

WE LISTEN, WE PLAN, WE DELIVER

Geotechnical Engineering and Environmental Services across the UK

GEO-ENVIRONMENTAL & GEOTECHNICAL ASSESSMENT (GROUND INVESTIGATION) REPORT

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON
N17 7AB



JOMAS ASSOCIATES LTD

Unit 24 Sarum Complex, Salisbury Road, Uxbridge, UB8 2RZ

www.jomasassociates.com 0333-305-9054 info@jomasassociates.com

Report Title: Geo-environmental & Geotechnical Assessment Ground Investigation Report for 313-315 The Roundway and 8-12 Church Lane, London N17 7AB

Report Status: Final

Job No: P5141J2799/CLP

Date: 04 July 2023

QUALITY CONTROL – REVISIONS

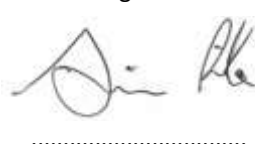
Version	Date	Issued By	Comment

Prepared by: JOMAS ASSOCIATES LTD **For:** IPE ROUNDWAY LIMITED

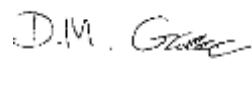
Prepared by
Hamza Hashi MEng (Hons)
Junior Engineer


.....

Reviewed by
Simon Pike BSc (Hons), MSc,
MIEEnvSc
Senior Principal Geo-Environmental
Engineer


.....

Approved by
Derek Grange BSc, MSc, CGeol,
FGS, RoGEP - Specialist
Senior Principal - Geotechnics


.....

Should you have any queries relating to this report, please contact

JOMAS ASSOCIATES LTD

www.jomasassociates.com

0333 305 9054

info@jomasassociates.com

CONTENTS

	Page
EXECUTIVE SUMMARY	V
1 INTRODUCTION	1
1.1 Terms of Reference	1
1.2 Proposed Development	1
1.3 Objectives	1
1.4 Scope of Works	1
1.5 Supplied Documentation	2
1.6 Limitations	2
2 DESK STUDY SUMMARY	4
2.1 Site Information	4
2.2 Site Walkover	4
2.3 Previous Ground Investigations	5
2.4 Summary of Preliminary Risk Assessment (Desk Study)	5
3 GROUND INVESTIGATION	9
3.1 Scope of Works	9
3.2 In-situ Geotechnical Testing	9
3.3 Laboratory Analysis	10
4 GROUND CONDITIONS ENCOUNTERED	13
4.1 General	13
4.2 Ground Conditions	13
4.3 Groundwater	14
4.4 Physical and Olfactory Evidence of Contamination	15
4.5 Limitations	15

5	RISK ASSESSMENT – ANALYTICAL FRAMEWORK.....	16
5.1	Context and Objectives	16
5.2	Analytical Framework – Soils.....	16
5.3	BRE.....	17
5.4	Analytical Framework – Groundwater and Leachate	17
6	GENERIC QUANTITATIVE RISK ASSESSMENT – SOIL DATA.....	20
6.1	Screening of Soil Chemical Analysis Results – Human Health Risk Assessment	20
6.2	Asbestos in Soil	22
6.3	Volatile Organic Compounds	22
6.4	Polychlorinated Biphenyl (PCB) Concentrations	22
6.5	Vapour Risk Assessment from a Soil Source	22
6.6	Summary of Human Health Generic Quantitative Risk Assessment	23
6.7	Screening of Soil Chemical Analysis Results – Potential Risks to Plant Growth	23
6.8	Screening for Water Pipes Materials	24
6.9	Assessment of Soil Analytical Data with Respect to Controlled Waters	24
6.10	Waste Characterisation	25
7	GENERIC QUANTITATIVE RISK ASSESSMENT – GROUNDWATER DATA	26
7.1	Groundwater sampling.....	26
7.2	Assessment of groundwater analytical data with respect to controlled waters.....	26
7.3	Assessment of Groundwater Analytical Data with Respect to Vapour Intrusion Pathways	29
8	SOIL GAS RISK ASSESSMENT	31
8.1	Soil Gas Results	31
8.2	Screening of Results	31
9	GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND RECOMMENDATIONS	33
9.1	Land Quality Impact Summary	33

9.2	Review of Pollutant Linkages Following Ground Investigation	34
10	DERIVATION OF GEOTECHNICAL PARAMETERS	37
10.1	Introduction	37
10.2	Plasticity of Cohesive Materials	37
10.3	Standard Penetration Tests	38
10.4	Undrained Shear Strength	39
10.5	Coefficient of Compressibility	40
10.6	Bulk Density	41
10.7	Effective Angle of Shearing Resistance / Angle of Friction	42
10.8	Stiffness Moduli	43
10.9	Summary of Derived General Properties	43
11	GEOTECHNICAL ENGINEERING RECOMMENDATIONS	45
11.1	General	45
11.2	Proposed Foundations	45
11.3	Aggressive Ground Conditions	46
11.4	Ground Floor Slabs	47
11.5	Excavations	47
11.6	Surface Water Drainage	48
11.7	Groundwater Control	48
12	REFERENCES	49

APPENDICES

APPENDIX 1 – FIGURES

APPENDIX 2 – EXPLORATORY HOLE RECORDS

APPENDIX 3 – CHEMICAL LABORATORY TEST RESULTS**APPENDIX 4 – GEOTECHNICAL LABORATORY TEST RESULTS****APPENDIX 6 – SOIL GAS MONITORING RESULTS****APPENDIX 7 – GROUNDWATER SAMPLING RECORDS**

EXECUTIVE SUMMARY

Site Details	Site Address	313-315 The Roundway and 8-12 Church Lane, London N17 7AB
	National Grid	E: 533328, N: 190658
	Site Area	0.42Ha (approx.)
	Proposed Development	It is understood that the development proposals comprise the demolition of the current buildings and construction of a three to five storey development of 76 new homes and 541sqm of retail and workspace at ground level. Private and communal soft landscaping is anticipated.
Encountered Conditions	Scope of Works	The assessment incorporated a desk study to determine the site's setting to inform a preliminary risk assessment followed by an intrusive investigation to confirm the ground and groundwater conditions and support the development of a geotechnical and geo-environmental assessment.
	Ground Conditions	The ground conditions encountered broadly consistent with those anticipated from the desk study, and comprised Made Ground, to depths of up to 3.0m, underlain locally by the Enfield Silt Member, underlain by the Taplow Gravel Member, to depths of up to 4.0m, underlain by clay of the London Clay Formation to the base of the boreholes (maximum depth of 20.45m).
	Groundwater	During the investigation groundwater was reported within Window Sample boreholes WS3, WS3 at 3.0mbgl depth. Groundwater was not reported within the remaining boreholes; however water was added to aid drilling within the cable percussive boreholes and could have masked groundwater strikes. During return monitoring groundwater was reported at depths of between 0.49m and 3.70mbgl.
Geo-environmental Assessment Summary and Recommendations		Following generic risk assessments, elevated concentrations of lead were detected in soils in excess of generic assessment criteria for the protection of human health within a residential with plant uptake end-use scenario. These have the potential to cause significant harm to human health in the context of the proposed development and some remediation is required. No asbestos fibres were detected in the samples analysed in the laboratory. The site proposal indicates that the majority of the site will remain covered by a combination of the proposed building footprint and hard surfacing. Where this is the case, no formal remedial measures are considered necessary in terms of human health, as the building and hard surfacing are expected to provide a barrier to potential receptors. In areas of gardens/soft landscaping, it would be prudent to replace Made Ground with approximately 450mm of imported clean topsoil, placed on a geotextile membrane. The risk to controlled waters from soils is considered low, however further groundwater sampling and testing is recommended, particularly from the monitoring well, WS5. Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary. As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out, and caution must be exercised during construction works. Should any contamination be encountered, a suitably qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.
Geotechnic	Foundations	A piled foundation would be suitable and indicative pile carrying capacities are given in Table 11.1.
	Sulphates	Buried concrete for foundations should be designed to Class DS-3 (AC-3s).

	Ground Floor Slabs	Given the presence of shrinkable soils and the recommended piling at the site, it is recommended that suspended floor slabs are used with an adequate void designed according to NHBC Standards. As a guide, initial modelling indicates a requirement for a sub-floor void of at least 300mm due to the presence of shrinkable soils of high volume change potential.
	Excavations	Temporary excavations are unlikely to remain stable and some form of temporary support or battering back to a safe angle and dewatering are likely to be required. Subject to seasonal variations, surface water/groundwater encountered during site works could likely be dealt with by conventional pumping from a sump used to collate waters.
	Surface Water Drainage	Based on the results of in-situ testing, and ground conditions encountered, conventional soakaways are not likely to be suitable and an alternative drainage solution should be sought.
Recommended Further Work		The following works are recommended: • Additional groundwater sampling and testing to further assess the risk to the controlled waters. • Production of a Materials Management Plan (MMP) prior to commencement of works to ensure legal compliance of on-site soil movement; • Seek approval of the Generic Quantitative Risk Assessment and Soil Gas Assessment from the Local Authority, NHBC and other relevant stakeholders; • Provision of a Remediation Method Statement (RMS); • Seek confirmation of the water supply pipe requirements by the appropriate service provider.
<i>This Executive Summary is intended to provide a brief summary of the main findings and conclusions of the investigation. For detailed information, the reader is referred to the main report ref. P5141J2799.</i>		

1 INTRODUCTION

1.1 Terms of Reference

- 1.1.1 IPE Roundway Limited ("The Client") has commissioned Jomas Associates Ltd ('Jomas') to undertake an investigation of the geotechnical and geo-environmental factors pertaining to the proposed development at a site referred to as 313-315 The Roundway and 8-12 Church Lane, London N17 7AB (herein referred to as 'the site'). The site's location is presented in Figure 1.
- 1.1.2 A Phase 1 Desk Study has been produced for the site and issued separately (detailed in Table 1.1 below), followed by an intrusive investigation (detailed in this report).
- 1.1.3 An intrusive investigation has been undertaken in accordance with Jomas' proposal dated 4th May 2023.

1.2 Proposed Development

- 1.2.1 The proposed development is to comprise the demolition of the current buildings and construction of a three to five storey development of 76 new homes and 541sqm of retail and workspace at ground level. Private and communal soft landscaping is anticipated.
- 1.2.2 For the purpose of geo-environmental assessment and selection of generic assessment criteria, the development is considered "residential with home grown produce".
- 1.2.3 A plan of the proposed development is provided as Figure 3.
- 1.2.4 For the purpose of geotechnical assessment, it is considered that the project could be classified as a Geotechnical Category (GC) 2 site in accordance with BS EN 1997.

1.3 Objectives

- 1.3.1 The objectives of Jomas' investigation are as follows:
- To undertake an intrusive investigation, to determine the ground and groundwater conditions as well as to assess the nature and extent of contaminants (if any) potentially present at the site;
 - To establish the presence of significant pollutant linkages, in accordance with the procedures set out within Part IIA of the Environmental Protection Act 1990, associated statutory guidance and current best practice including the EA land contamination risk management (LCRM) guidance; and,
 - To determine soil properties to inform the preliminary geotechnical assessment for foundations, drainage, excavation stability and buried concrete and recommendations for further action (if required).

1.4 Scope of Works

- 1.4.1 The following tasks were undertaken to achieve the objectives listed above:
- Intrusive ground investigation to determine shallow ground conditions, and potential for contamination to be present at the site;

- Undertaking of laboratory chemical and geotechnical testing upon samples obtained;
- Return ground gas/groundwater monitoring;
- The compilation of this report, which collects and discusses the above data, and presents an assessment of the site conditions, conclusions and recommendations.

1.5 Supplied Documentation

- 1.5.1 A number of relevant reports prepared by or supplied to Jomas Associates prior to the commencement of this investigation are detailed in Table 1.1:

Table 1.1: Previous/Supplied Reports

Title	Author	Reference	Date
Desk Study/Preliminary Risk Assessment Report for 313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Jomas Associates Ltd	P5141J2799/CLP	24 th May 2023

1.6 Limitations

- 1.6.1 Jomas has prepared this report for the sole use of IPE Roundway Limited, in accordance with the generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of Jomas. No other third party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety.
- 1.6.2 The records search was limited to information available from public sources; this information is changing continually and frequently incomplete. Unless Jomas has actual knowledge to the contrary, information obtained from public sources or provided to Jomas by site personnel and other information sources, have been assumed to be correct. Jomas does not assume any liability for the misinterpretation of information or for items not visible, accessible or present on the subject property at the time of this study.
- 1.6.3 Whilst every effort has been made to ensure the accuracy of the data supplied, and any analysis derived from it, there may be conditions at the site that have not been disclosed by the investigation, and could not therefore be taken into account. As with any site, there may be differences in soil conditions between exploratory hole positions. Furthermore, it should be noted that groundwater conditions may vary due to seasonal and other effects and may at times be significantly different from those measured by the investigation. No liability can be accepted for any such variations in these conditions.
- 1.6.4 Any reports provided to Jomas have been reviewed in good faith. Jomas cannot be held liable for any errors or omissions in these reports, or for any incorrect interpretation contained within them.
- 1.6.5 This investigation and report has been carried out in accordance with the relevant standards and guidance in place at the time of the works. Future changes to these may require a re-assessment of the recommendations made within this report.
- 1.6.6 **This report is not an engineering design and the figures and calculations contained in the report should be used by the Structural Engineer, taking note that variations may apply,**

depending on variations in design loading, in techniques used, and in site conditions. Our recommendations should therefore not supersede the Engineer's design.

2 DESK STUDY SUMMARY

2.1 Site Information

2.1.1 The site location plan is appended to this report in Figure 1, Appendix 1.

Table 2.1: Site Information

Name of Site	-
Address of Site	313 The Roundway and 8-12 Church Lane, Tottenham, London, N17 7AB
Approx. National Grid Ref.	533328, 190658
Site Area (Approx)	0.42ha
Site Occupation	Mixed commercial and MOT/Vehicle repair garages.
Local Authority	London Borough of Haringey
Proposed Site Use	Demolition of the current buildings and construction of a 3-5No storey development for residential and commercial use. Private and communal soft landscaping is anticipated.

2.2 Site Walkover

2.2.1 A site Walkover survey was undertaken by Jomas on the 11th May 2023.

Table 2.2: Site Description

Area	Item	Details
On-site:	Current Uses:	The site is occupied by various tenants and uses as follows: - LAR MOT garage in the north of the site, which is also used for car parking on the weekends. - Cooking oil collection company in the east of the site, extensive oil barrels and containers outside the main building. The inside of the building was being used as a suspected 'cannabis farm', since the writing of this report, Jomas understand that this has now been removed by the police. - Suspected 'squatters' in the south of the site with extensive amounts of general waste and a stockpile likely originating from fly tipping. - The building in the south west of the site is also occupied by what appears to be an MOT garage with vehicles parked in the accessway. - Evidence of burnt buildings from a previous fire were noted in the middle of the site.

Area	Item	Details
	Evidence of contamination:	Cooking oil was evidently spilled onto the ground surface within the site, as well as evidence of burned materials within the disused MOT garage in the middle of the site. A stockpile was noted in the south of the site which showed varying materials.
	Surfaces:	Much of the site is hard cover either by the buildings or by car parking areas and roadways. The hard cover consists of concrete.
	Vegetation:	Vegetation was not observed on site.
	Topography/Slope Stability:	Overall, the site is relatively flat.
	Drainage:	The site appears to be connected to normal drainage facilities, with some surface water drainage with ponding surrounding the drains. It should be noted that within the cooking oil storage area, extensive drums and containers are being stored with possible leaks into the surface water drainage.
	Services:	Parts of the site are evidently connected to services as the buildings are in use.
	Controlled waters:	No controlled waters were noted on site.
	Tanks:	A potential underground storage tank has been identified in the external area of the MOT garage in the far north east corner of the site.
Neighbouring land:	North:	Residential properties and All Hallows Road.
	East:	Bruce Castle Museum and recreational park area.
	South:	Spurz Autos, Electricity sub station, A10, Hotel with Pub and JFT Motor Services.
	West:	Shell petrol station and The Round Way.

2.3 Previous Ground Investigations

- 2.3.1 Jomas is not aware of any previous intrusive investigation works that have been undertaken on the site.

2.4 Summary of Preliminary Risk Assessment (Desk Study)

- 2.4.1 As detailed in Table 1.1, a Phase 1 Desk Study report has been produced for the site and issued separately (Jomas Associates Ltd – P5141J2799/CLP – 24th May 2023). The findings of the Phase 1 Desk Study are presented in the following section. Reference should be made to the original reports and documents for further details. Comments made in the following section regarding possible ground conditions on the site and within the surrounding area are based purely on the desk study. Where appropriate, this information will be used in the later sections of this report as supplementary information to assist in the evaluation of the ground conditions

and aid the identification of geotechnical and geochemical constraints and hazards that could impact on the scheme.

- 2.4.2 A review of earliest available (1864) historical maps indicates that the site comprised agricultural land. By the map dated 1873, 2No small buildings occupy the site, 1No in the north and 1No in the south west, small outbuildings are also present. By 1913, newly constructed buildings were present in the middle of the site, the uses of the buildings on site are unknown. By 1935, the building in the north had extended to the west, off site and the building in the south west was no longer present. 3No small attached buildings are shown along the southern boundary and rows of small buildings are shown in the middle of the site, possibly representing domestic style garages. By 1992, the main building in the middle of the site is identified as a garage.
- 2.4.3 The surrounding area is shown as mostly agricultural land with few sporadic buildings, including a nursery to the west and Bruce Castle to the east. By 1913, extensive residential developments had occurred to the south and west of the site. By 1935, a substation was present to the south east and by 1955, a garage is shown to the north west and south of the site.
- 2.4.4 Information provided by the British Geological Survey indicates that the site is directly underlain by superficial deposits of the Enfield Silt Member in the east of the site, underlain by superficial deposits of the Taplow Gravel Member across the entire site. These superficial deposits are underlain by solid deposits of the London Clay Formation. No artificial deposits are reported within the site.
- 2.4.5 With reference to British Geological Survey (BGS) records, borehole records from the south west of the site, indicated Made Ground to a depth of around 1.19m bgl underlain by a silty clay with sand lenses (considered to represent the London Clay Formation), to the base of the borehole at approximately 6.71m bgl.
- 2.4.6 The Enfield Silt Member underlying the site are identified as Unproductive and the Taplow Gravel Member is identified as a Secondary A Aquifer with the underlying solid deposits identified as Unproductive.
- 2.4.7 A review of the Enviro+Geosight Report indicates that there are no source protection zones within 500m of the site.
- 2.4.8 There are no groundwater, surface water or potable water abstractions reported within 1km of the site.
- 2.4.9 The nearest detailed river entry is reported 184m west of the site, identified as the Moselle River. There are no Environment Agency Zone 2 or Zone 3 floodplains reported within 50m of the site.
- 2.4.10 An intrusive investigation was recommended to confirm the preliminary geo-environmental risks identified and/or to provide geotechnical information for use in design.
- 2.4.11 A programme of soil gas monitoring was also recommended due to the proximity of a potentially infilled pond 20m north of the site and due to the site use and history.
- 2.4.12 The conceptual site model is reproduced in Table 2.3 overleaf.

Table 2.3: Preliminary Risk Assessment for the Site

Sources	Pathways (P)	Receptors	Consequence of Impact	Probability of Impact	Risk Estimation	Hazard Assessment
- Potential for contaminated ground associated with current site use – on site (S1) - MOT garages in the N and S. - Cooking oil company with extensive waste oil containers. - Stockpile of general waste, possible fly-tipping. - Previously burnt buildings during a fire. - Potential for Made Ground associated with previous development operations – on site (S2) - Potential buried tanks associated with former use as a Garage – on site in NE (S3) - Current and previous industrial use – on and off site (S4) On site – Possible domestic garages. Off site - Garage adjacent to NW and SE. - Garage SE has a licenced pollutant release for the respraying of road vehicles. - Laundry 90m SE. - Garages 50m SE, 200m SW. - Engineering works 200m SW.	- Ingestion and dermal contact with contaminated soil (P1) - Inhalation or contact with potentially contaminated dust and vapours (P2) - Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6)	- Construction workers (R1) - Maintenance workers (R2) - Neighbouring site users (R3) - Future site users (R4) - Building foundations and on site buried services (water mains, electricity and sewer) (R5)	Medium	Likely	Moderate	GI – Ground Investigation
	Accumulation and migration of soil gases (P5)		Severe	Low likelihood	Moderate	
	Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff (P3)	- Neighbouring site users (R3) - Building foundations and on site buried services (water mains, electricity and sewer) (R5) - Controlled Waters (Aquifer) (R6)	Medium	Likely	Moderate	

SECTION 2

DESK STUDY SUMMARY

Sources	Pathways (P)	Receptors	Consequence of Impact	Probability of Impact	Risk Estimation	Hazard Assessment
- Potential for Polychlorinated Biphenyls from substation adjacent to SE (1935) (S5) - Potential ground gas generation from possible degradable material within made ground on site and infilled pond off site 20m N (S6) - Potential asbestos containing materials at the site, particularly in roofing materials (S7)	Horizontal and vertical migration of contaminants within groundwater (P4)					

3 GROUND INVESTIGATION

3.1 Scope of Works

3.1.1 A ground investigation was undertaken on the 18th & 19th May 2023.

3.1.2 A summary of the fieldwork carried out at the site, with justifications for exploratory hole positions, is presented in Table 3.1 below.

Table 3.1: Scope of Intrusive Investigation

Investigation Type	Number of Exploratory Holes Achieved	Exploratory Hole Designation	Depth Achieved	Justification
Windowless Sample Boreholes	5	WS1-5	Up to 5mbgl	Obtain shallow samples for laboratory chemical and geotechnical testing. To allow in-situ geotechnical testing.
Cable Percussion Boreholes	4	BH1, BH3, BH4 & BH5	Up to 20mbgl	Obtain deeper samples for laboratory geotechnical testing. To allow in-situ geotechnical testing.
Hand dug Trial Pits	2	TP1 - 2	N/A	To obtain samples of a stockpile of materials.
Monitoring Wells	5	BH1, BH4, BH5, WS3 & WS5	Up to 5mbgl	Gas and groundwater monitoring wells.

3.1.3 The ground investigation was undertaken in accordance with British Standard BS5930:2015+A1:2020 "Code of practice for ground investigations", British Standard BS10175:2011+A2:2017 "Investigation of potentially contaminated sites - code of practice", NHBC Standards, Chapter 4.1 and AGS Guidelines for Good Practice in Site Investigations.

3.1.4 Exploratory hole positions are shown on the exploratory hole location plan presented in Figure 2, Appendix 1. The exploratory hole records are included in Appendix 2.

3.1.5 Where monitoring well installations were not installed, the exploratory holes were backfilled with the arisings (in the reverse order in which they were drilled) and the ground surface was reinstated so that no depression was left.

3.2 In-situ Geotechnical Testing

3.2.1 In-situ geotechnical testing included Standard Penetration Tests. The determined 'N' values have been used to determine the relative density of granular materials and have been used with standard correlations to infer various other derived geotechnical parameters including the undrained shear strength of the cohesive strata. The results of the individual tests are on the appropriate exploratory hole logs in Appendix 2.

3.2.2 The determination of permeability of the underlying ground was undertaken by carrying out in-situ falling head tests. These were carried out to conform with the methodology for falling

head permeability test formerly outlined in BS: 5930 (1999) and recently in BS EN ISO 22282-2. Copies of the results and calculations are provided in Appendix 7.

3.3 Laboratory Analysis

3.3.1 A programme of laboratory testing, scheduled by Jomas Associates Limited, was carried out on selected samples of Made Ground and natural strata.

Chemical Testing

3.3.2 Chemical testing of soils was undertaken by Terra Tek Site Investigation and Laboratory Services, which holds UKAS and MCERTS accreditations for a wide range of determinands.

3.3.3 The samples were analysed for a wide range of contaminants as shown in Table 3.2 below:

Table 3.2: Chemical Tests Scheduled

Test Suite	No. of tests	
	Made Ground	Natural
Basic Suite 3	5	0
Basic Suite 5	4	0
Total Organic Carbon	3	0
Jomas Modified BRE SD-1 Suite	1	4
TPHCWG (inc BTEX)	4	0
VOCs	4	0
PCBs	1	0
Asbestos Screen & ID	6	0

3.3.4 The determinands contained in the Basic Suite 3 are as detailed in Table 3.3 below. Basic Suite 5 contains the same determinands but without the hydrocarbon compounds to avoid overlapping with the extended hydrocarbon testing.

3.3.5 The Hydrocarbon Suite includes TPHCWG, PAH, phenols and VOCs including BTEX & MTBE.

Table 3.3: Basic Suite of Determinands

DETERMINAND	LIMIT OF DETECTION (mg/kg)	UKAS ACCREDITATION	TECHNIQUE
Arsenic	0.5	M (MCERTS and ISO 17025)	ICPMS
Cadmium	0.1	M (MCERTS and ISO 17025)	ICPMS
Chromium	1	M (MCERTS and ISO 17025)	ICPMS
Chromium (Hexavalent)	0.3	N (Outside of accreditation)	Colorimetry

DETERMINAND	LIMIT OF DETECTION (mg/kg)	UKAS ACCREDITATION	TECHNIQUE
Lead	1	M (MCERTS and ISO 17025)	ICPMS
Mercury	0.1	M (MCERTS and ISO 17025)	ICPMS
Nickel	1	M (MCERTS and ISO 17025)	ICPMS
Selenium	0.5	U (ISO 17025)	ICPMS
Copper	1	M (MCERTS and ISO 17025)	ICPMS
Zinc	0.5	M (MCERTS and ISO 17025)	ICPMS
Boron (Water Soluble)	0.2	U (ISO 17025)	ICPMS
pH Value	0 units	M (MCERTS and ISO 17025)	Electrometric
Sulphate (Water Soluble)	0.01g/l	M (MCERTS and ISO 17025)	Ion Chromatography
Total Cyanide	0.1	N (Outside of accreditation)	Colorimetry
Speciated/Total PAH	1.3	M (MCERTS and ISO 17025)	GCFID
Phenols	0.7	N (Outside of accreditation)	HPLC
Total Petroleum Hydrocarbons (banded)	1	N (Outside of accreditation)	Gas Chromatography

3.3.6 To support the selection of appropriate tier 1 screening values, 3No. samples were analysed for total organic carbon.

3.3.7 The laboratory test results are included in Appendix 3.

Geotechnical Laboratory Testing

3.3.8 In addition to the contamination assessment, soil samples were submitted to the UKAS Accredited laboratory of Terra Tek Site Investigation and Laboratory Services for a series of geotechnical analyses.

3.3.9 This testing was designed to classify the samples and to obtain parameters (either directly or sufficient to allow relevant correlations to be used) relevant to the technical objectives of the investigation.

3.3.10 The following laboratory geotechnical testing was carried out:

Table 3.4: Laboratory Geotechnical Analysis

Methodology	Test Description	Number of tests
BS1377:1990	Moisture Content Determination	8
BS1377:1990	Liquid and Plastic Limit Determination (Atterberg Limits)	8
BS1377:1990	Determination of the undrained shear strength in triaxial compression with single stage loading and without measurement of pore pressure	6

3.3.11 In addition, 5No. soil samples were analysed for a modified BRE Special Digest 1 suite (acid and water soluble sulphate, total sulphur and pH) to assist with the ACEC classification for buried concrete.

3.3.12 The laboratory test results are included in Appendix 4.

4 GROUND CONDITIONS ENCOUNTERED

4.1 General

4.1.1 A factual record of the conditions encountered during the physical investigation of the site is presented in the following section.

4.2 Ground Conditions

4.2.1 The ground conditions encountered were broadly consistent with those anticipated, i.e. a thickness of Made Ground over the Taplow Gravel Member overlying the London Clay Formation, and are summarised in Table 4.1 below.

Table 4.1: Ground Conditions Encountered

Stratum and Description	Encountered from (mbgl)	Base of strata (mbgl)	Thickness range (m)
Concrete/asphalt over greyish/light brown/black sandy gravelly clay/silt/sandy gravel. Gravel consists of angular to rounded flint and brick. (MADE GROUND)	0.00	0.90 – 3.00	0.90 – 3.00
Very soft consistency** light brown/orangish grey sandy CLAY. (ENFIELD SILT MEMBER) WS4 and WS5 only.	0.90 - 1.20	1.70 – 1.90	0.50 – 1.00
Very soft to firm consistency** orangish brown to grey silty sandy gravelly CLAY. Gravel consists of angular to rounded flint. (TAPLOW GRAVEL MEMBER - COHESIVE) WS1-WS3, BH5	1.20 – 2.00	2.20 – 3.00	0.20 – 1.20
Loose to very dense light brown to orangish grey clayey gravelly SAND / SAND and GRAVEL. Gravel consists of sub-angular to sub-rounded flint. (TAPLOW GRAVEL MEMBER – GRANULAR) WS4-WS5, BH3	1.30 – 1.90	>2.00 – 4.00	>0.30 – 2.70
Soft to very stiff consistency** light to dark brown mottled grey sandy CLAY/CLAY. Occasional claystone. (LONDON CLAY FORMATION)	1.80 – 4.00	>5.00 - >20.45 [base not proven]	>2.00 – >16.45 [thickness not proven]

****Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature**

4.2.2 Made Ground was encountered to 3.0m bgl within BH5 in the south of the site. However, superficial deposits of the Enfield Silt Member and Taplow Gravel Member have not been reported at this location as well as BH1. It is unlikely that these deposits are absent, but more likely that the nature of the cable percussive drilling has masked boundaries between these deposits and the overlying Made Ground and underlying London Clay Formation.

4.2.3 In addition, the sporadic distribution of Enfield Silt Member deposits across the site may be due to the fact that this material has been disturbed and reworked as a result of previous site developments, resulting in its identification as Made Ground.

- 4.2.4 A stockpile of material was identified during the Jomas walkover survey in the south of the site. 2No hand pits were excavated within the stockpile so that soil samples could be obtained. A description of the soil was given as:

“Dark brownish black sandy gravelly clay. Sand is fine to coarse. Gravel consists of fine to coarse, angular to rounded flint, brick, concrete, plastic, glass and organic material (MADE GROUND).”

4.3 Groundwater

- 4.3.1 Recorded groundwater strikes are summarised below.

Table 4.2: Groundwater Strikes During Investigation

Exploratory Hole ID	Depth Encountered (mbgl)	Depth After 20mins (mbgl)	Stratum
WS3	3.0	-	London Clay Formation

- 4.3.2 Although groundwater was not reported in any of the remaining boreholes during drilling, water was added to aid drilling and may have masked groundwater strikes.

- 4.3.3 4no. return groundwater monitoring results were conducted between 01st and 15th June 2023. The results are presented in Appendix 5 and are summarised below.

Table 4.3: Groundwater Monitoring Summary

Exploratory Hole ID	Depth Encountered (mbgl)	Well Response Zone as installed (top / bottom) mbgl (mbgl)	Depth to Base of Well – as gauged (mbgl)	Strata targeted by response zone
BH1	1.80 - 3.70	1m to 5m	4.94m – 5.01m	Made Ground/London Clay Formation
BH4	0.49 – 3.26	1m to 5m	3.60m – 3.79m	Made Ground/Taplow Gravel Member/London Clay Formation
BH5	1.89 – 2.48	1m to 5m	5.22m – 5.30m	Made Ground/London Clay Formation
WS3	0.74 – 0.86	1m to 5m	2.34m - 2.43m	Made Ground/Taplow Gravel Member/London Clay Formation
WS5	1.02 – 1.70	1m to 5m	3.69m – 4.08m	Made Ground/Enfield Silt Member/Taplow Gravel Member/London Clay Formation

4.3.4 It should be noted that changes in groundwater levels can occur for a number of reasons including seasonal effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones. Changes in groundwater level can have a direct effect on excavation stability and dewatering requirements, and cohesive soils can soften under rising or high groundwater levels.

4.4 Physical and Olfactory Evidence of Contamination

4.4.1 Black discolouration was reported within WS4, BH4 and BH5.

4.4.2 No other visual or olfactory evidence of potential contamination was identified within the investigation positions.

4.5 Limitations

4.5.1 During the intrusive ground investigation, access could not be granted within the buildings in the middle of the site. Therefore, exploratory hole positions have been positioned on either side of the buildings.

4.5.2 The possible presence of unidentified natural and/or manmade obstructions elsewhere on site cannot be discounted.

4.5.3 During the intrusive ground investigation, no impenetrable obstructions were encountered. However, the possible presence of natural and/or manmade obstructions on site cannot be discounted.

5 RISK ASSESSMENT – ANALYTICAL FRAMEWORK

5.1 Context and Objectives

5.1.1 This section seeks to evaluate the level of chronic risk pertaining to human health and the environment which may result from both the existing use and proposed future use of the site. It makes use of the ground investigation findings, as described in the previous sections, to evaluate further the potential pollutant linkages identified in the desk study. A combination of qualitative and quantitative techniques is used, as described below.

5.1.2 The purpose of generic quantitative risk assessment is to compare concentrations of contaminants found on site against generic assessment criteria (GAC) to establish whether there are actual or potential unacceptable risks. It also determines whether further detailed assessment is required. The approaches detailed all broadly fit within a tiered assessment structure in line with the framework set out in the Department of Environment, Food and Rural Affairs (DEFRA), EA and Institute for Environment and Health Publication, Guidelines for Environmental Risk Assessment and Management.

