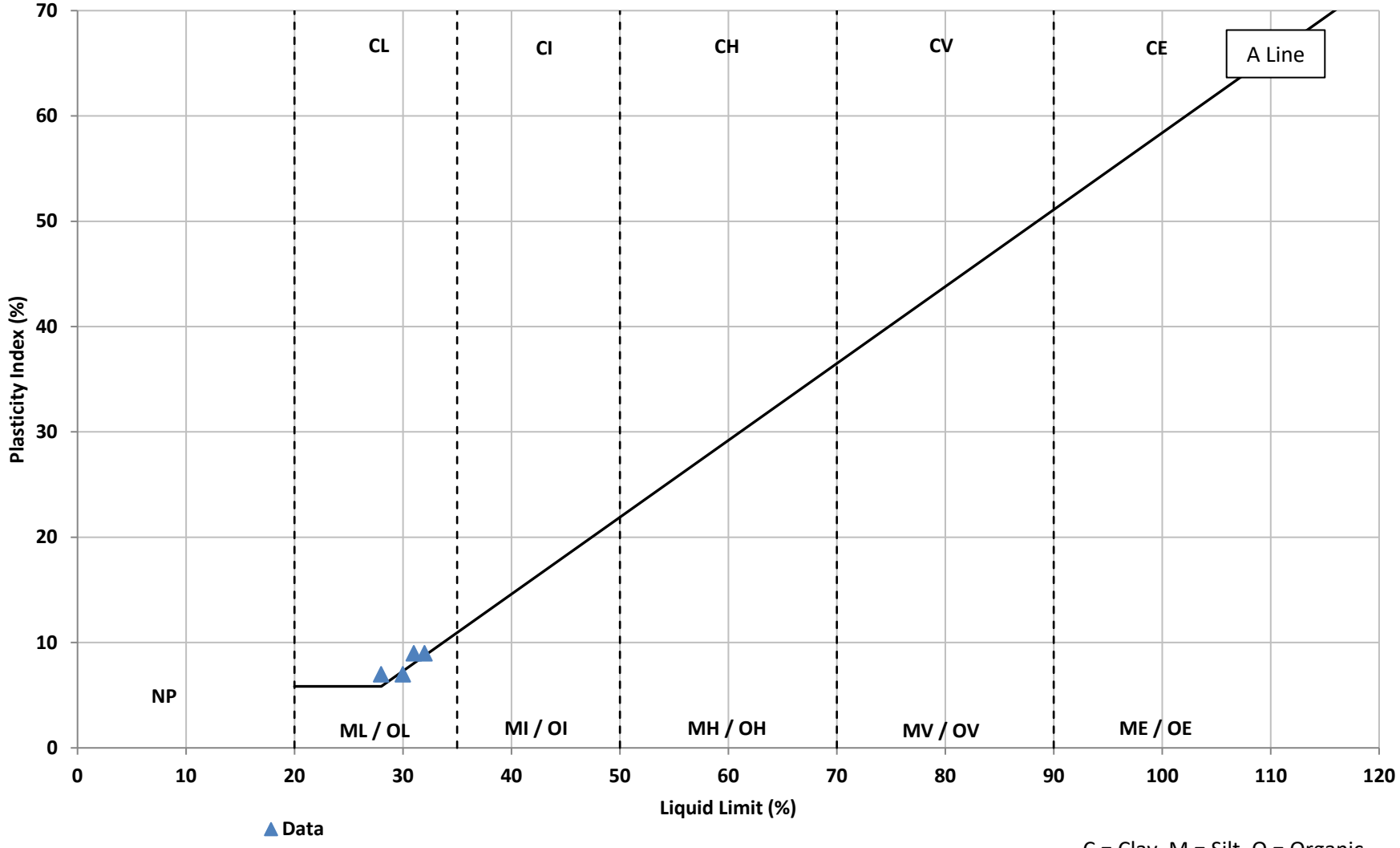
Title:	Uncorrected SPT N value by Elevation for STRUCTURELESS CHALK	Data Plot:	A1.16	Drawn:	FCAPA	Date:	05/08/2019
		Status:		Checked:	KS	Date:	16/08/2019

RAMBOLL	Project: STATION HILL, READING	Job No: 1620004716
	Location: STATION HILL, READING	Client: Lincoln



Title:	Moisture content by Elevation for STRUCTURED CHALK	Data Plot: A1.17	Drawn: FCAPA	Date: 05/08/2019
		Revision:	Checked:	Date:

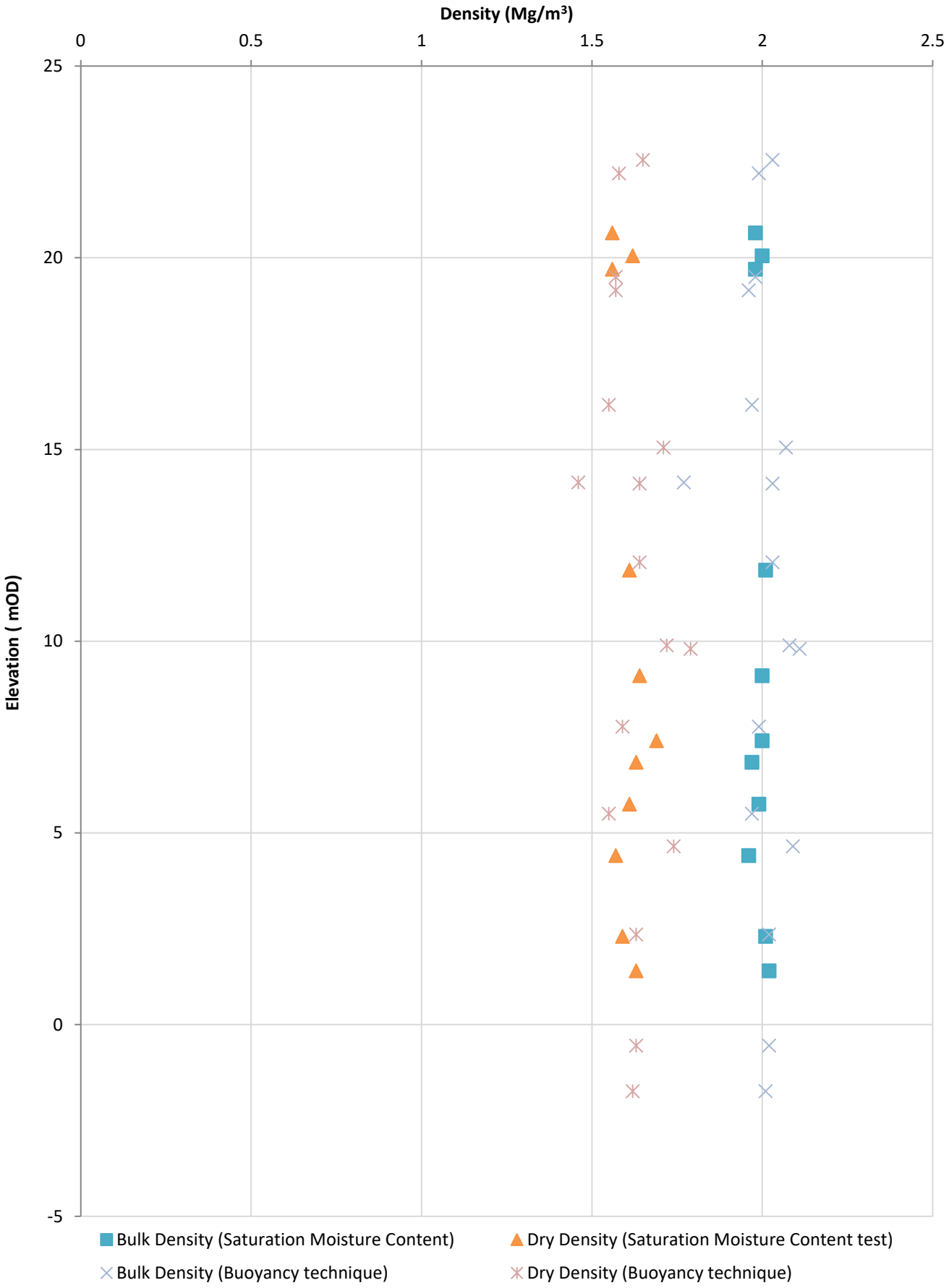
RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: Station Hill Road, Reading	**Client:** Lincoln	



C = Clay, M = Silt, O = Organic

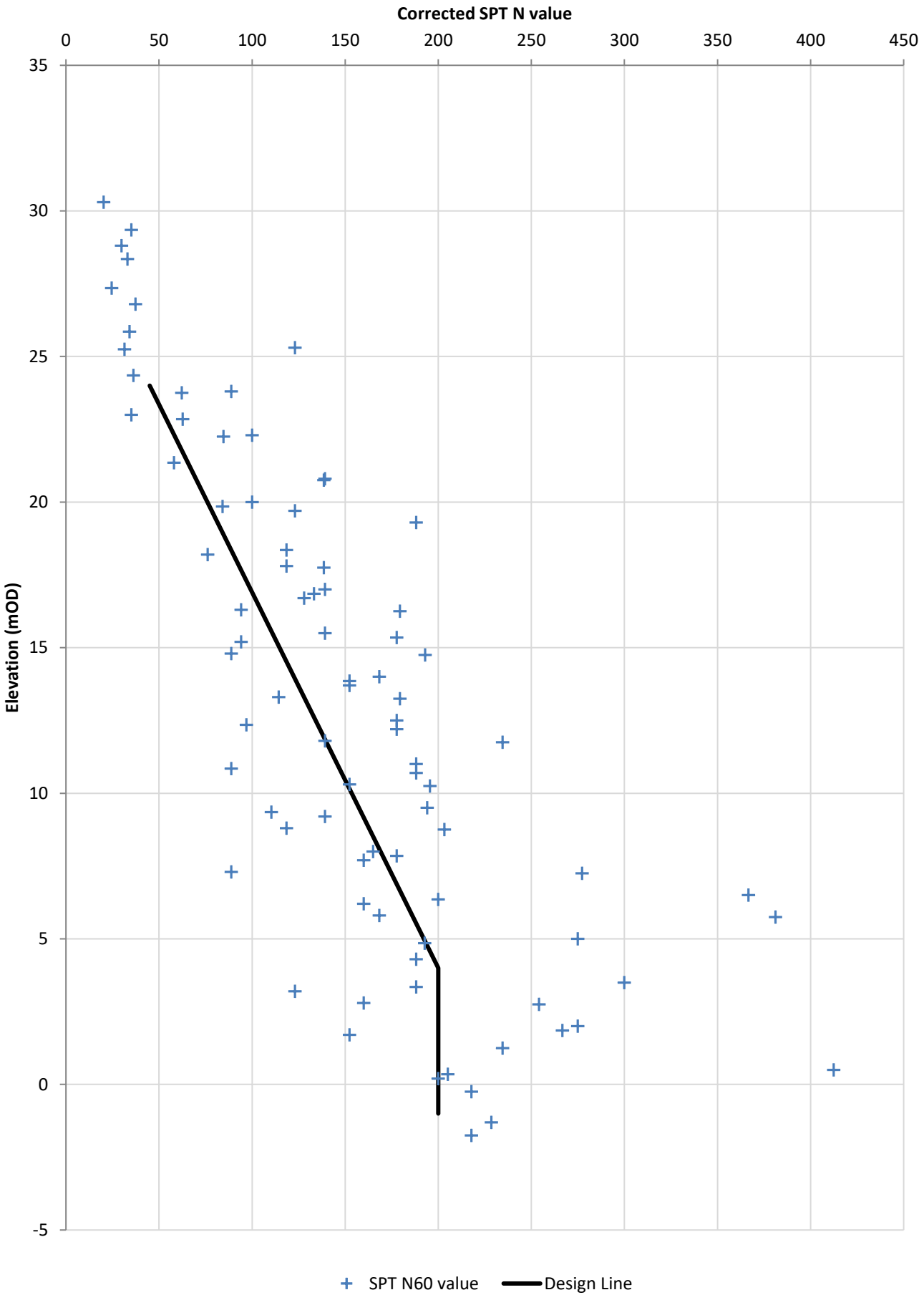
Title: Plasticity Chart for STRUCTURED CHALK	**Data Plot:** A1.18	**Status:**	**Drawn:** FCAPA	**Date:** 05/08/2019
			Checked: KS	**Date:** 16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:** 1620004716	
	Location: STATION HILL, READING	**Client:** Lincoln	



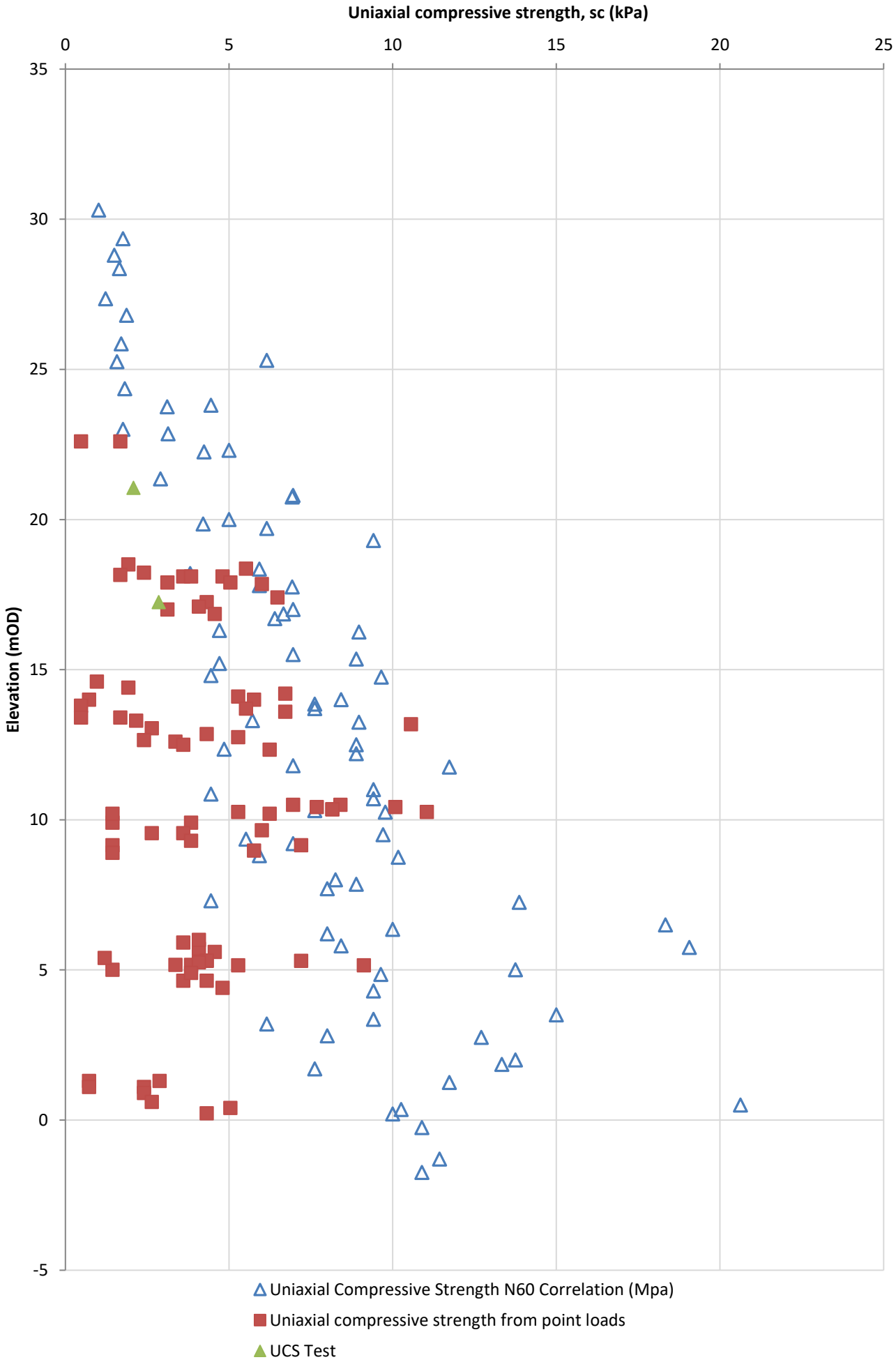
Title:	Dry and bulk density by Elevation for STRUCTURED CHALK	**Data Plot:** A1.19	**Drawn:** FCAPA	**Date:**	05/08/2019
		Revision:	**Checked:**	**Date:**	

RAMBOLL	**Project:** STATION HILL, READING	**Job No:**	1620004716
	Location: STATION HILL, READING	**Client:**	SH READING MASTER LLP



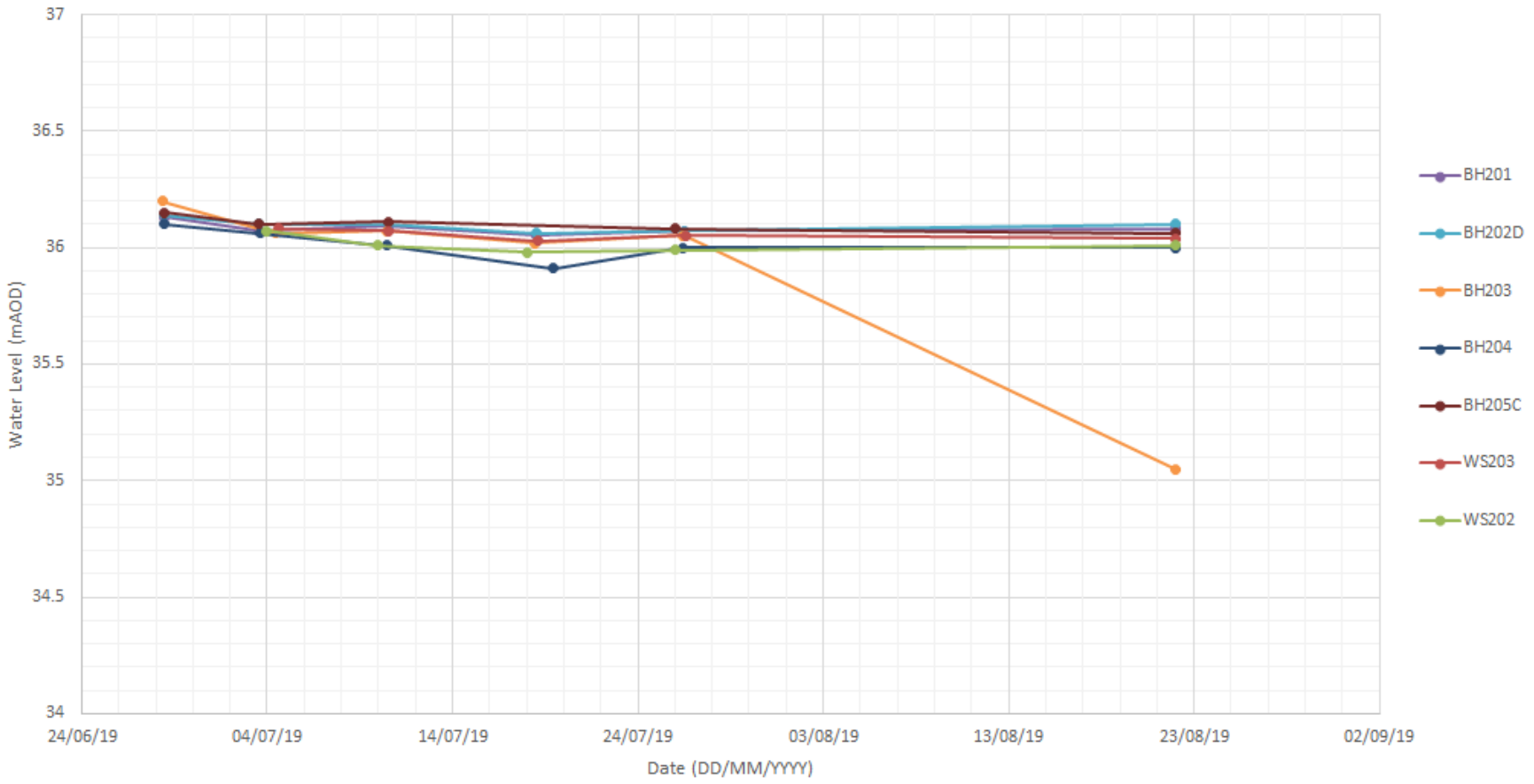
Title:	Corrected SPT N value by Elevation for STRUCTURED CHALK	**Data Plot:**	A1.20	**Drawn:**	FCAPA	**Date:**	05/08/2019
		Status:		**Checked:**	KS	**Date:**	16/08/2019

RAMBOLL	Project:	STATION HILL, READING	Job No:	1620004716
	Location:	STATION HILL, READING	Client:	SH READING MASTER LLP



Title:	Uniaxial Compressive Strength for Structured Chalk	Data Plot: A1.21	Drawn: FCAPA	Date: 05/08/2019
		Status:	Checked: KS	Date: 16/08/2019

RAMBOLL	**Project:** STATION HILL, READING	**Job No:**	1620004716
	Location: Station Hill Road, Reading	**Client:**	Lincoln



Title: Ground Water Levels	**Data Plot:** A1.22	**Status:**	**Drawn:** FCAPA	**Date:**	28/08/2019
			Checked:	**Date:**	28/08/2019

APPENDIX 2

STATION HILL, READING

FACTUAL REPORT ON GROUND INVESTIGATION

Prepared for SH READING MASTER LLP

Report Ref: 35248

Geotechnical Engineering Ltd
Centurion House, Olympus Park
Quedgeley, Gloucester. GL2 4NF

01452 527743
www.geoeng.co.uk

STATION HILL, READING

FACTUAL REPORT ON GROUND INVESTIGATION

Prepared for SH READING MASTER LLP

Report Ref: 35248

PROJECT: Redevelopment of Old Shopping Centre

CONSULTANT: Ramboll UK Ltd

VOLUME - VERSION	STATUS	ORIGINATOR	CHECKER	APPROVED	DATE
1 of 1 – A	DRAFT	AT/JS	CT	-	23/07/19
1 of 1 – A	FINAL	JS	CT	CT	06/08/19
1 of 1 – B	FINAL	JS	CT	CT	23/08/19

ORIGINATOR	APPROVER
	
J SURMAN Senior Engineering Geologist	C THOMAS Geotechnical Consultant

The report is not to be used for contractual or engineering purposes unless this sheet is signed and the report designated "Final".
The report has been prepared for the sole use and reliance by SH Reading Master LLP. GEL accepts no liability as a result of the use or reliance of this report by any other parties.

CONTENTS

REPORT **PAGE**

1. INTRODUCTION 1

2. SITE LOCATION AND GEOLOGY 1

3. GROUND INVESTIGATION 2

3.1 Fieldwork 2

3.2 Logging 5

3.3 Post Fieldwork Monitoring 6

3.4 Laboratory Testing 7

4. REFERENCES 9

FIGURES **Nos.**

EXPLORATORY HOLE LOCATION PLAN 1

APPENDICES

APPENDIX A FIELDWORK DATA

APPENDIX B LABORATORY TESTING

APPENDIX C CHEMICAL ANALYSES

APPENDIX C PHOTOGRAPHS

1. INTRODUCTION

It is proposed to redevelop a former shopping centre at Station Hill, Reading. Geotechnical Engineering Limited (GEL) was instructed by Ramboll Uk Ltd (the Consultant) acting on behalf of SH Reading Master LLP (the Client) to carry out an investigation to determine the ground conditions. This report covers the northern half of the site. Geotechnical Engineering Report reference 34769 covers the southern half of the site and should be read in conjunction.

The scope of works and terms and conditions of appointment were specified by the Consultant and GEL correspondence reference T28836_02 dated 8th April 2018. The investigation was carried out under direction and part-time supervision of the Consultant.

This report describes the investigation and presents the findings.

2. SITE LOCATION AND GEOLOGY

The site is situated directly north of Garrard Street (west of the NCP car park), Reading and may be located by its National Grid co-ordinates SU 713 737.

British Geological Survey (BGS) England and Wales (Sheet No. 268, 1:50,000, 2000) and the BGS online geology (1:50,000) indicate the site is underlain by superficial deposits of Alluvium (clay, silt, sand and gravel). The Taplow Gravel Member is recorded to the south of Garrard Street, Bedrock geology comprises the Seaford Chalk Formation and the Newhaven Chalk Formation. Made Ground was anticipated associated with road and building construction.

3. GROUND INVESTIGATION

3.1 Fieldwork

The fieldwork was carried out in general accordance with BS5930:2015 during the period 8th May to the 18th June 2019 and comprised five boreholes, two dynamic sample boreholes, eleven terminated hand dug inspection pits and seven machine excavated trial pits.

The exploratory hole locations were selected by the Consultant and set out by this Company and are shown as approximate locations on Figure 1. The ground level and co-ordinates at exploratory holes BH201, BH202D, BH203, BH204, BH205C, TP202 to TP206, TP208 and TP209, WS201 to WS204, WS211 and WS211A were established by this Company using GPS techniques. Survey data for the remaining terminated pits was not established.

The boreholes, referenced BH201, BH202D, BH203, BH204 and BH205C (Appendix A), were formed using a track-mounted Geotechnical Pioneer Rig. In BH201, BH203 and BH205C the surface was rotary cored drilled (300mm), in BH204 the surface was broken out with a hydraulic breaker. An inspection pit was then hand excavated to a maximum depth of 1.20m to check for buried services. BH202D was machine excavated from surface to a depth of 1.85m. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars. Heavy duty dynamic sampling techniques were then employed at each location to produce a continuous disturbed sample of 112mm nominal diameter. The samples were recovered in semi-rigid plastic liner.

On refusal to dynamic sampling the boreholes were continued by Geobor S wireline, rotary drilling techniques utilising a water or polymer flush. An inner barrel assembly, incorporating a semi-rigid plastic liner, is deployed down the borehole and is latched onto the outer barrel/casing to recover continuous cores of 102mm diameter. The outer barrel acts as the casing ensuring the hole is fully cased at all times.

The dynamic samples and rotary core were extracted horizontally from the sampler and core barrel respectively, the semi-rigid liner was cut to length and sealed at each end to retain moisture content. All samples and core were retained in sequence in labelled, wooden coreboxes.

The boreholes, referenced WS202 and WS203, (Appendix A), were formed using a Terrier 2000 rig. In WS202 the surface was rotary cored drilled (300mm diameter), in WS203 surface was broken out with a hydraulic breaker. An inspection pit was then hand excavated at each borehole location to a maximum depth of 1.20m to check for buried services. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars. Dynamic sampling techniques were then employed to produce a continuous disturbed sample of 97mm diameter. The samples were recovered in semi-rigid plastic liner.

The samples were extracted horizontally from the sampler, labelled and sealed at each end to retain moisture.

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005+A1:2011. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained in airtight jars. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. Detailed SPT results, together with the energy ratio (E_r), are presented in Appendix A and summarised as uncorrected N values on the borehole logs.

Boreholes were monitored for groundwater ingress as sampling proceeded. Upon encountering water in WS202 and WS203, sampling was temporarily stopped to allow the level to stabilise. Water levels were also recorded at the start and finish of each day's work and on completion of the borehole and are presented on the relevant log.

On completion gas/water monitoring standpipes were installed in BH201, BH202D, BH203, BH204, BH205C, WS201, WS202and WS203. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of non-calcareous pea gravel. The installation was sealed above with a bentonite plug and accessed via a valve assembly. The installations in BH201, BH202D, BH203, BH204 and BH205C, were also sealed below the response zone with bentonite pellets. The installations were protected at the surface by a lockable stopcock cover set in concrete. Installation details are given on the relevant borehole log and in Table 3.1 in Section 3.3. Subsequent water level readings are tabulated in Appendix A.

A number of exploratory hole locations were terminated in the pit due to obstructions or services. A summary of excavation techniques or the terminated pits is presented below:

Hand dug pit followed by mechanical excavator (JCB 3CX)	BH202
Hand dug pit	BH202A, WS204
Machine excavated (JCB 3CX)	BH202B, BH202C
Rotary core drilled (300mm) followed by hand dug pit	BH205, BH205A, WS201, WS211, WS211A
Hand dug pit followed by rotary core drilling (300mm)	BH205B

On completion, BH202, BH202A, BH202B, BH202C and BH205B were backfilled with arisings, BH205 and BH205A were backfilled with arisings and sand, WS204 was backfilled with arisings and concrete paving slab replaced, WS211 and WS211A were backfilled with arisings and the surface reinstated with concrete.

The trial pits, referenced TP202 to TP206, TP208 and TP209 (Appendix A), were formed by a wheeled excavator with a 0.60m wide backactor bucket.

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

Photographs of the trial pit profile and spoil heap were taken and are presented in Appendix D.

On completion all trial pits were backfilled with arisings compacted in suitable layers by the excavator bucket. The ground surface was left slightly proud to accommodate the future inevitable settlement of the backfill.

Samples for chemical analyses were dispatched from site directly to i2 Analytical Ltd under a Chain of Custody. The headspace of these environmental samples was monitored for Volatile Organic Compounds (VOC's) using a MiniRAE 3000 Portable Photo-Ionisation Detector (PID) with a 10.6eV gas discharge lamp. The detector uses an ultra violet light source to break down the chemicals into positive and negative ions (ionisation). The detector measures the charge of the ionised gas and converts the signal into current. The current is then amplified and displayed as "ppm"; the readings are presented on the relevant exploratory hole logs in Appendix A.

The remaining samples were brought to this Company's laboratory for testing and storage.

3.2 Logging

The logging of soils and rocks was carried out by an Engineering Geologist in general accordance with BS5930:2015 and CIRIA C574. A key to the exploratory hole logs is presented in Appendix A.

Detailed descriptions of the core and samples are given in the borehole logs, Appendix A, along with details of sampling, in situ testing, groundwater ingress, installations and relevant comments on drilling techniques.

Prior to logging, photographs of the core were taken and are presented in Appendix D. The trial pits were logged in situ to a depth of approximately 1.20m and thereafter from the surface. Detailed descriptions are given in the trial pit logs, Appendix A, along with details of sampling and in situ testing, groundwater ingress and relevant comments on stability and excavatability.

3.3 Post Fieldwork Monitoring

Following the main fieldwork, a period of monitoring was undertaken from 28th June to 22nd August 2019. The response zone of each installation is presented in Table 3.1 below.

Borehole	Standpipe (50mm) Response Zone (m bgl)
BH201	11.00 - 12.00
BH202D	6.00 - 7.00
BH203	11.00 - 12.00
BH204	3.00 - 4.00
BH205C	8.10 - 9.10
WS201	0.25 - 1.10
WS202	1.80 – 6.45
WS203	2.30 – 5.45

Table 3.1: Summary of installation response zones

The gas/water installations (50mm standpipes) were monitored for gas flow and then tested for methane, carbon dioxide, oxygen, hydrogen sulphide, and carbon monoxide using a Gas Data GFM 435 gas analyser. The installations were also monitored for Volatile Organic Compounds (VOC's) using a MiniRAE 2000 Portable Photo-Ionisation Detector (PID) with a

10.6eV gas discharge lamp. Subsequent readings, along with water level records from all standpipes, are tabulated in Appendix A.

3.4 Laboratory Testing

Two schedules of laboratory tests were prepared by the Consultant the following tests being carried out in accordance with BS1377:1990, unless stated otherwise. The number in brackets refers to the test number given in that standard. The results are presented in Appendix B.

The natural water content was determined on thirty-four selected samples in accordance with BS EN ISO 17892-1:2014.

Liquid limit, plastic limit and plasticity index tests [Part 2:4.2-4.6 & 5.2-5.4] were carried out on seventeen selected samples. Atterberg line plots have also been presented.

The saturated moisture content [Part 2:3.3] was determined on sixteen selected samples.

The linear shrinkage tests [Part 2:6.5] was carried out on four selected cohesive samples.

Particle densities were determined for seventeen samples using the fluid pycnometer method in accordance with BS EN ISO 17892-3:2015.

Particle size distributions were determined in accordance with BS EN ISO 17892-4:2016 for fifteen samples by wet sieving [5.2]. The fine fractions of six of these samples were further analysed by sedimentation using the pipette method [5.4]. The results are presented as grading curves.

The following tests on rock samples were carried out in accordance with ISRM (2007) unless stated otherwise. Test results are presented in Appendix B.

The natural moisture content of rock was determined on eighteen selected cores.

The porosity and density of rock was determined on one hundred and forty-three selected cores.

Two rock cores were tested for their unconfined compressive strength.

Point load index tests were carried out on one hundred and fifteen selected lengths of core.

The BRE SD1 (2005) suite of tests was carried out on thirteen samples by Chemtest Ltd using in-house methods.

The organic matter content was determined for sixteen selected samples by Chemtest Ltd using in-house methods.

The pH was determined for twenty-one selected samples by Chemtest Ltd using in-house methods.

Selected samples were despatched to i2 Analytical Ltd, where chemical analyses were carried out to in-house methods for a suite of contaminants. The results are presented in Appendix C.

GEOTECHNICAL ENGINEERING LIMITED

4. REFERENCES

British Standards Institution (2015): Code of practice for ground investigations. BS 5930:2015.

British Standards Institution (2016): Methods of test for soils for civil engineering purposes – Part 1: General requirements and sample preparation. BS1377-1:2016.

British Standards Institution (1990): Methods of tests for soils for civil engineering purposes. BS 1377 Parts 2-9.

British Standards Institution (2014): Geotechnical investigation and testing – Laboratory testing of soil. Part 1: Determination of water content. BS EN ISO 17892-1:2014.

British Standards Institution (2016): Geotechnical investigation and testing – Laboratory testing of soil. Part 3: Determination of particle density. BS EN ISO 17892-3:2015.

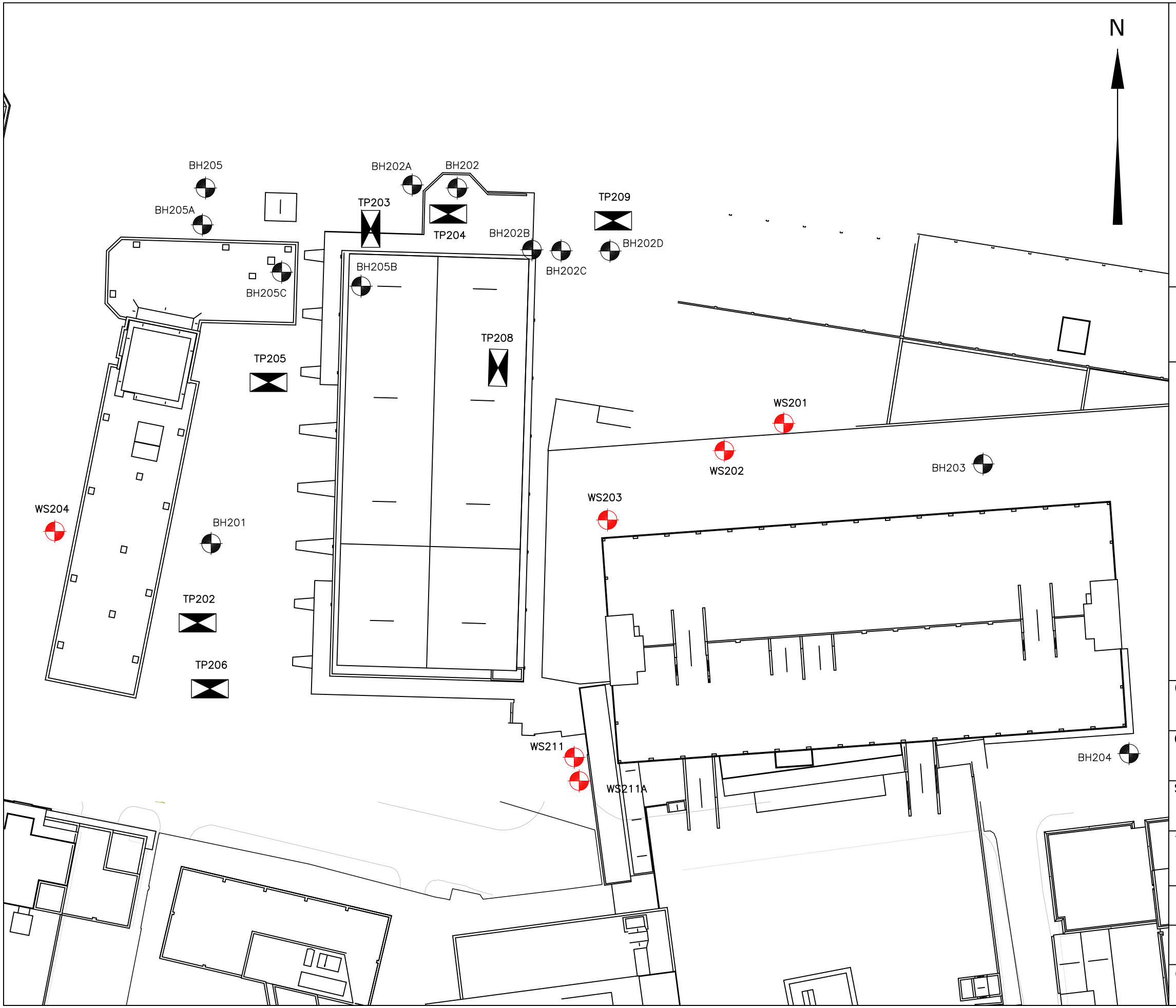
British Standards Institution (2016): Geotechnical investigation and testing – Laboratory testing of soil. Part 4: Determination of particle size distribution. BS EN ISO 17892-4:2016.

British Standards Institution (2012): Geotechnical investigation and testing. Field testing. Standard penetration test. BS EN ISO 22476-3:2005+A1:2011.

Lord J A, Clayton C R I and Mortimore R N (2002): Engineering in Chalk. CIRIA Report No. C574.

Building Research Establishment (2005): Concrete in aggressive ground. BRE Special Digest 1. Third Edition.

International Society for Rock Mechanics (2007). The complete ISRM suggested methods for rock characterization, testing and monitoring: 1974-2006, edited by R Ulusay & J A Hudson. Ankara, Turkey: Turkish National Group of the International Society for Rock Mechanics.

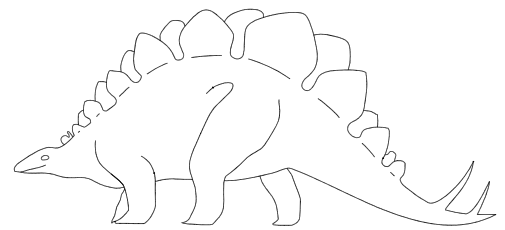


Key.

- Approximate Borehole Location
- Approximate Dynamic Sample Location
- Approximate Trial Pit Location

Notes:

Drawing supplied by the Consultant



geotechnical

Geotechnical Engineering Ltd

Centurion House, Olympus Park, Quedgeley,
Gloucester GL2 4NF
Telephone: (01452) 527743
Facsimile: (01452) 729314
E-mail: geotech@geoeng.co.uk
Web: www.geoeng.co.uk

Client: SH READING MASTER LLP		
Consultants: RAMBOLL UK LTD		
Site: STATION HILL, READING		
Title: EXPLORATORY HOLE LOCATION PLAN		
Drawn By: JB	**Checked By:** CT	**Paper Size:** A3
Scale: Not to scale	**Date:** July 2019	
Contract: 35248	**Figure:** 1	

APPENDIX A

FIELDWORK DATA

Geotechnical Engineering Limited

KEY TO EXPLORATORY HOLE LOGS

Sample type

D Small disturbed	U Undisturbed	L Dynamic	ES Environmental - soil	Cs Core subsample (prepared)
B Bulk disturbed	UT Undisturbed thin wall	C Core	EW Environmental - water	Ls Dynamic subsample (prepared)
LB Large bulk disturbed	P Piston	W Water		

Test type

S SPT - Split spoon sampler followed by uncorrected SPT 'N' Value

C SPT - Solid cone followed by uncorrected SPT 'N' Value

(*250 - Where full test drive not completed, linearly extrapolated 'N' value reported, ** - Denotes no effective penetration)

H Hand vane - direct reading in kPa - not corrected for BS1377 (1990). Re* denotes refusal

M Mackintosh probe - number of blows to achieve 100mm penetration

Mx Mexe cone - average reading of equivalent CBR value in %

PP Pocket penetrometer - direct reading in kg/sq.cm

Vo Headspace vapour reading, uncorrected peak values in ppm, using a PID (calibrated with Isobutylene, using a 10.6eV bulb)

Sample/core range/I_f

Dynamic sample

Undisturbed sample - open drive including thin wall. Symbol length reflects recovery

x x = Total Core Recovery (TCR) as percentage of core run

y y = Solid Core Recovery (SCR) as percentage of core run. Assessment of core is based on full diameter.

z z = Rock Quality Designation (RQD). The amount of solid core greater than 100mm expressed as percentage of core run.

Where SPT has been carried out at beginning of core run, disturbed section of core excluded from SCR and RQD assessment.

I_f - fracture spacing - the modal fracture spacing (mm) over the indicated length of core. Where spacing varies significantly, the minimum, mode and maximum values are given. NI = non-intact core NA = not applicable

Instrumentation

Porous tip | Perforated standpipe | Granular response zone | Bentonite seal | Cement/ bentonite grout | Soil Backfill | Concrete

Stratum boundaries

Estimated boundary

Grading boundary

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015.

Chalk is logged in general accordance with Lord et al (2002) CIRIA C574. Where possible, dynamic samples in chalk have been logged in accordance with CIRIA C574; descriptions and gradings (if presented) should be treated with caution given the potential for sample disturbance.

For rocks the term fracture has been used to identify a mechanical break within the core. Where possible incipient and drilling induced fractures have been excluded from the assessment of fracture state. Where doubt exists, a note has been made in the descriptions. All fractures are considered to be continuous unless otherwise reported.

Made Ground is readily identifiable when, within the material make up, man made constituents are evident. Where Made Ground appears to be reworked natural material the differentiation between in situ natural deposits and Made Ground is much more difficult to ascertain. The interpretation of Made Ground within the logs should therefore be treated with caution.

The descriptors "topsoil" and "tarmacadam" are used as generic terms and do not imply conformation to any particular standard or composition.

Rootlets are defined as being less than 2mm in diameter, roots are defined as in excess of 2mm diameter.

General Comments

The process of drilling and sampling will inevitably lead to disturbance, mixing or loss of material in some soil and rocks.

Indicated water levels are those recorded during the process of drilling or excavating exploratory holes and may not represent standing water levels.

All depths are measured along the axis of the borehole and are related to ground level at the point of entry. All inclinations are measured normal to the axis of the core.

Where provided, the stratigraphic names/geological rock units are for guidance only and may not be wholly accurate.

Geotechnical Engineering Limited

BOREHOLE LOG

BH201

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 4

Start Date 20 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 24 May 2019 — Northing 173736.20 — Ground level 38.30mOD — Depth 35.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
20/05/19 0930hrs	C	0.00 - 0.30			67			MADE GROUND composed light grey CONCRETE.	0.20	38.10	
	1B	0.30 - 0.50						0.20m: Black plastic mesh.	0.30	38.00	
	1ES	0.30 - 0.50		Vo 0.0				Brown slightly clayey sandy angular to rounded fine to coarse limestone and flint rarely chalk and sandstone GRAVEL. (MADE GROUND)			
	2B	0.70 - 0.90									
	2ES	0.70 - 0.90		Vo 0.0							
	3B	1.10 - 1.30									
	3ES	1.10 - 1.30		Vo 0.0							
	4D	1.20 - 1.65	Nil	S 3				Very soft brown mottled dark brown slightly sandy slightly gravelly silty CLAY with frequent fragments (up to 30x50mm) of slate roofing tiles. Gravel is subangular to rounded fine to coarse brick and flint rarely clinker and chalk. (MADE GROUND)			
	5L	1.20 - 2.00									
	4ES	1.60 - 1.80		Vo 0.0							
	6D	2.00 - 2.45	Nil	S 5					1.90	36.40	
	7L	2.00 - 3.00	2.00					Soft greyish green mottled brown slightly sandy becoming sandy slightly gravelly CLAY. Gravel is angular fine and medium flint. (ALLUVIUM)			
	5ES	2.20 - 2.40		Vo 0.0							
	6ES	2.80 - 3.00		Vo 0.0							
	8D	3.00 - 3.45	3.00	S 16					3.00	35.30	
	9L	3.00 - 4.00						Stiff yellowish brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine and medium rarely coarse flint and chalk. (ALLUVIUM)			
	7ES	3.60 - 3.80		Vo 0.0							
	8ES	4.00 - 4.20		Vo 0.0					3.80	34.50	
	10D	4.00 - 4.45	4.00	S 19				Medium dense yellowish brown gravelly fine to coarse SAND. Gravel is subangular and subrounded fine and medium rarely coarse flint and chalk rarely quartzite. (TAPLOW GRAVEL) 3.80 - 3.95m: Orangish brown.			
	11L	4.00 - 5.00									
	12D	5.00 - 5.45	5.00	S 26							
	13L	5.00 - 6.50									
	9ES	6.00 - 6.20		Vo 0.0							
		6.50 - 6.95	6.50	C 27							
	14L	6.50 - 8.00							7.00	31.30	
								Structureless CHALK composed of slightly sandy silty subangular to rounded fine rarely medium chalk rarely flint GRAVEL. Matrix is white. (Probably CIRIA Grade Dc) (STRUCTURELESS CHALK)	7.35	30.95	
20/05/19 1715hrs 2.40m		8.00 - 8.45	8.00	C 19				Extremely weak low density white rarely stained orangish brown with rare black specks CHALK. Fractures are			
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Rotary core drilled (300mm) 0.00-0.30m. Hand dug inspection pit 0.30-1.20m. Dynamic sampled (128mm) 1.20-9.50m. Waterflush rotary core drilled (146mm wireline) 9.50-35.50m.

CASING: 200mm diam to 10.00m, 168mm diam to 10.00mm and 140mm diam to 35.50m.

BACKFILL: On completion, hole backfilled with bentonite pellets 35.50-12.00m. A slotted standpipe (50mm) with geosock was installed to 12.00m, granular response zone 12.00-11.00m, bentonite seal 11.00-0.30m, concrete and stopcock cover 0.30- 0.00m.

