



Stage 1: Tier 2 Site Investigation GQRA

Project Reference: P25.205GQRA
Lttr 70-76 West St Havant

Prepared For



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Report Approval

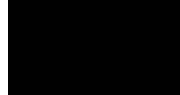
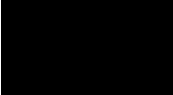
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Table of Contents

1.	INTRODUCTION	1
1.1	Brief	1
1.2	Proposals	1
2.	SITE LAYOUT	2
2.1	Location and Topography	2
2.2	Site Description	2
2.3	Vegetation	2
2.4	Surroundings	2
3.	PHYSICAL SETTING	3
3.1	Geological Hazards	3
3.2	Radon	4
3.3	Hydrology	4
3.4	Controlled Waters	4
4.	PREVIOUS REPORTS	5
4.1	Apple Environmental Limited – November 2022	5
5.	FIELDWORKS	7
5.1	Site Management and Preparation	7
5.2	Rationale and Methodology	7
6.	GROUND CONDITIONS	8
6.1	Summary of Ground Conditions	8
6.2	Soil Conditions	8
6.3	Groundwater Conditions	9
6.4	Visual and Olfactory Observations	9
6.5	In-Situ Testing	9
7.	LABORATORY TESTING	11
7.1	Geotechnical Testing	11
7.2	Geo-Environmental Soil Testing	11
7.3	Leachate Soil Testing	14
8.	GROUND GAS AND SOIL VAPOUR ASSESSMENT	16
8.1	Ground Gas and Soil Vapour Risk	16
9.	GEOTECHNICAL DISCUSSION	17
9.1	Soil Engineering Properties	17
9.2	Conclusions and recommendations	17
10.	GEO-ENVIRONMENTAL DISCUSSION AND CONCLUSIONS	20
10.1	Discussion of Findings	20
10.2	Conceptual Site Model	22
11.	GEO-ENVIRONMENTAL RECOMMENDATIONS	25
11.1	Surfacing	25
11.2	Piling Risk Assessment (PiRA)	25
11.3	Asbestos Mitigation	26
11.4	Health and Safety	26
11.5	Watching Brief	26
11.6	Services	26
11.7	Statutory Consultees	27



APPENDIX A – SITE PLANS	A
APPENDIX B – HOLE LOCATION PLAN	B
APPENDIX C – STRATIGRAPHIC LOGS	C
APPENDIX D – PHOTOGRAPHS	D
APPENDIX E – LABORATORY CERTIFICATES	E

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Context

This report is written in the context of an agreed scope of work between Impact Geotechnical Ltd and the Client and should not be used in a different context. In light of additional information becoming available, improved practices and changes in legislation amendment or re-interpretation of the report in whole or part may be necessary after its original submission.

Professional Interpretation

The recommendations made and opinions expressed in the report are based on the conditions revealed by the site works together with an assessment of the data from the insitu and laboratory testing or in respect of the desktop reports. No responsibility can be accepted for conditions that have not been revealed by the research, site works and testing.

The Client is advised that the conditions observed on site by Impact Geotechnical Ltd at the time of any site survey may be subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance and they may subsequently have become evident. It is not possible to assess areas which are inaccessible or where access is not granted and IGL accept no liability for risks subsequently identified therein.

The Conceptual Site Model, Risk Assessment and sampling regime has been formulated in accordance with current UK guidance at time of production based upon the relevant information gained from Stage1, Stage 2 and Stage 3 Risk Assessments. While the model and assessment offer opinions and interpretations of these guidelines, the comments made are for guidance only and no liability can be accepted for their accuracy. It is possible that aspects of Geo-environmental reports may need to be altered following consultation with the statutory regulatory bodies to suit planning requirements.

Intrusive Field Operations

The data collected through direct operations in the production of this report has been so obtained, unless directly otherwise stated, in accordance with current UK guidance, law or accepted industry practice, including but not limited to: BS.5930: 1990 Code of Practice for Site Investigations (Amendment 3: 2015+A1:2020), & BS.10175: 2011 + A2: 2017 Investigations into Potentially Contaminated Sites. Exact exploratory locations will depend upon access conditions, site use and plant capability, IGL do not accept liability for issues arising from material identified between or outside of the area of exploratory locations.

Laboratory Testing

Unless stated otherwise within the text, all geotechnical and material laboratory tests have been performed in accordance with the relevant British Standard Documents. Laboratory testing for contaminated land assessment is completed under the UKAS / MCERTS accreditation schemes, unless identified as otherwise in the report.

Human Health Risk Assessment Criteria

The Environment Agency has undertaken revision of the Soil Guideline Values (SGVs) which are partially complete. Where standards are available using the "new" approach, these have been utilised for correlative purposes. Where standards have not yet been revised, guidance following the "old" approach has been utilised. Please note that upon release of the remaining guidelines, the standards contained within this report may be subject to change. In addition, the second edition of the LQM CIEH guidance has now been released and will be utilised in favour of previously published guideline values.

Third Parties

The findings and opinions conveyed in this report are based on information obtained from a variety of sources, including that from previous Site investigations and chemical testing laboratories. IGL has assumed that such information is correct. IGL cannot and does not guarantee the authenticity or reliability of the information it has relied upon and can accept no responsibility for inaccuracies with the data supplied by other parties.

The accuracy of the historical map extracts supplied cannot be guaranteed and it should be noted that different conditions may have existed between mapping sheet editions. Therefore, there can be no certainty that all areas of contamination have been identified during the Stage 1: Tier 1 Preliminary Risk Assessment.

Definitions

Reference to the word "contamination" in this report does not relate to the statutory definition of contaminated land under 1990 Environmental Protection Act unless otherwise stated. The definition used in this report is: "Land that contains substances that, when present in sufficient quantities or concentrations, are likely to cause harm, directly or indirectly, to man, to the environment, or on occasion to other targets" (NATO CCMS, 1985).

1. INTRODUCTION

1.1 Brief

Impact Geotechnical Ltd (IGL) were instructed by VerdeGo Living (the Client) to carry out a ground investigation and compile a report of the findings to inform on a Stage 1: Tier 2 Site Investigation and Generic Quantitative Risk Assessment (GQRA) at Land to the Rear of 70-76 West St, Havant Hampshire PO9 1LM (hereafter referred to as the "site"). In summary, the site is formed by a parcel of land formerly of light industrial use which was post demolition and in the stages of site clearance at the time of the survey.

The brief was to undertake a ground investigation to identify any ground condition issues that may affect redevelopment of the site in terms of geo-environmental and geotechnical aspects, as well as to inform on the detailed design of temporary and permanent works associated with the planned construction. Investigation works included the construction of 4no windowless sample boreholes along with associated in-situ testing and 1no hand excavated trial pit for additional coverage.

Apple Environmental Limited have previously issued an Environmental Desk Study and Preliminary Risk Assessment (PRA) (Ref: CL/3384/WS; November 2022) at the study site. This document should be read in conjunction with this report for completeness. A summary is included within later report sections.

1.2 Proposals

Proposals relate to Havant Borough Council Planning Application reference APP/19/00542 and include for the construction of 4no new single storey 1 bed cottages to be erected on the footprint of the previous building on site. At the time of the scoping of this investigation the preferred construction methodology was for inert demolition materials won from the demolition of the previous structures to be used to increase site levels slightly, forming a subbase for the construction of a new insulated raft foundation. External areas are, based on discussions with the client, understood to be proposed as either concrete paved or laid to astroturf. A proposed site plan is included within Appendix A.

1.2.1. Planning Status

This report aims to assist meeting the requirements APP/19/00542 Condition 8. 2):

Site investigation based on [Preliminary Risk Assessment], to provide sufficient data and information to adequately identify & characterise any physical contamination on or affecting the site, and to inform an appropriate assessment of the risks to all receptors that may be affected, including those off site.

2. SITE LAYOUT

The descriptions below relates to site conditions at the time of the investigation only.

2.1 Location and Topography

The site is centred on National Grid Reference SU 71523 06342 within the town of Havant. The site is relatively flat, situated at approximately 5m AOD, according to Ordnance Survey.

2.2 Site Description

The study site is rectangular in plan area and was in a post-demolition condition at the time of the works. Access is gained via a partially covered driveway from West Street to the south, below a coach house and via a parking space allotted to the properties which front onto the road. The site boundaries are generally marked by wooden or mesh fencing, separating the development area from the neighbouring shop / residential units to the south, east and west and a restaurant to the north.

The previous buildings had been demolished down to slab level and the client was in the process of clearing and sorting significant overgrowth of vegetation as well as fly-tipped material, which is largely presumed to have been thrown onto site from neighbouring properties.

The central and southern areas of the site were generally cleared to slab / soil level, whereas the western, northern and north eastern areas were almost entirely covered by stockpiles of demolition rubble, scraped / levelled soils and a heap of household items for disposal; much of which was due to be cleared / removed.

2.3 Vegetation

A single mature eucalyptus tree is the most significant vegetation onsite, albeit that areas were covered by dense overgrowth of brambles, buddleia etc. Mature Sumac trees are located to the northwest corner and a mature Sycamore is noted immediately beyond the northern boundary.

2.4 Surroundings

The properties to the south of the site are formed by a mix of shops and residential premises, with gardens which extend to the west and east of the plot. A fast-food restaurant within a modern portal framed building is located to the north.

3. PHYSICAL SETTING

The British Geological Survey (BGS, 2025) indicates the site is likely underlain by Head Deposits over Bedrock Geology of the Undifferentiated Upper Chalk; the Lambeth Group which unconformably overlies the chalk is also noted to be shown immediately north of the site area. The table below identified the expected composition of the published strata and the associated aquifer classification.

Superficial / Drift Geology	
Unit Name	Head Deposits
Geology Description	River terrace deposits comprising sand and gravel
Aquifer Class	Secondary A Aquifer
Aquifer Description	Permeable layers that can support local water supplies, and may form an important source of base flow to river
Bedrock / Solid Geology	
Unit Name	Lambeth Group
Geology Description	Generally blocky form white chalks
Aquifer Class	Secondary A Aquifer
Aquifer Description	Permeable layers that can support local water supplies, and may form an important source of base flow to river
Unit Name	Lewes Nodular Chalk, Formation, the Seaford Chalk Formation, the Newhaven Chalk Formation, the Culver Chalk Formation and the Portsdown Chalk Formation (Undifferentiated)
Geology Description	Generally blocky form white chalks
Aquifer Class	Principal Aquifer
Aquifer Description	Layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage

Table 3.1: Geology and Hydrogeology

3.1 Geological Hazards

The following information from the British Geological Survey, which has been acquired by the Groundsure Enviro+Geo Insight Report appended to the Apple Environmental Ltd PRA (Ref: CL/3384/WS; November 2022), provides Geological Hazard directory information for the study site.

Hazard	Risk Level
Shrink Swell Clays	Moderate
Ground Dissolution	Moderate
Collapsible Ground	Very Low
Landslides	Very Low
Running Sands	Negligible
Compressible Ground	Negligible

Table 3.2: Geological Hazards

Investigation of the impact of potential moderately shrinkable clays and effects on the proposed development is discussed in later report sections.

3.2 Radon

It is advised that the client seeks an updated Radon site classification, as it is likely the Radon risk has been re-classified in this location since the production of the PRA report in 2022.

3.3 Hydrology

3.3.1. *Surface Water Features*

A drainage ditch is situated immediately off site, running along the northern boundary. This is considered to be associated with the surrounding drainage network.

3.3.2. *Flooding*

The majority of the site falls in an Environment Agency Flood Zone 1 (Low probability of flooding), albeit the far northern boundary is a Flood Zone 3 (1% or greater chance of flooding each year from rivers), likely associated with the aforementioned drainage ditch.

3.4 Controlled Waters

3.4.1. *Abstraction Licences*

The nearest abstraction to site pertains to an active licence for the abstraction of groundwater for potable water supply located approximately 490m west at the Bedhampton Springs at Portsmouth Water Works.

3.4.2. *Source Protection Zones*

The site is situated within a Source Protection Zone 1 (SPZ1), defined as inner protection zone, i.e. where groundwater takes 50 days or less to travel from below the water table to the abstraction point. In this instance, and relating to the SPZ, the abstraction point is considered to be the aforementioned potable water abstraction at Bedhampton Springs.

4. PREVIOUS REPORTS

4.1 Apple Environmental Limited – November 2022

A Preliminary Risk Assessment was completed by Apple Environmental Limited (AEL) at the study site (Ref: CL/3384/WS; November 2022). This report has been provided by the Client, with a summary included below. IGL cannot guarantee the accuracy of third party documents.

4.1.1. Brief

The purpose of the PRA was to collect and review information to enable the development of a preliminary Conceptual Site Model (CSM) and risk assessment. The objectives of the AEL PRA were as follows:

- Provide information from which likely contaminant-pathway-receptor relationships can be identified;
- Evaluate the environmental setting of the site and to identify sensitive receptors;
- Assess the likelihood of finding contamination on site, its nature and extent; and
- Determine the need or requirements for further investigation, by means of generic or detailed risk assessment.

4.1.2. Summary of Historical Maps

A detailed review of available historical map records is included within the AEL report. To summarise these records the key point is as follows:

- A number of different structures have been located on site, within the last circa 100 years. The footprint of each of these structures is incongruous with one another suggesting the buildings have been demolished and replaced in the past. The present site conditions contains no structures, and it has been intermated by AEL that the demolition material from these structures has been left on site and spread across.

4.1.3. Summary of Environmental Records

- There are no records of historical or current landfills on site or within a 500m radius.
- The surrounds historically included a bus station (40m east), parchment works (40m south-west), fire station (40m east) and garage (50-60m west).
- There are no records of petrol stations within a 250m radius.

4.1.4. AEL Preliminary Pollutant Linkages

Following a site walkover, review of historical maps, and information on public record, the AEL Preliminary CSM identified the following potential contaminant source(s):

- Possible heavy metals and other inorganics, hydrocarbons (including PAHs), asbestos and ground gases including radon.

AEL highlighted the following pathways:

- Direct and indirect ingestion of soil and soil-dust during construction and occupation.

- Direct dermal contact with soil and soil-dust during construction and occupation.
- Direct inhalation of soil-dust during construction and occupation.
- Consumption of home-grown vegetables.
- Inhalation or ignition of gases and/or vapours during construction and occupation.
- Direct or indirect contact with main services and building fabric below ground.
- Direct or indirect contact with groundwater and/or other off-site features.

Receptors were identified as being human health, building structures, underground services and groundwater.

4.1.5. AEL Preliminary Risk Assessment

In summary, the AEL preliminary CSM identified **Moderate to High** risks from the source to the identified receptors. Consequently, it was recommended that an intrusive site investigation is completed to assess the potential pollutant linkages, with the aim to refine the associated risks. Soil sampling and laboratory analysis against a contamination suite reflecting the Contaminants of Concern (CoC) highlighted in the Preliminary Conceptual Site Model should be undertaken during this investigation. It is recommended that the reader review the full list of recommendations included within the AEL PRA report for further information.

5. FIELDWORKS

An investigation was required to identify the ground conditions on site to inform on the proposed development in terms of geo-environmental and geotechnical aspects.

5.1 Site Management and Preparation

The following intrusive works were undertaken on 23rd June 2025, supervised by an Engineer from IGL. The works were carried out in general accordance with statutory guidance including BS5930:2015+A1:2020 *Code of Practice for Site Investigations* and BS 10175:2011+A2:2017 *Investigation of Potentially Contaminated Sites: Code of Practice*.

Prior to any excavations taking place, a Cable Avoidance Tool (CAT) was used to check for the position of any underlying electrical services. In addition, starter pits were excavated to 1.00 metres below ground level (mbgl) to clear test locations prior to the boreholes.

5.2 Rationale and Methodology

The scope was designed between the relevant parties and IGL, based on the proposed development plans. The aim of the scope was to advance intrusive locations to assist with the geo-environmental and geotechnical design recommendations in relation to the proposed development. This was to be achieved with the completion of boreholes and trial pits to assess the nature of the underlying soils and groundwater conditions, along with specified in-situ testing. Samples were collected for subsequent geotechnical and environmental laboratory analysis. A plan indicating intrusive locations can be viewed in Appendix B.

5.2.1. Windowless Sample Boreholes

Four windowless sample boreholes (WS1-WS4) were advanced through the base of their respective inspection pits to a maximum depth of 5.00mbgl (in the case of WS4), completed using a tracked dynamic sampling rig. The primary objective was to allow for the assessment of underlying ground conditions, production of detailed engineering logs and the recovery of samples for laboratory testing. Furthermore, these boreholes allowed for in-situ testing (SPT) to provide geotechnical parameters for future use. WS3 and WS4 were installed with groundwater monitoring standpipes, constructed with 35mm diameter HDPE plain and slotted pipe, finished in flush steel covers. The remaining two boreholes were backfilled with arisings.

5.2.2. Trial Pit

One hand excavated trial pit (TP1) was advanced using hand tools to a depth of 1.00mbgl. This was undertaken in order to provide additional site coverage, and to permit the recovery of samples for laboratory testing. This pit was backfilled with arisings once an assessment of underlying ground conditions was made.

5.2.3. Soil Sampling

All intrusive locations were logged, and visual/olfactory evidence of contamination noted in accordance with best practice. Soil sampling of the near surface materials was undertaken to assess generic contamination risks to human health. Samples were also removed at varying depths for geotechnical testing. Environmental samples were handled using a fresh pair of nitrile gloves. Selected samples were placed in sealable bags, sealed glass jars or plastic tubs (dependent on the exact laboratory requirement and analysis to be undertaken) and stored in a temperature-controlled environment before transit.

6. GROUND CONDITIONS

6.1 Summary of Ground Conditions

The following soil conditions were encountered during the investigation works. They are generally considered to be consistent with the published geology. A summary of the encountered ground strata is included within the table below. Please refer to the engineering logs within Appendix C for more detailed descriptions.