5.2 Analytical Framework – Soils

5.2.1 There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

5.2.2 The soil analytical test results have been compared to Sutable 4 Use Levels (S4UL) published by the Chartered Institute of Environmental Health in order to assess the potential long-term risks to human health posed by contaminants in the soils. S4UL'S have been derived for a range of land uses and Soil Organic Matter contents. They represent the minimal or tolerable risk, above which further assessment of the risks or remedial action may be required.

5.2.3 In the absence of a S4UL recommended concentration, other available general assessment criteria (GAC), including the Category 4 Screening Levels (C4SL) published by DEFRA have been used. Site-specific assessments are undertaken wherever possible and/or applicable. All assessments are carried out in accordance with the CLEA protocol.

5.2.4 The assessment criteria used for the screening of determinands within soils are identified within Table 5.1.

Table 5.1: Selected Assessment Criteria - Contaminants in Soils

Substance Group	Determinand(s)	Assessment Criteria Selected
<u>Organic Substances</u>		
Non-halogenated Hydrocarbons	Total Petroleum Hydrocarbons (TPHCWG banded)	S4UL
	Total Phenols	S4UL
Polycyclic Aromatic Hydrocarbons (PAH-16)	Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(123-cd)pyrene, Dibenzo(ah)anthracene, Benzo(ghi)perylene	S4UL
Volatile Organic Compounds (VOCs/sVOCs).	Toluene, Ethylbenzene, Benzene, Xylenes	S4UL
<u>Inorganic Substances</u>		
Heavy Metals and Metalloids	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	S4UL
	Copper, Zinc, Nickel	BS: 3882 (2015).
Cyanides	Free Cyanide	CLEA v1.06
Sulphates	Water Soluble Sulphate	BRE Special Digest 1:2005

5.2.5 It is understood that the site is to be converted to provide residential units with private gardens. As a result, the site has been assessed with regards to a residential with plant uptake end use scenario.

5.2.6 GAC have been selected with consideration to the Soil Organic Matter (SOM) content of the soil. From the soils analytical results, the average value for Total Organic Carbon for the Made Ground is 2.25%, which gives an equivalent SOM of 3.87%. Therefore, published GAC have been selected as those derived assuming a SOM of 2.5%.

5.3 BRE

5.3.1 The BRE Special Digest 1:2005, 'Concrete in Aggressive Ground' is used with soluble sulphate and pH results to assess the aggressive chemical environment of future underground concrete structures at the site.

5.4 Analytical Framework – Groundwater and Leachate

5.4.1 The requirement to protect groundwater from pollution is outlined in Groundwater Protection: Principles and Practice (GP3, EA, August 2013, v1.1).

5.4.2 Where undertaken, the groundwater quality analysis comprises a Level 1 assessment in accordance with the EA Remedial Targets Methodology Document (EA, 2006).

5.4.3 The criteria used by Jomas' in the Level 1 assessment of groundwater and leachate quality are shown in Table 5.2.

Table 5.2: Selected Assessment Criteria - Contaminants in Water

Substance Group	Determinand(s)	Assessment Criteria Selected
Metals	Arsenic, Boron, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel,	EQS/DWS
	Zinc	EQS
	Selenium	DWS
PAHs	Sum of Four – benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, indeno(123-c,d)pyrene	DWS
PAH	Anthracene, Naphthalene	EQS
PAHs	Benzo(a)pyrene	EQS/ DWS
PAHs	Remainder	LEC
Total Petroleum Hydrocarbons	Aliphatic C ₅ -C ₆ , Aliphatic >C ₆ -C ₈ , Aliphatic >C ₈ -C ₁₀ , Aliphatic >C ₁₀ -C ₁₂ , Aliphatic >C ₁₂ -C ₁₆ , Aliphatic >C ₁₆ -C ₂₁ , Aromatic C ₅ -C ₇ , Aromatic >C ₇ -C ₈ , Aromatic >C ₈ -C ₁₀ , Aromatic >C ₁₀ -C ₁₂ , Aromatic >C ₁₂ -C ₁₆ , Aromatic >C ₁₆ -C ₂₁ , Aromatic > C ₂₁ -C ₃₅	WHO
Benzene	Benzene	EQS/ DWS
Toluene	Toluene	EQS/ WHO
Ethylbenzene	Ethylbenzene	WHO
Xylene	Xylene	EQS/WHO

Environmental Quality Standards EQS

Environmental Quality Standards (EQS) have been released by the EA for dangerous substances, as identified by the EC Dangerous Substances Directive. EQS can vary for each substance, for the hardness of the water and can be different for fresh, estuarine or coastal waters.

WHO Health

These screening criteria have been taken from the World Health Organisation Guidelines for Drinking Water Quality (2017). The health value is a guideline value representing the

concentration of a contaminant that does not result in any significant risk to the receptor over a lifetime of exposure.

Further criteria have been obtained from 'Petroleum Products in Drinking-water' - Background document for development of WHO Guidelines for Drinking-water Quality (2005).

UK Drinking Water Standards (DWS)

These comprise screening criteria provided by the Drinking Water Inspectorate (DWI) in the Water Supply (Water Quality) Regulations 2018.

6 GENERIC QUANTITATIVE RISK ASSESSMENT – SOIL DATA

6.1 Screening of Soil Chemical Analysis Results – Human Health Risk Assessment

6.1.1 Laboratory analysis for soils is summarised in Table 6.1 to Table 6.4. Raw laboratory data is included in Appendix 3.

6.1.2 Results have been screened against generic assessment criteria for a “residential with home grown produce” end use, assuming 2.5% soil organic matter.

Table 6.1: Soil Laboratory Test Results - Metals, Metalloids, Phenol, Cyanide

Determinand	Unit	No. samples tested	Screening Criteria		Min	Max	No. Exceeding
Arsenic	mg/kg	8	S4UL	37	10.6	29.4	0
Cadmium	mg/kg	8	S4UL	11	0.42	1.74	0
Chromium	mg/kg	8	S4UL	910	16	32	0
Lead	mg/kg	8	C4SL	200	81	13700	6No:
							BH4 at 0.30m
							WS2 at 0.40m
							TP1 at 0.10m
							WS3 at 1.20m
WS4 at 0.60m							
BH3 at 0.50m							
Mercury	mg/kg	8	S4UL	40	0.22	3.7	0
Nickel	mg/kg	8	S4UL	180	19	50	0
Copper	mg/kg	8	S4UL	2400	18	281	0
Zinc	mg/kg	8	S4UL	3700	69.3	928	0
Total Cyanide ^A	mg/kg	8	CLEA v 1.06	33	<0.10	0.23	0
Selenium	mg/kg	8	S4UL	250	<0.50	1.06	0
Boron Water Soluble	mg/kg	8	S4UL	290	1.0	5.4	0
Phenols (monohydric)	mg/kg	8	S4UL	200*	<0.7	3.9	0

Notes: ^A Generic assessment criteria derived for free inorganic cyanide.

*GAC is total phenols

Table 6.2: Soil Laboratory Test Results - Polycyclic Aromatic Hydrocarbons (PAHs)

Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Naphthalene	mg/kg	8	S4UL	5.6	<0.05	0.43	0
Acenaphthylene	mg/kg	8	S4UL	420	<0.10	0.24	0
Acenaphthene	mg/kg	8	S4UL	510	<0.05	0.28	0
Fluorene	mg/kg	8	S4UL	400	<0.05	0.14	0

Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Phenanthrene	mg/kg	8	S4UL	220	<0.10	2.87	0
Anthracene	mg/kg	8	S4UL	5400	<0.10	0.68	0
Fluoranthene	mg/kg	8	S4UL	560	<0.10	6.30	0
Pyrene	mg/kg	8	S4UL	1200	<0.10	5.79	0
Benzo(a)anthracene	mg/kg	8	S4UL	11	<0.05	3.26	0
Chrysene	mg/kg	8	S4UL	22	<0.10	3.54	0
Benzo(b)fluoranthene	mg/kg	8	S4UL	3.3	<0.10	3.87	1No: TP1 at 0.10m
Benzo(k)fluoranthene	mg/kg	8	S4UL	93	<0.10	2.24	0
Benzo(a)pyrene	mg/kg	8	S4UL	2.7	<0.05	3.04	1No: TP1 at 0.10m
Indeno(123-cd)pyrene	mg/kg	8	S4UL	36	<0.10	1.58	0
Dibenzo(ah)anthracene	mg/kg	8	S4UL	0.28	<0.10	0.36	1No: TP1 at 0.10m
Benzo(ghi)perylene	mg/kg	8	S4UL	340	<0.05	1.83	0
Total PAH	mg/kg	8	-	-	<1.3	35.36	-

Table 6.3: Soil Laboratory Test Results - Total Petroleum Hydrocarbons (TPH)

TPH Band	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
C ₈ -C ₁₀	mg/kg	4	S4UL	65	<1	15	0
>C ₁₀ -C ₁₂	mg/kg	4	S4UL	180	<1	25	0
>C ₁₂ -C ₁₆	mg/kg	4	S4UL	330	<1	22	0
>C ₁₆ -C ₂₁	mg/kg	4	S4UL	540	<1	103	0
>C ₂₁ -C ₃₅	mg/kg	4	S4UL	1500	<1	588	0
Total TPH	mg/kg	4	-	-	<5	753	-

Note: *The lower value of guidelines for Aromatic/Aliphatics has been selected

Table 6.4: Soil Laboratory Analysis Results - Total Petroleum Hydrocarbons (TPHCWG)

TPH Band	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
>C ₅ -C ₆ Aliphatic	mg/kg	4	S4UL	78	<0.1	<1	0
>C ₆ -C ₈ Aliphatic	mg/kg	4	S4UL	230	<0.1	<1	0
>C ₈ -C ₁₀ Aliphatic	mg/kg	4	S4UL	65	<1.0	<1.0	0
>C ₁₀ -C ₁₂ Aliphatic	mg/kg	4	S4UL	330	<1.0	<1.0	0

TPH Band	Unit	No. Samples Tested	Screening Criteria	Min	Max	No. Exceeding
>C ₁₂ -C ₁₆ Aliphatic	mg/kg	4	S4UL 2400	<1.0	<1.0	0
>C ₁₆ -C ₃₅ Aliphatic	mg/kg	4	S4UL 92000	<2.0	<5.0	0
>C ₅ -C ₇ Aromatic	mg/kg	4	S4UL 92000	<0.01	<0.01	0
>C ₇ -C ₈ Aromatic	mg/kg	4	S4UL 140	<0.01	<0.01	0
>C ₈ -C ₁₀ Aromatic	mg/kg	4	S4UL 290	<0.01	<0.01	0
>C ₁₀ -C ₁₂ Aromatic	mg/kg	4	S4UL 83	<1.0	<1.0	0
>C ₁₂ -C ₁₆ Aromatic	mg/kg	4	S4UL 180	<1.0	<1.0	0
>C ₁₆ -C ₂₁ Aromatic	mg/kg	4	S4UL 330	<1.0	31	0
>C ₂₁ -C ₃₅ Aromatic	mg/kg	4	S4UL 540	<1.0	112	0
Total TPH (Ali/Aro)	mg/kg	4	- -	<9.23	<155.0	-

6.2 Asbestos in Soil

6.2.1 6No samples of the Made Ground were screened in the laboratory for the presence of asbestos.

6.2.2 No asbestos containing materials (ACM) or fibres were reported in samples analysed in the laboratory.

6.3 Volatile Organic Compounds

6.3.1 In addition to the suites outlined previously, 4No samples were tested for the presence of volatile organic compounds (VOCs) including BTEX compounds (benzene, toluene, ethylbenzene, xylene).

6.3.2 No VOCs were reported above the laboratory detection limit within any of the samples tested. Although. It should be noted that the laboratory detection limit varies from <5 to <500ug/kg due to the soil/surrogate matrix interaction.

6.4 Polychlorinated Biphenyl (PCB) Concentrations

6.4.1 In addition to the suites outlined previously, 1No samples from the vicinity of the electrical substation were analysed for the presence of PCBs.

6.4.2 No PCBs were reported above the laboratory method detection limit.

6.5 Vapour Risk Assessment from a Soil Source

6.5.1 As outlined in Table 6.2, elevated levels of polycyclic aromatic hydrocarbons (PAH's) have been reported in excess of their generic screening criteria for the protection of human health within a 'residential with homegrown produce' end-use scenario. The exceedances have been reported within only 1No sample, obtained from the stockpile in the south of the site. The generic screening criteria considers all possible pathways between the source and the receptor. In order to assess potential risks from inhalation of vapour, each organic compound that has been found in excess of its GAC will be assessed in terms of the contribution to total exposure from vapour inhalation inside a structure as reported within the LQM/CIEH S4UL

document. Where a significant proportion of the total exposure is reported from vapour inhalation, there could be a potential risk from vapour inhalation.

Table 6.5: Soil Laboratory Analysis Results - Contribution to Total Exposure from Vapour Inhalation (Indoor)

Compound	Contribution of Vapour Inhalation to Total Exposure (%)	Screening Criteria (mg/kg)	Maximum Recorded Value (mg/kg)	Potential Vapour Risk?
Benzo(b)fluoranthene	<0.1	3.3	3.87	X
Benzo(a)pyrene	0.0	2.7	3.04	X
Dibenzo(ah)anthracene	<0.1	0.28	0.36	X

6.5.2 As shown in the table above, all of the potentially volatile compounds detected in soils in excess of generic assessment criteria have a negligible contribution to total exposure via inhalation pathway (less or equal to 0.1%).

6.5.3 Therefore, it is considered that there is a negligible risk to end users of the proposed development associated with vapour risk inhalation from soils.

6.5.4 These soils should be removed from site and disposed of at a suitable waste facility. The chemical testing undertaken on these soils can be provided to the waste facility prior to disposal. Further testing may be required in the form of Waste Acceptance Criteria (WAC) testing or assessment in line with WM3.

6.6 Summary of Human Health Generic Quantitative Risk Assessment

6.6.1 In summary, concentrations of lead in excess of the GAC have been recorded in samples of Made Ground.

6.7 Screening of Soil Chemical Analysis Results – Potential Risks to Plant Growth

6.7.1 Zinc, copper and nickel are phytotoxins and could therefore inhibit plant growth in soft landscaped areas. Concentrations measured in soil for these determinands have been compared with the pH dependent values given in BS:3882 (2015). This does not constitute a full BS:3882 topsoil test.

6.7.2 Table 6.6 shows the soil analytical results compared with the relevant screening values, adopting a pH value of greater than 7, as indicated by the results of the laboratory analysis.

Table 6.6: Soil Laboratory Analysis Results - Phytotoxic Determinands

Determinand	Threshold level (mg/kg)	Min (mg/kg)	Max (mg/kg)	No. Exceeding
Nickel	110	19	50	0
Copper	200	18	281	1No: BH3 at 0.50m
Zinc	300	69.3	928	3No: BH4 at 0.40m TP1 at 0.10m

Determinand	Threshold level (mg/kg)	Min (mg/kg)	Max (mg/kg)	No. Exceeding
WS3 at 1.20m				

6.7.3 A number of samples have recorded determinands in excess of threshold levels. The current near surface soils may not satisfy the requirements of BS:3882.

6.8 Screening for Water Pipes Materials

6.8.1 The results of the analysis have been assessed for potential impact upon water supply pipes. Table 6.7 below summarises the findings of the assessment:

Table 6.7: Screening Guide for Water Pipes

Determinand	No. of tests	Threshold for Polyethylene Pipes* (mg/kg)	Value for site data (mg/kg)		No of Exceedances
			Min	Max	
Total VOCs	4	0.5	0.29	16.58	Not reported above LOD
BTEX	4	0.1	<0.03	<0.03	Not reported above LOD
MTBE	4	0.1	<0.05	<0.5	Not reported above LOD
EC5-EC10	4	1	<0.051	<2.031	Not reported above LOD
EC10-EC16	4	10	<4	<4	Not reported above LOD
EC16-EC40	4	500	<6	<149	0
Naphthalene	8	5	<0.05	0.43	0
Phenols		2	<0.7	3.9	TP1 at 0.10m

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

6.8.3 The above suggests that upgraded pipe work is unlikely to be required. The only exceedance relates to Phenols within a sample obtained from the stockpiled material in the south of the site.

6.8.4 The water supply pipe requirements for this site should be discussed at an early stage with the relevant utility provider.

6.9 Assessment of Soil Analytical Data with Respect to Controlled Waters

6.9.1 At the Preliminary Risk Assessment (Desk Study) stage, risks to controlled waters were moderate.

6.9.2 The following controlled waters receptors were identified:

- Secondary A aquifer within the Taplow Gravel Member

- River Lea 1.7km east
- Moselle River 184m west

- 6.9.3 Pathways for migration of leachable/mobile contamination were considered to be potentially present within the underlying Taplow Gravel Member.
- 6.9.4 Pathways for migration of leachable leachable/mobile contamination were not considered to be present within the underlying, relatively impermeable London Clay Formation.
- 6.9.5 The ground conditions encountered are considered to confirm the expected geological succession and confirmed that potential pathways for migration of leachable / mobile contamination are present. Further assessment of these risks is provided in Section 7, with the evaluation for groundwater analytical data.

6.10 Waste Characterisation

- 6.10.1 The classification of materials for waste disposal purposes was outside the scope of this report. Should quantities of material require off-site disposal, waste classification will be required to determine whether soils may be treated as hazardous or non-hazardous.
- 6.10.2 Note that Waste Acceptance Criteria (WAC) analysis may then be required by the landfill operator to determine whether materials can be disposed of at either an inert, stable non-reactive hazardous or hazardous landfill.

7 GENERIC QUANTITATIVE RISK ASSESSMENT – GROUNDWATER DATA

7.1 Groundwater sampling

7.1.1 Groundwater samples obtained from the monitoring wells installed within exploratory locations WS3, WS5, BH1, BH4 and BH5 were submitted for chemical analysis.

7.1.2 Sufficient water could not be sampled from WS5, due to the reduction in groundwater within the well. Consequently, some TPH chains and all PAH's have not been tested for within this sample.

7.1.3 The samples were obtained by means of low flow methodology. Groundwater sampling records are presented in Appendix 6.

7.2 Assessment of groundwater analytical data with respect to controlled waters

7.2.1 The results of the laboratory testing are summarised in Table 7.1 to Table 7.3 below and compared to GAC for controlled waters receptors. Analytical laboratory certificates are presented in Appendix 3.

Table 7.1: Groundwater Laboratory Analysis Results – Metals, Metalloids, Phenol, Cyanide

Determinand	Unit	No. samples tested	Screening Criteria		Min	Max	No of Exceedances
Arsenic	µg/l	5	10	DWS	0.50	7.7	0
	µg/l		50	EQS	0.50	7.7	0
Cadmium	µg/l	5	5	DWS	<0.04	0.11	0
	µg/l		<0.08-0.25*	EQS	<0.04	0.11	0
Chromium	µg/l	5	50	DWS	0.07	0.92	0
	µg/l		4.7	EQS	0.07	0.92	0
Lead	µg/l	5	10	DWS	0.01	3.14	0
	µg/l		1.2*	EQS	0.01	3.14	BH4
Nickel	µg/l	5	20	DWS	6.5	21.8	BH4
	µg/l		4*	EQS	6.5	21.8	WS3, BH1, BH4 and BH5
Copper	µg/l	5	1.0	EQS	1.77	50.8	WS3, WS5, BH1, BH4 and BH5
			2000	DWS	1.77	50.8	0
Zinc	µg/l	5	10.9*	EQS	0.7	37.9	BH1, BH4 and BH5
Mercury	µg/l	5	1.0	DWS	<0.05	0.10	0
	µg/l	5	0.07	EQS	<0.05	0.10	BH1
Selenium	µg/l	5	10	DWS	<0.5	23.3	BH1
Boron	µg/l	5	1000	DWS	370	550	0
	µg/l		2000	EQS	370	550	0
Cyanide (Total)	µg/l	5	50	DWS	<0.01	16	0

Determinand	Unit	No. samples tested	Screening Criteria		Min	Max	No of Exceedances
	µg/l		1	EQS	<0.01	16	BH4
Phenols (monohydric)	µg/l	5	7.7	EQS	<0.50	<0.50	0

* bioavailable concentration

*Assessment criteria dependent on water hardness

**bioavailable concentration + ambient background concentration dissolved for Thames Groundwater (2 µg/L)

Table 7.2: Groundwater Analysis Results - Polycyclic Aromatic Hydrocarbons (PAHs)

Determinand	Unit	No. samples tested	Screening Criteria		Min.	Max.	No. of Exceedances
Naphthalene	µg/l	5	2.0	EQS	<0.01	0.061	0
Acenaphthylene	µg/l	5	-	-	<0.01	0.023	-
Acenaphthene	µg/l	5	-	-	<0.01	0.984	-
Fluorene	µg/l	5	-	-	<0.01	0.837	-
Phenanthrene	µg/l	5	-	-	<0.01	0.205	-
Anthracene	µg/l	5	0.1	EQS	<0.01	0.084	0
Fluoranthene	µg/l	5	0.0063	EQS	<0.01	5.35	BH4 and WS3
Pyrene	µg/l	5	-	-	<0.01	3.62	-
Benzo(a)anthracene	µg/l	5	-	-	<0.01	0.783	-
Chrysene	µg/l	5	-	-	<0.01	0.423	-
Benzo(b)fluoranthene	µg/l	5	0.017	EQS	<0.01	1.05	WS3, BH4 and BH5
Benzo(k)fluoranthene	µg/l	5	0.017	EQS	<0.01	0.377	WS3, BH4 and BH5
Benzo(a)pyrene	µg/l	5	0.01	DWS	<0.01	0.660	WS3, BH4 and BH5
	µg/l	5	0.00017	EQS	<0.01	0.660	WS3, BH4 and BH5
Dibenzo(ah)anthracene	µg/l	5	-	-	<0.01	<0.01	-
Benzo(ghi)perylene	µg/l	5	0.0082	EQS	<0.01	0.701	BH4 and BH5
Sum of four		5					
Benzo(b)fluoranthene	µg/l		0.1	DWS	<0.04	2.563	BH4 and BH5
Benzo(k)fluoranthene							
Benzo(ghi)perylene							
Indeno(123-cd)pyrene							

Table 7.3: Groundwater Analysis Results - TPHCWG & BTEX - Controlled Waters

Determinand	Unit	No. Samples tested	Screening Criteria	Min.	Max.	No. of Exceedances
Benzene	µg/l	5	1.0 DWS	<1.0	<1.0	0
	µg/l	5	10 EQS	<1.0	<1.0	0
Toluene	µg/l	5	74 EQS	<1.0	4	0
Ethylbenzene	µg/l	5	300 WHO	<1.0	<1.0	0
Xylenes (total)	µg/l	5	500 WHO	<3.0	<3.0	0
	µg/l	5	30 EQS	<3.0	<3.0	0
MTBE	µg/l	5	15 WHO	<1.0	<1.0	0
>C ₅ -C ₆ Aliphatic	µg/l	5	15000 WHO	<10	<10	0
>C ₆ -C ₈ Aliphatic	µg/l	5	15000 WHO	<10	<10	0
>C ₈ -C ₁₀ Aliphatic	µg/l	5	300 WHO	<10	<10	0
>C ₁₀ -C ₁₂ Aliphatic	µg/l	5	300 WHO	<10	<10	0
>C ₁₂ -C ₁₆ Aliphatic	µg/l	5	300 WHO	<10	<10	0
>C ₁₆ -C ₂₁ Aliphatic	µg/l	5	- -	<10	12	-
>C ₂₁ -C ₃₅ Aliphatic	µg/l	5	- -	<10	55	-
>C ₅ -C ₇ Aromatic	µg/l	5	10 WHO	<10	<10	0
>C ₇ -C ₈ Aromatic	µg/l	5	700 WHO	<10	<10	0
>C ₈ -C ₁₀ Aromatic	µg/l	5	300 WHO	<10	<10	0
>C ₁₀ -C ₁₂ Aromatic	µg/l	5	90 WHO	<10	<10	0
>C ₁₂ -C ₁₆ Aromatic	µg/l	5	90 WHO	<10	16	0
>C ₁₆ -C ₂₁ Aromatic	µg/l	5	90 WHO	<10	17	0
>C ₂₁ -C ₃₅ Aromatic	µg/l	5	90 WHO	<10	53	0

- 7.2.2 In addition to the suite outlined above, the five water samples were also analysed for a suite of volatile organic compounds (VOCs). None of the compounds analysed for were reported above the laboratory method detection limit.
- 7.2.3 Similarly, for the BTEX (Benzene, Toluene, Ethylbenzene and Xylene) compounds, none of the results were reported above the laboratory method of detection. Although, it should be noted that the laboratory detection limit varies from <1 to <50ug/kg due to the soil/surrogate matrix interaction.
- 7.2.4 Concentrations of lead, nickel, copper, zinc, mercury, total cyanide, fluoranthene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and benzo(ghi)perylene were found to exceed Environmental Water Quality Standards (EQS).
- 7.2.5 Concentrations of nickel, selenium, benzo(a)pyrene and the sum of four (benzo(b)fluoranthene benzo(k)fluoranthene benzo(ghi)perylene indeno(123-cd)pyrene) were found to exceed Drinking Water Standards (DWS).

- 7.2.6 Based on the encountered geology of the site and the anticipated granular superficial deposits to the east of the site, it is considered that the site is in hydraulic continuity with the Moselle River/Brook and the River Lea to the east.
- 7.2.7 The groundwater elevation data indicates a groundwater surface within the superficial deposits. Given the site setting, it is considered likely that the overall direction of flow would be towards and in the direction of flow of the River Lea, i.e. towards the east.
- 7.2.8 The highest concentrations of lead, nickel, zinc, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and benzo(ghi)perylene are reported within BH4 with lower concentrations reported in wells to the south, north west and north east. Therefore, it is likely that the source of these determinands is on site.
- 7.2.9 The highest concentration of fluoranthene is reported within WS3 as 5.35µg/L, an increase of an order of magnitude of 0.429µg/L from BH4. Therefore, it is likely that the source has originated from off site to the north west or within the north west of the site. Water samples obtained from wells to the south and north east did not report concentrations of fluoranthene above the laboratory detection limit.
- 7.2.10 None of the PAH's tested within BH1 have been reported above the laboratory detection limit and therefore PAH's are not considered to be migrating off site at concentrations in excess of the EQS.
- 7.2.11 The site does not lie within a Source Protection Zone and no groundwater or potable abstractions are reported within 1km of the site.
- 7.2.12 None of the Made Ground soils tested at the site have exceeded the GAC for PAH's and it is therefore considered that the exceedances within the groundwater are not a result of downward leaching from the soils.
- 7.2.13 The PAH's reported to exceed standards, are all reported as priority pollutants by the USEPA. However, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(123-cd)pyrene are all reported to have very low mobility in groundwater, as reported by CL:AIRE (2017). Furthermore, metals are not considered highly mobile within groundwater.
- 7.2.14 Although based on the above justifications, it is considered that the concentrations detected do not pose a significant risk to the River Lea in a north easterly direction, it would be prudent to obtain additional groundwater samples from WS5 in order to fully assess the concentrations of PAH's within the well and an easterly direction.
- 7.3 Assessment of Groundwater Analytical Data with Respect to Vapour Intrusion Pathways**
- 7.3.1 In order to further assess potential risks to human health receptors via vapour intrusion pathways, the groundwater results have been compared to generic assessment criteria, published by the Society of Brownfield Risk Assessment (SoBRA) in 2017, relevant to a pollutant linkage via vapour intrusion from a dissolved phase source in groundwater. As per the CSM, potential receptors at risk comprise (future site users/construction and maintenance workers and neighbouring site users) and therefore the GAC have been selected for a residential end use.
- 7.3.2 This assessment supplements the assessment of risks via vapour intrusion from soil data provided in Section 7.5.

7.3.3 The assessment results are presented in Table 7.4. Only contaminants recorded above detection limits have been assessed.

Table 7.4: Groundwater Vapour Risk Assessment – Human Health

Determinand	Unit	No. samples tested	Screening Criteria	Min.	Max.	No. of Exceedances
Fluoranthene	µg/l	5	Insufficiently volatile	<0.01	5.35	-
Sum of four Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(ghi)perylene Indeno(123-cd)pyrene	µg/l	5	Insufficiently volatile	<0.04	2.563	-
Benzo(a)pyrene	µg/l	5	Insufficiently volatile	<0.01	0.660	-

7.3.4 From the above assessment, it is concluded that a pollutant linkage to end users of the proposed development and adjacent site users from vapour inhalation from a groundwater source does not exist.

7.3.5 Further consideration of vapour risks is provided within Section 8, alongside the ground gas assessment.

8 SOIL GAS RISK ASSESSMENT

8.1 Soil Gas Results

8.1.1 Four return monitoring visits have been undertaken between 1st and 15th June 2023, to monitor wells installed within boreholes at the site for soil gas concentrations and groundwater levels.

8.1.2 During these visits pressure trends observed were rising and falling.

8.1.3 The results of the monitoring undertaken are summarised in Table 8.1 below, with the monitoring records presented in Appendix 6.

Table 8.1: Summary of Gas Monitoring Data

Hole No.	Number of monitoring events	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	VOCs (ppm)	Steady Flow Rate (l/hr)	Peak Flow Rate (l/hr)	Depth to water (mbgl)	Well Response Zone as installed (top/bottom) (mbgl)	Strata targeted by response zone
BH1	4	0.1 – 0.2	1.5 – 2.6	17.0 – 18.4	0 – 0.3	-0.1 - +0.2	-0.1 - +0.2	3.7	1-5	Made Ground/Lond on Clay Formation
BH4	4	0 - 0.1	0.0 - 1.6	19.4 – 20.3	0 - 4.2	+0.1 - +0.2	+0.1 - +0.2	3.18	1-5	Made Ground/25% Taplow Gravel Member/Lon don Clay Formation
BH5	4	0.1	1.3 – 2.3	10.5 - 19.1	0- 4.7	0.0 - +0.1	0 - +0.1	1.89	1-5	Made Ground/Lond on Clay Formation
WS3	4	0 – 0.2	0.4 – 1.5	19.4 – 20.2	0 – 1.1	0 - +0.1	0 - +0.1	0.74	1-2.5	Taplow Gravel Member/Lon don Clay Formation
WS5	4	0 – 0.1	1.8 - 3.0	14.1 – 16.7	0 – 0.3	-0.2 - +0.2	-0.2 - +0.2	1.65	1-5	Enfield Silt Member/Tap low Gravel Member/Lon don Clay Formation

8.2 Screening of Results

8.2.1 As shown in Table 8.1, methane was detected to a maximum concentration of 0.2% during monitoring. The concentrations of carbon dioxide ranged from 0% to 3.0% v/v. The maximum concentration of Volatile Organic Compounds measured was 4.7ppm. The maximum gas flow rate recorded was 0.2l/hr.

8.2.2 In the assessment of risks posed by hazardous ground gases and selection of appropriate mitigation measures, BS8485 (2015) + A1 (2019) identifies four types of development, termed Type A to Type D.

8.2.3 Type A buildings are defined as

“private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises.”

8.2.4 Type A has been adopted as the relevant category for the proposed development.

8.2.5 The soil gas assessment method is based on that proposed by Wilson & Card (1999), which was a development of a method proposed in CIRIA publication R149 (CIRIA, 1995). The method uses both gas concentrations and borehole flow rates to define a characteristic situation based on the limiting borehole gas volume flow for methane and carbon dioxide. In both these methods, the limiting borehole gas volume flow is renamed as the Gas Screening Value (GSV).

8.2.6 The Gas Screening Value (litres of gas per hour) is calculated by using the following equation

$$\text{GSV} = (\text{Concentration}/100) \times \text{Flow rate}$$

Where concentration is measured in percent (%)
and flow rate is measured in litres per hour (l/hr)

8.2.7 In accordance with CIRIA C665, worst case conditions are used in the calculation of GSVs for the site. These have been summarised below in Table 8.2.

8.2.8 The Characteristic Situation is then determined from Table 8.5 of CIRIA C665.

Table 8.2: Summary of Gas Monitoring Data and Gas Screening Value

Gas	Concentration (v/v %)	Peak Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (after CIRIA C665)
CO ₂	3.0	0.2	0.006	1
CH ₄	0.2	0.2	0.0004	1

8.2.9 Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary.

9 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND RECOMMENDATIONS

9.1 Land Quality Impact Summary

9.1.1 Following the ground investigation, the following is noted:

- It is understood that the proposed development will comprise the demolition of the current buildings and construction of a three to five storey development of 76 new homes and 541sqm of retail and workspace at ground level. Private and communal soft landscaping is anticipated.
- Following generic risk assessments, elevated concentrations of lead, were detected in soils in excess of generic assessment criteria for the protection of human health within a residential with plant uptake end-use scenario.
- No asbestos containing materials or fibres were detected in the Made Ground samples analysed in the laboratory.
- The site proposal indicates that the majority of the site will remain covered by a combination of the proposed building footprint and hard surfacing. Where this is the case, no formal remedial measures are considered necessary in terms of human health, as the building and hard surfacing are expected to provide a barrier to potential receptors. In areas of gardens/soft landscaping, it would be prudent to replace Made Ground with approximately 450mm of imported clean topsoil, placed on a geotextile membrane.
- A potential risk to plant growth has been identified, the above recommendation within soft landscaped areas will suffice.
- The risk to end users associated with vapour risk inhalation from soils is considered negligible.
- The risk to controlled waters from soils is considered low, however further groundwater sampling and testing is recommended, particularly from the well, WS5.
- Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary.
- Upgraded potable water supply pipe materials are unlikely to be required. The water supply pipe requirements for this site should be discussed at an early stage with the relevant utility provider.
- A remedial strategy will be required for the proposed development.
- As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out. Should any contamination be encountered, a suitably

qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.

