



Main Investigation Report

at

**Samsons Gym, 237 Chamberlayne Road,
Eastleigh, Hampshire SO50 5JB**

for

Eastleigh Borough Council

**Reference: I9I92/MIR RevI02
November 2025**

Control Document

Project

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This is not a valid document for use in the design of the project unless it is titled Final in the document status box.

Current regulations and good practice were used in the preparation of this report. The recommendations given in this report must be reviewed by an appropriately qualified person at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.



Commission

This document comprises the Main Investigation Report (MIR) and incorporates the results, discussion, and conclusions to this intrusive works. General site data is recorded below:

Commission Record	
Client	Eastleigh Borough Council
Site Name	Samsons Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB
Grid Reference	SU 451 184
Soils Limited Quotation Ref	Q30459 dated 15 th September 2025
Clients Purchase Order	PO-000310410 dated 16 th September 2025

The record of revision to this document is presented below:

Record Of Revisions		
Revision	Date	Reason
Rev1.0	May 2021	Original
Rev101	July 2023	Update to Client name and plans
Rev102	November 2025	Additional site works and chemical lab testing

Note(s): The latest revised document supersedes all previous revisions of the MIR produced by Soils Limited.

Documents associated with this development that must be referred to are given below.

Record Of Associated Documents			
Reference	Type	Date	Creator
19192/PIR Rev1.1	Desk Study	May 2021	Soils Limited
ENC/231121/U3D6	Utility	November 2021	Encompass Surveys Ltd.
7694-08-200 P03	Existing Site Plan	26 th June 2023	FDG
7969-08-600 P03	Proposed Site Plan	26 th June 2023	FDG

Limitations and Disclaimers

The report was prepared solely for the brief described in our quotation and Section 1.1 of this report. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of our engagement.

We have exercised all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Conditions of Contract of Business and taking into account the resources devoted to us by agreement with the Client.

This report is a snapshot of the site and conditions taken only at the time of our investigation works and described in our reporting. The ground is a product of continuing natural and artificial processes, and has variation by depth and location that cannot be determined absolutely. While a ground investigation will aim to understand and mitigate, risk cannot be eliminated.

Current regulations and good practice were used in the preparation of this report. Consideration of any subsequent changes to regulations or practice that may have occurred following issue of this report is the responsibility of the user.

If the term “competent person” is used in this report or any Soils Limited document, it means an engineering geologist or civil engineer with a minimum of three years post graduate experience in the understanding and application of the appropriate codes of practice.

Unless the site investigation works have been designed and specified in accordance with EC7, this report is not a Ground Investigation Report as defined by Eurocode 7.

Any reference to ground level relates to the site level at the time of the investigation, unless otherwise stated. Ground elevations and coordinates are only provided when this forms part of our engagement.

A survey of the possible presence or absence of invasive species including Japanese Knotweed is outside the scope of this investigation.

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Section I Introduction

I.1 Objective of Investigation

The Client commissioned Soils Limited to undertake an intrusive ground investigation and to prepare a Main Investigation Report to supply the Client and their designers with information regarding ground conditions, to assist in preparing a foundation scheme for development that was appropriate to the settings present on the site.

The report was revised from the previously issued version 19121/MIR Rev101. The report included the additional site investigations conducted after the demolition of the existing building to cover wider areas which were not included in the previous investigation for any potential contaminations and ground conditions.

The investigation was to be made by means of in-situ testing and geotechnical laboratory testing undertaken on soil samples taken from the exploratory holes.

Soil samples were taken for chemical laboratory testing to enable recommendations for the safe redevelopment of the site and the protection of site workers, end-users and the public from any contamination identified as dictated by the Conceptual Site Model (CSM) in the Preliminary Investigation Report undertaken for the site by Soils Limited (Report ref: 19192/PIR Rev1.1, May 2021) and/or the Revised Conceptual Site Model presented in Appendix E.1.

I.2 Site Description

At the time of the investigation in October 2025, there was no structure onsite. The site was hard landscaped, comprising block paving and tarmacadam in poor condition. Weeds noted along cracks in the hardstanding.

However, from previous site walkover in 2021, where a large single storey building, comprising a gym and a food bank, covered the majority of the north of the site with a courtyard separating the gym from the food bank and parking space situated to the south of the site accessed from the east and the west of the site. A car park was located to the southwest corner of the site.

The site was relatively flat and slightly sloped down towards the south in the gradient of $<1^\circ$.

The wider surrounding areas were predominantly residential on all four sides and generally flat, slightly sloped down towards the south in the gradient of $<1^\circ$ with occasional mature trees lining nearby roads.

The site location plan is given in Figure 1.

An aerial photograph of the site and its close environs has been included in Figure 2.

1.3 Proposed Development

The proposal comprises the construction of three 2.5-storey terraced houses, alongside a three-storey apartment building comprising nine residential units. The development includes public open space, domestic gardens and provision for car parking spaces adjacent to the terraced row.

In compiling this report reliance was placed on drawings listed in the Commission Section and recommendations apply only to this scheme. Any changes require consultation with Soils Limited.

Development plans provided by the Client are presented in Appendix F.

1.4 Anticipated Geology

The 1:50,000 BGS Geology map showed the site to be situated on the London Clay Formation bedrock, with overlying superficial River Terrace Deposits.

1.4.1 Superficial – River Terrace Deposits

The rivers Test and Itchen have deposited extensive spreads of River Terrace Deposits in the Southampton area, representative of ancient floodplains. In total, eleven terraces have been recorded. The River Terrace Deposits consist predominantly of gravels made up of subangular to subrounded flints with a significant sand component locally with lenses of silt, clay or peat.

The five highest terraces have appreciable clay content. Poorly sorted, clayey and sandy silts and silty clays overlie the 1st, 3rd, 5th and 6th terraces and locally at above terrace gravels.

1.4.2 Bedrock – London Clay Formation

The London Clay Formation in the Hampshire region comprises silty and sandy clay, clayey and sandy silt, silty sand; sporadic claystones and thin beds of flint pebbles. The formation includes the Bognor Sand, Whitecliff Sand, Durley Sand, Portsmouth Sand and Nursling Sand Members. Crystals of gypsum (Selenite) are often found within the weathered part of the London Clay, and precautions against sulphate attack to concrete are sometimes required.

Section 2 Site Works

2.1 Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions and to aid the design of foundations for the proposed mixed residential and commercial development. The intended investigation, as outlined within the Soils Limited quotation (Q24219 dated 26th February 2021), was to comprise the following items:

- 1No. 15m deep cable percussive borehole
- 1No. 10m deep monitoring well
- 1Day Windowless sampler boreholes and dynamic probes
- 3No. dual purpose soil gas and groundwater monitoring wells
- 1No. machine excavated trial pit infiltration test
- Geotechnical laboratory testing
- Geoenvironmental laboratory testing

2.1.1 Actual Project Works

The actual project works were undertaken between 22nd and 24th March 2021 with subsequent laboratory testing and comprised:

- 1No. 15m deep cable percussive borehole
- 3No. windowless sampler boreholes and dynamic probe tests
- 1No. machine excavated trial pit infiltration test
- 4No. well installations
- Geotechnical laboratory testing
- Geoenvironmental laboratory testing

Three windowless sampler boreholes and one cable percussive borehole were backfilled with gravel and bentonite following the installation of monitoring wells. One machine excavate trial pit was backfilled with arising's upon completion and mounded over to allow for future settlement.

2.2 Additional Proposed Project Works

The proposed intrusive investigation was designed to provide information on the ground conditions and to aid the design of foundations for the proposed residential development. This additional site investigation conducted after the demolition of the existing building to cover wider areas which were not included in the previous investigation for any potential contaminations and ground conditions. The intended investigation, as outlined within the Soils Limited quotation (Q30459 dated 15th September 2025), was to comprise the following items:

- All exploratory holes were scanned with a Cable Avoidance Tool (CAT) and Genny prior to excavation
- 4No. (up to) 4m deep windowless sampler boreholes
- 4No. (up to) 6m deep dynamic probe DPSH

- Contamination laboratory testing

2.2.1 Additional Actual Project Works

The actual project works were undertaken on 7th October 2025 with subsequent laboratory testing and comprised:

- All exploratory holes were scanned with a Cable Avoidance Tool (CAT) and Genny prior to excavation
- 4No. 4m deep windowless sampler boreholes (WS101 to WS104)
- 4No. 6m deep dynamic probe DPSH (DP101 to DP104)
- Contamination laboratory testing

All windowless sampler boreholes were backfilled with gravel and arisings upon completion.

Following completion of site works, soil cores were logged and sub-sampled so that samples could be sent to the laboratory for both contamination and geotechnical testing.

All exploratory hole locations have been presented in Figure 3.

2.3 Ground Conditions

During the original investigation on 23rd March 2021, three windowless sampler boreholes (WS1, WS2 and WS4) were drilled, using an Archway Competitor type tracked windowless sampler drilling rig, to a depth of 4.00m below ground level (bgl) at locations selected by Soils Limited using a development plan provided by the client.

Standpipes were installed within three windowless sampler borehole locations (WS1, WS2 and WS4) to allow for continued monitoring of both groundwater and soils gas, where present.

Three dynamic probes, super heavy, (DP1, DP2 and DP4) were driven prior and adjacent to their corresponding windowless sampler borehole to depth a depth of 6.00m bgl. WS/DP3 was not carried out due to time constraints.

One trial pit (TPSA1) was machine excavated using a tracked mini digger to a depth of 1.60m bgl to allow for trial pit infiltration testing.

On 24th March 2021 a cable percussive borehole was drilled to a depth of 15.00m bgl using a Dando 4000 type drilling rig. Upon completion a 10.00m deep groundwater monitoring well was installed.

During this phase of the investigation conducted on 7th October 2025, four windowless sampler boreholes (WS101 to WS104) were drilled, using a Premier Compact 110 Series windowless sampler rig, to a depth of 4.00m below ground level (bgl) at locations selected by Soils Limited using a development plan provided by the Client and concentrating in the area of the former building.

Four super heavy dynamic probes, (DP101 to DP104) were driven prior and adjacent to their corresponding windowless sampler borehole to a depth of 6.00m bgl.

The maximum depths of trial holes have been included in Table 2.1.

Table 2.1 Final Depth of Trial Holes

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
TPSA1	1.60	WS/DPI01	4.00/6.00
WS/DPI(w)	4.00/6.00	WS/DPI02	4.00/6.00
WS/DP2(w)	4.00/6.00	WS/DPI03	4.00/6.00
WS/DP4(w)	4.00/6.00	WS/DPI04	4.00/6.00
BH1(w)	15.00		

Note(s): w - well installation. The depths given in this table are taken from the ground level adjacent to the exploratory hole at the time of investigation.

The soil conditions encountered were recorded and soil sampling commensurate with the purposes of the investigation was carried out. The depths given on the trial hole logs and quoted in this report were measured from ground level.

For more complete information about the soils encountered within the general area of the site reference should be made to the detailed records given within Appendix A, but for the purposes of discussion, the succession of conditions encountered in the trial holes in descending order can be summarised as:

Made Ground (MG)
River Terrace Deposits (RTD)
London Clay Formation (LC)

The ground conditions encountered in the trial holes are summarised in **Error! Reference source not found..**

Table 2.2 Ground Conditions

Strata	Depth Encountered (m bgl)		Typical Thickness (m)	Typical Description
	Top	Bottom		
MG	0.00	0.30–1.20	0.80	Soft to very stiff, dark brown, greyish brown, slightly gravelly slightly sandy cobbly CLAY, with flint, brick, concrete, chalk and clinker. Rare, rusted metal fragment.
RTD (c)	0.30–1.20	1.10–2.30	1.40	Firm to stiff, brown mottled greyish brown and orangish brown, slightly sandy slightly gravelly CLAY.
RTD (g)	1.10–2.30	4.00 ¹ –6.00 ^{1,3}	(4.70) Where Proven	Orangish/yellowish brown to brown mottled yellowish brown, slightly clayey very sandy GRAVEL.
LCF	4.00–6.00 ^{1,3}	>15.00 ¹	Not proven ²	Firm to stiff, greenish grey silty sandy CLAY.

Note(s): ¹ Final depth of exploratory hole. ² Base of strata not encountered. ³ Inferred by dynamic probing. The depths given in this table are taken from the ground level on-site at the time of investigation. c – cohesive soils; g – granular soils

The soils encountered from immediately below ground surface have been described in the following manner. Where the soil incorporated an organic content such as either decomposing leaf litter or roots, or has been identified as part of the in-situ weathering profile, it has been described as Topsoil both on the logs and within this report. Where man has clearly either placed the soil, or the composition altered, with say greater than an estimated 5% of a non-natural constituent, it has been referred to as Made Ground both on the log and within this report.

2.4 Ground Conditions Encountered in Exploratory Holes

The ground conditions encountered in exploratory holes have been described below in descending order. The engineering logs are presented in Appendix B.1.

2.4.1 Made Ground

Soils described as Made Ground were encountered in all trial holes from ground level to depths ranging between 0.30m (WS2 and WS104) and 1.20m bgl (WS101).

The Made Ground typically comprised soft to very stiff, dark brown, greyish brown, slightly gravelly slightly sandy cobbly CLAY. Sand is fine. Gravel angular to rounded, fine to coarse flint, brick, concrete, chalk and clinker. Occasional decomposing woody roots. Rare, rusted metal fragment.

The established depth of Made Ground found at each exploratory hole location has been included in Table 2.3.

Table 2.3 Established Depth of Made Ground

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
BH1	0.60	WS101	1.20
TPSA1	0.50	WS102	0.45
WS1	0.50	WS103	0.40
WS2	0.30	WS104	0.30
WS4	0.50		

Note(s): The depths given in this table are taken from the ground level adjacent to the exploratory hole at the time of investigation.

2.4.2 River Terrace Deposits

Soils described as River Terrace Deposits were encountered in all trial holes and were inferred in seven dynamic probes to be present from immediately underlying the base of the Made Ground and were present to depths ranging between 4.00m and 6.00m bgl.

The River Terrace Deposits typically comprised cohesive soils overlying granular soils.

The cohesive soils comprised firm to stiff, brown mottled greyish brown and orangish brown, slightly sandy slightly gravelly CLAY to between 1.10m and 2.30m bgl.

The underlying granular soils comprised orangish/yellowish brown to brown mottled yellowish brown, slightly clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint and chalk from the depth of 2.30m and inferred by dynamic probing up to 6.00m bgl.

The established depth of River Terrace Deposits found at each exploratory hole location has been included in Table 2.4.

Table 2.4 Established Depth of River Terrace Deposits

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
BH1	5.90	WS/DPI01	4.00 ¹ /4.80 ²
TPSA1	1.60 ¹	WS/DPI02	4.00 ¹ /6.00 ²
WS/DPI	4.00 ¹ /5.20 ²	WS/DPI03	4.00 ¹ /6.00 ²
WS/DP2	4.00 ¹ /4.60 ²	WS/DPI04	4.00 ¹ /4.00 ²
WS/DP4	4.00 ¹ /4.70 ²		

Note(s): The depths given in this table are taken from the ground level adjacent to the exploratory hole at the time of investigation. ¹ Final depth of exploratory hole. ²inferred by dynamic probing

2.4.3 London Clay Formation

Soils described as the London Clay Formation were encountered in one out of the nine trial holes and were inferred in five dynamic probes from immediately underlying the River Terrace Deposits to the base of the investigation, 15.00m bgl.

The soils of the London Clay Formation were typically described as firm to stiff greenish grey silty sandy CLAY.

The established depth of London Clay Formation found at each exploratory hole location have been included in Table 2.5.

Table 2.5 Established Depth of London Clay Formation

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
BH1	0.60	WSI01	1.20
TPSA1	0.50	WSI02	0.45
WSI	0.50	WSI03	0.40
WS2	0.30	WSI04	0.30
WS4	0.50	DPI01	6.00 ¹
DPI	6.00 ¹	DPI02	Not encountered
DP2	6.00 ¹	DPI03	Not encountered
DP4	6.00 ¹	DPI04	6.00 ¹

Note(s): The depths given in this table are taken from the ground level adjacent to the exploratory hole at the time of investigation. ¹ Final depth of exploratory hole.

2.5 Roots

Roots were encountered in seven out of the nine trial holes at depths ranging between 0.50m and 2.30m bgl, as detailed in Table 2.6.

Table 2.6 Established Depth of Root Penetration

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
BH1	None observed	WSI01	1.20
TPSA1	0.50	WSI02	1.00
WSI	1.70	WSI03	2.00

Exploratory Hole	Depth (m bgl)	Exploratory Hole	Depth (m bgl)
WS2	2.30	WS104	None observed
WS4	2.10		

Note(s): The depths given in this table are taken from the ground level adjacent to the exploratory hole at the time of investigation.

Roots may be found to greater depth at other locations on the site particularly close to trees and/or trees that have been removed both within the site and its close environs.

It must be emphasised that the probability of determining the maximum depth of roots from a narrow diameter borehole is low. A direct observation such as from within a trial pit is necessary to gain a better indication of the maximum root depth.

With reference to Google Earth history in the past 20 years, no significant vegetation changes were observed on site.

2.6 Groundwater

No groundwater was encountered within all exploratory holes.

Groundwater levels are influenced by seasonal changes and drainage variations. For the site works in March 2021, levels were around their annual maximum. Annual minimum levels typically occur in September.

During the additional site works in August 2025, levels were falling from their annual maximum (around March) toward the annual minimum (typically in September).

The elevation of the site was circa 14.95m Above Ordnance Datum (AOD). The site was not located within a Source Protection Zone (SPZ). And the nearest surface water feature was located circa 753m southwest. Superficial River Terrace Deposits were classified as a Secondary A Aquifer which are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. London Clay Formation was classified as Unproductive Strata which are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. Both surface and groundwater were expected to flow towards the south in line with the dominant surrounding topography. Flow through the London Clay Formation was anticipated to be very slow.

Groundwater equilibrium conditions may only be conclusively established, if a series of observations are made via groundwater monitoring wells. No groundwater monitoring was commissioned in this investigation.

Section 3 Geotechnical In-Situ and Laboratory Testing

3.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were undertaken in BH1. The results were interpreted based on the classifications outlined in Appendix C.1, Table C.1.1 to Table C.1.2.

Table 3.1 Hammer Efficiency

SPT Hammer Ref	Energy Ratio Er (%)
AR3552	69

Table 3.2 Standard Penetration Tests (SPT) Interpretation

Strata	Depth Range (m bgl)	N60 Range	Inferred Strength/Relative Density	Inferred Cu
RTD(c)	0.60-2.90	26	High	130kPa
RTD(g)	2.90-6.00	38-41	Dense	
LC	5.90-15.00	25-38	High to very high	125 to 190kPa

Note(s): c-cohesive soils; g – granular soils

A full interpretation of the SPT results, are outlined in Appendix C.2, Table C.2.1.

3.2 Dynamic Probe Tests

The results were converted to equivalent SPT “N60” values based on dynamic energy using commercial computer software (Geostru). Interpretation interpreted based on the classifications outlined in Appendix C.1, Table C.1.1 to Table C.1.2.

Table 3.3 Hammer Efficiency

Rig Reference	Energy Ratio Er (%)
Archway	80.28
Premier 4	90.85

Table 3.4 Inferred SPT Interpretation

Strata	Depth Range (m bgl)	Inferred N60 Range	Inferred Strength/Relative Density
RTD(c)	0.30-2.30	0-39	Extremely low to very high Cu = <10 to 195kPa
RTD (g)	2.30-6.00	13->50	Medium dense to very dense
LC	4.00-6.00	8-22	Medium to high Cu = 40 to 110kPa

Note(s): SPT “N60” values presented have been corrected in accordance with BS EN 22476 Part 3

A full interpretation of the DPSH tests, are outlined in Appendix C.2, Table C.2.2.

3.3 Infiltration Tests

Infiltration testing was undertaken in TPSA1 within the River Terrace Deposits following the principles of BRE Digest 365 Soakaway design: 2016. BRE 365 states that for an accurate infiltration rate to be obtained a soakage pit needs to be filled three times in quick succession. Each test can only be ended once 75% of the water present has drained away.

A single test was attempted in TPSA1 however the test did not complete in the time available due to slow infiltration and therefore the test result was extrapolated, and the results outlined in Table 3.5.

Table 3.5 Infiltration Rates

Trial Hole	Test No.	Infiltration Rate (m/s)	Note
TPSA1	1	1.6×10^{-6}	Estimated based on extrapolating the measured data. Must be used with caution

3.4 Quick Unconsolidated Undrained Triaxial Compression Tests

Quick Unconsolidated Undrained Triaxial Compression Tests (QUU) were performed on three samples obtained from the London Clay Formation. The strength interpretation was based on the classification outlined in Table C.1.1.

Soils of the London Clay Formation were of a medium becoming very high strength with undrained cohesions of between 42kPa and 166kPa, generally increasing with depth.

A full interpretation of the QUU tests is outlined in Table C.2.3, Appendix C.2 and the laboratory report in Appendix C.2.

3.5 Atterberg Limit Tests

Atterberg Limit tests were performed on four samples, three obtained from the cohesive parts of the River Terrace Deposits and the remaining one sample from the London Clay Formation. The results were classified in accordance with BRE Digest 240 and NHBC Standards Chapter 4.2.

Table 3.6 Atterberg Limit Results Classification

Strata	Depth (m bgl)	Classification	
		NHBC	BRE 240
RTD (c)	0.80-1.20	Low to Medium	Low to Medium
LC	13.50	Medium	Medium

Details are given in Table C.2.4, Appendix C.2 and the laboratory report in Appendix C.2.

3.6 Particle Size Distribution Tests

Particle Size Distribution (PSD) tests were performed on four samples from the granular soils of the River Terrace Deposits.

