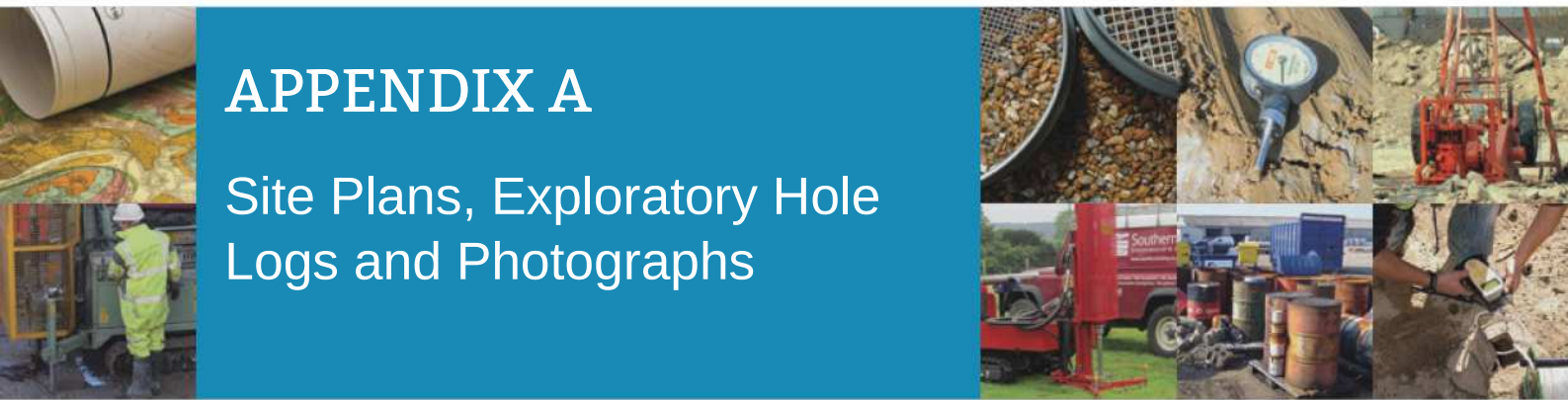
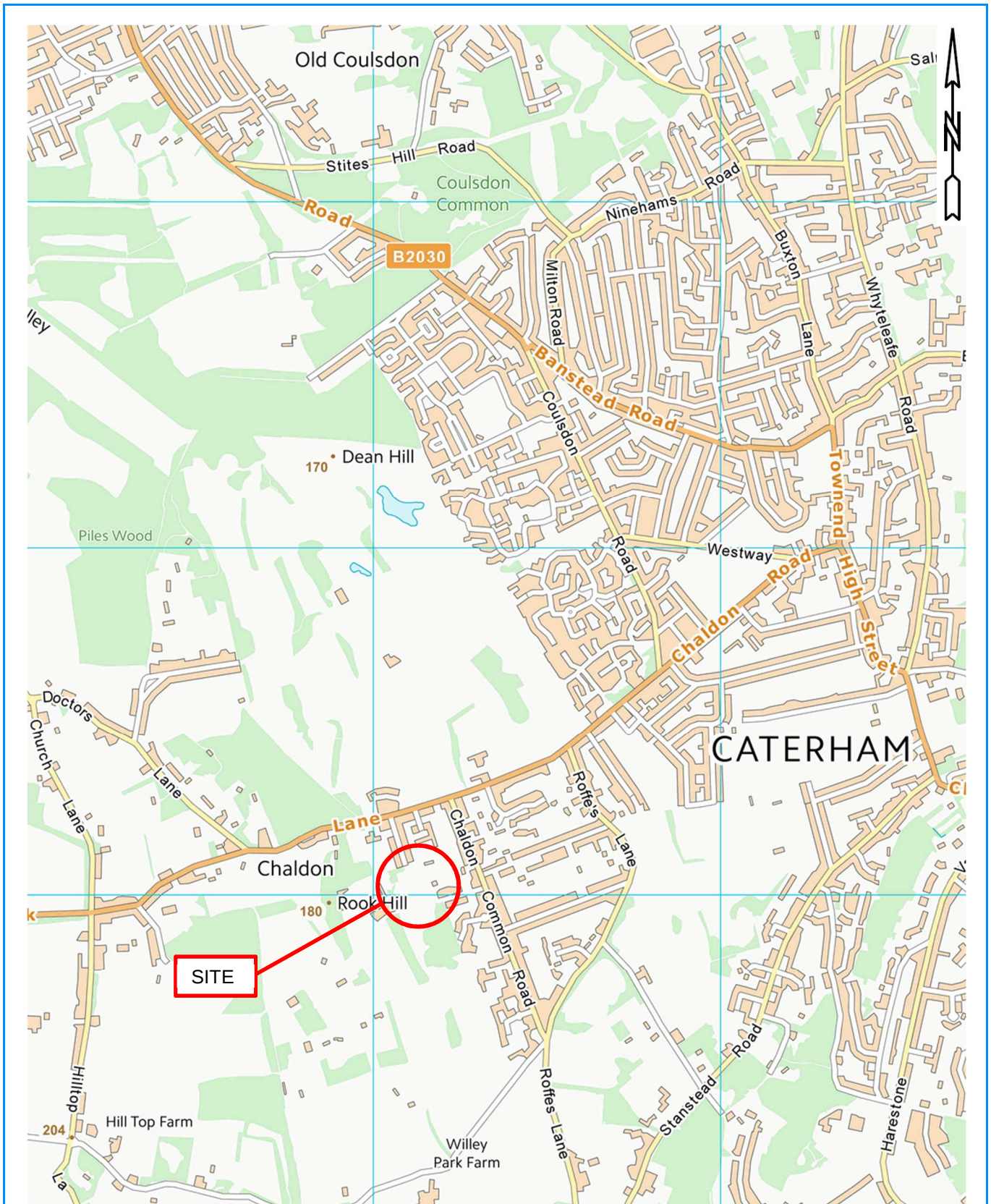




APPENDIX A

Site Plans, Exploratory Hole Logs and Photographs





Contains Ordnance Survey Data © Crown Copyright and Database Right 2025

Site:	Birchwood Lane, Caterham	Project ID	15961
Figure 1	Site Location Plan	Date:	April 2025



NB: Positions of exploratory holes / test positions are only indicative unless dimensioned.

