Arboricultural Consultancy for Aviva

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	Mr & Mrs Rod & Barbara Pudduck	Address	ARB LAST REPORT - Jones House, Bradford-on-Avon, BA15 2EE		
Client	Subsidence Management Services	Contact	Ian Domigan	Claim No.	IFS-AVI-SUB-22-0100930
ES Ref	SA-250103	Consultant	Giles Mercer	Contact No.	0330 380 1036
Report Date	23/08/2022				

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 3 storey detached house. The property occupies a level site with no adverse topographical features.

We have been advised that the current damage is noted throughout the property where cracking indicates downwards movement.

3. Technical Reports

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

Soil Analysis	☑	Drain Report	☑	Foundation Detail	☑
Root Analysis	☑	Borehole Log	☑		

4. Action Plan

Mitigation	
Insured involved?	Yes
Local Authority involved?	No
Other third party Mitigation involved?	Yes
Recovery	
Is there a potential recovery action?	Yes

Treeworks	
Local Authority	Wiltshire Council
TPO / Conservation Area / Planning Protection Searches	Awaiting Searches from LA
Additional Comments	
Awaiting Further Instructions. 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 Subsidence Management Services are satisfied that damage is the result of clay shrinkage subsidence exacerbated by the indirect influence of vegetation.

We have therefore been instructed to advise on the causal vegetation and to deliver management proposals which will provide on-going and long-term stability allowing repairs to be undertaken.

The conditions necessary for clay shrinkage subsidence to occur have been established by site investigations (TP/BH2, TP/BH3 and TP/BH4 only.

Soils within TP/BH1 have been identified as composing 'Dry light brown SAND and GRAVEL and therefore non-shrinkable.

The footings of the subject property fall within the anticipated rooting distance of a substantial quantity of vegetation and roots have been recovered below the property (TP/BH1, TP/BH2, TP/BH3 & TP/BH4).

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 genera Acer spp., Cupressaceae spp., Fraxinus spp., Pomoideae gp. and Quercus spp.

Fraxinus spp. include common Ash.
Pomoideae gp includes Apple, Cotoneaster, Hawthorn, Pear, Pyracantha, Quince, Rowan, Snowy mespilus and Whitebeam.
Acer spp. are maples, including Sycamore, Norway Maple, and Japanese Maples.
Cupressaceae spp. include Lawson cypress, Western red cedar, Monterey cypress, Leyland cypress and Junipers.
Quercus spp. are Oaks (both deciduous and evergreen).

A CCTV (Closed Circuit Television) survey of the drainage system on the property was undertaken, the drainage layout mapped and a report prepared on the system structure, condition and functionality together with any recommendations for remedial works.

We note that drain investigations found no damage in the immediate vicinity of the area of damage.

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

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 the Cypress (T1), Oaks (TG1), Sycamore (T8) and Mixed Species Hedge (H1) given their position relative to the damage it is our opinion that the roots identified in TP/BH2, TP/BH3 and TP/BH4 will emanate from this vegetation.

With regards to the roots recovered within TP/BH1, given the variable nature of the soils on site, the extent of the movement / damage, and the size of the trees in question, the Ash trees (T3 & T4) and Apple (T6) are also judged to be rooting below the advised area of damage and therefore are also likely to be exerting a contributory influence.

Whilst not positively implicated by root analysis, the Sycamore (T5) and Cypress (T7) are also considered to retain a contributory influence, albeit in a limited / secondary capacity when compared to the primary causal vegetation.

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

Given the above and considering the advised mechanism of movement, 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 vegetation management as detailed by this report.

Please refer to Section 6 for management prescriptions.

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

Whilst we have given consideration to pruning as a means of mitigating the vegetative influence of the above, this has been discounted; pruning is generally ineffective and in the context of the current claim we consider the above vegetation too large and close for pruning to be viable.

Consequently, complete removal of T1, TG1, T3, T4, T6, T7 & T8 along with the management (to include partial removal) of H1 (as detailed) 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?	Yes
Would DNA profiling be of assistance in this case?	No

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
H1	Mixed Species Hedge: including Hawthorn, Ivy and Forsythia,	1	2.5	2.4	C - Insured	Maintain as detailed	Remove section of hedge to acheive 3.5m of clearance to the subject property; do not treat stumps due to translocation risk. Where such a risk exists, we advise that any emergent regrowth is removed annually. Maintain retained section(s) at broadly current dimensions by way of regular pruning.
T1	Cypress	1	5.6	2.2	C - Insured	Remove	Remove close to ground level.
T3	Ash	1	15	7.4	A - Third Party	Remove	Remove close to ground level and treat stump to inhibit regrowth.
T4	Ash	1	12	8.5	A - Third Party	Remove	Remove close to ground level and treat stump to inhibit regrowth.
T5	Sycamore	1	16	7.8	A - Third Party	Remove	Remove close to ground level and treat stump to inhibit regrowth.
T6	Apple	1	5	5.1	C - Insured	Remove	Remove close to ground level and treat stump to inhibit regrowth.
T7	Cypress	1	12	7.85	C - Insured	Remove	Remove close to ground level.
T8	Acer	1	13.5	5.2	C - Insured	Remove	Remove close to ground level and treat stump to inhibit regrowth.
TG1	Oak	3	21	16.5	A - Third Party	Maintain as detailed	Remove x3 trees close to ground level and treat stumps to inhibit regrowth
Age Cat: 1 = Younger than property; 2 = Similar age to the property; 3 = Significantly older than property							

* Estimated

6.2 Future Risk Recommendations

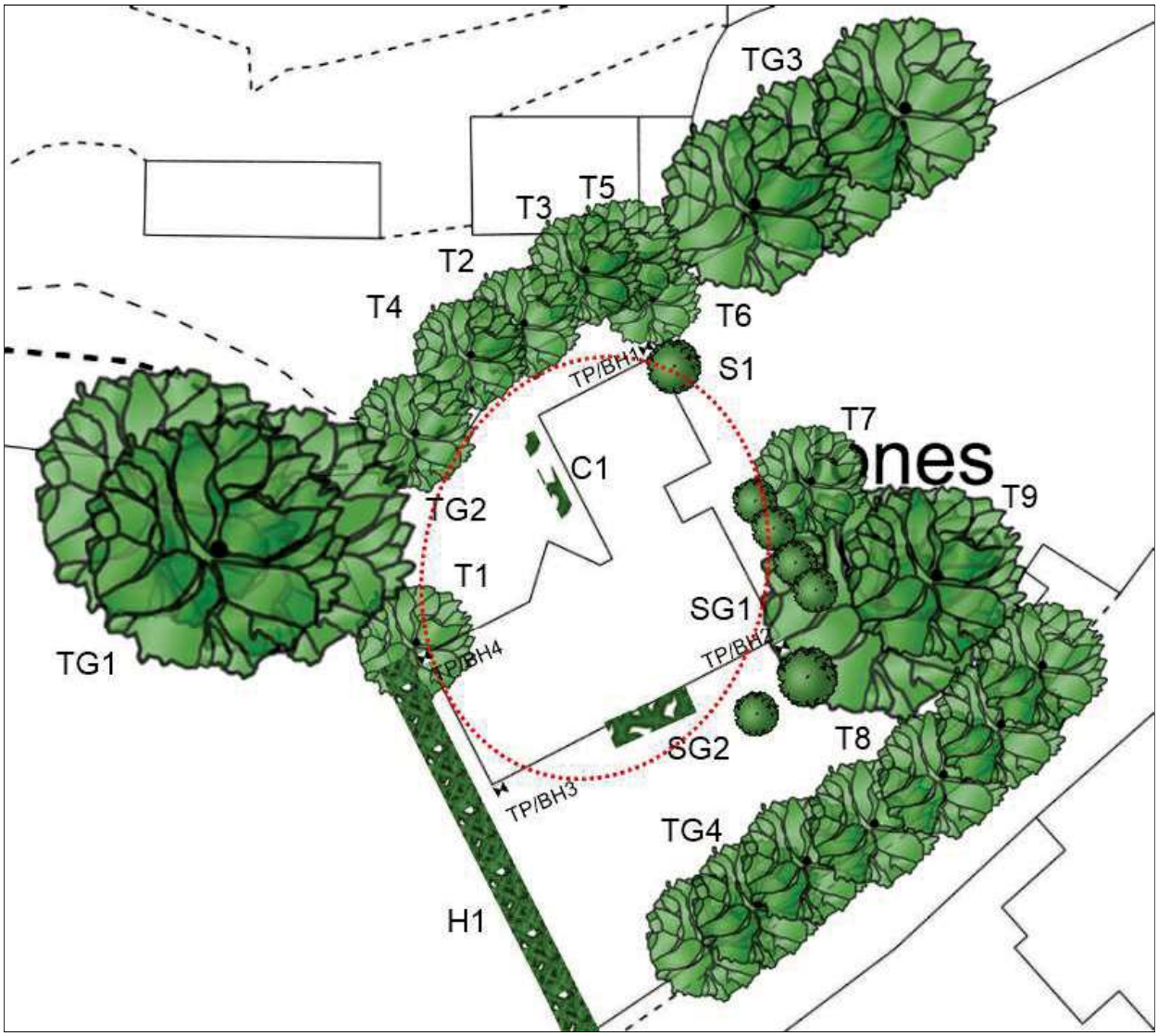
These recommendations may be subject to review following additional site investigations.

Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m) *	Ownership	Action	Requirement
C1	Vine	1	2.3	0.1	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
S1	Shrub	1	1.8	0.2	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
SG1	Mixed species shrubs: including fatsia, ivy, choisya, cotoneaster, laurel and hibiscus	1	3	1.5	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
SG2	Mixed species shrubs	1	2.6	0.2	C - Insured	Action to avoid future risk	Maintain at broadly current dimensions by way of regular pruning.
T2	Elm	1	9	6.5	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions by way of regular pruning.
T9	Birch	1	16	10	C - Insured	Action to avoid future risk	Maintain at, or below current dimensions by way of regular pruning.
TG2	Mixed Species Group: includes Sycamore, prunus and Field Maple.	1	8.25	6	A - Third Party	Action to avoid future risk	Clear back from fence by 2m and maintain remaining group at broadly current dimensions by way of regular pruning.
TG3	Sycamore	1	20	10	C - Insured	Action to avoid future risk	Crown reduce overall canopy by 30% (minimum) to achieve a crown volume reduction in line with BRE IP7/06. Maintain at reduced dimensions by re-pruning back to points of previous reduction on a 3 year (max) cycle. Group of 5-6 trees at top of steep slope.
TG4	Cypress	1	18	12.7	C - Insured	Action to avoid future risk	Crown reduce to a maximum height of 9m and thereafter maintain at broadly reduced dimensions through regular pruning (3-year max).
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

8. Photographs



H1 - Mixed species hedge



C1 - Vine



T2 - Elm



T3 - Ash



T3 - Ash



T5 - Sycamore



T7 - Cypress



T5 - Sycamore



T6 - Apple



S1 - Shrub



TG3 - Sycamore



T8 - Acer



T9 - Birch



T7 - Cypress



SG1 - Mixed species shrubs



TG4 - Cypress



SG2 - Mixed species shrubs



H1 - Mixed species hedge



T1 - Cypress



TG2 - Mixed species group



TG1 - Oak



TG1 - Oak

Date: 23/08/2022 Property: ARB LAST REPORT - Jones House, Bradford-on-Avon, BA15 2EE

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

Insured Property Tree Works	£2200.00
Third Party Tree Works	£5950.00
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.

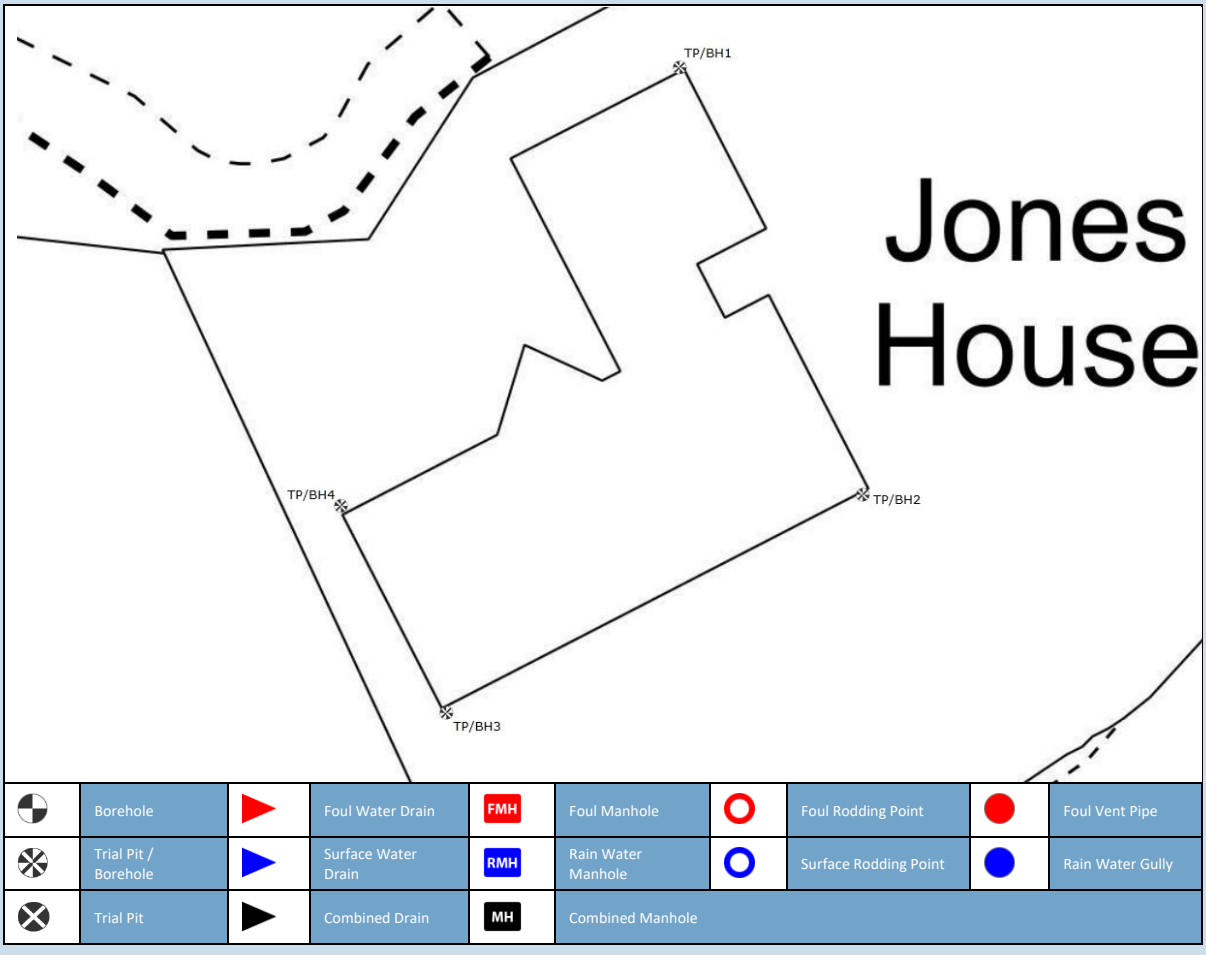
A legal Duty of Care requires that all works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried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

GEOTECHNICAL
for Subsidence Management Services

Jones House, Bradford-on-Avon, BA15 2EE

Client:	Subsidence Management Services
Client Contact:	Ian Domigan
Client Ref:	IFS-AVI-SUB-22-0100930
Policy Holder:	Mr and Mrs Rod and Barbara Pudduck
Report Date:	28 July 2022
Our Ref:	C64962G29253

Site Plan



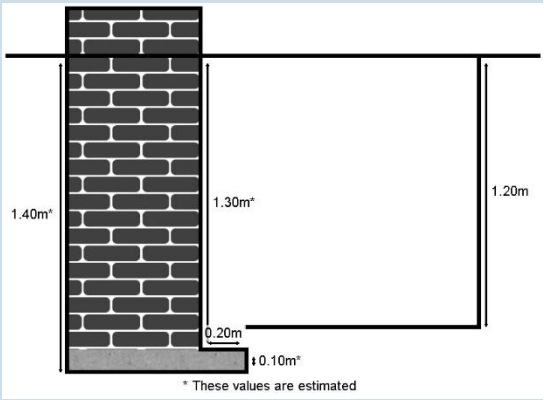
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Classification: General

TP/BH1 Foundation Detail and Borehole Log

Foundation Detail

House foundation comprised of brick wall to 1300mm bgl, bearing on concrete to an estimated depth of 1400mm bgl, with a total projection of 200mm from the elevation. Underside of foundation (USF) was estimated by pushing a probe, back from the face of the foundation, at an angle with no apparent contact with the face of the foundation beyond the estimated depth.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results	Legend	Stratum Description and Observations
						0	TOPSOIL.
							MADE GROUND: brown mottled grey gravelly CLAY with occasional fine to medium brick.
							...at 0.10m to 1.40m bgl numerous roots of live appearance encountered.
						0.5	
						1.0	
							Hard brown slightly clayey ROCK.
							...at 1.20m bgl base of hand excavated trial pit.
	D R	1.40 - 1.70 1.40 - 1.70	PEN	1.40	HP=5.0 (5.0,5.0,5.0,5.0,5.0)		...at 1.40m to 1.70m bgl numerous roots of live appearance encountered and sampled.
							...at 1.40m bgl ESTIMATED UNDERSIDE OF HOUSE FOUNDATION.
						1.5	
							...at 1.70m bgl unable to retrieve further sample due to rock preventing sample recovery.

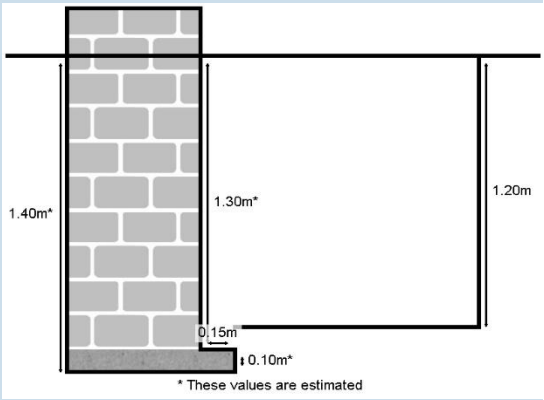
-- End of borehole at 1.70m --
PEN = Hand Penetrometer (kg/sq cm). Trial pit excavated to 1.20m bgl. Borehole completed by hand held percussive window sampler. Borehole completed by hand held percussive window sampler. Roots encountered to 1.70m bgl. Groundwater strikes not encountered.

SubsNetUK
Classification: General

TP/BH2 Foundation Detail and Borehole Log

Foundation Detail

House foundation comprised of blockwork wall to 1300mm bgl, bearing on concrete to an estimated depth of 1400mm bgl, with a total projection of 150mm from the elevation. Underside of foundation (USF) was estimated by pushing a probe back from the face of the foundation, at an angle with no apparent contact with the face of the foundation beyond the estimated depth.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results	Legend	Stratum Description and Observations
						0	PAVING SLAB.
							CONCRETE.
							MADE GROUND: brown mottled grey gravelly CLAY with numerous medium to coarse limestone and numerous fine to coarse brick.
						0.5	...at 0.10m to 1.40m bgl numerous roots of live appearance encountered.
						1.0	
	D R	1.40 - 1.90 1.40 - 2.40	PEN	1.40	HP=4.5 (4.5,4.5,4.5,4.5,4.5)		Stiff brown slightly sandy CLAY.
							...at 1.20m bgl base of hand excavated trial pit.
							...at 1.40m bgl ESTIMATED UNDERSIDE OF HOUSE FOUNDATION.
						1.5	...at 1.40m to 2.40m bgl numerous roots of live appearance encountered and sampled.
	D	1.90 - 2.40	PEN	1.90	HP=4.5 (4.5,4.5,4.5,4.5,4.5)	2.0	
	D R	2.40 - 2.90 2.40 - 2.90	PEN	2.40	HP=4.0 (4.0,4.0,4.0,4.0,4.0)		...at 2.40m to 2.90m bgl occasional roots of live appearance encountered and sampled.
						2.5	
	D	2.90 - 3.40	PEN	2.90	HP=5.0 (5.0,5.0,5.0,5.0,5.0)		Hard brown CLAY.
						3.0	...at 2.90m to 4.00m bgl no roots encountered. Extensive inspection of soil samples encountered no roots.
	D	3.40 - 4.00	PEN	3.40	HP=5.0 (5.0,5.0,5.0,5.0,5.0)	3.5	
							...at 4.00m bgl target depth achieved.
						4.0	

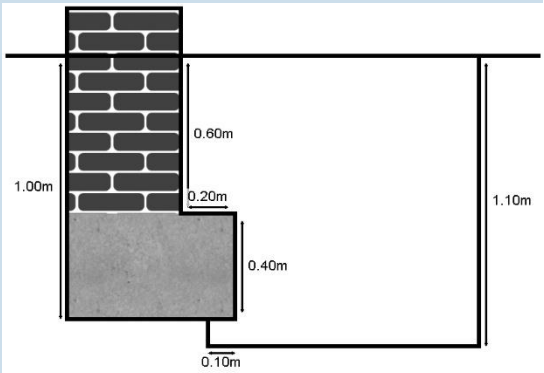
-- End of borehole at 4.00m --
PEN = Hand Penetrometer (kg/sq cm). Groundwater strikes not encountered. Trial pit excavated to 1.20m bgl. Borehole completed by hand held percussive window sampler. Borehole completed by hand held percussive window sampler. Roots encountered to 2.90m bgl.

