

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1804442



Prepared for

[REDACTED]

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SUBSIDENCE CLAIM

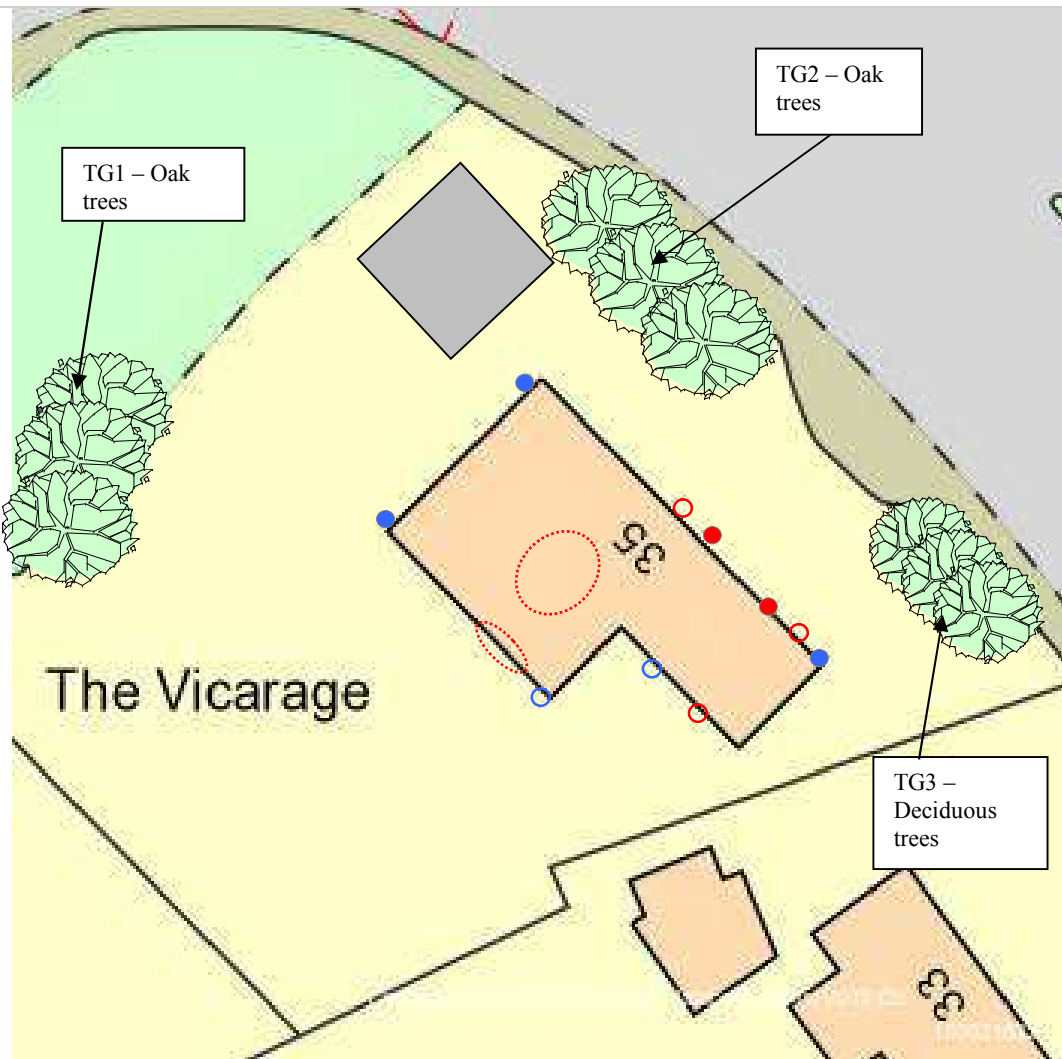
DATE 18th September 2018



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

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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Map Reproduced with the Permission of Ordnance Survey License Number #####

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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INTRODUCTION

We have been asked by Ecclesiastical Insurance Group 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 property has been subject to a number of previous subsidence claims.

