

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 Alan Carey	Address	53 Crescent Road, Tilehurst, Reading, RG31 5AH		
Client	Subsidence Management Services	Contact	Clive Surman	Claim No.	IFS-AVI-SUB-18-0080441
ES Ref	SA-244180	Consultant	Lewis Fraser	Contact No.	0330 380 1036
Report Date	21/06/2019				

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 single-storey extension to the rear. The property occupies a level site with no adverse topographical features.

Damage relates to the rear extension where cracking indicates downward movement. 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	☒	Drain Report	☒	Foundation Detail	☒
Root Analysis	☒	Borehole Log	☒	Engineers Report	☒
Monitoring	☒				

4. Action Plan

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

Treeworks	
Local Authority	Reading Borough Council
TPO / Conservation Area / Planning Protection Searches	Insured: TPO Adjacent & Adjoining properties: None
Additional Comments	
Awaiting Further Instructions.	

5. Technical Synopsis

This report is based upon our understanding at the time of visiting the property that Subsidence Management Services' engineers are satisfied that damage is due to clay shrinkage subsidence exacerbated by vegetation.

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

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

From our observations on site, the footings of the subject property fall within the anticipated rooting range of a quantity of vegetation located on/near the site, thereby indicating the potential for the observed damage to be the result of clay shrinkage subsidence exacerbated by the influence of vegetation.

Site Investigations revealed the presence of roots in TP/BH1 and TP/BH2 as having emanated from the genus *Liriodendron* spp. (Tulip Tree).

Our survey of the site identified T1 (Tulip Tree), given its position relative to the damage it is in our opinion that the roots identified within TP/BH1 and TP/BH2 will emanate from this vegetation.

In assessing the extent of damage, the potential drying influence of the vegetation on site and based on our site investigations, taking account of vegetation location, relative to the focal area of movement/ damage, it is our opinion that, T1 (Tulip Tree) is considered the dominant feature and accordingly we have identified it as the principal cause of the subsidence damage.

Considering engineers conclusions, results of site investigations and our observations on site, vegetation management is considered appropriate with a view to restoring stability.

Please refer to Section 6 for management prescriptions.

Vegetation management in the form of removal and appropriate stump treatment will help to promote the restoration of long-term stability to the insured property; pruning should not be considered as representing an effective or reliable long-term alternative solution given the size and proximity of the vegetation in this instance.

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 is simply too large and/or close for pruning to be effective.

Removal of T1 (Tulip Tree) will offer the most certain and reliable arboricultural solution likely to restore long-term stability.

Replacement planting is considered appropriate however 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.

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 of vegetation management required to restore and maintain long-term stability at this property is high and its impact 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.

Arboricultural Consultancy for Aviva

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
T1	Tulip Tree	2	18	7.6	C - Insured	Remove	Remove close to ground level and treat stump 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.

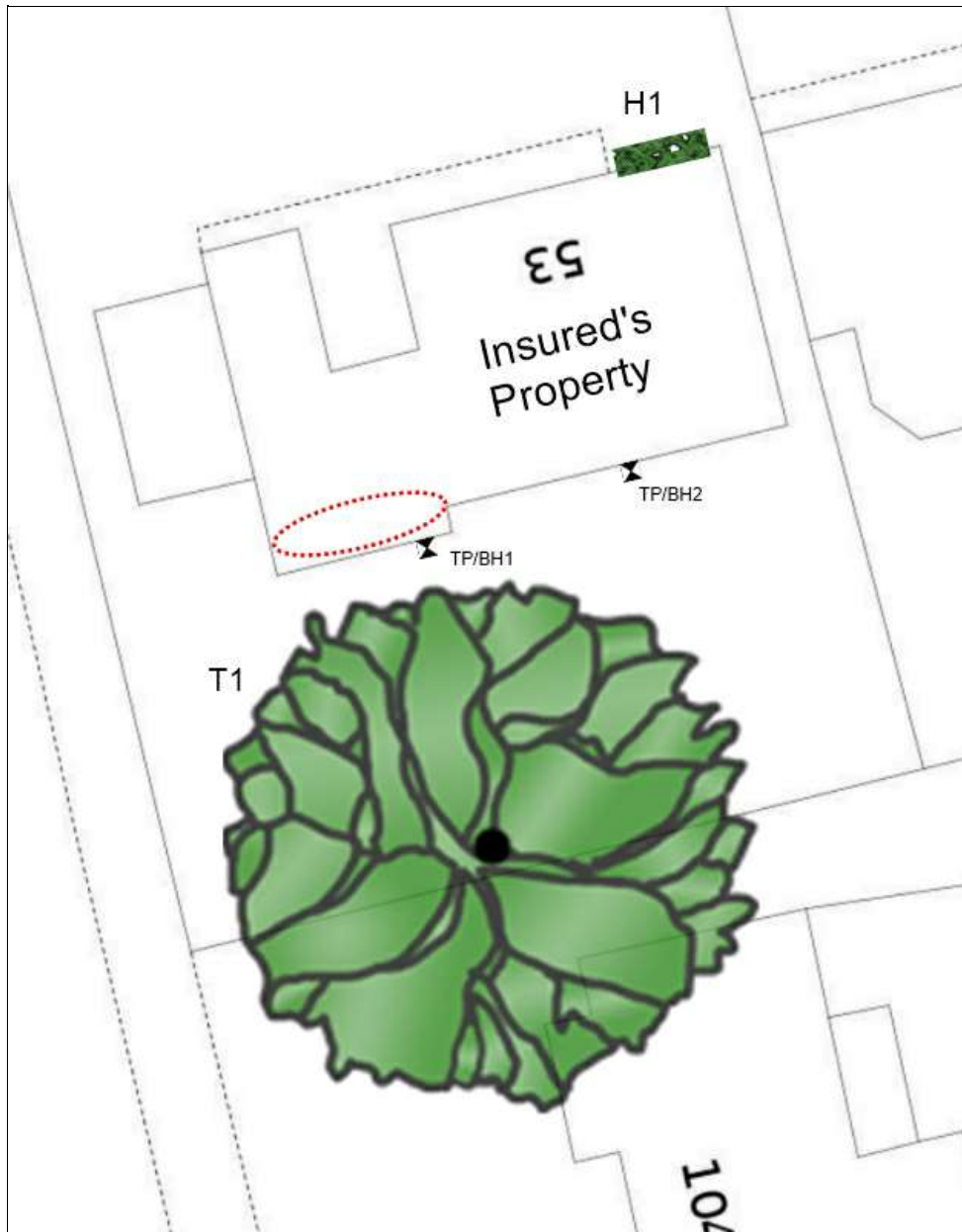
Tree No.	Species	Age Cat	Approx. Height (m)	Distance to Building (m) *	Ownership	Action	Requirement
H1	Jasmine	1	1.3	0.1	C - Insured	Action to avoid future risk	Do not allow to exceed current dimensions by way of regular pruning.