9.1.2 The above conclusions are made subject to approval by the statutory regulatory bodies.

9.2 Review of Pollutant Linkages Following Ground Investigation

9.2.1 The site CSM has been revised and updated from that suggested in the desk study in view of the ground investigation data, including soil laboratory analysis results. Table 9.1 highlights whether pollutant linkages identified in the original CSM are still relevant following the risk assessment, or whether pollutant linkages, not previously identified, exist.

SECTION 9
GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND
RECOMMENDATIONS

Table 9.1: Plausible Pollutants Linkages Summary (Pre-Remediation)

Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
- Potential for contaminated ground associated with current site use – on site (S1) - MOT garages in the N and S. - Cooking oil company with extensive waste oil containers. - Stockpile of general waste, possible fly-tipping. - Previously burnt buildings during a fire.	- Ingestion and dermal contact with contaminated soil (P1) - Inhalation or contact with potentially contaminated dust and vapours (P2) - Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6)	- Construction workers (R1) - Maintenance workers (R2) - Neighbouring site users (R3) - Future site users (R4) - Building foundations and on site buried services (water mains, electricity and sewer) (R5)	Y	See section 9.1 above for remedial measures. The findings of this report should be included in the construction health and safety file, with adequate measures put in place for the protection of construction and maintenance workers. Contact should be made with relevant utility providers to confirm if upgraded materials are required. The concrete classification to protect buried concrete is discussed in Section 11.3
Potential for Made Ground associated with previous development operations – on site (S2)	Accumulation and migration of soil gases (P5)		N	Site has been characterised as CS1 and no gas protection measures are deemed necessary.
- Potential buried tanks associated with former use as a Garage – on site in NE (S3) - Current and previous industrial use – on and off site (S4) On site – Possible domestic garages. Off site - Garage adjacent to NW and SE. - Garage SE has a licenced pollutant release for the respraying of road vehicles. - Laundry 90m SE. - Garages 50m SE, 200m SW. - Engineering works 200m SW.	- Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff (P3) - Horizontal and vertical migration of contaminants within groundwater (P4)	- Neighbouring site users (R3) - Building foundations and on site buried services (water mains, electricity and sewer) (R5)	?	A significant risk of impact to controlled waters has not been identified. However further groundwater sampling and testing is recommended, particularly from the well, WS5. The concrete classification to protect buried concrete is discussed in Section 11.3

SECTION 9
GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND
RECOMMENDATIONS

Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
- Potential for Polychlorinated Biphenyls from substation adjacent to SE (1935) (S5) - Potential ground gas generation from possible degradable material within made ground on site and infilled pond off site 20m N (S6) Potential asbestos containing materials at the site, particularly in roofing materials (S7)				

10 DERIVATION OF GEOTECHNICAL PARAMETERS

10.1 Introduction

10.1.1 A summary of ground conditions obtained from the ground investigation and the derived geotechnical parameters is provided below.

10.2 Plasticity of Cohesive Materials

10.2.1 Atterberg Limit determination was undertaken on 1No sample of the Enfield Silt Member (1.50m bgl), 3No samples of the cohesive Taplow Gravel Member at depths ranging from 1.50m to 2.30m bgl and 4No samples of the London Clay Formation at depths ranging from 2.0m to 18.50m bgl.

10.2.2 A Plasticity Index value of 49% was reported within the Enfield Silt Member, indicating very high plasticity. Plasticity Index values within the Taplow Gravel Member ranged from 24% to 59%, indicative of intermediate to very high plasticity, as illustrated in Figure 10.1 below.

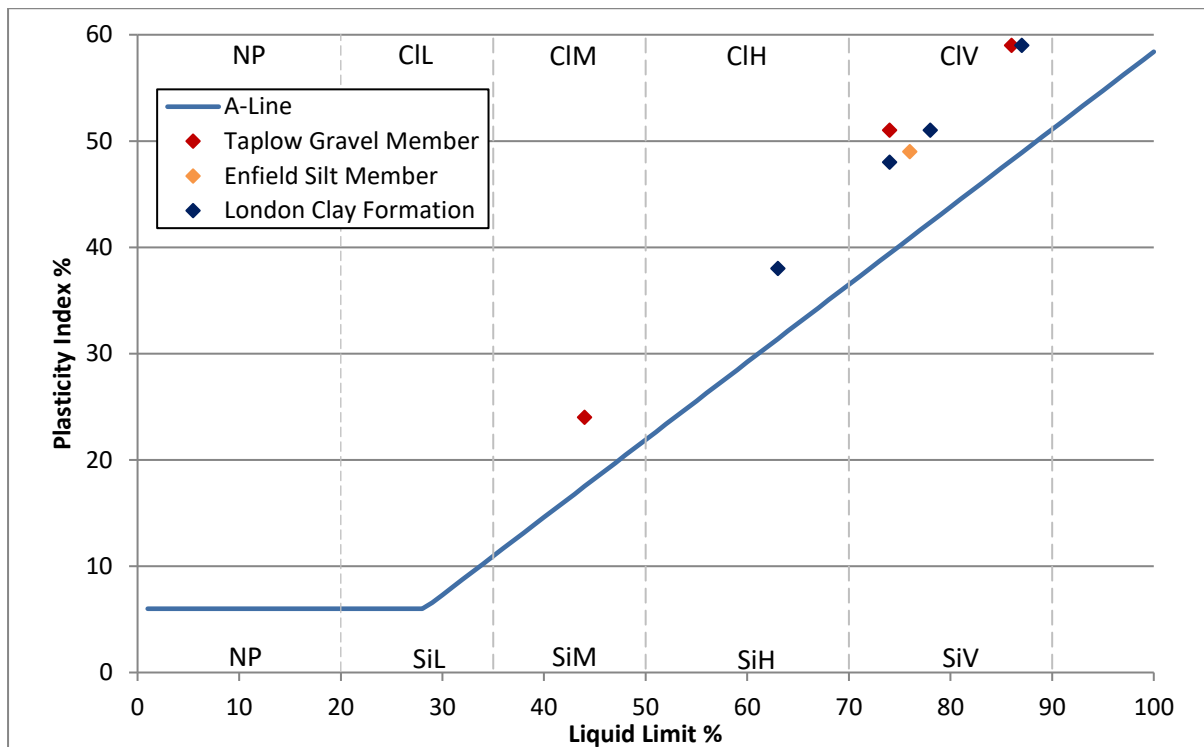
10.2.3 Plasticity Index values within the London Clay Formation ranged from 38% to 59%, indicating soils of high to very high plasticity.

10.2.4 A Modified Plasticity Index value of 49% within the Enfield Silt Member indicated soils of high volume change potential.

10.2.5 Modified Plasticity Index values ranged from 11.8% to 36.72% within the Taplow Gravel Member, indicating soils of low to medium volume change potential.

10.2.6 Modified Plasticity Index values within the London Clay Formation ranged from 30.78% to 51%, indicating soils with medium to high volume change potential.

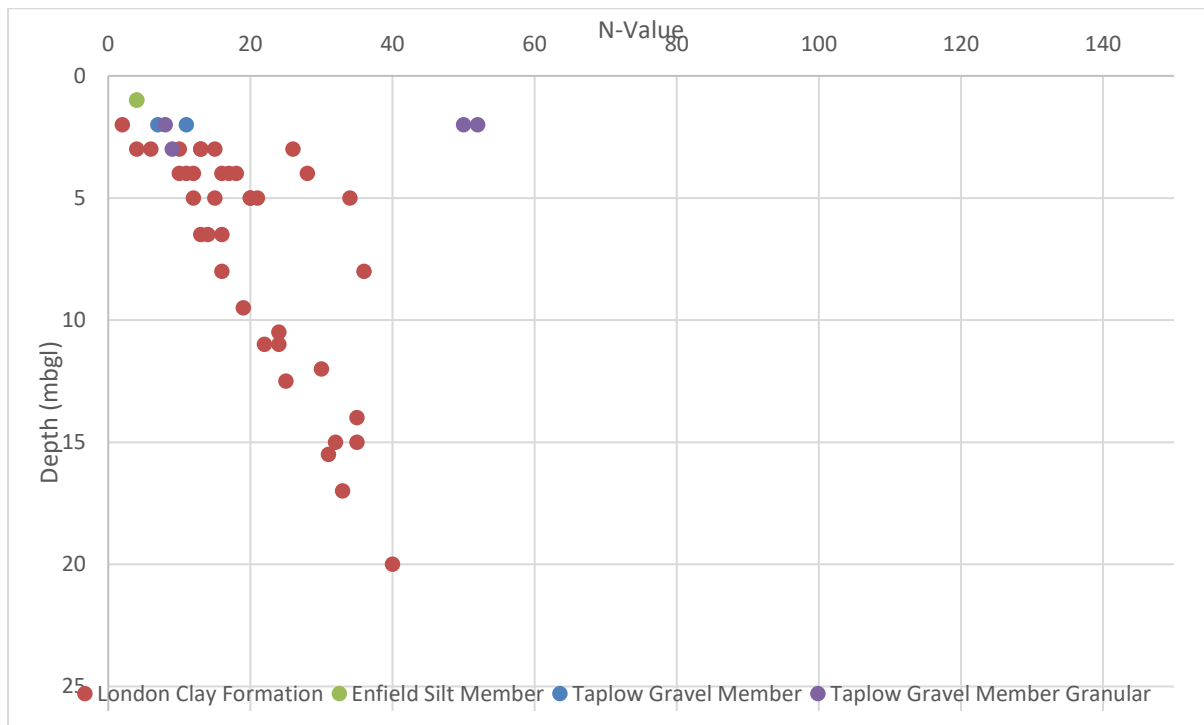
Figure 10.1: Plasticity Chart



10.3 Standard Penetration Tests

10.3.1 Standard Penetration Tests were undertaken at regular intervals throughout the windowless sample boreholes and cable percussive borehole. The results of the SPTs are plotted against depth in Figure 10.2 below.

Figure 10.2: SPT 'N' Value v Depth



10.3.2 As shown in the graph above, SPT N values within the London Clay Formation show a clear trend of increasing with depth.

10.3.3 The SPT N values are generally lower within the cohesive Taplow Gravel Member, with some variation due to locally higher granular content.

10.4 Undrained Shear Strength

10.4.1 As discussed above, the N values recorded in the clay vary with depth, this infers that the undrained shear strength of the clay similarly varies. Figure 10.3 below shows the undrained shear strength inferred by the correlation suggested by Stroud (1974);

$c_u = f_1 \times N$ can be applied,

in which

c_u = mass shear strength (kN)

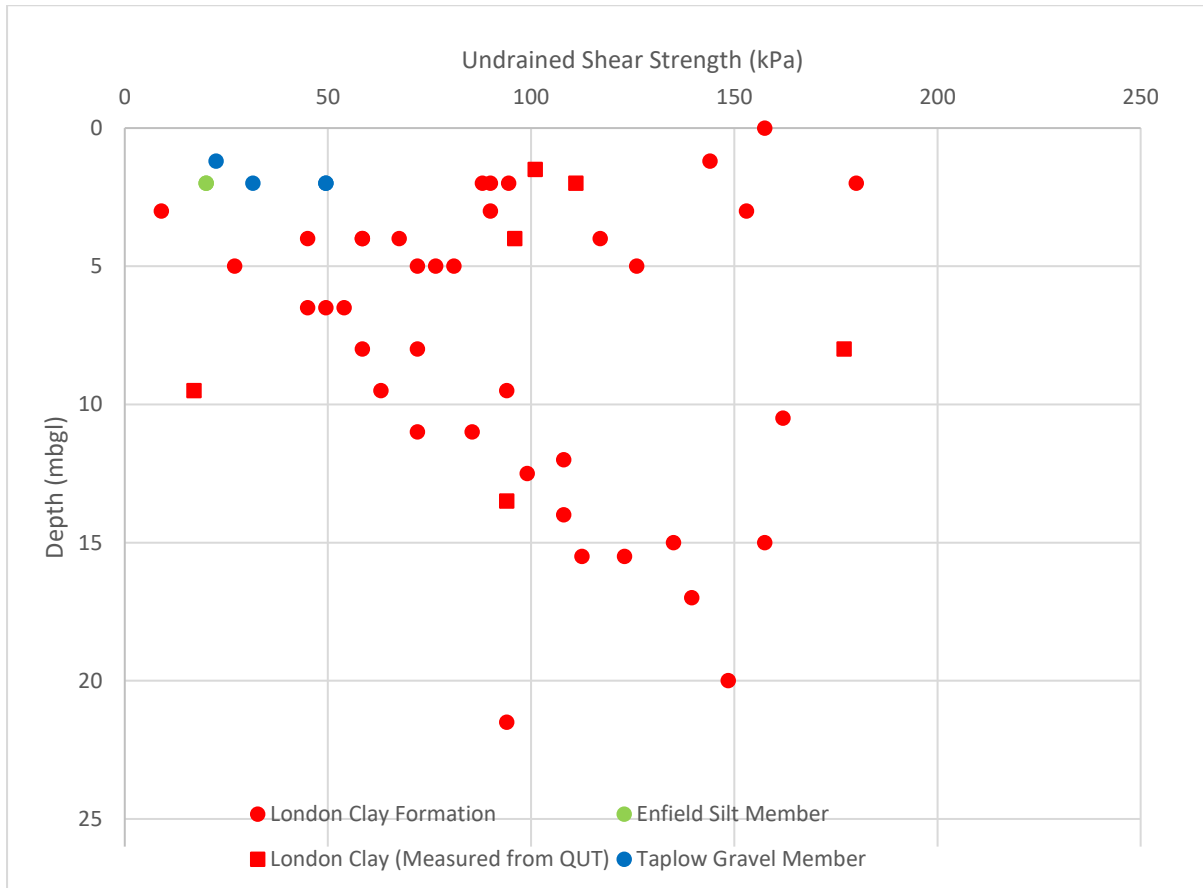
f_1 = constant

N = SPT Value achieved during boring operations

10.4.2 In the above equation f_1 is dependent on the plasticity of the material that the SPT is being carried out in. As the plasticity indices were shown to be greater than 25% a value for f_1 of 4.5 has been adopted after Tomlinson (2001).

10.4.3 The graph below shows the shear strength profile of the encountered cohesive materials at the site, based on the SPT to shear strength correlation described above, as well as the results of undrained triaxial tests on undisturbed samples taken from the borehole.

Figure 10.3: Undrained Shear Strength v Depth



10.5 Coefficient of Compressibility

10.5.1 Stroud and Butler (1974) developed a relationship between the coefficient of compressibility (m_v) and SPT 'N' value.

$m_v = 1 / f_2 \times N$ can be applied,

in which

m_v = coefficient of compressibility (m^2/MN)

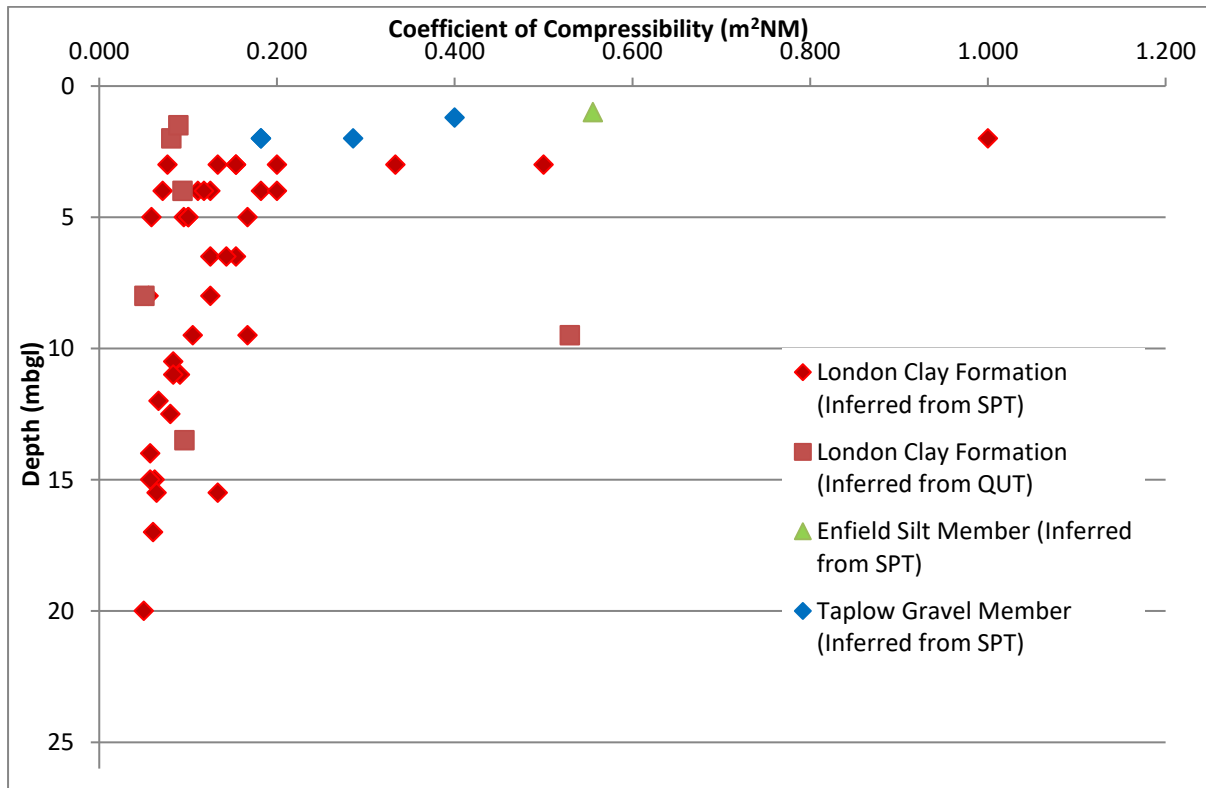
f_2 = constant dependent on the plasticity index

N = SPT Value achieved during boring operations

10.5.2 Using the plasticity indices obtained and the graphs provided in Tomlinson (2001) a value of f_2 of 0.45 has been taken and used with the SPT 'N' values to infer coefficient of compressibility (m_v).

10.5.3 Where the undrained shear strength of the clays was measured using the quick undrained triaxial methodology, the m_v value was calculated by rearranging the equations for f_1 and f_2 and substituting in the measured undrained shear strength.

Figure 10.4: Coefficient of Volume Compressibility (m_v) v Depth



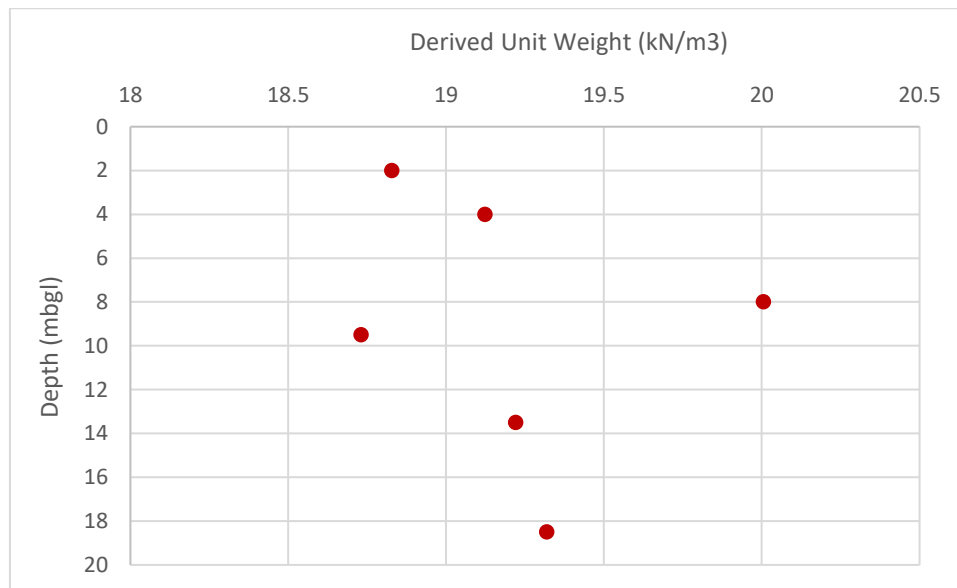
10.5.4 As would be expected, the results reduce with depth as the clay increases in strength and the over burden increases, reducing the potential for compressibility. This also may be indicative of weathering and softening of the upper horizon of London Clay.

10.5.5 As would be expected, the results from of the London Clay Formation are generally of “low” to “medium” compressibility.

10.6 Density

10.6.1 In order to calculate the undrained shear strength using the quick undrained triaxial methodology the bulk density of the materials has to be calculated. These values are provided on the quick undrained triaxial testing certificates provided in Appendix 4 and have been converted to provide a characteristic Unit Weight of $19kN/m^3$ for the London Clay Formation.

Figure 10.5: Unit Weights v Depth – London Clay Formation



10.6.2 In the absence of geotechnical laboratory test results, the correlations and suggested values for both cohesive and granular materials given in BS8004:2015 have been used. The derived bulk densities are summarised below in Table 10.1.

Table 10.1: Derived Bulk Densities

Strata	Unit Weight (kN/m³)
Made Ground	17
Enfield Silt Member	17
Taplow Gravel Member	19

10.7 Effective Angle of Shearing Resistance / Angle of Friction

10.7.1 In cohesive soils, the effective angle of shearing resistance can be derived from the plasticity index of the soil, using the following equation presented in BS8004:2015.

$$\phi' = 42 - (12.5 \times \log_{10}(PI))$$

Where PI = Plasticity Index.

10.7.2 Values have been calculated for all available Plasticity Index results and are presented in Table 10.2.

Table 10.2 Derived Angles of Shearing Resistance

Sample	Stratum	Derived Angle of Shearing Resistance (°)
WS4 at 1.50m	Enfield Silt Member	24.1

Sample	Stratum	Derived Angle of Shearing Resistance (°)
WS1 at 1.50m	Taplow Gravel Member	25.7
WS2 at 2.30m	Taplow Gravel Member	24.1
WS3 at 2.10m	Taplow Gravel Member	25.0
BH1 at 2.0m	London Clay Formation	23.9
BH1 at 13.50m	London Clay Formation	24.1
BH3 at 18.50m	London Clay Formation	24.5
WS5 at 5.00m	London Clay Formation	24.3

- 10.7.3 In granular materials, the effective angle of friction can be derived directly from shear box testing, or indirectly using the methodology outlined in Table 1 of BS8004:2015, using a combination of the SPT N-Values, Particle Size Distribution of the soil, and the field descriptions of angularity of the gravel fraction. This method assumes that the fines content of the material is less than 15%. An alternative method is to refer to the correlation between angle of friction and SPT N-values postulated by Peck *et al* (1967) and reproduced in Tomlinson (2001).

10.8 Stiffness Moduli

- 10.8.1 In cohesive materials, the undrained stiffness modulus (Young's Modulus) can be derived using the correlation with SPT N-Values, presented in CIRIA Report R143.

$$E_u = 1.2 * N$$

- 10.8.2 The drained Young's Modulus for cohesive material (with the exception of London Clay) can also be derived from the SPT-N values, as follows:

$$E' = 0.9N$$

- 10.8.3 In London Clay, the correlation is slightly different:

$$E' = 0.7N$$

- 10.8.4 In granular materials, the drained Young's Modulus can be derived using the following correlation:

$$E' = N$$

10.9 Summary of Derived General Properties

- 10.9.1 Based on the analysis of the ground investigation data and past experience with similar deposits, the following derived general parameters are given in Table 10.3.

Table 10.3 Derived Geotechnical Parameters

Property*	Enfield Silt Member	Taplow Gravel Member (granular)	Taplow Gravel Member (cohesive)	London Clay Formation
Unit Weight	17 ¹⁾	19 ¹⁾	19 ¹⁾	19
Drained Friction, ϕ' (°)	24 ²⁾	29 - 42 ³⁾	24 - 25.5 ²⁾	24 - 24.5 ²⁾
Drained Cohesion, c' (kPa)	0	0	0	0
SPT 'N' Value	4	8 - 52	5 - 11	2 - 40
Undrained Young's Modulus, E_u (MPa) ⁴⁾	4.8	-	6.0 - 13.2	2.4 - 48.0
Drained Young's Modulus E' (MPa)	3.6 ⁵⁾	8.0 - 52.0 ⁵⁾	4.5 - 9.9 ⁶⁾	1.4 - 28.0 ⁶⁾
Undrained Shear Strength, c_u (kPa) ⁷⁾	20	-	22.5 - 49.5	9 - 180
Undrained Shear Strength, c_u (kPa) ⁸⁾	-	-	-	94 - 177
Plasticity Index (%)	49	-	24 - 59	38 - 59
Modified Plasticity Index (%)	49	-	11.8 - 36.72	30.78 - 51
Volume Change Potential [NHBC]	High	-	Low to Medium	Medium to High
Modulus of Volume Compressibility, m_v (m ² /MN) ⁹⁾	0.556	-	0.182 - 0.400	0.050 - 1

¹⁾ Derived from Figures 1 and 2 of BS8004:2015

²⁾ Calculated from: $\phi' = (42^\circ - 12.5 \log 10 I_p)$ for $5\% \leq I_p \leq 100\%$ Where, I_p is the soil's plasticity index (BS8004:2015).

³⁾ Calculated from Table 1 of BS8004:2015 (Granular Soils with less than 15% fines) OR Correlation between N value and Φ (see chart in Guides and Standards – Relation of N-values and Friction Angle by Peck et al)

⁴⁾ Calculated from: $E_u = 1.2 N$ MPa, based on the guidance given in CIRIA Report 143.

⁵⁾ Calculated from: $E' = 1.0 N$ MPa, based on the guidance given in CIRIA Report 143.

⁶⁾ Calculated from $E' = 0.9 N$ MPa, based on the guidance given in CIRIA Report 143 (COHESIVE SOILS) OR 'Calculated from $E' = 0.7$ MPa, based on the guidance given in CIRIA Report 143 (LONDON CLAY)

⁷⁾ The undrained shear strength (c_u) of the cohesive soils was correlated to the SPT "N" values using Stroud (1974), where $c_u = f_1 N$ and f_1 is factor related to the Plasticity Index (PI) of the clay (a value of f_1 equal to 5.0 for $PI \leq 25\%$ and a value of f_1 value equal to 4.5 for $PI > 25\%$).

⁸⁾ These values have been determined from the unconsolidated undrained triaxial compression testing in accordance with BS1377: Part 7: 1990, Clause 8.

⁹⁾ Calculated from: $m_v = 1/f_2 N$ m²/MN, f_2 is a coefficient proposed by Stroud and Butler (1975) and varies with Plasticity Index (PI) as presented in Figure 27 of CIRIA Report 27 or $10/c_u$.

11 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

11.1 General

11.1.1 Subsequent to intrusive investigation of the site and receipt of the laboratory test results, the following geotechnical assessments have been made.

11.2 Proposed Foundations

General

11.2.1 The Made Ground and low strength clays of the Enfield Silt Member are not considered to provide suitable bearing strata due to their low and variable bearing properties, and the unacceptable risk of total and differential settlement. Furthermore, the Enfield Silt Member has not been encountered across the entire site.

11.2.2 All foundations should be deepened beneath these deposits and any soft/loose soils encountered in order to found within underlying competent strata.

11.2.3 As soils of high volume change potential are present, heave precautions will be required against the side of foundations and ground beams in accordance with the requirements set out in NHBC Standards Chapter 4.2.

Conventional Foundations

11.2.4 Due to the expected loadings from the proposed development, and the presence of deep deposits of Made Ground and soft clay, conventional shallow foundations are not considered suitable for the proposed 4-storey building.

Piled Foundations

11.2.5 Given the anticipated loads of the proposed 4-storey building, it is considered that conventional foundations are not likely to be suitable due to the high structural loads. Piled foundations are therefore recommended.

11.2.6 Preliminary load capacities calculated for varying diameter of CFA piles taken into the London Clay Formation are given in Table 11.1. The design should be used for preliminary purposes only as the actual working load is dependent on the type of pile and method of installation.

Table 11.1: Indicative Pile Capacities (kN)

Pile toe depth (mbgl)	Pile diameter (mm)		
	450	600	800
Indicative Allowable Pile Capacity (kN)			
12	223	320	466
14	278	397	577
16	338	481	696
18	405	575	829
20	480	679	974

- 11.2.7 To comply with BS EN 1997 and the guidance given by the Federation of Piling Specialists the ground must be proven to a minimum of 5m below the proposed toe of the piles. Consequently, values below 15mbgl have been given indicatively in grey italics.
- 11.2.8 The construction of a piled foundation is a specialist job and the advice of a reputable local contractor familiar with the type of ground and groundwater conditions encountered on this site should be sought prior to finalising the design.
- 11.2.9 These working loads have been calculated on the basis of the ground and groundwater conditions encountered in the boreholes and assume the following:
- The contribution to the working load on the upper 3.0m has been ignored due to the presence of Made Ground / soft clay.
 - Partial factors were applied on the sum of the end bearing and skin friction working loads as defined by BS EN 1997 using Design Approach 1 Combination 2.
 - No allowance has been made for additional forces acting on the pile shaft, such as negative skin friction, or loading due to desiccation or heave forces.
 - Groundwater level was adopted as 0.5mbgl.
- 11.2.10 The preliminary working loads given are applicable to single vertically loaded piles. Where groups of piles are to be constructed, the working load of each individual pile should be reduced appropriately and a calculation made to check for the factor of safety against block failure.
- 11.2.11 A temporary working platform is likely to be required. In addition, some form of temporary drainage may also be required to prevent the working platform becoming waterlogged or deteriorating during use. A working platform should be designed in accordance with BRE BR470, or similar design standard.
- Ground Improvement
- 11.2.12 Alternatively, consideration could be given to the use of ground improvement techniques, such as vibro-replacement stone columns (VSC).
- 11.2.13 Allowable bearing pressures for reinforced strip foundations in the order of approximately 100kPa to 125kPa can typically be achieved by this technique, though the advice and design of a specialist contractor should be sought for confirmation of the load carrying capacity and costs of their proprietary techniques.
- 11.3 Aggressive Ground Conditions**
- 11.3.1 Sulphate attack on building foundations occurs where sulphate solutions react with the various products of hydration in Ordinary Portland Cement (OPC) or converted High-Alumina Cement (HAC). The reaction is expansive, and therefore disruptive, not only due to the formation of minute cracks, but also due to loss of cohesion in the matrix.
- 11.3.2 In accordance with BRE Special Digest 1, the characteristic values of sulphate used to determine the concrete classification are determined using the methodology summarised in Table 11.2 below.

Table 11.2: Concrete in the Ground Characteristic Value Determination

No Samples in the dataset	Method for determining the sulphate characteristic value
1 - 4	Highest value
5 - 9	Mean of the top 2No highest results
10 or greater	Mean of the top 20% highest results

11.3.3 Table 11.3 summarises the analysis of the aggressive nature of the ground for each of the strata encountered within the ground investigation.

Table 11.3: Concrete in the Ground Class

Stratum	No Samples	pH range	Characteristic WS Sulphate (mg/l)	Characteristic Total Potential Sulphate (%) ¹⁾	Design Sulphate Class	ACEC Class
Made Ground	9	7.3 – 11.4	260	n/a	DS-1	AC-1s
Taplow Gravel Member	1	7.7	120	n/a	DS-1	AC-1
London Clay Formation	2	8.0 – 8.2	2670	n/a	DS-3	AC-3s

1) Applies to soils containing more than 0.3% of Oxidisable Sulphides, calculated in accordance with BRE SD-1

11.3.4 Analysis of the results indicates that the underlying soils do not contain appreciable concentrations of oxidisable sulphates and therefore the Design Class is dependent on the soluble sulphate content and pH only.

11.3.5 The concrete structures, including foundations, will need to be designed in accordance with BS EN 1992-1-1:2004+A1:2014. It is recommended that the advice of this publication be taken for the design and specification of all sub-surface concrete.

11.4 Ground Floor Slabs

Given the presence of shrinkable soils and the fact that piling is the preferred foundation solution it is recommended that suspended floor slabs are used with an adequate void designed according to NHBC Standards. As a guide, initial modelling indicates a requirement for a sub-floor void of at least 300mm due to the presence of shrinkable soils of high volume change potential.

11.5 Excavations

11.5.1 Temporary excavations within the Made Ground and granular soils are unlikely to remain stable and some form of temporary support or battering back to a safe angle is likely to be required.

11.5.2 Temporary excavations within the cohesive soils are likely to remain relatively stable in the short term though some spalling may be anticipated.

