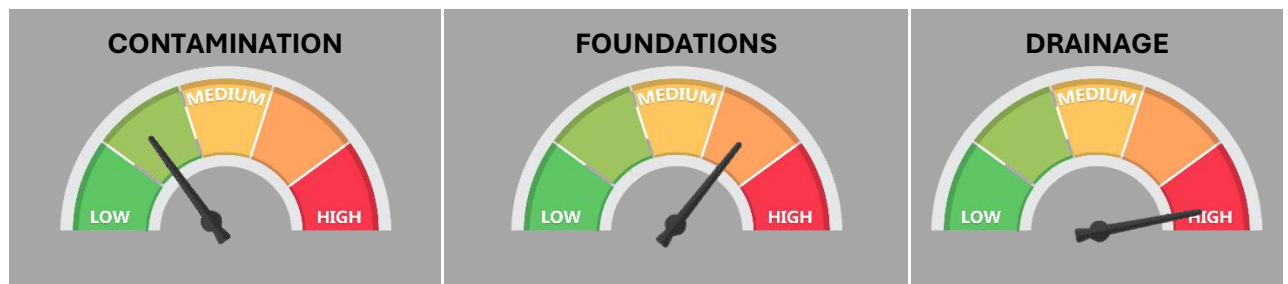
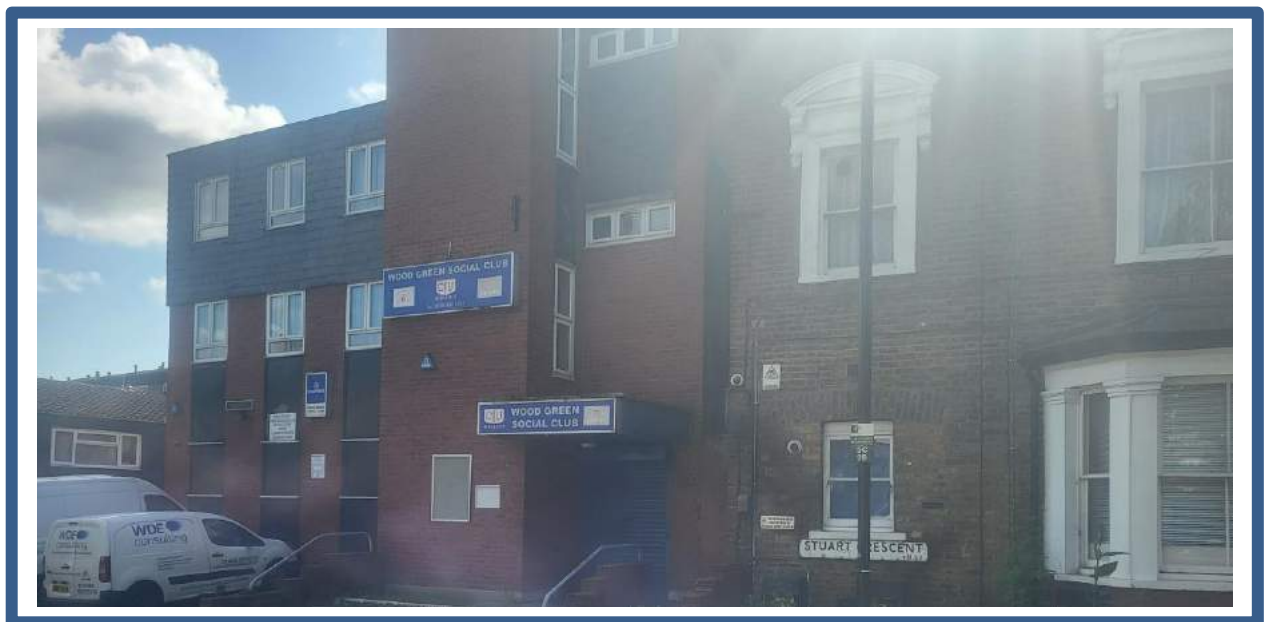


**Geo-Site Assessment Report
Wood Green Social Club
Wood Green, London
N22 5NJ**

**ISSUE DATE: July 2023
REPORT REF: 21206R1 (Issue C)**



DOCUMENT CONTROL

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The report has been prepared with reasonable skill, care and diligence within accordance with the current guidance and common practice at the time of issue. Any interpretation of the results contained within this document are based on the proposed site usage and the findings are not valid should the proposed land use and/or the regulatory regime/guidance change. The findings and opinions conveyed via this document are based on information obtained from a variety of sources as detailed within this report, which WDE Consulting Limited believes are reliable. Nevertheless, WDE Consulting Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon. In preparing this report, it has been assumed that all past and present occupants have provided all relevant and other information, especially relating to known or potential hazards.

The work is also subject to WDE Consulting's standard terms and conditions.

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Figure 1 – Site Location Plan

Figure 2 – Current Site Plan/Areas of Concern

Figure 3 – Proposed Site Plan

Figure 4 – Intrusive Location Plan

APPENDIX A

Limitations and Exceptions

APPENDIX B

Relevant Guidance and Legislation

APPENDIX C

Site Photos

APPENDIX D

Environmental Database

APPENDIX E

Borehole Logs

APPENDIX F

Ground Gas Sheets

Permeability Sheets

APPENDIX G

Analytical Test Results

APPENDIX H

Geotechnical Test Results

1.0 EXECUTIVE SUMMARY

Phase 1 Desk Study	Comments	Risk Rating
Site Setting	Wood Green Social Club with associated residential property. Set within a residential setting.	Moderate
Published Geology and Hydrogeology	Bedrock geology is London Clay Formation (unproductive) with no superficial deposits. Within SPZ 2	Low
Hydrology/Flood Risk	- Lies outside Flood Zone. - High risk of surface water flooding/Low risk of groundwater flooding - No surface water bodies within 250m	Low/Moderate
Historical land use	The house onsite appears from c1896. A Hall/Club is present from 1935 which became a Labour Club in 1978 before being expanded in 1983. This forms the current site configuration and was relabelled as a social club in 1994.	Low
Landfill/Infilled land	No historical landfill or infilled land recorded within 250m of the site.	Low
UXO	Preliminary UXO Risk Assessment advises no further action	Low
Phase 2 Intrusive	Comments	Risk Rating
Proven Ground Conditions	- Concrete/Made ground to 1m overlaying firm to very stiff clay to >10.00m bgl - Groundwater at 3m, which is potential perched on top of clay.	
Groundwater/Drainage	Very poor permeability encountered (<10⁻⁶ m/sec).	High
Ground Gas	- No radon protective measures required. - Very low risk/NHBC Green specification	Low
Contamination	Soil exceedances for Arsenic, Lead and non-volatile PAHs within made ground @ 0.35m.	Low/Moderate
Ground Engineering	Traditional strip foundations within London Clay adopting allowable bearing capacity of 150-200kPa. Potential desiccation should be assessed further, which may require alternative foundation such as piling to be adopted.	Moderate
Recommendations	Preparation of a Verification Plan, followed by verification visits during construction.	

2.0 INTRODUCTION

WDE Consulting Limited (WDE) was appointed by Mr Steve Satwick, Martin Cramer & Pentagon Ltd (the Client) to conduct a Geo-Site Assessment Report at Wood Green Social Club, Wood Green, London, N22 5NJ (Figure 1). The current site consists of a detached dwelling and Wood Green Social Club building and is situated at location 531022 190783, and What 3 Words ///broom.spoke.dance (Figure 2).

2.1 CONTEXT

It is understood that the client is proposing partial demolition and construction of 5no dwellings and refurbishment of existing units with creation of additional 9no dwellings with associated hardstanding and landscaping under planning reference HGY/2021/2031 issued by Haringey Council (Figure 3). It is understood that there are planter areas proposed but no soft-standing areas.

2.2 TERMS OF ENGAGEMENT

The works described in this report are subject to the WDE Service Constraints presented in Appendix A. This report was finalised in July 2023 and should be read in the light of the legislation, statutory requirements, statutory guidance, non-statutory guidance, relevant research, and industry practices at the date of issue. WDE Consulting has duly taken account of the recommendation contained within relevant guidance documents and legislation during the preparation of this report, details of which are presented in Appendix B. This report is currently assigned only to the *Client* for their sole reliance.

2.3 AGREED SCOPE OF WORKS AND OBJECTIVES

The scope of work that was agreed with client is presented in Table 1.

Table 1 – Agreed Scope of Works and Objectives

Item	Scope of Works	Objectives
1	Site walkover	To identify any areas of potential contamination
2	Intrusive site investigation	- To identify whether there is any contamination onsite which is considered to pose an unacceptable risk to human health, controlled waters or the environment. - To identify the geotechnical properties of the ground to enable design parameters for foundations and drainage
3	Monitoring rounds	To undertake groundwater and ground gas monitoring of borehole monitoring wells
4	Permeability testing	Investigate the drainage potential of the materials through field investigations
5	Laboratory analyses	Contamination and geotechnical soil/water samples are analysed at a laboratory
6	Reporting	- Complete a Phase 1 desk-based study of the site to ascertain information on the site geology, hydrology, and surrounding land uses. - Compare onsite soil and water concentrations with generic UK based assessment criteria. - Provide recommendations on contamination, foundations, and drainage

3.0 PHASE 1 DESK STUDY

3.1 INFORMATION SOURCES

The sources of information that were used during the desk study included the following items:

- Site walkover (Photos presented in Appendix C)
- Environmental database information (Appendix D)
- Publicly available information

3.2 SITE DESCRIPTION AND WALKOVER

The site measures 0.15 hectares with a N to S distance of ~50m and an E to W distance of ~35m comprising a detached brick-built residential dwelling (Photo 1) and Wood Green Social Club (Photo 2) building with hard standing in moderate condition across the site (Photo 3). A drainage system runs at the rear of the site along the eastern border (Photo 4). There were no signs of any surface contamination.

3.3 KEY FINDINGS OF DESK STUDY

The key findings from the desk study are presented in Table 2 with a qualitative risk ranking indicated.

Table 2 – Key Findings of Desk Study

Item	Details
Published Geology	Published geology indicates bedrock geology is London Clay Formation with no superficial deposits
Geological Hazards	• Shrink swell (moderate) • Running sands (very low) • Compressible deposits (negligible) • Collapsible deposits (very low) • Landslides (very low) • Soluble rocks (negligible) • Radon less than 1%. Unlikely to require protective measures.
Hydrogeology	The bedrock is classified as an unproductive aquifer and lies within Source Protection Zone 2, presumably associated with the deep chalk aquifer
Hydrology	The proposed residential area lies outside of a Flood Zone and within a high risk of surface water flooding (1 in 30 year) and low risk of groundwater flooding. The nearest surface water body is the Moselle Brook (467m SE).
Proximity of mature trees	No mature or semi mature trees are within the site boundaries
Current Land Use on site	Social Club
Current Land Use within 250m radius	• Electricity substation (86m E) • Asa Distribution (150m S) • Electricity substation (175m SW) • Electricity substation (205m N) • Newcom Distributors Ltd (208m W) • Parikiaki (235m N) • Fast Fit Tyres (236m S)

Historical land use on site	The site is an unnamed building from c1864 until 1935 then the structures are labelled as a <i>Hall</i> and <i>Club</i> and then relabelled in 1956 as the <i>Stirling Hall</i> . The hall is moved south within the site boundaries and labelled <i>Labour Club</i> . The Wood Social Club appears in c1994 and forms the current configuration.
Historical land use with 250m radius	The Fishmongers' Arms is present from c1873 (~100m NW) along with the asylum from c1873 (119m W). Residential expansion appears from c1894 in all boundaries surrounding the of site with White Hart Lane from c1920 on the northern boundary.
Identified potential areas of concern	Potentially imported made ground
Landfill	None recorded within 250m
Waste Licences/permits	None recorded within 250m
UXO Risk	Preliminary UXO Risk Assessment recommends no further actions
Environmental Sensitive Land Uses	Within conservation area

3.4 PRELIMINARY RISK ASSESSMENT

3.4.1 Identification of Critical Receptors

The identified potentially critical receptors are presented in Table 3.

Table 3 – Identification of Potential Receptors

Receptor Type	Current/Future	Receptor Details	Active
Human Health	Future	Residential receptors onsite	Yes
	Current	Residential receptors offsite	Yes
	Future	Public Open Space	No
Controlled waters	Current	Groundwater within aquifer	No
	Current/Future	Groundwater within SPZ/licensed abstraction	Yes
	Current/Future	Surface water body	No

The risks to onsite workers can be minimised by following appropriate health and safety guidance on site (i.e. wearing protective clothing and washing).

3.4.2 Identification of Potential Areas of Concern

The list of potential areas of concern on site and in the surrounding area are summarised in Table 4, and presented on Figure 2.

Table 4 – Identification of Potential Areas of Concern

Location	Potential Risk	Comments
Onsite	Potentially imported made ground	Hydrocarbons (TPH, BTEX, PAH), heavy metals, inorganics, asbestos, cyanide, phenols, ground gas
Offsite	Industrial land uses, electrical substations	Hydrocarbons (TPH, BTEX, PAH), heavy metals, inorganics, PCBs

The potential contaminants of PCBs arising from the electricity substation located offsite have been discounted as PCBs are not considered to be sufficiently mobile or soluble¹.

3.4.3 Identified Potential Pathways

Human Health Pathways

The potential human health exposure pathways, based on the Agency Soil Science Report SR3², for a residential/commercial receptor are indicated in Table 5.

Table 5 – Identification of Potentially Active Human Health Exposure Pathways

Potential Pathway	Active/ Inactive	Notes
Ingestion of soil and dusts	Inactive	Majority of site under hardstanding. No further assessment necessary
Ingestion of home grown produce	Inactive	Majority of site under hardstanding. No further assessment necessary
Dermal contact with soils and dust	Inactive	Majority of site under hardstanding. No further assessment necessary
Inhalation of dusts	Inactive	Majority of site under hardstanding. No further assessment necessary
Inhalation of organic vapours (generated by shallow soils) in external areas or inside buildings	Active	Qualitative Risk Assessment required
Inhalation of organic vapours generated by dissolved phase groundwater migrating offsite to neighbouring residential properties	Active	Qualitative Risk Assessment required
Inhalation of organic vapours generated by dissolved phase groundwater migrating onto site from surrounding offsite sources	Active	Qualitative Risk Assessment required
Contaminants from site entering groundwater and migrating into public water abstraction borehole for human consumption	Inactive	No potable abstractions within 500m. No further assessment necessary.