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



T1 - Tulip Tree



H1 - Jasmine

Arboricultural Consultancy for Aviva

Date: 21/06/2019

Property: 53 Crescent Road, Tilehurst, Reading, RG31 5AH

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

Insured Property Tree Works	£2500.00
Third Party Tree Works	£0.00
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".

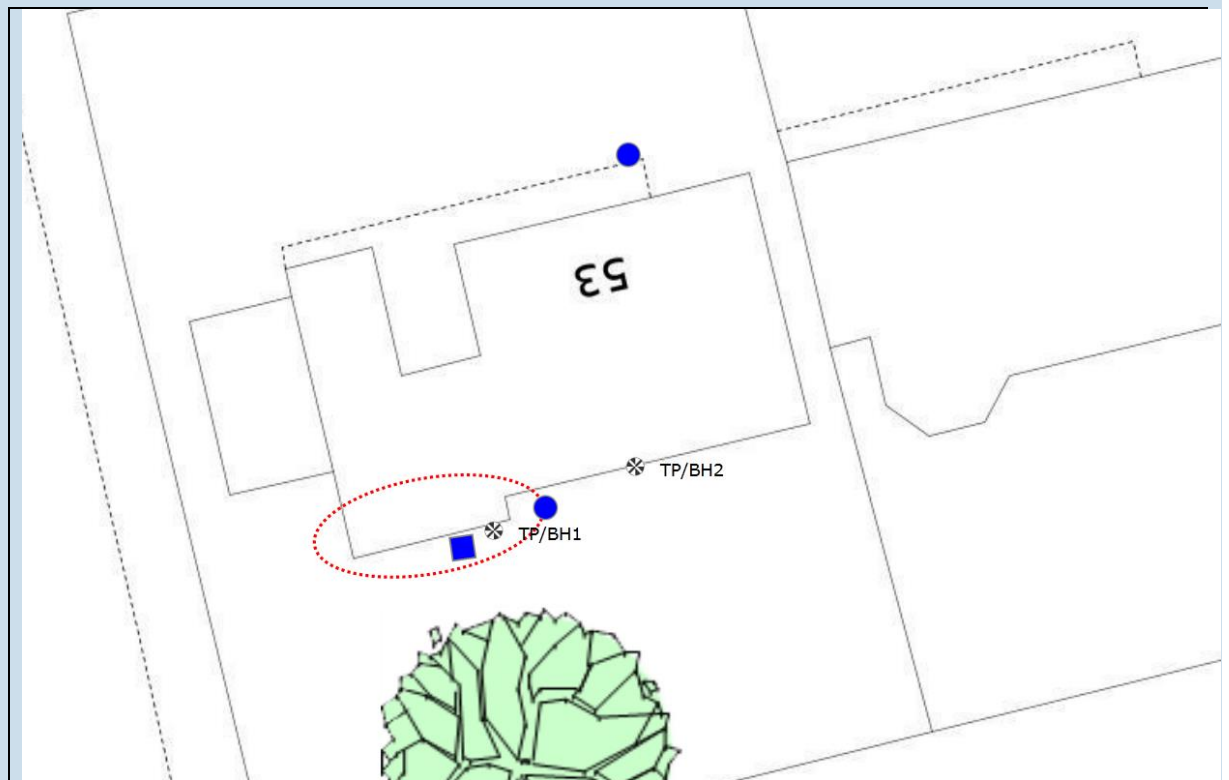
GEOTECHNICAL

for Subsidence Management Services

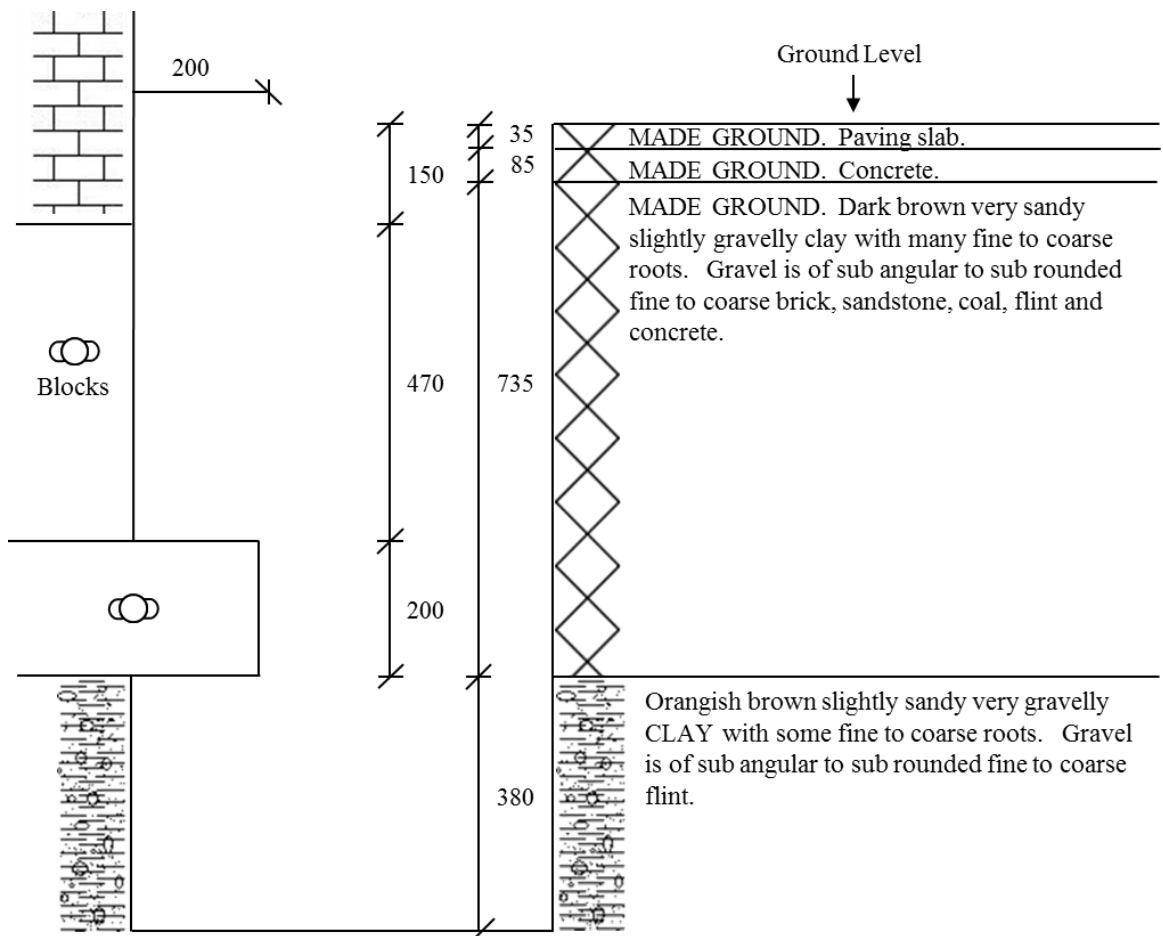
53 Crescent Road, Tilehurst, Reading, RG31 5AH

Client:	Subsidence Management Services
Client Contact:	R Taylor
Claim Number:	IFS-AVI-SUB-18-0080441
Policy Holder:	Carey
Report Date:	4 th April 2019
Our Ref:	HH/18/62733