REMARKS: Bentonite seal for aquifer protection installed 8.50-9.50m. Seal cured for 3hrs prior to progressing hole through seal at reduced casing diameter. 200mm and 168mm casing dropped to 10.00m as hole advanced. Driller notes reduced flush returns 9.50-35.50m (approx. 50-75% returned). Chalk grade based on CIRIA C574 (2002).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:29 JT CT

Geotechnical Engineering Limited

BOREHOLE LOG

BH201

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 2 of 4

Start Date 20 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 24 May 2019 — Northing 173736.20 — Ground level 38.30mOD — Depth 35.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
21/05/19 0830hrs 3.00m	15L	8.00 - 9.50						randomly orientated extremely closely spaced planar rough stained light yellowish brown with frequent black specks. (Probably CIRIA Grade B5) (STRUCTURED CHALK) 8.00 - 10.00m: Drilling disturbed. 8.75m: Coarse gravel sized rinded black nodular flint.			
	16D	9.50 - 9.95	9.50	S 28							
	17C	9.50 - 10.00			100 0 0	NI					
									10.00	28.30	
	18C	10.00 - 11.50	10.00		73 0 0	NI NI 55		Extremely weak low density white with rare black specks CHALK. Fractures are randomly orientated extremely closely and very closely spaced planar and stepped rough infilled (up to 2mm) with white silt. (CIRIA Grade B5) (STRUCTURED CHALK) 10.00m: Cobble sized rinded black nodular flint recovered non intact.			
		11.50 - 11.95	11.50	C 35							
	19C	11.50 - 13.00			87 0 0						
						NI 50 120			12.30	26.00	
		13.00 - 13.27	13.00	C*115				Extremely weak low density white with rare black specks CHALK. Fractures are subhorizontal to 10° and 80° to subvertical very closely and closely spaced planar rough infilled (up to 3mm) with white silt locally stained orangish brown. Widely spaced bands of medium and coarse gravel sized rinded black nodular flint (possible cobbles recovered non-intact. (CIRIA Grade B4) (STRUCTURED CHALK) 13.45 - 15.55m: 45° planar rough fracture.			
	20C	13.00 - 14.50			60 0 0						
21/05/19 1730hrs 2.50m											
		14.50 - 14.83	14.50	C*83							
22/05/19 0800hrs 4.00m	21C	14.50 - 16.00			93 7 7						
		16.00 - 16.31	16.00	C*94							
	22C	16.00 - 17.50			60 10 7						
		17.50 - 17.74	17.50	C*130							
	23C	17.50 - 19.00			93 17 12						
									18.00	20.30	
								Continued Next Page	{18.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG

BH201

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 3 of 4

Start Date 20 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 24 May 2019 — Northing 173736.20 — Ground level 38.30mOD — Depth 35.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						NI 50 160		Very weak medium density white with rare black specks CHALK with rare wisps of light grey marl. Fractures are subhorizontal and 70° very closely and closely spaced planar rough infilled (up to 4mm) with white silt. (CIRIA Grade C4) (STRUCTURED CHALK)			
		19.00 - 19.24	19.00	C*176				18.10 - 18.15m: 60° planar rough fracture stained orangish brown.	19.00	19.30	
	24C	19.00 - 20.50			60 20 20	20 115 190		18.10 - 18.50m: Subvertical planar rough fracture.			
								Very weak medium density white rarely stained orangish brown CHALK with rare wisps of light grey marl. Fractures are subhorizontal to 20° very closely and closely spaced planar rough infilled (up to 2mm) with light grey silt. Medium spaced bands of cobble sized rinded black nodular flint recovered non intact. (CIRIA Grade B3/4) (STRUCTURED CHALK)			
		20.50 - 20.79	20.50	C*111				19.25 - 19.65m: Subvertical planar rough fracture.			
	25C	20.50 - 22.00			53 7 7						
		22.00 - 22.32	22.00	C*88							
	26C	22.00 - 23.50			80 27 13						
						NI 90 180			22.70	15.60	
		23.50 - 23.81	23.50	C*83				Very weak and weak high density light yellowish brown CHALK with rare wisps of light grey marl. Fractures are subhorizontal to 15° closely spaced planar rough infilled (up to 2mm) with white silt, frequently stained with black specks and rarely stained orangish brown with a veneer of grey clay. (CIRIA Grade B3) (STRUCTURED CHALK)			
	27C	23.50 - 25.00			93 37 27						
								24.35m: 50mm rinded black finger flint.			
		25.00 - 25.29	25.00	C*107							
	28C	25.00 - 26.50			100 63 63						
		26.50 - 26.75	26.50	C*130							
	29C	26.50 - 28.00			97 53 27			26.70 - 27.10m: Subvertical planar rough fracture. 26.80m: Cobble sized rinded black nodular flint.			
22/05/19 1700hrs 2.90m								27.65m: Cobble sized rinded black nodular flint.			
		28.00 - 28.26	28.00	C*143							
								Continued Next Page	{28.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:30 JT CT

Geotechnical Engineering Limited

BOREHOLE LOG

BH201

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 4 of 4

Start Date 20 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 24 May 2019 — Northing 173736.20 — Ground level 38.30mOD — Depth 35.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
23/05/19 0800hrs 1.50m	30C	28.00 - 29.50			87 30 20	NI 170 230			28.30	10.00	
		29.50 - 29.79	29.50	C*111				Very weak medium locally high density light grey CHALK with abundant bands (up to 4mm) and wisps of light grey marl. Fractures are 20-40° closely and medium spaced planar rough infilled (up to 2mm) with white silt and frequent brown staining, a veneer of greenish grey clay and rare striations. (CIRIA Grade B3) (STRUCTURED CHALK)			
	31C	29.50 - 31.00			80 60 60			29.45m: Shell fragment (4x5mm)			
		31.00 - 31.33	31.00	C*83							
	32C	31.00 - 32.50			87 40 20				31.65	6.65	
		32.50 - 32.75	32.50	C*158		NI 90 170		Weak high density white CHALK with frequent bands (up to 20mm) and wisps of light grey marl. Fractures are 10º and 60-80° closely spaced planar rough infilled (up to 2mm) with white silt frequently stained greyish brown rarely stained orangish brown. (CIRIA Grade B3) (STRUCTURED CHALK)			
	33C	32.50 - 34.00			87 30 27			32.70 - 33.80m: Medium spaced bands of coarse gravel sized rinded black nodular flint recovered non intact.			
		34.00 - 34.24	34.00	C*176					33.80	4.50	
	34C	34.00 - 35.50			83 27 20	NI 55 100		Very weak medium density white rarely stained orangish brown CHALK. Fractures are subhorizontal to 10° very closely and closely spaced planar rough infilled (up to 2mm) with white silt. (CIRIA Grade B4) (STRUCTURED CHALK)			
23/05/19 1300hrs 2.90m		35.50 - 35.75	35.50	C*150					35.50	2.80	
								Borehole completed at 35.50m.	{38.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG



BH202

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 17 May 2019

End Date 20 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 1.60 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
17/05/19 0930hrs	1B	0.20 - 0.40						Grey angular concrete, flint and brick COBBLES with some slightly sandy angular and subangular flint, limestone, chalk and mudstone gravel. (MADE GROUND)	0.20		
	1ES	0.20 - 0.40		Vo 0.0							
	2B	0.80 - 1.00						Brown silty sandy angular to rounded fine to coarse flint, mudstone, sandstone, concrete and brick GRAVEL with a medium angular concrete, flint and brick cobble content and rare fragments of metal wire (up to 60mm) and plastic sheeting (up to 20x80mm). (MADE GROUND)	1.30		
	2ES	0.80 - 1.00		Vo 0.0							
20/05/19 1140hrs Dry								MADE GROUND comprising CONCRETE.	1.60		
								1.60m: Copper wiring (60x5mm) underlying base of concrete.			
								Borehole completed at 1.60m.	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig and JCB 3CX Mechanical Excavator.

METHOD: Hand dug inspection pit 0.00-1.30m. Machine excavated 1.30-1.60m

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings.

REMARKS: Hole terminated at 1.60m due to encountering copper wiring beneath concrete slab.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:33 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG



BH202A

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 17 May 2019

End Date 17 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 0.65 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
17/05/19 1310hrs	1B 1ES	0.10 - 0.30 0.10 - 0.30		Vo 0.0				Greyish brown silty sandy angular to rounded fine to coarse flint, mudstone, sandstone, concrete, brick and slag GRAVEL with a medium angular concrete, brick and flint cobble content and rare fragments of metal wiring (up to 60mm) and plastic sheeting (up to 20x80mm). (MADE GROUND)	0.65		
17/05/19 1500hrs Dry								0.65m: Grey concrete across pit. Borehole completed at 0.65m.	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-0.65m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings.

REMARKS: Hole terminated at 0.65m due to encountering concrete across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:33 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH202B

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 22 May 2019

End Date 22 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 0.60 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
22/05/19 1120hrs								Light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content, frequent fragments of metal (up to 40mm) and plastic (up to 80mm) and rare fragments of wood (up to 60mm) and steel reinforcement bar (up to 15mm diam). (MADE GROUND)			
22/05/19 1135hrs Dry								0.60m: Concrete obstruction across pit.	0.60		
								Borehole completed at 0.60m.	{8.00}		

EQUIPMENT: JCB 3CX Mechanical Excavator and Geotechnical Pioneer rig.

METHOD: Machine excavated 0.00-0.60m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings.

REMARKS: Hole terminated at 0.60m due to encountering concrete obstruction across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:34 MC AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202C

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 22 May 2019

End Date 22 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 0.10 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
22/05/19 1150hrs Dry									Light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded concrete cobble content and rare fragments of metal (up to 15mm), plastic (up to 10mm), wood (up to 30mm) and steel reinforcement bar (up to 15mm diam). (MADE GROUND) 0.10m: Concrete obstruction across pit. Borehole completed at 0.10m.	0.10 {8.00}		

EQUIPMENT: JCB 3CX Mechanical Excavator and Geotechnical Pioneer rig.

METHOD: Machine excavated 0.00-0.10m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings.

REMARKS: Hole terminated at 0.10m due to encountering concrete obstruction across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:34 MC AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202D

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 5

Start Date 22 May 2019 — Easting 471355.20 — Scale 1 : 50

End Date 31 May 2019 — Northing 173775.60 — Ground level 39.20mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
22/05/19 1155hrs	1B	0.80 - 1.00						Light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content and rare fragments of metal (up to 150mm), plastic (up to 200mm), wood (up to 30mm) and steel reinforcement bar (up to 30mm diam). (MADE GROUND)			
22/05/19 1210hrs Dry	2B	1.50 - 1.80									
24/05/19 1100hrs Dry	3L	1.85 - 2.00	Nil						2.00	37.20	
	4L	2.00 - 3.00	2.00					Black and dark brown clayey sandy angular to subrounded fine and medium flint, chalk, mudstone and brick GRAVEL. (MADE GROUND)	2.30	36.90	
	1ES	2.30 - 2.40		Vo 0.0				2.00 - 3.00m: Limited recovery (70%).			
	2ES	2.50 - 2.60		Vo 0.0							
	5D	3.00 - 3.45	3.00	S 12				Firm greyish green mottled dark brown slightly sandy silty CLAY with rare angular fine flint gravel and rare decomposed rootlets. (ALLUVIUM)	3.00	36.20	
	6L	3.00 - 4.00						2.30 - 2.40m: Strong organic odour.			
	3ES	3.00 - 3.20		Vo 0.0							
	4ES	3.80 - 4.00		Vo 0.0				Medium dense orangish brown clayey fine and medium SAND. (TAPLOW GRAVEL)			
	7D	4.00 - 4.31	4.00	S*97				3.00 - 3.60m: Locally light grey.			
	8L	4.00 - 5.50						4.00m: Very dense.	4.35	34.85	
	5ES	4.50 - 4.70		Vo 0.0				Very dense orangish brown silty sandy subangular and subrounded fine and medium rarely coarse flint, chalk and mudstone GRAVEL. (TAPLOW GRAVEL)			
								5.10 - 5.50m: No recovery.			
	9D	5.50 - 5.78	5.50	S*115							
	10L	5.50 - 7.00									
	6ES	6.00 - 6.20		Vo 0.0							
24/05/19 1530hrs 4.00m											
28/05/19 0750hrs 3.00m	11L	7.00 - 8.50	7.00					7.30 - 7.90m: Very sandy.	7.90	31.30	
								Continued Next Page	{8.00}		

EQUIPMENT: JCB 3CX Mechanical Excavator and Geotechnical Pioneer rig.

METHOD: Machine excavated 0.00-1.85m. Dynamic sampled (128mm) 1.85-10.00m. Rotary core drilled using a polymer flush (146mm wireline) 10.00-40.50m.

CASING: 200mm diam to 2.00m, 168mm diam to 10.00m and 140mm diam to 40.50m.

BACKFILL: On completion, hole backfilled with bentonite pellets 40.50-7.00m. A slotted standpipe (50mm) with geosock was installed to 7.00m, granular response zone 7.00-6.00m, bentonite seal 6.00-0.30m concrete and stopcock cover 0.30-0.00m.

REMARKS: Driller notes reduced flush returns 10.00-40.50m (approx. 65-80% returned). Chalk grade based on CIRIA C574 (2002).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:36 MC/JT AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202D

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Sheet 2 of 5

Start Date 22 May 2019 Easting 471355.20

Scale 1 : 50

End Date 31 May 2019 Northing 173775.60 Ground level 39.20mOD

Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	7ES 12D 13L	8.20 - 8.40 8.50 - 8.95 8.50 - 10.00	8.50	Vo 0.0 S 13				Structureless CHALK composed of slightly sandy silty subangular to rounded fine and medium rarely coarse GRAVEL. Clasts are extremely weak low density. Matrix is white with rare black specks. (Probably CIRIA Grade Dc) (STRUCTURELESS CHALK)	9.30	29.90	
	C	10.00 - 10.50	10.00		0	NA		Structureless CHALK composed of white locally stained brownish yellow slightly sandy slightly gravelly locally gravelly SILT. Gravel is subrounded and rounded fine and medium rarely coarse extremely weak low density chalk, rarely angular fine to coarse flint. (CIRIA Grade Dm) (STRUCTURELESS CHALK) 9.50 - 10.00m: No recovery. 10.00 - 10.50m: No recovery.			
	14C	10.50 - 12.00	10.50		93						
		12.00 - 12.45	12.00	C 33							
	C	12.00 - 13.50			0			12.00 - 13.50m: No recovery.			
		13.50 - 13.82	13.50	C*88							
	15C	13.50 - 15.00			87			13.50m: Cobble sized rinded black nodular flint recovered non intact. 14.50m: Medium density. 14.60m: Cobble sized rinded black nodular flint recovered non intact.			
		15.00 - 15.45	15.00	C 26							
	16C	15.00 - 16.50			97			15.90m: Yellow silt lens (2x15mm). 16.10m: Coarse gravel sized rinded black and grey nodular flint recovered non intact.			
		16.50 - 16.83	16.50	C*86							
	17C	16.50 - 18.00			73			17.30m: Coarse gravel sized rinded black and grey nodular flint recovered non intact. 17.60 - 18.00m: Assessed zone of core loss.			
						NR			18.00	21.20	
								Continued Next Page	{18.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:36 MC/JT AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202D

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 3 of 5

Start Date 22 May 2019 — Easting 471355.20 — Scale 1 : 50

End Date 31 May 2019 — Northing 173775.60 — Ground level 39.20mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	18C	18.00 - 19.50	18.00		93 13 0	NI 20 80		Very weak medium density white with frequent black specks and rare orangish brown staining CHALK. Fractures are randomly orientated very closely rarely closely spaced planar rough with frequent black specks and with a rare veneer of grey clay. (CIRIA Grade B4) (STRUCTURED CHALK)			
28/05/19 1700hrs 3.00m		19.50 - 19.78	19.50	C*115		NI 60 150			19.35	19.85	
29/05/19 0750hrs 3.20m	19C	19.50 - 21.00			87 23 10			Very weak medium density white with rare black specks and orangish brown staining CHALK. Fractures are subhorizontal to 15° and randomly orientated very closely and closely spaced planar rough with frequent black specks and greyish brown staining. Widely spaced bands of cobble and coarse gravel sized rinded black nodular flint recovered non intact. (CIRIA Grade B4) (STRUCTURED CHALK)			
		21.00 - 21.36	21.00	C*71							
	20C	21.00 - 22.50			93 3 0			21.10 - 21.30m: 70° planar rough fracture stained light grey.	21.50	17.70	
		22.50 - 22.74	22.50	C*120		NI NI 40		Extremely weak low density white with frequent black specks and rare orangish brown staining CHALK. Fractures are randomly orientated extremely closely rarely very closely spaced planar rough frequently stained stained greyish brown and brown with rare grey clay veneer. (CIRIA Grade B5) (STRUCTURED CHALK)			
	21C	22.50 - 24.00			80 7 0				23.50	15.70	
		24.00 - 24.32	24.00	C*88		NI 80 200		Weak high density white CHALK with rare bands (up to 1mm) and wisps (up to 3x5mm) of light grey marl. Fractures are subhorizontal to 15° closely and medium spaced planar and undulating rough rarely stained greyish brown and brown. (CIRIA Grade B4) (STRUCTURED CHALK) 24.40 - 25.70m: Cobble sized rinded black nodular flint recovered non intact.			
	22C	24.00 - 25.50			93 53 23						
		25.50 - 25.71	25.50	C*143							
	23C	25.50 - 27.00			97 47 37			25.90 - 26.00m: Intersecting 60° to subvertical planar rough fractures stained orangish brown. 26.30 - 26.40m: 60° planar rough fracture.			
		27.00 - 27.23	27.00	C*167							
	24C	27.00 - 28.50			87 50 40			27.10 - 27.20m: 60° planar rough fracture.			
						20 110 350		Very weak medium density white with frequent dark orangish brown staining CHALK with frequent bands (up	27.60	11.60	
								Continued Next Page	{28.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:36 MC/JT AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202D

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 4 of 5

Start Date 22 May 2019 — Easting 471355.20 — Scale 1 : 50

End Date 31 May 2019 — Northing 173775.60 — Ground level 39.20mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
		28.50 - 28.66	28.50	C*176	75			to 6mm) and rare wisps of light grey and grey marl. Fractures are subhorizontal and 15-25° closely and medium spaced planar and undulating rough with frequent greyish brown staining and grey clay veneer. (CIRIA Grade B3) (STRUCTURED CHALK)			
	25C	28.50 - 30.00			50						
	26Cs	28.70 - 29.05			47						
		30.00 - 30.20	30.00	C*130	100	NI			30.00	9.20	
	27C	30.00 - 31.50			40	60		Weak high density locally medium density white with rare orangish brown staining CHALK with rare bands (up to 1mm) and wisps of light grey marl. Fractures are 45-60° very closely and closely spaced planar rough with frequent black specks and orangish brown and brown staining. (CIRIA Grade B3) (STRUCTURED CHALK)			
					26	190		30.55 - 30.80m: Subvertical planar rough fracture stained light greyish brown.			
		31.50 - 31.67	31.50	C*150				30.80m: Cobble sized rinded black nodular flint recovered non intact.			
	28C	31.50 - 33.00			40						
					7						
					0			31.80m: Cobble sized rinded black nodular flint recovered non intact.			
						NR		32.10 - 33.00m: Assessed zone of core loss.			
		33.00 - 33.21	33.00	C*150					33.00	6.20	
	29C	33.00 - 34.50			80	NI		Weak high locally medium density white with rare orangish brown staining CHALK with rare wisps of light grey marl. Fractures are subhorizontal to 15° very closely and closely spaced planar rough frequently stained greyish brown and brown with a rare veneer of grey clay and rare black specks. (CIRIA Grade B3) (STRUCTURED CHALK)			
					27	90					
					23	150					
						NI		33.55m: Coarse gravel sized rinded black nodular flint.			
						NR		33.80 - 34.20m: Randomly orientated extremely closely spaced planar rough fractures with rare black specks.			
	30C	34.50 - 36.00	34.50		93	30		34.20 - 34.50m: Assessed zone of core loss.			
					30	60					
					30	130					
						NI		35.20 - 36.00m: Drilling disturbed.			
29/05/19 1630hrs 3.00m		36.00 - 36.21	36.00	C*115					36.00	3.20	
31/05/19 0815hrs 3.00m	31C	36.00 - 37.50			100	40		Weak medium density white with rare orangish brown staining CHALK with frequent bands (up to 2mm) and wisps of light grey and grey marl. Fractures are subhorizontal and 20-40° very closely to medium spaced planar and undulating rough with frequent greyish brown and orangish brown staining, rare black specks and a rare veneer of grey clay. (CIRIA Grade B3) (STRUCTURED CHALK)			
					47	180					
					47	250					
		37.50 - 37.67	37.50	C*143							
	32C	37.50 - 39.00			93						
					30						
					23						
								Continued Next Page	{38.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:36 MC/JT AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH202D

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Sheet 5 of 5

Start Date 22 May 2019 Easting 471355.20 Scale 1 : 50

End Date 31 May 2019 Northing 173775.60 Ground level 39.20mOD Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
							NI					
	33C	39.00	39.12	39.00	C*188	93	50					
		39.00	40.50			40	180					
31/05/19 1140hrs 2.80m						33	210					
		40.50	40.70	40.50	C*214				Borehole completed at 40.50m.	40.50	-1.30	
										{48.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:37 MC/JT AT

Geotechnical Engineering Limited

BOREHOLE LOG

BH203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 5

Start Date 3 June 2019 — Easting 471417.50 — Scale 1 : 50

End Date 6 June 2019 — Northing 173749.90 — Ground level 38.75mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
03/06/19 1430hrs	C	0.00 - 0.40			100			MADE GROUND comprising black TARMACADAM.	0.20	38.55	
								MADE GROUND comprising grey CONCRETE.	0.40	38.35	
	1ES	0.40 - 0.60		Vo 0.0				Very loose clayey very sandy angular to rounded fine to coarse flint, brick, chalk, mudstone and quartzite GRAVEL with a low angular and subangular brick rarely flint cobble content and frequent greyish brown silty clay pockets (up to 30x40mm). (MADE GROUND)			
	2ES	0.70 - 0.90		Vo 0.0							
	1D	1.20 - 1.65	Nil	S 4							
	2L	1.20 - 2.00									
	3ES	1.30 - 1.50		Vo 0.0							
	4ES	1.70 - 1.90		Vo 0.0							
	3D	2.00 - 2.45	Nil	S 2					2.00	36.75	
	4L	2.00 - 3.00						Firm greyish green mottled dark brown and black slightly sandy becoming sandy silty CLAY with rare angular fine flint gravel and rare decomposed rootlets. (MADE GROUND) 2.00 - 2.45m: Very soft.			
	5ES	2.40 - 2.60		Vo 0.0							
03/06/19 1800hrs 2.80m	5D	3.00 - 3.45	3.00	S 11							
04/06/19 0845hrs Dry	6L	3.00 - 4.00						3.00 - 4.00m: Limited recovery (30%)			
	6ES	3.20 - 3.40		Vo 0.0							
	7D	4.00 - 4.45	4.00	S 29					4.00	34.75	
	8L	4.00 - 5.00						Soft black slightly gravelly silty CLAY. Gravel is angular and subangular fine and medium flint. (MADE GROUND)	4.20	34.55	
	7ES	4.00 - 4.10		Vo 0.0				4.00 - 5.00m: Limited recovery (10%)			
	9D	5.00 - 5.39	5.00	S*57				Medium dense becoming very dense grey, white and red sandy angular to subrounded medium flint, brick and chalk GRAVEL. (MADE GROUND)			
	10L	5.00 - 6.00						5.00 - 6.00m: Limited recovery (10%)			
	11D	6.00 - 6.45	6.00	S 27					6.00	32.75	
	12L	6.00 - 7.50						Stiff light greenish grey mottled bluish grey slightly sandy silty CLAY with rare subangular and subrounded fine and medium chalk and flint gravel. (ALLUVIUM)			
	8ES	6.20 - 6.40		Vo 0.0					6.60	32.15	
	9ES	7.00 - 7.20		Vo 0.0				Yellowish brown clayey gravelly fine to coarse SAND. Gravel is angular to subrounded fine and medium rarely coarse flint, chalk and mudstone. (TAPLOW GRAVEL) 7.10 - 7.25m: Slightly sandy gravelly silty clay. Gravel is angular and subangular fine and medium chalk.			
	13D	7.50 - 7.95	7.50	S 4							
	14L	7.50 - 9.00						7.50 - 9.00m: Limited recovery (60%)	7.70	31.05	
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Rotary core drilled (300mm) 0.00-0.40m. Hand dug inspection pit 0.40-1.20m. Dynamic sampled (128mm) 1.20-12.00m. Waterflush rotary core drilled (146mm wireline) 12.00-40.50m.

CASING: 200mm diam to 10.50m, 168mm diam to 10.50m and 140mm diam to 40.50m.

BACKFILL: On 07/06/19, hole backfilled with bentonite pellets 40.50-12.00m. A slotted standpipe (50mm) with geosock was installed to 12.00m, granular response zone 12.00-11.00m, bentonite seal 11.00-0.50m, gravel drain 0.50-0.30m, concrete and stopcock cover 0.30-0.00m.

REMARKS: Bentonite seal for aquifer protection installed 9.50-10.50m. Seal cured for 3hr prior to progressing hole through seal at reduced casing diameter. Driller notes reduced flush returns 12.00-40.50m (approx 20-80% returned) and loss of flush returns 31.50-40.50m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Limited

BOREHOLE LOG

BH203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 2 of 5

Start Date 3 June 2019 — Easting 471417.50 — Scale 1 : 50

End Date 6 June 2019 — Northing 173749.90 — Ground level 38.75mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	10ES	8.20 - 8.40		Vo 0.0				Structureless CHALK composed of slightly sandy subangular to rounded fine to coarse GRAVEL. Clasts are very weak and weak medium density white frequently stained orangish brown. Matrix is white and light orangish brown (Probably CIRIA Grade Dc). (STRUCTURELESS CHALK)			
	15D 16L	9.00 - 9.45 9.00 - 10.50	9.00	S 27				8.30m: Cobble sized rinded black nodular flint recovered non intact.			
	17D 18L	10.50 - 10.95 10.50 - 12.00	10.50	S 25							
								Assessed zone of core loss.	10.90	27.85	
	19D 20C	12.00 - 12.45 12.00 - 13.50	12.00	S 15	90	NA		Structureless CHALK composed of slightly sandy subangular to rounded fine to coarse GRAVEL. Clasts are very weak and weak medium density white frequently stained orangish brown. Matrix is white and light orangish brown (CIRIA Grade Dc). (STRUCTURELESS CHALK)	12.00	26.75	
04/06/19 1745hrs 2.90m		13.50 - 13.95	13.50	C 31					13.50	25.25	
05/06/19 0855hrs 2.80m	21C	13.50 - 15.00			53 0 0	NI NI 20		Very weak medium density white CHALK rarely stained orangish brown with rare black specks. Fractures are subhorizontal to 20°, 30-50° and subvertical extremely closely and very closely spaced planar smooth stained orangish brown. Medium rarely widely spaced bands of cobble and coarse gravel sized rinded black nodular flint frequently recovered non intact. (CIRIA Grade B5). (STRUCTURED CHALK) 13.50m: Cobble sized rinded black nodular flint recovered non intact.			
		15.00 - 15.40	15.00	C*61							
	22C	15.00 - 16.50			93 15 9			14.25 - 15.00m: Assessed zone of core loss.			
						140			15.60	23.15	
						NI 10 50		Very weak medium density white CHALK rarely stained orangish brown with rare black specks. Fractures are subhorizontal to 15°, 30° to 50° and subvertical extremely closely and very closely spaced planar smooth rarely stained brownish grey. Medium rarely widely spaced cobble and coarse gravel sized rinded black nodular flint frequently recovered non intact. (CIRIA Grade B5). (STRUCTURED CHALK) 15.60 - 17.75m: Closely spaced fractures. 15.90 - 16.30m: Subvertical stepped rough fracture. 16.50m: Cobble sized rinded black nodular flint recovered non intact.			
		16.50 - 16.83	16.50	C*83							
	23C	16.50 - 18.00			66 10 0			17.50 - 18.00m: Assessed zone of core loss. 17.50m: Cobble sized rinded black nodular flint recovered non intact.			
		18.00 - 18.22	18.00	C*136							
								Continued Next Page	{18.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG

BH203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 3 of 5

Start Date 3 June 2019 — Easting 471417.50 — Scale 1 : 50

End Date 6 June 2019 — Northing 173749.90 — Ground level 38.75mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	24C	18.00 - 19.50			40 0 0			18.00 - 18.20m: Cobble sized rinded black nodular flint recovered non intact.			
						NR		Assessed zone of core loss.	18.60	20.15	
	25C	19.50 - 21.00			80 44 29	NI 30 100		Very weak medium density white CHALK with frequent wisps (up to 3x20mm) and bands (up to 4mm) of light grey marl and rare orangish brown staining. Fractures are 10° to 20° very closely and closely spaced planar rough with rare black specks and orangish brown staining (CIRIA Grade B4). (STRUCTURED CHALK) 19.90m: Coarse gravel sized rinded black nodular flint recovered non intact. 20.10m: 70° undulating rough fracture.	19.50	19.25	
		21.00 - 21.26	21.00	C*136							
	26C	21.00 - 22.50			100 20 13	NI					
						NI 30 100					
		22.50 - 22.65	22.50	C*176							
	27C	22.50 - 24.00			97 10 7						
		24.00 - 24.16	24.00	C*190							
	28C	24.00 - 25.50			40 24 7	NI 60 130					
						NR		Assessed zone of core loss.	24.65	14.10	
		25.50 - 25.63	25.50	C*176					25.50	13.25	
	29C	25.50 - 27.00			97 40 19	NI 90 180		Very weak medium density white CHALK with frequent wisps (up to 3x20mm) and bands (up to 4mm) of light grey marl and rare orangish brown staining. Fractures are 10° to 20° mainly closely spaced planar rough with rare black specks and orangish brown staining (CIRIA Grade B3). (STRUCTURED CHALK) 25.70 - 27.15m: Cobble sized rinded black nodular flint recovered non intact. 26.30 - 26.80m: Subvertical stepped rough fracture with frequent black specks. 27.00 - 27.40m: Cobble sized rinded black nodular flint recovered non intact.			
		27.00 - 27.13	27.00	C*231							
	30C	27.00 - 28.50			27 0 0						
						NR		Assessed zone of core loss.	27.40	11.35	
								Continued Next Page	{28.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG

BH203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 4 of 5

Start Date 3 June 2019 — Easting 471417.50 — Scale 1 : 50

End Date 6 June 2019 — Northing 173749.90 — Ground level 38.75mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
05/06/19 1730hrs 2.90m												
		28.50	28.63	28.50	C*192					28.50	10.25	
06/06/19 0830hrs 3.20m	31C	28.50	30.00			100 60 33	NI 95 210		Very weak medium locally high density light grey CHALK with abundant wisps (up to 3x15mm) and frequent bands (up to 2mm) of light grey marl. Fractures are subhorizontal closely and medium spaced planar rough with frequent grey clay veneer. (CIRIA Grade B3). (STRUCTURED CHALK) 28.70 - 28.75m: 50° undulating rough fracture. 28.80 - 28.85m: 45° undulating rough fracture.			
		30.00	30.15	30.00	C*200							
	32C	30.00	31.50			97 40 63						
		31.50	31.68	31.50	C*273							
	33C	31.50	33.00			90 63 47						
		33.00	33.12	33.00	C*375		NI 60 120			32.80	5.95	
	34C	33.00	34.50			87 57 23			Weak high density white CHALK with rare wisps (up to 3x15mm) of light grey marl and orangish brown staining. Fractures are 20° rarely randomly orientated closely rarely extremely closely spaced planar and undulating rough with rare black specks and brown staining. Medium spaced cobble and coarse gravel sized rinded black nodular flint frequently recovered non intact. (CIRIA Grade B4). (STRUCTURED CHALK)			
	35C	34.50	36.00	34.50		97 27 23						
		36.00	36.17	36.00	C*250					36.00	2.75	
	36C	36.00	37.50			93 60 50	NI 115 240		Very weak medium density white CHALK with frequent wisps (up to 5x10mm) and bands (up to 5mm) of light grey marl. Fractures are subhorizontal to 15° closely and medium spaced planar rarely undulating rough. Medium spaced cobble sized rinded black nodular flint. (CIRIA Grade B3). (STRUCTURED CHALK)			
		37.50	37.66	37.50	C*231							
	37C	37.50	39.00			97 40 40						
									Continued Next Page	{38.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:41 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG



BH203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Sheet 5 of 5

Start Date 3 June 2019 Easting 471417.50 Scale 1 : 50

End Date 6 June 2019 Northing 173749.90 Ground level 38.75mOD Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	38C	39.00	39.15	39.00	C*214	93						
		39.00	40.50			57 33						
06/06/19 1330hrs 3.00m		40.50	40.65	40.50	C*214				Borehole completed at 40.50m.	40.50	-1.75	
										{48.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:41 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 5

Start Date 10 June 2019 — Easting 471437.30 — Scale 1 : 50

End Date 18 June 2019 — Northing 173707.70 — Ground level 39.50mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
10/06/19 1600hrs	1ES	0.15	0.25		Vo 0.0				MADE GROUND comprising black TARMACADAM (100mm) over grey CONCRETE (50mm).	0.15	39.35	
										0.40	39.10	
11/06/19 0900hrs Dry	C	0.40	0.60			100			Brown silty sandy angular to rounded fine to coarse flint, brick, concrete, tarmac, slag, quartzite and mudstone GRAVEL with frequent fragments (up to 60mm) of glass. (MADE GROUND)	0.60	38.90	
	2ES	0.60	0.70		Vo 0.0					0.90	38.60	
11/06/19 1700hrs Dry	3ES	0.90	1.10		Vo 0.0							
	1D	1.20	1.65	Nil	S 2				MADE GROUND comprisng grey CONCRETE.			
12/06/19 0800hrs Dry	2L	1.20	2.00									
	4ES	1.30	1.50		Vo 0.0				Brown sandy gravelly SILT with a low angular and subangular flint and brick cobble content and rare pockets (up to 40mm) of dark brown clay. Gravel is angular to rounded fine to coarse flint, brick, mudstone, quartz, glass and concrete. (MADE GROUND)			
	5ES	1.80	2.00		Vo 0.0					1.85	37.65	
		2.00	2.45	Nil	S 15							
	3L	2.00	3.00									
	6ES	2.20	2.40		Vo 0.0				Very soft black mottled dark brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to subrounded fine and medium rarely coarse slag, brick, flint, mudstone and quartzite. (MADE GROUND)			
	7ES	2.90	3.00		Vo					2.80	36.70	
	4D	3.00	3.45	3.00	129.6 S 18				Firm brown slightly gravelly sandy silty CLAY. Gravel is subangular and subrounded fine chalk and rare brick. Strong hydrocarbon odour. (MADE GROUND)			
	5L	3.00	4.00							3.35	36.15	
	8ES	3.35	3.55		Vo 49.6				Stiff bluish grey mottled grey gravelly CLAY with frequent pockets (up to 30mm) of light yellow sand. Gravel is angular to subrounded fine and medium chalk and flint. Strong hydrocarbon odour. (MADE GROUND) 3.00 - 4.00m: Limited recovery (50%).			
		4.00	4.45	4.00	S 21							
	6L	4.00	5.50									
	9ES	4.10	4.30		44.8				Medium dense brownish grey mottled dark grey and orangish brown gravelly clayey fine to coarse SAND. Gravel is subangular and subrounded fine to coarse chalk rarely flint. Strong hydrocarbon odour. (MADE GROUND) 4.00 - 5.50m: Limited recovery (53%).	4.30	35.20	
	10ES	4.30	4.50		Vo 6.2							
		5.50	5.95	5.50	S 22				Structureless CHALK composed of light pink gravelly sandy SILT. Clasts are subangular to rounded fine to coarse extremely weak low density white chalk. (Probably CIRIA Grade Dm). (STRUCTURELESS CHALK) 4.30 - 4.50m: Light grey discolouration with a strong hydrocarbon odour. 5.50 - 7.00m: Limited recovery (40%).			
	7L	5.50	7.00									
	11ES	5.60	5.80		Vo 1.8							
12/06/19 1430hrs 3.00m		7.00	7.45	7.00	S 21					7.00	32.50	
13/06/19 0800hrs 2.10m	C	7.00	7.50			0			NO RECOVERY.			
										7.55	31.95	
	8C	7.50	9.00	7.50		63			Structureless CHALK composed of off white slightly gravelly sandy SILT. Gravel is angular to subrounded fine			
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hydraulic breaker 0.00-0.15m and 0.40-0.60m. Hand dug inspection pit 0.15-0.40m and 0.60-1.20m. Dynamic sampled (128mm) 1.20-7.00m. Waterflush rotary core drilled (146mm wireline) 7.00-40.50m.

CASING: 200mm diam to 7.00m, 168mm diam to 7.00m and 140mm diam to 40.50m.

BACKFILL: On completion, hole backfilled with bentonite pellets 40.50-4.00m. A slotted standpipe (50mm) was installed to 4.00m, granular response zone 4.00-3.00m, bentonite seal 3.00-0.50m, concrete and raised helmtet cover 0.50-0.00m.

REMARKS: Bentonite seal for aquifer protection installed 6.00-7.00m. Seal cured for 3hrs prior to progressing hole through seal at reduced casing diameter.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:45 JT/MC/KR EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 2 of 5

Start Date 10 June 2019 — Easting 471437.30 — Scale 1 : 50

End Date 18 June 2019 — Northing 173707.70 — Ground level 39.50mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
								to coarse flint and rarely subangular and subrounded extremely weak medium density off-white chalk (probably CIRIA Grade Dm). (STRUCTURELESS CHALK)	8.30	31.20	
	9D	9.00 - 9.45	9.00	S 26				Structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL. Clasts are weak and very weak low density white with rare black specks and orange staining. Matrix is white (probably CIRIA Grade Dc). (STRUCTURELESS CHALK)			
	10C	9.00 - 10.50			100			8.30 - 9.70m: Medium spaced bands of fine to coarse rinded flint.			
		10.50 - 10.95	10.50	C 28							
	11C	10.50 - 12.00			87				10.95	28.55	
								Structureless CHALK composed of white slightly gravelly sandy SILT. Gravel is subangular and subrounded fine and medium low density off-white chalk and angular to subrounded flint (probably CIRIA Grade DM). (STRUCTURELESS CHALK)	11.15	28.35	
		12.00 - 12.45	12.00	C 37				Structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL. Clasts are extremely weak and very weak low and medium density white with rare black specks and orange staining chalk rarely subangular flint. Matrix is white. (CIRIA Grade Dc) (STRUCTURELESS CHALK)			
	12C	12.00 - 13.50			87			11.50 - 11.75m: Frequent subangular fine to coarse flint.			
								13.00m: Thin bed of extremely weak low density white chalk.			
		13.50 - 13.95	13.50	C 37							
	13C	13.50 - 15.00			77						
		15.00 - 15.45	15.00	C 35							
	14C	15.00 - 16.50			100 32 32						
						NI 130 380			15.50	24.00	
								Extremely weak low locally medium density white with rare black specks and locally frequent orangish brown and dark orangish brown staining CHALK. Fractures are subhorizontal closely and medium spaced undulating smooth rarely infilled (up to 30mm) with white silt (CIRIA Grade C3). (STRUCTURED CHALK)			
		16.50 - 16.95	16.50	C 33				16.25 - 16.50m: Band of rinded dark grey nodular flint revovered non intact.			
	15C	16.50 - 18.00			87 41 32						
								17.10 - 17.20m: Fracture infilled with gravelly silt. Gravel is angular to subangular flint.			
						NI		17.60 - 18.00m: Recovered non intact.			
		18.00 - 18.32	18.00	C*79					18.00	21.50	
								Continued Next Page	{18.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:45 JT/MC/KR EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 3 of 5

Start Date 10 June 2019 — Easting 471437.30 — Scale 1 : 50

End Date 18 June 2019 — Northing 173707.70 — Ground level 39.50mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	C	18.00 - 19.50			0	NR		NO RECOVERY.			
		19.50 - 19.77	19.50	C*94					19.50	20.00	
	16C	19.50 - 21.00			87 32 27	NI 20 100		Extremely weak and very weak low density white with rare black specks CHALK. Fractures are subhorizontal white, 50° and subvertical extremely closely to closely spaced planar and undulating smooth and rough stained orangish brown (CIRIA Grade B5). (STRUCTURED CHALK)			
	17C	21.00 - 22.50	21.00		93 60 46	NI 120 195		Very weak low and medium density white with frequent black specks and rare orange staining CHALK. Fractures are subhorizontal to 10° and subvertical mainly closely spaced planar smooth frequently infilled (up to 10mm) with gravelly silt (CIRIA Grade C4). (STRUCTURED CHALK)	21.00	18.50	
13/06/19 1730hrs 3.20m		22.50 - 22.71	22.50	C*130							
14/06/19 0800hrs 3.00m	18C	22.50 - 24.00			89 72 72						
		24.00 - 24.27	24.00	C*130							
	19C	24.00 - 25.50			100 36 32						
						NI 160 200		Very weak low and medium density white CHALK with frequent wisps (up to 40mm) of light grey marl and rare orangish brown staining. Fractures are subhorizontal to 20° very closely and closely spaced planar smooth stained orange. Closely to medium spaced bands of coarse gravel sized flint (CIRIA Grade B4). (STRUCTURED CHALK)	24.70	14.80	
		25.50 - 25.69	25.50	C*158							
	20C	25.50 - 27.00			92 56 41						
		27.00 - 27.24	27.00	C*167					27.00	12.50	
	21C	27.00 - 28.50			97 70 46	NI 90 150		Weak medium density white CHALK with rare orangish brown staining. Fractures are subhorizontal to 25° very closely and closely spaced planar rough locally infilled (up to 10mm) with white silt (CIRIA Grade C3). (STRUCTURED CHALK)			
								Continued Next Page	{28.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Limited

BOREHOLE LOG

BH204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 4 of 5

Start Date 10 June 2019 — Easting 471437.30 — Scale 1 : 50

End Date 18 June 2019 — Northing 173707.70 — Ground level 39.50mOD — Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
								27.30 - 27.40m: Frequent wisps (up to 40mm) of light grey marl. 28.05m: 15° light grey marl (4mm thick). 28.40 - 28.45m: 65° intersecting planar smooth fractures.			
	22C	28.50 - 28.67 28.50 - 30.00	28.50	C*176	97 67 57	NI 70 180			28.90	10.60	
14/06/19 1300hrs 3.20m								Very weak and weak low and medium density light yellowish grey with black specks CHALK. Fractures are subhorizontal to 30° very closely and closely spaced undulating smooth locally infilled (up to 3mm) with white silt (CIRIA Grade B3). (STRUCTURED CHALK) 28.90m: Cobble sized black nodular flint. 29.50m: 15° band (30mm thick) of black nodular flint.			
17/06/19 0800hrs 3.00m	23C	30.00 - 30.15 30.00 - 31.50	30.00	C*176	95 73 42						
								31.05 - 31.10m: Dark grey coarse gravel sized nodular flint.			
	24C	31.50 - 31.75 31.50 - 33.00	31.50	C*150	90 59 50	NI 110 290		31.10m: Cobble sized black nodular flint.	31.45	8.05	
								Weak medium density white locally light grey CHALK with medium spaced cobble sized bands of black coarse gravel sized nodular flint. Fractures are subhorizontal to 20° closely and medium spaced planar smooth locally infilled (up to 1mm) with white silt. (CIRIA Grade B3). (STRUCTURED CHALK) 31.75 - 31.80m: Locally stained orangish brown.			
	25C	33.00 - 33.18 33.00 - 34.50	33.00	C*333	98 60 47			32.75 - 32.80m: 60° undulating smooth fracture locally stained orangish brown. 33.20m: Locally stained orangish brown. 33.60 - 33.90m: Recovered non intact. Fractures probably very closely spaced. 34.00 - 34.10m: Frequent thin laminae of light grey marl.			
	26C	34.50 - 34.65 34.50 - 36.00	34.50	C*250	93 55 35						
								35.40 - 35.65m: Very weak and weak low and medium density.			
	27C	36.00 - 36.16 36.00 - 37.50	36.00	C*273	100 50 27	NI 70 180		Weak medium density white locally grey CHALK with frequent wisps (up to 3x15mm) and rare bands (up to 12mm) of light grey and grey marl. Medium spaced coarse gravel and cobble sized rinded black nodular flint frequently recovered non intact. Fractures are subhorizontal to 20° very closely and closely spaced planar rough with rare brownish grey staining (CIRIA Grade B3). (STRUCTURED CHALK) 36.85 - 36.95m: 40° planar rough fracture. 37.20m: Shell fragment (15x20mm).	36.00	3.50	
	28C	37.50 - 37.59 37.50 - 39.00	37.50	C*250	100 38 21						
								Continued Next Page	{38.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:45 JT/MC/KR EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Sheet 5 of 5

Start Date 10 June 2019 Easting 471437.30 Scale 1 : 50

End Date 18 June 2019 Northing 173707.70 Ground level 39.50mOD Depth 40.50 m

progress date/time water depth	sample no & type	depth (m) from	depth (m) to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
17/06/19 1700hrs 3.00m		39.00	39.14	39.00	C*375							
18/06/19 0900hrs 3.00m	29C	39.00	40.50			96 94 56	NI 90 200		Weak medium densiry white locally grey CHALK. Fractures are subhorizontal closely spaced planar smooth locally stained orangish brown (CIRIA Grade B3). (STRUCTURED CHALK)	39.40	0.10	
18/06/19 0945hrs 3.00m		40.50	40.59	40.50	C*375					40.50	-1.00	
									Borehole completed at 40.50m.	{48.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:45 JT/MC/KR EL

Geotechnical Engineering Limited

BOREHOLE LOG



BH205

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 8 May 2019

End Date 8 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 0.65 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
08/05/19 1530hrs	C	0.00 - 0.20			100			MADE GROUND comprising black TARMACADAM (20mm) over grey CONCRETE. 0.20m: Sheet of black plastic mesh.	0.20		
	1B	0.20 - 0.40									
	2D	0.20 - 0.40									
	1ES	0.20 - 0.40		Vo 0.0				Light brown slightly clayey sandy angular to rounded fine to coarse limestone, mudstone, flint and rare brick GRAVEL. (MADE GROUND) 0.65m: Concrete slab across pit. Borehole completed at 0.65m.	0.65		
08/05/19 1615hrs Dry									{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Rotary core drilled (300mm) 0.00-0.20m. Hand dug inspection pit 0.20-0.65m.

CASING: None used.

BACKFILL: On completion, hole backfilled with materials arisings 0.65-0.10m and sand 0.10-0.00m.

REMARKS: Hole terminated at 0.65m due to encountering concrete slab obstruction across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:48 JT EC

Geotechnical Engineering Limited

BOREHOLE LOG



BH205A

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 9 May 2019

End Date 9 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 1.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
09/05/19 0845hrs	C	0.00 - 0.20			100			MADE GROUND comprising black TARMACADAM (20mm) over grey CONCRETE.	0.20		
	1B	0.20 - 0.40						Brown and pinkish brown clayey sandy angular to rounded fine to coarse limestone, mudstone, flint, brick and rare chalk GRAVEL. (MADE GROUND)			
	2D	0.20 - 0.40						0.60 - 0.80m: Frequent pockets (up to 30mm) of soft black slightly gravelly sandy clay.	0.80		
09/05/19 1130hrs Dry	1ES	0.20 - 0.40		Vo 0.0				Soft black slightly sandy slightly gravelly silty CLAY with frequent fragments (up to 20mm) of wood. Gravel is angular to subrounded fine to coarse limestone, mudstone, flint, brick and rare chalk. (MADE GROUND)	1.00		
	3B	0.80 - 0.95						Borehole completed at 1.00m.			
	4D	0.80 - 0.95									
	2ES	0.80 - 0.95		Vo 0.0					{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Rotary core drilled (300mm) 0.00-0.20m. Hand dug inspection pit 0.20-1.00m.

CASING: None used.

BACKFILL: On completion, hole backfilled with materials arising 1.00-0.10m and sand 0.10-0.00m.

REMARKS: Hole terminated at 1.00m due to positive power signal from Cable Avoidance Tool (CAT).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:48 JT EC

Geotechnical Engineering Limited

BOREHOLE LOG

BH205B

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Start Date 9 May 2019

End Date 9 May 2019

Sheet 1 of 1

Scale 1 : 50

Depth 0.40 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
09/05/19 1215hrs	C	0.20 - 0.40			100			Brown clayey sandy angular to subrounded fine to coarse limestone, mudstone, flint, chalk, brick and concrete GRAVEL with a low angular and subangular flint and limestone cobble content. Rare fragments of wood (up to 10mm) and metal (up to 30mm). (MADE GROUND)	0.40		
09/05/19 1400hrs Dry	1B	0.20 - 0.40		Vo 0.0				Borehole completed at 0.40m.	{8.00}		
	2D	0.20 - 0.40									
	1ES	0.20 - 0.40									

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-0.20m. Rotary core drilled 0.20-0.40m.

BACKFILL: On completion, hole backfilled with materials arising.

