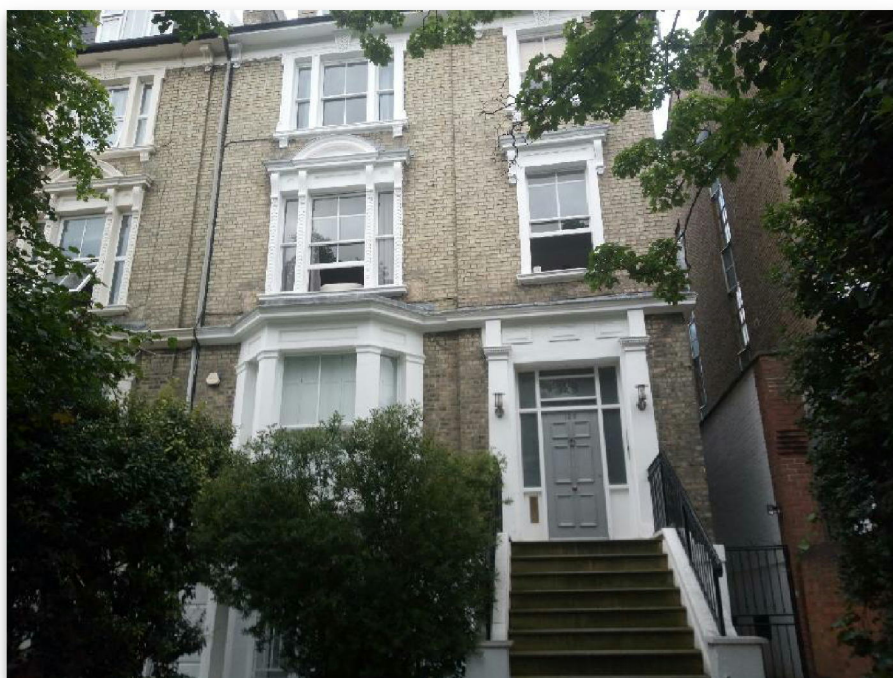


# Site Investigation Report

Auger Ref:



Job Information	
Client	Crawford & Co
Client ref	
Visit date	26/08/2021
Report date	01/09/2021

Job Summary	
✓	CCTV survey undertaken. <a href="#">Read more.</a>
!	Drainage repairs required. <a href="#">Read more.</a>
✓	1 trial hole undertaken. <a href="#">Read more.</a>
✓	Requested soil samples taken. <a href="#">Read more.</a>
✓	Requested root samples taken. <a href="#">Read more.</a>



# 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	<p><b>Line 1 - From WG1 downstream to MH1</b> Our CCTV survey revealed joint displacements and root ingress, in addition we would like to note WG1 appears to be half recessed, meaning half of the gully is exposed the other half is situated under the property steps (refer to the images below)</p> <p><b>Line 2 - From WG1 upstream to Unknown</b> Our CCTV survey was abandoned less than 1m upstream due to encountering mass root ingress. We unsuccessfully attempted to clear these roots, hence the end location of the pipe is unknown. However we do believe that the rainwater downpipe that serves the customer and the neighbour is the final destination of line 2. This will not be determined until our further investigations.</p> <p>The above mentioned defects to the below ground drainage system have been caused by ground movement.</p>
Recommendations	
	<p>It is recommended that the following repairs are carried out to prevent an escape of water from the system:</p> <p>On line 1, excavate and replace WG1 and 1m of 100 mm pipework at a depth no greater than 1m through thick concrete.</p> <p>This will require tunnelling under the building in order to make a connection to the existing pipework. In the event this option fails due to unforeseen complications, then excavation through the steps is the alternative solution which will involve extensive and costly works to ensure the property is returned to its original condition.</p> <p>From the above excavation install up to 3m of 100mm flexi-liner downstream to the main line</p> <p>On line 2, excavate and replace less than 1m of 100mm pipework upstream from WG1 at a depth less than 1m through thick concrete. From the open excavation carry out extensive root cutting.</p> <p>It will then be necessary to CCTV survey line 2 to check for any further issues. Please note that the further CCTV investigation may reveal additional defects to the drainage system. This will be reported whilst on-site and could potentially cause an increase in repair costs and provide further inconvenience to the customer/occupants.</p> <p><b>We will now refer back to the client in order to progress the claim.</b></p>
Repair Caveats	<p><i>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.</i></p> <p><i>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.</i></p> <p><i>Where any excavation reinstatement of the surface is required, the reinstatement will always attempt to match the previous surface patterns and colouring, however we cannot guarantee an exact match.</i></p> <p><i>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. The relining of a severe joint displacement is normally unadvised due to the potential for complications in the future. 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.</i></p> <p><i>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 <b>strong smell which can linger for up to 72 hours</b> once works are completed - this is not harmful. It is recommended that</i></p>

any areas where smells are experienced are kept well ventilated until the odour subsides.

