CABLE AND PERCUSSION BOREHOLES FOR PILED FOUNDATION DESIGN

Client	Bugler Developments Limited
Works	Cable and Percussion Boreholes with in-situ Testing and Sampling
Site	Former Childrens Centre, 113 Charville Lane, Hayes, UB4 8PD

Project	Revision	Date
23-267.02	B – final	15 February 2024

1.0 INTRODUCTION

At the instruction of Bugler Developments Limited (The Client), Aviron Associates Limited (Aviron) has completed the drilling of two cable and percussion boreholes to enable the design of a piled foundation solution at the above referenced site.

2.0 ANTICIPATED GEOLOGY

The British Geological Survey (BGS) and a previously completed site investigation report have been consulted. Table 1 indicates the anticipated geology beneath the site.

Table 1: Anticipated Geology	
Superficial Geology	No superficial geology noted within the site.
Solid Geology	London Clay Formation.
Reported Geology	A Card Geotechnics Limited (CGL) investigation and interpretation is summarised as follows: • Seven (WS01 to WS07) window sample boreholes were advanced to depths up to 4.45 metres (m) below ground level (bgl). • Made Ground are varying descriptions and generally considered to be re-worked Topsoil present within all locations, proven to 0.8m bgl. Beneath the overlying unit of Made Ground the brown, grey Clay of the London Clay Formation was encountered. The CGL investigation can be reviewed within their Geoenvironmental and Geotechnical Interpretative Report, dated September 2023 and referenced CGK/00808.

3.0 FIELD WORK

At the time of the investigation works the site was unchanged in appearance from that investigated by CGL in July 2023, comprising parking and soft landscaping to the front, a single storey former children's centre in the centre and tarmac play area with soft landscaping in the rear.

Enclosed within **Appendix I** is **Figure 1** which provides a borehole location plan on an existing site layout plan.

Investigation works were completed using a Dando 150 cable and percussion drilling rig on 17 and 18 January 2024. The Client requested two boreholes to depths of 25m bgl to compliment the aforementioned CGL investigation.

Figure 2 is included within **Appendix I** and provides and a **Borehole Location Plan** indicating the location on a proposed development plan.

BH11 was positioned in the northwest of the site below the row of terrace homes and BH12 in the south-west of the site below the row of terrace homes.

Both boreholes (BH11 and BH12) were drilled and cased at 150mm diameter to depths of 9m and 12m bgl respectively and open-hole drilled to 25m bgl. Standard penetration tests (SPTs) were completed at 1.5m intervals. Disturbed soil samples were collected throughout the boreholes to enable strata logging and laboratory testing, as necessary. Undisturbed samples were taken where appropriate in fine (clay) soils for laboratory triaxial testing and to enable strata description.

Detailed strata descriptions are presented within the **borehole logs** which are presented in **Appendix II**.

Ground conditions are consistent with the British Geological Survey (BGS) anticipated geology of the London Clay Formation. Generally, ground conditions in BH11 and BH12 comprised:

- MADE GROUND/Re-worked Topsoil to depths of 0.3m bgl.
- Firm to stiff sandy, gravelly silty CLAY (LONDON CLAY FORMATION) to 1.6m bgl in BH11 and 1.8m bgl in BH12.
- Firm becoming stiff and very stiff, fissured silty, CLAY (LONDON CLAY FORMATION) proven to 25m bgl.
- Groundwater not encountered in either borehole during the drilling process.

Claystone was encountered, as well as chiselling required within the boreholes as follows:

- BH11. Claystone at ~6.2m bgl. Chiselled from 6.2m bgl to 6.3m bgl for 30 minutes.
- BH12. Claystone at ~5.9m bgl and 9.1m bgl. Chiselled from 5.9m bgl to 6.1m bgl for 30 minutes and at 9.1m for 30 minutes.

On completion the boreholes were backfilled with the materials arising.

4.0 IN-SITU AND LABORATORY TESTING

As previously mentioned, Standard Penetration Tests were undertaken at 1.5m intervals within the boreholes in accordance with BS EN ISO 22476-3 “Standard Penetration Test 2005”. Disturbed and undisturbed samples were collected at 1.0m or 2.0m intervals or where appropriate throughout the boreholes.

A programme of geotechnical laboratory testing was undertaken at K4 Soils Laboratory and i2 Analytical Limited. Testing was completed using the fine soils and chalk encountered. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of geotechnical testing are provided in table 2.

Table 2: Soil Geotechnical Testing

Test	Standard	Number of Samples
Atterberg Limits and Moisture Content *To determine the material properties and volume change potential of fine soils.*	BS1377:1990:Part 2:Clauses 3.2, 4.3, 5.0	6
Undrained Triaxial (TXL) *To determine the undrained shear strength of fine soils.*	BS1377:1990:Part 2:Clauses 3.3	6
Aviron LC Suite (pH, water soluble sulphate, total sulphate & total sulphur) *To determine buried concrete design class.*	UKAS accredited (i2 Analytical Limited)	4

5.0 ATTERBERG LIMITS AND MATERIAL PROPERTIES (DESIGN PARAMETERS)

The results of Atterberg limits tests undertaken using the CLAY sampled from borehole BH11 and BH12 at depths of between 1.2m and 20.0m bgl indicate that the fine soils between these depths comprise inorganic clay of high becoming locally very high plasticity (CH/CV). The modified plasticity index of the CLAY was determined to be between 34% and 39% and is therefore classified as being of medium volume change potential.

The result of triaxial tests undertaken using the CLAY sampled from borehole BH11 at depths of 1.65m, 6.5m and 17.0m bgl and BH12 at depths of 1.2m, 15.5m and 20.0m bgl indicates that the soil is of locally very high strength, and medium strength, becoming high strength with undrained shear strength of 212kPa, 100kPa, 123kPa, 63kPa, 119kPa and 129kPa respectively.

The results of laboratory geotechnical testing are enclosed as **Appendix III.**

6.0 CONCRETE CLASSIFICATION

In accordance with Building Research Establishment (BRE) Special Digest 1: 2005 - Concrete in Aggressive Ground, the following laboratory test data (from BH11 and BH12 only, at depths of between 4.5m and 21.0m bgl) have been used to derive the classification for buried concrete at depth (Table C1 natural ground locations) beneath the site:

- Soluble Sulphate (2:1 extract) 0.175 – 2.7g/l
- pH 7.7 – 8.5
- Total Sulphate SO4 0.093 to 1.9%
- Total Sulphur 0.29 to 0.74%
- Total Potential Sulphate 0.87 to 2.22%
- Oxidisable Sulphide 0.32 to 1.137%

"BRE guidance suggests that 'if significant number of determination of oxidisable sulphides is above 0.3%, then use the results of total potential sulphate to determine the concrete class".

Oxidisable sulphide has been calculated above 0.3% SO4 in all of the soil samples tested and exceeds the threshold where the concrete classification is based on oxidisable sulphide and total potential sulphate. However, the action of piling is unlikely to result in 'disturbed ground', and the results of soluble sulphate apply.

Based on the results of soluble sulphate obtained from BH11 and BH12 only, the Design Sulphate (DS) Class for buried concrete at depth beneath the site is DS-3. For piled foundations constructed above the groundwater level the Aggressive Chemical Environment for Concrete (ACEC) Class is AC-2s, and below the groundwater level is AC-3.

The results of laboratory geochemical testing are enclosed as **Appendix III.**

7.0 CONCLUSIONS

Our report and laboratory results should be passed to the appointed piling contractor to enable pile design in accordance with their proprietary piling technique.

Project designers should also consult previous ground investigation reports, such as the aforementioned CGL report.

We trust that you find the above to be satisfactory, however should you require any further information please do not hesitate to contact the undersigned.