The initial subsidence claim was in 1990. The cause of the subsidence was established to be due root exacerbated clay shrinkage subsidence. It is understood that repairs were completed in 1992 and involved underpinning of the left, front and right hand elevations to a depth of 2.35m.

In 2001 the property was purchased by a Mr & Mrs Gordon with the benefit of the previous claim and policy being transferred with the sale.

We understand that shortly after purchasing the property that cavity wall ties were replaced and external walls were repointed. At this time very slight external and internal cracks to the rear right bay window brickwork was discovered. This was reported to Insurers and Ashworth Mairs Loss Adjusters (AMG) were appointed. AMG monitored the property and concluded that no significant movement was taking place.

In summer 2013 Mr & Mrs Gordon reported that internal cracks in the sitting room had increased in width and that some external cracks had appeared. Having notified Insurers, Innovation Group Subsidence Management Services (SMS) were appointed to investigate the matter further. Following site investigations and a period of monitoring it was determined that the damage was the result of very minor influence from the adjacent trees. It was agreed due to the slight damage that repairs to the superstructure would be undertaken. These included masonry reinforcement stitching to resist against possible future fluctuations.

In 2013 SMS noted internal cracking above the rear left sitting room French doors and to internal cross walls between the rear rooms and hallway, directly above door openings.

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In 2014 SMS reported to Insurers under Interim Report No. 4. The report advised that following a period of monitoring that the results established very slight seasonal movement consistent with clay shrinking and swelling associated with changes in moisture content. However the slight movement was considered by IMIS to be insufficient to justify removal of all the trees within influencing distance of the building.

SMS requested instructions from Insurers to undertake further robust superstructure repairs. We do not have details of this work but understand that it incorporated steel bed joint reinforcement. In February 2015 a Certificate of Structural Adequacy was issued to Mr & Mrs Gordon by SMS following completion of building repairs by their building contractor.

In January 2018 the property was purchased by Mr & Mrs Mitton (the Insured). The Insured was aware of the previous subsidence claims and it was agreed that Insurers would provide them with the benefit of the previous claim and policy was transferred with the sale.

In August 2018 the Insured advises that internal damage to the rear sitting room, hall and rear bedrooms was discovered. Upon inspection some slight external cracking was noted to the brickwork above the rear sitting room French doors. Becoming concerned a claim was submitted to Insurers for consideration.

PROPERTY

Two storey detached house of traditional construction with brick walls surmounted by a pitched tiled roof. The property benefits from a large detached garage to the right hand side.

HISTORY & TIMESCALE

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

Date of Construction	Circa 1930
Purchased	December 2017
Policy Inception Date	21/12/2017
Damage First Noticed	24/08/2018
Claim Notified to Insurer.....	24/08/2018
Date of our Inspection.....	07/09/2018
Issue of Report	18/09/2018
Anticipated Completion of Claim	Winter 2018

TOPOGRAPHY

The property occupies a site sloping from front down to the rear.

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GEOLOGY

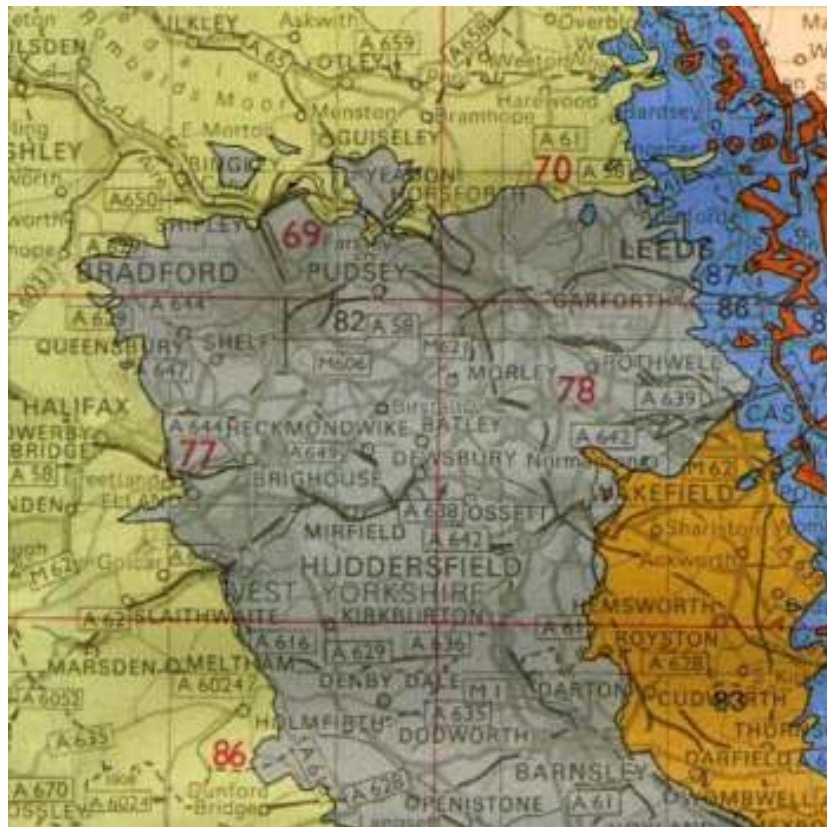
Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number SESW suggests the underlying geology to be Sandstone.