Site Plan



TP/BH1 Foundation Detail



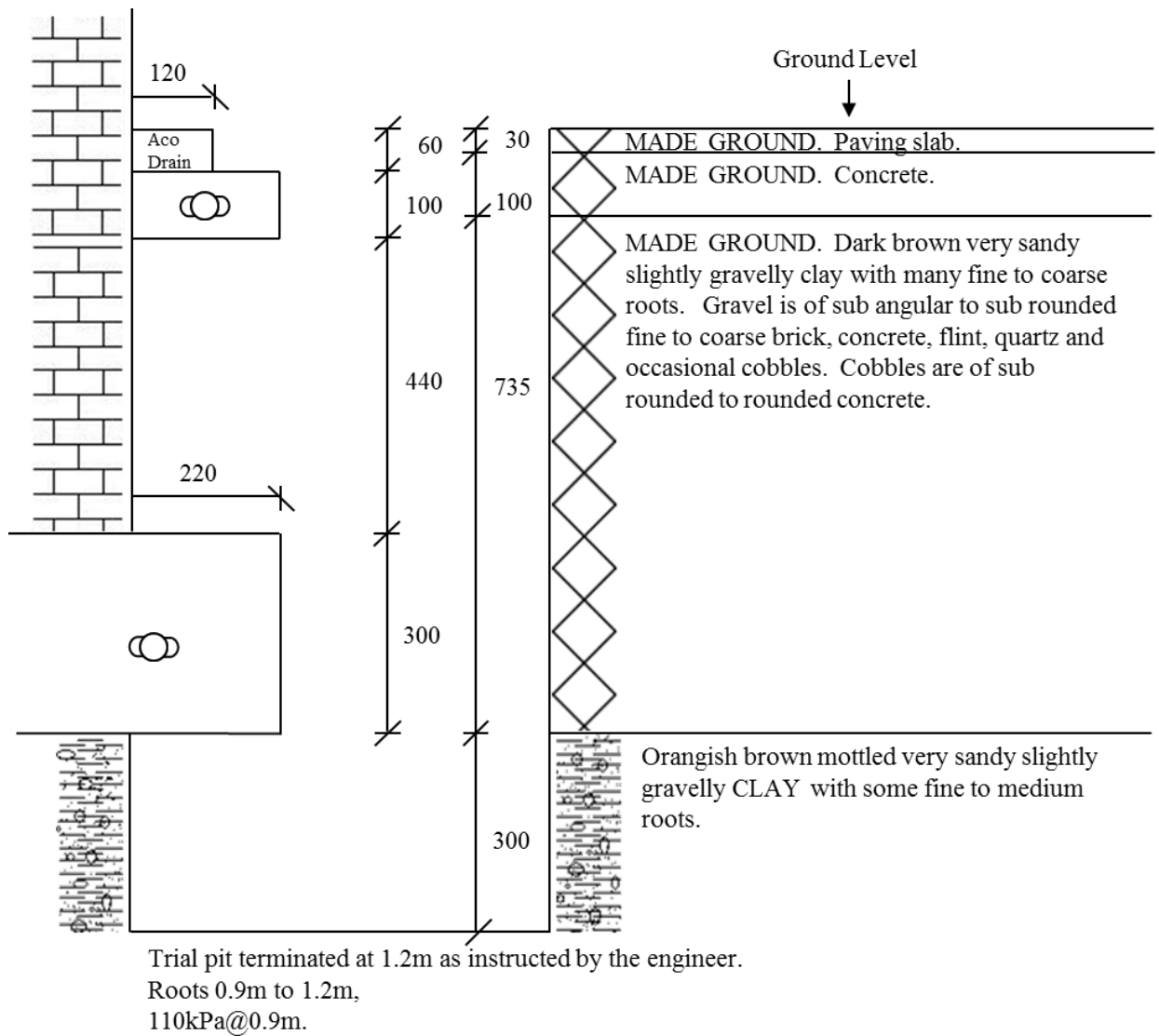
For strata information below 1.2m, please refer to borehole log TPBH1.

TP/BH1 Borehole Log

Location 53 Crescent Road, Tilehurst, Reading, RG31 5AH						BOREHOLE No TP/BH01					
Job No HH/18/62733		Date 22-03-19		Ground Level (m)		Co-Ordinates ()					
Client Environmental Services						Sheet 1 of 1					
SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		DESCRIPTION			
0.82-1.70 0.90	ROOTS B1					(1.20)	Trial pit. Base of foundation 0.82m.				
1.40	HVB2	136kPa@1.4m				1.20 (0.90)	Orangish brown slightly sandy very gravelly becoming more gravelly with depth CLAY with some fine to coarse roots. Gravel is of sub angular to sub rounded fine to coarse flint.				
1.90	HVB3	110kPa@1.9m				2.10 (0.90)	Orangish brown very sandy gravelly CLAY. Gravel is of sub angular to sub rounded fine to coarse flint.				
2.40	HVB4	98kPa@2.4m				3.00					
2.90	HVB5	100kPa@2.9m									
Boring Progress and Water Observations						Chiselling		Water Added		GENERAL REMARKS	
Date	Time	Depth	Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From		To
											Borehole terminated at 3.0m. Excavation remained open and dry on completion.

E BH 62733 GPJ AUGUST 768 GPJ 1/4/19

TP/BH2 Foundation Detail



SOIL ANALYSIS

for Subsidence Management Services

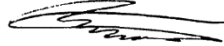
53 Crescent Road, Tilehurst, Reading, RG31 5AH

Client: Subsidence Management Services
Client Contact: Robbie Taylor
Claim Number: 18MHO047803
Policy Holder: Mr Alan Carey
Report Date: 28 May 2019
Our Ref: C15099S44473
Laboratory Ref: L16188

Compiled By:



Checked By:



Date samples received: 27 March 2019
Moisture Content Test Date: 16 April 2019
Atterberg Limits Test Date: 20 May 2019

Notes relating to soils testing

Unless otherwise stated, all soils testing was undertaken at Environmental Services' soils laboratory at unit 10H Maybrook Business Park, B76 1AL.

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 have been shortened to remove tertiary components for ease of reference.

Following the issue of this soil analysis report, samples will be retained for 1 month 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.