SubsNetUK
Classification: General

TP/BH3 Foundation Detail and Borehole Log

Foundation Detail

Garage foundation comprised of brick wall to 600mm bgl, bearing on concrete to 1000mm bgl with a total projection of 200mm from the elevation. Underside of foundation (USF) was exposed to 100mm back from the face of the foundation and probed 450mm back from the face of the foundation.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results	Legend	Stratum Description and Observations
						0	Gravel.
							MADE GROUND: brown mottled grey gravelly CLAY with occasional fine to coarse brick.
							...at 0.10m to 1.00m bgl numerous roots of live appearance encountered.
						0.5	Hard brown CLAY.
	R D	1.00 - 2.00 1.00 - 1.50	PEN	1.00	HP=5.0 (5.0,5.0,5.0,5.0,5.0)	1.0	...at 1.00m bgl UNDERSIDE OF GARAGE FOUNDATION. ...at 1.00m to 2.00m bgl numerous roots of live appearance encountered and sampled. ...at 1.10m bgl base of hand excavated trial pit.
	D	1.50 - 2.00	PEN	1.50	HP=5.0 (5.0,5.0,5.0,5.0,5.0)	1.5	
	D	2.00 - 2.50	PEN	2.00	HP=5.0 (5.0,5.0,5.0,5.0,5.0)	2.0	...at 2.00m to 4.00m bgl no roots encountered. Extensive inspection of soil samples encountered no roots.
	D	2.50 - 3.00	PEN	2.50	HP=4.5 (4.5,4.5,4.5,4.5,4.5)	2.5	...at 2.50m bgl becoming stiff.
	D	3.00 - 3.50	PEN	3.00	HP=4.0 (4.0,4.0,4.0,4.0,4.0)	3.0	
	D	3.50 - 4.00	PEN	3.50	HP=4.0 (4.0,4.0,4.0,4.0,4.0)	3.5	
						4.0	...at 4.00m bgl target depth achieved.

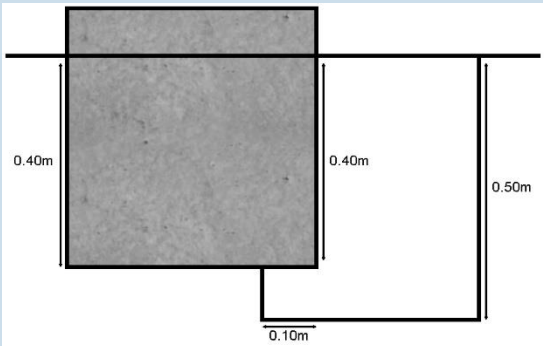
-- End of borehole at 4.00m --
PEN = Hand Penetrometer (kg/sq cm). Trial pit excavated to 1.10m bgl. Borehole completed by hand held percussive window sampler. Borehole completed by hand held percussive window sampler. Roots encountered to 2.00m bgl. Groundwater strikes not encountered.

SubsNetUK
Classification: General

TP/BH4 Foundation Detail and Borehole Log

Foundation Detail

Garage foundation comprised of a concrete slab to 400mm bgl with no projection from the elevation. Underside of slab (USS) was exposed to 100mm back from the exposed face of the slab and probed 450mm back from the exposed face of the slab.



WS	Samples Type	Samples Depth (m)	Tests Type	Tests Depth (m)	Tests Results
	D	0.40 - 0.90	PEN	0.40	HP=5.0 (5.0,5.0,5.0,5.0,5.0)
	R	0.40 - 1.40			
	D	0.90 - 1.40	PEN	0.90	HP=5.0 (5.0,5.0,5.0,5.0,5.0)
	D	1.40 - 1.90	PEN	1.40	HP=5.0 (5.0,5.0,5.0,5.0,5.0)
	R	1.40 - 1.90			
	D	1.90 - 2.40	PEN	1.90	HP=5.0 (5.0,5.0,5.0,5.0,5.0)
	D	2.40 - 2.60	PEN	2.40	HP=5.0 (5.0,5.0,5.0,5.0,5.0)

Legend

Stratum Description and Observations

0 Gravel.

MADE GROUND: brown mottled grey gravelly CLAY with occasional fine to coarse brick. Gravel is fine to coarse.

...at 0.10m to 0.40m bgl numerous roots of live appearance encountered.

0.5 Hard brown CLAY.

...at 0.40m bgl UNDERSIDE OF GARAGE FOUNDATION.

...at 0.40m to 1.40m bgl numerous roots of live appearance encountered and sampled.

...at 0.50m bgl base of hand excavated trial pit.

1.0

...at 1.40m to 1.90m bgl occasional roots of live appearance encountered and sampled.

1.5

...at 1.90m to 2.60m bgl no roots encountered. Extensive inspection of soil samples encountered no roots.

2.0

2.5

...at 2.60m bgl unable to retrieve further sample due to rock preventing sample recovery.

-- End of borehole at 2.60m --

PEN = Hand Penetrometer (kg/sq cm). Trial pit excavated to 0.50m bgl. Borehole completed by hand held percussive window sampler. Borehole completed by hand held percussive window sampler. Roots encountered to 1.90m bgl. Groundwater strikes not encountered.

SubsNetUK
Classification: General

Site Observations

GENERAL:
Site Investigation works undertaken on 15 July 2022 during dry weather (i.e. no rain).

HEALTH AND SAFETY:
Negative signal obtained in Power, Radio and Genny mode on the Cable Avoidance Tool (CAT) (TP/BH1, TP/BH 2, TP/BH 3 and TP/BH 4).

FOUNDATIONS:
At 1.40m bgl ESTIMATED UNDERSIDE OF HOUSE FOUNDATION in TP/BH1 and TP/BH 2.
At 1.00m bgl UNDERSIDE OF GARAGE FOUNDATION in TP/BH3.
At 0.40m bgl UNDERSIDE OF GARAGE FOUNDATION in TP/BH4.

BOREHOLE:
At 1.20m bgl base of hand excavated trial pit in TP/BH1. At 1.70m bgl unable to retrieve further sample due to rock preventing sample recovery in TP/BH1.
At 1.20m bgl base of hand excavated trial pit in TP/BH2. At 4.00m bgl target depth achieved in TP/BH2.
At 1.10m bgl base of hand excavated trial pit in TP/BH3. At 4.00m bgl target depth achieved in TP/BH3.
At 0.50m bgl base of hand excavated trial pit in TP/BH4. At 2.60m bgl unable to retrieve further sample due to rock preventing sample recovery in TP/BH4.

ROOTS:
At 0.10m to 1.40m bgl numerous roots of live appearance encountered in TP/BH1. At 1.40m to 1.70m bgl numerous roots of live appearance encountered and sampled in TP/BH1.
At 0.10m to 1.40m bgl numerous roots of live appearance encountered in TP/BH2. At 1.40m to 2.40m bgl numerous roots of live appearance encountered and sampled in TP/BH2. At 2.40m to 2.90m bgl occasional roots of live appearance encountered and sampled in TP/BH2. At 2.90m to 4.00m bgl no roots encountered. Extensive inspection of soil samples encountered no roots in TP/BH2.
At 0.10m to 1.00m bgl numerous roots of live appearance encountered in TP/BH3. At 1.00m to 2.00m bgl numerous roots of live appearance encountered and sampled in TP/BH3. At 2.00m to 4.00m bgl no roots encountered. Extensive inspection of soil samples encountered no roots in TP/BH3.
At 0.10m to 0.40m bgl numerous roots of live appearance encountered in TP/BH4. At 0.40m to 1.40m bgl numerous roots of live appearance encountered and sampled in TP/BH4. At 1.40m to 1.90m bgl occasional roots of live appearance encountered and sampled in TP/BH4. At 1.90m to 2.60m bgl no roots encountered. Extensive inspection of soil samples encountered no roots in TP/BH4.

INSITU TESTING:
Hand Penetrometer (PEN) undertaken at 1.40m bgl (TP/BH 1 & TP/BH 2) within the window sampler at maximum 0.50m intervals.
Hand Penetrometer (PEN) undertaken at 1.00m bgl (TP/BH 3) within the window sampler at maximum 0.50m intervals.
Hand Penetrometer (PEN) undertaken at 0.40m bgl (TP/BH 4) within the window sampler at maximum 0.50m intervals.

WATER STRIKES:
No water strikes (NWS) encountered.

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.