REMARKS: Hole terminated at 0.40m due to concrete obstruction across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:49 JT EC

Geotechnical Engineering Limited

BOREHOLE LOG

BH205C

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 4

Start Date 9 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 16 May 2019 — Northing 173777.50 — Ground level 38.35mOD — Depth 38.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
09/05/19 1500hrs	C	0.00 - 0.30			100			MADE GROUND comprising light grey CONCRETE.	0.30	38.05	
	1B	0.20 - 0.30									
	2D	0.20 - 0.30						Brown clayey sandy angular to rounded fine to coarse limestone, flint, chalk, mudstone, brick, clinker and rare sandstone GRAVEL. Rare wood fragments (up to 15mm). (MADE GROUND)			
	1ES	0.20 - 0.30		Vo 0.0							
	3B	0.30 - 0.50							0.80	37.55	
09/05/19 1630hrs Dry	4D	0.30 - 0.50									
	2ES	0.30 - 0.50		Vo 0.0				0.70 - 0.80m: Abundant brick fragments (up to 80mm).			
	5B	0.90 - 1.00							1.20	37.15	
10/05/19 0750hrs Dry	6D	0.90 - 1.00						Dark brown sandy clayey angular to subrounded fine to coarse chalk, limestone, mudstone, sandstone, brick and rare clinker GRAVEL with a low subangular brick cobble content and rare pockets (up to 60mm) of soft yellowish brown sandy clay. Frequent wood fragments (up to 15mm). (MADE GROUND)			
	3ES	0.90 - 1.00		Vo 0.0							
	7D	1.20 - 1.65	Nil	S 4					1.80	36.55	
	8L	1.20 - 2.00									
	4ES	1.40 - 1.60		Vo 0.0							
	5ES	1.80 - 2.00		Vo 0.1							
	9D	2.00 - 2.45	Nil	S 25				Soft brown mottled black sandy gravelly silty CLAY with rare black wood fragments (up to 20mm). Gravel is angular to subrounded fine to coarse chalk, flint, limestone, mudstone and brick. (MADE GROUND)			
	10L	2.00 - 3.00	2.00						2.50	35.85	
	6ES	2.55 - 2.70		Vo 0.0							
	11D	3.00 - 3.45	3.00	S 34				Firm brownish grey sightly gravelly sandy silty CLAY. Gravel is angular to subrounded fine to coarse flint, mudstone, sandstone and chalk. (MADE GROUND)	3.00	35.35	
	12L	3.00 - 4.00									
	7ES	3.20 - 3.40		Vo 0.0							
								Soft thinly laminated black and greenish grey slightly sandy slightly gravelly silty CLAY. Gravel is angular and subangular fine and medium flint and rare brick. (MADE GROUND)	3.60	34.75	
	13D	4.00 - 4.45	4.00	S 49				2.55m: Subangular coarse gravel sized brick fragment.	4.00	34.35	
	14L	4.00 - 5.00									
	8ES	4.00 - 4.20		Vo 0.0				Dense dark brown becoming brown clayey sandy angular to subrounded fine to coarse flint, mudstone, chalk and brick GRAVEL. (MADE GROUND)			
	15D	5.00 - 5.34	5.00	S*71				Yellowish brown slightly clayey sandy subangular to rounded fine to coarse flint, mudstone, limestone and chalk GRAVEL. (TAPLOW GRAVEL)			
	16L	5.00 - 6.00									
10/05/19 1430hrs 4.00m								Very dense yellowish brown clayey gravelly fine to coarse SAND locally slightly clayey very sandy gravel. Gravel is subangular to rounded fine to coarse flint, mudstone and chalk. (TAPLOW GRAVEL)			
	17D	6.00 - 6.33	6.00	S*68				4.00 - 4.20m: Faint organic odour.	6.00	32.35	
13/05/19 1045hrs 5.00m	18L	6.00 - 7.50						5.30m: Angular flint cobble.			
	9ES	6.40 - 6.60		Vo 0.0				Very dense becoming dense light grey, orangish brown and black slightly sandy angular to rounded fine to coarse flint, chalk, quartzite and rare sandstone GRAVEL. (TAPLOW GRAVEL)			
								6.00 - 7.50m: Limited recovery (53%).			
	19D	7.50 - 7.95	7.50	S 46							
	20L	7.50 - 8.00						7.50 - 8.00m: With a low cobble content.			
								7.70 - 8.00m: Rare pockets (up to 10mm) of chalk.			
	21D	8.00 - 8.45	8.00	S 38							
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Rotary core drilled (300mm) 0.00-0.30m. Hand dug inspection pit 0.30-1.20m. Dynamic sampled (128mm) 1.20-10.00m. Waterflush rotary core drilled (146mm wireline) 10.00-38.00m.

CASING: 200mm diam to 12.00m, 168mm diam to 12.00m and 140mm to 38.00m.

BACKFILL: On completion, hole backfilled with bentonite pellets 38.00-9.10m. A slotted standpipe (50mm) with geosock was installed to 9.10m, granular response zone 9.10-8.10m, bentonite seal 8.10-0.50m, concrete and stopcock cover 0.50-0.00m.

REMARKS: Bentonite seal for aquifer protection installed 8.00-9.00m. Seal cured for 3hrs prior to progressing hole through seal at reduced casing diameter. 200mm diam and 168mm diam casing dropped to 12.00m as hole advanced. Driller notes flush returns reduced 10.00-38.00m (approx. 40-75% returned). Chalk grade based on CIRIA C574 (2002).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:51 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH205C

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 2 of 4

Start Date 9 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 16 May 2019 — Northing 173777.50 — Ground level 38.35mOD — Depth 38.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp./core range	I_f	instru-ment	description	depth (m)	reduced level (m)	legend
	22L	8.00 - 9.00							8.15	30.20	
13/05/19 1500hrs 6.00m	23D	9.00 - 9.45	9.00	S 33				Structureless CHALK composed of slightly sandy silty subangular and subrounded fine and medium GRAVEL. Clasts are white chalk. Matrix is white. (Probably CIRIA Grade Dc) (STRUCTURELESS CHALK) 8.80m: Cobble sized rinded nodular flint recovered non intact.	9.00	29.35	
14/05/19 0720hrs 4.50m	24L	9.00 - 10.00									
	10ES	9.20 - 9.40		Vo 0.0				Extremely weak medium density white locally stained orangish brown CHALK. Fractures are randomly orientated extremely closely to very closely spaced planar rough locally stained orangish brown. Medium spaced bands of cobble sized rinded nodular flint. (CIRIA Grade A5) (STRUCTURED CHALK)			
	25D	10.00 - 10.45	10.00	S 31							
	26C	10.00 - 11.00			10 0 0	NI		10.00 - 11.00m: Limited recovery (10%). Rinded nodular flint recovered non intact. Core loss suspected to be chalk, not recovered due to flint jamming in the barrel.			
	27D	11.00 - 11.45	11.00	S 23					11.00	27.35	
	28C	11.00 - 12.50			40 0 0	NI NI 100		Very weak medium density white with frequent black specks and rare orangish brown staining CHALK. Fractures are randomly orientated extremely closely and closely spaced planar rough. (CIRIA Grade A5) (STRUCTURED CHALK)			
	29D	12.50 - 12.95	12.50	S 32							
	30C	12.50 - 14.00			47 7 0			12.40 - 14.60m: Drilling disturbed.			
	31D	14.00 - 14.45	14.00	S 34							
	32C	14.00 - 15.50			73 10 0			14.00 - 14.40m: Assessed zone of core loss.			
	33D	15.50 - 15.91	15.50	S*59							
	34C	15.50 - 17.00			100 0 0			16.00 - 16.70m: Rare subrounded medium gravel sized flint.			
14/05/19 1630hrs 3.00m	35D	17.00 - 17.42	17.00	S*54							
15/05/19 0930hrs 3.00m	36C	17.00 - 18.50			97 20 13			17.40 - 17.90m: Fractures are extremely closely to closely spaced.			
								Continued Next Page	{18.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:51 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH205C

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

Sheet 3 of 4

Start Date 9 May 2019 Easting 471311.90 Scale 1 : 50

End Date 16 May 2019 Northing 173777.50 Ground level 38.35mOD Depth 38.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	37D	18.50 - 18.84	18.50	S*79					18.50	19.85	
	38C	18.50 - 20.00			93 20 7	NI 60 120		Very weak low and medium density white with rare black specks and orangish brown staining CHALK. Fractures are subhorizontal to 25° and 45-60° very closely and closely spaced planar and undulating rough with frequent black specks stained greyish brown. (CIRIA Grade B4) (STRUCTURED CHALK) 19.30 - 19.40m: Stained orangish brown.			
	39D	20.00 - 20.26	20.00	S*111							
	40C	20.00 - 21.50			80 13 0			20.00 - 20.50m: Subangular fine to coarse gravel and cobble sized flint. 20.65 - 20.75m: Stained yellowish brown.			
	41D	21.50 - 21.69	21.50	S*125							
	42C	21.50 - 23.00			87 20 13			22.30 - 22.60m: 60° planar rough fracture with black specks stained orangish brown with a veneer of greenish grey clay.			
	43D	23.00 - 23.24	23.00	S*167							
	44C	23.00 - 24.50			97 23 7			23.30m: High density.	23.60	14.75	
						NI 50 110		Very weak low and medium density white with rare black specks and rare orangish brown staining CHALK with frequent bands (up to 20mm) and wisps of light grey marl. Fractures are subhorizontal and 45° very closely and closely spaced planar and undulating rough rarely stained light brown. Rare coarse gravel sized rinded nodular flint. (CIRIA Grade B4) (STRUCTURED CHALK) 24.20m: Shell fragment (15mm). 24.50 - 25.30m: Drilling disturbed.			
	45D	24.50 - 24.72	24.50	S*143							
	46C	24.50 - 26.00			93 33 17				25.30	13.05	
						20 45 125		Very weak medium density white CHALK with rare light yellowish brown staining and rare bands (up to 15mm) and wisps of light grey marl. Fractures are subhorizontal to 20° and 40-60° very closely and closely spaced planar and undulating rough locally with a veneer of greenish grey clay. (CIRIA Grade B4) (STRUCTURED CHALK) 25.30m: Cobble sized rinded nodular flint. 25.55 - 25.70m: Subvertical planar rough fracture infilled (3mm) with reddish brown clay. 26.60 - 27.10m: Fractures are randomly orientated extremely closely spaced planar rough.			
	47D	26.00 - 26.31	26.00	S*91							
	48C	26.00 - 27.50			87 30 13						
						NI					
						20 45 110					
		27.50 - 27.81	27.50	C*83							
	49C	27.50 - 29.00			87 27 10						
								Continued Next Page	{28.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:51 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

BH205C

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 4 of 4

Start Date 9 May 2019 — Easting 471311.90 — Scale 1 : 50

End Date 16 May 2019 — Northing 173777.50 — Ground level 38.35mOD — Depth 38.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						NI		Very weak medium density white CHALK with frequent bands (up to 15mm) and wisps of light grey marl and rare styolites. Fractures are subhorizontal to 15° very closely and closely spaced planar rough locally with a veneer of grey clay. Medium spaced bands of rinded black nodular flint cobbles, recovered non intact. (CIRIA Grade B3) (STRUCTURED CHALK)	28.10	10.25	
						NI 105 140					
		29.00 - 29.26	29.00	C*103							
	50C	29.00 - 30.50			87 33 23			28.10 - 28.40m: Fractures are randomly orientated extremely closely spaced planar rough.			
								29.50 - 29.60m: Subvertical planar rough fracture with frequent black specks.			
15/05/19 1630hrs 2.00m		30.50 - 30.68	30.50	C*167							
16/05/19 0750hrs 2.50m	51C	30.50 - 32.00			80 60 47						
						NI 120 160			31.20	7.15	
	52D	32.00 - 32.14	32.00	S*188				Very weak low and medium density white CHALK with rare orangish brown staining frequent bands (up to 20mm) and wisps of light grey marl. Fractures are subhorizontal to 15° and 45-60° very closely and closely spaced planar and undulating rough locally with a veneer of grey clay. (CIRIA Grade B3) (STRUCTURED CHALK)			
	53C	32.00 - 33.50			93 40 40						
		33.50 - 33.66	33.50	C*181					33.50	4.85	
	54C	33.50 - 35.00			93 80 63	60 95 280		Very weak locally weak medium density white CHALK with frequent bands (up to 35mm) and wisps of light grey marl. Fractures are 15-30° very closely to medium spaced planar rough frequently stained brown locally with a veneer of grey clay. (CIRIA Grade B3) (STRUCTURED CHALK) 33.50 - 35.30m: Closely and medium spaced bands of medium gravel sized rinded nodular flint.			
		35.00 - 35.15	35.00	C*176							
	55C	35.00 - 36.50			60 27 20			35.00 - 36.50m: Limited recovery (67%). Recovered as rinded nodular flint. Core loss presumed to be chalk, not recovered due to flint jamming in the barrel.			
						NI 50 250					
		36.50 - 36.60	36.50	C*250							
	56C	36.50 - 38.00			97 43 43			36.80 - 37.10m: Drilling disturbed. 37.05m: Cobble sized rinded nodular flint.			
16/05/19 1300hrs 2.00m		38.00 - 38.14	38.00	C*192					38.00	0.35	
								Borehole completed at 38.00m.	{38.00}		

water strike (m) casing (m) rose to (m) time to rise (m) remarks

Groundwater not encountered prior to use of water flush.

AGS

CONTRACT 35248

CHECKED CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:51 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG

WS201

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 16 May 2019 — Easting 471382.20 — Scale 1 : 50

End Date 16 May 2019 — Northing 173750.10 — Ground level 40.80mOD — Depth 1.10 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend
16/05/19 1010hrs	1C	0.00 - 0.20			100		MADE GROUND comprising orangish brown tarmacadam (50mm) over black TARMACADAM.	0.20	40.60	
	2B	0.50 - 0.60		Vo 0.0			Brownish grey silty gravelly fine to coarse SAND with a low subangular concrete and brick cobble content and frequent fragments of plastic (up to 70mm) and wood (up to 40mm). Gravel is angular to subrounded fine to coarse brick, flint and quartzite. (MADE GROUND)			
	1ES	0.50 - 0.60		Vo 0.0						
16/05/19 1240hrs Dry	2ES	1.00 - 1.10		Vo 0.0						
		1.10 - 1.24	Nil	C*200				1.10	39.70	
		1.24 - 1.29	Nil	C*333			1.10m: Suspected concrete cobble. Borehole completed at 1.10m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Rotary core drilled (300mm) 0.00-0.20m. Hand dug inspection pit 0.20-1.10m.

CASING: None used.

BACKFILL: On completion, a slotted standpipe (50mm) was installed to 1.10m, granular response zone 1.10-0.25m, bentonite seal 0.25-0.15m, gravel drain 0.15-0.10, concrete and a stopcock cover 0.10-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
				Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Limited

BOREHOLE LOG

WS202

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 20 May 2019 — Easting 471375.90 — Scale 1 : 50

End Date 20 May 2019 — Northing 173750.10 — Ground level 38.65mOD — Depth 6.45 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend
20/05/19 0900hrs	C	0.00 - 0.10			100		MADE GROUND comprising black TARMACADAM.	0.10	38.55	
	1B	0.10 - 0.30					Dark brown clayey very sandy angular to subrounded fine to coarse flint, brick and slag GRAVEL with rare fragments of ceramic (up to 30x40mm) and glass (up to 20x30mm). (MADE GROUND)			
	1ES	0.10 - 0.30		Vo 0.0						
	2B	0.50 - 0.70								
	2ES	0.50 - 0.70		Vo 0.0						
	3B	0.90 - 1.10		Vo 0.0						
	3ES	1.20 - 1.76	Nil	S<1						
	4D	1.20 - 2.00	1.20					1.40	37.25	
	5L						Very soft dark brown slightly sandy slightly gravelly silty CLAY with rare fragments of brick (up to 15x30mm) and slate roofing tile (up to 70x80mm). (MADE GROUND)			
	4ES	1.70 - 1.90		Vo 0.0			1.70 - 1.75m: Angular to subrounded fine and medium sandstone gravel.			
	6D	2.00 - 2.45	2.00	S 4				2.20	36.45	
	7L	2.00 - 3.00					Very soft greyish green mottled brown slightly sandy becoming sandy CLAY with rare angular fine and medium flint gravel and a faint organic odour. (ALLUVIUM)			
	5ES	2.20 - 2.40		Vo 0.0						
	6ES	2.80 - 3.00		Vo 0.0						
	8D	3.00 - 3.78	3.00	S<1						
	9L	3.00 - 4.00								
	7ES	3.20 - 3.40		Vo 0.0			3.30 - 3.90m: Frequent pockets (up to 10x20mm) orangish brown sand and subangular and subrounded fine chalk gravel.			
	8ES	3.70 - 3.90		Vo 0.0			3.50m: Rounded flint cobble.	3.90	34.75	
	10D	4.00 - 4.45	4.00	S 34			Dense brown gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine and medium rarely coarse flint, mudstone and chalk. (TAPLOW GRAVEL)			
	11L	4.00 - 5.00					4.00 - 5.00m: Limited recovery (65%).			
	9ES	4.40 - 4.60		Vo 0.0						
	12D	5.00 - 5.45	5.00	S 30						
	13L	5.00 - 6.00					5.00 - 6.00m: Limited recovery (50%).			
	10ES	5.20 - 5.40		Vo 0.0						
20/05/19 1215hrs 3.10m	14D	6.00 - 6.45	6.00	S 5			6.00m: Loose.	6.45	32.20	
							Borehole completed at 6.45m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Rotary core drilled (300mm) 0.00-0.10m. Hand dug inspection pit 0.10-1.20m. Dynamic sampled (113mm) 1.20-6.00m.

CASING: 128mm diam to 6.00nm.

BACKFILL: On completion, a slotted standpipe (50mm) with geosock was installed to 6.00m, granular response zone 6.45-1.80m, bentonite seal 1.80-0.15m, gravel drain 0.15-0.10m, concrete and stopcock cover 0.15-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
4.24	4.00	2.84	20	Encountered during SPT 4.00-4.45m.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG

WS203

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 17 May 2019 — Easting 471359.90 — Scale 1 : 50

End Date 17 May 2019 — Northing 173742.60 — Ground level 39.05mOD — Depth 5.45 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	instru -ment	description	depth (m)	reduced level (m)	legend
17/05/19 1125hrs	1B	0.10 - 0.20					MADE GROUND comprising light grey CONCRETE.	0.05	39.00	
	1ES	0.10 - 0.20		Vo 0.0			Yellowish brown gravelly clayey SAND. Gravel is subangular and subrounded fine to coarse flint, sandstone, quartzite and crystalline. (MADE GROUND)	0.25	38.80	
	2B	0.55 - 0.70								
	2ES	0.55 - 0.70		Vo 0.0						
	3ES	1.10 - 1.20		Vo 0.0			Dark brown clayey very sandy angular to subrounded fine to coarse slate, brick, clinker and flint GRAVEL with a low subangular brick and slate cobble content. (MADE GROUND)	1.10	37.95	
	3D	1.20 - 1.80	Nil	S<1						
	4L	1.20 - 2.00	1.20							
	4ES	1.65 - 1.85		Vo 0.0			Very soft dark brown slightly sandy slightly gravelly silty CLAY with rare fragments of glass (up to 40mm) and shell debris (up to 8mm). Gravel is subangular and subrounded fine and medium brick and chalk. (MADE GROUND)			
	5B	1.65 - 1.85					1.65 - 1.80m: Band of yellowish brown slightly sandy gravelly silty clay with rare relict rootlets. Gravel is subangular and subrounded fine and medium chalk and brick.	2.20	36.85	
	6D	2.00 - 2.75	2.00	S<1			2.00 - 2.20m: Subangular brick cobbles.			
	7L	2.00 - 3.00								
	5ES	2.35 - 2.45		Vo 0.0						
	8D	3.00 - 3.70	3.00	S 12			Very soft dark green speckled black slightly gravelly CLAY with rare becoming frequent stained white relict rootlets. Gravel is fine and medium angular and subrounded flint. (MADE GROUND)	2.95	36.10	
	9L	3.00 - 4.00					2.20 - 2.40m: Black.			
	6ES	3.10 - 3.30		Vo 0.0			2.20 - 2.50m: Rare brick fragments (up to 5mm).	3.60	35.45	
							2.25 - 2.30m: Rare orangish brown staining.			
	10D	4.00 - 4.45	4.00	S 18			Firm bluish grey mottled orangish brown slightly sandy slightly gravelly CLAY with rare pockets (up to 5mm) of black organic material. Gravel is subangular and subrounded fine and medium brick and flint. (MADE GROUND)			
	11L	4.00 - 5.00								
	7ES	4.50 - 4.70		Vo 0.0						
17/05/19 1440hrs 3.20m	12D	5.00 - 5.45	5.00	S 6			Medium dense becoming loose dark orangish brown very gravelly fine to coarse fining upwards SAND. Gravel is sandstone, flint, chalk and limestone. (TAPLOW GRAVEL)	5.45	33.60	
							5.00m: Loose.			
							Borehole completed at 5.45m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Hydraulic breaker 0.00-0.06m. Hand dug inspection pit 0.06-1.20m. Dynamic sampled (113mm) 1.20-5.00m

CASING: 128mm diam to 5.00m.

BACKFILL: On completion, a slotted standpipe (50mm) with geosock was installed to 5.00m, granular response zone 5.45-2.30m, bentonite seal 2.30-0.15m, gravel drain 0.15-0.10m, concrete and stopcock cover 0.10-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
4.21	4.00	3.12	20	Encountered during SPT 4.00-4.45m.

AGS

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

BOREHOLE LOG

WS204

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 20 May 2019 — Easting 471273.70 — Scale 1 : 50

End Date 20 May 2019 — Northing 173734.90 — Ground level 38.35mOD — Depth 0.35 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
20/05/19 1400hrs	1B 1ES	0.10 - 0.30 0.10 - 0.30		Vo 0.0				MADE GROUND comprising grey concrete paving slab (50mm) over yellowish brown gravelly silty fine to coarse SAND. Gravel is angular and subangular fine and medium flint, brick and slag rarely mudstone. (MADE GROUND)	0.35	38.00	
20/05/19 1500hrs Dry								0.35m: Grey concrete across pit. Borehole completed at 0.35m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Hand dug inspection pit 0.00-0.35m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings 0.35-0.05m and concrete paving slab reinstated 0.05-0.00m.

REMARKS: Hole terminated at 0.35m due to encountering concrete across pit.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:57 JT EL

Geotechnical Engineering Limited

BOREHOLE LOG



WS211

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 16 May 2019 — Easting 471348.10 — Scale 1 : 50

End Date 16 May 2019 — Northing 173702.30 — Ground level 39.20mOD — Depth 1.07 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
16/05/19 1430hrs	C	0.00 - 0.10			100			MADE GROUND comprising light grey CONCRETE.	0.10	39.10	
	1B	0.50 - 0.70						Soft dark greyish brown slightly sandy gravelly silty CLAY with a low subangular brick cobble content. Gravel is angular to subrounded fine to coarse flint, brick, chalk, quartzite and clinker. (MADE GROUND)			
	1ES	0.50 - 0.70		Vo 0.0							
16/05/19 1530hrs Dry	2B	0.85 - 1.00							0.85	38.35	
	2ES	0.85 - 1.00		Vo 0.0					1.00	38.20	
								Soft dark greyish brown slightly sandy slightly gravelly silty CLAY with a low subangular brick cobble content. Gravel is angular to subrounded fine to coarse flint, brick and chalk. (MADE GROUND)	1.07	38.13	
								Yellowish brown sandy subangular and subrounded fine and medium sandstone and quartzite GRAVEL. (MADE GROUND) 1.05m: Clay drainage duct (approx.100mm diam.)			
								Borehole completed at 1.07m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Rotary core drilled (300mm) 0.00-0.10m. Hand dug inspection pit 0.10-1.07m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings 1.07-0.10m and concrete 0.10-0.00m.

REMARKS: Hole terminated at 1.07m due to encountering clay drainage duct.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:58 MC AT

Geotechnical Engineering Limited

BOREHOLE LOG

WS211A

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING — Sheet 1 of 1

Start Date 16 May 2019 — Easting 471348.20 — Scale 1 : 50

End Date 16 May 2019 — Northing 173701.50 — Ground level 39.10mOD — Depth 1.00 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
16/05/19 1530hrs	C	0.00 - 0.10			100			MADE GROUND comprising light grey CONCRETE.	0.10	39.00	
	1B	0.50 - 0.60						Soft dark greyish brown slightly sandy gravelly silty CLAY with a low subangular brick cobble content. Gravel is angular to subrounded fine to coarse flint, brick, chalk, quartzite and clinker. (MADE GROUND)	0.75	38.35	
16/05/19 1700hrs Dry	1ES	0.50 - 0.60		Vo 0.0					0.95	38.15	
	2ES	0.95 - 1.00		Vo 0.0				Yellowish brown sandy subangular and subrounded fine and medium sandstone and quartzite GRAVEL. (MADE GROUND)	1.00	38.10	
								Soft black slightly sandy slightly gravelly clayey SILT with rare fragments (up to 50mm) of glass. Gravel is angular to subrounded fine to coarse clinker with rare brick. (MADE GROUND)			
								1.00m: Clay drainage duct (100mm diam. approx.)			
								Borehole completed at 1.00m.	{8.00}		

EQUIPMENT: Geotechnical Terrier 2000 rig.

METHOD: Rotary core drilled (300mm) 0.00-0.10m. Hand dug inspection pit 0.10-1.00m.

CASING: None used.

BACKFILL: On completion, hole backfilled with arisings 1.00-0.10m and concrete 0.10-0.00m.

REMARKS: Hole terminated at 1.00m due to encountering clay drainage duct.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m) casing (m) rose to (m) time to rise (min) remarks

Groundwater not encountered.

AGS

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 23/08/2019 14:23:58 MC AT

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH201	1.20		1.65	Nil	Dry	1 1	75 75	1 0 1 1	75 75 75 75	S	3	64
BH201	2.00		2.45	Nil	Dry	1 1	75 75	1 2 1 1	75 75 75 75	S	5	64
BH201	3.00		3.45	3.00	2.00	1 1	75 75	2 2 5 7	75 75 75 75	S	16	64
BH201	4.00		4.45	4.00	2.50	2 3	75 75	3 4 4 8	75 75 75 75	S	19	64
BH201	5.00		5.45	5.00	2.00	4 8	75 75	6 6 7 7	75 75 75 75	S	26	64
BH201	6.50		6.95	6.50	2.30	4 6	75 75	6 8 7 6	75 75 75 75	C	27	64
BH201	8.00		8.45	8.00	2.00	3 2	75 75	4 4 5 6	75 75 75 75	C	19	64
BH201	9.50		9.95	9.50	2.00	4 8	75 75	8 7 7 6	75 75 75 75	S	28	64
BH201	11.50		11.95	11.50	2.20	2 7	75 75	7 10 9 9	75 75 75 75	C	35	64
BH201	13.00		13.27	13.00	3.00	6 19	75 60	23 27	75 55	C	115	64
BH201	14.50		14.83	14.50	2.70	5 11	75 75	18 23 9	75 75 30	C	83	64
BH201	16.00		16.31	16.00	2.50	4 13	75 75	20 24 6	75 75 10	C	94	64
BH201	17.50		17.74	17.50	2.40	8 17	75 50	32 18	75 40	C	130	64
BH201	19.00		19.24	19.00	2.90	8 13	75 75	42 8	75 10	C	176	64
BH201	20.50		20.79	20.50	3.20	5 13	75 75	22 28	75 60	C	111	64
BH201	22.00		22.32	22.00	2.50	6 17	75 75	18 20 12	75 75 20	C	88	64
BH201	23.50		23.81	23.50	2.70	10 15	75 50	20 22 8	75 75 30	C	83	64
BH201	25.00		25.29	25.00	2.50	10 12	75 75	33 17	75 65	C	107	64
BH201	26.50		26.75	26.50	2.60	5 20	75 60	26 24	75 40	C	130	64
BH201	28.00		28.26	28.00	4.00	9 11	75 75	20 30	75 30	C	143	64
BH201	29.50		29.79	29.50	2.50	7 10	75 75	26 24	75 60	C	111	64
BH201	31.00		31.33	31.00	2.50	9 14	75 75	20 21 9	75 75 30	C	83	64
BH201	32.50		32.75	32.50	2.50	10 12	75 75	34 16	75 20	C	158	64
BH201	34.00		34.24	34.00	2.70	6 17	75 75	41 9	75 10	C	176	64

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH201	35.50		35.75	35.50	2.90	8 13	75 75	33 17	75 25	C	150	64
BH202D	3.00		3.45	3.00	Dry	1 1	75 75	2 2 3 5	75 75 75 75	S	12	64
BH202D	4.00		4.31	4.00	Dry	7 14	75 75	21 25 4	75 75 5	S	97	64
BH202D	5.50		5.78	5.50	4.00	2 12	75 75	20 30	75 55	S	115	64
BH202D	8.50		8.95	8.50	2.90	2 2	75 75	2 3 3 5	75 75 75 75	S	13	64
BH202D	12.00		12.45	12.00	2.80	4 8	75 75	8 8 9 8	75 75 75 75	C	33	64
BH202D	13.50		13.82	13.50	2.90	4 5	75 75	19 22 9	75 75 20	C	88	64
BH202D	15.00		15.45	15.00	3.10	1 3	75 75	5 6 5 10	75 75 75 75	C	26	64
BH202D	16.50		16.83	16.50	2.60	6 15	75 75	20 21 9	75 75 25	C	86	64
BH202D	19.50		19.78	19.50	3.00	3 18	75 75	25 25	75 55	C	115	64
BH202D	21.00		21.36	21.00	2.80	6 10	75 75	12 24 14	75 75 60	C	71	64
BH202D	22.50		22.74	22.50	2.50	10 15	75 40	22 28	75 50	C	120	64
BH202D	24.00		24.32	24.00	2.70	12 10	75 75	18 20 12	75 75 20	C	88	64
BH202D	25.50		25.71	25.50	3.30	10 15	75 25	32 18	75 30	C	143	64
BH202D	27.00		27.23	27.00	3.00	12 13	75 65	35 15	75 15	C	167	64
BH202D	28.50		28.66	28.50	3.00	25	70	39 11	75 10	C	176	64
BH202D	30.00		30.20	30.00	2.70	20 5	75 5	29 21	75 40	C	130	64
BH202D	31.50		31.67	31.50	3.00	25	65	31 19	75 25	C	150	64
BH202D	33.00		33.21	33.00	3.20	15 10	75 30	34 16	75 25	C	150	64
BH202D	36.00		36.21	36.00	2.80	21 4	75 5	28 22	75 55	C	115	64
BH202D	37.50		37.67	37.50	2.70	25	60	32 18	75 30	C	143	64
BH202D	39.00		39.12	39.00	3.20	25	40	43 7	75 5	C	188	64
BH202D	40.50		40.70	40.50	2.80	5 20	75 50	50	70	C	214	64
BH203	1.20		1.65	Nil	Dry	1 1	75 75	1 1 1 1	75 75 75 75	S	4	61

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH203	2.00		2.45	Nil	Dry	1 0	75 75	1 0 1 0	75 75 75 75	S	2	61
BH203	3.00		3.45	3.00	Dry	1 2	75 75	2 2 4 3	75 75 75 75	S	11	61
BH203	4.00		4.45	4.00	3.10	4 6	75 75	7 8 7 7	75 75 75 75	S	29	61
BH203	5.00		5.39	5.00	2.40	10 15	75 50	13 15 15 7	75 75 75 40	S	57	61
BH203	6.00		6.45	6.00	2.50	3 5	75 75	6 6 7 8	75 75 75 75	S	27	61
BH203	7.50		7.95	7.50	2.40	1 1	75 75	1 1 1 1	75 75 75 75	S	4	61
BH203	9.00		9.45	9.00	2.40	1 5	75 75	6 6 7 8	75 75 75 75	S	27	61
BH203	10.50		10.95	10.50	3.40	4 6	75 75	6 6 6 7	75 75 75 75	S	25	61
BH203	12.00		12.45	12.00	2.80	1 2	75 75	3 3 4 5	75 75 75 75	S	15	61
BH203	13.50		13.95	13.50	3.20	5 7	75 75	7 8 8 8	75 75 75 75	C	31	61
BH203	15.00		15.40	15.00	1.80	4 5	75 75	5 18 20 7	75 75 75 20	C	61	61
BH203	16.50		16.83	16.50	2.40	10 13	75 75	22 20 8	75 75 30	C	83	61
BH203	18.00		18.22	18.00	2.80	11 14	75 30	32 18	75 35	C	136	61
BH203	21.00		21.26	21.00	2.70	4 21	75 70	37 13	75 35	C	136	61
BH203	22.50		22.65	22.50	2.80	25	60	42 8	75 10	C	176	61
BH203	24.00		24.16	24.00	2.80	20 5	75 5	46 4	75 4	C	190	61
BH203	25.50		25.63	25.50	2.80	25	40	39 11	75 10	C	176	61
BH203	27.00		27.13	27.00	2.80	25	60	50	65	C	231	61
BH203	28.50		28.63	28.50	2.60	25	55	42 8	75 3	C	192	61
BH203	30.00		30.15	30.00	3.20	18 7	75	50	75	C	200	61
BH203	31.50		31.68	31.50	3.20	10 15	75 45	50	55	C	273	61
BH203	33.00		33.12	33.00	3.00	25	75	50	40	C	375	61
BH203	36.00		36.17	36.00	3.00	15 10	75 35	50	60	C	250	61
BH203	37.50		37.66	37.50	3.00	18 7	75 20	50	65	C	231	61

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH203	39.00		39.15	39.00	3.00	20 5	75 0	50	70	C	214	61
BH203	40.50		40.65	40.50	3.00	25	75	50	70	C	214	61
BH204	1.20		1.65	Nil	Dry	1 0	75 75	1 1 0 0	75 75 75 75	S	2	64
BH204	2.00		2.45	Nil	Dry	5 3	75 75	3 4 3 5	75 75 75 75	S	15	64
BH204	3.00		3.45	3.00	Dry	3 5	75 75	4 5 5 4	75 75 75 75	S	18	64
BH204	4.00		4.45	4.00	3.20	4 5	75 75	6 5 5 5	75 75 75 75	S	21	64
BH204	5.50		5.95	5.50	3.20	6 5	75 75	7 4 5 6	75 75 75 75	S	22	64
BH204	7.00		7.45	7.00	3.20	6 7	75 75	6 5 5 5	75 75 75 75	S	21	64
BH204	9.00		9.45	9.00	2.40	1 3	75 75	4 5 8 9	75 75 75 75	S	26	64
BH204	10.50		10.95	10.50	2.80	5 7	75 75	7 8 7 6	75 75 75 75	C	28	64
BH204	12.00		12.45	12.00	3.00	6 8	75 75	9 9 10 9	75 75 75 75	C	37	64
BH204	13.50		13.95	13.50	3.10	4 8	75 75	10 9 10 8	75 75 75 75	C	37	64
BH204	15.00		15.45	15.00	3.10	5 6	75 75	8 9 9 9	75 75 75 75	C	35	64
BH204	16.50		16.95	16.50	3.20	5 6	75 75	8 8 8 9	75 75 75 75	C	33	64
BH204	18.00		18.32	18.00	3.10	12 13	75 50	18 20 12	75 75 40	C	79	64
BH204	19.50		19.77	19.50	3.40	17 8	75 30	20 22 8	75 75 10	C	94	64
BH204	22.50		22.71	22.50	3.20	19 6	75 20	26 24	75 40	C	130	64
BH204	24.00		24.27	24.00	3.10	4 10	75 75	24 26	75 40	C	130	64
BH204	25.50		25.69	25.50	3.10	20 5	75 20	32 18	75 20	C	158	64
BH204	27.00		27.24	27.00	3.20	4 10	75 75	31 19	75 15	C	167	64
BH204	28.50		28.67	28.50	3.10	21 4	75 5	34 16	75 10	C	176	64
BH204	30.00		30.15	30.00	3.20	25	60	35 15	75 10	C	176	66
BH204	31.50		31.75	31.50	3.20	2 12	75 75	21 29	75 25	C	150	66
BH204	33.00		33.18	33.00	3.10	4 21	75 60	50	45	C	333	66

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH204	34.50		34.65	34.50	2.70	15 10	75 10	50	60	C	250	66
BH204	36.00		36.16	36.00	2.90	14 11	75 30	50	55	C	273	66
BH204	37.50		37.59	37.50	2.80	25	30	50	60	C	250	66
BH204	39.00		39.14	39.00	3.00	15 10	75 20	50	40	C	375	66
BH204	40.50		40.59	40.50	3.00	25	50	50	40	C	375	66
BH205C	1.20		1.65	Nil	Dry	1 1	75 75	1 1 1 1	75 75 75 75	S	4	64
BH205C	2.00		2.45	Nil	Dry	5 7	75 75	6 6 7 6	75 75 75 75	S	25	64
BH205C	3.00		3.45	3.00	Dry	6 9	75 75	8 8 9 9	75 75 75 75	S	34	64
BH205C	4.00		4.45	4.00	3.00	7 12	75 75	12 12 14 11	75 75 75 75	S	49	64
BH205C	5.00		5.34	5.00	4.00	12 13	75 55	14 20 16	75 75 60	S	71	64
BH205C	6.00		6.33	6.00	5.00	12 13	75 35	15 17 18	75 75 70	S	68	64
BH205C	7.50		7.95	7.50	5.00	8 12	75 75	13 12 10 11	75 75 75 75	S	46	64
BH205C	8.00		8.45	8.00	5.00	8 9	75 75	8 10 12 8	75 75 75 75	S	38	64
BH205C	9.00		9.45	9.00	6.00	7 9	75 75	8 8 8 9	75 75 75 75	S	33	64
BH205C	10.00		10.45	10.00	4.00	4 5	75 75	7 8 8 8	75 75 75 75	S	31	64
BH205C	11.00		11.45	11.00	4.00	2 4	75 75	5 6 5 7	75 75 75 75	S	23	64
BH205C	12.50		12.95	11.00	2.00	4 6	75 75	7 8 8 9	75 75 75 75	S	32	64
BH205C	14.00		14.45	14.00	3.00	4 7	75 75	7 8 10 9	75 75 75 75	S	34	64
BH205C	15.50		15.91	15.50	2.00	1 4	75 75	13 14 16 7	75 75 75 30	S	59	64
BH205C	17.00		17.42	17.00	2.00	4 7	75 75	12 15 14 8	75 75 75 45	S	54	64
BH205C	18.50		18.84	18.50	2.00	4 8	75 75	14 22 14	75 75 40	S	79	64
BH205C	20.00		20.26	20.00	3.00	7 18	75 50	22 28	75 60	S	111	64
BH205C	21.50		21.69	21.50	2.50	25	70	26 24	75 45	S	125	64
BH205C	23.00		23.24	23.00	2.00	1 7	75 75	35 15	75 15	S	167	64

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole no.	borehole depth (m)	s.w.p (m)	bottom depth (m)	casing depth (m)	water level (m)	seating drive blows	seating drive pen (mm)	test drive blows	test drive pen (mm)	test type	N	energy ratio (%)
BH205C	24.50		24.72	24.50	3.00	4 21	75 40	33 17	75 30	S	143	64
BH205C	26.00		26.31	26.00	2.60	6 19	75 65	21 24 5	75 75 15	S	91	64
BH205C	27.50		27.81	27.50	3.00	8 17	75 50	20 23 7	75 75 30	C	83	64
BH205C	29.00		29.26	29.00	2.80	10 15	75 40	21 29	75 70	C	103	64
BH205C	30.50		30.68	30.50	2.50	20 5	75 10	32 18	75 15	C	167	64
BH205C	32.00		32.14	32.00	1.50	25	60	45 5	75 5	S	188	64
BH205C	33.50		33.66	33.50	2.00	23 2	75 2	40 10	75 8	C	181	64
BH205C	35.00		35.15	35.00	2.50	25	60	43 7	75 10	C	176	64
BH205C	36.50		36.60	36.50	2.60	25	40	50	60	C	250	64
BH205C	38.00		38.14	38.00	2.00	25	60	45 5	75 3	C	192	64
WS201	1.10		1.24	Nil	Dry	25	65	50	75	C	200	75
WS201	1.24		1.29	Nil	Dry	25	5	50	45	C	333	75
WS202	1.20		1.76	Nil	Dry	1 0	75 75	0 0 0 0	75 75 75 185	S	<1	75
WS202	2.00		2.45	2.00	Dry	1 1	75 75	1 1 1 1	75 75 75 75	S	4	75
WS202	3.00	0.78	3.78	3.00	Dry					S		75
WS202	4.00		4.45	4.00	Dry	2 4	75 75	7 7 8 12	75 75 75 75	S	34	75
WS202	5.00		5.45	5.00	4.24	4 10	75 75	9 7 6 8	75 75 75 75	S	30	75
WS202	6.00		6.45	6.00	3.10	1 4	75 75	2 1 1 1	75 75 75 75	S	5	75
WS203	1.20	0.60	1.80	Nil	Dry					S	<1	75
WS203	2.00		2.75	2.00	Dry	1 0	75 75	0 0 0 0	75 75 75 375	S	<1	75
WS203	3.00	0.25	3.70	3.00	Dry	3 3	75 75	2 3 2 5	75 75 75 75	S	12	75
WS203	4.00		4.45	4.00	Dry	3 6	75 75	5 5 4 4	75 75 75 75	S	18	75
WS203	5.00		5.45	5.00	3.20	2 3	75 75	2 2 1 1	75 75 75 75	S	6	75

notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

TRIAL PIT LOG

TP202

CLIENT	SH READING MASTER LLP						
SITE	STATION HILL, READING					Sheet	1 of 1
Start Date	22 May 2019	Easting	471306			Scale	1 : 25
End Date	22 May 2019	Northing	173725	Ground level	38.85mOD	Depth	1.50 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
	1B		0.30- 0.40	Light grey slightly sandy silty angular to subrounded fine to coarse concrete and brick GRAVEL with a high angular and subangular concrete cobble content. Frequent steel reinforcement bar (up to 20mm diam) and fragments of plastic (up to 50mm) and metal (up to 70mm). (MADE GROUND)			
	1ES	Vo 0.0	0.30- 0.40				
	2D		0.30- 0.40				
					0.60	38.25	
	3B		0.65- 0.75	Soft dark brown slightly gravelly silty CLAY with a high angular to subrounded brick and concrete cobble content. Frequent fragments of porcelain (up to 20mm), plastic (up to 80mm) and metal (up to 90mm). Gravel is angular to subrounded fine to coarse clinker, flint, brick, sandstone, slate and rare chalk. (MADE GROUND)			
	2ES	Vo 0.0	0.65- 0.75				
	4D		0.65- 0.75				
	5B		1.35- 1.50				
	3ES	Vo 0.0	1.35- 1.50	1.40m: Brick structure in the east and west of the pit.			
Dry				1.50m: Brick structure across the base of the pit.	1.50	37.35	
				Trial pit completed at 1.50m.			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater not encountered.
Trial pit sides remained stable and vertical.
Trial pit dimensions 3.00x1.00x1.50m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated at 1.50m due to presence of a brick structure.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:27 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP203

CLIENT	SH READING MASTER LLP					Sheet	1 of 2
SITE	STATION HILL, READING					Scale	1 : 25
Start Date	20 May 2019	Easting	471334				
End Date	20 May 2019	Northing	173777	Ground level	39.10mOD	Depth	4.30 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
				Light grey silty sandy subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content. (MADE GROUND)	0.50	38.60	
	1B		0.50- 0.60	Reddish brown silty sandy subangular and subrounded fine to coarse brick GRAVEL with a high subangular and subrounded brick cobble content. Frequent steel reinforcement bar (up to 30mm diam), rare metal fragments (up to 500mm) and pockets (up to 70mm) of grey gravelly clay. (MADE GROUND)			
	2D		0.50- 0.60				
	1ES	Vo 0.0	0.50- 0.60		0.90	38.20	
	3B		1.00- 1.20	Dark brown and black slightly sandy gravelly SILT with frequent fragments of glass (up to 10mm), wood (up to 40mm) and metal (up to 70mm). Gravel is angular to subrounded fine to coarse clinker, flint, brick, sandstone, rare chalk and slate. (MADE GROUND)			
	2ES	Vo 0.0	1.00- 1.20				
	4D		1.00- 1.20				
	5B		2.00- 2.10				
	3ES	Vo 0.0	2.00- 2.10				
	6D		2.00- 2.10		2.30	36.80	
	7B		2.50- 2.60	Very soft dark green speckled black slightly gravelly CLAY with a strong organic odour and rare fragments of metal (up to 100mm). Gravel is angular to subrounded fine to coarse flint, clinker, wood, ceramic and glass. Frequent relict rootlets. (MADE GROUND)			
	4ES	Vo 0.0	2.50- 2.60				
2.60m: Flow	8D		2.50- 2.60	2.40m: Ceramic bowl (200mm diam).	2.90	36.20	
	9B		3.00- 3.10	Soft yellowish brown slightly gravelly sandy CLAY with frequent pockets (up to 200mm) of dark grey organic clay. Gravel is angular to subrounded fine to coarse flint. Frequent relict roots (up to 4mm diam) and rootlets. (MADE GROUND)			
	5ES	Vo 0.0	3.00- 3.10				
	10D		3.00- 3.10		3.90	35.20	
				Yellowish brown sandy clayey subangular and subrounded fine to coarse flint and			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater encountered at 2.60m.
Trial pit sides collapsed between 3.90-4.30m.
Trial pit dimensions 3.00x0.90x4.30m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated due to water in the base of the pit.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:28 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP203

CLIENT	SH READING MASTER LLP					Sheet	2 of 2
SITE	STATION HILL, READING					Scale	1 : 25
Start Date	20 May 2019	Easting	471334				
End Date	20 May 2019	Northing	173777	Ground level	39.10mOD	Depth	4.30 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
	11B		4.00- 4.10	sandstone GRAVEL. (TAPLOW GRAVEL)			
	12D		4.00- 4.10				
4.20m	6ES	Vo 0.0	4.00- 4.10		4.30	34.80	
				Trial pit completed at 4.30m.			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater encountered at 2.60m.
Trial pit sides collapsed between 3.90-4.30m.
Trial pit dimensions 3.00x0.90x4.30m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated due to water in the base of the pit.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:28 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP204

CLIENT	SH READING MASTER LLP						
SITE	STATION HILL, READING					Sheet	1 of 1
Start Date	20 May 2019	Easting	471346			Scale	1 : 25
End Date	20 May 2019	Northing	173779	Ground level	39.15mOD	Depth	0.65 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
				Light grey slightly sandy silty subangular and subrounded fine to coarse brick concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content. (MADE GROUND)	0.40	38.75	
Dry	1ES	Vo 0.0	0.55- 0.65	Yellowish brown slightly clayey sandy angular to subrounded fine to coarse flint and sandstone GRAVEL. (MADE GROUND) 0.60 - 0.65m: Brick structure and concrete foundation.	0.65	38.50	
				Trial pit completed at 0.65m.			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater not encountered.
Trial pit sides remained stable and vertical.
Trial pit dimensions 3.00x1.80x0.65 expanded to 3.50x1.80x0.65m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated at 0.65m due to encountering a brick structure and a foundation across the north of the pit and possible yellow marker tape in the south.

Sketch of Foundation - Not to scale. All dimensions in metres.

