GROUND INVESTIGATION REPORT

WASHINGTON CARAVAN PARK, WEST SUSSEX

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1.0 INTRODUCTION

Shire Geotechnical were appointed by Saville Jones Architects to carry out a ground investigation. The investigation was required to determine the ground conditions below the proposed development site.

It is proposed to construct a new toilet block and dwelling.

The work included Window Sample Boreholes, in situ and laboratory testing, Falling Head Testing and a Drainage Investigation.

The report is carried out generally in accordance with BS 10175 (2011) and CLR 11 (2004), and presents full factual records of the site work, the ground conditions encountered and laboratory test results.

The recommendations and opinions expressed in this report are based on the strata observed in the exploratory holes. No responsibility is taken for conditions that have not been revealed by the exploratory holes, or which occur between them. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative and liability cannot be accepted for its accuracy.

2.0 THE SITE

2.1 Site Location and Description:

The site is located at National Grid reference 512179, 113345 and is shown on the Exploratory Hole Location Plan, included in Appendix A.

The area of the proposed development is currently an existing toilet block and grassed area?

2.2 Published Geology:

The British Geological Survey shows the site is underlain by the Gault Formation – Mudstone and Folkestone Formation - Sandstone.

2.3 Radon:

A study of the following maps was carried out to determine whether radon protection is required:

- BR211 Radon: Guidance on protective measures for new dwellings (1999)
- HPA: Indicative Atlas of Radon in England and Wales (2007)

These maps indicate that radon protection is not required.

2.4 Coal Mining:

The Coal Authority were contacted regarding any mining workings that are likely to influence the site.

There are no records of any mining in the area.

3.0 FIELDWORK

3.1 General:

The fieldwork was scheduled and carried out by Shire Geotechnical on 22nd January 2018.

The fieldwork was carried out generally in accordance with BS10175 (2011) and Eurocode 7 (BS EN 1997) *Geotechnical Design*. The exploratory hole locations are shown approximately on the Site Location Plan, included in the Appendices.

All exploratory hole locations were scanned for buried services using a Cable Avoidance Tool (CAT) and excavated in accordance with Health & Safety Executive document HSG47.

3.2 Window Sample Boreholes

Four Window Sample Boreholes were drilled to a maximum depth of 4.0m below existing ground level (m bgl) using a Competitor 130 rig.

Standard Penetration Testing (SPT) were carried out at 1.00m intervals.

Groundwater observations were noted where possible. These observations relate to the time of the investigation only and do not necessarily reflect seasonal fluctuations.

The boreholes were backfilled with arisings on completion and copies of the borehole logs are included in Appendix B.

3.3 Infiltration Testing

Two boreholes (BH1 and BH4) were filled with water and infiltration recorded over a four hour period.

The tests were carried out in accordance with BS 5930: 1999 – Falling Head Tests in Boreholes.

The results of the tests are included in Appendix D.

3.4 Drainage Investigation

Three manhole covers were lifted and revealed the following: -

MHA – Depth 0.4m. The upstream run confirmed as foul. Downstream run 100mm diameter.

MHB – Depth 1.02m.

MHC – Depth 2.1m (150mm diameter main run)

The upstream run from MHB connects into the manhole at 0.6m.

4.0 GROUND CONDITIONS

4.1 Soil Profile:

The sequence of strata encountered beneath the site and the general soil profiles for the entire site is given below:

- TOPSOIL AND MADE GROUND
- CLAY

Details of each stratum are given in the borehole and trial pit logs and discussed below.

4.2 Topsoil and Made Ground

This material was encountered to a depth of between 0.3m and 0.5m and generally comprised soft brown Topsoil in BH1, 2 and 4. BH3 revealed Made Ground comprising gravelly sand with clinker.

4.3 Clay

This material was encountered below the Topsoil and Made Ground to a maximum proven depth of 4.0m and comprised firm becoming very stiff grey brown silty Clay. Firm Chalk was noted in BH1 between 0.2m and 0.6m and in BH3 between 0.5m and 0.8m.

Fine roots were noted to a maximum depth of 3.2m in BH4.

4.4 Groundwater:

Groundwater was not encountered within any of the exploratory holes.

5.0 LABORATORY WORK AND MONITORING

5.1 General:

Selected disturbed samples of soil were taken and returned to MCERTS accredited laboratories for testing. The tests were carried out in accordance with the methods outlined in BS 1377, "Method of Test Soils for Civil Engineering Purposes" 1990.

Copies of the laboratory soil test results are included in Appendix C.