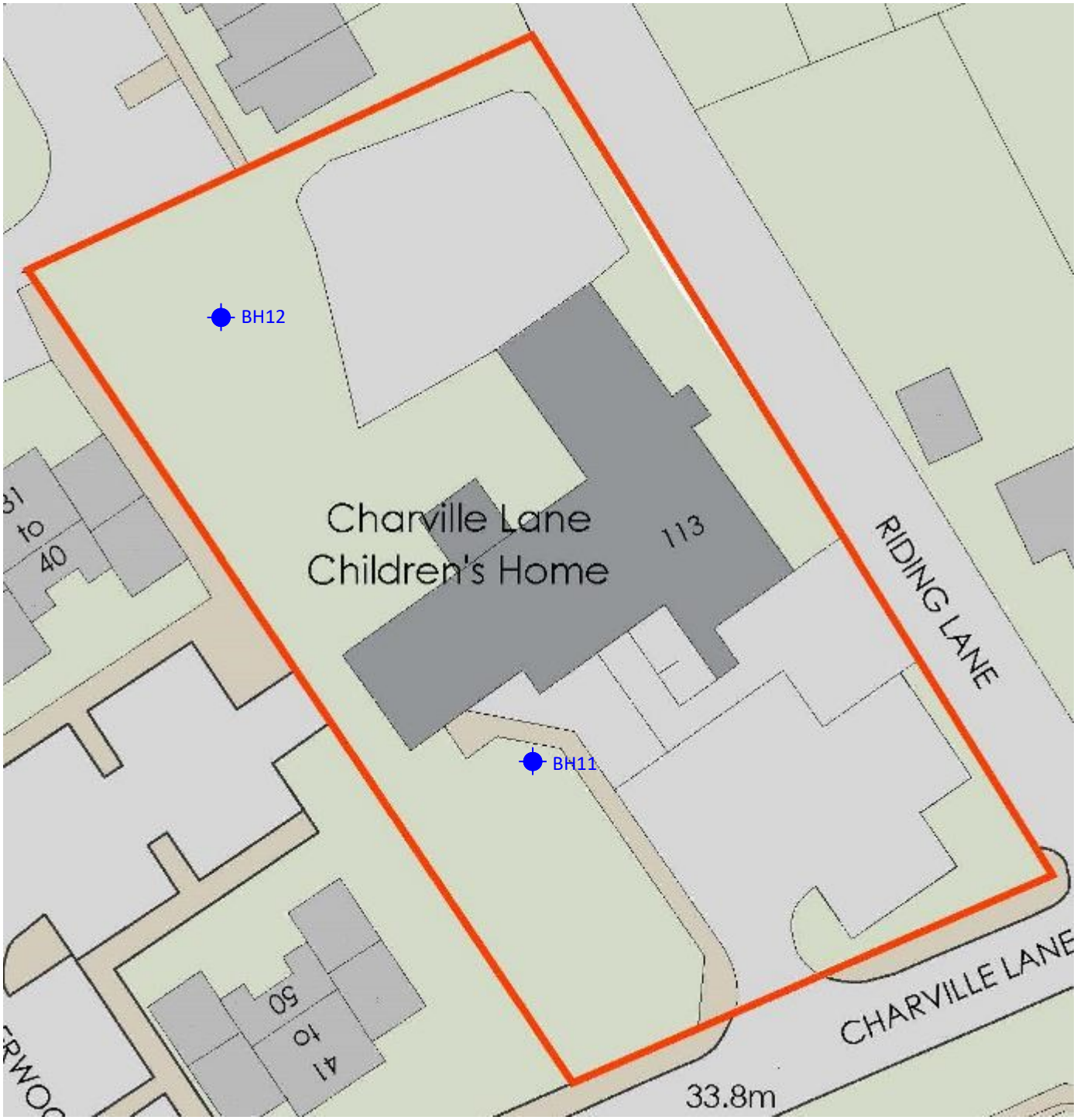
Prepared by

James Burkitt BEng (Hons) CEnv MRICS
Managing Director

APPENDIX I

Figure 1 – Borehole Location and Existing Site Layout Plan

Figure 2 – Borehole Location and Proposed Site Layout Plan



Legend

Cable Percussion Borehole

Notes

Figure 1

Drawing Title	Borehole Location and Existing Site Layout Plan
Project Number	23-267.02
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

Aviron Associates Limited - Badgemore House - Gravel Hill - Henley on Thames - RG9 4NR - T: 01491 413 722 - M: 07787 771 686 - E: james@aviron.co.uk

Legend

Cable Percussion Borehole

Notes

Figure 1

Drawing Title

Borehole Location and Proposed Site Layout Plan

Project Number	23-267.02
Project Title	113 Charville Lane, Hayes, UB4 8PD
Drawn by	DN
Checked by	JB
Scale	NTS

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APPENDIX II
Borehole Logs

PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH11
Client:	Start:	End:	Sheet:
Bugler Developments Limited	18/01/2024	18/01/2024	1 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	SPT Results 150mm	75mm	75mm	75mm	75mm	N' Value	Notes
Dark brown dark grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint.. Rare sub-angular fine gravel size fragments of brick. (REWORKED TOPSOIL/MADE GROUND)		(0.3) 0.3											
Firm becoming stiff orange light brown locally mottled light grey silty sandy rarely gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. (LONDON CLAY FORMATION)		(1.3)		0.9	1	D							
				1.0-1.5	2	B							
		1.6		1.6	3	U							U Blow = 60
Firm to stiff, very high strength brown silty CLAY (LONDON CLAY FORMATION)		(2.1)		1.95	4	D							
				2.0	5	SPT	5	5	4	3	4	16	
				2.45	6	D							
				3.0	7	D							
				3.5	8	SPT	4	3	4	3	4	14	
		3.7											
Stiff, fissured brown grey silty CLAY (LONDON CLAY FORMATION)		(2.5)		3.95	9	D							
				4.5	10	D							
Continued....				5.0	11	SPT	3	4	5	4	5	18	

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
18/01/2024	150	9.00	30	1.2	1.6	18/01/2024	-	-	-	Dry	
			30	6.2	6.3						

Remarks		By
No groundwater encountered. No visual or olfactory evidence of contamination. No roots noted in borehole. Borehole backfilled with arisings.	Logged	AC
SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample	Checked	JB
		Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH11
Client:	Start:	End:	Sheet:
Bugler Developments Limited	18/01/2024	18/01/2024	2 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	SPT Results 150mm	75mm	75mm	75mm	75mm	N' Value	Notes
.....continued....													
Stiff, fissured brown grey silty CLAY (LONDON CLAY FORMATION)				5.45	12	D							
				6.0	13	D							
		6.2											
Hard brown CLAYSTONE.		6.3											
Stiff, high strength, fissured grey mottled brown silty CLAY (LONDON CLAY FORMATION)		(7.7)		6.5	14	U							U Blow = 75
				7.0	15	D							
				7.5	16	D							
				8.0	17	SPT	4	5	6	5	7	23	
				8.45	18	D							
				9.0	19	D							
				9.5	20	SPT	5	4	6	7	8	25	
Continued...				9.95	21	D							

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
18/01/2024	150	9.00	30 30	1.2 6.2	1.6 6.3	18/01/2024	-	-	-	Dry	

Remarks	By	
No groundwater encountered. No visual or olfactory evidence of contamination. No roots noted in borehole. Borehole backfilled with arisings. SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample	Logged	AC
	Checked	JB
		Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH11
Client:	**Start:**	**End:**	**Sheet:**
Bugler Developments Limited	18/01/2024	18/01/2024	3 of 5
Method/Plant Used:	**Co-ordinates:**	**Ground Level:**	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests			SPT Results					N' Value	Notes
				Depth	No	Type	150mm	75mm	75mm	75mm	75mm		
...continued...													
Stiff, high strength, fissured grey mottled brown silty CLAY (LONDON CLAY FORMATION)				10.5	22	D							
				11.0	23	SPT	6	4	5	7	9	25	
				11.45	24	D							
				12.0	25	D							
				12.5	26	U							U Blow = 100
				13.0	27	D							
				13.5	28	D							
		14.0		14.0	29	SPT	8	7	7	8	10	32	
Very stiff, high strength, fissured grey mottled brown silty CLAY (LONDON CLAY FORMATION)		*(11.0)*		14.45	30	D							
Continued...				15.0	31	D							

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
18/01/2024	150	9.00	30 30	1.2 6.2	1.6 6.3	18/01/2024	-	-	-	Dry	

Remarks	By	
No groundwater encountered. No visual or olfactory evidence of contamination. No roots noted in borehole. Borehole backfilled with arisings. SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample	Logged	AC
	Checked	JB
		Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH11
Client:	**Start:**	**End:**	**Sheet:**
Bugler Developments Limited	18/01/2024	18/01/2024	4 of 5
Method/Plant Used:	**Co-ordinates:**	**Ground Level:**	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests			SPT Results					N' Value	Notes
				Depth	No	Type	150mm	75mm	75mm	75mm	75mm		
...continued...													
Very stiff, high strength, fissured grey mottled brown silty CLAY (LONDON CLAY FORMATION)													
				15.5	32	SPT	9	7	8	9	9	33	
				15.95	33	D							
				16.5	34	D							
				17.0	35	U							U Blow = 110
				17.5	36	D							
				18.0	37	D							
				18.5	38	SPT	10	8	9	10	9	36	
				18.95	39	D							
				19.5	40	D							
Continued...				20.0	41	SPT	11	9	10	12	11	42	

Casing record

Date	Diameter (mm)	Depth (m)
18/01/2024	150	9.00

Chiselling records

Time (Mins)	From (m)	To (m)
30	1.2	1.6
30	6.2	6.3

Water level observations (depths in metres below gl)

Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
18/01/2024	-	-	-	Dry	

Remarks

No groundwater encountered.
No visual or olfactory evidence of contamination.
No roots noted in borehole.
Borehole backfilled with arisings.

SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample

	By
Logged	AC
Checked	JB

Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.01	BH11
Client:	**Start:**	**End:**	**Sheet:**
Bugler Developments Limited	18/01/2024	18/01/2024	5 of 5
Method/Plant Used:	**Co-ordinates:**	**Ground Level:**	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests			SPT Results					N' Value	Notes
				Depth	No	Type	150mm	75mm	75mm	75mm	75mm		
...continued...													
Very stiff, high strength, fissured grey mottled brown silty CLAY (LONDON CLAY FORMATION)													
				20.45	42	D							
				21.0	43	D							
				21.5	44	SPT	12	10	12	11	13	46	
				21.95	45	D							
				22.5	46	D							
				23.0	47	SPT	10	9	11	13	15	48	
				23.45	48	D							
				24.0	49	D							
				24.5	50	SPT	13	11	12	14	17	54	
				24.95	51	D							
End of BH.		25.0											

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
18/01/2024	150	9.00	30 30	1.2 6.2	1.6 6.3	18/01/2024	-	-	-	Dry	

Remarks		By
No groundwater encountered. No visual or olfactory evidence of contamination. No roots noted in borehole. Borehole backfilled with arisings. SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample	Logged	AC
	Checked	JB
		Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	17/01/2024	17/01/2024	1 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	SPT Results 150mm	75mm	75mm	75mm	75mm	N' Value	Notes
Dark brown dark grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded of flint.Rare sub-angular fine gravel size fragments of brick. (REWORKED TOPSOIL/MADE GROUND)		(0.3) **0.3**		0.3	1	ES1							
Firm becoming stiff, medium strength orange light brown locally mottled light grey silty sandy rarely gravelly CLAY. Gravel is fine to coarse sub-angular to rounded of flint. (LONDON CLAY FORMATION)		(1.5) **1.8**		1.0	2	D							
				1.2	3	U							U Blow = 60
				1.7	4	D							
Firm brown grey silty CLAY (LONDON CLAY FORMATION)		(0.8) **2.6**		2.0	5	SPT	2	2	2	3	2	9	
				2.45	6	D							
Firm orange brown sandy silty CLAY (LONDON CLAY FORMATION)		(1.0) **3.6**		2.7	7	D							
				3.5	8	SPT	3	2	2	2	3	9	
Firm, fissured grey brown silty CLAY (LONDON CLAY FORMATION)		(0.7) **4.3**		3.95	9	D							
Stiff, high strength, fissured grey silty CLAY (LONDON CLAY FORMATION)		(1.6)		4.5	10	D							
Continued...				5.0	11	U							U Blow = 70