Controlled Waters Pathways

The potentially active controlled waters migration pathways are indicated in Table 6.

¹ Department of the Environment, 1996, Industry Profile: Engineering works. P.14 Sect 3.2.1

² Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

Table 6 – Identification of Potentially Active Controlled Water Pathways

Potential Pathway	Active/ Inactive	Notes
Impacted soils leaching to groundwater within Aquifer	Inactive	Unproductive strata: No further assessment required
Impacted soils leaching to groundwater and migration to surface water	Inactive	No surface water within 250m: No further assessment required

Ground Gas Pathways

The potential for ground gas risk depends on the age of infilling and type of waste as controlling factors¹⁸. The potentially active migration pathways for ground gas are indicated in Table 7.

Table 7 – Identification of Potentially Active Ground Gas Pathways

Ground Gas Migration Potential Factors	Active/ Inactive	Notes
Potential for natural materials with high organic content, such as peat	Active	Qualitative Risk Assessment required
Availability of readily degradable material, such as vegetable matter and food waste	Inactive	No further assessment required
Nature of fill material - depth of fill >1m, incohesive materials, poorly compacted and within unsaturated zone.	Active	Qualitative Risk Assessment required
Age of Materials - Ground gas generated from current/historical landfills <50yrs old	Inactive	No further assessment required
Distance from receptor – a higher distance reduces the potential risk for offsite migration. High risk generally limited to within 100m distance.	Inactive	No further assessment required
Presence of Preferential Pathways – fissures/fractures in bedrock or permeable strata beneath an impermeable cover	Inactive	No further assessment required
Chemical storage/spillages with potential for hydrocarbon vapours	Inactive	No further assessment required
Shallow or deep mine workings	Inactive	No further assessment required
Radon gas protective measures required	Inactive	No further assessment required

3.4.4 Qualitative Risk Assessment

A summary of the relevant pollutant linkages based on a source-pathway-receptors analysis is provided in Table 8.

Table 8 – Summary of Potentially Active Source-Pathway-Target Assessment

Sources	Potential Pathway	Potential Receptor	Risk Classification
Onsite Sources (Potential made ground)	Outdoor and indoor inhalation	Human Health (Onsite Residential)	Low/moderate
	Vapour inhalation from dissolved phase groundwater migrating from site to neighbouring properties	Human Health (Offsite Residential)	Low
Offsite Source (Industrial land uses)	Vapour inhalation from dissolved phase migration from offsite sources	Human Health (Onsite Residential)	Low
Potential made ground >1m thick/highly organic materials	Source for ground gas generation	Human Health (Onsite Residential)	Low/moderate

4.0 PHASE II INVESTIGATION WORKS

4.1 SUMMARY OF WORKS

The locations of the intrusive investigation are presented on Figure 4 and comprised the following:

Table 9 – Summary of Phase II Intrusive Works

Item	Details	Appendix
Shallow Boreholes	2no. boreholes (BH1 to BH2) were drilled with SPTs to maximum of 10m bgl using tracked window sampler.	E
Groundwater monitoring	1no. boreholes (BH2) were monitored for ground gas and groundwater	F
Analytical Testing	3no. samples were sent for a standard QRA suite	G
Geotechnical Testing	8no. samples were sent for Atterberg limit tests. 5no. samples were sent for quick undrained triaxial tests.	H

4.2 CONSTRAINTS/SELECTION OF INTRUSIVE LOCATIONS

Access was only possible in external areas. The thickness of concrete and location of underground utilities also constrained the locations.

4.3 RATIONALE ADOPTED FOR SELECTION OF INTRUSIVE LOCATIONS

The intrusive locations are indicated on Figure 4, with rationale used for the selection of locations presented in Table 10.

Table 10 – Rationale for Exploratory Hole Locations

Ref	Description	Location
BH1	Geotechnical, Contamination	Residential dwelling
BH2	Geotechnical, Contamination, Drainage	Proposed basement

4.4 FIELD RESULTS

4.4.1 Geology

A summary of the geology encountered during the intrusive investigation is summarised in Table 11 and are presented in full Appendix E.

Table 11 – Summary of Geology Proved Onsite

Strata	Description	Min – Max Depth Proved (m bgl)	Average Depth To – From (m bgl)	Locations
Hard Standing	Concrete	Absent – 0.20	0.00 – 0.20	BH2
Made Ground	Brown sandy clay with red brick fragments	1.00 – 1.05	0.20 – 1.00	All
Gravelly Clay	Firm brown gravelly clay	1.80 – 2.00	1.00 – 2.00	All
London Clay	Firm to very stiff brown clay	6.00 – 10.00	2.00 – 10.00+	All

4.4.2 Groundwater

A summary of the groundwater monitoring results are presented in Table 12.

Table 12 – Groundwater Field Monitoring Results (m bgl)

Date	BH2	Comment
02/06/2023	3.10	Likely perched water

4.4.3 Contamination Observations

All PID readings returned concentrations of <0.1ppm with no olfactory or visual observations of contamination being present.

4.4.4 Permeability Results

A summary of the borehole permeability testing results is presented in Table 13 and are presented in full in Appendix F.

Table 13 – Soakage Test Results

Location	Test Type	Material	Depth of Test m bgl	Test No	Drainage (m/sec)	Adopted Value (m/sec)	Qualitative Soakage Potential
BH3	Borehole	Clay	3.1	1	<10E-06	<10E-06	Very Poor

5.0 GROUND GAS ASSESSMENT

5.1 PUBLISHED GUIDANCE

A ground gas assessment has been undertaken to assess risks associated with carbon dioxide and methane to new buildings and their users. The relevant guidance has been used to assess the risks posed by ground gas (Appendix B).

5.2 GROUND GAS MONITORING RESULTS

A summary of the steady state ground gas monitoring results obtained on 2nd June 2023 are presented in Table 14 and presented fully in Appendix F.

Table 14 – Ground Gas Field Monitoring Results

Date	Location Reference	O ₂ (%)	CH ₄ (%)	CO ₂ (%)	Atmospheric Pressure (mB)	Flow rate (l/ hr)
02/06/2023	BH2	19.9	0.0	1.6	1022	+0.1

5.3 COMPARISON WITH SITE DATA

Steady state readings have been taken from the monitoring wells and have been selected for the determination of the relevant gas screening values. If the readings were <0.01 a value of 0.01 is used in line with CIRIA, 2007 guidelines. A summary of gas screening calculations and the associated characterisation of the site are identified below in Table 15.

Table 15 - Summary of Gas Screening Values

Gas	Screening Value	Characterisation Situation	Likely NHBC Spec	Comment
Methane (CH ₄)	$((0.01/100) \times 0.1) = 0.00001$	1 (Very Low)	Green	-
Carbon Dioxide (CO ₂)	$((1.6/100) \times 0.1) = 0.0016$	1 (Very Low)	Green	-

Very low levels of ground gas have been identified onsite from the single monitoring visit which has returned a maximum characterisation value of 1 (Very Low/NHBC Green). There is unlikely to be a requirement for further ground gas monitoring visits or special ground gas protective measures.

6.0 CONTAMINATION ASSESSMENT

6.1 ANALYTICAL TEST RESULTS

Table 16 is a comparison with residential GACs with the full results presented in Appendix G.

Table 16 – Comparison of Soil Laboratory Results with Adopted GACs (mg/kg)

Contaminant of Concern	No. of samples	GAC	Source	Min	Max	No. > GAC	Samples Exceeded
Asbestos	3	Absent	WDE	Absent	Absent	0	-
Total Phenols	3	750	LQM	BDL	BDL	0	-
Cyanide	3	50	DIV	BDL	BDL	0	-
Naphthalene	3	2.3	LQM	BDL	BDL	0	-
Acenaphthylene	3	2900	LQM	BDL	BDL	0	-
Acenaphthene	3	3000	LQM	BDL	BDL	0	-
Fluorene	3	2800	LQM	BDL	BDL	0	-
Phenanthrene	3	1300	LQM	BDL	2.8	0	-
Anthracene	3	31000	LQM	BDL	1.4	0	-
Fluoranthene	3	1500	LQM	BDL	9.3	0	-
Pyrene	3	3700	LQM	BDL	11	0	-
Benzo(a)anthracene	3	11	LQM	BDL	5.9	0	-
Chrysene	3	30	LQM	BDL	7.4	0	-
Benzo(b)fluoranthene	3	3.9	LQM	BDL	9.6	1	BH1 @ 0.35
Benzo(k)fluoranthene	3	110	LQM	BDL	3.7	0	-
Benzo(a)pyrene	3	3.2	LQM	BDL	7.4	1	BH1 @ 0.35
Indeno(1,2,3-cd)pyrene	3	45	LQM	BDL	5.5	0	-
Dibenz(a,h)anthracene	3	0.31	LQM	BDL	1.2	1	BH1 @ 0.35
Benzo(ghi)perylene	3	360	LQM	BDL	5.9	0	-
Arsenic	3	40	LQM	12	46	1	BH1 @ 0.35
Boron	3	11000	LQM	0.46	1.7	0	-
Cadmium	3	85	LQM	0.19	6.4	0	-
Chromium	3	910	LQM	11	41	0	-
Copper	3	7100	LQM	6.4	600	0	-
Lead	3	330	C4SL	89	1900	1	BH1 @ 0.35
Mercury	3	56	LQM	BDL	1.6	0	-
Nickel	3	180	LQM	6.2	67	0	-
Selenium	3	430	LQM	BDL	1.7	0	-
Zinc	3	40000	LQM	93	2300	0	-
Benzene	3	0.38	LQM	BDL	BDL	0	-
Toluene	3	880	LQM	BDL	BDL	0	-
Ethylbenzene	3	83	LQM	BDL	BDL	0	-
Xylenes (sum)	3	79	LQM	BDL	BDL	0	-
MTBE	3	73	CLAIRE	BDL	BDL	0	-
TPH - Aliphatic >C5 - C6	3	42	LQM	BDL	BDL	0	-
TPH - Aliphatic >C6 - C8	3	100	LQM	BDL	BDL	0	-
TPH - Aliphatic >C8 - C10	3	27	LQM	BDL	BDL	0	-
TPH - Aliphatic >C10 - C12	3	130	LQM	BDL	BDL	0	-
TPH - Aliphatic >C12 - C16	3	1100	LQM	BDL	BDL	0	-
TPH - Aliphatic >C16 - C21	3	65000	LQM	BDL	BDL	0	-
TPH - Aliphatic >C21 - C35	3	65000	LQM	BDL	BDL	0	-
TPH - Aromatic >C5 - C7	3	370	LQM	BDL	BDL	0	-
TPH - Aromatic >C7 - C8	3	860	LQM	BDL	BDL	0	-
TPH - Aromatic >C8 - C10	3	47	LQM	BDL	BDL	0	-
TPH - Aromatic >C10 - C12	3	250	LQM	BDL	BDL	0	-
TPH - Aromatic >C12 - C16	3	1800	LQM	BDL	BDL	0	-
TPH - Aromatic >C16 - C21	3	1900	LQM	BDL	BDL	0	-
TPH - Aromatic >C21 - C35	3	1900	LQM	BDL	BDL	0	-

6.2 WASTE CLASSIFICATION/ONSITE REUSE OPTIONS

Table 17 provides an overview of the likely waste classification for onsite materials, as well as onsite reuse options. Reuse of site won materials is to be encouraged, which will require a CL:AIRE DoW:CoP Materials Management Plan (MMP) or U1 waste exemption form to be completed.

Table 17 – Likely Waste Classification/Reuse Options for Onsite Materials

Material	Waste Classification	On Site Reuse Options
Made Ground	Non-hazardous	Beneath roads, hardstanding
Natural materials	Inert	All scenarios except topsoil

6.3 CONCLUSIONS ON CONTAMINATION

The following exceedances have been recorded:

Soils

- PAHs (Benzo(a)pyrene), Benzo(b)fluoranthene, Dibenz(a,h)anthracene) upper 0.35m of BH1
- Heavy metals (Arsenic, Lead) upper 0.35m of BH1

Elsewhere, there have been no further exceedances within the soil. The exceedances are all non-volatile will be beneath areas of hard-standing. Therefore, pathway control measures will manage the contamination and no large-scale remedial works are likely to be required. A revised conceptual site model is presented in Table 18.

