



### Geotechnical Testing Analysis Report



environmental +  
 claims mgmt +  
 subsidence +  
 drainage +

Unit 3 & 4,  
 Heol Aur,  
 Dafen Ind Estate,  
 Dafen  
 Llanelli,  
 Carmarthenshire,  
 SA14 8QN

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

**Auger House,  
 Cross Lane,  
 Wallasey,  
 Wirral,  
 CH45 8RH**

### Summary Of Claim Details

Policy Holder	
GSTL Job Reference	65178
SI Date	08/03/2023
Issue Date	08/03/2023
Report Date	22/03/2023
Auger Reference	146228.1.2.RSS
Insurance Company	Axa Insurance
LA Claim Reference	SU2207230
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 and approved	22/03/2023	Wayne Honey	<i>W. Honey</i>
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**LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX  
( BS 1377:1990 - Part 2 : 4.4 & 5.3 )**



environmental  
claims mgmt  
subsidence  
drainage

**DESCRIPTIONS**

GSTL Contract Number	65178	
Report Date	22/03/2023	
Auger Reference	146228.1.2.RSS	

TH Trial Hole	Sample Type	Depth (m)	Sample Description
TH1	D	0.80	Brown (organic) fine to medium gravelly clayey SILT
TH1	D	1.30	Brown fine to medium gravelly silty CLAY
TH1	D	1.80	Brown fine to medium gravelly silty CLAY
TH1	D	2.30	Brown fine to medium gravelly silty CLAY
TH1	D	2.80	Brown fine to medium gravelly silty CLAY
TH2	D	0.40	Brown fine to medium gravelly silty CLAY
TH2	D	0.90	Brown fine to medium gravelly silty CLAY
TH2	D	1.40	Brown fine to medium gravelly silty CLAY
TH2	D	1.90	Brown fine to medium gravelly silty CLAY
TH2	D	2.40	Brown fine to medium gravelly silty CLAY
TH2	D	2.90	Brown fine to medium gravelly silty CLAY
TH3	D	1.20	Brown slightly sandy fine to medium gravelly silty CLAY
TH3	D	1.70	Brown slightly sandy fine to medium gravelly silty CLAY
TH3	D	2.20	Brown slightly sandy fine to medium gravelly silty CLAY
TH3	D	2.70	Brown slightly sandy fine to medium gravelly silty CLAY

Test Operator
Jason Smith



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



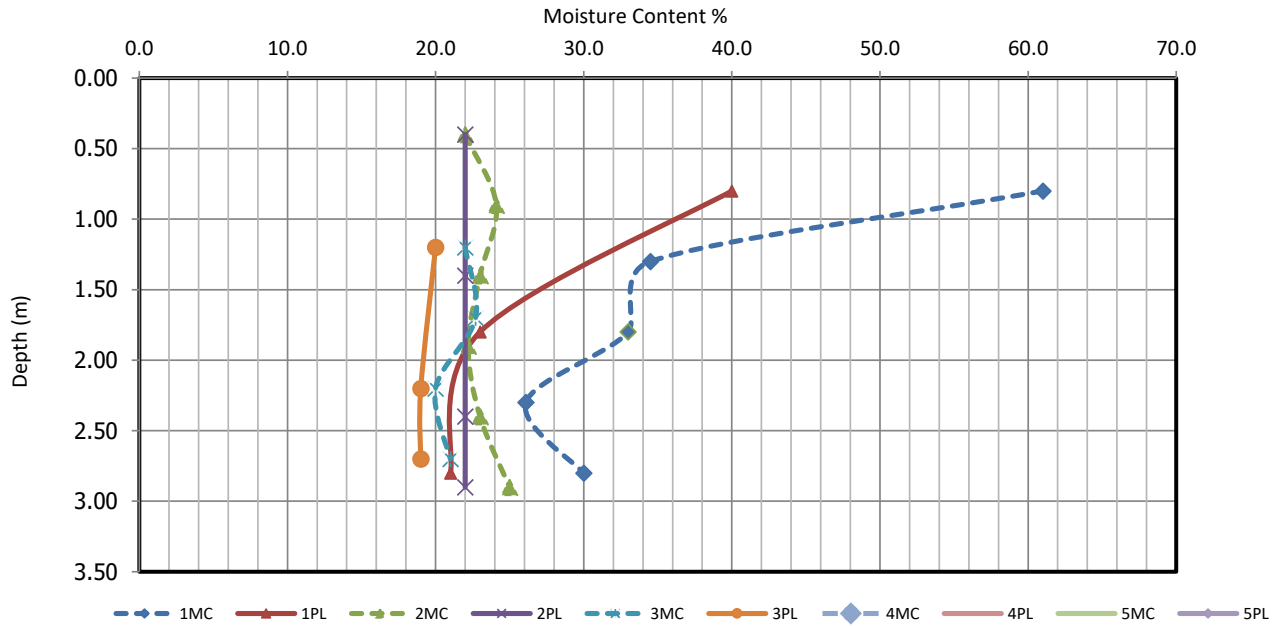
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Remarks	NP - (Non-Plastic), # - (Liquid Limit and Plastic Limit Wet Sieved)

