[redacted]

Site Investigation Report

Auger Ref:

[redacted]

Job Information	
Client	Crawford & Co
Client ref	[redacted]
Visit date	05/07/2021
Report date	07/07/2021

Job Summary

- CCTV survey undertaken. Read more.
- Drainage repairs required. Read more.
- 2 trial holes undertaken. Read more.
- Requested soil samples taken. Read more.
- Requested root samples taken. Read more.

ROSPA Member

ROSPA Fleet Safety Award Gold

Drain Shield uk

[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 at the property.

Findings

Drain Survey	**Line 1 - From SVP1 downstream to MH1** There were no defects noted within the line which could be allowing an escape of water. The line was seen to be free flowing and serviceable. The SVP was found to extend into the manhole and then reached the channel within the manhole via an internal dropper. **Line 2 - From MH1 downstream** There were no defects noted within the line which could be allowing an escape of water. The line was seen to be free flowing and serviceable. **Line 3 - From MH1 upstream** There were no defects noted within the line which could be allowing an escape of water. The line was seen to be free flowing and serviceable. **Line 4 - From SVP2 downstream to MH1** Our CCTV survey revealed joint displacements to the SVP rest bend and the pipework downstream from this point, this will be resulting in an escape of water. The SVP was found to extend below the ground to the level of the manhole before reaching the rest bend and then extending into the manhole. **RWP1** We were unable to survey this RWP as the above ground pipework was found to be of a small diameter in which we could not carry out a below ground break-in. We then scoped to attempt a below ground break-in on site, however, we discovered a gas main which runs in this location. We did however discover that the branch connection to this line on Line 2 contained no defects. 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 2 -** Auger recommend to install 1.5m of 100mm flexi liner from MH1 upstream then install a 100mm radial patch on the rest bend from MH1. **Please Note:** Deep MH entry will be required. We will now refer the claim back to the client in order to progress.
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.* *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.* *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.* *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.*

