

Arboricultural Consultancy for Lloyds Bank

Note: This report is intended for use between the client, Environmental Services and any parties detailed within the report. It is based on the understanding at the time of visiting the property that Engineers are satisfied that damage is attributable to clay shrinkage subsidence exacerbated by vegetation.

1. Case Details

Insured	Dr Sundaramani Kumari	Address	19 Woodgate Crescent, Middlesex, HA6 3RB		
Client	Subsidence Management Services	Contact	Kevin Phillips	Claim No.	IFS-LBG-SUB-20-0088871
ES Ref	SA-247235	Consultant	Kirk Thompson	Contact No.	0330 380 1036
Report Date	17/12/2020				

Scope of Report: To survey the property and determine significant vegetation contributing to subsidence damage, make recommendation for remedial action and assess initial mitigation and recovery prospects. The survey does not make an assessment for decay or hazard evaluation.

2. Property and Damage Description

The insured structure is a 2 storey detached house. It has been extended with a conservatory addition to the rear. The property occupies a level site with no adverse topographical features.

Damage relates to the rear elevation and conservatory of the insured dwelling. Please refer to the engineers report for a full description of the claim history and damage.

3. Technical Reports

In preparing our report we have had the benefit of the following technical investigations:

Soil Analysis	☒	Foundation Detail	☒	Root Analysis	☒
Borehole Log	☒	Engineers Report	☒		

4. Action Plan

Mitigation		Treeworks	
Insured involved?	Yes	Local Authority	Hillingdon London Borough
Local Authority involved?	No	TPO / Conservation Area / Planning Protection Searches	Insured: TPO Adjacent & Adjoining properties: TPO
Other third party Mitigation involved?	Yes	Additional Comments	
Recovery		Awaiting Further Instructions.	
Is there a potential recovery action?	Yes	A potential recovery action has been identified.	
		Engineers should consider focusing investigations to strengthen factual evidence for disclosure to third party tree owners.	

5. Technical Synopsis

This report is based on our understanding, at the time of visiting the property, that engineers are satisfied that damage is the result of clay shrinkage subsidence exacerbated by the indirect influence of vegetation.

The conditions necessary for clay shrinkage subsidence to manifest have been established by site investigations, whilst roots have been recovered below the property (TP/BH1 & TP/BH2).

Samples of these roots were recovered from underside of foundations and throughout the borehole, these roots were identified (using anatomical analysis) as having emanated from the genus Cupressaceae spp.

Given the above, vegetation is deemed to retain the capacity to be causal to the current movement / damage.

We have therefore been instructed to advise on the causal vegetation and to deliver management proposals which will provide

Arboricultural Consultancy for Lloyds Bank

on-going and long-term stability allowing repairs to be undertaken.

In assessing the potential drying influence of the vegetation on site, we have considered, in addition to the above, species profile, normally accepted influencing distance and the position of vegetation relative to the observed damage.

Our survey of the site identified Cypress hedge (H3), given its position relative to the damage it is our opinion that the roots identified will emanate from this vegetation and accordingly we have identified it as a significant cause of the subsidence damage.

However, whilst not positively implicated by root analysis, TG2 (Beech) cannot be discounted as contributing to the overall level of soil drying proximate to the area of damage and is therefore also considered to retain a contributory influence, albeit in a secondary capacity when compared to H3.

The size and proximity of the above vegetation is consistent with the location of damage and advised mechanism of movement; accordingly, we have identified their collective / cohesive influence as the primary cause of the subsidence damage.

Considering engineers conclusions and in order to mitigate the current damage thereby allowing soils beneath the property to recover to a position such that an effective engineering repair solution can be implemented, we recommend a program of management as listed by this report.

Please refer to Section 6 for management prescriptions.

The recommendations contained within this arboricultural report are prescribed to give the most reliable arboricultural solution likely to restore long-term stability.

Consequently, complete removal of H3 & TG2 will offer the most certain arboricultural solution likely to restore long-term stability.

We recommend the efficacy of the management recommendations be qualified by means of further monitoring to confirm stability.

Please note that the footing of the insured property fall within the anticipated rooting distance of additional vegetation which we believe presents a foreseeable risk of future damage and accordingly we have made recommendations in respect of this.

The extent / impact of vegetation management required to restore and maintain long-term stability at this property is acknowledged.

However, we consider the impact on the wider public amenity from the proposed tree works is mitigated by the presence of further trees and the scope for replacement planting.

Whilst replacement planting is considered appropriate, due consideration must be given to the ultimate size of the replacement and future management requirements. Species selection should be appropriate for the chosen site and ultimate tree height should not exceed 75% of the available distance to built structures.

Is vegetation likely to be a contributory factor in the current damage?	Yes
Is vegetation management likely to contribute to the future stability of the property?	Yes
Is replacement planting considered appropriate?	See above
Would DNA profiling be of assistance in this case?	No

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6.0 Recommendations

6.1 Current Claim Requirements

These recommendations may be subject to review following additional site investigations.

Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m) *	Ownership	Action	Requirement
H3	Cypress (Leyland)	2	9.5	3.7	A - Third Party	Remove	Remove close to ground level.
TG2	Beech	3	16.4	10.8	A - Third Party	Remove	Remove close to ground level.

Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property

* Estimated

6.2 Future Risk Recommendations

These recommendations may be subject to review following additional site investigations.

