[redacted]

Site Investigation Report

Auger Ref: [redacted]

Job Information	
Client	Crawford & Co
Client ref	[redacted]
Visit date	18/03/2022
Report date	21/03/2022

Job Summary

- CCTV survey undertaken. Read more.
- Drainage repairs required. Read more.
- 2 trial holes undertaken. Read more.

[redacted]

Job Information

Overview	
Brief	Auger were commissioned by Crawford & Co to undertake a site investigation and CCTV inspection of the underground drainage within the area of concern (AOC) at the property.

Findings	
Trial Hole Findings	Within TH1, we also took footing measurements from the projection of the front elevation. These measurements are shown in Trial Hole Log 1b below. The footings exposed during TH1 were brick step outs on top of loose concrete. During the excavation to expose the footing of the two storey addition we encountered a broken drain pipe, however as this was outside the AOC we did not further investigate this drain, should this be required then a cost and scope for this can be completed on request
Visual Inspection	A visual inspection of MH1 revealed the outlet of this run is an interceptor trap, this was partially blocked and causing the channel of the manhole to retain water. In addition the chamber walls appear to be falling in and the pointing between the bricks are non-existent. We believe a section of the chamber wall has broken off, fell in the channel and caused the blocking of the trap. Furthermore RWG1 was seen to be a back inlet gully whereby the inlet was a 50mm plastic pipe serving the rainwater downpipe and the outlet was also a 50mm plastic pipe leading into (we assume) MH1. However the outlet of this gully was blocked and due to the diameter of the pipe we were unable to cleanse and survey this run. We would inform the client that 50mm pipework should not be used as a substitute to 100mm below ground pipework. Therefore we recommend the downstream pipework serving this gully is renewed in 100mm pipework. This action should however be completed on a private basis as this is classed as poor workmanship.
Drain Survey	We carried out a CCTV survey of the below ground drainage system, our findings of which are as follows: **Line 1 - From MH1 upstream to Outside AOC** Our survey of line 1 revealed joint displacements. The above mentioned defects to the below ground drainage system have been caused by ground movement.

Recommendations	
Refer Back to Client	It is recommended that the following repairs are carried out to prevent an escape of water from the system: **Line 1** Install a 100mm patch liner 6m upstream of MH1 to cover the displacement. **Manhole 1** Excavate and replace the interceptor trap with 100mm straight pipework. This will involve removing the chamber wall and installing a 100mm patch liner after completion in order to connect the new to existing pipework. Re-bench and re-channel MH1. Also the top of the chamber the bricks are loose, please replace the defective bricks and reform the upper level of the chamber, this may involve lifting/ breaking the paving slabs to facilitate this work. Should this happen then this will prolong the claim and incur further costs. Due to the depth of the chamber special health and safety measures must be undertook. Interceptor traps were originally designed to keep foul smells from entering the property. It is now generally accepted that they should be removed as they are a major cause of blockages within a drainage system. Auger like most drainage contractors and Water and Sewerage Companies replace these traps with a straight section of pipe to prevent blockages. In some circumstances this does result in smells becoming apparent in the property as it occasionally highlights existing defects with internal traps and seals. Auger is unable to take responsibility if this happens after work is completed. Smells in the house will not be covered under policy terms and if this occurs customers will need to employ their own plumber to resolve the issue. If this is of concern please discuss the matter with your account manager before repairs commence. **We will now refer back to the client in order to progress the claim.**
Repair Caveats	*Once repairs have been undertaken the customer should ensure the drainage system is periodically inspected in the future for any deterioration and kept free flowing / free of blockages. Any damage noted during future inspections should be repaired immediately in accordance with current Building Regulations.* *Recommendations have been made to reline or patch reline sections of the drainage system at the property. This process combines a number of chemicals in a resin, which then harden in a fibreglass matting to create a new section of drain within the original. The reaction creates a strong smell which can linger for up to 72 hours once works are completed - this is not harmful. It is recommended that any areas where smells are experienced are kept well ventilated until the odour subsides.* *If any issues arise in the future regarding this pipework, then excavation within the property would be required to replace the defective area of pipework. This in turn would result in major inconvenience to the occupier and a potentially large repair bill.* *If any of the above lining recommendations fail then excavation and replacement of the pipework would be required. This would severely increase the cost of repairs and would provide greater inconvenience to the residents.* *With any repair process, complications and unforeseen circumstances can arise. These scenarios will be reported whilst on-site and could potentially cause an increase in repair costs and inconvenience.*