CONTRACT	CHECKED
35248	CT

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:29 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP205

CLIENT	SH READING MASTER LLP						
SITE	STATION HILL, READING					Sheet	1 of 1
Start Date	21 May 2019	Easting	471312			Scale	1 : 25
End Date	21 May 2019	Northing	173762	Ground level	38.35mOD	Depth	3.00 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
				Light grey slightly sandy silty subangular and subrounded fine to coarse concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content and frequent fragments of metal (up to 100mm), plastic (up to 150mm), wood (up to 30mm) and rare steel reinforcement bar (up to 15mm diam). (MADE GROUND)	0.25	38.10	
				Dark brown slightly sandy clayey subrounded to subangular fine to coarse brick and sandstone GRAVEL with a high subangular cobble content and rare fragments of plastic (up to 40mm), metal (up to 20mm) and glass (up to 10mm). (MADE GROUND)	0.50	37.85	
	1B		0.70- 1.00	Soft dark brown slightly sandy gravelly CLAY with a medium subangular brick cobble content, frequent pockets (up to 400mm) of black organic silt and yellow brown fine and medium sand and frequent fragments of wood (up to 40mm) and plastic (up to 60mm). Gravel is subangular to subrounded fine to coarse brick, flint and chalk. (MADE GROUND)			
	1ES	Vo 0.0	0.70- 1.00				
	2D		0.70- 1.00				
	3B		1.50- 1.70				
	2ES	Vo 0.0	1.50- 1.70				
	4D		1.50- 1.70				
	5B		2.30- 2.50	Soft black and dark green slightly sandy slightly gravelly silty CLAY with a strong organic odour. Frequent decomposing wood fragments (up to 70mm) and rare pockets (up to 300mm) of dark yellowish brown fine and medium sand. Gravel is subangular and subrounded fine to coarse brick, porcelain, rare chalk and sandstone. (MADE GROUND)	2.30	36.05	
	6D		2.30- 2.50				
	3ES	Vo 0.0	2.30- 2.50				
	7B		2.80- 3.00				
3.00m: Seepage 2.80m	8D		2.80- 3.00				
	4ES	Vo 0.3	2.80- 3.00				
				Trial pit completed at 3.00m.	3.00	35.35	

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater seepage encountered at 3.00m rising to 2.80m after 20minutes.
Trial pit sides remained stable and vertical.
Trial pit dimensions 3.00x1.00x3.00m.
On completion, the trial pit was backfilled with materials arising.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:29 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP206

CLIENT	SH READING MASTER LLP						
SITE	STATION HILL, READING					Sheet	1 of 1
Start Date	22 May 2019	Easting	471304			Scale	1 : 25
End Date	22 May 2019	Northing	173716	Ground level	38.90mOD	Depth	2.50 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
	1B		0.50- 0.60	MADE GROUND comprising black TARMACADAM (15mm) over brownish grey silty angular to subrounded fine to coarse concrete and brick GRAVEL with a low subangular concrete and brick cobble content. (MADE GROUND)			
	1ES	Vo 0.0	0.50- 0.60				
	2D		0.50- 0.60				
					0.75	38.15	
	3B		1.30- 1.60	Soft dark brown slightly sandy gravelly silty CLAY with a high angular and subangular brick and concrete cobble content. Rare fragments of plastic (up to 20mm) and metal (up to 30mm). Gravel is angular to subrounded fine to coarse concrete and brick. (MADE GROUND)			
	2ES	Vo 0.0	1.30- 1.60				
	4D		1.30- 1.60				
	5B		2.10- 2.20				
	3ES	Vo 0.0	2.10- 2.20				
	6D		2.10- 2.20				
					2.50	36.40	
Dry				Trial pit completed at 2.50m.			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater not encountered.
Trial pit sides remained stable and vertical.
Trial pit dimensions 2.30x1.10x2.50m.
On completion, the trial pit was backfilled with materials arising.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:30 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP208

CLIENT	SH READING MASTER LLP					Sheet	1 of 1
SITE	STATION HILL, READING					Scale	1 : 25
Start Date	21 May 2019	Easting	471346				
End Date	21 May 2019	Northing	173757	Ground level	39.00mOD	Depth	2.20 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
	1B		0.50- 0.60	Light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content and frequent fragments of metal (up to 150mm), plastic (up to 200mm), wood (up to 30mm) and steel reinforcement bar (up to 15mm diam). (MADE GROUND)			
	1ES	Vo 0.0	0.50- 0.60				
	2D		0.50- 0.60		0.60	38.40	
	3B		1.00- 1.20	Dark brown slightly sandy silty subangular and subrounded fine to coarse brick and sandstone GRAVEL with a high subangular cobble content and a low subangular boulder content. (MADE GROUND)			
	2ES	Vo 0.0	1.00- 1.20				
	4D		1.00- 1.20				
	5B		1.50- 1.70				
	3ES	Vo 0.0	1.50- 1.70				
	6D		1.50- 1.70				
Dry				2.20m: North section: Dark brown duct (200mm diam. approx.) covered by 300mm concrete orientated east-west. Trial pit completed at 2.20m.	2.20	36.80	

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater not encountered.
Trial pit sides remained stable and vertical.
Trial pit dimensions 2.90x1.20x2.20m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated on the Client's instruction due to encountering duct (200mm diam. approx.) at 2.20m.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:31 MC EL

Geotechnical Engineering Limited

TRIAL PIT LOG

TP209

CLIENT	SH READING MASTER LLP					Sheet	1 of 1
SITE	STATION HILL, READING					Scale	1 : 25
Start Date	20 May 2019	Easting	471356				
End Date	20 May 2019	Northing	173778	Ground level	39.25mOD	Depth	2.90 m

water record	sample/test no/type	sample/test result	sample/test depth (m)	description	depth (m)	level (m)	legend
	1B		0.50- 0.70	Light grey slightly sandy silty subangular and subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium subangular and subrounded brick and concrete cobble content and frequent fragments of metal (up to 150mm), plastic (up to 200mm), wood (up to 30mm), rubber (200mm) and steel reinforcement bar (up to 30mm diam). (MADE GROUND)			
	1ES	Vo 0.0	0.50- 0.70				
	2D		0.50- 0.70				
	3B		1.50- 2.00				
	2ES	Vo 0.0	1.50- 2.00				
	4D		1.50- 2.00				
	5B		2.50- 2.60				
	6D		2.50- 2.60				
	3ES	Vo 0.0	2.50- 2.60				
2.80m: Seepage 2.50m	7B		2.70- 2.90				
	8D		2.70- 2.90	Soft dark green speckled black slightly gravelly CLAY. Gravel is angular to subrounded fine and medium flint. Frequent relict rootlets stained white. (MADE GROUND)	2.70	36.55	
	4ES	Vo 0.0	2.70- 2.90		2.90	36.35	
				Trial pit completed at 2.90m.			

Notes

Trial pit excavated by JCB 3CX mechanical excavator.
Groundwater encountered at 2.80m rising to 2.50m after 20 minutes.
Trial pit sides remained stable and vertical.
Trial pit dimensions 1.70x2.90x2.90m.
On completion, the trial pit was backfilled with materials arising.
Trial pit terminated due to the groundwater covering the base of the pit.

Sketch of Foundation - Not to scale. All dimensions in metres.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

AGS

CONTRACT	CHECKED
35248	CT

Geotechnical Engineering Ltd, Tel. 01452 527743 35248-STATION HILL MASTER.GPJ TRIALJH.GPJ GEOTECH2.GLB 06/08/2019 13:47:31 MC EL

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH201	18/06/19 14:10:00												2.18	
BH201	28/06/19 10:41:00	1024	0								0.0	21		
BH201	28/06/19 10:42:00	1024	0								0.0			
BH201	28/06/19 10:43:00	1024	0								0.0			
BH201	28/06/19 10:44:00	1024	0								0.0			
BH201	28/06/19 10:45:00	1024	0								0.0			
BH201	28/06/19 10:46:00	1024	0								0.0			
BH201	28/06/19 10:47:00			0.0	0.0	20.9	0.0	0	0	0.7				
BH201	28/06/19 10:48:00			0.4	0.0	20.4	0.0	0	0	19.8				
BH201	28/06/19 10:49:00			0.4	0.0	20.4	0.0	0	10	21.0				
BH201	28/06/19 10:50:00			0.3	0.0	20.4	0.0	0	10	21.5				
BH201	28/06/19 10:51:00			0.3	0.0	20.4	0.0	0	10	21.4				
BH201	28/06/19 10:52:00			0.3	0.0	20.4	0.0	0	10	21.2				
BH201	28/06/19 10:53:00												2.17	
BH201	03/07/19 12:24:00	1026	0								0.0	21		
BH201	03/07/19 12:25:00	1026	0								0.0			
BH201	03/07/19 12:26:00	1026	0								0.0			
BH201	03/07/19 12:27:00	1026	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH201	03/07/19 12:28:00	1026	0								0.0			
BH201	03/07/19 12:29:00	1026	0								0.0			
BH201	03/07/19 12:34:00			0.3	0.0	20.6	0.0	0	0	2.2				
BH201	03/07/19 12:35:00			0.3	0.0	20.5	0.0	0	0	14.0				
BH201	03/07/19 12:36:00			0.3	0.0	20.6	0.0	0	0	14.8				
BH201	03/07/19 12:37:00			0.3	0.0	20.5	0.0	0	0	15.3				
BH201	03/07/19 12:38:00			0.3	0.0	20.6	0.0	0	0	15.4				
BH201	03/07/19 12:39:00			0.3	0.0	20.6	0.0	0	0	15.4			2.23	Groundwater sample taken.
BH201	10/07/19 12:43:00	1016	15								3.7			
BH201	10/07/19 12:44:00	1016	5								1.6			
BH201	10/07/19 12:45:00	1015	1								0.3			
BH201	10/07/19 12:46:00	1015	0								0.0			
BH201	10/07/19 12:47:00	1016	0								0.0			
BH201	10/07/19 12:48:00	1016	0								0.0			
BH201	10/07/19 12:49:00			0.0	0.0	19.8	0.0	0	0	14.9				
BH201	10/07/19 12:50:00			0.0	0.0	19.8	0.0	0	0	13.0				
BH201	10/07/19 12:51:00			0.0	0.0	19.9	0.0	0	0	9.1				
BH201	10/07/19 12:52:00			0.0	0.0	19.9	0.0	0	0	7.0				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH201	10/07/19 12:53:00			0.0	0.0	19.9	0.0	0	0	4.4				
BH201	10/07/19 12:54:00			0.0	0.0	19.9	0.0	0	0	3.0				
BH201	10/07/19 12:56:00												2.21	
BH201	18/07/19 14:39:00	1005	0								0.0			
BH201	18/07/19 14:40:00	1006	0								0.0			
BH201	18/07/19 14:41:00	1006	0								0.0			
BH201	18/07/19 14:42:00	1006	0								0.0			
BH201	18/07/19 14:43:00	1006	0								0.0			
BH201	18/07/19 14:44:00	1006	0								0.0			
BH201	18/07/19 14:46:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:47:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:48:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:49:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:50:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:51:00			0.4	0.0	20.5	0.0	0	0	0.0				
BH201	18/07/19 14:52:00												2.25	
BH201	26/07/19 10:17:00	1009	0								0.0			
BH201	26/07/19 10:18:00	1010	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH201	26/07/19 10:19:00	1010	0								0.0			
BH201	26/07/19 10:20:00	1010	0								0.0			
BH201	26/07/19 10:21:00	1010	0								0.0			
BH201	26/07/19 10:22:00	1010	0								0.0			
BH201	26/07/19 10:23:00			0.1	0.0	20.7	0.0	0	0	76.1				
BH201	26/07/19 10:24:00			0.4	0.0	20.5	0.0	0	0	246.6				
BH201	26/07/19 10:25:00			0.4	0.0	20.4	0.0	0	0	372.1				
BH201	26/07/19 10:26:00			0.4	0.0	20.4	0.0	0	0	291.0				
BH201	26/07/19 10:27:00			0.4	0.0	20.4	0.0	0	0	259.1				
BH201	26/07/19 10:28:00			0.4	0.0	20.5	0.0	0	0	207.3				
BH201	26/07/19 10:29:00												2.23	
BH201	22/08/19 08:57:00	1024	-72								-17.3			
BH201	22/08/19 08:58:00	1024	-3								0.0			
BH201	22/08/19 08:59:00	1024	0								0.0			
BH201	22/08/19 09:00:00	1024	0								0.0			
BH201	22/08/19 09:01:00	1024	0								0.0			
BH201	22/08/19 09:05:00			0.5	0.0	20.1	0.0	0	0	9.1				
BH201	22/08/19 09:06:00			0.6	0.0	20.0	0.0	0	0	10.7				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH201	22/08/19 09:07:00			0.0	0.0	19.9	0.0	0	0	11.6				
BH201	22/08/19 09:08:00			0.5	0.0	20.0	0.0	0	0	12.3				
BH201	22/08/19 09:09:00			0.5	0.0	20.0	0.0	0	0	12.4				
BH201	22/08/19 09:10:00			0.5	0.0	20.0	0.0	0	0	12.4				
BH201	22/08/19 09:12:00												2.22	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH202D	18/06/19 13:50:00												2.63	
BH202D	28/06/19 10:00:00	1024	0								0.0	19		
BH202D	28/06/19 10:01:00	1024	0								0.0			
BH202D	28/06/19 10:02:00	1024	0								0.0			
BH202D	28/06/19 10:03:00	1024	0								0.0			
BH202D	28/06/19 10:04:00	1024	0								0.0			
BH202D	28/06/19 10:05:00	1024	0								0.0			
BH202D	28/06/19 10:06:00			0.0	0.0	20.9	0.0	0	0	0.6				
BH202D	28/06/19 10:07:00			0.0	0.0	20.6	0.0	0	0	7.9				
BH202D	28/06/19 10:08:00			0.0	0.0	20.7	0.0	0	0	7.0				
BH202D	28/06/19 10:09:00			0.0	0.0	20.7	0.0	0	0	5.3				
BH202D	28/06/19 10:10:00			0.0	0.0	20.7	0.0	0	0	3.8				
BH202D	28/06/19 10:11:00			0.0	0.0	20.8	0.0	0	0	2.8				
BH202D	28/06/19 10:12:00												3.06	
BH202D	03/07/19 13:24:00	1024	0								-4.0	21		
BH202D	03/07/19 13:25:00	1024	0								0.0			
BH202D	03/07/19 13:26:00	1024	0								0.0			
BH202D	03/07/19 13:27:00	1024	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH202D	03/07/19 13:28:00	1024	0								0.0			
BH202D	03/07/19 13:29:00	1024	0								0.0			
BH202D	03/07/19 13:31:00			0.0	0.0	21.6	0.0	0	0	1.4				
BH202D	03/07/19 13:32:00			0.1	0.0	21.0	0.0	0	0	10.2				
BH202D	03/07/19 13:33:00			0.1	0.0	21.0	0.0	0	0	10.5				
BH202D	03/07/19 13:34:00			0.1	0.0	21.0	0.0	0	0	10.7				
BH202D	03/07/19 13:35:00			0.1	0.0	21.0	0.0	0	0	10.8				
BH202D	03/07/19 13:36:00			0.1	0.0	21.1	0.0	0	0	10.8				
BH202D	03/07/19 13:37:00												3.10	Groundwater sample taken.
BH202D	10/07/19 12:13:00	1013	0								0.0			
BH202D	10/07/19 12:14:00	1013	0								0.0			
BH202D	10/07/19 12:15:00	1013	0								0.0			
BH202D	10/07/19 12:16:00	1013	0								0.0			
BH202D	10/07/19 12:17:00	1013	0								0.0			
BH202D	10/07/19 12:18:00	1013	0								0.0			
BH202D	10/07/19 12:19:00			0.0	0.0	18.8	0.0	0	0	13.9				
BH202D	10/07/19 12:20:00			0.1	0.0	19.2	0.0	0	0	13.5				
BH202D	10/07/19 12:21:00			0.1	0.0	19.2	0.0	0	0	12.1				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH202D	10/07/19 12:22:00			0.1	0.0	19.2	0.0	0	0	11.6				
BH202D	10/07/19 12:23:00			0.1	0.0	19.2	0.0	0	0	11.2				
BH202D	10/07/19 12:24:00			0.1	0.0	19.3	0.0	0	0	10.9				
BH202D	10/07/19 12:26:00												3.10	
BH202D	18/07/19 15:30:00	1004	0								0.0			
BH202D	18/07/19 15:31:00	1004	0								0.0			
BH202D	18/07/19 15:32:00	1004	0								0.0			
BH202D	18/07/19 15:33:00	1004	0								0.0			
BH202D	18/07/19 15:34:00	1004	0								0.0			
BH202D	18/07/19 15:35:00	1004	0								0.0			
BH202D	18/07/19 15:36:00			0.1	0.0	21.0	0.0	0	0	0.0				
BH202D	18/07/19 15:37:00			0.2	0.0	20.6	0.0	0	0	0.0				
BH202D	18/07/19 15:38:00			0.1	0.0	20.7	0.0	0	0	0.0				
BH202D	18/07/19 15:39:00			0.1	0.0	20.8	0.0	0	0	0.0				
BH202D	18/07/19 15:40:00			0.1	0.0	20.9	0.0	0	0	0.0				
BH202D	18/07/19 15:41:00			0.0	0.0	20.9	0.0	0	0	0.0				
BH202D	18/07/19 15:42:00												3.14	
BH202D	26/07/19 09:35:00	1010	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH202D	26/07/19 09:36:00	1010	0								0.0			
BH202D	26/07/19 09:37:00	1010	0								0.0			
BH202D	26/07/19 09:38:00	1010	0								0.0			
BH202D	26/07/19 09:39:00	1010	0								0.0			
BH202D	26/07/19 09:40:00	1010	0								0.0			
BH202D	26/07/19 09:41:00			0.1	0.0	19.8	0.0	0	0	258.0				
BH202D	26/07/19 09:42:00			0.1	0.0	20.6	0.0	0	0	60.7				
BH202D	26/07/19 09:43:00			0.1	0.0	20.8	0.0	0	0	8.9				
BH202D	26/07/19 09:44:00			0.1	0.0	20.9	0.0	0	0	0.0				
BH202D	26/07/19 09:45:00			0.0	0.0	20.9	0.0	0	0	0.0				
BH202D	26/07/19 09:46:00			0.0	0.0	20.9	0.0	0	0	0.0				
BH202D	26/07/19 09:47:00												3.13	
BH202D	22/08/19 08:57:00	1022	-30								0.0			
BH202D	22/08/19 08:58:00	1022	0								0.0			
BH202D	22/08/19 08:59:00	1022	0								0.0			
BH202D	22/08/19 09:00:00	1022	0								0.0			
BH202D	22/08/19 09:01:00	1022	0								0.0			
BH202D	22/08/19 09:05:00			0.3	0.0	20.6	0.0	0	0	9.8				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH202D	22/08/19 09:06:00			0.4	0.0	20.1	0.0	0	0	13.4				
BH202D	22/08/19 09:07:00			0.4	0.0	20.1	0.0	0	0	13.3				
BH202D	22/08/19 09:08:00			0.4	0.0	20.1	0.0	0	0	13.5				
BH202D	22/08/19 09:09:00			0.4	0.0	20.1	0.0	0	0	13.3				
BH202D	22/08/19 09:10:00			0.4	0.0	20.2	0.0	0	0	13.3				
BH202D	22/08/19 09:12:00												3.10	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH203	14/06/19 13:35:00												2.72	
BH203	28/06/19 08:32:00	1025	0								0.0	17		
BH203	28/06/19 08:33:00	1025	0								0.0			
BH203	28/06/19 08:34:00	1025	0								0.0			
BH203	28/06/19 08:35:00	1025	0								0.0			
BH203	28/06/19 08:36:00	1025	0								0.0			
BH203	28/06/19 08:37:00	1025	0								0.0			
BH203	28/06/19 08:38:00			0.0	0.0	20.6	0.0	0	0	0.6				
BH203	28/06/19 08:39:00			0.1	0.0	20.5	0.0	0	0	8.4				
BH203	28/06/19 08:40:00			0.0	0.0	20.6	0.0	0	0	7.5				
BH203	28/06/19 08:41:00			0.0	0.0	20.6	0.0	0	0	6.4				
BH203	28/06/19 08:42:00			0.0	0.0	20.6	0.0	0	0	5.3				
BH203	28/06/19 08:43:00			0.0	0.0	20.7	0.0	0	0	4.2				
BH203	28/06/19 08:44:00												2.55	
BH203	04/07/19 11:20:00												2.69	Groundwater sample taken. No gas tap present.
BH203	10/07/19 10:20:00	1014	0								0.0	15		
BH203	10/07/19 10:21:00	1014	0								0.0			
BH203	10/07/19 10:22:00	1014	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH203	10/07/19 10:23:00	1014	0								0.0			
BH203	10/07/19 10:24:00	1014	0								0.0			
BH203	10/07/19 10:25:00	1014	0								0.0			
BH203	10/07/19 10:26:00			0.2	0.0	18.1	0.0	0	0	12.7				
BH203	10/07/19 10:27:00			0.2	0.0	19.0	0.0	0	0	13.4				
BH203	10/07/19 10:28:00			0.2	0.0	19.2	0.0	0	0	13.3				
BH203	10/07/19 10:29:00			0.2	0.0	19.2	0.0	0	0	12.7				
BH203	10/07/19 10:30:00			0.2	0.0	19.2	0.0	0	0	12.1				
BH203	10/07/19 10:31:00			0.1	0.0	19.3	0.0	0	0	11.6				
BH203	10/07/19 10:33:00												2.68	
BH203	18/07/19 16:32:00	1004	0								0.0			
BH203	18/07/19 16:33:00	1004	0								0.0			
BH203	18/07/19 16:34:00	1004	0								0.0			
BH203	18/07/19 16:35:00	1004	0								0.0			
BH203	18/07/19 16:36:00	1004	0								0.0			
BH203	18/07/19 16:37:00	1004	0								0.0			
BH203	18/07/19 16:38:00			0.5	0.0	19.6	0.0	0	0	0.0				
BH203	18/07/19 16:39:00			0.2	0.0	20.8	0.0	0	0	0.0				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH203	18/07/19 16:40:00			0.2	0.0	20.9	0.0	0	0	0.0				
BH203	18/07/19 16:41:00			0.2	0.0	20.9	0.0	0	0	0.0				
BH203	18/07/19 16:42:00			0.1	0.0	21.0	0.0	0	0	0.0				
BH203	18/07/19 16:43:00			0.1	0.0	21.0	0.0	0	0	0.0				
BH203	18/07/19 16:44:00												2.73	
BH203	26/07/19 08:11:00	1010	0								0.0			
BH203	26/07/19 08:12:00	1010	0								0.0			
BH203	26/07/19 08:13:00	1010	0								0.0			
BH203	26/07/19 08:14:00	1010	0								0.0			
BH203	26/07/19 08:15:00	1010	0								0.0			
BH203	26/07/19 08:16:00	1010	0								0.0			
BH203	26/07/19 08:17:00			0.0	0.0	20.7	0.0	0	0	5.8				
BH203	26/07/19 08:18:00			0.3	0.0	20.5	0.0	0	0	95.7				
BH203	26/07/19 08:19:00			0.3	0.0	20.5	0.0	0	0	90.5				
BH203	26/07/19 08:20:00			0.2	0.0	20.6	0.0	0	0	72.3				
BH203	26/07/19 08:21:00			0.2	0.0	20.6	0.0	0	0	47.5				
BH203	26/07/19 08:22:00			0.2	0.0	20.6	0.0	0	0	37.5				
BH203	26/07/19 08:23:00												2.70	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH203	22/08/19 10:33:00	1023	-104								-17.2			
BH203	22/08/19 10:34:00	1023	0								0.0			
BH203	22/08/19 10:35:00	1023	0								0.0			
BH203	22/08/19 10:36:00	1023	0								0.0			
BH203	22/08/19 10:37:00	1023	0								0.0			
BH203	22/08/19 10:39:00			0.4	0.0	20.7	0.0	0	0	98.1				
BH203	22/08/19 10:40:00			0.6	0.0	20.0	0.0	0	0	51.6				
BH203	22/08/19 10:41:00			0.6	0.0	19.9	0.0	0	0	36.2				
BH203	22/08/19 10:42:00			0.6	0.0	19.9	0.0	0	0	29.7				
BH203	22/08/19 10:43:00			0.6	0.0	20.0	0.0	0	0	24.4				
BH203	22/08/19 10:44:00			0.5	0.0	120.1	0.0	0	0	22.3				
BH203	22/08/19 10:46:00												3.70	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH204	28/06/19 11:25:00												3.40	Unable to gas monitor due to no gas tap.
BH204	03/07/19 14:45:00	1021	0								0.0	21		
BH204	03/07/19 14:46:00	1021	0								0.0			
BH204	03/07/19 14:47:00	1021	0								0.0			
BH204	03/07/19 14:48:00	1021	0								0.0			
BH204	03/07/19 14:49:00	1021	0								0.0			
BH204	03/07/19 14:50:00	1021	0								0.0			
BH204	03/07/19 14:55:00			3.6	0.0	18.9	0.0	0	0	3.4				
BH204	03/07/19 14:56:00			0.1	0.0	20.5	0.0	0	0	10.6				
BH204	03/07/19 14:57:00			0.1	0.0	20.6	0.0	0	0	8.3				
BH204	03/07/19 14:58:00			0.1	0.0	20.8	0.0	0	0	5.6				
BH204	03/07/19 14:59:00			0.0	0.0	20.9	0.0	0	0	4.6				
BH204	03/07/19 15:00:00			0.0	0.0	21.0	0.0	0	0	3.7				
BH204	03/07/19 15:01:00												3.44	Groundwater sample taken.
BH204	10/07/19 10:37:00	1013	0								0.0	15		
BH204	10/07/19 10:38:00	1013	0								0.0			
BH204	10/07/19 10:39:00	1013	0								0.0			
BH204	10/07/19 10:40:00	1013	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH204	10/07/19 10:41:00	1013	0								0.0			
BH204	10/07/19 10:42:00	1013	0								0.0			
BH204	10/07/19 10:43:00			0.6	0.0	18.1	0.0	0	0	72.4				VOC peaked at 76.2ppm.
BH204	10/07/19 10:44:00			0.5	0.0	18.3	0.0	0	0	32.5				
BH204	10/07/19 10:45:00			0.5	0.0	18.5	0.0	0	0	34.6				
BH204	10/07/19 10:46:00			0.4	0.0	18.7	0.0	0	0	20.4				
BH204	10/07/19 10:47:00			0.2	0.0	19.0	0.0	0	0	13.3				
BH204	10/07/19 10:48:00			0.2	0.0	19.1	0.0	0	0	11.2				
BH204	10/07/19 10:50:00												3.49	
BH204	19/07/19 09:55:00	1007	0								0.0			
BH204	19/07/19 09:56:00	1006	0								0.0			
BH204	19/07/19 09:57:00	1007	0								0.0			
BH204	19/07/19 09:58:00	1007	0								0.0			
BH204	19/07/19 09:59:00	1006	0								0.0			
BH204	19/07/19 10:00:00	1006	0								0.0			
BH204	19/07/19 10:01:00			1.2	0.0	18.5	0.0	0	0	8.5				
BH204	19/07/19 10:02:00			1.2	0.0	17.9	0.0	0	0	8.8				Test paused: blocked flow messgae on PID connection.

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH204	19/07/19 10:04:00			0.7	0.0	19.5	0.0	0	0	8.6				Test paused: blocked flow messgae on PID connection.
BH204	19/07/19 10:49:00			0.7	0.0	20.0	0.0	0	0	8.3				
BH204	19/07/19 10:50:00			0.7	0.0	19.4	0.0	0	0	8.9				Test stopped: blocked flow messgae on PID connection.
BH204	19/07/19 10:51:00												3.59	
BH204	26/07/19 10:49:00	1009	0								0.0			
BH204	26/07/19 10:50:00	1009	0								0.0			
BH204	26/07/19 10:51:00	1008	0								0.0			
BH204	26/07/19 10:52:00	1008	0								0.0			
BH204	26/07/19 10:53:00	1008	0								0.0			
BH204	26/07/19 10:54:00	1008	0								0.0			
BH204	26/07/19 10:55:00			0.4	0.0	20.5	0.0	0	0	56.3				
BH204	26/07/19 10:56:00			0.7	0.0	19.6	0.0	0	0	405.5				
BH204	26/07/19 10:57:00			0.6	0.0	19.9	0.0	0	0	279.3				
BH204	26/07/19 10:58:00			0.5	0.0	20.1	0.0	0	0	194.8				
BH204	26/07/19 10:59:00			0.5	0.0	20.3	0.0	0	0	150.4				
BH204	26/07/19 11:00:00			0.4	0.0	20.4	0.0	0	0	117.9				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH204	26/07/19 11:01:00												3.50	
BH204	22/08/19 10:55:00	1022	0								-3.6			
BH204	22/08/19 10:56:00	1022	0								0.0			
BH204	22/08/19 10:57:00	1022	0								0.0			
BH204	22/08/19 10:58:00	1022	0								0.0			
BH204	22/08/19 10:59:00	1022	0								0.0			
BH204	22/08/19 11:01:00			0.9	0.0	19.4	0.0	0	0	125.5				
BH204	22/08/19 11:02:00			0.6	0.0	19.9	0.0	0	0	117.4				
BH204	22/08/19 11:03:00			0.5	0.0	20.2	0.0	0	0	116.4				
BH204	22/08/19 11:04:00			0.3	0.0	20.5	0.0	0	0	99.6				
BH204	22/08/19 11:05:00			0.2	0.0	20.7	0.0	0	0	78.8				
BH204	22/08/19 11:06:00			0.1	0.0	20.8	0.0	0	0	72.2				
BH204	22/08/19 11:08:00												3.50	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH205C	18/06/19 14:00:00												2.20	
BH205C	28/06/19 11:01:00	1022	0								0.0	21		
BH205C	28/06/19 11:02:00	1022	0								0.0			
BH205C	28/06/19 11:03:00	1022	0								0.0			
BH205C	28/06/19 11:04:00	1022	0								0.0			
BH205C	28/06/19 11:05:00	1022	0								0.0			
BH205C	28/06/19 11:06:00	1022	0								0.0			
BH205C	28/06/19 11:07:00			0.0	0.0	21.0	0.0	0	0	7.6				
BH205C	28/06/19 11:08:00			0.0	0.0	20.6	0.0	0	0	5.0				
BH205C	28/06/19 11:09:00			0.0	0.0	20.9	0.0	0	0	3.4				
BH205C	28/06/19 11:10:00			0.0	0.0	21.0	0.0	0	0	2.6				
BH205C	28/06/19 11:11:00			0.0	0.0	21.0	0.0	0	0	1.9				
BH205C	28/06/19 11:12:00			0.0	0.0	21.0	0.0	0	0	1.5				
BH205C	28/06/19 11:13:00												2.20	
BH205C	03/07/19 13:00:00	1025	0								0.0	21		
BH205C	03/07/19 13:01:00	1025	0								0.0			
BH205C	03/07/19 13:02:00	1025	0								0.0			
BH205C	03/07/19 13:03:00	1025	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH205C	03/07/19 13:04:00	1025	0								0.0			
BH205C	03/07/19 13:05:00	1025	0								0.0			
BH205C	03/07/19 13:09:00			0.3	0.0	20.1	0.0	0	0	3.5				
BH205C	03/07/19 13:10:00			0.1	0.0	20.7	0.0	0	0	3.6				
BH205C	03/07/19 13:11:00			0.0	0.0	21.0	0.0	0	0	2.2				
BH205C	03/07/19 13:12:00			0.0	0.0	21.1	0.0	0	0	1.8				
BH205C	03/07/19 13:13:00			0.0	0.0	21.2	0.0	0	0	1.4				
BH205C	03/07/19 13:14:00			0.0	0.0	21.2	0.0	0	0	1.2				
BH205C	03/07/19 13:15:00												2.25	Groundwater sample taken.
BH205C	10/07/19 12:28:00	1015	0								0.0			
BH205C	10/07/19 12:29:00	1016	0								0.0			
BH205C	10/07/19 12:30:00	1016	0								0.0			
BH205C	10/07/19 12:31:00	1015	0								0.0			
BH205C	10/07/19 12:32:00	1015	0								0.0			
BH205C	10/07/19 12:33:00	1016	0								0.0			
BH205C	10/07/19 12:34:00			0.3	0.0	19.2	0.0	0	0	8.1				
BH205C	10/07/19 12:35:00			0.0	0.0	19.4	0.0	0	0	1.2				
BH205C	10/07/19 12:36:00			0.0	0.0	19.5	0.0	0	0	0.8				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH205C	10/07/19 12:37:00			0.0	0.0	19.5	0.0	0	0	0.5				
BH205C	10/07/19 12:38:00			0.0	0.0	19.6	0.0	0	0	0.4				
BH205C	10/07/19 12:39:00			0.0	0.0	19.5	0.0	0	0	0.3				
BH205C	10/07/19 12:41:00												2.24	
BH205C	18/07/19 15:06:00	1006	0								0.0			
BH205C	18/07/19 15:07:00	1005	0								0.0			
BH205C	18/07/19 15:08:00	1005	0								0.0			
BH205C	18/07/19 15:09:00	1005	0								0.0			
BH205C	18/07/19 15:10:00	1005	0								0.0			
BH205C	18/07/19 15:11:00	1005	0								0.0			
BH205C	18/07/19 15:13:00			0.2	0.0	20.6	0.0	0	0	0.0				
BH205C	18/07/19 15:14:00			0.1	0.0	20.9	0.0	0	0	0.0				
BH205C	18/07/19 15:15:00			0.0	0.0	21.0	0.0	0	0	0.0				
BH205C	18/07/19 15:16:00			0.0	0.0	21.1	0.0	0	0	0.0				
BH205C	18/07/19 15:17:00			0.0	0.0	21.1	0.0	0	0	0.0				
BH205C	18/07/19 15:18:00			0.0	0.0	21.1	0.0	0	0	0.0				
BH205C	18/07/19 15:19:00												Dry	
BH205C	26/07/19 09:59:00	1010	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH205C	26/07/19 10:00:00	1010	0								0.0			
BH205C	26/07/19 10:01:00	1010	0								0.0			
BH205C	26/07/19 10:02:00	1010	0								0.0			
BH205C	26/07/19 10:03:00	1010	0								0.0			
BH205C	26/07/19 10:04:00	1010	0								0.0			
BH205C	26/07/19 10:05:00			0.5	0.0	20.6	0.0	0	0	0.0				
BH205C	26/07/19 10:06:00			0.5	0.0	19.7	0.0	0	0	94.2				
BH205C	26/07/19 10:07:00			0.2	0.0	20.6	0.0	0	0	389.2				
BH205C	26/07/19 10:08:00			0.1	0.0	20.8	0.0	0	0	255.7				
BH205C	26/07/19 10:09:00			0.1	0.0	20.9	0.0	0	0	199.8				
BH205C	26/07/19 10:10:00			0.1	0.0	20.9	0.0	0	0	167.9				
BH205C	26/07/19 10:11:00												2.27	
BH205C	22/08/19 12:06:00	1025	0								0.0			
BH205C	22/08/19 12:07:00	1025	0								0.0			
BH205C	22/08/19 12:08:00	1025	0								0.0			
BH205C	22/08/19 12:09:00	1025	0								0.0			
BH205C	22/08/19 12:10:00	1025	0								0.0			
BH205C	22/08/19 12:12:00			0.7	0.0	19.7	0.0	0	0	13.1				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
BH205C	22/08/19 12:13:00			0.2	0.0	20.6	0.0	0	0	60.5				
BH205C	22/08/19 12:14:00			0.1	0.0	20.8	0.0	0	0	517.1				
BH205C	22/08/19 12:15:00			0.1	0.0	20.9	0.0	0	0	462.3				
BH205C	22/08/19 12:16:00			0.1	0.0	20.9	0.0	0	0	429.9				
BH205C	22/08/19 12:17:00			0.1	0.0	21.0	0.0	0	0	420.6				
BH205C	22/08/19 12:19:00												2.29	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS201	18/06/19 14:30:00												Damp	
WS201	04/07/19 13:30:00	1025	0								0.0	24		
WS201	04/07/19 13:31:00	1025	0								0.0			
WS201	04/07/19 13:32:00	1025	0								0.0			
WS201	04/07/19 13:33:00	1025	0								0.0			
WS201	04/07/19 13:34:00	1025	0								0.0			
WS201	04/07/19 13:35:00	1025	0								0.0			
WS201	04/07/19 13:40:00												Dry	Gas tap blocked.
WS201	10/07/19 11:18:00	1016	0								0.0			
WS201	10/07/19 11:19:00	1016	0								0.0			
WS201	10/07/19 11:20:00	1016	0								0.0			
WS201	10/07/19 11:21:00	1016	0								0.0			
WS201	10/07/19 11:22:00	1016	0								0.0			
WS201	10/07/19 11:23:00	1016	0								0.0			
WS201	10/07/19 11:24:00			0.0	0.0	19.2	0.0	0	0	1.8				
WS201	10/07/19 11:25:00			0.0	0.0	17.2	0.0	0	0	2.5				
WS201	10/07/19 11:26:00			0.0	0.0	17.0	0.0	0	0	2.5				
WS201	10/07/19 11:27:00			0.0	0.0	17.0	0.0	0	0	2.6				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS201	10/07/19 11:28:00			0.0	0.0	16.9	0.0	0	0	2.6				
WS201	10/07/19 11:29:00			0.0	0.0	16.9	0.0	0	0	2.6				
WS201	10/07/19 11:31:00												Dry	
WS201	19/07/19 11:08:00	1005	0								0.0			
WS201	19/07/19 11:09:00	1005	0								0.0			
WS201	19/07/19 11:10:00	1005	0								0.0			
WS201	19/07/19 11:11:00	1005	0								0.0			
WS201	19/07/19 11:12:00	1005	0								0.0			
WS201	19/07/19 11:13:00	1005	0								0.0			
WS201	19/07/19 12:23:00			0.0	0.0	20.7	0.0	0	0	7.2				
WS201	19/07/19 12:24:00			0.0	0.0	17.3	0.0	0	0	6.0				
WS201	19/07/19 12:25:00			0.0	0.0	17.3	0.0	0	0	5.8				
WS201	19/07/19 12:26:00			0.0	0.0	17.2	0.0	0	0	5.2				
WS201	19/07/19 12:27:00			0.0	0.0	17.2	0.0	0	0	3.8				
WS201	19/07/19 12:28:00			0.0	0.0	17.2	0.0	0	0	3.7				
WS201	19/07/19 12:29:00												Dry	
WS201	26/07/19 09:09:00	1009	0								0.0			
WS201	26/07/19 09:10:00	1009	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS201	26/07/19 09:11:00	1009	0								0.0			
WS201	26/07/19 09:12:00	1009	0								0.0			
WS201	26/07/19 09:13:00	1009	0								0.0			
WS201	26/07/19 09:14:00	1009	0								0.0			
WS201	26/07/19 09:15:00			0.6	0.0	19.7	0.0	0	0	75.3				
WS201	26/07/19 09:16:00			0.0	0.0	16.2	0.0	0	0	290.2				
WS201	26/07/19 09:17:00			0.0	0.0	16.2	0.0	0	0	7.7				
WS201	26/07/19 09:18:00			0.0	0.0	16.1	0.0	0	0	313.8				
WS201	26/07/19 09:19:00			0.0	0.0	16.1	0.0	0	0	234.9				
WS201	26/07/19 09:20:00			0.0	0.0	16.1	0.0	0	0	176.2				
WS201	26/07/19 09:21:00												1.07	
WS201	22/08/19 11:25:00	1023	0								0.0			
WS201	22/08/19 11:25:00	1023	0								0.0			
WS201	22/08/19 11:25:00	1023	0								0.0			
WS201	22/08/19 11:25:00	1023	0								0.0			
WS201	22/08/19 11:25:00	1023	0								0.0			
WS201	22/08/19 11:25:00			0.0	0.0	17.5	0.0	0	0	36.4				
WS201	22/08/19 11:25:00			0.0	0.0	17.5	0.0	0	0	19.8				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS201	22/08/19 11:25:00			0.0	0.0	16.9	0.0	0	0	16.7				
WS201	22/08/19 11:25:00			0.0	0.0	16.9	0.0	0	0	15.7				
WS201	22/08/19 11:25:00			0.0	0.0	16.8	0.0	0	0	16.1				
WS201	22/08/19 11:25:00			0.0	0.0	16.8	0.0	0	0	11.6				
WS201	22/08/19 11:25:00												0.96	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS202	14/06/19 13:40:00												2.63	
WS202	04/07/19 14:20:00	1020	0								0.0	20		
WS202	04/07/19 14:21:00	1020	0								0.0			
WS202	04/07/19 14:22:00	1020	0								0.0			
WS202	04/07/19 14:23:00	1020	0								0.0			
WS202	04/07/19 14:24:00	1020	0								0.0			
WS202	04/07/19 14:25:00	1020	0								0.0			
WS202	04/07/19 14:29:00			2.3	0.0	15.4	0.0	0	0	0.9				
WS202	04/07/19 14:30:00			4.6	0.0	11.5	0.0	0	0	7.5				
WS202	04/07/19 14:31:00			4.5	0.0	11.6	0.0	0	0	7.9				
WS202	04/07/19 14:32:00			4.4	0.0	11.9	0.0	0	0	8.1				
WS202	04/07/19 14:33:00			4.4	0.0	12.1	0.0	0	0	8.2				
WS202	04/07/19 14:34:00			4.4	0.0	12.3	0.0	0	0	8.1				
WS202	04/07/19 14:35:00												2.58	
WS202	10/07/19 08:58:00	1014	0								0.0	13		
WS202	10/07/19 08:59:00	1014	0								0.0			
WS202	10/07/19 09:00:00	1014	0								0.0			
WS202	10/07/19 09:01:00	1014	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS202	10/07/19 09:02:00	1014	0								0.0			
WS202	10/07/19 09:03:00	1014	0								0.0			
WS202	10/07/19 09:04:00			3.8	0.0	16.3	0.0	0	0	7.3				
WS202	10/07/19 09:05:00			4.4	0.0	13.6	0.0	0	0	9.1				
WS202	10/07/19 09:06:00			4.2	0.0	12.5	0.0	0	0	9.5				
WS202	10/07/19 09:07:00			4.1	0.0	12.7	0.0	0	0	9.3				
WS202	10/07/19 09:08:00			3.9	0.0	12.9	0.0	0	0	9.2				
WS202	10/07/19 09:09:00			3.9	0.0	13.0	0.0	0	0	8.9				
WS202	10/07/19 09:11:00												2.64	Groundwater sample taken.
WS202	18/07/19 16:14:00	1004	0								0.0			
WS202	18/07/19 16:15:00	1004	0								0.0			
WS202	18/07/19 16:16:00	1004	0								0.0			
WS202	18/07/19 16:17:00	1004	0								0.0			
WS202	18/07/19 16:18:00	1004	0								0.0			
WS202	18/07/19 16:19:00	1004	0								0.0			
WS202	18/07/19 16:20:00			2.4	0.0	16.7	0.0	0	0	0.0				
WS202	18/07/19 16:21:00			2.5	0.0	15.9	0.0	0	0	0.0				
WS202	18/07/19 16:22:00			2.5	0.0	15.9	0.0	0	0	0.0				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS202	18/07/19 16:23:00			2.4	0.0	16.0	0.0	0	0	0.0				
WS202	18/07/19 16:24:00			2.4	0.0	16.0	0.0	0	0	0.0				
WS202	18/07/19 16:25:00			2.5	0.0	15.9	0.0	0	0	0.0				
WS202	18/07/19 16:26:00												2.67	
WS202	26/07/19 08:45:00	1010	0								0.0			
WS202	26/07/19 08:46:00	1010	0								0.0			
WS202	26/07/19 08:47:00	1010	0								0.0			
WS202	26/07/19 08:48:00	1009	0								0.0			
WS202	26/07/19 08:49:00	1009	0								0.0			
WS202	26/07/19 08:50:00	1009	0								0.0			
WS202	26/07/19 08:51:00			8.2	0.0	11.4	0.0	0	0	45.5				
WS202	26/07/19 08:52:00			4.2	0.0	12.6	0.0	0	0	148.1				
WS202	26/07/19 08:53:00			4.1	0.0	12.7	0.0	0	0	247.9				
WS202	26/07/19 08:54:00			4.1	0.0	12.9	0.0	0	0	140.1				
WS202	26/07/19 08:55:00			4.0	0.0	13.0	0.0	0	0	95.2				
WS202	26/07/19 08:56:00			4.0	0.0	13.0	0.0	0	0	82.2				
WS202	26/07/19 08:57:00												2.66	
WS202	22/08/19 10:12:00	1023	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS202	22/08/19 10:13:00	1023	0								0.0			
WS202	22/08/19 10:14:00	1023	0								0.0			
WS202	22/08/19 10:15:00	1023	0								0.0			
WS202	22/08/19 10:16:00	1023	0								0.0			
WS202	22/08/19 10:18:00			0.7	0.0	19.6	0.0	0	0	227.6				
WS202	22/08/19 10:19:00			0.0	0.0	26.7	0.0	0	0	195.7				
WS202	22/08/19 10:20:00			0.0	0.0	20.7	0.0	0	0	96.5				
WS202	22/08/19 10:21:00			0.0	0.0	20.7	0.0	0	0	89.5				
WS202	22/08/19 10:22:00			0.0	0.0	20.7	0.0	0	0	65.7				
WS202	22/08/19 10:23:00			0.0	0.0	20.7	0.0	0	0	48.3				
WS202	22/08/19 10:25:00												2.64	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS203	18/06/19 14:45:00													Unable to access, car parked over position throughout visit.
WS203	04/07/19 11:24:00	1024	0								0.0	21		
WS203	04/07/19 11:25:00	1024	0								0.0			
WS203	04/07/19 11:26:00	1024	0								0.0			
WS203	04/07/19 11:27:00	1024	0								0.0			
WS203	04/07/19 11:28:00	1024	0								0.0			
WS203	04/07/19 11:29:00	1024	0								0.0			
WS203	04/07/19 11:31:00			0.1	0.0	21.2	0.0	0	0	1.3				
WS203	04/07/19 11:32:00			4.6	0.0	16.0	0.0	0	0	8.2				
WS203	04/07/19 11:33:00			4.6	0.0	15.9	0.0	0	0	8.9				
WS203	04/07/19 11:34:00			4.6	0.0	15.9	0.0	0	0	8.9				
WS203	04/07/19 11:35:00			4.6	0.0	15.9	0.0	0	0	8.8				
WS203	04/07/19 11:36:00			4.6	0.0	15.9	0.0	0	0	8.5				
WS203	04/07/19 11:38:00												2.97	Groundwater sample taken.
WS203	10/07/19 09:32:00	1013	0								0.0	13		
WS203	10/07/19 09:33:00	1014	0								0.0			
WS203	10/07/19 09:34:00	1014	0								0.0			

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS203	10/07/19 09:35:00	1013	0								0.0			
WS203	10/07/19 09:36:00	1013	0								0.0			
WS203	10/07/19 09:37:00	1014	0								0.0			
WS203	10/07/19 09:38:00			3.7	0.0	14.7	0.0	0	0	12.6				
WS203	10/07/19 09:39:00			4.3	0.0	13.6	0.0	0	0	14.8				
WS203	10/07/19 09:40:00			4.4	0.0	13.3	0.0	0	0	14.5				
WS203	10/07/19 09:41:00			4.4	0.0	13.2	0.0	0	0	14.1				
WS203	10/07/19 09:42:00			4.5	0.0	13.1	0.0	0	0	13.2				
WS203	10/07/19 09:43:00			4.5	0.0	13.0	0.0	0	0	12.2				
WS203	10/07/19 09:45:00												2.98	
WS203	18/07/19 15:55:00	1004	0								0.0			
WS203	18/07/19 15:56:00	1004	0								0.0			
WS203	18/07/19 15:57:00	1004	0								0.0			
WS203	18/07/19 15:58:00	1004	0								0.0			
WS203	18/07/19 15:59:00	1004	0								0.0			
WS203	18/07/19 16:00:00	1004	0								0.0			
WS203	18/07/19 16:01:00			0.0	0.0	21.3	0.0	0	0	0.0				
WS203	18/07/19 16:02:00			0.0	0.0	21.4	0.0	0	0	0.0				

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT **35248**

CHECKED **CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS203	18/07/19 16:03:00			0.0	0.0	21.4	0.0	0	0	0.0				
WS203	18/07/19 16:04:00			0.0	0.0	21.4	0.0	0	0	0.0				
WS203	18/07/19 16:05:00			0.0	0.0	21.4	0.0	0	0	0.0				
WS203	18/07/19 16:06:00			0.0	0.0	21.4	0.0	0	0	0.0				
WS203	18/07/19 16:07:00												3.02	
WS203	26/07/19 08:30:00	1010	0								0.0			
WS203	26/07/19 08:31:00	1010	0								0.0			
WS203	26/07/19 08:32:00	1010	0								0.0			
WS203	26/07/19 08:33:00	1010	0								0.0			
WS203	26/07/19 08:34:00	1010	0								0.0			
WS203	26/07/19 08:35:00	1010	0								0.0			
WS203	26/07/19 08:36:00			0.1	0.0	21.0	0.0	0	0	19.5				
WS203	26/07/19 08:37:00			8.3	0.0	8.4	0.0	0	0	412.8				
WS203	26/07/19 08:38:00			8.4	0.0	8.2	0.0	0	0	128.2				
WS203	26/07/19 08:39:00			8.4	0.0	8.1	0.0	0	0	86.0				
WS203	26/07/19 08:40:00			8.5	0.0	8.0	0.0	0	0	81.7				
WS203	26/07/19 08:41:00			8.5	0.0	7.9	0.0	0	0	52.9				
WS203	26/07/19 08:42:00												3.00	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: SH READING MASTER LLP

SITE: STATION HILL, READING

Borehole /trial pit no.	date and time	barometric pressure (mb)	pressure differentiation (mm H_2O)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	temperature (°C)	water level (m - bgl)	remarks
WS203	22/08/19 09:50:00	1024	0								0.0			
WS203	22/08/19 09:51:00	1024	0								0.0			
WS203	22/08/19 09:52:00	1024	0								0.0			
WS203	22/08/19 09:53:00	1024	0								0.0			
WS203	22/08/19 09:54:00	1024	0								0.0			
WS203	22/08/19 09:56:00			8.9	0.0	10.1	0.0	0	0	260.8				
WS203	22/08/19 09:57:00			9.8	0.0	9.2	0.0	0	0	217.1				
WS203	22/08/19 09:58:00			9.9	0.0	9.1	0.0	0	0	120.7				
WS203	22/08/19 09:59:00			9.9	0.0	8.9	0.0	0	0	79.1				
WS203	22/08/19 10:00:00			10.0	0.0	8.9	0.0	0	0	62.2				
WS203	22/08/19 10:01:00			10.0	0.0	8.8	0.0	0	0	50.0				
WS203	22/08/19 10:02:00												3.01	

remarks
denotes result exceeding capacity of gas monitoring equipment
VOC - Photoionisation Detector Mini RAE 2000 measures VOC vapours with 10.6eV lamp calibrated against isobutylene.
Single

CONTRACT	CHECKED
35248	**CT**

APPENDIX B

LABORATORY TESTING

2718

Geotecnical Engineering Limited

Version No.	3
For the attention of David Owen/Andrew Tatnell	Page No. 1 of 50
	Date of Issue 23/07/2019

TEST REPORT

PROJECT/SITE	Station Hill, Reading	Samples received	13/06/2019
GEL REPORT NUMBER	35248	Schedule received	13/06/2019
Your ref/PO:		Testing commenced	14/06/2019
Test report refers to	Combined Schedules	Status	Final

SUMMARY OF RESULTS ATTACHED

TEST METHOD & DESCRIPTION	QUANTITY	ACCREDITED TEST
BS EN ISO 17892-1: 2014:5. Water Content	34	YES
BS1377: Part 2: 1990:4.2-4.4&5.2-5.4, Liquid & Plastic Limits	16	YES
BS1377: Part 2: 1990:4.5-4.6&5.2-5.4, Liquid (Casagrande Method) & Plastic Limits	1	NO
BS1377: Part 2: 1990:3.3, Saturation Moisture Content	16	YES
BS1377: Part 2: 1990:6.5, Linear Shrinkage	4	NO
BS EN ISO 17892-3: 2015:5, Particle Density - Pycnometer	17	YES
BS EN ISO 17892-4: 2016: 5.2, Particle Size Distribution - Wet Sieve	15	YES
BS EN ISO 17892-4: 2016: 5.4, Particle Size Distribution - Pipette	6	YES
ISRM: Suggested Methods: 1974 - 2006: Water Content of Rock (Subcontracted)	18	YES
ISRM: Suggested Methods: 1974 - 2006: Porosity/Density of Rock (Subcontracted)	18	YES
ISRM: Suggested Methods: 2007: Uniaxial Compressive Strength of Rock	2	YES
ISRM: 2007: Point Load Strength Test	115	YES
pH (Subcontracted)	21	YES
Organic Matter Content Subcontracted)	16	YES

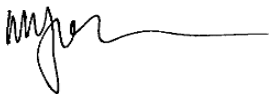
Remarks

This report may not be partially reproduced without written permission from this laboratory.