Stratum	Depth to Top (mbgl)	Depth to Base (mbgl)
Made Ground	Ground level	>1.20 – 1.70
Head Deposits	1.50 – 1.70	2.40 – 3.90
Lambeth Group	2.40 – 3.90	>3.00 – >5.00

Table 6.1: Summary of Ground Conditions

6.2 Soil Conditions

Photographs of the recovered soils are included within Appendix D. Information regarding each stratum is included below.

6.2.1. Made Ground

The surface of all five exploratory holes comprised Made Ground. The Made Ground on site was found to a depth of 1.70mbgl within all exploratory holes; the thickness was not proven within the hand excavated trial pit (TP1).

The encountered Made Ground on site was recorded to be primarily granular, as either a Sand or Gravel. The frequency and variety of the anthropogenic materials encountered (i.e. glass and brick) was greater in the top circa 1.00m. Moreover, the initial Made Ground within the exploratory holes was broadly described as a dark greyish brown slightly ashy Sand or Gravel, with flint, brick, glass, wood and chalk. Deeper Made Ground was notably less ashy.

It is recommended that the reader reviews the logs within Appendix C for more information pertaining to the encountered Made Ground soils.

6.2.2. Head Deposits

The initial natural soils identified exclusive to the windowless samples boreholes were logged as granular Head Deposits. These soils were encountered from depths ranging 1.50m to 3.90mbgl, and predominantly described as a brown speckled grey, becoming pale brownish red with depth, sandy clayey angular to sub-rounded fine to coarse Gravel of flint. Based on in-situ testing these soils can be said to be Medium Dense in terms of relative density.

A 400mm thick layer of buff mottled grey clayey silty slightly organic fine to coarse Sand was recorded within WS3 from 2.00m to 2.40mbgl. These sandy soils have been classified as Loose, based on in-situ testing.

6.2.3. Lambeth Group

Soils considered to be representative of the underlying Lambeth Group were identified within all four windowless sample boreholes. This stratum was identified from depths ranging 2.40-2.90mbgl, to the maximum intrusive depth of 5.00mbgl. The soils were described as a stiff reddish brown mottled brown and grey silty sandy Clay.

6.3 Groundwater Conditions

Groundwater was encountered within the four windowless sample boreholes at depths of 1.60m and 1.80mbgl, near to the boundary between the Made Ground and granular Head Deposits.

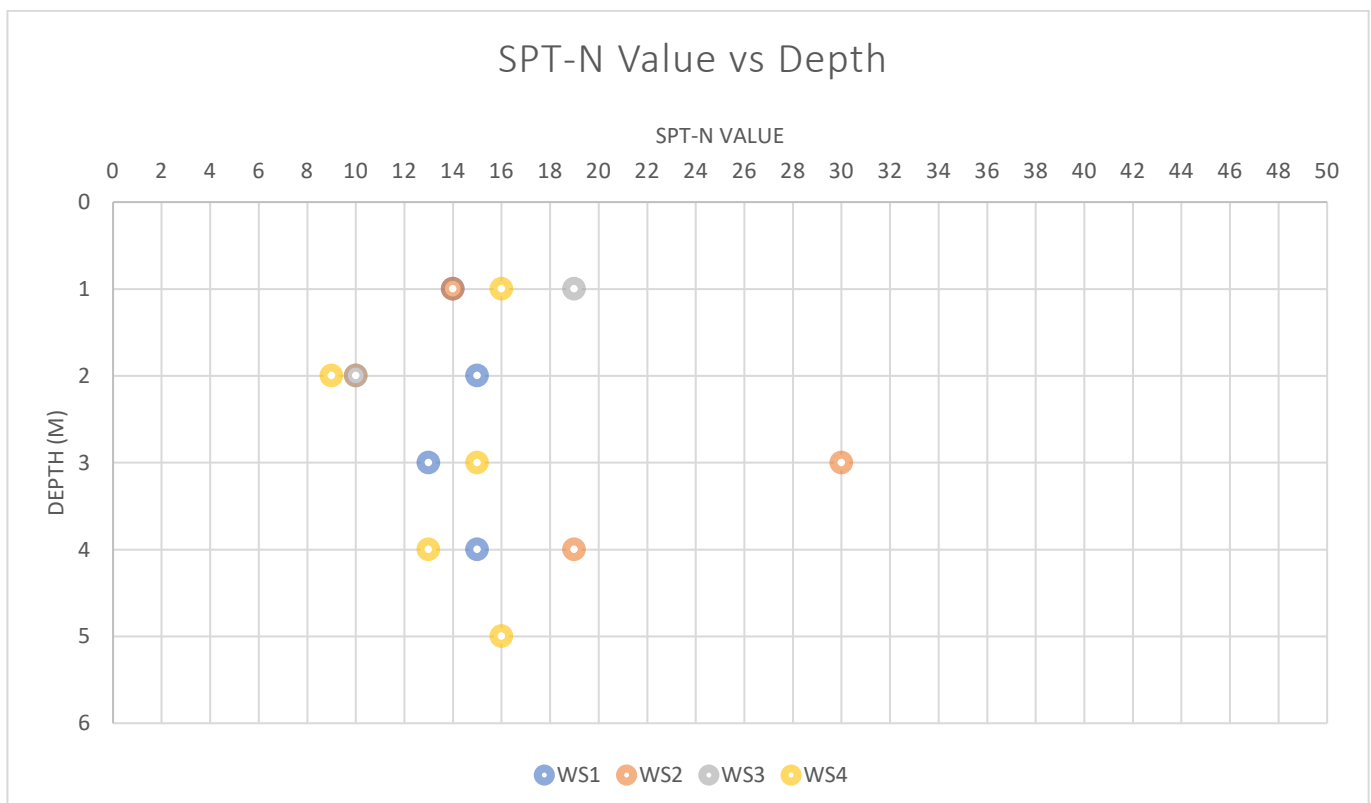
6.4 Visual and Olfactory Observations

An organic odour was noted within the Head Deposits of WS3 at 1.90mbgl. Otherwise, with the exception of anthropogenic materials encountered within the Made Ground soils, no visual or olfactory evidence of soil or groundwater contamination was noted during the investigation works. This includes any hydrocarbon-specific contamination, such as staining and sheens.

6.5 In-Situ Testing

6.5.1. Standard Penetration Testing

Standard Penetration Testing (SPT) was completed throughout the drilling of the boreholes at 1.00m centres. SPT is an in-situ dynamic penetration test to provide information on the geotechnical engineering properties of soil. This form of testing is completed using a 63.5kg drop hammer weight, over a 750mm drop, measuring the blow counts for six, 75mm increments. The first two values are recorded as seating blows, with the remaining four values, added together to provide an 'N-value'. 'N-value' of $N \geq 50$ is considered a refusal. The results are presented within the graph below. It is recommended to review the engineering logs within Appendix C for further information.



Graph 6.1: Standard Penetration Testing

N Values within the Made Ground soil at 1.00mbgl indicate medium dense granular materials. Within the underlying Head Deposits, encountered at depths of 2.00-3.00mbgl, values range from $N=9-15$, which is indicative of loose to medium dense granular materials.



The Lambeth Group bedrock soils record values of $N=13-30$, with an average of $N=18$. This is considered to be indicative of stiff to very stiff consistency clay soils.

7. LABORATORY TESTING

Soil samples collected during the IGL investigation from various depths and locations were submitted to UKAS accredited laboratories. Laboratory test certificates are included as Appendix E.

7.1 Geotechnical Testing

7.1.1. Atterberg Limits and Natural Moisture Content

Four soil samples were submitted for determination of their Natural Moisture Content (NMC) and Plasticity Index (PI). The results are tabulated below.

Stratum	Depth Range	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425µm sieve (%)	Modified Plasticity Index (%)
Lambeth Group	2.50-4.00m	14.3-23.6	44-60	16-19	12-15	36-100	9-41

Table 7.1: Atterberg Limits Testing Results

7.1.2. Particle Size Distribution and Sedimentation

Four samples of the underlying superficial deposits at various depths and locations were submitted for Particle Size Distribution (PSD) testing by wet sieve, in order to determine the percentage and range of grain sizes. The table below provides a summary of the testing.

Sample Reference	Component of Sample (%)				Laboratory Description
	Gravel	Sand	Silt	Clay	
WS1 2.00m	85	9	6		Clayey sandy GRAVEL
WS1 3.00m	79	10	11		Clayey sandy GRAVEL
WS2 2.00m	81	14	5		Clayey sandy GRAVEL
WS4 2.00m	82	12	6		Clayey sandy GRAVEL

Table 7.2: Particle Size Distribution and Sedimentation

7.1.3. Water Soluble Sulphate and pH

Eight samples were submitted for determination of pH and Water Soluble Sulphate concentration over the depth range of 0.20m to 5.00mbgl. Water soluble sulphate concentrations were found to range from 238mg/l to 3200mg/l, with pH levels ranging from 7.3 to 8.0.

7.2 Geo-Environmental Soil Testing

In light of the AEL PRA (Ref: CL/3384/WS; November 2022), it was recommended to undertake an intrusive site investigation, along with soil analysis, in order to assess and refine the risks associated with the potential pollutant linkages.

7.2.1. Rationale

Soil samples collected during the IGL investigation were submitted to a UKAS accredited laboratory for analysis against contamination suites reflecting the Contaminants of Concern (CoC) identified within the Preliminary CSM. The standard suite included for heavy metals, speciated polyaromatic hydrocarbons (PAHs) and Extractable Petroleum Hydrocarbons (EPH), with the more detailed suite also including fractionated total petroleum

hydrocarbons (TPHs), BTEX and MTBE compounds and an asbestos screen. Generally, Made Ground samples were submitted for the detailed contamination suite, with natural soil samples being submitted for basic screening.

Eight soil samples were chosen at various locations and depths (ranging 0.20m to 2.00mbgl) to provide coverage of the development area. Generally, samples were selected from the encountered Made Ground; and therefore, probable worst-case with respect to the site and development area.

7.2.2. Generic Assessment Criteria

In order to assess the soil analysis with regard to potential human health risks, IGL has compared the results against Generic Assessment Criteria (GAC). GAC are conservative contaminant concentration values used for comparison purposes to assess the risks associated with contaminant concentrations on site and are derived using non-site-specific information. For the purposes of these works, these include the following:

- Suitable 4 Use Levels (S4ULs) Generic Assessment Criteria (GAC) developed by the Chartered Institute of Environmental Health (CIEH) in partnership with Land Quality Management Ltd. (LQM).
- Category 4 Screening Levels (C4SL) for lead, produced by CL:AIRE (2014).
- The UK Soil Guideline Values (SGVs) for selected metals, BTEX and phenols, produced by the EA and Department of Environment, Food and Rural Affairs (2009).

Based on the proposed end use, comparisons have been made against the 'Residential without homegrown produce - RwoHP' land use setting; this assumes that pollutant pathway associated with the ingestion of homegrown food produce is negligible for the site. A conservative Soil Organic Matter (SOM) value of 1% is used for organic contaminants (i.e. TPH and PAHs) as a worst-case scenario, unless otherwise stated.

7.2.3. Soil Results

Laboratory certificates are included as Appendix E.

Asbestos

Chrysotile and amosite asbestos fibres were identified within the Made Ground soils of WS1 at 0.60mbgl. It should be noted that IGL have not undertaken any form of asbestos quantification on this sample at this time.

Asbestos was not detected within any of the remaining tested samples, following the asbestos screen.

Heavy Metals

Exceedances of the screening criteria were recorded from the seven Made Ground soil samples, specifically relating to lead, as tabulated overleaf.

Contaminant	Max. Concentration (mg/kg)	'RwoHP' Screening Criteria (mg/kg)	'Commercial' Screening Criteria (mg/kg)	Exceedances of Screening Value
Lead	2180	300	1100	WS1 at 0.60m: 603mg/kg WS2 at 0.30m: 890mg/kg WS3 at 0.20m: 646mg/kg
				TP1 at 0.20m: 2180mg/kg WS1 at 0.20m: 1770mg/kg WS4 at 0.20m: 1680mg/kg WS4 at 1.20m: 1940mg/kg

Table 7.3: Exceedances – Heavy Metals

Seven samples returned exceedances of the 'RwoHP' screening criteria for lead. In addition, four of these samples returned lead levels in excess of the less stringent 'Commercial' land-use setting screening criteria. The natural soil sample (WS3 at 2.00mbgl) did not return any exceedances of the screening criteria for any of the heavy metal determinands.

PAHs

Exceedances of the screening criteria for a number of PAH determinands were recorded from six Made Ground soil samples, detailed in the table below.

Contaminant	Max. Concentration (mg/kg)	'RwoHP' Screening Criteria (mg/kg)	'Commercial' Screening Criteria (mg/kg)	Exceedances of Screening Value
Benzo(b)fluoranthene	11.6	3.9	44	TP1 at 0.20m: 11.60mg/kg WS1 at 0.20m: 4.06mg/kg WS2 at 0.30m: 8.59mg/kg WS4 at 0.20m: 5.06mg/kg
Benzo(a)pyrene	11.8	3.2	35	TP1 at 0.20m: 11.80mg/kg WS1 at 0.20m: 3.43mg/kg WS2 at 0.30m: 6.49mg/kg WS4 at 0.20m: 4.51mg/kg
Dibenz(a,h)anthracene	2.21	0.31	3.5	TP1 at 0.20m: 2.21mg/kg WS1 at 0.20m: 0.58mg/kg WS1 at 0.60m: 0.33mg/kg WS2 at 0.30m: 1.17mg/kg WS3 at 0.20m: 0.51mg/kg WS4 at 0.20m: 0.80mg/kg

Table 7.4: Exceedances – PAHs

The exceedances relate to the applicable RwoHP screening criteria pertaining to: benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene.

It should be noted that all PAH determinands were recorded below their respective laboratory Limit of Detection (LOD) from the natural soil sample (WS3 at 2.00mbgl).

TPH + EPH

There were no exceedances of the screening criteria from the tested samples for all TPH determinands. Furthermore, the EPH results for each respective carbon chain range are considered to be below significant levels when compared to the TPH CWG C-chain split.

BTEX and MTBE

There were no exceedances of the screening criteria from the tested samples submitted for analysis of BTEX determinands and MTBE. Furthermore, the all determinands were recorded below laboratory LOD.

7.2.4. Summary

Exceedances of the 'Residential without homegrown produce' land-use screening criteria were recorded for lead, and three PAH determinands: benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene. These exceedances of the assessment criteria were recorded exclusive to Made Ground soil samples. Furthermore, lead concentrations for four of the tested soil samples were in excess of the far less stringent 'Commercial' land-use setting assessment criteria (GAC=1100mg/kg); these values were recorded from and as follows: TP1 at 0.20m (2180mg/kg), WS1 at 0.20m (1770mg/kg), WS4 at 0.20m (1680mg/kg) and WS4 at 1.20m (1940mg/kg). In context the lead within these samples is circa 0.15-0.20%. With respect to human health these concentrations represent a concern. The concentrations of lead likely subject the material as hazardous in terms of waste classification, should the decision be to dispose of the material as muckaway in the future, subject to further assessment and analysis.

With regards to stratigraphic logs, the presence of bricks and ash may likely be attributable to the relatively high concentrations of lead within the soils. For context the Normal Background Concentration (NBC) of lead within Havant is likely to range between ~50-250mg/kg, according to the BGS (BGS, 2025).

Chrysotile and amosite asbestos fibres were identified within the Made Ground soils of WS1 at 0.60mbgl. It should be noted that IGL have not undertaken any form of asbestos quantification on this sample at this time. Asbestos was not detected within any of the remaining tested samples.

The sample from natural soils did not record any exceedances of the assessment criteria for any of the tested determinands.

7.3 Leachate Soil Testing

It was deemed necessary to undertake basic leachate testing, in light of the high levels of lead recorded within the Made Ground samples, mindful that the site is located within a SPZ1. The leachate testing undertaken is specific to leachable lead, in or to determine the leachability of the contaminants, with the aim to help assess the risks to controlled waters.

Samples from the geo-environmental soil analysis were scheduled at the same UKAS accredited laboratory for leachate testing. A total of six samples were deemed suitable for leachate preparation and subsequent leachable lead testing, from depths ranging 0.20m to 1.20mbgl.

7.3.1. Leachate Assessment Criteria

In the absence of dedicated UK groundwater/leachate standards, leachate analytical results were screened against the conservative Water Framework Directive (WFD), Environmental Quality Standards (EQS), UK Drinking Water Standards (DWS) as taken from the Water Supply Regulations (WSR) (2000), the New Dutch List (Dutch Target and Intervention Values, 2000) and the US EPA Drinking Water Standards (and Health Advisories).

Where a number of standards are available for a particular determinand, the standard selected for screening purposes is based on the most conservative criteria, in the first instance. Thereafter, statutory standards are prioritised over non-statutory standards.

7.3.2. *Leachate Results*

Laboratory certificates are included as Appendix E.

Leachable Heavy Metals (Lead)

An exceedance of the conservative UK Drinking Water Standards (DWS) - Water Supply Regulations (WSR) (2000) – was reported for lead from one sample (WS4 at 0.20m), with a recorded concentration of lead as 11ug/l. The criteria limit of lead for WSR (2000) is 10ug/l, and as such the exceedance is 10% above this limit. The concentration of leachable lead from WS4 at 0.20m does not exceed the New Dutch List (Dutch Target and Intervention Values, 2000) value of 75ug/l. It should be noted that that leachable lead from the deeper sample within WS4 (at 1.20m) was recorded <0.60ug/l (i.e. laboratory LOD). There were no other recorded exceedances of the leachate assessment criteria for lead from the remaining five samples.

7.3.3. *Summary*

Exceedances of the Water Supply Regulations (2000) were recorded for lead from one shallow Made Ground sample: WS4 at 0.20m. There were no other notable exceedances of the groundwater/leachate assessment criteria from any of the remaining tested samples.