Photographs

Trial Hole 1

Fig 1.1: Trial Hole 1 Location

Fig 1.2: Trial Hole 1 Footing

Fig 1.3: Trial Hole 1

Trial Hole 2

Fig 2.1: Trial Hole 2 Location

Fig 2.2: Trial Hole 2 Footing

Site Photos

Fig 3.1: MH1

Fig 3.2: Defective MH1 chamber walls

CCTV Survey – Inspection Listings *(WRc Guidelines Applied)*

L1

Direction	Upstream	**From**	MH1
Pipe Size (mm)	100	**Depth (m)**	1.8
Pipe Material	PF	**To**	U/S

0.0m	Start of Survey Length
4.8m	Joint Displacement - Medium
5.9m	Deformed 10%
5.9m	Finish of Survey Length

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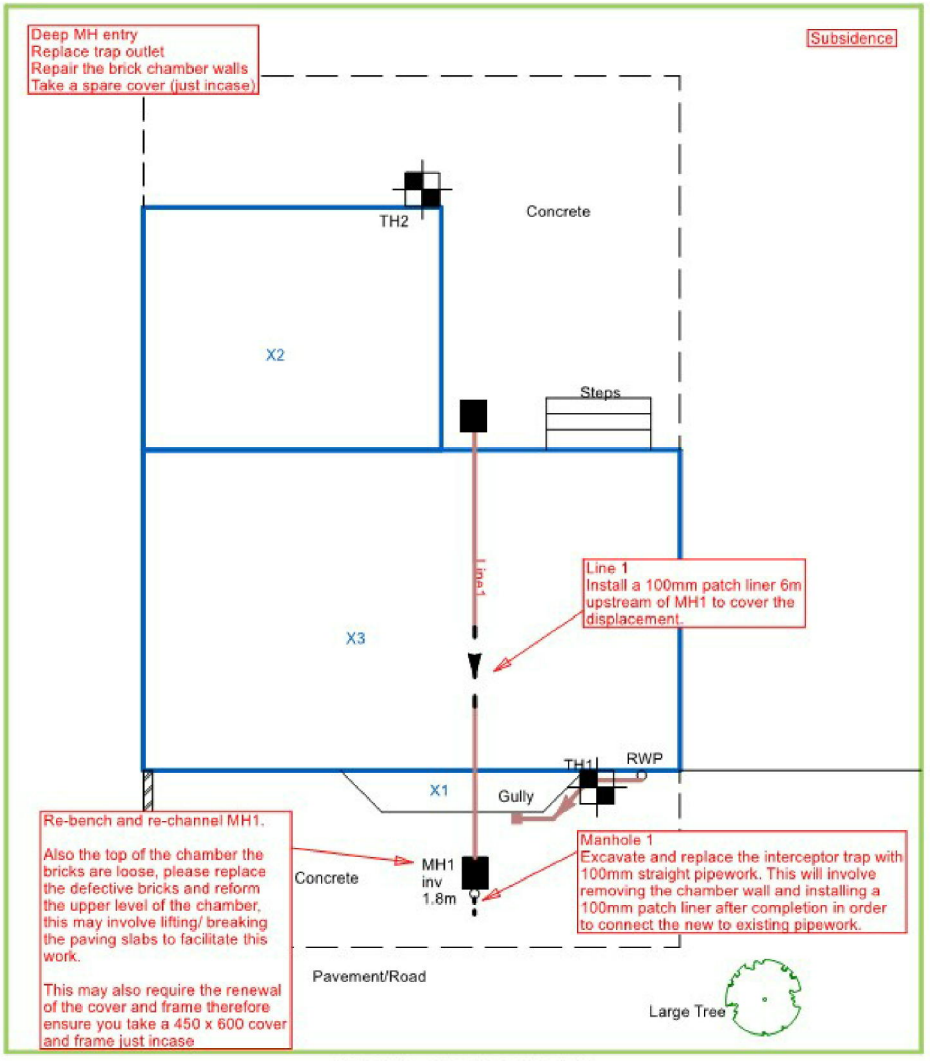
Proposed Layout

