

TECHNICAL REPORT

Crawford Reference: SU1901098

[REDACTED]
The Lodge
77 Chazey Road
Caversham
Reading
Berkshire
RG4 7DU



Prepared for

[REDACTED]
[REDACTED]

[REDACTED]

SUBSIDENCE CLAIM

DATE 6 March 2019



Subsidence Division
Crawford and Company
1st Floor.
Cassiobury House
11-19 Station Road
Watford
WD17 1AP

Tel: 01923 471755

Site Plan

This plan is Not to Scale

This is an Aerial Photograph of the property and the immediate surrounding area. The positions of utilities etc are only indicative and contractors must satisfy themselves regarding actual location before commencing works.



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Key:

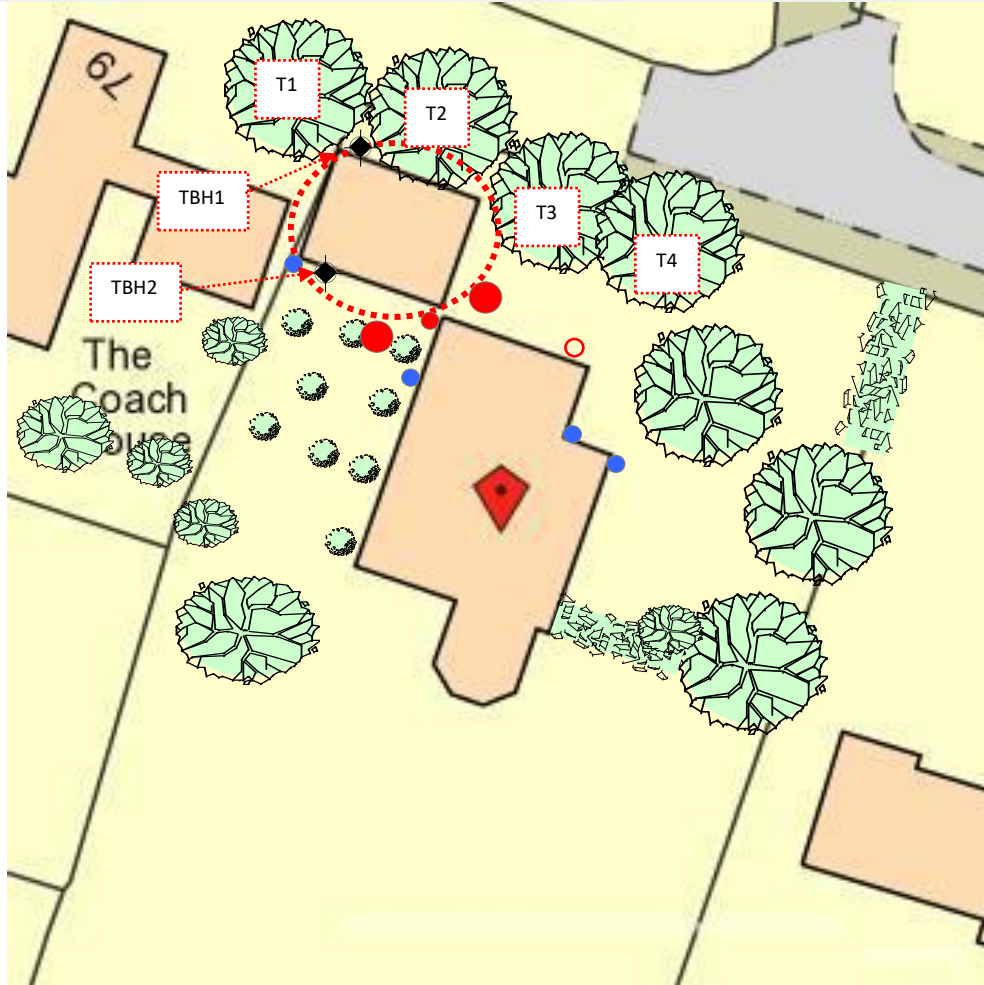
	Tree: Deciduous		Tree: Conifer		Shrub
	Hedge		Area of Damage		Bore Hole
	Trial Hole		Trial & Bore Hole		Level Monitoring
	Rain Water Manhole		Rain Water Gully		Rain Water Pipe
	Waste Water Manhole		Waste Water Gully		Toilet Pipe
	Rain Water Drain		Waste Water Drain		Electricity Cable
	Water Supply Pipe		Gas Supply Pipe		Incoming Gas Pipe
	Incoming Water		Incoming Electrics		

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Site Plan

This plan is Not to Scale

This plan is diagrammatic only and has been prepared to illustrate the general position of the property and its relationship to nearby trees etc. The boundaries are not accurate, and do not infer or confer any rights of ownership or right of way. Position of utilities is only indicative and contractors must satisfy themselves regarding actual location before commencing works.