The UK Drinking Water Standards (DWS) Water Supply Regulations (WSR) (2000) is a particularly stringent assessment criteria for groundwater quality, as the maximum allowable values provided are specific to potable water directly taken from a household tap. In light of this, this assessment criteria is often used as a 'worst-case'. It should be noted that the lead concentration was marginally elevated above WSR (2000) and did not exceed the New Dutch List (Dutch Target and Intervention Values, 2000).

8. GROUND GAS AND SOIL VAPOUR ASSESSMENT

The Preliminary Risk Assessment completed by AEL (Ref: CL/3384/WS; November 2022) deemed there to be a **Moderate** risk from ground gas and soil vapour on site. In general accordance with BS8576:2013 *Guidance on investigations for ground gas – permanent gases and volatile organic compounds*, and utilising a multiple-lines-of-evidence approach, the ground gas/soil vapour potential and associated risks can be defined. This assessment does not pertain to radon; information relating to radon is included in Section 3.2. Information detailed in the table below has either been taken from a review of previous report and/or interpreted from the intrusive investigation conducted.

Factor	Evidence for Ground Gas/Soil Vapour Potential on Site	Evidence against Ground Gas/Soil Vapour Potential on Site
Landfills	-	There are no records of current and/or historical landfills in or within a 500m radius of the site.
Ground/mine workings	-	There are no pertinent records within a circa 100m radius of site.
Made Ground organic content	Organic matter ranging from 4.93% to 23.10%, which coincides with TOC values with an average of 5.9%. However, this is considered to be skewed as a result of the ashy soils within the Made Ground soils that increase the carbon content but not necessarily the ground gas generation potential.	No evidence of any significant ground gas generating material (peat, rags, decomposing organic matter), albeit wood identified. With reference to BS8576, typical Made Ground can be considered to have low ground gas generation potential.
Natural Soil organic content	Slightly organic sandy soils identified within WS3 from 2.00m to 2.40mbgl.	No evidence of any significant ground gas generating material (peat, decomposing organic matter).
Site Investigation	-	-
Volatiles	-	No evidence of any hydrocarbon-specific visual and/or olfactory evidence of contamination during investigation. Soil laboratory results returned comparatively low concentrations of hydrocarbon-specific contaminants.

Table 8.1: Factors Influencing Ground Gas Potential

8.1 Ground Gas and Soil Vapour Risk

Based on the information within Table 8.1, the risks from both ground gas and soil vapour have been reclassified as **Low**. It is unlikely that large volumes of gas will be generated from the underlying Made Ground. Consequently, the requirement for on-going ground gas/soil vapour monitoring is not deemed necessary at this stage. The requirement for ground gas/soil vapour specific mitigation is not deemed necessary within the temporary and/or permanent design of the proposals. The above is caveated on the basis that IGL understand that a radon membrane is planned to be installed within the proposed development.

9. GEOTECHNICAL DISCUSSION

Proposals comprise the removal of the foundations for the previous buildings and the construction of new single storey dwellings over a similar footprint. The preferred foundation solution for the buildings, prior to any investigations, was understood to be a reinforced and insulated concrete raft.

In accordance with EC7 design protocols and on the basis of the proposed construction it is considered that Design Approach DA1/2 will be appropriate. The full selection of design criteria and application of partial factors is beyond the scope of this investigation, however the following sections provide soil parameters, based on the investigation data, which are considered suitable for use in subsequent design calculations.

9.1 Soil Engineering Properties

9.1.1. Soil Density / Consistency and Classification

The table below summarises the key soil consistency, strength and classification properties derived during the investigation.

Stratum	Basic Soil type	Depth range (m)	SPT- N value Range	Undrained Cohesion c_u (Cohesive)	Relative Soil Density (Granular)	Soil Shrinkage Potential
Made Ground	Sand / Gravel	GL – max. 1.70m	14 – 19	-	-	Negligible
Head Deposits	Sandy GRAVEL	1.50 – 1.70m to 2.40 – 3.90m	9 – 15	-	Loose to medium dense	Negligible
Lambeth Group	Silty sandy CLAY	2.40 – 3.90m to >5.00m	13 – 30 (average 18)	55 - 100	-	Medium to High

Table 9.1: Summary of Investigation Data

9.1.2. Groundwater

Groundwater was encountered within the four windowless sample boreholes at depths of 1.60m and 1.80mbgl, near to the boundary between the Made Ground and granular Head Deposits.

9.2 Conclusions and recommendations

The following conclusions and recommendations have been made based on the investigation undertaken to date in light of the outlined proposals. Any alterations to the proposals may warrant a reassessment.

9.2.1. Shallow Foundations

The Made Ground soils encountered across the site would not be considered suitable as a bearing stratum. Soils of this origin are frequently present in a weak and variable condition such that unacceptable settlement would be anticipated even under light loading intensities.

Consequently, it cannot be recommended that a raft type foundation is used for the new development unless the Made Ground is removed and replaced with fully compacted granular fill. Considering the thickness of Made Ground soils and the scope of the development, this is unlikely to be economically viable. Additionally the maximum thickness of granular material permitted below a raft foundation under NHBC guidance is 1.25m, and any such construction would necessarily exceed this figure.

It is acknowledged that the Made Ground soils are granular in nature and therefore it may be possible to consider their mechanical compaction to improve their condition such as to allow the construction of a lightly loaded raft foundation; it must be noted that this would not be the recommended course of action, given the above, and that this would be at the discretion and risk of the client and / or the designing engineer.

Spread foundations may also prove problematic for the site given the presence of groundwater at the approximate depth of the base of the Made Ground soils, at the top of the natural granular deposits. Whilst not impossible, the effects of sloughing to the sides of excavations is likely to cause issues in the formation of trenches for strip or pad foundations.

Any foundations formed in this way would likely be sited at ~100-200mm only into natural soils; furthermore the granular layer into which they would bear is variably thick and had a notable compositional variation in WS3. Such foundations would require reinforcement to account for these factors as it is unlikely that removal of softer spots or the compaction of trench bases would be possible.

It may be possible to partially fill trenches with granular engineering material and fully compact, provided that groundwater conditions can be controlled, however this should be completed by a suitably experienced contractor.

The soils of the Lambeth Group are noted to be (worst case) highly shrinkable in accordance with NHBC guidance. The gravel material overlying the Lambeth Group stratum serves to significantly reduce the effects of tree root influence on the cohesive bedrock soils, such that required foundation depths indicated in the NHBC guidance may be reduced by 25%. Nevertheless, it would be recommended that the designing engineer completes a suitable check on the relevant recommended depths to ensure they fall within the granular Head Deposits, rather than the underlying clay soils, with particular attention to the high water demand eucalyptus tree.

Subsequently, a safe bearing pressure of 75kN/m^2 is considered appropriate at a depth of 1.60-1.80mbgl.

Safe bearing capacity figures are offered on the basis of a minimum foundation width of 600mm and assume a Factor of Safety (FoS) = 3.0.

Care should be taken around the locations of existing or previous buried structures on site. Any such structures should be fully removed, along with any loose or soft soils prior to the formation of new structural foundations. It may also be necessary to deepen foundations locally to account for former structures.

9.2.2. Deep Foundations

Whilst spread foundations are not considered entirely precluded by the ground conditions, given the anticipated difficulties with their formation it is considered that piled foundations would be the most prudent option and would likely provide a greater degree of design certainty.

Any use of piled foundations, however, is likely to require additional ground investigation at depth to provide the necessary design parameters, as well as potentially incurring additional geo-environmental assessment on the basis of possible impact to the underlying Chalk aquifer.

9.2.3. Floor Slabs

The floor slab design will depend on the final foundation designs and is dependent on the underlying materials, including bearing capacity and the presence of any cohesive or Made Ground Soils.

A suspended floor would be considered the most suitable option for the new development on the basis of the significant thickness of Made Ground soils. It is understood that the original design philosophy for the development included an insulated raft foundation and therefore it is anticipated that some degree of ground bearing will likely be required in the finished design of the ground floor. Any such slab would require a fully compacted subbase to eliminate issues arising from adverse / differential settlement.

9.2.4. Excavations and Groundwater

It is possible that excavations of less than 1.20mbgl will require support to their faces due to the loose granular soil conditions encountered. Should excavations be taken below this then adequate support should be provided in order to satisfy statutory safety regulations, particularly where manned entry is required and groundwater was encountered.

Groundwater levels vary throughout the year based upon seasonal changes in rainfall and tree root uptake; the levels revealed by this investigation may not be reflective of those at other times of the year.

Groundwater has been recorded at 1.60-1.80mbgl; WS3 and WS4 were installed to allow future monitoring and water levels should be checked periodically as these can vary according to seasonal variations and weather conditions.

It should be anticipated that perched water may be encountered in the variable shallow soils during the excavation works, particularly at the base of foundation trenches. Saturated soils are likely to become unstable and may lead to collapse of excavation sides. It may be necessary, therefore, to utilise local support to the excavation faces as well as to employ dewatering techniques.

If groundwater is identified within any of the excavations during the construction phase then it should be dealt with appropriately and removed using good engineering practices.

9.2.5. Retaining Structures

The following moderately conservative values may be utilised in the design of the permanent basement walls as well as any temporary retaining structures.

Material	Effective angle of friction (ϕ')	Effective Cohesion; c' (kPa)	Bulk Density kN/m^3
Made Ground	24-26	0	16
Head Deposit – Gravel	28-30	0	18
Lambeth Group	23-24	0	19

Table 9.2: Retaining Wall Parameters

9.2.6. Aggressive Chemical Environment to Concrete

Sulphate concentrations within the Made Ground and Natural soils were found to range 238mg/l to 3200mg/l, with pH levels ranging from 7.3 to 8.0 suggesting that a design class of DS-4 and a sub class of AC-4 should be adopted for buried concrete structures within these soils (Reference made to current BRE SD1 Guidelines).

10. GEO-ENVIRONMENTAL DISCUSSION AND CONCLUSIONS

The following conclusions have been made based on the investigation undertaken to date in light of the outlined proposals. Any alterations to the proposals may warrant a reassessment. In summary, proposals include for the construction of 4no new single storey 1 bed cottages with all external areas to be laid with concrete or astroturf.

10.1 Discussion of Findings

10.1.1. Preliminary Risk Assessment

The Preliminary Risk Assessment, completed by AEL (Ref: CL/3384/WS; November 2022), identified the following source of contamination:

- Possible heavy metals and other inorganics, hydrocarbons (including PAHs), asbestos and ground gases including radon.

In summary, the preliminary CSM identified **Moderate to High** risks from the source to the identified receptors, which included human health, building structures, underground services and groundwater. Consequently, it was recommended that an intrusive site investigation be undertaken to assess the pollutant linkages, with the aim to refine the associated risks.

10.1.2. Encountered Ground Conditions

The encountered ground conditions comprised Made Ground over granular Head Deposits, over cohesive soils of the Lambeth Group. The underlying basal chalk was not encountered within any of the exploratory holes during the investigation to a maximum intrusive depth of 5.00mbgl.

Made Ground was recorded to a depth of 1.70mbgl, and pertinently included ash, brick, glass and wood. Deeper Made Ground was notably less ashy. Groundwater was recorded near to the boundary between the Made Ground and the granular Head Deposits at depths circa 1.60m and 1.80mbgl.

10.1.3. Significance of Soil Results

Soil samples were submitted to the laboratory for analysis against a contamination suite reflecting the contaminants of concern highlighted within the PRA, completed by AEL (Ref: CL/3384/WS; November 2022). Results were compared against GAC using 'RwoHP' land-use setting. Following analysis, exceedances of the 'Residential without homegrown produce' land-use screening criteria were recorded for lead, and three PAH determinands: benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene. These exceedances of the assessment criteria were recorded exclusive to Made Ground soil samples. Furthermore, lead concentrations for four of the tested soil samples were in excess of the far less stringent 'Commercial' land-use setting assessment criteria. Analysis of the tested natural soil reported no exceedances of the applicable screening criteria, and moreover, a significant number of determinands were reported below laboratory LOD; consistent with the descriptions made in field.

The elevated concentrations of lead and PAH determinands were consistently recorded in near-surface Made Ground, which itself was identified across the site, as evidenced within each exploratory hole.

The concentrations of the elevated PAH determinands, and pertinently the high levels of lead, warrant a concern to human health. The proposals include for private gardens, and therefore, there is a possibility that future residential end users will come into exposure with near-surface Made Ground soils. Until such a time that the detail

of surface make up of these external areas is realised, and information provided to IGL, i.e. thickness of concrete; thickness of sub-base to astroturf etc., the risks to residential end users remains **Moderate**.

It is probable that future groundworkers will come into contact with the Made Ground soils during future works.

10.1.4. Asbestos in Soils

Chrysotile and amosite asbestos fibres were identified within the Made Ground soils of WS1 at 0.60mbgl. Visible asbestos was not encountered within the soils during the investigation, however. Asbestos Containing Soils (ACSs) are common within Made Ground, particularly where soils have been imported/reused (e.g. to raise site levels) with poor materials management.

It is generally accepted that the nature and degree of potential risks from exposure to asbestos fibres when working with ACSs in the external environment is significantly lower than that which might be expected when working with Asbestos Containing Materials (ACMs) internally within buildings (CAR 2012). However, because asbestos is a non-threshold substance (i.e. there is currently no applicable screening criteria for human health), it can be assumed that the presence of asbestos in soils can potentially cause a risk to human health. Therefore, similar to the above, the risks to residential end users from airborne asbestos fibres/ACS is **Moderate**.

The Control of Asbestos Regulations 2012 (CAR-SOIL, CL:AIRE) requires adequate documentation to ensure that exposure to asbestos can be prevented, and exposures during disturbance of the soils are controlled and managed. This is particularly pertinent with respect to groundworks. The decision on whether the work is licensed or not will be dependent, in most circumstances, on the potential degree of exposure to airborne fibres caused by the work activity. The above assessment does not preclude the guidance provided by Health and Safety Executive (HSE).

10.1.5. Controlled Water

During the investigation, groundwater was recorded near to the boundary between the Made Ground and underlying granular soils of the Head Deposits, at depths of 1.60-1.80mbgl. The AEL PRA (Ref: CL/3384/WS; November 2022) identified **Moderate** risks to controlled waters.

The underlying groundwater is considered to have a high sensitivity given that the site is located within a SPZ1 and both a Principal and Secondary A Aquifers are beneath. The Principal Aquifer is associated with the deeper White Chalk Subgroup, which was not confirmed during the investigation to a depth of 5.00mbgl. The Secondary A Aquifers relate to the Head Deposits and Lambeth Group. It should be noted that the Lambeth Group geology is quite variable, and contains irregular layers of water-bearing sand, which is attributable to the Secondary A designation. The Lambeth Group beneath the site was predominantly a stiff silty sandy Clay, and likely to be relatively impermeable.

Due to the high levels of lead identified in the soil samples it was deemed necessary to undertake lead leachate testing of the Made Ground in order to help assess the risks to controlled waters from this contaminant. Following testing, exceedances of the Water Supply Regulations (2000) were recorded for lead from one shallow Made Ground sample: WS4 at 0.20m. There were no other notable exceedances of the groundwater/leachate assessment criteria from any of the remaining tested samples. The deeper tested leachate sample from WS4 at 1.20mbgl recorded leachable lead below laboratory LOD, which may suggest that the lead within the Made Ground is relatively immobile.

The findings of the investigation, and laboratory leachate analysis, suggest whilst there may be the possibility that *significant* concentrations of lead may leach to the underlying aquifers to cause harm, the likelihood of this is low. Furthermore, the exceedances from leachate analysis are of a particularly stringent assessment criteria (i.e. WSR), which may not be considered wholly applicable. Finally, there is an argument that the cohesive soils of the Lambeth Group act to confine the deeper Chalk Principal Aquifer, of which the SPZ1 is an important consideration.

The relatively low sensitivity of surface water features, including the neighbouring drainage ditch, acts to reduce the overall risk to this receptor (i.e. surface water bodies within the surrounds).

The above is caveated should there be a requirement for piled foundation design for the proposals on site. A Piling Risk Assessment (PiRA) should aim to assess the hazards caused from piling to environmental receptors, particularly the underlying chalk aquifer. Recommendations are included in later report sections.

10.1.6. Ground Gas

The risks from both ground gas and soil vapour to site have been classified as **Low**, based on the findings of the investigation and utilising multiple-lines-of-evidence approach. Therefore, further assessment and mitigation is not deemed necessary. This assessment does relate to the risks from Radon, which are covered principally by building control.

10.2 Conceptual Site Model

The refined Conceptual Site Model (CSM) has been formulated in accordance with BS EN ISO 21365:2019 Soil Quality – Conceptual Site Models for Potentially Contaminated Sites and following information collated within the Site Investigation conducted and is intended to complete the GQRA, in accordance with LCRM 2025. In this instance, it is used to assess the significance of contaminative sources associated with Made Ground soils identified across the site, receptors, and the validity of the pathway between them. As such, whilst other pollutant linkages may have been acknowledged within the Preliminary CSM, these will not be included within the updated CSM and Risk Assessment. An explanation of categories is provided below the CSM table.

Category	Examples
High	Residential with gardens/Groundwater Source Protection Zone
Medium	Residential without gardens/Principal (Major) Aquifer/sensitive watercourse
Low	Commercial and industrial use/Secondary (Minor) Aquifer
Very Low	Construction and maintenance workers/non-sensitive watercourse

Table 10.1: Sensitivity of Receptor

Category	Examples
Gross Impact	Heavily contaminated gasworks or industrial site, hazardous waste landfill
Moderate Impact	Major leaks and spills from fuel infrastructure (e.g. petrol stations), domestic waste landfills
Slight Impact	Minor leaks and spills from fuel infrastructure, 'inert' waste landfills

Table 10.2: Magnitude of Impact

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway.