Site:	Birchwood Lane, Caterham	Project ID	J15961
Figure 2	Proposed Layout & Site Investigation Layout Plan	Date:	April 2025



Photo 1 - View of the site and entrance from the SW (looking E)



Photo 2 - View of the site from the SW (looking N)



Photo 3 - View of the site from the NW (looking E)



Photo 4 - View of the site from the NE (looking S)



Photo 5 - Shallow depression in the SE (looking E)



Photo 6 – Lean-to shed building in the NW



Photo 7 – Machinery/materials in the W/NW of the site (looking S)

[illegible]

Logger:

1. Preliminary borehole soakaway (constant-head) test undertaken at 20.0m.
2. Groundwater monitoring well installed to 20.0m.

Sigma Homes Limited

[illegible]

[illegible]

[illegible]

Logger:

2 -

[illegible]

Logger:

2 -

[illegible]

[illegible]

[illegible]

SKT

Sigma Homes Limited

2 -[illegible]

[illegible]

Key to Exploratory Hole Logs, Plans and Sections

Backfill Symbols		Pipe Symbols		Principal Soil Types		Principal Rock Types		Drilling Records	
Arisings		Plain Pipe		Topsoil		Mudstone		Water Strike	
Concrete		Slotted Pipe		Made Ground		Claystone		Depth Water Rose	
Blacktop		Piezometer		Clay		Siltstone		Total Core Recovery (%) [TCR]	
Bentonite		Piezometer Tip		Silt		Sandstone		Solid Core Recovery (%) [SCR]	
Gravel Filter		Filter Tip		Sand		Limestone		Rock Quality Index (%) RQD]	
Sand Filter		Extensometer		Gravel		Chalk		Fracture Index (fractures / m) [FI]	
		Inclinometers		Peat					

All soil and rock descriptions are in general accordance with BS5930 2015, BS EN ISO 14688-1:2002+A1:2013 and BS EN ISO 14689-1:2003. Chalk descriptions are also based on CIRIA C574 and "Logging the Chalk – R.N. Mortimer 2015". The Geology Code is only provided where a positive identification of the sample strata has been made.

Location / Method Identifiers		In-situ Test Location / Method	
BH	Borehole (undefined)	DP	Dynamic Probe
CP	Cable Percussive	CPT	Cone Penetration Test
RC	Rotary Core	CBR	In-situ CBR Test
RO	Rotary Open Hole	DCP	CBR using Dynamic Cone Penetrometer
ODC	Rotary Odex/Symmetrix drilling cased	CBRT	CBR using TRL Probe
CP+RC	Cable Percussive to Rotary Core	PB	Plate Bearing Test
SNC	Sonic	SPT (S)	Standard Penetration Test (Split Barrel Sampler)
CFA	Continuous Flight Auger	SPT (C)	Standard Penetration Test (Solid Cone)
FA	Flight Auger	N	SPT Result
VC	Vibro Core	-/-	Blows/Penetration (mm) after seating drive
WLS+RC	Windowless (Dynamic) Sampler to Rotary Core	-*/-	Total Blows / Penetration (mm)
WLS	Windowless Sampler	()	Extrapolated Value
WS	Window Sampler	PPT	Perth Penetration (In-House Method - Equivalent N Value)
HA	Hand Auger	HP / UCS	Strength from Hand Penetrometer (kN/m ²)
C	Road / Pavement Core	IVN	Strength from Hand Vane ((kN/m ²) P = peak, R = residual
IP	Inspection Pit (Hand Excavation)	PID	Photo Ionisation Detector (ppm)
TP	Trial Pit (Machine Excavated)	MEXE	Mexi-Cone CBR (%)
OP	Observation Pit (Supported Excavation Hand or Machine)		

Samples / Test Type	
B	Bulk Sample
BLK	Block Sample
C	Core Sample
CBRS	CBR Mould Sample
D	Small Disturbed Sample
ES	Environmental Sample (Soil)
EW	Environmental Sample (Water)
GS	Environmental Sample (Gas)

Samples / Test Type	
SPTLS	Standard Penetration Test Split Barrel Sample
TW	Thin Wall Push In Sample (e.g. Shelby Sampler)
U	Undisturbed Open Drive Sample (blows to take)
UT	Thin Wall Undisturbed Open Drive Sample (blows to take)
W	Water Sample (Geotechnical)
SP	Sample from Stockpile
P	Piston Sample
AMAL	Amalgamated Sample

APPENDIX B

Field Sampling and In-Situ Test Methods and Results



B

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing
Unit 11
Charlwoods Road
East Grinstead
West Sussex
RH19 2HU

SPT Hammer Ref: RF3
Test Date: 20/09/2024
Report Date: 24/09/2024
File Name: RF3.spt
Test Operator: BOB