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
17/01/2024	150	12.00		GL	1	17/01/2024	-	-	Seepage	0.30	
			30	5.9	6.1						
			30	9.1							

Remarks		By
Groundwater seepage encountered from 0.3m bgl. No visual or olfactory evidence of contamination. Fine roots noted to 1.8m bgl. Borehole backfilled with arisings.	Logged	AC
	Checked	JB
SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample		Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	17/01/2024	17/01/2024	2 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	SPT Results 150mm	75mm	75mm	75mm	75mm	N' Value	Notes
...continued...													
Stiff, high strength, fissured grey silty CLAY (LONDON CLAY FORMATION)				5.5	12	D							
		5.9											
Hard brown CLAYSTONE.		*(0.2)*		6.0	13	D							
		6.1											
Stiff, fissued grey silty CLAY (LONDON CLAY FORMATION)		*(3.0)*		6.5	14	SPT	7	6	7	9	11	33	
				6.95	15	D							
				7.5	16	D							
				8.0	17	SPT	5	4	5	6	6	21	
				8.45	18	D							
				9.0	19	D							
		9.1											
Hard grey CLAYSTONE.		**9.2**											
Stiff, fissued grey silty CLAY (LONDON CLAY FORMATION)		*(3.3)*		9.5	20	SPT	4	4	5	7	7	23	
Continued...				9.95	21	D							

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
17/01/2024	150	12.00		GL	1	17/01/2024	-	-	Seepage	0.30	
			30	5.9	6.1						
			30	9.1							

Remarks		By	
Groundwater seepage encountered from 0.3m bgl. No visual or olfactory evidence of contamination. Fine roots noted to 1.8m bgl. Borehole backfilled with arisings.	Logged	AC	
SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample	Checked	OB	Scale 01:25

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	17/01/2024	17/01/2024	3 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests Depth	No	Type	SPT Results 150mm	75mm	75mm	75mm	75mm	N' Value	Notes
...continued...													
Stiff, fissued grey silty CLAY (LONDON CLAY FORMATION)				10.5	22	D							
				11.0	23	SPT	5	4	6	7	8	25	
				11.45	24	D							
				12.0	25	D							
		12.5											
Very stiff, high strength, fissued grey silty CLAY (LONDON CLAY FORMATION)		*(12.5)*		12.5	26	SPT	5	6	7	8	10	31	
				12.95	27	D							
				13.5	28	D							
				14.0	29	SPT	7	6	7	9	11	33	
				14.45	30	D							
Continued...				15.0	31	D							

Casing record

Date	Diameter (mm)	Depth (m)
17/01/2024	150	12.00

Chiselling records

Time (Mins)	From (m)	To (m)
	GL	1
30	5.9	6.1
30	9.1	

Water level observations (depths in metres below gl)

Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
17/01/2024	-	-	Seepage	0.30	

Remarks

Groundwater seepage encountered from 0.3m bgl.
No visual or olfactory evidence of contamination.
Fine roots noted to 1.8m bgl.
Borehole backfilled with arisings.

SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample

	By
Logged	AC
Checked	OB

Scale 01:25

Aviron Associates Limited - Badgemore House || Badgemore Park || Gravel Hill || Henley on Thames || RG9 4NR - T:01491 413 722 - M: 07787771686 -E:james@aviron.co.uk

PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	17/01/2024	17/01/2024	4 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests			SPT Results					N' Value	Notes
				Depth	No	Type	150mm	75mm	75mm	75mm	75mm		
...continued...													
Very stiff, high strength, fissued grey silty CLAY (LONDON CLAY FORMATION)													
				15.5	32	U							U Blow = 100
				16.0	33	D							
				16.5	34	D							
				17.0	35	SPT	8	7	9	11	12	39	
				17.45	36	D							
				18.0	37	D							
				18.5	38	SPT	10	8	10	12	14	44	
				18.95	39	D							
				19.5	40	D							
Continued...				20.0	41	U							U Blow = 110

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
17/01/2024	150	12.00		GL	1	17/01/2024	-	-	Seepage	0.30	
			30	5.9	6.1						
			30	9.1							

Remarks		By	
Groundwater seepage encountered from 0.3m bgl. No visual or olfactory evidence of contamination. Fine roots noted to 1.8m bgl. Borehole backfilled with arisings.	Logged	AC	
	Checked	OB	Scale 01:25

SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample

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PERCUSSION DRILLING LOG

Site:		Project No.	Borehole:
113 Charville Lane, Hayes, UB4 8PD		23-267.02	BH12
Client:	Start:	End:	Sheet:
Bugler Developments Limited	17/01/2024	17/01/2024	5 of 5
Method/Plant Used:	Co-ordinates:	Ground Level:	
Dando 150 CP Rig	NT	NT	

Description of Strata	Legend	Depth (m bgl) (thickness)	Well Cnstr.	Samples/Tests			SPT Results					N' Value	Notes
				Depth	No	Type	150mm	75mm	75mm	75mm	75mm		
...continued...													
Very stiff, high strength, fissued grey silty CLAY (LONDON CLAY FORMATION)													
				20.5	42	D							
				21.0	43	D							
				21.5	44	SPT	12	10	11	13	15	49	
				21.95	45	D							
				22.5	46	D							
				23.0	47	SPT	11	10	12	14	16	52	
				23.45	48	D							
				24.0	49	D							
				24.5	50	SPT	12	11	13	15	18	57	
				24.95	51	D							
End of BH.		**25.0**											

Casing record			Chiselling records			Water level observations (depths in metres below gl)					
Date	Diameter (mm)	Depth (m)	Time (Mins)	From (m)	To (m)	Date	Water strike	Water level (after 20mins)	Flow	Standing level	Remarks
17/01/2024	150	12.00		GL	1	17/01/2024	-	-	Seepage	0.30	
			30	5.9	6.1						
			30	9.1							

Remarks		By	
Groundwater seepage encountered from 0.3m bgl. No visual or olfactory evidence of contamination. Fine roots noted to 1.8m bgl. Borehole backfilled with arisings.	Logged	AC	
	Checked	OB	Scale 01:25

SPT: Standard Penetration Test, HP: Hand Penetrometer, B: Bulk Sample, D: Disturbed Sample

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APPENDIX III
Laboratory Test Results

Unconsolidated Undrained Triaxial Compression tests without measurement of pore pressure
Summary of Results

Tests carried out in accordance with BS1377:Part 7 : 1990 clause 8 or 9 as appropriate to test

Job No.	Project Name	Programme	
34713	113 Charville Lane, Hayes, UB4 8PD	Samples received	18/01/2024
		Schedule received	19/01/2024
Project No.	Client	Project started	22/01/2024
23-267.01	Aviron	Testing Started	01/02/2024

Hole No.	Sample Ref	Sample Top m	Sample Base m	Sample Type	Soil Description	Test Type	Density bulk Mg/m3	Density dry Mg/m3	w %	Length mm	Diameter mm	σ3 kPa	At failure: Axial strain %	At failure: σ1 - σ3 kPa	At failure: cu kPa	At failure: Mode	Remarks
BH11	-	1.65	-	U	Very high strength brown slightly mottled grey and orangish brown silty CLAY with occasional pockets of fm calcareous fragments	UU	2.07	1.71	21	198	102	30	6.6	423	212	B	
BH11	-	6.50	-	U	High strength dark brown silty CLAY with rare fm selenite crystals	UU	1.99	1.54	29	198	102	117	7.1	200	100	B	
BH11	-	17.00	-	U	High strength dark grey silty CLAY with occasional fm claystone fragments	UU	2.06	1.61	28	198	102	306	12	246	123	C	
BH12	-	1.20	-	U	Medium strength brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with occasional rootlets (gravel is fm and sub-angular)	UU	1.98	1.55	28	198	102	22	10	125	63	C	
BH12	-	15.50	-	U	High strength dark grey silty CLAY with occasional pockets of fine sand	UU	2.03	1.62	26	198	102	279	6.1	238	119	B	
BH12	-	20.00	-	U	High strength dark grey silty CLAY	UU	1.99	1.56	28	198	102	360	6.6	258	129	B	

Legend
UU - single stage test (single and multiple specimens) — σ3 Cell pressure — Mode of failure ; B - Brittle
UUM - Multistage test on a single specimen — σ1 - σ3 Maximum corrected deviator stress — P - Plastic
suffix R - remoulded or recompacted — cu Undrained shear strength, ½ (σ1 - σ3) — C - Compound

Test Report by K4 SOILS LABORATORY
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Checked and Approved

Initials: J.P

Date: 09/02/2024

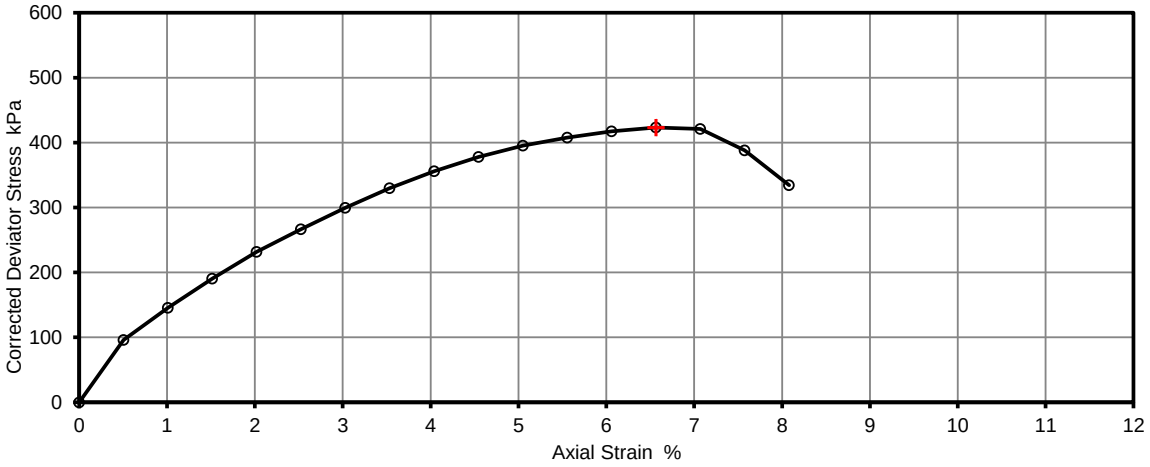
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	1.65 m
Soil Description	Very high strength brown slightly mottled grey and orangish brown silty CLAY with occasional pockets of fm calcareous fragments			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