Table 18 – Summary of Revised Active Source-Pathway-Target Assessment

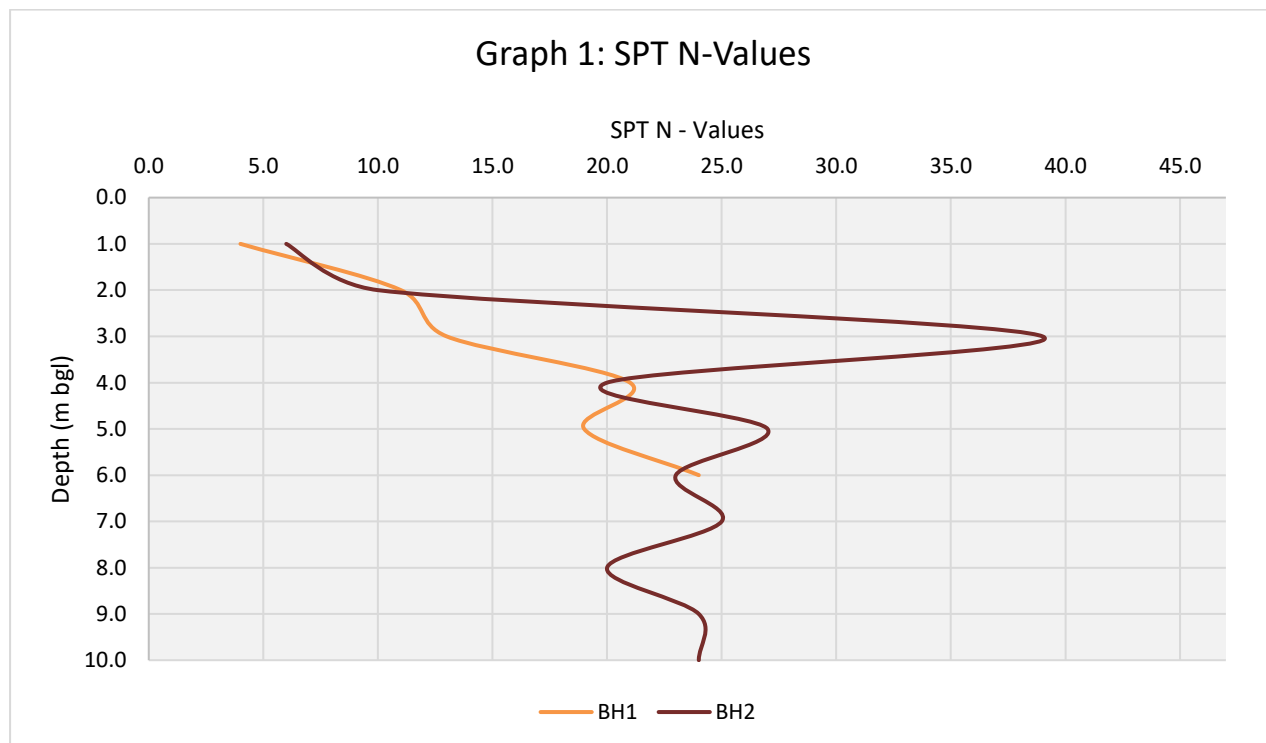
Sources	Potential Pathway	Potential Receptor	Risk Classification
Onsite Sources (Potential made ground)	Outdoor and indoor inhalation	Human Health (Onsite Residential)	Low
	Vapour inhalation from dissolved phase groundwater migrating from site to neighbouring properties	Human Health (Offsite Residential)	Low
Offsite Source (Industrial land uses)	Vapour inhalation from dissolved phase migration from offsite sources	Human Health (Onsite Residential)	Low
Potential made ground >1m thick/highly organic materials	Source for ground gas generation	Human Health (Onsite Residential)	Low

A Verification Plan should be prepared that will include a discovery strategy and criteria to follow for importation of materials for use in areas of soft-standing. Additional verification visits will be required during construction.

7.0 GROUND ENGINEERING

7.1 FIELD TESTING RESULTS

A summary of the SPT N value field testing results is provided in Graph 1.



7.2 GEOTECHNICAL TESTING

Triaxial undrained shear strength (Cu) and Atterberg limit (PI) testing of the encountered strata were undertaken. A copy of the test results is presented in Appendix H and are summarised in Table 19.

Table 19 – Summary of Geotechnical Properties

Description	Depth tested (m bgl)	Moisture Content (%)	Modified Plasticity Index (%)	Cu kPa
Gravelly Clay	1.00 – 2.00	37	14 – 45	-
London Clay	2.00 – 10.00	27 – 32	38 – 45	66 - 194

Gravelly Clay

Testing of the gravelly clay at 1.00 to 2.00m returned intermediate to very high plasticity values. The modified plasticity index of 14 – 45% indicates that there is a low to high volume change potential.

London Clay

Testing of the London Clay between 2.00 and 10.00m returned intermediate to very high plasticity values. The modified plasticity index of 38 – 45% indicates that there is a medium to high volume change potential. The shear strength ranges from 66 – 194 kPa indicating a medium to very high strength material.

7.3 POTENTIAL DESICCATION

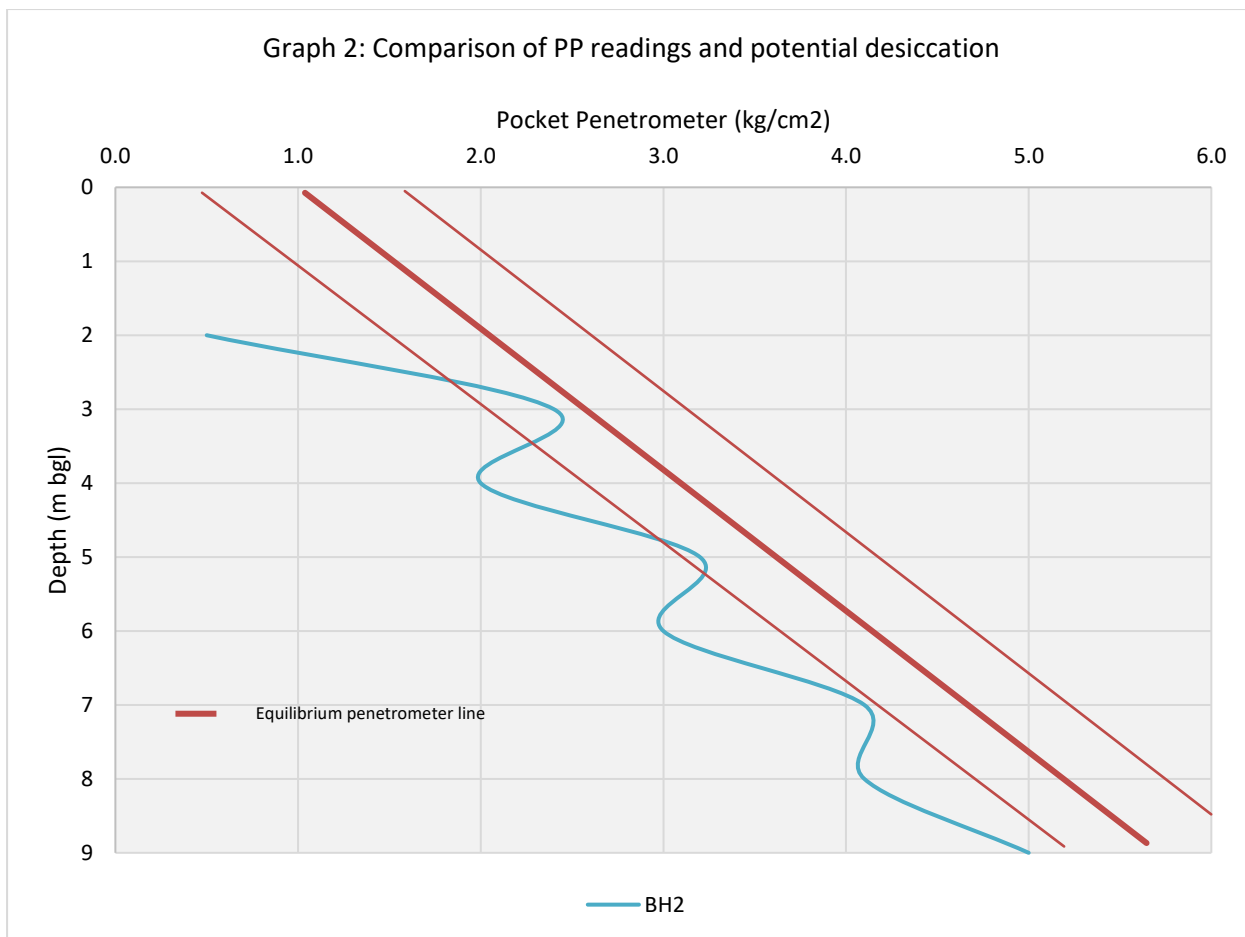
Following laboratory testing of cohesive soils, the most commonly accepted method for determining the degree of desiccation³ is that significant desiccation has occurred when the moisture content (MC) is less than 0.4 x the liquid limit (LL). A summary of whether the materials are potentially desiccated is presented in Table 20. Values are calculated after soil particles with a nominal diameter greater than 425um are removed in line with BS1377.

Table 20 – Potential for Desiccation of Soils

Borehole	Depth (m)	MC (%)	Modified LL (%)	0.4 x LL (%)	Significant Desiccation
BH1	1	37	72.52	29	No
BH1	2	28	48	19.2	No
BH1	3	28	74	29.6	Yes
BH1	4	28	75	30	Yes
BH2	2	32	63.36	25.344	No
BH2	3	28	71	28.4	Yes
BH2	4	28	73	29.2	Yes
BH2	5	27	71	28.4	Yes

The depth and extent of desiccation can also be assessed by comparison of penetrometer readings. Graph 2 shows an assessment of desiccation by comparing the results of the borehole to the profile representing equilibrium conditions for London Clay.

³ BRE 1996. Desiccation in clay soils. Digest 412.



Desiccation would not therefore appear to be present, based on the results from the pocket penetrometer.

7.4 CONCRETE DESIGN PARAMETERS

A summary of the sulphate, pH and corresponding BRE concrete in aggressive ground parameters⁴ for concrete design are presented in Table 21.

Table 21 – Summary of BRE Concrete in Aggressive Ground Parameters

Location	Concrete Parameters
pH (pH Units)	7.6-10.1
Water Soluble Sulphate as (2:1 Leachate Equivalent) (mg/l)	710
ACEC Classification	AC-1s
Design Sulphate Class	DS-2

⁴ BRE 2005. Concrete in Aggressive Ground. Special Digest 1.

7.5 COMPARISON WITH WATER UK THRESHOLD CONCENTRATION VALUES

The soil laboratory results from the upper 1.35m have been compared to the UKWIR thresholds for the selection of water supply pipes in Table 22 with full results presented in Appendix G.

Table 22 - Comparison of Soil Laboratory Results from the upper 1.35m with UKWIR (mg/kg)

Contaminant of Concern	No. of Samples	UKWIR Threshold	Min	Max	No. Samples > GAC	Samples Exceeded
Total BTEX & MTBE	3	0.1	BDL	BDL	0	-
EC5-EC10 Aliphatic	3	2	BDL	BDL	0	-
EC10-EC16 Aliphatic	3	10	BDL	BDL	0	-
EC16-EC40 Aliphatic	3	500	BDL	BDL	0	-
EC5-EC10 Aromatic	3	2	BDL	BDL	0	-
EC10-EC16 Aromatic	3	10	BDL	BDL	0	-
EC16-EC40 Aromatic	3	500	BDL	BDL	0	-
Phenol	3	2	BDL	BDL	0	-
Cresols and chlorinated phenols	3	2	-	-	-	-
Corrosive	3	Various	7.6	10.1	0	-

There have been no exceedances of the UKWIR threshold values and therefore it is unlikely that additional mitigation measures in the form of protective pipe will be necessary. Further consultation should be sought with the water supply company.

7.6 EXCAVATIONS, GROUNDWATER CONTROL AND SERVICES

There is potential some perched water present at 3m depth, which should be taken into account for the design of the basement by incorporating appropriate tanking/waterproofing measures. Water control measures may also be required during periods of increased rainfall. Excavation walls are not likely to require additional support within the cohesive London Clay. There are a number of potentially live services beneath the site which will need to be safely dealt with during construction.

7.7 PRELIMINARY ROAD DESIGN PARAMETERS

Frost susceptibility tends to be a feature of silty and sandy clays, of low to medium plasticity. Table 23 gives an indication of frost susceptibility and permeability with grading and plasticity index for preliminary identification.

Table 23 – Likely Frost Susceptibility of Soil Materials (adapted from TRRL)

Permeability	Soil Texture	Frost Susceptible
High Permeability	Granular, <10% finer than 75 microns	No
Intermediate Permeability	Granular, >10% finer than 75 microns. Cohesive PI <20%	Yes
Low Permeability	Cohesive PI >20%	No

This site has recorded a PI of 46% within the upper 1m and therefore in accordance with the TRRL is not considered to have frost susceptible soil materials and should be taken into the total highway pavement construction thickness.

It is anticipated that the soils encountered at formation level will a mixture of cohesive and incohesive materials and will be above the water table. The amount of loading is unknown for the roads and pavements, but for poor to good construction conditions⁵, a CBR design value of 2.5 to 3% is recommended for initial design.

Where the CBR is <2% it will be required to either increase the capping layer or to excavate out any soft spots.

7.8 PRELIMINARY FLOOR DESIGN

The ground gas risk for the site has been characterised as a Very Low Risk, which does not require any enhancement above the standard specification (CS1/NHBC Green). Compressible materials should be incorporated within solid concrete flooring to accommodate potential heave.

7.9 SOAKAGE POTENTIAL

The borehole permeability tests indicate poor permeability (<10⁻⁶ m/sec) within the clay materials, indicating that soakages to ground are unlikely to be viable.

It is likely that alternative drainage measures will be require in line with the SuDS guidelines.

7.10 PRELIMINARY FOUNDATION DESIGN

Factors that will need to be considered when selecting the type and depth of foundations includes:

- Anticipated loads required by proposed development
- Depth of groundwater
- Depth of made ground
- Areas containing soft/loose or peaty materials identified during field testing
- Differences in founding materials to avoid differential settlement issues
- Type/height and types of trees in combination with volume change potential of soils
- Potential desiccation

It is understood that the development is to comprise construction of three-storey residential dwellings with basements and refurbishment of the current social club.

⁵ TRRL 1984 Structure Design of Bituminous Roads. Report LR1132

Traditional strip foundations within the London Clay could be utilised, adopting an allowable bearing capacity of 150 to 200kPa. There is potential desiccation to the cohesive materials which should be further assessed once additional access is available. If proven, then an alternative foundation method may be required such piling.

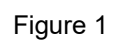
It is recommended that a structural engineer is consulted for the detailed foundation design.

8.0 RECOMMENDATIONS FOR FUTHER WORK

WDE recommends that the following items are undertaken:

- Preparation of Verification Plan with additional verification site visits during construction.

FIGURES





©Open Street Maps





APPENDIX A - LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

Mr Steve Satwick, Martin Cramer & Pentagon Ltd (the client) has requested that a Geo-Site Assessment Report be performed for Wood Green Social Club, Wood Green, London to provide information to permit formulation of an opinion as to the potential for risks to human health & controlled waters posed by identified substances of concern.

The Geo-Site Assessment Report was conducted and this report has been prepared for the sole use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of WDE Consulting Limited. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill.

The findings and opinions conveyed via this Geo-Site Assessment Report are based on information obtained from a variety of sources as detailed within this report, and which WDE Consulting Limited believes are reliable. Nevertheless, WDE Consulting Limited cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

The report represents the findings and opinions of experienced geo-environmental consultants. WDE Consulting Limited does not provide legal advice and the advice of lawyers may also be required.