SubsNetUK
Classification: General

Environmental Services

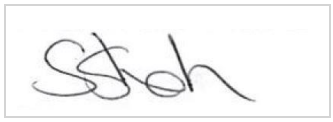
SOIL ANALYSIS

for Subsidence Management Services

Jones House, Bradford-on-Avon, BA15 2EE

Client:	Subsidence Management Services
Claim Number:	4501979544
Policy Holder:	Mr and Mrs Rod and Barbara Pudduck
Report Date:	25/07/2022
Our Ref:	L23036

Compiled By:

Name	Position	Signature
Saira Dougan	Laboratory Technician	

Checked By:

Name	Position	Signature
Bob Walker	Laboratory Manager	

Date samples received:	18-Jul-22
Water Content Test Date:	18-Jul-22
Atterberg Limits Test Date:	22-Jul-22
Oedometer Test Date:	20-Jul-22

UKAS TESTING

9265

Environmental Services

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. Sieve percentage reported in BOLD denote that the sample has been oven-dried prior to testing.
Unless otherwise specified herein, the one-point cone penetrometer method has been used with increasing water content. Atterberg results depicted in green have not been tested and are duplicates of the preceding sample, included for reference only.

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

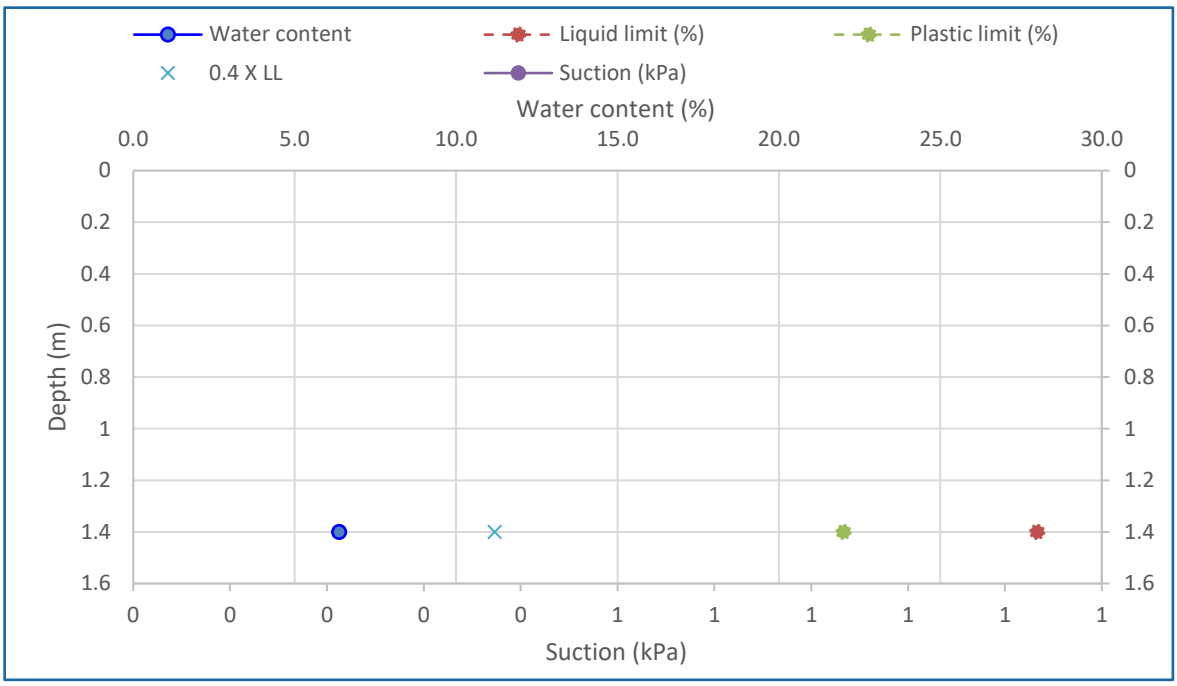
If you would like to provide feedback on this report or any laboratory services or performance, please complete the form below. All appropriate feedback will be used in the continual improvement of laboratory services.

Laboratory feedback form

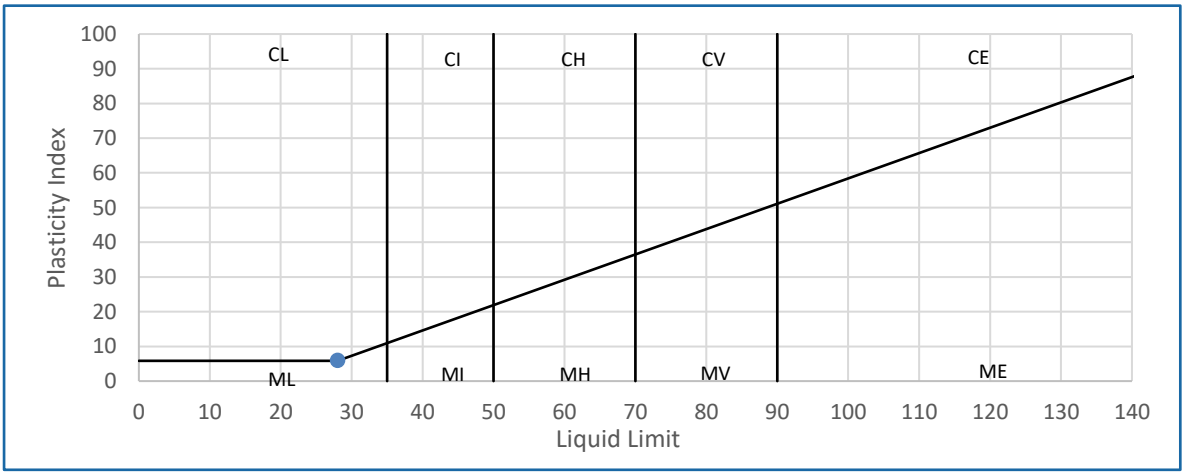
Environmental Services

Samples from BH1

Lab Ref	Depth (m)	WC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
1	1.4	6.4	28	22	6	37	2		Dry light brown SAND and GRAVEL . Gravel is fine, medium and coarse.



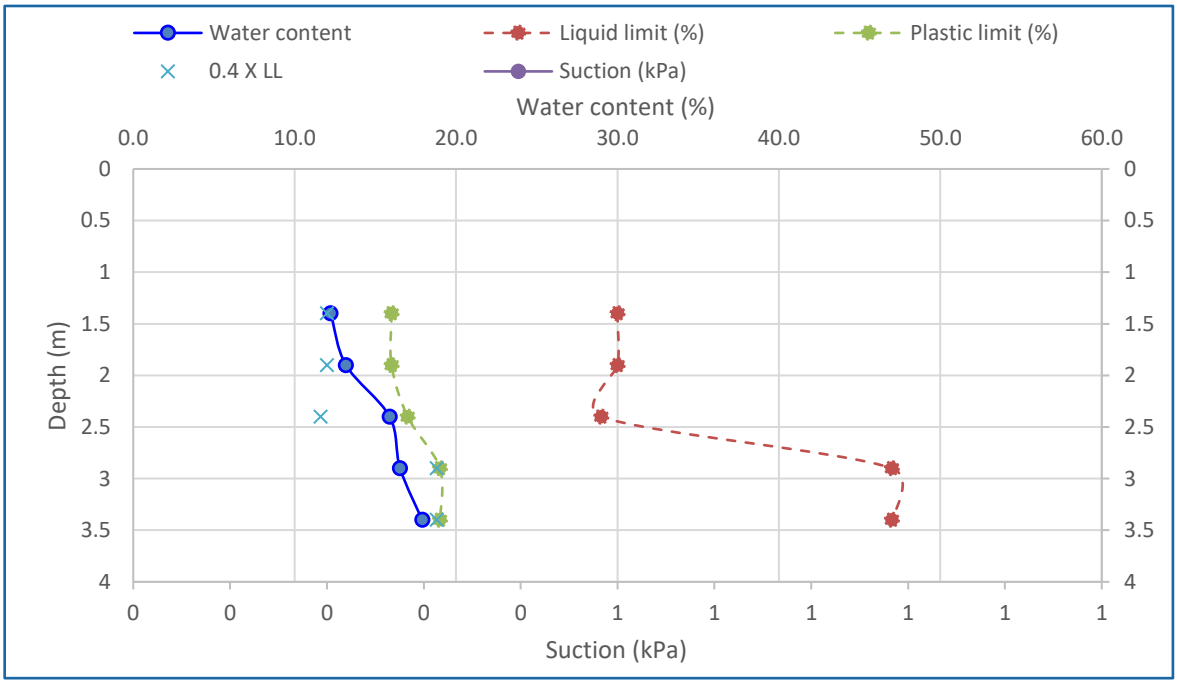
Plasticity Chart for Casagrande Classification



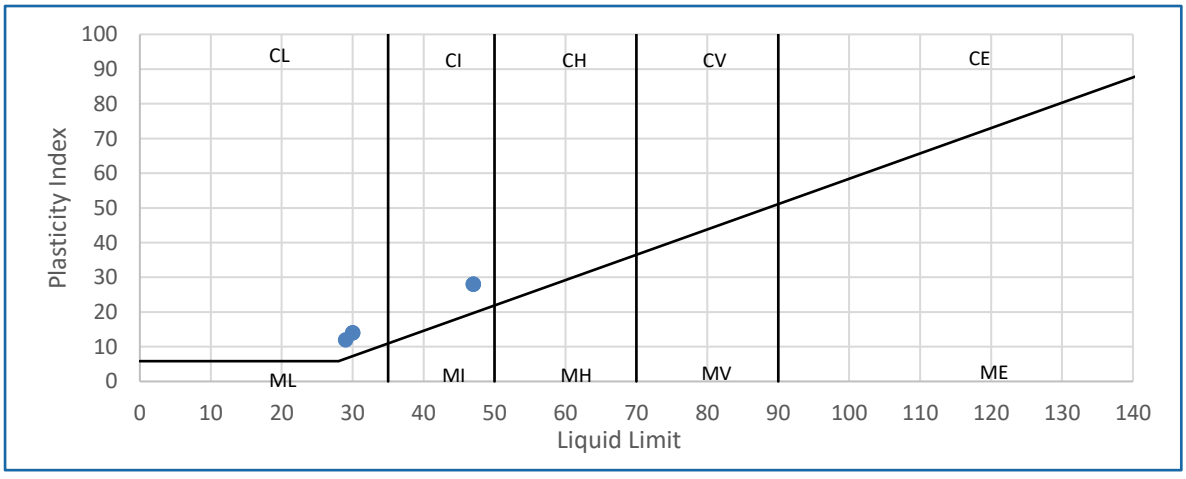
Environmental Services

Samples from BH2

Lab Ref	Depth (m)	WC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
2	1.4	12.2	30	16	14	97	14		Stiff brown sandy CLAY/SILT
3	1.9	13.2	30	16	14	97	14		Stiff brown sandy CLAY/SILT
4	2.4	15.9	29	17	12	97	12		Soft brown very sandy silty CLAY
5	2.9	16.5	47	19	28	95	27		Very stiff grey-brown silty CLAY
6	3.4	17.9	47	19	28	95	27		Very stiff grey-brown silty CLAY