TH Trial Hole	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	NHBC Chapter 4.2	Remarks
TH1	D	0.80	61	81	40	41	92	HIGH VCP	MV Very High Plasticity
TH1	D	1.30	35						
TH1	D	1.80	33	63	23	40	93	MEDIUM VCP	CH High Plasticity
TH1	D	2.30	26						
TH1	D	2.80	30	57	21	36	90	MEDIUM VCP	CH High Plasticity
TH2	D	0.40	22	56	22	34	90	MEDIUM VCP	CH High Plasticity
TH2	D	0.90	24						
TH2	D	1.40	23	51	22	29	94	MEDIUM VCP	CH High Plasticity
TH2	D	1.90	22						
TH2	D	2.40	23	50	22	28	94	MEDIUM VCP	Cl/H Inter/High Plasticity
TH2	D	2.90	25	53	22	31	90	MEDIUM VCP	CH High Plasticity
TH3	D	1.20	22	51	20	31	86	MEDIUM VCP	CH High Plasticity
TH3	D	1.70	23						
TH3	D	2.20	20	53	19	34	82	MEDIUM VCP	CH High Plasticity
TH3	D	2.70	21	50	19	31	82	MEDIUM VCP	Cl/H Inter/High Plasticity

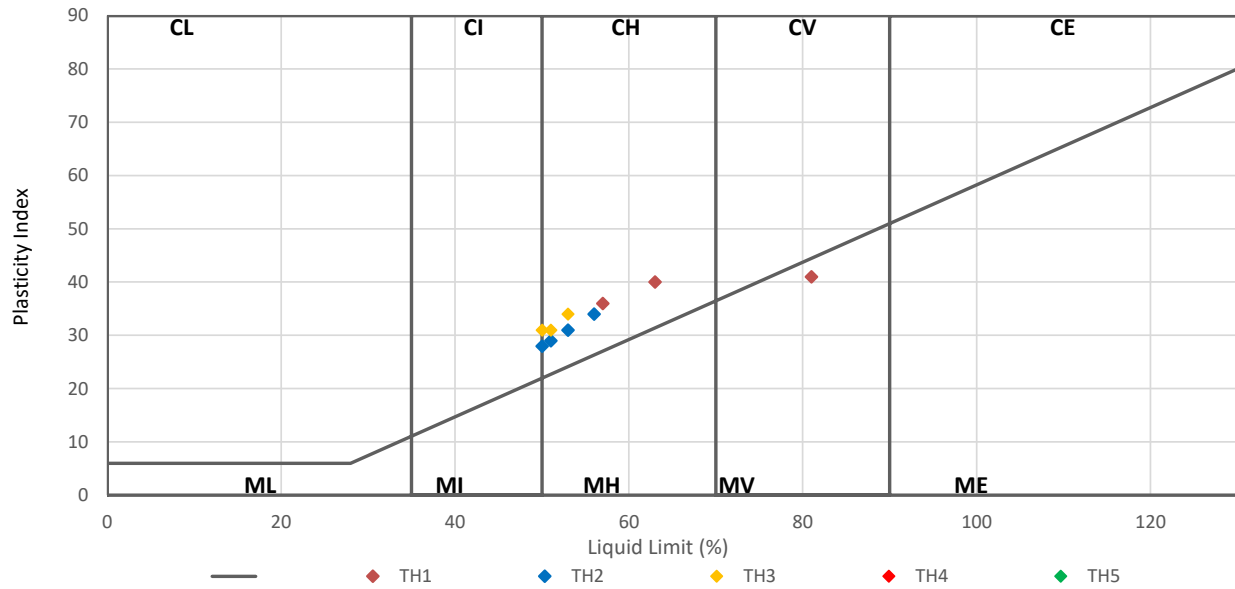
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 Modified PI = 10 to <20 : Low volume change potential (LOW VCP)  
 Modified PI = 20 to <40 : Medium volume change potential (Med VCP)  
 Modified PI = 40 or greater : High volume change potential (HIGH VCP)