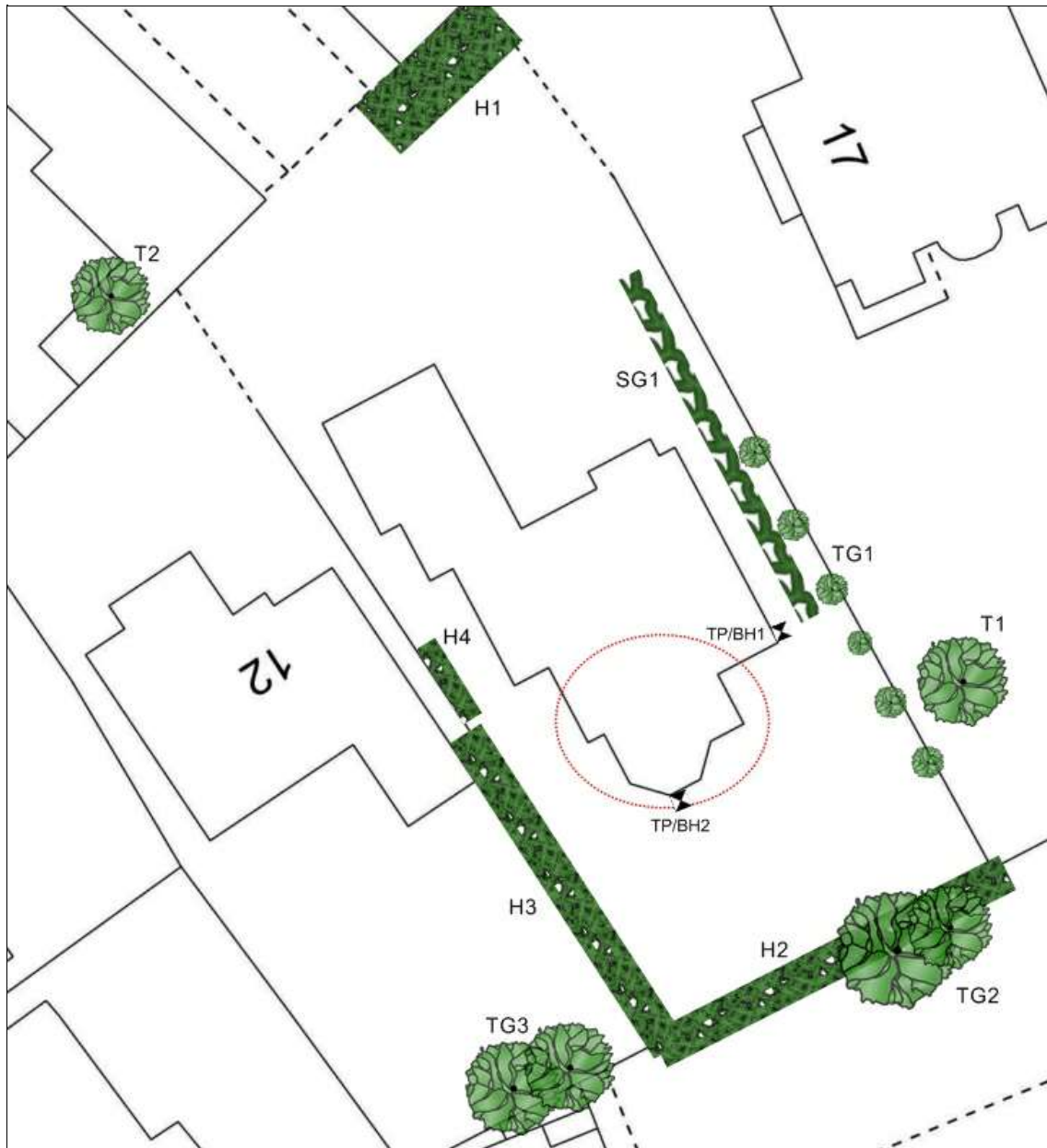
Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m) *	Ownership	Action	Requirement
H1	Mixed coniferous group	3	10	8.7	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
H2	Cypress (Leyland)	2	9.2	9.5	E - Boundary Veg (ownership to be confirmed)	Action to avoid future risk	Reduce hedge to height of 6m and maintain at reduced dimensions by way of regular pruning.
H4	Cypress (Leyland)	2	4	2.3	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions by way of regular pruning.
SG1	Mixed species shrubs	1	1.8	2.6	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning. Includes Euonymus, Hebe, Bay, Fatsia and Buddleia
T1	Birch	3	15	12	A - Third Party	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning. Situated 4m - 5m above ground level of property.
T2	Indian Bean Tree	3	8.8	8.8	A - Third Party	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
TG1	Mixed species group	1	7.2	4.5	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning. Situated 2m above ground level. Birch x 2, Rowan x 2, Apple and Prunus.
TG3	Beech	3	15	14	A - Third Party	Action to avoid future risk	Do not allow to exceed current dimensions by way of regular pruning.

Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property

* Estimated

Third party property addresses should be treated as indicative only, should precise detail be required then Environmental Services can undertake Land Registry Searches

7. Site Plan



Please note that this plan is not to scale. OS Licence No. 100043218

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8. Photographs



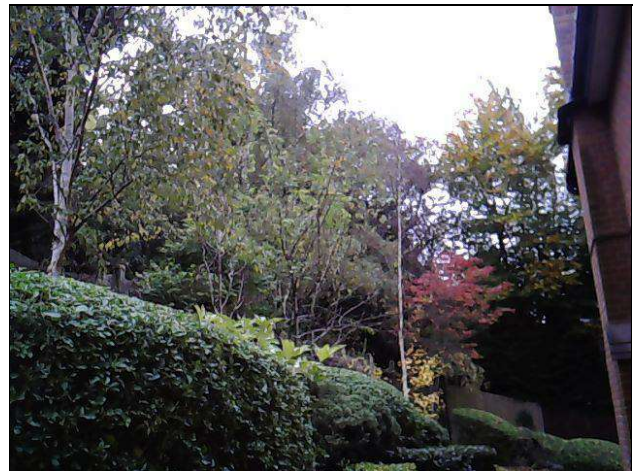
H1 - Mixed coniferous group



T2 - Indian Bean Tree



SG1 - Mixed species shrubs



TG1 - Mixed species group



T1 - Birch



H2 - Cypress (Leyland)

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TG2 - Beech



H3 - Cypress (Leyland)



H4 - Cypress (Leyland)



TG3 - Beech

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Date: 17/12/2020

Property: 19 Woodgate Crescent, Middlesex, HA6 3RB

9. Tree Works Reserve - Does not include recommendations for future risk.

Insured Property Tree Works	£0.00
Third Party Tree Works	£2250.00
Provisional Sum	£0.00

- The above prices are based on works being performed as separate operations.
- The above is a reserve estimate only.
- Ownerships are assumed to be correct and as per Section 6.
- A fixed charge is made for Tree Preservation Order/Conservation Area searches unless charged by the Local Authority in which case it is cost plus 25%.
- Should tree works be prevented due to statutory protection then we will automatically proceed to seek consent for the works and Appeal to the Secretary of State if appropriate.
- All prices will be subject to V.A.T., which will be charged at the rate applying when the invoice is raised.
- Trees are removed as near as possible to ground level, stump and associated roots are not removed or included in the price.
- Where chemical application is made to stumps it cannot always be guaranteed that this will prevent future regrowth. Should this occur we would be pleased to provide advice to the insured on the best course of action available to them at that time. Where there is a risk to other trees of the same species due to root fusion, chemical control may not be appropriate.

