

ADDENDUM TECHNICAL REPORT

Crawford Reference: SU1901098

**The Lodge
77 Chazey Road
Caversham
Reading
Berkshire
RG4 7DU**



Prepared for

**Chubb Insurance Company of Europe SA
1 America Square
17 Crosswall
London
EC3N 2AD**

Claim Reference 32637786


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Crawford and Company

**Watford Specialist Subsidence Unit
First Floor, Cassiobury House,
11-19 Station Road,
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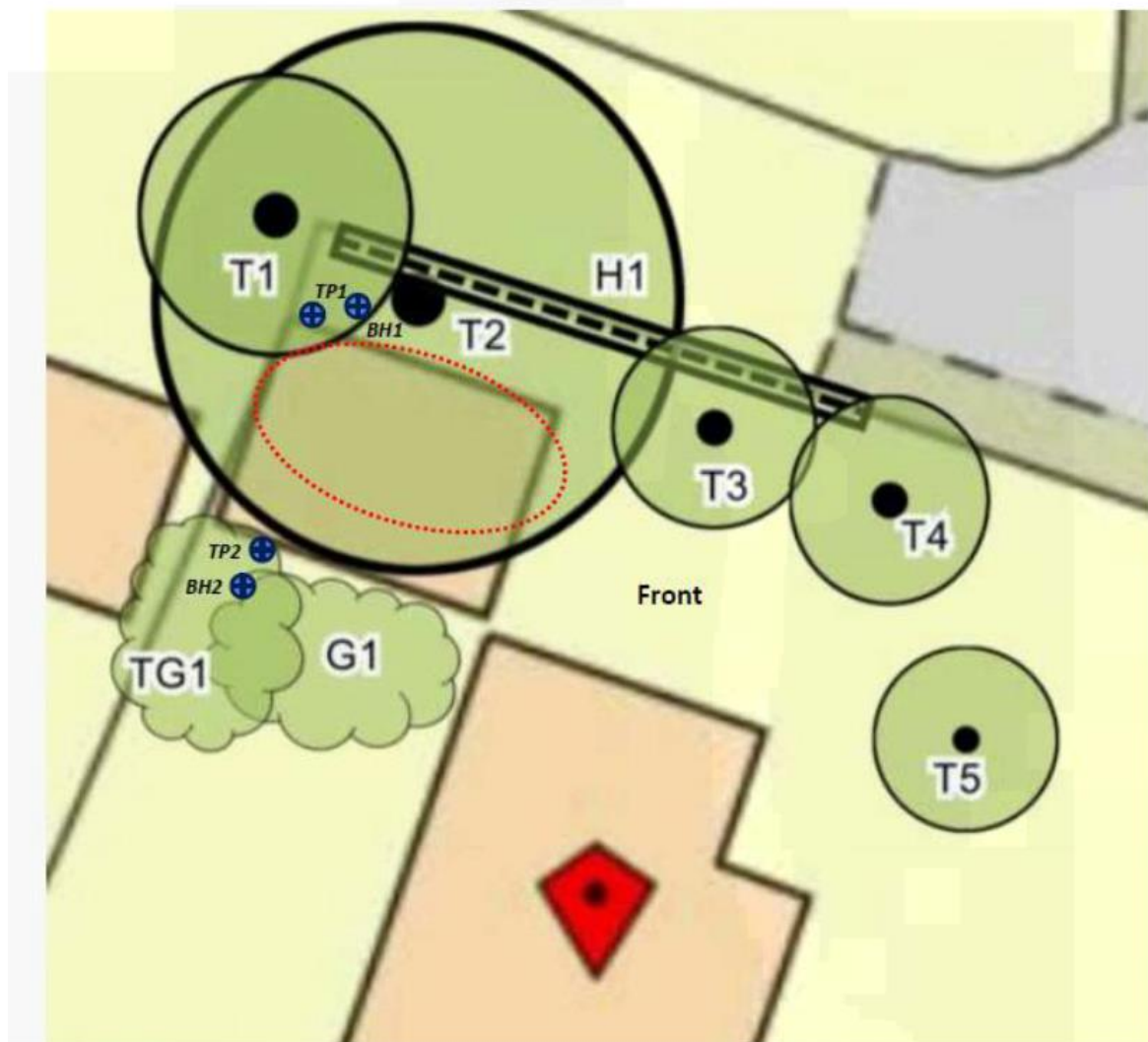
SUBSIDENCE CLAIM