Natural Moisture 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

The Plastic Limit test and the determination of the Plasticity Index is undertaken in accordance with BS1377:Part 2:1990 Section 5

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

Note

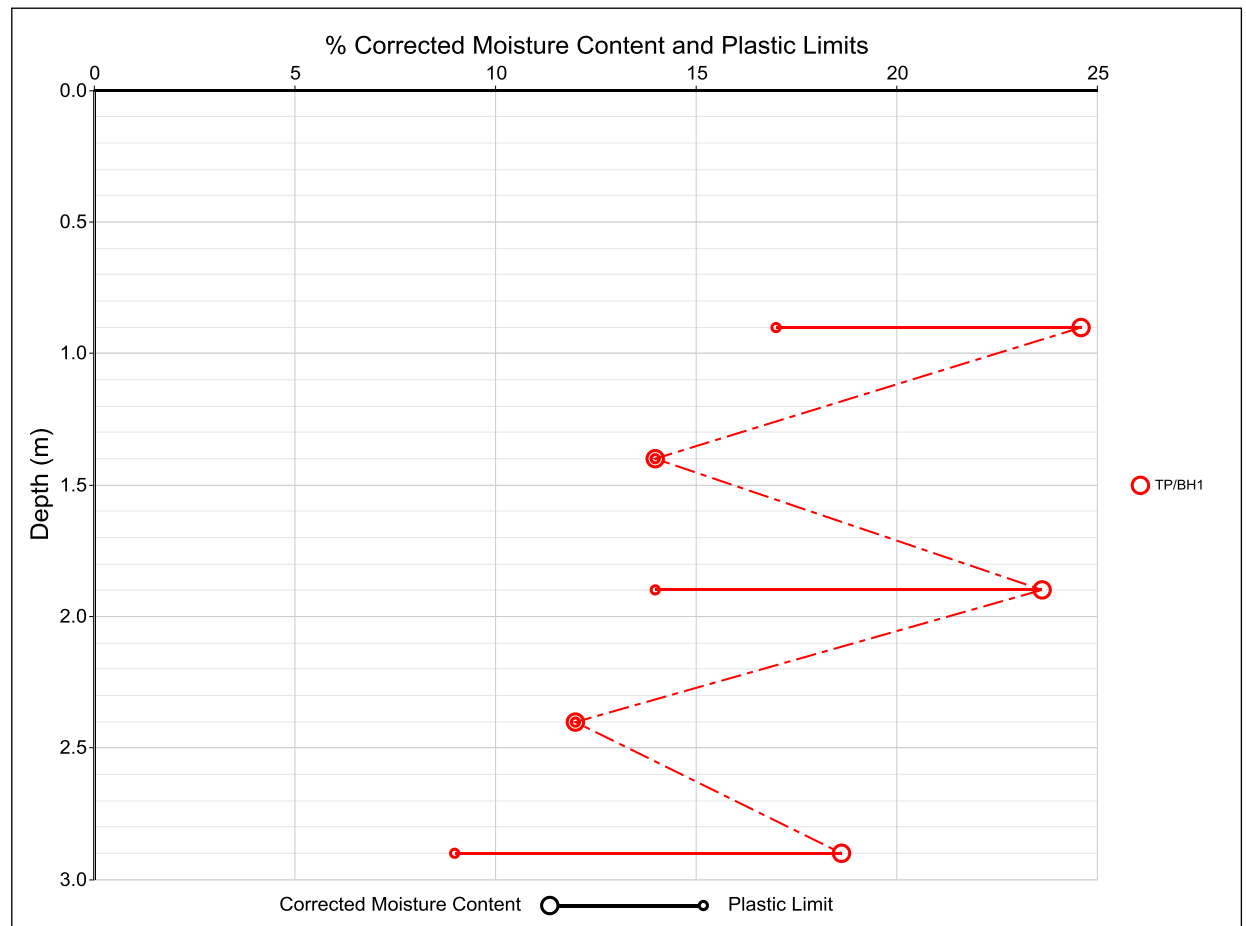
Where appropriate moisture contents have been corrected to demonstrate the equivalent moisture content following the sample being passed through a .425 mm sieve for comparison with the Liquid & Plastic Limit. Where this is not available, uncorrected moisture contents have been used in the graph on the following page.

Deviations to testing schedule:

All samples were scheduled for oedometer testing but all samples were too soft or gravelly for preparation and testing was abandoned