11.5.3 Ground works should always be designed in such a manner to avoid entry into excavations by construction or maintenance personnel. However, in the event that such works cannot be

avoided or designed out, they should only be undertaken in accordance with a safe system of work, following an appropriate risk assessment and in accordance with any legislative requirements, e.g. Confined Spaces Regulations.

11.6 Surface Water Drainage

Falling Head Permeability Tests

11.6.1 Five falling head permeability tests were undertaken within the installed wells at the site and all tests concluded very low to low permeability.

11.6.2 Each test was undertaken over a 1-hour period. Table 11.4 summarises the falling head permeability tests' results:

Table 11.4: Summary of Soakage Test Results

Position	Depth Range of Test (m) (Response Zone)	Results (m/s)
BH1	1.00 – 5.01m	8.64×10^{-9}
BH4	1.00 – 3.79m	1.05×10^{-7}
BH5	1.00 – 5.30m	4.67×10^{-7}
WS3	1.00 – 2.34m	1.13×10^{-6}
WS5	1.00 – 4.07m	2.80×10^{-7}

11.7 Groundwater Control

11.7.1 During the investigation groundwater was reported within Window Sample boreholes WS3, WS3 at 3.0mbgl depth. Groundwater was not reported within the remaining boreholes; however water was added to aid drilling within the cable percussive boreholes and could have masked groundwater strikes.

11.7.2 During return monitoring groundwater was reported at depths of between 0.49m and 3.70mbgl. Such variance suggests the presence of perched water bodies, as opposed to the natural groundwater table.

11.7.3 Subject to seasonal variations, any groundwater encountered during site works could be readily dealt with by conventional pumping from a sump used to collate waters.

11.7.4 Surface water or rainfall ingress could be similarly dealt with.

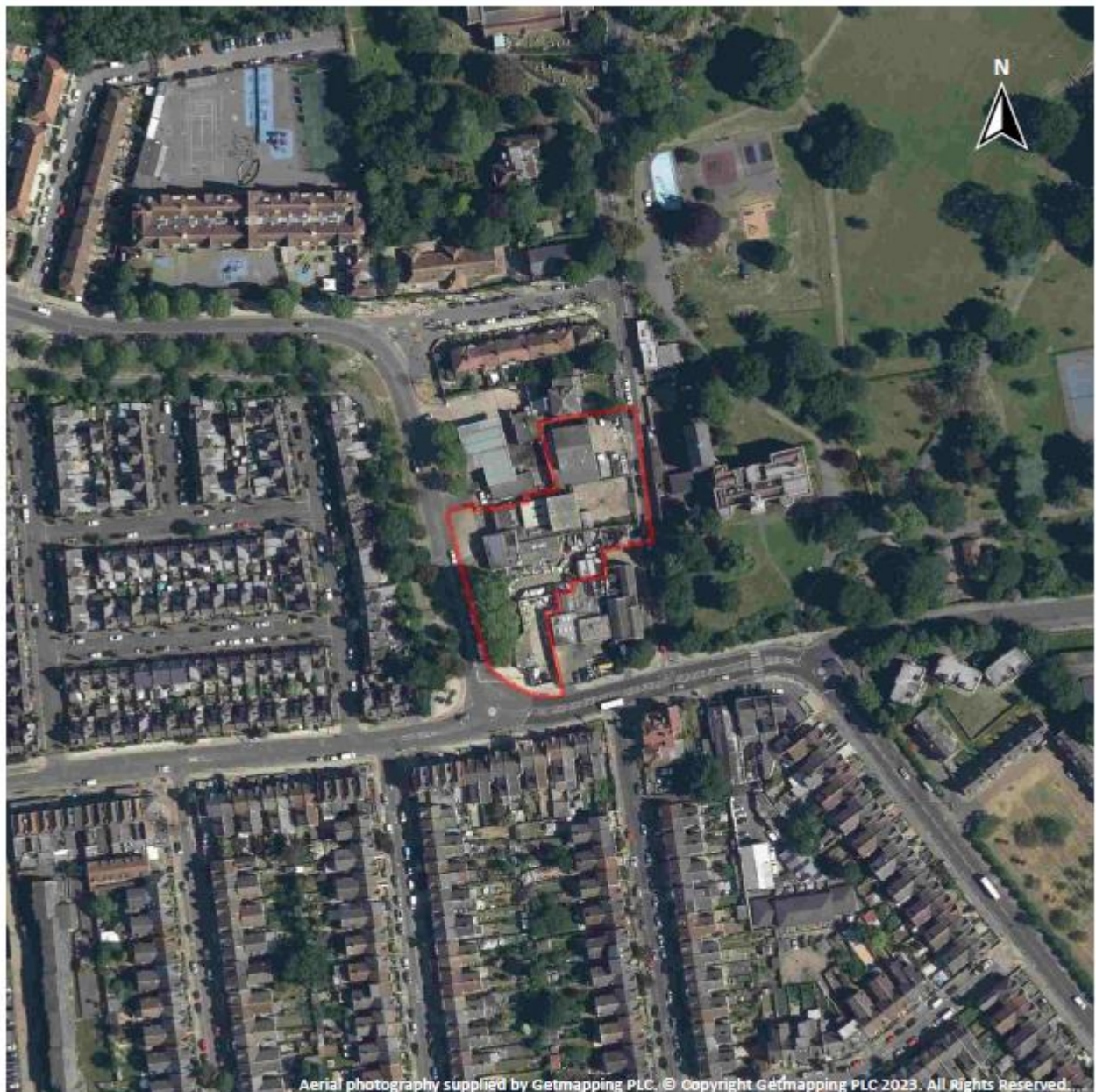
12 REFERENCES

- BRE Report BR211: Radon: Protective measures for new dwellings, 2015. BRE, Watford.
- BRE Digest 365 (2016): Soakaway design. BRE, Watford.
- BRE Special Digest 1: Concrete in Aggressive Ground, 2005. BRE, Watford.
- British Standards Institution (2004) Eurocode 7 – Geotechnical design - Part 1: General rules. BS EN 1997-1. Incorporating Corrigendum No.1. BSI, London
- British Standards Institution (2007) Eurocode 7 – Geotechnical design - Part 2: Geotechnical investigation and testing. BS EN 1997-2. BSI, London
- British Standards Institution (2015) BS 3882 *Specification for topsoil and requirements for use*. BSI, London
- British Standards Institution (2011) BS 10175 *Code of practice for the investigation of potentially contaminated sites*. BSI, London
- British Standards Institution (2013) BS 8576 *Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOC's)*, BSI, London
- British Standards Institution BS 5930:2015+A1:2020 *Code of practice for ground investigations*. BSI, London
- British Standards Institution (2015) BS 8485:2015 Incorporating corrigendum No.1 *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. BSI, London
- CIEH & CL:AIRE (2008) *Guidance on comparing soil contamination data with a critical concentration*. London: Chartered Institute of Environmental Health (CIEH) and CL:AIRE
- CIRIA C665 (2007) *Assessing risks posed by hazardous ground gases to buildings*. CIRIA, London
- CIRIA Report R143 (1995): The Standard Penetration Test (SPT): Methods and use. CIRIA, London.
- CL:AIRE (2020) Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration. CL:AIRE, Buckinghamshire
- Environment Agency (2020) *Land contamination risk management (LCRM)*
- Environment Agency, NHBC & CIEH (2008) *Guidance for the safe development of housing on land affected by contamination*. R & D Publication 66. London: Environment Agency
- Environment Agency (2006) *Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination* Environment Agency
- LQM/CIEH S4ULs. LQM, 2014
- Ministry of Housing, Communities & Local Government: *National Planning Policy Framework*. February 2019.
- NHBC Standards 2022. NHBC, Milton Keynes
- Tomlinson M.J (2001): *Foundation Design and Construction*: 7th Edition. Pearson Prentice Hall, Harlow.

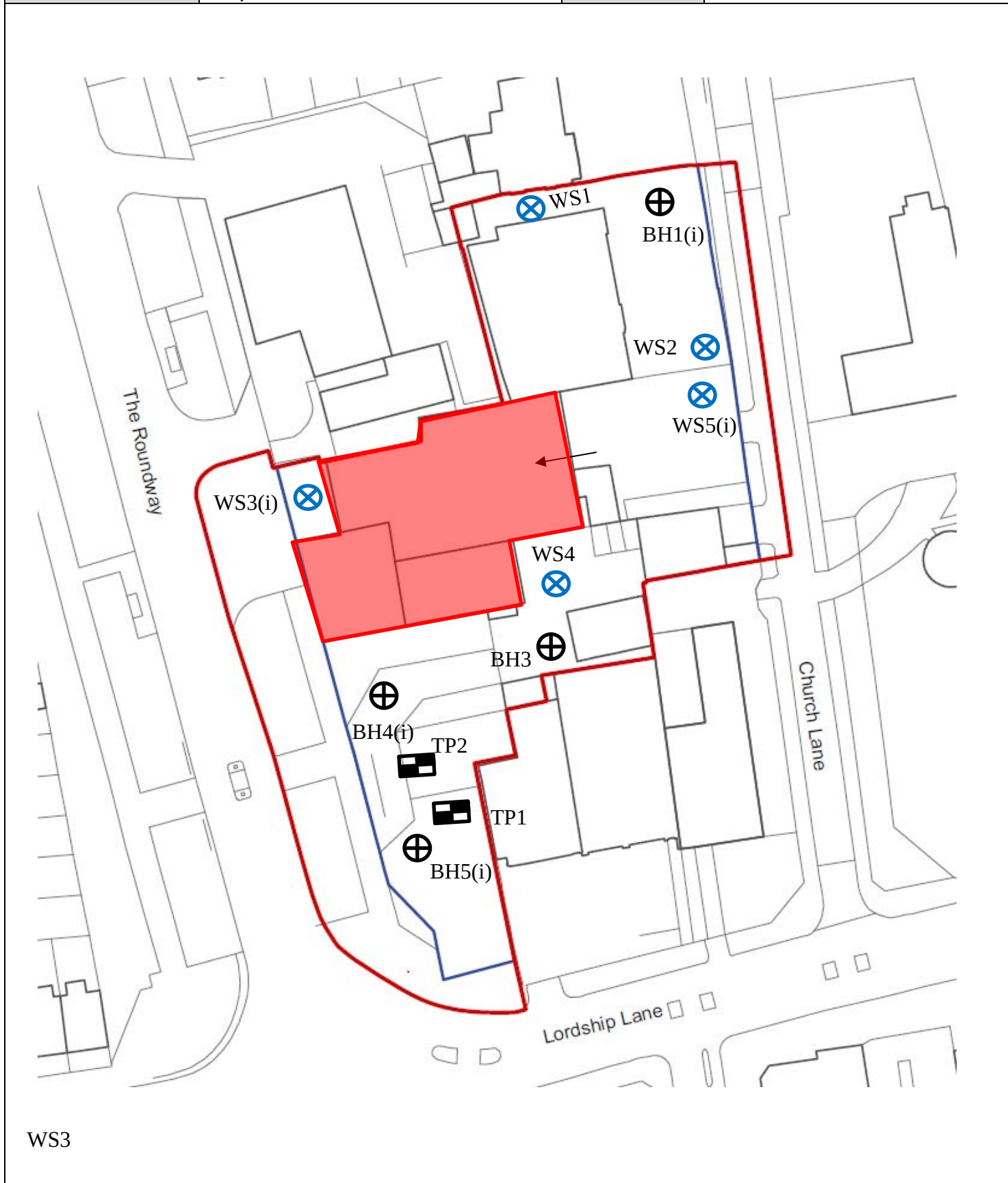
APPENDICES

APPENDIX 1 – FIGURES

PROJECT NAME	The Roundway	CLIENT	IPE Roundway Limited
TITLE	Site location plan	PROJECT NO.	P5141J2799
DATE	May 2023	FIGURE	1



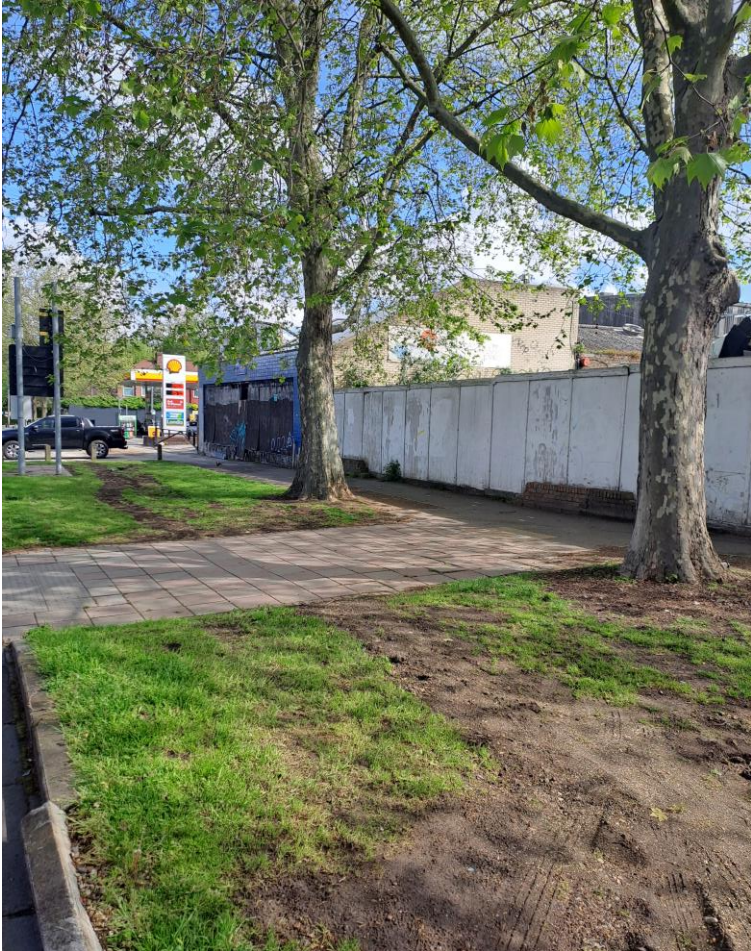
PROJECT NAME	313-315 The Roundway and 8-12 Church Lane	CLIENT	IPE Roundway Limited
TITLE	Completed Ground Investigation Plan	PROJECT NO.	P5141J2799
DATE	May 2023	FIGURE	2

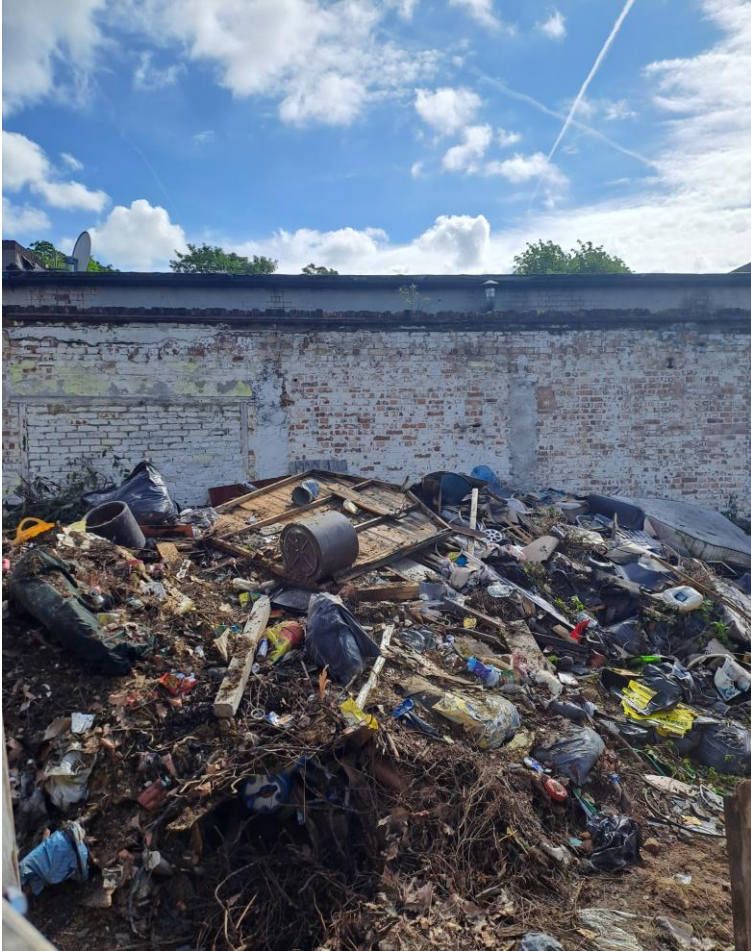


PROJECT NAME	The Roundway	CLIENT	IPE Roundway Limited
TITLE	Proposed development plan	PROJECT NO.	P5141J2799
DATE	May 2023	FIGURE	3



PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 1: Entrance to site from The Roundway.		Photo 2: Low density housing on the right hand side of entrance.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 3: Service station on the left hand side of entrance.		Photo 4: Disused cars inside the entrance to site.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 5: Suspected fly tipping and rubbish near entrance of site.		Photo 6: Large truck parked inside entrance, obstructing some of the driveway.	
			

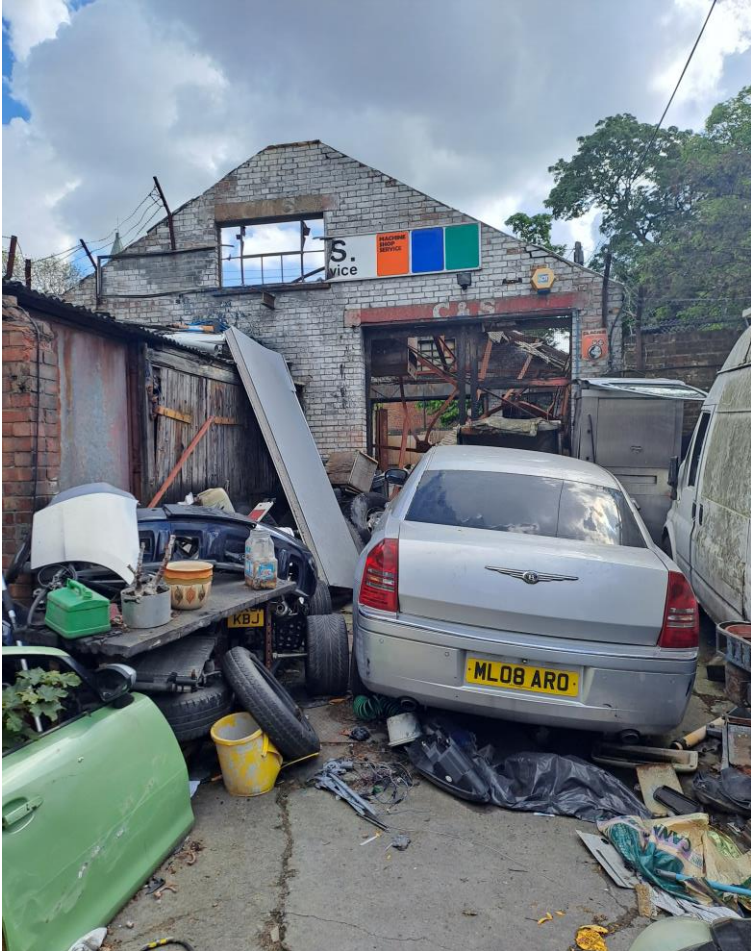
PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 7: Large metal gate leading further into site.		Photo 8: Beyond metal gate, 4 skips piled as well as disused cars.	
			

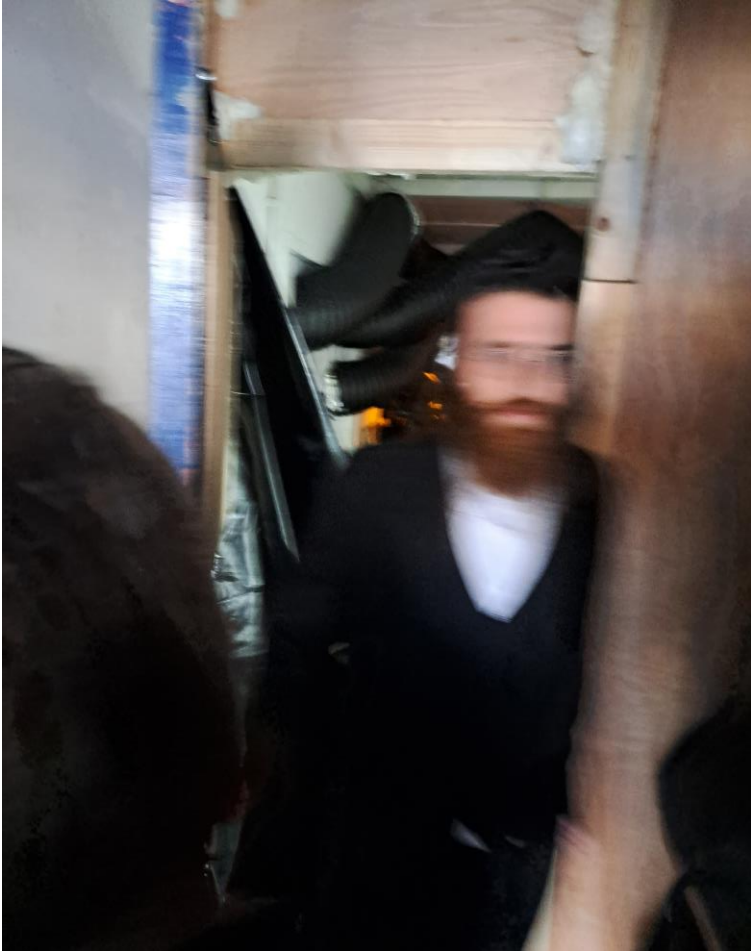
PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 9: Partially burnt down building on site.		Photo 10: Active MOT centre on accessible from Church Lane.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 11: Entrance and inside MOT centre.		Photo 12: Disused and rusted barrels in front of MOT centre.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 13: Suspected interceptor.		Photo 14: Cooking oil barrels.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 15: Empty cooking oil buckets.		Photo 16: Wide angle view of another entrance to site from Church Lane.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 17: Disused car and rubbish on site.		Photo 18: Locked storage, bins and rubbish on site.	
			

PROJECT NAME	The Roundway N17	CLIENT	IPE Roundway Limited
TITLE	Photoplan	FIGURE	4
Photo 19: Entrance to suspected cannabis farm.		Photo 20: Substation found offsite.	
			

APPENDIX 2 – EXPLORATORY HOLE RECORDS



WINDOW / WINDOWLESS SAMPLING BOREHOLE RECORD

Exploratory Hole No:

WS1

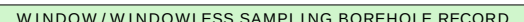
Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.596
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Windowless sampler	Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
ES	0.30								0.00		0.10		Asphalt. (MADE GROUND).	
	0.1PPM												Greyish brown sandy gravelly clay. Sand is fine to medium. Gravel consists of fine to coarse, angular to rounded flint and brick. (MADE GROUND).	
ES	0.60								0.50					
ES	0.80													
SPT	1.00	1	2	2	2	2	3	9	1.00					
ES	1.20										1.30			
D	1.50								1.50				Firm consistency** orangish brown sandy gravelly CLAY. Sand is fine. Gravel consists of fine to medium angular to rounded flint. (TAPLOW GRAVEL MEMBER).	
SPT	2.00	2	2	2	3	3	3	11	2.00					
D	2.50								2.50				Firm becoming stiff consistency** brown mottled grey CLAY. (LONDON CLAY FORMATION).	
SPT	3.00	2	3	3	4	4	4	15	3.00					
D	3.50								3.50					
SPT	4.00	3	3	3	4	4	5	16	4.00					
D	4.50								4.50					
SPT	5.00	4	4	4	5	6	6	21	5.00		5.00			

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com

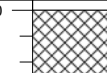
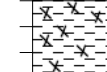
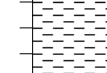


WS2

Project No:	P5141J2799
Ground Level:	17.838
Date Commenced:	19/05/2023
Date Completed:	19/05/2023
Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks
1: Groundwater was not observed.
2:
3:
4:

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
ES	0.40								0.00		0.25		Reinforced concrete. (MADE GROUND).	
									0.50		Light brown sandy gravelly silt. Sand is fine to medium. Gravel consists of fine to coarse, angular to rounded flint and brick. (MADE GROUND).			
ES	0.80													
SPT	1.00	1	1	1	1	1	2	5	1.00					
ES	1.10													
D	1.50								1.20		1.20		Soft consistency** brown silty slightly gravelly CLAY. Gravel consists of fine to medium, sub-angular to rounded flint. (TAPLOW GRAVEL MEMBER).	
									1.50					
SPT	2.00	4	3	2	2	1	2	7	2.00					
D	2.30								2.20					
									2.40		2.40		Soft consistency** Light brown sandy very gravelly CLAY. Sand is fine to medium. Gravel consists of fine to coarse, sub-rounded to rounded flint. (TAPLOW GRAVEL MEMBER).	
									2.50		Firm becoming stiff consistency** grey mottled dark brown CLAY. (LONDON CLAY FORMATION).			
SPT	3.00	3	3	3	3	4	3	13	3.00					
D	3.50								3.50					
SPT	4.00	3	3	4	4	5	5	18	4.00					
D	4.50								4.50					
SPT	5.00	4	4	4	5	5	6	20	5.00		5.00			

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
 Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
 T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



WINDOW / WINDOWLESS SAMPLING BOREHOLE RECORD

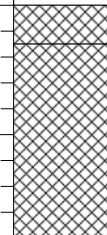
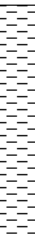
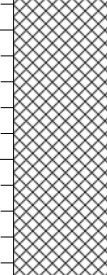
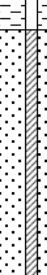
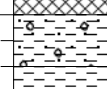
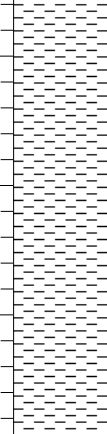
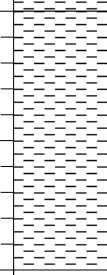
Exploratory Hole No:

WS3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	16.831
Logged By:	RAY	Date Commenced:	19/05/2023
Checked By:	CLP	Date Completed:	19/05/2023
Type and diameter of equipment:	Windowless sampler	Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:	19/05/2023					
Hole depth:	5.00					
Casing depth:	0.00					
Level water on strike:	3					
Water Level after 20mins:						

Remarks						
1: Groundwater observed at 3mbgl.						
2: No recovery between 0.4 and 1mbgl						
3: No recovery between 1.5 and 2mbgl						
4: No recovery between 2.6 and 3mbgl						

Sample or Tests										Strata			Strata Description	Installation	
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)			
		75	75	75	75	75	75	N							
ES	0.20								0.00		0.15		Concrete. (MADE GROUND).		
									0.50			Dark orangish brown sandy gravelly clay. Sand is fine to coarse. Gravel consists of fine to coarse, angular to rounded flint and brick. (MADE GROUND).			
CPT	1.00	1	1	1	1	1	1	4	1.00						
ES	1.20								1.50						
SPT D	2.00 2.10	0	1	1	0	0	1	2	2.00		2.00		Very soft consistency** grey sandy gravelly CLAY. Sand is fine to coarse. Gravel consists of fine to coarse sub-rounded to rounded flint. (TAPLOW GRAVEL MEMBER).		
	D	2.50							2.50		2.20	Very soft becoming firm consistency** grey CLAY. (LONDON CLAY FORMATION).			
SPT D	3.00 3.05	1	1	1	1	1	1	4	3.00						
								3.50							
SPT	4.00	2	2	2	3	3	4	12	4.00		4.00		Firm consistency** brown mottled grey CLAY. (LONDON CLAY FORMATION).		
D	4.50								4.50						
SPT	5.00	3	4	4	4	4	3	15	5.00		5.00				

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



WINDOW / WINDOWLESS SAMPLING BOREHOLE RECORD

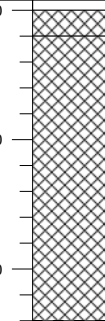
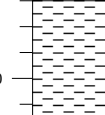
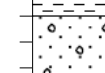
Exploratory Hole No:

WS4

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.489
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Windowless sampler	Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2:						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
ES	0.40								0.00		0.10		Concrete. (MADE GROUND).	
	0.7PPM								0.50				Black sandy gravelly clay. Sand is fine. Gravel consists of fine to medium, angular to rounded flint and brick. (MADE GROUND).	
	0.60													
	0.6PPM													
	0.90													
SPT	0.32PPM	1	1	1	1	1	1	4	1.00		1.20			
D	1.50								1.50				Light brown sandy CLAY. Sand is fine. (ENFIELD SILT MEMBER).	
									1.70					
SPT	2.00	6	6	6	15	19	10	50	2.00		2.00		Very dense light brown clayey gravelly SAND. Sand is fine to medium. Gravel consists of fine to medium, sub-angular to sub-rounded flint. (TAPLOW GRAVEL MEMBER).	
									2.50					
									3.00					
									3.50					
									4.00					
									4.50					
									5.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



WINDOW / WINDOWLESS SAMPLING BOREHOLE RECORD

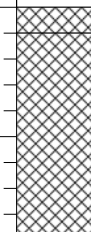
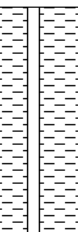
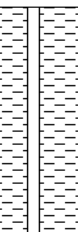
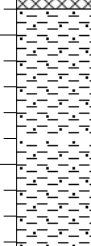
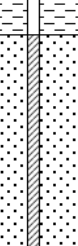
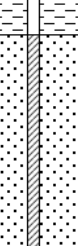
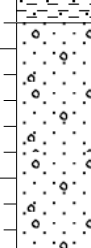
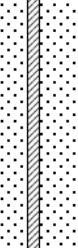
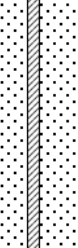
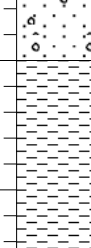
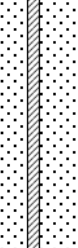
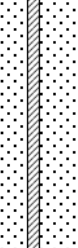
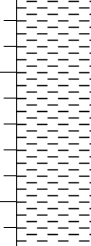
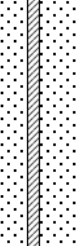
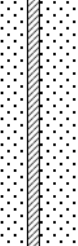
Exploratory Hole No:

WS5

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.89
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Windowless sampler	Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation	
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)			
		75	75	75	75	75	75	N							
ES	0.20								0.00		0.10		Concrete. (MADE GROUND).		
	ES	0.40							0.50			Light brown sandy gravelly clay. Sand is fine to medium. Gravel is fine to medium, sub-angular to rounded flint and brick. (MADE GROUND).			
	ES	0.70									0.90				
SPT	1.00	1	1	1	1	1	1	4	1.00				Very soft consistency** orangish grey sandy CLAY. Sand is fine. (ENFIELD SILT MEMBER).		
D SPT	2.00								1.50						
									1.90						
	D SPT	2.00	8	10	13	13	16	10	52	2.00			Very dense orangish grey SAND and GRAVEL. Sand is fine to coarse. Gravel consists of sub-angular to sub-rounded flint. (TAPLOW GRAVEL MEMBER).		
D SPT	3.00								2.50				Stiff becoming very stiff consistency** light grey mottled brown CLAY. (LONDON CLAY FORMATION).		
									3.00						
	D SPT	3.00	6	6	6	6	6	8	26		3.00				
D SPT	4.00								3.50						
									4.00						
	D SPT	4.00	6	7	7	7	8	6	28		4.50				
D SPT	5.00								5.00		5.00				
D SPT		7	7	8	8	9	9	34							



CABLE PERCUSSION BOREHOLE RECORD

Exploratory Hole No:

BH1

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.53
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	1 Of 4

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation	
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)			
		75	75	75	75	75	75	N							
									0.00						
ES	0.25									0.15		Reinforced concrete. (MADE GROUND).			
ES	0.50								0.50			Sandy gravelly clay. Gravel consists of brick. (MADE GROUND).			
ES	1.00								1.00						
C B	1.20	1	2	2	2	2	2	8	1.50						
									1.80						
U	2.00								2.00			Firm consistency** brownish grey sandy CLAY. (LONDON CLAY FORMATION).			
50 blows for 100% recovery															
									2.50						
S	3.00	2	2	2	3	2	3	10	3.00						
D	3.50								3.50						
S	4.00	2	2	3	3	2	3	11	4.00						
D	4.50								4.50						
U	5.00								5.00						
60 blows for 100% recovery															

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

Exploratory Hole No:

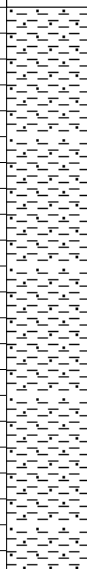
BH1

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB
Client:	IPE Roundway Ltd
Logged By:	RAY
Checked By:	CLP
Type and diameter of equipment:	Cable Percussive Rig

Project No:	P5141J2799
Ground Level:	17.53
Date Commenced:	18/05/2023
Date Completed:	18/05/2023
Sheet No:	2 Of 4

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
U	5.00								5.00			Firm consistency** brownish grey sandy CLAY. (LONDON CLAY FORMATION).		
	60 blows for 100% recovery													
									5.50					
									6.00					
S	6.50	3	4	4	3	4	5	16	6.50					
D	7.00								7.00					
									7.20					
									7.50					
S	8.00	3	5	7	8	10	11	36	8.00					
D	8.50								8.50					
U	9.00								9.00					
	60 blows for 100% recovery													
									9.50					
									10.00					