27 November 2020

Chartered Loss Adjusters

First Floor, Cassiobury House, 11-19 Station Road, Watford WD17 1AP. Tel 01923 471755 ■ www.crawfordandcompany.com

Registered Office ■ Crawford & Company Adjusters (UK) Ltd, The Hallmark Building, 106 Fenchurch Street, London, EC3M 5JE ■ Registered in England No 2908444



Plan not to scale – indicative only

 Approximate areas of damage

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INTRODUCTION

We have been instructed by insurers to investigate a claim for subsidence at the above detached garage. The area of damage, timescale and circumstances are outlined in our initial Technical Report. This report should be read in conjunction with that report.

To establish the cause of damage, further investigations have been undertaken and these are described below.

INVESTIGATIONS

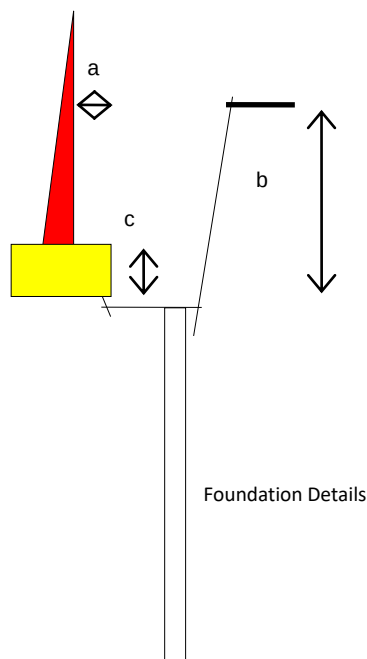
The following investigations were undertaken to identify the cause of movement.

TRIAL HOLES

Two trial holes were excavated to expose the foundations of the detached garage and four bore holes completed - see site plan for location and the diagram below for details:-

TRIAL HOLES

The trial hole was excavated to expose the foundations - see site plan for location and the diagram below for details.



No.	Borehole Depth	Footing (a)	Underside (b)	Thickness (c)
TH1	1200 mm	0 mm	300 mm	300 mm
TH2	1800 mm	0 mm	300 mm	300 mm

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AUGERED BOREHOLES

A 50mm diameter hand auger was sunk - see site plan for location(s).

Observations

BOREHOLES

Borehole EH1A confirmed stiff brown slight sandy slightly gravelly clay with occasional rootlets within the trial pit to 1800mm.

The borehole was terminated at 1800mm below ground level due to gravelly clay obstruction.

Trail borehole EH1 was carried out to the left of the detached garage and identified a 300mm concrete raft foundation sited upon brown gravelly clayey sand to a depth of 1200mm below ground level, where the trail borehole was abandoned due to the pit collapsing.

Borehole EH1B confirmed brown sandy clayey gravel within the trial pit to 1300mm, which changed to very stiff greyish brown rarely mottled orangish brown slightly sandy gravelly clay with occasional rootlets within the trial pit to 2500mm, which changed to brownish grey sandy clayey gravel.

The borehole was terminated at 2600mm below ground level due to gravelly clay obstruction.

Trail borehole EH2 was carried out to the right of the detached garage and identified a 300mm concrete raft foundation sited upon brown gravelly clayey sand to a depth of 700mm below ground level, where the trail borehole was abandoned due to the pit collapsing.

SOIL SAMPLES AND TESTING

MACKINTOSH PROBE

In-situ Mackintosh Probe testing confirmed the subsoil to be dense.

MOISTURE CONTENT

Borehole EH1A in this case the lowest moisture content is 18% at a depth of 1500mm below ground level. This is just more than 40% of the liquid limit of 37%. This suggests that the soil at the depth of 1500mm is near on desiccated.

Borehole EH2A in this case the lowest moisture content is 17% at a depth of 1500mm below ground level. This is less than 40% of the liquid limit of 47%. This suggests that the soil at the depth of 1500mm is desiccated.