Date: 18/03/2022



FRONT OF PROPERTY

LEGEND

- = Manhole (MH)
- = Inspection Chamber (IC)
- = Inspection Point (IP)
- = Blockage / Collapse
- = Soil Vent Pipe (SVP) / WC
- = Combined Waste Gully (CWG) / Foul Waste Gully (FWG)
- = Rainwater Gully (RWG)
- = Rainwater Pipe (RWP)
- = Lines not camera surveyed
- = Lines camera surveyed
- = Assumed water mains feed
- = Walls
- = Fences
- = Building Outline
- = Trial hole
- = Borehole
- = Direction of flow
- = Gate / Door
- = Shrubs / Bush
- = Hedge
- = Tree
- = Steps

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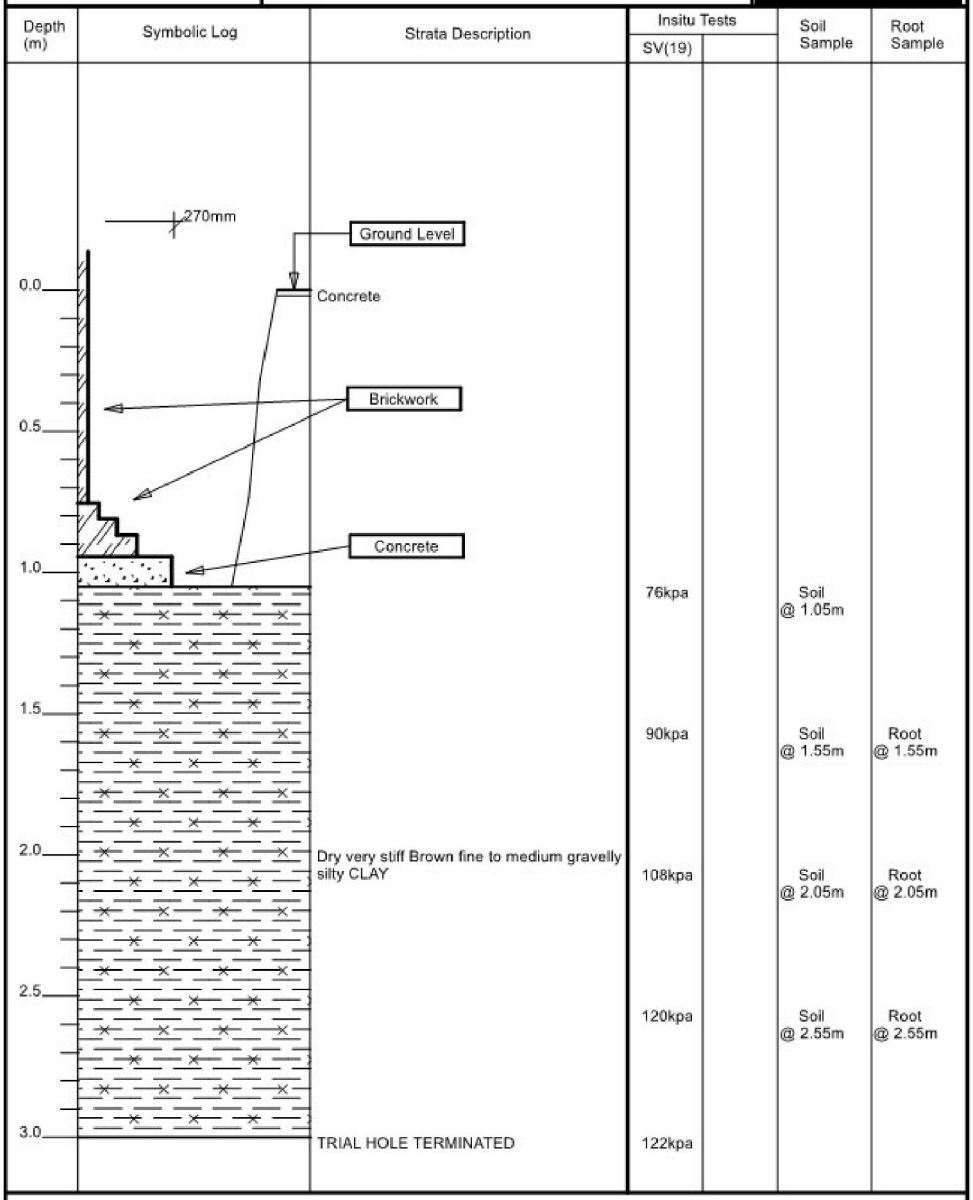
Trial Hole Log No.1