Table 3.7 Particle Size Distribution Classification

Strata	Depth (m bgl)	Classification	
		NHBC	BRE 240
RTD (g)	1.30-3.00	None	None

Note that a cohesive soil is only classified as having a volume change potential if it is also plastic and an Atterberg Limit test can be conducted on the strata.

A full interpretation of the PSD tests, are outlined in Table C.2.5, Appendix C.2 and the laboratory report in Appendix C.2.

3.7 Sulphate and pH Tests

Two samples were taken from the River Terrace Deposits (WS2:1.30m bgl and WS4:2.20m bgl) and one from the London Clay Formation (BH1:9.00m bgl) for water soluble sulphate (2:1) and pH testing in accordance with Building Research Establishment Special Digest 1, 2005, 'Concrete in Aggressive Ground'.

Table 3.8 Sulphate and pH Test Results

Strata	Depth (m bgl)	Sulphate Concentration (mg/l)	pH
RTD	1.30-2.20	19-28	7.8-8.2
LC	9.00	270	8.1

The significance of the sulphate and pH Test results are discussed in Section 5.2 and the laboratory report in Appendix C.2.

Section 4 Engineering Appraisal

4.1 Established Ground Conditions

An engineering appraisal of the soil types encountered during the site investigation and likely to be encountered during the redevelopment of this site is presented. Soil descriptions are based on analysis of disturbed samples taken from the exploratory holes.

4.1.1 Made Ground and Topsoil

Soils described as Made Ground were encountered in all trial holes from ground level to depths ranging between 0.30m (WS2 and WS104) and 1.20m bgl (WS101).

Foundations must not be placed on non-engineered fill unless such use can be justified on the basis of a thorough ground investigation and detailed design. Foundations must be taken through any Topsoil and/or Made Ground and either into, or onto a suitable underlying natural stratum of adequate bearing characteristics.

4.1.2 River Terrace Deposits

Soils described as River Terrace Deposits were encountered in all trial holes and were inferred in seven dynamic probes to be present from immediately underlying the base of the Made Ground and were present to depths ranging between 4.00m and 6.00m bgl.

Soils of the River Terrace Deposits are normally consolidated, predominantly cohesive soils to between 1.10m and 2.30m bgl, as such are expected to display low to moderate bearing capacities with moderate settlement characteristics. The cohesive soils overlay granular soils of the River Terrace Deposits which extended to between 4.00m and 6.00m bgl that are expected to have moderate to high bearing and settlement characteristics.

The granular soils of the River Terrace Deposits are considered suitable bearing stratum for the proposed development.

4.1.3 London Clay Formation

Soils described as the London Clay Formation were encountered in one out of the nine trial holes and were inferred in five dynamic probes from immediately underlying the River Terrace Deposits to the base of the investigation, 15.00m bgl. The soils of the London Clay Formation were typically described as firm to stiff greenish grey silty sandy CLAY.

The soils of the London Clay Formation are heavily overconsolidated, predominantly cohesive soils and were anticipated to provide moderate bearing and settlement characteristics. The soils of the London Clay Formation were considered to be a suitable bearing stratum providing that a deep piled foundation solution was adopted.

4.1.4 Guidance on Shrinkable Soils

The ground conditions were established as cohesive and granular soils of the River Terrace Deposits overlying the bedrock of London Clay Formation.

The volume change potential for the strata was established and presented in Table 4.1.

Table 4.1 Established Volume Change Potential by Strata

Strata	Volume Change Potential		Established Lower Boundary (m bgl)
	BRE	NHBC	
RTD (c)	Medium	Medium	2.30
RTD (g)	None	None	5.90 (where proven)
LC	Medium	Medium	15.00m+ Not Proven

Medium potential volume change should be adopted in both the River Terrace Deposits and the London Clay Formation.

4.1.5 Groundwater

No groundwater was encountered within all exploratory holes.

Section 5 Foundation Scheme

5.1 Foundation Recommendations

Foundations **must not** be constructed within any Made Ground/Topsoil due to the likely variability and potential for large load induced settlements both total and differential.

Roots were encountered in seven out of the nine trial holes at depths ranging between 0.50m and 2.30m bgl. If roots are encountered during the construction phase foundations **must not be placed within any live root penetrated** or desiccated **cohesive soils or those with a volume change potential**. Should the foundation excavations reveal such materials, the excavations **must** be extended to greater depth in order to bypass these unsuitable soils. Excavations must be checked by a suitable person prior to concrete being poured.

Considering the type of development, a shallow foundation solution was considered the most suitable.

5.1.1 Shallow Foundations In the Granular River Terrace Deposits

Based on a 5.00 by 0.75m strip foundation, using commercial software Table 5.1 shows the calculated bearing values and anticipated settlement characteristics. Made Ground was noted a depth up to 1.20m bgl in WS101 and rootlets were observed up to 2.30m bgl with average of 1.70m bgl. The granular River Terrace Deposits were found from the shallowest at 1.10m bgl therefore bearing capacities were calculated below this depth.

Table 5.1 Allowable Bearing Capacities in the River Terrace Deposits

Depth (m bgl)	Size (m)	Bearing Capacity (kPa)	Anticipated Settlement (mm)
1.50 ¹	5.00 x 0.75	100	<25
2.00		140	<25

Note: ¹locally deepen to ensure founding in the granular soils.

All foundation formations must be examined, recorded, and signed off by a competent person.

Care must be exercised where foundations pass over soils of different engineering properties or different soil types to minimise the potential effects of differential settlements.

For the allowable bearing value given above, settlements should not exceed the presented values, provided that excavation bases are carefully bottomed out and blinded or concreted as soon after excavation as possible and kept dry.

Foundations must not be constructed over former structures and other hard spots. The foundations design must be suitable for the conditions present at the site.

The anticipated settlement includes both elastic settlement and long-term drained settlement (in the case of cohesive soils).

Anticipated settlements may be taken as proportional to the bearing capacity adopted (for the same configuration of foundation), therefore if the bearing value is halved the anticipated settlement will halve.

It has been assumed that the foundations to any existing structures have been grubbed out. Where foundations have been grubbed out the new foundation must be taken through any backfill material into suitable natural ground as outlined in this report.

5.1.2 Piled Foundations

If adopted the piled foundations must be taken through any Made Ground and River Terrace Deposits into suitable strength soils of the London Clay Formation .

The construction of a piled foundation is a specialist job with the actual pile working load depending on the pile type and installation method. Prior to finalising the foundation design the advice from a reputable contractor who is familiar with the ground and groundwater conditions present at the site must be sought.

The vertical load capacities are provided for varying diameters and lengths of bored piles taken into the London Clay Formation, based on geotechnical laboratory testing and in-situ testing and must only be used for preliminary design purposes.

A factor of safety of 3 was applied to the characteristic line derived from testing undertaken, for both design values were calculated using an α factor of 0.45 for shaft resistance and an N_c value of 9 for base resistance.

The bearing values given in Appendix D.1. are applicable to single vertically loaded piles. Where piles are to be constructed in groups the bearing value of each individual pile should be reduced by a factor of about 0.8 and a calculation made to check the factor of safety against block failure.

From ground level the upper 5m of the pile shaft has been ignored in the preliminary pile design given.

To prevent necking of the green concrete, temporary casing may be required where the pile passes through the Made Ground or London Clay Formation and below the groundwater table (if encountered). To achieve the full bearing value a pile should penetrate the bearing stratum by at least five times the pile diameter.

No allowance has been made for negative skin friction that could be generated where piles pass through Made Ground and very soft cohesive and / or organic soils underlying the site. The negative skin friction must be applied to the pile working load and must not be factored.

5.2 Subsurface Concrete

The sulphate and pH tests carried out in accordance with BRE Special Digest 1, 2005, 'Concrete in Aggressive Ground', established the site concrete classifications for each

stratum as presented in Table 5.2.

Table 5.2 Concrete Classification

Stratum	Design Sulphate Class	ACEC Class
RTD	DS-I	AC-I
LC	DS-I	AC-Is

Concrete to be placed in contact with soil or groundwater must be designed in accordance with the recommendations of Building Research Establishment Special Digest 1 2005, '*Concrete in Aggressive Ground*' taking into account any possible exposure of potentially pyrite bearing natural ground and the pH of the soils.

5.3 Excavations

Shallow excavations in the Made Ground/Topsoil and the cohesive soils of the River Terrace Deposits are likely to be marginally stable in the short term at best.

Deeper excavations taken into the granular soils of the River Terrace Deposits and London Clay Formation are likely to be unstable and require support. Unsupported earth faces formed during excavation may be liable to collapse without warning and suitable safety precautions must therefore be taken to ensure that such earth faces are adequately supported or battered back to a safe angle of repose.

Excavations beneath the groundwater table are likely to be unstable and dewatering of foundation trenches may be necessary.

Section 6 Site Drainage

6.1 Soakaways

The Trial Pit Soakage test carried out in TPSA1 did not complete in the time available due to slow infiltration. The extrapolated infiltration rate was 1.6×10^{-6} m/sec was calculated.

Section 7 Determination of Chemical Analysis

7.1 Site Characterisation and Revised Conceptual Site Model

The Preliminary Investigation Report undertaken by Soils Limited (report ref: 19192/PIR dated May 2021) identified no risk of ground contamination from previous usage of the site or offsite sources.

The Main Investigation Report identified Made Ground to a depth of up to 1.20m bgl and in one trial hole (WS2) “organic / hydrocarbon” type odour was recorded between 1.60m and 2.30m bgl during detailed logging within the River Terrace Deposits and targeted environmental testing was scheduled within both Made Ground at 0.40m bgl and River Terrace Deposits at 3.30m bgl in WS2. The preliminary conceptual site model was updated to take these sources into account.

Soils described as Made Ground were encountered in all trial holes from ground level to depths ranging between 0.30m and 1.20m bgl.

The Made Ground typically comprised soft to very stiff, dark brown, greyish brown, slightly gravelly slightly sandy cobbly CLAY. Sand is fine. Gravel angular to rounded, fine to coarse flint, brick, concrete, chalk and clinker. Occasional decomposing woody roots. Rare, rusted metal fragment.

7.2 Soil Sampling

Exploratory hole locations were established to provide an overview of ground conditions across the site in relation to the proposed construction, together with enabling the collection of samples to enable chemical characterisation of the underlying strata.

Representative samples for potential environmental testing were obtained from the exploratory holes at depths of between 0.20m and 3.30m to allow appropriate representation of the materials encountered, with additional samples to be obtained, if necessary, where there was visual or olfactory evidence of contamination.

Unless otherwise stated, analytical testing was based initially on a screening suite of commonly identified inorganic and organic contaminants, taking into account the prevailing site conditions and the findings of the conceptual site model.

7.3 Determination of Chemical Analysis

The driver for determination of the analysis suite was the information obtained from the Preliminary Investigation Report and this investigation.

The chemical analyses were carried out on 2No samples of Made Ground and 5No samples of the River Terrace Deposits. Additional chemical analyses were carried out on 3No samples of Made Ground. The nature of the analyses is detailed in Table 7.1.

Table 7.1 Chemical Analyses Suites - Soil

No. of Tests		Determinants
MG	RTD	
5	5	Metal suites: Arsenic, Boron (Water Soluble), Cadmium, Chromium (total & hexavalent), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc
5	5	Organic Matter
5	5	pH
5	5	Polycyclic aromatic hydrocarbons (PAH) – (EPA 16)
5	5	Phenols – total monohydric
5	5	Extractable petroleum hydrocarbons (EPH) – Texas banding
2		Total petroleum hydrocarbons (TPH) – CWG banding
2		BTEX and MTBE
2		Cyanide total & free
2		Polychlorinated biphenyls (PCB) – 7 Congeners
5	5	Asbestos screening

The soil testing was carried out in compliance with the MCERTS performance standard, and the results are shown in Appendix E.2, test reports 21-04413.1 and L25-11007-SLT - 25-86768.

Section 8 Qualitative Risk Assessment

8.1 Assessment Criteria

The assessment criteria used to determine risks to human health are derived and explained within Appendix E.3.

8.2 Representative Contamination Criteria - Soil

The proposal comprises the construction of three 2.5-storey terraced houses, alongside a three-storey apartment building comprising nine residential units. The development includes public open space or domestic gardens and provision for car parking spaces adjacent to the terraced row. In compiling this report reliance was placed on drawings listed in the Commission Section and recommendations apply only to this scheme. Any changes require consultation with Soils Limited. Soils Limited must be notified about any change or deviation from the scheme outlined.

Based on the proposed development, the results of the chemical analysis have been compared against generic assessment criteria (GAC) for a '**Residential with home grown produce**' end use, as presented in SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014 (C4SL), derived for the protection of human health. Where this document has not published screening values for determinants, GACs derived for the same end use have been adopted from the following published guidance; DEFRA Soil Guideline Values (SGV) and LQM/CIEH/Suitable 4 Use Level (S4UL).

To assess the potential toxicity of organic determinants (Petroleum Hydrocarbons and Polyaromatic Hydrocarbons) to the human health, soils samples were analysed for Soil Organic Matter (SOM). The selected samples analysed recorded, SOM values of between <0.1% and 1.3%. For each soil sample tested, the resultant SOM allowed for the correct comparison to be made with the appropriate guideline value for each organic determinant analysed.

8.2.1 Risk Assessment – Made Ground

Table 8.1 outlines any samples that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix E.2.

Table 8.1 Summary of GAC Exceedances – Made Ground

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
None				

The risk assessment has established no pollutant linkage in relation to human health within the Made Ground.

8.2.2 Risk Assessment – River Terrace Deposits

Table 8.2 outlines any samples that have exceeded their relevant assessment criteria. The full laboratory report is presented in Appendix E.2.

Table 8.2 Summary of GAC Exceedances – River Terrace Deposits

Location	Depth (m bgl)	Contaminant	Concentration	Guidance Level
None				

The risk assessment has established no pollutant linkage in relation to human health within the River Terrace Deposits.

8.3 Asbestos

The test certificate for each sample submitted for contamination analysis during this investigation includes the results of an Asbestos Screen.

In each case 'Not detected' was reported.

This finding does not obviate the risk of asbestos being present on the site and the Client must seek advice from qualified and competent asbestos specialist during and prior to undertaking works to ensure compliance with appropriate legislation and guidance.

8.4 Risk to Controlled Waters

Taking into consideration the ground conditions encountered and the lack of contaminant concentrations observed, there is not considered to be any significant risk to controlled waters and no further assessment deemed necessary at this time.

The proposed development will need to consider the implementation of a new drainage regime on site, as such the proposed development is considered to provide a betterment of site conditions where site drainage would not follow a pathway to impact on third party land or property.

8.5 Risk from Ground Gas Ingression

The Preliminary Investigation Report identified no risk of ground gas from offsite sources and the intrusive investigation did not identify any significant sources of ground gas. Therefore, it is considered that there is negligible risk from ground gas.

8.5.1 Radon

The site **was not situated** within an area where protection or risk assessment against the ingress of radon was required. Radon protective measures **will not be required** within the proposed new development.

8.6 Generic Quantitative Risk Assessment

Quantitative risk assessments were undertaken for soil and groundwater. The CSM has been updated to take account of the assessments below and presented in Appendix E.1. The full laboratory chemical report is presented in Appendix E.2.

8.6.1 Soils

The Tier 1 Quantitative risk assessment established that there was **no risk to the human health receptors** of construction workers or future end-users.

8.6.2 Controlled Waters

The Groundwater Risk Assessment established that **there was no risk** to the groundwater receptor.

8.6.3 Ground Gas

There is negligible risk from ground gas and no further assessment is required.

8.7 Recommendations

Soils testing undertaken did not indicate any further works were required subjected to Local Authority approval and with an emplacement of a discovery strategy.

8.8 Protection of Services

Contamination of the ground may pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligations, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from contaminants specified in UKWIR Report 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (UKWIR, 2010), or that the proposed remedial strategy will mitigate any existing risk.

8.9 Duty of Care

Groundworkers must maintain a good standard of personal hygiene including the wearing of overalls, boots, gloves and eye protectors and the use of dust masks during periods of dry weather.

8.10 Excavated Material

Excavated material as waste must be defined or classified prior to any disposal, transport, recycling or re-use at or by an appropriately licensed or exempt carrier and/or off-site disposal facility. The requirements inherent in both Duty of Care and Health and Safety must also be complied with. In order to determine what is to happen, what is suitable, appropriate and most effective in the disposal of wastes, especially those subject to CDM waste management plan requirements, several factors must be considered, and competent advice must always be sought.

8.11 HazWasteOnline

Further consideration of results using HazWasteOnlineTM can be undertaken on request to give an indication of potentially hazardous properties in the materials analysed.

8.12 Re-use of Excavated Material On-site

The re-use of on-site soils may be undertaken either under the Environmental Permitting Regulations 2007 (EPR), in which case soils other than uncontaminated soils are classed as waste, or under the CL:AIRE Voluntary Code of Practice (CoP) which was published in September 2008 and is accepted as an alternative regime to the EPR.

8.13 Imported Material

Any soil, which is to be imported onto the site, must undergo chemical analysis to permit classification prior to its importation and placement in order to ascertain its status with specific regard to contamination, i.e. to prove that it is suitable for the purpose for which it is intended.

8.14 Discovery Strategy

There may be areas of contamination not identified during the investigation. Such occurrences may also be discovered during the demolition and construction phases for the redevelopment of the site.

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Appendix F Information Provided by the Client

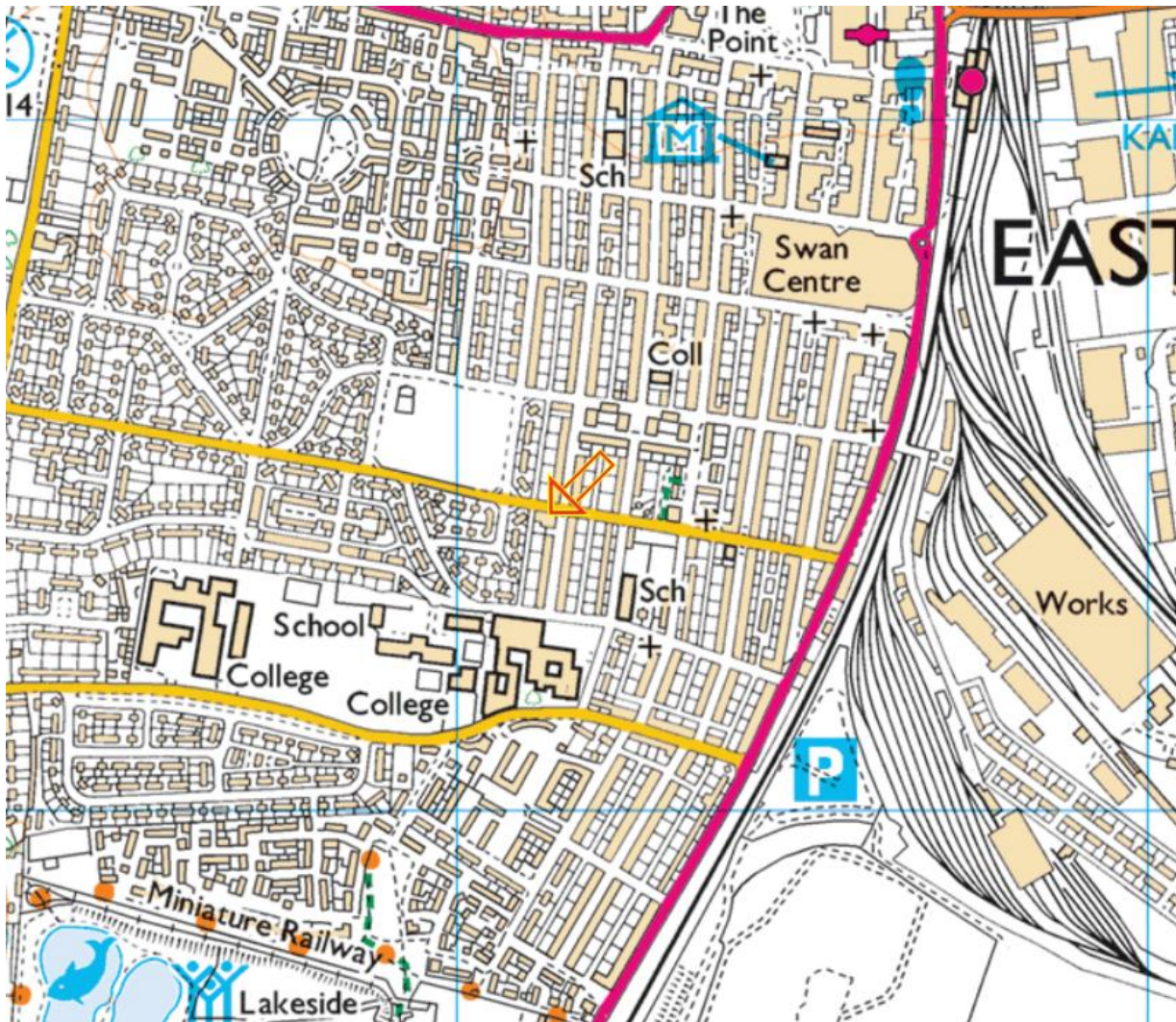


Figure 1 – Site Location Map

Job Number
19192

Project

Samsons Gym, 237 Chamberlayne Road, Eastleigh,
Hampshire SO50 5JB

Client
Eastleigh Borough Council

Date
November 2025



Figure 2 – Aerial Photograph



Job Number
19192

Project
237 Chamberlayne Road, Eastleigh, Hampshire
SO50 5JB

Client
Eastleigh Borough Council

Date
November 2025



Figure 3 – Exploratory Hole Plan



Job Number
19192

Project
237 Chamberlayne Road, Eastleigh, Hampshire
SO50 5JB

Client
Eastleigh Borough Council

Date
November 2025

Appendix A Standards and Resources

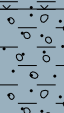
The site works, soil descriptions and geotechnical testing were undertaken in accordance with the following standards where applicable:

- BS 5930:2015 and BS EN ISO 22476-2&3:2005+A1:2011
- BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design
- BS EN ISO 14688-1:2018 - Geotechnical investigation and testing - Identification and description
- BS EN ISO 14688-2:2018 - Geotechnical investigation and testing - Principles for a classification
- BS 10175:2011+A2:2017 - Investigation of potentially contaminated sites
- LCRM 2021 Environment Agency
- BS 8004:2015 – Code of practice for foundations
- BS 1377:1990 Parts 1 to 8
- BRE Digest 241 “Low-rise buildings on shrinkable clay soils: Part 2
- BRE Special Digest 1, 2005, ‘Concrete in Aggressive Ground’
- Stroud, M. A. 1974, “The Standard Penetration Test – its application and interpretation”, Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.
- N.E. Simons, B.K. Menzies, “A Short Course in Foundation Engineering”
- NHBC Standards Chapter 4.2, January 2025.
- SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination December 2014
- CIRIA C733, Asbestos in soil and made ground: a guide to understanding and managing risks and CAR2012 regulations.
- Google Earth accessed in November 2025
- British Geological Survey Website & iGeology App accessed in November 2025

Appendix B Field Work

Appendix B.1 Engineers Logs

					Window Sampler					WS101 Sheet 1 of 1				
					Hole Type WS		Easting		Northing		Ground Level (m)		Scale 1:50	
					Project Name Samsons Gym			Project No. 22136			Start Date 2025-10-07		End Date 2025-10-07	
Client Eastleigh Borough Council					Consultant ML					Contractor Soils Limited				
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata							
		Depth (m)	Type/ Ref	Results			Legend	Description						
						(0.25) 0.25 (0.10) 0.35		CONCRETE						
		0.40	ES			(0.45) 0.80		BRICK. MADE GROUND.		0.5				
		0.60	ES			(0.45) 0.80		Very stiff becoming firm to stiff greyish brown slightly gravelly slightly sandy CLAY. Sand is fine. Gravel angular to rounded, fine to coarse flint, brick, chalk and clinker. Occasional decomposing woody roots.						
		0.60	D			(0.45) 0.80		MADE GROUND.		1.0				
		0.90	ES			(0.40) 1.20		Firm brown mottled greyish brown, and yellowish brown, slightly gravelly slightly sandy CLAY. Gravel angular to rounded, fine to coarse flint, brick, chalk and clinker. Occasional decomposing woody roots. Rare rusted metal fragment. MADE GROUND.		1.5				
		0.90	D			(0.40) 1.20		Firm greyish brown mottled brown and dark brown, slightly sandy gravelly CLAY. Gravel is angular to sub-angular, fine to coarse flint and chalk. Grades into clayey gravel near base of stratum. (RIVER TERRACE DEPOSITS)		2.0				
		1.30	ES			2.30		Yellowish brown mottled brown, clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint. (RIVER TERRACE DEPOSITS)		2.5				
		1.30	D			2.30				3.0				
		1.80	D			(1.40)				3.5				
		2.20	D							4.0				
		2.40	D							4.5				
		2.90	D							5.0				
		3.40	D							5.5				
		3.80	D							6.0				
										6.5				
										7.0				
										7.5				
										8.0				
										8.5				
										9.0				
										9.5				
										10.0				
Remarks Rootlets observed to 1.20m bgl.										Method, Plant, Stability, Dimensions 0.00 - 4.00m		Logger		
Checked By: ML Status: FINAL														

					Window Sampler					WS102	
										Sheet 1 of 1	
					Hole Type WS		Easting		Northing		Ground Level (m)
Project Name Samsons Gym					Project No. 22136		Start Date 2025-10-07		End Date 2025-10-07		
Client Eastleigh Borough Council					Consultant ML		Contractor Soils Limited				
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata				
		Depth (m)	Type/ Ref	Results			Legend	Description			
						(0.25)		CONCRETE			
		0.40	ES			0.25		Red mottled black and brown, clayey gravelly brick COBBLES. Gravel is angular to sub-angular, fine to coarse brick, clinker and chalk. MADE GROUND. <i>Very low sample in liner. (0.25 - 0.35m)</i>	0.5		
		0.60	ES			0.10					
		0.60	D			0.35					
		0.90	ES			0.10					
		0.90	D			0.45					
		1.30	D			(1.05)		Stiff greyish brown slightly gravelly slightly sandy CLAY. Sand is fine. Gravel angular to rounded, fine to medium flint, brick, chalk and clinker. Occasional rootlets. MADE GROUND.	1.0		
		1.60	D			1.50		Stiff brown mottled greyish brown and orangish brown, slightly silty sandy CLAY. Sand is fine to medium. Highly bioturbated. Occasional rootlets. Rare sub-angular fine to medium flint gravel. (RIVER TERRACE DEPOSITS)	1.5		
		2.10	D			(0.70)					
		2.30	D			2.20					
		2.80	D			(0.80)		Firm greyish brown mottled brown and dark brown, slightly sandy gravelly CLAY. Gravel is angular to sub-angular, fine to coarse flint and chalk. Grades into clayey gravel near base of stratum. (RIVER TERRACE DEPOSITS)	2.5		
		3.30	D			3.00		Yellowish brown mottled light brown, clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint. (RIVER TERRACE DEPOSITS)	3.0		
		3.80	D			(1.00)		Yellowish brown mottled light brown, slightly silty/clayey SAND AND GRAVEL. Gravel is angular to well rounded, fine to coarse flint.	3.5		
						4.00		Fragments of brick gravel located at depth anticipated introduced due to dynamic probing. (3.90 - 4.00m)	4.0		
								End of Borehole at 4.00m	4.5		
									5.0		
									5.5		
									6.0		
									6.5		
									7.0		
									7.5		
									8.0		
									8.5		
									9.0		
									9.5		
									10.0		
Remarks Rootlets observed to 1.00m bgl.								Method, Plant, Stability, Dimensions 0.00 - 4.00m		Logger	
Checked By: ML Status: FINAL											

soils LIMITED					Window Sampler					WS103				
										Sheet 1 of 1				
					Hole Type WS		Easting		Northing		Ground Level (m)		Scale 1:50	
Project Name Samsons Gym					Project No. 22136		Start Date 2025-10-07		End Date 2025-10-07					
Client Eastleigh Borough Council					Consultant ML			Contractor Soils Limited						
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata							
		Depth (m)	Type/ Ref	Results			Legend	Description						
						(0.25)		CONCRETE. Underlain by brick gravel and cobbles.						
		0.30	ES			0.25		Red mottled black and brown, clayey gravelly brick COBBLES. Gravel is angular to sub-angular, fine to coarse brick, clinker and chalk. Frequent rootlets. MADE GROUND.		0.5				
		0.50	ES			(0.15)								
		0.50	D			0.40								
		0.90	ES			(1.10)		Stiff brown mottled greyish brown and orangish brown, slightly silty sandy CLAY. Sand is fine to medium. Highly bioturbated. Occasional rootlets. Rare sub-angular fine to medium flint gravel. (RIVER TERRACE DEPOSITS)		1.0				
		0.90	D											
		1.40	D			1.50						1.5		
		1.60	D			(0.45)								
		1.90	D			1.95		Stiff greyish brown, slightly sandy gravelly CLAY. Gravel is angular to sub-angular, fine to coarse flint and chalk. Occasional rootlets. (RIVER TERRACE DEPOSITS)		2.0				
		2.10	D			(0.35)								
		2.20	ES			2.30						2.5		
		2.40	D			(0.40)								
		2.80	D			2.70		Orange mottled yellowish brown slightly silty sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint and chalk. (RIVER TERRACE DEPOSITS)		3.0				
		3.30	D			(1.30)						3.5		
		3.80	D			4.00						4.0		
								End of Borehole at 4.00m		4.0				
										4.5				
										5.0				
										5.5				
										6.0				
										6.5				
										7.0				
										7.5				
										8.0				
										8.5				
										9.0				
										9.5				
										10.0				
Remarks Rootlets observed to 2.00m bgl.								Method, Plant, Stability, Dimensions 0.00 - 4.00m		Logger				
Checked By: ML Status: FINAL														

soils LIMITED					Window Sampler					WS104				
										Sheet 1 of 1				
					Hole Type WS		Easting		Northing		Ground Level (m)		Scale 1:50	
Project Name Samsons Gym					Project No. 22136		Start Date 2025-10-07		End Date 2025-10-07					
Client Eastleigh Borough Council					Consultant ML			Contractor Soils Limited						
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (m)	Strata							
		Depth (m)	Type/ Ref	Results			Legend	Description						
		0.40	ES			(0.20) 0.20 (0.10) 0.30		CONCRETE						
						(0.60) (0.30) 0.90 1.20		BRICK. MADE GROUND.						
		0.80 0.80	ES D			(0.60) (0.30) 0.90 1.20		Stiff brown mottled greyish brown and orangish brown, slightly silty sandy CLAY. Sand is fine to medium. Highly bioturbated. Occasional rootlets. Rare sub-angular fine to medium flint gravel. Rare rootlets. (RIVER TERRACE DEPOSITS)		0.5 1.0				
		1.10 1.10 1.30	ES D D			(0.60) (0.30) 0.90 1.20		Stiff brown, slightly sandy slightly gravelly CLAY. Gravel is angular to sub-angular fine to coarse flint. Rare rootlets. (RIVER TERRACE DEPOSITS)		1.5				
		1.90	D			(0.60) (0.30) 0.90 1.20		Firm greyish brown, slightly sandy gravelly CLAY. Gravel is angular to sub-angular, fine to coarse flint and chalk. (RIVER TERRACE DEPOSITS)		2.0				
		2.20	ES			(0.70)		Greyish brown, sandy clayey GRAVEL. Gravel is angular to sub-angular, fine to coarse flint and chalk. (RIVER TERRACE DEPOSITS)		2.5				
		2.70	D			2.50		Odour of chlorinated solvents. (1.90 - 3.00m)		3.0				
						(1.50)		Brown mottled yellowish brown, slightly clayey very sandy GRAVEL. Gravel is angular to sub-angular, fine to coarse flint, and chalk. (RIVER TERRACE DEPOSITS)		3.5				
		3.60	D			4.00		Very low sample in liner. (3.00 - 3.50m)		4.0				
								End of Borehole at 4.00m		4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0				
Remarks								Method, Plant, Stability, Dimensions 0.00 - 4.00m			Logger			
Checked By: ML Status: FINAL														

		Dynamic Probe								DP101 Sheet 1 of 1																																																																																																																																																																																																																																																																																																																					
		Probe Type DPSH		Easting		Northing		Ground Level (m)		Scale 1:50																																																																																																																																																																																																																																																																																																																					
		Project Name Samsons Gym			Project No. 22136			Start Date 2025-10-07		End Date 2025-10-07																																																																																																																																																																																																																																																																																																																					
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<table><tr><th colspan="2">Readings (Blows/100mm)</th><th colspan="10">Diagram (N100 Values)</th><th colspan="2">Torque (Nm)</th></tr><tr><th colspan="2"></th><th>5</th><th>10</th><th>15</th><th>20</th><th>25</th><th>30</th><th>35</th><th>40</th><th>45</th><th>50</th><th colspan="2"></th></tr><tr><td>0.5</td><td>3</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0.5</td></tr><tr><td>1.0</td><td>1</td><td>0</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1.0</td></tr><tr><td>1.5</td><td>7</td><td>6</td><td>5</td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1.5</td></tr><tr><td>2.0</td><td>7</td><td>6</td><td>8</td><td>9</td><td>12</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2.0</td></tr><tr><td>2.5</td><td>11</td><td>12</td><td>14</td><td>11</td><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>2.5</td></tr><tr><td>3.0</td><td>9</td><td>6</td><td>6</td><td>7</td><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.0</td></tr><tr><td>3.5</td><td>13</td><td>18</td><td>15</td><td>16</td><td>17</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.5</td></tr><tr><td>4.0</td><td>17</td><td>17</td><td>14</td><td>13</td><td>14</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.0</td></tr><tr><td>4.5</td><td>11</td><td>13</td><td>10</td><td>5</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.5</td></tr><tr><td>5.0</td><td>3</td><td>2</td><td>4</td><td>2</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>5.0</td></tr><tr><td>5.5</td><td>4</td><td>3</td><td>3</td><td>4</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>5.5</td></tr><tr><td>6.0</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6.0</td></tr><tr><td>6.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>6.5</td></tr><tr><td>7.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>7.0</td></tr><tr><td>7.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>7.5</td></tr><tr><td>8.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>8.0</td></tr><tr><td>8.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>8.5</td></tr><tr><td>9.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>9.0</td></tr><tr><td>9.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>9.5</td></tr><tr><td>10.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>10.0</td></tr></table>												Readings (Blows/100mm)		Diagram (N100 Values)										Torque (Nm)				5	10	15	20	25	30	35	40	45	50			0.5	3	2											0.5	1.0	1	0	1										1.0	1.5	7	6	5	6									1.5	2.0	7	6	8	9	12								2.0	2.5	11	12	14	11	8								2.5	3.0	9	6	6	7	10								3.0	3.5	13	18	15	16	17								3.5	4.0	17	17	14	13	14								4.0	4.5	11	13	10	5	2								4.5	5.0	3	2	4	2	3								5.0	5.5	4	3	3	4	3								5.5	6.0	3												6.0	6.5													6.5	7.0													7.0	7.5													7.5	8.0													8.0	8.5													8.5	9.0													9.0	9.5													9.5	10.0													10.0
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Remarks SPT Hammer Energy Ratio = 90.85%							Method, Plant Hammer Weight (kg) 63.5 Hammer Drop (mm) 750 Cone Diameter (mm) 20 Cone Angle 90 Rod Diameter (mm) 35 Damper None					Logger																																																																																																																																																																																																																																																																																																																			
Checked By: ML Status: FINAL																																																																																																																																																																																																																																																																																																																															

soils LIMITED		Dynamic Probe				DP102							
						Sheet 1 of 1							
		Probe Type DPSH	Easting	Northing	Ground Level (m)	Scale 1:50							
Project Name Samsons Gym		Project No. 22136		Start Date 2025-10-07		End Date 2025-10-07							
Client Eastleigh Borough Council		Consultant ML		Contractor Soils Limited									
		Diagram (N100 Values)										Torque (Nm)	
Readings (Blows/100mm)		5	10	15	20	25	30	35	40	45	50		
0.5		2											0.5
1.0		0											1.0
1.5		1											1.5
2.0		1											2.0
2.5		1											2.5
3.0		1											3.0
3.5		1											3.5
4.0		3											4.0
4.5		4											4.5
5.0		7											5.0
5.5		6											5.5
6.0		5											6.0
6.5		9											6.5
7.0		10											7.0
7.5		10											7.5
8.0		11											8.0
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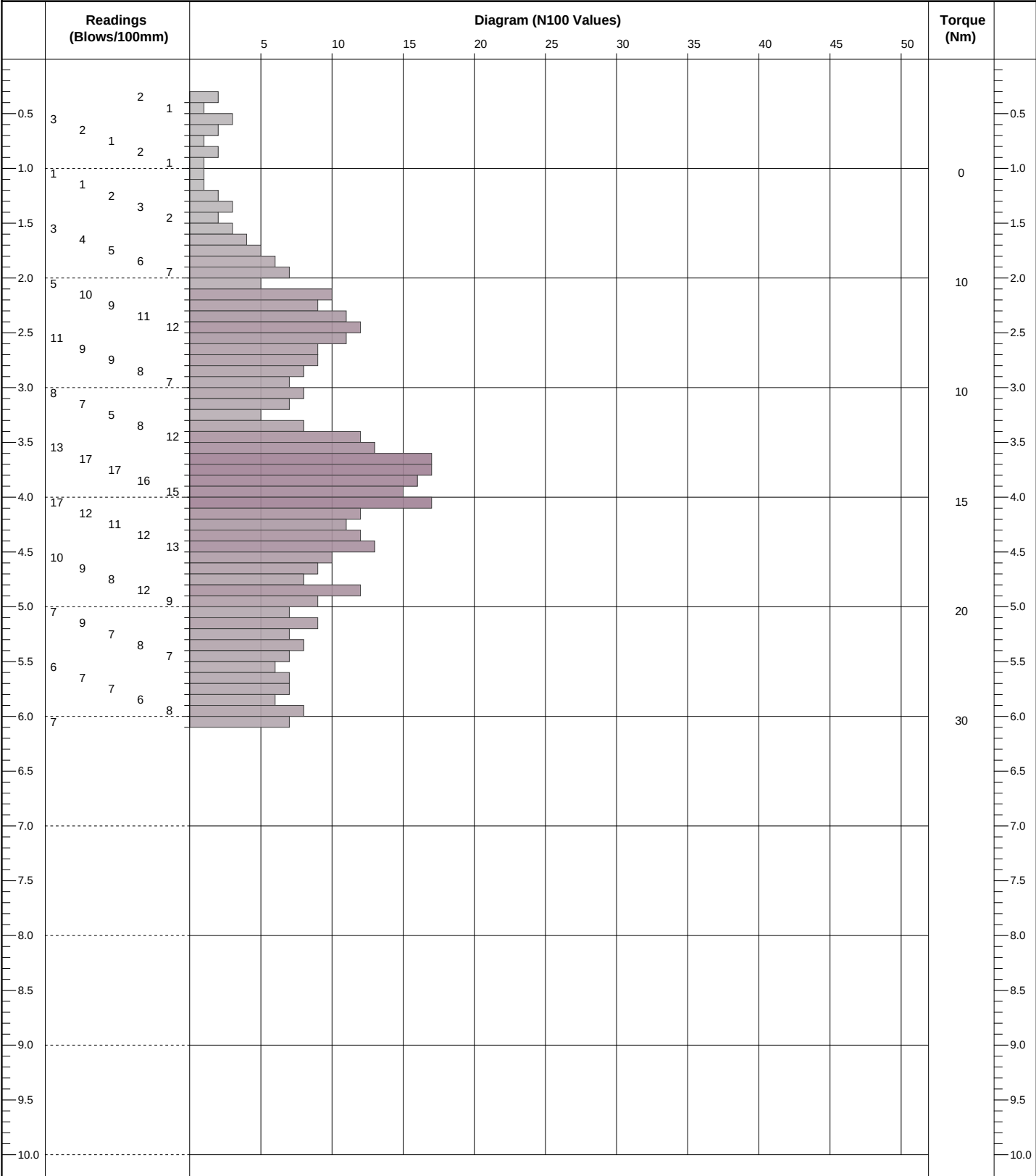


Dynamic Probe

DP103
Sheet 1 of 1

Probe Type DPSH	Easting	Northing	Ground Level (m)	Scale 1:50
Project Name Samsons Gym	Project No. 22136		Start Date 2025-10-07	End Date 2025-10-07

Client Eastleigh Borough Council	Consultant ML	Contractor Soils Limited
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Remarks SPT Hammer Energy Ratio = 90.85%	Method, Plant	Logger
Checked By: ML Status: FINAL	Hammer Weight (kg) Hammer Drop (mm) Cone Diameter (mm) Cone Angle Rod Diameter (mm) Damper	63.5 750 20 90 35 None

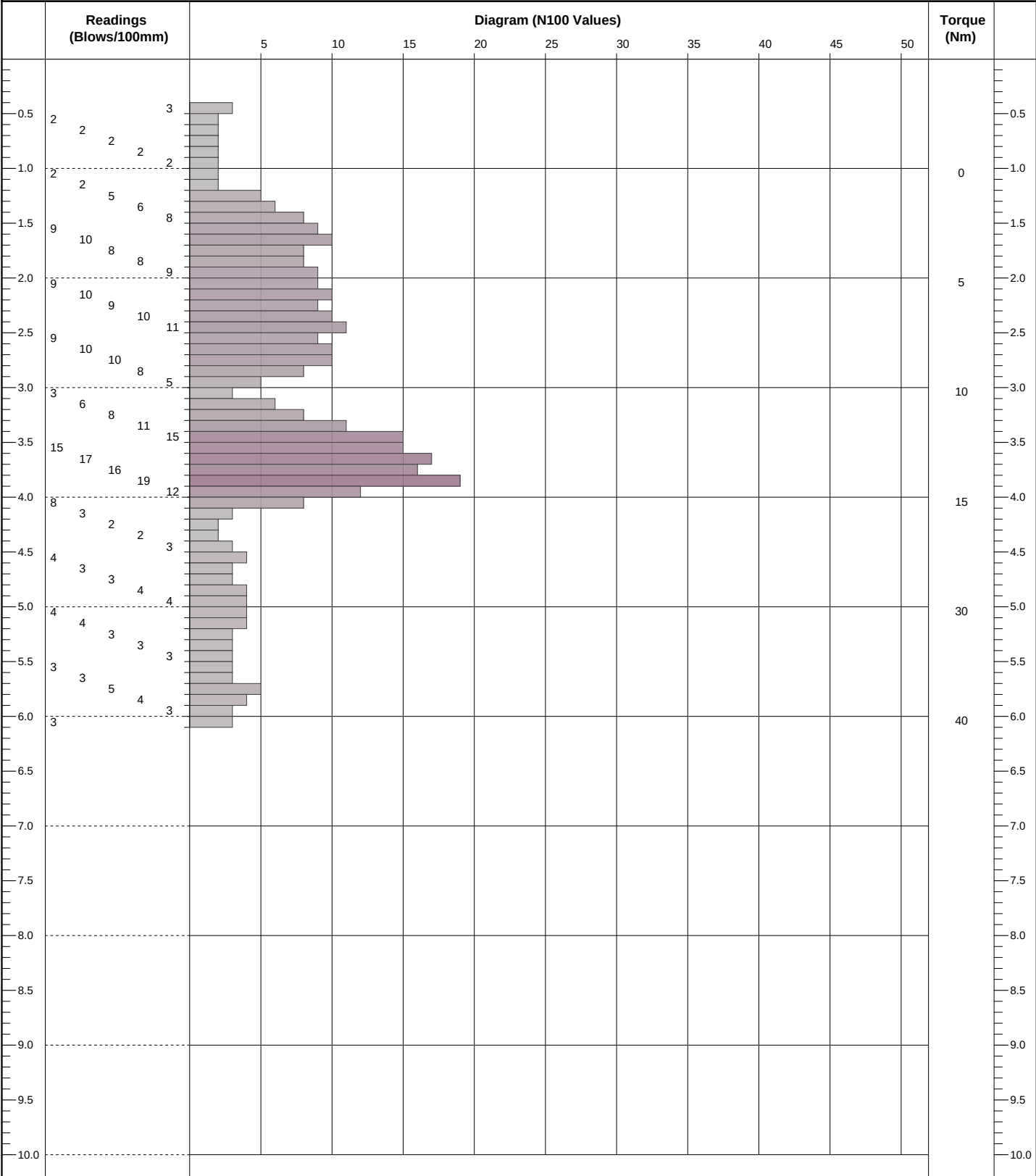


Dynamic Probe

DP104
Sheet 1 of 1

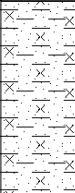
Probe Type DPSH	Easting	Northing	Ground Level (m)	Scale 1:50
Project Name Samsons Gym	Project No. 22136		Start Date 2025-10-07	End Date 2025-10-07