The above recommendations allow for the replacement of gullies & connected underground drainage only. The insured should be made aware that the aesthetic appearance of this gully may be different from what is currently in place.

The above recommendation is to attempt to repair the drainage system from externally, by tunnelling under the property wall. Currently we do not know the foundations or type of footings which the house is built on, and until these are exposed we do not know if the repairs proposed will work. In the event this option fails due to unforeseen complications, then internal excavation is the alternative solution which will involve extensive and costly works to ensure the property is returned to its original condition.

## Photographs

### Trial Hole 1

Fig 1.1: Trial Hole 1 Location



Fig 1.2: Trial Hole 1 Footing



### Other Photos

Fig 7.1: WG1, that is half recessed



Fig 7.2: RWP1 that deviates off property then we believes loops around and connects into WG1



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

L1			
Direction	Downstream	From	WG1
Pipe Size (mm)	100MM	Depth (m)	0.0
Pipe Material	VC	To	DS MAIN

0.0m	Start of Survey Length
0.0m	Joint Displacement - Large
0.9m	Water Level 30%
1.9m	Joint Displacement - Large (INGROWING ROOTS ALSO)
2.5m	Joint Displacement - Large (INGROWING ROOTS)
3.0m	Line of Sewer Deviates Right (BENDS RIGHT SLIGHTLY)
3.0m	Joint Displacement - Large
3.7m	Joint Displacement - Large
3.8m	Junction (ENTER MAIN LINE FOR ALL FLATS)
4.5m	Finish of Survey Length (ENTER MHI)

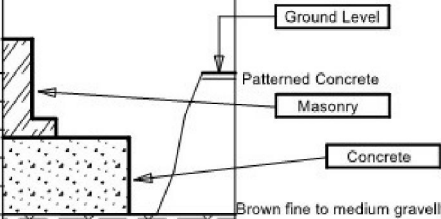
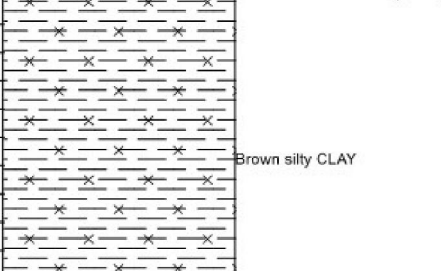
L2			
<b>Direction</b>	Upstream	<b>From</b>	WG1
<b>Pipe Size (mm)</b>	100MM	<b>Depth (m)</b>	0.0
<b>Pipe Material</b>	VC	<b>To</b>	US TO RWP

0.0m	Start of Survey Length
0.1m	Roots - Mass 30%
0.4m	Survey Abandoned (ROOT NETWORK COVERS 100% OF PIPEWORK UNABLE TO PASS)



## Trial Hole Log No.1

Location: Front right of basement floor flat

Depth (m)	Symbolic Log	Strata Description	Insitu Tests		Soil Sample	Root Sample
			SV(19)			
0.0		Ground Level				
		Patterned Concrete				
		Masonry				
		Concrete				
0.5		Brown fine to medium gravelly silty CLAY	132kpa		Soil @ 0.5m	Root @ 0.5m
1.0		Brown silty CLAY	140kpa		Soil @ 1m	
1.5		Brown fine to medium gravelly silty CLAY	140kpa		Soil @ 1.5m	
2.0		Brown silty CLAY	140kpa		Soil @ 2m	
2.5		Brown silty CLAY	140kpa		Soil @ 2.5m	
3.0		Brown silty CLAY	140kpa		Soil @ 3m	
		TRIAL HOLE TERMINATED				





# 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**  
**Auger House**  
**Cross Lane**  
**WALLASEY**  
**Wirral CH45 8RH**

09/09/2021

Dear Sirs

## Root ID

The samples you sent in relation to the above on 26/08/2021 have been examined. Their structures were referable as follows:

TH1, 0.5m		
3 no.	Examined root: most referable to TILIA (Lime). This was a very IMMATURE sample.	Alive, recently*.
1 no.	A piece of BARK only, insufficient material for identification.	
4 no.	Unfortunately all with insufficient cells for identification.	