Location: Front right corner of three storey property

[redacted]




190mm

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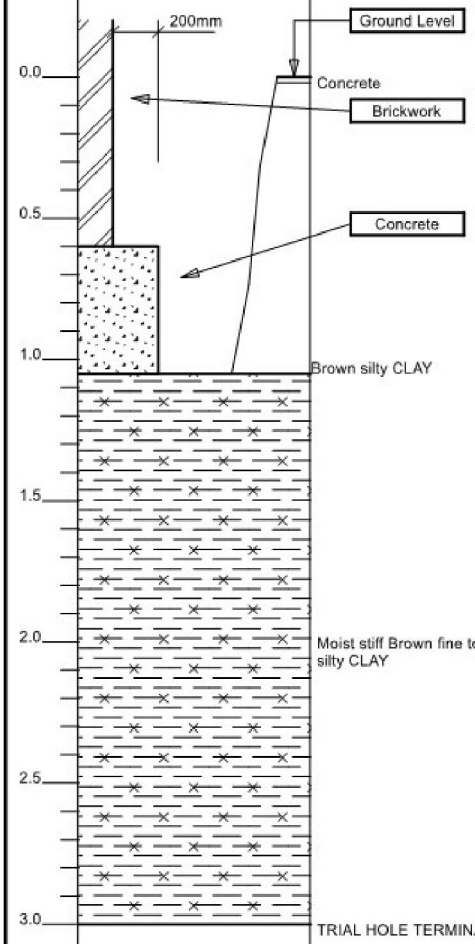
Trial Hole Log No.2

Location: Rear right corner of rear extension

[redacted]



Depth (m)	Symbolic Log	Strata Description	Insitu Tests SV(19)		Soil Sample	Root Sample
0.0						
0.5						
1.0		Brown silty CLAY	70kpa		Soil @ 1.05m	
1.5			86kpa		Soil @ 1.55m	
2.0		Moist stiff Brown fine to medium gravelly silty CLAY	104kpa		Soil @ 2.05m	
2.5			116kpa		Soil @ 2.55m	
3.0		TRIAL HOLE TERMINATED	120kpa			

Richardson's Botanical Identifications

Root identification
Vegetation surveys
Tree/Building investigations
Plant taxonomy

Dr Ian B K Richardson
BSc, MSc, PhD, MRSB, FLS
James Richardson
BSc (Hons. Biology)

Enterprise House
[redacted]

Auger Solutions
[redacted]

07/04/2022

Dear Sirs

Root ID

The samples you sent in relation to the above on 18/03/2022 have been examined. Their structures were referable as follows:

TH1, 1.55m		
4 no.	Examined root: the family Rosaceae, subfamily POMOIDEAE (a group of closely related trees: Malus (Apple), Pyrus (Pear), Crataegus (Hawthorn), Sorbus (Rowan, Whitebeam, Service tree), Mespilus (Medlar), and some shrubs (Pyracantha (Firethorn), Chaenomeles (Japonica), Cydonia (Quince), Amelanchier, Cotoneaster)).	Alive, recently*.
TH1, 2.05m		
3 no.	Examined root: the family Rosaceae, subfamily POMOIDEAE (as listed above).	Alive, recently*.
TH1, 2.55m		
1 no.	Examined root: the family SALICACEAE (Salix (Willows) and Populus (Poplars)).	Alive, recently*.
3 no.	Unfortunately all with insufficient cells for identification.	

Click here for more information: POMOIDEAE SALICACEAE

I trust this is of help. Please call us if you have any queries; our Invoice is enclosed.

Yours faithfully

[redacted]

Dr Ian B K Richardson

* Based mainly on the Iodine test for starch. Starch is present in some cells of a living woody root, but is more or less rapidly broken down by soil micro-organisms on death of the root, sometimes before decay is evident. This result need not reflect the state of the parent tree.

* * Try out our web site on www.botanical.net * *

Identified with no information on vegetation, on or off site.