The Client is advised that the conditions stated within reports supplied to WDE Consulting Limited are subject to change. Certain indicators of the presence of hazardous substances may have been latent at the time of the most recent site reconnaissance and may subsequently have become observable.

It is possible that WDE Consulting's research, while fully appropriate for a Geo-Site Assessment Report, failed to indicate the existence of important information sources. Assuming such sources actually exist, their information could not have been considered in the formulation of WDE Consulting's findings and opinions.

Certain indicators or evidence of hazardous substances may have been outside the very limited portion of the subsurface investigated or monitored, latent at the time of this work or only partially intercepted by the works and thus their full significance could not have been appreciated. Groundwater levels are particularly susceptible to variations due to seasonal or other effects. Any comments on groundwater conditions are based on observations and analyses made by third parties at the time the site work was carried out. Accordingly, it is possible that WDE Consulting's work, whilst fully appropriate for a Geo-Site Assessment Report failed to indicate the presence or significance of hazardous substances. Assuming such materials present a hazard, their presence could not have been considered in the formulation of WDE Consulting's findings and opinions. The subsurface geological profiles and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

Any interpretation of the results of the Geo-Site Assessment Report has been based on the proposed site usage and the findings are not valid should the proposed land use and/or the regulatory regime/guidance change. Where interpretation is based on public domain guidance/protocols/models/software/code, WDE Consulting Limited is not liable for errors in the guidance/protocols/models/software/code.

WDE Consulting Limited believes that providing information about limitations is essential to help the client identify and thereby manage their risks. These risks can be mitigated, but they cannot be eliminated, through additional research. WDE Consulting Limited will on request, advise the client of the additional research opportunities available, their impact on risk, and their cost.

In preparing this report, it has been assumed that all past and present occupants have provided all relevant and other information, especially relating to known or potential hazards. This report is not required to identify insufficiencies or mistakes in the information provided by the user/owner or from any other source but has sought to compensate for these where obvious in the light of other information.

The work is also subject to WDE Consulting's standard terms and conditions.

APPENDIX B- RELEVANT GUIDANCE AND LEGISLATION

WDE Consulting has duly taken account of the recommendation contained within relevant guidance documents and legislation during the preparation of this report.

CONTAMINATION

Part IIa of the Environmental Protection Act 1990 defined contamination in relation to continued land use and introduced the “polluter pays” principal. The Groundwater Regulations 1998 defined List 1 and List 2 substances and the procedures for preventing them from entering groundwater. The Water Resources Act of 1991 introduced the term “controlled waters” and gave powers to the Environment Agency to require remediation where there was pollution of controlled waters.

The National Planning Policy Framework⁶ requires the following:

- The site is made suitable for its intended use, taking account of all ground conditions arising from natural and former activities, pollution arising from previous uses and proposals for mitigation including land remediation.
- After remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990.
- Adequate site information, prepared by a competent person, is presented.

The methodology adopted for this report follows the guidance and procedures for Land Contamination Risk Management (LCRM) produced by the Agency⁷. The LCRM process provides a reasoned and structured mechanism to identify potential risk issues and, where necessary, provide a way forward to develop a robust risk management strategy to address potentially unacceptable risks in an appropriate manner. Contained within the LCRM Framework are the following stages:

1. Stage 1 risk assessment
2. Stage 2 options appraisal
3. Stage 3 remediation and verification

British Standards has issued guidance for the Investigation of Potentially Contaminated Sites⁸ and for undertaking Site Investigations⁹ which have duly been considered. An update to the potential human health exposure pathways is provided in the Environment Agency Soil Science Report SR3¹⁰. In 2008 the Environment Agency and the National House-Building Council (NHBC), Chartered Institute of Environmental Health (CIEH) released a joint publication for the Safe Development of Housing on Land

⁶ Department of Communities and Local Government. March 2012

⁷ Environment Agency. 2020. Land Contamination Risk Management (LCRM)

⁸ British Standards 2011. Investigation of Potentially Contaminated Sites-Codes of Practice. BS10175:2011

⁹ British Standards. 2015. Code of Practice for Site Investigations. BS5930

¹⁰ Environment Agency, August 2008, Updated technical background to the CLEA model, Science Report - SC050021/SR3

Affected by Contamination¹¹. Guidance is provided in the CLR Report No 4 on sampling strategies for contaminated land¹².

QUALITATIVE RISK ASSESSMENT

To assess the potential for risk, the Source → Pathway → Receptor relationships have been evaluated to determine whether there are potentially active pollutant linkages between sources and receptors. Only when there is an active pollutant linkage, can there be a potential risk to a receptor from a source via a particular pathway. Each active pathway has been assigned a qualitative assessment as to the level of risk as shown in the below table and as per R&D 66¹¹.

Qualitative Risk Classification Scheme

		CONSEQUENCE			
		Severe	Medium	Mild	Minor
PROBABILITY (Likelihood)	High likelihood	Very High Risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

ADOPTED GACS

The Generic Assessment Criteria (GACs) that have been adopted are based on the Land Quality Management (LQM) Suitable for Use Levels (S4UL)¹³. These published values are available for residential with/without home grown produce, commercial, allotment and public open space land use scenarios. As there is no current UK GAC for lead or cyanide, the Category 4 Screening Level (C4SL) will be adopted for lead and the Dutch Intervention Value (DIV) for cyanide. In the absence of any UK published value, the detection limits have been adopted.

For asbestos, there are no current GAC for asbestos fibres in soils. For surface soils within a residential/allotments setting, it is best practice to take a conservative approach and to adopt the detection limit (0.001%) as the threshold. A *very low quantity* threshold for asbestos of 0.01% had been proposed by CL:AIRE²⁷, which is considered to be appropriate for adoption within a commercial/public open space scenario.

11 Environment Agency. 2008. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D 66

12 DOE. 1994. Sampling Strategies for Contaminated Land. CLR Report No 4

13 LQM/CIEH 2014. The LQM/CIEH S4ULs for Human Health Risk Assessment.

GACs For Various Land Uses (mg/kg)

Contaminant of Concern	Residential with HGP	Residential without HGP	Allotments	Commercial	Public Open Space Res
Asbestos	DL	DL	DL	DL	DL
Asbestos Quantification %	0.001	0.001	0.001	0.01	0.01
Total Cyanide	50	50	50	50	50
Total Phenols	280	750	66	760	760
Naphthalene	2.3	2.3	4.1	190	4900
Acenaphthylene	170	2900	28	83000	15000
Acenaphthene	210	3000	34	84000	15000
Fluorene	170	2800	27	63000	9900
Phenanthrene	95	1300	15	22000	3100
Anthracene	2400	31000	380	520000	74000
Fluoranthene	280	1500	52	23000	3100
Pyrene	620	3700	110	54000	7400
Benzo(a)anthracene	7.2	11	2.9	170	29
Chrysene	15	30	4.1	350	57
Benzo(b)fluoranthene	2.6	3.9	0.99	44	7.1
Benzo(k)fluoranthene	77	110	37	1200	190
Benzo(a)pyrene	2.2	3.2	0.97	35	5.7
Indeno(1,2,3-cd)pyrene	27	45	9.5	500	82
Dibenz(a,h)anthracene	0.24	0.31	0.14	3.5	0.57
Benzo(ghi)perylene	320	360	290	3900	640
Arsenic	37	40	43	640	79
Boron	290	11000	45	240000	21000
Cadmium	11	85	1.9	190	120
Chromium	910	910	18000	8600	1500
Copper	2400	7100	520	68000	12000
Lead	210	330	84	6600	760
Mercury	40	56	19	1100	120
Nickel	180	180	230	980	230
Selenium	250	430	88	12000	1100
Zinc	3700	40000	620	730000	81000
Benzene	0.087	0.38	0.017	27	72
Toluene	130	880	22	56000	56000
Ethylbenzene	47	83	16	5700	24000
Xylenes (sum)	56	79	28	5900	41000
MTBE	0.001	0.001	0.001	0.001	0.001
TPH - Aliphatic >C5 - C6	42	42	730	3200	570000
TPH - Aliphatic >C6 - C8	100	100	2300	7800	600000
TPH - Aliphatic >C8 - C10	27	27	320	2000	13000
TPH - Aliphatic >C10 - C12	130	130	2200	9700	13000
TPH - Aliphatic >C12 - C16	1100	1100	11000	59000	13000
TPH - Aliphatic >C16 - C21	65000	65000	260000	1600000	250000
TPH - Aliphatic >C21 - C35	65000	65000	260000	1600000	250000
TPH - Aromatic >C5 - C7	70	370	13	26000	56000
TPH - Aromatic >C7 - C8	130	860	22	56000	56000
TPH - Aromatic >C8 - C10	34	47	8.6	3500	5000
TPH - Aromatic >C10 - C12	74	250	13	16000	5000
TPH - Aromatic >C12 - C16	140	1800	23	36000	5100
TPH - Aromatic >C16 - C21	260	1900	46	28000	3800
TPH - Aromatic >C21 - C35	1100	1900	370	28000	3800

CONTROLLED WATER EALS

In the UK there are two published Environmental Assessment Levels (EALs) available for comparison with groundwater, the Water Framework Directive¹⁴ and the Water Supply Regulations¹⁵, apart from TPH fractions, Ethylbenzene and Xylenes where the DWS and EQS values has been adopted, respectively. Detection Limit (DL) is used where a standard has not been derived. SoBRA have calculated the risks from vapour inhalation from volatile dissolved phase contaminants for residential and commercial human health receptors.

Adopted Groundwater/Leachate Target Values(mg/l)

Contaminant of Concern	EAL	Source	SoBRA Res	SoBRA Comm
Total Phenols	0.0077	UK WFD	-	-
Cyanide	0.05	UK WSR	-	-
Naphthalene	0.002	UK WFD	-	-
Acenaphthylene	0.0001	UK WSR	-	-
Acenaphthene	0.0001	UK WSR	-	-
Fluorene	0.0001	UK WSR	-	-
Phenanthrene	0.0001	UK WSR	-	-
Anthracene	0.0001	UK WSR	-	-
Fluoranthene	0.0001	UK WSR	-	-
Pyrene	0.0001	UK WSR	-	-
Benzo(a)anthracene	0.0001	UK WSR	-	-
Chrysene	0.0001	UK WSR	-	-
Benzo(b)fluoranthene	0.0001	UK WSR	-	-
Benzo(k)fluoranthene	0.0001	UK WSR	-	-
Benzo(a)pyrene	0.00001	UK WSR	-	-
Indeno(1,2,3-cd)pyrene	0.0001	UK WSR	-	-
Dibenz(a,h)anthracene	0.0001	UK WSR	-	-
Benzo(ghi)perylene	0.0001	UK WSR	-	-
Arsenic	0.01	UK WSR	-	-
Boron	1	UK WSR	-	-
Cadmium	0.005	UK WSR	-	-
Chromium	0.05	UK WSR	-	-
Copper	2	UK WSR	-	-
Lead	0.01	UK WSR	-	-
Mercury	0.001	UK WSR	-	-
Nickel	0.02	UK WSR	-	-
Selenium	0.01	UK WSR	-	-
Zinc	0.0123	UK WFD	-	-
Benzene	0.001	UK WSR	0.21	20
Toluene	0.074	UK WFD	230	21000
Ethylbenzene	0.02	UK EQS	10	960
Xylenes (sum)	0.03	UK EQS	31.4	3020
MTBE	DL	WDE	-	-
TPH - Aliphatic >C5 - C6	0.01	UK DWS	1.9	190
TPH - Aliphatic >C6 - C8	0.01	UK DWS	1.5	150
TPH - Aliphatic >C8 - C10	0.01	UK DWS	0.057	5.7
TPH - Aliphatic >C10 - C12	0.01	UK DWS	0.037	3.6
TPH - Aliphatic >C12 - C16	0.01	UK DWS	-	-
TPH - Aliphatic >C16 - C21	0.01	UK DWS	-	-
TPH - Aliphatic >C21 - C35	0.01	UK DWS	-	-
TPH - Aromatic >C5 - C7	0.01	UK DWS	210	20000
TPH - Aromatic >C7 - C8	0.01	UK DWS	220	21000

¹⁴ The Water Framework Directive (Standards and Classifications) Directions (England and Wales). 2015.

¹⁵ The Water Supply (Water Quality) Regulations. 2016.

TPH - Aromatic >C8 - C10	0.01	UK DWS	1.9	190
TPH - Aromatic >C10 - C12	0.01	UK DWS	6.8	660
TPH - Aromatic >C12 - C16	0.01	UK DWS	39	3700
TPH - Aromatic >C16 - C21	0.01	UK DWS	-	-
TPH - Aromatic >C21 - C35	0.01	UK DWS	-	-

GROUND GAS

The following relevant guidance will be used to assess the risks posed by ground gas:

- CIRIA Assessing risks posed by hazardous ground gases to buildings¹⁶
- NHBC: Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present¹⁷
- NHBC: An essential guide for housebuilders¹⁸
- The Building Regulations Site Preparation and resistance to contaminants and moisture. ¹⁹
- British Standard. Guidance on Investigations for Ground Gas²⁰
- Steve Wilson Error! Bookmark not defined. Screening Approach for Landfill Gas Migration around Landfills.

Groundgas guidance has been recently updated by NHBC ¹⁸ that assesses the potential for groundgas risk in relation to the age and type of infilling. The 2007 CIRIA guidance calculates a gas screening value to identify the protective measures required, as shown below.

Summary of CIRIA 2007 Guidance

Characterisation Situation	Risk Classification	Gas Screening Value (l/hr)	Typical Factors	Protective Measure
1	Very Low	<0.07	Methane <1% or carbon dioxide <5%; otherwise increase to Situation 2	No special precautions (See recommendation)
2	Low	<0.7	Air Flow rate <70l/hr; otherwise increase to Situation 3	Block and beam with 2,000g, Cast in situ with 1,200g. All joints and penetrations sealed
3	Moderate	<3.5	-	As above but with gas resistant membranes and passively ventilated or positive pressured sub-floor void
4	Moderate to High	<15	QRA recommended	As above but with oversite capping, in-ground venting layer and in ground wells or barriers
5 – 6	High to Very High	<70		Not suitable unless gas regime is reduced first and QRA completed

¹⁶ CIRIA 2007. Assessing Risks Posed by Hazardous Ground Gases to Buildings. C665

¹⁷ NHBC 2007. Guidance on Evaluation of Development Proposals on Sites where methane and carbon dioxide are present

¹⁸ NHBC 2023. Hazardous Ground Gas- An essential guide for housebuilders. NF94.