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  
Jason Smith



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



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Test Operator  
 Jason Smith

# Site Investigation Report

Auger Ref:

146228.1.BSI



## Job Information

Client	Crawford & Co
Client ref	SU2207230
Visit date	08/03/2023
Report date	19/04/2023

## Job Summary

- ✓ CCTV survey undertaken. [Read more.](#)
- ✓ 3 trial holes undertaken. [Read more.](#)
- ✓ No drainage defects found. [Read more.](#)



**INVESTORS IN PEOPLE®**  
We invest in people Gold

# 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

TH1 and TH2 were all completed in the proposed location and revealed the footing. Soil and root samples were taken.

The underside of TH3s footing could not be determined. The footing was probed to 1.2m and is believed to continue past this point. Soil and root samples were taken from 1.2m. If deemed necessary Auger may return with 2 men for a full day to attempt a deep trial hole to fully expose the footings.

### Drain Survey

We carried out a CCTV survey of the below ground drainage system, our findings of which are as follows:

#### Lines 1 - 7

Our survey of lines 1-7 revealed no significant defects that could lead to an escape of water within the area of concern. All pipework was noted to be PVC.

Dye testing was undertaken with green dye, this did not reveal an escape of water.

## Recommendations

### Refer Back to Client

We will now refer the claim back to the client in order to progress the claim.