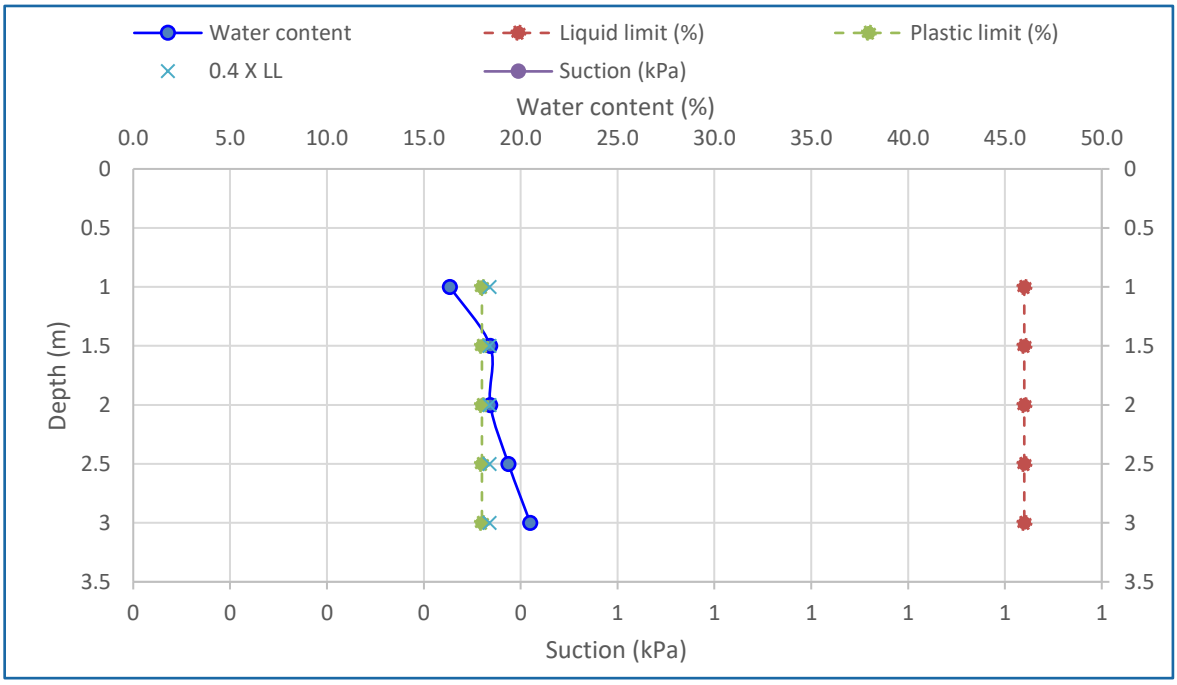


Plasticity Chart for Casagrande Classification

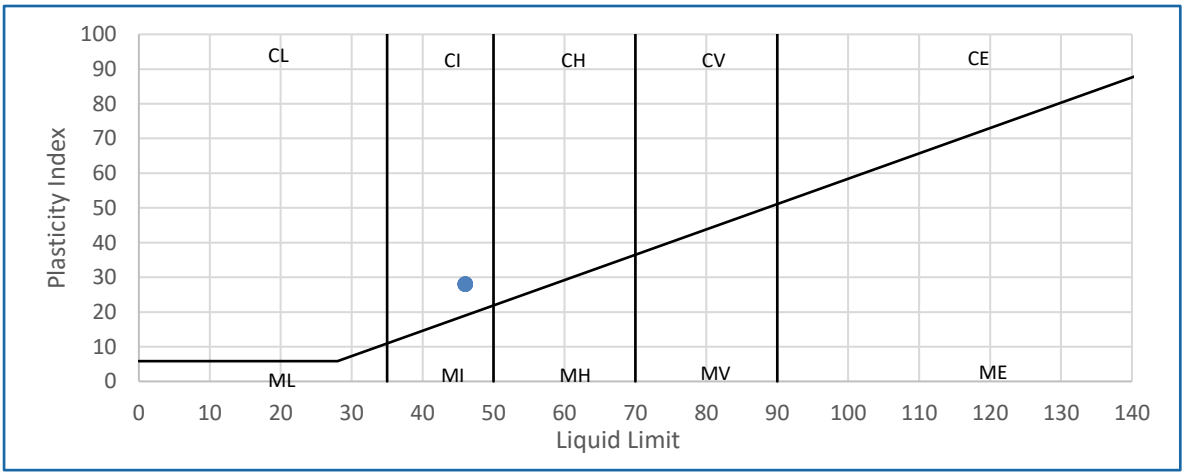


Samples from BH3

Lab Ref	Depth (m)	WC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
7	1	16.4	46	18	28	91	25		Very stiff grey-brown silty CLAY
8	1.5	18.4	46	18	28	91	25		Very stiff grey-brown silty CLAY
9	2	18.4	46	18	28	91	25		Very stiff grey-brown silty CLAY
10	2.5	19.4	46	18	28	91	25		Very stiff grey-brown silty CLAY
11	3	20.5	46	18	28	91	25		Very stiff grey-brown silty CLAY

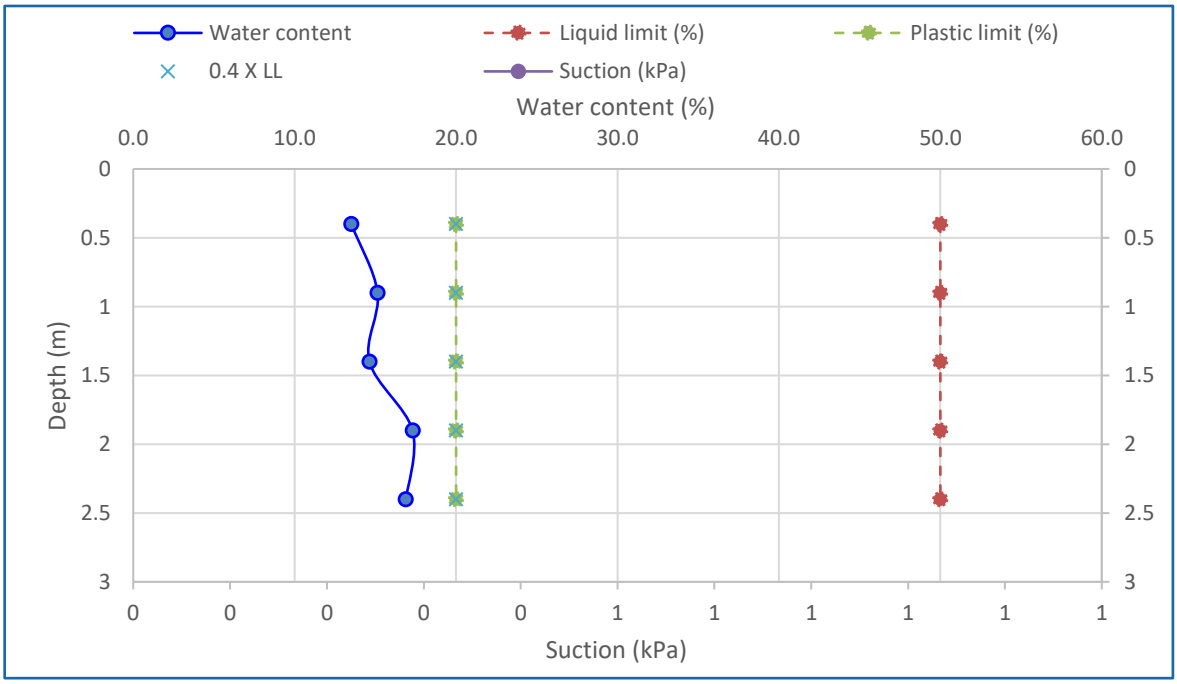


Plasticity Chart for Casagrande Classification

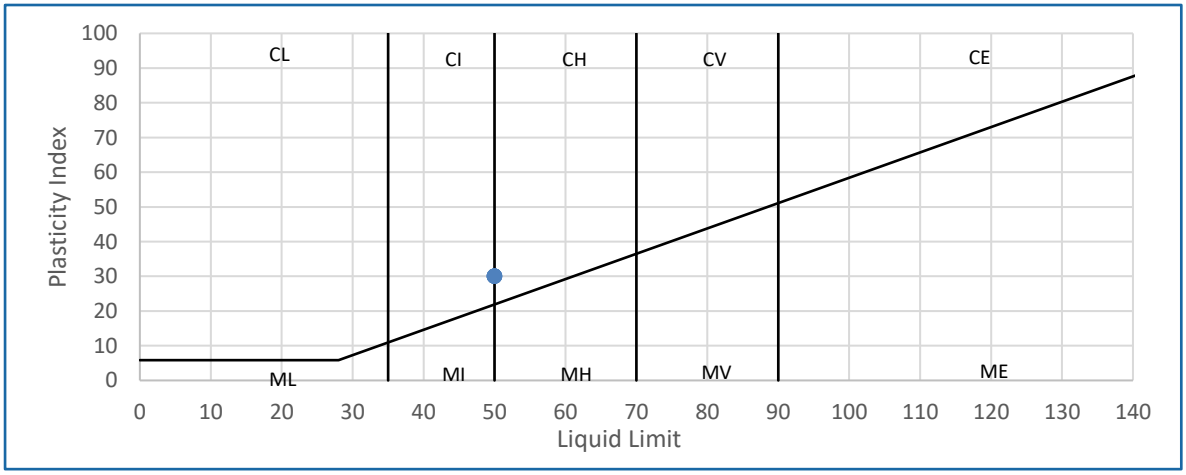


Samples from BH4

Lab Ref	Depth (m)	WC (%)	LL (%)	PL (%)	PI (%)	.425 mm(%)	mod. PI (%)	Av. Suc. (kPa)	Description
12	0.4	13.5	50	20	30	93	28		Very stiff grey-brown silty CLAY
13	0.9	15.1	50	20	30	93	28		Very stiff grey-brown silty CLAY
14	1.4	14.6	50	20	30	93	28		Very stiff grey-brown silty CLAY
15	1.9	17.3	50	20	30	93	28		Very stiff grey-brown silty CLAY
16	2.4	16.9	50	20	30	93	28		Very stiff grey-brown silty CLAY