¹⁹ Building Regulations 2004. Approved Document C, Site Preparation and resistance to contaminants and moisture.

²⁰ British Standards 2013. Guidance on Investigation for Ground Gas. BS8576. 2013

Summary of NHBC Traffic Light System

Gas Regime	Methane		Carbon Dioxide	
	Typical max %	Gas Screening Value (l/hr)	Typical max %	Gas Screening Value (l/hr)
Green	<1	<0.16	<5	<0.78
Amber 1	1 – 5	0.16 – 0.63	5 – 10	0.78 – 1.56
Amber 2	5 – 20	0.63 – 1.56	10 – 30	1.56 – 3.13
Red	20+	1.56+	30+	3.13+

UK WATER SUPPLY PIPES

The following guidance has been followed for the selection of water supply pipes:

- UKWIR Guidance for the selection of Water Supply Pipes²¹
- Water UK Contaminated Land Assessment Guidance²²

These mainly apply to brownfield sites, although may apply to greenfield sites should the preliminary risk assessment identify there is a potential for contamination to be present.

WASTE MANAGEMENT

The EU Waste Framework Directive 2008 presents the legislative framework for the collection, transport, recovery, and disposal of waste. This framework provides a five-step hierarchical plan for managing waste comprising prevention, preparing for re-use, recycling, recovery, and disposal, which have been made into UK law via the UK Waste Regulations 2011. This requires all businesses/organisations that either produces or handles waste to either prevent waste or to apply the waste hierarchy for the transfer of waste. The Environment Protection (Duty of Care) Regulations 1991 require that transfer notes are used to identify the type of waste, volume, source and intended destination along with the details of the licensed carrier.

The Agency have published guidance on the classification of Hazardous Waste²³, which defines how man-made materials are classified as being hazardous by exceeding at least one of the fifteen hazardous properties (H1 to H15). Man Made materials can either be absolute hazardous, absolute non-hazardous or mirror and if mirror then an assessment needs to be made as to whether the materials poses any of the hazardous properties before classifying the materials as being either hazardous or

²¹ UK Water Industry Research 2011. Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. 10/WM/03/21.

²² Water UK 2014. Contaminated Land Assessment Guidance.

²³ Environment Agency. 2013. Interpretation of the Definition and Classification of Hazardous Waste. Technical Guidance WM2

non-hazardous. The Agency has also published guidance on the Waste Acceptance at Landfills²⁴. Landfills are classified as to whether they can accept hazardous, non-hazardous, or inert materials. Waste Acceptance Criteria (WAC) thresholds have been set to determine the class of landfill that can accept the materials. Disposal of hazardous materials requires pre-treatment. WAC limits are not to be used for determining whether waste is hazardous.

The CL:AIRE CoP of the Definition of Waste²⁵ was developed to provide clarity on when the reuse of site won materials will cease to be waste. It requires the development of Material Management Plan (MMP) that is specific to the site and the intended reuse of materials. The MMP will need to be based on a site specific Remedial Strategy/Design Statement that will demonstrate that the reuse of the site won materials will not pose an unacceptable risk to sensitive receptors. There will then need to be a requirement for verification that the proposed reuse has been carried out as was planned.

CLIMATE CHANGE

The UK has signed up to achieving a net zero target by 2050 under the COP 21 Paris Agreement in 2015, which requires all industry to reduce its emissions by 78% by 2035 compared to 1990 levels. Approximately 1.25% of the UK total greenhouse gases are attributable to the built environment, with CO₂ emissions amounting to 40-50million tonnes, more than for aviation and shipping combined²⁶. The use of low carbon materials, retrofitting old ones and the need for considering whole-life carbon of new buildings needs to be balanced with the need for additional housing.

The National Planning Policy Framework (NPPF) and LCRM advocates the adoption of sustainable development practices. The Sustainable Management Practices for the Management of Land Contamination issued in 2021 by CL:AIRE/SuRF-UK promote sustainability principles for all aspects of land contamination management, a summary of which is provided below.

²⁴ Environment Agency. 2010 Waste Acceptance at Landfills. Version 1.

²⁵ CL:AIRE 2001. The Definition of Waste: Development Industry Code of Practice. Version 2.

²⁶ UK Parliament. Building to new zero: costing carbon in construction. First Report of Session 2022-23

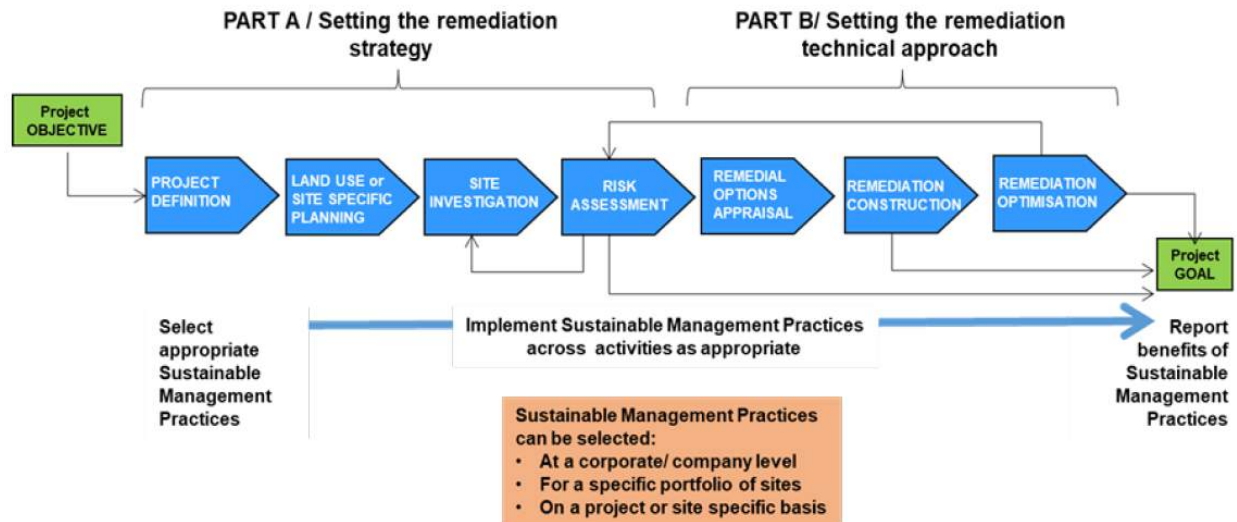


Figure 2.1: Application of sustainable management practices in context of life cycle of land contamination management and SuRF UK Framework

GROUND ENGINEERING

In accordance with BS-EN-1997-1 2004 Geotechnical Design: General Rules, engineering parameters for use in geotechnical design have been assessed using a three-step process:

1. Compilation of test data to determine a range of values for each relevant engineering parameter either by using direct results, geotechnical theory/correlations, or empiricism
2. Use of engineering judgement to determine a characteristic value for each parameter
3. Application of partial factors to give a design value for each parameter

Geotechnical site assessments were carried out in accordance where practical with the recommendations of BS EN 1997:2 2007 Eurocode 7 Geotechnical Design: Ground Investigation and Testing. This report has been written in line with the requirements of a Ground Investigation Report (GIR) as set out in BS EN 1997:2 and does not constitute a Geotechnical Design Report.

DESICCATION TESTING

Another method for determining desiccation involves the use of a pocket penetrometer with measurements taken directly on borehole core samples²⁷. The depth and extent of desiccation is assessed by comparison of penetrometer readings against a control. An assessment of desiccation can be made by comparing the results of each borehole to the profile representing equilibrium conditions for London Clay.

²⁷ Proceedings of The Institute of Civil Engineers: Geotechnical Engineering. 1995,113, 25-30

SOAKAGE TESTING AND DESIGN

The following guidance has been followed during the soakage testing:

- Falling Head Tests in boreholes – BS5930⁹
- BRE Digest 365 2003 Soakage testing

The CIRIA publication²⁸ provides guidance as to the required distance of buildings from soakages to ground in chalk as follows:

- 20m distance of soakaways from buildings where dissolution features are known to be prevalent
- 10m distance of soakaways from buildings where chalk is low density or unknown
- 5m distance of soakaways from buildings where chalk is of medium to high density

EFFECTS OF TREES AND SHRINKABLE MATERIALS ON FOUNDATION DEPTHS

The following guidance has been followed for determining the foundation depths:

- NHBC Standards 2010 Part 4 Foundations

This document includes guidance on likely foundation depth required when taking into account the volume change potential of materials in combination with the distance to different tree species (height and water demand status).

PRELIMINARY ROAD DESIGN PARAMETERS

The following guidance has been followed for the preliminary likelihood of frost susceptible soils affecting the site:

- Transport and Road Research Laboratory (1970) (TRRL)

²⁸ CIRIA. 2002. Engineering in Chalk. C574.

APPENDIX C - SITE PHOTOS

Photo 1 – Detached dwelling (facing south)



Photo 2 – Wood Green Social Club (facing east)



Photo 3– Rear hard standing area (facing southeast)

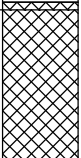
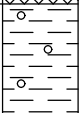
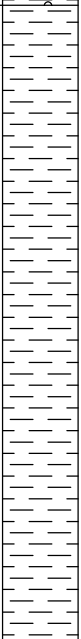


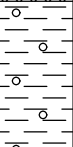
Photo 4– Drain at the rear of the site.



APPENDIX D - [ENVIRONMENTAL DATABASE](#)

APPENDIX E - BOREHOLE LOGS

			62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410			Site Wood Green Social Club		Borehole Number BH1	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Steve Satwick, Martin Cramer and Pentagon LTD		Job Number 21206	
		Location		Dates 16/05/2023 - 16/05/2023		Engineer AR & JH		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.30	J1				0.05	MADE GROUND: Yellow Sand			
					(1.00)	MADE GROUND: Brown sandy clay with red brick fragments.			
1.00 1.10	C1 (1-2m) D1 (1m) SPT N=4 J2		1,1/1,1,1,1		1.05 (0.75)	Soft to stiff brown gravelly CLAY. Gravels are sub rounded to rounded fine to coarse flint.			
2.00	C2 (2-3m) D2 (2m) SPT N=11		2,2/2,2,3,4		1.80	Firm to very stiff brown CLAY 1.90 - 2.20 ...Becomes very sandy			
3.00	D3 SPT N=13		3,3/3,3,3,4						
4.00	D4 SPT N=21	4.00	Water Strike at 4.00m 4,4/5,5,5,6		(4.20)				
5.00	D5 SPT N=19		4,4/4,4,5,6						
6.00	SPT N=24		6,5/6,5,6,7		6.00	Complete at 6.00m			
Remarks Groundwater encountered at 4m.							Scale (approx) 1:50	Logged By AR	Figure Number 21206.BH1

			62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410			Site Wood Green Social Club		Borehole Number BH2	
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Steve Satwick, Martin Cramer and Pentagon LTD		Job Number 21206	
		Location		Dates 26/05/2023 - 26/05/2023		Engineer AR & JH		Sheet 1/2	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
0.80	J1				0.20	CONCRETE.			
1.00	C1(1-2m) D1(1m) SPT N=6		1,1/1,1,2,2		(0.80)	MADE GROUND: Brown sandy clay with red brick fragments.			
2.00	C2(2-3m) D2(2m) PP= 50 kPa SPT N=10		1,1/2,2,3,3		1.00	Firm light brown to orange silty gravelly CLAY.			
3.00	C3(3-4m) D3(3m) PP= 240 kPa SPT N=39		2,2/3,12,15,9		2.00	Firm to very stiff brown to dark brown CLAY.			
4.00	C4(4-5m) D4(4m) PP= 200 kPa SPT N=20		4,4/5,5,5,5			3.00 - 3.10 ...Gravel band.			
5.00	D5 PP= 320 kPa SPT N=27		7,6/6,6,7,8						
6.00	C5 (5-6m) D6 (6m) PP= 300 kPa SPT N=23	6.00	Water Strike at 6.00m 5,5/5,5,6,7		(8.00)				
7.00	C6(7-8m) D7 (7m) PP= 410 kPa SPT N=25		6,6/6,6,6,7						
8.00	C7(8-9) D8(8m) PP= 410 kPa SPT N=20		2,3/4,6,4,6						
9.00	D9 PP =500 kPa SPT N=24		3,5/5,5,6,8						
Remarks Groundwater encountered at 6m.							Scale (approx) 1:50	Logged By JH	Figure Number 21206.BH2

WDEconsulting 62a Western Road Tring, Hertfordshire HP23 4BB Tel. 01442 825570 Fax. 01442 891410				Site Wood Green Social Club		Borehole Number BH2			
Excavation Method Window Sampler		Dimensions		Ground Level (mOD)		Client Steve Satwick, Martin Cramer and Pentagon LTD		Job Number 21206	
		Location		Dates 26/05/2023 - 26/05/2023		Engineer AR & JH		Sheet 2/2	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	DESCRIPTION	Legend	Water	Instr
10.00	D10 SPT N=24		5,5/6,6,6,6		10.00				
Remarks							Scale (approx)	Logged By	
							1:50	JH	
							Figure Number 21206.BH2		