Approved Signatories:

W Jones (Laboratory Manager) E Crimp (Senior Engineer)

J Hanson (Director) N Parry (Director)



Geotechnical Engineering Ltd
Centurion House
Olympus Park, Quedgeley
Gloucester GL2 4NF

www.geoeng.co.uk
geotech@geoeng.co.uk
TEL: 01452 527743
Fax: 01452 729314

Registered number: 00700739
VAT Number: 682 5857 89

Payments: Geotechnical Engineering Limited
Sort code: 16-22-11 **Bank account**: 11125135

2718

Geotecnical Engineering Limited

Version No.	3
For the attention of David Owen/Andrew Tatnell	Page No. 2 of 50
Date of Issue	23/07/2019

TEST REPORT

PROJECT/SITE	Station Hill, Reading	Samples received	13/06/2019
GEL REPORT NUMBER	35248	Schedule received	13/06/2019
Your ref/PO:		Testing commenced	14/06/2019
Test report refers to	Combined Schedules	Status	Final

SUMMARY OF RESULTS ATTACHED

TEST METHOD & DESCRIPTION	QUANTITY	ACCREDITED TEST
BRE SD1 Suite (Subcontracted)	13	YES/NO

Remarks

This report may not be partially reproduced without written permission from this laboratory.

Approved Signatories:

W Jones (Laboratory Manager) E Crimp (Senior Engineer)

J Hanson (Director) N Parry (Director)

Geotechnical Engineering Ltd
Centurion House
Olympus Park, Quedgeley
Gloucester GL2 4NF

www.geoeng.co.uk
geotech@geoeng.co.uk
TEL: 01452 527743
Fax: 01452 729314

Registered number: 00700739
VAT Number: 682 5857 89

Payments: Geotechnical Engineering Limited
Sort code: 16-22-11 **Bank account**: 11125135

Geotechnical Engineering Limited

LIQUID AND PLASTIC LIMITS

BS.1377 : PART 2 : 1990 : 4 and 5

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
BH201	3B	1.10	1.10	16.5	BXE	58	31	20	11	Brown clayey very sandy GRAVEL
BH201	7L	2.00	2.70	7	BXE	46	30	16	14	Yellowish brown slightly gravelly sandy CLAY
BH201	8D	3.00	3.00	15.6	E					Yellowish brown slightly gravelly slightly sandy CLAY
BH201	16D	9.50	9.50	18.5	E					Off white slightly sandy gravelly SILT (chalk)
BH201	17C	9.50	9.85	21.7	BYE	64	30	23	7	Off white sandy very silty GRAVEL (chalk)
BH201	24C	19.00	19.15	21.8	BYE	8	28	21	7	Off white slightly gravelly slightly sandy SILT (chalk)
BH201	32C	31.00	31.90	19.4	E					Off white slightly sandy slightly gravelly SILT (chalk)
BH202D	2B	1.50	1.50	0.8	E					Brown slightly sandy very gravelly COBBLES
BH202D	12D	8.50	8.50	29.9	E					Off white slightly sandy slightly gravelly SILT (chalk)
BH202D	15C	13.50	14.00	38.2	BXE	35	29	22	7	Off white slightly sandy slightly gravelly SILT (chalk)
BH202D	26Cs	28.70	28.70	19.6	E					White CHALK
BH202D	27C	30.00	31.45	23.7	BZE	52	32	23	9	Off white slightly sandy gravelly SILT (chalk)
BH202D	32C	37.50	37.75	22.4	BXE	3	31	22	9	Off white slightly gravelly slightly sandy SILT (chalk)
BH203	6L	3.00	3.50	35.3	BXE	19	63	29	34	Brownish grey slightly gravelly slightly sandy silty CLAY
BH203	7D	4.00	4.00	25	E					Yellowish brown clayey sandy GRAVEL
BH203	9D	5.00	5.00	11.3	E					Yellowish brown slightly sandy slightly gravelly silty CLAY
BH203	12L	6.00	6.55	25.1	BXE	18	37	16	21	Greyish brown slightly sandy slightly gravelly silty CLAY
BH203	15D	9.00	9.00	27.2	E					Off white slightly sandy gravelly SILT (chalk)
BH203	16L	9.00	9.80	26.5	BYE	25	32	24	8	Off white and yellow slightly sandy slightly gravelly SILT (chalk)

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

denotes sample tested is smaller than that which is recommended in accordance with BS1377 or BS EN ISO 17892

specimen preparation		test method	CONTRACT	CHECKED
A - as received	D - oven dried (60oC)	X - cone penetrometer (test 4.3)		
B - washed on 0.425mm sieve	E - oven dried (105oC)	Y - cone penetrometer (test 4.4)	**35248**	**TB**
C - air dried	F - not known	Z - casagrande apparatus (test 4.5)		

Geotechnical Engineering Limited

LIQUID AND PLASTIC LIMITS

BS.1377 : PART 2 : 1990 : 4 and 5

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
BH204	7L	5.50	6.70	31.8	BXE	18	33	26	7	Off white slightly sandy slightly gravelly SILT (chalk)
BH204	20C	25.50	26.10	25.5	E					Off white slightly sandy gravelly SILT (chalk)
BH204	25C	33.00	33.25	24.4	E					Off white slightly sandy gravelly SILT (chalk)
BH205C	8L	1.20	1.20	21.1	E					Brown very clayey very gravelly SAND
BH205C	9D	2.00	2.00	33.6	BYE	54	43	28	15	Brown mottled orange slightly sandy gravelly clayey SILT
BH205C	12L	3.00	3.15	15.3	BYE	58	34	22	12	Brown slightly sandy gravelly silty CLAY
BH205C	22L	8.00	8.60	23.2	BYE	59	30	23	7	Off white slightly sandy gravelly SILT (chalk)
BH205C	27D	11.00	11.00	26.8	E					Off white slightly sandy slightly gravelly SILT (chalk)
BH205C	33D	15.50	15.50	25.9	E					Off white slightly sandy slightly gravelly SILT (chalk)
BH205C	39D	20.00	20.00	28.2	E					Off white slightly sandy slightly gravelly SILT (chalk)
BH205C	47D	26.00	26.00	22.6	E					Off white mottled brown slightly sandy slightly gravelly SILT (chalk)
BH205C	52D	32.00	32.00	29.3	E					Off white slightly sandy slightly gravelly SILT (chalk)
WS202	8D	3.00	3.00	29.5	BXE	6	50	21	29	Brown mottled grey slightly gravelly slightly sandy CLAY
WS202	13L	5.00	5.00	10.8	BXE	51	23	14	9	Yellowish brown slightly sandy gravelly CLAY
WS203	8D	3.00	3.00	21.1	BXE	21	32	16	16	Yellowish brown slightly gravelly slightly sandy CLAY

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

denotes sample tested is smaller than that which is recommended in accordance with BS1377 or BS EN ISO 17892

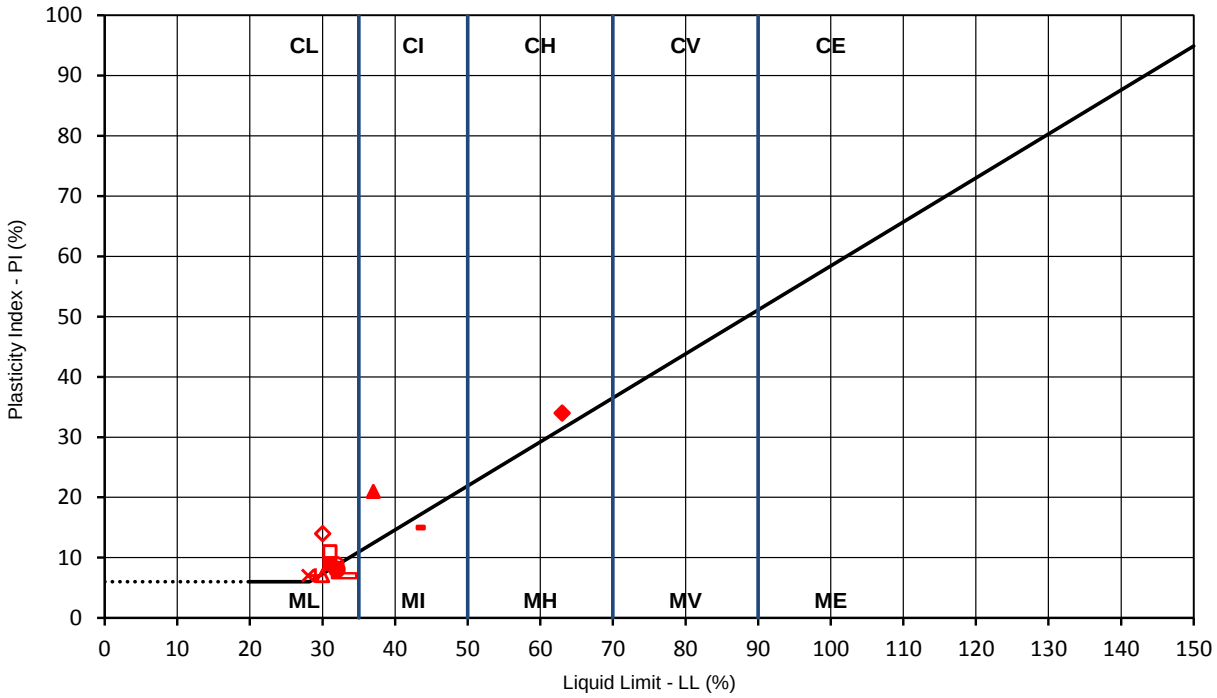
specimen preparation		test method	CONTRACT	CHECKED
A - as received	D - oven dried (60oC)	X - cone penetrometer (test 4.3)		
B - washed on 0.425mm sieve	E - oven dried (105oC)	Y - cone penetrometer (test 4.4)	**35248**	**TB**
C - air dried	F - not known	Z - casagrande apparatus (test 4.5)		

Geotechnical Engineering Limited

ATTERBERG LINE PLOT

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING



	BH/TP No.	depth (m)	LL	PL	PI	remarks
□	BH201	1.10	31	20	11	
◇	BH201	2.70	30	16	14	
△	BH201	9.85	30	23	7	
×	BH201	19.15	28	21	7	
+	BH202D	14.00	29	22	7	
○	BH202D	31.45	32	23	9	
■	BH202D	37.75	31	22	9	
◆	BH203	3.50	63	29	34	
▲	BH203	6.55	37	16	21	
●	BH203	9.80	32	24	8	
▭	BH204	6.70	33	26	7	
▪	BH205C	2.00	43	28	15	

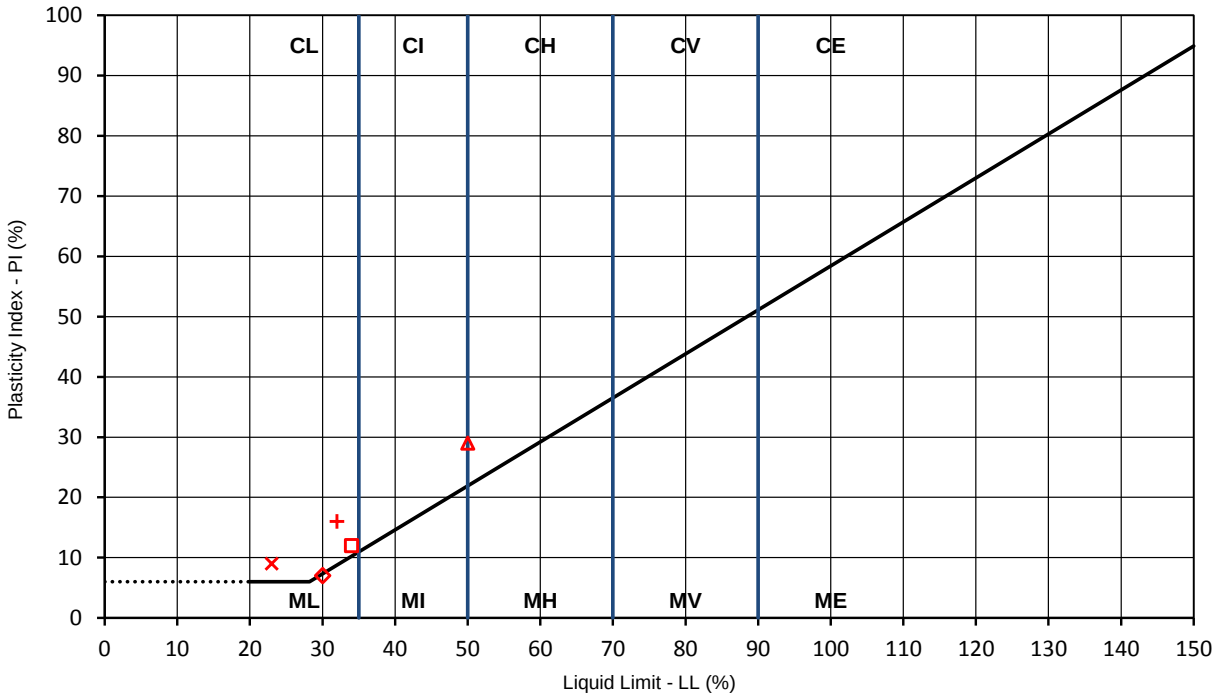
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

ATTERBERG LINE PLOT

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING



	BH/TP No.	depth (m)	LL	PL	PI	remarks
□	BH205C	3.15	34	22	12	
◇	BH205C	8.60	30	23	7	
△	WS202	3.00	50	21	29	
×	WS202	5.00	23	14	9	
+	WS203	3.00	32	16	16	

CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

SATURATION MOISTURE CONTENT OF CHALK

BS.1377 : PART 2 : 1990 : 3.3

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample		specimen depth (m)	natural moisture content (%)	bulk density (Mg/m3)	dry density (Mg/m3)	saturation moisture content (%)	porosity (%)	description and remarks
	no./type	depth (m)							
BH201	23C	17.50	18.25	23.60	2.00	1.62	25	40	White CHALK
BH201	31C	29.50	30.90	18.60	2.00	1.69	22	37	White CHALK
BH201	32C	31.00	31.46	21.00	1.97	1.63	24	40	White CHALK
BH202D	15C	13.50	14.50	24.40	2.01	1.62	25	40	White CHALK #
BH202D	19C	19.50	20.52	27.20	1.98	1.56	27	42	White CHALK
BH202D	27C	30.00	30.10	22.00	2.00	1.64	24	39	White CHALK
BH202D	31C	36.00	36.90	25.90	2.01	1.59	26	41	White CHALK
BH202D	32C	37.50	37.80	24.20	2.02	1.63	24	40	White CHALK
BH203	16L	9.00	9.60	26.90	1.99	1.57	27	42	White CHALK #
BH203	16L	9.00	9.60	24.40	2.02	1.62	25	40	White CHALK #
BH203	20C	12.00	12.80	26.40	2.00	1.58	26	41	White CHALK #
BH203	29C	25.50	26.90	24.70	2.01	1.61	25	40	White CHALK
BH205C	28C	11.00	12.40	0.70	1.53	1.52	29	44	White CHALK #
BH205C	36C	17.00	17.70	27.10	1.98	1.56	27	42	White CHALK
BH205C	53C	32.00	32.60	23.90	1.99	1.61	25	40	White CHALK
BH205C	54C	33.50	33.94	24.60	1.96	1.57	26	42	White CHALK

general remarks

natural moisture content determined in accordance with BS1377 : Part 2 : 1990 : 3.2 (unless specified)

denotes sample tested is smaller than that which is recommended in accordance with BS1377

test method

immersion in water (test 3.3)

CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

LINEAR SHRINKAGE

BS.1377 : PART 2 : 1990 : 6.5

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	specimen preparation	fraction > 0.425 mm (%)	linear shrinkage (%)	description and remarks
BH201	17C	9.50	9.85	BD	64	3	Off white sandy very silty GRAVEL (chalk)
BH201	24C	19.00	19.15	BD	8	5	Off white slightly gravelly slightly sandy SILT (chalk)
BH203	16L	9.00	9.80	BD	25	3	Off white and yellow slightly sandy gravelly SILT (chalk)
BH205C	22L	8.00	8.60	BD	59	2	Off white slightly sandy gravelly SILT (chalk)

general remarks

specimen preparation

A - as received
B - washed on 0.425mm seive
C - air dried
D - oven dried (50o)
E - unknown

CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE DENSITY - PYCNOMETER METHOD

BS EN ISO 17892 - 3 : 2015 : 5

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	test method	mean particle density Mg/m3	description and remarks
BH201	7L	2.00	2.70	SP	2.66	Yellowish brown slightly gravelly sandy CLAY
BH201	11L	4.00	4.50	SP	2.64	Light brown slightly clayey sandy GRAVEL
BH201	16D	9.50	9.50	SP	2.70	Off white sandy very silty GRAVEL (chalk)
BH201	22C	16.00	16.00	SP	2.69	Off white slightly sandy slightly gravelly SILT (chalk)
BH201	31C	29.50	31.90	SP	2.70	Off white slightly sandy slight gravelly SILT (chalk)
BH202D	10L	5.50	5.90	SP	2.75	Yellowish brown slightly clayey gravelly SAND
BH202D	15C	13.50	14.00	SP	2.70	Off white slightly sandy slightly gravelly SILT (chalk)
BH202D	19C	19.50	19.75	SP	2.70	Off white slightly sandy slightly gravelly SILT (chalk)
BH202D	27C	30.00	31.45	SP	2.66	Off white slightly sandy gravelly SILT (chalk)
BH202D	32C	37.50	37.75	SP	2.69	Off white slightly gravelly slightly sandy SILT (chalk)
BH203	4L	2.00	2.25	SP	2.63	Brown slightly sandy CLAY
BH203	12L	6.00	6.55	SP	2.66	Greyish brown slightly sandy slightly gravelly CLAY
BH204	11C	10.50	11.20	SP	2.70	Off white slightly sandy gravelly SILT (chalk)
BH205C	8L	1.20	1.20	SP	2.60	Brown slightly sandy slightly gravelly CLAY
BH205C	10L	2.00	2.50	SP	2.60	Brown slightly sandy gravelly CLAY
BH205C	27D	11.00	11.00	SP	2.71	Off white slightly sandy slightly gravelly SILT (chalk)
BH205C	53C	32.00	32.57	SP	2.67	Off white slightly sandy slightly gravelly SILT (chalk)

general remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN ISO 17892

test method
SP - small pycnometer ~ 50ml (test 5.1)
LP - large pycnometer ~ 100ml (test 5.1)

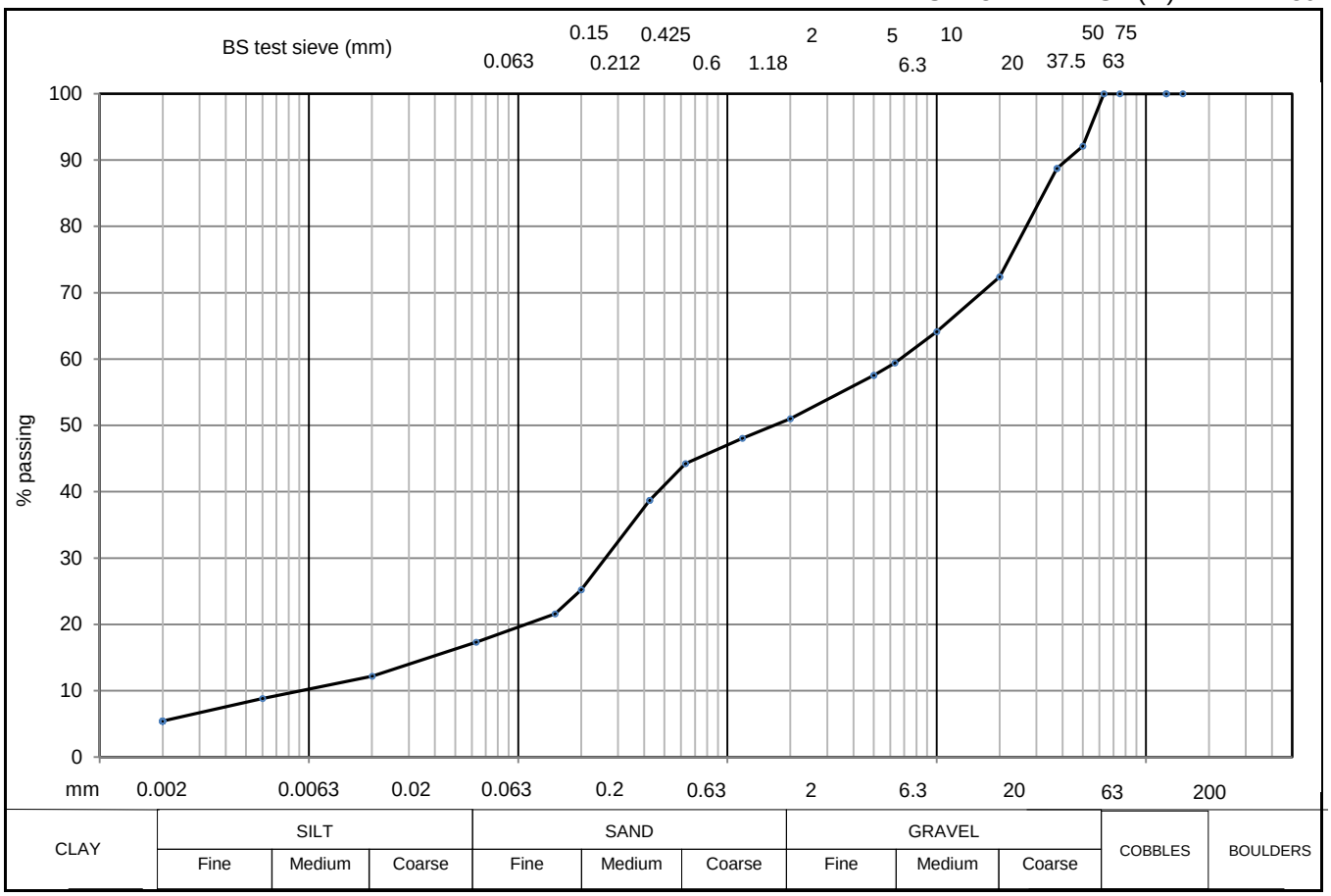
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH201
SITE	STATION HILL, READING	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.10
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.10
		SPECIMEN BASE (m)	1.30



soil type	% fraction
CLAY	5
SILT	12
SILT & CLAY	17
SAND	34
GRAVEL	49
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	92
37.5	89
20	72
10	64
6.3	59

BS test sieve (mm)	% passing
5	58
2	51
1.18	48
0.63	44
0.425	39
0.2	25
0.15	22
0.063	17

BS test sieve (µm)	% finer
20	12
6	9
2	5

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

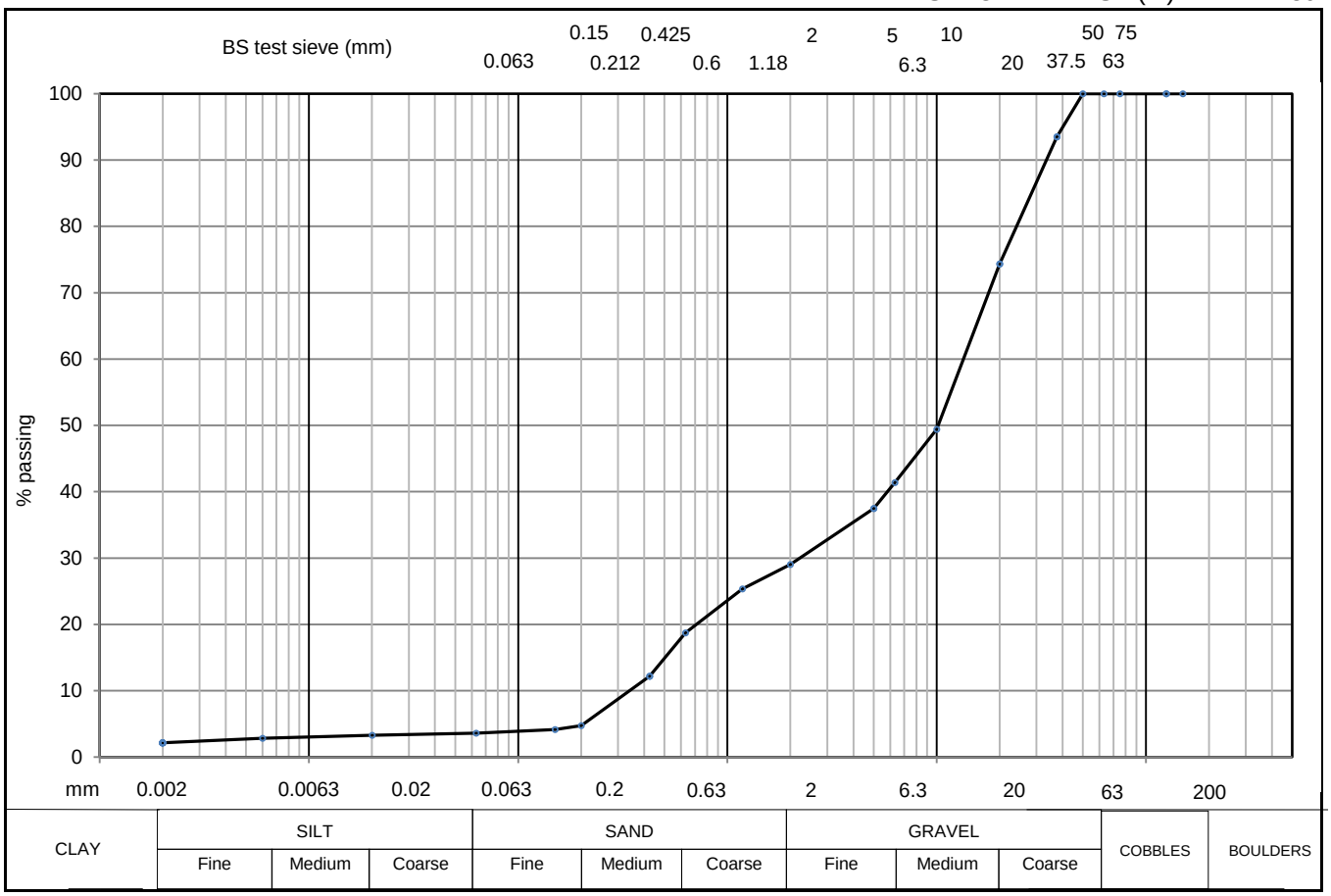
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH201
SITE	STATION HILL, READING	SAMPLE No./TYPE	11L
		SAMPLE DEPTH (m)	4.00
DESCRIPTION	Light brown slightly clayey sandy GRAVEL	SPECIMEN TOP (m)	4.50
		SPECIMEN BASE (m)	4.80



soil type	% fraction
CLAY	2
SILT	1
SILT & CLAY	4
SAND	25
GRAVEL	71
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	100
37.5	93
20	74
10	49
6.3	41

BS test sieve (mm)	% passing
5	37
2	29
1.18	25
0.63	19
0.425	12
0.2	5
0.15	4
0.063	4

BS test sieve (µm)	% finer
20	3
6	3
2	2

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

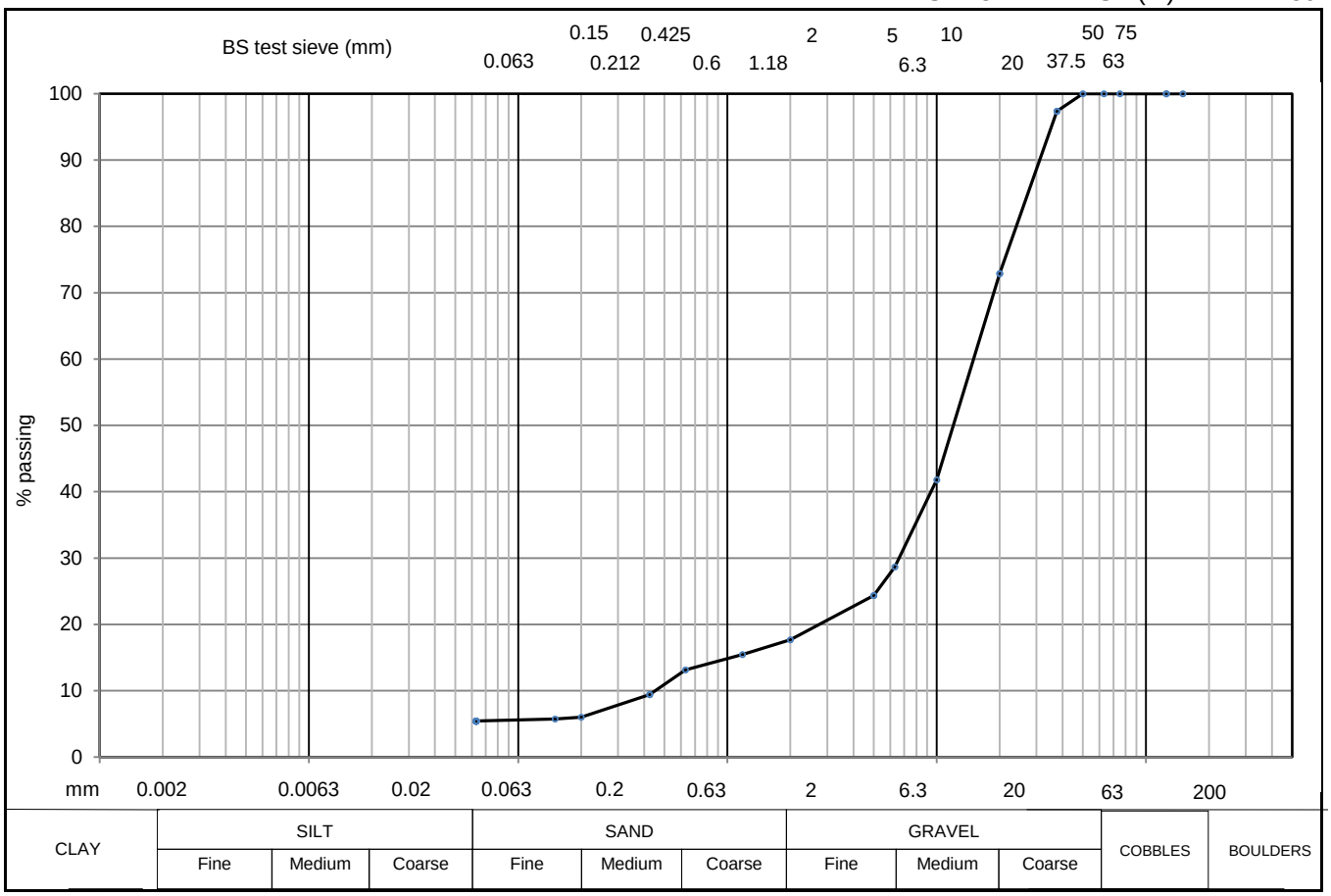
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH201
SITE	STATION HILL, READING	SAMPLE No./TYPE	14L
		SAMPLE DEPTH (m)	6.50
DESCRIPTION	Off white and brown silty sandy GRAVEL (chalk)	SPECIMEN TOP (m)	6.50
		SPECIMEN BASE (m)	7.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	5
SAND	12
GRAVEL	82
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	24	20	
75		2	18	6	
63		1.18	15	2	
50	100	0.63	13		
37.5	97	0.425	9		
20	73	0.2	6		
10	42	0.15	6		
6.3	29	0.063	5		

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

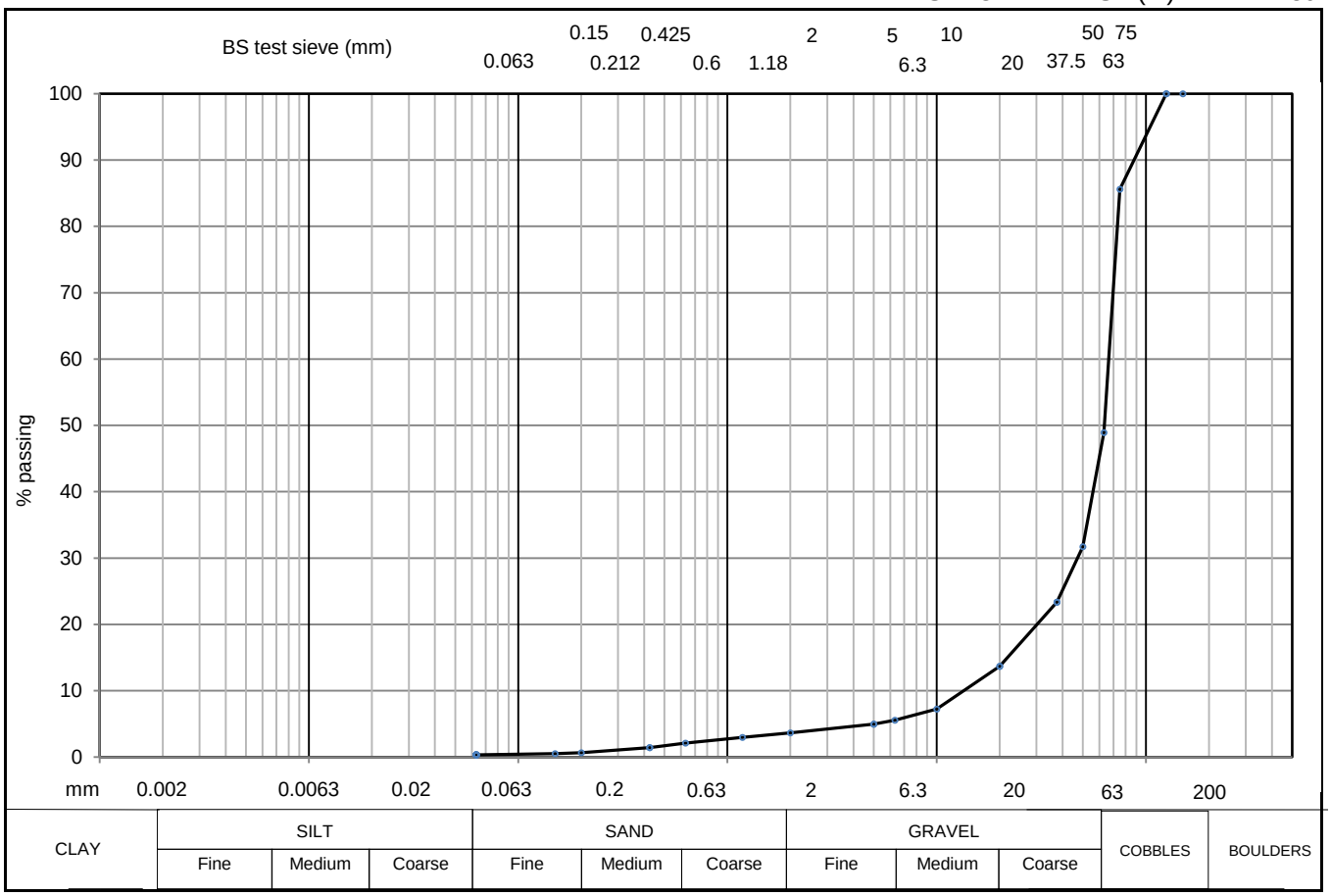
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH202D
SITE	STATION HILL, READING	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown slightly sandy very gravelly COBBLES	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.80



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	0
SAND	3
GRAVEL	45
COBBLE & BOULDER	51
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	5	20	
75	86	2	4	6	
63	49	1.18	3	2	
50	32	0.63	2		
37.5	23	0.425	1		
20	14	0.2	1		
10	7	0.15	1		
6.3	6	0.063	0		

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

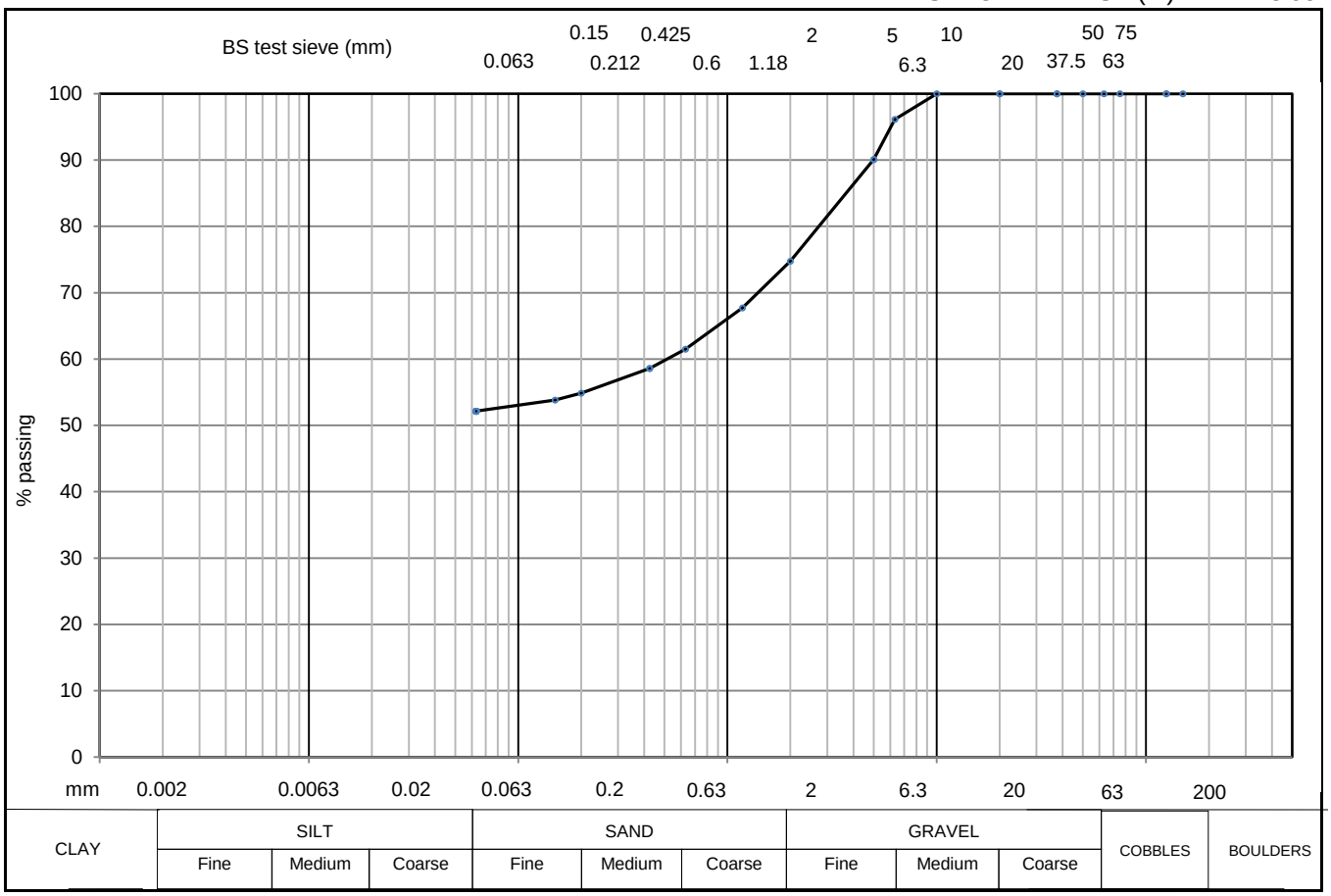
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH202D
SITE	STATION HILL, READING	SAMPLE No./TYPE	12D
		SAMPLE DEPTH (m)	8.50
DESCRIPTION	Off white slightly sandy slightly gravelly SILT (chalk)	SPECIMEN TOP (m)	8.50
		SPECIMEN BASE (m)	8.95



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	52
SAND	23
GRAVEL	25
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	
20	
10	100
6.3	96

BS test sieve (mm)	% passing
5	90
2	75
1.18	68
0.63	61
0.425	59
0.2	55
0.15	54
0.063	52

BS test sieve (µm)	% finer
20	
6	
2	

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

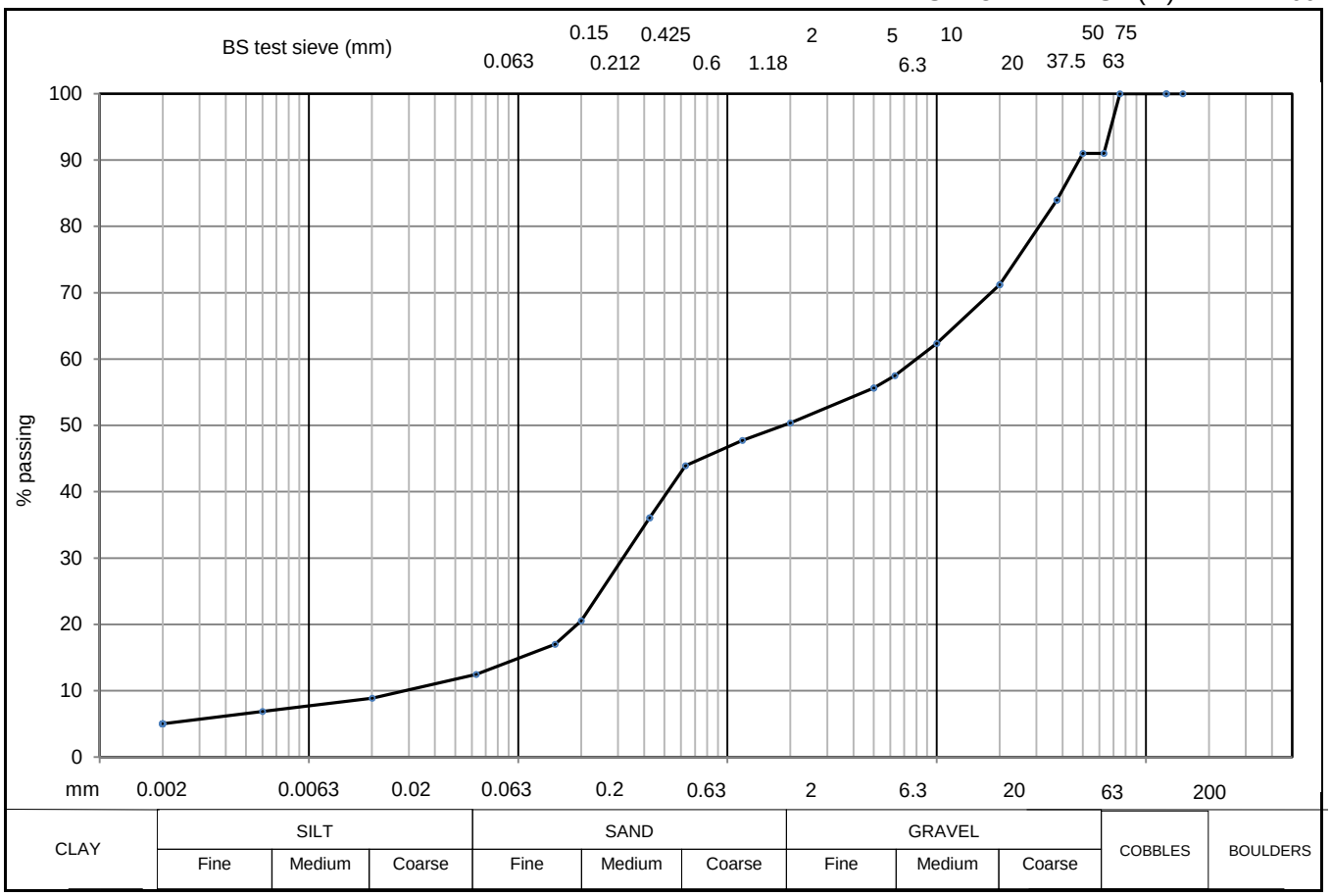
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH203
SITE	STATION HILL, READING	SAMPLE No./TYPE	2L
		SAMPLE DEPTH (m)	1.20
DESCRIPTION	Brown clayey very sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	1.20
		SPECIMEN BASE (m)	2.00



soil type	% fraction
CLAY	5
SILT	7
SILT & CLAY	12
SAND	38
GRAVEL	41
COBBLE & BOULDER	9
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	100
63	91
50	91
37.5	84
20	71
10	62
6.3	58