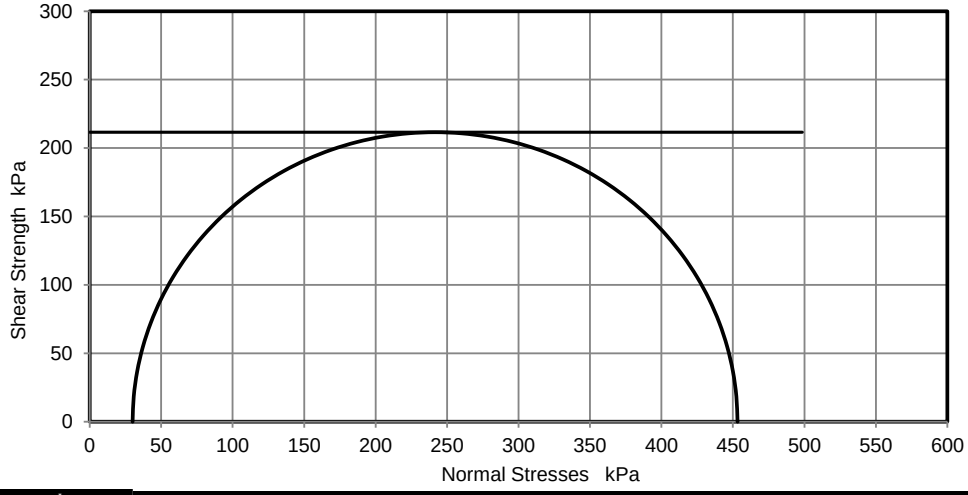
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.07	Mg/m3
Moisture Content	21	%
Dry Density	1.71	Mg/m3
Rate of Strain	1.5	%/min
Cell Pressure	30	kPa
Axial Strain	6.6	%
Deviator Stress, (σ1 - σ3)f	423	kPa
Undrained Shear Strength, cu	212	kPa ½(σ1 - σ3)f
Mode of Failure	Brittle	

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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Checked and Approved
Initials: J.P
Date 09/02/2024

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

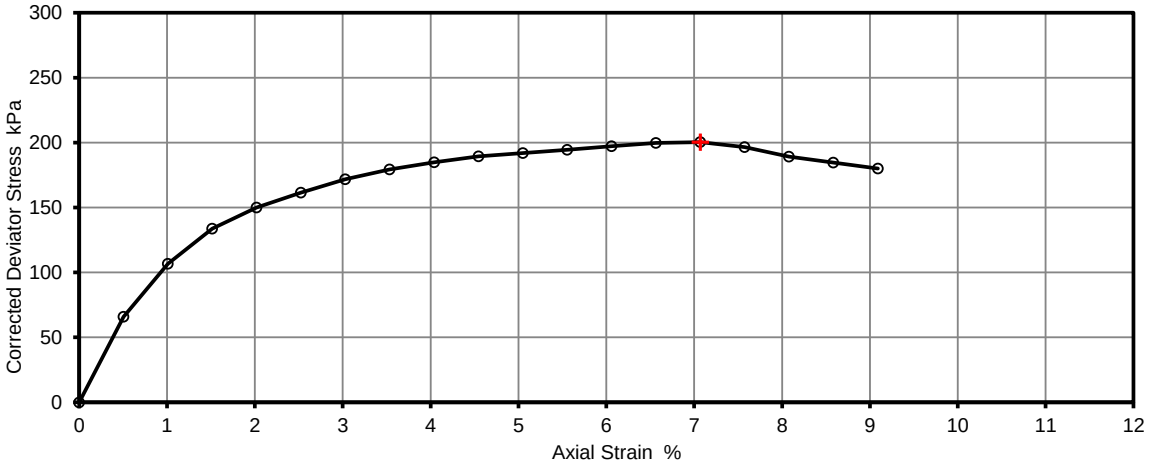
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	6.50 m
Soil Description	High strength dark brown silty CLAY with rare fm selenite crystals			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

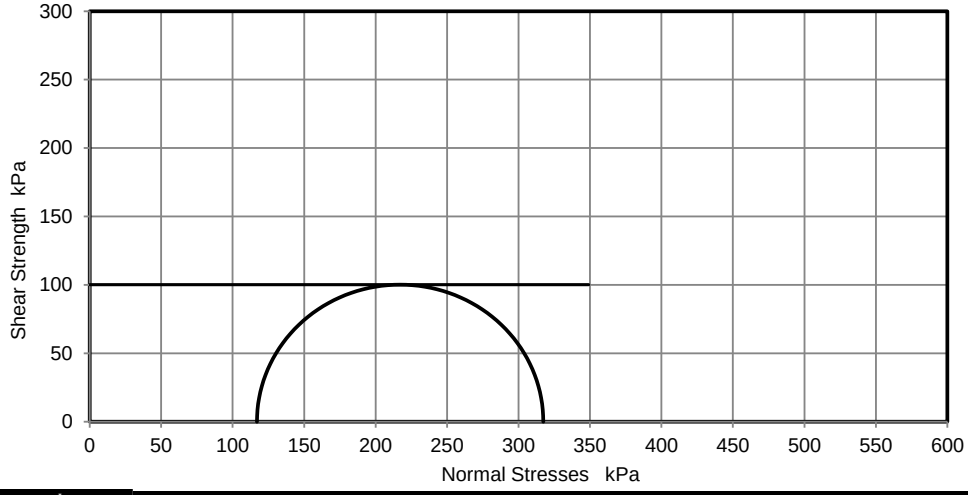
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.99	Mg/m3
Moisture Content	29	%
Dry Density	1.54	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	117	kPa
Axial Strain	7.1	%
Deviator Stress, (σ1 - σ3)f	200	kPa
Undrained Shear Strength, cu	100	kPa ½(σ1 - σ3)f
Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Date 09/02/2024

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

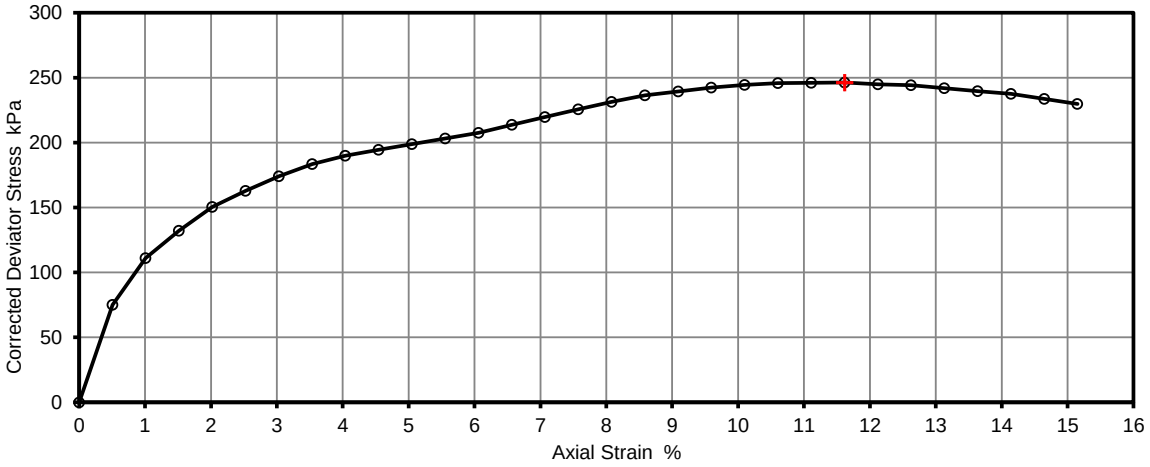
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	17.00 m
Soil Description	High strength dark grey silty CLAY with occasional fm claystone fragments			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