Instrumented Rod Data

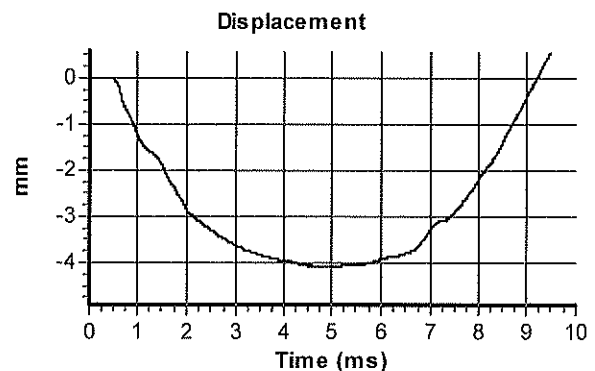
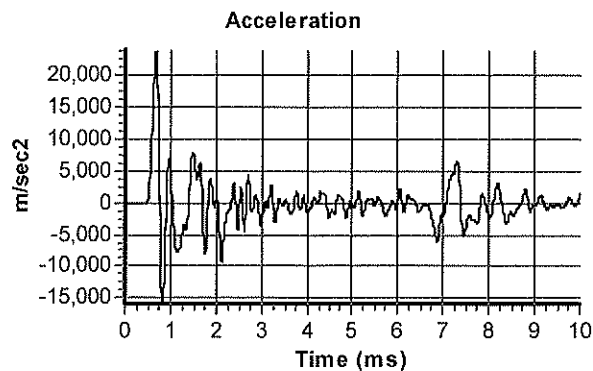
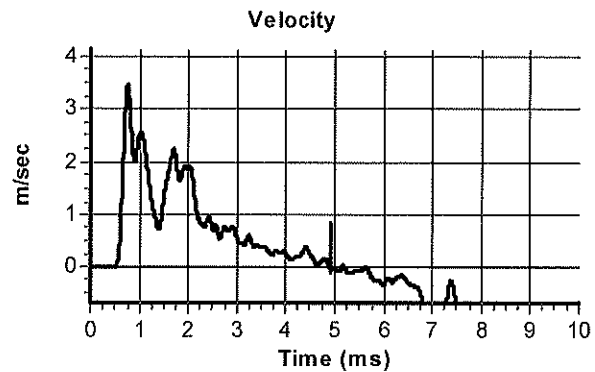
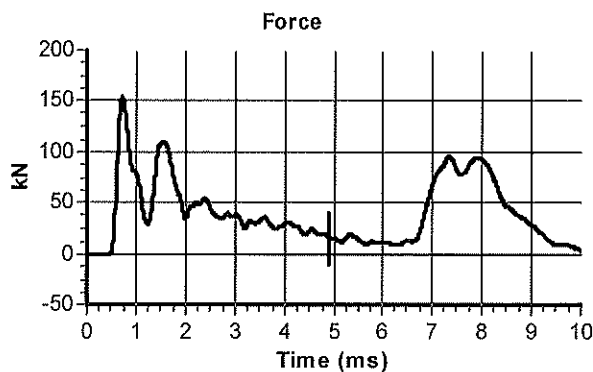
Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.7
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 73547
Accelerometer No.2: 64789

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 14.7

Comments / Location

CHARLWOODS



Calculations

Area of Rod A (mm^2): 996
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 304

Energy Ratio E_r (%): **64**

Signed: Bob Stewart
Title: Technician

The recommended calibration interval is 12 months

Soil and Rock Descriptions

All soil and rock descriptions are in general accordance with BS5930 Ref [4].

Anthropogenic soils ('made ground' or 'fill') describe materials which have been placed by man and can be divided into those composed of reworked natural soils and those composed of or containing man-made materials. 'Fill' is used to describe material placed in a controlled manner and 'made ground' is used to describe materials placed without strict engineering control.

The classification of materials such as topsoil is based on visual description only and should not be interpreted to mean that the material complies with criteria used in BS 3882 Ref [33].

Chalk descriptions are based on CIRIA C574 Ref [34] and Mortimore Ref [35].

The geology code is only provided on logs where a positive identification of the sample strata has been made.

Standard Penetration Test (SPT)

The Standard Penetration Test (SPT) is specified in BS EN ISO 22476-3 Ref [36]. In this test, an open-ended tube is driven into the ground by blows from a free-falling hammer (with specified sizes, weights and distances).

The tube is seated by driving to a penetration of 150mm, or by 25 blows, whichever occurs first. It is then driven for a maximum of a further 300mm and the number of blows is termed the penetration resistance (N). If 300mm penetration cannot be achieved in 50 blows, the test drive is terminated and penetration depth is recorded.

When testing in gravels, a conical end piece is attached to the tube. The test is then called an SPT(C).

A classification of relative density descriptions as used on borehole logs, based upon uncorrected SPT N values, is given within BS5930 Ref [4] and set out as follows:

Classification based on uncorrected SPT N Value	Term
0 - 4	Very Loose
4 - 10	Loose
10 – 30	Medium Dense
30 – 50	Dense
Over 50	Very Dense

Hand Penetrometer Test

The handheld soil penetrometer consists of a spring loaded and calibrated plunger which is forced into cohesive soil. A reading of unconfined compression strength (equal to twice cohesion) is given on a calibrated scale. The average of a set of three readings shall be recorded.

In common with other hand methods of strength assessment it does not give an accurate indication of bearing capacity in stiff or fissured soils, because of the small test area.

Disturbed Samples

Disturbed samples were taken from exploratory holes in general accordance with BS 5930 [4] and BS EN ISO 22475-1 Ref [41] as required and stored in appropriately labelled containers. Details of the type, size and depth of sample will be recorded within the exploratory hole record. Such samples can be regarded as being between Class 5 up to Class 3 quality depending upon their method of sampling.

Open-tube Samples

Open-tube samples were taken within cohesive soils in general accordance with BS 5930 [4] and BS EN ISO 22475-1 Ref [41]. Details of the type, size and depth of sample will be recorded within the exploratory hole record. The open-tube samples were sealed with wax and had end caps fitted before transport from site. Open tube samples are typically of Class 2 or Class 1 quality depending upon the soil type, sampling technique and sampler used.

Environmental Samples

Environmental samples were taken from the boreholes at regular intervals in the made ground and natural soils as indicated on the exploratory hole logs. The sampling strategy was in general accordance with BS10175 Ref [5] and BS ISO 18400 Refs [42], [43], [44], [45] & [46].

These samples were collected and stored in glass jars or plastic pots and transferred to the laboratory in cool boxes as appropriate to the proposed laboratory testing.

Monitoring Well

A groundwater and/or ground gas monitoring well consists of a perforated pipe, which is installed in the ground. The standpipe is typically 50mm nominal in diameter and is installed in a lined borehole. It is perforated from the base with a sand/gravel surround through the soil horizon of interest to an appropriate depth below ground level. Above this there is a bentonite seal with solid pipework and is provided with an end cap or a gas valve at the top as appropriate.