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	Incoming Water		Incoming Electrics		

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INTRODUCTION

We have been asked by Chubb Insurance Company of Europe SA to comment on movement that has taken place to the above property. We are required to briefly describe the damage, establish a likely cause and list any remedial measures that may be needed.

Our report should not be used in the same way as a pre-purchase survey. It has been prepared specifically in connection with the present insurance claim and should not be relied on as a statement of structural adequacy. It does not deal with the general condition of the building, decorations, timber rot or infestation etc.

The report is made on behalf of Crawford & Company and by receiving the report and acting on it, the client - or any third party relying on it - accepts that no individual is personally liable in contract, tort or breach of Statutory duty. Where works address repairs **that are not covered** by the insurance policy we recommend that you seek professional advice on the repair methodology and whether the works will involve the Construction (Design & Management) Regulations 2015. Compliance with these Regulations is compulsory; failure to do so may result in prosecution. We have not taken account of the regulations and you must take appropriate advice.

We have not commented on any part of the building that is covered or inaccessible.

TECHNICAL CIRCUMSTANCES

The damage to the garage was noticed by a friend/neighbour who suspected it may be due to structural movement and hence a claim was intimated to Insurers.

PROPERTY

The risk address is a two storey with attic rooms, detached house of traditional construction with brick walls surmounted by a hipped, slated roof. There is a detached garage to the front of the property, constructed 1978 and the root to the garage converted to a play room in 1996.

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HISTORY & TIMESCALE

We await insurer's advice on how they wish us to proceed with the claim.

Date of Construction	1903
Purchased	1975
Policy Inception Date.....	27/03/1999
Damage First Noticed	December 2018
Claim Notified to Insurer.....	27/02/2019
Date of our Inspection	06/03/2019
Issue of Report.....	13/03/2019
Anticipated Completion of Claim	March 2021

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SITE DETAILS

TOPOGRAPHY

The property occupies a reasonably level site with no unusual or adverse topographic features.

GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number SUNE suggests the underlying geology to be Chalk.

Chalk¹ is a white, fine grained, powdery, limestone formed of calcium carbonate, containing small amounts of silt and mud but predominantly microscopic organic remains and shell debris. It is a marine deposit and effervesces strongly when in contact with cold, dilute hydrochloric acid. It is finer grained than limestones.

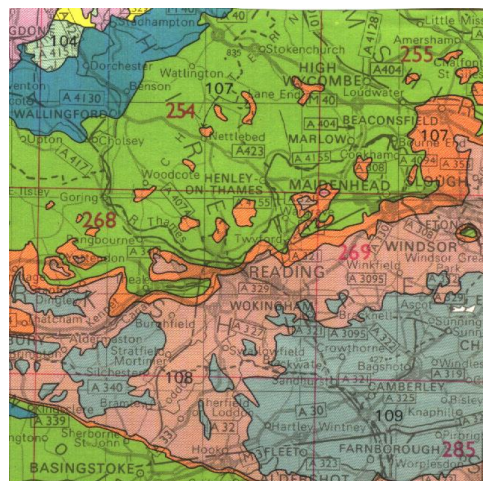
High porosity (>40%) and variable permeability. Often associated with aquifers.

The superficial deposits are thought to be Sand and Gravel.

Sand is a detrital sedimentary rock (arenaceous - sandy) with a grain size in the range of 0.06 - 2mm in diameter. Individual [particles are mainly mineral fragments, and quart grains predominate². Gravels on the other hand have particles in the range of 2 - 60mm in diameter. Above this, in size, are cobbles (60 - 200mm diameter) and boulders (200mm in dia. and above).

Generally a good bearing medium, but finer grained soils can suffer erosion in flowing water, and liquefy when under the water table (quicksand). They can also be troublesome in earthquakes at shallow depth, and when loosely compacted.