Category	Examples
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

Table 10.3: Likelihood of Pollutant Linkage

A description of these risk classifications and likely action required are given in the tables below.

Negligible Risk	The site should be considered suitable for the present or future use and environmental setting. Contaminants unlikely to be present, which might have unacceptable impact on key targets.
Low Risk	The site should be considered suitable for the present or future use and environmental setting. Contaminants may be present but unlikely to have unacceptable impact on key targets.
Moderate Risk	The site may not be suitable for the present or future use and environmental setting. Contaminants are probably present and might have unacceptable impact on key targets.
High Risk	The site is probably or certainly not suitable for the present or future use and environmental setting. Contaminants are probably or certainly present and likely to have unacceptable impact on key targets.

Table 10.4: Risk Classification

10.2.1. Conceptual Site Model and Risk Assessment

The assessment below relates to current site conditions, based on the proposed development, and without any further investigation or mitigation measures.

Source	Pathway	Receptor	Likelihood	Potential Risk
Made Ground on site; Elevated levels of lead (Pb) and PAH determinands	Inhalation, ingestion and dermal contact from exposure to contaminated soils	Residential end users	Possible*	Moderate*
		Site workers (during development / construction)	Likely	Low to Moderate
	Contact with impacted soils	Proposed potable water services installed within the new development	Likely	Moderate
	Migration of soil gases through the soil pores of the underlying geology	End users and proposed development	Low Likelihood	Low
		Site workers (during development / construction)	Unlikely	Negligible
	Infiltration and migration of contaminants through the underlying geology and surface water flow	Secondary (A) Aquifer	Likely	Low
		Bedrock Principal Aquifer	Low Likelihood	Low (Moderate+)
		Surrounding River Network	Likely	Low
Discussion of Risks				
Future residential end users represent a sensitive receptor due to age profile and potential for exposure to impacted soils within a private garden setting. However, preliminary plans indicate external areas are to be laid with concrete or astroturf, thereby potentially reducing the likelihood of a pollutant pathway. Irrespective of this, the high levels of lead are such that there is the potential for a significant hazard to residential end users; consequently, the risk to residential end users will remain as Moderate until such a time that the detail of surface make up of these external areas is realised, and information				

Source	Pathway	Receptor	Likelihood	Potential Risk
<p>provided to IGL. As an example, within areas of private gardens (and amenity landscaping) the use of an engineered concrete hardstanding (i.e. foundation-grade concrete) of suitable thickness, or engineered 'no-dig' membrane/layer incorporated in the design of the astroturf (i.e. below the binding sand/subbase), should be sufficient to reduce the risks to residential end users (i.e. human health) to Low (*).</p> <p>Given the high levels of lead, and elevated PAH, the risks to future potable water supply pipes is enough to warrant the use of barrier pipe, as discussed in later report sections.</p> <p>Site workers are likely to come into contact during the groundworks stage. The short exposure time and sensitivity of the receptor reduces this risk somewhat compared to residential end users; the receptor (site workers during development) is less vulnerable as it excludes children and the elderly. Moreover, any salient risks should be managed by good working practices, i.e. wash/mess facilities, correct PPE etc.</p> <p>The ground gas potential of this source (on-site Made Ground) is considered to be low, and as a result, the level of risk to human health receptors is currently considered to be (as a worst-case) Low.</p> <p>The sensitivity of controlled waters is deemed to be between High, due to the presence of the Principal Aquifer and SPZ. The findings of the investigation, and laboratory leachate analysis, suggest the likelihood that <i>significant</i> concentrations of lead may leach to the underlying aquifers is low. Moreover, the cohesive soils of the Lambeth Group beneath the site act to confine the deeper Chalk Principal Aquifer.</p> <p>† - Piling on site is likely to increase this risk to controlled waters. A piling risk assessment should be undertaken if a piled foundation solution is adopted for the development.</p>				

Table 10.5: Source 1 – CSM

Source	Pathway	Receptor	Likelihood	Potential Risk
ACSs on site, containing chrysotile and amosite fibres	Inhalation, ingestion and dermal contact from exposure to contaminated soils and respirable airborne fibres	Residential end users	Likely	Moderate*
		Site workers (during development)	Low likelihood / Likely	Low to Moderate
Discussion of Risks				
<p>Without any mitigation measures, residential end users are likely to be exposed to the source, as the site includes a residential private garden. The acute risk from asbestos warrants a viable risk. (*) The thickness and composition of either the proposed concrete slab to the gardens of astroturf may mitigate/reduce this risk; subject to a review by IGL of detailed drawings.</p> <p>Site workers (during development) are likely to come into contact with ACSs during the groundworks stage. The short exposure time and sensitivity of the receptor reduces this risk somewhat compared to residential end users (CAR 2012); the receptor (site workers during development) is less vulnerable as it excludes children and the elderly. However, the acute risk presented by ACSs does present concerns, and will need to be addressed through mitigation during future groundworks.</p>				

Table 10.6: Source 2 – CSM

11. GEO-ENVIRONMENTAL RECOMMENDATIONS

The following recommendations are based on the plans proposed at the time of writing this report and may be subject to change. The design of the site investigation incorporated information from previous reports along with consideration of the preliminary development plans. Potential contamination sources were investigated as far as reasonably practicable and within the permitted timeframe.

Following the investigation to date, a **Moderate** risk has been identified to residential end users from the Made Ground identified on site, which includes the elevated levels of lead and PAH determinands, as well as the ACS. The risk to residential end users will remain at this level until the surface details of the private gardens and amenity soft-landscaped areas has been provided. As an example, within areas of private gardens (and amenity landscaping) the use of an engineered concrete hardstanding (i.e. foundation-grade concrete) of suitable thickness, or engineered 'no-dig' membrane/layer incorporated in the design of the astroturf (i.e. below the binding sand/subbase), should be sufficient to reduce the risks to residential end users (i.e. human health) to Low.

A **Moderate** risk has been identified to new potable water supply pipes installed for the new development. This is principally due to the high levels of lead.

Generally **Low** risks have been identified to controlled waters from the highlighted contaminant sources. However, piling on site is likely to considerably increase this risk to controlled waters, and as such, the risk will need to be reassessed should a piled foundation solution be adopted.

Consequently, the following measures have been recommended with the aim to further assess, or reduce and/or eliminate the identified pollutant pathways and associated risks.

11.1 Surfacing

It is recommended that cross-sectional drawings are provided detailing the composition of the surfacing to the private gardens, patio areas, highways and any amenity landscaping. As per the proposals, it is planned to lay a concrete slab or astroturf to the gardens; without information regarding the thicknesses and make-up, there is considered to be a potential for residential end users to come into contact with the Made Ground soils.

Should the plans change, and the decision is made to surface the private gardens and amenity areas with soft-landscaping/turf, then the risk assessment will need to be reviewed. In this instance, it is likely that an engineered cover system will be required in all areas of gardens. The cover system would a suitable thickness of 'clean' certified soils and specified membrane/geotextiles, depending on the requirements.

11.2 Piling Risk Assessment (PiRA)

In the instance that the proposals require a piled foundation design it is recommended that Piling Risk Assessment (PiRA) is commissioned. A PiRA should be completed to fully assess the environmental risks associated with the use of piles for the site prior to development works. This assessment should identify the environmental risks associated with the use of piled foundations at the site, and subsequently identify the range of appropriate risk management and monitoring requirements, which should be adopted to limit and control the identified risks to a practicable minimum. The piling contractor must provide in depth methodology and subsequent mitigation for inclusion into the report. The PiRA report should be prepared by an Environmental Consultant in line with *Piling and Penetrative*

Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (CL:AIRE, March 2025).

11.3 Asbestos Mitigation

Asbestos fibres were identified within the underlying Made Ground. The Control of Asbestos Regulations (CAR) 2012, requires an assessment of work which exposes employees to asbestos that specifically addresses all potential risks to workers for any work involving asbestos – the CAR risk assessment.

As detailed within CIRIA document C733 Asbestos in soil and Made Ground: *a guide to understanding and managing the risks*, the risk assessment, compiled by the Site Supervisor, will define the mitigation measures required, the need for, and specification of PPE and decontamination facilities (e.g. clean and dirty areas for site workers, showering facilities, disposable PPE or laundering clothing), and whether air monitoring is required. The required mitigation measures will depend on the working methods, nature and extent of asbestos, and the ground conditions.

Mitigation measures to minimise asbestos exposures and prevent the spread of asbestos may include ‘damping down’ of all site materials, managing stockpiles, segregated areas, wheel washes, road wetting and road cleaning.

11.4 Health and Safety

Contractors working on-site should be warned that there is a salient risk of contamination when undertaking groundworks. Therefore, appropriate protection measures should be adopted to guarantee their health and safety. Site workers should be protected by tool box talks, site inductions, the use of PPE and appropriate wash facilities. Measures should be put in place during construction to restrict the release of nuisance dust in response to elevated levels of Lead and the presence of asbestos. Further advice should be sought from Health and Safety Executive.

11.5 Watching Brief

A watching brief should be maintained on site, particularly during groundworks. This must be undertaken as part of good working practices and in case there are any areas of unidentified contamination.

During any ground works, an appraisal of the exposed soils should be made by the on-site manager or developer’s nominated person. If any material is noted to show visual and/or olfactory sign of contamination this material should be stockpiled separately and tested prior to its appropriate removal off site or re-use where necessary. A suitably qualified environmental specialist should be contacted to advise what further investigation is required.

The on-site manager/developer’s nominated person should be able to display the relevant level of qualification and/or experience in managing construction works.

11.6 Services

We would recommend that the local water board are contacted to determine the type of pipework that should be used on this site on the basis of the elevated levels of contamination proven, particularly the lead. It should be expected that a form of barrier pipe (such as protecta-line barrier pipe systems) will be required.

As good practice, it is recommended that buried services are situated within lined trenches. The trenches should be lined with a geotextile membrane and backfilled with clean fill, such as pea shingle, which will demarcate the services from the surrounding soils, protecting both the services and the future maintenance workers.

11.7 Statutory Consultees

We would recommend that this report be forwarded to the relevant Statutory Consultees including the Local Council's Environmental Health and Planning Department to seek their comments and subsequent approval prior to works commencing on site.

The LCRM guidelines require Contaminated Land Risk Assessment to include for a Stage 2: Remediation Options Appraisal to inform the Stage 3: Tier 1 Remediation Strategy Report. These reports document the most suitable form of remediation techniques for the site and provide a methodology for how they are to be implemented.

Following the submission of a Stage 3: Tier 1 Remediation Strategy Report, and completion of the remedial works, an updated CSM should be provided with the Stage 3: Tier 2 Remediation Progress and Stage 3: Tier 3 Verification Reports. These reports document the remedial works undertaken on site and provide necessary audit trails to prove works have been completed adequately, as well as identifying any need for ongoing monitoring/assessment. It is recommended that the specific requirements of the Local Planning authority are ascertained prior to any works commencing onsite.



APPENDIX A – SITE PLANS



- NOTES
- The details shown are for design intent purposes only and are subject to further design development with suppliers and sub-contractors.
 - Proposals subject to consultation and approval from Local Authority Planning Department and Building Control (or an Approved Inspector).
 - All setting out dimensions should be checked on site prior to construction and any discrepancies and/or omissions should be reported to the Architect immediately.
 - Do not scale from drawings, any dimensions shown are indicative only and are subject to verification on site.
 - This drawing is to be read in conjunction with all other plans, structural calculations and specifications.



Critchley Architecture And Design Ltd.
Contact: 02392 474 919 | info@caad.online

The Old Bakery, 34 North Street, Havant, PO9 1PT

- Revisions
- A. Roof updates. 06/08/24. JHL
 - B. Client revisions. 07/08/24. JHL
 - C.

Project Address

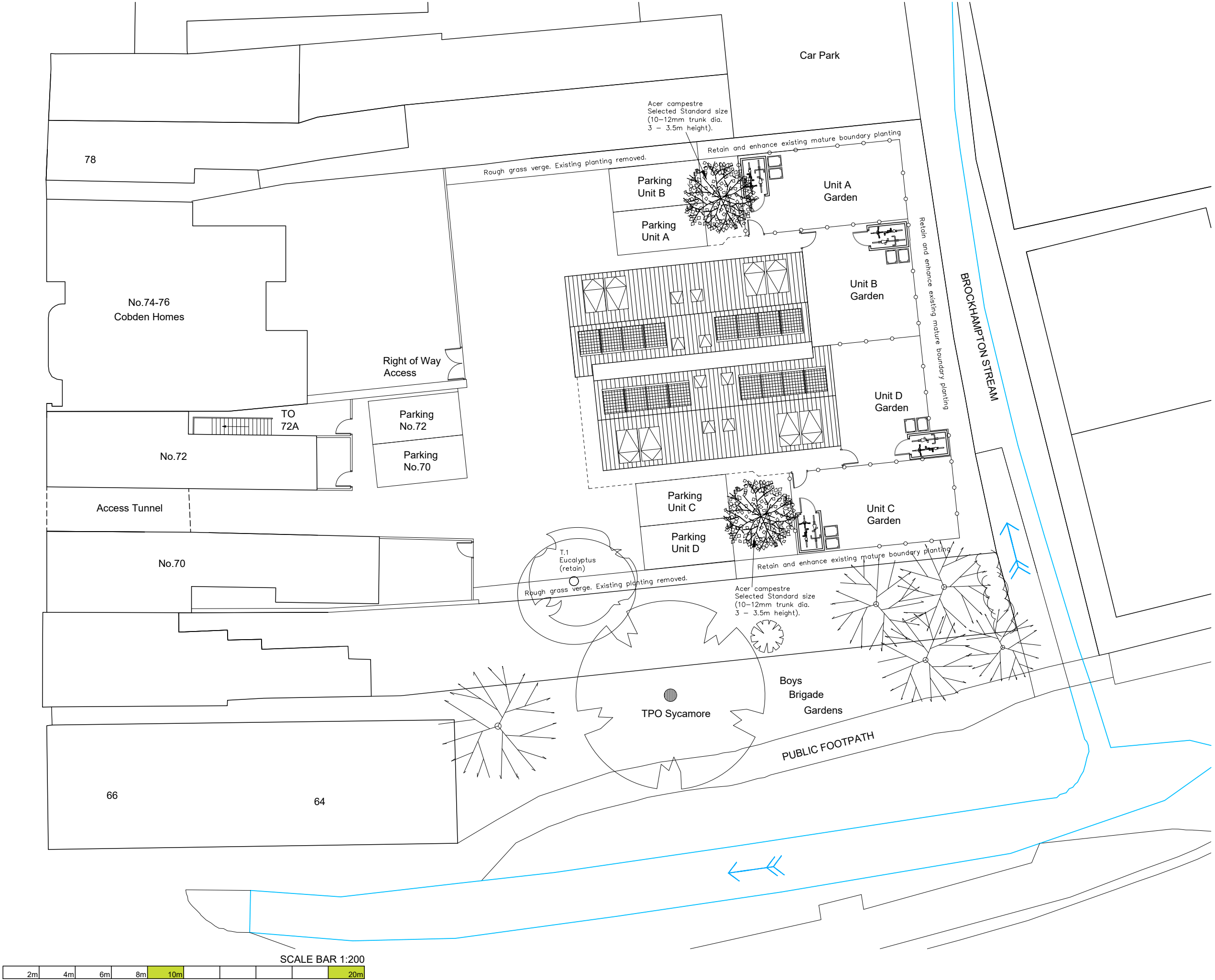
Land Rear of
70-76 West Street,
Havant,
Hampshire

PROPOSED SITE PLAN

Scale A3 1:100
Drawn By OS/JHL
Date 01.08.2024

Project No. Sheet No. Rev.