Gas monitoring is carried out via the gas tap. Water sampling/purging can be undertaken by removing the gas tap and bung.

The well is usually completed at the surface with a flush cast iron cover or raised lockable cover.

Groundwater Monitoring – Dip Meter

The dip meter is used to measure standing water levels within boreholes. The probe is lowered into the borehole until the meter detects the groundwater with an audible 'beep'. The level is then read from the tape.

In-situ Permeability Tests (after BS EN ISO 22282)

Testing within boreholes can either be a variable head test (falling or rising head) where the hydraulic pressure within the borehole during the test is either increased or lowered or a constant head where the hydraulic pressure is held constant. During boring when the required depth for testing has been reached, the borehole casing is withdrawn by one metre and the borehole cleaned out if necessary. Testing can alternatively be undertaken within a piezometer sealed into the strata of interest.

Detailed guidance for such tests are given within BS EN ISO 22282 Ref [47], and are summarised below.

- **Falling Head Test** - the borehole is filled with water and the head loss is then recorded either until the level falls to the standing water level (or until dry), or a maximum two-hour period.
- **Rising Head Test** - where a standing water level is established, the groundwater is pumped to reduce the head and then the rise in water level is recorded against time.
- **Constant Head Test** - the borehole is filled to a specified level and water is then pumped in, or discharged from a bowser, to maintain that level. The quantities of water used are recorded at regular intervals and a steady rate of flow is determined. In some cases where the borehole acceptance is very high, it may not be possible to achieve a steady state, and the quantity of water delivered to the borehole is averaged out over the test period.



APPENDIX C

Geotechnical Laboratory Test Methods and Results



Plasticity Index and Water Content Summary

BS1377-2:2022 cl. 5, BS EN ISO 17892-1:2014 + A1:2022, BS EN ISO 17892-12:2018 + A2:2022

Project Name		Land North of Birchwood Lane, Caterham					Project Number		J15961	
Client		Sigma Homes Limited				PE	CL	Date Issued		06-May-25
Location ID	Depth m	Sample Type	Visual Description	Comments	Initial WC %	Liquid Limit %	Plastic Limit %	Plasticity Index	Classi- fication	Passing 425 micron %
BH1	1.00	D	Stiff red brown mottled yellow grey and yellow brown slightly sandy slightly gravelly CLAY. Gravel consists of fine and medium angular to rounded flint and chalk.		22	51	18	33	CH	96
BH1	2.50	D	Firm brown silty slightly sandy gravelly CLAY. Gravel consists of fine to coarse subangular flint.	Sample passed through 425µm sieve.	22	53	16	37	CH	72
BH1	6.00	D	Stiff orange brown mottled dark brown slightly sandy gravelly CLAY. Gravel consists of fine to coarse angular flint.	Sample passed through 425µm sieve.	29	82	25	57	CV	64
BH2	0.50	D	Pale grey brown silty sandy slightly gravelly CLAY. Gravel consists of fine and medium angular flint.		17	24	15	9	CL	89
BH2	2.00	D	Stiff orange brown mottled red orange silty slightly sandy CLAY.		18	48	13	35	CI	100
BH2	5.50	D	Stiff pale orange brown mottled black slightly sandy slightly gravelly CLAY. Gravel consists of fine and medium angular flint.	Sample passed through 425µm sieve.	32	79	26	53	CV	84

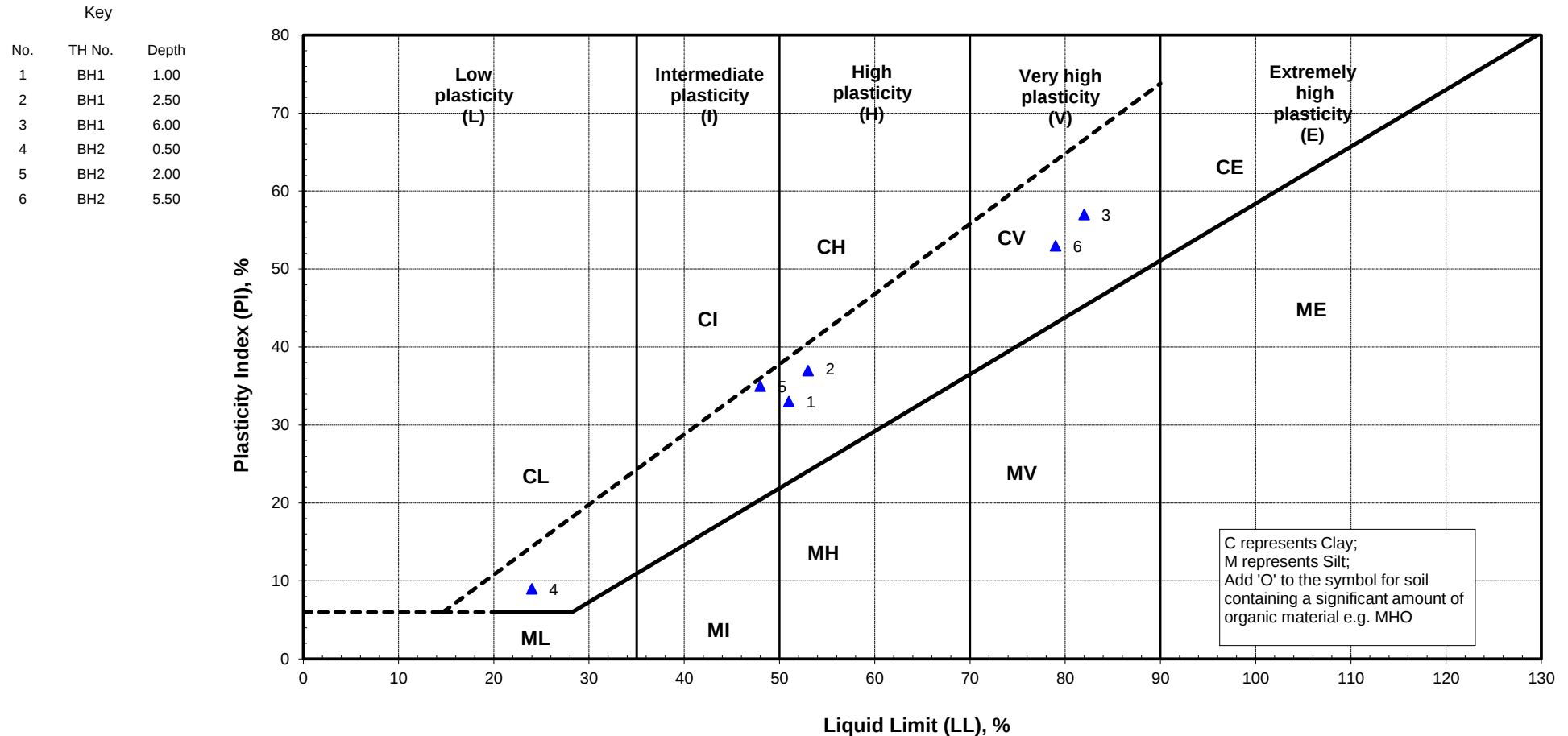
Registered office Southern Testing Laboratories Ltd, Keeble House, Stuart Way, East Grinstead RH19 4QA. Testing carried out at Units 20A & B, Durkins Road, East Grinstead RH19 2RW. BSI Ref: FS29280 under BS EN ISO 9001.