CABLE PERCUSSION BOREHOLE RECORD

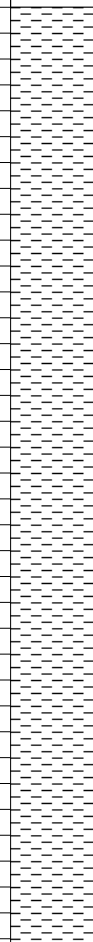
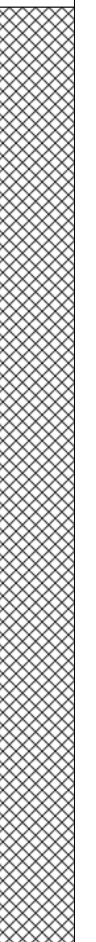
Exploratory Hole No:

BH1

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.53
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	3 Of 4

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation					
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)							
		75	75	75	75	75	75	N											
S	10.50	3	5	5	6	6	7	24	10.00				Stiff to very stiff consistency** grey CLAY with occasional CLAYSTONES. (LONDON CLAY FORMATION).						
									10.50										
D	11.00								11.00										
									11.50										
S	12.00	4	6	7	7	8	8	30	12.00										
									12.50										
D	12.50								12.50										
									13.00										
U	13.50								13.50										
									80 blows for 90% recovery										
									14.00										
									14.50										
S	15.00	6	7	7	8	8	9	32	15.00										

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com

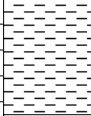


CABLE PERCUSSION BOREHOLE RECORD	
Exploratory Hole No:	BH1
Project No:	P5141J2799
Ground Level:	17.53
Date Commenced:	18/05/2023
Date Completed:	18/05/2023
Sheet No:	4 Of 4

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.53
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	4 Of 4

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks
1: Groundwater was not observed.
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.
3:
4:

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
S	15.00	6	7	7	8	8	9	32	15.00		15.45		Stiff to very stiff consistency** grey CLAY with occasional CLAYSTONES. (LONDON CLAY FORMATION).	
									15.50					
									16.00					
									16.50					
									17.00					
									17.50					
									18.00					
									18.50					
									19.00					
									19.50					
									20.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
 Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
 T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

Exploratory Hole No:

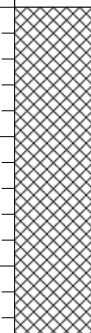
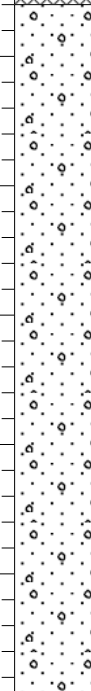
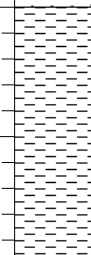
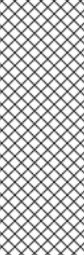
BH3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB
Client:	IPE Roundway Ltd
Logged By:	RAY
Checked By:	CLP
Type and diameter of equipment:	Cable Percussive Rig

Project No:	P5141J2799
Ground Level:	17.512
Date Commenced:	18/05/2023
Date Completed:	18/05/2023
Sheet No:	1 Of 5

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
ES	0.00								0.00				Concrete over brown gravelly clay. (MADE GROUND).	
	0.25													
ES B	0.50								0.50					
ES	1.00								1.00					
S	1.20	1	2	1	1	1	2	5			1.30			
D S	2.00								1.50				Soft consistency* orange to light brown SAND and GRAVEL with very clayey band. (TAPLOW GRAVEL MEMBER).	
D S	3.00	1	2	2	3	2	1	8	2.00					
D S	4.00								2.50					
									3.00					
D S		2	2	3	2	2	2	9	3.50					
D S	5.00								4.00				Firm consistency** light becoming dark brown CLAY. (LONDON CLAY FORMATION).	
D U									4.50					
									5.00					

35 blows for 100% recovery

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

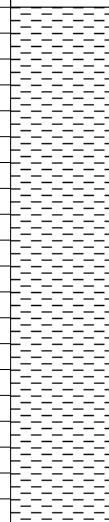
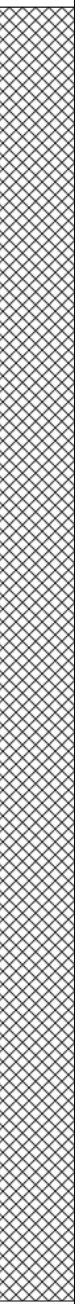
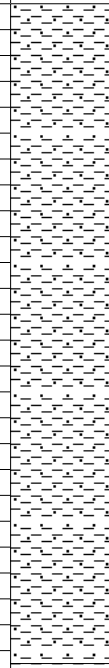
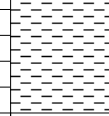
Exploratory Hole No:

BH3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.512
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	2 Of 5

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
D U	5.00								5.00			Firm consistency** light becoming dark brown CLAY. (LONDON CLAY FORMATION).		
35 blows for 100% recovery														
								5.50						
D	6.00								6.00					
S	6.50	3	4	3	3	4	3	13	6.50					
D	7.00								7.00			Firm consistency** dark brown CLAY with sand bands. (LONDON CLAY FORMATION).		
									7.50					
D S	8.00								8.00					
		4	4	3	4	5	4	16						
									8.50					
D	9.00								9.00					
U	9.50								9.50			Stiff consistency** grey CLAY. (LONDON CLAY FORMATION).		
43 blows for 70% recovery														
D	10.00								10.00					

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

Exploratory Hole No:

BH3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.512
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	3 Of 5

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
D	10.00									10.00			Stiff consistency** grey CLAY. (LONDON CLAY FORMATION).	
										10.50				
D	11.00									11.00				
S		4	5	5	6	5	6	22						
										11.50				
D	12.00									12.00			Stiff becoming very stiff consistency* grey CLAY. (LONDON CLAY FORMATION).	
S	12.50	5	7	5	7	7	6	25						
										12.50				
D	13.00									13.00	12.95		Stiff becoming very stiff consistency* grey CLAY. (LONDON CLAY FORMATION).	
										13.50				
D	14.00									14.00				
U		63 blows for 75% recovery												
										14.50				
D	15.00									15.00				

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

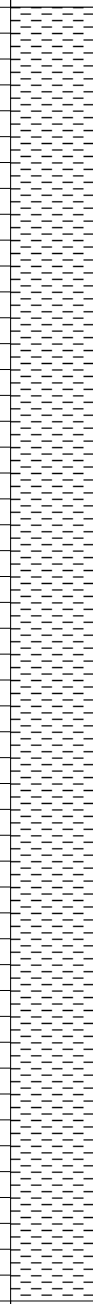
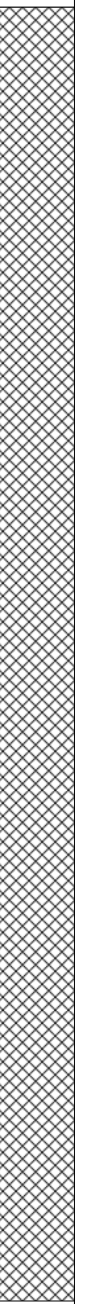
Exploratory Hole No:

BH3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.512
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	4 Of 5

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
D	15.00								15.00			Stiff becoming very stiff consistency* grey CLAY. (LONDON CLAY FORMATION).		
S	15.50	5	7	7	8	8	8	31	15.50					
D	16.00								16.00					
									16.50					
D	17.00								17.00					
S		5	6	6	8	9	10	33	17.50					
									18.00					
D	18.00								18.50					
U	18.50	80 blows for 85% recovery							19.00					
									19.50					
D	19.00								20.00					
D	20.00													
S		6	8	10	9	10	11	40						

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

Exploratory Hole No:

BH3

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.512
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	5 Of 5

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
D	20.00								20.00				Stiff becoming very stiff consistency* grey CLAY. (LONDON CLAY FORMATION).	
S		6	8	10	9	10	11	40			20.45			
									20.50					
									21.00					
									21.50					
									22.00					
									22.50					
									23.00					
									23.50					
									24.00					
									24.50					
									25.00					



CABLE PERCUSSION BOREHOLE RECORD

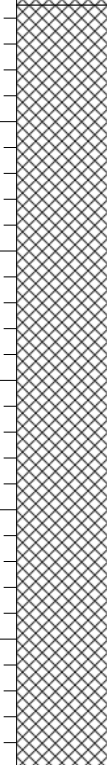
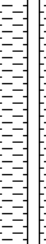
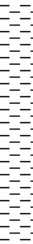
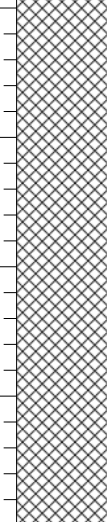
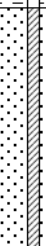
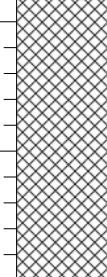
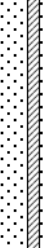
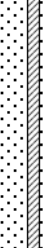
Exploratory Hole No:

BH5

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.629
Logged By:	RAY	Date Commenced:	11/05/2023
Checked By:	CLP	Date Completed:	11/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	1 Of 3

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation	
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)			
		75	75	75	75	75	75	N							
ES	0.25								0.00		0.05		Asphalt. (MADE GROUND).		
ES	0.50								0.50				Black sandy gravel. Sand is fine to medium. Gravel consists of fine to coarse, angular to rounded flint and brick. (MADE GROUND).		
ES	1.00								1.00						
S	1.20	1	2	1	1	2	2	6	1.50						
									2.00						
D	2.00								2.50						
									3.00		3.00		Soft becoming firm consistency** brown CLAY. (LONDON CLAY FORMATION).		
S	3.00	2	1	1	1	2	2	6	3.50						
									4.00						
D U	4.00								4.50						
30 blows for 80% recovery															
									5.00						
D S	5.00	2	3	3	2	3	4	12							

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



CABLE PERCUSSION BOREHOLE RECORD

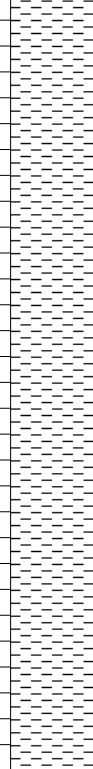
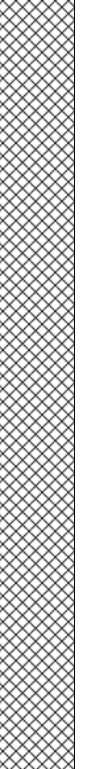
Exploratory Hole No:

BH5

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.629
Logged By:	RAY	Date Commenced:	11/05/2023
Checked By:	CLP	Date Completed:	11/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	2 Of 3

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)		
		75	75	75	75	75	75	N						
D	5.00								5.00			Soft becoming firm consistency** brown CLAY. (LONDON CLAY FORMATION).		
S		2	3	3	2	3	4	12	5.50					
									6.00					
D	6.00								6.50					
S	6.50	3	4	3	4	4	3	14	7.00					
D	7.00								7.50					
									8.00					
U	8.00	58 blows for 75% recovery							8.00	8.00			Stiff becoming very stiff consistency** grey CLAY. (LONDON CLAY FORMATION).	
D									8.50					
									9.00					
D	9.00								9.50					
S	9.50	4	5	4	4	5	6	19	10.00					
D	10.00													



CABLE PERCUSSION BOREHOLE RECORD

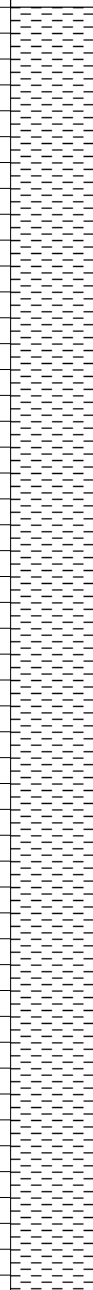
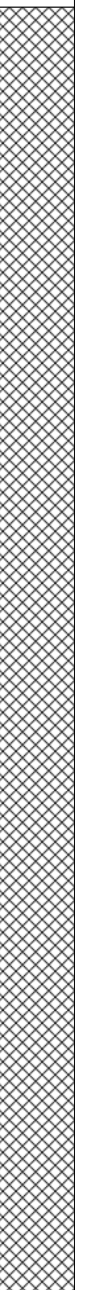
Exploratory Hole No:

BH5

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.629
Logged By:	RAY	Date Commenced:	11/05/2023
Checked By:	CLP	Date Completed:	11/05/2023
Type and diameter of equipment:	Cable Percussive Rig	Sheet No:	3 Of 3

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: Groundwater was not observed.						
2: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
3:						
4:						

Sample or Tests										Strata			Strata Description	Installation			
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)					
		75	75	75	75	75	75	N									
D	10.00								10.00			Stiff becoming very stiff consistency** grey CLAY. (LONDON CLAY FORMATION).					
									10.50								
S	11.00	5	5	6	5	6	7	24	11.00								
D									11.50								
									12.00								
D	12.00								12.50								
U	12.50	70 blows for 65% recovery							12.50								
									13.00								
D	13.00								13.50								
									14.00								
S	14.00	5	8	8	8	10	9	35	14.50								
D									15.00								
									15.00								
S	15.00	8	7	9	8	8	10	35	15.00								
D																	



ROTARY BOREHOLE RECORD

Exploratory Hole No:

BH4

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	17.289
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Windowless Sampler	Sheet No:	1 Of 1

Water levels recorded during boring, m						
Date:						
Hole depth:						
Casing depth:						
Level water on strike:						
Water Level after 20mins:						

Remarks						
1: *Field observation.						
2: Groundwater was not observed.						
3: **Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature.						
4:						

Sample or Tests										Strata			Strata Description	Installation	
Type	Depth (mbgl)	Result								Legend	Depth (mbgl)	Water Strikes (mbgl)			
		75	75	75	75	75	75	N							
ES	0.30								0.00		0.05		Asphalt. (MADE GROUND).		
	0.7PPM											Dark brownish black sandy gravel. Sand is fine to medium. Gravel consists of fine to coarse, angular to rounded flint and brick. (MADE GROUND).			
ES	0.50								0.50		0.30		Black sandy gravelly clay. Sand is fine to medium. Gravel consists of angular to rounded flint and brick. (MADE GROUND).		
	0.2PPM														
ES	0.80								1.00						
	0PPM														
SPT	1.00	1	1	1	1	1	1	4	1.00						
ES	1.50								1.50						
SPT	2.00	1	1	2	2	3	4	11	2.00		2.00		Firm consistency** orangish brown sandy gravelly CLAY. Sand is fine. Gravel consists of fine to medium angular to rounded flint. (TAPLOW GRAVEL MEMBER).		
D	2.50								2.50						
SPT	3.00	3	3	3	3	3	4	13	3.00		3.00		Stiff consistency** light grey slightly sandy CLAY. Sand is fine. (LONDON CLAY FORMATION).		
	D	3.50							3.50						
SPT	4.00	3	4	4	4	4	5	17	4.00						
D	4.50								4.50						
SPT	5.00	4	4	4	4	6	6	20	5.00		5.00				

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample
Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com



TRIAL PIT RECORD

Exploratory Hole No:

TP1

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Hand digging tools	Sheet No:	1 Of 1
Pit Dimension:	Length:	Width:	Depth:
			0.10

Remarks
1: Trial pit completed within a stockpile on site.
2:
3:
4:

Sample or Tests			Strata			Strata Description
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	
ES	0.10			0.20		Dark brownish black sandy gravelly clay. Sand is fine to coarse. Gravel consists of fine to coarse, angular to rounded flint, brick, concrete, plastic, glass, and organic material. (MADE GROUND).
				0.50		
				1.00		
				1.50		
				2.00		
				2.50		
				3.00		
				3.50		
				4.00		
				4.50		
				5.00		



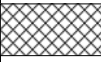
TRIAL PIT RECORD

Exploratory Hole No:

TP2

Site Address:	313-315 The Roundway and 8-12 Church Lane, London N17 7AB	Project No:	P5141J2799
Client:	IPE Roundway Ltd	Ground Level:	
Logged By:	RAY	Date Commenced:	18/05/2023
Checked By:	CLP	Date Completed:	18/05/2023
Type and diameter of equipment:	Hand digging tools	Sheet No:	1 Of 1
Pit Dimension:	Length:	Width:	Depth:

Remarks
1: Trial pit undertaken within stockpile on site.
2:
3:
4:

Sample or Tests			Strata			Strata Description
Type	Depth (mbgl)	Result	Legend	Depth (mbgl)	Water Strikes (mbgl)	
ES	0.10			0.20		Dark brownish black sandy gravelly clay. Sand is fine to coarse. Gravel consists of fine to coarse, angular to rounded flint, brick, concrete, plastic glass, and organic material. (MADE GROUND).
				0.50		
				1.00		
				1.50		
				2.00		
				2.50		
				3.00		
				3.50		
				4.00		
				4.50		
				5.00		

APPENDIX 3 – CHEMICAL LABORATORY TEST RESULTS

Jomas Associates
Unit 24
Sarum Complex
Salisbury Road
UB8 2RZ

Moor Lane
Witton
Birmingham
B6 7HG
Tel: +44 (0)121 344 4838
birmingham@terratek.co.uk
www.terratek.co.uk

Chemical Analysis - The Roundway

For the Attention of	Clare Prosser
Report Number	23-02000
Client Reference/Site	The Roundway
Order Number	J2799
Date Samples Received	02/06/2023
Date Instructions Received	02/06/2023

Samples Taken By:	
Date Testing Commenced	02/06/2023
Date Testing Completed	12/06/2023

Dear Clare,

Thank you for your recent submission of samples for testing. Analysis has now been completed and please find herein your laboratory testing report.

If you would like to discuss your report or have any questions, comments or feedback, please don't hesitate to get in touch, we'd be delighted to hear from you.

Thanks again for choosing Terra Tek for your analytical requirements, we hope the experience has been a pleasant one and we look forward to working with you again in the not too distant future.

Notes

Only those results indicated in this report are ISO 17025 or MCERTS accredited and any opinions or interpretations expressed are outside the scope of ISO 17025 accreditation. This report is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

All results contained in this report are provisional unless signed by an approved signatory.

Unless we are advised to the contrary, samples will be disposed after a period of one month from the reporting date. Samples tested for asbestos are retained for six months.

Sample location, site address, taken by and client reference are included where provided by the client. Terra Tek accepts no responsibility for the validity or accuracy of this information.

This report should not be reproduced in full without the written approval of the laboratory.



Date of Issue 14/06/2023

Approved by: Andrew Timms, General Manager



SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Metals - Solid													
Sulphur, total	TP129	M	0.01	% S	0.03	-	-	-	-	-	-	-	-
Arsenic	TP137	M	0.5	mg/kg	-	15.1	23.1	13.9	16.5	10.6	24.6	15.6	
Boron, water soluble	TP032	U	0.2	mg/kg	-	1.0	5.4	2.4	3.7	1.1	1.9	4.0	
Cadmium	TP137	M	0.1	mg/kg	-	0.58	1.54	0.55	1.74	0.42	1.55	0.72	
Chromium	TP137	M	1	mg/kg	-	26	32	18	29	16	30	28	
Chromium, hexavalent	TP040	N	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Copper	TP137	M	1	mg/kg	-	25	167	35	94	18	154	38	
Lead	TP137	M	1	mg/kg	-	81	13700	488	725	103	834	218	
Mercury	TP137	M	0.1	mg/kg	-	3.70	1.34	0.52	0.39	0.22	0.60	1.33	
Nickel	TP137	M	1	mg/kg	-	19	30	19	26	22	35	33	
Selenium	TP137	U	0.5	mg/kg	-	0.80	0.79	< 0.50	1.03	< 0.50	0.65	1.06	
Zinc	TP137	M	0.5	mg/kg	-	69.3	928	109	523	97.3	676	79.8	
Inorganic Suite - Solid													
Cyanide, total	TP193	N	0.1	mg/kg	-	< 0.10	0.17	< 0.10	0.23	< 0.10	< 0.10	< 0.10	
pH	TP019	M	0	-	8.4	7.9	8.3	8.0	7.7	11.4	8.4	7.3	
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	0.06	0.06	0.32	0.09	0.18	0.43	0.08	0.07	
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	0.01	0.11	0.25	0.06	0.18	0.23	0.04	0.12	
Phenol, monohydric	TP193	N	0.7	mg/kg	-	< 0.7	< 0.7	< 0.7	3.9	< 0.7	< 0.7	< 0.7	
Total Organic Carbon	TP189	N	0.1	%	-	-	-	-	-	1.6	2.9	-	
TPH - Solid													
Total Petroleum Hydrocarbons (C6-C10)	TP067	N	1	mg/kg	-	5 ^d	15 ^d	< 1 ^d	< 1 ^d	-	-	-	
Total Petroleum Hydrocarbons (C10-C12)	TP067	N	1	mg/kg	-	< 1 ^d	25 ^d	< 1 ^d	< 1 ^d	-	-	-	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Total Petroleum Hydrocarbons (C12-C16)	TP067	N	1	mg/kg	-	< 1 ^d	22 ^d	3 ^d	1 ^d	-	-	-	-
Total Petroleum Hydrocarbons (C16-C21)	TP067	N	1	mg/kg	-	< 1 ^d	16 ^d	103 ^d	38 ^d	-	-	-	-
Total Petroleum Hydrocarbons (c8-c40)	TP067	N	1	mg/kg	-	< 1 ^d	282 ^d	202 ^d	627 ^d	-	-	-	-
Mineral Range Organics (c21-c40)	TP067	N	1	mg/kg	-	< 1 ^d	207 ^d	96 ^d	588 ^d	-	-	-	-
TPHCWG/VPHCWG - Solid													
TPH (Aliphatics C5-C6)	TP154	M	10	µg/kg	-	-	-	-	-	< 1000 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aliphatics C6-C8)	TP154	M	10	µg/kg	-	-	-	-	-	< 1000 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aliphatics C8-C10)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C10-C12)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C12-C16)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C16-C21)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C21-C35)	TP126	U	1	mg/kg	-	-	-	-	-	2 ^d	4 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C35-C40)	TP126	N	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C6-C7)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C7-C8)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C8-C10)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C10-C12)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C12-C16)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C16-C21)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	31 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C21-C35)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	112 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C35-C40)	TP126	N	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
PAHs - Solid													
Acenaphthene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d	0.28 ^d	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Acenaphthylene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.12 ^d	< 0.10 ^d	0.24 ^d	< 0.10 ^d	0.13 ^d	< 0.10 ^d	< 0.10 ^d
Anthracene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.39 ^d	< 0.10 ^d	0.66 ^d	< 0.10 ^d	0.68 ^d	< 0.10 ^d	< 0.10 ^d
Benzo(a)anthracene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	1.17 ^d	0.25 ^d	3.26 ^d	0.08 ^d	1.87 ^d	0.07 ^d	0.07 ^d
Benzo(a)pyrene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	1.47 ^d	0.20 ^d	3.04 ^d	< 0.05 ^d	1.44 ^d	< 0.05 ^d	< 0.05 ^d
Benzo(b)fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.52 ^d	0.30 ^d	3.87 ^d	< 0.10 ^d	1.86 ^d	< 0.10 ^d	< 0.10 ^d
Benzo(ghi)perylene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.78 ^d	0.20 ^d	1.83 ^d	< 0.05 ^d	0.81 ^d	< 0.05 ^d	< 0.05 ^d
Benzo(k)fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	1.34 ^d	0.25 ^d	2.24 ^d	< 0.10 ^d	1.32 ^d	< 0.10 ^d	< 0.10 ^d
Chrysene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	1.76 ^d	0.31 ^d	3.54 ^d	0.10 ^d	2.05 ^d	< 0.10 ^d	< 0.10 ^d
Dibenzo(ah)anthracene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.26 ^d	< 0.10 ^d	0.36 ^d	< 0.10 ^d	0.27 ^d	< 0.10 ^d	< 0.10 ^d
Fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.33 ^d	0.45 ^d	6.30 ^d	0.14 ^d	3.60 ^d	< 0.10 ^d	< 0.10 ^d
Fluorene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.06 ^d	< 0.05 ^d	0.14 ^d	< 0.05 ^d	0.09 ^d	< 0.05 ^d	< 0.05 ^d
Indeno(123-cd)pyrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.73 ^d	0.16 ^d	1.58 ^d	< 0.10 ^d	0.74 ^d	< 0.10 ^d	< 0.10 ^d
Naphthalene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.43 ^d	0.08 ^d	0.26 ^d	0.07 ^d	0.07 ^d	< 0.05 ^d	< 0.05 ^d
Phenanthrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.55 ^d	0.15 ^d	2.87 ^d	0.10 ^d	1.23 ^d	< 0.10 ^d	< 0.10 ^d
Pyrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.24 ^d	0.50 ^d	5.79 ^d	0.18 ^d	3.06 ^d	0.11 ^d	0.11 ^d
Total PAHs (USEPA 16)	TP045	M	1.3	mg/kg	-	< 1.3 ^d	13.7 ^d	2.6 ^d	28.9 ^d	< 1.3 ^d	16.9 ^d	< 1.3 ^d	< 1.3 ^d
VOCs - Solid													
1,1,1,2-Tetrachloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,1-Trichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,2,2-Tetrachloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,2-Trichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1-Dichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
1,1-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2,3-Trichloropropane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2,4-Trimethylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,2-Dibromoethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2-Dichlorobenzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,2-Dichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,3,5-Trimethylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,3-Dichlorobenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,3-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,4-Dichlorobenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
2,2-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
2-Chlorotoluene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
4-Chlorotoluene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
4-Isopropyltoluene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Bromobenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Bromochloromethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Bromodichloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Bromomethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chlorobenzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Chloroethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chloroform	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Choroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
cis-1,2-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
cis-1,3-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dibromochloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dibromomethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dichlorodifluoromethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dichloromethane	TP154	U	50	µg/kg	-	-	-	-	-	-	< 500 ^d	< 50 ^d	< 50 ^d
Isopropylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
n-Butylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
n-Propylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
sec-Butylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Styrene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
tert-Butylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Tetrachloroethene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Tetrachloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
trans-1,2-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
trans-1,3-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Tribromomethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Trichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Trichlorofluoromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
VOCs (BTEX) - Solid													
Benzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Ethyl benzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

	Sample ID	10304	10305	10306	10307	10308	10309	10310	10311			
	Other ID											
	Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60			
	Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4			
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
	Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023			
Test	Method	Acc	LOD	Units								
m/p-Xylene	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d
Methyl tert-butyl ether (MTBE)	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
o-Xylene	TP154	M	5	µg/kg	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Toluene	TP154	M	5	µg/kg	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Metals - Solid					
Sulphur, total	TP129	M	0.01	% S	-
Arsenic	TP137	M	0.5	mg/kg	29.4
Boron, water soluble	TP032	U	0.2	mg/kg	1.1
Cadmium	TP137	M	0.1	mg/kg	0.95
Chromium	TP137	M	1	mg/kg	31
Chromium, hexavalent	TP040	N	0.3	mg/kg	< 0.3
Copper	TP137	M	1	mg/kg	281
Lead	TP137	M	1	mg/kg	462
Mercury	TP137	M	0.1	mg/kg	0.66
Nickel	TP137	M	1	mg/kg	50
Selenium	TP137	U	0.5	mg/kg	0.96
Zinc	TP137	M	0.5	mg/kg	300
Inorganic Suite - Solid					
Cyanide, total	TP193	N	0.1	mg/kg	< 0.10
pH	TP019	M	0	-	10.5
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	0.25
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	0.27
Phenol, monohydric	TP193	N	0.7	mg/kg	< 0.7
Total Organic Carbon	TP189	N	0.1	%	-
TPH - Solid					
Total Petroleum Hydrocarbons (C6-C10)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (C10-C12)	TP067	N	1	mg/kg	-

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Total Petroleum Hydrocarbons (C12-C16)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (C16-C21)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (c8-c40)	TP067	N	1	mg/kg	-
Mineral Range Organics (c21-c40)	TP067	N	1	mg/kg	-
TPHCWG/VPHCWG - Solid					
TPH (Aliphatics C5-C6)	TP154	M	10	µg/kg	< 1000 ^d
TPH (Aliphatics C6-C8)	TP154	M	10	µg/kg	< 1000 ^d
TPH (Aliphatics C8-C10)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C10-C12)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C12-C16)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C16-C21)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C21-C35)	TP126	U	1	mg/kg	37 ^d
TPH (Aliphatics C35-C40)	TP126	N	1	mg/kg	< 1 ^d
TPH (Aromatics C6-C7)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C7-C8)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C8-C10)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C10-C12)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C12-C16)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C16-C21)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C21-C35)	TP126	U	1	mg/kg	19 ^d
TPH (Aromatics C35-C40)	TP126	N	1	mg/kg	< 1 ^d
PAHs - Solid					
Acenaphthene	TP045	M	0.05	mg/kg	0.23 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Acenaphthylene	TP045	M	0.1	mg/kg	< 0.10 ^d
Anthracene	TP045	M	0.1	mg/kg	0.40 ^d
Benzo(a)anthracene	TP045	M	0.05	mg/kg	1.83 ^d
Benzo(a)pyrene	TP045	M	0.05	mg/kg	1.97 ^d
Benzo(b)fluoranthene	TP045	M	0.1	mg/kg	2.47 ^d
Benzo(ghi)perylene	TP045	M	0.05	mg/kg	1.20 ^d
Benzo(k)fluoranthene	TP045	M	0.1	mg/kg	1.27 ^d
Chrysene	TP045	M	0.1	mg/kg	2.03 ^d
Dibenzo(ah)anthracene	TP045	M	0.1	mg/kg	0.23 ^d
Fluoranthene	TP045	M	0.1	mg/kg	3.93 ^d
Fluorene	TP045	M	0.05	mg/kg	0.12 ^d
Indeno(123-cd)pyrene	TP045	M	0.1	mg/kg	0.98 ^d
Naphthalene	TP045	M	0.05	mg/kg	0.19 ^d
Phenanthrene	TP045	M	0.1	mg/kg	1.77 ^d
Pyrene	TP045	M	0.1	mg/kg	3.59 ^d
Total PAHs (USEPA 16)	TP045	M	1.3	mg/kg	19.6 ^d
VOCs - Solid					
1,1,1,2-Tetrachloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,1-Trichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,2,2-Tetrachloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,2-Trichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1-Dichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
1,1-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
1,2,3-Trichloropropane	TP154	U	5	µg/kg	< 500 ^d
1,2,4-Trimethylbenzene	TP154	N	5	µg/kg	< 5 ^d
1,2-Dibromoethane	TP154	U	5	µg/kg	< 500 ^d
1,2-Dichlorobenzene	TP154	M	5	µg/kg	< 5 ^d
1,2-Dichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,2-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
1,3,5-Trimethylbenzene	TP154	N	5	µg/kg	< 5 ^d
1,3-Dichlorobenzene	TP154	U	5	µg/kg	< 5 ^d
1,3-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
1,4-Dichlorobenzene	TP154	U	5	µg/kg	< 5 ^d
2,2-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
2-Chlorotoluene	TP154	U	5	µg/kg	< 5 ^d
4-Chlorotoluene	TP154	M	5	µg/kg	< 5 ^d
4-Isopropyltoluene	TP154	N	5	µg/kg	< 5 ^d
Bromobenzene	TP154	U	5	µg/kg	< 5 ^d
Bromochloromethane	TP154	U	5	µg/kg	< 500 ^d
Bromodichloromethane	TP154	M	5	µg/kg	< 500 ^d
Bromomethane	TP154	U	5	µg/kg	< 500 ^d
Chlorobenzene	TP154	M	5	µg/kg	< 5 ^d
Chloroethane	TP154	M	5	µg/kg	< 500 ^d
Chloroform	TP154	M	5	µg/kg	< 500 ^d
Chloromethane	TP154	M	5	µg/kg	< 500 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Choroethene	TP154	M	5	µg/kg	< 500 ^d
cis-1,2-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d
cis-1,3-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
Dibromochloromethane	TP154	M	5	µg/kg	< 500 ^d
Dibromomethane	TP154	M	5	µg/kg	< 500 ^d
Dichlorodifluoromethane	TP154	U	5	µg/kg	< 500 ^d
Dichloromethane	TP154	U	50	µg/kg	< 500 ^d
Isopropylbenzene	TP154	U	5	µg/kg	< 5 ^d
n-Butylbenzene	TP154	N	5	µg/kg	< 5 ^d
n-Propylbenzene	TP154	U	5	µg/kg	< 5 ^d
sec-Butylbenzene	TP154	N	5	µg/kg	< 5 ^d
Styrene	TP154	U	5	µg/kg	< 5 ^d
tert-Butylbenzene	TP154	U	5	µg/kg	< 5 ^d
Tetrachloroethene	TP154	U	5	µg/kg	< 500 ^d
Tetrachloromethane	TP154	M	5	µg/kg	< 500 ^d
trans-1,2-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d
trans-1,3-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
Tribromomethane	TP154	U	5	µg/kg	< 500 ^d
Trichloroethene	TP154	M	5	µg/kg	< 500 ^d
Trichlorofluoromethane	TP154	M	5	µg/kg	< 500 ^d
VOCs (BTEX) - Solid					
Benzene	TP154	M	5	µg/kg	< 5 ^d
Ethyl benzene	TP154	M	5	µg/kg	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
m/p-Xylene	TP154	M	10	µg/kg	< 10 ^d
Methyl tert-butyl ether (MTBE)	TP154	M	5	µg/kg	< 500 ^d
o-Xylene	TP154	M	5	µg/kg	< 5 ^d
Toluene	TP154	M	5	µg/kg	< 5 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

					Sample ID	10313	10314	10315
					Other ID			
					Depth m	4.50	1.50	16.00
					Lab ID	WS1	WS2	BH3
					Sample Type	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units				
Metals - Solid								
Sulphur, total	TP129	M	0.01	% S	0.59	0.02	0.57	
Inorganic Suite - Solid								
pH	TP019	M	0	-	8.0	7.7	8.2	
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	1.73	0.05	0.24	
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	2.67	0.12	0.92	

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	10306	10307	10308	10309	10310
Other ID					
Depth m	0.30	0.40	0.10	0.50	1.20
Lab ID	BH4	WS2	TP1	BH1	WS3
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023

Test	Method	Acc	LOD	Units					
Asbestos									
Asbestos Screen	TP181	U	~	-	ND	ND	ND	ND	ND
Weight of Sample Material	TP183	U	0.001	g	422.23	354.93	500.41	716.04	708.32
Chrysotile (White Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Amosite (Brown Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Crocidolite (Blue Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Anthophyllite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND
Tremolite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND
Actinolite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

Analyst: Matthew Nicholls, Asbestos Lab Team Leader

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway

Asbestos Notes

The Limit of Detection of the method is 0.001% dry mass of asbestos fibre of the dry weight of soil provided. Where the result of analysis is ND (Not Detected), this indicates that no asbestos fibres were identified by the analyst.