Sandstones comprise cemented sand particles. They have an average porosity of around 30% or more, depending on the degree and nature of the cementitious material that binds the grains. Although not shrinkable, the superficial weathered deposits may be.

The superficial deposits are thought to be Clay Soils.

Clay soil superficial deposits are a cohesive soil characterised by their fine particle size and are usually derived from weathering of an underlying "solid geology" clay soil such as London Clay or Oxford Clay.

Like the solid geology sub-soil from which they are derived they shrink when dry, and swell when wet and can be troublesome when there is vegetation¹ nearby and Gypsum and selenite crystals can be encountered (particularly in the south east). Protection using Class II Sulphate Resisting cement is therefore recommended for buried concrete.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.
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¹ Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

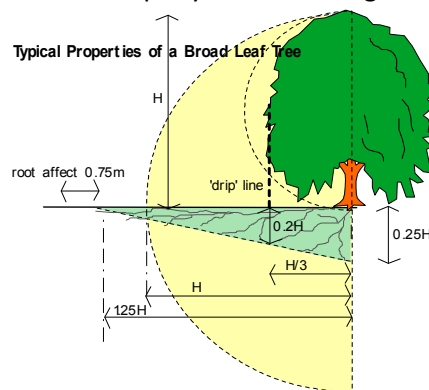
VEGETATION

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
TG1 - Oak	17 m	15 m	Owners
TG2 - Oak	17 m	5 m	Owners
TG3 – Deciduous	12 m	5 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.

Oak trees (*Quercus*) are deciduous and native to Europe. They can reach heights in excess of 35m, but more typically grow to between 18 - 25m, depending on health, environment and soil conditions. They have a medium growth rate of around 250mm per year and strong root activity².



Typical proportions of an Oak showing the potential root zone. They have by far the most aggressive of root systems, often spreading considerable distances (1.5 x height or more).

Maximum tree-to-damage distance recorded in the Kew survey was 30mtrs, with 50% of all cases occurring within 9.5mtrs³. Life expectancy > 100 years, although they are vulnerable to insect and fungal attack. Old and young trees are tolerant of quite heavy pruning and crown reduction, although re-growth can be an ongoing problem.

Oaks are, in my experience, worthy of considerable respect when dealing with subsidence claims. Their root system extends for surprising distances and can be associated with particularly high soil suctions.

Because of difficulties in controlling the oak, and its vigorous root system, I regard it as being far more significant (in terms of a subsidence league table) than either the willow or poplar tree.

² Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

³ Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific

OBSERVATIONS

The main area of damage affects the internal walls to the rear left sitting room, hall, rear left and right first floor bedrooms and first floor landing.

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

INTERNAL



Internal crack above front right internal door to rear left lounge



Internal crack above rear facing internal door leading to rear left lounge in front hallway

Ground floor

Rear left sitting room

Non-tapered cracking above the right and left to the rear uPVC French doors, along the rear coving and into the ceiling. Cracking less than 0.5mm wide.

Separation non-tapered cracking above the front internal door leading to the hallway in the wall and coving. Cracking less than 1mm wide.

Hall

Non-tapered cracking above the rear facing doors leading to the rear left sitting room and rear right lounge. Cracks extend from left up towards the right and do not exceed 0.5mm width. The crack above the left door leading to the rear left sitting room is mirrored on both sides of the internal supporting wall.

First floor landing

Horizontal non-tapered crack between the door heads to the rear left and rear right bedrooms with the crack less than 0.5mm wide. The plaster has de-bonded causing a small section to protrude slightly away from the vertical face of the internal wall.

Above the internal door leading to the rear left bedroom there is a further non-tapered crack extending upwards into the coving and timber loft hatch. Crack is less than 0.5mm wide.

Diagonal non-tapered crack on the left facing wall shared with the front mid-section bathroom. The crack is not mirrored on both sides of the wall is less than 0.5mm wide.

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Rear right bedroom

Horizontal and diagonal non-tapered cracking above the door head leading to the landing with cracking less than 0.5mm wide.

Separate cracking to the rear left corner of the bedroom in the coving adjacent to the left of the rear bay window projection and extending into the ceiling running towards the left. Cracking less than 0.5mm wide.

Rear left bedroom

Diagonal non-tapered crack extending upwards from the right of the internal door leading to the landing with cracking less than 0.5 wide.

EXTERNAL

External cracking above right to rear left lounge French doors



External cracking in loose bricks beneath rear left lounge French doors

Rear elevation above the rear left sitting room French uPVC doors

Stepped crack rising up from the right of the door lintel extending up towards the right and then returning to extend up towards the left of the property. Cracking is slightly tapered up to 1mm wide.

Brickwork beneath the rear uPVC French door is cracked to the right hand side with cracking up to 2mm wide.

Rear Indian stone raised patio

Paving stones drop from level towards the rear small retaining stone wall. Some paving stones are loose.

CATEGORY

In structural terms the damage falls into Category 1 of Table 1, Building Research Establishment⁴ Digest 251, which describes it as "very slight".

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.

DISCUSSION

The pattern and nature of cracking is indicative of thermal movement but we cannot ignore the history of the claim where movement was determined to relate to the seasonal affects to the underlying clay soils from nearby trees.

In respect of the damage affecting the rear elevation to the rear sitting room, masonry expands and contracts with changes in temperature. For example, a 12m long brick wall can expand by as much as 6mm in the first few months after construction. This is classified as irreversible movement and is due to water uptake of clay which has been kiln fired - it is a one off occurrence. In subsequent years, there can be further cyclical and reversible movement which causes minor cracks to develop.

The thermal movement affecting the property to the rear is also considered to be the operating cause of the internal damage around the central hall. The seasonal movement appears to have been picked up during previous monitoring which concluded with an assumption that the damage was due to the influence of nearby trees. However we consider that the Oak trees to the rear right of the property are located at a reasonable distance and are seated at least 3m lower than the level of the property and therefore are not of influence.

The movement to the rear raised patio is due to rain water percolation which has resulted in movement of the underlying ground. This is not related to the movement affecting the main property.

RECOMMENDATIONS

We consider that there is no evidence of any progressive subsidence to the property and hence the damage is not covered under the insurance policy.

However due to the history of damage affecting the property we have reported our findings to your Insurers for their further instructions.

David Caress BSc (Hons) Geol, BSc (Hons) Construct Mgmt, MCIOB, C Build E, MCABE

Subsidence Division

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⁴ Building Research Establishment, Garston, Watford. Tel: 01923.674040

PHOTOGRAPHS



Oak trees to rear right of site at lower level



External movement to raised patio to rear of property due to rain water percolation



Internal crack to left internal wall on front stairs shared with front bathroom



Internal cracking above left to rear left lounge French doors



Internal cracking above right to rear left lounge French doors



Internal cracking to wall and coving adjacent to loft hatch adjacent to internal door leading to rear left bedroom

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Internal horizontal crack between rear left
and right bedrooms

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