ROOT ID

Roots were found in the trail boreholes and were identified as the following:-

EH1A, 0.5-1.0m	
1 no.	Examined root: the family Rosaceae, subfamily POMOIDEAE (a group of closely related trees: Malus (Apple), Pyrus (Pear), Crataegus (Hawthorn), Sorbus (Rowan, Whitebeam, Service tree), Mespilus (Medlar), and some shrubs (Pyracantha (Firethorn), Chaenomeles (Japonica), Cydonia (Quince), Amelanchier, Cotoneaster)).
4 no.	Examined root: AESCULUS (Horse Chestnut and related Buckeyes).
2 no.	Both samples revealed too few cells for microscopic identification.
EH1A, 1.0-1.5m	
2 no.	Examined root: TILIA (Lime).
2 no.	Examined root: AESCULUS (Horse Chestnut and related Buckeyes).
EH1A, 1.5-1.8m	
2 no.	Examined root: TILIA (Lime).
2 no.	Examined root: most referable to AESCULUS (Horse Chestnut and related Buckeyes). This was a very IMMATURE sample.
EH2A, 0.5-0.7m	
2 no.	Examined root: TILIA (Lime).
1 no.	Microscopic examination showed insufficient cells for recognition.
EH2A, 0.7-1.3m	
4 no.	Examined root: TILIA (Lime).
1 no.	Microscopic examination showed insufficient cells for recognition.
EH2A, 1.3-2.0m	
2 no.	Examined root: could well be TILIA (Lime). Less than 0.2mm in diameter.
1 no.	Microscopic examination showed insufficient cells for recognition.
EH2A, 2.0-2.5m	
2 no.	Examined root: also most referable to TILIA (Lime). Again, under 0.2mm in diameter.

DRAINS

The drainage has been tested during our investigations and no damage noted to the drainage system was noted. As such, an escape of water can be ruled out as the cause of the claim

ARBORICULTURAL REPORT

The removal of the offending trees is recommended to help prevent any further foundation movement as follows:-

Table 1 **Current Claim - Tree Details & Recommendations**

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T1	Horse Chestnut	13	700 *	7 *	3	Older than Property	Third Party The Coach House Chazey Road RG4 7DU
Management history		Subject to past management/pruning.					
Recommendation		Remove (fell) to near ground level.					
T2	Lime	25 *	910	18 *	2	Older than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Remove (fell) to near ground level. Owner to physically remove any regrowth (no chemical treatment due to translocation risk).					

Ms: multi-stemmed

* Estimated value

MONITORING

Level monitoring commenced at this property November 2019 and further readings have been taken at two monthly intervals.

The movement recorded is cyclical with the property moving downward through dry periods. This sort of movement only occurs when a clay shrinkage effect is in operation.

Further level monitoring will be undertaken to establish seasonal movement.

DISCUSSION

The results of the site investigations confirm that the cause of subsidence is root-induced clay shrinkage. The clay is plastic and thus will shrink and swell with changes in moisture content. Roots have extracted moisture below the depth of the footings of the detached garage, thus causing differential foundation movement to occur. This is supported by the following investigation results:

- Engineering opinion is that the damage is related to clay shrinkage subsidence.
- There is significant vegetation present with the potential to influence soil moisture and volumes below foundation level.
- Roots have been observed to the underside of the foundations and identified samples correspond to vegetation identified on site (Horse Chestnut) T1 and (Lime) T2.
- Moisture content confirms desiccation within bore hole 2 and very near desiccation in bore hole 1.
- Level monitoring indicates that there was significant downward movement and recovery of the foundations of the detached garage, which is attributed to the drying action of the clays caused by the nearby trees (Horse Chestnut) T1 and (Lime) T2.
- Arboricultural report confirms that the (Horse Chestnut) T1 and (Lime) T2 have been identified as the cause of the damage to the detached garage and removal of the offending trees is recommended to help prevent any further foundation movement.

RECOMMENDATIONS

The cause of the movement needs to be dealt with first. From the results of the site investigation, we are satisfied that (Horse Chestnut) T1 and (Lime) T2 should be removed and the stumps poisoned. Based on our analysis, we are satisfied there is no adverse heave risk to the property.

Provided the tree management is approved and works are carried out expeditiously, we anticipate that superstructure repairs and decorations only will be required. If tree management is not carried out, it may be necessary to consider a much more costly and disruptive scheme of stabilisation, such as installation of a Root Barrier. Budget estimates are presently as follows:-

Superstructure repairs and decorations	- £10,500.00
Rebuild of the garage on a piled raft foundation	- £150,000.00

Yours faithfully,

Ashley Stevens ACIOB ACABE MFPWS Cert CILA
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