APPENDIX F – FIELD SHEETS

Ground Gas Sheets

Permeability Sheets

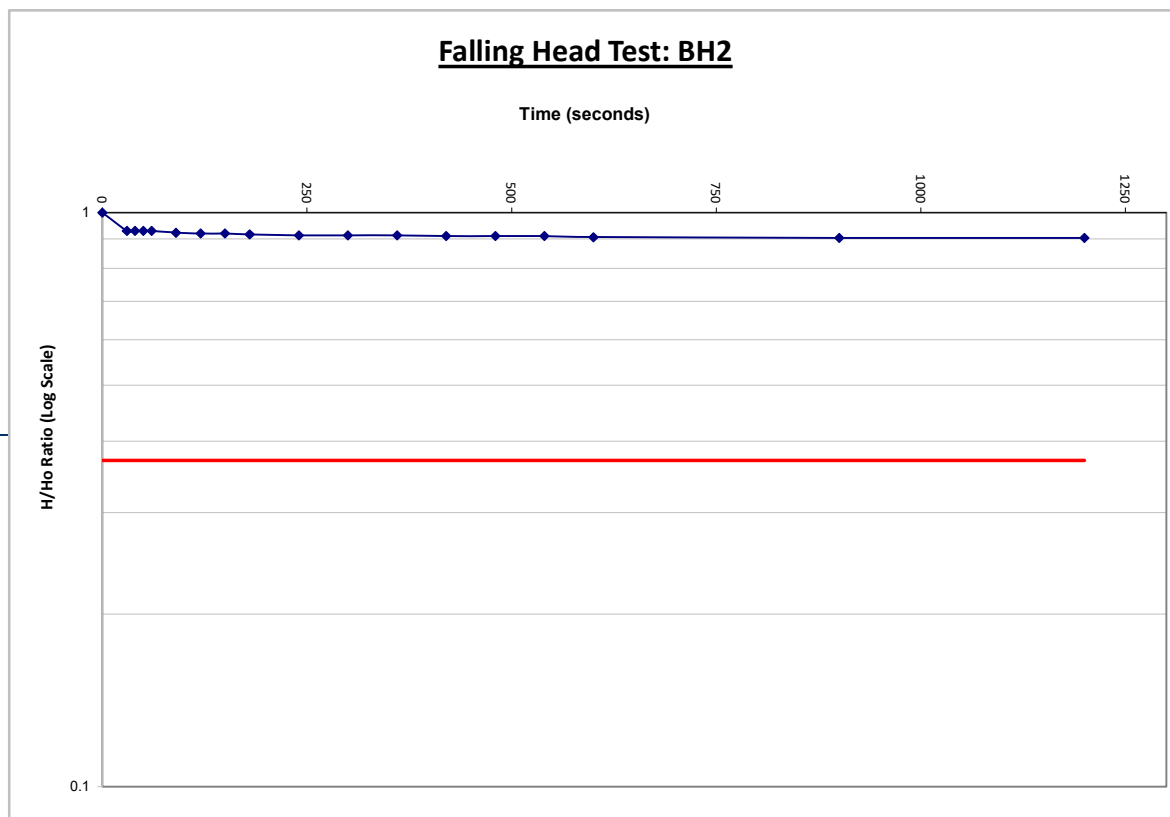
Date of Test	02/06/2023
Completed by	JH
Site Name	WOOD GREEN SOCIAL CLUB, N22
BH Location	BH2

Depth to Water-M (TOC)	3.100
Diameter of well (m)	0.05

		Units
Area (A)	0.4867	m ²
F	0.1375	
Head (H ^o)	3.1	m
Time (T)	N/A	sec
Permeability K	#VALUE!	m/sec

Comments:
Poor permeability (<10-06)

Time (Secs)	DTW	H	H/Ho Ratio
0	0.000	3.10000	1
30	0.220	2.88000	0.929032258
40	0.220	2.88000	0.929032258
50	0.220	2.88000	0.929032258
60	0.220	2.88000	0.929032258
90	0.240	2.86000	0.922580645
120	0.250	2.85000	0.919354839
150	0.250	2.85000	0.919354839
180	0.260	2.84000	0.916129032
240	0.270	2.83000	0.912903226
300	0.270	2.83000	0.912903226
360	0.270	2.83000	0.912903226
420	0.280	2.82000	0.909677419
480	0.280	2.82000	0.909677419
540	0.280	2.82000	0.909677419
600	0.290	2.81000	0.906451613
900	0.300	2.80000	0.903225806
1200	0.300	2.80000	0.903225806



Visit Date: 02/06/2023

Visit Number: 1 **Air Temperature:** 16 °C

Borehole Number	BH2		
	0 mins	5 mins	10 mins
Combustible gas (CH4) %LEL	0	0	-
Combustible gas (CH4) % vol	0	0	-
Combustible gas (CH4) Peak	0	0	-
Carbon dioxide % vol	0	1.6	-
Oxygen % vol	0.05	0	-
Carbon monoxide ppm	0000	0000	-
Hydrogen sulfide ppm	0000	0000	-
Flow Rate (l/hr)	+00.1		
Barometric Pressure (mB)	1022		
Relative Downhole Pressure (mB)	-000.00		
Depth to Groundwater (m)	3.15		
Depth to Base of Borehole (m)	5.1		
Condition of Standpipe	Good		

APPENDIX G - ANALYTICAL TEST RESULTS



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Final Report

Report No.: 23-16489-1**Initial Date of Issue:** 25-May-2023**Re-Issue Details:****Client** WDE Consulting Ltd**Client Address:** 62a Western Road
Tring
Herts
HP23 4BB**Contact(s):** Results
Simon Ware**Project** 21206 Wood Green Social Club**Quotation No.:** Q22-27635**Date Received:** 18-May-2023**Order No.:** 23-187**Date Instructed:** 18-May-2023**No. of Samples:** 2**Turnaround (Wkdays):** 5**Results Due:** 24-May-2023**Date Approved:** 25-May-2023**Approved By:****Details:** Stuart Henderson, Technical
Manager

Results - Soil

Project: 21206 Wood Green Social Club

Client: WDE Consulting Ltd	Chemtest Job No.:				23-16489	23-16489
Quotation No.: Q22-27635	Chemtest Sample ID.:				1641456	1641457
Order No.: 23-187	Client Sample Ref.:				J1	J1
	Sample Location:				BH1	BH1
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.35	1.1
	Date Sampled:				16-May-2023	16-May-2023
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Moisture	N	2030	%	0.020	21	25
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected
ACM Type	U	2192		N/A	-	-
pH	U	2010		4.0	7.6	8.1
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphate (Total)	U	2430	%	0.010	0.65	0.064
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.44	< 0.010
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.2	2.2
Total Organic Carbon	U	2625	%	0.20	17	0.89
Total Phenols	U	2920	mg/kg	0.10	< 0.10	< 0.10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	2.8	< 0.10
Anthracene	U	2700	mg/kg	0.10	1.4	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	9.3	0.55
Pyrene	U	2700	mg/kg	0.10	11	0.49
Benzo[a]anthracene	U	2700	mg/kg	0.10	5.9	0.20
Chrysene	U	2700	mg/kg	0.10	7.4	0.39
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	9.6	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	3.7	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	7.4	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	5.5	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	1.2	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	5.9	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	71	< 2.0
Arsenic	U	2455	mg/kg	0.5	46	18
Beryllium	U	2455	mg/kg	0.5	4.9	0.9
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.46	1.7
Cadmium	U	2455	mg/kg	0.10	6.4	0.19
Chromium	U	2455	mg/kg	0.5	41	34
Copper	U	2455	mg/kg	0.50	600	30
Lead	U	2455	mg/kg	0.50	1900	180
Mercury	U	2455	mg/kg	0.05	1.6	0.27
Nickel	U	2455	mg/kg	0.50	67	24
Selenium	U	2455	mg/kg	0.25	1.7	0.93

Results - Soil

Project: 21206 Wood Green Social Club

Client: WDE Consulting Ltd	Chemtest Job No.:				23-16489	23-16489
Quotation No.: Q22-27635	Chemtest Sample ID.:				1641456	1641457
Order No.: 23-187	Client Sample Ref.:				J1	J1
	Sample Location:				BH1	BH1
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.35	1.1
	Date Sampled:				16-May-2023	16-May-2023
	Asbestos Lab:				DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD		
Vanadium	U	2455	mg/kg	0.5	66	59
Zinc	U	2455	mg/kg	0.50	2300	93
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



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Final Report

Report No.: 23-18816-1**Initial Date of Issue:** 13-Jun-2023**Re-Issue Details:****Client** WDE Consulting Ltd**Client Address:** 62a Western Road
Tring
Herts
HP23 4BB**Contact(s):** Results**Project** 21206 Wood Green, Social Club**Quotation No.:** Q22-27635**Date Received:** 05-Jun-2023**Order No.:** 23-199**Date Instructed:** 05-Jun-2023**No. of Samples:** 1**Turnaround (Wkdays):** 5**Results Due:** 09-Jun-2023**Date Approved:** 13-Jun-2023**Approved By:****Details:** Stuart Henderson, Technical
Manager

Results - Soil

Project: 21206 Wood Green, Social Club

Client: WDE Consulting Ltd	Chemtest Job No.:				23-18816
Quotation No.: Q22-27635	Chemtest Sample ID.:				1651150
	Client Sample ID.:				J1
	Sample Location:				BH2
	Sample Type:				SOIL
	Top Depth (m):				0.8
	Date Sampled:				26-May-2023
	Asbestos Lab:				DURHAM
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	26
Asbestos Identification	U	2192		N/A	No Asbestos Detected
ACM Type	U	2192		N/A	-
pH	U	2010		4.0	10.1
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50
Sulphate (Total)	U	2430	%	0.010	0.24
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.71
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	3.1
Total Organic Carbon	U	2625	%	0.20	1.3
Total Phenols	U	2920	mg/kg	0.10	< 0.10
Naphthalene	U	2700	mg/kg	0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0
Arsenic	U	2455	mg/kg	0.5	12
Beryllium	U	2455	mg/kg	0.5	< 0.5
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.54
Cadmium	U	2455	mg/kg	0.10	0.92
Chromium	U	2455	mg/kg	0.5	11
Copper	U	2455	mg/kg	0.50	6.4
Lead	U	2455	mg/kg	0.50	89
Mercury	U	2455	mg/kg	0.05	< 0.05
Nickel	U	2455	mg/kg	0.50	6.2
Selenium	U	2455	mg/kg	0.25	< 0.25

Results - Soil

Project: 21206 Wood Green, Social Club

Client: WDE Consulting Ltd	Chemtest Job No.:		23-18816		
Quotation No.: Q22-27635	Chemtest Sample ID.:		1651150		
	Client Sample ID.:		J1		
	Sample Location:		BH2		
	Sample Type:		SOIL		
	Top Depth (m):		0.8		
	Date Sampled:		26-May-2023		
	Asbestos Lab:		DURHAM		
Determinand	Accred.	SOP	Units	LOD	
Vanadium	U	2455	mg/kg	0.5	12
Zinc	U	2455	mg/kg	0.50	95
Benzene	U	2760	µg/kg	1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

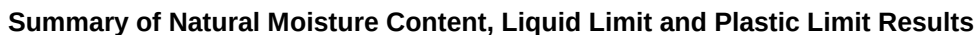
Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	C	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic			Corrosive	Teratogenic		Mutagenic	Ecotoxic	
Risk Phase	R36-38	R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	R35	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H8	H10		H11	H14	H14
Naphthalene				0.00001					0.00001					0.00001	0.00001
Acenaphthylene	0.00001			0.00001											
Acenaphthene	0.00001														
Fluorene															
Phenanthrene	0.00028			0.00028					0.00028						
Anthracene	0.00014													0.00014	0.00014
Fluoranthene	0.00093			0.00093					0.00093						
Pyrene	0.0011			0.0011											
Benzo(a)anthracene															
Chrysene				0.00074			0.00074						0.00074		
Benzo(b)fluoranthene							0.00096							0.00096	0.00096
Benzo(k)fluoranthene				0.00037			0.00037								
Benzo(a)pyrene							0.00074				0.00074		0.00074	0.00074	0.00074
Indeno[1,2,3-cd]pyrene															
Dibenz(a,h)anthracene							0.00012							0.00012	0.00012
Benzo(ghi)perylene														0.00059	0.00059
Arsenic			0.0046		0.0046									0.0046	0.0046
Boron	0.000046			0.000046											
Cadmium	0.00064	0.00064	0.00064		0.00064	0.00064	0.00064								
Chromium										0.0041			0.0041		
Copper				0.06										0.06	0.06
Lead				0.19					0.19		0.19	0.19		0.19	0.19
Mercury		0.00016				0.00016								0.00016	0.00016
Nickel							0.0067	0.0067	0.0067						
Selenium			0.00017		0.00017										0.00017
Zinc	0.23			0.23											
Benzene	0.0001		0.0001		0.0001		0.0001								
Toluene				0.0001								0.0001			
Ethylbenzene				0.0001	0.0001							0.0001			
p & m-xylene	0.0001			0.0001											
o-xylene	0.0001			0.0001											
MTBE (Methyl Tertiary Butyl Ethel	0.0001														
PRO C6-C10				0.0006			0.0006							0.0006	0.0006
DRO C10-C25				0.0008					0.0008					0.0008	0.0008
Total (or greatest)	0.2336	0.0008	0.0055	0.4854	0.0055	0.0008	0.0067	0.0067	0.1900	0.0041	0.1900	0.1900	0.0041	0.2587	0.2589
Threshold (%)	20.0	0.1	3	25.0	3.0	0.1	0.1	0.1	1.0	1.0	0.5	5.0	0.1	25.00	25.00
Exceeded? (y/n)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	C	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic			Corrosive	Teratogenic		Mutagenic	Ecotoxic	
Risk Phase	R36-38	R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	R35	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H8	H10		H11	H14	H14
Benzo(a)pyrene							7.4						0.00074		
BaP Concentration in TPH													7.4E-09		
BaP Exceeded (y/n)													N		
TPH (EC5 - EC35)				0.001			10				0.001		0.001	0.001	0.001
Threshold (%)				25.0			Y				5.0		0.1	2.50	2.50
Hazardous Properties				N			N				N		N	N	N

TPH has to be >1000mg otherwise non-haz

Category or Danger	Xi	T+	T	Xn	T	T+	Car. Cat 1 / 2		Carc. Cat 3	Car. Cat 1a	Repr. Cat 1 / 2		Muta. Cat 1 / 2	N	
Substance	Irritant	Harmful			Toxic		Carcinogenic				Teratogenic		Mutagenic	Ecotoxic	
Risk Phase	R36-38	R26-28, R39	R23-25, R39, R48	R20-22, 48,65,68	R23-25, R39, R48	R26-28, R39	R45	R49	R40	RE1	R60 / R61	R62 / R63	R46	R50	R53
Hazard	H4	H5	H5	H5	H6	H6	H7			H350	H10		H11	H14	H14
Asbestos										0.001					
Threshold (%)										0.1					
Hazardous Properties										N					