BS test sieve (mm)	% passing
5	56
2	50
1.18	48
0.63	44
0.425	36
0.2	21
0.15	17
0.063	12

BS test sieve (µm)	% finer
20	9
6	7
2	5

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

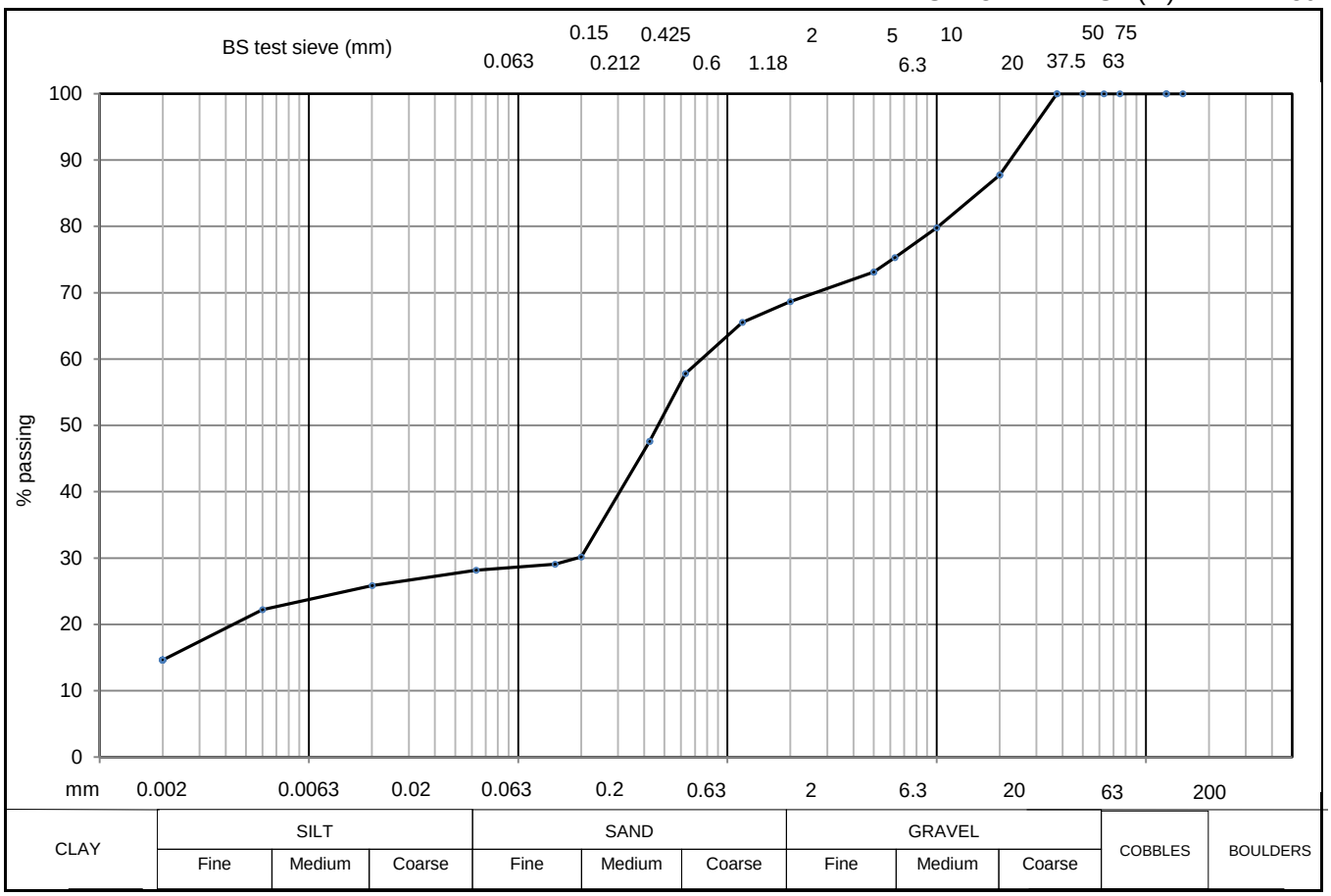
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH203
SITE	STATION HILL, READING	SAMPLE No./TYPE	12L
		SAMPLE DEPTH (m)	6.00
DESCRIPTION	Orangish brown very clayey very gravelly SAND	SPECIMEN TOP (m)	6.83
		SPECIMEN BASE (m)	7.36



soil type	% fraction
CLAY	15
SILT	14
SILT & CLAY	28
SAND	41
GRAVEL	31
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	100
20	88
10	80
6.3	75

BS test sieve (mm)	% passing
5	73
2	69
1.18	66
0.63	58
0.425	48
0.2	30
0.15	29
0.063	28

BS test sieve (µm)	% finer
20	26
6	22
2	15

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

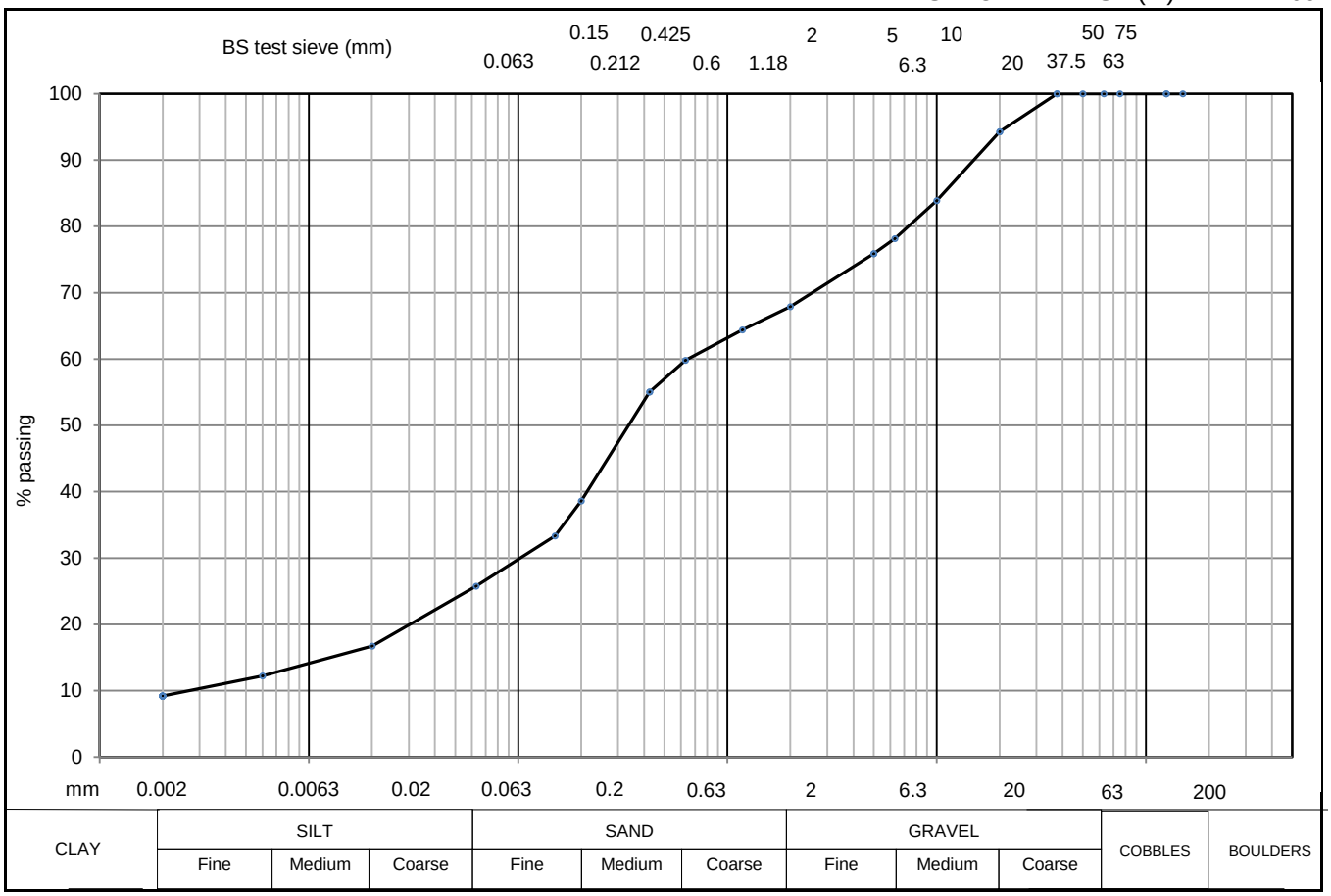
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH205C
SITE	STATION HILL, READING	SAMPLE No./TYPE	8L
		SAMPLE DEPTH (m)	1.20
DESCRIPTION	Brown slightly gravelly sandy CLAY	SPECIMEN TOP (m)	1.20
		SPECIMEN BASE (m)	2.00



soil type	% fraction
CLAY	9
SILT	17
SILT & CLAY	26
SAND	42
GRAVEL	32
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	100
20	94
10	84
6.3	78

BS test sieve (mm)	% passing
5	76
2	68
1.18	64
0.63	60
0.425	55
0.2	39
0.15	33
0.063	26

BS test sieve (µm)	% finer
20	17
6	12
2	9

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

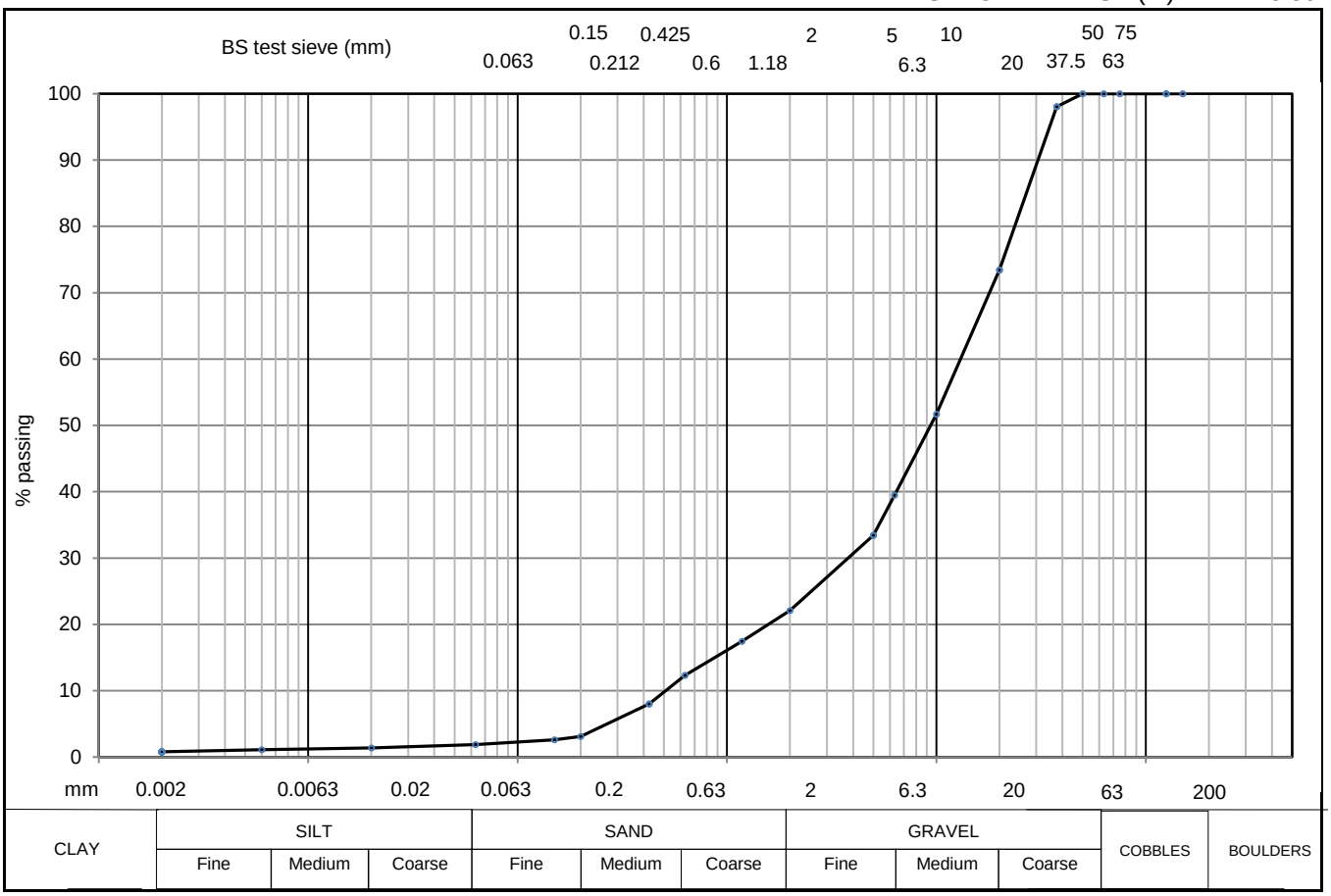
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH205C
SITE	STATION HILL, READING	SAMPLE No./TYPE	16L
		SAMPLE DEPTH (m)	5.00
DESCRIPTION	Brown slightly clayey very sandy GRAVEL	SPECIMEN TOP (m)	5.00
		SPECIMEN BASE (m)	5.50



soil type	% fraction
CLAY	1
SILT	1
SILT & CLAY	2
SAND	20
GRAVEL	78
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	100
37.5	98
20	73
10	52
6.3	39

BS test sieve (mm)	% passing
5	33
2	22
1.18	17
0.63	12
0.425	8
0.2	3
0.15	3
0.063	2

BS test sieve (µm)	% finer
20	1
6	1
2	1

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

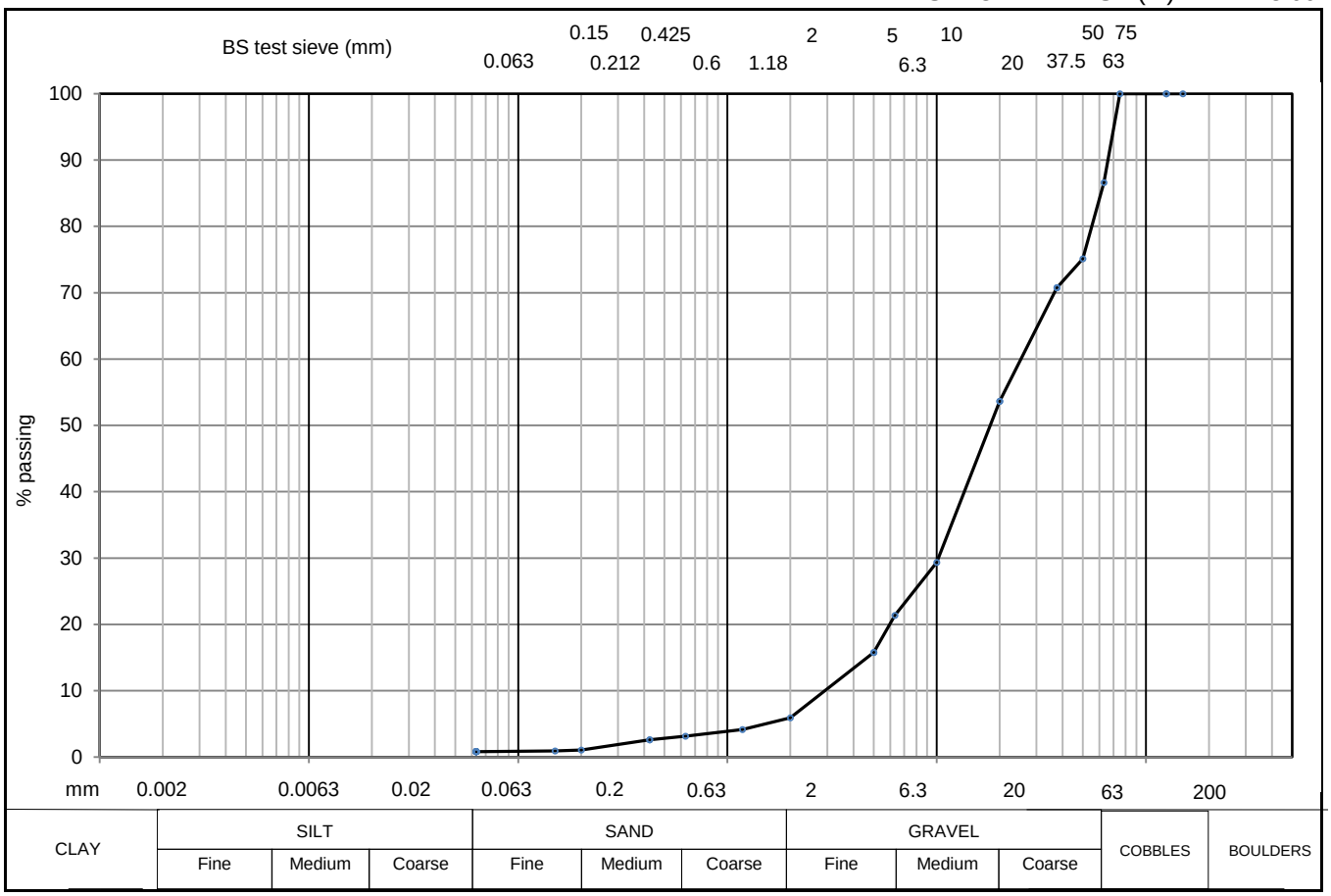
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	BH205C
SITE	STATION HILL, READING	SAMPLE No./TYPE	20L
		SAMPLE DEPTH (m)	7.50
DESCRIPTION	Light brown slightly silty sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	7.50
		SPECIMEN BASE (m)	8.00



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	1
SAND	5
GRAVEL	81
COBBLE & BOULDER	13
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	100
63	87
50	75
37.5	71
20	54
10	29
6.3	21

BS test sieve (mm)	% passing
5	16
2	6
1.18	4
0.63	3
0.425	3
0.2	1
0.15	1
0.063	1

BS test sieve (µm)	% finer
20	
6	
2	

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

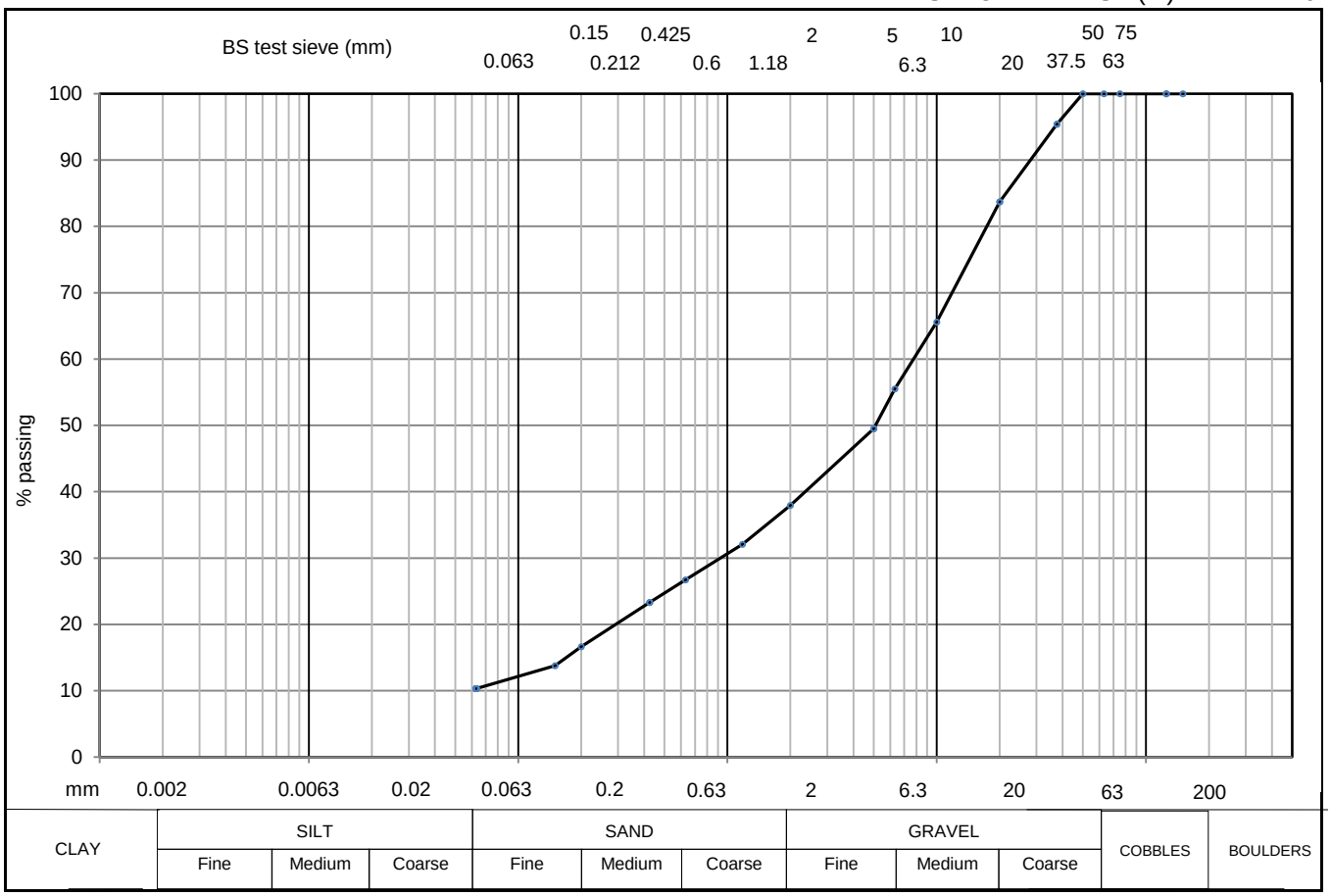
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	WS202
SITE	STATION HILL, READING	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	0.90
DESCRIPTION	Dark brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.10



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	10
SAND	28
GRAVEL	62
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	100
37.5	95
20	84
10	66
6.3	55

BS test sieve (mm)	% passing
5	50
2	38
1.18	32
0.63	27
0.425	23
0.2	17
0.15	14
0.063	10

BS test sieve (µm)	% finer
20	
6	
2	

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

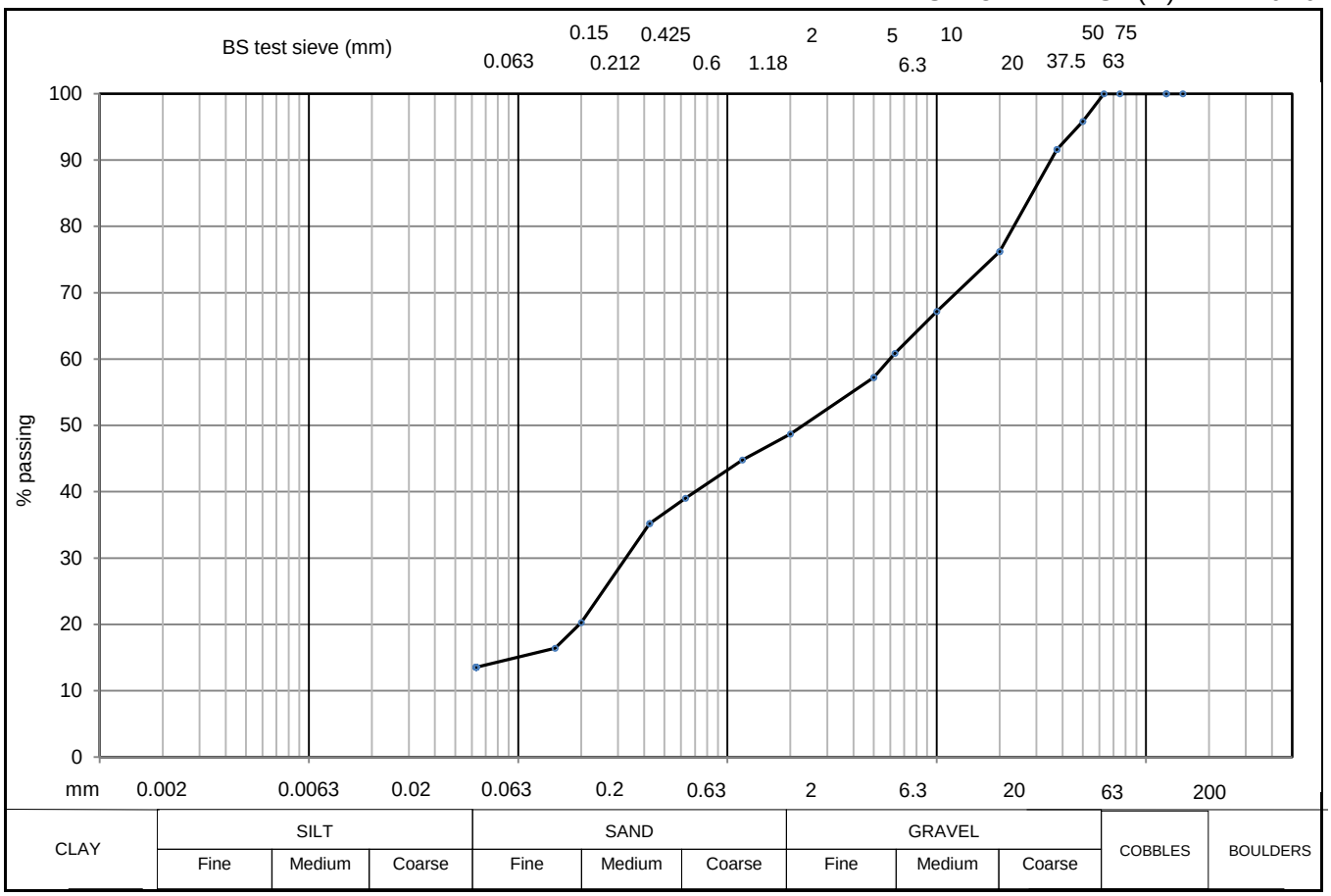
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	WS203
SITE	STATION HILL, READING	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	0.55
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	0.55
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	14
SAND	35
GRAVEL	51
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	96
37.5	92
20	76
10	67
6.3	61

BS test sieve (mm)	% passing
5	57
2	49
1.18	45
0.63	39
0.425	35
0.2	20
0.15	16
0.063	14

BS test sieve (µm)	% finer
20	
6	
2	

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

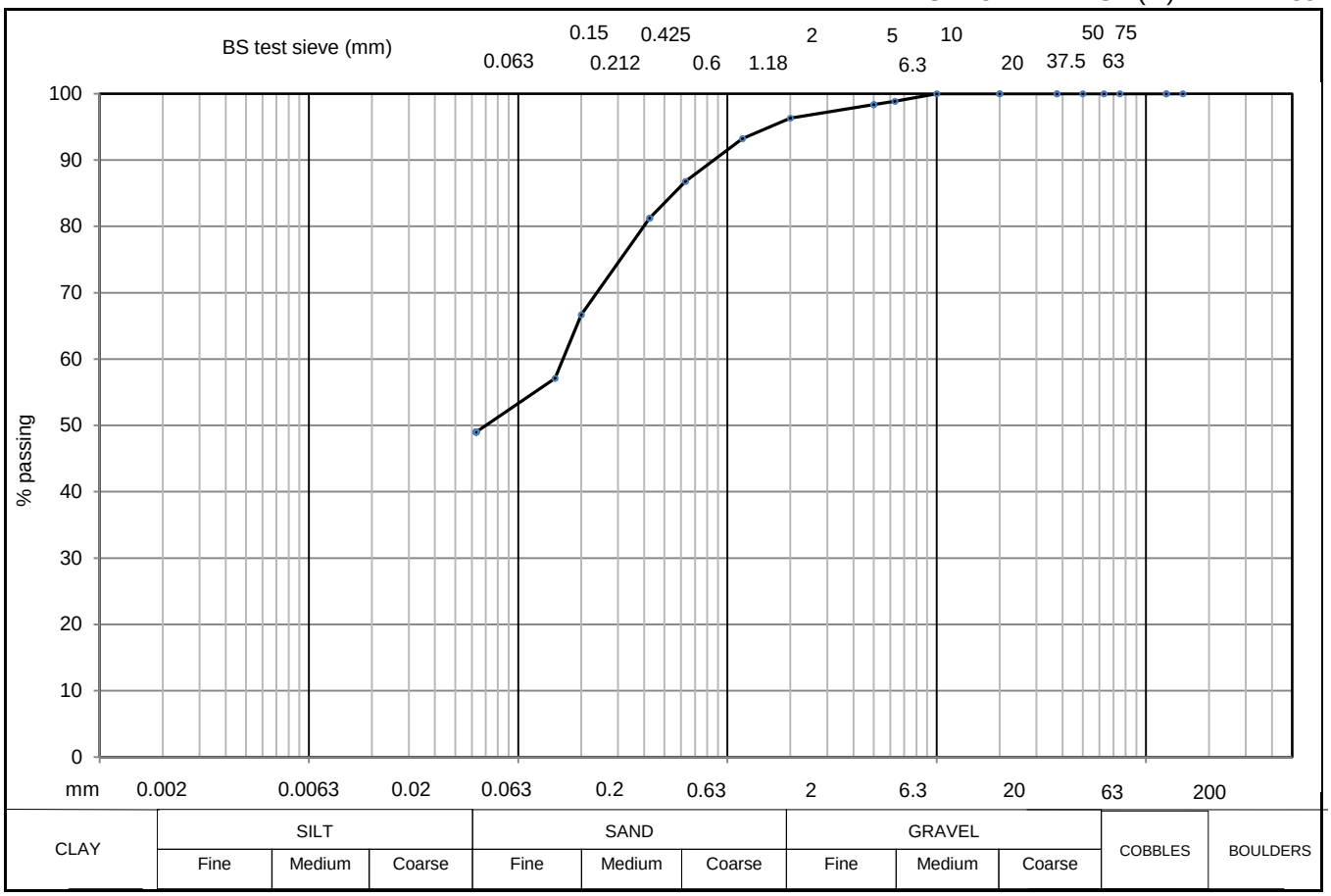
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	WS203
SITE	STATION HILL, READING	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	1.65
DESCRIPTION	Dark brown slightly gravelly sandy CLAY	SPECIMEN TOP (m)	1.65
		SPECIMEN BASE (m)	1.85



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	49
SAND	47
GRAVEL	4
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	98	20	
75		2	96	6	
63		1.18	93	2	
50		0.63	87		
37.5		0.425	81		
20		0.2	67		
10	100	0.15	57		
6.3	99	0.063	49		

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

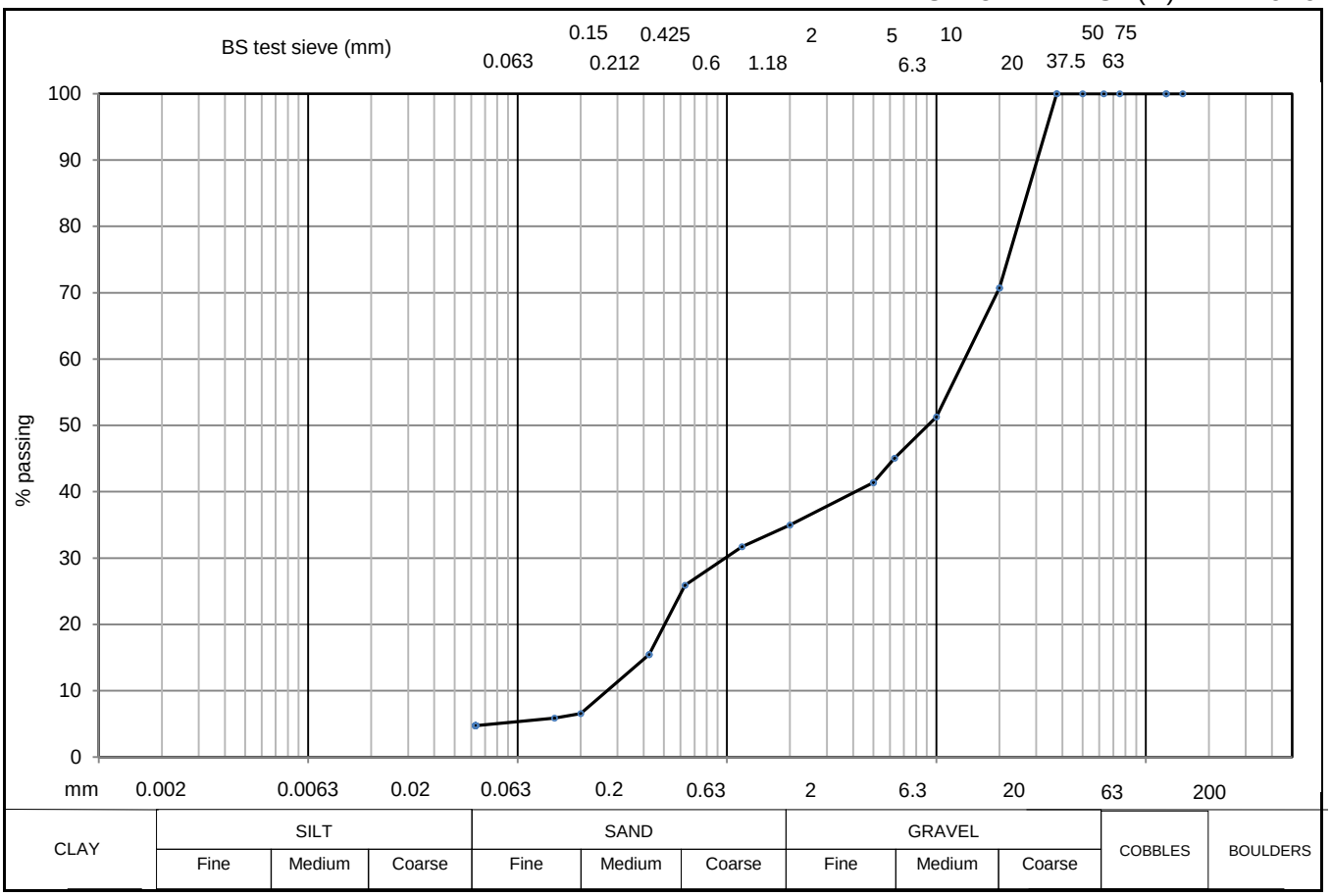
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	WS203
SITE	STATION HILL, READING	SAMPLE No./TYPE	12D
		SAMPLE DEPTH (m)	5.00
DESCRIPTION	Orangish brown slightly clayey very sandy GRAVEL	SPECIMEN TOP (m)	5.00
		SPECIMEN BASE (m)	5.45



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	5
SAND	30
GRAVEL	65
COBBLE & BOULDER	0
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	41	20	
75		2	35	6	
63		1.18	32	2	
50		0.63	26		
37.5	100	0.425	15		
20	71	0.2	7		
10	51	0.15	6		
6.3	45	0.063	5		

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

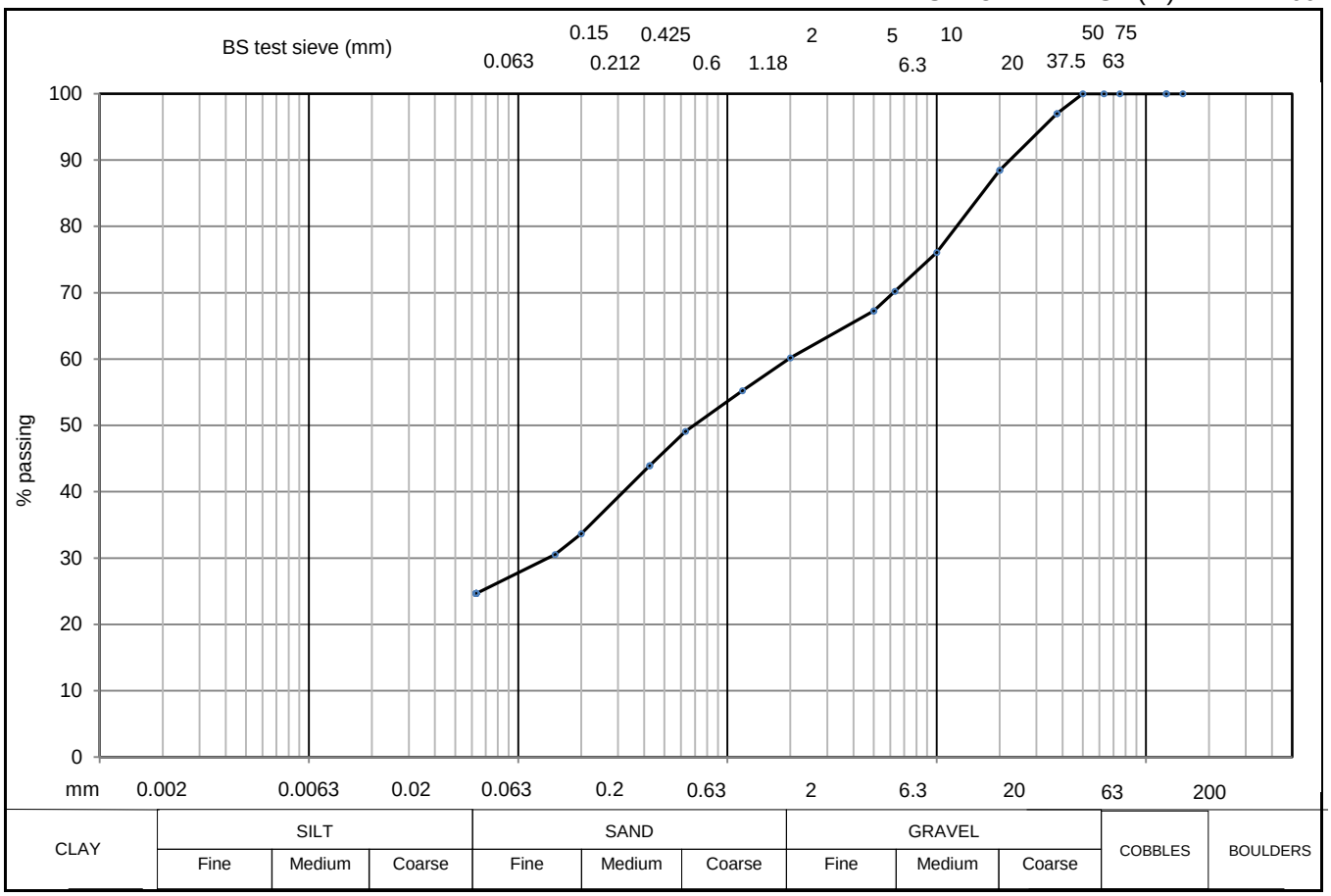
CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	SH READING MASTER LLP	BH/TP No.	WS211
SITE	STATION HILL, READING	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	0.85
DESCRIPTION	Dark brown very clayey very sandy GRAVEL	SPECIMEN TOP (m)	0.85
		SPECIMEN BASE (m)	1.00



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	25
SAND	36
GRAVEL	40
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	100
37.5	97
20	88
10	76
6.3	70

BS test sieve (mm)	% passing
5	67
2	60
1.18	55
0.63	49
0.425	44
0.2	34
0.15	31
0.063	25

BS test sieve (µm)	% finer
20	
6	
2	

remarks

denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
35248	**TB**

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

DETERMINATION OF THE WATER CONTENT OF A ROCK SAMPLE

Sample details				Test results		
Borehole Ref.	Sample Ref.	Depth (m)	Description	Water Content (%)	Oven Temp. (ºC)	Remarks
BH201	23C	18.80	White CHALK	25.0	105º	
BH201	30C	28.50	White CHALK	18.4	105º	
BH202D	22C	25.06	White CHALK	19.3	105º	
BH202D	29C	33.70	White CHALK	23.6	105º	
BH205C	44C	23.30	White CHALK	20.7	105º	

Note: Water Content in a rock sample as received

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29536

Project Name:

STATION HILL, READING
35248

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

DETERMINATION OF THE WATER CONTENT OF A ROCK SAMPLE

Sample details				Test results		
Borehole Ref.	Sample Ref.	Depth (m)	Description	Water Content (%)	Oven Temp. (ºC)	Remarks
BH203	22C	16.20	White CHALK	23.3	105º	
BH203	25C	19.60	White CHALK	21.8	105º	
BH203	28C	24.64	White CHALK	23.0	105º	
BH203	31C	28.86	White CHALK	20.4	105º	
BH203	34C	34.10	White CHALK	19.9	105º	
BH203	38C	39.30	White CHALK	22.0	105º	
BH204	12C	13.02	White CHALK	25.5	105º	
BH204	15C	17.30	White CHALK	25.4	105º	
BH204	18C	23.34	White CHALK	27.5	105º	
BH204	21C	27.44	White CHALK	23.1	105º	

Note: Water Content in a rock sample as received

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29537

Project Name:

STATION HILL, READING
35248

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

DETERMINATION OF THE WATER CONTENT OF A ROCK SAMPLE

Sample details				Test results		
Borehole Ref.	Sample Ref.	Depth (m)	Description	Water Content (%)	Oven Temp. (ºC)	Remarks
BH204	24C	31.73	White CHALK	24.5	105º	
BH204	27C	37.15	White CHALK	22.1	105º	
BH204	29C	40.04	White CHALK	25.8	105º	

Note: Water Content in a rock sample as received

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29537

Project Name:

STATION HILL, READING
35248

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

POROSITY/DENSITY DETERMINATION USING SATURATION AND CALIPER/BUOYANCY TECHNIQUES

Sample details				Test results							
Borehole Ref.	Sample Ref.	Depth (m)	Description	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Water Content (%)	Volume (cm³)	Method of volume calculation	D. Tested	(*) Pore Volume (cm³)	Porosity (%)
BH201	23C	18.80	White CHALK	1.98	1.57	27	42.48	Buoyancy technique	16/07/19	17.73	41.75
BH201	30C	28.50	White CHALK	2.11	1.79	18	66.12	Buoyancy technique	16/07/19	21.64	32.73
BH202D	22C	25.06	White CHALK	1.77	1.46	21	95.87	Buoyancy technique	16/07/19	29.25	30.51
BH202D	29C	33.70	White CHALK	1.97	1.55	27	59.31	Buoyancy technique	16/07/19	24.74	41.72
BH205C	44C	23.30	White CHALK	2.07	1.71	21	64.72	Buoyancy technique	16/07/19	23.34	36.07

(*) Pore volume obtained by water saturation at 20°.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29536

Project Name:

STATION HILL, READING
35248

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

POROSITY/DENSITY DETERMINATION USING SATURATION AND CALIPER/BUOYANCY TECHNIQUES

Sample details				Test results							
Borehole Ref.	Sample Ref.	Depth (m)	Description	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Water Content (%)	Volume (cm³)	Method of volume calculation	D. Tested	(*) Pore Volume (cm³)	Porosity (%)
BH203	22C	16.20	White CHALK	2.03	1.65	24	48.69	Buoyancy technique	16/07/19	18.93	38.89
BH203	25C	19.60	White CHALK	1.96	1.57	25	32.96	Buoyancy technique	16/07/19	13.02	39.51
BH203	28C	24.64	White CHALK	2.03	1.64	24	51.59	Buoyancy technique	16/07/19	19.94	38.64
BH203	31C	28.86	White CHALK	2.08	1.72	21	54.10	Buoyancy technique	16/07/19	19.43	35.93
BH203	34C	34.10	White CHALK	2.09	1.74	20	54.70	Buoyancy technique	16/07/19	19.33	35.35
BH203	38C	39.30	White CHALK	2.02	1.63	24	70.03	Buoyancy technique	16/07/19	27.55	39.34
BH204	12C	13.02	White CHALK	1.96	1.55	26	62.51	Buoyancy technique	16/07/19	25.65	41.03
BH204	15C	17.30	White CHALK	1.99	1.58	26	62.31	Buoyancy technique	16/07/19	25.65	41.16
BH204	18C	23.34	White CHALK	1.97	1.55	27	33.46	Buoyancy technique	16/07/19	14.23	42.51
BH204	21C	27.44	White CHALK	2.03	1.64	24	65.82	Buoyancy technique	16/07/19	25.55	38.81

(*) Pore volume obtained by water saturation at 20º.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29537

Project Name:

STATION HILL, READING

35248

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods – Rock Characterization Testing and Monitoring 1974 - 2006

POROSITY/DENSITY DETERMINATION USING SATURATION AND CALIPER/BUOYANCY TECHNIQUES

Sample details				Test results							
Borehole Ref.	Sample Ref.	Depth (m)	Description	Bulk Density (Mg/m³)	Dry Density (Mg/m³)	Water Content (%)	Volume (cm³)	Method of volume calculation	D. Tested	(*) Pore Volume (cm³)	Porosity (%)
BH204	24C	31.73	White CHALK	1.99	1.59	25	46.48	Buoyancy technique	16/07/19	18.73	40.30
BH204	27C	37.15	White CHALK	2.02	1.63	24	58.30	Buoyancy technique	16/07/19	22.64	38.83
BH204	29C	40.04	White CHALK	2.01	1.62	25	49.39	Buoyancy technique	16/07/19	19.74	39.96

(*) Pore volume obtained by water saturation at 20º.