Jun 13

Plasticity Chart for Atterberg Limit Tests



Project Name	Land North of Birchwood Lane, Caterham			Project Number	J15961
Client Name	Sigma Homes Limited	PE	CL	Date Issued	06-May-25

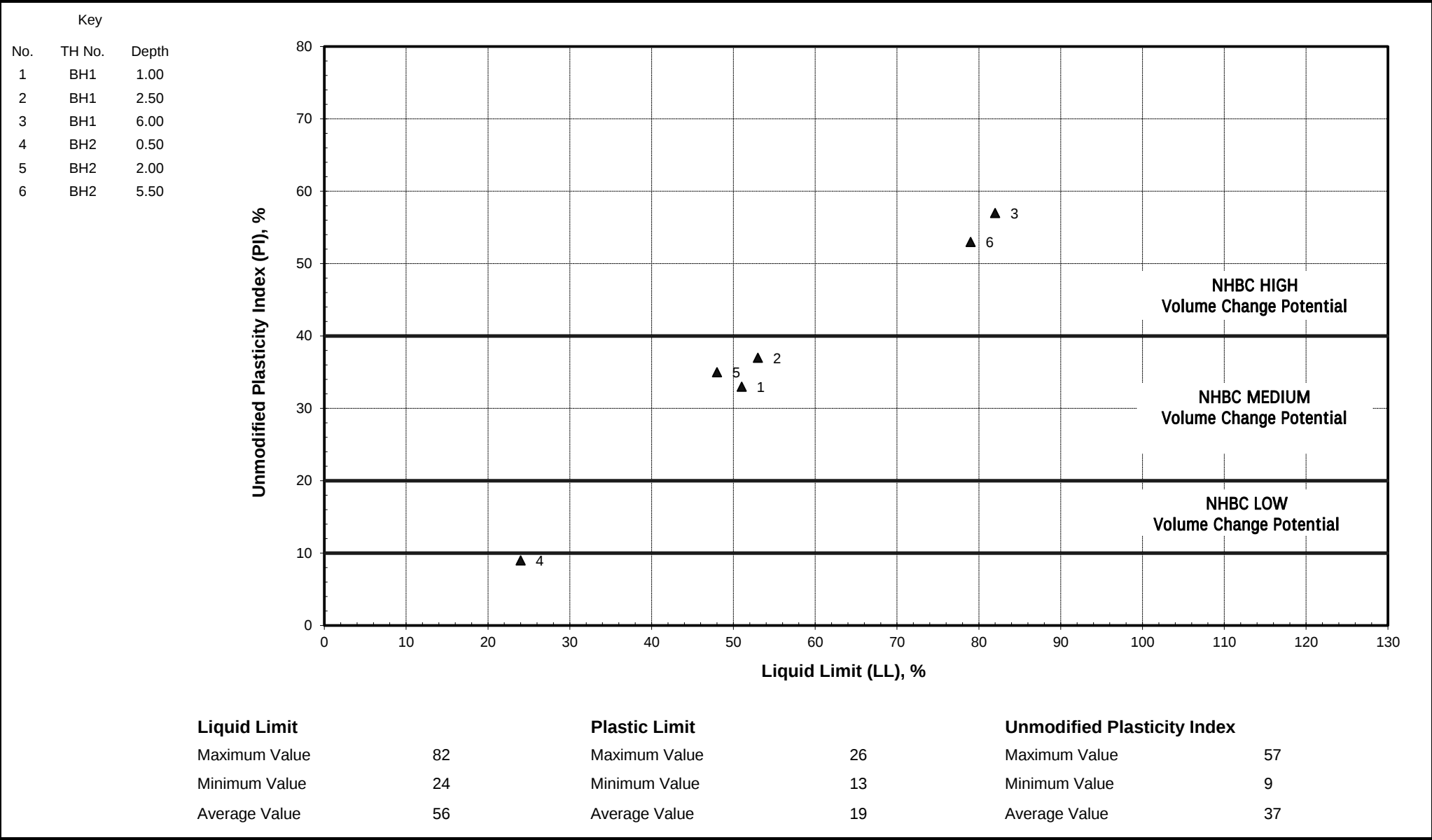


Liquid Limit		Plastic Limit		Plasticity Index	
Maximum Value	82	Maximum Value	26	Maximum Value	57
Minimum Value	24	Minimum Value	13	Minimum Value	9
Average Value	56	Average Value	19	Average Value	37

NHBC Classification for Volume Change Potential



Project Name	Land North of Birchwood Lane, Caterham			Project Number	J15961
Client Name	Sigma Homes Limited	PE	CL	Date Issued	06-May-25