Report commissioned by auger

GSTL	Geotechnical Testing Analysis Report	auger environmental + claims mgmt + subsidence + drainage +
[redacted]	*The testing results contained within this report have been performed by GSTL a UKAS accredited laborotory on behalf of Auger.	[redacted]

Summary Of Claim Details

Policy Holder	Unknown
Risk Address	Unknown
SI Date	18/03/2022
Issue Date	18/03/2022
Report Date	28/03/2022
Auger Reference	[redacted]
Insurance Company	Aviva
LA Claim Reference	[redacted]
LA Co. Reference	Crawford & Co

	Checked	29/03/2022	Wayne Honey	[redacted]
	Approved	29/03/2022	Paul Evans	

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GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377:1990 - Part 2 : 4.4 & 5.3) DESCRIPTIONS	auger environmental + claims mgmt + subsidence + drainage +
GSTL Contract Number	[redacted]	
Risk Address		
Auger Reference		

TH Trial Hole	Sample Type	Depth (m)	Sample Description
TH1	SOIL	1.05	Brown fine to medium gravelly silty CLAY
TH1	SOIL	1.55	Brown fine to medium gtavelly silty CLAY
TH1	SOIL	2.05	Brown fine to medium gravelly silty CLAY
TH1	SOIL	2.55	Brown fine to medium gravelly silty CLAY
TH2	SOIL	1.05	Brown silty CLAY
TH2	SOIL	1.55	Brown fine to medium gravelly silty CLAY
TH2	SOIL	2.05	Brown fine to medium gravelly silty CLAY
TH2	SOIL	2.55	Brown fine to medium gravelly silty CLAY

Test Operator	Checked	29/03/2022	Wayne Honey	[redacted]
Luke Williams	Approved	29/03/2022	Paul Evans	

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GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.4 & 5.3)

auger environmental + claims mgmt + subsidence + drainage +

GSTL Contract Number	[redacted]	
Risk Address		
Auger Reference		
Remarks	NP - (Non-Plastic), # - (Liquid Limit and Plastic Limit Wet Sieved)	

TH Trial Hole	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	NHBC Chapter 4.2	Remarks
TH1	SOIL	1.05	30	81	21	60	90	HIGH VCP	CV Very High Plasticity
TH1	SOIL	1.55	33						
TH1	SOIL	2.05	33	80	20	60	98	HIGH VCP	CV Very High Plasticity
TH1	SOIL	2.55	29	68	20	48	92	HIGH VCP	CH High Plasticity
TH2	SOIL	1.05	28	70	26	44	100	HIGH VCP	CH/V High/HighPlasticity
TH2	SOIL	1.55	31						
TH2	SOIL	2.05	28	65	19	46	98	HIGH VCP	CH High Plasticity
TH2	SOIL	2.55	28	67	21	46	99	HIGH VCP	CH High Plasticity

Modified Plasticity Index (PI) <10	: Non Classified
Modified PI = 10 to <20	: Low volume change potential (LOW VCP)
Modified PI = 20 to <40	: Medium volume change potential (Med VCP)
Modified PI = 40 or greater	: High volume change potential (HIGH VCP)

The Atterberg Limits May also be used to classify the volume change potential of fine soils using the National House building system, as given in the NHBC's Standards Chapter 4.2 (2003) "Building Near Trees"

Test Operator	Checked	29/03/2022	Wayne Honey	[redacted]
Luke Williams	Approved	29/03/2022	Paul Evans	