APPENDIX H - GEOTECHNICAL TEST RESULTS

[illegible]

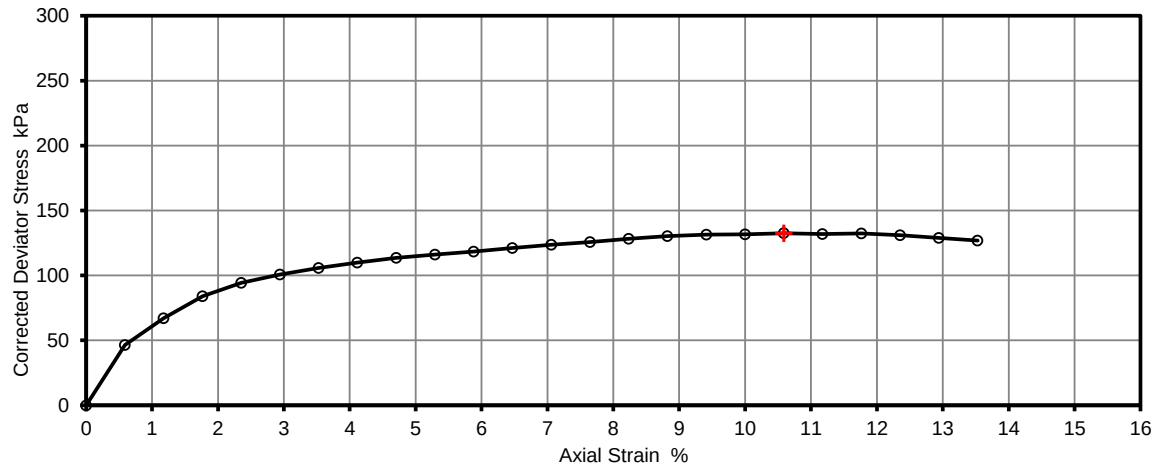
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	33462
				Borehole/Pit No.	BH1
Site Name	Wood Green Social Club			Sample No.	1
Project No.	21206/PO 23-188	Client	WDE Consulting	Depth Top	1.00 m
Soil Description	Medium strength brown slightly mottled orangish brown and grey silty CLAY with rare black flecks			Depth Base	2.00 m
				Sample Type	C
				Samples received	17/05/2023
				Schedules received	17/05/2023
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	30/05/2023

Remarks

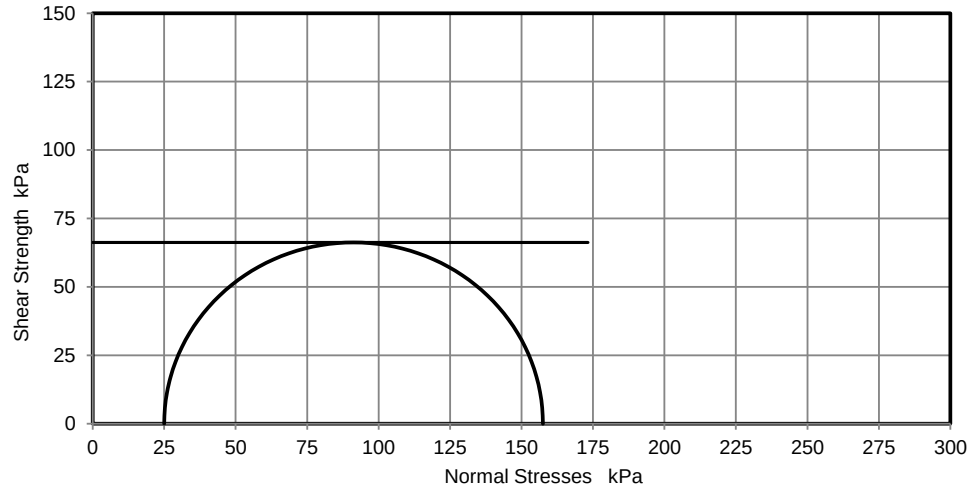
Position within sample

Test Number	1	
Length	170.0	mm
Diameter	85.0	mm
Bulk Density	1.87	Mg/m ³
Moisture Content	30	%
Dry Density	1.44	Mg/m ³
Rate of Strain	2.0	%/min
Cell Pressure	25	kPa
Axial Strain	11	%
Deviator Stress, ($\sigma_1 - \sigma_3$)f	132	kPa
Undrained Shear Strength, cu	66	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$ f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.



Test Report by **K4 SOILS LABORATORY**
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

Checked and Approved
Initials: J.P
Date 31/05/2023

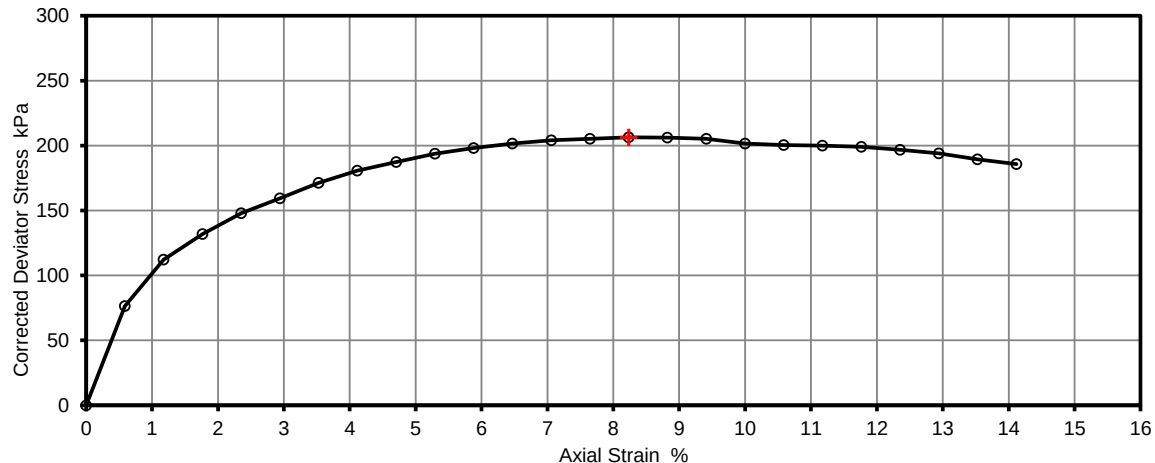
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	33462
				Borehole/Pit No.	BH1
Site Name	Wood Green Social Club			Sample No.	2
Project No.	21206/PO 23-188	Client	WDE Consulting	Depth Top	2.00 m
Soil Description	High strength brown slightly mottled grey and orangish brown silty CLAY			Depth Base	3.00 m
				Sample Type	C
				Samples received	17/05/2023
				Schedules received	17/05/2023
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	30/05/2023

Remarks

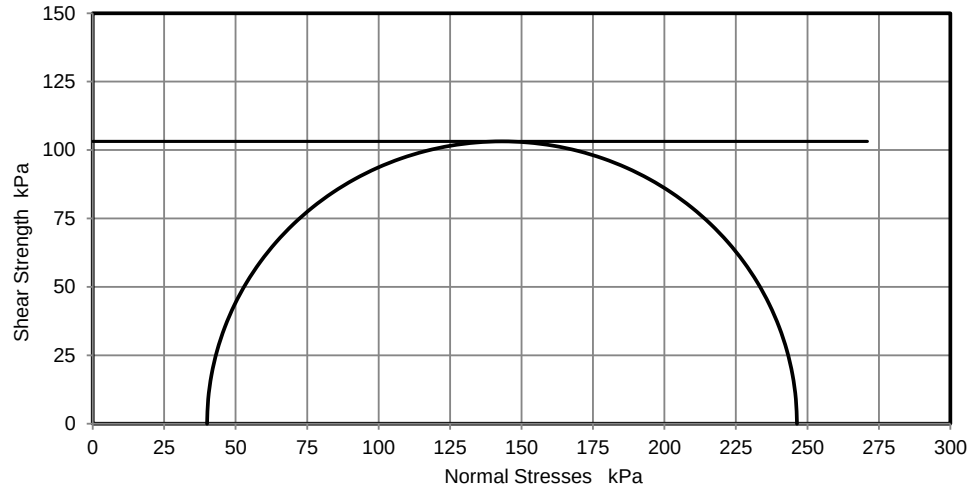
Position within sample

Test Number	1	
Length	170.0	mm
Diameter	85.0	mm
Bulk Density	1.85	Mg/m3
Moisture Content	30	%
Dry Density	1.42	Mg/m3
Rate of Strain	1.5	%/min
Cell Pressure	40	kPa
Axial Strain	8.2	%
Deviator Stress, ($\sigma_1 - \sigma_3$)f	206	kPa
Undrained Shear Strength, cu	103	kPa $\frac{1}{2}(\sigma_1 - \sigma_3)$ f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



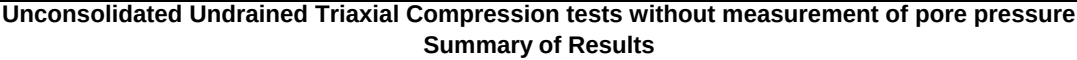
Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.



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Job No.	Project Name	Programme	
33462	Wood Green Social Club	Samples received	17/05/2023
		Schedule received	17/05/2023
Project No.	Client	Project started	17/05/2023
21206/PO 23-188	WDE Consulting	Testing Started	30/05/2023

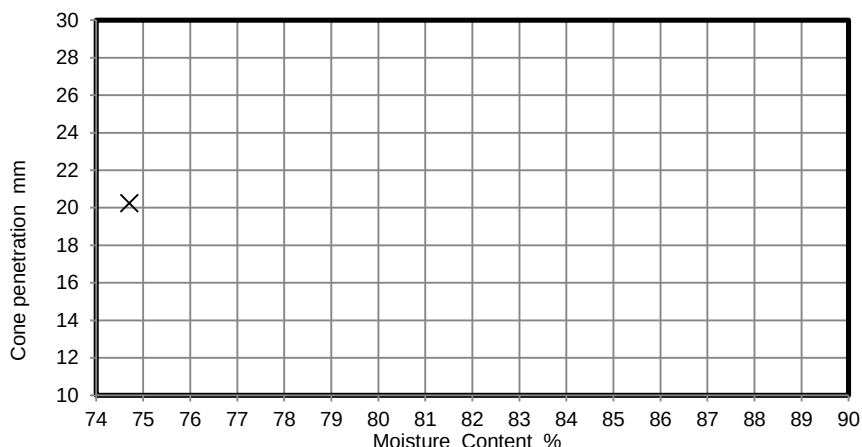
Legend	UU - single stage test (single and multiple specimens)	σ_3	Cell pressure	Mode of failure ;	B - Brittle
	UUM - Multistage test on a single specimen	$\sigma_1 - \sigma_3$	Maximum corrected deviator stress		P - Plastic
	suffix R - remoulded or recompacted	cu	Undrained shear strength, $\frac{1}{2} (\sigma_1 - \sigma_3)$		C - Compound

	Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU Tel: 01923 711 288 Email: james@k4soils.com Email: james@k4soils.com	Checked and Approved
	<i>These results only apply to the items tested. The report shall not be reproduced except in full without authority of the laboratory</i>	Initials: J.P Date: 31/05/2023
2519	Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)	MSF-5-R7b



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	33462
				Borehole/Pit No.	BH1
Site Name	Wood Green Social Club			Sample No.	1
Project No.	21206/PO 23-188	Client	WDE Consulting	Depth Top m	1.00
Soil Description	Orangish brown and occasional grey silty CLAY with rare fine gravel			Depth Base m	-
				Sample Type	D
				Samples received	17/05/2023
				Schedules received	17/05/2023
				Project Started	17/05/2023
				Date Tested	23/05/2023

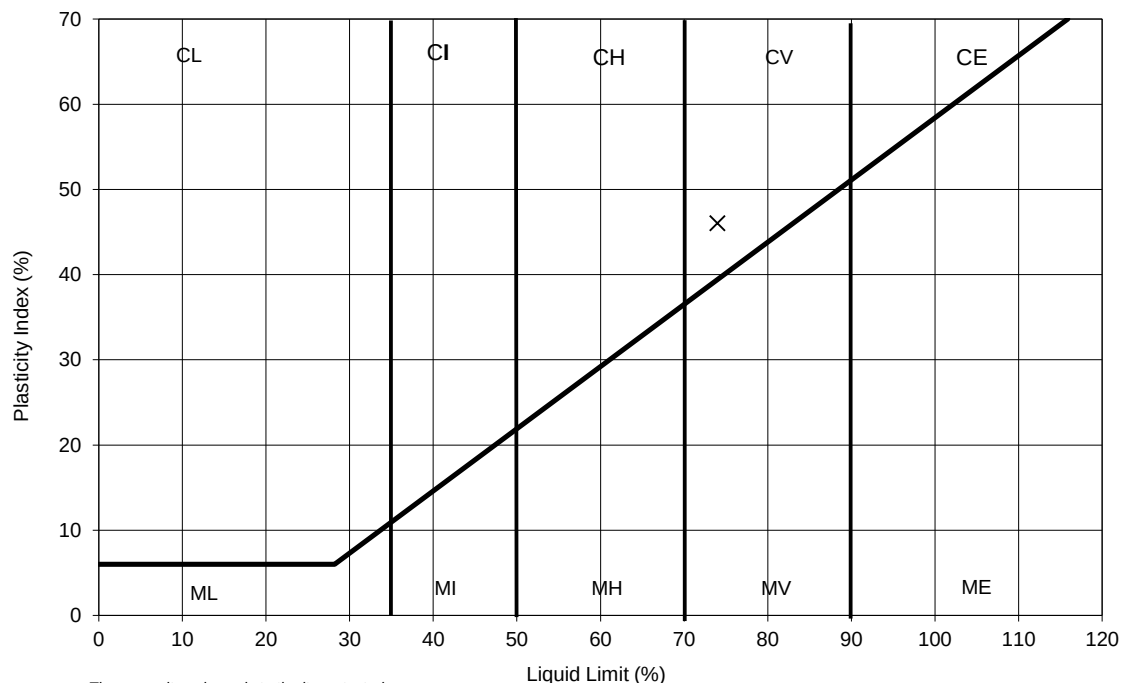


NATURAL MOISTURE CONTENT	37	%
% PASSING 425µm SIEVE	98	%
LIQUID LIMIT	74	%
PLASTIC LIMIT	28	%
PLASTICITY INDEX	46	%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