5.2 Geotechnical Tests:

5.2.1 Sulphate and PH

Sulphate and pH analysis was carried out the following samples within the natural material:

BH1 @ 2.0m	340mg/l
BH2 @ 1.0m	60mg/l
BH4 @ 2.0m	70mg/l

5.2.2 Moisture Content and plasticity

Moisture content and plasticity was carried out the following samples:

BH1 @ 1.0m	Medium Shrinkage Potential
BH2 @ 2.0m	Medium Shrinkage Potential
BH4 @ 1.0m	High Shrinkage Potential

5.3 Environmental Tests:

Chemical analysis was carried out in accordance with CLR 11 (2004). The samples were submitted for the following suite of determinants:

Arsenic, Cadmium (total), Chromium (total), Copper, Lead, Mercury, Nickel, Selenium, Zinc, Cyanide (total), Sulphate (SO_4), Sulphide, pH, Sulphur, Speciated Polyaromatic Hydrocarbons (PAH) and Speciated Total Petroleum Hydrocarbons (TPH), Soil Organic Matter Content.

It is emphasised that only a limited number of tests for contamination have been carried out and that the possibility of further contamination existing elsewhere on the site cannot be ruled out. Shire Geotechnical does not accept any liability for contamination.

The CLEA model indicates Soil Guideline Values (SGVs) for various parameters (shown in the table below). A direct comparison was made between the soils results and the CLEA SGVs for residential, allotment, and commercial end use. For contaminants not covered by the CLEA assessment criteria, reference is made to the soil screening values derived using the LQM/CIEH S4ULs for Human Health Risk Assessment.

Category 4 Screening Levels (C4SL) were used for Arsenic, Benzo(a)pyrene, Cadmium and Lead, in accordance with the DEFRA Report SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document. – March 2014.

The LQM values are based on a 1% Soil Organic Matter Content (SOM). The CLEA Soil Guideline Values for metals and the Category 4 Screening Levels used are not sensitive to Soil Organic Matter (SOM).

Copper and Zinc are not generally considered to represent a significant risk to Human Health, however they are phytotoxic and harmful to plants.

5.4 Generic Soil Comparison with Assessment Criteria:

Determinand	Assessment Criteria (mg/kg)			No. of Samples	Min. (mg/kg)	Max. (mg/kg)	No. of Exceedances
	Residential with home - grown produce (A)	Residential without home-grown produce (B)	Commercial (C)				
Arsenic	37	49	640	3	12.5	16.9	0
Cadmium	22	150	410	3	<0.5	<0.5	0
Chromium	130	130	5000	3	22.9	31.1	0
Lead	200	310	2330	3	29.0	66.6	0
Mercury	1.2	1.2	58	3	<0.5	<0.5	0
Nickel	180	180	980	3	14.0	22.5	0
Selenium	250	430	120000	3	1.1	1.5	0
Total TPH (C_8-C_{10})	27	8.6	2000	3	<1.0	<1.0	0
Total TPH (C_{10}-C_{12})	74	13	9700	3	<1.0	<1.0	0
Total TPH (C_{12}-C_{16})	140	23	36000	3	<1.0	<1.0	0
Total TPH (C_{16}-C_{21})	260	46	28000	3	<1.0	<1.0	0
Total TPH (C_{21}-C_{40})	1100	370	28000	3	<1.0	<1.0	0
Naphthalene	2.3	2.3	190	3	<0.1	<0.1	0
Benzo(a)pyrene	5.0	5.3	76	3	0.2	0.4	0
Copper	2400	7100	68000	3	12.6	79.1	0
Zinc	3750	40000	730000	3	47.2	175	0

The samples indicate all contaminants are below the recommended assessment criteria for a residential site.

6.0 CONCLUSIONS

6.1 Ground Conditions

Beneath the surface Topsoil and Made Ground the soil encountered was generally firm becoming very stiff silty Clay. This is consistent with the geological survey.

Roots were noted in the Clay to depths of 2.6m, 2.8m and 3.2m.

Groundwater was not encountered within any of the exploratory holes.

6.2 Proposed Foundations

The natural Clay at depth provides a suitable formation level to sustain loads without significant settlement. Traditional strip foundations should be designed to an allowable bearing pressure of 100kN/m2 within this material at a minimum depth of 1.0m.

However, due to the presence of trees and roots noted within the clay, the foundations depths should be increased in accordance with the NHBC document 'Building near trees', based on a high shrinkage Clay and formed below any visible tree roots.