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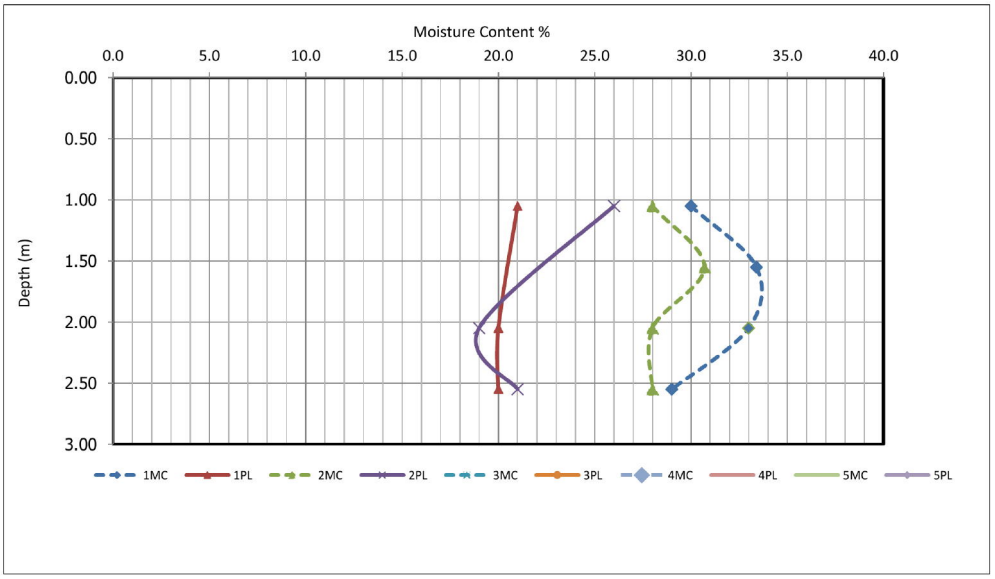
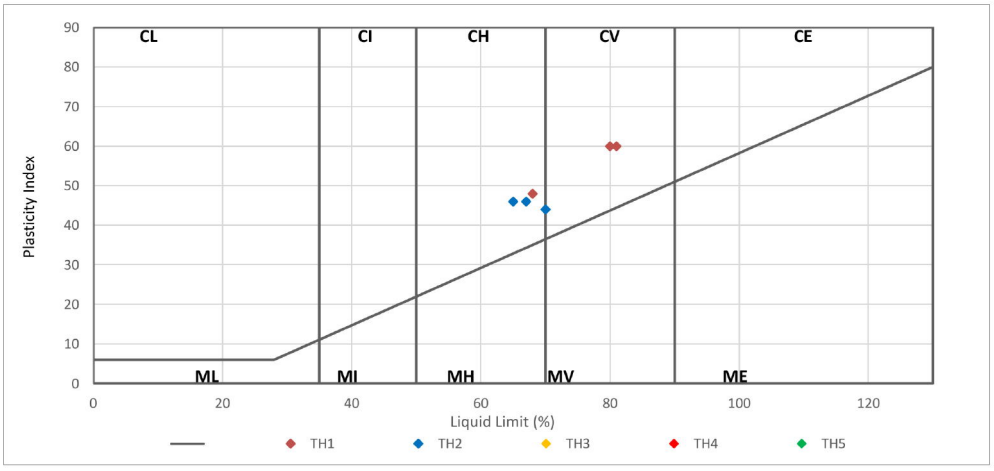


PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Modified Plasticity Index (PI) <10	: Non Classified
Modified PI = 10 to <20	: Low volume change potential (LOW VCP)
Modified PI = 20 to <40	: Medium volume change potential (Med VCP)
Modified PI = 40 or greater	: High volume change potential (HIGH VCP)

The Atterberg Limits May also be used to classify the volume change potential of fine soils using the National House building system, as given in the NHBC's Standards Chapter 4.2 (2003) "Building Near Trees"

Test Operator	Checked	29/03/2022	Wayne Honey	[redacted]
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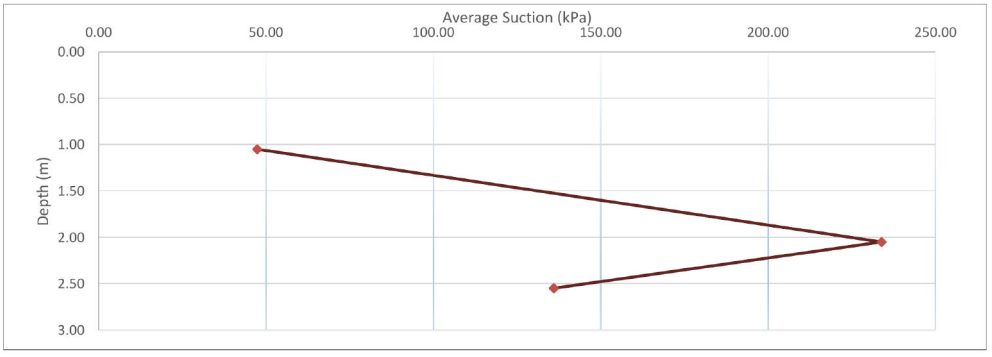
UKAS TESTING 2788

GSTL	SUMMARY OF SOIL CLASSIFICATION TESTS, BRE Information Paper IP 4/93 February 1993 (Cl/SfB p1), BRE Information Paper Digest 412 ci/sFb (A3s) February 1996	auger environmental + claims mgmt + subsidence + drainage +
GSTL Contract Number	[redacted]	
Risk Address		
Auger Reference		
Remarks	D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample	