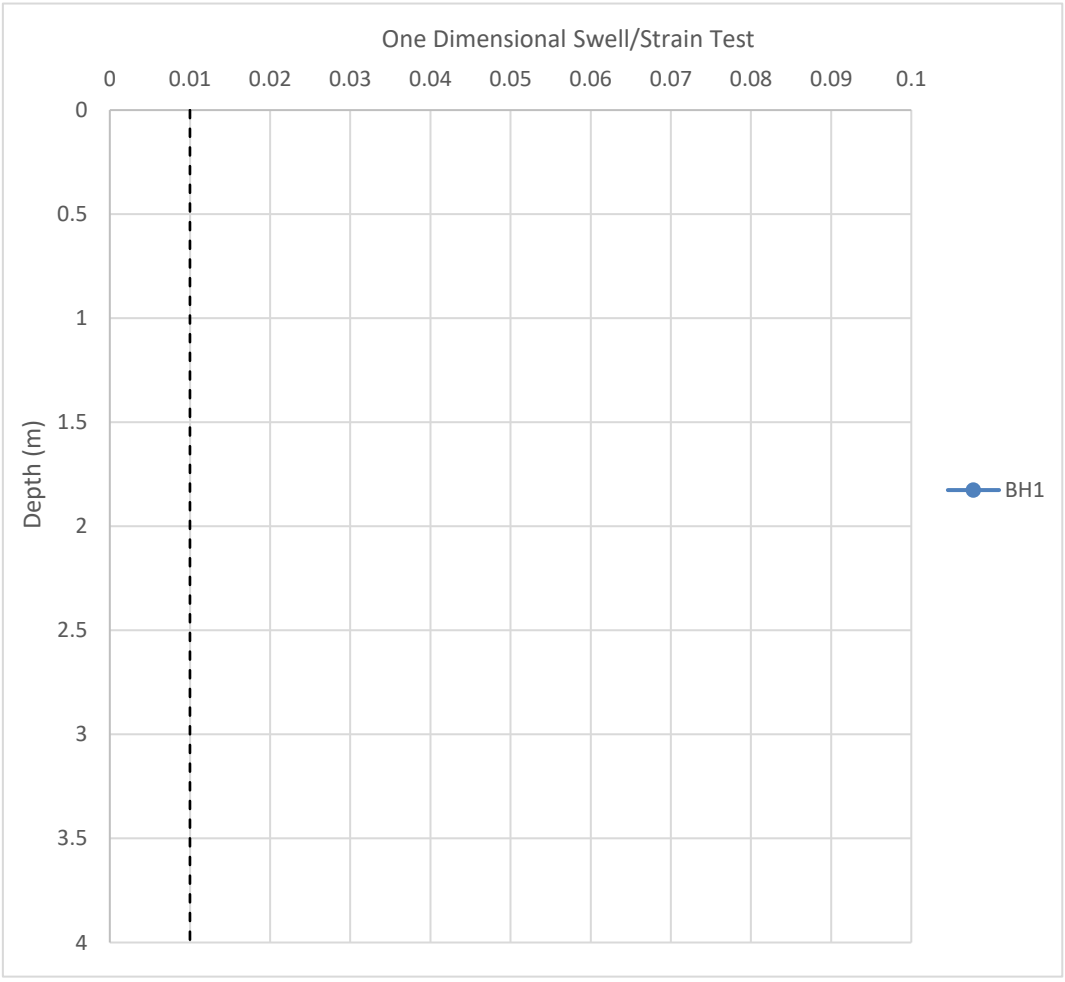
Plasticity Chart for Casagrande Classification