Alternatively, a piled foundation solution should be adopted.

6.3 Floor Slab

Ground floor slabs should be suspended where made ground is 600mm thickness or greater or where the slab is constructed in an area within the zone of influence of trees/vegetation. Alternatively ground bearing floor slabs could be adopted where made ground is excavated, removed and replaced by a suitable granular layer.

6.4 Sulphate Design

Based on the ground conditions and the chemical analysis carried out on the soil and groundwater, it is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1[(2005)], are taken as [DS-1], and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as [AC-1].

6.5 Contamination

The soil test results indicate no elevated levels of contamination (above the recommended assessment criteria for a commercial or residential site), and no remediation is required.

Due diligence is required during the construction period, and should any evidence of contamination be found, appropriate investigation and/or action should be taken.

6.6 Radon

No radon protection is required

6.7 Soakaways

The ground conditions revealed cohesive soil and the Falling Head tests carried out in BH1 and 4 failed to infiltrate over a 4 hour period.

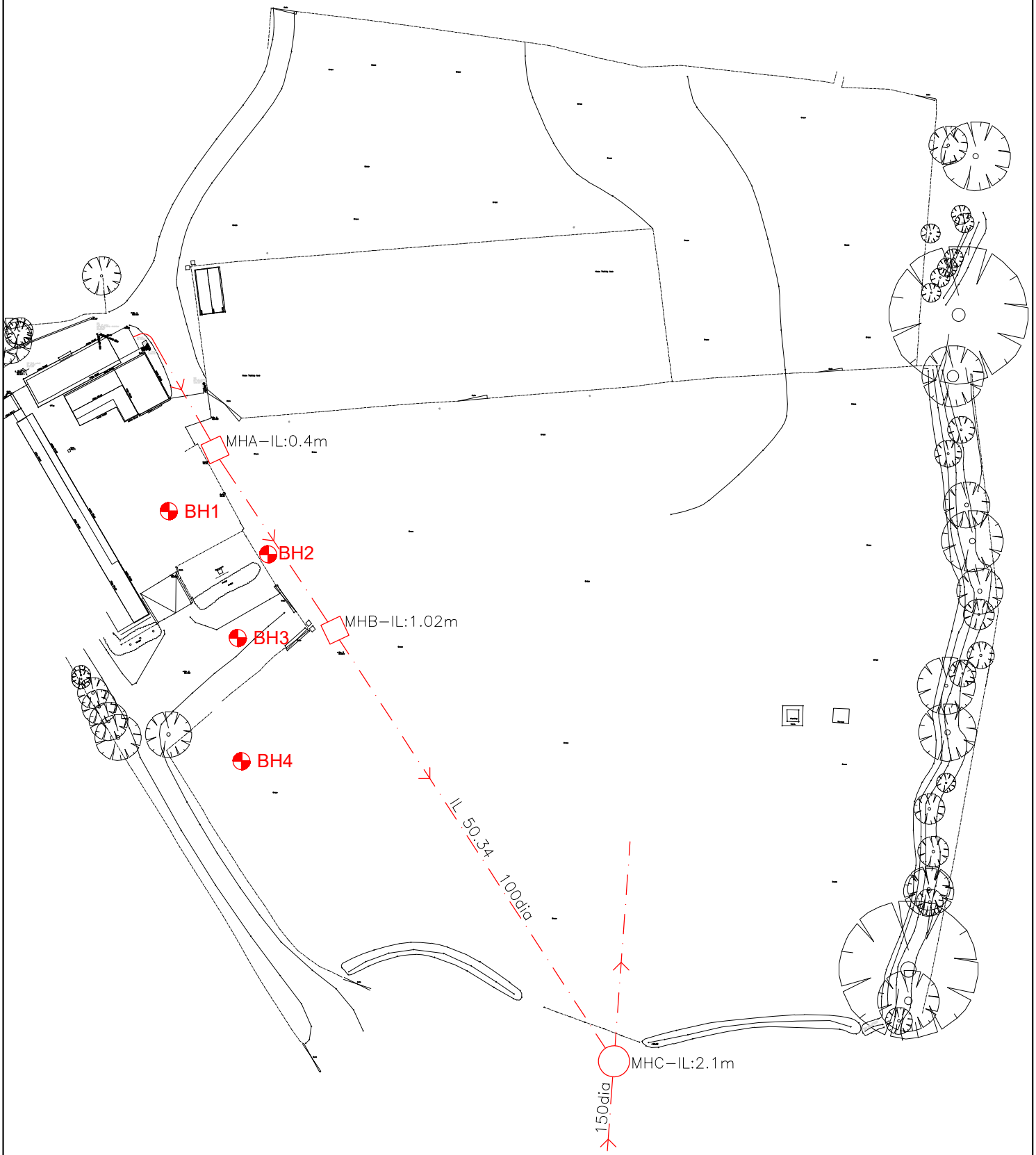
Soakaways are not considered to be an option at the site.