NOTE: The report shall not be reproduced except in full without authority of the laboratory



TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

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

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

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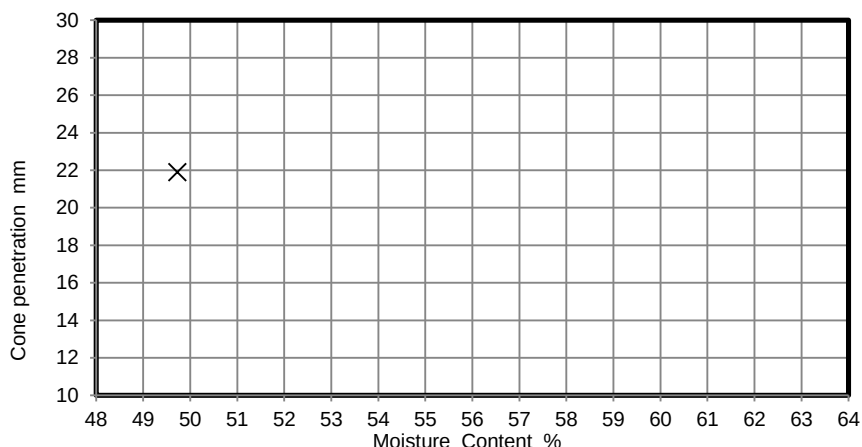
Initials: J.P

Date: 31/05/2023



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	33462
				Borehole/Pit No.	BH1
Site Name	Wood Green Social Club			Sample No.	2
Project No.	21206/PO 23-188	Client	WDE Consulting	Depth Top m	2.00
Soil Description	Light orangish brown slightly mottled light grey very silty CLAY/clayey SILT			Depth Base m	-
				Sample Type	D
				Samples received	17/05/2023
				Schedules received	17/05/2023
				Project Started	17/05/2023
				Date Tested	23/05/2023

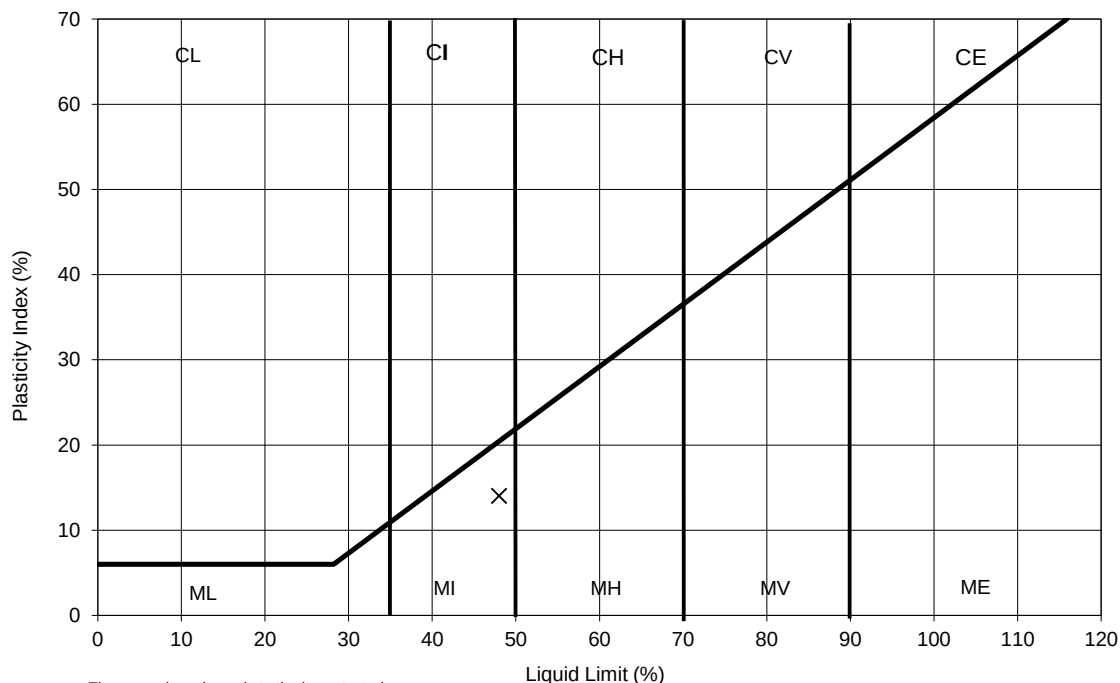


NATURAL MOISTURE CONTENT	28	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	48	%
PLASTIC LIMIT	34	%
PLASTICITY INDEX	14	%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



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TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

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

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Checked and Approved

Initials: J.P

Date: 31/05/2023



LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

Job No. 33462

Borehole/Pit No. BH1

Site Name Wood Green Social Club

Sample No. 3

Project No. 21206/PO 23-188 Client WDE Consulting

Depth Top m 3.00

Soil Description Brown and occasional bluish grey silty CLAY

Depth Base m -

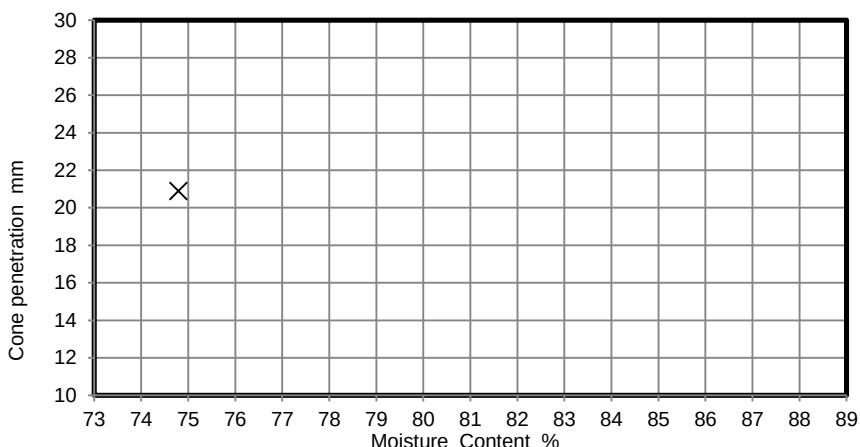
Sample Type D

Samples received 17/05/2023

Schedules received 17/05/2023

Project Started 17/05/2023

Date Tested 23/05/2023

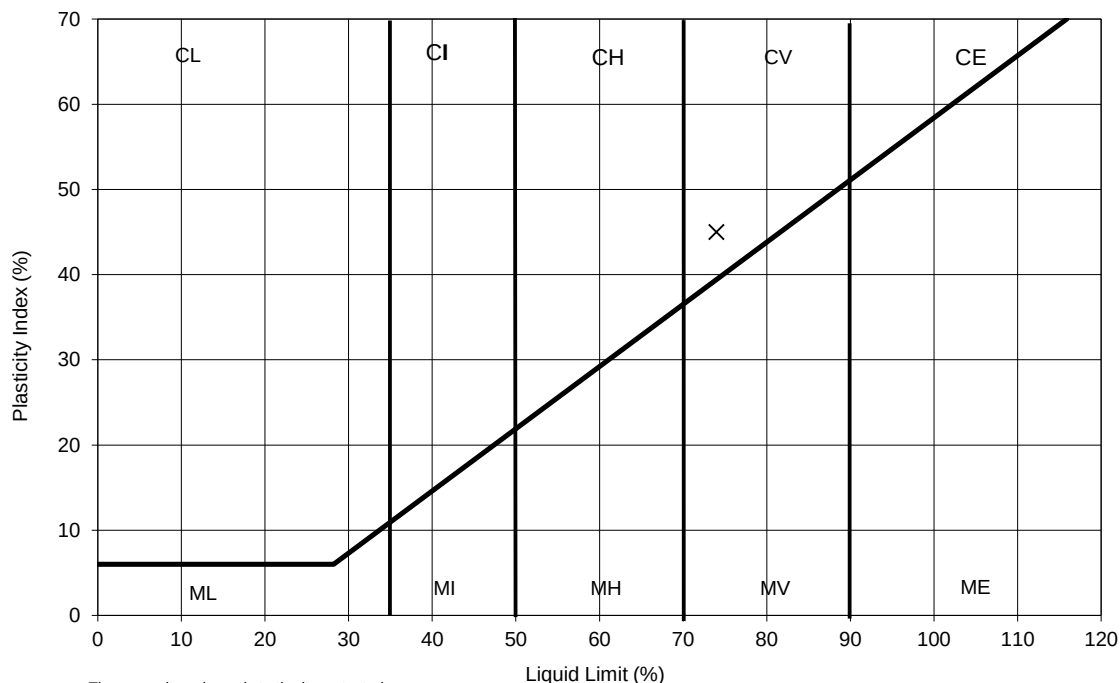


NATURAL MOISTURE CONTENT	28	%
% PASSING 425µm SIEVE	100	%
LIQUID LIMIT	74	%
PLASTIC LIMIT	29	%
PLASTICITY INDEX	45	%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



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TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

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

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

Checked and Approved

Initials: J.P

Date: 31/05/2023

2519

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

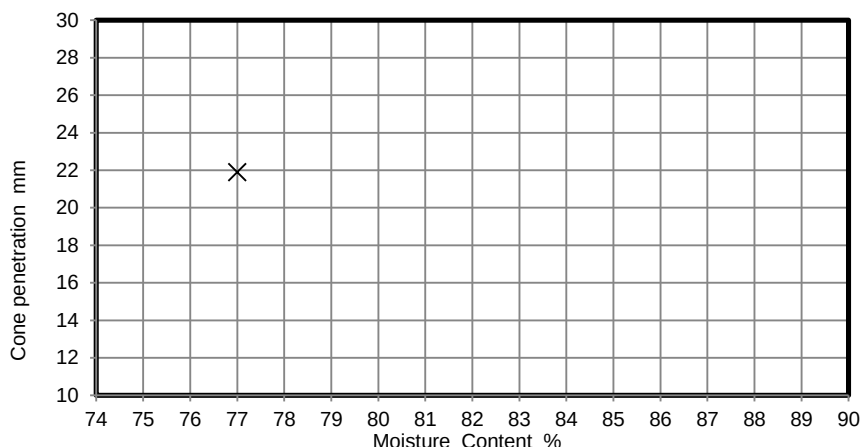
MSF-5 R2





LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	33462
				Borehole/Pit No.	BH1
Site Name	Wood Green Social Club			Sample No.	4
Project No.	21206/PO 23-188	Client	WDE Consulting	Depth Top m	4.00
Soil Description	Brown and occasional bluish grey silty CLAY with scattered selenite crystals and rare fine gravel			Depth Base m	-
				Sample Type	D
				Samples received	17/05/2023
				Schedules received	17/05/2023
				Project Started	17/05/2023
				Date Tested	23/05/2023

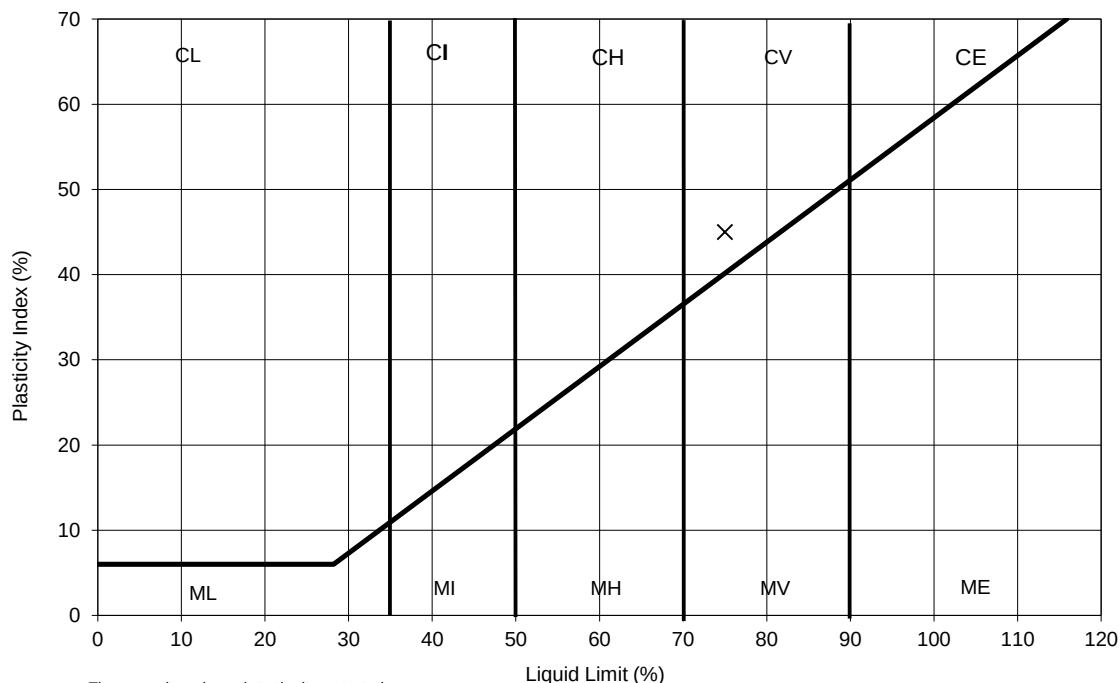


NATURAL MOISTURE CONTENT	28	%
% PASSING 425µm SIEVE	99	%
LIQUID LIMIT	75	%
PLASTIC LIMIT	30	%
PLASTICITY INDEX	45	%

Remarks

Factors corresponding to the cone penetration and moisture content range in Table 1 (BS1377:1990 ; Part 2)

PLASTICITY INDEX



These results only apply to the items tested

NOTE: The report shall not be reproduced except in full without authority of the laboratory



TEST METHOD

BS1377: Part 2 :Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method

BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index

BS1377: Part 2 :Clause 3.2 : 1990:Determination of the moisture content by the oven drying

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

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Checked and Approved

Initials: J.P

Date: 31/05/2023

WDE RANGE OF SERVICES