24053 102 B





APPENDIX B – HOLE LOCATION PLAN



Project:		West St Havant		Title:		Hole Location Plan	
Job Number:	P25.205	Client:		<div>Notes:</div> <div><div>1.</div><div>Do not scale from this drawing.</div></div> <div><div>2.</div><div>All dimensions must be checked on site prior to commencement of work.</div></div> <div><div>3.</div><div>Where applicable this drawing is to be read in conjunction with other consultants drawings.</div></div> <div><div>4.</div><div>This drawing is the copyright of Impact Geotechnical Ltd.</div></div>	<div><div><div></div></div><div><div>IMPACT</div><div>GEO TECHNICAL</div></div><div><div>Impact Geotechnical Limited</div><div>www.impactgeo.co.uk</div></div></div>		
Drawing:	P25.205.HLP	Revision:	-				
Drawn:	GC	Date:					
Checked by:	RM	Scale:	NTS				



APPENDIX C – STRATIGRAPHIC LOGS

Percussion Drilling Log

Project Name: 72-76 West Street		Client: VerdeGo Living		Date: 23/06/2025	
Location: Havant		Contractor: IGL			
Project No. : P25.205		Crew Name: IGL		Drilling Equipment: Dart 195 WLS Rig	
Borehole Number WS1	Hole Type WLS	Level	Logged By GC	Scale 1:50	Page Number Sheet 1 of 1

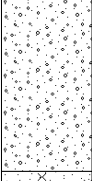
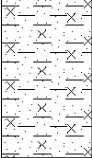
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.40			MADE GROUND Dark greyish brown slightly ashy slightly gravelly silty Sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	1
		0.50	D					MADE GROUND Dark greyish brown slightly ashy silty sandy Gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	
		0.60	ES					MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	
		1.00	D		1.10			MADE GROUND Dark greyish brown slightly ashy silty sandy Gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	
		1.00	SPT	N=14 (5,4/4,4,3,3)				MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	
		1.30	ES					Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	
		1.50	D		1.60			MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	2
		2.00	D					Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	
		2.00	SPT	N=15 (1,1/3,3,4,5)				MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	
		2.50	D					MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	3
		3.00	D					Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	
		3.00	SPT	N=13 (3,3/2,2,4,5)				MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	
		3.50	D		3.90 4.00			MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	4
		4.00	D					Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	
		4.00	SPT	N=15 (1,2/3,3,4,5)				MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Hand excavated pit to 1.00mbgl. SPT's completed at 1.00m centres. Groundwater encountered at 1.80mbgl. Backfilled with arisings on completion. Hole terminated at 4.00mbgl due to collapse of borehole sides up to 1.80mbgl.										
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Percussion Drilling Log

Project Name: 72-76 West Street		Client: VerdeGo Living		Date: 23/06/2025	
Location: Havant		Contractor: IGL			
Project No. : P25.205		Crew Name: IGL		Drilling Equipment: Dart 195 WLS Rig	
Borehole Number WS2	Hole Type WLS	Level	Logged By GC	Scale 1:50	Page Number Sheet 1 of 1

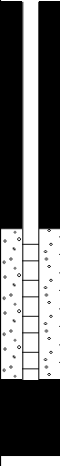
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.60			MADE GROUND Dark greyish brown slightly ashy slightly gravelly silty Sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	1
		0.50	D					MADE GROUND Dark greyish brown slightly ashy silty sandy Gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	
		0.70	ES					MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	
		1.00	D		1.20				
		1.00	SPT	N=14 (1,2/3,5,3,3)					
		1.30	ES		1.60				
		1.50	D						
		2.00	D		2.90			Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	2
		2.00	SPT	N=10 (1,1/1,2,3,4)					
		2.50	D						
		3.00	D		4.00			Stiff reddish brown mottled brown and grey silty sandy CLAY. (LAMBETH GROUP)	3
		3.00	SPT	N=30 (4,4/5,6,9,10)					
		3.50	D		4.00				4
		4.00	D					End of Borehole at 4.000m	
		4.00	SPT	N=19 (3,3/4,4,5,6)					4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Hand excavated pit to 1.00mbgl. SPT's completed at 1.00m centres. Groundwater encountered at 1.80mbgl, rising to 1.60m after 20 mins. Backfilled with arisings on completion. Hole terminated at 4.00mbgl due to collapse of borehole sides up to 1.80mbgl.										
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Percussion Drilling Log

Project Name: 72-76 West Street		Client: VerdeGo Living		Date: 23/06/2025	
Location: Havant		Contractor: IGL			
Project No. : P25.205		Crew Name: IGL		Drilling Equipment: Dart 195 WLS Rig	
Borehole Number WS3	Hole Type WLS	Level	Logged By GC	Scale 1:50	Page Number Sheet 1 of 1

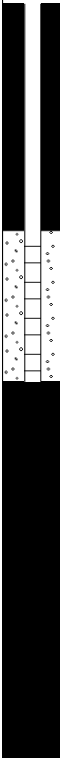
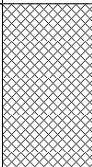
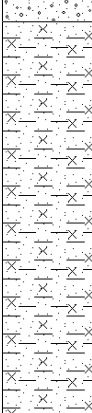
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=19 (2,5/5,5,5,4)	0.25			MADE GROUND light greyish brown slightly ashy slightly gravelly silty Sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	1
		0.50	D						
		0.70	ES		0.80			MADE GROUND Dark greyish brown slightly ashy silty sandy Gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	
		1.00	D						
		1.00	SPT						
		1.30	ES	N=10 (3,4/4,3,2,1)	1.50			MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.	2
		1.50	D						
		2.00	ES		2.00			Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	
		2.00	SPT						
		2.40	D		2.40			Becoming dark grey with an organic odour at 1.90m Loose buff mottled grey slightly organic silty clayey fine to coarse SAND (HEAD DEPOSITS)	
		3.00	D		3.00			Stiff reddish brown mottled brown and grey silty sandy CLAY. (LAMBETH GROUP) End of Borehole at 3.000m	3
									4
									5
									6
									7
									8
									9
									10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Hand excavated pit to 1.00mbgl. SPT's completed at 1.00m centres. Groundwater encountered at 1.80mbgl. Borehole installed with a 35mm diameter standpipe, Ground level to 1.50m, plain pipe with bentonite surround, 1.50-2.50m slotted pipe in gravel filter pack.										
---	--	--	--	--	--	--	--	--	--	---

Percussion Drilling Log

Project Name: 72-76 West Street		Client: VerdeGo Living		Date: 23/06/2025	
Location: Havant		Contractor: IGL			
Project No. : P25.205		Crew Name: IGL		Drilling Equipment: Dart 195 WLS Rig	
Borehole Number WS4	Hole Type WLS	Level	Logged By GC	Scale 1:50	Page Number Sheet 1 of 1

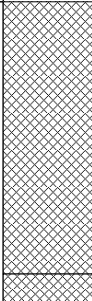
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.20	ES	N=16 (3,4/5,4,4,3)	1.10		MADE GROUND light greyish brown slightly ashy slightly gravelly silty Sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	1				
		0.50	D									
		0.70	ES									
		1.00	D									
		1.00	SPT									
		1.20	ES	N=9 (3,2/4,1,2,2)	1.70		MADE GROUND greyish brown sandy clayey Gravel. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint and brick.					
		1.50	D									
		2.00	D									
		2.00	SPT									
		2.50	D									
		3.00	D	N=15 (1,2/3,3,4,5)	2.40		Medium dense brown speckled grey, becoming pale brownish red sandy clayey GRAVEL. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse sized flint. (HEAD DEPOSITS)	2				
		3.00	SPT									
		3.50	D									
		4.00	D									
		4.00	SPT									
		4.50	D	N=13 (2,1/3,3,3,4)	5.00		Stiff reddish brown mottled brown and grey silty sandy CLAY. (LAMBETH GROUP)	3				
5.00	D											
5.00	SPT											
End of Borehole at 5.000m									4			
									5			
							6					
							7					
							8					
							9					
							10					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Hand excavated pit to 1.00mbgl. SPT's completed at 1.00m centres. Groundwater encountered at 1.80mbgl. Borehole installed with a 35mm diameter standpipe, Ground level to 1.50m, plain pipe with bentonite surround, 1.50-2.50m slotted pipe in gravel filter pack.										
---	--	--	--	--	--	--	--	--	--	---

Trial Pit Log

Project Name: 72-76 West Street		Client: VerdeGo Living		Date: 23/06/2025	
Location: Havant		Contractor: IGL			
Project No. : P25.205		Crew Name: IGL		Equipment: Dart 195 WLS Rig	
Location Number TP1	Location Type TP	Level	Logged By GC	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES					MADE GROUND Dark greyish brown slightly ashy slightly gravelly silty Sand. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk.	
		0.80	ES		0.90 1.00			MADE GROUND Dark greyish brown slightly ashy silty sandy Gravel. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium sized flint, brick, glass, wood and chalk. End of Borehole at 1.000m	1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Hand excavated pit to 1.00mbgl. Backfilled with arisings on completion.



APPENDIX D – PHOTOGRAPHS

1.



2.



3.



4.



Project:	West St Havant	Title:	Site Photographs
Job Number:	P25.205	<div> <div>1.</div> <div>Existing site</div> </div> <div> <div>2.</div> <div>Existing site</div> </div> <div> <div>3.</div> <div>Existing site</div> </div> <div> <div>4.</div> <div>Existing site</div> </div>	
Client:	VerdeGo Living		
Produced by:	GC		
Checked by:	RM		
		<div>  <div> <div>IMPACT</div> <div>GEO</div> <div>TECHNICAL</div> </div> </div> <div> <div>Impact Geotechnical Limited</div> <div>www.impactgeo.co.uk</div> </div>	

5.



6.



7.



8.



Project:	West St Havant		Title:	Site Photographs
Job Number:	P25.205	5. WS1 6. WS1 GL-1.00m 7. WS1 spoil 8. WS1 1.00-5.00m		 IMPACT GEO TECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	VerdeGo Living			
Produced by:	GC			
Checked by:	RM			

9.



10.



11.



12.



Project:	West St Havant		Title:	Site Photographs
Job Number:	P25.205	9. WS2 10. WS2 GL-1.00m 11. WS2 spoil 12. WS2 1.00-5.00m		 IMPACT GEO TECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	VerdeGo Living			
Produced by:	GC			
Checked by:	RM			

13.



14.



15.



16.



Project:	West St Havant	Title:	Site Photographs
Job Number:	P25.205	13. WS3 14. WS3 GL-1.00m 15. WS3 spoil 16. WS3 1.00-5.00m	 IMPACT GEO TECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	VerdeGo Living		
Produced by:	GC		
Checked by:	RM		

17.



18.



19.



20.



Project:	West St Havant		Title:	Site Photographs
Job Number:	P25.205	17. WS4 18. WS4 GL-1.00m 19. WS4 spoil 20. WS4 1.00-5.00m		 Impact Geotechnical Limited www.impactgeo.co.uk
Client:	VerdeGo Living			
Produced by:	GC			
Checked by:	RM			

21.



22.



Project:	West St Havant		Title:	Site Photographs
Job Number:	P25.205	21. TP1 22. TP1		 IMPACT GEO TECHNICAL Impact Geotechnical Limited www.impactgeo.co.uk
Client:	VerdeGo Living			
Produced by:	GC			
Checked by:	RM			



APPENDIX E – LABORATORY CERTIFICATES



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No.

37524

Borehole/Pit No.

WS2

Site Name

West Street

Sample No.

-

Project No.

P25.205

Client

Impact Geotechnical

Depth Top

3.00

m

Depth Base

-

m

Sample Type

D

Soil Description

Reddish brown and bluish grey mottled gravelly silty CLAY (gravel is fmc and angular to sub-angular)

Samples received

01/07/2025

Schedules received

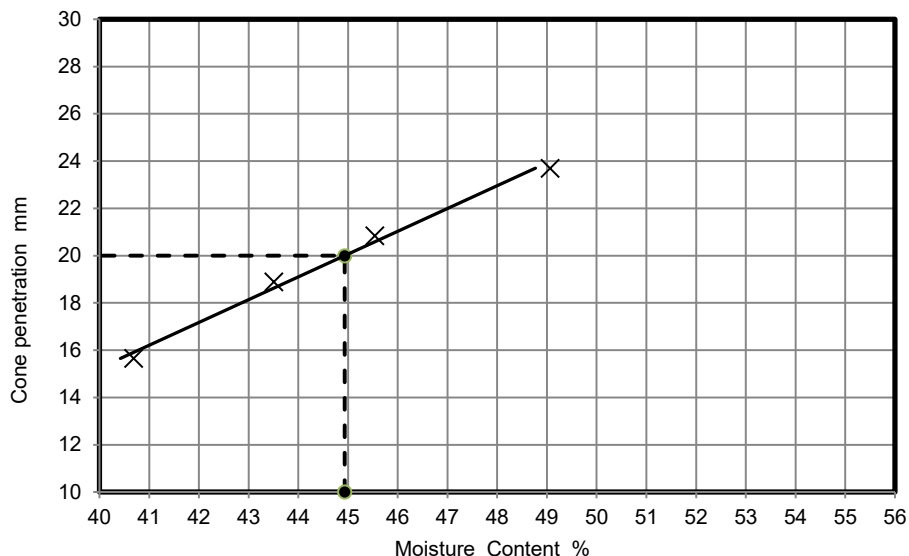
23/06/2025

Project Started

02/07/2025

Date Tested

17/07/2025



WATER CONTENT

19.9

%

% PASSING 425µm SIEVE

36

%

LIQUID LIMIT

45

%

PLASTIC LIMIT

19

%

PLASTICITY INDEX

26

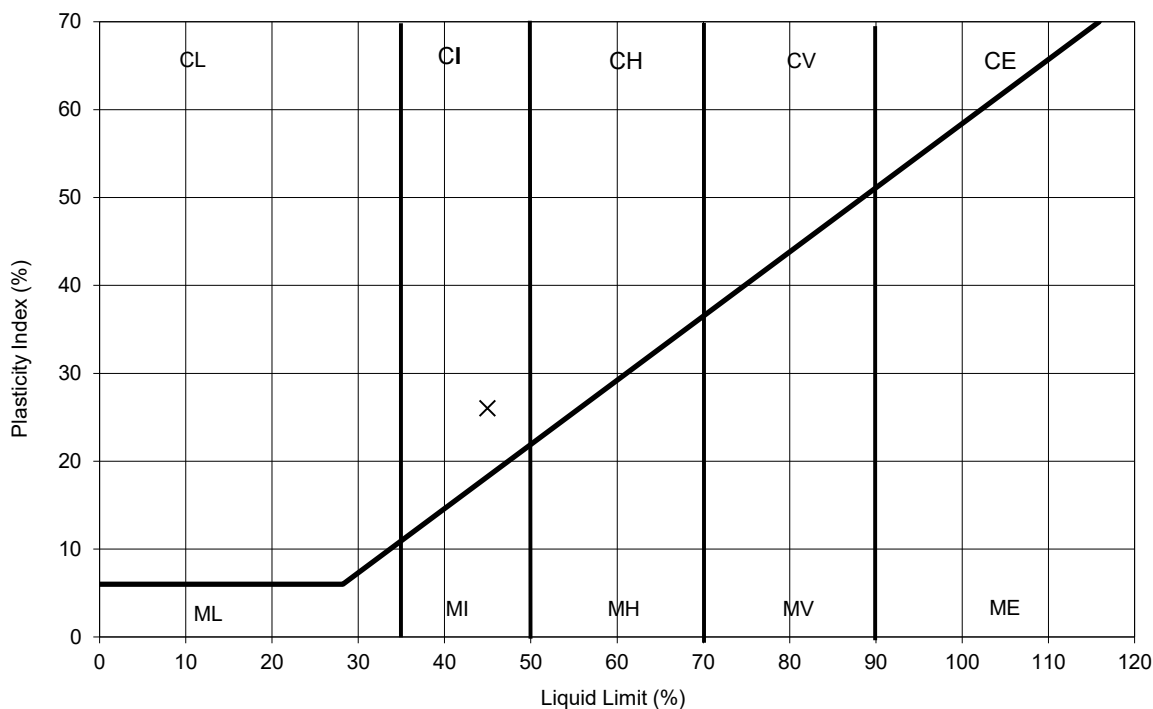
%

Preparation Method

Tested after washing to remove >425µm

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Checked and Approved

Initials: J.P

Date: 22/07/2025

MSF-5 R2



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No.

37524

Borehole/Pit No.

WS3

Site Name

West Street

Sample No.

-

Project No.

P25.205

Client

Impact Geotechnical

Depth Top

2.50

m

Depth Base

-

m

Sample Type

D

Soil Description

Reddish brown and bluish grey mottled silty CLAY

Samples received

01/07/2025

Schedules received

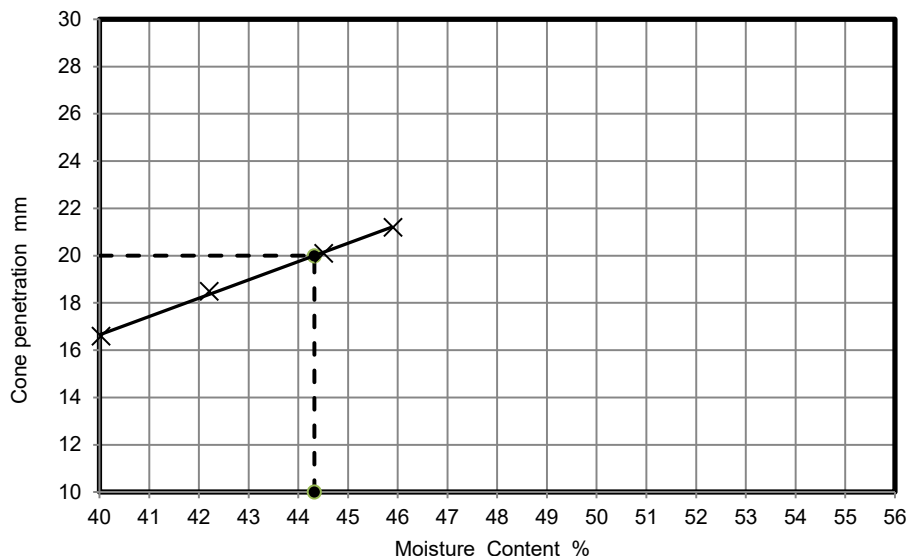
23/06/2025

Project Started

02/07/2025

Date Tested

17/07/2025



WATER CONTENT

14.3

%

% PASSING 425µm SIEVE

100

%

LIQUID LIMIT

44

%

PLASTIC LIMIT

16

%

PLASTICITY INDEX

28

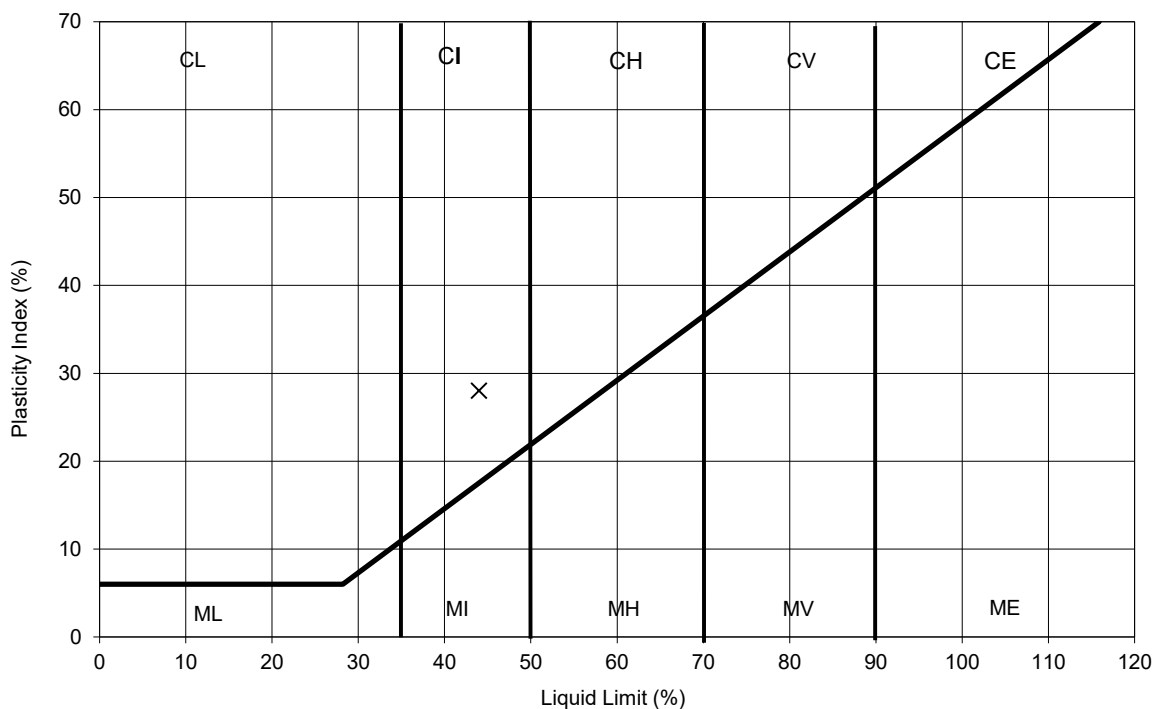
%

Preparation Method

Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved

Initials: J.P

Date: 22/07/2025

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5 R2



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No.