Photographs

Trial Hole 1

Fig 1.1: Trial Hole 1 Location

Fig 1.2: Trial Hole 1 Footing

Trial Hole 2

Fig 2.1: Trial Hole 2 Location

Fig 2.2: Trial Hole 2 Footing

CCTV Stills

Fig 3.1: Line 4, joint displacement

Fig 3.2: Line 4, joint displacement

Other Photos

Fig 4.1: Side of property

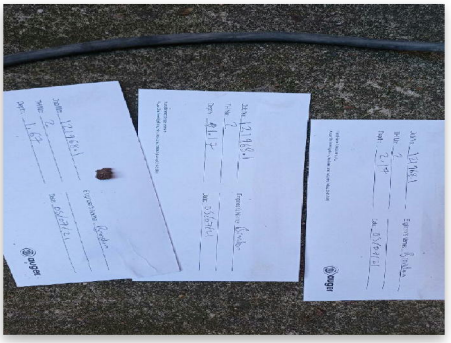
Fig 4.2: MH1

Fig 4.3: Side of property

Fig 4.4: Side of property

Fig 4.5: Soil samples collected

Fig 4.6: Root samples collected



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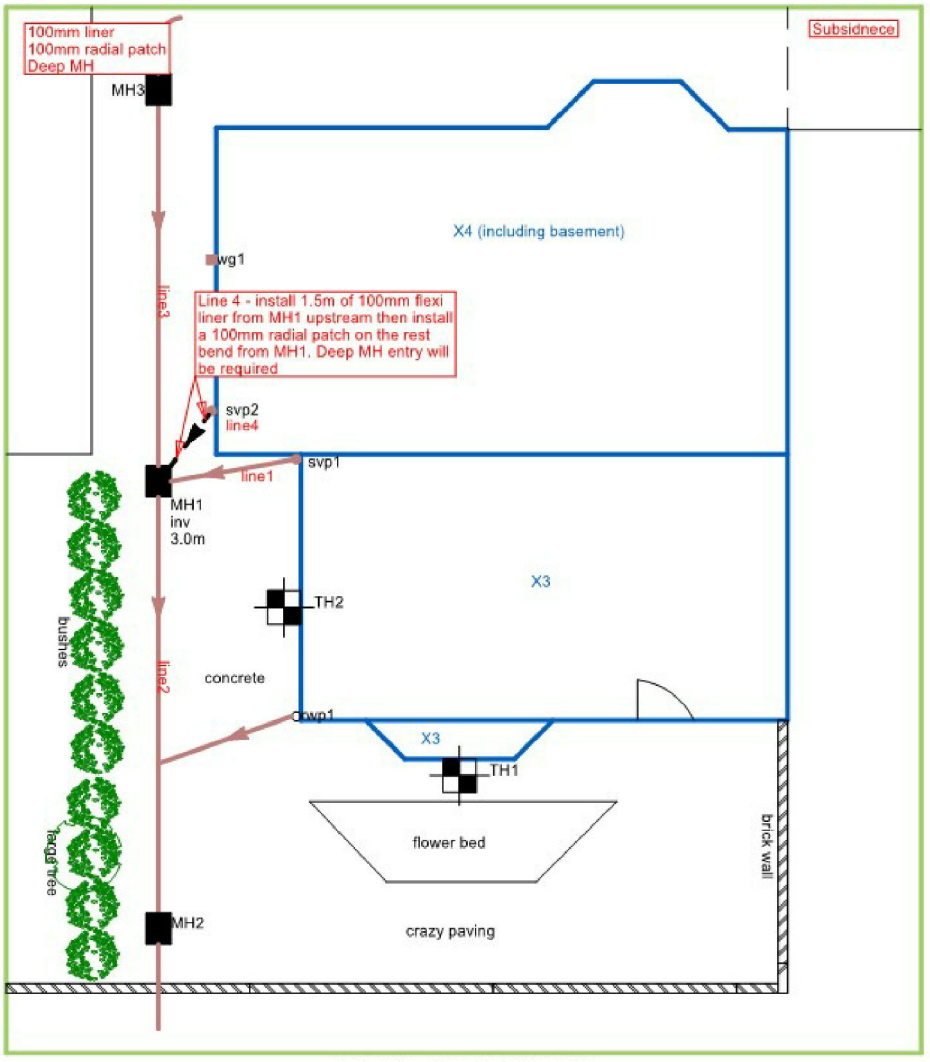
Proposed Layout

Date: 05/07/2021



FRONT OF PROPERTY

This drawing should be used for diagrammatic purposes only. Auger are not responsible or liable for any 3rd party works undertaken using the details outlined in this drawing. Confirmation of the drainage configuration can only be confirmed by excavation or detailed technical survey.

LEGEND

- = Manhole
- = Inspection Chamber
- = Inspection Pot
- = Blockage
- = svp/w/c
- = wg/fwg
- = rwg
- = rwp
- = Lines not camera surveyed
- = Lines camera surveyed
- = Assumed water mains feed
- = Walls
- = Fences
- = Building Outline
- = Steps
- = gate / door
- = Trial hole
- = Borehole
- = Direction of flow
- = Shrubs/bush
- = Hedge
- = Tree

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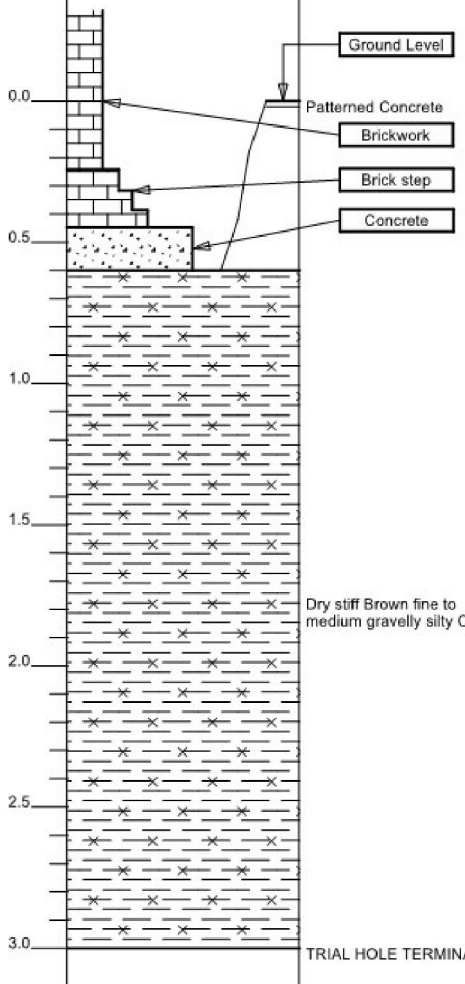
Trial Hole Log No.1

Location: Front middle of bay

[redacted]



Depth (m)	Symbolic Log	Strata Description	Insitu Tests SV(19)		Soil Sample	Root Sample
0.0		Ground Level / Patterned Concrete / Brickwork / Brick step / Concrete				
0.5			74kpa		Soil @ 0.6m	Root @ 0.6m
1.0			86kpa		Soil @ 1.1m	Root @ 1.1m
1.5			90kpa		Soil @ 1.6m	Root @ 1.6m
2.0		Dry stiff Brown fine to medium gravelly silty CLAY	102kpa		Soil @ 2.1m	Root @ 2.1m
2.5			118kpa		Soil @ 2.6m	
3.0		TRIAL HOLE TERMINATED	124kpa			