Client Eastleigh Borough Council	Consultant ML	Contractor Soils Limited
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Remarks SPT Hammer Energy Ratio = 90.85%	Method, Plant	Logger
Checked By: ML Status: FINAL	Hammer Weight (kg) Hammer Drop (mm) Cone Diameter (mm) Cone Angle Rod Diameter (mm) Damper	63.5 750 20 90 35 None

		Contract Name: Samson Gym				Client: Eastleigh Borough Council				Hole ID: BH1				
		Contract Number: 19192		Start and End Date: 24/03/21		Logged By: DJ		Checked By: JD		Status: FINAL		Hole Type: BH		
		Easting:		Northing:		Ground Level:		Plant Used: Dando 4000		Print Date: 14/05/2021		Scale: 1:50		
Weather:				Termination:				SPT Hammer: N/R, Energy Ratio: N/R				Sheet 1 of 2		
Samples & In Situ Testing				Strata Details								Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation	
0.25	D			0.05		Tarmac. MADE GROUND								
0.50 - 0.70	B			0.30		Soft, orangish brown silty sandy CLAY. Sand is fine. Rare angular fine gravels of chalk. MADE GROUND								
				(0.30)		Firm yellow brown clay and chalk fill. MADE GROUND.								
				0.60		Firm orange brown silty CLAY. RIVER TERRACE DEPOSITS								
1.00	D			(0.85)								1		
1.20 - 1.60	U													
1.60 - 2.10	D			1.45		Firm brown slightly sandy gravelly CLAY. Sand is fine, Gravel is angular fine to coarse flint. RIVER TERRACE DEPOSITS								
2.10	SPT B	N=23 (6,9/6,5,5,7)		(1.45)								2		
3.00	SPT B	N=34 (7,9/7,8,9,10)		2.90		Orangish brown sandy GRAVEL. Gravel is angular to rounded fine to coarse flint. RIVER TERRACE DEPOSITS						3		
4.00	SPT B	N=33 (7,9/8,7,8,10)		(3.00)								4		
5.00	SPT B	N=36 (5,6/8,9,10,9)										5		
5.90 - 6.40	B			5.90		Firm stiff greenish grey silty sandy CLAY. Partially laminated pockets of clay. Becoming increasingly sandy with depth. LONDON CLAY FORMATION						6		
6.50	SPT D	N=22 (2,2/4,5,5,8)										7		
7.50	D													
8.00	SPT D	N=23 (2,3/4,6,6,7)		(5.40)								8		
9.00	D											9		
9.50 - 9.90	U													
9.90	D											10		
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
24-03-2021	15:00	15.00	11.50	14.80										
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
												0	0.00	
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

	Contract Name: Samson Gym				Client: Eastleigh Borough Council				Hole ID: BH1																					
	Contract Number: 19192		Start and End Date: 24/03/21		Logged By: DJ		Checked By: JD		Status: FINAL		Hole Type: BH																			
	Easting:		Northing:		Ground Level:		Plant Used: Dando 4000		Print Date: 14/05/2021		Scale: 1:50																			
Weather:			Termination:				SPT Hammer: N/R, Energy Ratio: N/R				Sheet 2 of 2																			
Samples & In Situ Testing					Strata Details							Groundwater																		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/ Installation																	
11.00	SPT D	N=20 (2,4/4,4,6,6)		11.30		Firm stiff greenish grey silty sandy CLAY. Partially laminated pockets of clay. Becoming increasingly sandy with depth. LONDON CLAY FORMATION						11																		
12.00	D											Stiff greenish grey silty sandy CLAY, Sand is fine, Clay is partially laminated. LONDON CLAY FORMATION						12												
12.50 - 12.85	U																	13												
12.85	D																							14						
13.50	D											15																		
14.00 - 14.35	U											16																		
14.35	D																17													
14.50	SPT D	N=33 (3,5/6,8,9,10)		15.00	End of Borehole at 15.00m												18													
																	19													
																							20							
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:																					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)																						
Chiselling					Installation				Water Strikes																					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks																
												0	0.00																	
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.																														

Project Name:	Samson Gym	Project No.	19192	Co-ords:		Hole Type	DP
Location:	Eastleigh	Level:	m AOD	Scale	1:50	Logged By	CF
Client:	Eastleigh Borough Council	Dates:	23/03/2021				

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0	3				5
0.1	4				
0.2	1				
0.3	1				
0.4	1				
0.5	1				
0.6	2				
0.7	5				
0.8	4				
0.9	6				
1	6				5
1.1	6				
1.2	6				
1.3	6				
1.4	6				
1.5	6				
1.6	7				
1.7	8				
1.8	8				
1.9	9				
2	8				10
2.1	8				
2.2	7				
2.3	8				
2.4	6				
2.5	8				
2.6	10				
2.7	9				
2.8	11				
2.9	13				
3	17				25
3.1	16				
3.2	15				
3.3	16				
3.4	12				
3.5	13				
3.6	14				
3.7	10				
3.8	10				
3.9	10				
4	12				25
4.1	11				
4.2	15				
4.3	15				
4.4	11				
4.5	11				
4.6	13				
4.7	8				
4.8	7				
4.9	4				
5	6				30
5.1	4				
5.2	4				
5.3	3				
5.4	2				
5.5	3				
5.6	4				
5.7	10				
5.8					
5.9					
6					
6.1					
6.2					
6.3					
6.4					
6.5					
6.6					
6.7					
6.8					
6.9					
7					
7.1					
7.2					
7.3					
7.4					
7.5					
7.6					
7.7					
7.8					
7.9					
8					
8.1					
8.2					
8.3					
8.4					
8.5					
8.6					
8.7					
8.8					
8.9					
9					
9.1					
9.2					
9.3					
9.4					
9.5					
9.6					
9.7					
9.8					
9.9					
10					
Remarks		Fall Height 760mm	Cone Base Diameter 5.3mm		
		Hammer Weight 63.5kg	Final Depth 6m		
		Probe Type	Energy Ratio (Er) 80.28%		

Project Name:	Samson Gym	Project No.	19192	Co-ords:		Hole Type	DP
Location:	Eastleigh	Level:	m AOD	Scale	1:50	Logged By	CF
Client:	Eastleigh Borough Council	Dates:	23/03/2021				

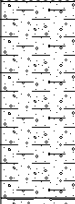
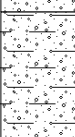
Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	

Project Name:	Samson Gym	Project No.	19192	Co-ords:		Hole Type	DP
Location:	Eastleigh	Level:	m AOD	Scale	1:50	Logged By	CF
Client:	Eastleigh Borough Council	Dates:	23/03/2021				

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
1	4 4 5 2 3 1 1 2 2 1 1 2 5 6 5 5 4 3 7 10 12 12 10 9 10 9 7 6 7 9 7 3 2 1 6 7 10 8 9 12 11 10 11 8				5
2	3 4 5 5 6 7 10 12 12 10 9 10 9 7 6 7 9 7 3 2 1 6 7 10 8 9 12 11 10 11 8				5
3	2 3 1 6 7 10 8 9 12 11 10 11 8				10
4	2 3 3 3 4 4 3 3 2 3 4 4 4 4 3				25
5	3				25
6					30
7					
8					
9					
10					
Remarks	Fall Height	760mm	Cone Base Diameter	5.3mm	
	Hammer Weight	63.5kg	Final Depth	6m	
	Probe Type		Energy Ratio (Er)	%	

		Soils Limited Newton House, Cross Road, Tadworth KT20 5SR Tel: 01737 814221 Email: admin@soilslimited.co.uk			Trial Pit Log		Trial Pit No. TPSA1 Sheet 1 of 1	
Project Name: Samson Gym				Project No.: 19192		Method: Machine Excavated		Hole Type TP
Location: Eastleigh						Plant: JCB		
Client: Eastleigh Borough Council				Trial Pit Length: m		Trial Pit Width: m		Scale 1:25
Dates: 22/03/2021				Level:		Co-ords:		Logged By CF
Water Strike	Samples & In Situ Testing			Depth (m)	Level (mAOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.05			Tarmac. MADE GROUND	
				0.10			Pinkish grey fine to medium limestone GRAVEL. MADE GROUND.	
	0.30	D					Dark brown slightly sandy cobbley gravelly CLAY. Gravel is angular to sub rounded, fine to coarse, flint, brick, concrete and breeze block. Cobble is angular to sub rounded, breeze block and concrete. Occasional rootlets. MADE GROUND	
	0.60	D		0.50			Dark orangish brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular to sub-rounded, fine to coarse flint. RIVER TERRACE DEPOSITS	
	0.90	D						
	1.50	D		1.60			End of Pit at 1.600m	
General Remarks:								Sample Type D: Disturbed B: Bulk J: Jar W: Water
Groundwater Remarks: No groundwater encountered								

	Contract Name: Samson Gym				Client: Eastleigh Borough Council				Hole ID: WS1					
	Contract Number: 19192		Start and End Date: 23/03/21		Logged By: CF		Checked By: JD		Status: FINAL		Hole Type: WS			
	Easting:		Northing:		Ground Level:		Plant Used: Archway		Print Date: 14/05/2021		Scale: 1:50			
Weather:			Termination:					Sheet 1 of 1						
Samples & In Situ Testing				Strata Details								Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/ Installation	
0.20	D			0.10		Tarmac. MADE GROUND	1			2				
ES				0.35		Red angular to sub rounded, fine to coarse, brick GRAVEL. MADE GROUND.								
D				0.50		Soft, dark greyish brown slightly sandy, slightly gravelly CLAY. Gravel is sub angular to sub rounded, fine, flint and occasional brick. Frequent black staining. MADE GROUND.								
ES				(0.50)		Soft orangish brown slightly sandy, slightly gravelly CLAY. Gravel is sub angular to sub rounded, fine to medium, flint. Occasional rootlets. RIVER TERRACE DEPOSITS								
0.80	D			1.00		Orangish brown slightly sandy, very clayey GRAVEL. Gravel is sub angular to sub rounded fine to coarse flint. Occasional rootlets. RIVER TERRACE DEPOSITS								
ES				(0.70)										
1.30	D			1.70		Yellowish brown slightly clayey, sandy GRAVEL. Gravel is sub angular to sub rounded, fine to coarse, flint. RIVER TERRACE DEPOSITS								
ES				(2.30)										
1.80	D			4.00										
2.20	D													
2.70	D													
3.20	D													
3.70	D													
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.00	PLAIN	50				0	0.00	No groundwater encountered
					1.00	3.70	SLOTTED	50						
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

	Contract Name: Samson Gym				Client: Eastleigh Borough Council				Hole ID: WS2					
	Contract Number: 19192		Start and End Date: 23/03/21		Logged By: CF		Checked By: JD		Status: FINAL		Hole Type: WS			
	Easting:		Northing:		Ground Level:		Plant Used: Archway		Print Date: 14/05/2021		Scale: 1:50			
Weather:			Termination:					Sheet 1 of 1						
Samples & In Situ Testing					Strata Details							Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation	
0.40	D ES			0.10		Tarmac. MADE GROUND								
				0.30		Red angular to sub rounded, fine to coarse, brick GRAVEL. MADE GROUND.								
0.80	D ES			(1.30)		Soft to firm, orangish brown slightly sandy, slightly gravelly CLAY. Gravel is sub angular to sub rounded, fine to medium, flint. Occasional rootlets. RIVER TERRACE DEPOSITS						1		
1.30	D ES													
1.70	D ES			1.60		Orangish brown slightly sandy, very clayey GRAVEL. Gravel is sub angular to sub rounded, fine to coarse flint, Occasional rootlets. Strong organic odour. RIVER TERRACE DEPOSITS						2		
2.30	D ES			(0.70)										
2.70	D ES			2.30		Yellowish brown slightly clayey, sandy, sub angular to sub rounded, fine to coarse, flint GRAVEL. Strong organic odour. RIVER TERRACE DEPOSITS						3		
3.30	D ES			(1.70)										
3.70	D ES			4.00	End of Borehole at 4.00m						4			
												5		
												6		
												7		
												8		
												9		
												10		
Start & End of Shift Observations				Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)							Dia (mm)
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.00	PLAIN	50				0	0.00	No groundwater encountered
					1.00	3.90	SLOTTED	50						
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

	Contract Name: Samson Gym				Client: Eastleigh Borough Council				Hole ID: WS4					
	Contract Number: 19192		Start and End Date: 23/03/21		Logged By: CF		Checked By: JD		Status: FINAL		Hole Type: WS			
	Easting:		Northing:		Ground Level:		Plant Used: Archway		Print Date: 14/05/2021		Scale: 1:50			
Weather:			Termination:					Sheet 1 of 1						
Samples & In Situ Testing					Strata Details							Groundwater		
Depth	Type	Results	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description						Water Strike	Backfill/Installation	
0.40	D ES			0.20		Concrete slab. MADE GROUND								
				(0.30)		Loosely cemented CONCRETE. MADE GROUND.								
0.70	D ES			0.50		Soft to firm, orangish brown slightly sandy, slightly gravelly CLAY. Gravel is sub angular to sub rounded, fine to medium, flint. Occasional rootlets. RIVER TERRACE DEPOSITS						1		
1.20	D ES			(0.90)										
1.70	D ES			1.40		Orangish brown slightly sandy, very clayey, GRAVEL. Gravel is sub angular to sub rounded, fine to coarse flint. Occasional rootlets. RIVER TERRACE DEPOSITS						2		
2.20	D			(0.70)										
2.70	D			2.10		Yellowish brown slightly clayey, sandy, sub angular to sub rounded, fine to coarse, flint GRAVEL. Slight organic odour. RIVER TERRACE DEPOSITS						3		
3.20	D ES			(1.90)										
3.70	D ES			4.00		End of Borehole at 4.00m						4		
												5		
												6		
												7		
												8		
												9		
												10		
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:					
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)						
Chiselling					Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks
					0.00	1.00	PLAIN	50				0	0.00	No groundwater encountered
					1.00	3.80	SLOTTED	50						
Hand vane (HV), Hand penetrometer (HP) reported in kPa. PID reported in ppm.														

Appendix C Geotechnical In-Situ and Laboratory Testing

Appendix C.1 Classification

Classification based on SPT “N” values:

The inferred undrained strength of the cohesive soils was based on the SPT “N” blow counts, derived from the relationship suggested by Stroud (1974) and classified using Table C.1.1. (Ref: Stroud, M. A. 1974, “The Standard Penetration Test – its application and interpretation”, Proc. ICE Conf. on Penetration Testing in the UK, Birmingham. Thomas Telford, London.).

Table C.1.1 SPT “N” Blow Count Cohesive Classification

Classification	Undrained Cohesive Strength C_u (kPa)
Extremely low	<10
Very low	10 – 20
Low	20 – 40
Medium	40 – 75
High	75 – 150
Very high	150 – 300
Extremely high	> 300
Note(s): (Ref: BS EN ISO 14688-2:2004+A1:2013 Clause 5.3.)	

The relative density of granular soils was classified based of the relationship given in Table C.1.2.

The *UK National Annex to Eurocode 7: Geotechnical design – Part 2: Ground investigation and testing, NA 3.7 SPT test, BS EN 1997-2:2007, Annex F* states “Relative density descriptions on borehole records should also be based on uncorrected SPT N values, unless significantly disturbed, using the density classification in BS 5930:2015, Table 7.

Table C.1.2 SPT “N” Blow Count Granular Classification

Classification	SPT “N” blow count (blows/300mm)
Very loose	0 to 4
Loose	4 to 10
Medium dense	10 to 30
Dense	30 to 50
Very dense	Greater than 50
Note(s): (Ref: The Standard Penetration Test (SPT): Methods and Use, CIRIA Report 143, 1995)	

Appendix C.2 Interpretation**Table C.2.1 Interpretation of SPT Tests**

BH	Strata	SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
BHI	RTD 0.60 – 2.90 CLAY	26	High (Cu = 130kPa)
	RTD 2.90 – 5.90 GRAVEL	38 – 41	Dense
	LC 5.90 – 15.00 CLAY	25 – 38	High to very high (Cu = 125 – 190kPa)

Table C.2.2 Interpretation of DPSH Blow Counts

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DPI	RTD 0.65 – 1.10 CLAY	4 – 8	Low (Cu = 20 – 40kPa)
	RTD 1.10 – 3.10 GRAVEL	19 – 35	Medium dense to dense
	RTD ¹ 3.10 – 5.20 ¹ GRAVEL	39 – >50	Dense to very dense
	LC 5.20 ¹ – 6.00 ¹ CLAY	8 – 15	Medium (Cu = 40 – 75kPa)
DP2	RTD 0.50 – 1.50 CLAY	4 – 8	Low (Cu = 20 – 40kPa)
	RTD 1.50 – 2.10 SAND	15 – 23	Medium dense
	RTD 2.10 – 3.40 GRAVEL	23 – 50	Medium dense to dense
	RTD 3.40 – 3.70 CLAY	4 – 8	Low (Cu = 20 – 40kPa)
	RTD 3.70 – 4.60 ¹ GRAVEL	27 – 42	Medium dense to dense
	LC 4.60 ¹ – 6.00 ¹ CLAY	8 – 15	Medium (Cu = 40 – 75kPa)

DP	Strata	Equivalent SPT N60 Blow Counts	Inferred Cohesive Strength/Granular Density
DP4	RTD 0.60 – 1.50 CLAY	4 – 8	Low (Cu = 20 – 40kPa)
	RTD 1.50 – 2.10 SAND	15 – 19	Medium dense
	RTD 2.10 – 3.40 GRAVEL	27 – 46	Medium dense to dense
	RTD 3.40 – 3.70 CLAY	4 – 12	Low to medium (Cu = 20 – 60kPa)
	RTD 3.70 – 4.70 ¹ GRAVEL	27 – 42	Medium dense to dense
	LC 4.70 ¹ – 6.00 ¹ CLAY	8 – 12	Medium (Cu = 40 – 60kPa)
DPI01	RTD 1.20 – 2.30 CLAY	4 - 39	Low to very high (Cu = 20 – 195kPa)
	RTD 2.30 – 4.80 ¹ SAND/GRAVEL	26 - 78	Medium dense to very dense
	LC 4.80 ¹ – 6.00 ¹ CLAY	9-22	Medium to high (Cu = 45 – 110kPa)
DPI02	RTD 0.45 – 1.30 CLAY	0 - 4	Extremely low to low (Cu = <10 – 20kPa)
	RTD 1.30 – 2.20 CLAY	9 - 43	Medium to very high (Cu = 45 – 215kPa)
	RTD 2.20 – 6.00 ¹ SAND/GRAVEL	26 – 78	Medium dense to very dense
DPI03	RTD 0.40 – 1.95 CLAY	4 - 30	Low to medium (Cu = 20 – 150kPa)
	RTD 1.95 – 6.00 ¹ SAND/GRAVEL	22 – 74	Medium dense to very dense
DPI04	RTD 0.30 – 1.80 CLAY	9 – 35	Medium to high (Cu = 45 – 175kPa)
	RTD 1.80 – 4.00 SAND/GRAVEL	13 - 82	Medium dense to very dense
	LC 4.00 ¹ – 6.00 ¹ CLAY	9 - 22	Medium to high (Cu = 45 – 110kPa)
Note: ¹ Ground conditions inferred past the base of windowless sampler boreholes.			

Table C.2.3 Interpretation of QUU Tests

Location	Stratum	Sample Depth (m bgl)	Moisture Content (%)	Soil Strength	Shear Strength (kPa)
BHI	LC	9.50 – 9.95	24	Medium	42
BHI	LC	12.50 – 12.85	26	High	125
BHI	LC	14.00 – 14.35	23	Very high	166

Table C.2.4 Interpretation of Atterberg Limit Tests

Stratum	Moisture Content (%)	Plasticity Index (%)	Passing 425µm Sieve (%)	Modified Plasticity Index (%)	Soil Classification	Volume Change Potential	
						BRE	NHBC
RTD	15 – 22	21 – 24	72 – 100	17 – 23	CI	Low to medium	Low to medium
LCF	29	35	100	35	CH	Medium	Medium

Note: BRE Volume Change Potential refers to BRE Digest 240 (based on Atterberg results)

NHBC Volume Change Potential refers to NHBC Standards Chapter 4.2

Soils Classification based on British Soil Classification System

The most common use of the term clay is to describe a soil that contains enough clay-sized material or clay minerals to exhibit cohesive properties. The fraction of clay-sized material required varies, but can be as low as 15%. Unless stated otherwise, this is the sense used in Digest 240. The term can be used to denote the clay minerals. These are specific, naturally occurring chemical compounds, predominately silicates. The term is often used as a particle size descriptor. Soil particles that have a nominal diameter of less than 2 µm are normally considered to be of clay size, but they are not necessarily clay minerals. Some clay minerals are larger than 2 µm and some particles, 'rock flour' for example, can be finer than 2 µm but are not clay minerals.