# 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



## Trial Hole 3

Fig 3.1: Trial Hole 3 Location



Fig 3.2: Trial Hole 3 Footing



## CCTV Stills

Fig 4.1: Plastic Pipework



Site Photos

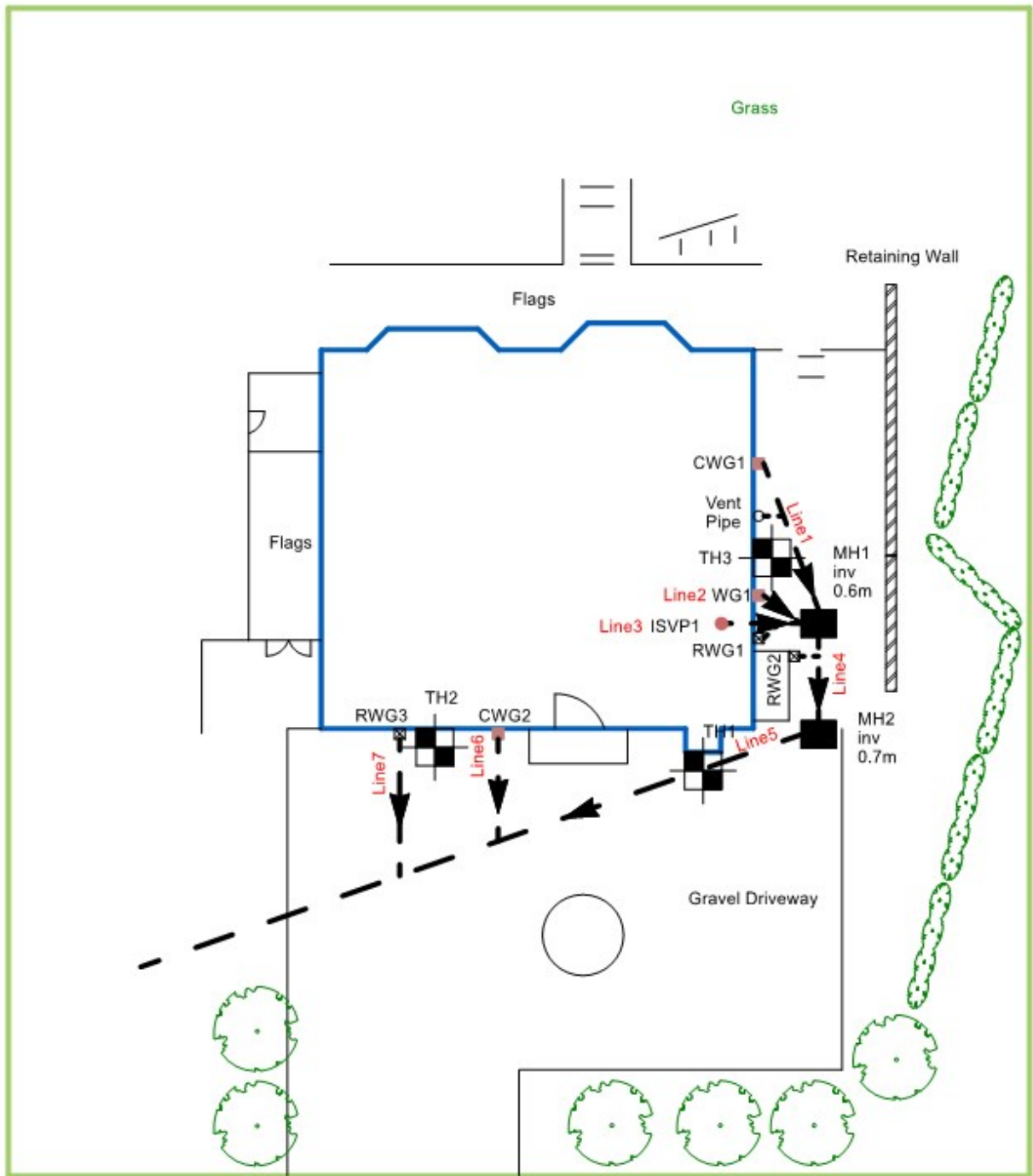
Fig 5.1: Dye Testing



Fig 5.2: MH1







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



# Trial Hole Log No.1

Location: Front Right hand side bay window

Job Ref:  
146228.1.BSI

Depth (m)	Symbolic Log	Strata Description	Insitu Tests		Soil Sample	Root Sample
			SV(19)			
0.0	<p>800mm</p> <p>Ground Level</p> <p>Gravel</p> <p>Brickwork</p> <p>Concrete</p>					
0.5						
1.0		Moist very stiff Brown (organic) fine to medium gravelly clayey SILT	82kpa		Soil @ 0.8m	Root @ 0.8m
1.5		Moist Very Stiff Brown fine to medium gravelly silty CLAY	96kpa		Soil @ 1.3m	Root @ 1.3m
2.0			110kpa		Soil @ 1.8m	
2.5			108kpa		Soil @ 2.3m	
3.0			90kpa		Soil @ 2.8m	
3.5		TRIAL HOLE TERMINATED	90kpa			



# Trial Hole Log No.2

Location: Front Left hand side of the property

Job Ref:  
146228.1.BSI

Depth (m)	Symbolic Log	Strata Description	Insitu Tests		Soil Sample	Root Sample	
			SV(19)				
0.0		Ground Level Rendered Masonry Soil (Border) Concrete Moist very stiff Brown fine to medium gravelly silty CLAY					
0.5			104kpa		Soil @ 0.4m	Root @ 0.4m	
1.0			110kpa		Soil @ 0.9m	Root @ 0.9m	
1.5			122kpa		Soil @ 1.4m	Root @ 1.4m	
2.0			118kpa		Soil @ 1.9m		
2.5			104kpa		Soil @ 2.4m		
3.0			100kpa		Soil @ 2.9m		
3.5			100kpa	TRIAL HOLE TERMINATED			



# Trial Hole Log No.3

Location: RHS gable end

Job Ref:  
146228.1.BSI

Depth (m)	Symbolic Log	Strata Description	Insitu Tests		Soil Sample	Root Sample		
			SV(19)					
0.0		Moist stiff Brown slightly sandy fine to medium gravelly silty CLAY	58kpa		Soil @ 1.2m	Root @ 1.2m		
0.5								
1.0								
1.5					60kpa		Soil @ 1.7m	
2.0					54kpa		Soil @ 2.2m	
2.5					52kpa		Soil @ 2.7m	
3.0								
3.5				TRIAL HOLE TERMINATED	52kpa			