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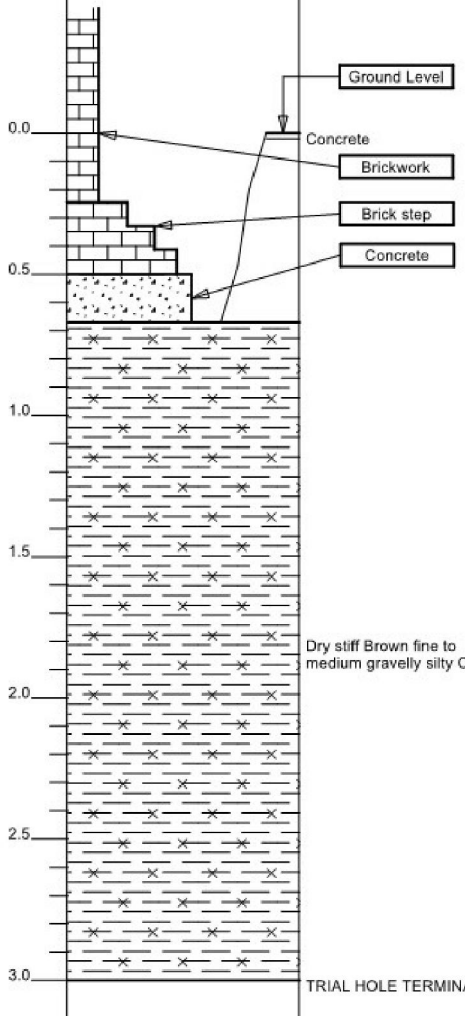
Trial Hole Log No.2

Location: Left hand side of front projection

[redacted]



Depth (m)	Symbolic Log	Strata Description	Insitu Tests SV(19)		Soil Sample	Root Sample
0.0		Ground Level / Concrete / Brickwork / Brick step / Concrete				
0.5			68kpa		Soil @ 0.67m	
1.0			78kpa		Soil @ 1.17m	Root @ 1.17m
1.5			86kpa		Soil @ 1.67m	Root @ 1.67m
2.0		Dry stiff Brown fine to medium gravelly silty CLAY	96kpa		Soil @ 2.17m	Root @ 2.17m
2.5			82kpa		Soil @ 2.67m	
3.0		TRIAL HOLE TERMINATED	86kpa			

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)

Auger Solutions

[redacted]

[redacted]

16/07/2021

Dear Sirs

Root ID

The samples you sent in relation to the above on 05/07/2021 have been examined. Their structures were referable as follows:

TH1, 0.60m		
3 no.	Examined root: TILIA (Lime). Less than 0.15mm in diameter.	Alive, recently*.
TH1, 1.10m		
3 no.	Examined root: very THIN (under 0.1mm in diameter). We cannot rule out TILIA (Lime).	Dead* (note this 'dead' result can be unreliable with such thin samples).
2 no.	Both pieces of BARK only - insufficient material for recognition.	
TH1, 1.60m		
2 no.	Examined root: an unusual sample; also less than 0.1mm in diameter. NOT coniferous. Similar in some ways to the family MAGNOLIACEAE (Magnolia and Liriodendron (Tulip Tree)). Tentative.	Alive, recently*.
2 no.	Both samples revealed too few cells for microscopic identification.	
TH1, 2.10m		
1 no.	Examined root: again, tentatively like the family MAGNOLIACEAE (Magnolia and Liriodendron (Tulip Tree)). As above, under 0.1mm in diameter.	Dead* (as previously, this 'dead' result could be unreliable).
3 no.	Unfortunately all with insufficient cells for identification.	
TH2, 1.17m		
2 no.	Examined root: a SHRUB, similar in some ways to the family CAPRIFOLIACEAE (the most common members being Viburnum (Laurestinus and Guelder-rose), Weigela, Symphoricarpos (Snowberry), Lonicera (Honeysuckle)).	Alive, recently*.
1 no.	A piece of BARK only, insufficient material for identification.	

/ continued overleaf

TH2, 1.67m		
1 no.	Examined root: most referable to TILIA (Lime). Not more than 0.15mm in diameter.	Dead* (as above, this 'dead' result could be an unreliable one).
3 no.	Unfortunately all with insufficient cells for identification.	
TH2, 2.17m		
3 no.	Examined root: TILIA (Lime). Another THIN sample	Dead*.