(The Atterberg Limit Tests were undertaken in accordance with BS 1377:Part 2:1990 Clauses 3.2, 4.3 and 5)

Table C.2.5 Interpretation of PSD Tests

Location	Depth (m bgl)	Soil Description	Volume Change Potential		Passing 63µm Sieve (%)
			BRE	NHBC	
WS1	1.30	Dark brown clayey/silty fine to coarse sandy fine to coarse GRAVEL.	No	No	13
WS2	2.30	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL.	No	No	6
WS4	1.70	Dark brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL.	No	No	9
BHI	3.00	Light brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL.	No	No	8

Note: BRE 240 states that a soil has a volume change potential when the clay fraction **exceeds 15%**. Only the silt and clay combined fraction are determined by sieving therefore the volume change potential is estimated from the percentage passing the 63µm sieve. NHBC Standards Chapter 4.2 states that a soil is shrinkable if the percentage of silt and clay passing the 63µm sieve is greater than 35% and the Plasticity Index is greater than 10%.

(The Particle Size Distribution Tests were undertaken in accordance with BS 1377: Part 2: 1990 Clause 9)

Appendix C.3 Geotechnical In-Situ and Laboratory Results

Soakaway Calculations

Soakaway Test No.	TPSA1 Test 1
Contract:	Samsons Gym
Contract No.	19192

Field Test

Trial Pit Log (include details of groundwater):

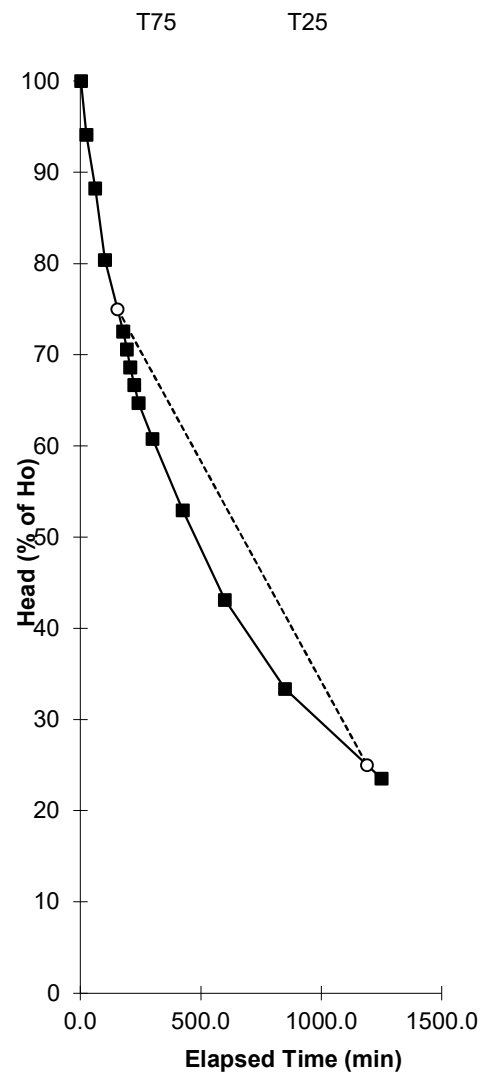
See trial Pit record

Depth of Pit	1.57 m
Width of Pit	0.45 m
Length of Pit	1.20 m
Depth of Pit Soaked	0.51 m
ap50	1.3815 m ²
Vp75-25	0.1377 m ³
t75-25	1035.5 min
water used	0.2754 m ³
f	1.604E-06 m/sec.

Field Data

Depth to Water (m)	Elapsed Time (min)	Head of Water (% of Ho)	Head of Water (m)
1.06	0	100	0.51
1.06	2.4	100	0.51
1.09	24.7	94	0.48
1.12	61.8	88	0.45
1.16	102.1	80	0.41
1.20	178.2	73	0.37
1.21	193.0	71	0.36
1.22	206.7	69	0.35
1.23	223.5	67	0.34
1.24	241.2	65	0.33
1.26	300.0	61	0.31
1.30	425.0	53	0.27
1.35	600.0	43	0.22
1.40	850.0	33	0.17
1.45	1250.0	24	0.12

T75	154.458	75
T25	1190.000	25
T75-25	1035.542	Derived from Best Fit



Comments

extrapolated after 241.2 minutes.

SOILS LIMITED

Newton House, Cross Road, Tadworth
Surrey, KT20 5SR

Telephone: 01737 814 221

Facsimile: 01737 812 557



Contract Number: 53405

Client Ref: **19192**

Report Date: **26-04-2021**

Client PO:

Client **Soils Limited**
Newton House
Cross Road
Tadworth
Surrey
KT20 5SR

Contract Title: **19192 - Samsons Gym**
For the attention of: **Tom Rees-Blanchard**

Date Received: **15-04-2021**

Date Completed: **26-04-2021**

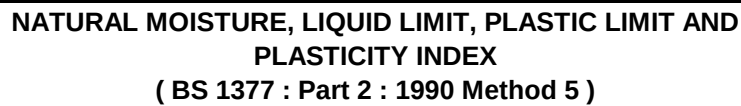
Test Description	Qty
Samples Received - @ Non Accredited Test	11
Moisture Content of Soil BS1377 : Part 2 : Clause 3.2 : 1990 - * UKAS	4
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	4
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	4
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	3
Disposal of samples for job	1

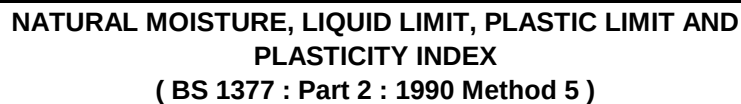
Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager)
Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

[illegible]





**PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2**

Contract Number **53405**

Borehole/Pit No. **WS1**

Site Name **19192 - Samsons Gym**

Sample No.

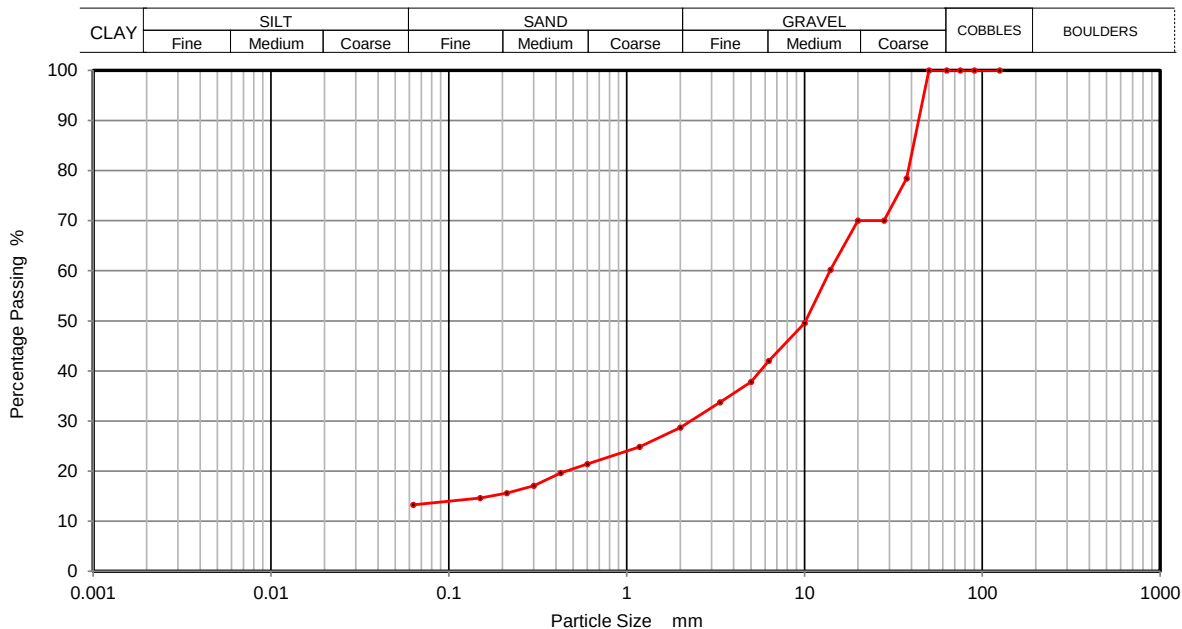
Soil Description **Dark brown clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **1.30**

Depth Base

Date Tested **23/04/2021**

Sample Type **D**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	78		
28	70		
20	70		
14	60		
10	50		
6.3	42		
5	38		
3.35	34		
2	29		
1.18	25		
0.6	21		
0.425	20		
0.3	17		
0.212	16		
0.15	15		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	71
Sand	16
Silt and Clay	13

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2021	Richard John	
David	Approved	26/04/2021	Paul Evans	





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number

53405

Borehole/Pit No.

WS2

Site Name

19192 - Samsons Gym

Sample No.

Soil Description

Brown slightly clayey/silty fine to coarse sandy fine to coarse
GRAVEL

Depth Top

2.30

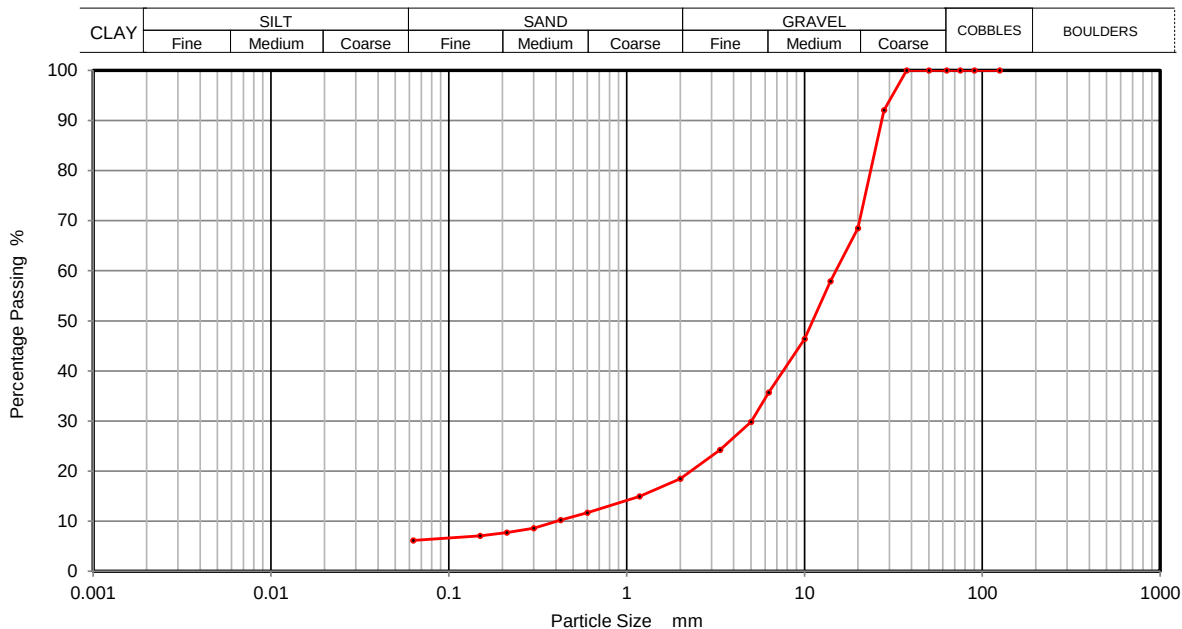
Depth Base

Date Tested

23/04/2021

Sample Type

D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	68		
14	58		
10	46		
6.3	36		
5	30		
3.35	24		
2	18		
1.18	15		
0.6	12		
0.425	10		
0.3	9		
0.212	8		
0.15	7		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	82
Sand	12
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2021	Richard John
David	Approved	26/04/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number **53405**

Borehole/Pit No. **WS4**

Site Name **19192 - Samsons Gym**

Sample No.

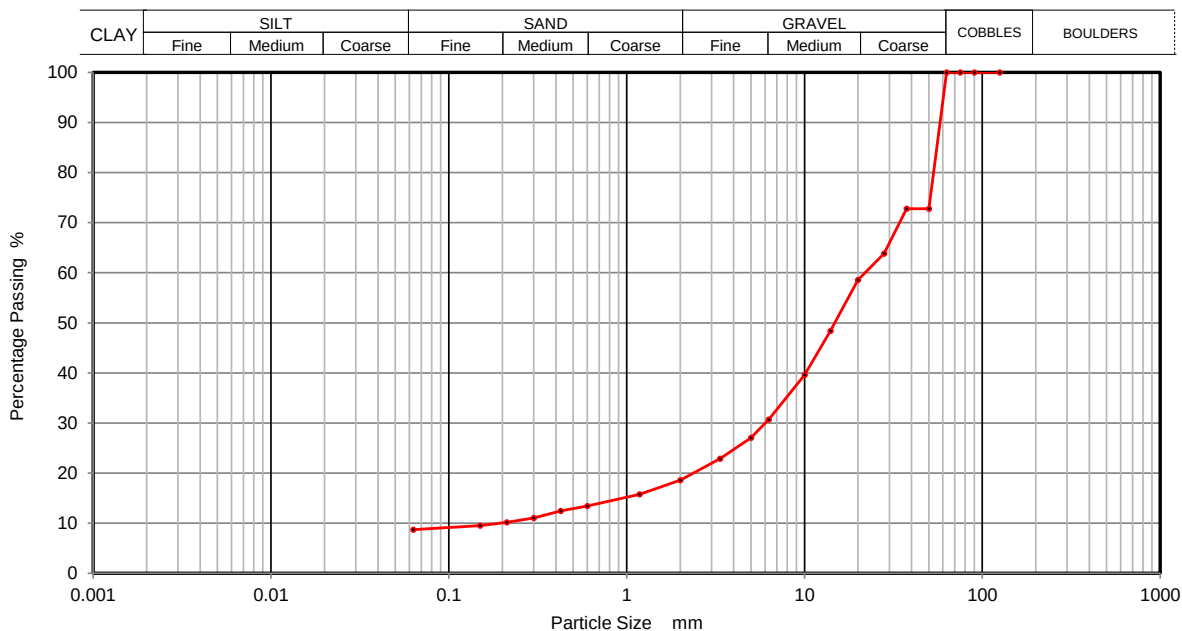
Soil Description **Dark brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL**

Depth Top **1.70**

Depth Base

Date Tested **23/04/2021**

Sample Type **D**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	73		
37.5	73		
28	64		
20	59		
14	48		
10	40		
6.3	31		
5	27		
3.35	23		
2	19		
1.18	16		
0.6	13		
0.425	12		
0.3	11		
0.212	10		
0.15	10		
0.063	9		

Sample Proportions	% dry mass
Cobbles	0
Gravel	81
Sand	10
Silt and Clay	9

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2021	Richard John
David	Approved	26/04/2021	Paul Evans



2788



PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number

53405

Borehole/Pit No.

BH1

Site Name

19192 - Samsons Gym

Sample No.

Soil Description

Light brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL

Depth Top

3.00

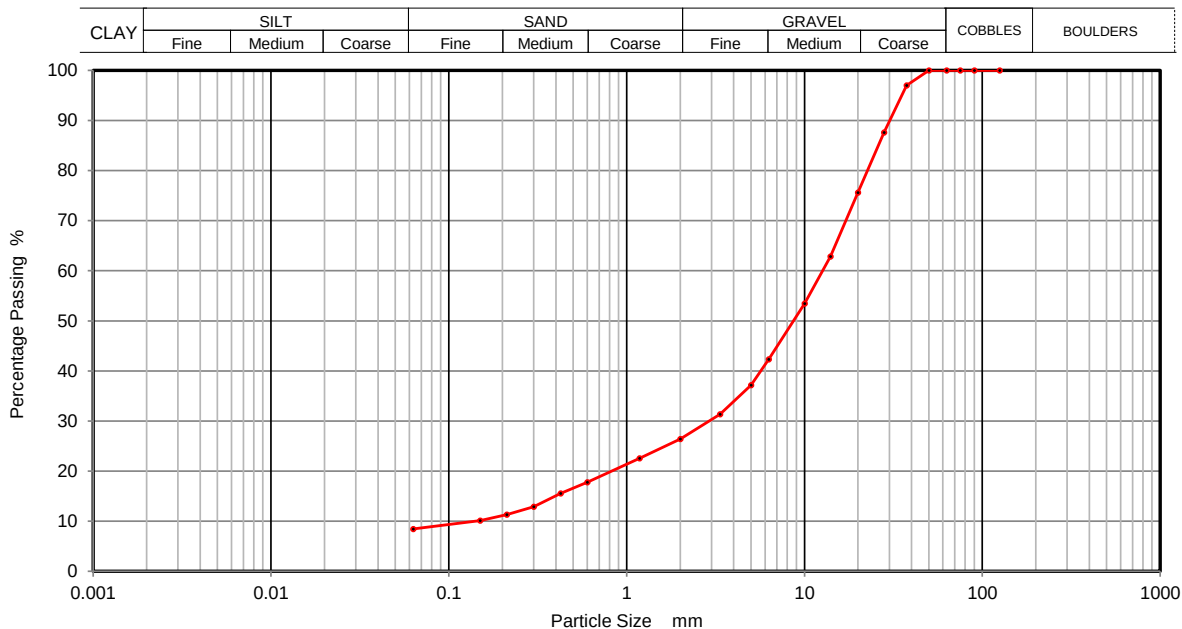
Depth Base

Date Tested

23/04/2021

Sample Type

B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	88		
20	76		
14	63		
10	53		
6.3	42		
5	37		
3.35	31		
2	26		
1.18	23		
0.6	18		
0.425	16		
0.3	13		
0.212	11		
0.15	10		
0.063	8		

Sample Proportions	% dry mass
Cobbles	0
Gravel	74
Sand	18
Silt and Clay	8

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	25/04/2021	Richard John
David	Approved	26/04/2021	Paul Evans





Single Stage Unconsolidated-Undrained Triaxial Test
BS 1377 : 1990 Part 7 : 8

Contract Number 53405

Borehole/Pit No. BH1

Site Name 19192 - Samsons Gym

Sample No.

Soil Description Grey sandy silty CLAY

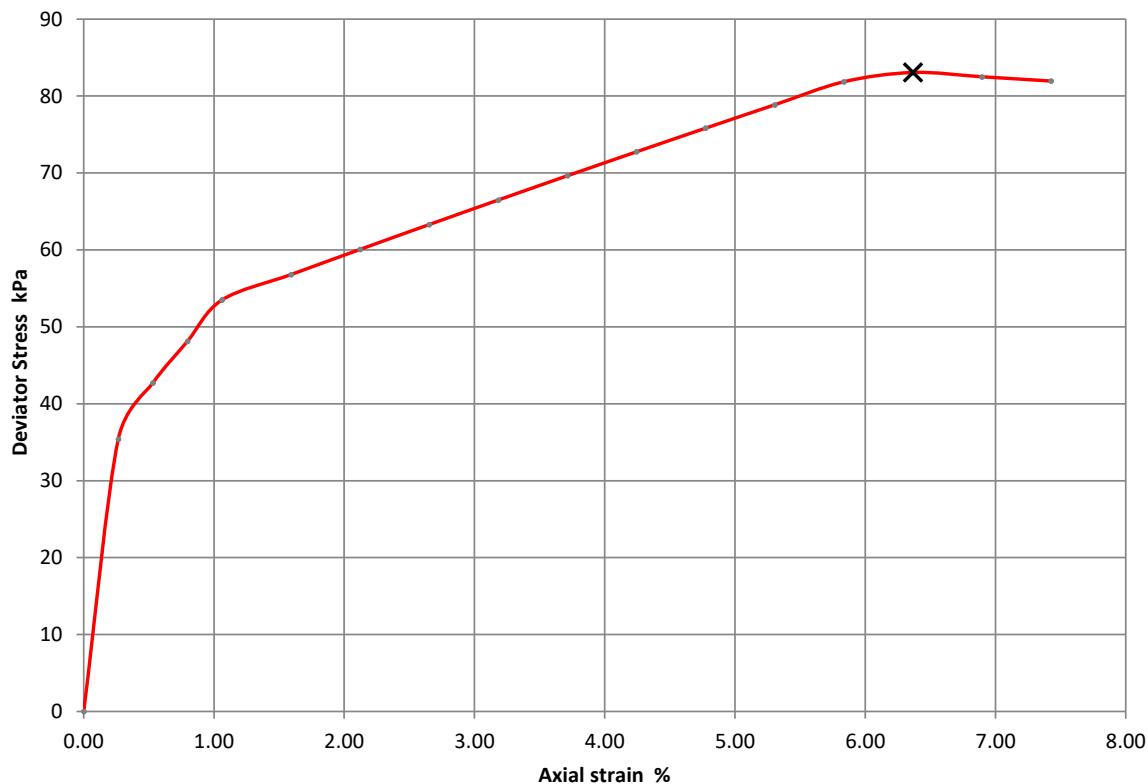
Depth Top (m) 9.50

Depth Base (m) 9.95

Date Tested 22/04/2021

Sample Type U

Technician Daniel



Moisture Content (%)	24
Bulk Density (Mg/m ³)	1.94
Dry Density (Mg/m ³)	1.57
Specimen Length (mm)	188.5
Specimen Diameter (mm)	105.1
Cell Pressure (kPa)	170
Deviator Stress (kPa)	83
Undrained Shear Strength (kPa)	42
Failure Strain (%)	6
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.59

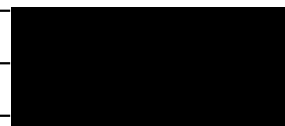
Specimen Post Test



Sample Split



Checked	25/04/2021	Richard John
Approved	26/04/2021	Paul Evans





**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number 53405

Borehole/Pit No. BH1

Site Name 19192 - Samsons Gym

Sample No.