The Limit of Quantitation of the test is 0.001% dry mass of asbestos fibre of dry weight of soil/material provided based on method validation where the size of sample provided is in excess of 600g, and results associated with a sample mass less than 600g are DEVIATING.

Asbestos analysis is only undertaken at the Birmingham Laboratory only.

The uncertainty of measurement for the quantification of asbestos fibre in soil can be provided on request.

The identification of product type or the Asbestos Containing Material (ACM) within a soil sample is based on the opinion of the analyst based on the visual assessment and may not be accurate and is not covered by the scope of UKAS accreditation.

The analysis result pertains only to the sample provided and is not guaranteed to be representative in whole or part from where it was taken.

Information relating to the sampling site, ie hole depth and location, is provided by the client and Terra Tek do not accept any responsibility for the accuracy or validity of this information.

SAMPLE DESCRIPTION AND PREPARATION DATA

Report Number: 23-02000

Client Reference / Site: The Roundway

Sample ID	Other ID	Depth (m)	Lab ID	Sample Date	Temperature on receipt (°C)	Primary (in uppercase) and Secondary Matrix	% Loss at 30°C	% Retained 2mm
10304		0.30	WS1	18/05/2023	15.7	Clayey SAND with Fine to Medium Gravel	7.93	49.8
10305		0.40	WS5	18/05/2023		Clayey SAND with Fine to Medium Gravel	16.8	29.8
10306		0.30	BH4	18/05/2023		Sandy CLAY with Fine to Medium Gravel	17.7	31.1
10307		0.40	WS2	18/05/2023		Sandy CLAY with Fine to Medium Gravel	13.2	34.3
10308		0.10	TP1	18/05/2023		Peaty SAND with Fine to Medium Roots/Twigs and Glass/Metal	24.0	29.2
10309		0.50	BH1	18/05/2023		SAND with Fine to Medium Gravel	4.52	65.1
10310		1.20	WS3	18/05/2023		CLAY with Fine to Medium Gravel	14.6	37.5
10311		0.60	WS4	18/05/2023		Sandy CLAY with Fine to Medium Gravel	19.3	29.8
10312		0.50	BH3	18/05/2023		Clayey SAND with Fine to Medium Gravel	14.3	36.2
10313		4.50	WS1	18/05/2023		CLAY	19.1	< 0.01
10314		1.50	WS2	18/05/2023		Sandy CLAY with Fine to Medium Gravel	18.6	22.5
10315		16.00	BH3	18/05/2023		CLAY	18.4	< 0.01

Notes

Terra Tek are accredited for clay, sand and loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials such as gravel, are not accredited where they comprise the major constituent of the sample (listed as primary matrix above). Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated within the test report. Samples for asbestos testing are dried at 85°C. With the exception of samples analysed for asbestos, the laboratory removes any material greater than 2mm prior to analysis. The quantity and nature of the material is shown as the secondary matrix type above.

DEVIATING SAMPLES

Report Number: 23-02000

Client Reference/Site: The Roundway

Sample ID	Other ID	Depth (m)	Lab ID	Sample Type	Sample Date	Container Type	DEVIATING CONDITIONS						
							Sampling date not provided	Incorrect sampling container	Exceeds maximum holding time for indicated test	Presence of headspace in vial	Poorly fitting cap or lid	Damaged container	Preservatives used
10304		0.30	WS1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial							No
10305		0.40	WS5	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10306		0.30	BH4	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10307		0.40	WS2	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10308		0.10	TP1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, Glass Jar			✓				No
10309		0.50	BH1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10310		1.20	WS3	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10311		0.60	WS4	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10312		0.50	BH3	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10313		4.50	WS1	Solid	18/05/2023	800mL Tub							No
10314		1.50	WS2	Solid	18/05/2023	800mL Tub							No
10315		16.00	BH3	Solid	18/05/2023	25kg Bulk Bag							No

Presence of ✓ means that the respective sample has met the deviating condition and therefore results for a sample that has been classified as deviating, so may be compromised.

SUMMARY OF METHODS USED

Report Number: 23-02000

Client Reference/Site: The Roundway

Method Code	Method Title	Reference	MCERTS Accredited	UKAS Accredited	Wet/dry sample tested
TP137	Acid extractable metals in soil	BS7755: Section 3.9: 1995/ISO 11466:1995	Selected	Selected	DRY
TP171	Acid soluble sulphate in soil	In-house documented method	Yes	Yes	DRY
TP181	Asbestos Identification in bulk samples	HSG 248, Ed. 2	No	Yes	DRY
TP019	Determination of pH	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	DRY
TP040	Hexavalent Chromium in soil	APHA/AWWA, 19th edition: Method 3500Cr-D	No	No	DRY
TP067	Petroleum hydrocarbons (C8 - C40) in soil	TNRCC Method 1005: 2001 (modified)	Yes	Yes	WET
TP045	Polyaromatic hydrocarbons in soil	GACHAMJA A.M. Chromatography and Analysis: 1992 9-11 (modified)	Yes	Yes	WET
GP001	Preservation & Preparation of Soil	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	~
TP193	Skalar Analysis of Soil		No	No	DRY
TP126	TPHCWG in soil (C8 - C40)	TNRCC Method 1006 (modified)	No	Yes	WET
TP189	Total organic carbon in soil	In-house documented method	No	No	DRY
TP129	Total sulphur in soil	In-house documented method	Yes	Yes	DRY
TP154	Volatiles in soil by headspace	USEPA Method 5021. Wisconsin DNR modified GRO method	Selected	Yes	WET
TP032	Water soluble boron in soil	MAFF Book 427: The Analysis of Agricultural Materials: Method 8	No	Yes	DRY
TP169	Water soluble sulphate in soil	In-house documented method	Yes	Yes	DRY

Jomas Associates
Unit 24
Sarum Complex
Salisbury Road
UB8 2RZ

Moor Lane
Witton
Birmingham
B6 7HG
Tel: +44 (0)121 344 4838
birmingham@terratek.co.uk
www.terratek.co.uk

Chemical Analysis - The Roundway, London

For the Attention of	Clare Prosser	Samples Taken By:	
Report Number	23-02096	Date Testing Commenced	14/06/2023
Client Reference/Site	The Roundway, London	Date Testing Completed	29/06/2023
Order Number	J2799		
Date Samples Received	14/06/2023		
Date Instructions Received	14/06/2023		

Dear Clare,

Thank you for your recent submission of samples for testing. Analysis has now been completed and please find herein your laboratory testing report.

If you would like to discuss your report or have any questions, comments or feedback, please don't hesitate to get in touch, we'd be delighted to hear from you.

Thanks again for choosing Terra Tek for your analytical requirements, we hope the experience has been a pleasant one and we look forward to working with you again in the not too distant future.

Notes

Only those results indicated in this report are ISO 17025 or MCERTS accredited and any opinions or interpretations expressed are outside the scope of ISO 17025 accreditation. This report is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

All results contained in this report are provisional unless signed by an approved signatory.

Unless we are advised to the contrary, samples will be disposed after a period of one month from the reporting date. Samples tested for asbestos are retained for six months.

Sample location, site address, taken by and client reference are included where provided by the client. Terra Tek accepts no responsibility for the validity or accuracy of this information.

This report should not be reproduced in full without the written approval of the laboratory.



Date of Issue 29/06/2023

Approved by: Andrew Timms, General Manager



SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02096

Client Reference/Site: The Roundway, London

					Sample ID	10866	10867	10868
					Other ID			
					Depth m	0.00	0.00	0.00
					Lab ID	WS5	BH4	BH5
					Sample Type	WATER	WATER	WATER
					Sample Date	Not Provided	Not Provided	Not Provided
Test	Method	Acc	LOD	Units				
Metals - Water								
Arsenic	TP156	U	0.2	µg/l	0.5 ^d	2.2 ^d	2.3 ^d	
Boron	TP054	U	0.05	mg/l	0.49 ^d	0.44 ^d	0.55 ^d	
Cadmium	TP156	U	0.04	µg/l	< 0.04 ^d	0.10 ^d	0.07 ^d	
Chromium	TP156	U	0.04	µg/l	0.49 ^d	0.92 ^d	0.07 ^d	
Chromium, hexavalent	TP184	N	0.03	mg/l	< 0.03 ^d	< 0.03 ^d	< 0.03 ^d	
Copper	TP156	U	0.03	µg/l	1.77 ^d	50.8 ^d	9.21 ^d	
Lead	TP156	U	0.01	µg/l	< 0.01 ^d	3.14 ^d	< 0.01 ^d	
Mercury	TP156	U	0.05	µg/l	0.08 ^d	0.10 ^d	< 0.05 ^d	
Nickel	TP156	U	0.3	µg/l	6.5 ^d	21.8 ^d	11.6 ^d	
Selenium	TP156	U	0.5	µg/l	0.7 ^d	1.4 ^d	0.8 ^d	
Zinc	TP156	U	0.3	µg/l	10.5 ^d	37.9 ^d	28.8 ^d	
Inorganic Suite - Water								
Cyanide, total	TP194	N	0.01	µg/l	< 0.01 ^d	16.0 ^d	< 0.01 ^d	
pH	TP020	U	0	-	8.0 ^d	7.6 ^d	7.9 ^d	
Sulphate (as SO ₄)	TP170	U	0.1	mg/l	483 ^d	2790 ^d	755 ^d	
Phenol, monohydric	TP194	N	0.5	µg/l	< 0.50 ^d	< 0.50 ^d	< 0.50 ^d	
TPHCWG/VPHCWG - Water								
TPH (Aromatics C6-C7)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	< 10 ^d	
TPH (Aromatics C7-C8)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	< 10 ^d	
TPH (Aromatics C8-C10)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	< 10 ^d	
TPH (Aliphatics C10-C12)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	
TPH (Aliphatics C12-C16)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02096

Client Reference/Site: The Roundway, London

					Sample ID	10866	10867	10868
					Other ID			
					Depth m	0.00	0.00	0.00
					Lab ID	WS5	BH4	BH5
					Sample Type	WATER	WATER	WATER
					Sample Date	Not Provided	Not Provided	Not Provided
Test	Method	Acc	LOD	Units				
TPH (Aliphatics C16-C21)	TP130	N	10	µg/l	-	< 10 ^d	12 ^d	
TPH (Aliphatics C21-C35)	TP130	N	10	µg/l	-	52 ^d	55 ^d	
TPH (Aliphatics C35-C40)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	
TPH (Aliphatics C5-C6)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	< 10 ^d	
TPH (Aliphatics C6-C8)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	< 10 ^d	
TPH (Aliphatics C8-C10)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	
TPH (Aromatics C10-C12)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	
TPH (Aromatics C12-C16)	TP130	N	10	µg/l	-	16 ^d	16 ^d	
TPH (Aromatics C16-C21)	TP130	N	10	µg/l	-	16 ^d	17 ^d	
TPH (Aromatics C21-C35)	TP130	N	10	µg/l	-	52 ^d	53 ^d	
TPH (Aromatics C35-C40)	TP130	N	10	µg/l	-	< 10 ^d	< 10 ^d	
PAHs (Low Level) - Water								
Acenaphthene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Acenaphthylene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Anthracene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Benzo(a)anthracene	TP112	N	10	ng/l	-	545 ^d	140 ^d	
Benzo(a)pyrene	TP112	N	10	ng/l	-	660 ^d	170 ^d	
Benzo(b)fluoranthene	TP112	N	10	ng/l	-	1050 ^d	317 ^d	
Benzo(ghi)perylene	TP112	N	10	ng/l	-	701 ^d	157 ^d	
Benzo(k)fluoranthene	TP112	N	10	ng/l	-	377 ^d	65 ^d	
Chrysene	TP112	N	10	ng/l	-	216 ^d	108 ^d	
Dibenzo(ah)anthracene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Fluoranthene	TP112	N	10	ng/l	-	429 ^d	< 10 ^d	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02096

Client Reference/Site: The Roundway, London

					Sample ID	10866	10867	10868
					Other ID			
					Depth m	0.00	0.00	0.00
					Lab ID	WS5	BH4	BH5
					Sample Type	WATER	WATER	WATER
					Sample Date	Not Provided	Not Provided	Not Provided
Test	Method	Acc	LOD	Units				
Fluorene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Indeno(123-cd)pyrene	TP112	N	10	ng/l	-	435 ^d	54 ^d	
Naphthalene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Phenanthrene	TP112	N	10	ng/l	-	< 10 ^d	< 10 ^d	
Pyrene	TP112	N	10	ng/l	-	402 ^d	< 10 ^d	
Total PAHs (USEPA 16)	TP112	N	160	ng/l	-	4810 ^d	1010 ^d	
VOCs - Water								
1,1,1-Trichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,1,2,2-Tetrachloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,1,2-Trichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,1-Dichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,1-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,1-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2,3-Trichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2,4-Trimethylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2-Dibromoethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2-Dichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,2-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,3,5-Trimethylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,3-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,3-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	
1,4-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02096

Client Reference/Site: The Roundway, London

					Sample ID	10866	10867	10868
					Other ID			
					Depth m	0.00	0.00	0.00
					Lab ID	WS5	BH4	BH5
					Sample Type	WATER	WATER	WATER
					Sample Date	Not Provided	Not Provided	Not Provided
Test	Method	Acc	LOD	Units				
2,2-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
2-Chlorotoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
4-Chlorotoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
4-Isopropyltoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Bromobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Bromochloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Bromodichloromethane	TP155	U	5	µg/l	< 5 ^d	< 5 ^d	< 5 ^d	< 5 ^d
Bromomethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Chlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Chloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Chloroethene	TP155	N	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
cis-1,2-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
cis-1,3-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Dibromochloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Dichloromethane	TP155	U	50	µg/l	< 50 ^d	< 50 ^d	< 50 ^d	< 50 ^d
Isopropylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Styrene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
tert-Butylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Tetrachloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Tetrachloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
trans-1,2-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
trans-1,3-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Tribromomethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02096

Client Reference/Site: The Roundway, London

					Sample ID	10866	10867	10868
					Other ID			
					Depth m	0.00	0.00	0.00
					Lab ID	WS5	BH4	BH5
					Sample Type	WATER	WATER	WATER
					Sample Date	Not Provided	Not Provided	Not Provided
Test	Method	Acc	LOD	Units				
Trichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Trichlorofluoromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
VOCs (BTEX) - Water								
Benzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Ethyl benzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
m/p-Xylene	TP155	U	2	µg/l	< 2 ^d	< 2 ^d	< 2 ^d	< 2 ^d
Methyl tert-butyl ether (MTBE)	TP155	N	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
o-Xylene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
Toluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

DEVIATING SAMPLES

Report Number: 23-02096

Client Reference/Site: The Roundway, London

Sample ID	Other ID	Depth (m)	Lab ID	Sample Type	Sample Date	Container Type	DEVIATING CONDITIONS						
							Sampling date not provided	Incorrect sampling container	Exceeds maximum holding time for indicated test	Presence of headspace in vial	Poorly fitting cap or lid	Damaged container	Preservatives used
10866		0.00	WS5	Water	-	40mL Glass Vial, 40mL Glass Vial	✓	✓					No
10867		0.00	BH4	Water	-	Glass Bottle, 40mL Glass Vial, 40mL Glass Vial	✓						No
10868		0.00	BH5	Water	-	Glass Bottle, 40mL Glass Vial, 40mL Glass Vial	✓						No

Presence of ✓ means that the respective sample has met the deviating condition and therefore results for a sample that has been classified as deviating, so may be compromised.

SUMMARY OF METHODS USED

Report Number: 23-02096

Client Reference/Site: The Roundway, London

Method Code	Method Title	Reference	MCERTS Accredited	UKAS Accredited	Wet/dry sample tested
TP054	Boron in water (ICP-OES)	MAFF Book 427: The Analysis of Agricultural Materials: Method 8	No	Yes	~
TP184	Hexavalent Chromium in Water	APHA/AWWA, 19th edition: Method 3500Cr-D	No	No	~
TP112	Low level PAHs in water	USEPA Method 8100	No	No	~
TP156	Metals in water (ICP-MS)	APHA/AWWA, 19th edition: Method 3030B (filtration)	No	No	~
GP001	Preservation & Preparation of Soil	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	~
TP194	Skalar Analysis of Water		No	No	~
TP170	Sulphate (as SO ₄) + Sulphur by ICP-OES		No	No	~
TP130	TPHCWG in water (C8 - C40)	Texas Natural Resource Conservation Commission Method 1005 & 1006	No	No	~
TP155	Volatiles in water by headspace	USEPA method 5021. Wisconsin DNR modified GRO method	No	Yes	~
TP020	pH in water	APHA/AWWA, 19th edition	No	Yes	~

Jomas Associates
Unit 24
Sarum Complex
Salisbury Road
UB8 2RZ

Moor Lane
Witton
Birmingham
B6 7HG
Tel: +44 (0)121 344 4838
birmingham@terratek.co.uk
www.terratek.co.uk

Chemical Analysis - The Roundway London

For the Attention of	Clare Prosser	Samples Taken By:	
Report Number	23-01999	Date Testing Commenced	06/06/2023
Client Reference/Site	The Roundway London	Date Testing Completed	15/06/2023
Order Number	J2799		
Date Samples Received	02/06/2023		
Date Instructions Received	02/06/2023		

Dear Clare,

Thank you for your recent submission of samples for testing. Analysis has now been completed and please find herein your laboratory testing report.

If you would like to discuss your report or have any questions, comments or feedback, please don't hesitate to get in touch, we'd be delighted to hear from you.

Thanks again for choosing Terra Tek for your analytical requirements, we hope the experience has been a pleasant one and we look forward to working with you again in the not too distant future.

Notes

Only those results indicated in this report are ISO 17025 or MCERTS accredited and any opinions or interpretations expressed are outside the scope of ISO 17025 accreditation. This report is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

All results contained in this report are provisional unless signed by an approved signatory.

Unless we are advised to the contrary, samples will be disposed after a period of one month from the reporting date. Samples tested for asbestos are retained for six months.

Sample location, site address, taken by and client reference are included where provided by the client. Terra Tek accepts no responsibility for the validity or accuracy of this information.

This report should not be reproduced in full without the written approval of the laboratory.



Date of Issue 15/06/2023

Approved by: Andrew Timms, General Manager



SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-01999

Client Reference/Site: The Roundway London

					Sample ID	10302	10303
					Other ID		
					Depth m		
					Lab ID	BH1	WS3
					Sample Type	WATER	WATER
					Sample Date	26/05/2023	26/05/2023
Test	Method	Acc	LOD	Units			
Metals - Water							
Arsenic	TP156	U	0.2	µg/l	0.7	7.7	
Boron	TP054	U	0.05	mg/l	0.37	0.45	
Cadmium	TP156	U	0.04	µg/l	0.11	< 0.04	
Chromium	TP156	U	0.04	µg/l	0.47	0.14	
Chromium, hexavalent	TP184	N	0.03	mg/l	< 0.03	< 0.03	
Copper	TP156	U	0.03	µg/l	5.93	2.69	
Lead	TP156	U	0.01	µg/l	0.25	0.05	
Mercury	TP156	U	0.05	µg/l	0.10	< 0.05	
Nickel	TP156	U	0.3	µg/l	15.2	8.4	
Selenium	TP156	U	0.5	µg/l	23.3	< 0.5	
Zinc	TP156	U	0.3	µg/l	13.2	0.7	
Inorganic Suite - Water							
Cyanide, total	TP194	N	0.01	µg/l	< 0.01	< 0.01	
pH	TP020	U	0	-	7.5	7.9	
Sulphate (as SO ₄)	TP170	U	0.1	mg/l	3620	25.7	
Phenol, monohydric	TP194	N	0.5	µg/l	< 0.50	< 0.50	
TPHCWG/VPHCWG - Water							
TPH (Aromatics C6-C7)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	
TPH (Aromatics C7-C8)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	
TPH (Aromatics C8-C10)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	
TPH (Aliphatics C10-C12)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aliphatics C12-C16)	TP130	N	10	µg/l	< 10	< 10	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-01999

Client Reference/Site: The Roundway London

					Sample ID	10302	10303
					Other ID		
					Depth m		
					Lab ID	BH1	WS3
					Sample Type	WATER	WATER
					Sample Date	26/05/2023	26/05/2023
Test	Method	Acc	LOD	Units			
TPH (Aliphatics C16-C21)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aliphatics C21-C35)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aliphatics C35-C40)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aliphatics C5-C6)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	
TPH (Aliphatics C6-C8)	TP155	U	10	µg/l	< 10 ^d	< 10 ^d	
TPH (Aliphatics C8-C10)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aromatics C10-C12)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aromatics C12-C16)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aromatics C16-C21)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aromatics C21-C35)	TP130	N	10	µg/l	< 10	< 10	
TPH (Aromatics C35-C40)	TP130	N	10	µg/l	< 10	< 10	
PAHs (Low Level) - Water							
Acenaphthene	TP112	N	10	ng/l	< 10	984	
Acenaphthylene	TP112	N	10	ng/l	< 10	23	
Anthracene	TP112	N	10	ng/l	< 10	84	
Benzo(a)anthracene	TP112	N	10	ng/l	< 10	783	
Benzo(a)pyrene	TP112	N	10	ng/l	< 10	81	
Benzo(b)fluoranthene	TP112	N	10	ng/l	< 10	217	
Benzo(ghi)perylene	TP112	N	10	ng/l	< 10	< 10	
Benzo(k)fluoranthene	TP112	N	10	ng/l	< 10	108	
Chrysene	TP112	N	10	ng/l	< 10	423	
Dibenzo(ah)anthracene	TP112	N	10	ng/l	< 10	< 10	
Fluoranthene	TP112	N	10	ng/l	< 10	5350	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-01999

Client Reference/Site: The Roundway London

					Sample ID	10302	10303
					Other ID		
					Depth m		
					Lab ID	BH1	WS3
					Sample Type	WATER	WATER
					Sample Date	26/05/2023	26/05/2023
Test	Method	Acc	LOD	Units			
Fluorene	TP112	N	10	ng/l	< 10	837	
Indeno(123-cd)pyrene	TP112	N	10	ng/l	< 10	< 10	
Naphthalene	TP112	N	10	ng/l	< 10	61	
Phenanthrene	TP112	N	10	ng/l	< 10	205	
Pyrene	TP112	N	10	ng/l	< 10	3620	
Total PAHs (USEPA 16)	TP112	N	160	ng/l	< 160	12800	
VOCs - Water							
1,1,1-Trichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,1,2,2-Tetrachloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,1,2-Trichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,1-Dichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,1-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,1-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2,3-Trichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2,4-Trimethylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2-Dibromoethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2-Dichloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,2-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,3,5-Trimethylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,3-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,3-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
1,4-Dichlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-01999

Client Reference/Site: The Roundway London

					Sample ID	10302	10303
					Other ID		
					Depth m		
					Lab ID	BH1	WS3
					Sample Type	WATER	WATER
					Sample Date	26/05/2023	26/05/2023
Test	Method	Acc	LOD	Units			
2,2-Dichloropropane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
2-Chlorotoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
4-Chlorotoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
4-Isopropyltoluene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Bromobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Bromochloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Bromodichloromethane	TP155	U	5	µg/l	< 5 ^d	< 5 ^d	
Bromomethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Chlorobenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Chloroethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Chloroethene	TP155	N	1	µg/l	< 1 ^d	< 1 ^d	
cis-1,2-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
cis-1,3-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Dibromochloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Dichloromethane	TP155	U	50	µg/l	< 50 ^d	< 50 ^d	
Isopropylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Styrene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
tert-Butylbenzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Tetrachloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Tetrachloromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
trans-1,2-Dichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
trans-1,3-Dichloropropene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	
Tribromomethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-01999

Client Reference/Site: The Roundway London

Sample ID	10302	10303
Other ID		
Depth m		
Lab ID	BH1	WS3
Sample Type	WATER	WATER
Sample Date	26/05/2023	26/05/2023

Test	Method	Acc	LOD	Units		
Trichloroethene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d
Trichlorofluoromethane	TP155	U	1	µg/l	< 1 ^d	< 1 ^d
VOCs (BTEX) - Water						
Benzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d
Ethyl benzene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d
m/p-Xylene	TP155	U	2	µg/l	< 2 ^d	< 2 ^d
Methyl tert-butyl ether (MTBE)	TP155	N	1	µg/l	< 1 ^d	< 1 ^d
o-Xylene	TP155	U	1	µg/l	< 1 ^d	< 1 ^d
Toluene	TP155	U	1	µg/l	< 1 ^d	4 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

DEVIATING SAMPLES

Report Number: 23-01999

Client Reference/Site: The Roundway London

Sample ID	Other ID	Depth (m)	Lab ID	Sample Type	Sample Date	Container Type	DEVIATING CONDITIONS						
							Sampling date not provided	Incorrect sampling container	Exceeds maximum holding time for indicated test	Presence of headspace in vial	Poorly fitting cap or lid	Damaged container	Preservatives used
10302			BH1	Water	26/05/2023	Glass Bottle, 40mL Glass Vial, 40mL Glass Vial			✓				No
10303			WS3	Water	26/05/2023	Glass Bottle, 40mL Glass Vial, 40mL Glass Vial			✓				No

Presence of ✓ means that the respective sample has met the deviating condition and therefore results for a sample that has been classified as deviating, so may be compromised.

SUMMARY OF METHODS USED

Report Number: 23-01999

Client Reference/Site: The Roundway London

Method Code	Method Title	Reference	MCERTS Accredited	UKAS Accredited	Wet/dry sample tested
TP054	Boron in water (ICP-OES)	MAFF Book 427: The Analysis of Agricultural Materials: Method 8	No	Yes	~
TP184	Hexavalent Chromium in Water	APHA/AWWA, 19th edition: Method 3500Cr-D	No	No	~
TP112	Low level PAHs in water	USEPA Method 8100	No	No	~
TP156	Metals in water (ICP-MS)	APHA/AWWA, 19th edition: Method 3030B (filtration)	No	No	~
GP001	Preservation & Preparation of Soil	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	~
TP194	Skalar Analysis of Water		No	No	~
TP170	Sulphate (as SO ₄) + Sulphur by ICP-OES		No	No	~
TP130	TPHCWG in water (C8 - C40)	Texas Natural Resource Conservation Commission Method 1005 & 1006	No	No	~
TP155	Volatiles in water by headspace	USEPA method 5021. Wisconsin DNR modified GRO method	No	Yes	~
TP020	pH in water	APHA/AWWA, 19th edition	No	Yes	~

Jomas Associates
Unit 24
Sarum Complex
Salisbury Road
UB8 2RZ

Moor Lane
Witton
Birmingham
B6 7HG
Tel: +44 (0)121 344 4838
birmingham@terratek.co.uk
www.terratek.co.uk

Chemical Analysis - The Roundway, London

For the Attention of	Clare Prosser	Samples Taken By:	
Report Number	23-02000	Date Testing Commenced	02/06/2023
Client Reference/Site	The Roundway, London	Date Testing Completed	12/06/2023
Order Number	J2799		
Date Samples Received	02/06/2023		
Date Instructions Received	02/06/2023		

Dear Clare,

Thank you for your recent submission of samples for testing. Analysis has now been completed and please find herein your laboratory testing report.

If you would like to discuss your report or have any questions, comments or feedback, please don't hesitate to get in touch, we'd be delighted to hear from you.

Thanks again for choosing Terra Tek for your analytical requirements, we hope the experience has been a pleasant one and we look forward to working with you again in the not too distant future.

Notes

Only those results indicated in this report are ISO 17025 or MCERTS accredited and any opinions or interpretations expressed are outside the scope of ISO 17025 accreditation. This report is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

All results contained in this report are provisional unless signed by an approved signatory.

Unless we are advised to the contrary, samples will be disposed after a period of one month from the reporting date. Samples tested for asbestos are retained for six months.

Sample location, site address, taken by and client reference are included where provided by the client. Terra Tek accepts no responsibility for the validity or accuracy of this information.

This report should not be reproduced in full without the written approval of the laboratory.