Checked and Approved by

CC

C Clergeaud (Snr. Geologist)

Date: 18/07/2019

Project Number:

GEO / 29537

Project Name:

STATION HILL, READING
35248

GEOLABS®

UKAS TESTING 1982

Geotechnical Engineering Limited

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	diameter D (mm)	height H (mm)	H/D	moisture content (%)	bulk density (Mg/m3)	loading rate (kN/min)	time to failure (min:sec)	UCS (MPa)	description, codes and remarks
BH201	31C	29.50	29.60	91.5	204.2	2.23	20.7	1.55	3	06:48	3.09	White CHALK, P, AxCa. H/D ratio falls outside ISRM specification
BH205C	56C	36.50	37.72	98.1	238.8	2.44	25.4	1.96	3	07:46	3.14	White CHALK, P, AxCa. H/D ratio falls outside ISRM specification

general remarks

sample obtained from vertically drilled core (unless specified), test machine - VJT6000

coding:

moisture condition	sample storage	failure mode
N - natural moisture content	U - not wrapped	Ax - axial cleavage
F - fully saturated	F - wrapped in cling film/foil	Ca - cataclasis
S - soaked	W - waxed	Sh - shear
P - air/partially dried	G - contained in sealed Geoline	Ex - explosive
		Ot - other

CONTRACT	CHECKED
35248	**TB**

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH201	12.10	I	U	P	40	70	40	0.16	45.14	0.08	0.95	0.08	White CHALK
BH201	12.80	I	U	P	70	70	60	0.36	73.13	0.07	1.19	0.08	White CHALK
BH201	15.70	D	Y	P		30	90	0.14	90.00	0.02	1.30	0.02	White CHALK
BH201	15.70	A	X	P	90		30	0.21	58.63	0.06	1.07	0.07	White CHALK
BH201	19.80	D	Y	P		40	50	0.19	50.00	0.08	1.00	0.08	White CHALK
BH201	19.94	D	Y	P		30	30	0.26	30.00	0.29	0.79	0.23	White CHALK
BH201	20.07	A	X	P	90		60	0.53	82.92	0.08	1.26	0.10	White CHALK
BH201	20.15	A	X	P	90		60	0.36	82.92	0.05	1.26	0.07	White CHALK
BH201	20.20	D	Y	P		60	90	0.96	90.00	0.12	1.30	0.15	White CHALK
BH201	20.20	A	X	P	90		65	0.91	86.30	0.12	1.28	0.16	White CHALK
BH201	20.40	I	U	P	50	50	55	0.42	59.17	0.12	1.08	0.13	White CHALK
BH201	20.45	I	U	P	50	35	30	0.51	43.70	0.27	0.94	0.25	White CHALK
BH201	23.70	I	U	P	85	100	75	0.26	90.09	0.03	1.30	0.04	White CHALK
BH201	23.90	I	U	P	85	80	70	0.47	87.04	0.06	1.28	0.08	White CHALK
BH201	24.10	D	Y	P		40	80	1.47	80.00	0.23	1.24	0.28	White CHALK
BH201	24.20	D	Y	P		30	90	1.36	90.00	0.17	1.30	0.22	White CHALK
BH201	24.30	D	Y	P		80	90	0.21	90.00	0.03	1.30	0.03	White CHALK
BH201	24.30	A	X	P	90		80	1.63	95.75	0.18	1.34	0.24	White CHALK
BH201	24.50	I	U	P	70	110	60	0.11	73.13	0.02	1.19	0.02	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH201	24.60	D	Y	P		20	75	1.06	75.00	0.19	1.20	0.23	White CHALK
BH201	24.70	D	Y	P		30	75	1.29	75.00	0.23	1.20	0.28	White CHALK
BH201	24.90	D	Y	P		40	90	0.10	90.00	0.01	1.30	0.02	White CHALK
BH201	28.40	D	Y	P		40	90	0.38	90.00	0.05	1.30	0.06	White CHALK
BH201	28.40	A	X	P	90		40	0.65	67.70	0.14	1.15	0.16	White CHALK
BH201	28.65	A	X	P	90		50	1.19	75.69	0.21	1.21	0.25	White CHALK
BH201	28.75	D	Y	P		80	90	0.93	90.00	0.11	1.30	0.15	White CHALK
BH201	28.75	A	X	P	90		80	0.76	95.75	0.08	1.34	0.11	White CHALK
BH201	29.00	D	Y	P		30	70	0.69	70.00	0.14	1.16	0.16	White CHALK
BH201	29.15	D	Y	P		50	90	0.36	90.00	0.04	1.30	0.06	White CHALK
BH201	29.15	A	X	P	90		50	1.41	75.69	0.25	1.21	0.30	White CHALK
BH201	29.33	A	X	P	90		30	0.76	58.63	0.22	1.07	0.24	White CHALK
BH201	29.40	D	Y	P		50	90	0.39	90.00	0.05	1.30	0.06	White CHALK
BH201	32.60	I	U	P	90	90	55	0.86	79.39	0.14	1.23	0.17	White CHALK
BH201	32.70	D	Y	P		30	60	0.62	60.00	0.17	1.09	0.19	White CHALK
BH201	33.00	D	Y	P		80	90	1.14	90.00	0.14	1.30	0.18	White CHALK
BH201	33.00	A	X	P	90		80	2.06	95.75	0.22	1.34	0.30	White CHALK
BH201	33.13	D	Y	P		80	90	0.89	90.00	0.11	1.30	0.14	White CHALK
BH201	33.13	A	X	P	90		80	1.10	95.75	0.12	1.34	0.16	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH201	33.30	D	Y	P		30	90	0.39	90.00	0.05	1.30	0.06	White CHALK
BH201	33.66	D	Y	P		80	90	0.96	90.00	0.12	1.30	0.15	White CHALK
BH201	33.66	A	X	P	90		80	1.23	95.75	0.13	1.34	0.18	White CHALK
BH201	33.90	D	Y	P		50	60	0.67	60.00	0.19	1.09	0.20	White CHALK
BH202D	21.10	I	U	P	50	60	40	0.51	50.46	0.20	1.00	0.20	White CHALK
BH202D	21.30	I	U	P	40	40	55	0.56	52.93	0.20	1.03	0.21	White CHALK
BH202D	21.80	I	U	P	50	60	40	0.69	50.46	0.27	1.00	0.27	White CHALK
BH202D	21.95	A	X	P	90		40	0.71	67.70	0.15	1.15	0.18	White CHALK
BH202D	22.10	I	U	P	60	60	50	0.59	61.80	0.15	1.10	0.17	White CHALK
BH202D	22.20	I	U	P	40	70	30	0.23	39.09	0.15	0.90	0.13	White CHALK
BH202D	22.35	I	U	P	40	80	35	0.36	42.22	0.20	0.93	0.19	White CHALK
BH202D	25.80	D	Y	P		35	90	0.46	90.00	0.06	1.30	0.07	White CHALK
BH202D	25.90	D	Y	P		30	70	0.39	70.00	0.08	1.16	0.09	White CHALK
BH202D	26.02	D	Y	P		45	90	2.74	90.00	0.34	1.30	0.44	White CHALK
BH202D	26.15	D	Y	P		40	90	0.71	90.00	0.09	1.30	0.11	White CHALK
BH202D	26.35	D	Y	P		40	90	1.10	90.00	0.14	1.30	0.18	White CHALK
BH202D	26.45	I	U	P	50	60	50	0.66	56.42	0.21	1.06	0.22	White CHALK
BH202D	26.55	A	X	P	90		40	0.38	67.70	0.08	1.15	0.10	White CHALK
BH202D	26.60	D	Y	P		60	90	0.89	90.00	0.11	1.30	0.14	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH202D	26.70	D	Y	P		40	90	0.96	90.00	0.12	1.30	0.15	White CHALK
BH202D	26.87	A	X	P	90		50	1.24	75.69	0.22	1.21	0.26	White CHALK
BH202D	28.70	D	Y	N		80	90	1.81	90.00	0.22	1.30	0.29	White CHALK
BH202D	28.70	A	X	N	90		80	2.41	95.75	0.26	1.34	0.35	White CHALK
BH202D	28.78	D	Y	N		70	90	1.97	90.00	0.24	1.30	0.32	White CHALK
BH202D	28.78	A	X	N	90		70	2.61	89.56	0.33	1.30	0.42	White CHALK
BH202D	28.85	D	Y	N		90	90	2.13	90.00	0.26	1.30	0.34	White CHALK
BH202D	28.85	A	X	N	90		90	2.53	101.55	0.25	1.38	0.34	White CHALK
BH202D	28.94	D	Y	N		65	90	1.34	90.00	0.17	1.30	0.22	White CHALK
BH202D	28.94	A	X	N	90		60	2.51	82.92	0.37	1.26	0.46	White CHALK
BH202D	29.00	D	Y	N		20	90	0.40	90.00	0.05	1.30	0.06	White CHALK
BH202D	29.00	A	X	N	90		20	0.61	47.87	0.27	0.98	0.26	White CHALK
BH202D	33.20	A	X	P	90		40	0.66	67.70	0.14	1.15	0.17	White CHALK
BH202D	33.29	A	X	P	90		45	0.64	71.81	0.12	1.18	0.15	White CHALK
BH202D	33.80	I	U	P	40	40	60	0.14	55.28	0.05	1.05	0.05	White CHALK
BH202D	33.89	A	X	P	90		65	1.02	86.30	0.14	1.28	0.18	White CHALK
BH202D	33.95	A	X	P	90		50	0.82	75.69	0.14	1.21	0.17	White CHALK
BH202D	34.05	D	Y	P		60	90	1.34	90.00	0.17	1.30	0.22	White CHALK
BH202D	34.05	A	X	P	90		60	2.07	82.92	0.30	1.26	0.38	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH202D	34.30	I	U	P	60	100	40	0.46	55.28	0.15	1.05	0.16	White CHALK
BH202D	37.90	D	Y	P		50	90	0.19	90.00	0.02	1.30	0.03	White CHALK
BH202D	37.90	A	X	P	90		50	0.56	75.69	0.10	1.21	0.12	White CHALK
BH202D	38.10	D	Y	P		100	95	0.22	95.00	0.02	1.33	0.03	White CHALK
BH202D	38.10	A	X	P	95		110	0.90	115.35	0.07	1.46	0.10	White CHALK
BH202D	38.30	A	X	P	90		35	0.36	63.33	0.09	1.11	0.10	White CHALK
BH202D	38.60	I	U	P	60	90	70	0.49	73.13	0.09	1.19	0.11	White CHALK
BH202D	38.80	I	U	P	70	65	50	0.81	66.76	0.18	1.14	0.21	White CHALK
BH202D	38.98	I	U	P	60	90	60	0.71	67.70	0.15	1.15	0.18	White CHALK
BH204	5.35	I	U	P	70	80	40	0.26	59.71	0.07	1.08	0.08	White CHALK
BH204	5.35	I	U	P	45	70	30	0.21	41.46	0.12	0.92	0.11	White CHALK
BH204	15.40	A	X	P	95		60	0.11	85.19	0.02	1.27	0.02	White CHALK
BH204	15.62	I	U	P	95	100	30	0.09	60.24	0.02	1.09	0.03	White CHALK
BH204	15.78	D	Y	P		20	95	0.17	95.00	0.02	1.33	0.03	White CHALK
BH204	16.00	I	U	P	40	40	30	0.08	39.09	0.05	0.90	0.05	White CHALK
BH204	16.17	I	U	P	70	50	50	0.36	66.76	0.08	1.14	0.09	White CHALK
BH204	16.25	I	U	P	55	90	40	0.19	52.93	0.07	1.03	0.07	White CHALK
BH204	16.30	A	X	P	95		75	1.46	95.25	0.16	1.34	0.22	White CHALK
BH204	16.45	I	U	P	95	110	45	0.79	73.78	0.15	1.19	0.17	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH204	28.53	D	Y	P		30	95	0.49	95.00	0.05	1.33	0.07	White CHALK
BH204	28.65	D	Y	P		40	95	0.71	95.00	0.08	1.33	0.11	White CHALK
BH204	28.80	A	X	P	95		70	0.93	92.02	0.11	1.32	0.14	White CHALK
BH204	28.95	I	U	P	70	95	50	0.06	66.76	0.01	1.14	0.02	White CHALK
BH204	29.10	D	Y	P		30	95	0.29	95.00	0.03	1.33	0.04	White CHALK
BH204	29.25	D	Y	P		40	95	1.03	95.00	0.11	1.33	0.15	White CHALK
BH204	29.41	D	Y	P		50	95	0.84	95.00	0.09	1.33	0.12	White CHALK
BH204	29.70	I	U	P	50	50	35	0.19	47.20	0.09	0.97	0.08	White CHALK
BH204	29.90	D	Y	P		30	95	0.36	95.00	0.04	1.33	0.05	White CHALK
BH204	36.25	A	X	P	95		60	0.29	85.19	0.04	1.27	0.05	White CHALK
BH204	36.35	D	Y	P		20	95	0.40	95.00	0.04	1.33	0.06	White CHALK
BH204	36.70	A	X	P	95		50	0.26	77.77	0.04	1.22	0.05	White CHALK
BH204	36.83	D	Y	P		20	95	0.49	95.00	0.05	1.33	0.07	White CHALK
BH204	36.94	D	Y	P		30	95	0.57	95.00	0.06	1.33	0.08	White CHALK
BH205C	10.00	I	U	P	90	110	60	0.81	82.92	0.12	1.26	0.15	White CHALK
BH205C	15.10	I	U	P	60	80	40	0.63	55.28	0.21	1.05	0.22	White CHALK
BH205C	15.20	D	Y	P		40	90	0.69	90.00	0.09	1.30	0.11	White CHALK
BH205C	15.20	A	X	P	90		35	0.52	63.33	0.13	1.11	0.14	White CHALK
BH205C	15.30	D	Y	P		30	90	0.36	90.00	0.04	1.30	0.06	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH205C	15.30	A	X	P	90		30	0.54	58.63	0.16	1.07	0.17	White CHALK
BH205C	15.45	I	U	P	25	60	40	0.81	35.68	0.64	0.86	0.55	White CHALK
BH205C	20.70	I	U	P	60	90	60	0.22	67.70	0.05	1.15	0.06	White CHALK
BH205C	20.80	I	U	P	40	90	60	0.09	55.28	0.03	1.05	0.03	White CHALK
BH205C	21.00	D	Y	P		30	70	0.14	70.00	0.03	1.16	0.03	White CHALK
BH205C	21.25	D	Y	P		30	90	0.23	90.00	0.03	1.30	0.04	White CHALK
BH205C	21.25	A	X	P	90		25	0.41	53.52	0.14	1.03	0.15	White CHALK
BH205C	21.35	D	Y	P		40	90	0.66	90.00	0.08	1.30	0.11	White CHALK
BH205C	21.35	A	X	P	90		30	0.59	58.63	0.17	1.07	0.18	White CHALK
BH205C	21.43	D	Y	P		30	90	0.71	90.00	0.09	1.30	0.11	White CHALK
BH205C	21.43	A	X	P	90		25	0.96	53.52	0.34	1.03	0.35	White CHALK
BH205C	26.50	I	U	P	40	90	50	1.43	50.46	0.56	1.00	0.56	White CHALK
BH205C	26.65	I	U	P	30	90	60	0.19	47.87	0.08	0.98	0.08	White CHALK
BH205C	26.80	A	X	P	90		50	1.60	75.69	0.28	1.21	0.34	White CHALK
BH205C	26.97	A	X	P	90		45	1.65	71.81	0.32	1.18	0.38	White CHALK
BH205C	27.10	A	X	P	90		60	1.51	82.92	0.22	1.26	0.28	White CHALK
BH205C	27.20	A	X	P	90		60	1.81	82.92	0.26	1.26	0.33	White CHALK
BH205C	27.28	D	Y	P		30	90	0.64	90.00	0.08	1.30	0.10	White CHALK
BH205C	27.40	D	Y	P		20	90	0.31	90.00	0.04	1.30	0.05	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT SH READING MASTER LLP

SITE STATION HILL, READING

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH205C	27.40	A	X	P	90		25	0.59	53.52	0.21	1.03	0.21	White CHALK
BH205C	27.46	A	X	P	90		45	1.39	71.81	0.27	1.18	0.32	White CHALK
BH205C	35.27	D	Y	P		40	90	0.61	90.00	0.08	1.30	0.10	White CHALK
BH205C	35.27	A	X	P	90		45	0.91	71.81	0.18	1.18	0.21	White CHALK
BH205C	35.45	D	Y	P		70	90	1.30	90.00	0.16	1.30	0.21	White CHALK
BH205C	35.45	A	X	P	90		70	1.90	89.56	0.24	1.30	0.31	White CHALK
BH205C	35.60	D	Y	P		20	90	0.66	90.00	0.08	1.30	0.11	White CHALK
BH205C	35.60	A	X	P	90		20	1.01	47.87	0.44	0.98	0.43	White CHALK
BH205C	36.03	D	Y	P		50	90	1.06	90.00	0.13	1.30	0.17	White CHALK
BH205C	36.03	A	X	P	90		50	1.64	75.69	0.29	1.21	0.34	White CHALK

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**35248**	**TB**
I - irregular lump	Z - oblique		S - soaked		

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

Final Report

Report No.:	19-20348-1
Initial Date of Issue:	24-Jun-2019
Client	Geotechnical Engineering Ltd
Client Address:	Centurion House Olympus Park Quedgeley Gloucester Gloucestershire GL2 4NF
Contact(s):	GEL Wendy Jones
Project	35248 Station Hill, Reading

Quotation No.:		**Date Received:**	18-Jun-2019
Order No.:	35248/WJ	**Date Instructed:**	18-Jun-2019
No. of Samples:	26		
Turnaround (Wkdays):	5	**Results Due:**	24-Jun-2019
Date Approved:	24-Jun-2019		

Approved By:



Details: Robert Monk, Technical Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 35248 Station Hill, Reading

Client: Geotechnical Engineering Ltd					**Chemtest Job No.:**	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348
Quotation No.:					**Chemtest Sample ID.:**	843999	844000	844001	844002	844003	844004	844005	844006	844007
					Client Sample ID.:	5L	6D	7L	11L	13L	14L	18C	19C	3L
					Sample Location:	BH201	BH201	BH201	BH201	BH201	BH201	BH201	BH201	BH202D
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.20	2.00	2.00	4.00	5.00	6.50	10.00	11.50	1.85
					Bottom Depth (m):	2.00	2.45	3.00			8.00	11.50	13.00	2.00
					Date Sampled:	14-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019	17-Jun-2019
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Moisture	N	2030	%	0.020		9.7	21	13	4.1	9.7	1.9	12	17	3.1
pH	U	2010		N/A		8.6		7.8			8.9	8.8		
pH (2.5:1)	N	2010		N/A			7.9			8.8			9.0	11.1
Magnesium (Water Soluble)	N	2120	g/l	0.010			< 0.010			< 0.010			< 0.010	< 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			0.56			0.028			< 0.010	1.1
Total Sulphur	U	2175	%	0.010			0.092			0.016			< 0.010	0.36
Chloride (Water Soluble)	U	2220	g/l	0.010			0.013			< 0.010			< 0.010	0.015
Nitrate (Water Soluble)	N	2220	g/l	0.010			< 0.010			< 0.010			< 0.010	< 0.010
Sulphate (Acid Soluble)	U	2430	%	0.010			0.16			0.016			< 0.010	0.58
Organic Matter	U	2625	%	0.40		0.83			< 0.40					

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 35248 Station Hill, Reading

Client: Geotechnical Engineering Ltd					**Chemtest Job No.:**	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348
Quotation No.:					**Chemtest Sample ID.:**	844008	844009	844010	844011	844012	844013	844014	844015	844016
					Client Sample ID.:	4L	6L	10L	11L	15C	22C	28C	10L	11D
					Sample Location:	BH202D	BH202D	BH202D	BH202D	BH202D	BH202D	BH202D	BH205C	BH205C
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.00	3.00	5.50	7.00	13.50	24.00	31.50	2.00	3.00
					Bottom Depth (m):	3.00	4.00	7.00	8.50	15.00	25.50	33.00	3.00	3.45
					Date Sampled:	17-Jun-2019	17-Jun-2019	17-Jun-2019	17-Jun-2019	17-Jun-2019	17-Jun-2019	17-Jun-2019	14-Jun-2019	14-Jun-2019
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Moisture	N	2030	%	0.020		16	10	2.4	5.1	19	7.4	15	15	9.2
pH	U	2010		N/A		8.2		9.3		9.2	9.2	9.0	8.0	
pH (2.5:1)	N	2010		N/A			9.1		9.3					8.6
Magnesium (Water Soluble)	N	2120	g/l	0.010			< 0.010		< 0.010					< 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			0.022		< 0.010					0.23
Total Sulphur	U	2175	%	0.010			0.014		0.022					0.055
Chloride (Water Soluble)	U	2220	g/l	0.010			< 0.010		< 0.010					< 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010			< 0.010		< 0.010					< 0.010
Sulphate (Acid Soluble)	U	2430	%	0.010			0.024		0.011					0.081
Organic Matter	U	2625	%	0.40		6.7		< 0.40		2.9	< 0.40	< 0.40	3.1	

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 35248 Station Hill, Reading

Client: Geotechnical Engineering Ltd					**Chemtest Job No.:**	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348	19-20348
Quotation No.:					**Chemtest Sample ID.:**	844017	844018	844019	844020	844021	844022	844023	844024
					Client Sample ID.:	12L	15D	18L	20L	24L	8D	13L	8D
					Sample Location:	BH205C	BH205C	BH205C	BH205C	BH205C	WS202	WS202	WS203
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	3.00	5.00	6.00	7.50	9.00	3.00	5.00	3.00
					Bottom Depth (m):	4.00	5.34			10.00	3.78	6.00	3.70
					Date Sampled:	14-Jun-2019	14-Jun-2019	17-Jun-2019	17-Jun-2019	17-Jun-2019	14-Jun-2019	14-Jun-2019	14-Jun-2019
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Moisture	N	2030	%	0.020		6.5	8.4	5.1	0.34	22	26	2.5	19
pH	U	2010		N/A		8.3			8.9	9.0			
pH (2.5:1)	N	2010		N/A				9.1		9.2			
Magnesium (Water Soluble)	N	2120	g/l	0.010				< 0.010		< 0.010			
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010				< 0.010		0.035			
Total Sulphur	U	2175	%	0.010				0.029		0.013			
Chloride (Water Soluble)	U	2220	g/l	0.010				< 0.010		< 0.010			
Nitrate (Water Soluble)	N	2220	g/l	0.010				< 0.010		< 0.010			
Sulphate (Acid Soluble)	U	2430	%	0.010				0.015		< 0.010			
Organic Matter	U	2625	%	0.40			< 0.40				0.55	< 0.40	< 0.40

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

Report Information

Key

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

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

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

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

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

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

Final Report

Report No.:	19-22076-1
Initial Date of Issue:	05-Jul-2019
Client	Geotechnical Engineering Ltd
Client Address:	Centurion House Olympus Park Quedgeley Gloucester Gloucestershire GL2 4NF
Contact(s):	GEL Wendy Jones
Project	35248 B Station Hill, Reading

Quotation No.:		**Date Received:**	01-Jul-2019
Order No.:	35248/WJ	**Date Instructed:**	01-Jul-2019
No. of Samples:	14		
Turnaround (Wkdays):	5	**Results Due:**	05-Jul-2019
Date Approved:	05-Jul-2019		

Approved By:



Details: Robert Monk, Technical Manager

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 35248 B Station Hill, Reading

Client: Geotechnical Engineering Ltd					**Chemtest Job No.:**	19-22076	19-22076	19-22076	19-22076	19-22076	19-22076	19-22076	19-22076
Quotation No.:					**Chemtest Sample ID.:**	851242	851243	851244	851245	851246	851247	851248	851249	851250
					Client Sample ID.:	4L	5D	7D	11D	17D	34C	7L	8C	14C
					Sample Location:	BH203	BH203	BH203	BH203	BH203	BH203	BH204	BH204	BH204
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.00	3.00	4.00	6.00	10.50	33.00	5.50	7.50	15.00
					Bottom Depth (m):	3.00	3.45	4.45	6.45	10.95	34.50	7.00	9.00	16.50
					Date Sampled:	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Moisture	N	2030	%	0.020		26	15	7.6	11	23	21	15	30	22
pH	U	2010		N/A		8.0		8.4		8.8	8.8	8.5		
pH (2.5:1)	N	2010		N/A			8.3		8.4					8.8
Magnesium (Water Soluble)	N	2120	g/l	0.010			< 0.010		< 0.010					< 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			0.053		< 0.010					< 0.010
Total Sulphur	U	2175	%	0.010			0.055		0.070					0.076
Chloride (Water Soluble)	U	2220	g/l	0.010			0.011		< 0.010					< 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010			< 0.010		< 0.010					< 0.010
Sulphate (Acid Soluble)	U	2430	%	0.010			0.038		0.026					< 0.010
Organic Matter	U	2625	%	0.40		0.97			< 0.40				5.0	

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 35248 B Station Hill, Reading

Client: Geotechnical Engineering Ltd			**Chemtest Job No.:**		19-22076	19-22076	19-22076	19-22076	19-22076
Quotation No.:			**Chemtest Sample ID.:**		851251	851252	851253	851254	851255
			Client Sample ID.:		16C	18C	20C	22C	26C
			Sample Location:		BH204	BH204	BH204	BH204	BH204
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		19.50	22.50	25.50	28.50	34.50
			Bottom Depth (m):		21.00	24.00	27.00	30.00	36.00
			Date Sampled:		28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019	28-Jun-2019
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Moisture	N	2030	%	0.020	19	19	21	17	16
pH	U	2010		N/A	8.6			8.8	8.8
pH (2.5:1)	N	2010		N/A			8.9		
Magnesium (Water Soluble)	N	2120	g/l	0.010			< 0.010		
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010			< 0.010		
Total Sulphur	U	2175	%	0.010			0.015		
Chloride (Water Soluble)	U	2220	g/l	0.010			< 0.010		
Nitrate (Water Soluble)	N	2220	g/l	0.010			< 0.010		
Sulphate (Acid Soluble)	U	2430	%	0.010			< 0.010		
Organic Matter	U	2625	%	0.40		< 0.40			

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

Report Information

Key

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

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

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

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

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

APPENDIX C

CHEMICAL ANALYSES

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-41032

Project / Site name:	Station Hill, Reading	**Samples received on:**	10/05/2019
Your job number:	35248	**Samples instructed on:**	14/05/2019
Your order number:		**Analysis completed by:**	20/05/2019
Report Issue Number:	1	**Report issued on:**	20/05/2019
Samples Analysed:	3 soil samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-41032

Project / Site name: Station Hill, Reading

Lab Sample Number				1220390	1220391	1220392		
Sample Reference				BH205	BH205A	BH205C		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20-0.40	0.80-0.95	1.80-2.00		
Date Sampled				08/05/2019	09/05/2019	10/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	63	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	2.4	17	17		
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.1	8.4	-		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	-		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.046	0.50	-		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.25	-		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.14	-		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.43	-		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.4	-		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.95	-		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	4.0	-		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	3.4	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.3	-		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	2.1	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.4	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.92	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.9	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.89	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.24	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.91	-		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	22.3	-		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	36	-		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	< 0.06	0.40	-		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	6.8	-		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	< 0.2	-		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	3.8	9.4	-		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.2	33	-		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	270	180	-		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	-		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	2.0	13	-		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	2.5	18	-		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	110	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-41032

Project / Site name: Station Hill, Reading

Lab Sample Number				1220390	1220391	1220392		
Sample Reference				BH205	BH205A	BH205C		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20-0.40	0.80-0.95	1.80-2.00		
Date Sampled				08/05/2019	09/05/2019	10/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.8	2.1	-		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.1	7.0	-		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	13	26	-		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	25	43	-		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	45	79	-		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	5.1	-		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	8.7	-		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	45	-		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	100	-		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	160	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-41032

Project / Site name: Station Hill, Reading

Lab Sample Number				1220390	1220391	1220392		
Sample Reference				BH205	BH205A	BH205C		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20-0.40	0.80-0.95	1.80-2.00		
Date Sampled				08/05/2019	09/05/2019	10/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Chloroethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	< 1.0		
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0		
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Styrene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Tribromomethane	µg/kg	1	NONE	-	< 1.0	< 1.0		
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	< 1.0		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-41032

Project / Site name: Station Hill, Reading

Lab Sample Number				1220390	1220391	1220392		
Sample Reference				BH205	BH205A	BH205C		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20-0.40	0.80-0.95	1.80-2.00		
Date Sampled				08/05/2019	09/05/2019	10/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2		
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05		
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2		
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Naphthalene	mg/kg	0.05	MCERTS	-	0.25	< 0.05		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1		
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.14	0.11		
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	0.23		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3		
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Fluorene	mg/kg	0.05	MCERTS	-	0.43	0.22		
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Phenanthrene	mg/kg	0.05	MCERTS	-	1.4	0.77		
Anthracene	mg/kg	0.05	MCERTS	-	0.95	0.71		
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2		
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3		
Fluoranthene	mg/kg	0.05	MCERTS	-	4.0	3.9		
Pyrene	mg/kg	0.05	MCERTS	-	3.4	3.7		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	2.3	2.3		
Chrysene	mg/kg	0.05	MCERTS	-	2.1	2.3		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	2.4	1.9		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	0.92	0.92		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1.9	2.1		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.89	0.83		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.24	0.18		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.91	0.94		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-41032

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1220390	BH205	None Supplied	0.20-0.40	Brown gravel with stones.**
1220391	BH205A	None Supplied	0.80-0.95	Brown sandy gravel with brick.**
1220392	BH205C	None Supplied	1.80-2.00	Brown clay.

** NON MCERTS MATRIX

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-41032

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-42156

Project / Site name:	Station Hill, Reading	**Samples received on:**	17/05/2019
Your job number:	35248	**Samples instructed on:**	21/05/2019
Your order number:	35248-DO	**Analysis completed by:**	29/05/2019
Report Issue Number:	1	**Report issued on:**	29/05/2019
Samples Analysed:	3 soil samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42156

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1226674	1226675	1226676		
Sample Reference				WS201	WS211	WS211A		
Sample Number				2	1	2		
Depth (m)				1.00-1.20	0.50-0.70	0.95-1.00		
Date Sampled				16/05/2019	16/05/2019	16/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	6.1	9.9	15		
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	12.0	8.5	7.9		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	77	550	780		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.039	0.27	0.39		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	38.7	274	388		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.35	0.77		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.19	0.27		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.34		
Phenanthrene	mg/kg	0.05	MCERTS	1.7	3.9	5.2		
Anthracene	mg/kg	0.05	MCERTS	0.48	1.4	2.0		
Fluoranthene	mg/kg	0.05	MCERTS	4.8	12	18		
Pyrene	mg/kg	0.05	MCERTS	4.1	12	18		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	5.6	12		
Chrysene	mg/kg	0.05	MCERTS	2.0	6.2	8.9		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.8	8.6	17		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.4	3.5	5.2		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	7.0	14		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.82	4.0	7.7		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.99	2.0		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	4.8	10		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	21.4	70.7	122		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42156

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1226674	1226675	1226676		
Sample Reference				WS201	WS211	WS211A		
Sample Number				2	1	2		
Depth (m)				1.00-1.20	0.50-0.70	0.95-1.00		
Date Sampled				16/05/2019	16/05/2019	16/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	21	20		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.81	1.1	1.0		
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	2.7	4.1		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	21	18		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	70	170		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	440	690		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	1.2	0.7		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	27	20		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	33	42	39		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	140	130		
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	3.0	< 1.0	8.3		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.9	< 2.0	7.1		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	26	< 8.0	15		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	140	< 8.0	80		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	180	< 10	110		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	5.7	7.9	6.9		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	34	78	100		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	120	210	290		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	160	300	400		
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	< 0.001		
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	< 0.007		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42156

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1226674	WS201	2	1.00-1.20	Light grey gravelly sand with rubble and vegetation.
1226675	WS211	1	0.50-0.70	Brown loam and clay with gravel and rubble.
1226676	WS211A	2	0.95-1.00	Grey gravelly loam with rubble.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42156

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-42229

Replaces Analytical Report Number : 19-42229, issue no. 1

Project / Site name:	Station Hill North Site	**Samples received on:**	21/05/2019
Your job number:	35248	**Samples instructed on:**	21/05/2019
Your order number:	35067	**Analysis completed by:**	17/06/2019
Report Issue Number:	2	**Report issued on:**	17/06/2019
Samples Analysed:	6 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227035	1227036	1227037	1227038	1227039
Sample Reference				WS202	WS202	WS202	WS202	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.50-0.70	2.20-2.40	3.70-3.90	5.20-5.40
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	39
Moisture Content	%	N/A	NONE	9.2	7.9	24	13	9.3
Total mass of sample received	kg	0.001	NONE	2.0	1.8	2.0	1.9	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	Amosite	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	0.024	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	0.024	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.7	10.5	7.9	8.4	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1	1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.035	0.17	0.22	0.025	0.028
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.21	0.33	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.47	0.76	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.23	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.31	0.22	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.4	3.7	0.51	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.5	1.1	0.17	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	10	12	2.3	< 0.05	0.36
Pyrene	mg/kg	0.05	MCERTS	9.0	11	2.2	< 0.05	0.33
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.5	7.7	0.96	< 0.05	0.18
Chrysene	mg/kg	0.05	MCERTS	5.2	5.1	1.1	< 0.05	0.15
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	6.1	7.8	1.4	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.4	4.8	0.50	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.6	7.4	1.0	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.2	4.7	0.47	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.82	1.1	0.17	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.0	5.7	0.67	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	60.0	72.4	11.4	< 0.80	1.02
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	12	15	15	3.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.77	0.83	1.0	0.48	0.21
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	0.9	2.2	0.6	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	21	37	18	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	63	120	16	11	5.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	240	22	6.5	4.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	0.9	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	19	19	19	7.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	27	52	42	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82	110	55	28	15

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227035	1227036	1227037	1227038	1227039
Sample Reference				WS202	WS202	WS202	WS202	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.50-0.70	2.20-2.40	3.70-3.90	5.20-5.40
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	5.7	1.5	< 1.0	< 1.0	4.4
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	18	8.3	< 2.0	< 2.0	6.4
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	48	16	< 8.0	< 8.0	12
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	160	62	< 8.0	< 8.0	55
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	240	88	< 10	< 10	79
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	11	11	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	6.5	29	18	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	62	76	26	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	190	190	53	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	260	310	110	< 10	< 10

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227035	1227036	1227037	1227038	1227039
Sample Reference				WS202	WS202	WS202	WS202	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.50-0.70	2.20-2.40	3.70-3.90	5.20-5.40
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site

Your Order No: 35067

Lab Sample Number				1227035	1227036	1227037	1227038	1227039
Sample Reference				WS202	WS202	WS202	WS202	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.50-0.70	2.20-2.40	3.70-3.90	5.20-5.40
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	0.33	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.76	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	0.22	< 0.05	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	3.7	0.51	-	-
Anthracene	mg/kg	0.05	MCERTS	-	1.1	0.17	-	-
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	12	2.3	-	-
Pyrene	mg/kg	0.05	MCERTS	-	11	2.2	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	7.7	0.96	-	-
Chrysene	mg/kg	0.05	MCERTS	-	5.1	1.1	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	7.8	1.4	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	4.8	0.50	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	7.4	1.0	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	4.7	0.47	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	1.1	0.17	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	5.7	0.67	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227035	1227036	1227037	1227038	1227039
Sample Reference				WS202	WS202	WS202	WS202	WS202
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10-0.30	0.50-0.70	2.20-2.40	3.70-3.90	5.20-5.40
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	< 0.007	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site

Your Order No: 35067

Lab Sample Number				1227040				
Sample Reference				WS204				
Sample Number				None Supplied				
Depth (m)				0.10-0.30				
Date Sampled				20/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	8.8				
Total mass of sample received	kg	0.001	NONE	1.9				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-				
Asbestos Quantification Total	%	0.001	ISO 17025	-				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.5				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.091				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	1.3				
Pyrene	mg/kg	0.05	MCERTS	1.6				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.97				
Chrysene	mg/kg	0.05	MCERTS	0.94				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.75				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.49				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.67				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.90				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.31				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	28				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227040				
Sample Reference				WS204				
Sample Number				None Supplied				
Depth (m)				0.10-0.30				
Date Sampled				20/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	16				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	48				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	25				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	89				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	24				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	52				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	88				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	160				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site

Your Order No: 35067

Lab Sample Number				1227040				
Sample Reference				WS204				
Sample Number				None Supplied				
Depth (m)				0.10-0.30				
Date Sampled				20/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0				
Chloroethane	µg/kg	1	NONE	< 1.0				
Bromomethane	µg/kg	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/kg	1	NONE	< 1.0				
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0				
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloromethane	µg/kg	1	MCERTS	< 1.0				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0				
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0				
Benzene	µg/kg	1	MCERTS	< 1.0				
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloroethene	µg/kg	1	MCERTS	< 1.0				
Dibromomethane	µg/kg	1	MCERTS	< 1.0				
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/kg	1	NONE	< 1.0				
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0				
Chlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-Xylene	µg/kg	1	MCERTS	< 1.0				
Styrene	µg/kg	1	MCERTS	< 1.0				
Tribromomethane	µg/kg	1	NONE	< 1.0				
o-Xylene	µg/kg	1	MCERTS	< 1.0				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0				
Bromobenzene	µg/kg	1	MCERTS	< 1.0				
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site

Your Order No: 35067

Lab Sample Number				1227040				
Sample Reference				WS204				
Sample Number				None Supplied				
Depth (m)				0.10-0.30				
Date Sampled				20/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1				
Phenol	mg/kg	0.2	ISO 17025	< 0.2				
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1				
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2				
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1				
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2				
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1				
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3				
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05				
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3				
4-Methylphenol	mg/kg	0.2	NONE	< 0.2				
Isophorone	mg/kg	0.2	MCERTS	< 0.2				
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3				
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3				
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3				
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3				
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1				
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1				
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1				
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1				
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2				
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1				
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1				
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1				
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2				
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2				
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3				
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Azobenzene	mg/kg	0.3	MCERTS	< 0.3				
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2				
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Carbazole	mg/kg	0.3	MCERTS	< 0.3				
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2				
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3				
Fluoranthene	mg/kg	0.05	MCERTS	1.3				
Pyrene	mg/kg	0.05	MCERTS	1.6				
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.97				
Chrysene	mg/kg	0.05	MCERTS	0.94				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.75				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.49				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.67				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229

Project / Site name: Station Hill North Site
Your Order No: 35067

Lab Sample Number				1227040				
Sample Reference				WS204				
Sample Number				None Supplied				
Depth (m)				0.10-0.30				
Date Sampled				20/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001				
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001				
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42229
Project / Site name: Station Hill North Site
Your Order No: 35067

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1227035	WS202	0.10-0.30	141	Loose Fibrous Debris & Loose Fibres	**Chrysotile & Amosite**	0.002	**0.002**
1227036	WS202	0.50-0.70	148	Sheeting/Board Debris	**Amosite**	0.024	**0.024**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42229

Project / Site name: Station Hill North Site

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1227035	WS202	None Supplied	0.10-0.30	Brown sand with gravel and vegetation.
1227036	WS202	None Supplied	0.50-0.70	Brown clay and sand with rubble.
1227037	WS202	None Supplied	2.20-2.40	Grey clay.
1227038	WS202	None Supplied	3.70-3.90	Grey clay and sand with gravel.
1227039	WS202	None Supplied	5.20-5.40	Brown sand with gravel and stones.
1227040	WS204	None Supplied	0.10-0.30	Brown clay and sand with rubble and brick.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42229

Project / Site name: Station Hill North Site

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42229

Project / Site name: Station Hill North Site

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-42284

Project / Site name:	Station Hill North Site	**Samples received on:**	21/05/2019
Your job number:	35248	**Samples instructed on:**	21/05/2019
Your order number:	35067-TW	**Analysis completed by:**	29/05/2019
Report Issue Number:	1	**Report issued on:**	29/05/2019
Samples Analysed:	4 soil samples		

Signed: Karolina Marek

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42284

Project / Site name: Station Hill North Site
Your Order No: 35067-TW

Lab Sample Number				1227311	1227312	1227313	1227314
Sample Reference				BH201	BH201	BH201	BH201
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	1.10-1.30	3.60-3.80	6.00-6.20
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	16	13	6.7
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-
General Inorganics							
pH - Automated	pH Units	N/A	MCERTS	8.5	8.6	8.8	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.035	0.026	0.011	0.011
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.47	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	5.5	0.92	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	14	2.1	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	12	1.8	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.8	0.68	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.9	1.2	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.1	1.1	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.5	0.54	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	6.9	0.87	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.3	0.61	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.80	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.1	0.63	< 0.05	< 0.05
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	75.0	10.4	< 0.80	< 0.80

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42284

Project / Site name: Station Hill North Site
Your Order No: 35067-TW

Lab Sample Number				1227311	1227312	1227313	1227314
Sample Reference				BH201	BH201	BH201	BH201
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	1.10-1.30	3.60-3.80	6.00-6.20
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	12	17	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.48	0.44	0.49
Boron (water soluble)	mg/kg	0.2	MCERTS	2.3	1.6	0.4	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.4	0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	14	14	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	63	31	6.6	9.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	630	200	5.2	6.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.3	1.0	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	15	14	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	28	33	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	420	92	24	31
Monoaromatics & Oxygenates							
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.2	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	18	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	75	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	99	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	6.7	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	64	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	190	22	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	260	30	< 10	< 10

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42284

Project / Site name: Station Hill North Site
Your Order No: 35067-TW

Lab Sample Number				1227311	1227312	1227313	1227314
Sample Reference				BH201	BH201	BH201	BH201
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	1.10-1.30	3.60-3.80	6.00-6.20
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
VOCs							
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Chloroethane	µg/kg	1	NONE	< 1.0	-	-	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42284

Project / Site name: Station Hill North Site
Your Order No: 35067-TW

Lab Sample Number				1227311	1227312	1227313	1227314
Sample Reference				BH201	BH201	BH201	BH201
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	1.10-1.30	3.60-3.80	6.00-6.20
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
SVOCs							
Aniline	mg/kg	0.1	NONE	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	0.47	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.24	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Fluorene	mg/kg	0.05	MCERTS	0.24	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	5.5	-	-	-
Anthracene	mg/kg	0.05	MCERTS	1.4	-	-	-
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	14	-	-	-
Pyrene	mg/kg	0.05	MCERTS	12	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.8	-	-	-
Chrysene	mg/kg	0.05	MCERTS	5.9	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.1	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.5	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	6.9	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.3	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.80	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.1	-	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42284

Project / Site name: Station Hill North Site
Your Order No: 35067-TW

Lab Sample Number				1227311	1227312	1227313	1227314
Sample Reference				BH201	BH201	BH201	BH201
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	1.10-1.30	3.60-3.80	6.00-6.20
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
PCBs by GC-MS							
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-
Total PCBs by GC-MS							
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42284

Project / Site name: Station Hill North Site

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1227311	BH201	None Supplied	0.30-0.50	Brown clay and sand with rubble and brick.
1227312	BH201	None Supplied	1.10-1.30	Brown clay and sand with brick.
1227313	BH201	None Supplied	3.60-3.80	Brown sand.
1227314	BH201	None Supplied	6.00-6.20	Brown sand with gravel.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42284

Project / Site name: Station Hill North Site

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-42770

Replaces Analytical Report Number : 19-42770, issue no. 1

Project / Site name:	Station Hill Reading	**Samples received on:**	23/05/2019
Your job number:	35248-DO	**Samples instructed on:**	24/05/2019
Your order number:		**Analysis completed by:**	18/06/2019
Report Issue Number:	2	**Report issued on:**	18/06/2019
Samples Analysed:	7 soil samples		

Signed: K. Lewicka

Katarzyna Lewicka
Head of Reporting Section
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230000	1230001	1230002	1230003	1230004
Sample Reference				TP206	TP206	TP208	TP208	TP205
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.60	2.10-2.20	0.50-0.70	1.50-1.70	0.70-1.00
Date Sampled				22/05/2019	22/05/2019	22/05/2019	22/05/2019	22/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.5	14	5.2	15	17
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.6	8.7	11.7	9.0	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.021	0.18	0.020	0.090	0.25
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.40	4.4	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.3	16	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.44	3.0	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.45	4.7	0.24
Phenanthrene	mg/kg	0.05	MCERTS	0.32	0.22	6.5	37	1.4
Anthracene	mg/kg	0.05	MCERTS	0.10	< 0.05	1.7	17	0.57
Fluoranthene	mg/kg	0.05	MCERTS	0.86	0.68	19	140	2.0
Pyrene	mg/kg	0.05	MCERTS	0.82	0.64	19	160	1.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.46	0.41	10	88	1.3
Chrysene	mg/kg	0.05	MCERTS	0.49	0.43	9.5	73	1.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.49	0.57	13	100	0.84
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.29	0.34	5.1	67	0.66
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.48	0.53	12	120	0.96
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.26	0.35	6.7	74	0.40
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.7	18	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.29	0.40	7.7	89	0.43
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.86	4.57	114	1020	11.8
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	16	12	9.4	16
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	1.4	0.57	1.3	0.92
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	2.3	1.2	1.3	2.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.2	0.3	0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	21	15	22	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	140	48	57	120	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	52	280	97	160	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.5	< 0.3	< 0.3	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	21	17	37	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	30	32	75	38
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	130	110	170	61

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230000	1230001	1230002	1230003	1230004
Sample Reference				TP206	TP206	TP208	TP208	TP205
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.60	2.10-2.20	0.50-0.70	1.50-1.70	0.70-1.00
Date Sampled				22/05/2019	22/05/2019	22/05/2019	22/05/2019	22/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	2.4	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12	< 8.0	22	18	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	130	< 8.0	150	120	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	140	< 10	170	140	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	7.5	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	5.4	41	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	17	12	60	690	21
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	84	37	230	2900	64
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	100	49	300	3600	85

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230000	1230001	1230002	1230003	1230004
Sample Reference				TP206	TP206	TP208	TP208	TP205
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.60	2.10-2.20	0.50-0.70	1.50-1.70	0.70-1.00
Date Sampled				22/05/2019	22/05/2019	22/05/2019	22/05/2019	22/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230000	1230001	1230002	1230003	1230004
Sample Reference				TP206	TP206	TP208	TP208	TP205
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.60	2.10-2.20	0.50-0.70	1.50-1.70	0.70-1.00
Date Sampled				22/05/2019	22/05/2019	22/05/2019	22/05/2019	22/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230000	1230001	1230002	1230003	1230004
Sample Reference				TP206	TP206	TP208	TP208	TP205
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-0.60	2.10-2.20	0.50-0.70	1.50-1.70	0.70-1.00
Date Sampled				22/05/2019	22/05/2019	22/05/2019	22/05/2019	22/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	0.001	< 0.001	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	0.002	< 0.001	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	0.002	< 0.001	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	0.002	< 0.001	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	0.002	< 0.001	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	0.002	< 0.001	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	0.003	< 0.001	-	-	< 0.001
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	0.015	< 0.007	-	-	< 0.007

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230005	1230006			
Sample Reference				TP205	TP205			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.30-2.50	2.80-3.00			
Date Sampled				22/05/2019	22/05/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	13	38			
Total mass of sample received	kg	0.001	NONE	2.0	2.0			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	-	-			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-			
Asbestos Quantification Total	%	0.001	ISO 17025	-	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	7.7			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.055	1.5			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.68			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.45			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.30			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.75			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.9			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.71			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.57			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.28			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.29			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	5.89			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	16			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	0.80			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	5.6			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	23			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	68			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	150			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.6			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	23			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	53	44			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	41	100			

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230005	1230006			
Sample Reference				TP205	TP205			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.30-2.50	2.80-3.00			
Date Sampled				22/05/2019	22/05/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	24			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	24			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	31			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	31			

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230005	1230006			
Sample Reference				TP205	TP205			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.30-2.50	2.80-3.00			
Date Sampled				22/05/2019	22/05/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0			
Chloroethane	µg/kg	1	NONE	-	< 1.0			
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0			
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0			
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0			
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0			
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0			
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0			
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0			
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0			
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0			
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0			
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0			
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0			
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0			
Benzene	µg/kg	1	MCERTS	-	< 1.0			
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0			
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0			
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0			
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0			
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0			
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0			
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0			
Toluene	µg/kg	1	MCERTS	-	< 1.0			
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0			
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0			
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0			
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0			
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0			
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0			
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0			
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0			
Styrene	µg/kg	1	MCERTS	-	< 1.0			
Tribromomethane	µg/kg	1	NONE	-	< 1.0			
o-Xylene	µg/kg	1	MCERTS	-	< 1.0			
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0			
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0			
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0			
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0			
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0			
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0			
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0			
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0			
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0			
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0			
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0			
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0			
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0			
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0			
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0			
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0			
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0			
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0			
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0			

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230005	1230006			
Sample Reference				TP205	TP205			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.30-2.50	2.80-3.00			
Date Sampled				22/05/2019	22/05/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1			
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2			
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1			
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2			
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2			
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1			
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2			
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1			
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3			
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05			
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3			
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2			
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2			
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3			
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3			
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3			
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3			
Naphthalene	mg/kg	0.05	MCERTS	-	0.68			
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3			
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1			
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1			
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1			
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1			
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2			
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1			
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1			
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1			
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1			
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.45			
Acenaphthene	mg/kg	0.05	MCERTS	-	0.30			
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2			
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2			
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3			
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2			
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2			
Fluorene	mg/kg	0.05	MCERTS	-	0.75			
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3			
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2			
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3			
Phenanthrene	mg/kg	0.05	MCERTS	-	1.9			
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3			
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2			
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3			
Fluoranthene	mg/kg	0.05	MCERTS	-	0.71			
Pyrene	mg/kg	0.05	MCERTS	-	0.57			
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	0.28			
Chrysene	mg/kg	0.05	MCERTS	-	0.29			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05			