TH Trial Hole	Depth (m)	Filter Paper Location	Filter Paper	Sample Prep Method	Test Duration (Days)	Water Content (%)	Soil Suction Pk (kPa)	Average Soil Suction Pk (kPa)	Cumalative Heave Potential (mm) from bottom of the hole
TH1	1.05	Top	I	D	5	75.5	25	47	2
TH1		Middle	II	D	5	53.9	57		
TH1		Bottom	III	D	5	52.7	60		
TH1	1.55								
TH1									
TH1									
TH1	2.05	Top	I	D	5	48.8	73	234	2
TH1		Middle	II	D	5	42.4	160		
TH1		Bottom	III	D	5	34.9	468		
TH1	2.55	Top	I	D	5	48.6	74	136	2
TH1		Middle	II	D	5	45.5	102		
TH1		Bottom	III	D	5	39.8	231		

Heave potential is calculated from the bottom of the hole and heaves above the bottom of the hole are reported as a cumalative value.
The values reported for heave above only apply to the strata the suction and plasticity have been performed on. The shallowest depth reported is assumed to be a strata thickness to GL and Heave is calculated based on that layer thickness, if the next sample is in 0.5m increments the heave is calculated based on the layer thickness of 0.5m and depths 1m from the sample above will include heave over 1m.
Consideration should be made for other stratas where values are not reported and when working out the heave potential over the entire trial hole.



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Luke Williams	Approved	29/03/2022	Paul Evans	

UKAS TESTING 2788

GSTL	SUMMARY OF SOIL CLASSIFICATION TESTS, BRE Information Paper IP 4/93 February 1993 (Cl/SfB p1), BRE Information Paper Digest 412 ci/sFb (A3s) February 1996	auger environmental + claims mgmt + subsidence + drainage +
GSTL Contract Number	[redacted]	
Risk Address		
Auger Reference		
Remarks	D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample	

TH Trial Hole	Depth (m)	Filter Paper Location	Filter Paper	Sample Prep Method	Test Duration (Days)	Water Content (%)	Soil Suction Pk (kPa)	Average Soil Suction Pk (kPa)	Cumalative Heave Potential (mm) from bottom of the hole
TH2	1.05	Top	I	D	5	61.9	41	62.4	4
TH2	1.05	Middle	II	D	5	51.7	63		
TH2	1.05	Bottom	III	D	5	46.9	83		
TH2	1.55								
TH2	1.55								
TH2	1.55								
TH2	2.05	Top	I	D	5	46.5	89	85.5	4
TH2	2.05	Middle	II	D	5	48.8	73		
TH2	2.05	Bottom	III	D	5	46.0	95		
TH2	2.55	Top	I	D	5	40.8	202	203	4
TH2	2.55	Middle	II	D	5	40.7	204		
TH2	2.55	Bottom	III	D	5	40.7	202		

Heave potential is calculated from the bottom of the hole and heaves above the bottom of the hole are reported as a cumalative value.
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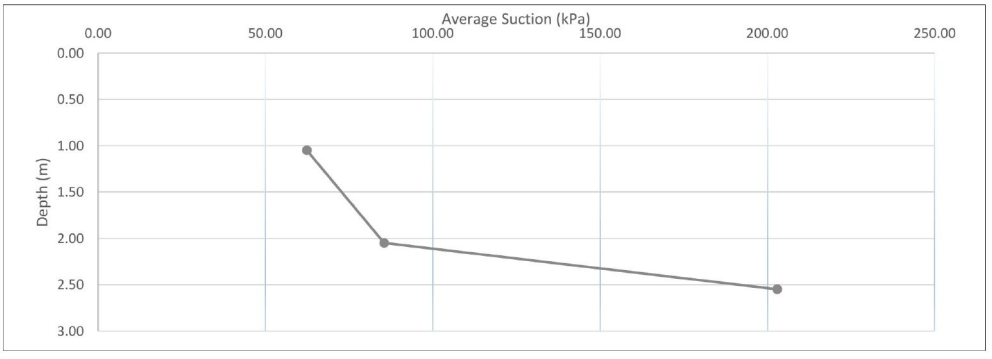

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