6.8 Drainage

The drainage was found to run downstream to a 150mm diameter main run (MHC). The main run is 2.1m deep. Foul water was noted to run into MHA from the existing building.

APPENDIX A

Exploratory Hole Location Plan



ORIGINAL DRAWING SIZE A4

Site Date	Scale	Job No	
05/04/18	NTS	G-18-011	
Drawn	**Checked**	**Drawing No**	**Issue**
BK	RR	LP1	A

Title
LOCATION PLAN No.1

Project
WASHINGTON CARAVAN PARK

Shiregeotechnical
The Chapel Barnsley Hall Road
BROMSGROVE Worcestershire B61 0SZ
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w: www.shire-uk.com

APPENDIX B

Borehole Logs

SPT RESULTS

SOIL SAMPLES/TEST DEPTH(m)	TYPE	SPT VALUE	FIELD RECORDS	WELL	SHEAR VANE kN/m2	DEPTH (m)	SOIL REF	SOIL	DESCRIPTION
						0.2	A		Soft brown TOPSOIL with rootlets
						0.6	B		Firm white CHALK
1.00-1.45	C1	N = 15	2,2/3,5,3,4		108	1.0	C		Stiff becoming very stiff bluey grey/light brown silty CLAY
2.00-2.45	C2	N = 18	3,3/4,4,5,5		80	2.0			
3.00-3.45	C3	N = 21	3,4/4,5,5,7		110	3.0			
4.00-4.45	C4	N = 29	5,5/6,7,7,9		130+	4.0			
						5.0			
						6.0			

Remarks:
1. Borehole carried out by Competitor 130 Window Sample Rig
2. Hand shear vanes were taken in the end of the sample tubes
3.
4.
5.

Key:
- ▽ - Water Strike
- D - Disturbed Sample
- B - Bulk Sample
- C - Cone (SPT Test)
- S - Split Spoon (SPT Test)

Date	Site Engineer	Job No	
22/01/18	GW/MH	G-18-011	
Drawn	Checked	Drawing No	Issue
BK	RR	BH1	A

Address
WASHINGTON CARAVAN PARK
LONDON ROAD
WEST SUSSEX
RH20 4 AJ

Drawing Title
BOREHOLE No.1

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SPT RESULTS							SOIL	DESCRIPTION
SOIL SAMPLES/TEST		SPT VALUE	FIELD RECORDS	WELL	SHEAR VANE kN/m2	DEPTH (m)	SOIL REF	
DEPTH(m)	TYPE							
						0.2	A	Soft brown TOPSOIL with rootlets
1.00-1.45	C1	N =9	1,2/3,2,2,2		86	1.0		
2.00-2.45	C2	N = 16	3,3/4,4,4,4		128	2.0	B	Firm becoming very stiff bluey grey/light brown silty CLAY with fine roots @2.6m
3.00-3.45	C3	N = 25	4,4/5,6,6,8		130+	3.0		
4.00-4.45	C4	N = 31	5,5/6,8,8,9		130+	4.0		
						5.0		
						6.0		

Remarks:
1. Borehole carried out by Competitor 130 Window Sample Rig
2. Hand shear vanes were taken in the end of the sample tubes
3.
4.
5.

Key:
- ▽ - Water Strike
- D - Disturbed Sample
- B - Bulk Sample
- C - Cone (SPT Test)
- S - Split Spoon (SPT Test)

Date	Site Engineer	Job No	
22/01/18	GW/MH	G-18-011	
Drawn	Checked	Drawing No	Issue
BK	RR	BH2	A