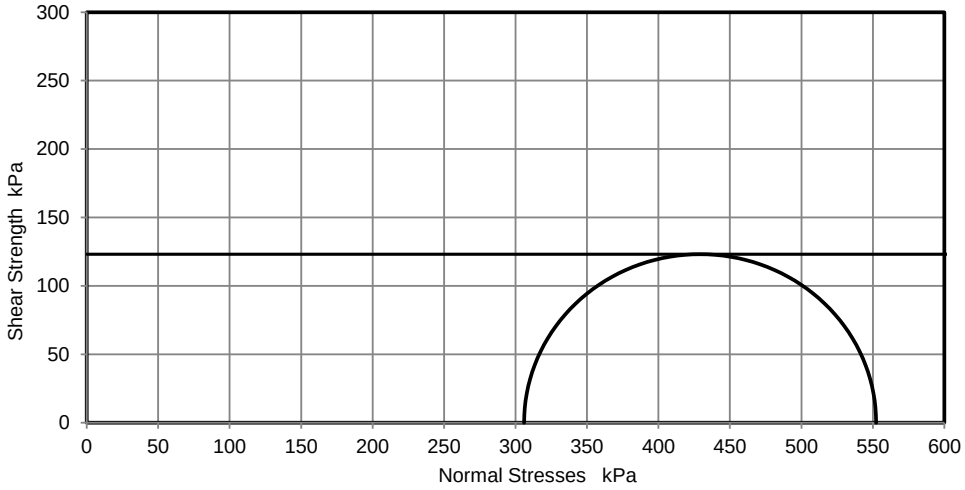
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.06	Mg/m3
Moisture Content	28	%
Dry Density	1.61	Mg/m3
Rate of Strain	1.5	%/min
Cell Pressure	306	kPa
Axial Strain	12	%
Deviator Stress, (σ1 - σ3)f	246	kPa
Undrained Shear Strength, cu	123	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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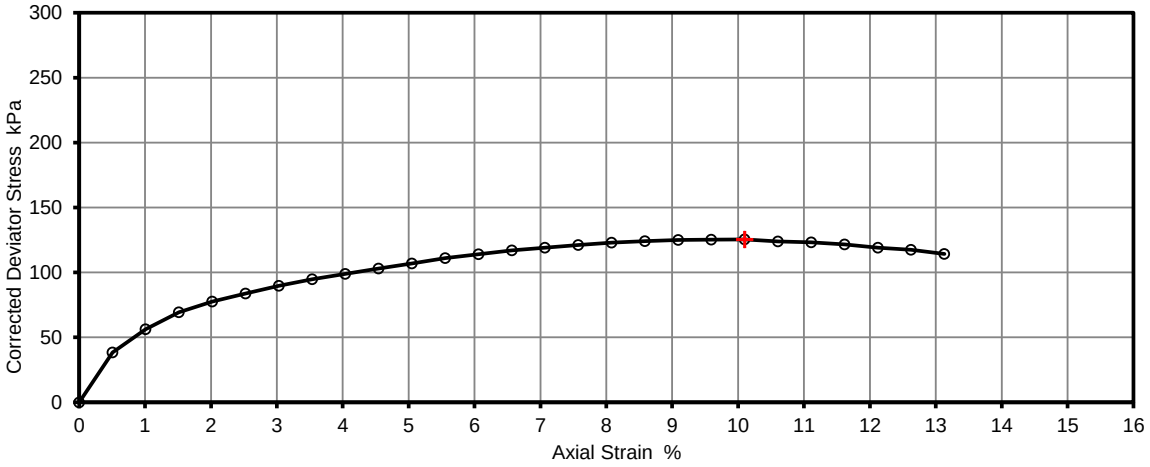
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	1.20 m
Soil Description	Medium strength brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with occasional rootlets (gravel is fm and sub-angular)			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

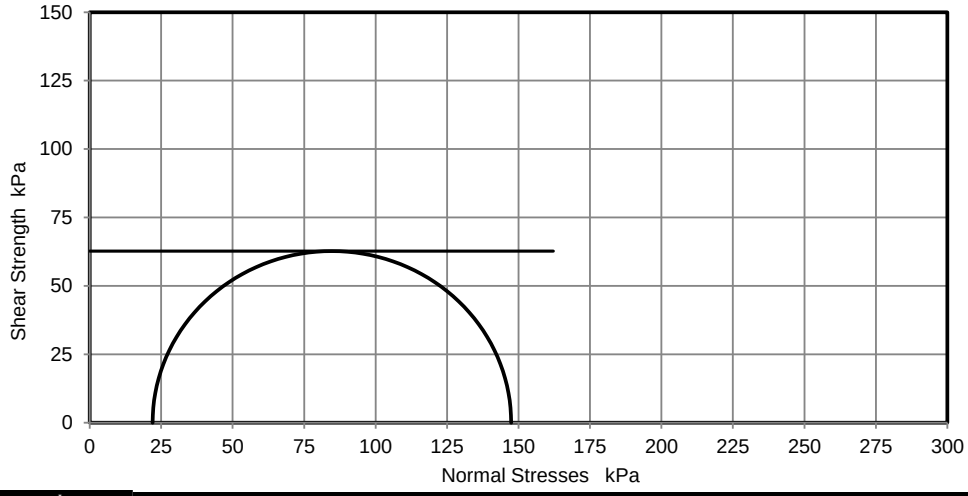
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.98	Mg/m3
Moisture Content	28	%
Dry Density	1.55	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	22	kPa
Axial Strain	10	%
Deviator Stress, (σ1 - σ3)f	125	kPa
Undrained Shear Strength, cu	63	kPa ½(σ1 - σ3)f
Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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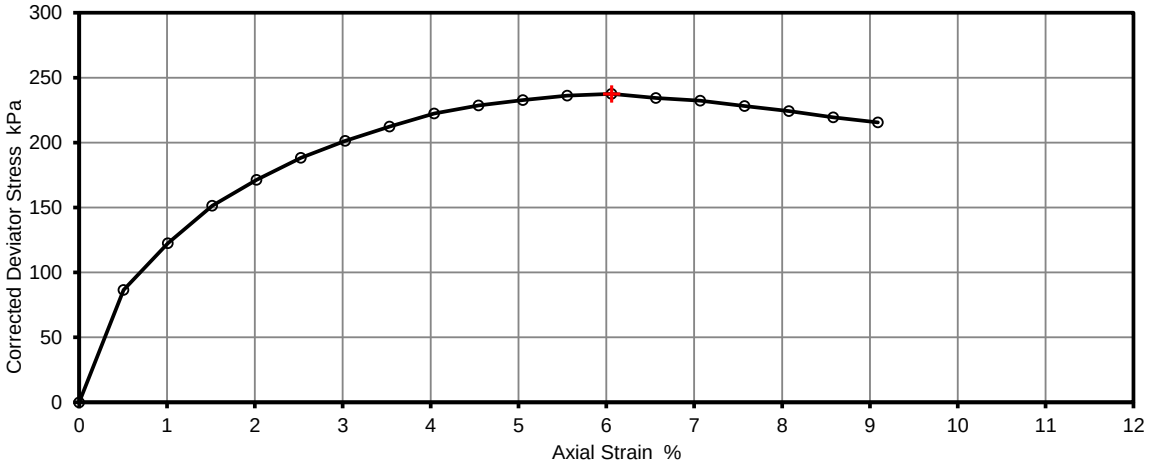
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	15.50 m
Soil Description	High strength dark grey silty CLAY with occasional pockets of fine sand			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

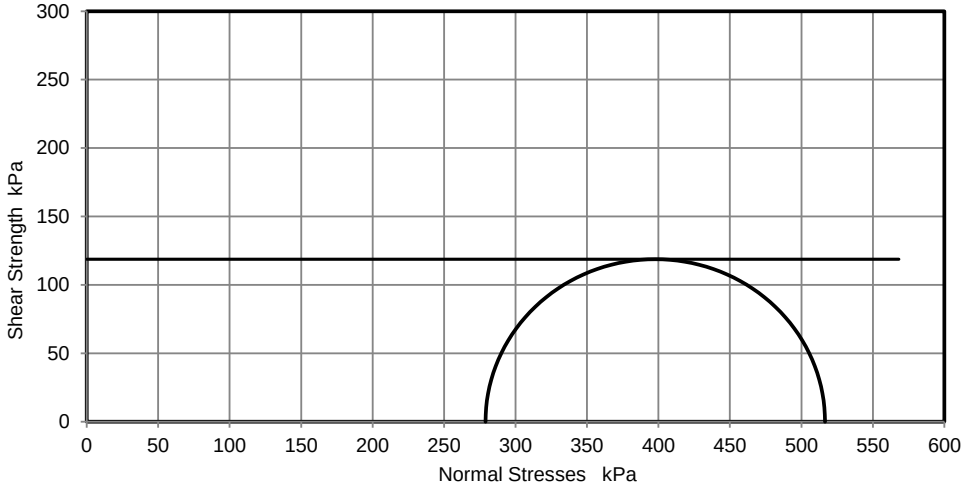
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	2.03	Mg/m3
Moisture Content	26	%
Dry Density	1.62	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	279	kPa
Axial Strain	6.1	%
Deviator Stress, (σ1 - σ3)f	238	kPa
Undrained Shear Strength, cu	119	kPa ½(σ1 - σ3)f
Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Initials: J.P
Date 09/02/2024

UKAS TESTING 2519

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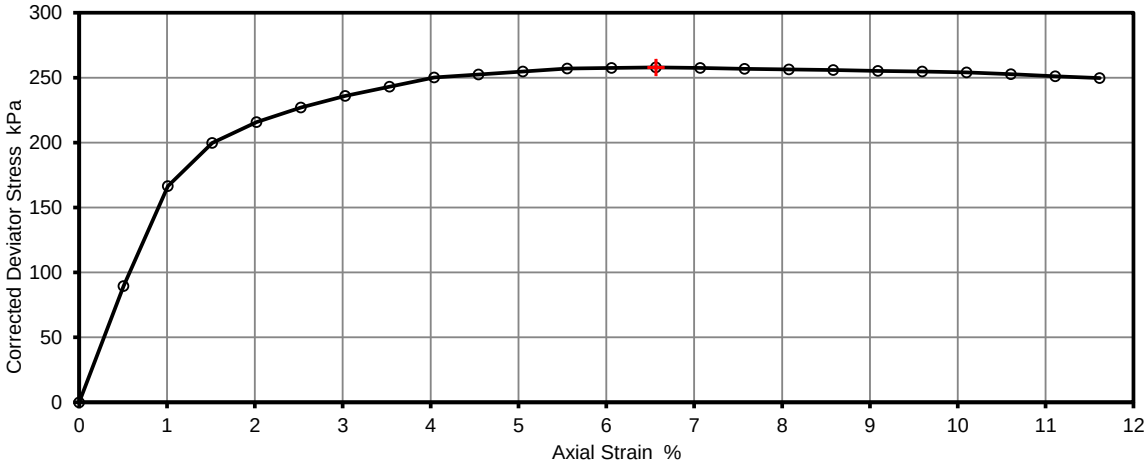
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top	20.00 m
Soil Description	High strength dark grey silty CLAY			Depth Base	- m
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	01/02/2024