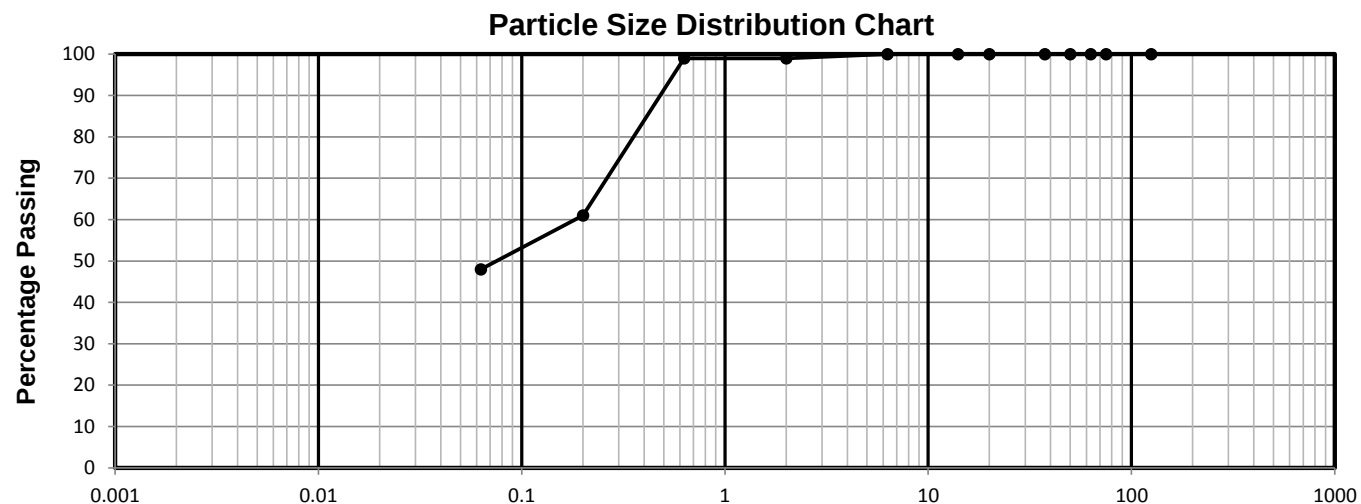
PARTICLE SIZE DISTRIBUTION REPORT

BS EN ISO 17892-4:2016 cl. 5.2, 5.4



Project Name	Land North of Birchwood Lane, Caterham			Project Number	J15961
Client Name	Sigma Homes Limited	PE	CL	Date Issued	06-May-25

Particle Size	% Passing
125mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
20mm	100
14mm	100
6.3mm	100
2mm	99
630µm	99
200µm	61
63µm	48



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
48			51			1			0	

Visual Description of Sample:

Stiff orange sandy CLAY.

Particle Density Mg/m³

Coefficient of Uniformity

N/A

Test Methods:

Wet & Dry Grading BS EN ISO 17892-4:2016 cl. 5.2

Location

BH1

Depth (m)

2.00

Sample Type

D

Comments:

Tested By

STL Lab

Checked By

Timon

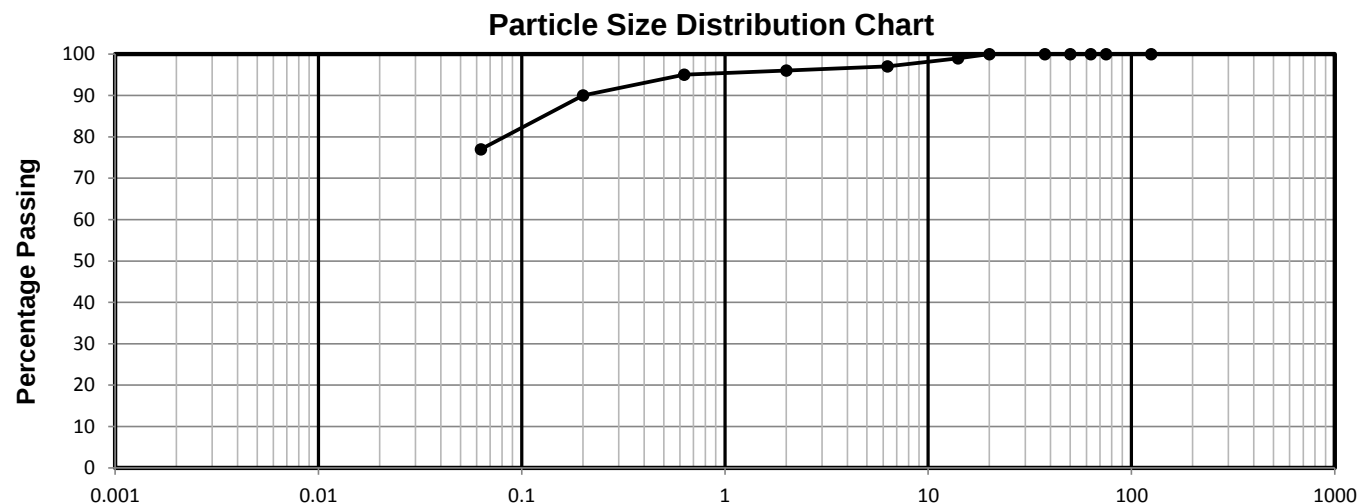
PARTICLE SIZE DISTRIBUTION REPORT

BS EN ISO 17892-4:2016 cl. 5.2, 5.4



Project Name	Land North of Birchwood Lane, Caterham			Project Number	J15961
Client Name	Sigma Homes Limited	PE	CL	Date Issued	06-May-25

Particle Size	% Passing
125mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
20mm	100
14mm	99
6.3mm	97
2mm	96
630µm	95
200µm	90
63µm	77



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
77				19			4			0

Visual Description of Sample:

Stiff pale grey brown and pale brown mottled red slightly sandy slightly gravelly CLAY. Gravel consists of medium subrounded and rounded chalk and flint.