Address
WASHINGTON CARAVAN PARK
LONDON ROAD
WEST SUSSEX
RH20 4AJ

Drawing Title
BOREHOLE No.2

Shiregeotechnical
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SPT RESULTS							SOIL	DESCRIPTION
SOIL SAMPLES/TEST DEPTH(m)	TYPE	SPT VALUE	FIELD RECORDS	WELL	SHEAR VANE kN/m2	DEPTH (m)	SOIL REF		
						0.1	A		MADE GROUND : Brown sand & gravel + fine roots
						0.5	B		MADE GROUND : Black very gravelly fine to coarse SAND with gravel of clinker
						0.8	C		CHALK
1.00-1.45	C1	N = 9	1,1/2,2,2,3		52	1.0	D		Firm grey silty CLAY with roots (Disturbed)
2.00-2.45	C2	N = 15	3,3/3,3,3,6		130+	2.0	E		Firm becoming very stiff bluey grey / light brown silty CLAY with occasional fine roots noted to 2.8m
3.00-3.45	C3	N = 17	3,3/4,3,4,6		130+	3.0			
4.00-4.45	C4	N = 32	6,6/7,7,7,11		130+	4.0			
						5.0			
						6.0			

Remarks:
1. Borehole carried out by Competitor 130 Window Sample Rig
2. Hand shear vanes were taken in the end of the sample tubes
3.
4.
5.

Key:
- ▽ - Water Strike
- D - Disturbed Sample
- B - Bulk Sample
- C - Cone (SPT Test)
- S - Split Spoon (SPT Test)

Address
WASHINGTON CARAVAN PARK
LONDON ROAD
WASHINGTON, WEST SUSSEX
RH20 4AJ

Drawing Title
BOREHOLE No.3

Date	Site Engineer	Job No	
22/01/18	GW/MH	G-18-011	
Drawn	Checked	Drawing No	Issue
OS	RR	BH3	A

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SPT RESULTS							SOIL	DESCRIPTION
SOIL SAMPLES/TEST		SPT VALUE	FIELD RECORDS	WELL	SHEAR VANE kN/m2	DEPTH (m)	SOIL REF	
DEPTH(m)	TYPE							
						0.6	A	Soft brown TOPSOIL with rootlets
1.00-1.45	C1	N = 6	1,1/1,1,2,2		72	1.0		
2.00-2.45	C2	N = 13	2,2/3,3,3,4		84	2.0		
3.00-3.45	C3	N = 24	3,4/5,5,6,8		120	3.0	B	Firm becoming very stiff bluey grey/light brown silty CLAY with fine roots noted to 3.2m
4.00-4.45	C4	N = 37	7,7/7,9,9,12			4.0		
						5.0		
						6.0		

Remarks:
1. Borehole carried out by Competitor 130 Window Sample Rig
2. Hand shear vanes were taken in the end of the sample tubes
3.
4.
5.

Key:
- ▽ - Water Strike
- D - Disturbed Sample
- B - Bulk Sample
- C - Cone (SPT Test)
- S - Split Spoon (SPT Test)

Date	Site Engineer	Job No	
22/01/18	GW/MH	G-18-011	
Drawn	Checked	Drawing No	Issue
OS	RR	BH4	A

Address
WASHINGTON CARAVAN PARK
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Drawing Title
BOREHOLE No.4

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APPENDIX C

Laboratory Test Results

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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	18-16247
Issue:	1
Date of Issue:	20/02/2018
Contact:	Rob Ray
Customer Details:	Shire Consulting The Chapel Bromsgrove WorcestershireB61 OSZ
Quotation No:	Q14-00098
Order No:	G-18-011
Customer Reference:	G-18-011
Date Received:	16/02/2018
Date Approved:	20/02/2018
Details:	Washington Caravan Park
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

Sample Summary

Report No.: 18-16247

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
127285	BH1 0.20	12/02/2018	16/02/2018	Silty loam	
127286	BH2 0.50	12/02/2018	16/02/2018	Silty clayey loam	
127287	BH4 0.30	12/02/2018	16/02/2018	Silty loam	
127288	BH1 2.00	12/02/2018	16/02/2018	Silty clayey loam	
127289	BH2 1.00	12/02/2018	16/02/2018	Silty clayey loam	
127290	BH4 2.00	12/02/2018	16/02/2018	Clayey loam	