Remarks

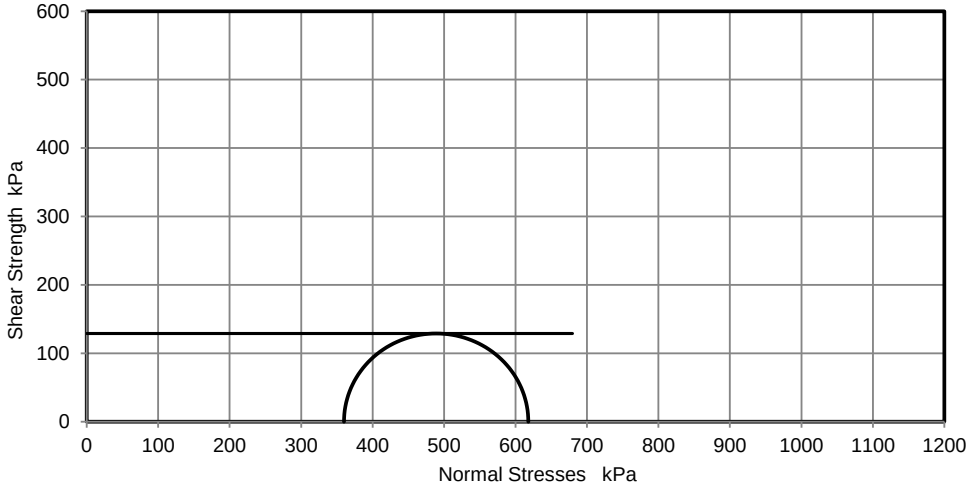
Position within sample

Test Number	1	
Length	198.0	mm
Diameter	102.0	mm
Bulk Density	1.99	Mg/m3
Moisture Content	28	%
Dry Density	1.56	Mg/m3
Rate of Strain	2.0	%/min
Cell Pressure	360	kPa
Axial Strain	6.6	%
Deviator Stress, (σ1 - σ3)f	258	kPa
Undrained Shear Strength, cu	129	kPa ½(σ1 - σ3)f
Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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UKAS TESTING 2519

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

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
34713	113 Charville Lane, Hayes, UB4 8PD	Samples received	18/01/2024
		Schedule received	19/01/2024
Project No.	Client	Project started	22/01/2024
23-267.01	Aviron	Testing Started	02/02/2024

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BH11	-	1.65	-	U	Very high strength brown slightly mottled grey and orangish brown silty CLAY with occasional pockets of fm calcareous fragments	21	99	62	27	35	
BH11	-	6.50	-	U	High strength dark brown silty CLAY with rare fm selenite crystals	27	100	63	29	34	
BH11	-	17.00	-	U	High strength dark grey silty CLAY with occasional fm claystone fragments	28	100	69	30	39	
BH12	-	1.20	-	U	Medium strength brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with occasional rootlets (gravel is fm and sub-angular)	30	94	67	29	38	
BH12	-	15.50	-	U	High strength dark grey silty CLAY with occasional pockets of fine sand	29	100	66	29	37	
BH12	-	20.00	-	U	High strength dark grey silty CLAY	28	100	71	32	39	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0
These results only apply to the items tested

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Email: James@k4soils.com

Checked and Approved

Initials J.P

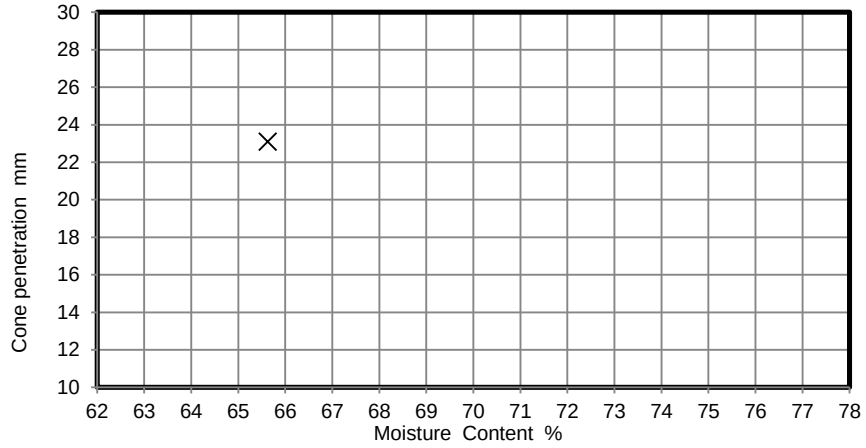
Date: 09/02/2024

UKAS TESTING 2519

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

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

				Job No.	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	1.65
Soil Description	Very high strength brown slightly mottled grey and orangish brown silty CLAY with occasional pockets of fm calcareous fragments			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

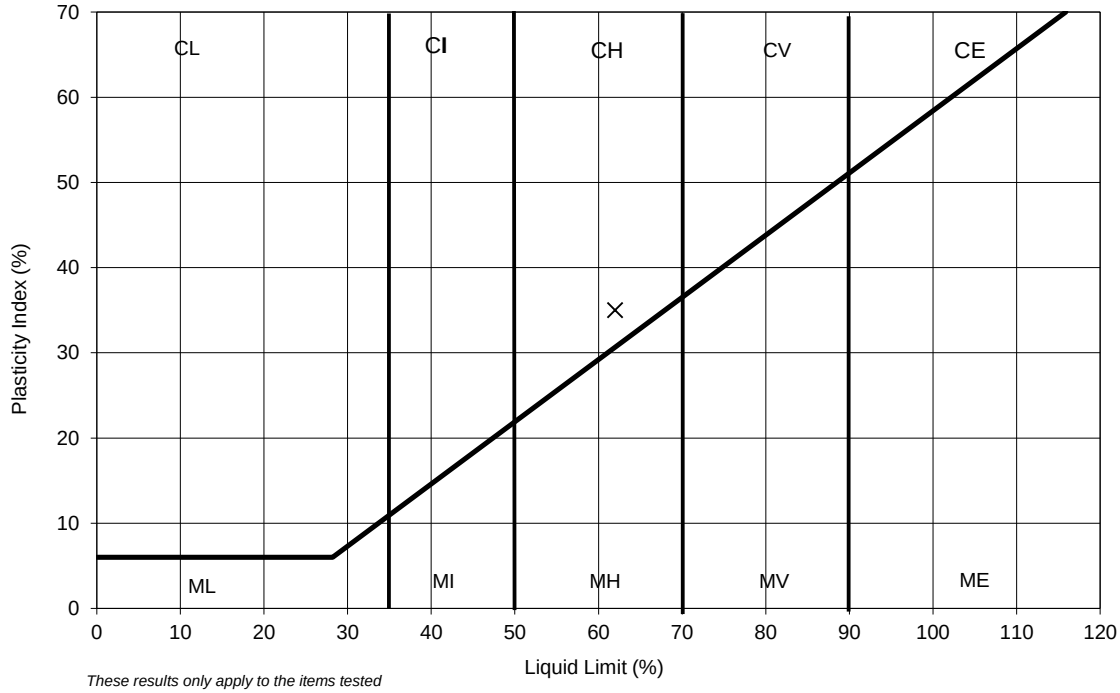


NATURAL MOISTURE CONTENT	**21**	**%**
% PASSING 425µm SIEVE	**99**	**%**
LIQUID LIMIT	**62**	**%**
PLASTIC LIMIT	**27**	**%**
PLASTICITY INDEX	**35**	**%**

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

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

Checked and Approved

Initials: J.P
Date: 09/02/2024

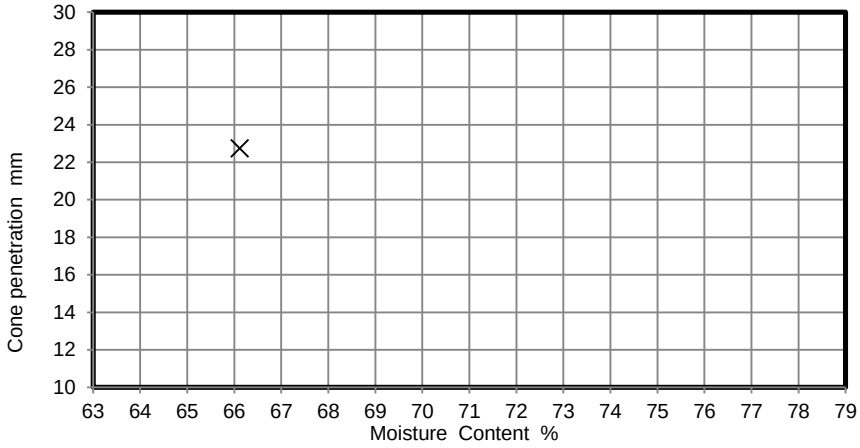
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU
Tel: 01923 711 288 Email: James@k4soils.com

UKAS TESTING

2519

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

	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	6.50
Soil Description	High strength dark brown silty CLAY with rare fm selenite crystals			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

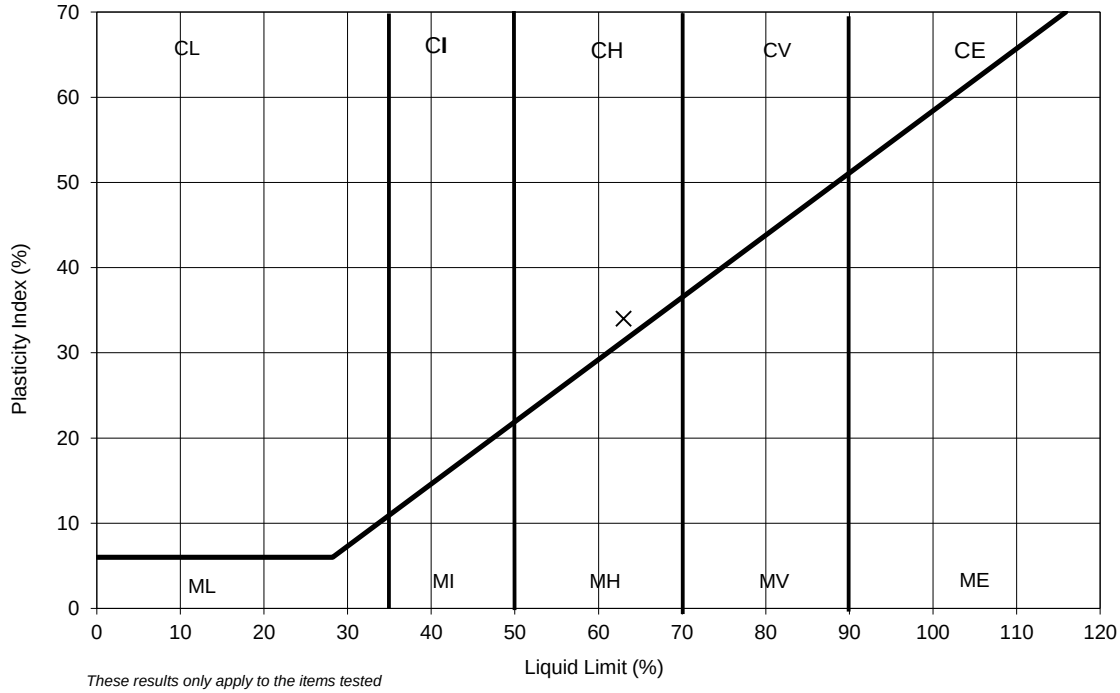


NATURAL MOISTURE CONTENT	**27**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**63**	**%**
PLASTIC LIMIT	**29**	**%**
PLASTICITY INDEX	**34**	**%**