Click here for more information: [TILIA](#)

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

Yours faithfully

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](http://www.botanical.net) \*\*

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

Report commissioned by





## Geotechnical Testing Analysis Report



environmental  
claims mgmt  
subsidence  
drainage

\*The testing results contained within this report have been performed by GSTL a UKAS accredited laboratory on behalf of Auger.

### Summary Of Claim Details

Policy Holder	Unknown
Risk Address	Unknown
SI Date	17/08/2021
Issue Date	17/08/2021
Report Date	06/09/2021
Auger Reference	
Insurance Company	Axa Insurance
LA Claim Reference	
LA Co. Reference	Crawford & Co

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

	Checked	06/09/2021	Wayne Honey	
	Approved	06/09/2021	Paul Evans	






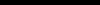


GSTL Contract Number		
Risk Address		
Auger Reference		
Remarks	NP - (Non-Plastic), # - (Liquid Limit and Plastic Limit Wet Sieved)	

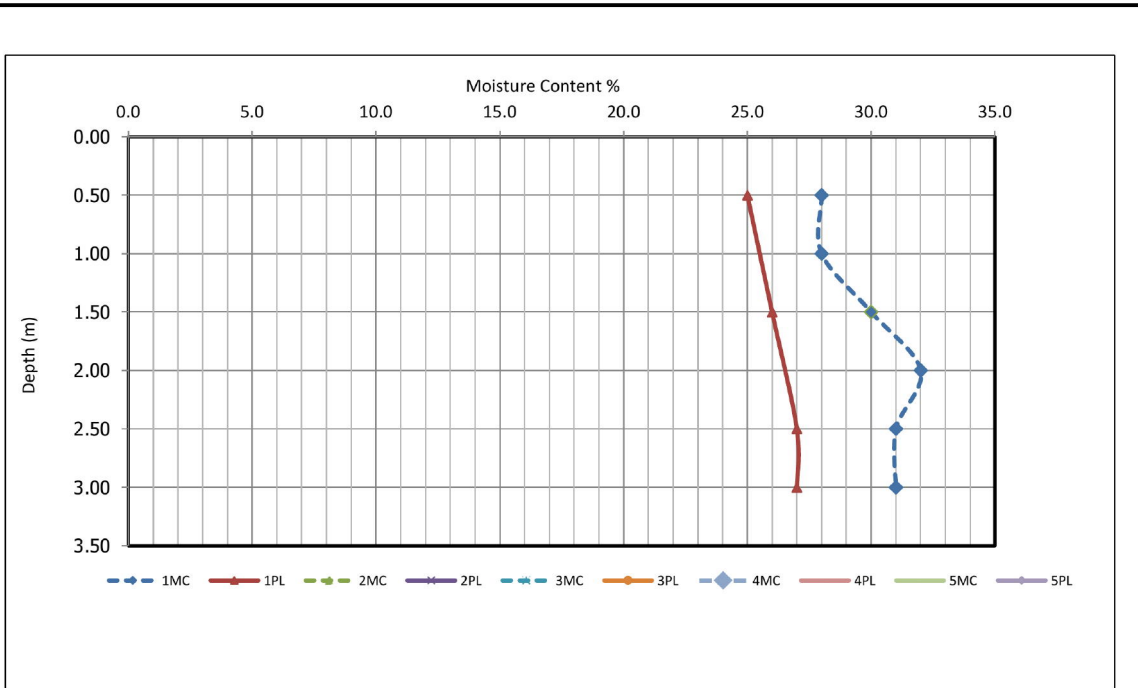
[illegible]

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)