Results Summary

Report No.: 18-16247

			ELAB Reference	127285	127286	127287	127288	127289	127290
			Customer Reference						
			Sample ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Location	BH1	BH2	BH4	BH1	BH2	BH4
			Sample Depth (m)	0.20	0.50	0.30	2.00	1.00	2.00
			Sampling Date	12/02/2018	12/02/2018	12/02/2018	12/02/2018	12/02/2018	12/02/2018
Determinand	**Codes**	**Units**	**LOD**						
Metals									
Arsenic	M	mg/kg	1	16.9	12.5	15.3	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	n/t	n/t
Chromium	M	mg/kg	5	26.7	22.9	31.1	n/t	n/t	n/t
Copper	M	mg/kg	5	79.1	12.6	21.4	n/t	n/t	n/t
Lead	M	mg/kg	5	66.6	29.0	48.2	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	n/t	n/t	n/t
Nickel	M	mg/kg	5	22.5	14.0	20.0	n/t	n/t	n/t
Selenium	M	mg/kg	1	1.4	1.1	1.5	n/t	n/t	n/t
Zinc	M	mg/kg	5	175	47.2	83.8	n/t	n/t	n/t
Anions									
Water Soluble Sulphate	M	g/l	0.02	0.06	0.07	0.05	0.34	0.06	0.07
Miscellaneous									
pH	M	pH units	0.1	7.8	7.5	7.3	7.6	7.9	8.0
Soil Organic Matter	U	%	0.1	6.9	1.4	6.2	n/t	n/t	n/t
Organics									
>C8-C10 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
>C10-C12 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
>C12-C16 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
>C16-C21 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
>C21-C35 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
>C35-C40 BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
Total (>C8-C40) BCB	N	mg/kg	1	< 1.0	< 1.0	< 1.0	n/t	n/t	n/t
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	< 0.1	0.2	0.1	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	0.2	0.5	0.6	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	< 0.1	0.4	0.5	n/t	n/t	n/t
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.2	0.4	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	0.4	0.3	0.4	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	0.3	0.3	0.4	n/t	n/t	n/t
Benzo(k)fluoranthene	M	mg/kg	0.1	0.2	0.2	0.5	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	0.2	0.2	0.4	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	0.2	0.2	0.3	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	n/t	n/t	n/t
Benzo[g,h,i]perylene	M	mg/kg	0.1	0.4	0.2	0.3	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	2.4	2.8	4.1	n/t	n/t	n/t

Tests marked N are not UKAS accredited.

Method Summary

Report No.: 18-16247

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	20/02/2018	113	Electromeric
Aqua regia extractable metals	M	Air dried sample	19/02/2018	118	ICPMS
PAH (GC-FID)	M	As submitted sample	19/02/2018	133	GC-FID
Water soluble anions	M	Air dried sample	19/02/2018	172	Ion Chromatography
Basic carbon banding in soil	N	As submitted sample	19/02/2018	218	GC-FID
Soil organic matter	U	Air dried sample	19/02/2018	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

Report No.: 18-16247

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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28 February 2018

Issue No : 01

For the attention of Mr R Ray

Dear Sirs

Our ref **GEO / 27110**
Your Ref **G-18-011**

Project **WASHINGTON CARAVAN PARK**

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

Item No	Test Quantity	Description
1	~	Liquid & Plastic Limits Summary
2	3	Liquid & Plastic Limits

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of no less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after a period of 28 days from the date of this report. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully
on behalf of **GEOLABS Limited**

S. A Reynolds

S A Reynolds
Group Quality Manager

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BS1377:Part 2:1990

SUMMARY OF LIQUID AND PLASTIC LIMIT TESTS

Borehole / Trial Pit	Depth m	Sample Ref	Sample Type	Description	Water Content BS EN ISO 17892-1 : 2014 %	Liquid Limit %	Plastic Limit %	Plasticity Index	Percentage Passing 425µm %	Atterberg Classification	Test Type	Sample Condition
BH1	1.00		D	Firm yellowish brown mottled grey CLAY with rare fine to medium gravel.	22.4	59	22	37	99	CH	2	1
BH2	2.00		D	Stiff dark brown CLAY with rare medium gravel.	25.7	61	25	36	99	CH	2	1
BH4	1.00		D	Soft greenish grey CLAY with rare fine to medium gravel.	31.8	71	23	48	98	CV	2	1

Test Type:
1 - 1 point cone penetrometer clause 4.4
2 - 4 point cone penetrometer clause 4.3
3 - Non plastic determination

Sample condition:
1 - As Received
2 - Air Dried
3 - Washed & Air Dried

Checked and Approved by:

S. A Reynolds

S A Reynolds - Group Quality Manager
28/02/2018

Project Number:

GEO / 27110

Project Name:

WASHINGTON CARAVAN PARK
G-18-011

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UKAS TESTING 1982

BS1377 : Part 2 : 1990 Clauses 4.3 & 5

LIQUID AND PLASTIC LIMITS

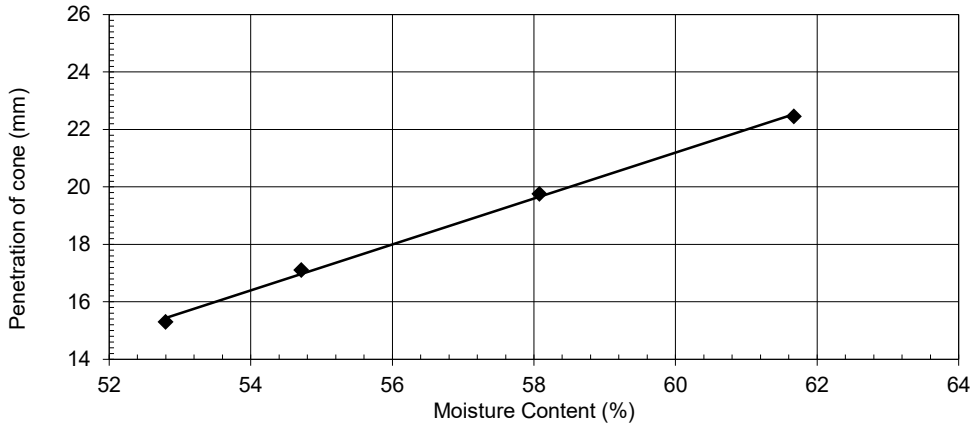
BH / TP	BH1
Depth (m)	1.00
Sample Type	D

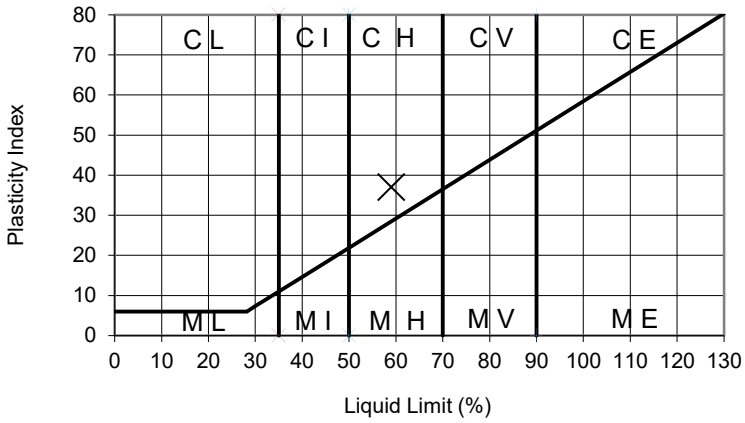
Description:

Firm yellowish brown mottled grey CLAY with rare fine to medium gravel.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014)	22.4	%
Percentage passing 425µm sieve :	99	%
Liquid Limit :	59	%
Plastic Limit :	22	%
Plasticity Index :	37	
Equivalent Water Content of material passing 425µm sieve :	23	%
Liquidity Index :	0.02	





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UKAS TESTING 1982

BS1377 : Part 2 : 1990 Clauses 4.3 & 5

LIQUID AND PLASTIC LIMITS

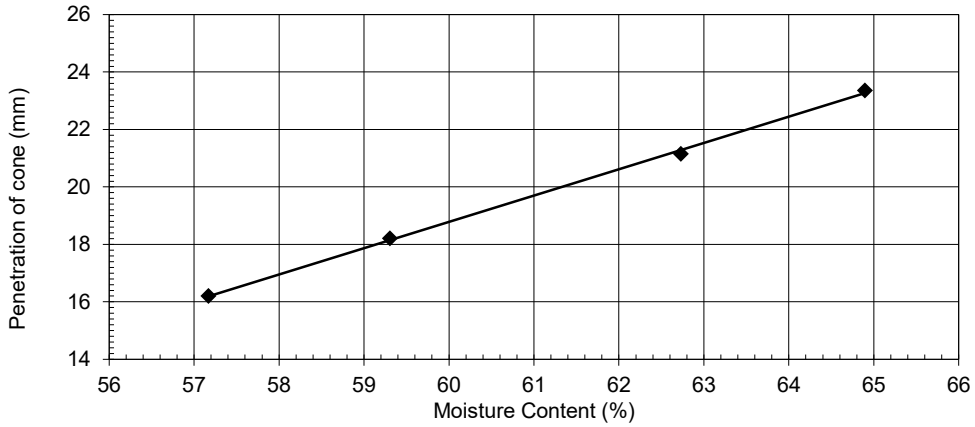
BH / TP	BH2
Depth (m)	2.00
Sample Type	D