Remarks

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

PLASTICITY INDEX



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UKAS TESTING

2519

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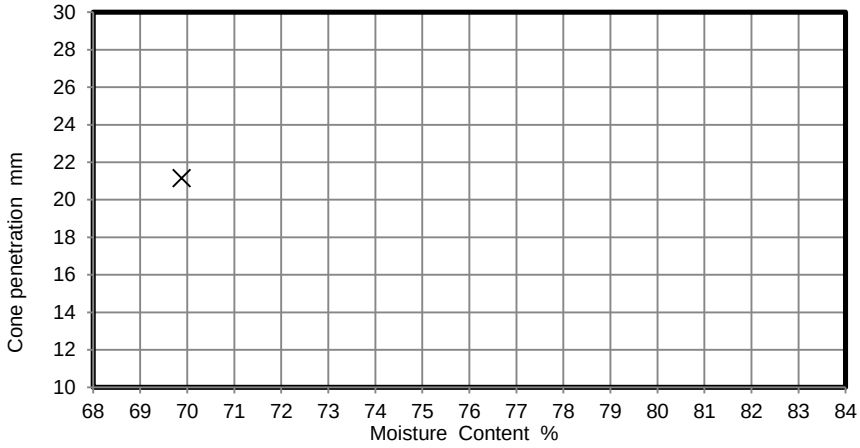
	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	34713
				Borehole/Pit No.	BH11
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	17.00
Soil Description	High strength dark grey silty CLAY with occasional fm claystone fragments			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

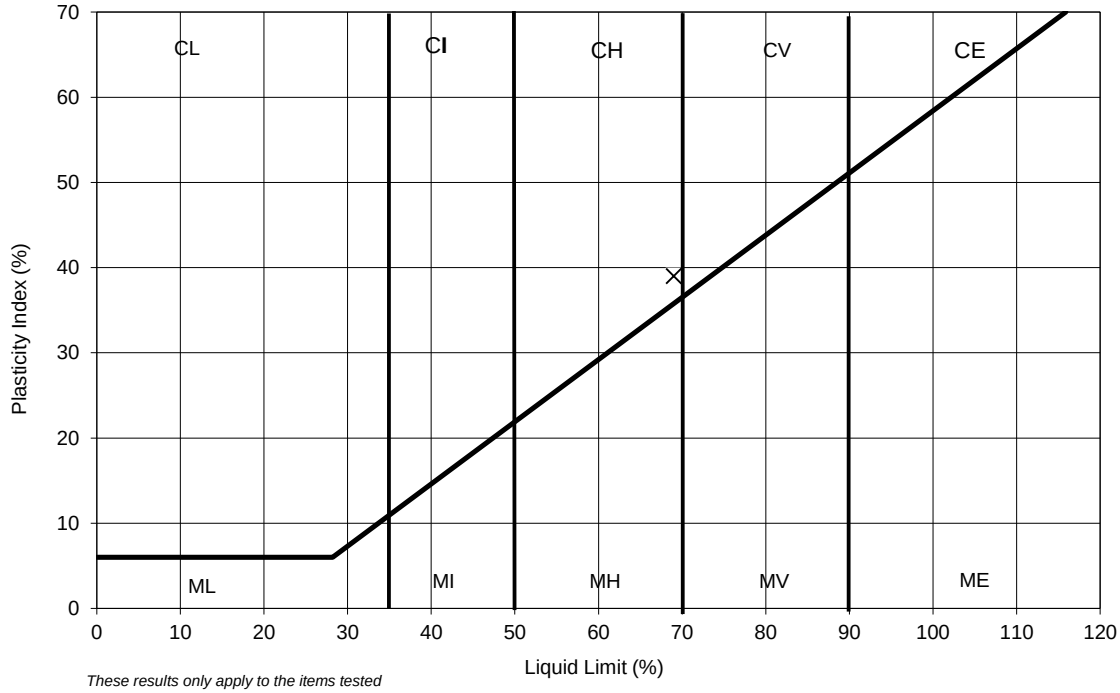


NATURAL MOISTURE CONTENT	**28**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**69**	**%**
PLASTIC LIMIT	**30**	**%**
PLASTICITY INDEX	**39**	**%**

Remarks

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

PLASTICITY INDEX



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BS1377: Part 2 :Clause 5.0 : 1990: Determination of the plastic limit and plasticity index
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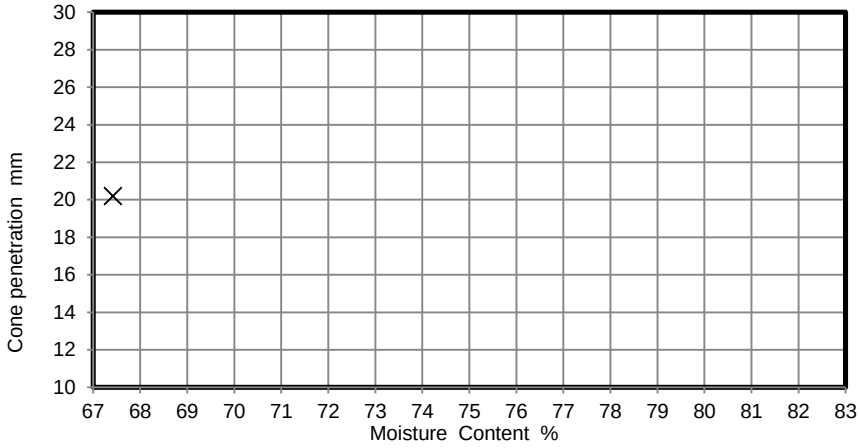
LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

				Job No.	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	1.20
Soil Description	Medium strength brown mottled orangish brown and grey slightly sandy slightly gravelly silty CLAY with occasional rootlets (gravel is fm and sub-angular)			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

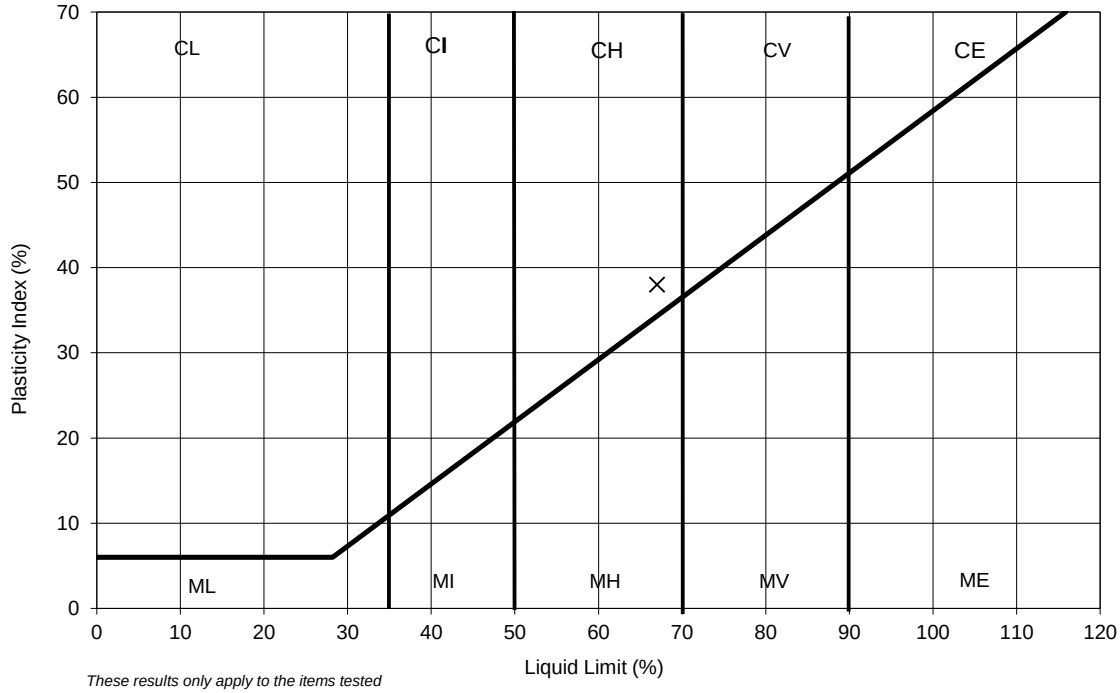


NATURAL MOISTURE CONTENT	**30**	**%**
% PASSING 425µm SIEVE	**94**	**%**
LIQUID LIMIT	**67**	**%**
PLASTIC LIMIT	**29**	**%**
PLASTICITY INDEX	**38**	**%**