Date of Issue 14/06/2023

Approved by: Andrew Timms, General Manager



SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Metals - Solid													
Sulphur, total	TP129	M	0.01	% S	0.03	-	-	-	-	-	-	-	-
Arsenic	TP137	M	0.5	mg/kg	-	15.1	23.1	13.9	16.5	10.6	24.6	15.6	
Boron, water soluble	TP032	U	0.2	mg/kg	-	1.0	5.4	2.4	3.7	1.1	1.9	4.0	
Cadmium	TP137	M	0.1	mg/kg	-	0.58	1.54	0.55	1.74	0.42	1.55	0.72	
Chromium	TP137	M	1	mg/kg	-	26	32	18	29	16	30	28	
Chromium, hexavalent	TP184	N	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Copper	TP137	M	1	mg/kg	-	25	167	35	94	18	154	38	
Lead	TP137	M	1	mg/kg	-	81	13700	488	725	103	834	218	
Mercury	TP137	M	0.1	mg/kg	-	3.70	1.34	0.52	0.39	0.22	0.60	1.33	
Nickel	TP137	M	1	mg/kg	-	19	30	19	26	22	35	33	
Selenium	TP137	U	0.5	mg/kg	-	0.80	0.79	< 0.50	1.03	< 0.50	0.65	1.06	
Zinc	TP137	M	0.5	mg/kg	-	69.3	928	109	523	97.3	676	79.8	
Inorganic Suite - Solid													
Cyanide, total	TP193	N	0.1	mg/kg	-	< 0.10	0.17	< 0.10	0.23	< 0.10	< 0.10	< 0.10	
pH	TP019	M	0	-	8.4	7.9	8.3	8.0	7.7	11.4	8.4	7.3	
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	0.06	0.06	0.32	0.09	0.18	0.43	0.08	0.07	
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	0.01	0.11	0.25	0.06	0.18	0.23	0.04	0.12	
Phenol, monohydric	TP193	N	0.7	mg/kg	-	< 0.7	< 0.7	< 0.7	3.9	< 0.7	< 0.7	< 0.7	
Total Organic Carbon	TP189	N	0.1	%	-	-	-	-	-	1.6	2.9	-	
TPH - Solid													
Total Petroleum Hydrocarbons (C6-C10)	TP067	N	1	mg/kg	-	5 ^d	15 ^d	< 1 ^d	< 1 ^d	-	-	-	
Total Petroleum Hydrocarbons (C10-C12)	TP067	N	1	mg/kg	-	< 1 ^d	25 ^d	< 1 ^d	< 1 ^d	-	-	-	

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Total Petroleum Hydrocarbons (C12-C16)	TP067	N	1	mg/kg	-	< 1 ^d	22 ^d	3 ^d	1 ^d	-	-	-	-
Total Petroleum Hydrocarbons (C16-C21)	TP067	N	1	mg/kg	-	< 1 ^d	16 ^d	103 ^d	38 ^d	-	-	-	-
Total Petroleum Hydrocarbons (c8-c40)	TP067	N	1	mg/kg	-	< 1 ^d	282 ^d	202 ^d	627 ^d	-	-	-	-
Mineral Range Organics (c21-c40)	TP067	N	1	mg/kg	-	< 1 ^d	207 ^d	96 ^d	588 ^d	-	-	-	-
TPHCWG/VPHCWG - Solid													
TPH (Aliphatics C5-C6)	TP154	M	10	µg/kg	-	-	-	-	-	< 1000 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aliphatics C6-C8)	TP154	M	10	µg/kg	-	-	-	-	-	< 1000 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aliphatics C8-C10)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C10-C12)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C12-C16)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C16-C21)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C21-C35)	TP126	U	1	mg/kg	-	-	-	-	-	2 ^d	4 ^d	< 1 ^d	< 1 ^d
TPH (Aliphatics C35-C40)	TP126	N	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C6-C7)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C7-C8)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C8-C10)	TP154	M	10	µg/kg	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d	< 10 ^d
TPH (Aromatics C10-C12)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C12-C16)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C16-C21)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	31 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C21-C35)	TP126	U	1	mg/kg	-	-	-	-	-	< 1 ^d	112 ^d	< 1 ^d	< 1 ^d
TPH (Aromatics C35-C40)	TP126	N	1	mg/kg	-	-	-	-	-	< 1 ^d	< 1 ^d	< 1 ^d	< 1 ^d
PAHs - Solid													
Acenaphthene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d	0.28 ^d	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d	< 0.05 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Acenaphthylene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.12 ^d	< 0.10 ^d	0.24 ^d	< 0.10 ^d	0.13 ^d	< 0.10 ^d	< 0.10 ^d
Anthracene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.39 ^d	< 0.10 ^d	0.66 ^d	< 0.10 ^d	0.68 ^d	< 0.10 ^d	< 0.10 ^d
Benzo(a)anthracene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	1.17 ^d	0.25 ^d	3.26 ^d	0.08 ^d	1.87 ^d	0.07 ^d	0.07 ^d
Benzo(a)pyrene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	1.47 ^d	0.20 ^d	3.04 ^d	< 0.05 ^d	1.44 ^d	< 0.05 ^d	< 0.05 ^d
Benzo(b)fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.52 ^d	0.30 ^d	3.87 ^d	< 0.10 ^d	1.86 ^d	< 0.10 ^d	< 0.10 ^d
Benzo(ghi)perylene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.78 ^d	0.20 ^d	1.83 ^d	< 0.05 ^d	0.81 ^d	< 0.05 ^d	< 0.05 ^d
Benzo(k)fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	1.34 ^d	0.25 ^d	2.24 ^d	< 0.10 ^d	1.32 ^d	< 0.10 ^d	< 0.10 ^d
Chrysene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	1.76 ^d	0.31 ^d	3.54 ^d	0.10 ^d	2.05 ^d	< 0.10 ^d	< 0.10 ^d
Dibenzo(ah)anthracene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.26 ^d	< 0.10 ^d	0.36 ^d	< 0.10 ^d	0.27 ^d	< 0.10 ^d	< 0.10 ^d
Fluoranthene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.33 ^d	0.45 ^d	6.30 ^d	0.14 ^d	3.60 ^d	< 0.10 ^d	< 0.10 ^d
Fluorene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.06 ^d	< 0.05 ^d	0.14 ^d	< 0.05 ^d	0.09 ^d	< 0.05 ^d	< 0.05 ^d
Indeno(123-cd)pyrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.73 ^d	0.16 ^d	1.58 ^d	< 0.10 ^d	0.74 ^d	< 0.10 ^d	< 0.10 ^d
Naphthalene	TP045	M	0.05	mg/kg	-	< 0.05 ^d	0.43 ^d	0.08 ^d	0.26 ^d	0.07 ^d	0.07 ^d	< 0.05 ^d	< 0.05 ^d
Phenanthrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	0.55 ^d	0.15 ^d	2.87 ^d	0.10 ^d	1.23 ^d	< 0.10 ^d	< 0.10 ^d
Pyrene	TP045	M	0.1	mg/kg	-	< 0.10 ^d	2.24 ^d	0.50 ^d	5.79 ^d	0.18 ^d	3.06 ^d	0.11 ^d	0.11 ^d
Total PAHs (USEPA 16)	TP045	M	1.3	mg/kg	-	< 1.3 ^d	13.7 ^d	2.6 ^d	28.9 ^d	< 1.3 ^d	16.9 ^d	< 1.3 ^d	< 1.3 ^d
VOCs - Solid													
1,1,1,2-Tetrachloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,1-Trichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,2,2-Tetrachloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1,2-Trichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1-Dichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d
1,1-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
1,1-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2,3-Trichloropropane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2,4-Trimethylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,2-Dibromoethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2-Dichlorobenzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,2-Dichloroethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,2-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,3,5-Trimethylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,3-Dichlorobenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
1,3-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
1,4-Dichlorobenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
2,2-Dichloropropane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
2-Chlorotoluene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
4-Chlorotoluene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
4-Isopropyltoluene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Bromobenzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Bromochloromethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Bromodichloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Bromomethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chlorobenzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Chloroethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chloroform	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Chloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
Choroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
cis-1,2-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
cis-1,3-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dibromochloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dibromomethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dichlorodifluoromethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Dichloromethane	TP154	U	50	µg/kg	-	-	-	-	-	-	< 500 ^d	< 50 ^d	< 50 ^d
Isopropylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
n-Butylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
n-Propylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
sec-Butylbenzene	TP154	N	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Styrene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
tert-Butylbenzene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Tetrachloroethene	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Tetrachloromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
trans-1,2-Dichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
trans-1,3-Dichloropropene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Tribromomethane	TP154	U	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Trichloroethene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
Trichlorofluoromethane	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
VOCs (BTEX) - Solid													
Benzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Ethyl benzene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10304	10305	10306	10307	10308	10309	10310	10311
					Other ID								
					Depth m	0.30	0.40	0.30	0.40	0.10	0.50	1.20	0.60
					Lab ID	WS1	WS5	BH4	WS2	TP1	BH1	WS3	WS4
					Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units									
m/p-Xylene	TP154	M	10	µg/kg	-	-	-	-	-	-	< 10 ^d	< 10 ^d	< 10 ^d
Methyl tert-butyl ether (MTBE)	TP154	M	5	µg/kg	-	-	-	-	-	-	< 500 ^d	< 5 ^d	< 5 ^d
o-Xylene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d
Toluene	TP154	M	5	µg/kg	-	-	-	-	-	-	< 5 ^d	< 5 ^d	< 5 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Metals - Solid					
Sulphur, total	TP129	M	0.01	% S	-
Arsenic	TP137	M	0.5	mg/kg	29.4
Boron, water soluble	TP032	U	0.2	mg/kg	1.1
Cadmium	TP137	M	0.1	mg/kg	0.95
Chromium	TP137	M	1	mg/kg	31
Chromium, hexavalent	TP184	N	0.3	mg/kg	< 0.3
Copper	TP137	M	1	mg/kg	281
Lead	TP137	M	1	mg/kg	462
Mercury	TP137	M	0.1	mg/kg	0.66
Nickel	TP137	M	1	mg/kg	50
Selenium	TP137	U	0.5	mg/kg	0.96
Zinc	TP137	M	0.5	mg/kg	300
Inorganic Suite - Solid					
Cyanide, total	TP193	N	0.1	mg/kg	< 0.10
pH	TP019	M	0	-	10.5
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	0.25
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	0.27
Phenol, monohydric	TP193	N	0.7	mg/kg	< 0.7
Total Organic Carbon	TP189	N	0.1	%	-
TPH - Solid					
Total Petroleum Hydrocarbons (C6-C10)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (C10-C12)	TP067	N	1	mg/kg	-

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Total Petroleum Hydrocarbons (C12-C16)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (C16-C21)	TP067	N	1	mg/kg	-
Total Petroleum Hydrocarbons (c8-c40)	TP067	N	1	mg/kg	-
Mineral Range Organics (c21-c40)	TP067	N	1	mg/kg	-
TPHCWG/VPHCWG - Solid					
TPH (Aliphatics C5-C6)	TP154	M	10	µg/kg	< 1000 ^d
TPH (Aliphatics C6-C8)	TP154	M	10	µg/kg	< 1000 ^d
TPH (Aliphatics C8-C10)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C10-C12)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C12-C16)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C16-C21)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aliphatics C21-C35)	TP126	U	1	mg/kg	37 ^d
TPH (Aliphatics C35-C40)	TP126	N	1	mg/kg	< 1 ^d
TPH (Aromatics C6-C7)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C7-C8)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C8-C10)	TP154	M	10	µg/kg	< 10 ^d
TPH (Aromatics C10-C12)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C12-C16)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C16-C21)	TP126	U	1	mg/kg	< 1 ^d
TPH (Aromatics C21-C35)	TP126	U	1	mg/kg	19 ^d
TPH (Aromatics C35-C40)	TP126	N	1	mg/kg	< 1 ^d
PAHs - Solid					
Acenaphthene	TP045	M	0.05	mg/kg	0.23 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Acenaphthylene	TP045	M	0.1	mg/kg	< 0.10 ^d
Anthracene	TP045	M	0.1	mg/kg	0.40 ^d
Benzo(a)anthracene	TP045	M	0.05	mg/kg	1.83 ^d
Benzo(a)pyrene	TP045	M	0.05	mg/kg	1.97 ^d
Benzo(b)fluoranthene	TP045	M	0.1	mg/kg	2.47 ^d
Benzo(ghi)perylene	TP045	M	0.05	mg/kg	1.20 ^d
Benzo(k)fluoranthene	TP045	M	0.1	mg/kg	1.27 ^d
Chrysene	TP045	M	0.1	mg/kg	2.03 ^d
Dibenzo(ah)anthracene	TP045	M	0.1	mg/kg	0.23 ^d
Fluoranthene	TP045	M	0.1	mg/kg	3.93 ^d
Fluorene	TP045	M	0.05	mg/kg	0.12 ^d
Indeno(123-cd)pyrene	TP045	M	0.1	mg/kg	0.98 ^d
Naphthalene	TP045	M	0.05	mg/kg	0.19 ^d
Phenanthrene	TP045	M	0.1	mg/kg	1.77 ^d
Pyrene	TP045	M	0.1	mg/kg	3.59 ^d
Total PAHs (USEPA 16)	TP045	M	1.3	mg/kg	19.6 ^d
VOCs - Solid					
1,1,1,2-Tetrachloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,1-Trichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,2,2-Tetrachloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1,2-Trichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1-Dichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,1-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
1,1-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
1,2,3-Trichloropropane	TP154	U	5	µg/kg	< 500 ^d
1,2,4-Trimethylbenzene	TP154	N	5	µg/kg	< 5 ^d
1,2-Dibromoethane	TP154	U	5	µg/kg	< 500 ^d
1,2-Dichlorobenzene	TP154	M	5	µg/kg	< 5 ^d
1,2-Dichloroethane	TP154	M	5	µg/kg	< 500 ^d
1,2-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
1,3,5-Trimethylbenzene	TP154	N	5	µg/kg	< 5 ^d
1,3-Dichlorobenzene	TP154	U	5	µg/kg	< 5 ^d
1,3-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
1,4-Dichlorobenzene	TP154	U	5	µg/kg	< 5 ^d
2,2-Dichloropropane	TP154	M	5	µg/kg	< 500 ^d
2-Chlorotoluene	TP154	U	5	µg/kg	< 5 ^d
4-Chlorotoluene	TP154	M	5	µg/kg	< 5 ^d
4-Isopropyltoluene	TP154	N	5	µg/kg	< 5 ^d
Bromobenzene	TP154	M	5	µg/kg	< 5 ^d
Bromochloromethane	TP154	U	5	µg/kg	< 500 ^d
Bromodichloromethane	TP154	M	5	µg/kg	< 500 ^d
Bromomethane	TP154	U	5	µg/kg	< 500 ^d
Chlorobenzene	TP154	M	5	µg/kg	< 5 ^d
Chloroethane	TP154	M	5	µg/kg	< 500 ^d
Chloroform	TP154	M	5	µg/kg	< 500 ^d
Chloromethane	TP154	M	5	µg/kg	< 500 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
Choroethene	TP154	M	5	µg/kg	< 500 ^d
cis-1,2-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d
cis-1,3-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
Dibromochloromethane	TP154	M	5	µg/kg	< 500 ^d
Dibromomethane	TP154	M	5	µg/kg	< 500 ^d
Dichlorodifluoromethane	TP154	U	5	µg/kg	< 500 ^d
Dichloromethane	TP154	U	50	µg/kg	< 500 ^d
Isopropylbenzene	TP154	U	5	µg/kg	< 5 ^d
n-Butylbenzene	TP154	N	5	µg/kg	< 5 ^d
n-Propylbenzene	TP154	U	5	µg/kg	< 5 ^d
sec-Butylbenzene	TP154	N	5	µg/kg	< 5 ^d
Styrene	TP154	U	5	µg/kg	< 5 ^d
tert-Butylbenzene	TP154	U	5	µg/kg	< 5 ^d
Tetrachloroethene	TP154	U	5	µg/kg	< 500 ^d
Tetrachloromethane	TP154	M	5	µg/kg	< 500 ^d
trans-1,2-Dichloroethene	TP154	M	5	µg/kg	< 500 ^d
trans-1,3-Dichloropropene	TP154	M	5	µg/kg	< 500 ^d
Tribromomethane	TP154	U	5	µg/kg	< 500 ^d
Trichloroethene	TP154	M	5	µg/kg	< 500 ^d
Trichlorofluoromethane	TP154	M	5	µg/kg	< 500 ^d
VOCs (BTEX) - Solid					
Benzene	TP154	M	5	µg/kg	< 5 ^d
Ethyl benzene	TP154	M	5	µg/kg	< 5 ^d

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10312
Other ID	
Depth m	0.50
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
m/p-Xylene	TP154	M	10	µg/kg	< 10 ^d
Methyl tert-butyl ether (MTBE)	TP154	M	5	µg/kg	< 500 ^d
o-Xylene	TP154	M	5	µg/kg	< 5 ^d
Toluene	TP154	M	5	µg/kg	< 5 ^d

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

					Sample ID	10313	10314	10315
					Other ID			
					Depth m	4.50	1.50	16.00
					Lab ID	WS1	WS2	BH3
					Sample Type	SOIL	SOIL	SOIL
					Sample Date	18/05/2023	18/05/2023	18/05/2023
Test	Method	Acc	LOD	Units				
Metals - Solid								
Sulphur, total	TP129	M	0.01	% S	0.59	0.02	0.57	
Inorganic Suite - Solid								
pH	TP019	M	0	-	8.0	7.7	8.2	
Sulphate, acid soluble (as SO ₄)	TP171	U	0.02	% SO ₄	1.73	0.05	0.24	
Sulphate, water soluble in 2:1 extract (as SO ₄)	TP169	M	0.01	g/l	2.67	0.12	0.92	

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	10306	10307	10308	10309	10310
Other ID					
Depth m	0.30	0.40	0.10	0.50	1.20
Lab ID	BH4	WS2	TP1	BH1	WS3
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023

Test	Method	Acc	LOD	Units					
Asbestos									
Asbestos Screen	TP181	U	~	-	ND	ND	ND	ND	ND
Weight of Sample Material	TP183	U	0.001	g	422.23	354.93	500.41	716.04	708.32
Chrysotile (White Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Amosite (Brown Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Crocidolite (Blue Asbestos)	TP181	U	~	-	ND	ND	ND	ND	ND
Anthophyllite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND
Tremolite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND
Actinolite Asbestos	TP181	U	~	-	ND	ND	ND	ND	ND

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

Analyst: Matthew Nicholls, Asbestos Lab Team Leader

SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Asbestos Notes

The Limit of Detection of the method is 0.001% dry mass of asbestos fibre of the dry weight of soil provided. Where the result of analysis is ND (Not Detected), this indicates that no asbestos fibres were identified by the analyst.

The Limit of Quantitation of the test is 0.001% dry mass of asbestos fibre of dry weight of soil/material provided based on method validation where the size of sample provided is in excess of 600g, and results associated with a sample mass less than 600g are DEVIATING.

Asbestos analysis is only undertaken at the Birmingham Laboratory only.

The uncertainty of measurement for the quantification of asbestos fibre in soil can be provided on request.

The identification of product type or the Asbestos Containing Material (ACM) within a soil sample is based on the opinion of the analyst based on the visual assessment and may not be accurate and is not covered by the scope of UKAS accreditation.

The analysis result pertains only to the sample provided and is not guaranteed to be representative in whole or part from where it was taken.

Information relating to the sampling site, ie hole depth and location, is provided by the client and Terra Tek do not accept any responsibility for the accuracy or validity of this information.

SAMPLE DESCRIPTION AND PREPARATION DATA

Report Number: 23-02000

Client Reference / Site: The Roundway, London

Sample ID	Other ID	Depth (m)	Lab ID	Sample Date	Temperature on receipt (°C)	Primary (in uppercase) and Secondary Matrix	% Loss at 30°C	% Retained 2mm
10304		0.30	WS1	18/05/2023	15.7	Clayey SAND with Fine to Medium Gravel	7.93	49.8
10305		0.40	WS5	18/05/2023		Clayey SAND with Fine to Medium Gravel	16.8	29.8
10306		0.30	BH4	18/05/2023		Sandy CLAY with Fine to Medium Gravel	17.7	31.1
10307		0.40	WS2	18/05/2023		Sandy CLAY with Fine to Medium Gravel	13.2	34.3
10308		0.10	TP1	18/05/2023		Peaty SAND with Fine to Medium Roots/Twigs and Glass/Metal	24.0	29.2
10309		0.50	BH1	18/05/2023		SAND with Fine to Medium Gravel	4.52	65.1
10310		1.20	WS3	18/05/2023		CLAY with Fine to Medium Gravel	14.6	37.5
10311		0.60	WS4	18/05/2023		Sandy CLAY with Fine to Medium Gravel	19.3	29.8
10312		0.50	BH3	18/05/2023		Clayey SAND with Fine to Medium Gravel	14.3	36.2
10313		4.50	WS1	18/05/2023		CLAY	19.1	< 0.01
10314		1.50	WS2	18/05/2023		Sandy CLAY with Fine to Medium Gravel	18.6	22.5
10315		16.00	BH3	18/05/2023		CLAY	18.4	< 0.01

Notes

Terra Tek are accredited for clay, sand and loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials such as gravel, are not accredited where they comprise the major constituent of the sample (listed as primary matrix above). Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated within the test report. Samples for asbestos testing are dried at 85°C. With the exception of samples analysed for asbestos, the laboratory removes any material greater than 2mm prior to analysis. The quantity and nature of the material is shown as the secondary matrix type above.

DEVIATING SAMPLES

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Sample ID	Other ID	Depth (m)	Lab ID	Sample Type	Sample Date	Container Type	DEVIATING CONDITIONS						
							Sampling date not provided	Incorrect sampling container	Exceeds maximum holding time for indicated test	Presence of headspace in vial	Poorly fitting cap or lid	Damaged container	Preservatives used
10304		0.30	WS1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial							No
10305		0.40	WS5	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10306		0.30	BH4	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10307		0.40	WS2	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10308		0.10	TP1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, Glass Jar			✓				No
10309		0.50	BH1	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10310		1.20	WS3	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10311		0.60	WS4	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10312		0.50	BH3	Solid	18/05/2023	800mL Tub, 60mL Glass Vial, 60mL Glass Vial			✓				No
10313		4.50	WS1	Solid	18/05/2023	800mL Tub							No
10314		1.50	WS2	Solid	18/05/2023	800mL Tub							No
10315		16.00	BH3	Solid	18/05/2023	25kg Bulk Bag							No

Presence of ✓ means that the respective sample has met the deviating condition and therefore results for a sample that has been classified as deviating, so may be compromised.

SUMMARY OF METHODS USED

Report Number: 23-02000

Client Reference/Site: The Roundway, London

Method Code	Method Title	Reference	MCERTS Accredited	UKAS Accredited	Wet/dry sample tested
TP137	Acid extractable metals in soil	BS7755: Section 3.9: 1995/ISO 11466:1995	Selected	Selected	DRY
TP171	Acid soluble sulphate in soil	In-house documented method	Yes	Yes	DRY
TP181	Asbestos Identification in bulk samples	HSG 248, Ed. 2	No	Yes	DRY
TP019	Determination of pH	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	DRY
TP184	Hexavalent Chromium in soil	APHA/AWWA, 19th edition: Method 3500Cr-D	No	No	DRY
TP067	Petroleum hydrocarbons (C8 - C40) in soil	TNRCC Method 1005: 2001 (modified)	Yes	Yes	WET
TP045	Polyaromatic hydrocarbons in soil	GACHAMJA A.M. Chromatography and Analysis: 1992 9-11 (modified)	Yes	Yes	WET
GP001	Preservation & Preparation of Soil	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	~
TP193	Skalar Analysis of Soil		No	No	DRY
TP126	TPHCWG in soil (C8 - C40)	TNRCC Method 1006 (modified)	No	Yes	WET
TP189	Total organic carbon in soil	In-house documented method	No	No	DRY
TP129	Total sulphur in soil	In-house documented method	Yes	Yes	DRY
TP154	Volatiles in soil by headspace	USEPA Method 5021. Wisconsin DNR modified GRO method	Selected	Yes	WET
TP032	Water soluble boron in soil	MAFF Book 427: The Analysis of Agricultural Materials: Method 8	No	Yes	DRY
TP169	Water soluble sulphate in soil	In-house documented method	Yes	Yes	DRY

Jomas Associates
Unit 24
Sarum Complex
Salisbury Road
UB8 2RZ

Moor Lane
Witton
Birmingham
B6 7HG
Tel: +44 (0)121 344 4838
birmingham@terratek.co.uk
www.terratek.co.uk

Chemical Analysis - 313-315 The Roundway

For the Attention of	Clare Prosser	Samples Taken By:	
Report Number	23-02140	Date Testing Commenced	20/06/2023
Client Reference/Site	313-315 The Roundway	Date Testing Completed	22/06/2023
Order Number	J2799		
Date Samples Received	20/06/2023		
Date Instructions Received	20/06/2023		

Dear Clare,

Thank you for your recent submission of samples for testing. Analysis has now been completed and please find herein your laboratory testing report.

If you would like to discuss your report or have any questions, comments or feedback, please don't hesitate to get in touch, we'd be delighted to hear from you.

Thanks again for choosing Terra Tek for your analytical requirements, we hope the experience has been a pleasant one and we look forward to working with you again in the not too distant future.

Notes

Only those results indicated in this report are ISO 17025 or MCERTS accredited and any opinions or interpretations expressed are outside the scope of ISO 17025 accreditation. This report is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service.

All results contained in this report are provisional unless signed by an approved signatory.

Unless we are advised to the contrary, samples will be disposed after a period of one month from the reporting date. Samples tested for asbestos are retained for six months.

Sample location, site address, taken by and client reference are included where provided by the client. Terra Tek accepts no responsibility for the validity or accuracy of this information.

This report should not be reproduced in full without the written approval of the laboratory.



Date of Issue 22/06/2023

Approved by: Andrew Timms, General Manager



SUMMARY OF CHEMICAL ANALYSIS

Report Number: 23-02140

Client Reference/Site: 313-315 The Roundway

Sample ID	11082
Other ID	
Depth m	0.25
Lab ID	BH3
Sample Type	SOIL
Sample Date	18/05/2023

Test	Method	Acc	LOD	Units	
PCB 7 Congeners - Solid					
PCB congener 28	TP110	M	0.5	µg/kg	< 0.50
PCB congener 52	TP110	N	0.5	µg/kg	< 0.50
PCB congener 101	TP110	N	0.5	µg/kg	< 0.50
PCB congener 118	TP110	N	0.5	µg/kg	< 0.50
PCB congener 138	TP110	M	0.5	µg/kg	< 0.50
PCB congener 153	TP110	N	0.5	µg/kg	< 0.50
PCB congener 180	TP110	N	0.5	µg/kg	< 0.50
Total PCBs (sum 7 congeners)	TP110	N	3.5	µg/kg	< 3.5

Key

U - Results are ISO 17025 accredited

M - Results are MCERTS and ISO 17025 accredited

N - Results are outside of accreditation

A result value of 'D' or 'ND' refers to Detected/Not Detected

d - Result deviating. Please refer to deviation table at the end of the report

SAMPLE DESCRIPTION AND PREPARATION DATA

Report Number: 23-02140

Client Reference / Site: 313-315 The Roundway

Sample ID	Other ID	Depth (m)	Lab ID	Sample Date	Temperature on receipt (°C)	Primary (in uppercase) and Secondary Matrix	% Loss at 30°C	% Retained 2mm
11082		0.25	BH3	18/05/2023	21.3	Clayey SAND with Fine to Medium Gravel	11.9	

Notes

Terra Tek are accredited for clay, sand and loam matrix types only, where they constitute the major component of the sample. Other coarse granular materials such as gravel, are not accredited where they comprise the major constituent of the sample (listed as primary matrix above). Results are expressed on a dry-weight basis (samples dried at <30°C) except where stated within the test report. Samples for asbestos testing are dried at 85°C. With the exception of samples analysed for asbestos, the laboratory removes any material greater than 2mm prior to analysis. The quantity and nature of the material is shown as the secondary matrix type above.

DEVIATING SAMPLES

Report Number: 23-02140

Client Reference/Site: 313-315 The Roundway

Sample ID	Other ID	Depth (m)	Lab ID	Sample Type	Sample Date	Container Type	DEVIATING CONDITIONS						
							Sampling date not provided	Incorrect sampling container	Exceeds maximum holding time for indicated test	Presence of headspace in vial	Poorly fitting cap or lid	Damaged container	Preservatives used
11082		0.25	BH3	Solid	18/05/2023	60mL Glass Vial							No

Presence of ✓ means that the respective sample has met the deviating condition and therefore results for a sample that has been classified as deviating, so may be compromised.

SUMMARY OF METHODS USED

Report Number: 23-02140

Client Reference/Site: 313-315 The Roundway

Method Code	Method Title	Reference	MCERTS Accredited	UKAS Accredited	Wet/dry sample tested
TP110	Determination of 7 PCB congeners in soil	USEPA Methods 8082A & 3665A	Yes	Yes	WET
TP067	Petroleum hydrocarbons (C8 - C40) in soil	TNRCC Method 1005: 2001 (modified)	Yes	Yes	WET
GP001	Preservation & Preparation of Soil	BS1377, Part 3, 1990: Soils for Civil Engineering Purposes.	Yes	Yes	~

APPENDIX 4 – GEOTECHNICAL LABORATORY TEST RESULTS

Jomas Associates Ltd.

 Unit 24 Sarum Complex
 Salisbury Road
 Uxbridge
 UB8 2RZ

Page 1 of 1

For the attention of Clare Prosser

Report No: C8175

Issue No 01

LABORATORY TEST REPORT

Project Name	313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB		
Project Number	C8175	Date samples received	19th & 30th May
Your Ref	J2799	Date written instructions received	24/06/2023
Purchase Order	P5141J2799.8	Date testing commenced	02/06/2023
Please find enclosed the results as summarised below			
Item No	Test Quantity	Description	ISO 17025 Accredited
2.11	5	Moisture Content	Yes
2.21	7	Four point liquid and plastic limits	Yes
2.22	1	One point liquid and plastic limits	Yes
7.33	6	Single stage quick undrained triaxial	Yes
Remarks :			
Issued by : J Hopkins		Date of Issue : 07/06/2023	Key to symbols used in this report S/C : Testing was sub-contracted
Approved Signatories :  07/06/2023			
J.Hopkins (Laboratory Coordinator), M D Brown (Senior Quality Manager), R Norris (Supervisor), R Collett (Site Supervisor)			
Unless we are notified to the contrary, samples will be disposed after a period of one month from this date. The results reported relate to samples received in the laboratory only. All results contained in this report are provisional unless signed by an approved signatory This report should not be reproduced except in full without the written approval of the laboratory. Under multisite accreditation the testing contained in this report may have been performed at another Terra Tek laboratory. Only those results indicated in this report are UKAS accredited and any opinions or interpretations expressed are outside the scope of UKAS accreditation. Feedback on the this report may be left via our website terratek.co.uk/feedback			



College Road North, Aston Clinton, Bucks, HP22 5EZ

Tel: 01494 810136

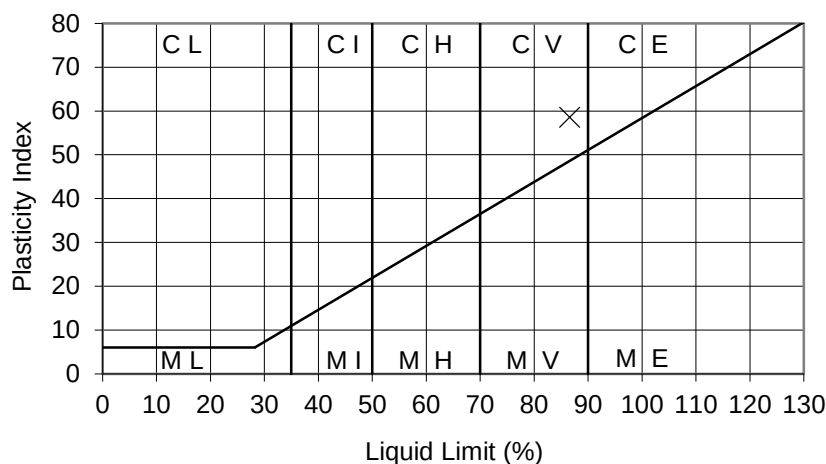
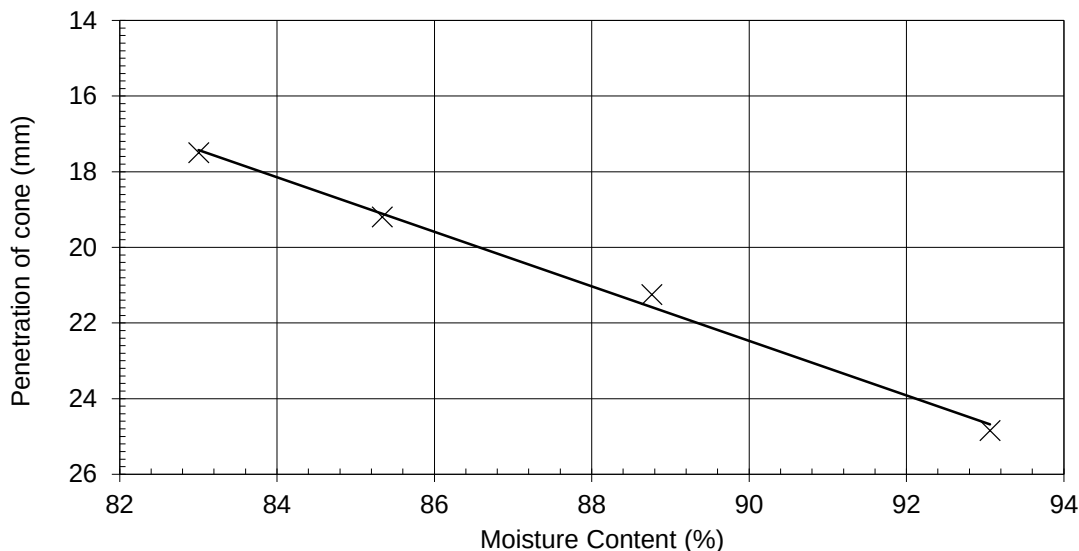
astonclinton@terratek.co.uk
www.terratek.co.uk

 Terra Tek Ltd is registered in Scotland No. 121594
 Offices in Airdrie, Birmingham, Belfast and Aston Clinton

Head Office : 62 Rochsolloch Road, Airdrie, ML6 9BG

Non Engineering Description : Stiff fissured slightly sandy slightly gravelly CLAY. Gravel is fine to coarse.

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990) 30 %
Percentage retained on 425µm sieve : 37 %
Liquid Limit : 87 %
Plastic Limit : 28 %
Plasticity Index : 59

Equivalent moisture content of material passing 425µm sieve : 48 %
Liquidity Index : 0.34

Originator

HW

Checked &
Approved

Jan.
07/06/2023

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

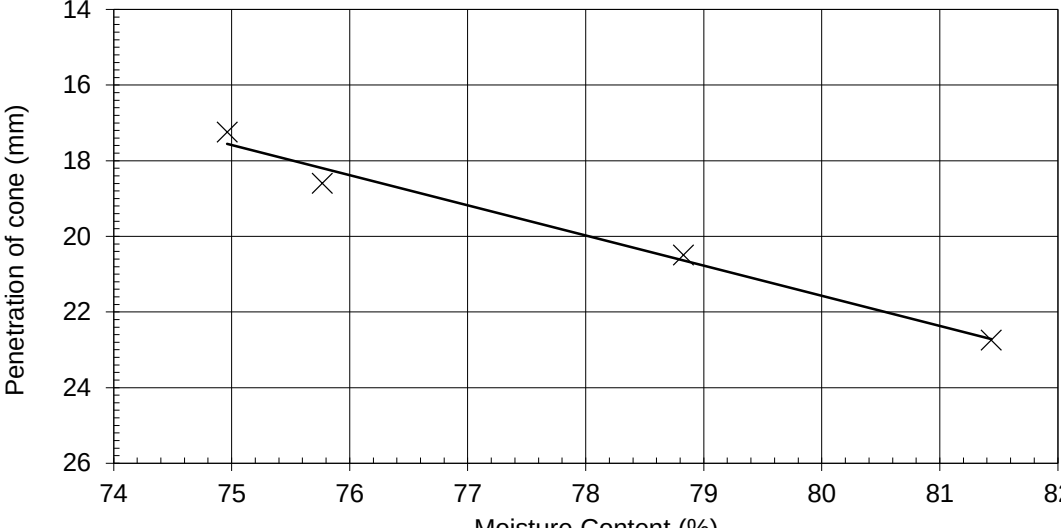
BS 1377:Part 2:Clause 5:1990



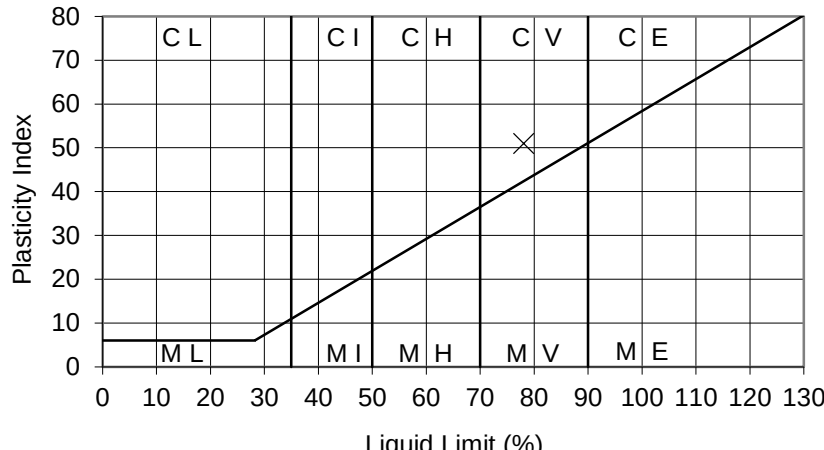
 TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB	Contract No. J2799 Hole ID BH1
	Client Jomas Associates Ltd. Engineer	Depth (m) 13.50 Sample Type U100

Non Engineering Description : Stiff fissured brown slightly sandy CLAY.