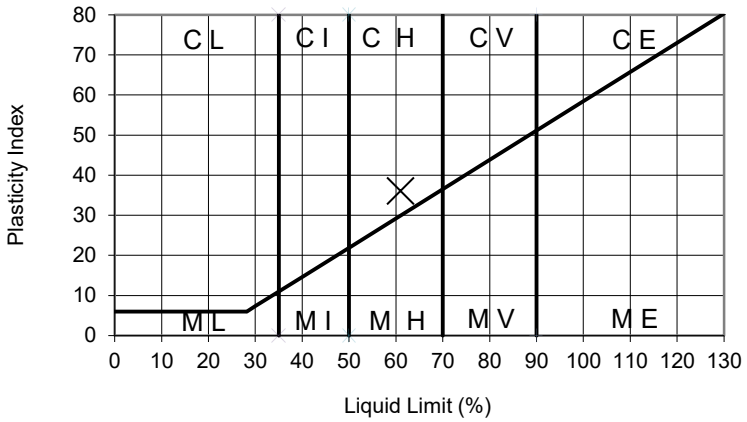
Description:

Stiff dark brown CLAY with rare medium gravel.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014)	25.7	%
Percentage passing 425µm sieve :	99	%
Liquid Limit :	61	%
Plastic Limit :	25	%
Plasticity Index :	36	
Equivalent Water Content of material passing 425µm sieve :	26	%
Liquidity Index :	0.03	





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UKAS TESTING 1982

BS1377 : Part 2 : 1990 Clauses 4.3 & 5

LIQUID AND PLASTIC LIMITS

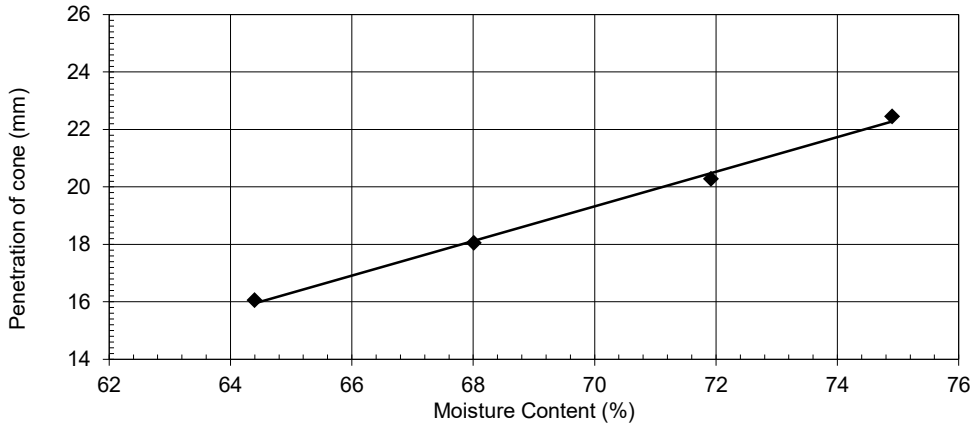
BH / TP	BH4
Depth (m)	1.00
Sample Type	D

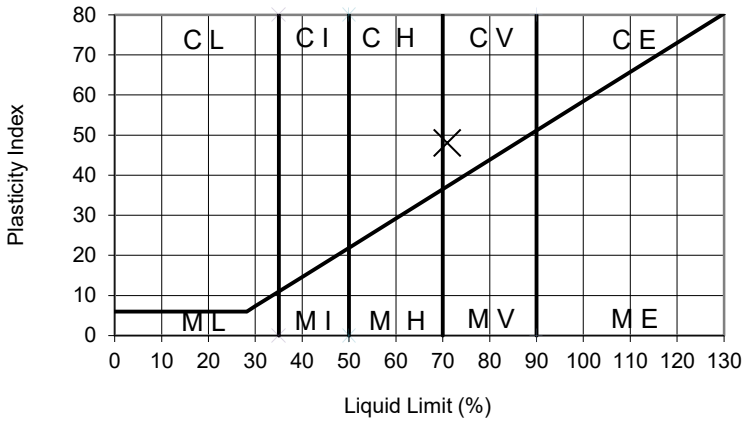
Description:

Soft greenish grey CLAY with rare fine to medium gravel.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014)	31.8	%
Percentage passing 425µm sieve :	98	%
Liquid Limit :	71	%
Plastic Limit :	23	%
Plasticity Index :	48	
Equivalent Water Content of material passing 425µm sieve :	32	%
Liquidity Index :	0.20	





Checked and Approved by:

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28/02/2018

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