Sands and gravels are termed non-cohesive soils, and apart from the above problems, tend to be stable. They do not suffer the shrink/swell problems of cohesive (clay) soils, and plants and trees are rarely troublesome when near to a property - apart from root infiltration to drains and services.



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C03/129-CSL CSL British Geological Survey. ©NERC. All rights reserved.

¹ BS 5930 (1981) "Code of Practice for Site Investigation"

² B.S. 5930 (1981) "Site Investigations"

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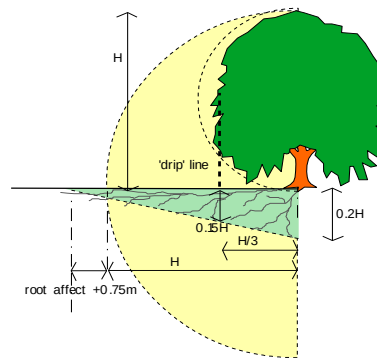
VEGETATION

There are several trees and shrubs nearby, some with roots that may extend beneath the house foundations. The following are of particular interest:-

Type	Height	Distance	Ownership
T1- Chestnut	10 m	3 m	Neighbour 5
T2- Lime	20 m	2 m	Owners
T3- Cypress	20 m	3 m	Owners
T4- Cypress	20 m	6 m	Owners

See sketch. Tree roots can be troublesome in cohesive (clay) soils because they can induce volumetric change. They are rarely troublesome in non-cohesive soils (sands and gravels etc.) other than when they enter drains, in which case blockages can ensue.

Horse Chestnut (*Aesculus*) are deciduous and can reach heights between 20-28m depending on health, environment and soil conditions. They have a fast growth rate of around 400mm per year and medium root activity³.



Typical proportions of a Horse Chestnut. Note the potential root zone.

Maximum tree-to-damage distance in the Kew survey was 23mtrs, and 50% of cases occurred within 7.5mtrs⁴. Life expectancy > 100 years in good conditions. Both young and old trees withstand quite heavy pruning or crown reduction.

Limes (*Tilia*) are deciduous and can reach heights between 25-30m depending on health, environment and soil conditions.

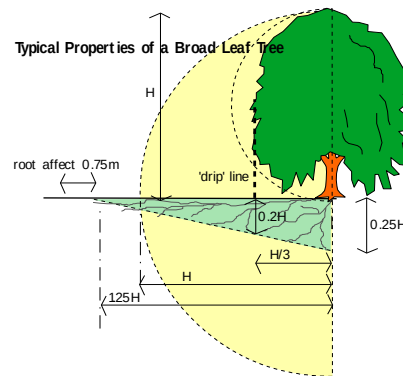
They have a medium growth rate of around 300mm per year and medium root activity⁵. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, with 50% of all cases occurring within 6mtrs⁶.

³ Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications

⁴ Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

⁵ Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications

⁶ Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific



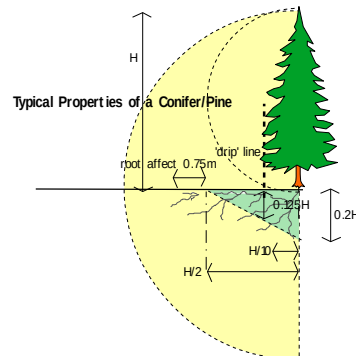
Typical proportions of a Lime tree, showing the potential root zone.

Lime roots can be moderately deep on clay soils. They have a life expectancy > 100 years and both old and young trees withstand quite heavy pruning and crown thinning.

Older trees frequently develop shoots around the base of the trunk. They are vulnerable to aphid attack that produces sticky exudates of honeydew.

Cypresses (Thuja) is an evergreen and can reach heights between 20 - 30mtrs (Lawson's & Monterey) depending on health, environment and soil conditions.

They have a fast growth rate of around 600mm per year and weak root activity⁷. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, and 50% of cases occurred within 2.5mtrs⁸. Life expectancy between 50 - 100 years and capable of withstanding surgery when young, although difficult to keep their architectural appearance. Less tolerant when older.



Typical proportions of a Cypresses. The root zone shown is conservative as it will often equal, Or even exceed, its height. The Cypresses has an aggressive root system and is involved in Building damage often because it has been used in the passed as a border tree.

Surgery can be disfiguring unless carried out by professional arboriculturalist. Moderately deep rooting system on clay soils.