Comments:

Particle Density Mg/m³

Coefficient of Uniformity

N/A

Test Methods:

Wet & Dry Grading BS EN ISO 17892-4:2016 cl. 5.2

Location

BH2

Depth (m)

1.00

Sample Type

B

Tested By

STL Lab

Checked By

Timon

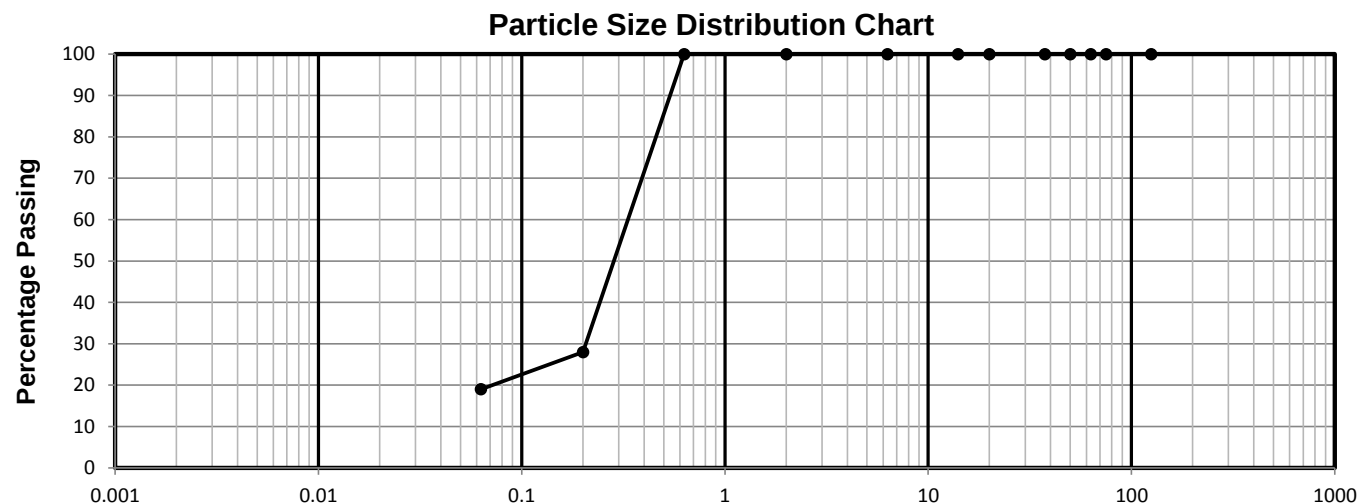
PARTICLE SIZE DISTRIBUTION REPORT

BS EN ISO 17892-4:2016 cl. 5.2, 5.4



Project Name	Land North of Birchwood Lane, Caterham			Project Number	J15961
Client Name	Sigma Homes Limited	PE	CL	Date Issued	06-May-25

Particle Size	% Passing
125mm	100
75mm	100
63mm	100
50mm	100
37.5mm	100
20mm	100
14mm	100
6.3mm	100
2mm	100
630µm	100
200µm	28
63µm	19



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			
19				80			0			0

Visual Description of Sample:
Yellow ochre clayey/silty medium SAND.

Particle Density Mg/m³

Coefficient of Uniformity

N/A

Test Methods:

Wet & Dry Grading BS EN ISO 17892-4:2016 cl. 5.2

Location

BH2

Depth (m)

3.00

Sample Type

B

Tested By

STL Lab

Checked By

Timon

Comments:

Classification Summary

BS 1377-2:2022 cl. 4.2, BS EN ISO 17892-1:2014 + A1:2022, 17892-2:2014, 17892-3:2015

Project Name		Land North of Birchwood Lane, Caterham				Project Number		J15961	
Client		Sigma Homes Limited			PE	CL	Date Issued		06-May-25
Location ID	Depth m	Sample Type	Visual Description	Comments	Initial WC %	Particle Density Mg/m ³	Bulk Density Mg/m ³	Dry Density Mg/m ³	Saturation WC %
BH1	9.00	D	Off white patched pale brown very clayey/silty fine to coarse subangular chalk GRAVEL.		25		2.04	1.63	24
BH1	15.00	D	Off white gravelly SILT. Gravel consists of fine to coarse subangular chalk.		24		2.04	1.65	24
BH2	10.50	D	Off white patched pale brown gravelly SILT. Gravel consists of fine to coarse subangular chalk.		28		1.99	1.56	27
BH2	19.50	D	Off white gravelly SILT. Gravel consists of fine to coarse subangular chalk.		25		2.01	1.61	25

Notes: Saturation Water Content of chalk test is carried out on intact fragments selected from the supplied sample. Particle density of chalk is assumed to be 2.7Mg/m³ unless otherwise stated above.

Southern Testing Laboratories Limited, East Grinstead is registered under BS EN ISO 9001 BSI ref: FS29280

Oct 14



APPENDIX D

Contamination Laboratory Test Methods and Results



Southern Testing Laboratories Ltd
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

t: 01342 333100

e: contamresults@southerntesting.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 25-016501

Project / Site name: Land North of Birchwood Lane,
Caterham

Your job number: J15961

Your order number: J15961_1

Report Issue Number: 1

Samples Analysed: 7 soil samples

Samples received on: 02/04/2025

**Samples instructed on/
Analysis started on:** 02/04/2025

Analysis completed by: 10/04/2025

Report issued on: 10/04/2025

Signed:



Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting
air - once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-016501
 Project / Site name: Land North of Birchwood Lane, Caterham
 Your Order No: J15961_1