37524

Borehole/Pit No.

WS4

Site Name

West Street

Sample No.

-

Project No.

P25.205

Client

Impact Geotechnical

Depth Top

3.00

m

Depth Base

-

m

Sample Type

D

Soil Description

Reddish brown and bluish grey mottled silty CLAY

Samples received

01/07/2025

Schedules received

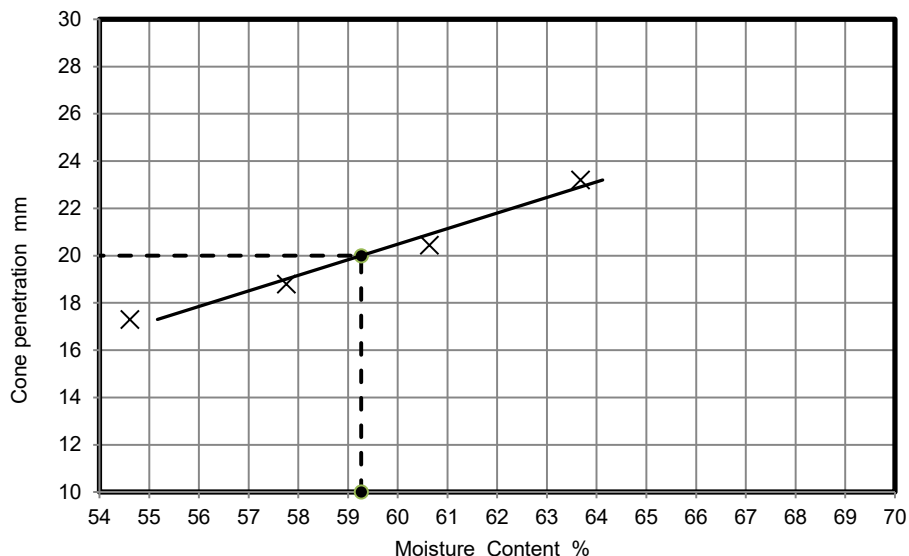
23/06/2025

Project Started

02/07/2025

Date Tested

18/07/2025



WATER CONTENT

22.8

%

% PASSING 425µm SIEVE

100

%

LIQUID LIMIT

59

%

PLASTIC LIMIT

18

%

PLASTICITY INDEX

41

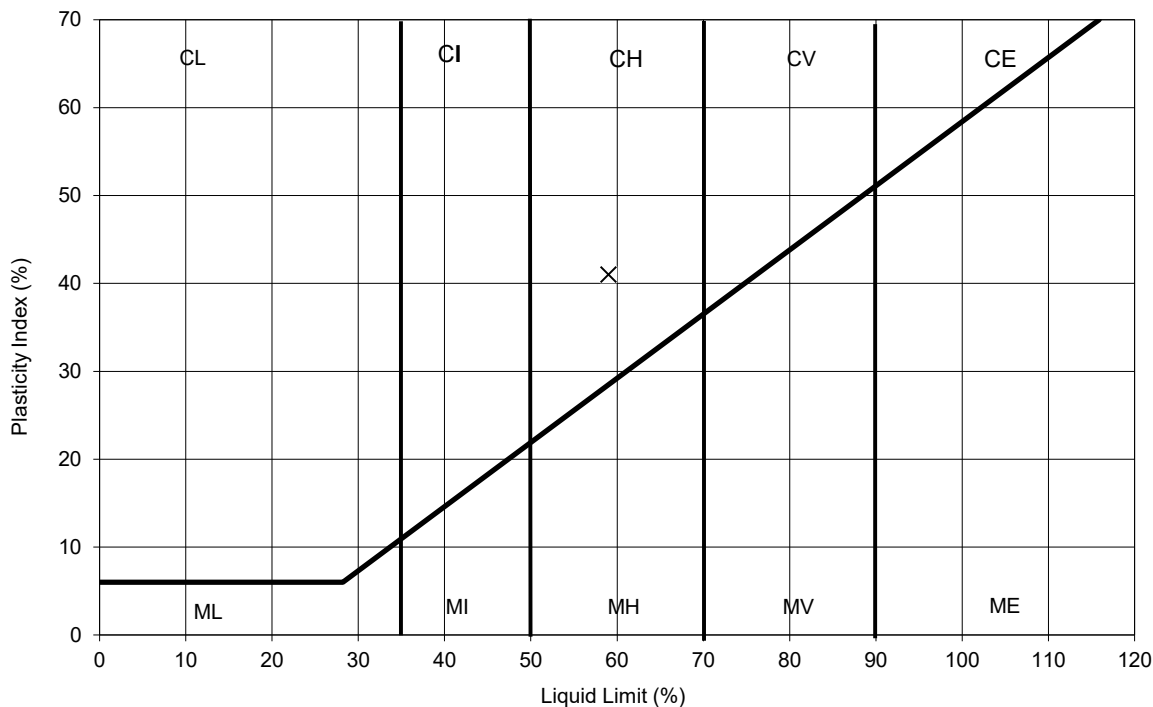
%

Preparation Method

Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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MSF-5 R2



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No.

37524

Borehole/Pit No.

WS4

Site Name

West Street

Sample No.

-

Project No.

P25.205

Client

Impact Geotechnical

Depth Top

4.00

m

Depth Base

-

m

Sample Type

D

Samples received

01/07/2025

Schedules received

23/06/2025

Project Started

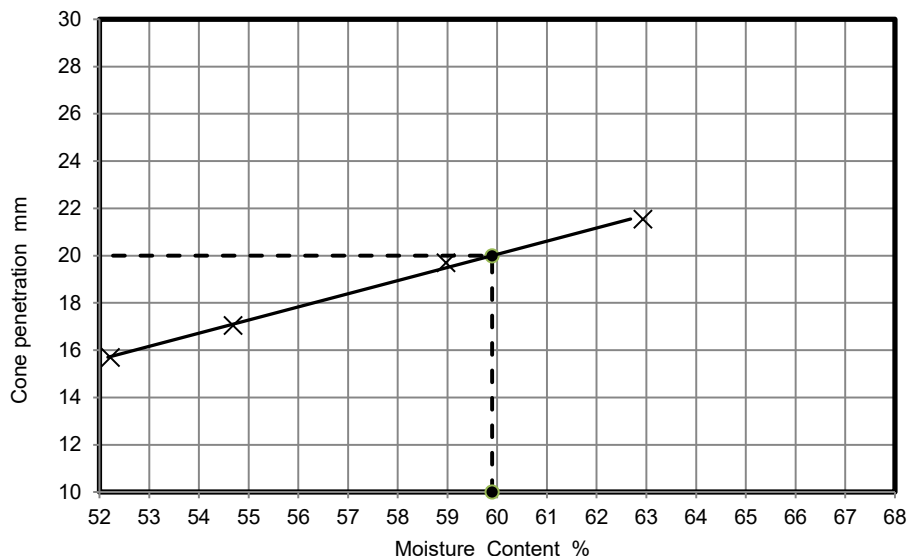
02/07/2025

Date Tested

18/07/2025

Soil Description

Reddish brown and bluish grey mottled silty CLAY



WATER CONTENT

23.6

%

% PASSING 425µm SIEVE

100

%

LIQUID LIMIT

60

%

PLASTIC LIMIT

19

%

PLASTICITY INDEX

41

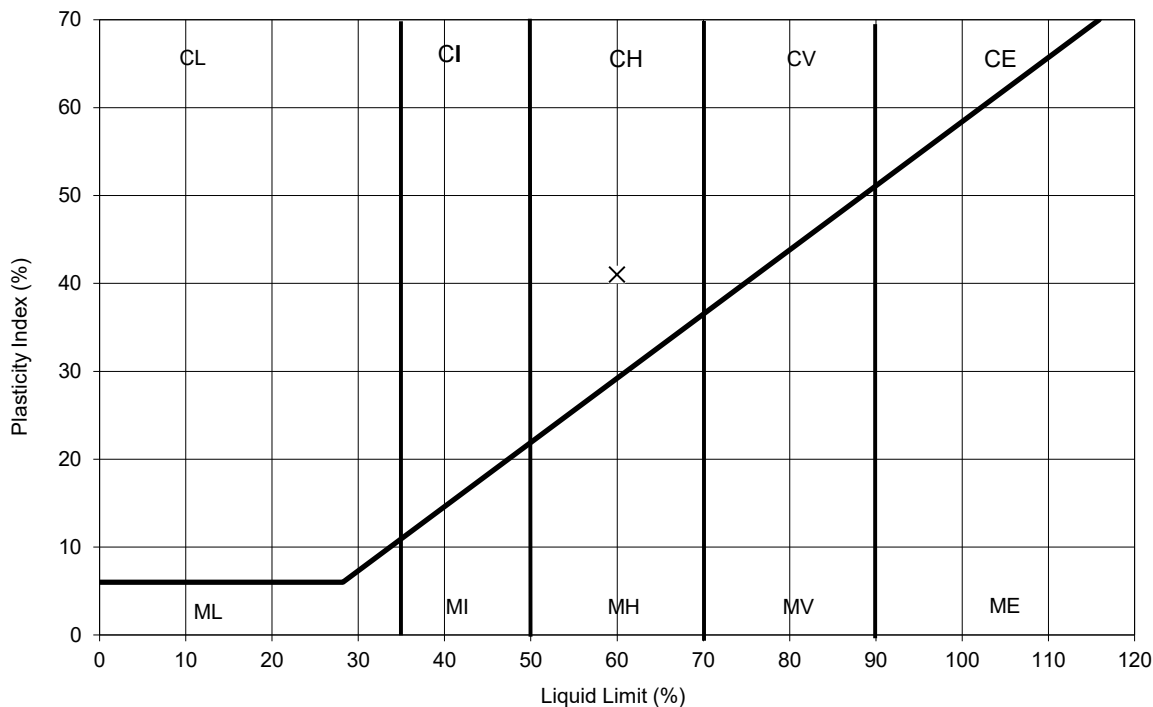
%

Preparation Method

Tested in natural condition

Remarks

PLASTICITY INDEX



TEST METHODS:

BS EN ISO 17892 Part 1: 2014 + A1:2022 Water Content

BS EN ISO 17892 Part 12: 2018 +A2:2022 Liquid and plastic limit

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Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

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Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Checked and Approved

Initials: J.P

Date: 22/07/2025

MSF-5 R2

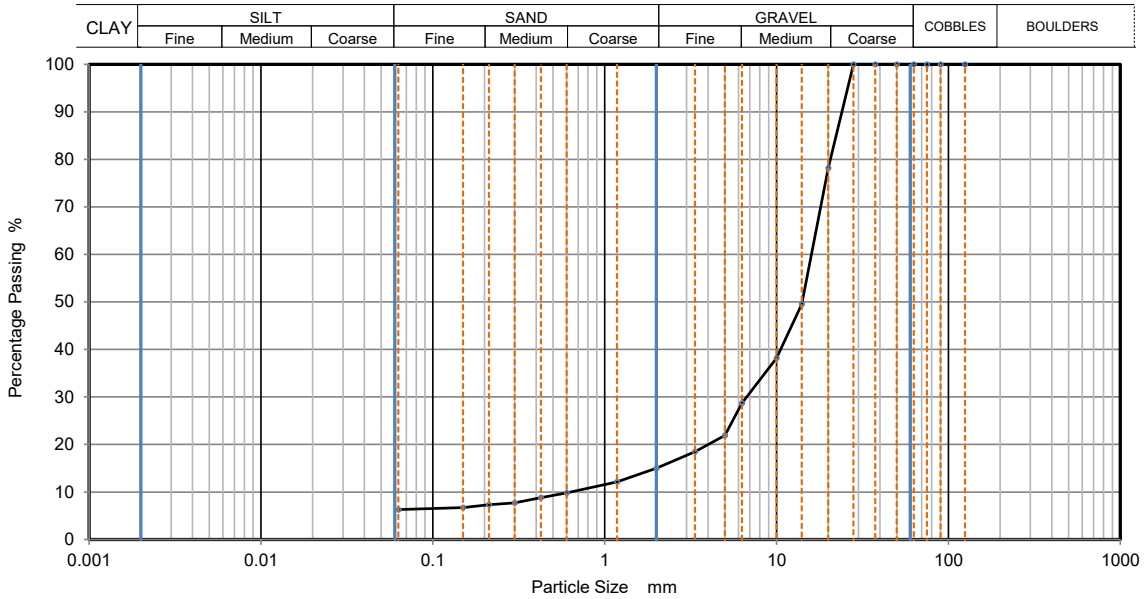
		Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results Tested in accordance with BS1377 : Part 3 : 2018, Clause 7.6 & Clause 12							
Job No. 37524		Project Name West Street						Programme	
								Samples received	01/07/2025
								Schedule received	23/06/2025
Project No. P25.205		Client Impact Geotechnical						Project started	02/07/2025
								Testing Started	22/07/2025
Hole No.	Sample				Soil description	Dry Mass passing 2mm %	SO4 Content mg/l	pH	Remarks
	Ref	Top m	Base m	Type					
WS1	-	2.50	-	D	Pinkish brown and reddish brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)	25	270	8.0	
WS2	-	2.50	-	D	Brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)	20	410	7.8	
WS2	-	3.50	-	D	Reddish brown and bluish grey mottled silty CLAY	100	310	7.9	
WS4	-	2.00	-	D	Brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)	18	360	7.9	
WS4	-	3.50	-	D	Bluish grey slightly mottled reddish brown silty CLAY	100	320	7.9	
WS4	-	5.00	-	D	Reddish brown slightly mottled bluish grey silty CLAY	100	280	7.9	
		Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: James@k4soils.com <small>These results only apply to the items tested</small> <small>NOTE: The report shall not be reproduced except in full without authority of the laboratory</small>							Checked and Approved Initials J.P
		2519							Date: 22/07/2025 MSF-5-R29
		Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)							



PARTICLE SIZE DISTRIBUTION

Job Ref		37524	
		Borehole/Pit No.	
Site Name		West Street	
Sample No.		-	
Project No.		P25.205	Client
Impact Geotechnical		Depth Top	
2.00		m	
Soil Description		Depth Base	
		-	
		m	
		Sample Type	
Brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)		D	
Samples received		01/07/2025	
Schedules received		23/06/2025	
Test Method		BS EN ISO 17892 Part 4: 2016	
Project started		02/07/2025	
Date tested		21/07/2025	

These results only apply to the items tested



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	78		
14	50		
10	38		
6.3	29		
5	22		
3.35	19		
2	15		
1.18	12		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	7		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	85
Sand	9
Fines <0.063mm	6

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	25
Curvature Coefficient	4.5

Remarks
Preparation and testing in accordance with ISO17892 Part 4 unless noted below

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K4 Soils Laboratory

Unit 8, Olds Close, Watford, Herts, WD18 9RU

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Checked and Approved

Initials: J.P

Date: 22/07/2025

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

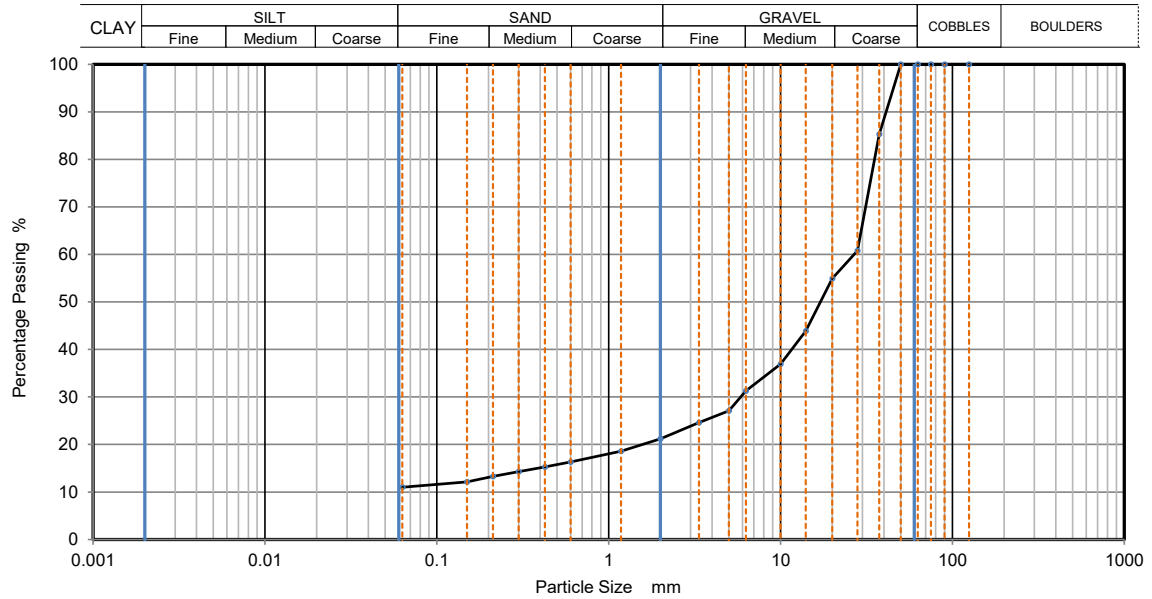
MSF-5-R3



PARTICLE SIZE DISTRIBUTION

	PARTICLE SIZE DISTRIBUTION			Job Ref	37524	
				Borehole/Pit No.	WS1	
Site Name	West Street			Sample No.	-	
Project No.	P25.205	Client	Impact Geotechnical	Depth Top	3.00	m
Soil Description	Pink silty clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)			Depth Base	-	m
				Sample Type	D	
				Samples received	01/07/2025	
				Schedules received	23/06/2025	
Test Method	BS EN ISO 17892 Part 4: 2016			Project started	02/07/2025	
These results only apply to the items tested				Date tested	21/07/2025	