Soil Description Grey sandy silty CLAY

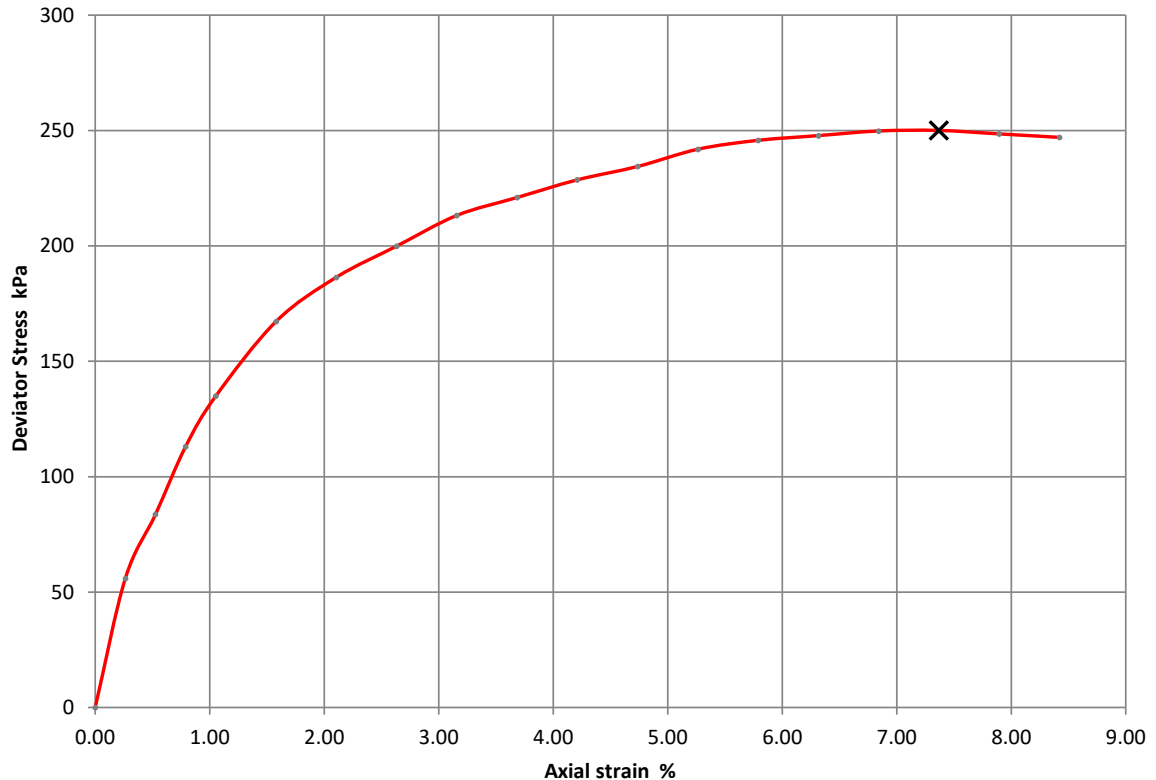
Depth Top (m) 12.50

Depth Base (m) 12.85

Date Tested 22/04/2021

Sample Type U

Technician Daniel



Moisture Content (%)	26
Bulk Density (Mg/m ³)	1.92
Dry Density (Mg/m ³)	1.53
Specimen Length (mm)	190
Specimen Diameter (mm)	105.1
Cell Pressure (kPa)	225
Deviator Stress (kPa)	250
Undrained Shear Strength (kPa)	125
Failure Strain (%)	7
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.58

Specimen Post Test



Sample Split



Checked	25/04/2021	Richard John
Approved	26/04/2021	Paul Evans





**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number 53405

Borehole/Pit No. BH1

Site Name 19192 - Samsons Gym

Sample No.

Soil Description Grey sandy silty CLAY

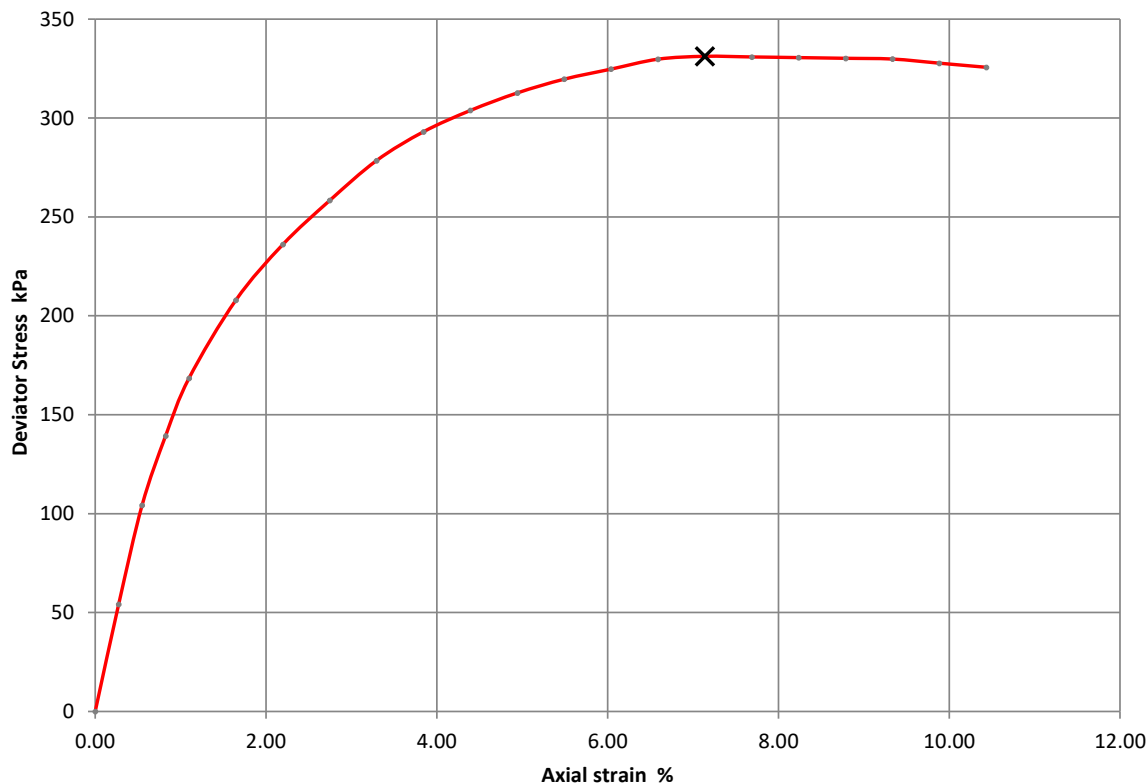
Depth Top (m) 14.00

Depth Base (m) 14.35

Date Tested 22/04/2021

Sample Type U

Technician Daniel



Moisture Content (%)	23
Bulk Density (Mg/m ³)	1.94
Dry Density (Mg/m ³)	1.58
Specimen Length (mm)	182.1
Specimen Diameter (mm)	105
Cell Pressure (kPa)	250
Deviator Stress (kPa)	331
Undrained Shear Strength (kPa)	166
Failure Strain (%)	7
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.65

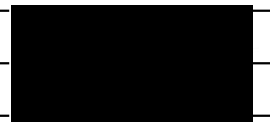
Specimen Post Test



Sample Split



Checked	25/04/2021	Richard John
Approved	26/04/2021	Paul Evans

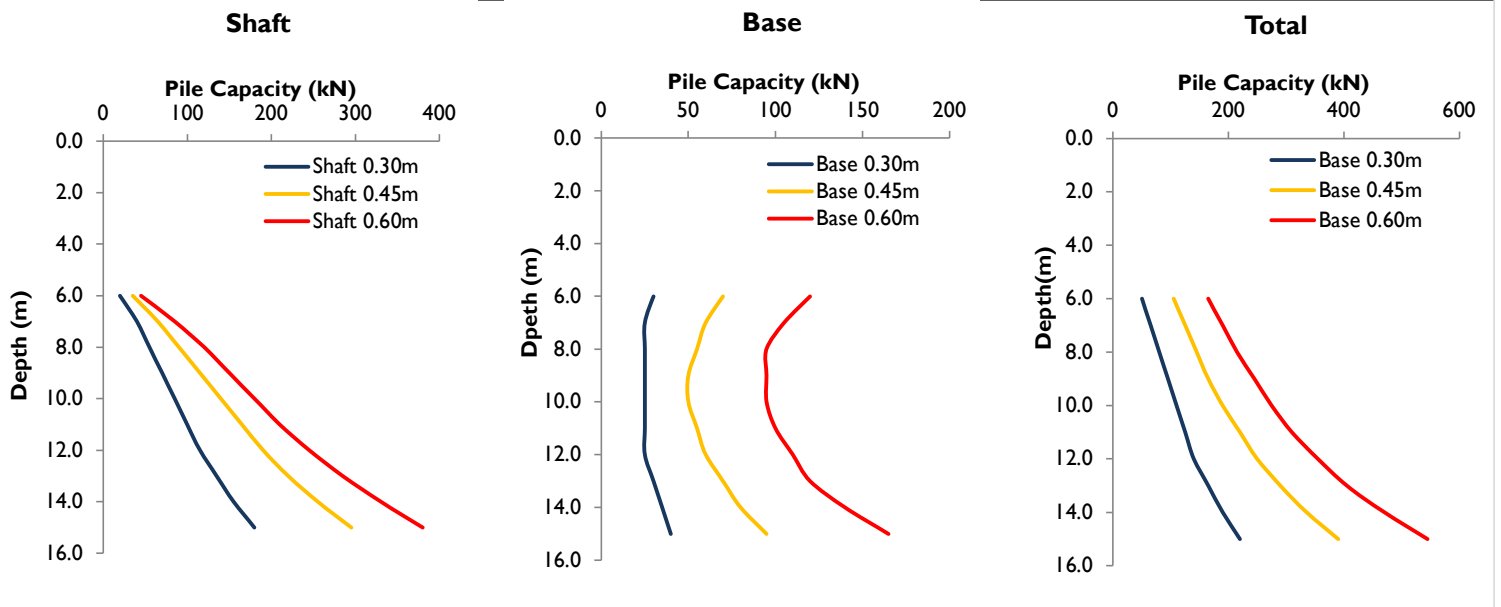


Appendix D Foundation Design

Appendix D.1 Preliminary Pile Design

Preliminary Pile Working Loads
Single Vertically Loaded Pile (kN)

Name:	TRB	N_C value	9	Pile Start Depth:	5	FOS	
Job No:	19192	α value:	0.45	Pile Final Depth:	15	Shaft	Base
Date:	1.5.21			Pile Increment:	1	3	3



Pile Diameter (m):									
0.30			0.45			0.60			
Pile Depths	Shaft	Base	Total	Shaft	Base	Total	Shaft	Base	Total
(m bgl)									
5.0									
6.0	20	30	50	35	70	105	45	120	165
7.0	40	25	65	65	60	125	85	105	190
8.0	55	25	80	90	55	145	120	95	215
9.0	70	25	95	115	50	165	150	95	245
10.0	85	25	110	140	50	190	180	95	275
11.0	100	25	125	165	55	220	210	100	310
12.0	115	25	140	190	60	250	245	110	355
13.0	135	30	165	220	70	290	285	120	405
14.0	155	35	190	255	80	335	330	140	470
15.0	180	40	220	295	95	390	380	165	545

Appendix E Chemical Laboratory Analyses

Appendix E.I Conceptual Site Model

Table E.I.I CSM Revised Pre-Chemical Analyses

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Desk Study and Main Investigation Report Information			Comments	Proposed Investigation
				Severity	Probability	Risk		
Made Ground/Car park On-site historic and current site usage.	Metals, Semi-metals and non-metals, PAHs, TPHs, MTBE and BTEX, Asbestos, pH	Inhalation of dust	Site Workers/Site Maintenance	Mild	Low	Low	The site is located on Unproductive strata of the London Clay Formation, rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.	Chemical testing prior to undertaking a generic quantitative risk assessment.
			End Users	Mild	Unlikely	Very low		
			Off-site Users	Mild	Unlikely	Very low		
	PAHs, TPHs, MTBE and BTEX	Inhalation of vapour/gases (including Radon)	Site Workers/Site Maintenance	Mild	Low	Low	Superficial River Terrace Deposits classified as Secondary A Aquifer which support shallow groundwater flow.	There was no groundwater observed in both investigations.
			End Users	Mild	Unlikely	Very low		
			Off-site Users	Mild	Unlikely	Very low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, MTBE and BTEX, Asbestos, pH	Ingestion and absorption via direct contact	Site Workers/Site Maintenance	Mild	Low	Low		
			End Users	Mild	Unlikely	Very low		
	Metals, Semi-metals and non-metals, PAHs, TPHs, MTBE and BTEX, Asbestos, pH	Migration via surface runoff	Surface Water	Mild	Low	Low		
		Migration in solution via groundwater	Surface Water	Mild	Low	Low		
			Shallow Aquifer	Mild	Low	Low		
		Direct contact with construction material	Buried Structures	Mild	Low	Low		
			Buried Services					

Table E.1.2 CSM Revised Post-Chemical Analyses

Source	Potential Contaminant	Exposure Pathway	Receptor	Initial Assessment from Desk Study and Main Investigation Report Information			Comments	Proposed Investigation
				Severity	Probability	Risk		
None								None required, subject to local authority approval.

Appendix E.2 Chemical Laboratory Results



Tom Rees-Blanchard
Soils Ltd
Thomas Telford House - Unit 11
Sun Valley Business Park
Winnall Close
Winchester
SO23 0LB

DETS Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 21-04413

Site Reference: Samson's Gym

Project / Job Ref: 19192

Order No: 19192

Sample Receipt Date: 07/04/2021

Sample Scheduled Date: 07/04/2021

Report Issue Number: 1

Reporting Date: 13/04/2021

Authorised by:



Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

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DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Samson's Gym	TP / BH No	WS1	WS1	WS1	WS2	WS2
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 19192	Depth (m)	0.20	0.40	0.80	0.40	3.30
Reporting Date: 13/04/2021	DETS Sample No	535985	535986	535987	535988	535989

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.6	8.1	8.0	7.9	8.1
Organic Matter	%	< 0.1	MCERTS	1	1.3	< 0.1	0.8	0.1
Arsenic (As)	mg/kg	< 2	MCERTS	2	6	5	5	< 2
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	5	13	21	19	4
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	4	12	9	7	< 4
Lead (Pb)	mg/kg	< 3	MCERTS	43	33	11	11	< 3
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	< 3	10	16	14	< 3
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Vanadium (V)	mg/kg	< 1	MCERTS	4	19	29	27	4
Zinc (Zn)	mg/kg	< 3	MCERTS	43	41	38	40	5
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied			
Soils Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Samson's Gym	TP / BH No	WS4	WS4			
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied			
Order No: 19192	Depth (m)	0.70	1.20			
Reporting Date: 13/04/2021	DETS Sample No	535990	535991			

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected			
pH	pH Units	N/a	MCERTS	8.1	8.0			
Organic Matter	%	< 0.1	MCERTS	0.2	0.6			
Arsenic (As)	mg/kg	< 2	MCERTS	5	7			
W/S Boron	mg/kg	< 1	NONE	< 1	< 1			
Cadmium (Cd)	mg/kg	< 0.2	NONE	< 0.2	< 0.2			
Chromium (Cr)	mg/kg	< 2	MCERTS	21	23			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	9	11			
Lead (Pb)	mg/kg	< 3	MCERTS	10	12			
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1			
Nickel (Ni)	mg/kg	< 3	MCERTS	17	26			
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3			
Vanadium (V)	mg/kg	< 1	MCERTS	28	31			
Zinc (Zn)	mg/kg	< 3	MCERTS	38	45			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Rose Lane
Lenham Heath
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Kent ME17 2JN
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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Samson's Gym	TP / BH No	WS1	WS1	WS1	WS2	WS2
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 19192	Depth (m)	0.20	0.40	0.80	0.40	3.30
Reporting Date: 13/04/2021	DETS Sample No	535985	535986	535987	535988	535989

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.32	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.29	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.12	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.18	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.19	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.14	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6



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Maidstone
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Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied			
Soils Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Samson's Gym	TP / BH No	WS4	WS4			
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied			
Order No: 19192	Depth (m)	0.70	1.20			
Reporting Date: 13/04/2021	DETS Sample No	535990	535991			

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6		



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Rose Lane
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Tel : 01622 850410



Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Samson's Gym	TP / BH No	WS1	WS1	WS1	WS2	WS2
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 19192	Depth (m)	0.20	0.40	0.80	0.40	3.30
Reporting Date: 13/04/2021	DETS Sample No	535985	535986	535987	535988	535989

Determinand	Unit	RL	Accreditation					
EPH Texas (C6 - C8)	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
EPH Texas (>C8 - C10)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	2
EPH Texas (>C10 - C12)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	5
EPH Texas (>C12 - C16)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH Texas (>C16 - C21)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	6
EPH Texas (>C21 - C40)	mg/kg	< 6	MCERTS	12	< 6	< 6	< 6	16
EPH Texas (C6 - C40)	mg/kg	< 6	NONE	12	< 6	< 6	< 6	29



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Soil Analysis Certificate - EPH Texas Banded						
DETS Report No: 21-04413	Date Sampled	None Supplied	None Supplied			
Soils Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Samson's Gym	TP / BH No	WS4	WS4			
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied			
Order No: 19192	Depth (m)	0.70	1.20			
Reporting Date: 13/04/2021	DETS Sample No	535990	535991			

Determinand	Unit	RL	Accreditation				
EPH Texas (C6 - C8)	mg/kg	< 0.05	NONE	< 0.05	< 0.05		
EPH Texas (>C8 - C10)	mg/kg	< 1	MCERTS	< 1	< 1		
EPH Texas (>C10 - C12)	mg/kg	< 1	MCERTS	< 1	< 1		
EPH Texas (>C12 - C16)	mg/kg	< 1	MCERTS	< 1	< 1		
EPH Texas (>C16 - C21)	mg/kg	< 1	MCERTS	< 1	< 1		
EPH Texas (>C21 - C40)	mg/kg	< 6	MCERTS	< 6	< 6		
EPH Texas (C6 - C40)	mg/kg	< 6	NONE	< 6	< 6		



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 21-04413	
Soils Ltd	
Site Reference: Samson's Gym	
Project / Job Ref: 19192	
Order No: 19192	
Reporting Date: 13/04/2021	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 535985	WS1	None Supplied	0.20	15.3	Red sandy clay with brick
^ 535986	WS1	None Supplied	0.40	16.3	Brown sandy clay
^ 535987	WS1	None Supplied	0.80	15.6	Light brown sandy clay
^ 535988	WS2	None Supplied	0.40	14.2	Light brown sandy clay
^ 535989	WS2	None Supplied	3.30	5.2	Brown sandy clay with stones
^ 535990	WS4	None Supplied	0.70	13.2	Light brown sandy clay
^ 535991	WS4	None Supplied	1.20	13.9	Light brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{I/S}

Unsuitable Sample ^{U/S}

^ no sampling date provided; unable to confirm if samples are within acceptable holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 21-04413

Soils Ltd

Site Reference: Samson's Gym

Project / Job Ref: 19192

Order No: 19192

Reporting Date: 13/04/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



Tom Rees-Blanchard
Soils Ltd
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Winchester
SO23 0LB

DETS Ltd
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Kent
ME17 2JN
t: 01622 850410

DETS Report No: 21-04414

Site Reference: Samson's Gym

Project / Job Ref: 19192

Order No: 19192

Sample Receipt Date: 07/04/2021

Sample Scheduled Date: 07/04/2021

Report Issue Number: 1

Reporting Date: 19/04/2021

[Redacted Signature]
Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 21-04414	Date Sampled	None Supplied	None Supplied	None Supplied		
Soils Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Samson's Gym	TP / BH No	WS2	WS4	BH1		
Project / Job Ref: 19192	Additional Refs	None Supplied	None Supplied	None Supplied		
Order No: 19192	Depth (m)	1.30	2.20	9.00		
Reporting Date: 19/04/2021	DETS Sample No	535992	535993	535994		

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	MCERTS	7.8	8.2	8.1	
Total Sulphate as SO ₄	mg/kg	< 200	MCERTS	< 200	302	408	
Total Sulphate as SO ₄	%	< 0.02	MCERTS	< 0.02	0.03	0.04	
W/S Sulphate as SO ₄ (2:1) ^(S)	mg/l	< 10	MCERTS	28	19	270	
W/S Sulphate as SO ₄ (2:1) ^(S)	g/l	< 0.01	MCERTS	0.03	0.02	0.27	
Total Sulphur	%	< 0.02	NONE	< 0.02	< 0.02	0.23	
Ammonium as NH ₄	mg/kg	< 0.5	NONE	0.7	0.9	4.5	
Ammonium as NH ₄	mg/l	< 0.05	NONE	0.07	0.09	0.45	
W/S Chloride (2:1) ^(S)	mg/kg	< 1	MCERTS	8	22	28	
W/S Chloride (2:1) ^(S)	mg/l	< 0.5	MCERTS	3.8	11	14	
Water Soluble Nitrate (2:1) as NO ₃ ^(S)	mg/kg	< 3	MCERTS	14	< 3	38	
Water Soluble Nitrate (2:1) as NO ₃ ^(S)	mg/l	< 1.5	MCERTS	7.2	< 1.5	19	
W/S Magnesium	mg/l	< 0.1	NONE	0.8	0.9	2.1	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 21-04414	
Soils Ltd	
Site Reference: Samson's Gym	
Project / Job Ref: 19192	
Order No: 19192	
Reporting Date: 19/04/2021	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 535992	WS2	None Supplied	1.30	12.1	Light brown sandy clay with stones
^ 535993	WS4	None Supplied	2.20	8.3	Light brown sandy gravel with stones
^ 535994	BH1	None Supplied	9.00	18.3	Grey sandy clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/5}

Unsuitable Sample ^{1/5}

^ no sampling date provided; unable to confirm if samples are within acceptable holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 21-04414

Soils Ltd

Site Reference: Samson's Gym

Project / Job Ref: 19192

Order No: 19192

Reporting Date: 19/04/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received



4161

**SOILS LIMITED**

Newton House
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Surrey
KT20 5SR



7 - 11 Harding Street
Leicester
LE1 4DH

Analytical Test Report: L25/11007/SLT - 25-86768

Your Project Reference: **Samson Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB 22136/ML**

Your Order Number: 22136/ML Samples Received / Instructed: 17/10/2025 / 17/10/2025

Report Issue Number: 1 Sample Tested: 17/10 to 31/10/2025

Samples Analysed: 4 sample(s) Report issued: 31/10/2025

Signed

James Gane
Analytical Services Manager
CTS

Notes:**General**

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30°C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Samples were supplied by customer, results apply to the samples as received.