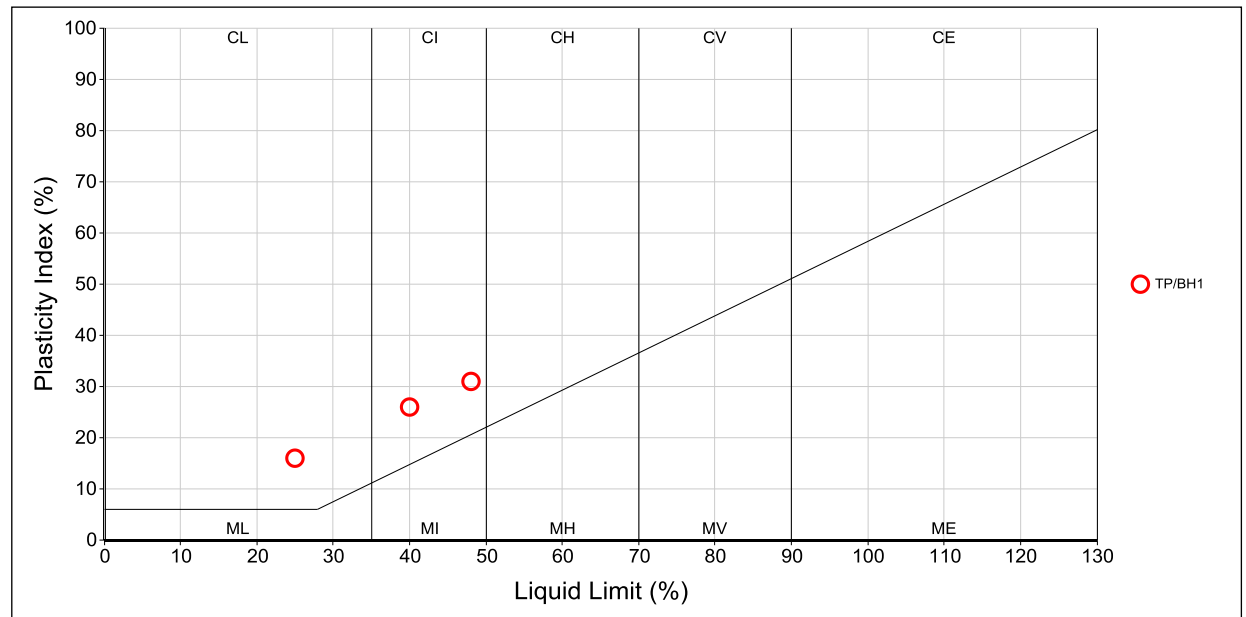
Lab Ref	Depth (m)	MC (%)	Corr MC (%)	LL (%)	PL (%)	PI (%)	% Passing .425mm
Samples from TP/BH1							
001	0.90	16	25	48	17	31	65
002	1.40	14					
003	1.90	13	24	40	14	26	55
004	2.40	12					
005	2.90	11	19	25	9	16	59

Corrected Moisture Content and Plastic Limits Graph



Lab Ref	Depth (m)	Description	BS:5930	NHBC Chapter 4.2
Samples from TP/BH1				
001	0.90	Soft to firm brown CLAY	CI	Medium
002	1.40	Soft to firm brown CLAY		
003	1.90	Soft to firm brown slightly gravelly slightly sandy slightly silty CLAY	CI	Medium
004	2.40	Soft to firm brown sandy slightly gravelly CLAY		
005	2.90	Soft to firm brown sandy gravelly CLAY.	CL	Low

Plasticity Chart for Casagrande Classification



References and Interpretation

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 BS5930:1999 "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

53 Crescent Road, Tilehurst, Reading, RG31 5AH

Client: Subsidence Management Services
Client Contact: Robbie Taylor
Claim Number: 18MHO047803
Client Reference: IFS-AVI-SUB-18-0080441
Policy Holder: Mr Alan Carey
Report Date: 9 April 2019
Our Ref: R26522



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

Sub Sample	Species Identified		Root Diameter	Starch
TP/BH1:				
0.82-1.7m	<i>Liriodendron</i> spp.	1	4 mm	Abundant
TP/BH2:				
0.4-1.2m	<i>Liriodendron</i> spp.	2	4 mm	Abundant

Comments:

- 1 - Plus 3 others also identified as *Liriodendron* spp.
- 2 - Plus 3 others also identified as *Liriodendron* spp.

Liriodendron spp. are tulip trees.