Summary of Oedometer Testing for BH1

Lab Ref	Depth (m)	Strain	Heave (mm)	Remarks
1	1.4			

BH 1 estimate of heave	0mm

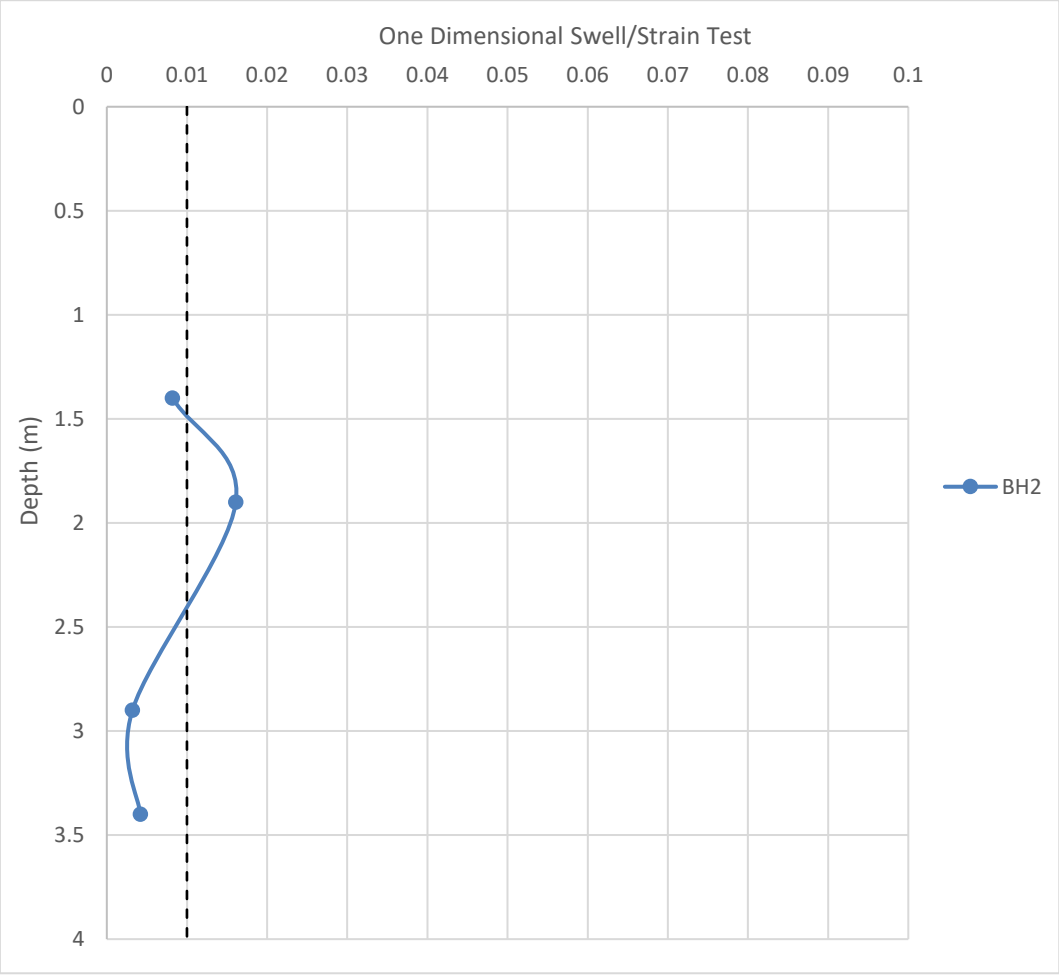


Summary of Oedometer Testing for BH2

Lab Ref	Depth (m)	Strain	Heave (mm)	Remarks

2	1.4	0.0082	0	
3	1.9	0.0161	4	
4	2.4			
5	2.9	0.0032	0	
6	3.4	0.0042	0	

BH 2 estimate of heave	4mm

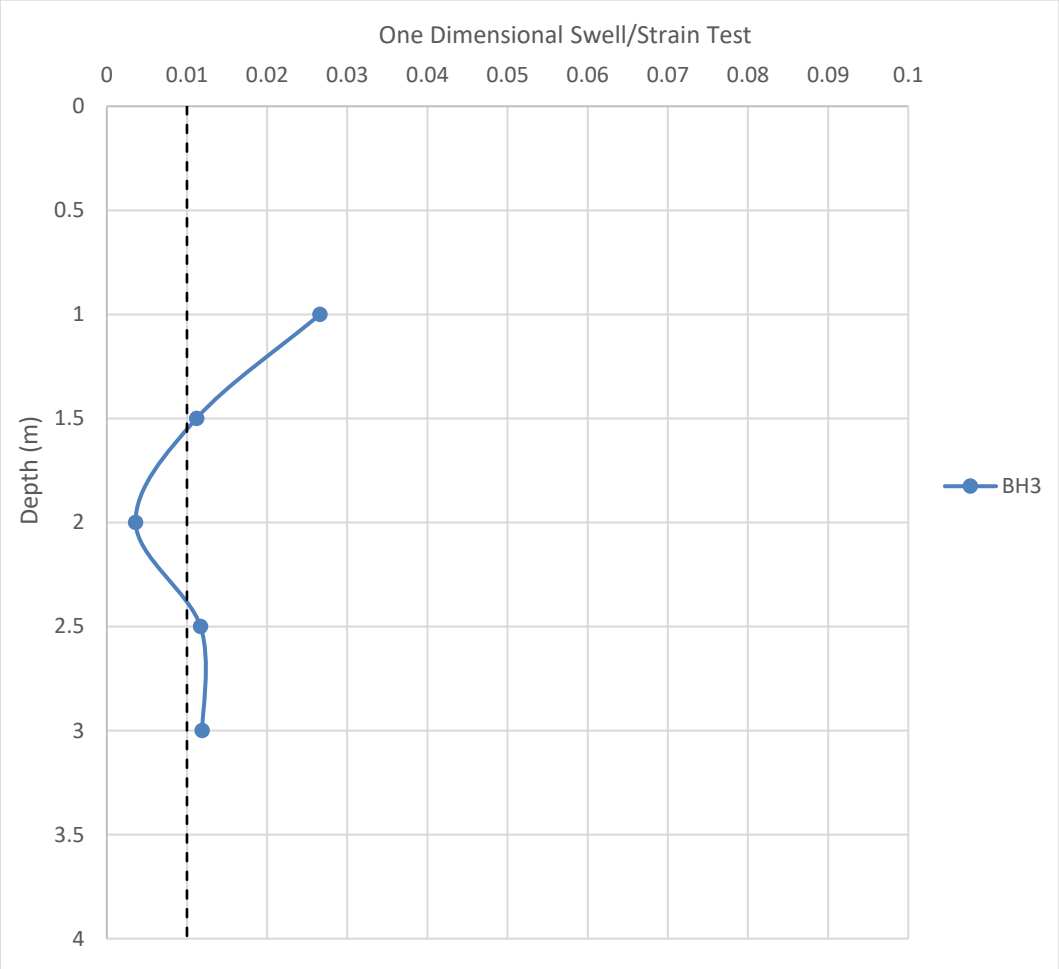


Summary of Oedometer Testing for BH3

Lab Ref	Depth (m)	Strain	Heave (mm)	Remarks
7	1	0.0266	13.3	
8	1.5	0.0112	2.8	

9	2	0.0036	0	
10	2.5	0.0117	2.9	
11	3	0.0119	3	

BH 3 estimate of heave	22mm

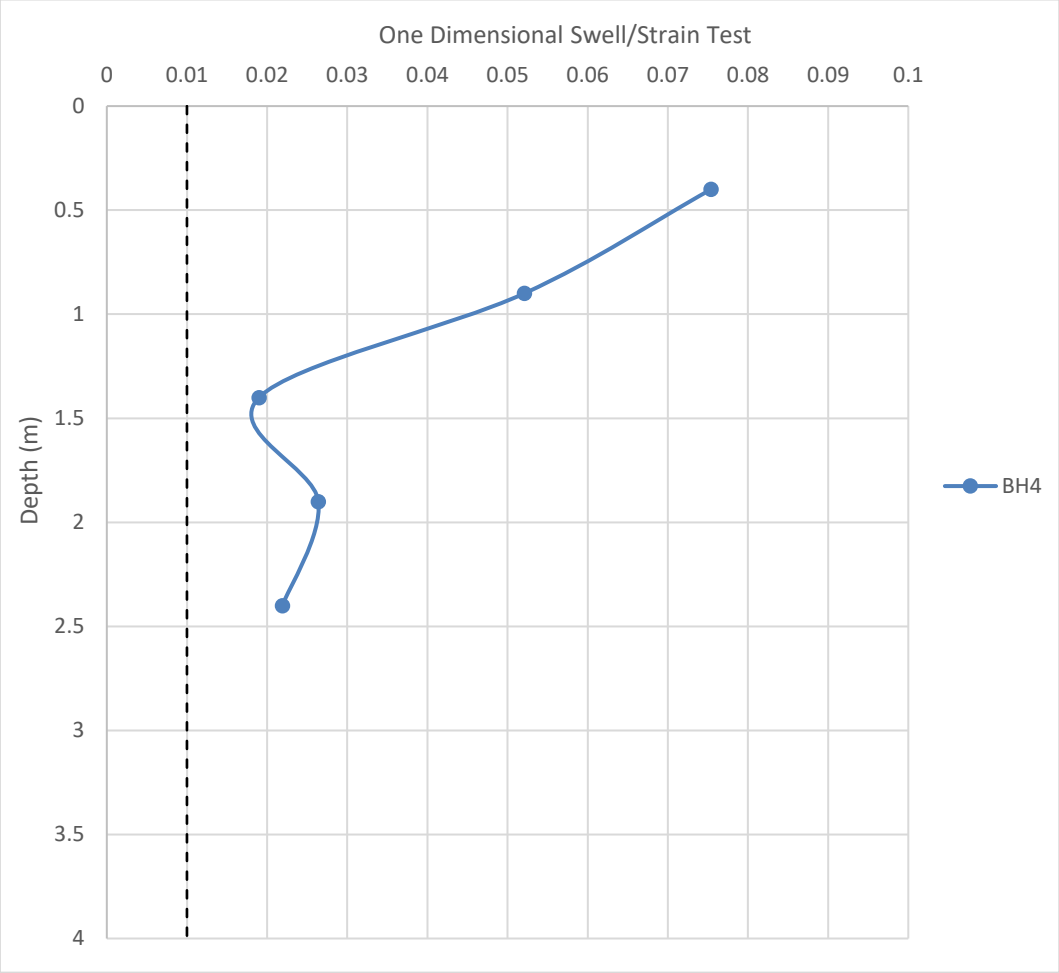


Summary of Oedometer Testing for BH4

Lab Ref	Depth (m)	Strain	Heave (mm)	Remarks
12	0.4	0.0754	15.1	
13	0.9	0.0521	13	
14	1.4	0.019	3.2	
15	1.9	0.0264	13.2	

16	2.4	0.0219	5.5	

BH 4 estimate of heave	50mm



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

Key

1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

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
H	Sample depth too shallow
X	Testing result too similar to above sample

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.

Environmental Services

ROOT IDENTIFICATION

for Subsidence Management Services

Jones House, Bradford-on-Avon, BA15 2EE

Client:	Subsidence Management Services
Client Contact:	Ian Domigan
Claim Number:	4501979544
Client Reference:	IFS-AVI-SUB-22-0100930
Policy Holder:	Mr and Mrs Rod and Barbara Pudduck
Report Date:	25 July 2022
Our Ref:	R45530

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

Sub Sample	Species Identified		Root Diameter	Starch
TP/BH1:				
1.4-1.7m	*Fraxinus* spp.	1	1 mm	Low
1.4-1.7m	Pomoideae gp.	2	<1 mm	Abundant
TP/BH2:				
1.4-2.4m	*Acer* spp.	3	2 mm	Abundant
2.4-2.9m	*Acer* spp.	4	2 mm	Abundant
TP/BH3:				
1-2m	Pomoideae gp.	5	1 mm	Abundant
TP/BH4:				
0.4-1.4m	Cupressaceae spp.	6	2 mm	Abundant
0.4-1.4m	*Quercus* spp.	7	2 mm	Abundant
1.4-1.9m	Cupressaceae spp.	8	1 mm	Moderate

Comments:

1 - Plus 1 other also identified as *Fraxinus* spp.
2 - Plus 1 other also identified as Pomoideae gp.
3 - Plus 3 others also identified as *Acer* spp.
4 - Plus 3 others also identified as *Acer* spp.
5 - Plus 3 others also identified as Pomoideae gp.
6 - Plus 1 other also identified as Cupressaceae spp.
7 - Plus 1 other also identified as *Quercus* spp.
8 - Plus 2 others also identified as Cupressaceae spp.

Fraxinus spp. include common ash.
Pomoideae gp include apple, cotoneaster, hawthorn, pear, pyracantha, quince, rowan, snowy mespil and whitebeam.
Acer spp. are maples, including sycamore, Norway maple, and Japanese maples.
Cupressaceae spp. include Lawson cypress, western red cedar, Monterey cypress, Leyland cypress and junipers.
Quercus spp. are oaks (both deciduous and evergreen).

Signed: R J Shaw

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

SubsNetUK

Drainage Investigation Report

For Subsidence Management Services

Client Mr & Mrs Pudduck

Risk Address: Jones House, Bradford-on-Avon, BA15 2EE

Visit Date: 21st July 2022

Client Reference: IFS-AVI-SUB-22-0100930

Our Reference: C64962 D22712

Report Date: 21st July 2022

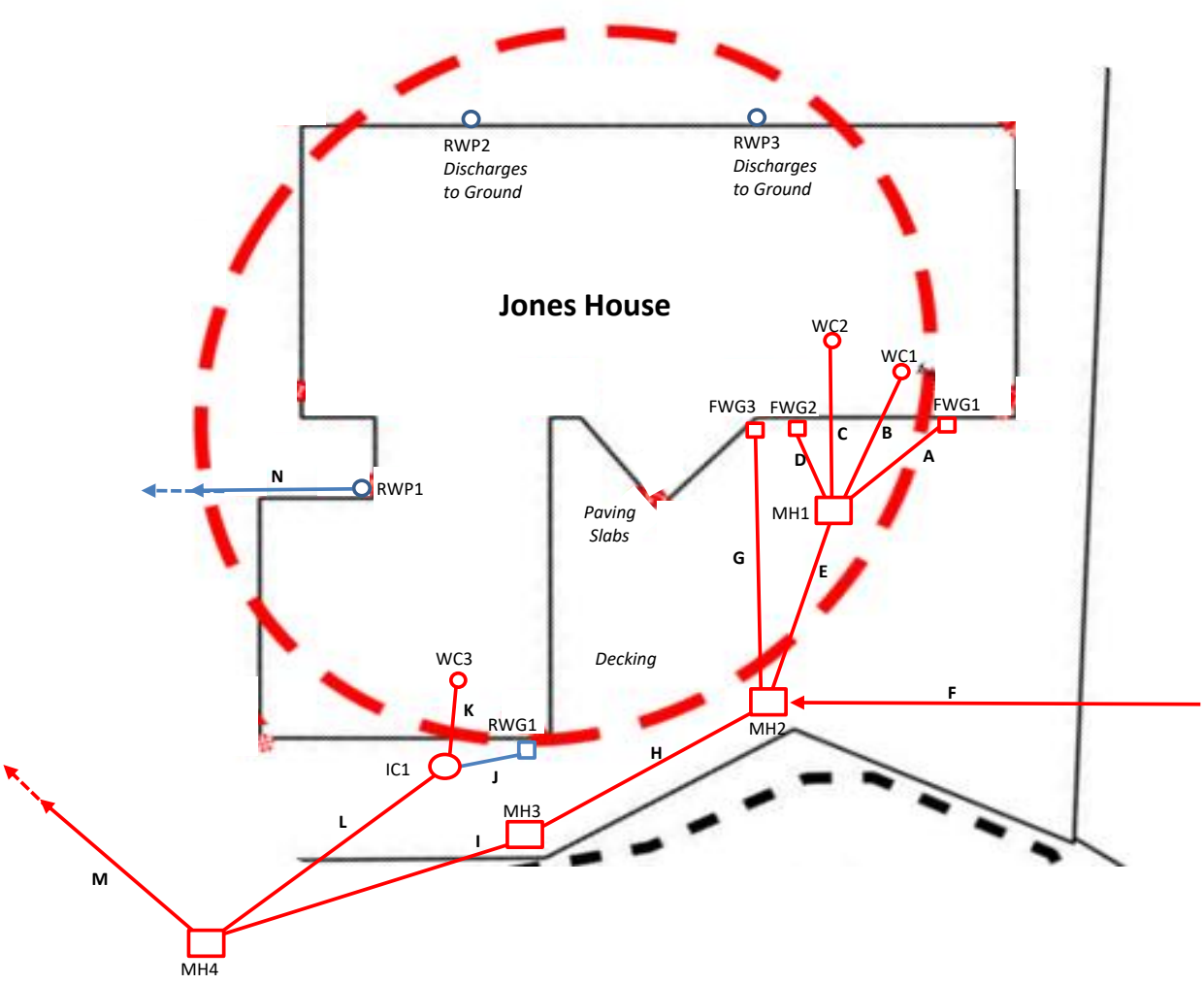
Report Content: Front Page
Site Plan
CCTV Coding
Drain Overview