Asbestos

Please note: Where further analysis is required samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and other than the asbestos test(s) these results are not covered by our accreditation

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

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

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UKAS = UKAS Accreditation, MCERTS = MCERTS Accreditation, u = Unaccredited, subUKAS - Subcontracted to a laboratory UKAS accredited for this test, subMCERTS - Subcontracted to a laboratory MCERTS accredited for this test

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

UKAS accreditation on waters only covers the Ground water and Surface water matrices

Date of Issue: 27.08.25

Issued by: J. Gane

Issue No: 4

Rev No: 27



4161



L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237

Chamberlayne Road, Eastleigh, Hampshire SO50

Analytical Test Results - Solid

Lab Reference			618752	618753	618754	618755
Client Sample ID			-	-	-	-
Client Sample Location			WS3	WS4	WS1	WS2
Client Sample Type			D	D	D	D
Client Sample Number			-	-	-	-
Depth - Top (m)			0.30	0.40	0.90	0.40
Depth - Bottom (m)			0.30	0.40	0.90	0.40
Date of Sampling			15/10/2025	15/10/2025	15/10/2025	15/10/2025
Time of Sampling			-	-	-	-
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	Units	Accreditation				
Arsenic	(mg/kg)	MCERTS	< 10	< 10	< 10	< 10
Boron (w/s)	(mg/kg)	u	< 2.5	< 2.5	< 2.5	< 2.5
Cadmium	(mg/kg)	MCERTS	0.4	0.4	0.5	0.4
Chromium (Total)	(mg/kg)	UKAS	7.6	5.8	7.5	5.9
Copper	(mg/kg)	MCERTS	8.7	7.0	14	11
Lead	(mg/kg)	MCERTS	18	12	160	33
Mercury	(mg/kg)	UKAS	< 2.5	< 2.5	< 2.5	< 2.5
Nickel	(mg/kg)	MCERTS	11	11	15	11
Selenium	(mg/kg)	u	< 8.0	< 8.0	< 8.0	< 8.0
Vanadium	(mg/kg)	UKAS	24	24	31	24
Zinc	(mg/kg)	MCERTS	30	27	48	43
Total Phenols	(mg/kg)	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Cyanide (Total)	(mg/kg)	MCERTS	-	-	< 1.0	< 1.0
Cyanide (Free)	(mg/kg)	u	-	-	< 1.0	< 1.0
Chromium (Hexavalent)	(mg/kg)	u	< 1.0	< 1.0	< 1.0	< 1.0
pH	pH Units	MCERTS	9.0	8.7	8.3	8.4
Acenaphthene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Acenaphthylene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Anthracene	(mg/kg)	UKAS	< 0.02	< 0.02	< 0.02	< 0.02
Benzo (a) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.05	< 0.02
Benzo (a) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.05	< 0.02
Benzo (b) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.06	< 0.02
Benzo (g, h, i) perylene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.04	< 0.02
Benzo (k) fluoranthene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.02	< 0.02
Chrysene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.05	< 0.02
Dibenzo (a,h) anthracene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Fluoranthene	(mg/kg)	MCERTS	0.03	< 0.02	0.12	< 0.02
Fluorene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Indeno (1, 2, 3,-cd) pyrene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.04	< 0.02
Naphthalene	(mg/kg)	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
Phenanthrene	(mg/kg)	MCERTS	< 0.02	< 0.02	0.04	< 0.02
Pyrene	(mg/kg)	MCERTS	0.02	< 0.02	0.11	< 0.02
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	0.37	< 0.32	0.71	< 0.32
SOM (via TOC)	(%)	UKAS	< 0.9	< 0.9	0.9	1.0
Asbestos	-	UKAS	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
PCB 28	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 52	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 101	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 118	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 153	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 138	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004
PCB 180	(mg/kg)	MCERTS	-	-	< 0.004	< 0.004



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L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237

Chamberlayne Road, Eastleigh, Hampshire SO50

Analytical Test Results - VPH / EPH

Lab Reference			618752	618753	618754	618755
Client Sample ID			-	-	-	-
Client Sample Location			WS3	WS4	WS1	WS2
Client Sample Type			D	D	D	D
Client Sample Number			-	-	-	-
Depth - Top (m)			0.30	0.40	0.90	0.40
Depth - Bottom (m)			0.30	0.40	0.90	0.40
Date of Sampling			15/10/2025	15/10/2025	15/10/2025	15/10/2025
Time of Sampling			-	-	-	-
Sample Matrix			Clay	Clay	Clay	Clay
Determinant	Units	Accreditation				
Benzene	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
Toluene	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
Ethylbenzene	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
m&p Xylene	(mg/kg)	MCERTS	-	-	< 0.02	< 0.02
o-Xylene	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
MTBE	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
Aliphatic >C ₅ to C ₆ [HS_MS_1D_AL]	(mg/kg)	MCERTS	-	-	< 0.06	< 0.06
Aliphatic >C ₆ to C ₈ [HS_MS_1D_AL]	(mg/kg)	MCERTS	-	-	< 0.06	< 0.06
Aliphatic >C ₈ to C ₁₀ [HS_MS_1D_AL]	(mg/kg)	MCERTS	-	-	< 0.06	< 0.06
Aliphatic >C ₁₀ to C ₁₂ [EH_2D_AL]	(mg/kg)	MCERTS	-	-	< 1.0	< 1.0
Aliphatic >C ₁₂ to C ₁₆ [EH_2D_AL]	(mg/kg)	MCERTS	-	-	< 1.0	< 1.0
Aliphatic >C ₁₆ to C ₂₁ [EH_2D_AL]	(mg/kg)	MCERTS	-	-	3.7	1.8
Aliphatic >C ₂₁ to C ₃₅ [EH_2D_AL]	(mg/kg)	MCERTS	-	-	10	4.7
Aliphatic >C ₃₅ to C ₄₄ [EH_2D_AL]	(mg/kg)	u	-	-	< 5.0	< 5.0
Aromatic >C ₅ to C ₇ [HS_MS_1D_AR]	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
Aromatic >C ₇ to C ₈ [HS_MS_1D_AR]	(mg/kg)	MCERTS	-	-	< 0.01	< 0.01
Aromatic >C ₈ to C ₁₀ [HS_MS_1D_AR]	(mg/kg)	MCERTS	-	-	< 0.06	< 0.06
Aromatic >C ₁₀ to C ₁₂ [EH_2D_AR]	(mg/kg)	MCERTS	-	-	< 1.0	< 1.0
Aromatic >C ₁₂ to C ₁₆ [EH_2D_AR]	(mg/kg)	MCERTS	-	-	< 1.0	< 1.0
Aromatic >C ₁₆ to C ₂₁ [EH_2D_AR]	(mg/kg)	MCERTS	-	-	2.0	1.3
Aromatic >C ₂₁ to C ₃₅ [EH_2D_AR]	(mg/kg)	MCERTS	-	-	5.3	< 2.0
Aromatic >C ₃₅ to C ₄₄ [EH_2D_AR]	(mg/kg)	u	-	-	< 5.0	< 5.0
Total >C ₅ to C ₃₅ [EH_2D+HS_1D_Total]	(mg/kg)	MCERTS	-	-	21	< 10
Total >C ₅ to C ₄₀ [EH_2D+HS_1D_Total]	(mg/kg)	MCERTS	-	-	21	< 10
GRO (>C ₅ to C ₈) [HS_MS_1D_AL+AD]	(mg/kg)	u	< 0.16	< 0.16	-	-
GRO (>C ₈ to C ₁₀) [EH_1D_Total]	(mg/kg)	MCERTS	< 5.0	< 5.0	-	-
Total TPH (>C ₁₀ to C ₁₂) [EH_1D_Total]	(mg/kg)	MCERTS	< 5.0	< 5.0	-	-
Total TPH (>C ₁₂ to C ₁₆) [EH_1D_Total]	(mg/kg)	MCERTS	< 5.0	< 5.0	-	-
Total TPH (>C ₁₆ to C ₂₁) [EH_1D_Total]	(mg/kg)	MCERTS	< 5.0	< 5.0	-	-
MRO (>C ₂₁ to C ₄₀) [EH_1D_Total]	(mg/kg)	MCERTS	< 15.0	< 15.0	-	-
Total TPH (C ₆ -C ₄₀) [EH+HS_1D_Total]	(mg/kg)	u	17	17	-	-



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7 - 11 Harding Street
Leicester
LE1 4DH

L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB 22136/ML

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)
618752	-	WS3	D	-	Brown sandy clay with rare rootlets	13	< 0.1
618753	-	WS4	D	-	Brown sandy clay	11	< 0.1
618754	-	WS1	D	-	Brown silty clay	19	7.5
618755	-	WS2	D	-	Brown silty clay	21	< 0.1



L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB 22136/ML

7 - 11 Harding Street
Leicester
LE1 4DH

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
618752	-	WS3	D	-	
618753	-	WS4	D	-	
618754	-	WS1	D	-	
618755	-	WS2	D	-	



L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB 22136/ML

Analysis Methodologies - Please refer to sample comments page (if present) for any changes to methods

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PCB7S	MS - CL - PCB Soils	As received	Passing 10mm test sieve	Determination of PCB's (7 congeners) in soils via GC-MS
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
TPHS	MS - CL - TPH (GC-FID)	As received	Passing 10mm test sieve	Determination of Total Petroleum Hydrocarbons in soil using GC-FID
GCXGCS	MS - CL - TPH & EPH by GCXGC	As received	Passing 10mm test sieve	Determination of TPH and EPH in soils via GCxGC-FID
CWGS	Calculation from VPH-S and EPH-S	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-GC-FID respectively
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis



L25/11007/SLT - 25-86768

Project Reference - Samson Gym, 237 Chamberlayne Road, Eastleigh, Hampshire SO50 5JB 22136/ML

HWOL TPH Acronym Index

Acronym	Description
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 and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathmatically subtracted
#2	EH_Total but with fatty acids mathmatically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Appendix E.3 General Assessment Criteria

HUMAN HEALTH RISK ASSESSMENT

Introduction

The statutory definition of contaminated land was initially defined in the Environmental Protection Act 1990, ref. 1.1, which was introduced by the Environment Act 1995, ref. 1.2, and retained in the Environment Act 2021, ref 1.3, as;

‘Land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

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

The UK guidance on the assessment of contaminated land has developed as a direct result of the introduction of these Acts. The technical guidance supporting the original legislation was summarised in a number of key documents collectively known as the Contaminated Land Reports (CLRs). These have since been replaced or superseded by Land Contamination Risk Management (LCRM) 2021, ref 1.4 produced and administrated by the Environment Agency online through the .GOV.uk website <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> .

However, the basic definitions, methodology and guidance remain essentially the same utilizing the UK Contaminated Land Exposure Assessment Models (CLEA) as within the original CLR and planning guidance it replaces or supersedes.

In establishing whether a site fulfils the statutory definition of ‘contaminated land’ it remains necessary to identify, whether a pollutant linkage exists in respect of the land in question and whether the pollutant linkage:

- is resulting in significant harm being caused to the identified receptor in the pollutant linkage,
- presents a significant possibility of significant harm being caused to that receptor,
- is resulting in the pollution of the controlled waters which constitute the receptor, or
- is likely to result in such pollution.

A ‘pollutant linkage’ may therefore be defined as the confirmation of a link between a contaminant ‘source’ and a vulnerable at risk ‘receptor’ by means of a ‘pathway’ and that the risk is potentially significant. If there is no complete linkage, risk defaults to low to negligible and can never be potentially significant.

Assessment Methodology

A four-stage assessment process is followed for identifying potential pollutant linkages on a site. These stages are summarised in the table below:

No.	Process	Description
1	Hazard Identification	Establishing contaminant sources, pathways and receptors (the conceptual model).
2	Hazard Assessment	Analysing the potential for unacceptable risks (what linkages could be present, what could be the effects).
3	Risk Estimation	Trying to establish the magnitude and probability of the possible consequences (what degree of harm might result and to what receptors, and how likely is it).
4	Risk Evaluation	Deciding whether the risk is unacceptable in the context of existing and future proposals.

Stages 1 and 2 develop an initial '*conceptual model*' based upon information collated from desk-based available and existing site information and a walkover of the site as recommended in BS10175 and LCRM. The formation of any conceptual model is an iterative process and as such it should be updated and refined throughout each phase of the project to reflect any additional information obtained and unknowns being resolved and identify the potential contaminants of concern at the site, i.e. those with the potential to cause significant harm to identified receptors.

The extent of the desk studies and enquiries to be conducted should be in general accordance with BS10175 and other UK guidance to produce an initial conceptual model highlighting the known potential risks, remaining unknowns and contaminants of concern. The information from these enquiries is presented in a desk study or preliminary report with recommendations, if necessary, for further work based upon the conceptual model findings and any identified or unresolved unknowns.

If potential pollutant linkages or potentially significant unknowns are identified within the initial conceptual model, further site investigation and report will be recommended and usually required under planning. Such investigation should be based on and driven by the findings of the initial conceptual model and planned in general accordance with BS10175, LCRM and other current UK guidance where relevant. The number of exploratory holes and samples collected for analysis should be consistent with the size, extent and nature of the site, the identified contaminants of concern and the level of initial risk identified in the initial conceptual model. This will enable a contamination risk assessment to be conducted in accordance with current UK requirements, at which point the conceptual model can be updated and any relevant pollutant linkages can be further quantified and any remaining unknowns resolved. As previously this is an iterative process that may highlight or require additional investigation to resolve to the satisfaction of the regulator.

A two-stage investigation process may therefore be more appropriate where time constraints are less of an issue with the first intrusive investigation being conducted as an initial or screening assessment to confirm or validate the presence of potential sources on site identified in the initial conceptual model and to investigate if additional unknown sources not previously identified are present. This helps to define the scope, extent and requirements of a second more refined and targeted investigation to delineate wherever possible the extent of the identified contamination, contaminants of concern and/or remaining unknowns.

All site works should be undertaken in general accordance with the British Standards BS 10175, ref. 5, for environmental only investigations and BS 5930:2015, ref. 1.6, in the case of combined Geoenvironmental and/or Geotechnical investigations.

The results of analysis are compared initially against generic guidance values which are dependent on the proposed end-use of the development and which must ultimately be based on traceable, scientifically valid and justified exposure and chemical data using the UKCLEA methodology.

The end-use and therefore potential exposure pathways may be defined as one of the following under current UK guidance;

- Residential with homegrown produce i.e. typical low rise and low-density housing with gardens where vegetables and fruits may be grown for home consumption.
- Residential without homegrown produce i.e. low-density housing where no gardens are present where vegetables and fruits could be grown for home consumption.
- Allotments – i.e. areas where vegetables and fruits are grown for home consumption but are not specifically associated with a residential property.
- Public open space residential – i.e. grassed areas adjacent and/or directly related to high density housing and other common or communal open areas on which underlying soils could be exposed but on which vegetables and fruits are not grown for consumption.
- Public open space – i.e. areas such as parks, playing fields and other recreational areas to which public access is possible but otherwise to which there is no direct residential linkage.
- Commercial – i.e. industrial premises where there is limited exposure to soil and residents are not present on site.

Standard Land-use Scenarios

The standard land-use scenarios used to develop exposure models are further detailed in the following sections:

Residential with homegrown produce

Generic scenario assumes a house built on a ground bearing slab with a private garden having a lawn, flowerbeds and a small fruit and vegetable patch.

-
- Critical receptor is assumed to be a young female child (zero to six years old)
 - Exposure pathways include direct soil and indoor dust ingestion, consumption of home-grown produce and any adhering soil, skin contact with soils and indoor dust and inhalation of indoor and outdoor dust and vapours.
-

A sub-set of the Residential land-use is **Residential without Homegrown produce**. The generic scenario assumes low density housing with communal landscaped gardens where the consumption of homegrown vegetables will not occur and the pathways of direct ingestion and produce inputs are suitably moderated.

Allotments

Areas of open space commonly made available to local users but remote from residential properties, but on which tenants may grow fruit and vegetables for their own consumption. Typically, there are a number of plots to a site which may have a total area of up to 1 hectare. The tenants are assumed to be adults and that young children make only occasional accompanied visits.

Although some allotment holders may choose to keep animals on allotments, potential exposure to animal products is not currently considered within the CLEA model.

-
- Critical receptor is a young female child (zero to six years old)
 - Exposure pathways include direct soil ingestion, consumption of homegrown produce and any adhering soil, skin contact with soils and inhalation of outdoor dust and vapours but at reduced exposure levels reflecting non-residential status.
-

Commercial

This generic scenario assumes a typical commercial or light industrial property at which employees spend most time indoors and are involved in office-based or relatively light physical work.

-
- Critical receptor is a working female adult (aged 16 to 65 years old).
 - Exposure duration is over working lifetime
 - Exposure pathways include direct soil and indoor dust ingestion, skin contact with soils and dusts and inhalation of dust and vapours but exposure reduced to reflect non-residential nature and general lack of open spaces.
-

Public Open Space within Residential Area

This generic scenario refers to any grassed area up to 0.05 ha that is associated with residential properties but is not for their exclusive use and on which no fruit or vegetables are grown for home consumption.

-
- Grassed area of up to 0.05 ha and a considerable proportion of this (up to 50%) may be bare soil which can be interacted with directly
 - Predominantly used by children for play and/or access
 - Sufficiently close proximity to home for tracking back of soil to occur, thus indoor exposure pathways apply
-

-
- older children chosen as the critical receptor on basis that they will use site most frequently (age class 4-9 years)
-
- ingestion rate assumed to be 75 mg.day⁻¹
-

Public Open Space Park

This generic scenario refers to any public park or grassed space that is more than 0.5ha in area:

-
- Public park (>0.5 ha), predominantly grassed and may also contain children's play equipment and border areas of soil containing flowers or shrubs (75% assumed cover)
-
- Female child age classes 1-6
-
- Soil ingestion rate of 50 mg.day⁻¹
-
- Occupancy period outdoors = 2 hours.day⁻¹
-
- Exposure frequency of 170 days.year⁻¹ for age classes 2-18 and 85 days.year⁻¹ for age class 1
-
- Outdoor exposure pathways only (no tracking back of soils).
-

Human Health Generic Quantitative Risk Assessment (GQRA) involves the comparison of contaminant concentrations measured in soil at the site with Generic Assessment Criteria (GAC) generated using the CLEA model based on the exposure and land use scenario assumptions noted above.

GAC's are deliberately conservative values adopted to ensure that they are applicable to the majority of possible contaminated sites and below which there is considered a low to negligible risk to identified human health receptors, i.e. there can be no harm. These values may be published Contaminated Land Exposure Assessment Model (CLEA) derived GAC's derived by a competent third party or the Environment Agency / DEFRA. It is imperative to the risk assessor to understand the uncertainties and limitations associated with these GAC's to ensure that they are used appropriately.

Where the adoption of a GAC is not appropriate, for instance when the intended land-use is at variance the CLEA standard land-uses or the contaminant is susceptible to wide variation depending on factors such as form and bioavailability, then a Detailed Quantitative Risk Assessment (DQRA) may be undertaken to develop site specific or remediation values for relevant soil contaminants based on site and contaminant specific conditions.

In 2014, the publication of Category 4 Screening Levels (C4SL), refs 1.8 and 1.9, as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3) ref 1.7 used in the generation of SGVs. C4SL were published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern. Where a C4SL has been published, Soils Limited has adopted them as GAC for these six substances.

For all other substances the soils will be compared to Suitable For Use Levels (S4ULs) published by LQM, ref. 1.10, which were developed for around 85 substances and are

intended to enable a screening assessment of the risks posed by soil quality on development sites. The updated LQM/CIEH GAC publication was developed to accommodate recent developments in the understanding of chemical, toxicological and routine exposure to soil-based contaminants.

Where no S4UL or C4SL is available, assessment criteria may be generated using the Contaminated Land Exposure Assessment (CLEA) Software Version 1.07, ref. 1.11, Toxicological and physico-chemical/fate and transport data used to generate the criteria has been derived from a hierarchy of data sources as follows:

1. Environment Agency or Department of Environment Food and Rural Affairs (DEFRA) documents;
2. Other documents produced by UK Government or state organisations;
3. European institution documents;
4. International organisation documents;
5. Foreign government institutions.

In the case of the majority of contaminants considered, the toxicological data has been drawn originally from the relevant CLR 9 TOX report, or updated toxicological data published by the Environment Agency (2009), where available. Where no TOX report is available reference has been made to appropriately determined health criteria values, derived from the above-noted hierarchy, as this is considered to represent appropriate peer reviewed data sources. Similarly, fate and transport data should also be determined by reference to appropriate sources and the CLEA model assumptions.

Chemical laboratory test results are processed as follows. A statistical analysis of the results is conducted, as detailed in CIEH and CL:AIRE 'Guidance on Comparing Soil Contamination Data with a Critical Concentration', ref. 1.12. Individual concentrations are then compared to the selected guideline values to identify and isolate concentrations of contaminants that are in excess of the selected screening low or no risk criteria.