These results only apply to the items tested



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	85		
28	61		
20	55		
14	44		
10	37		
6.3	31		
5	27		
3.35	25		
2	21		
1.18	19		
0.6	16		
0.425	15		
0.3	14		
0.212	13		
0.15	12		
0.063	11		

Sample Proportions	% dry mass
Very coarse	0
Gravel	79
Sand	10
Fines <0.063mm	11

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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Initials: J.P

Date: 22/07/2025

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R3

	PARTICLE SIZE DISTRIBUTION			Job Ref	37524
				Borehole/Pit No.	WS2
Site Name	West Street			Sample No.	-
Project No.	P25.205	Client	Impact Geotechnical	Depth Top	2.00 m
Soil Description	Brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)			Depth Base	- m
				Sample Type	D
				Samples received	01/07/2025
				Schedules received	23/06/2025
Test Method	BS EN ISO 17892 Part 4: 2016			Project started	02/07/2025
				Date tested	21/07/2025

These results only apply to the items tested

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

Percentage Passing %

Particle Size mm

Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	90		
20	74		
14	55		
10	44		
6.3	33		
5	29		
3.35	24		
2	19		
1.18	15		
0.6	11		
0.425	10		
0.3	8		
0.212	7		
0.15	7		
0.063	5		

Sample Proportions		% dry mass
Very coarse		0
Gravel		81
Sand		14
Fines <0.063mm		5

Grading Analysis		
D100	mm	
D60	mm	15.4
D30	mm	5.37
D10	mm	0.468
Uniformity Coefficient		33
Curvature Coefficient		4

Remarks

Preparation and testing in accordance with ISO17892 Part 4 unless noted below

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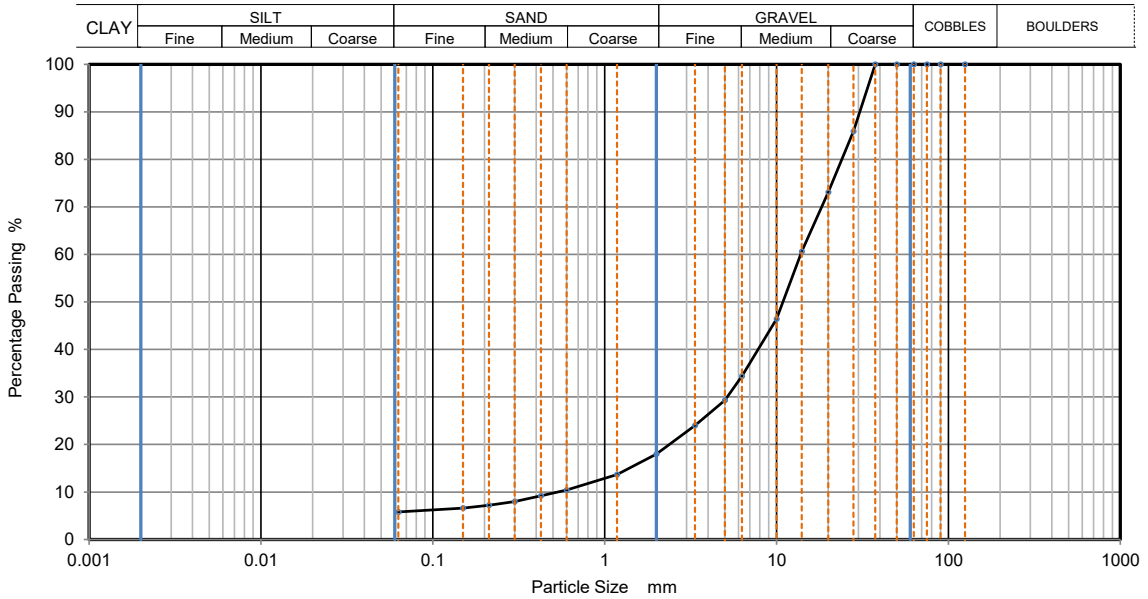
	K4 Soils Laboratory		Checked and Approved Initials: J.P Date: 22/07/2025
	Unit 8, Olds Close, Watford, Herts, WD18 9RU		
	Email: james@k4soils.com		
	Tel: 01923 711288		
2519	Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)		MSF-5-R3



PARTICLE SIZE DISTRIBUTION

	PARTICLE SIZE DISTRIBUTION			Job Ref	37524	
				Borehole/Pit No.	WS4	
Site Name	West Street			Sample No.	-	
Project No.	P25.205	Client	Impact Geotechnical	Depth Top	2.00	m
Soil Description	Brown clayey sandy GRAVEL (gravel is fmc and sub-angular to sub-rounded)			Depth Base	-	m
				Sample Type	D	
				Samples received	01/07/2025	
				Schedules received	23/06/2025	
Test Method	BS EN ISO 17892 Part 4: 2016			Project started	02/07/2025	
These results only apply to the items tested				Date tested	21/07/2025	

These results only apply to the items tested



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	86		
20	73		
14	61		
10	46		
6.3	34		
5	29		
3.35	24		
2	18		
1.18	14		
0.6	10		
0.425	9		
0.3	8		
0.212	7		
0.15	7		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	82
Sand	12
Fines <0.063mm	6

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	25
Curvature Coefficient	3.6

Remarks

Preparation and testing in accordance with ISO17892 Part 4 unless noted below

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K4 Soils Laboratory

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Email: james@k4soils.com

Tel: 01923 711288

Checked and Approved

Initials: J.P

Date: 22/07/2025

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R3



Summary of Water Content, Liquid Limit (4 point) and Plastic Limit Results

Job No.	Project Name	Programme	
37524	West Street	Samples received	01/07/2025
		Schedule received	23/06/2025
Project No.	Client	Project started	02/07/2025
P25.205	Impact Geotechnical	Testing Started	17/07/2025

[illegible]

80g/300 cone used unless otherwise stated.



Test Methods: BS EN ISO 17892
Part 1: 2014+A1:2022 Water content
Part 12: 2018+A2:2022 Liquid & plastic limit

These results only apply to the items tested
NOTE: The report shall not be reproduced except in full
without authority of the laboratory

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

**Checked and
Approved**

Initials J.P

Date: 22/07/2025

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)



ANALYTICAL TEST REPORT

Report Number 25-06337, issue number 2

Contract name: West St Havant

Client reference: Not Supplied

Clients name: Impact Geotechnical

Clients address: Waterloooville
1 Glasspool
Denmead

Hampshire PO7 6EA

Samples received: 26/06/2025

Analysis started: 26/06/2025

Analysis completed: 15/07/2025

Report issued: 15/07/2025
2. Replaces Analytical Report number 25-06337; issue no.1

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
I/S	Insufficient sample to carry out test
U/S	Sample not suitable for testing
NAD	No Asbestos Detected

Approved by:

Georgia Hunter
Senior Reporting Administrator

Re-Issue Summary

Client: Impact Geotechnical
Address: 1 Glasspool, Denmead, Waterlooville, Hampshire, PO7
6EA

Date: 15-Jul-25

Report No.: 25-06337

Issue: 2

This report replaces 25-06337, issue: 1, issued: 07 July 2025

Reason for Change

additional testing

A - Additional Work added

D - Work Deleted

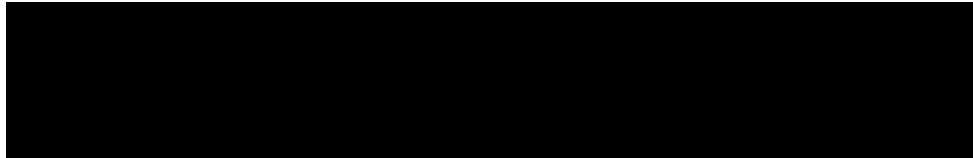
E - Result Edited*

R - Work Repeated*

*If a result changed, please refer to the previous report for the old result. The new result will be shown in this report.

Re-issued by: Georgia Hunter
Senior Reporting Administrator

Approved by: Georgia Hunter
Senior Reporting Administrator



SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
55925	TP1	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	16.0
55926	WS1	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	18.9
55927	WS1	0.60	Brown Sandy Loam with Gravel.	-	-	15.5
55928	WS2	0.30	Brown Sandy Loam with Gravel and Vegetation.	-	-	8.7
55929	WS3	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	8.5
55930	WS3	2.00	Brown Clay with Gravel.	-	-	15.6
55931	WS4	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	12.9
55932	WS4	1.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	10.7
55933	TP1	0.80	-	-	-	-
55934	WS1	1.30	-	-	-	-
55935	WS2	0.70	-	-	-	-
55936	WS2	1.30	-	-	-	-
55938	WS3	1.30	-	-	-	-
55939	WS4	0.70	-	-	-	-

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

- a Sampling date not provided
- b Sampling time not provided (waters only)
- c Sample not received in appropriate containers
- d Storage Temperature
- e Headspace present in sample container
- f Sample exceeded sampling to receipt
- g Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
55925	TP1	0.20	N	
55926	WS1	0.20	Y	Cyanides in Soils (f), BTEX in Soils (f), VPH in Soil (f)
55927	WS1	0.60	Y	Cyanides in Soils (f), VPH in Soil (f)
55928	WS2	0.30	Y	Cyanides in Soils (f), VPH in Soil (f)
55929	WS3	0.20	Y	Cyanides in Soils (f), BTEX in Soils (f), VPH in Soil (f)
55930	WS3	2.00	N	
55931	WS4	0.20	Y	Cyanides in Soils (f), VPH in Soil (f)
55932	WS4	1.20	Y	Cyanides in Soils (f), VPH in Soil (f)

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	1	1	1	1
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
Asbestos									
Asbestos Identification	SUBCO N	SU	0	-	NAD	NAD	Chrysotile, Amosite	NAD	NAD
Metals									
Water Soluble Sulphate	CE061	M	20	mg/kg	n/t	3200	n/t	n/t	238
Arsenic	CE264	U	1.8	mg/kg	29.0	21.5	9.5	9.7	11.3
Cadmium	CE264	M	1.6	mg/kg	1.9	3.9	< 1.6	< 1.6	< 1.6
Chromium	CE264	U	2	mg/kg	28.5	46.2	21.8	20.3	17.9
Copper	CE264	M	1.6	mg/kg	142	157	81.1	70.9	64.0
Lead	CE264	U	2.3	mg/kg	2180	1770	603	890	646
Mercury	CE264	U	0.7	mg/kg	8.0	2.4	1.1	< 0.7	1.7
Nickel	CE264	M	2.1	mg/kg	35.7	36.6	18.2	17.0	18.0
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	591	977	476	314	434
Colourimetric									
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	n/t	< 0.040	n/t	n/t	< 0.040
Total Monohydric Phenols	CE078	N	0.5	mg/kg	n/t	< 0.50	n/t	n/t	< 0.50
Total Cyanide	CE077	N	1	mg/kg	1.8	f 1.6	f < 1.0	f < 1.0	f < 1.0
Combustion									
Moisture Content	CE001	N	0.1	%	16.0	18.9	15.5	8.7	8.5
Soil Organic Matter	CE192	N	0.1	%	18.3	14.2	9.40	4.93	7.16
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	0.398	0.198	0.112	0.421	0.319
Acenaphthylene	CE087	M	0.015	mg/kg	0.117	0.189	0.105	0.570	0.241
Acenaphthene	CE087	M	0.013	mg/kg	0.532	0.100	0.023	0.042	0.039
Fluorene	CE087	U	0.013	mg/kg	0.331	0.176	0.062	0.136	0.211
Phenanthrene	CE087	M	0.014	mg/kg	5.44	3.36	1.70	4.46	4.14
Anthracene	CE087	U	0.017	mg/kg	1.17	0.595	0.238	0.487	0.399
Fluoranthene	CE087	M	0.017	mg/kg	8.83	6.49	3.78	12.8	6.45
Pyrene	CE087	M	0.016	mg/kg	6.96	5.24	2.96	10.5	4.88
Benzo(a)anthracene	CE087	U	0.012	mg/kg	7.04	3.13	1.68	4.69	2.26
Chrysene	CE087	M	0.028	mg/kg	6.20	3.05	1.73	5.68	2.80

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	1	1	1	1
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	11.6	4.06	2.38	8.59	3.68
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	4.94	1.71	0.998	3.09	1.49
Benzo(a)pyrene	CE087	U	0.019	mg/kg	11.8	3.43	1.88	6.49	2.90
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	10.9	2.81	1.42	5.82	2.49
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	2.21	0.580	0.331	1.17	0.505
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	7.49	2.09	1.13	4.65	1.93
Coronene	CE087	N	0.02	mg/kg	n/t	0.435	n/t	n/t	0.352
Total PAH(16)	CE087	N	0.28	mg/kg	86.0	37.2	20.5	69.6	34.7
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	37.6	n/t	n/t	35.1
BTEX									
Benzene	CE267	U	0.001	mg/kg	n/t	f < 0.001	n/t	n/t	f < 0.001
Toluene	CE267	U	0.001	mg/kg	n/t	f < 0.001	n/t	n/t	f < 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	f < 0.001	n/t	n/t	f < 0.001
MTBE	CE267	N	0.002	mg/kg	n/t	f < 0.002	n/t	n/t	f < 0.002
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	f < 0.002	n/t	n/t	f < 0.002
oXylenes	CE267	U	0.002	mg/kg	n/t	f < 0.002	n/t	n/t	f < 0.002
Total Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	f < 0.10	n/t	n/t	f < 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	f < 0.10	n/t	n/t	f < 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	f < 0.10	n/t	n/t	f < 0.10
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	< 1.0	n/t	n/t	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	0.6	n/t	n/t	< 0.5
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	1.3	n/t	n/t	1.9
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	< 4.0	n/t	n/t	< 4.0
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	1.4	n/t	n/t	1.0
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	f < 0.010	n/t	n/t	f < 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	f < 0.010	n/t	n/t	f < 0.010
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	f < 0.010	n/t	n/t	f < 0.010
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	3.2	n/t	n/t	2.0
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	9.6	n/t	n/t	4.8
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	33.9	n/t	n/t	8.2

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	1	1	1	1
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	117	n/t	n/t	28.9
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	35.9	n/t	n/t	9.4
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	< 0.10	n/t	f < 0.10	f < 0.10	n/t
>C10-C25 Soil (EH_1D_Total)	CE033	M	12	mg/kg	110	n/t	87.1	242	n/t
>C25-C40 Soil (EH_1D_Total)	CE033	M	16	mg/kg	302	n/t	156	335	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	n/t	7.3	n/t	n/t	7.6

SOILS

Lab Number					55930	55931	55932
Client Reference					1	1	1
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
Asbestos							
Asbestos Identification	SUBCO N	SU	0	-	n/t	NAD	NAD
Metals							
Water Soluble Sulphate	CE061	M	20	mg/kg	n/t	n/t	n/t
Arsenic	CE264	U	1.8	mg/kg	5.8	34.1	11.3
Cadmium	CE264	M	1.6	mg/kg	< 1.6	3.5	< 1.6
Chromium	CE264	U	2	mg/kg	14.2	34.2	25.4
Copper	CE264	M	1.6	mg/kg	14.8	174	63.3
Lead	CE264	U	2.3	mg/kg	86.9	1680	1940
Mercury	CE264	U	0.7	mg/kg	< 0.7	1.3	< 0.7
Nickel	CE264	M	2.1	mg/kg	14.3	37.0	21.6
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	60.3	1990	457
Colourimetric							
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	n/t	n/t	n/t
Total Monohydric Phenols	CE078	N	0.5	mg/kg	n/t	n/t	n/t
Total Cyanide	CE077	N	1	mg/kg	< 1.0	f 2.4	f < 1.0
Combustion							
Moisture Content	CE001	N	0.1	%	15.6	12.9	10.7
Soil Organic Matter	CE192	N	0.1	%	0.48	23.1	3.98
Polyaromatic hydrocarbons							
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	0.312	0.017
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	0.159	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	0.110	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	0.120	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	< 0.014	2.47	0.179
Anthracene	CE087	U	0.017	mg/kg	< 0.017	0.520	0.039
Fluoranthene	CE087	M	0.017	mg/kg	< 0.017	5.97	0.471
Pyrene	CE087	M	0.016	mg/kg	< 0.016	5.01	0.365
Benzo(a)anthracene	CE087	U	0.012	mg/kg	< 0.012	3.42	0.248
Chrysene	CE087	M	0.028	mg/kg	< 0.028	3.30	0.212

SOILS

Lab Number					55930	55931	55932
Client Reference					1	1	1
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	5.06	0.293
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	1.95	0.114
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	4.51	0.225
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	3.69	0.191
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	0.799	0.035
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	2.73	0.149
Coronene	CE087	N	0.02	mg/kg	n/t	n/t	n/t
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	40.1	2.54
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	n/t	n/t
BTEX							
Benzene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	n/t	n/t	n/t
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	n/t	n/t	n/t
Total Petroleum Hydrocarbons							
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	n/t	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t