Signed: R J Shaw

Checked: M D Mitchell

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

Drainage Investigation Report

For Subsidence Management Services

Client Alan Carey

Risk Address: 53 Crescent Road, Reading, RG31 5AH

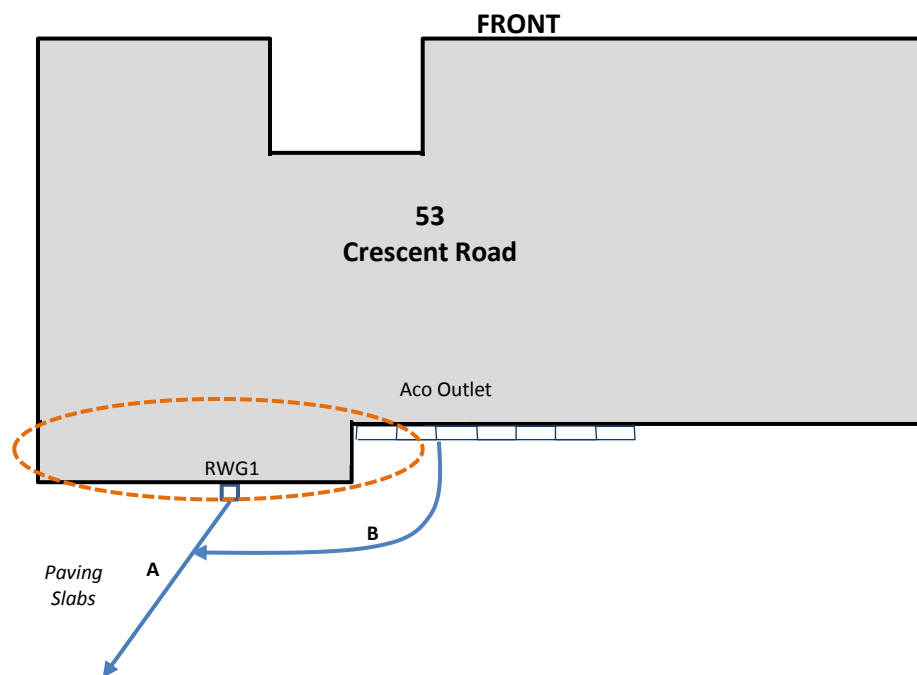
Visit Date: 21st December 2018

Client Reference: IFS-AVI-SUB-18-0080441

Our Reference: C44473 D15044

Report Date: 22nd January 2019

Report Content: Front Page
Site Plan
CCTV Coding
Drain Overview
Quote



Key

	Tree		Building		Combined Drains		Unsurveyed Drains
	Shrubs		Water Supply		Foul Drains		Storm Drains
	Bushes		Launch Pit		WC		Excavation
	Boundary		Stop Valve		Exploratory Hole		Area of Concern
			Soak-Away		Bore Hole		

Notes:

Address:

53 Crescent Road, Reading, RG31 5AH

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. It was noted that water drained satisfactorily into the soakaway from our jetting works.

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: RWG1 to Downstream Node Point

Pipe Diameter: 100mm

Responsibility: Home Owner

Hydraulic Pressure Test: Not Tested

CCTV Survey Result: Structural Damage

Recommended Repair:

To excavate and replace existing gully including 2.75m of pipework.

Survey from excavation within the area of concern and report on findings

Drain Run B: Aco Outlet Downstream to Run A

Pipe Diameter: 100mm

Responsibility: Home Owner

Hydraulic Pressure Test: Not Tested

CCTV Survey Result: Structural Damage

Recommended Repair:

Excavate and replace pipework from junction upstream for approx 0.5m to remove defect noted at 1.9m.

Works to be done in conjunction with Run A

NOTE: The re-instatement will be carried out on a like-for-like basis but where concrete or tarmac has been re-instated these surfaces will not match to the existing surface and will be seen as its new material.

RUN / LOCATION: RUN A

Repair Item	Description	Unit	Rate (£)	Quantity	Amount (£)
UK0010	Remove existing UPVC pipework in isolated lengths, refix with new 69mm UPVC pipework (incl. brackets).	nr	£14.25	1.00	£14.25
UK0015	Extra over for bends.	nr	£8.31	1.00	£8.31
UK0595	Gully, 225mm x 225mm. Remove existing and replace with new PVCu item. Bed, surround and backfill .	nr	£146.43	1.00	£146.43
UK0825	Excavate & remove pipework. Replace with new 110mm PVCu. Bed, surround & backfill. n.e. 1000mm	m	£81.39	3.00	£244.17
UK0880	Short Radius Bend. Remove existing item and replace with new 110mm PVCu.	nr	£14.89	2.00	£29.78
UK1060	Extra over pipework for surrounding drain run in 100mm thick concrete.	m	£14.40	1.00	£14.40
UK0025	Protection Temporary works to floors, 1000 gauge polythene.	m2	£1.79	6.00	£10.76
UK8120300	Hardcore Filling to excavations over 250 mm average thick.	m	£35.35	1.00	£35.35
UK2050005	Disposal by hand excavated contaminated/saturated material off site.	m3	£45.30	1.00	£45.30
UK1045	Removal, set aside and reinstatement of concrete slab paving n.e 100mm thick.	m2	£24.61	3.00	£73.82
	CCTV survey of underground drainage & report (where undertaken as part of other drainage works on	nr	£165.00	1.00	£165.00
Total (Excl VAT)					£787.58

RUN / LOCATION: RUN B

Repair Item	Description	Unit	Rate (£)	Quantity	Amount (£)
UK0660	Excavate & remove junction. Replace with new 110mm PVCu. Bed, surround & backfill. n.e. 1000mm	nr	£142.50	1.00	£142.50
UK0025	Protection Temporary works to floors, 1000 gauge polythene.	m2	£1.79	2.00	£3.59
UK8120300	Hardcore Filling to excavations over 250 mm average thick.	m	£35.35	1.00	£35.35
UK2050005	Disposal by hand excavated contaminated/saturated material off site.	m3	£45.30	1.00	£45.30
UK1045	Removal, set aside and reinstatement of concrete slab paving n.e 100mm thick.	m2	£24.61	1.00	£24.61
Total (Excl VAT)					£251.35

REPAIR ESTIMATE TOTALS:

Run / Location	Amount (£)
RUN A	£787.58
RUN B	£251.35
Total (Excl VAT)	£1,038.93

Address:

53 Crescent Road, Reading, RG31 5AH

LEVEL MONITORING

for Subsidence Management Services

53 Crescent Road, Tilehurst, Reading, RG31 5AH

Client:	Subsidence Management Services
Client Contact:	Robbie Taylor
Claim Number:	18MHO047803
Client Reference:	IFS-AVI-SUB-18-0080441
Policy Holder:	Mr Alan Carey
Report Date:	19 September 2020
Our Ref:	M15245

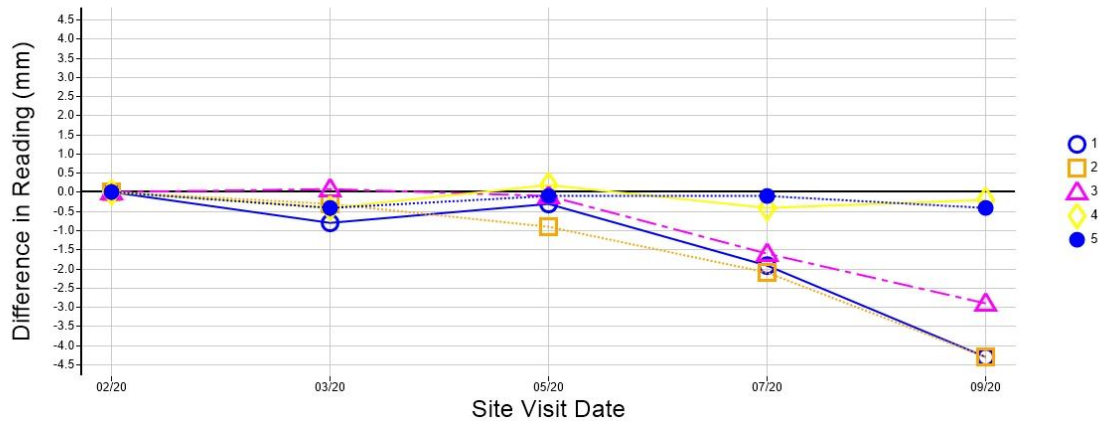
Level Monitoring Readings

The following table shows the reading levels of the various Level Monitoring Station points.

Date	1	2	3	4	5
04/02/2020	9.8239	9.8255	9.9074	9.8938	9.8883
30/03/2020	9.8231	9.8252	9.9075	9.8934	9.8879
20/05/2020	9.8236	9.8246	9.9073	9.8940	9.8882
16/07/2020	9.8220	9.8234	9.9058	9.8934	9.8882
11/09/2020	9.8196	9.8212	9.9045	9.8936	9.8879

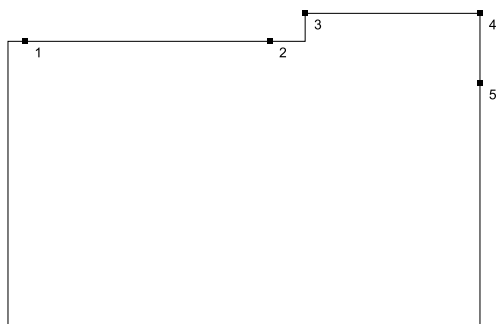
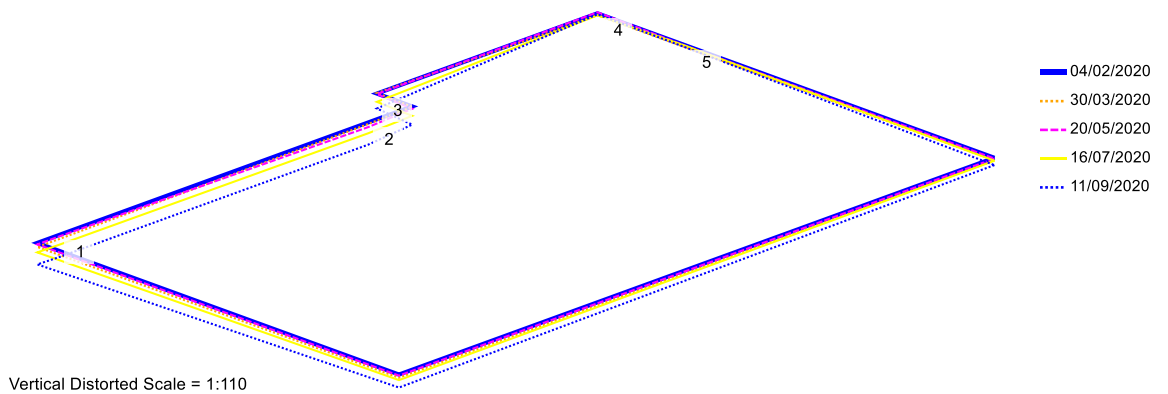
Level Monitoring Difference Graphs

The following graphs display the progressive movement that each Level Monitoring Station recorded at each separate site visit date to give an overall look at how much the property is moving.



Level Monitoring Displacement Map

The following image shows an isometric representation of the movement of the property, based on the Level Monitoring Stations that were installed.



FRONT

Site Visit Notes

Datum is point on front left corner of house, it has an assumed value of 10,0000m. No suitable remote datum available, if this is not suitable please advise if a deep datum is required. Relative survey.