Click here for more information: MAGNOLIACEAE TILIA

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.

GSTL	Geotechnical Testing Analysis Report	auger environmental + claims mgmt + subsidence + drainage +
[redacted]		[redacted]

Summary Of Claim Details

Policy Holder	Unknown
Risk Address	Unknown
SI Date	05/07/2021
Issue Date	05/07/2021
Report Date	19/07/2021
Auger Reference	[redacted]
Insurance Company	Allianz
LA Claim Reference	[redacted]
LA Co. Reference	Crawford & Co

	Checked	19/07/2021	Wayne Honey	[redacted]
	Approved	19/07/2021	Paul Evans	

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GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)
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	D	0.60	Brown fine to medium gravelly silty CLAY
TH1	D	1.10	Brown fine to medium gravelly silty CLAY
TH1	D	1.60	Brown fine to medium gravelly silty CLAY
TH1	D	2.10	Brown fine to medium gravelly silty CLAY
TH1	D	2.60	Brown fine to medium gravelly silty CLAY
TH2	D	0.67	Brown fine to medium gravelly silty CLAY
TH2	D	1.17	Brown fine to medium gravelly silty CLAY
TH2	D	1.67	Brown fine to medium gravelly silty CLAY
TH2	D	2.17	Brown fine to medium gravelly silty CLAY
TH2	D	2.67	Brown fine to medium gravelly silty CLAY

Test Operator	Checked	19/07/2021	Wayne Honey	[redacted]
Luke Williams	Approved	19/07/2021	Paul Evans	

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GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)

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	D	0.60	27	68	21	47	91	HIGH VCP	CH High Plasticity
TH1	D	1.10	27						
TH1	D	1.60	26	57	19	38	90	MEDIUM VCP	CH High Plasticity
TH1	D	2.10	30						
TH1	D	2.60	28	66	19	47	92	HIGH VCP	CH High Plasticity
TH2	D	0.67	30	51	22	29	93	MEDIUM VCP	CH High Plasticity
TH2	D	1.17	27						
TH2	D	1.67	28	61	23	38	93	MEDIUM VCP	CH High Plasticity
TH2	D	2.17	28						
TH2	D	2.67	19	61	24	37	93	MEDIUM 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	19/07/2021	Wayne Honey	[redacted]
Luke Williams	Approved	19/07/2021	Paul Evans	

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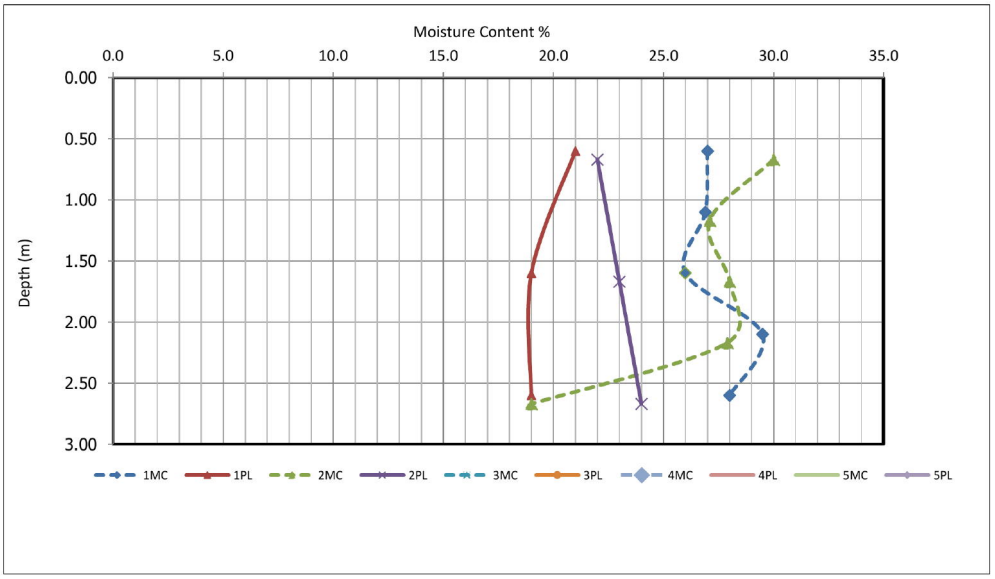
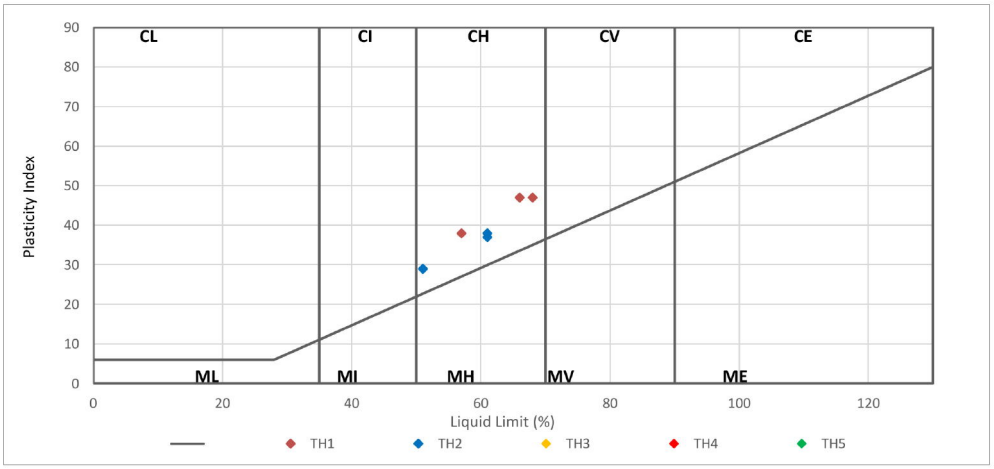


PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



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Modified PI = 40 or greater	: High volume change potential (HIGH VCP)

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Luke Williams	Approved	19/07/2021	Paul Evans	

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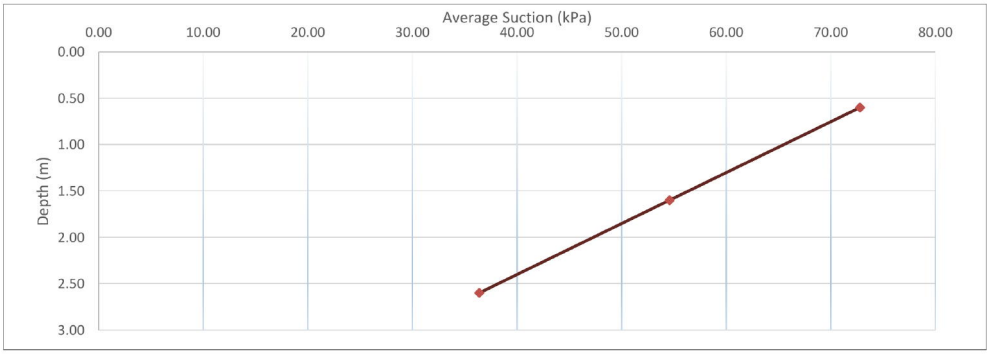
GSTL	SUMMARY OF SOIL CLASSIFICATION TESTS, BRE Information Paper IP 4/93 February 1993 (Cl/SfB p1), BRE Information Paper Digest 412 ci/sFb (A3s) February 1996	auger
GSTL Contract Number	[redacted]	
Risk Address		
Auger Reference		
Remarks	D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample	

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	0.60	Top	I	D	5	54.1	56	73	2
TH1		Middle	II	D	5	44.5	118		
TH1		Bottom	III	D	5	59.9	44		
TH1	1.10								
TH1									
TH1									
TH1	1.60	Top	I	D	5	48.9	73	55	0
TH1		Middle	II	D	5	62.9	39		
TH1		Bottom	III	D	5	55.7	53		
TH1	2.10								
TH1									
TH1									
TH1	2.60	Top	I	D	5	87.4	17	36	0
TH1		Middle	II	D	5	51.9	63		
TH1		Bottom	III	D	5	70.3	30		

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.



Test Operator	Checked	19/07/2021	Wayne Honey	[redacted]
Luke Williams	Approved	19/07/2021	Paul Evans	

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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	0.67	Top	I	D	5	60.2	43	47.4	0
TH2	0.67	Middle	II	D	5	57.2	49		
TH2	0.67	Bottom	III	D	5	56.9	50		
TH2	1.17								
TH2	1.17								
TH2	1.17								
TH2	1.67	Top	I	D	5	64.2	37	53.5	0
TH2	1.67	Middle	II	D	5	56.4	51		
TH2	1.67	Bottom	III	D	5	48.9	73		
TH2	2.17								
TH2	2.17								
TH2	2.17								
TH2	2.67	Top	I	D	5	57.8	48	41.3	0
TH2	2.67	Middle	II	D	5	67.0	33		
TH2	2.67	Bottom	III	D	5	60.5	43		

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.

Test Operator	Checked	19/07/2021	Wayne Honey	[redacted]
Luke Williams	Approved	19/07/2021	Paul Evans	

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