Where the risk estimation identifies significant concentrations of one or more contaminants, further risk evaluation needs to be undertaken often as a site specific DQRA in line with current guidance to determine and confirm if the identified exceedances are significant in the context of the proposed development or activity.

References

- 1.1 The Environmental Protection Act, Part IIA, Section 78, DoE 1990.
- 1.2 Environment Act 1995, Section 57, DoE 1995.
- 1.3 Environment Act 2021 OEP 2021.
- 1.4 Land Contamination Risk Management Gov.UK (EA) 2021
- 1.5 BS 10175: 2011+A2:2017 '*Investigation of potentially contaminated sites. Code of practice*', British Standards Institute, 2017
- 1.6 BS 5930: 2015+A1:2020 '*Code of practice for ground investigations*', British Standards Institute, 2015
- 1.7 Science Report SC050021/SR3 '*Updated technical background to the CLEA model*', Environment Agency, 2008
- 1.8 DEFRA SP1010: Development of Category 4 Screening Levels for the Assessment of Land Affected by Contamination, published March 2014.
- 1.9 Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). '*Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination*', Revision 2, DEFRA research project SP1010.
- 1.10 The LQM/S4ULs for Human Health Risk Assessment, Nathanail P, McCaffery C, Gillett A, Ogden R, and Nathanail J, Land Quality Press, Nottingham, published 2015.
- 1.11 CLEA '*Software Version 1.071*' (downloaded from the CL:AIRE website , <https://www.claire.co.uk/home/news/44-risk-assessment/178-soil-guideline-values>)
- 1.12 CIEH '*Guidance on Comparing Soil Contamination Data with a Critical Concentration*', Chartered Institute of Environmental Health (CIEH) and Contaminated Land: Applications in Real Environments (CL:AIRE), May 2008.

Land Use			Residential With or Without Plant Uptake									Public Open Space (POS)											Name	Authority	Date
			With			Without			Allotments			Commercial			Residential						Park				
			SOM	1.0	2.5	6	1	2.5							6	1	2.5	6	1	2.5	6	1			
Type	Contaminants	Species	Year																						
Metals	Antimony		2010					550						7500								EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010	
	Arsenic		2014		37		40			49			640		79		168				C4SL	DEFRA	2014		
			2015		37		40			40			640		79		170				S4UL	LQM/CIEH	2015		
	Barium		2010					1300						22000							EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010		
	Beryllium		2015		1.7		1.7			35			12		2.2		63				S4UL	LQM/CIEH	2015		
	Boron		2015		290		11000			45			240000		21000		46000				S4UL	LQM/CIEH	2015		
	Cadmium		2015		11		85			1.9			190		120		532				S4UL	LQM/CIEH	2015		
	Chromium	III	2014		26		149		4.9		410		220		880		C4SL	DEFRA	2014						
			2015		910		910		18000		8600		1500		33000		S4UL	LQM/CIEH	2015						
			2014		21		21		170		49		23		250		C4SL	DEFRA	2014						
		VI	2015		6		6		1.8		33		7.7		220		S4UL	LQM/CIEH	2015						
	Copper		2015		2400		7100		520		68000		12000		44000		S4UL	LQM/CIEH	2015						
	Lead		2014*		82-210		130-310		30-84		1100-6000		270-760		580-1400		C4SL	DEFRA	2014						
	Mercury	Elemental	2012		1.0		1.0		26		26				210		DEFRA	2012							
			2015		1.2		1.2		21		58		16		30		S4UL	LQM/CIEH	2015						
		Inorganic	2012		170		170		80		36000				SGV	DEFRA	2012								
			2015		40		56		19		1100		120		240		S4UL	LQM/CIEH	2015						
		Methyl	2012		11		11		8		410				SGV	DEFRA	2012								
			2015		11		15		6		320		40		68		S4UL	LQM/CIEH	2015						
	Molybdenum		2010					670						17000				EIC/AGS/ CL:AIRE	EIC/AGS/ CL:AIRE	2010					
	Nickel		2012		130		130		230		1800				SGV	DEFRA	2012								
			2015		130		180		53		980		230		800		S4UL	LQM/CIEH	2015						
	Selenium		2012		350		595		120		13000				SGV	DEFRA	2012								
			2015		250		430		88		12000		1100		1800		S4UL	LQM/CIEH	2015						
	Vanadium		2015		410		1200		91		9000		2000		5000		S4UL	LQM/CIEH	2015						
	Zinc		2015		3700		40000		620		730000		81000		170000		S4UL	LQM/CIEH	2015						
BTEX & MTBE	Benzene		2012		0.33		0.33		0.07		95			SGV	DEFRA	2012									
			2014		0.87		3.3		0.18		98		140		230		C4SL	DEFRA	2014						
			2015	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	S4UL	LQM/CIEH	2015	
	Toluene		2012		610		610		120		4400				SGV	DEFRA	2012								
			2015	130	290	660	880	1900	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000	S4UL	LQM/CIEH	2015	
	Ethylbenzene		2012		350		350		90		2800				SGV	DEFRA	2012								
			2015	47	110	260	83	190	440	16	39	91	5700	13000	27000	24000	24000	25000	17000	22000	27000	S4UL	LQM/CIEH	2015	
	Xylenes	o-xylene	2012		250		250		160		2600				SGV	DEFRA	2012								
			2015	60	140	330	88	210	480	28	67	160	6600	15000	33000	41000	42000	43000	17000	24000	33000	S4UL	LQM/CIEH	2015	
		m-xylene	2012		240		240		180		3500				SGV	DEFRA	2012								
2015			59	140	320	82	190	450	31	74	170	6200	14000	31000	41000	42000	43000	17000	24000	32000	S4UL	LQM/CIEH	2015		
	p-xylene	2012		230		230		160		3200				SGV	DEFRA	2012									
		2015	56	130	310	79	180	430	29	69	160	5900	14000	30000	41000	42000	43000	17000	23000	31000	S4UL	LQM/CIEH	2015		
Petroleum Hydrocarbons Fractions	Aliphatic >C5 - C6		2015	42	78	160	42	78	160	730	1700	3900	3200	5900	12000	570000	590000	600000	95000	5900	12000	S4UL	LQM/CIEH	2015	
	Aliphatic >C6 - C8		2015	100	230	530	100	230	530	2300	5600	13000	7800	17000	40000	600000	610000	620000	150000	17000	40000	S4UL	LQM/CIEH	2015	
	Aliphatic >C8 - C10		2015	27	65	150	27	65	150	320	770	1700	2000	4800	11000	13000	13000	13000	14000	4800	11000	S4UL	LQM/CIEH	2015	
	Aliphatic >C10 - C12		2015	130	330	760	130	330	770	2200	4400	7300	9700	23000	47000	13000	13000	13000	21000	23000	47000	S4UL	LQM/CIEH	2015	
	Aliphatic >C12 - C16		2015	1100	2400	4300	1100	2400	4400	11000	13000	13000	59000	82000	90000	13000	13000	13000	25000	82000	90000	S4UL	LQM/CIEH	2015	
	Aliphatic >C16 - C35		2015	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	170000	180000	S4UL	LQM/CIEH	2015	
	Aliphatic >C35 - C44		2015	65000	92000	140000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	170000	180000	S4UL	LQM/CIEH	2015	
	Aromatic >C5 - C7		2015	70	140	300	370	690	1400	13	27	57	26000	46000	86000	56000	56000	56000	76000	84000	92000	S4UL	LQM/CIEH	2015	
	Aromatic >C7 - C8		2015	130	290	660	860	1800	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000	S4UL	LQM/CIEH	2015	

Land Use			Residential With or Without Plant Uptake									Public Open Space (POS)									Name	Authority	Date	
			With			Without			Allotments			Commercial			Residential			Park						
			SOM	1.0	2.5	6	1	2.5							6	1	2.5	6	1	2.5				6
Type	Contaminants	Species	Year																					
	Aromatic >C8 - C10		2015	34	83	190	47	110	270	8.6	21	51	3500	8100	17000	5000	5000	5000	7200	8500	9200	S4UL	LQM/CIEH	2015
	Aromatic >C10 - C12		2015	74	180	380	250	590	1200	13	31	74	16000	28000	34000	5000	5000	5000	9200	9700	10000	S4UL	LQM/CIEH	2015
	Aromatic >C12 - C16		2015	140	330	660	1800	2300	2500	23	57	130	36000	37000	38000	5100	5100	5000	10000	10000	10000	S4UL	LQM/CIEH	2015
	Aromatic >C16 - C21		2015	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	S4UL	LQM/CIEH	2015
	Aromatic >C21 - C35		2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aromatic >C34 - C44		2015	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	S4UL	LQM/CIEH	2015
	Aliphatic + Aromatic >C44 - C70			1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	28000	28000	7800	7800	7900	S4UL	LQM/CIEH	2015
Polycyclic Aromatic Hydrocarbons (PAH' s) (mg/kg)	Acenaphthene		2015	210	510	1100	3000	4700	6000	34	85	200	84000	97000	100000	15000	15000	15000	29000	29000	29000	S4UL	LQM/CIEH	2015
	Acenaphthylene		2015	170	420	920	2900	4600	6000	28	69	160	83000	97000	100000	15000	15000	15000	29000	29000	29000	S4UL	LQM/CIEH	2015
	Anthracene		2015	2400	5400	11000	31000	35000	37000	380	950	2200	520000	54000	540000	74000	74000	74000	150000	150000	150000	S4UL	LQM/CIEH	2015
	Benzo(a)anthracene		2015	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	S4UL	LQM/CIEH	2015
	Benzo(a)pyrene		2014			5			5.3			5.7			76			10		21	C4SL	DEFRA	2014	
			2015	2.2	2.7	3	3.2	3.2	3.2	0.79	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	S4UL	LQM/CIEH	2015
	Benzo(b)fluoranthene		2015	2.6	3.3	3.7	3.9	4.0	4.0	0.99	2.1	3.9	44	44	45	7.1	7.2	7.2	13	15	16	S4UL	LQM/CIEH	2015
	Benzo(ghi)perylene		2015	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	S4UL	LQM/CIEH	2015
	Benzo(k)fluoranthene		2015	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	S4UL	LQM/CIEH	2015
	Chrysene		2015	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	S4UL	LQM/CIEH	2015
	Dibenz(a,h)anthracene		2015	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	S4UL	LQM/CIEH	2015
	Fluoranthene		2015	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400	S4UL	LQM/CIEH	2015
	Fluorene		2015	170	400	860	2800	3800	4500	27	67	160	63000	68000	71000	9900	9900	9900	20000	20000	20000	S4UL	LQM/CIEH	2015
	Indeno(1,2,3-cd)pyrene		2015	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	S4UL	LQM/CIEH	2015
	Naphthalene		2015	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190	460	1100	4900	4900	4900	1200	1900	3000	S4UL	LQM/CIEH	2015
	Phenanthrene		2015	95	220	440	1300	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	S4UL	LQM/CIEH	2015
	Pyrene		2015	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	S4UL	LQM/CIEH	2015
	Coal Tar (Bap as surrogate matter)		2015	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	S4UL	LQM/CIEH	2015
Chloroalkanes & alkenes	1,2 Dichloroethane		2015	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	S4UL	LQM/CIEH	2015
	1,1,1 Trichloroethane		2015	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	140000	57000	76000	100000	S4UL	LQM/CIEH	2015
	1,1,2,2 Tetrachloroethane		2015	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	S4UL	LQM/CIEH	2015
	1,1,1,2 Tetrachloroethane		2015	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	110	250	560	1400	1400	1400	1500	1800	2100	S4UL	LQM/CIEH	2015
	Tetrachloroethene (PCE)		2015	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	42	95	1400	1400	1400	810	1100	1500	S4UL	LQM/CIEH	2015
			2021	0.31	0.7	1.6	0.32	0.71	1.6	2	4.8	11	24	55	130	3200	3300	3400	1400	1900	2500	C4SL	CLAIRE	2021
	Tetrachloromethane (Carbon Tetrachloride)		2015	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	S4UL	LQM/CIEH	2015
	Trichloroethene (TCE)		2015	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	S4UL	LQM/CIEH	2015
			2021	0.0093	0.02	0.043	0.0097	0.02	0.045	0.032	0.072	0.16	0.73	1.5	3.4	76	78	79	41	54	69	C4SL	CLAIRE	2021
	Trichloromethane (Chloroform)		2015	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	S4UL	LQM/CIEH	2015
	Vinyl Chloride (Cloroethene)		2015	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	S4UL	LQM/CIEH	2015
			2021	0.0064	0.01	0.017	0.015	0.019	0.029	0.0017	0.0031	0.0058	1.1	1.4	2.2	7.8	7.8	7.8	18	19	19	C4SL	CLAIRE	2021
Explosives	2,4,6 Trinitrotoluene		2015	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	S4UL	LQM/CIEH	2015
	RDX (Hexogen/Cyclonite/1,3,5-trinitro-1,3,5-triazacyclohexane)		2015	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000	51000	53000	S4UL	LQM/CIEH	2015
	HMX (Octogen/1,3,5,7-tetrenitro-1,3,5,7-tetrazacyclo-octane)		2015	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	23000	23000	24000	S4UL	LQM/CIEH	2015
Pesticides	Aldrin		2015	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	S4UL	LQM/CIEH	2015
	Dieldrin		2015	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170											

Land Use			Residential With or Without Plant Uptake									Allotments			Commercial			Public Open Space (POS)									Name	Authority	Date
			With home-grown produce			Without home-grown produce			Residential									Park											
			SOM	1.0	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6								
Type	Contaminants	Species	Year																										
Chlorobenzenes	Chlorobenzene		2015	0.46	1	2.4	0.46	1	2.4	5.9	14	32	56	130	290	11000	13000	14000	1300	2000	2900	S4UL	LQM/CIEH	2015					
	1,2-Dichlorobenzene		2015	23	55	130	24	57	130	94	230	540	2000	4800	11000	90000	95000	98000	24000	36000	51000	S4UL	LQM/CIEH	2015					
	1,3-Dichlorobenzene		2015	0.4	1	2.3	0.44	1.1	2.5	0.25	0.6	1.5	30	73	170	300	300	300	390	440	470	S4UL	LQM/CIEH	2015					
	1,4-Dichlorobenzene		2015	61	150	350	61	150	350	15	37	88	4400	10000	25000	17000	17000	1700	36000	36000	36000	S4UL	LQM/CIEH	2015					
	1,2,3,-Trichlorobenzene		2015	1.5	3.6	8.6	1.5	3.7	8.8	4.7	12	28	102	250	590	1800	1800	1800	770	1100	1600	S4UL	LQM/CIEH	2015					
	1,2,4,-Trichlorobenzene		2015	2.6	6.4	15	2.6	6.4	15	55	140	320	220	530	1300	15000	17000	19000	1700	2600	4000	S4UL	LQM/CIEH	2015					
	1,3,5,-Trichlorobenzene		2015	0.33	0.81	1.9	0.33	0.81	1.9	4.7	12	28	23	55	130	1700	1700	1800	380	580	860	S4UL	LQM/CIEH	2015					
	1,2,3,4,-Tetrachlorobenzene		2015	15	36	78	24	56	120	4.4	11	26	1700	3080	4400	830	830	830	1500	1600	1600	S4UL	LQM/CIEH	2015					
	1,2,3,5,- Tetrachlobenzene		2015	0.66	1.6	3.7	0.75	1.9	4.3	0.38	0.9	2.2	49	120	240	78	79	79	110	120	130	S4UL	LQM/CIEH	2015					
	1,2,4, 5,- Tetrachlobenzene		2015	0.33	0.77	1.6	0.73	1.7	3.5	0.06	0.16	0.37	42	72	96	13	13	13	25	26	26	S4UL	LQM/CIEH	2015					
	Pentachlrobenzene		2015	5.8	12	22	19	30	38	1.2	3.1	7	640	770	830	100	100	100	190	190	190	S4UL	LQM/CIEH	2015					
	Hexachlorobenzene		2015	1.8	3.3	4.9	4.1	5.7	6.7	0.47	1.1	2.5	110	120	120	16	16	16	30	30	30	S4UL	LQM/CIEH	2015					
Phenols & Chlorophenols																													
	Phenols		2012	420			420			280			3200									SGV	DEFRA	2012					
			2015	120	200	380	440	690	1200	23	42	83	440	690	1300	440	690	1300	440	690	1300	S4UL	LQM/CIEH	2015					
	Chlorophenols (4 Congeners)		2015	0.87	2	4.5	94	150	210	0.13	0.3	0.7	3500	4000	4300	620	620	620	1100	1100	1100	S4UL	LQM/CIEH	2015					
Others	Pentachlorophenols		2015	0.22	0.52	1.2	27	29	31	0.03	0.08	0.19	400	400	400	60	60	60	110	120	120	S4UL	LQM/CIEH	2015					
	Carbon Disulphide		2015	0.14	0.29	0.62	0.14	0.29	0.62	4.8	10	23	11	22	47	11000	11000	12000	1300	1900	2700	S4UL	LQM/CIEH	2015					
	Hexachloro-1,3-Butadiene		2015	0.29	0.7	1.6	0.32	0.78	1.8	0.25	0.61	1.4	31	66	120	25	25	25	48	50	51	S4UL	LQM/CIEH	2015					
	Sum of PCDDs, PCDFs and dioxin-like PCB's.		2012	8			8			8			240									SGV	DEFRA	2012					
NOTE																													
	Priority	Guideline (mg kg ⁻¹)																											
	1	Site Specific Assessment Criteria (SSAC) (Soils Limited)																											
	2	2014: Category 4 Screening Level (C4SL) (Contaminated Land: Application in Real Environment (CL:ARE), 2014 and 2021) * Use upper range value for Lead unless otherwise indicated																											
	3	2012: Soil Guideline Value (SGV) (Environment Agency, 2009)																											
	4	2015: Suitable 4 Use Level (S4UL) (Nathanail et al, 2015)																											
For Generic Risk Assessment, the values in Bold should have priority unless site specific, Client or regulatory requirements dictate otherwise – which must be justified																													
Table reviewed January 2024																													

Appendix F Information Provided by the Client

Notes	Scale	Author	Check	Date
1. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
2. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
3. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
4. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
5. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
6. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
7. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
8. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
9. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date
10. All dimensions are to be confirmed on site before construction. All dimensions are to be confirmed on site before construction.	1:100	Author	Check	Date



- KEY:**
- Site boundary line
 - Grassland areas
 - Black paved areas
 - Tarmac areas
 - Concrete Slab paved areas
 - Landscaped areas
 - Existing trees to be removed
 - Existing trees to be retained
 - 1.0m high brick wall to be retained
 - 1.0m high brick wall to be removed
 - 1.0m high brick wall to be retained
 - 1.0m high brick wall to be removed
 - Gravel edging to buildings
 - Concrete kerbs
 - Concrete Drop Kerbs
 - Car Chipping point

PROPOSED SITE PLAN

Aspect (Eastleigh) Ltd
Redevelopment of
Samson's Gym

Stage	Planning
1	17/06/2022
2	17/06/2022
3	17/06/2022
4	17/06/2022
5	17/06/2022
6	17/06/2022
7	17/06/2022
8	17/06/2022
9	17/06/2022
10	17/06/2022





Notes

The Contractor is to check **all** dimensions and conditions on site before commencing, but not scale from this drawing.

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Scale bars TO BE USED ON ALL DRAWINGS

1:100	0m	10m	20m	30m	40m
1:200	0m	10m	20m	30m	40m
1:500	0m	10m	20m	30m	40m
1:1,250	0m	10m	20m	30m	40m

KEY PLAN

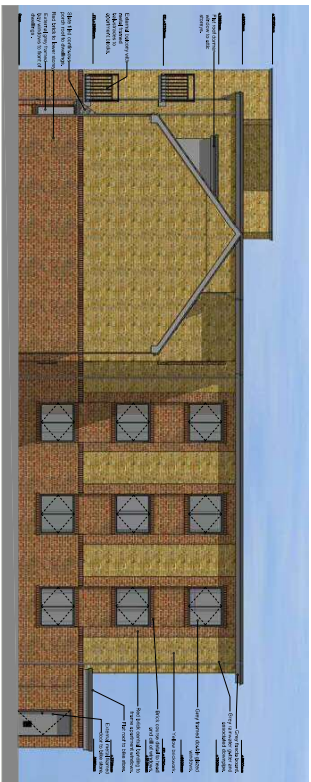
Rev	Description	By	Date
P03	Issued for Planning	LOJ	28.06.23
P02	Issued for Planning	LOJ	31.05.23
P01	Issued for review	LOJ	17.05.23

Project Status	Drawing Status
Stage 3	Planning

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Aspect (Eastleigh) Ltd Redevelopment of Samson's Gym					Drawing	
Proposed Street Elevations & 3d's						
Ref	17/006/23	Scale	1 : 100	© A1		
Drawn by	LOJ	Checked	EF			

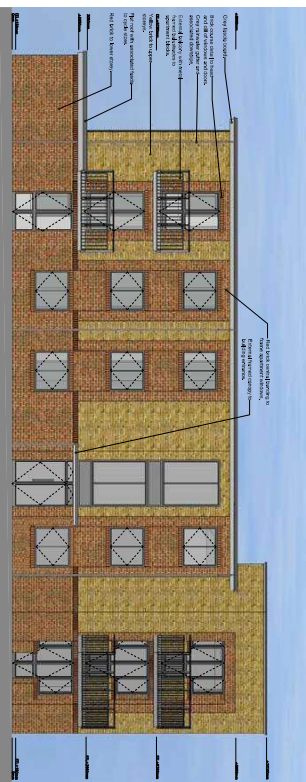
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West Elevation



South Elevation



East Elevation



North Elevation

Proposed Elevations					
Elev	Date	Proj	Scale	Drawing	Sheet
12/05/23		1 : 100		LOJ	@ A1
10 Cadet					EF

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