Preparation : Sample as received



Moisture Content (%)	Penetration of cone (mm)
75.0	17.5
75.8	18.5
78.8	20.5
81.5	22.5



Liquid Limit (%)	Plasticity Index
78	51

Results :

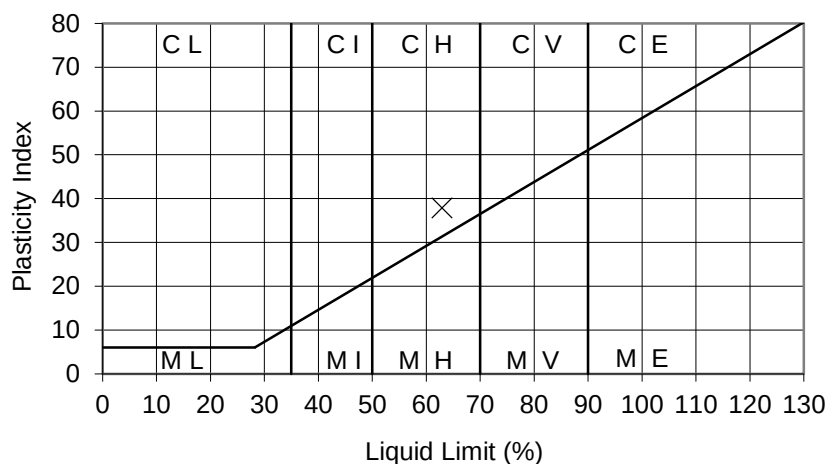
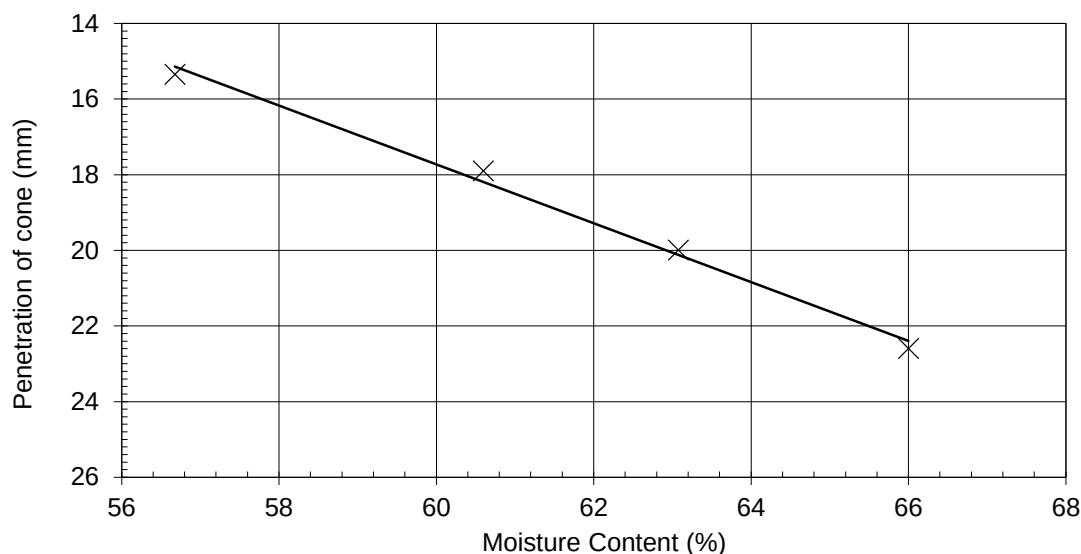
As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	29 %
Percentage retained on 425µm sieve :	0 %
Liquid Limit :	78 %
Plastic Limit :	27 %
Plasticity Index :	51
Equivalent moisture content of material passing 425µm sieve :	29 %
Liquidity Index :	0.04

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	
HW	07/06/2023		

Sheet 1 of 1

Non Engineering Description : Stiff fissured brown CLAY.

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990) 29 %
Percentage retained on 425µm sieve : 19 %
Liquid Limit : 63 %
Plastic Limit : 25 %
Plasticity Index : 38

Equivalent moisture content of material passing 425µm sieve : 36 %
Liquidity Index : 0.29

Originator

HW

Checked &
Approved

Jan.
07/06/2023

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990



TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client Jomas Associates Ltd.

Engineer

Contract No. **J2799**

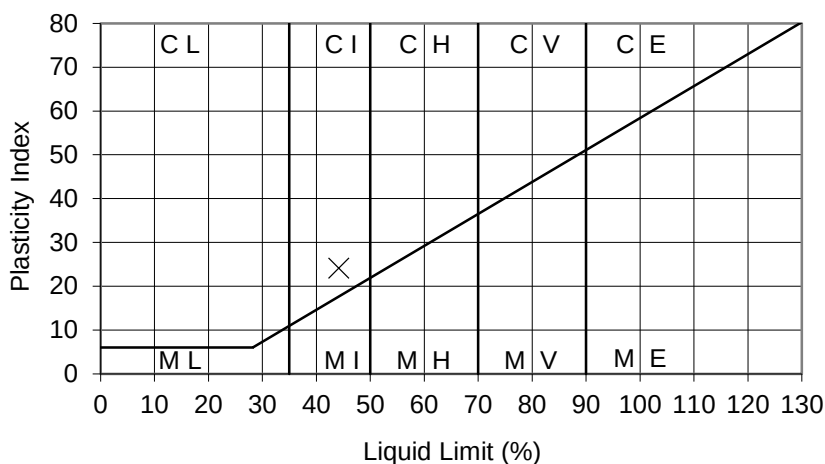
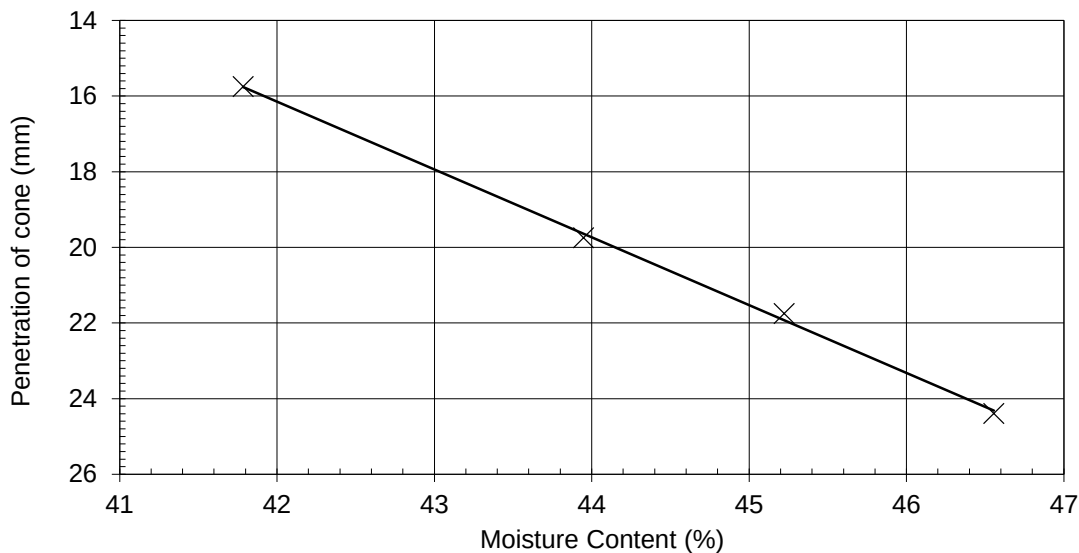
Hole ID WS1

Depth (m) 1.50

Sample Type D

Non Engineering Description : Grey mottled orangey brown slightly sandy slightly gravelly
CLAY. Gravel is fine to coarse with occasional rootlets.

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990) 20 %
Percentage retained on 425µm sieve : 23 %
Liquid Limit : 44 %
Plastic Limit : 20 %
Plasticity Index : 24

Equivalent moisture content of material passing 425µm sieve : 26 %
Liquidity Index : 0.25

Originator

Checked &
Approved

HW

Jan.
07/06/2023

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990

TTK

Sheet 1 of 1

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB	Contract No. J2799
	Client Jomas Associates Ltd.	Hole ID WS2
	Engineer	Depth (m) 2.30
		Sample Type D

Non Engineering Description :

Brown mottled orangey brown sandy gravelly CLAY. Gravel is fine to coarse.

Preparation :

Sample washed and air dried

The chart is a standard plasticity chart with Plasticity Index (PI) on the y-axis (0 to 80) and Liquid Limit (LL) in percent on the x-axis (0 to 130). A diagonal line (A-line) starts at (0, 0) and goes to (100, 100). A horizontal line (U-line) is at PI = 5. The chart is divided into regions: CL, CI, CH, CV, CE in the upper half and ML, MI, MH, MV, ME in the lower half. A data point is plotted at LL = 86% and PI = 59, which falls within the CH (Clay of High Plasticity) region.

Insufficient material for a four point liquid limit test due to the amount of material >425 micron test sieve.

Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)

11 %

Percentage retained on 425µm sieve :

80 %

Liquid Limit :

86 %

Plastic Limit :

27 %

Plasticity Index :

59

Equivalent moisture content of material passing 425µm sieve :

55 %

Liquidity Index :

0.47

Originator	Checked & Approved	Liquid Limit (One Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS 1377:Part 2:Clause 4.4:1990 BS 1377:Part 2:Clause 5:1990	Tk
HW	07/06/2023		

Sheet 1 of 1

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client Jomas Associates Ltd.

Engineer

Contract No. **J2799**

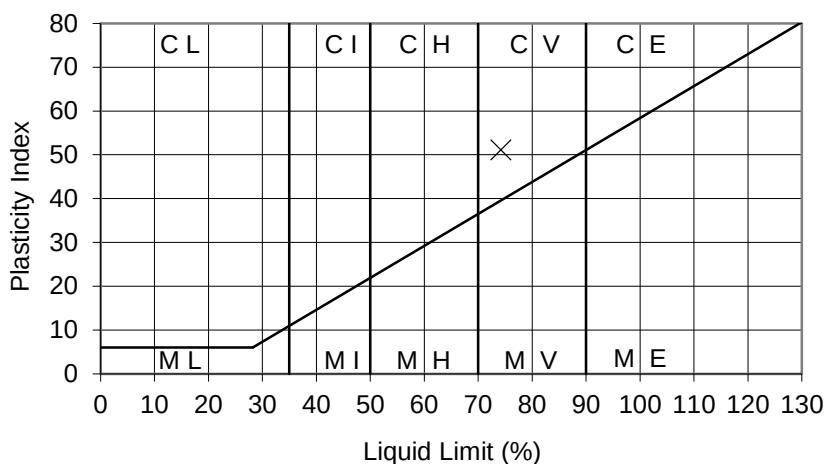
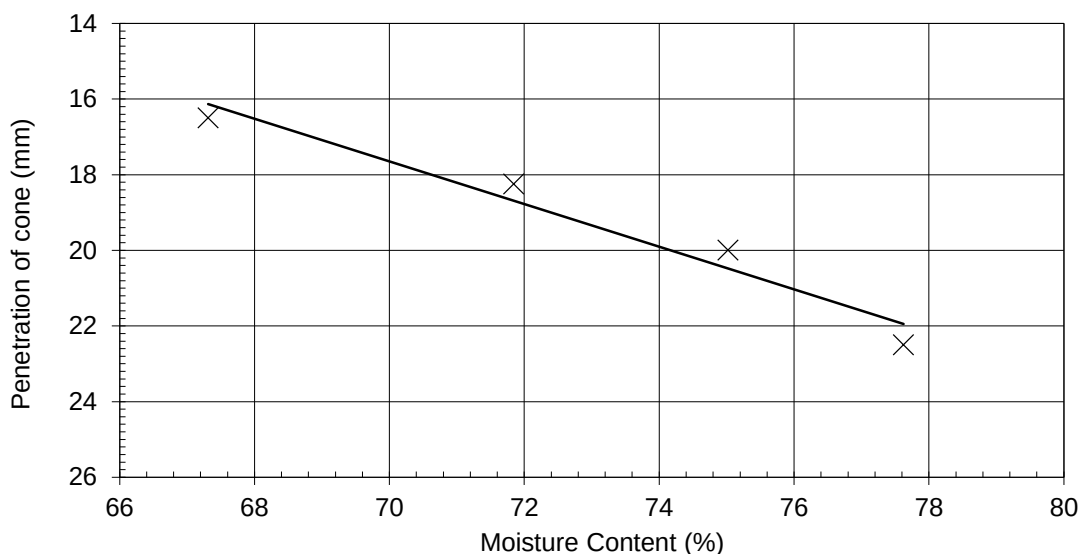
Hole ID WS3

Depth (m) 2.10

Sample Type D

Non Engineering Description : Light brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse.

Preparation : Sample washed and air dried



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)	32 %
Percentage retained on 425µm sieve :	28 %
Liquid Limit :	74 %
Plastic Limit :	23 %
Plasticity Index :	51
Equivalent moisture content of material passing 425µm sieve :	44 %
Liquidity Index :	0.41

Originator

Checked &
Approved

HW

Jan.
07/06/2023

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990

TTK

Sheet 1 of 1

TERRA TEK
SITE INVESTIGATION AND LABORATORY SERVICES

Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client Jomas Associates Ltd.

Engineer

Contract No. **J2799**

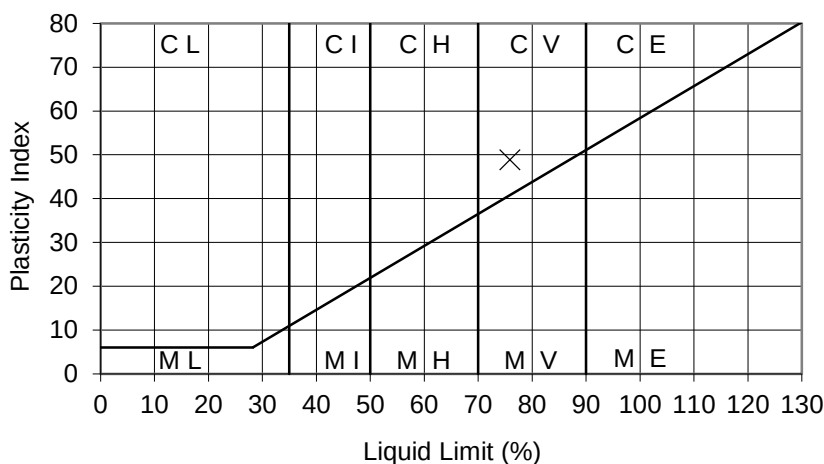
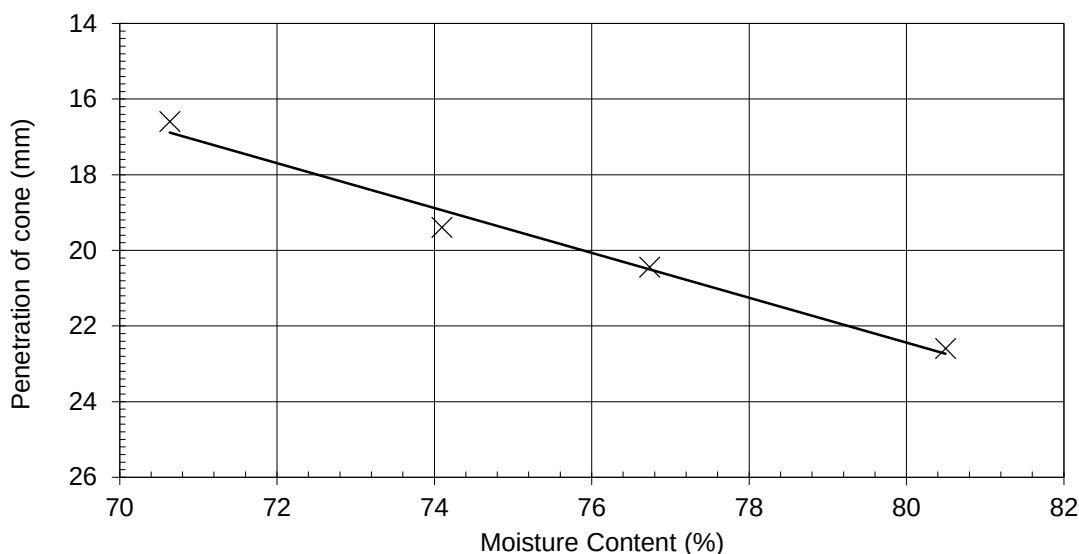
Hole ID WS4

Depth (m) 1.50

Sample Type D

Non Engineering Description : Brown mottled dark brown CLAY.

Preparation : Sample as received



Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990) 30 %
Percentage retained on 425µm sieve : 0 %
Liquid Limit : 76 %
Plastic Limit : 27 %
Plasticity Index : 49

Equivalent moisture content of material passing 425µm sieve : 30 %
Liquidity Index : 0.06

Originator

Checked &
Approved

HW

Jan.
07/06/2023

**Liquid Limit (Four Point Cone Penetrometer Method)
Plastic Limit, Plasticity Index & Liquidity Index**

BS 1377:Part 2:Clause 4.3:1990

BS 1377:Part 2:Clause 5:1990

TTK

Sheet 1 of 1

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site 313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB	Contract No. J2799
	Client Jomas Associates Ltd.	Hole ID WS5
	Engineer	Depth (m) 5.00
Sample Type D		

Non Engineering Description :

Brown slightly sandy slightly gravelly CLAY. Gravel is fine.

Preparation :

Sample washed and air dried

Penetration of cone (mm)

Moisture Content (%)	Penetration of cone (mm)
64	15
70	18
74	20
76	21

Moisture Content (%)

Plasticity Index

Liquid Limit (%)	Plasticity Index
74	48

Liquid Limit (%)

Results :

As Received Moisture Content : (BS1377:Part 2:Clause 3:1990)

30 %

Percentage retained on 425µm sieve :

6 %

Liquid Limit :

74 %

Plastic Limit :

26 %

Plasticity Index :

48

Equivalent moisture content of material passing 425µm sieve :

32 %

Liquidity Index :

0.13

Originator	Checked & Approved	Liquid Limit (Four Point Cone Penetrometer Method) Plastic Limit, Plasticity Index & Liquidity Index BS 1377:Part 2:Clause 4.3:1990 BS 1377:Part 2:Clause 5:1990	Tk Sheet 1 of 1
HW	07/06/2023		

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site	313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB		Contract No.	J2799	
		Client	Jomas Associates Ltd.		Hole	BH1	
		Engineer			Depth (m)	2.00	
				Sample Type	U100		

Sample Details				Comments Undisturbed specimen taken 100mm below top of tube	
Sample Condition		Undisturbed			
Height	mm	200.1			
Diameter	mm	99.7			
Moisture Content	%	30			
Bulk Density	Mg/m³	1.92			
Dry Density	Mg/m³	1.49			
Test Details				Shear Strength Parameters	
Membrane Thickness	mm	0.39			
Membrane Correction	kPa	0.59			
Rate of Axial Displacement	%/min	0.76			
Cell Pressure	kPa	40			
Strain at Failure	%	6.0			
Maximum Deviator Stress	kPa	223			
Shear Strength	kPa	111			
Mode of Failure	Plastic				
Non Engineering Description		Stiff fissured slightly sandy slightly gravelly CLAY. Gravel is fine to coarse.		C n/a kPa	
				Phi n/a °	

Deviator Stress - kPa

Strain - %

Shear Stress - kPa

Normal Stress - kPa

Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	
HW	<i>Jan.</i> 07/06/2023		

Sheet 1 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole BH1

Depth (m) 2.00

Sample Type U100



Originator

Checked &
Approved

HW

HW

07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk

Sheet 2 of 2

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB	Contract No. J2799	
		ClientJomas Associates Ltd.	HoleBH1	Depth (m)13.50
		Engineer	Sample Type	U100

Sample Details		Undisturbed			Comments Undisturbed specimen taken 100mm below top of tube
Sample Condition					
Height	mm	200.2			
Diameter	mm	102.7			
Moisture Content	%	29			
Bulk Density	Mg/m³	1.96			
Dry Density	Mg/m³	1.52			
Test Details					
Membrane Thickness	mm				0.39
Membrane Correction	kPa	0.49			
Rate of Axial Displacement	%/min	0.76			
Cell Pressure	kPa	270			
Strain at Failure	%	5.0			
Maximum Deviator Stress	kPa	188			
Shear Strength	kPa	94			
Mode of Failure	Compound				
Non Engineering Description		Stiff fissured brown slightly sandy CLAY.			

Shear Strength Parameters		
C	n/a	kPa
Phi	n/a	°

Strain (%)	Deviator Stress (kPa)
0	0
1	80
2	140
3	170
4	185
5	188
6	180

Normal Stress (kPa)	Shear Stress (kPa)
270	0
360	94
450	0

Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	Tk
HW	07/06/2023		

Sheet 1 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole BH1

Depth (m) 13.50

Sample Type U100



Originator

Checked &
Approved

HW

HW

07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

TK

Sheet 2 of 2

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB ClientJomas Associates Ltd. Engineer	Contract No. J2799 HoleBH3 Depth (m)9.50 Sample TypeU100																																																																											
Sample Details <table><tr><td>Sample Condition</td><td></td><td>Undisturbed</td><td></td><td></td></tr><tr><td>Height</td><td>mm</td><td>201.2</td><td></td><td></td></tr><tr><td>Diameter</td><td>mm</td><td>99.4</td><td></td><td></td></tr><tr><td>Moisture Content</td><td>%</td><td>34</td><td></td><td></td></tr><tr><td>Bulk Density</td><td>Mg/m³</td><td>1.91</td><td></td><td></td></tr><tr><td>Dry Density</td><td>Mg/m³</td><td>1.43</td><td></td><td></td></tr></table> Test Details <table><tr><td>Membrane Thickness</td><td>mm</td><td>0.39</td><td></td><td></td></tr><tr><td>Membrane Correction</td><td>kPa</td><td>0.23</td><td></td><td></td></tr><tr><td>Rate of Axial Displacement</td><td>%/min</td><td>0.76</td><td></td><td></td></tr><tr><td>Cell Pressure</td><td>kPa</td><td>190</td><td></td><td></td></tr><tr><td>Strain at Failure</td><td>%</td><td>2.1</td><td></td><td></td></tr><tr><td>Maximum Deviator Stress</td><td>kPa</td><td>34</td><td></td><td></td></tr><tr><td>Shear Strength</td><td>kPa</td><td>17</td><td></td><td></td></tr><tr><td>Mode of Failure</td><td></td><td></td><td>Compound</td><td></td></tr></table> Non Engineering Description Very soft intact brown CLAY.		Sample Condition		Undisturbed			Height	mm	201.2			Diameter	mm	99.4			Moisture Content	%	34			Bulk Density	Mg/m ³	1.91			Dry Density	Mg/m ³	1.43			Membrane Thickness	mm	0.39			Membrane Correction	kPa	0.23			Rate of Axial Displacement	%/min	0.76			Cell Pressure	kPa	190			Strain at Failure	%	2.1			Maximum Deviator Stress	kPa	34			Shear Strength	kPa	17			Mode of Failure			Compound		Comments Undisturbed specimen taken 100mm below top of tube Shear Strength Parameters <table><tr><td>C</td><td>n/a</td><td>kPa</td></tr><tr><td>Phi</td><td>n/a</td><td>°</td></tr></table>	C	n/a	kPa	Phi	n/a	°
Sample Condition		Undisturbed																																																																												
Height	mm	201.2																																																																												
Diameter	mm	99.4																																																																												
Moisture Content	%	34																																																																												
Bulk Density	Mg/m ³	1.91																																																																												
Dry Density	Mg/m ³	1.43																																																																												
Membrane Thickness	mm	0.39																																																																												
Membrane Correction	kPa	0.23																																																																												
Rate of Axial Displacement	%/min	0.76																																																																												
Cell Pressure	kPa	190																																																																												
Strain at Failure	%	2.1																																																																												
Maximum Deviator Stress	kPa	34																																																																												
Shear Strength	kPa	17																																																																												
Mode of Failure			Compound																																																																											
C	n/a	kPa																																																																												
Phi	n/a	°																																																																												
Deviator Stress - kPa 40 35 30 25 20 15 10 5 0 0 0.5 1 1.5 2 2.5 3 Strain - % Shear Stress - kPa 100 50 0 0 50 100 150 200 250 Normal Stress - kPa																																																																														

Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	Tk Sheet 1 of 2
HW	07/06/2023		

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole BH3

Depth (m) 9.50

Sample Type U100



Originator

Checked &
Approved

HW

Jan
07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES	Site	313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB		Contract No.	J2799	
	Client	Jomas Associates Ltd.		Hole	BH3	
	Engineer			Depth (m)	18.50	
				Sample Type	U100	

Sample Details			Undisturbed			Comments Undisturbed specimen taken 100mm below top of tube	
Sample Condition							
Height	mm	175.3					
Diameter	mm	101.3					
Moisture Content	%	29					
Bulk Density	Mg/m ³	1.97					
Dry Density	Mg/m ³	1.53					
Test Details			Compound			Shear Strength Parameters	
Membrane Thickness	mm	0.39					
Membrane Correction	kPa	0.60					
Rate of Axial Displacement	%/min	0.87					
Cell Pressure	kPa	390					
Strain at Failure	%	6.3					
Maximum Deviator Stress	kPa	203					
Shear Strength	kPa	101					
Mode of Failure							
Non Engineering Description			Stiff fissured brown CLAY.				C n/a kPa Phi n/a °

Deviator Stress - kPa

Strain - %

Shear Stress - kPa

Normal Stress - kPa

Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	Tk
HW	<i>for.</i> 07/06/2023		

Sheet 1 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole BH3

Depth (m) 18.50

Sample Type U100



Originator

Checked &
Approved

HW

HW

07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk

Sheet 2 of 2

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,LONDON N17 7AB ClientJomas Associates Ltd. Engineer	Contract No. J2799 HoleBH5 Depth (m)4.00 Sample TypeU100																																																																											
Sample Details <table><tr><td>Sample Condition</td><td></td><td>Undisturbed</td><td></td><td></td></tr><tr><td>Height</td><td>mm</td><td>200.9</td><td></td><td></td></tr><tr><td>Diameter</td><td>mm</td><td>102.1</td><td></td><td></td></tr><tr><td>Moisture Content</td><td>%</td><td>27</td><td></td><td></td></tr><tr><td>Bulk Density</td><td>Mg/m³</td><td>1.95</td><td></td><td></td></tr><tr><td>Dry Density</td><td>Mg/m³</td><td>1.53</td><td></td><td></td></tr></table> Test Details <table><tr><td>Membrane Thickness</td><td>mm</td><td>0.39</td><td></td><td></td></tr><tr><td>Membrane Correction</td><td>kPa</td><td>1.23</td><td></td><td></td></tr><tr><td>Rate of Axial Displacement</td><td>%/min</td><td>0.76</td><td></td><td></td></tr><tr><td>Cell Pressure</td><td>kPa</td><td>80</td><td></td><td></td></tr><tr><td>Strain at Failure</td><td>%</td><td>15.9</td><td></td><td></td></tr><tr><td>Maximum Deviator Stress</td><td>kPa</td><td>192</td><td></td><td></td></tr><tr><td>Shear Strength</td><td>kPa</td><td>96</td><td></td><td></td></tr><tr><td>Mode of Failure</td><td></td><td>Compound</td><td></td><td></td></tr></table> Non Engineering Description Stiff fissured brown CLAY.		Sample Condition		Undisturbed			Height	mm	200.9			Diameter	mm	102.1			Moisture Content	%	27			Bulk Density	Mg/m³	1.95			Dry Density	Mg/m³	1.53			Membrane Thickness	mm	0.39			Membrane Correction	kPa	1.23			Rate of Axial Displacement	%/min	0.76			Cell Pressure	kPa	80			Strain at Failure	%	15.9			Maximum Deviator Stress	kPa	192			Shear Strength	kPa	96			Mode of Failure		Compound			Comments Undisturbed specimen taken 100mm below top of tube Shear Strength Parameters <table><tr><td>C</td><td>n/a</td><td>kPa</td></tr><tr><td>Phi</td><td>n/a</td><td>°</td></tr></table>	C	n/a	kPa	Phi	n/a	°
Sample Condition		Undisturbed																																																																												
Height	mm	200.9																																																																												
Diameter	mm	102.1																																																																												
Moisture Content	%	27																																																																												
Bulk Density	Mg/m³	1.95																																																																												
Dry Density	Mg/m³	1.53																																																																												
Membrane Thickness	mm	0.39																																																																												
Membrane Correction	kPa	1.23																																																																												
Rate of Axial Displacement	%/min	0.76																																																																												
Cell Pressure	kPa	80																																																																												
Strain at Failure	%	15.9																																																																												
Maximum Deviator Stress	kPa	192																																																																												
Shear Strength	kPa	96																																																																												
Mode of Failure		Compound																																																																												
C	n/a	kPa																																																																												
Phi	n/a	°																																																																												
250 200 150 100 50 0 0 2 4 6 8 10 12 14 16 18 Deviator Stress - kPa Strain - % 150 100 50 0 0 50 100 150 200 250 300 Shear Stress - kPa Normal Stress - kPa																																																																														
Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8		Tk Sheet 1 of 2																																																																										
HW	07/06/2023																																																																													

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole

BH5

Depth (m)

4.00

Sample Type

U100



Originator

HW

Checked &
Approved*HW*

07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk

Sheet 2 of 2

TERRA TEK SITE INVESTIGATION AND LABORATORY SERVICES		Site313-315 THE ROUNDWAY AND 8-12 CHURCH LANE, LONDON N17 7AB	Contract No. J2799	
		ClientJomas Associates Ltd.	HoleBH5	Depth (m)8.00
		Engineer	Sample TypeU100	

Sample Details		Undisturbed			Comments Undisturbed specimen taken 100mm below top of tube
Sample Condition					
Height	mm	199.9			
Diameter	mm	101.0			
Moisture Content	%	25			
Bulk Density	Mg/m³	2.04			
Dry Density	Mg/m³	1.64			
Test Details					
Membrane Thickness	mm				0.39
Membrane Correction	kPa	0.54			
Rate of Axial Displacement	%/min	0.76			
Cell Pressure	kPa	160			
Strain at Failure	%	5.5			
Maximum Deviator Stress	kPa	354			
Shear Strength	kPa	177			
Mode of Failure	Compound				
Non Engineering Description	Very stiff fissured brown CLAY.				

Shear Strength Parameters		
C	n/a	kPa
Phi	n/a	°

Deviator Stress - kPa

Strain - %

Shear Stress - kPa

Normal Stress - kPa

Originator	Checked & Approved	UNCONSOLIDATED UNDRAINED SINGLE STAGE TRIAXIAL COMPRESSION BS 1377 : Part 7 : 1990 Clause 8	Tk
HW	<i>Jan.</i> 07/06/2023		

Sheet 1 of 2

TERRA TEK

SITE INVESTIGATION AND LABORATORY SERVICES

Site

313-315 THE ROUNDWAY AND 8-12 CHURCH LANE,
LONDON N17 7AB

Client

Jomas Associates Ltd.

Engineer

Contract No **J2799**

Hole BH5

Depth (m) 8.00

Sample Type U100



Originator

Checked &
Approved

HW

HW

07/06/2023

Please note that these photographs are intended to show the failure mode, and do not necessarily show accurately the colouration of the soil.

Tk

Sheet 2 of 2

APPENDIX 5 – SOIL GAS MONITORING RESULTS

APPENDIX 6 – GROUNDWATER SAMPLING RECORDS

APPENDIX 7 – FALLING HEAD PERMEABILITY TESTS

WE LISTEN, WE PLAN, WE DELIVER

Geotechnical Engineering and Environmental Services across the UK



JOMAS ASSOCIATES LTD

Unit 24 Sarum Complex
Salisbury Road
Uxbridge
UB8 2RZ

CONTACT US

Website: www.jomasassociates.com
Tel: 0333 305 9054
Email: info@jomasassociates.com