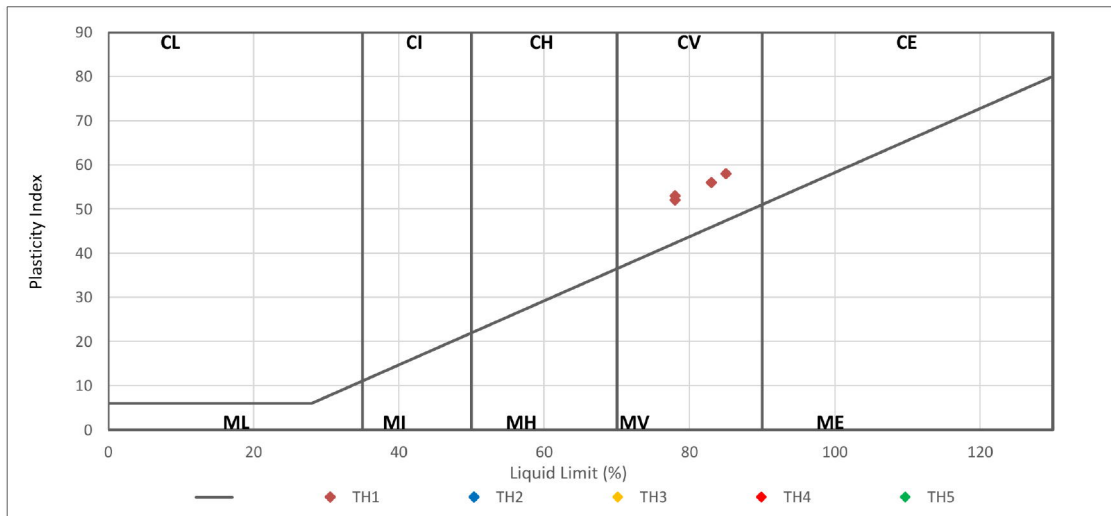
The Atterberg Limits May also be used to classify the volume change potential of fine soils using the National House building system, as given in the NHBC's Standards Chapter 4.2 (2003) "Building Near Trees"

Test Operator	Checked	06/09/2021	Wayne Honey		
Luke Williams	Approved	06/09/2021	Paul Evans		





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	06/09/2021	Wayne Honey
Luke Williams	Approved	06/09/2021	Paul Evans





**SUMMARY OF SOIL CLASSIFICATION TESTS,**  
**Information Paper IP 4/93 February 1993 (CI/SfB p1),**  
**Information Paper Digest 412 ci/sFb (A3s) February 1996**

BRE  
BRE



environmental +  
claims mgmt +  
subsidence +  
drainage +

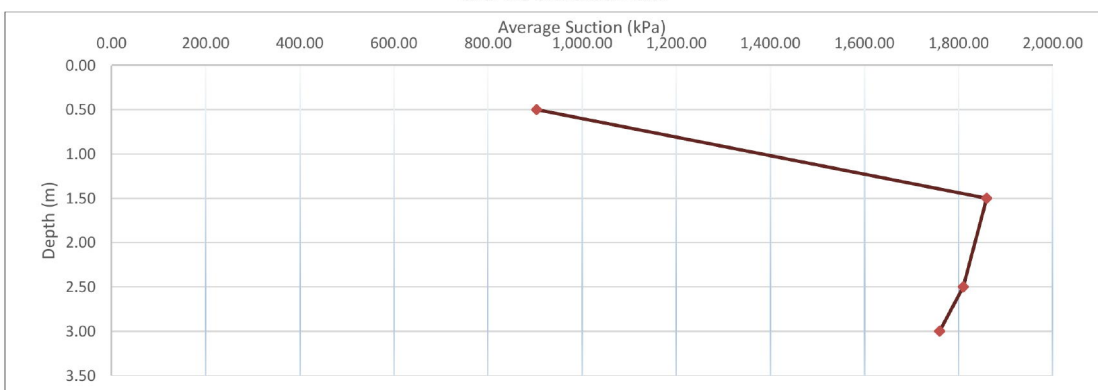
GSTL Contract Number	
Risk Address	
Auger Reference	
Remarks	D - Disturbed (Recompacted 2.5kg Rammer), U - Undisturbed Sample

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)	Cumulative Heave Potential (mm) from bottom of the hole
TH1	0.50	Top	I	D	5	30.2	919	903	82
TH1		Middle	II	D	5	30.2	917		
TH1		Bottom	III	D	5	30.5	872		
TH1	1.00								
TH1									
TH1									
TH1	1.50	Top	I	D	5	24.9	1960	1860	62
TH1		Middle	II	D	5	25.3	1850		
TH1		Bottom	III	D	5	25.6	1780		
TH1	2.00								
TH1									
TH1									
TH1	2.50	Top	I	D	5	26.2	1620	1810	41
TH1		Middle	II	D	5	25.6	1780		
TH1		Bottom	III	D	5	24.7	2030		
TH1	3.00	Top	I	D	5	25.5	1790	1760	20
TH1		Middle	II	D	5	25.9	1700		
TH1		Bottom	III	D	5	25.5	1790		

Heave potential is calculated from the bottom of the hole and heaves above the bottom of the hole are reported as a cumulative 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	06/09/2021	Wayne Honey
Luke Williams	Approved	06/09/2021	Paul Evans