Lab Sample Number				501126	501127	501128	501129	501130
Sample Reference				HA01	HA02	HA02	HA03	HA04
Sample Number				ES	ES	ES	ES	ES
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.10	0.40	0.10	0.30
Date Sampled				01/04/2025	01/04/2025	01/04/2025	01/04/2025	01/04/2025
Time Taken				1230	1200	1200	1230	1300
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	21	12	10	8.9
Total mass of sample received	kg	0.1	NONE	0.2	0.2	0.2	0.2	0.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KMC	KMC	KMC	KMC	KMC
Analysis completed	N/A	N/A	N/A	08/04/2025	08/04/2025	08/04/2025	08/04/2025	08/04/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.3	7.3	6.6	6.3	6.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	16	25	36	40	12
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.00794	0.0124	0.018	0.0199	0.00587
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	7.94	12.4	18	19.9	5.87
Sulphide	mg/kg	1	MCERTS	< 1.0	1.6	< 1.0	< 1.0	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	3.7	4	0.9	2.6	1.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.05	< 0.05	0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.08	0.16	0.07	< 0.05	0.07
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.17	0.34	0.08	0.13	0.05
Pyrene	mg/kg	0.05	MCERTS	0.15	0.29	0.07	0.09	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	0.16	< 0.05	0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.16	0.17	< 0.05	0.06	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.22	0.21	< 0.05	0.08	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.1	0.08	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.13	0.18	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.09	0.09	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.11	0.07	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.31	1.8	< 0.80	< 0.80	< 0.80
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Analytical Report Number: 25-016501
Project / Site name: Land North of Birchwood Lane, Caterham
Your Order No: J15961_1

Lab Sample Number				501126	501127	501128	501129	501130
Sample Reference				HA01	HA02	HA02	HA03	HA04
Sample Number				ES	ES	ES	ES	ES
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.10	0.10	0.40	0.10	0.30
Date Sampled				01/04/2025	01/04/2025	01/04/2025	01/04/2025	01/04/2025
Time Taken				1230	1200	1200	1230	1300
Analytical Parameter (Soil Analysis)				Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.6	5.3	6	10	8.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.2	< 0.2	0.3	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	13	15	23	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	12	7.1	17	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	28	17	41	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	5.8	6.5	11	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	37	27	60	43

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number: 25-016501
Project / Site name: Land North of Birchwood Lane, Caterham
Your Order No: J15961_1

Lab Sample Number				501131	501132
Sample Reference				HA05	HA05
Sample Number				ES	ES
Water Matrix				N/A	N/A
Depth (m)				0.10	0.30
Date Sampled				01/04/2025	01/04/2025
Time Taken				1300	1300
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.2	9
Total mass of sample received	kg	0.1	NONE	0.2	0.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KMC	KMC
Analysis completed	N/A	N/A	N/A	08/04/2025	08/04/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	5.8	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	11	14
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0057	0.00679
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	5.7	6.79
Sulphide	mg/kg	1	MCERTS	< 1.0	1.8
Organic Matter (automated)	%	0.1	MCERTS	3.1	0.9

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.06	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.11	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.1	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.07	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80
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Analytical Report Number: 25-016501
Project / Site name: Land North of Birchwood Lane, Caterham
Your Order No: J15961_1

Lab Sample Number				501131	501132
Sample Reference				HA05	HA05
Sample Number				ES	ES
Water Matrix				N/A	N/A
Depth (m)				0.10	0.30
Date Sampled				01/04/2025	01/04/2025
Time Taken				1300	1300
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.6	7.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	7.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	41	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.3	7.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	42	26

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 25-016501
Project / Site name: Land North of Birchwood Lane, Caterham

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
501126	HA01	ES	0.1	Brown loam and clay with vegetation
501127	HA02	ES	0.1	Brown clay and loam with vegetation
501128	HA02	ES	0.4	Brown clay and loam with vegetation
501129	HA03	ES	0.1	Brown loam and clay with vegetation
501130	HA04	ES	0.3	Brown loam and clay with gravel and vegetation
501131	HA05	ES	0.1	Brown loam and clay with gravel and vegetation
501132	HA05	ES	0.3	Brown loam and clay with gravel and vegetation

Analytical Report Number : 25-016501

Project / Site name: Land North of Birchwood Lane, Caterham

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

These screening values are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

Table 1 – Tier 1 Screening Values

Contaminant	Units	Proposed Land Use					
		Residential with home grown produce consumption	Residential without home grown produce consumption	Open Space * (Residential)	Open Space * (Park)	Allotments	Commercial / Industrial
Arsenic (As) [2]	mg/kg	37	40	79	170	43	640
Cadmium (Cd) [2]	mg/kg	11	85	120	555	1.9	190
Trivalent Chromium (CrIII) [2]	mg/kg	910	910	1,500	33,000	18,000	8600
Hexavalent Chromium (CrVI) [2]	mg/kg	6	6	7.7	220	1.8	33
Lead (Pb) [3]	mg/kg	200	310	630	1300	80	2330
Mercury (Hg) [1,2,7]	mg/kg	7.6-11	9.2-15	40	68-71	6.0	29-320
Selenium (Se) [2]	mg/kg	250	430	1,100	1,800	88	12,000
Nickel (Ni) [2,4]	mg/kg	130	180	230	800	53	980
Copper (Cu) [2,4]	mg/kg	2,400	7,100	12,000	44,000	520	68,000
Zinc (Zn) [2,4]	mg/kg	3,700	40,000	81,000	170,000	620	730,000
Phenol [1,2]	mg/kg	120-380	440-1200	440-1300	440-1300	23-83	440-1300
Benzo[a]pyrene [1,5]	mg/kg	1.7-2.4	2.6	4.9	10	0.67-2.7	36
Naphthalene [1,2]	mg/kg	2.3-13	2.3-13	77-430*	77-430*	4.1-24	77-430*
Total Cyanide (CN) [6]	mg/kg	/	/	/	/	/	/
Free Cyanide [6]	mg/kg	/	/	/	/	/	/
Complex Cyanides [6]	mg/kg	/	/	/	/	/	/
Thiocyanate [6]	mg/kg	/	/	/	/	/	/

Notes:

* Open Space levels calculated on the basis of the exposure modelling developed in the C4SL research.

+ Screening values constrained to saturation limit. Higher values may be acceptable on a site specific basis.

[1] Where ranges of values are given for organic contaminants the screening value is dependent on the Soil +Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd. reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2015 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.