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Checked and approved

22/03/2023

Wayne Honey

*W. Honey*



2788

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Jason Smith



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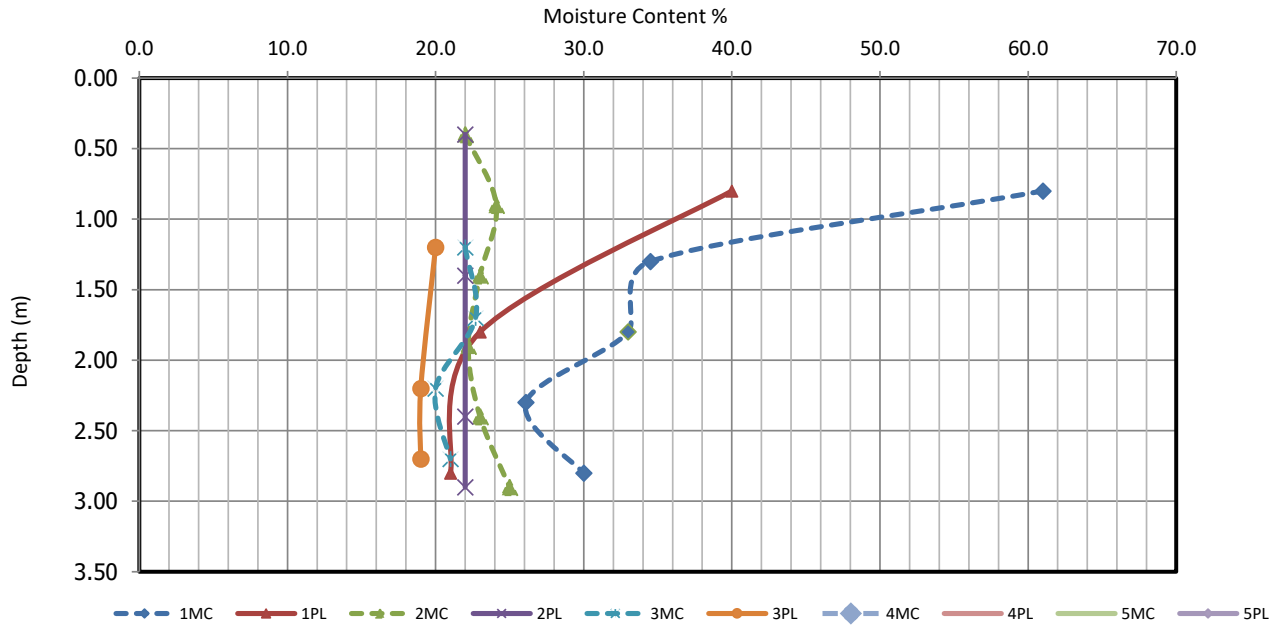
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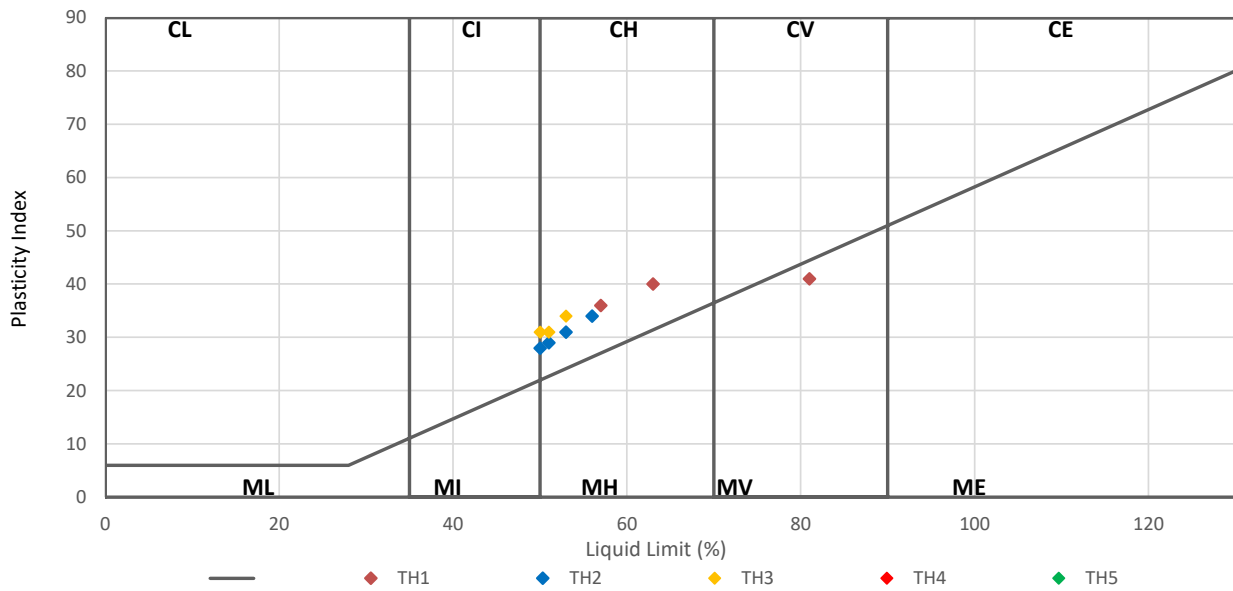
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Test Operator
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BS 5930:1999+A2:2010



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Jason Smith





# Richardson's Botanical Identifications

Root identification  
Vegetation surveys  
Tree/Building investigations  
Plant taxonomy

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

18/04/2023

**Dr Ian B K Richardson**  
*BSc, MSc, PhD, MRSB, FLS*

**James Richardson**  
*BSc (Hons. Biology)*

**Enterprise House**  
**49-51 Whiteknights Road**  
**Reading**  
**RG6 7BB**

**Tel: (0118) 986 9552** (*Direct line*)

**E-mail:** [richardsons@botanical.net](mailto:richardsons@botanical.net)

**Web:** [www.botanical.net](http://www.botanical.net)

*Your ref:* **146228-1-1**

*Our ref:* **86/2108**

Dear Sirs

## Root ID

The samples you sent in relation to the above on 08/03/2023 have been examined. Their structures were referable as follows:

<b>TH1, 0.8m</b>		
4 no.	Examined root: AESCULUS (Horse Chestnut and related Buckeyes).	<a href="#">Alive, recently*</a> .
1 no.	A piece of BARK only, insufficient material for identification.	
<b>TH1, 1.3m</b>		
3 no.	Examined root: AESCULUS (Horse Chestnut and related Buckeyes).	<a href="#">Alive, recently*</a> .
2 no.	Both samples revealed too few cells for microscopic identification.	
<b>TH2, 0.4m</b>		
1 no.	Examined root: very THIN (under 0.08mm in diameter). We cannot rule out AESCULUS (Horse Chestnut and related Buckeyes).	<a href="#">Alive, recently*</a> .
5 no.	Examined root: a conifer, could well be the family CUPRESSACEAE (cypresses ('macrocarpa', 'Leylandii' etc.), Thuja (Western Red Cedar), Junipers). Very immature.	<a href="#">Dead*</a> .
3 no.	Unfortunately all with insufficient cells for identification.	
<b>TH2, 0.9m</b>		
1 no.	Examined root: could also be the family CUPRESSACEAE (as listed above). Less than 0.08mm in diameter.	<a href="#">Alive, recently*</a> .
1 no.	Microscopic examination showed insufficient cells for recognition.	
<b>TH2, 1.4m</b>		
2 no.	Examined root: ACER (Maples, Sycamores).	<a href="#">Alive, recently*</a> .

*/ continued overleaf*

1 no.	Microscopic examination showed insufficient cells for recognition.	
<b>TH3, 1.2m</b>		
1 no.	Examined root: most referable to the family VITACEAE (includes Vitis (Grape-Vine) and Parthenocissus (Virginia Creeper etc.)). POOR in condition.	Very decayed*.
1 no.	Examined root: similar in many ways to CLEMATIS. Tentative.	Alive, recently*.

Click here for more information: [ACER](#) [AESCULUS](#) [CUPRESSACEAE](#)

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) \*\*