Remarks

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

PLASTICITY INDEX



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UKAS TESTING

2519

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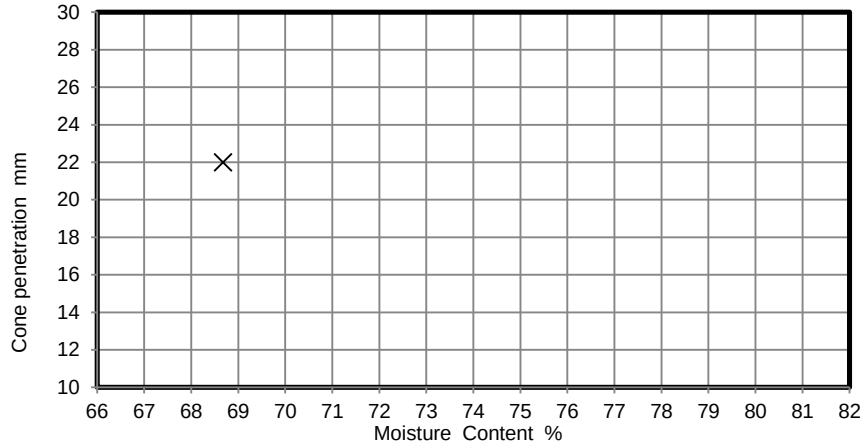
LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX

				Job No.	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	15.50
Soil Description	High strength dark grey silty CLAY with occasional pockets of fine sand			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

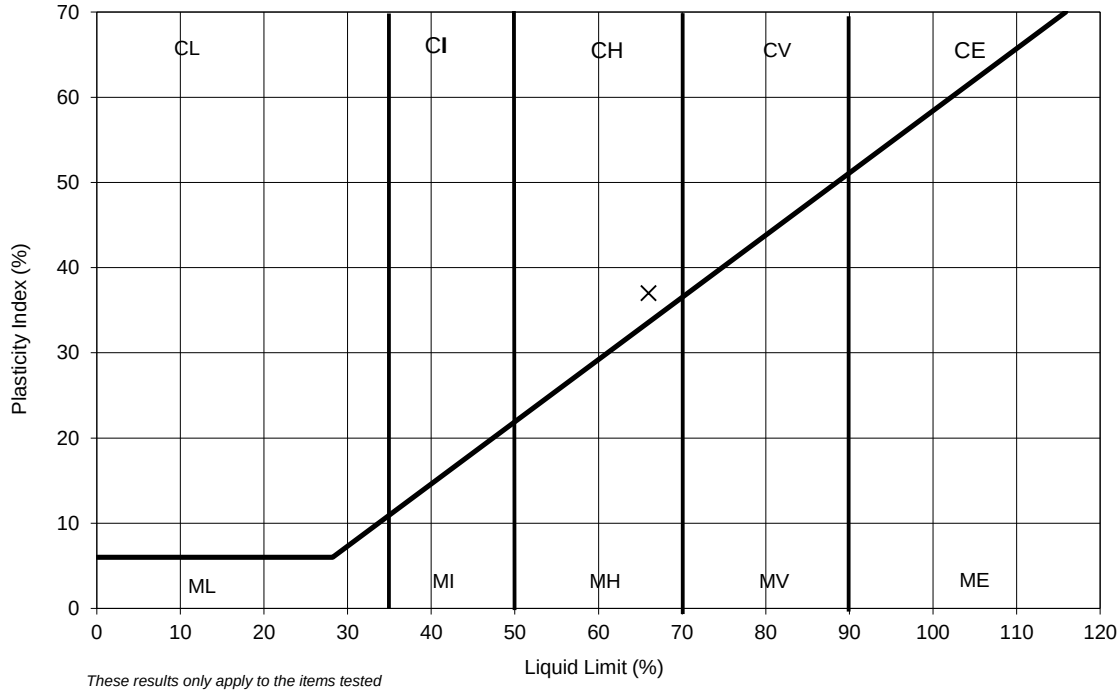


NATURAL MOISTURE CONTENT	**29**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**66**	**%**
PLASTIC LIMIT	**29**	**%**
PLASTICITY INDEX	**37**	**%**

Remarks

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

PLASTICITY INDEX



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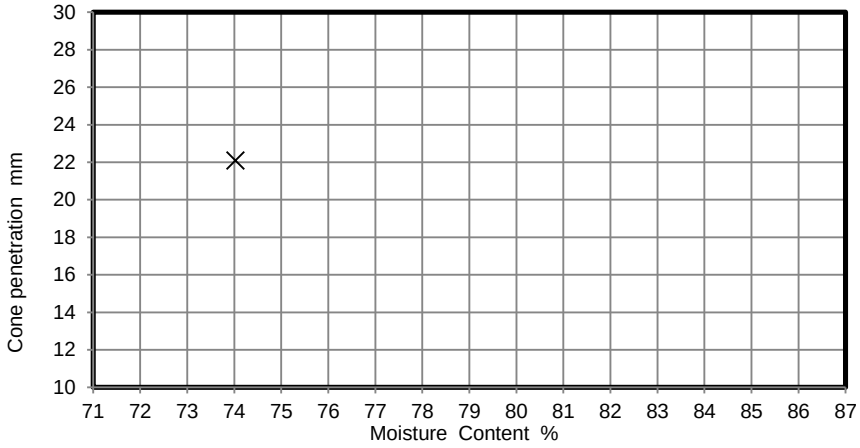
	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX			Job No.	34713
				Borehole/Pit No.	BH12
Site Name	113 Charville Lane, Hayes, UB4 8PD			Sample No.	-
Project No.	23-267.01	Client	Aviron	Depth Top m	20.00
Soil Description	High strength dark grey silty CLAY			Depth Base m	-
				Sample Type	U
				Samples received	18/01/2024
				Schedules received	19/01/2024
				Project Started	22/01/2024
				Date Tested	02/02/2024

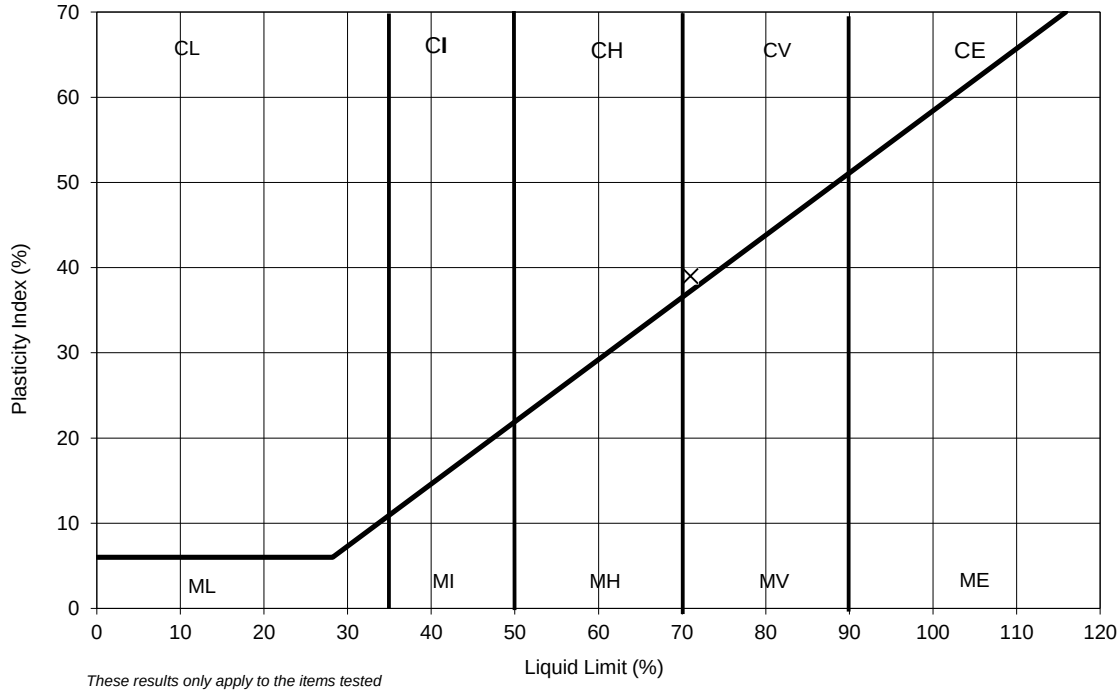


NATURAL MOISTURE CONTENT	**28**	**%**
% PASSING 425µm SIEVE	**100**	**%**
LIQUID LIMIT	**71**	**%**
PLASTIC LIMIT	**32**	**%**
PLASTICITY INDEX	**39**	**%**

Remarks

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

PLASTICITY INDEX



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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 : 24-000908

Project / Site name:	Former Childrens Centre, 113 Charvile Lane, Hayes	**Samples received on:**	29/01/2024
Your job number:	23-267.01-2	**Samples instructed on/ Analysis started on:**	29/01/2024
Your order number:	23-267.01	**Analysis completed by:**	06/02/2024
Report Issue Number:	1	**Report issued on:**	09/02/2024
Samples Analysed:	4 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Senior 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

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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: 24-000908
Project / Site name: Former Childrens Centre, 113 Charvile Lane, Hayes
Your Order No: 23-267.01

Lab Sample Number				106469	106470	106471	106472
Sample Reference				BH11	BH11	BH12	BH12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50	15.00	9.00	21.00
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	15	15	15
Total mass of sample received	kg	0.1	NONE	0.5	0.4	0.7	0.6
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	7.7	8.5	8.2	8.3
Total Sulphate as SO4	mg/kg	50	MCERTS	19000	1400	1800	930
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	5400	350	1900	910
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.7	0.175	0.947	0.457
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2700	175	947	457
Total Sulphur	mg/kg	50	MCERTS	7400	2900	4100	4100

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

Analytical Report Number : 24-000908
Project / Site name: Former Childrens Centre, 113 Charvile Lane, Hayes

* 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 *
106469	BH11	None Supplied	4.5	Brown clay
106470	BH11	None Supplied	15	Brown clay
106471	BH12	None Supplied	9	Brown clay
106472	BH12	None Supplied	21	Brown clay

Analytical Report Number : 24-000908
Project / Site name: Former Childrens Centre, 113 Charvile Lane, Hayes

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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 30oC.
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.