⁷ Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

⁸ Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific

OBSERVATIONS

The detached garage is the focal point of the Insured's concerns / movement.

The following is an abbreviated description. Photographs accompanying this report illustrate the nature and extent of the problem.

INTERNAL



Detached garage-
Vertical and stepped tapered cracking of up to 7mm was noted to the brickwork rear centre elevation of the garage.



Detached garage-
Front to rear to the centre of the garage is a crack to the concrete floor, with signs of a slope to the rear right corner, with maximum crack widths of 2mm.

Detached garage-

- Stepped tapered cracking of up to 7mm was noted to the brickwork top left of the front garage door.
- Vertical and stepped tapered cracking of up to 7mm was noted to the brickwork rear centre elevation of the garage.
- Stepped tapered cracking of up to 1mm was noted to the brickwork top and bottom right of the left hand front window.
- Front to rear to the centre of the garage is a crack to the concrete floor, with signs of a slope to the rear right corner, with maximum crack widths of 2mm.

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EXTERNAL



Detached garage-
Stepped tapered cracking of up to 7mm was noted to the brickwork top left of the front garage door.

Detached garage-
Vertical and stepped tapered cracking of up to 7mm was noted to the brickwork rear centre elevation of the garage.

Detached garage-

- Stepped tapered cracking of up to 7mm was noted to the brickwork top left of the front garage door.
- Vertical and stepped tapered cracking of up to 7mm was noted to the brickwork rear centre elevation of the garage.
- Stepped tapered cracking of up to 1mm was noted to the brickwork top and bottom right of the left hand front window.

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment⁹ Digest 251, which describes it as "moderate".

Category 0	"negligible"	< 0.1mm
Category 1	"very slight"	0.1 - 1mm
Category 2	"slight"	>1 but < 5mm
Category 3	"moderate"	>5 but < 15mm
Category 4	"severe"	>15 but < 25mm
Category 5	"very severe"	>25 mm

Extract from Table 1, B.R.E. Digest 251
Classification of damage based on crack widths.

⁹ Building Research Establishment, Garston, Watford. Tel: 01923.674040
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DISCUSSION

The pattern and nature of the cracks is indicative of an episode of subsidence. The cause of movement appears to be either clay shrinkage or subsoil softening/erosion due to drains leakage.

Further site investigations will be required. Typically, these would involve trial pit(s) to determine the nature of the footings and subsoil and a localised drainage survey and level monitoring and possibly an Arborist report.

We will report further once these investigations have been completed.

RECOMMENDATIONS

On receipt of the Site Investigation report, we will advise on causation and the scope of mitigation works required.

6 March 2019

Ashley Stevens ACIOB ACABE MFPWS Cert CILA

Subsidence Division

Direct Dial: 01923 471755

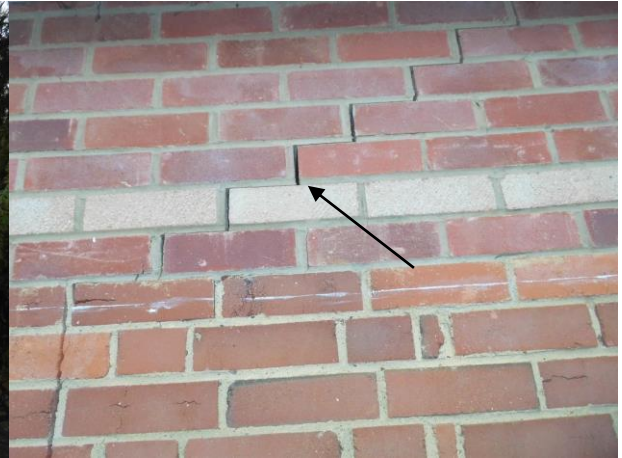
subsidence@crawco.co.uk

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PHOTOGRAPHS



Detached garage



Detached garage-
Vertical and stepped tapered cracking of up to 7mm was noted to the brickwork rear centre elevation of the garage.



Detached garage-
Stepped tapered cracking of up to 1mm was noted to the brickwork top right of the left hand front window.



Detached garage-
Stepped tapered cracking of up to 1mm was noted to the brickwork bottom right of the left hand front window.

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Rear of detached garage.



Left elevation of detached garage.



Possible offending trees.



Possible offending trees.

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