10. Limitations

This report is an appraisal of vegetation influence on the property and is made on the understanding that that engineers suspect or have confirmed that vegetation is contributing to clay shrinkage subsidence, which is impacting upon the building. Recommendations for remedial tree works and future management are made to meet the primary objective of assisting in the restoration of stability to the property. In achieving this, it should be appreciated that recommendations may in some cases be contrary to best Arboricultural practice for tree pruning/management and is a necessary compromise between competing objectives.

Following tree surgery we recommended that the building be monitored to establish the effectiveness of the works in restoring stability.

The influence of trees on soils and building is dynamic and vegetation in close proximity to vulnerable structure should be inspected annually.

The statutory tree protection status as notified by the Local Authority was correct at the time of reporting. It should be noted however that this may be subject to change and we therefore advise that further checks with the Local Authority MUST be carried out prior to implementation of any tree works. Failure to do so can result in fines in excess of £20,000.

Our flagging of a possible recovery action is based on a broad approach that assume all third parties with vegetation contributing to the current claim have the potential for a recovery action (including domestic third parties). This way opportunities do not "fall through the net"; it is understood that domestic third parties with no prior knowledge may be difficult to recover against but that decision will be fully determined by the client.

A legal Duty of Care requires that all works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried out according to British Standard 3998:2010 "Tree Work. Recommendations".

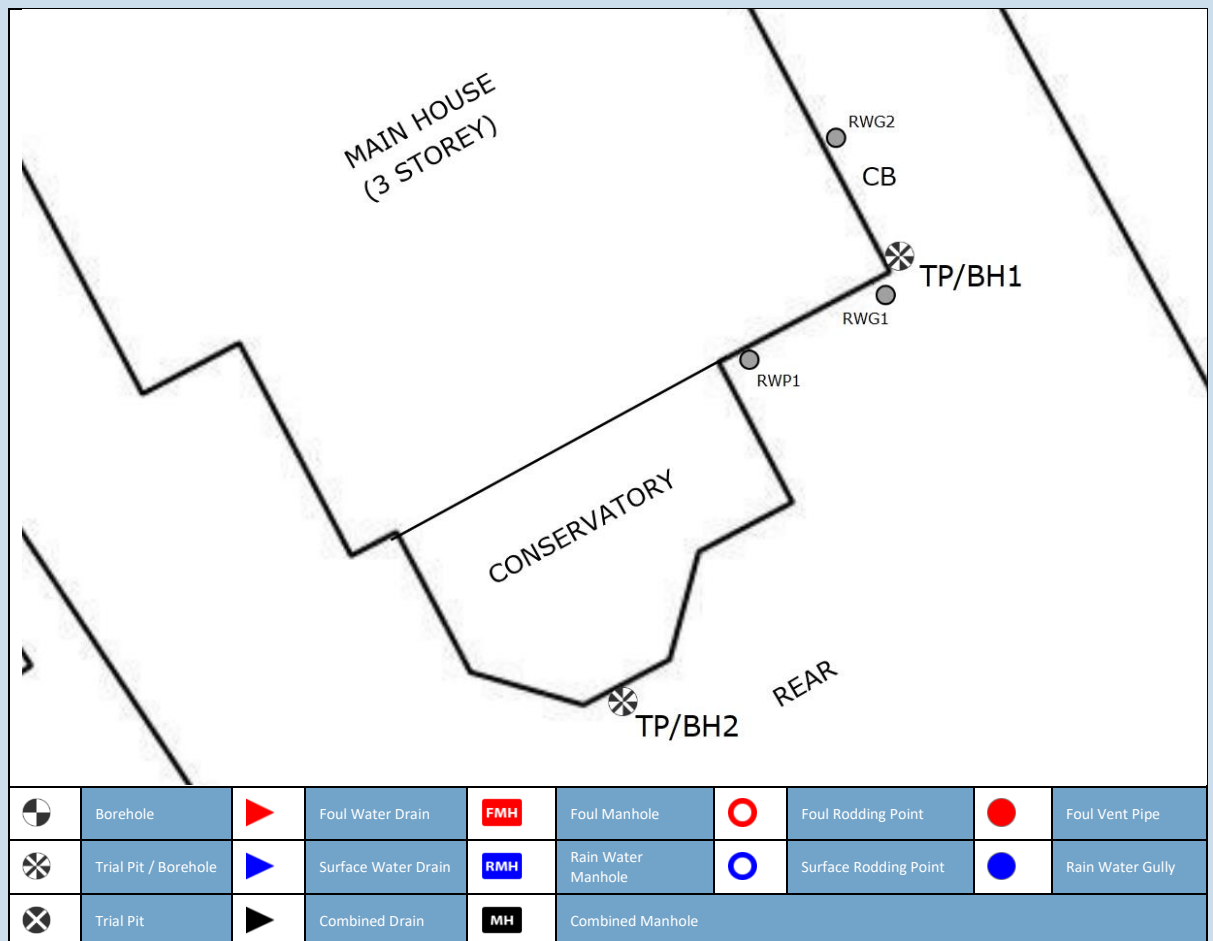
GEOTECHNICAL

for Subsidence Management Services

19 Woodgate Crescent, , Middlesex, HA6 3RB

Client: Subsidence Management Services
Client Contact: Kevin Phillips
Client Ref: IFS-LBG-SUB-20-0088871
Policy Holder: Dr Sundaramani Kumari
Report Date: 02.12.2020
Our Ref: C57489G25786

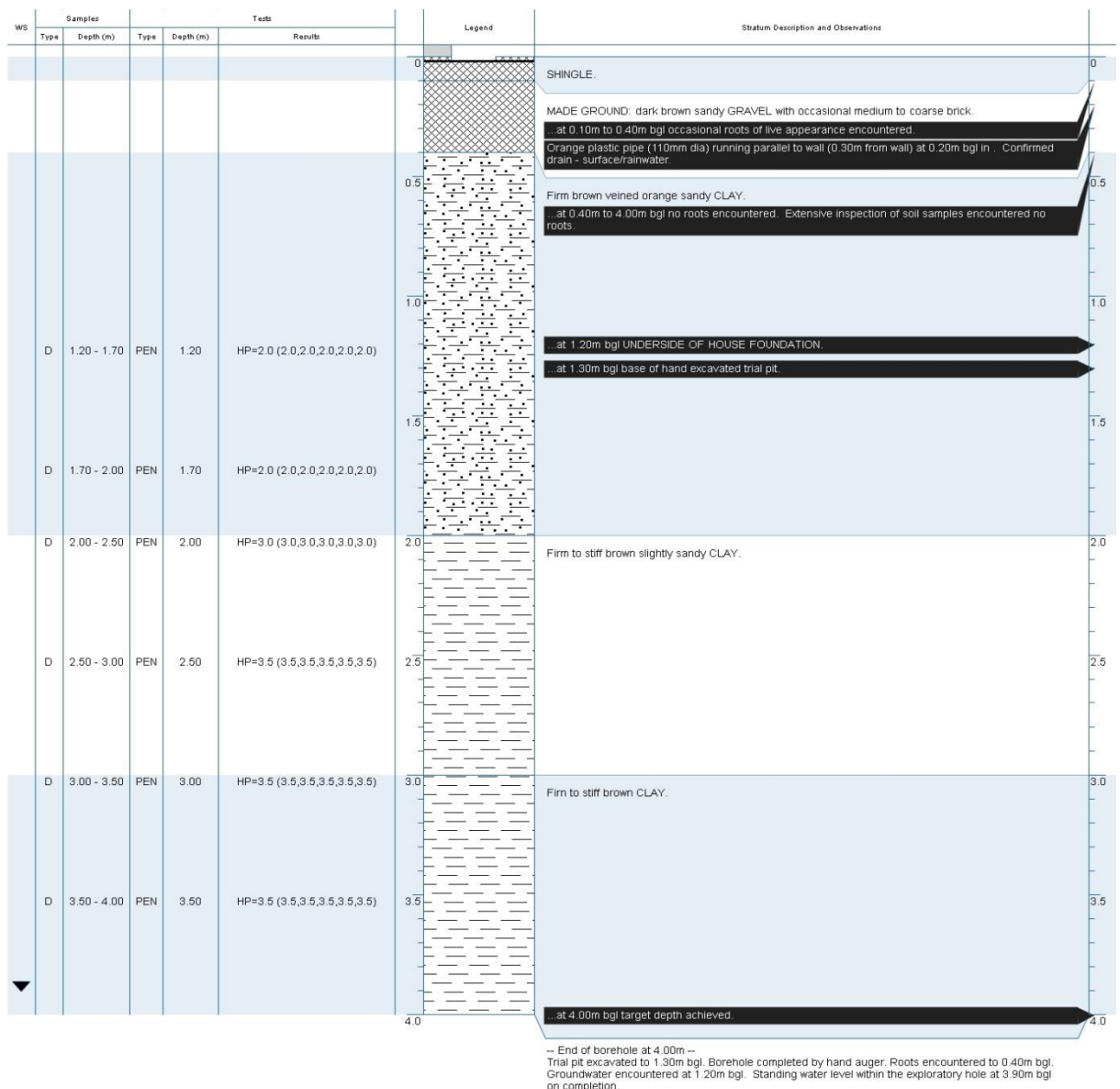
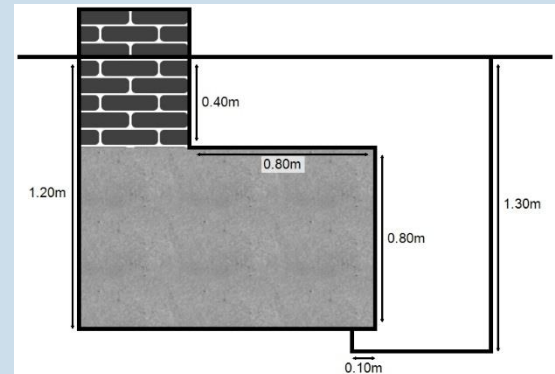
Site Plan



TP/BH1 Foundation Detail and Borehole Log

Foundation Detail

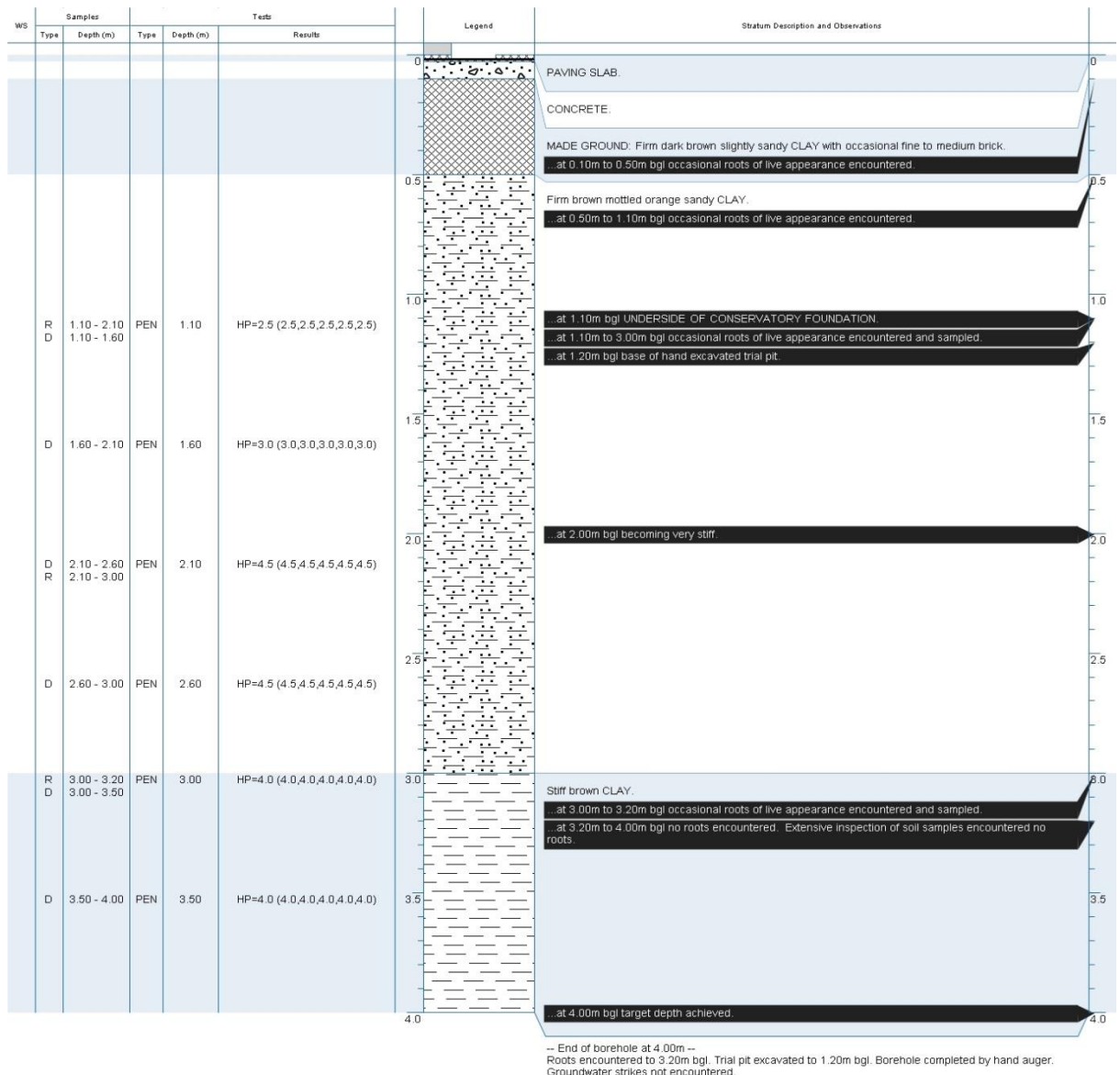
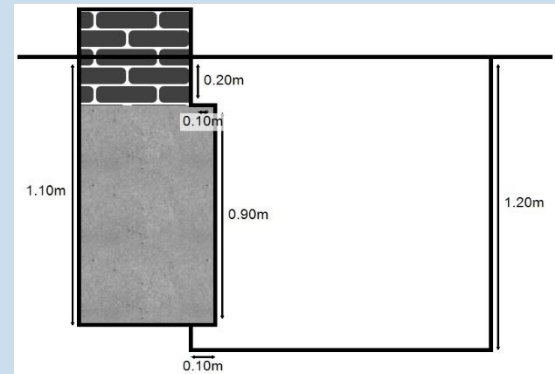
House foundation comprised of brick wall to 400mm bgl, bearing on concrete to 1200mm bgl, with a total projection of 800mm from the elevation. Underside of foundation (USF) was exposed to 100mm back from the face of the foundation and probed 400mm back from the face of the foundation.



TP/BH2 Foundation Detail and Borehole Log

Foundation Detail

Conservatory foundation comprised of brick wall to 200mm bgl, bearing on concrete to 1100mm bgl, with a total projection of 100mm from the elevation. Underside of foundation (USF) was exposed to 100mm back from the face of the foundation and probed 300mm back from the face of the foundation.



Site Observations

GENERAL:

Site Investigation works (TP/BH 1, TP/BH 2) undertaken on 16 November 2020 during dry weather (i.e. no rain).

Orange unidentified type of plastic pipe (110mm dia) running parallel to wall (0.30m from wall) at 0.20m bgl (TP/BH 1). Confirmed surface/rain water drain.

HEALTH AND SAFETY:

Negative signal obtained in Power, Radio and Genny mode on the Cable Avoidance Tool (CAT) (TP/BH1 and TP/BH 2).

DRAINAGE:

The rainwater downpipe (RWP1) was encountered not connected to the sub-surface drainage system and discharging to ground surface.

FOUNDATIONS:

House foundation was exposed and the underside of foundation (USF) recorded to be 1.20m bgl (TP/BH 1).

Conservatory foundation was exposed and the underside of foundation (USF) recorded to be 1.10m bgl (TP/BH 2).

ROOTS:

Roots encountered to 0.40m and 3.20m bgl (TP/BH 1 and TP/BH 2).

IN SITU TESTING:

Hand Penetrometer (PEN) undertaken at 1.20m and 1.10m bgl (TP/BH 1 and TP/BH 2) within the hand auger and thereafter in the hand auger at maximum 0.50m intervals.

WATER STRIKES:

A water strike (WS) was encountered in the clay at 1.20m bgl (TP/BH 1), with a standing water level (SWL) recorded at 1.20m bgl after 10 minutes (TP/BH 1). Standing water level within the exploratory hole at 3.90m bgl (TP/BH 1) on completion.

No water strike/s (NWS) encountered (TP/BH 2).

The groundwater observations do not necessarily indicate equilibrium conditions. It should be appreciated that groundwater levels are subject to both seasonal and weather induced variations. Other effects such as construction activities may also change groundwater levels.

SOIL ANALYSIS

for Subsidence Management Services

19 Woodgate Crescent, Middlesex, HA6 3RB

Client: Subsidence Management Services
Claim Number: 500217112
Policy Holder: Dr Sundaramani Kumari
Report Date: 07/12/2020
Our Ref: L19925

Compiled By:

Name	Position	Signature
Saira Dougan	Laboratory Technician	

Checked By:

Name	Position	Signature
Bob Walker	Laboratory Manager	

Date samples received: 18-Nov-20
Water Content Test Date: 24-Nov-20
Atterberg Limits Test Date: 02-Dec-20

Oedometer Test Date: 29-Nov-20



9265

Notes relating to soils testing

Unless otherwise stated, all soil testing was undertaken by Environmental Services at unit 10H Maybrook Business Park, B76 1AL for SubsNetUK of Unit 4 Linnet Court, Cawledge Business Park, Alnwick, NE66 2GD

Soil samples have been prepared in accordance with BS1377:Part 1: 2016 Section 7

Descriptions of soil samples within the laboratory have been undertaken generally in accordance with BS5930:2015. Descriptions of soil samples fall outside of the scope of UKAS accreditation and may have been shortened to remove tertiary components for ease of reference.

The graphical representation of 40% of the LL and the numerical representation of the modified plasticity index (mod. PI) fall outside of the scope of UKAS accreditation.

Following the issue of this soil analysis report, samples will be retained for at least 28 days should additional testing, or referencing, be required. It should be noted that any tests undertaken on soils retained subsequent to the issue of this report may not give an accurate indication of the in-situ conditions of the sample.

This Soil Analysis Report may not be reproduced, in part or in full, without written approval of the laboratory.

The results contained herein relate only to items tested and no others. Additionally as the laboratory is not responsible for the sampling process it takes no responsibility for the condition of the samples and all samples are tested "as received".

Where samples of the same test type are not tested on the same day, or the testing spans multiple days, the test date states the day of the final test or the test date of the final sample.

All information above the laboratory reference on the cover page of this report are as provided by the customer and the laboratory is not responsible for any errors or omissions therein.

Water Content Tests are undertaken in accordance with ISO 17892:Part 1:2014

The Liquid Limit test is undertaken in accordance with BS1377:Part 2:1990 Section 4.4 using an 80g cone with a 30° tip. Sieve percentages reported in blue denote that the sample has been sieved otherwise it has been prepared from its natural state.

Unless otherwise specified herein, the four-point cone penetrometer method has been used with increasing water content

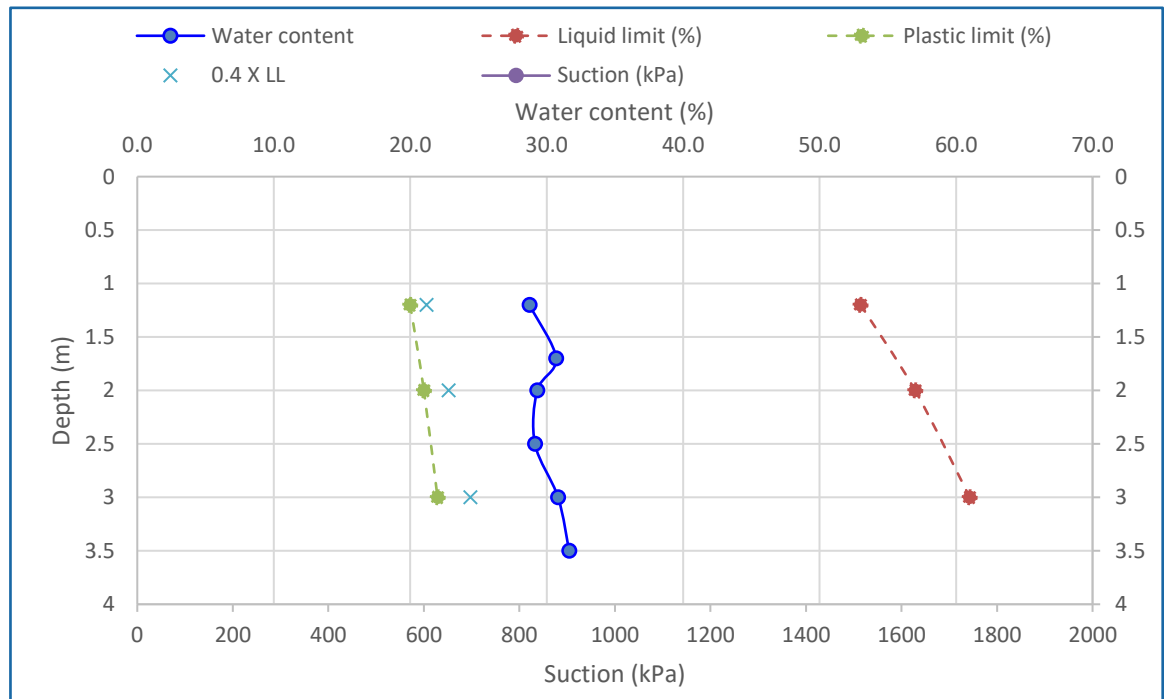
The Plastic Limit test and the determination of the Plasticity Index is undertaken in accordance with BS1377:Part 2:1990. Where a plastic limit has been denoted with an asterisk (*) then it has been derived from the liquid limit and has not been tested.

The Oedometer swell/strain test method is based upon BS1377:Part 5:1990 Section 4.4 'Determination of swelling and collapse characteristics' and unless otherwise stated is undertaken on a remoulded, disturbed, sample.

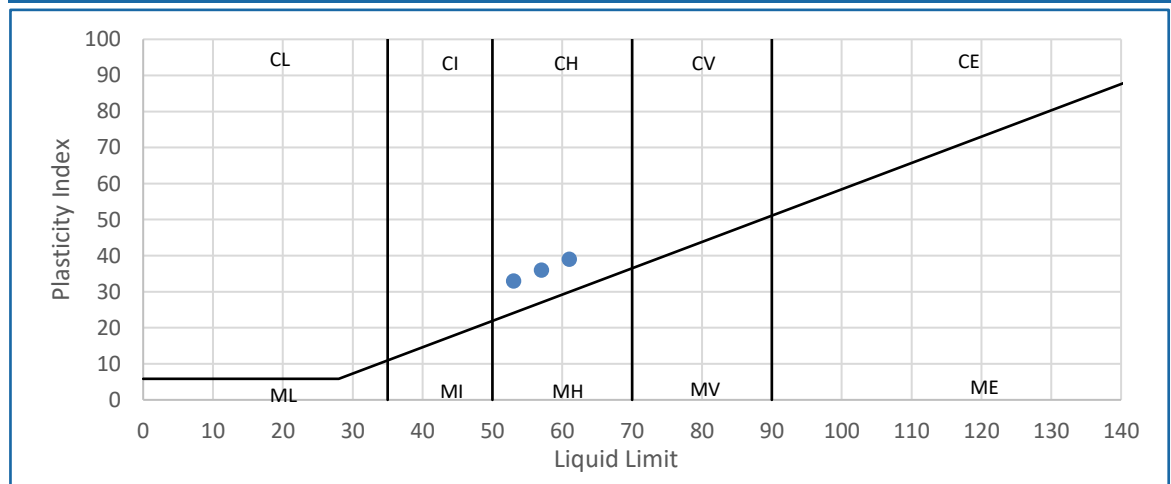
The Oedometer Swell/Strain Test is undertaken in a controlled environment within a temperature range of 16°C and 24°C

Samples from BH1

Lab Ref	Depth (m)	MC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
1	1.2	28.7	53	20	33	100	33		Soft brown/orange-brown/light grey veined slightly sandy CLAY with rare gravel. Gravel is fine and medium.
2	1.7	30.7							Soft brown/orange-brown/light grey veined slightly sandy CLAY with rare gravel. Gravel is fine and medium.
3	2	29.3	57	21	36	100	36		Soft to firm brown/orange-brown/light grey veined CLAY with rare gravel and sand. Gravel is fine
4	2.5	29.1							Firm brown/orange-brown/light grey veined CLAY with rare gravel and sand. Gravel is fine
5	3	30.8	61	22	39	100	39		Firm to stiff brown/grey veined CLAY with rare gravel. Gravel is fine
6	3.5	31.6							Firm brown/grey veined CLAY with rare gravel. Gravel is fine

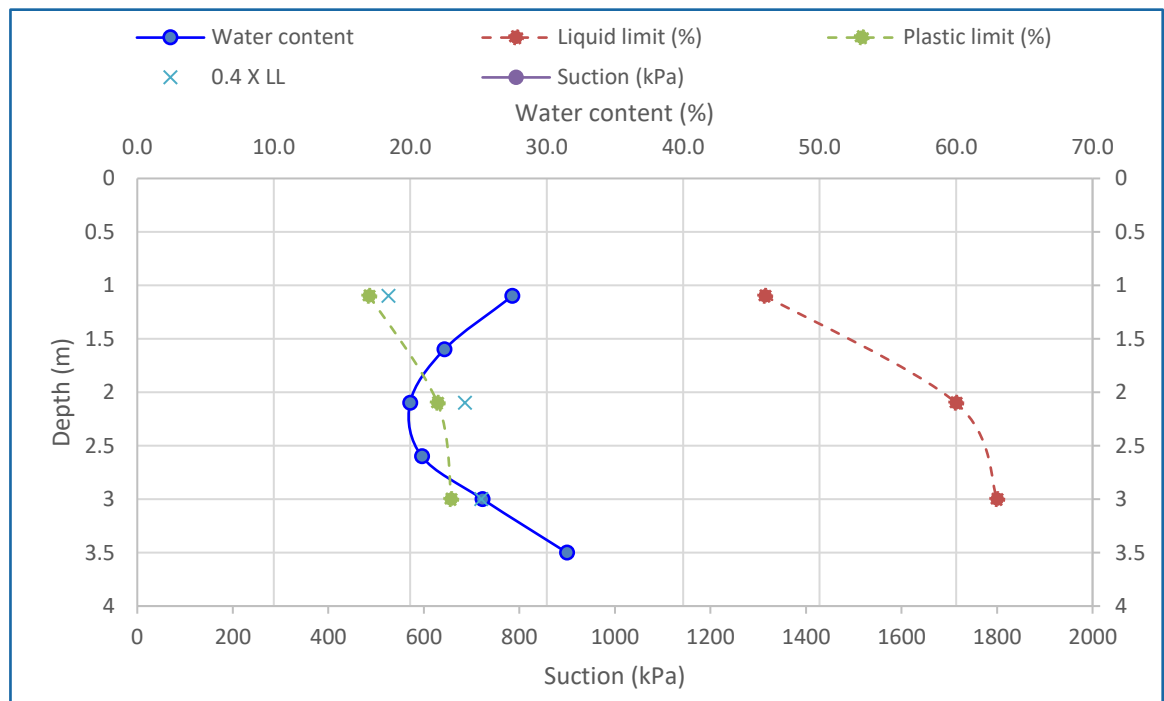


Plasticity Chart for Casagrande Classification

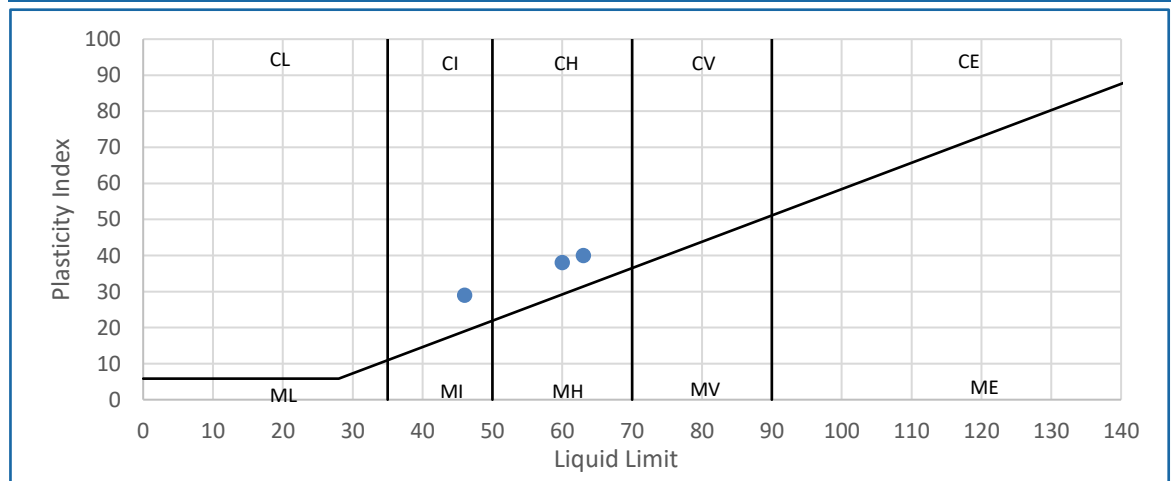


Samples from BH2

Lab Ref	Depth (m)	MC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
7	1.1	27.5	46	17	29	100	29		Soft brown/orange-brown/light grey veined CLAY with rare gravel and sand bandings. Gravel is fine
8	1.6	22.5							Firm brown/orange-brown/light grey veined slightly sandy CLAY with rare gravel. Gravel is fine and medium.
9	2.1	20.0	60	22	38	100	38		Very stiff brown/orange-brown/light grey veined slightly sandy CLAY with rare gravel. Gravel is fine and medium.
10	2.6	20.9							Stiff brown/orange-brown/light grey veined slightly sandy CLAY with rare gravel. Gravel is fine
11	3	25.3	63	23	40	100	40		Stiff brown/orange-brown/light grey veined CLAY with rare gravel. Gravel is fine
12	3.5	31.5							Firm to stiff brown/orange-brown/light grey veined CLAY with rare gravel and sand. Gravel is fine

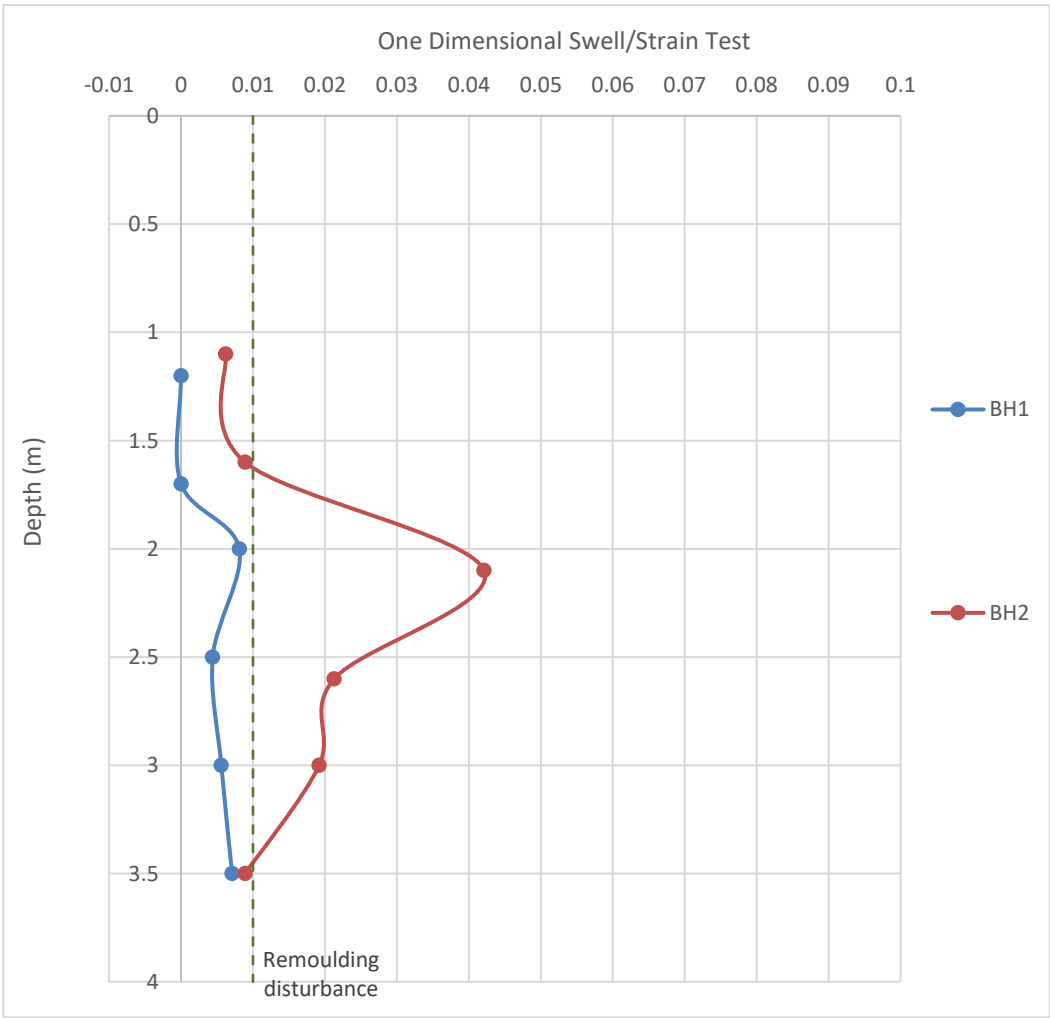


Plasticity Chart for Casagrande Classification



Summary of Oedometer Testing

Lab Ref	Depth (m)	Strain	Heave (mm)	Remarks
1	1.2			
2	1.7			
3	2	0.0081	0	
4	2.5	0.0044	0	
5	3	0.0056	0	
6	3.5	0.0071	0	
7	1.1	0.0062	0	
8	1.6	0.0089	0	
9	2.1	0.0421	8	
10	2.6	0.0213	14.7	
11	3	0.0192	1.8	
12	3.5	0.0089	0	



Deviating Samples

The table below details any samples deviating from laboratory procedure or deviating in condition to an extent whereby the validity of results may be affected. A test denoted "I" is likely to have had testing abandoned but where a test result has been provided a non-standard procedure may have been used, details of which will be provided upon request.

LAB REF	CONDITION	WC	ATT	SUC	OED
1					V
2					V
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Key

- D Delay in sample receipt
- C Contaminated sample
- B Sample not bagged correctly
- S Sample too sandy (unsuitable for testing)
- G Sample too gravelly (unsuitable for testing)
- V Sample too soft (unsuitable for preparation)
- L Sample too silty
- I Insufficient sample
- O Too much organic content (unsuitable for testing)
- N Non-standard procedure used

References

The following provides a brief interpretation of the test results by comparison of the results to published classifications. The Atterberg Limit test may be used to classify the plasticity of soils; the plasticity classes defined in BS5930:2015 "Code of Practice for Site Investigations" are as follows.

CL (ML)	CLAY and CLAY/SILT of Low plasticity
CI (MI)	CLAY and CLAY/SILT of Intermediate plasticity
CH (MH)	CLAY and CLAY/SILT of High plasticity
CV (MV)	CLAY and CLAY/SILT of Very High plasticity
CE (ME)	CLAY and CLAY/SILT of Extremely High plasticity
O	The letter O is added to prefixes to symbolise a significant proportion of organic matter.
NP	Non-plastic

The Plasticity Index (PI) Result obtained from the Atterberg Limit tests may also be used to classify the potential for volume change of fine soils, in accordance with the National House Building Council's standards - Chapter 4.2 (2003) "Building Near Trees", as summarised below.

Modified PI < 10	Non Classified.
Modified PI = 10 to <20	Low volume change potential.
Modified PI = 20 to <40	Medium volume change potential.
Modified PI = 40 or greater	High volume change potential.

The 2003 edition of Chapter 4.2 also permits use of the Plasticity Index without modification. The classifications for this are grouped by soil type (soils with similar visual soils description and using unmodified Plasticity Indices).

ROOT IDENTIFICATION

for Subsidence Management Services

19 Woodgate Crescent, Middlesex, HA6 3RB

Client: Subsidence Management Services
Client Contact: Kevin Phillips
Claim Number: 500217112
Client Reference: IFS-LBG-SUB-20-0088871
Policy Holder: Dr Sundaramani Kumari
Report Date: 9 December 2020
Our Ref: R38612



Intec
Parc Menai, Bangor,
Gwynedd, North Wales
LL57 4FG
Tel: 01248 672652

Sub Sample	Species Identified		Root Diameter	Starch
TP/BH2:				
1.1-2.1m	Cupressaceae spp.	1	4 mm	Moderate
2.1-3m	Cupressaceae spp.	2	1.5 mm	Moderate
3-3.2m	Cupressaceae spp.	3	<1 mm	Moderate

Comments:

- 1 - Plus 4 others also identified as Cupressaceae spp.
- 2 - Plus 3 others also identified as Cupressaceae spp.
- 3 - Plus 2 others also identified as Cupressaceae spp.

Cupressaceae spp. include Lawson cypress, western red cedar, Monterey cypress, Leyland cypress and junipers.

Signed: G S Turner

Unless we are otherwise instructed in writing, the above sample material will normally be disposed of 6 years after the date of this report.