SubsNetUK

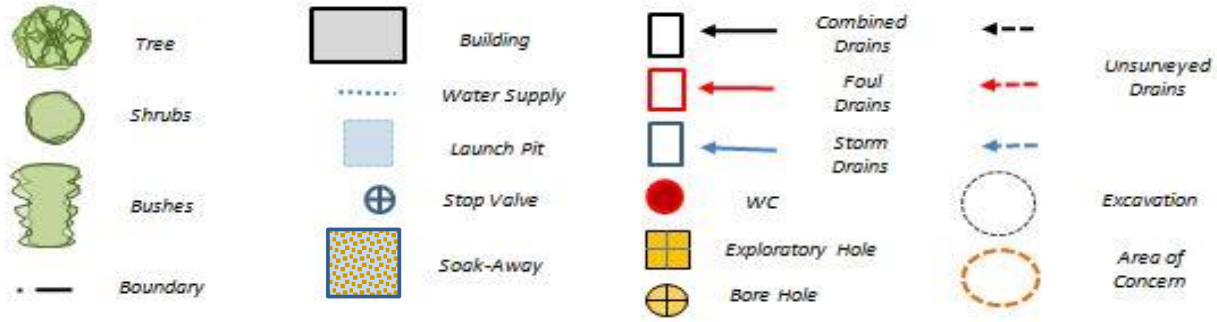
Site Plan

SubsNetUK

FRONT



Key



Notes:	
Address:	Jones House, Bradford-on-Avon, BA15 2EE

CCTV Survey

RUN	Start From :	FWG1	Finish at :	MH1	Pipe Ø:	100mm
A	Invert Level (m):	N/a	Invert Level (m):	N/a	Material:	Plastic
FOUL	Condition grade:	A	Direction:	Downstream	Responsibility:	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from FWG1				
0.00	WL	Water Level 0%				
2.10	FN	Finish Node at MH1				
RUN	**Start From :**	WC1	**Finish at :**	MH1	**Pipe Ø:**	100mm
B	**Invert Level (m):**	N/a	**Invert Level (m):**	N/a	**Material:**	Plastic
FOUL	**Condition grade:**	A	**Direction:**	Downstream	**Responsibility:**	Home Owner
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from WC1				
0.00	WL	Water Level 0%				
2.00	FN	Finish Node at MH1				
RUN	**Start From :**	WC2	**Finish at :**	MH1	**Pipe Ø:**	100mm
C	**Invert Level (m):**	N/a	**Invert Level (m):**	N/a	**Material:**	Plastic
FOUL	**Condition grade:**	A	**Direction:**	Downstream	**Responsibility:**	Home Owner
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from WC2				
0.00	WL	Water Level 0%				
1.00	FN	Finish Node at MH1				
RUN	**Start From :**	FWG2	**Finish at :**	MH1	**Pipe Ø:**	100mm
D	**Invert Level (m):**	N/a	**Invert Level (m):**	N/a	**Material:**	Plastic
FOUL	**Condition grade:**	A	**Direction:**	Downstream	**Responsibility:**	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from FWG2				
0.00	WL	Water Level 0%				
0.40	FN	Finish Node at MH1				
RUN	**Start From :**	MH1	**Finish at :**	MH2	**Pipe Ø:**	100mm
E	**Invert Level (m):**	0.4	**Invert Level (m):**	N/a	**Material:**	Plastic
FOUL	**Condition grade:**	A	**Direction:**	Downstream	**Responsibility:**	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from MH1				
0.00	WL	Water Level 0%				
2.10	LR	Line of drain deviates right °				
2.70	FN	Finish Node at MH2				
RUN	**Start From :**	MH2	**Finish at :**	Upstream Node	**Pipe Ø:**	100mm
F	**Invert Level (m):**	0.7	**Invert Level (m):**	N/a	**Material:**	Clay
FOUL	**Condition grade:**	A	**Direction:**	Upstream	**Responsibility:**	3rd Party
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from MH2				
0.00	WL	Water Level 0%				
8.70	FN	Finish Node - Beyond Area of Concern				

Address: Jones House, Bradford-on-Avon, BA15 2EE

CCTV Survey

RUN	Start From :	FWG3	Finish at :	MH2	Pipe Ø:	100mm
G	Invert Level (m):	N/a	Invert Level (m):	N/a	Material:	Plastic
FOUL	Condition grade:	A	Direction:	Downstream	Responsibility:	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from FWG3				
0.00	WL	Water Level 0%				
2.80	FN	Finish Node at MH2				
RUN	**Start From :**	MH2	**Finish at :**	MH3	**Pipe Ø:**	100mm
H	Invert Level (m):	0.7	Invert Level (m):	N/a	Material:	Plastic
FOUL	Condition grade:	A	Direction:	Downstream	Responsibility:	Local Authority
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from MH2				
0.00	WL	Water Level 0%				
7.20	LR	Line of drain deviates right °				
7.70	FN	Finish Node at MH3				
RUN	**Start From :**	MH3	**Finish at :**	MH4	**Pipe Ø:**	100mm
I	Invert Level (m):	0.7	Invert Level (m):	N/a	Material:	Plastic
FOUL	Condition grade:	A	Direction:	Downstream	Responsibility:	Local Authority
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from MH3				
0.00	WL	Water Level 0%				
8.70	FN	Finish Node at MH4				
RUN	**Start From :**	RWG1	**Finish at :**	IC1	**Pipe Ø:**	100mm
J	Invert Level (m):	N/a	Invert Level (m):	N/a	Material:	Plastic
STORM	Condition grade:	A	Direction:	Downstream	Responsibility:	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from RWG1				
0.00	WL	Water Level 0%				
2.30	FN	Finish Node at IC1				
RUN	**Start From :**	WC3	**Finish at :**	IC1	**Pipe Ø:**	100mm
K	Invert Level (m):	N/a	Invert Level (m):	N/a	Material:	Plastic
FOUL	Condition grade:	A	Direction:	Downstream	Responsibility:	Home Owner
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from WC3				
0.00	WL	Water Level 0%				
0.40	FN	Finish Node at IC1				
RUN	**Start From :**	IC1	**Finish at :**	MH4	**Pipe Ø:**	100mm
L	Invert Level (m):	0.7	Invert Level (m):	N/a	Material:	Plastic
COMBINED	Condition grade:	A	Direction:	Downstream	Responsibility:	Home Owner
Distance	*Code*	*Hydraulic Test - Pass*				
0.00	SN	Start Node from IC1				
0.00	WL	Water Level 0%				
6.80	FN	Finish Node at MH4				

Address: Jones House, Bradford-on-Avon, BA15 2EE

CCTV Survey

RUN	Start From :	MH4	Finish at :	Downstream node	Pipe Ø:	100mm
M	Invert Level (m):	0.2	Invert Level (m):	N/a	Material:	Clay
COMBINED	Condition grade:	A	Direction:	Upstream	Responsibility:	Local Authority
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from MH4				
0.00	WL	Water Level 0%				
7.00	FN	Finish Node - Beyond Area of Concern				
RUN	**Start From :**	RWP1	**Finish at :**	Downstream node	**Pipe Ø:**	100mm
N	Invert Level (m):	N/a	Invert Level (m):	N/a	Material:	Clay
COMBINED	Condition grade:	A	Direction:	Upstream	Responsibility:	Local Authority
Distance	*Code*	*Hydraulic Test - Not Tested*				
0.00	SN	Start Node from RWP1				
0.00	WL	Water Level 0%				
6.00	FN	Finish Node - Beyond Area of Concern				

Address: Jones House, Bradford-on-Avon, BA15 2EE

SubsNetUK

Drainage Overview

SubsNetUK

Following the receipt of your instruction, we attended site to carry out a CCTV survey.

The CCTV survey was undertaken in general accordance with the Manual of Sewer Classification and the WRc Drain Repair Book.

All runs were cleaned by high pressure water jetting prior to the CCTV survey.

The following presents a summary of the findings with recommendations to repair and/ or return the drains to a serviceable state, where necessary.

Drain Run A: FWG1 Downstream to MH1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run B: WC1 Downstream to MH1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Not tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run C: WC2 Downstream to MH1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Not tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run D: FWG2 Downstream to MH1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run E: MH1 Downstream to MH2
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run F: MH2 to Upstream Node Point
Pipe Diameter: 100mm
Responsibility: 3rd Party
Hydraulic Pressure Test: Not Tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run G: FWG3 Downstream to MH2
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run H: MH2 Downstream to MH3
Pipe Diameter: 100mm
Responsibility: Local Water Authority
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run I: MH3 Downstream to MH4
Pipe Diameter: 100mm
Responsibility: Local Water Authority
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run J: RWG1 Downstream to IC1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run K: WC3 Downstream to IC1
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Not tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run L: IC1 Downstream to MH4
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Pass
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run M: MH4 to Downstream Node Point
Pipe Diameter: 100mm
Responsibility: Local Water Authority
Hydraulic Pressure Test: Not Tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Drain Run N: RWP1 to Downstream Node Point
Pipe Diameter: 100mm
Responsibility: Home Owner
Hydraulic Pressure Test: Not Tested
CCTV Survey Result: No structural damage
Recommended Repair:
No repairs have been recommended as the drain line was found to be free from defects.

Water Main Test	Result	Acoustic Test
	PASS	No noise could be heard which indicates that there is no leak