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770

Project / Site name: Station Hill Reading

Lab Sample Number				1230005	1230006			
Sample Reference				TP205	TP205			
Sample Number				None Supplied	None Supplied			
Depth (m)				2.30-2.50	2.80-3.00			
Date Sampled				22/05/2019	22/05/2019			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-			
PCB Congener 52	mg/kg	0.001	MCERTS	-	-			
PCB Congener 101	mg/kg	0.001	MCERTS	-	-			
PCB Congener 118	mg/kg	0.001	MCERTS	-	-			
PCB Congener 138	mg/kg	0.001	MCERTS	-	-			
PCB Congener 153	mg/kg	0.001	MCERTS	-	-			
PCB Congener 180	mg/kg	0.001	MCERTS	-	-			
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-			

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-42770
Project / Site name: Station Hill Reading
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1230002	TP208	0.50-0.70	107	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42770

Project / Site name: Station Hill Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1230000	TP206	None Supplied	0.50-0.60	Beige rubble.
1230001	TP206	None Supplied	2.10-2.20	Brown clay and sand with brick and rubble.
1230002	TP208	None Supplied	0.50-0.70	Brown gravelly sand with rubble.
1230003	TP208	None Supplied	1.50-1.70	Brown loam and clay with gravel.
1230004	TP205	None Supplied	0.70-1.00	Brown clay and sand with gravel.
1230005	TP205	None Supplied	2.30-2.50	Brown clay and sand.
1230006	TP205	None Supplied	2.80-3.00	Brown clay.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42770

Project / Site name: Station Hill Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-42770

Project / Site name: Station Hill Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-43154

Project / Site name:	Station Hill, Reading	**Samples received on:**	28/05/2019
Your job number:	35248	**Samples instructed on:**	29/05/2019
Your order number:		**Analysis completed by:**	04/06/2019
Report Issue Number:	1	**Report issued on:**	04/06/2019
Samples Analysed:	3 soil samples		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	27		
Moisture Content	%	N/A	NONE	32	16	3.6		
Total mass of sample received	kg	0.001	NONE	1.6	2.0	2.0		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	8.5	8.7		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1000	26	39		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.52	0.013	0.019		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	524	13.1	19.3		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	1.3	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	0.99	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	0.58	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	3.3	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	17	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	5.2	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	19	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	15	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.3	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	5.6	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.5	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.7	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.98	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.5	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	101	< 0.80	< 0.80		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	32	10	39		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	0.57	0.75		
Boron (water soluble)	mg/kg	0.2	MCERTS	9.6	1.3	0.4		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.9	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (III)	mg/kg	1	NONE	22	19	43		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	19	43		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6900	20	9.1		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	410	6.1	8.8		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	160	15	38		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	25	61		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	3800	25	45		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.4	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	38	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	160	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	210	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.3	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	45	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	250	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	360	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	670	< 10	< 10		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	-		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Acenaphthylene	mg/kg	0.05	MCERTS	0.99	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	0.58	< 0.05	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Dibenzofuran	mg/kg	0.2	MCERTS	1.0	< 0.2	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Fluorene	mg/kg	0.05	MCERTS	3.3	< 0.05	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Phenanthrene	mg/kg	0.05	MCERTS	17	< 0.05	-		
Anthracene	mg/kg	0.05	MCERTS	5.2	< 0.05	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Fluoranthene	mg/kg	0.05	MCERTS	19	< 0.05	-		
Pyrene	mg/kg	0.05	MCERTS	15	< 0.05	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.3	< 0.05	-		
Chrysene	mg/kg	0.05	MCERTS	5.6	< 0.05	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.5	< 0.05	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	< 0.05	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.7	< 0.05	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.98	< 0.05	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.5	< 0.05	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43154

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1231886	BH202D	None Supplied	2.30-2.040	Brown clay and sand with gravel.
1231887	BH202D	None Supplied	3.00-3.20	Light brown clay.
1231888	BH202D	None Supplied	6.00-6.20	Brown sand with gravel and stones.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43154

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-43154

Project / Site name:	Station Hill, Reading	**Samples received on:**	28/05/2019
Your job number:	35248	**Samples instructed on:**	29/05/2019
Your order number:		**Analysis completed by:**	04/06/2019
Report Issue Number:	1	**Report issued on:**	04/06/2019
Samples Analysed:	3 soil samples		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	27		
Moisture Content	%	N/A	NONE	32	16	3.6		
Total mass of sample received	kg	0.001	NONE	1.6	2.0	2.0		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	8.5	8.7		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	1000	26	39		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.52	0.013	0.019		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	524	13.1	19.3		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	1.3	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	0.99	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	0.58	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	3.3	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	17	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	5.2	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	19	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	15	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.3	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	5.6	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.5	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.7	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.98	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.5	< 0.05	< 0.05		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	101	< 0.80	< 0.80		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	32	10	39		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	0.57	0.75		
Boron (water soluble)	mg/kg	0.2	MCERTS	9.6	1.3	0.4		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.9	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (III)	mg/kg	1	NONE	22	19	43		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	19	43		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6900	20	9.1		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	410	6.1	8.8		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	160	15	38		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.7	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38	25	61		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	3800	25	45		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.4	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	38	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	160	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	210	< 10	< 10		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.3	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	45	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	250	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	360	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	670	< 10	< 10		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	-		
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-		
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	-		
o-Xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43154

Project / Site name: Station Hill, Reading

Lab Sample Number				1231886	1231887	1231888		
Sample Reference				BH202D	BH202D	BH202D		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				2.30-2.040	3.00-3.20	6.00-6.20		
Date Sampled				23/05/2019	23/05/2019	23/05/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Acenaphthylene	mg/kg	0.05	MCERTS	0.99	< 0.05	-		
Acenaphthene	mg/kg	0.05	MCERTS	0.58	< 0.05	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Dibenzofuran	mg/kg	0.2	MCERTS	1.0	< 0.2	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Fluorene	mg/kg	0.05	MCERTS	3.3	< 0.05	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Phenanthrene	mg/kg	0.05	MCERTS	17	< 0.05	-		
Anthracene	mg/kg	0.05	MCERTS	5.2	< 0.05	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Fluoranthene	mg/kg	0.05	MCERTS	19	< 0.05	-		
Pyrene	mg/kg	0.05	MCERTS	15	< 0.05	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.3	< 0.05	-		
Chrysene	mg/kg	0.05	MCERTS	5.6	< 0.05	-		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.5	< 0.05	-		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.3	< 0.05	-		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	< 0.05	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3.7	< 0.05	-		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.98	< 0.05	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	4.5	< 0.05	-		

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43154

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1231886	BH202D	None Supplied	2.30-2.040	Brown clay and sand with gravel.
1231887	BH202D	None Supplied	3.00-3.20	Light brown clay.
1231888	BH202D	None Supplied	6.00-6.20	Brown sand with gravel and stones.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43154

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-43168

Project / Site name:	Station Hill, Reading	**Samples received on:**	21/05/2019
Your job number:	35248	**Samples instructed on:**	28/05/2019
Your order number:		**Analysis completed by:**	04/06/2019
Report Issue Number:	1	**Report issued on:**	04/06/2019
Samples Analysed:	4 soil samples		

Signed: Karoline Marek

Karolina Marek
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43168

Project / Site name: Station Hill, Reading

Lab Sample Number				1231926	1231927	1231928	1231929	
Sample Reference				TP 209	TP 209	TP 209	TP 205	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50-0.70	1.50-2.00	2.70-2.90	1.50-1.70	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	21/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	29	33	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	3.9	5.8	29	15	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.7	12.0	7.7	8.3	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.027	0.0063	0.27	0.037	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.48	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.17	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	1.4	2.0	0.64	0.55	
Anthracene	mg/kg	0.05	MCERTS	0.39	0.61	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	4.0	5.2	0.76	0.59	
Pyrene	mg/kg	0.05	MCERTS	3.9	5.0	0.72	0.50	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.2	3.5	0.45	0.31	
Chrysene	mg/kg	0.05	MCERTS	1.7	2.8	0.41	0.23	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.2	4.4	0.54	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.4	1.5	0.19	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.8	3.6	0.45	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.9	2.7	0.34	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.44	0.60	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.3	3.2	0.39	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	26.6	35.6	4.89	2.18	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43168

Project / Site name: Station Hill, Reading

Lab Sample Number				1231926	1231927	1231928	1231929	
Sample Reference				TP 209	TP 209	TP 209	TP 205	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50-0.70	1.50-2.00	2.70-2.90	1.50-1.70	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	21/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	13	15	17	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	0.60	1.1	0.87	
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	1.4	7.1	0.8	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	0.4	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	18	28	25	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	53	56	230	16	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	61	79	95	25	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	15	24	27	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	29	53	50	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	67	100	180	54	
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.6	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.1	7.5	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	21	19	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	67	69	< 8.0	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	90	99	< 10	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	15	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	34	13	< 10	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	49	22	< 10	< 10	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43168

Project / Site name: Station Hill, Reading

Lab Sample Number				1231926	1231927	1231928	1231929	
Sample Reference				TP 209	TP 209	TP 209	TP 205	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50-0.70	1.50-2.00	2.70-2.90	1.50-1.70	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	21/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	-	
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	-	
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	-	
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	-	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	-	
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	-	
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	-	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	-	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	-	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43168

Project / Site name: Station Hill, Reading

Lab Sample Number				1231926	1231927	1231928	1231929	
Sample Reference				TP 209	TP 209	TP 209	TP 205	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50-0.70	1.50-2.00	2.70-2.90	1.50-1.70	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	21/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	-	
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	-	
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	-	
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	-	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	-	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	-	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	0.64	-	
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	-	
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.76	-	
Pyrene	mg/kg	0.05	MCERTS	-	-	0.72	-	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.45	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	0.41	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.54	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	0.19	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.45	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.34	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.39	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43168

Project / Site name: Station Hill, Reading

Lab Sample Number				1231926	1231927	1231928	1231929	
Sample Reference				TP 209	TP 209	TP 209	TP 205	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50-0.70	1.50-2.00	2.70-2.90	1.50-1.70	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	21/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43168

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1231926	TP 209	None Supplied	0.50-0.70	Grey gravel with stones.
1231927	TP 209	None Supplied	1.50-2.00	Grey sand with stones and gravel.
1231928	TP 209	None Supplied	2.70-2.90	Grey clay.
1231929	TP 205	None Supplied	1.50-1.70	Brown clay.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43168

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP 205		S	19-43168	1231929	c	Total cyanide in soil	L080-PL	c
TP 209		S	19-43168	1231926	c	Total cyanide in soil	L080-PL	c
TP 209		S	19-43168	1231927	c	Total cyanide in soil	L080-PL	c
TP 209		S	19-43168	1231928	c	Total cyanide in soil	L080-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-43214

Replaces Analytical Report Number : 19-43214, issue no. 1

Project / Site name:	Station Hill, Reading	**Samples received on:**	21/05/2019
Your job number:	35248	**Samples instructed on:**	28/05/2019
Your order number:		**Analysis completed by:**	18/06/2019
Report Issue Number:	2	**Report issued on:**	18/06/2019
Samples Analysed:	9 soil samples		

Signed: K. Lewicka

Katarzyna Lewicka
Head of Reporting Section
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232398	1232399	1232400	1232401	1232402
Sample Reference				WS203	WS203	WS203	WS203	WS203
Sample Number				1	2	3	5	7
Depth (m)				0.10-0.20	0.55-0.75	1.10-1.20	2.35-2.45	4.50-4.70
Date Sampled				17/05/2019	17/05/2019	17/05/2019	17/05/2019	17/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	40	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.3	9.5	16	18	8.3
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Detected	-	-	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.3	8.0	8.3	7.5	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	120	530	94	1900	57
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060	0.26	0.047	0.97	0.028
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	60.4	263	47.0	972	28.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.95	7.3	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.54	1.0	34	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	1.5	4.8	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.28	1.4	4.9	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.8	15	56	0.46	0.22
Anthracene	mg/kg	0.05	MCERTS	0.68	3.7	30	0.12	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	5.5	28	250	0.73	0.73
Pyrene	mg/kg	0.05	MCERTS	5.1	26	250	0.79	0.79
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.1	15	190	0.28	0.72
Chrysene	mg/kg	0.05	MCERTS	2.6	15	160	0.80	0.43
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.7	19	240	0.71	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.7	8.4	120	0.43	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.0	16	270	0.58	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.5	11	170	0.39	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.50	3.0	44	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.8	13	210	0.55	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	34.7	178	2050	5.84	2.89

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232398	1232399	1232400	1232401	1232402
Sample Reference				WS203	WS203	WS203	WS203	WS203
Sample Number				1	2	3	5	7
Depth (m)				0.10-0.20	0.55-0.75	1.10-1.20	2.35-2.45	4.50-4.70
Date Sampled				17/05/2019	17/05/2019	17/05/2019	17/05/2019	17/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.5	19	12	18	9.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.44	1.1	1.0	0.95	0.55
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.9	1.2	6.9	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.5	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	20	15	28	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	35	230	90	130	8.1
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	1100	170	170	6.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	3.6	1.0	0.9	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	27	33	21	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	30	61	37	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	330	180	170	26
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	8.4	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	27	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	17	95	13	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	17	130	13	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	69	210	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	66	230	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	15	91	680	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	31	220	2600	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	46	450	3700	12	< 10

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232398	1232399	1232400	1232401	1232402
Sample Reference				WS203	WS203	WS203	WS203	WS203
Sample Number				1	2	3	5	7
Depth (m)				0.10-0.20	0.55-0.75	1.10-1.20	2.35-2.45	4.50-4.70
Date Sampled				17/05/2019	17/05/2019	17/05/2019	17/05/2019	17/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	-	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	-	< 1.0	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232398	1232399	1232400	1232401	1232402
Sample Reference				WS203	WS203	WS203	WS203	WS203
Sample Number				1	2	3	5	7
Depth (m)				0.10-0.20	0.55-0.75	1.10-1.20	2.35-2.45	4.50-4.70
Date Sampled				17/05/2019	17/05/2019	17/05/2019	17/05/2019	17/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	0.95	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	1.0	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	1.5	-	< 0.05	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	0.4	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
Fluorene	mg/kg	0.05	MCERTS	-	1.4	-	< 0.05	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Phenanthrene	mg/kg	0.05	MCERTS	-	15	-	0.46	-
Anthracene	mg/kg	0.05	MCERTS	-	3.7	-	0.12	-
Carbazole	mg/kg	0.3	MCERTS	-	0.7	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	< 0.3	-
Fluoranthene	mg/kg	0.05	MCERTS	-	28	-	0.73	-
Pyrene	mg/kg	0.05	MCERTS	-	26	-	0.79	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	15	-	0.28	-
Chrysene	mg/kg	0.05	MCERTS	-	15	-	0.80	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	19	-	0.71	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	8.4	-	0.43	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	16	-	0.58	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	11	-	0.39	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	3.0	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	13	-	0.55	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232398	1232399	1232400	1232401	1232402
Sample Reference				WS203	WS203	WS203	WS203	WS203
Sample Number				1	2	3	5	7
Depth (m)				0.10-0.20	0.55-0.75	1.10-1.20	2.35-2.45	4.50-4.70
Date Sampled				17/05/2019	17/05/2019	17/05/2019	17/05/2019	17/05/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	< 0.007	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232403	1232404	1232405	1232406	
Sample Reference				TP203	TP203	TP203	TP204	
Sample Number				1	3	6	1	
Depth (m)				0.50-0.60	2.00-2.10	3.50-3.60	0.60-0.65	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	11	17	14	4.8	
Total mass of sample received	kg	0.001	NONE	2.0	2.0	2.0	2.0	
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.2	8.5	8.6	9.9	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	220	330	130	340	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.11	0.17	0.067	0.17	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	111	167	67.3	168	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	2.4	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	0.56	7.0	0.62	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	1.2	0.87	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	0.85	1.4	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	11	23	2.5	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	4.0	7.5	0.74	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	43	70	6.9	0.40	
Pyrene	mg/kg	0.05	MCERTS	46	69	6.6	0.46	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	33	42	3.8	0.34	
Chrysene	mg/kg	0.05	MCERTS	23	35	2.8	0.25	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	43	57	4.0	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	13	18	1.9	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	33	45	3.7	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	19	32	2.4	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	4.6	8.0	0.53	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	21	36	2.8	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	295	454	39.2	1.45	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232403	1232404	1232405	1232406	
Sample Reference				TP203	TP203	TP203	TP204	
Sample Number				1	3	6	1	
Depth (m)				0.50-0.60	2.00-2.10	3.50-3.60	0.60-0.65	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.1	44	17	4.6	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.51	3.0	0.51	0.29	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	1.3	1.0	0.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	3.1	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	20	17	21	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	520	9.5	16	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	210	730	13	28	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.9	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	57	16	14	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.8	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	55	39	22	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78	260	39	17	
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	3.6	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	7.1	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	74	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	290	< 8.0	< 8.0	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	380	< 10	< 10	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	110	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	3.6	110	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	110	190	23	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	410	640	46	< 10	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	520	1100	69	< 10	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232403	1232404	1232405	1232406	
Sample Reference				TP203	TP203	TP203	TP204	
Sample Number				1	3	6	1	
Depth (m)				0.50-0.60	2.00-2.10	3.50-3.60	0.60-0.65	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	
Chloroethane	µg/kg	1	NONE	-	-	-	-	
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	
Benzene	µg/kg	1	MCERTS	-	-	-	-	
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	
Toluene	µg/kg	1	MCERTS	-	-	-	-	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	
Styrene	µg/kg	1	MCERTS	-	-	-	-	
Tribromomethane	µg/kg	1	NONE	-	-	-	-	
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232403	1232404	1232405	1232406	
Sample Reference				TP203	TP203	TP203	TP204	
Sample Number				1	3	6	1	
Depth (m)				0.50-0.60	2.00-2.10	3.50-3.60	0.60-0.65	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214

Project / Site name: Station Hill, Reading

Lab Sample Number				1232403	1232404	1232405	1232406	
Sample Reference				TP203	TP203	TP203	TP204	
Sample Number				1	3	6	1	
Depth (m)				0.50-0.60	2.00-2.10	3.50-3.60	0.60-0.65	
Date Sampled				20/05/2019	20/05/2019	20/05/2019	20/05/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007	-	-	

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43214
Project / Site name: Station Hill, Reading
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1232399	WS203	0.55-0.75	116	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43214

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1232398	WS203	1	0.10-0.20	Brown clay and sand with gravel.
1232399	WS203	2	0.55-0.75	Brown loam and sand with stones and brick.
1232400	WS203	3	1.10-1.20	Brown loam and sand with gravel.
1232401	WS203	5	2.35-2.45	Brown clay and sand with gravel.
1232402	WS203	7	4.50-4.70	Light brown sand with gravel.
1232403	TP203	1	0.50-0.60	Brown sand with brick and rubble.
1232404	TP203	3	2.00-2.10	Brown gravelly sand.
1232405	TP203	6	3.50-3.60	Brown sand with gravel.
1232406	TP204	1	0.60-0.65	Brown clay and sand with gravel.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43214

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43214

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP203	1	S	19-43214	1232403	c	Total cyanide in soil	L080-PL	c
TP203	3	S	19-43214	1232404	c	Total cyanide in soil	L080-PL	c
TP203	6	S	19-43214	1232405	c	Total cyanide in soil	L080-PL	c
TP204	1	S	19-43214	1232406	c	Total cyanide in soil	L080-PL	c
WS203	1	S	19-43214	1232398	c	Total cyanide in soil	L080-PL	c
WS203	2	S	19-43214	1232399	c	Total cyanide in soil	L080-PL	c
WS203	3	S	19-43214	1232400	c	Total cyanide in soil	L080-PL	c
WS203	5	S	19-43214	1232401	c	Total cyanide in soil	L080-PL	c
WS203	7	S	19-43214	1232402	c	Total cyanide in soil	L080-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-43322

Project / Site name:	Station Hill, Reading	**Samples received on:**	29/05/2019
Your job number:	35248	**Samples instructed on:**	29/05/2019
Your order number:	35248-DO	**Analysis completed by:**	05/06/2019
Report Issue Number:	1	**Report issued on:**	05/06/2019
Samples Analysed:	1 soil sample		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43322

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1232937				
Sample Reference				BH202D				
Sample Number				None Supplied				
Depth (m)				8.20-8.40				
Date Sampled				28/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	21				
Total mass of sample received	kg	0.001	NONE	2.0				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.8				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.029				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	< 0.06				
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	1.1				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.3				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	1.4				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	2.2				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	6.1				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-43322

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1232937				
Sample Reference				BH202D				
Sample Number				None Supplied				
Depth (m)				8.20-8.40				
Date Sampled				28/05/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43322

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1232937	BH202D	None Supplied	8.20-8.40	White clay with chalk and gravel.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-43322

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-44384

Project / Site name:	Station Hill, Reading	**Samples received on:**	05/06/2019
Your job number:	35248	**Samples instructed on:**	05/06/2019
Your order number:	35248-DO	**Analysis completed by:**	12/06/2019
Report Issue Number:	1	**Report issued on:**	12/06/2019
Samples Analysed:	5 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-44384

Project / Site name: Station Hill, Reading
Your Order No: 35248-DO

Lab Sample Number				1238604	1238605	1238606	1238607	1238608
Sample Reference				BH203	BH203	BH203	BH203	BH203
Sample Number				1	3	5	7	8
Depth (m)				1.30-1.50	2.40-2.60	4.00-4.10	7.00-7.20	8.20-8.40
Date Sampled				04/06/2019	04/06/2019	04/06/2019	04/06/2019	04/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	18	31	17	22
Total mass of sample received	kg	0.001	NONE	2.0	2.0	0.47	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.6	7.6	8.5	8.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.097	0.49	0.022	0.024
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.33	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.65	< 0.05	0.51	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.27	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.3	< 0.05	0.49	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	2.0	< 0.05	0.46	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	16	< 0.05	4.9	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	16	< 0.05	4.6	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	8.3	< 0.05	3.7	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	5.6	< 0.05	2.8	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.8	< 0.05	5.1	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.5	< 0.05	3.2	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	9.3	< 0.05	6.7	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.5	< 0.05	4.1	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.98	< 0.05	0.89	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.4	< 0.05	4.4	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	86.6	< 0.80	41.8	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	20	12	9.5	1.2
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.73	0.77	1.1	0.36	< 0.06
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	1.6	6.2	0.4	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	< 0.2	0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	25	31	12	1.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29	15	100	8.4	3.3
Lead (aqua regia extractable)	mg/kg	1	MCERTS	92	11	200	4.9	< 1.0
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.8	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	27	20	12	1.1
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.0	1.3	1.2	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	43	43	23	2.1
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	41	390	26	6.6

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-44384

Project / Site name: Station Hill, Reading
Your Order No: 35248-DO

Lab Sample Number				1238604	1238605	1238606	1238607	1238608
Sample Reference				BH203	BH203	BH203	BH203	BH203
Sample Number				1	3	5	7	8
Depth (m)				1.30-1.50	2.40-2.60	4.00-4.10	7.00-7.20	8.20-8.40
Date Sampled				04/06/2019	04/06/2019	04/06/2019	04/06/2019	04/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	8.7	< 2.0	8.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	38	< 8.0	30	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	170	< 8.0	210	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	220	< 10	250	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	12	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	17	< 2.0	2.7	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	86	< 10	28	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	330	< 10	210	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	450	< 10	240	< 10	< 10

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-44384

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1238604	BH203	1	1.30-1.50	Brown clay and sand with gravel.
1238605	BH203	3	2.40-2.60	Grey clay.
1238606	BH203	5	4.00-4.10	Black clay and sand with gravel.
1238607	BH203	7	7.00-7.20	Brown sandy clay.
1238608	BH203	8	8.20-8.40	White clay with chalk.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-44384

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-45566

Project / Site name:	Station Hill Reading	**Samples received on:**	13/06/2019
Your job number:	35248	**Samples instructed on:**	13/06/2019
Your order number:	35248-DO	**Analysis completed by:**	20/06/2019
Report Issue Number:	1	**Report issued on:**	20/06/2019
Samples Analysed:	5 soil samples		

Signed:

Rexona Rahman
Head of Customer Services
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45566

Project / Site name: Station Hill Reading
Your Order No: 35248-DO

Lab Sample Number				1244909	1244910	1244911	1244912	1244913
Sample Reference				BH204	BH204	BH204	BH204	BH204
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.70	1.30-1.50	2.90-3.00	4.10-4.30	5.60-5.80
Date Sampled				11/06/2019	12/06/2019	12/06/2019	12/06/2019	12/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	17	14	11	24
Total mass of sample received	kg	0.001	NONE	2.0	1.6	1.9	2.0	2.0
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.8	8.0	8.0	8.5	8.8
Total Cyanide	mg/kg	1	MCERTS	< 1	2	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.32	0.14	0.42	0.023	0.018
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.55	1.6	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.64	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.34	0.95	0.35	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.6	11	0.41	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.7	2.9	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	10	29	1.0	< 0.05	0.41
Pyrene	mg/kg	0.05	MCERTS	9.0	27	0.94	< 0.05	0.47
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.7	17	0.45	< 0.05	0.27
Chrysene	mg/kg	0.05	MCERTS	4.8	15	0.52	< 0.05	0.29
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	4.1	15	0.35	< 0.05	0.24
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.6	10	0.27	< 0.05	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4.8	16	0.34	< 0.05	0.28
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.7	10	< 0.05	< 0.05	0.20
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.80	2.6	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.7	12	< 0.05	< 0.05	0.26
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	56.5	172	4.65	< 0.80	2.66
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	22	5.1	7.6	3.2
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	0.83	0.23	0.26	< 0.06
Boron (water soluble)	mg/kg	0.2	MCERTS	2.1	4.5	1.3	0.3	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	24	10	10	1.5
Copper (aqua regia extractable)	mg/kg	1	MCERTS	70	71	7.4	8.2	2.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	150	760	10	3.4	1.6
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	38	10	9.3	2.8
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	37	16	17	1.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	270	27	20	11

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45566

Project / Site name: Station Hill Reading
Your Order No: 35248-DO

Lab Sample Number				1244909	1244910	1244911	1244912	1244913
Sample Reference				BH204	BH204	BH204	BH204	BH204
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.70	1.30-1.50	2.90-3.00	4.10-4.30	5.60-5.80
Date Sampled				11/06/2019	12/06/2019	12/06/2019	12/06/2019	12/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	1.2	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.2	3.1	9.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	10	50	130	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	29	65	140	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	74	45	46	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	110	160	330	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	5.7	1.7	9.1	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	11	5.3	100	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	88	72	150	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	210	110	68	< 10	16
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	310	190	320	< 10	22

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45566

Project / Site name: Station Hill Reading
Your Order No: 35248-DO

Lab Sample Number				1244909	1244910	1244911	1244912	1244913
Sample Reference				BH204	BH204	BH204	BH204	BH204
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.70	1.30-1.50	2.90-3.00	4.10-4.30	5.60-5.80
Date Sampled				11/06/2019	12/06/2019	12/06/2019	12/06/2019	12/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Chloroethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Bromomethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Styrene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Tribromomethane	µg/kg	1	NONE	-	< 1.0	< 1.0	-	-
o-Xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0	< 1.0	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45566

Project / Site name: Station Hill Reading
Your Order No: 35248-DO

Lab Sample Number				1244909	1244910	1244911	1244912	1244913
Sample Reference				BH204	BH204	BH204	BH204	BH204
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.70	1.30-1.50	2.90-3.00	4.10-4.30	5.60-5.80
Date Sampled				11/06/2019	12/06/2019	12/06/2019	12/06/2019	12/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2	-	-
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	1.0	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	1.6	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	0.64	< 0.05	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	0.4	< 0.2	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Fluorene	mg/kg	0.05	MCERTS	-	0.95	0.35	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	11	0.41	-	-
Anthracene	mg/kg	0.05	MCERTS	-	2.9	< 0.05	-	-
Carbazole	mg/kg	0.3	MCERTS	-	1.3	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	1.0	< 0.3	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	29	1.0	-	-
Pyrene	mg/kg	0.05	MCERTS	-	27	0.94	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	17	0.45	-	-
Chrysene	mg/kg	0.05	MCERTS	-	15	0.52	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	15	0.35	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	10	0.27	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	16	0.34	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	10	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	2.6	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	12	< 0.05	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45566

Project / Site name: Station Hill Reading
Your Order No: 35248-DO

Lab Sample Number				1244909	1244910	1244911	1244912	1244913
Sample Reference				BH204	BH204	BH204	BH204	BH204
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60-0.70	1.30-1.50	2.90-3.00	4.10-4.30	5.60-5.80
Date Sampled				11/06/2019	12/06/2019	12/06/2019	12/06/2019	12/06/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	< 0.001	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	< 0.007	-	-	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-45566

Project / Site name: Station Hill Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1244909	BH204	None Supplied	0.60-0.70	Light brown clay and sand with gravel.
1244910	BH204	None Supplied	1.30-1.50	Brown clay and sand with gravel and clinker.
1244911	BH204	None Supplied	2.90-3.00	Light brown clay and sand with gravel.
1244912	BH204	None Supplied	4.10-4.30	Light brown clay and sand with gravel and chalk.
1244913	BH204	None Supplied	5.60-5.80	Beige clay and sand with gravel and chalk.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-45566

Project / Site name: Station Hill Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-45728

Project / Site name:	Station Hill, Reading	**Samples received on:**	14/06/2019
Your job number:	35248	**Samples instructed on:**	14/06/2019
Your order number:	3548-DO	**Analysis completed by:**	21/06/2019
Report Issue Number:	1	**Report issued on:**	21/06/2019
Samples Analysed:	1 soil sample		

Signed: K. Lewicka

Katarzyna Lewicka
Head of Reporting Section
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45728

Project / Site name: Station Hill, Reading
Your Order No: 3548-DO

Lab Sample Number				1245918				
Sample Reference				BH204				
Sample Number				None Supplied				
Depth (m)				8.40-8.70				
Date Sampled				14/06/2019				
Time Taken				1700				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	20				
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0				
Chloroethane	µg/kg	1	NONE	< 1.0				
Bromomethane	µg/kg	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/kg	1	NONE	< 1.0				
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0				
1,1-Dichloroethene	µg/kg	1	NONE	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloromethane	µg/kg	1	MCERTS	< 1.0				
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0				
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0				
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0				
Benzene	µg/kg	1	MCERTS	< 1.0				
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0				
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0				
Trichloroethene	µg/kg	1	MCERTS	< 1.0				
Dibromomethane	µg/kg	1	MCERTS	< 1.0				
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0				
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0				
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/kg	1	NONE	< 1.0				
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0				
Chlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-Xylene	µg/kg	1	MCERTS	< 1.0				
Styrene	µg/kg	1	MCERTS	< 1.0				
Tribromomethane	µg/kg	1	NONE	< 1.0				
o-Xylene	µg/kg	1	MCERTS	< 1.0				
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0				
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0				
Bromobenzene	µg/kg	1	MCERTS	< 1.0				
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0				
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Butylbenzene	µg/kg	1	MCERTS	< 1.0				
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0				
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0				
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-45728

Project / Site name: Station Hill, Reading
Your Order No: 3548-DO

Lab Sample Number				1245918				
Sample Reference				BH204				
Sample Number				None Supplied				
Depth (m)				8.40-8.70				
Date Sampled				14/06/2019				
Time Taken				1700				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-45728

Project / Site name: Station Hill, Reading

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1245918	BH204	None Supplied	8.40-8.70	White clay and gravel with chalk.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-45728

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-48596

Replaces Analytical Report Number : 19-48596, issue no. 1

Project / Site name:	Station Hill, Reading	**Samples received on:**	05/07/2019
Your job number:	35248	**Samples instructed on:**	05/07/2019
Your order number:	35248-DO	**Analysis completed by:**	25/07/2019
Report Issue Number:	2	**Report issued on:**	25/07/2019
Samples Analysed:	6 water samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260151	1260152	1260153	1260154	1260155
Sample Reference				BH201	BH202D	BH203	BH204	BH205C
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.23M	3.10M	2.69M	3,44M	2.25M
Date Sampled				04/07/2019	04/07/2019	04/07/2019	04/07/2019	04/07/2019
Time Taken				1045	1105	1130	1300	1020
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.8	7.7	7.8	7.6	7.4
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	49300	50400	45200	445000	110000
Sulphate as SO_4	mg/l	0.045	ISO 17025	49.3	50.4	45.2	445	110
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	20	660	49	1200	130
Hardness - Total	mgCaCO3/l	1	ISO 17025	361	348	344	293	405
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	1.94	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.64	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.34	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.68	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	3.33	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.69	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	7.16	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	6.12	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	2.90	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	3.12	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	3.69	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	1.55	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	3.25	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	2.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.58	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	2.33	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16	40.3	< 0.16

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260151	1260152	1260153	1260154	1260155
Sample Reference				BH201	BH202D	BH203	BH204	BH205C
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.23M	3.10M	2.69M	3,44M	2.25M
Date Sampled				04/07/2019	04/07/2019	04/07/2019	04/07/2019	04/07/2019
Time Taken				1045	1105	1130	1300	1020
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.48	0.31	0.51	1.91	1.19
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Boron (dissolved)	µg/l	10	ISO 17025	63	140	59	89	170
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0.02	0.06	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	130	130	130	86	150
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	U/S	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	U/S	6.7
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.6	< 0.2	0.7	1.1	6.7
Copper (dissolved)	µg/l	0.5	ISO 17025	3.1	3.3	1.5	0.8	6.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	0.9	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	6.2	8.4	6.3	19	8.7
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	0.15	0.32	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	4.3	15	4.9	13	29
Selenium (dissolved)	µg/l	0.6	ISO 17025	4.1	1.8	3.4	8.8	3.5
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.6	0.3	1.2	1.6	0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.9	3.2	1.2	9.4	4.4
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	7.6	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	13.4	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	3.6	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	390	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	200	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	350	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	3000	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	3900	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	34	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	330	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	660	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	190	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	1200	< 10

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260151	1260152	1260153	1260154	1260155
Sample Reference				BH201	BH202D	BH203	BH204	BH205C
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.23M	3.10M	2.69M	3,44M	2.25M
Date Sampled				04/07/2019	04/07/2019	04/07/2019	04/07/2019	04/07/2019
Time Taken				1045	1105	1130	1300	1020
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Bromomethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/l	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/l	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Benzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dichloropropane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Toluene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/l	1	ISO 17025	-	-	11.1	< 1.0	-
1,2-Dibromoethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	7.6	-
p & m-Xylene	µg/l	1	ISO 17025	-	-	< 1.0	13.4	-
Styrene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
o-Xylene	µg/l	1	ISO 17025	-	-	< 1.0	3.6	-
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Bromobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	5.6	-
tert-Butylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	4.0	-
sec-Butylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	-	-	< 1.0	< 1.0	-

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260151	1260152	1260153	1260154	1260155
Sample Reference				BH201	BH202D	BH203	BH204	BH205C
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.23M	3.10M	2.69M	3,44M	2.25M
Date Sampled				04/07/2019	04/07/2019	04/07/2019	04/07/2019	04/07/2019
Time Taken				1045	1105	1130	1300	1020
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Phenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2-Chlorophenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
1,3-Dichlorobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
1,2-Dichlorobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
1,4-Dichlorobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2-Methylphenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Hexachloroethane	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Nitrobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
4-Methylphenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Isophorone	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2-Nitrophenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2,4-Dimethylphenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Naphthalene	µg/l	0.01	ISO 17025	-	-	< 0.01	1.9	-
2,4-Dichlorophenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
4-Chloroaniline	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Hexachlorobutadiene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
4-Chloro-3-methylphenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2,4,6-Trichlorophenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2,4,5-Trichlorophenol	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2-Methylnaphthalene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2-Chloronaphthalene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Dimethylphthalate	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
2,6-Dinitrotoluene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Acenaphthylene	µg/l	0.01	ISO 17025	-	-	< 0.01	0.64	-
Acenaphthene	µg/l	0.01	ISO 17025	-	-	< 0.01	0.34	-
2,4-Dinitrotoluene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Dibenzofuran	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Diethyl phthalate	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
4-Nitroaniline	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Fluorene	µg/l	0.01	ISO 17025	-	-	< 0.01	0.68	-
Azobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Bromophenyl phenyl ether	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Hexachlorobenzene	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Phenanthrene	µg/l	0.01	ISO 17025	-	-	< 0.01	3.3	-
Anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	0.69	-
Carbazole	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Dibutyl phthalate	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Anthraquinone	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	7.2	-
Pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	6.1	-
Butyl benzyl phthalate	µg/l	0.05	NONE	-	-	< 0.05	< 0.05	-
Benzo(a)anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	2.9	-
Chrysene	µg/l	0.01	ISO 17025	-	-	< 0.01	3.1	-
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	3.7	-
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	-	-	< 0.01	1.6	-
Benzo(a)pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	3.3	-
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	-	-	< 0.01	2.0	-
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	-	-	< 0.01	0.58	-
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	-	-	< 0.01	2.3	-
PCBs by GC-MS								
PCB Congener 28	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCB Congener 52	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260151	1260152	1260153	1260154	1260155
Sample Reference				BH201	BH202D	BH203	BH204	BH205C
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.23M	3.10M	2.69M	3,44M	2.25M
Date Sampled				04/07/2019	04/07/2019	04/07/2019	04/07/2019	04/07/2019
Time Taken				1045	1105	1130	1300	1020
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCB Congener 101	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCB Congener 118	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCB Congener 138	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCB Congener 153	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCB Congener 180	µg/l	0.02	NONE	-	-	-	< 0.02	< 0.02
PCBs by GC-MS								
Total PCBs	µg/l	0.14	NONE	-	-	-	< 0.14	< 0.14

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260156				
Sample Reference				WS203				
Sample Number				None Supplied				
Depth (m)				2.97M				
Date Sampled				04/07/2019				
Time Taken				1145				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	45	ISO 17025	121000				
Sulphate as SO_4	mg/l	0.045	ISO 17025	121				
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	940				
Hardness - Total	mgCaCO3/l	1	ISO 17025	567				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260156				
Sample Reference				WS203				
Sample Number				None Supplied				
Depth (m)				2.97M				
Date Sampled				04/07/2019				
Time Taken				1145				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.57				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Boron (dissolved)	µg/l	10	ISO 17025	270				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04				
Calcium (dissolved)	mg/l	0.012	ISO 17025	200				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (III)	µg/l	1	NONE	< 1.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3				
Copper (dissolved)	µg/l	0.5	ISO 17025	2.8				
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	16				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.6				
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.4				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.6				
Zinc (dissolved)	µg/l	0.5	ISO 17025	57				
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260156				
Sample Reference				WS203				
Sample Number				None Supplied				
Depth (m)				2.97M				
Date Sampled				04/07/2019				
Time Taken				1145				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/l	1	NONE	< 1.0				
Trichlorofluoromethane	µg/l	1	NONE	< 1.0				
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0				
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-Xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0				
o-Xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0				
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0				
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0				
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260156				
Sample Reference				WS203				
Sample Number				None Supplied				
Depth (m)				2.97M				
Date Sampled				04/07/2019				
Time Taken				1145				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	µg/l	0.05	NONE	< 0.05				
Phenol	µg/l	0.05	NONE	< 0.05				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				
PCBs by GC-MS								
PCB Congener 28	µg/l	0.02	NONE	-				
PCB Congener 52	µg/l	0.02	NONE	-				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-48596

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1260156				
Sample Reference				WS203				
Sample Number				None Supplied				
Depth (m)				2.97M				
Date Sampled				04/07/2019				
Time Taken				1145				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCB Congener 101	µg/l	0.02	NONE	-				
PCB Congener 118	µg/l	0.02	NONE	-				
PCB Congener 138	µg/l	0.02	NONE	-				
PCB Congener 153	µg/l	0.02	NONE	-				
PCB Congener 180	µg/l	0.02	NONE	-				
PCBs by GC-MS								
Total PCBs	µg/l	0.14	NONE	-				

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-48596

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
PCB's By GC-MS in water	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-48596

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Andrew Tatnell
Geotechnical Engineering Ltd
Centurion House
Olympus Park
Quedgeley
Gloucester
GL2 4NF

t: 01452 527 743
f: 01452 729 314
e: andrew.tatnell@geoeng.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 19-49450

Project / Site name:	Station Hill, Reading	**Samples received on:**	11/07/2019
Your job number:	35248	**Samples instructed on:**	11/07/2019
Your order number:	35248-DO	**Analysis completed by:**	17/07/2019
Report Issue Number:	1	**Report issued on:**	24/07/2019
Samples Analysed:	1 water sample		

Signed:

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-49450

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1264900				
Sample Reference				WS202				
Sample Number				None Supplied				
Depth (m)				2.64				
Date Sampled				10/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	45	ISO 17025	34500				
Sulphate as SO_4	mg/l	0.045	ISO 17025	34.5				
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	810				
Hardness - Total	mgCaCO3/l	1	ISO 17025	435				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.65				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Boron (dissolved)	µg/l	10	ISO 17025	71				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.06				
Calcium (dissolved)	mg/l	0.012	ISO 17025	160				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (III)	µg/l	1	NONE	2.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	2.0				
Copper (dissolved)	µg/l	0.5	ISO 17025	17				
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	8.8				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	7.7				
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.5				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Zinc (dissolved)	µg/l	0.5	ISO 17025	34				

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 19-49450

Project / Site name: Station Hill, Reading

Your Order No: 35248-DO

Lab Sample Number				1264900				
Sample Reference				WS202				
Sample Number				None Supplied				
Depth (m)				2.64				
Date Sampled				10/07/2019				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

U/S = Unsuitable Sample I/S = Insufficient Sample

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 19-49450

Project / Site name: Station Hill, Reading

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

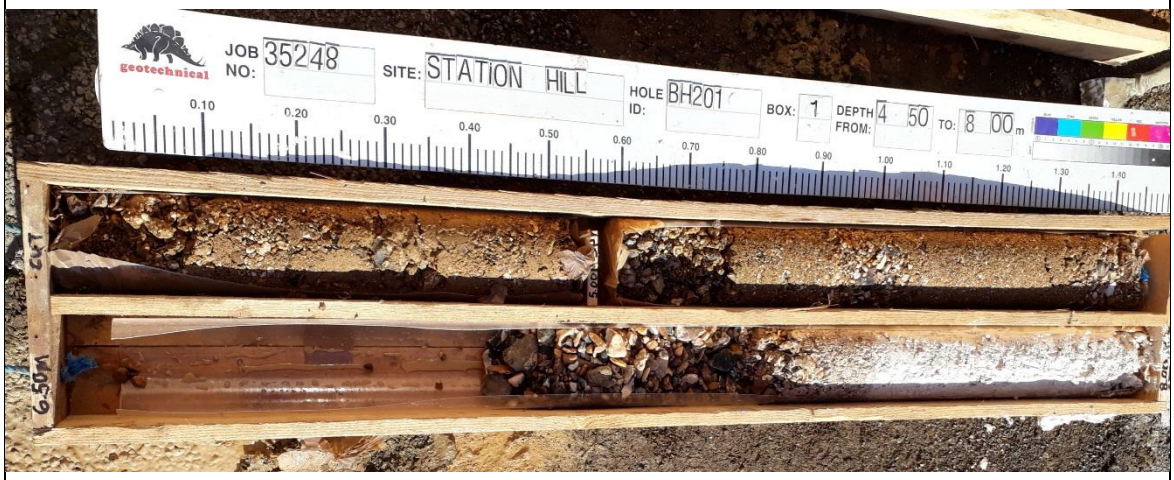
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

APPENDIX D

PHOTOGRAPHS



Borehole: BH201 Box 1: 1.30-4.50m



Borehole: BH201 Box 2: 4.50-8.00m



Borehole: BH201 Box 3: 8.00-10.00m



Borehole: BH201 Box 4: 10.00-13.00m



Borehole: BH201 Box 5: 13.00-16.00m



Borehole: BH201 Box 6: 16.00-19.00m

Not Available.

Borehole: BH201 Box 7: 19.00-22.00m



Borehole: BH201 Box 8: 22.00-25.00m



Borehole: BH201 Box 9: 25.00-28.00m



Borehole: BH201 Box 10: 28.00-31.00m



Borehole: BH201 Box 11: 31.00-34.00m



Borehole: BH201 Box 12: 34.00-35.50m



Borehole: BH202D Box 1: 1.20-4.00m



Borehole: BH202D Box 2: 4.00-7.00m



Borehole: BH202D Box 3: 7.00-8.50m



Borehole: BH202D Box 4: 8.50-10.00m



Borehole: BH202D Box 5: 10.00-15.00m



Borehole: BH202D Box 6: 15.00-18.00m



Borehole: BH202D Box 7: 18.00-21.00m



Borehole: BH202D Box 8: 21.00-24.00m



Borehole: BH202D Box 9: 24.00-27.00m



Borehole: BH202D Box 10: 27.00-30.00m



Borehole: BH202D Box 11: 30.00-33.00m



Borehole: BH202D Box 12: 33.00-36.00m



Borehole: BH202D Box 13: 36.00-39.00m



Borehole: BH202D Box 14: 39.00-40.50m



Borehole: BH203 Box 1: 1.20-5.00m



Borehole: BH203 Box 2: 5.00-7.50m



Borehole: BH203 Box 3: 7.50-10.50m



Borehole: BH203 Box 4: 10.50-13.00m



Borehole: BH203 Box 5: 13.50-16.50m



Borehole: BH203 Box 6: 16.50-19.50m



Borehole: BH203 Box 7: 19.50-22.50m



Borehole: BH203 Box 8: 22.50-25.50m



Borehole: BH203 Box 9: 25.50-28.50m



Borehole: BH203 Box 10: 28.50-31.50m



Borehole: BH203 Box 11: 31.50-34.50m



Borehole: BH203 Box 12: 34.50-37.50m



Borehole: BH203 Box 13: 37.50-40.50m



Borehole: BH204 Box 1: 1.20-4.00m



Borehole: BH204 Box 2: 4.00-7.00m



Borehole: BH204 Box 3: 7.00-10.50m



Borehole: BH204 Box 4: 10.50-13.00m



Borehole: BH204 Box 5: 13.50-16.50m



Borehole: BH204 Box 6: 16.50-21.00m



Borehole: BH204 Box 7: 21.00-24.00m



Borehole: BH204 Box 8: 24.00-27.00m



Borehole: BH204 Box 9: 27.00-30.00m



Borehole: BH204 Box 10: 30.00-33.00m



Borehole: BH204 Box 11: 33.00-36.00m



Borehole: BH204 Box 12: 36.00-39.00m



Borehole: BH204 Box 13: 39.00-40.50m



Borehole: BH205C Box 1: 1.20-4.00m



Borehole: BH205C Box 2: 4.00-6.00m



Borehole: BH205C Box 3: 6.00-9.00m



Borehole: BH205C Box 4: 9.0-12.50m



Borehole: BH205C Box 5: 12.50-15.50m



Borehole: BH205C Box 6: 15.50-17.00m



Borehole: BH205C Box 7: 17.00-18.50m



Borehole: BH205C Box 8: 18.50-21.50m



Borehole: BH205C Box 9: 21.50-24.50m



Borehole: BH205C Box 10: 24.50-27.50m



Borehole: BH205C Box 11: 27.50-30.50m



Borehole: BH205C Box 12: 30.50-33.50m



Borehole: BH205C Box 10: 33.50-36.50m



Borehole: BH205C Box 11: 36.50-38.00m



Trial Pit: TP202 1.50m



Trial Pit: TP202 1.50m



Trial Pit: TP202 1.50m



Trial Pit: TP202 Backfilled



Trial Pit: TP203 4.30m



Trial Pit: TP203 Spoil



Trial Pit: TP203 Backfill



Trial Pit: TP204 0.65m



Trial Pit: TP204 Backfill



Trial Pit: TP205 3.00m



Trial Pit: TP205 3.00m



Trial Pit: TP205 Spoil



Trial Pit: TP205 Backfill



Trial Pit: TP206 2.50m



Trial Pit: TP206 Backfill



Trial Pit: TP208 2.20m



Trial Pit: TP209 Backfill