SOILS

Lab Number					55930	55931	55932
Client Reference					1	1	1
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	n/t	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	< 0.10	f < 0.10	f < 0.10
>C10-C25 Soil (EH_1D_Total)	CE033	M	12	mg/kg	< 12.0	120	18.1
>C25-C40 Soil (EH_1D_Total)	CE033	M	16	mg/kg	< 16.0	238	58.5
Wet Chem							
pH	CE004	M	0.1	pH units	n/t	n/t	n/t



LEACHATE

Lab Number					55926	55927	55928	55929	55931
Client Reference					1	1	1	1	1
Sample ID					WS1	WS1	WS2	WS3	WS4
Depth (m)					0.20	0.60	0.30	0.20	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
Metals									
Lead Leachate	CE265	U	0.6	µg/l	< 0.60	< 0.60	< 0.60	1.26	11.0



LEACHATE

Lab Number					55932
Client Reference					1
Sample ID					WS4
Depth (m)					1.20
Sampling Date					23/06/2025
Test	Method	Accred	LoD	Units	
Metals					
Lead Leachate	CE265	U	0.6	µg/l	< 0.60

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
CE250	GCXGC in Soil	DCM Extraction and GCxGC-FID	As submitted sample
SUBCON	Asbestos Soil	HSG248	Air Dried Sample
CE033	EPH in Soil	Acetone:Hexane Extraction and GCFID	As submitted sample
CE061	W. Sol Metals	ICPOES	Air dried sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE267	BTEX in Soils	Analysis by HSGCFID	As submitted sample
CE265	Dissolved metals by ICP in Leachate	ICPMS	As submitted sample
CE263	ChromiumVI by Discrete Analyser in Soil	Gallery	Air dried sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE078	Phenols in Road Cores	Continuous Flow Analyser	As submitted sample
CE077	Cyanides in Soils	Continuous Flow Analyser	As submitted sample

REPORT INFORMATION

Report No.:25-06337, issue number 2

Key

U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix. Result is unaccredited.
*	ISO17025 accreditation not applicable for sample matrix. Result is unaccredited.
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry



ANALYTICAL TEST REPORT

Report Number 25-06337, issue number 1

Contract name: West St Havant

Client reference: Not Supplied

Clients name: Impact Geotechnical

Clients address: Waterloooville
1 Glasspool
Denmead

Hampshire PO7 6EA

Samples received: 26/06/2025

Analysis started: 26/06/2025

Analysis completed: 07/07/2025

Report issued: 07/07/2025

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
I/S	Insufficient sample to carry out test
U/S	Sample not suitable for testing
NAD	No Asbestos Detected



Approved by: Sam Rogerson
Receipt and Reporting Manager

SAMPLE INFORMATION

MCERTS (Soils):
Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample ID	Depth (m)	Sample description	Material removed	% Removed	% Moisture
55925	TP1	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	16.0
55926	WS1	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	18.9
55927	WS1	0.60	Brown Sandy Loam with Gravel.	-	-	15.5
55928	WS2	0.30	Brown Sandy Loam with Gravel and Vegetation.	-	-	8.7
55929	WS3	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	8.5
55930	WS3	2.00	Brown Clay with Gravel.	-	-	15.6
55931	WS4	0.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	12.9
55932	WS4	1.20	Brown Sandy Loam with Gravel and Vegetation.	-	-	10.7
55933	TP1	0.80	-	-	-	-
55934	WS1	1.30	-	-	-	-
55935	WS2	0.70	-	-	-	-
55936	WS2	1.30	-	-	-	-
55938	WS3	1.30	-	-	-	-
55939	WS4	0.70	-	-	-	-

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

- a Sampling date not provided
- b Sampling time not provided (waters only)
- c Sample not received in appropriate containers
- d Storage Temperature
- e Headspace present in sample container
- f Sample exceeded sampling to receipt
- g Sample exceeded holding time(s)

Lab ref	Sample ID	Depth (m)	Deviating	Tests (Reason for deviation)
55925	TP1	0.20	N	
55926	WS1	0.20	N	
55927	WS1	0.60	N	
55928	WS2	0.30	N	
55929	WS3	0.20	N	
55930	WS3	2.00	N	
55931	WS4	0.20	N	
55932	WS4	1.20	N	

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	2	3	4	5
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
Asbestos									
Asbestos Identification	SUBCO N	SU	0	-	NAD	NAD	Chrysotile, Amosite	NAD	NAD
Metals									
Water Soluble Sulphate	CE061	M	20	mg/kg	n/t	3200	n/t	n/t	238
Arsenic	CE264	U	1.8	mg/kg	29.0	21.5	9.5	9.7	11.3
Cadmium	CE264	M	1.6	mg/kg	1.9	3.9	< 1.6	< 1.6	< 1.6
Chromium	CE264	U	2	mg/kg	28.5	46.2	21.8	20.3	17.9
Copper	CE264	M	1.6	mg/kg	142	157	81.1	70.9	64.0
Lead	CE264	U	2.3	mg/kg	2180	1770	603	890	646
Mercury	CE264	U	0.7	mg/kg	8.0	2.4	1.1	< 0.7	1.7
Nickel	CE264	M	2.1	mg/kg	35.7	36.6	18.2	17.0	18.0
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	591	977	476	314	434
Colourimetric									
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	n/t	< 0.040	n/t	n/t	< 0.040
Total Monohydric Phenols	CE078	N	0.5	mg/kg	n/t	< 0.50	n/t	n/t	< 0.50
Total Cyanide	CE077	N	1	mg/kg	1.8	1.6	< 1.0	< 1.0	< 1.0
Combustion									
Moisture Content	CE001	N	0.1	%	16.0	18.9	15.5	8.7	8.5
Soil Organic Matter	CE192	N	0.1	%	18.3	14.2	9.40	4.93	7.16
Polyaromatic hydrocarbons									
Naphthalene	CE087	M	0.016	mg/kg	0.398	0.198	0.112	0.421	0.319
Acenaphthylene	CE087	M	0.015	mg/kg	0.117	0.189	0.105	0.570	0.241
Acenaphthene	CE087	M	0.013	mg/kg	0.532	0.100	0.023	0.042	0.039
Fluorene	CE087	U	0.013	mg/kg	0.331	0.176	0.062	0.136	0.211
Phenanthrene	CE087	M	0.014	mg/kg	5.44	3.36	1.70	4.46	4.14
Anthracene	CE087	U	0.017	mg/kg	1.17	0.595	0.238	0.487	0.399
Fluoranthene	CE087	M	0.017	mg/kg	8.83	6.49	3.78	12.8	6.45
Pyrene	CE087	M	0.016	mg/kg	6.96	5.24	2.96	10.5	4.88
Benzo(a)anthracene	CE087	U	0.012	mg/kg	7.04	3.13	1.68	4.69	2.26
Chrysene	CE087	M	0.028	mg/kg	6.20	3.05	1.73	5.68	2.80

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	2	3	4	5
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	11.6	4.06	2.38	8.59	3.68
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	4.94	1.71	0.998	3.09	1.49
Benzo(a)pyrene	CE087	U	0.019	mg/kg	11.8	3.43	1.88	6.49	2.90
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	10.9	2.81	1.42	5.82	2.49
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	2.21	0.580	0.331	1.17	0.505
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	7.49	2.09	1.13	4.65	1.93
Coronene	CE087	N	0.02	mg/kg	n/t	0.435	n/t	n/t	0.352
Total PAH(16)	CE087	N	0.28	mg/kg	86.0	37.2	20.5	69.6	34.7
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	37.6	n/t	n/t	35.1
BTEX									
Benzene	CE267	U	0.001	mg/kg	n/t	< 0.001	n/t	n/t	< 0.001
Toluene	CE267	U	0.001	mg/kg	n/t	< 0.001	n/t	n/t	< 0.001
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	< 0.001	n/t	n/t	< 0.001
MTBE	CE267	N	0.002	mg/kg	n/t	< 0.002	n/t	n/t	< 0.002
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	< 0.002	n/t	n/t	< 0.002
oXylenes	CE267	U	0.002	mg/kg	n/t	< 0.002	n/t	n/t	< 0.002
Total Petroleum Hydrocarbons									
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	< 0.10	n/t	n/t	< 0.10
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	< 0.10	n/t	n/t	< 0.10
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	< 0.10	n/t	n/t	< 0.10
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	< 1.0	n/t	n/t	< 1.0
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	0.6	n/t	n/t	< 0.5
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	1.3	n/t	n/t	1.9
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	< 4.0	n/t	n/t	< 4.0
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	1.4	n/t	n/t	1.0
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	< 0.010	n/t	n/t	< 0.010
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	< 0.010	n/t	n/t	< 0.010
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	< 0.010	n/t	n/t	< 0.010
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	3.2	n/t	n/t	2.0
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	9.6	n/t	n/t	4.8
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	33.9	n/t	n/t	8.2

SOILS

Lab Number					55925	55926	55927	55928	55929
Client Reference					1	2	3	4	5
Sample ID					TP1	WS1	WS1	WS2	WS3
Depth (m)					0.20	0.20	0.60	0.30	0.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units					
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	117	n/t	n/t	28.9
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	35.9	n/t	n/t	9.4
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	< 0.10	n/t	< 0.10	< 0.10	n/t
>C10-C25 Soil (EH_1D_Total)	CE033	M	12	mg/kg	110	n/t	87.1	242	n/t
>C25-C40 Soil (EH_1D_Total)	CE033	M	16	mg/kg	302	n/t	156	335	n/t
Wet Chem									
pH	CE004	M	0.1	pH units	n/t	7.3	n/t	n/t	7.6

SOILS

Lab Number					55930	55931	55932
Client Reference					6	7	8
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
Asbestos							
Asbestos Identification	SUBCO N	SU	0	-	n/t	NAD	NAD
Metals							
Water Soluble Sulphate	CE061	M	20	mg/kg	n/t	n/t	n/t
Arsenic	CE264	U	1.8	mg/kg	5.8	34.1	11.3
Cadmium	CE264	M	1.6	mg/kg	< 1.6	3.5	< 1.6
Chromium	CE264	U	2	mg/kg	14.2	34.2	25.4
Copper	CE264	M	1.6	mg/kg	14.8	174	63.3
Lead	CE264	U	2.3	mg/kg	86.9	1680	1940
Mercury	CE264	U	0.7	mg/kg	< 0.7	1.3	< 0.7
Nickel	CE264	M	2.1	mg/kg	14.3	37.0	21.6
Selenium	CE264	U	3	mg/kg	< 3.0	< 3.0	< 3.0
Zinc	CE264	M	4	mg/kg	60.3	1990	457
Colourimetric							
Water Soluble Chromium VI	CE263	N	0.04	mg/kg	n/t	n/t	n/t
Total Monohydric Phenols	CE078	N	0.5	mg/kg	n/t	n/t	n/t
Total Cyanide	CE077	N	1	mg/kg	< 1.0	2.4	< 1.0
Combustion							
Moisture Content	CE001	N	0.1	%	15.6	12.9	10.7
Soil Organic Matter	CE192	N	0.1	%	0.48	23.1	3.98
Polyaromatic hydrocarbons							
Naphthalene	CE087	M	0.016	mg/kg	< 0.016	0.312	0.017
Acenaphthylene	CE087	M	0.015	mg/kg	< 0.015	0.159	< 0.015
Acenaphthene	CE087	M	0.013	mg/kg	< 0.013	0.110	< 0.013
Fluorene	CE087	U	0.013	mg/kg	< 0.013	0.120	< 0.013
Phenanthrene	CE087	M	0.014	mg/kg	< 0.014	2.47	0.179
Anthracene	CE087	U	0.017	mg/kg	< 0.017	0.520	0.039
Fluoranthene	CE087	M	0.017	mg/kg	< 0.017	5.97	0.471
Pyrene	CE087	M	0.016	mg/kg	< 0.016	5.01	0.365
Benzo(a)anthracene	CE087	U	0.012	mg/kg	< 0.012	3.42	0.248
Chrysene	CE087	M	0.028	mg/kg	< 0.028	3.30	0.212

SOILS

Lab Number					55930	55931	55932
Client Reference					6	7	8
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
Benzo(b)fluoranthene	CE087	M	0.02	mg/kg	< 0.020	5.06	0.293
Benzo(k)fluoranthene	CE087	M	0.025	mg/kg	< 0.025	1.95	0.114
Benzo(a)pyrene	CE087	U	0.019	mg/kg	< 0.019	4.51	0.225
Indeno(1,2,3-cd)pyrene	CE087	M	0.019	mg/kg	< 0.019	3.69	0.191
Dibenzo(a,h)anthracene	CE087	M	0.017	mg/kg	< 0.017	0.799	0.035
Benzo(g,h,i)perylene	CE087	M	0.019	mg/kg	< 0.019	2.73	0.149
Coronene	CE087	N	0.02	mg/kg	n/t	n/t	n/t
Total PAH(16)	CE087	N	0.28	mg/kg	< 0.280	40.1	2.54
Total PAH(17)	CE087	N	0.3	mg/kg	n/t	n/t	n/t
BTEX							
Benzene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
Toluene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
Ethylbenzene	CE267	U	0.001	mg/kg	n/t	n/t	n/t
MTBE	CE267	N	0.002	mg/kg	n/t	n/t	n/t
m,p-Xylene	CE267	U	0.002	mg/kg	n/t	n/t	n/t
oXylenes	CE267	U	0.002	mg/kg	n/t	n/t	n/t
Total Petroleum Hydrocarbons							
>C5-C6 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C6-C8 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C8-C10 Aliphatic (HS_1D_AL)	CE267	N	0.1	mg/kg	n/t	n/t	n/t
>C10-C12 Aliphatic (EH_2D_AL)	CE250	N	1	mg/kg	n/t	n/t	n/t
>C12-C16 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t
>C16-C21 Aliphatic (EH_2D_AL)	CE250	N	0.7	mg/kg	n/t	n/t	n/t
>C21-C35 Aliphatic (EH_2D_AL)	CE250	N	4	mg/kg	n/t	n/t	n/t
>C35-C44 Aliphatic (EH_2D_AL)	CE250	N	0.5	mg/kg	n/t	n/t	n/t
>C5-C7 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C7-C8 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C8-C10 Aromatic (HS_1D_AR)	CE267	N	0.01	mg/kg	n/t	n/t	n/t
>C10-C12 Aromatic (EH_2D_AR)	CE250	N	0.6	mg/kg	n/t	n/t	n/t
>C12-C16 Aromatic (EH_2D_AR)	CE250	N	1	mg/kg	n/t	n/t	n/t
>C16-C21 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t

SOILS

Lab Number					55930	55931	55932
Client Reference					6	7	8
Sample ID					WS3	WS4	WS4
Depth (m)					2.00	0.20	1.20
Sampling Date					23/06/2025	23/06/2025	23/06/2025
Test	Method	Accred	LoD	Units			
>C21-C35 Aromatic (EH_2D_AR)	CE250	N	4.5	mg/kg	n/t	n/t	n/t
>C35-C44 Aromatic (EH_2D_AR)	CE250	N	2	mg/kg	n/t	n/t	n/t
>C5-C10 Total (HS_1D_Total)	CE267	N	0.1	mg/kg	< 0.10	< 0.10	< 0.10
>C10-C25 Soil (EH_1D_Total)	CE033	M	12	mg/kg	< 12.0	120	18.1
>C25-C40 Soil (EH_1D_Total)	CE033	M	16	mg/kg	< 16.0	238	58.5
Wet Chem							
pH	CE004	M	0.1	pH units	n/t	n/t	n/t

METHOD DETAILS

METHOD	TESTNAME	METHOD SUMMARY	ANALYSIS BASIS
CE267	VPH in Soil	HS-GCFID	As submitted sample
CE250	GCXGC in Soil	DCM Extraction and GCxGC-FID	As submitted sample
SUBCON	Asbestos Soil	HSG248	Air Dried Sample
CE033	EPH in Soil	Acetone:Hexane Extraction and GCFID	As submitted sample
CE061	W. Sol Metals	ICPOES	Air dried sample
CE264	Metals by ICP in Soil	ICPOES	Air dried sample
CE267	BTEX in Soils	Analysis by HSGCFID	As submitted sample
CE263	ChromiumVI by Discrete Analyser in Soil	Gallery	Air dried sample
CE087	PAH in Soil	DCM Extraction and GCMS	As submitted sample
CE078	Phenols in Road Cores	Continuous Flow Analyser	As submitted sample
CE077	Cyanides in Soils	Continuous Flow Analyser	As submitted sample

REPORT INFORMATION

Report No.:25-06337, issue number 1

Key

U	ISO17025 Accredited Result
M	ISO17025 and MCERTS Accredited Result
N	Do not currently hold accreditation
^	MCERTS accreditation not applicable for sample matrix. Result is unaccredited.
*	ISO17025 accreditation not applicable for sample matrix. Result is unaccredited.
S	Subcontracted
I/S	Insufficient Sample
U/S	Unsuitable sample
N/T	Not tested
<	Means "less than"
>	Means "greater than"

LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.

This report shall not be reproduced except in full, without prior written approval.

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

The results relate only to the sample received.

Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Moisture Content Calculated on a Wet Weight basis

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

Sampling was undertaken by Chemtech Environmental Limited and is outside the UKAS accreditation scope.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying

For soils and solids, analytical results are inclusive of stones, where applicable.

Sample Retention and Disposal

All soil samples will be retained for a period of 4 weeks from the point of receipt

All water samples will be retained for a period of 2 weeks from the point of Reporting

Charges may apply to extended sample storage

TPH Classification - HWOL Acronym System

HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
2D	GC-GC - Double coil gas chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry