

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU2103539

**Miss Anna Bryant
61 Lodge Lane, Hassocks
West Sussex, BN6 8LX**



prepared for

**AXA Retail
PO Box 7073, Willenhall, WV1 9ZW**

Claim Reference 53570323

SUBSIDENCE CLAIM

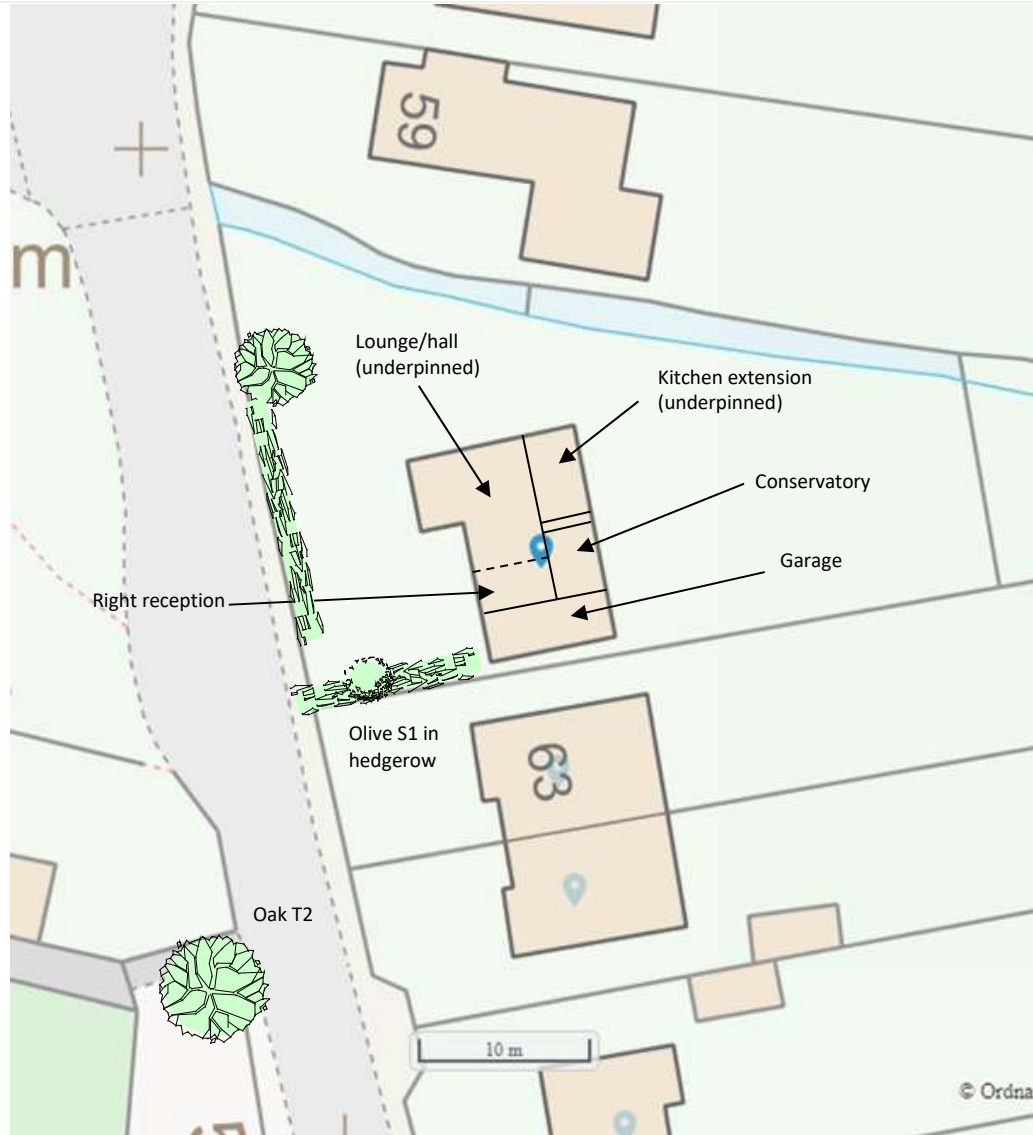
DATE 26 October 2021

**Crawford Claims Solutions – Subsidence
Cartwright House, Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8266**

Chartered Loss Adjusters

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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Key:

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

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INTRODUCTION

We have been asked by AXA Retail 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 was partially underpinned in 2005 by means of a piled slab and repairs subsequently undertaken. There was then an incident of rodent infestation beneath the piled slab and so Robert Evans (Chartered Engineer) was engaged and arranged a scheme to stop the infestation. We understand this was around 2016. Further damage occurred and further repairs were carried out under the guidance of Mr Evans, but some snagging works remain outstanding. However, Ms Bryant also became concerned about further cracking which is thought to have occurred around 2018/2020. Following referral to FOS, it has been agreed with Insurers that we should make a further inspection to assess the new damage and the outstanding snagging.

PROPERTY

Two storey detached house of traditional construction with brick walls surmounted by a gabled, tiled roof. There is a single storey kitchen extension to the rear left, a single long garage attached on the right and a conservatory between these two structures on the rear. The property has been subject to traditional underpinning and repairs in the 1970s (exact details unknown) and partial piled slab underpinning in 2005. This encompassed the entire left side of the building together with central hallway, but excluding the right ground floor reception, bedroom above, conservatory and garage.

HISTORY & TIMESCALE

Next Steps:

1. Arrange further investigations and monitoring.
2. Liaise with Axa regarding how to procure snagging works.

Date of Construction	c.1900
Purchased	1999
Policy Inception Date.....	08/08/1999
Damage First Noticed	1999
Claim Notified to Insurer.....	30/07/2021
Date of our Inspection.....	19/10/2021
Issue of Report.....	26/10/2021
Anticipated Completion of Claim	Summer 2023

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TOPOGRAPHY

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

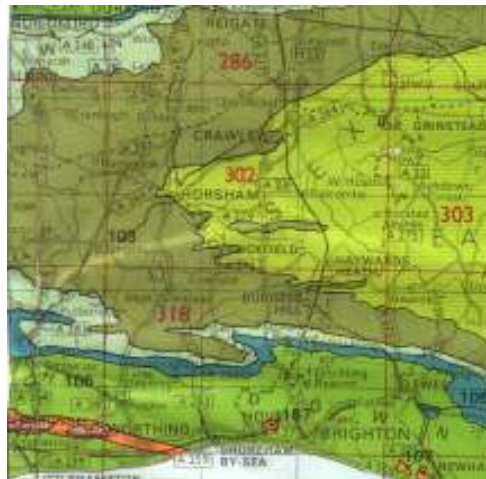
GEOLOGY

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

Gault & Greensands belong to the same series geologically, with the Greensands being the sandy equivalent of the Gault, laid down in shallow water. A marine deposit, the Gault may overlie one another. The green colour of the sand is due to the presence of glauconite. It is characterised as a stiff, blue clay¹. It has very high shrink/swell characteristics^{2,3}, and can be troublesome where there is vegetation due to volumetric changes⁴. In fact, Gault clays have Plasticity Index's of 60% upwards, being amongst the most prone to volumetric movement in the country. Tomlinson⁵ describes it as a 'fat' clay with high loadbearing characteristics due to preconsolidation pressures in its geological history.

The superficial deposits are thought to be Head.

Broadly, 'Glacial Till' is a term used for drift deposits found north of a line joining the Thames and Severn estuaries whereas Head is encountered to the south of it. These drift deposits are usually locally derived washes of London Clay or the Claygate beds that have been deposited at the foot of inclines etc. Although the clay content can have high shrink/swell characteristics, the behaviour of the soil *in situ* will depend on the clay fraction. Classified as Quaternary in age, Head deposits vary in thickness, being absent where the solid geology outcrops, and extending to depths of several metres elsewhere. They are derived from weathered rock and transported, sorted, and eventually deposited by water and glacial action⁶. They can suffer volumetric changes in periods of exceptionally dry weather if they have a high clay content.



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¹ Sherlock R.L. (1962) "LONDON & THAMES VALLEY" H.M.S.O.

² NHBC Standards "Building Near Trees" Chapter 4.2

³ B.S. 5930 (1981) "Code of Practice for Site Investigation"

⁴ Driscoll R (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

⁵ Tomlinson M.J. (1991) "Foundations Design & Construction" Longman Scientific Publishing.

⁶ Sherlock R.L. (1962) "LONDON & THAMES VALLEY" H.M.S.O.

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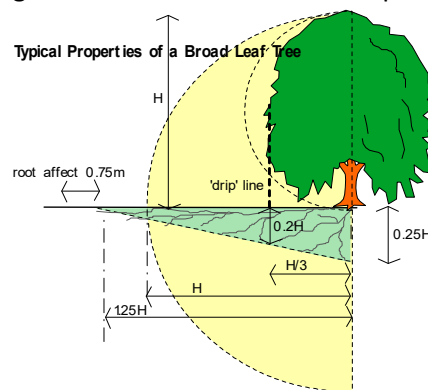
VEGETATION

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 Oak	14 m	11 m	Owners
S1 Shrubs (inc Olive)	5 m	4 m	Owners
T2 Oak	22 m	28 m	Council

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 activity⁷.



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 9.5mtrs⁸. 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.

Shrubs. Sometimes even small shrubs can cause localised subsidence damage. In the Kew Garden Survey data was collected between 1979 - 86 to record the number of roots of each species received for identification. Of the 1009 roots identified, 367 (36%) belonged to the family *Rosoideae* or Rose. Next came the family *Oleaceae* (Forsythia, Jasmin, Privet and Lilac) with 354 (35%) enquiries.

Berberis, *Viburnum*, *Hedera* (ivy), *Hydrangea* and *Pyracanthus* are also regularly associated with foundation movement, the latter having surprisingly large roots on occasions.

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

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

OBSERVATIONS

The area of damage appears to be the non-underpinned part of the house.

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

INTERNAL

Left reception - below right of window



Half-landing - below window on rear wall

Hall & Stairs

Front door swings open to the right side.

Vertical crack below right side and diagonal crack above left side of half-landing rear window

GF Right Reception

Cracking around lintel above left side of front window

Diagonal crack below right side of front window

Feint cracking around lintel above rear patio doors (to conservatory)

FF Right Bedroom

Cracking along right gable wall/ceiling junction and extending through coving joint

Feint cracking above and below corners of front window

Garage

Stepped crack on right house gable wall at rear corner. Appears longstanding.

EXTERNAL

Below GF right reception window



Above GF right reception window

Front Elevation

Laser level shows bed joints tilt down by 20mm to right on GF front right window

Stepped crack below GF front right window, extending as stepped & vertical cracks to bedroom window above

Stepped crack above left side of garage door

Rear Elevation

Stepped crack above patio doors extending up to half-landing window and above.

Snagging Items

1. Rear steps now constructed but photo shows horizontal gap at patio level to rear kitchen wall brickwork. There is no indication of any further damage/cracking caused by such a gap but the proposed monitoring would confirm the absence of movement.
2. No safety barrier on rear steps. Old photo shows one was formerly present so is a justified part of the original works.
3. Piled slab extends out from the rear steps to support an area of paving. The edging brickwork is not supported on the piled slab so moves up and down seasonally with the clay. Mr Evans has suggested a cantilever beam foundation to support these edging bricks.
4. North Elevation - piled slab is exposed in front area. Suggestion is a render plinth to cover and match in with the front.
5. Gapping between concrete slab and brickwork to left side of front door and extending partly along side wall. Requires cement packing/resin injection.
6. Path in front of door needs to be tiled. Tiles already purchased and was due to be carried out.
7. Front door swings to right when opened. Requires adjustment by carpenter.

CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁹ Digest 251, which describes it as “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 further cracking is located at the junction of the underpinned and non-underpinned sections of the property. This would indicate subsidence of one of these parts of the property. From the existing distortions, and absence of any other damage to the underpinned section, we believe the movement is occurring to the non-underpinned section. This could either be due to normal seasonal movement caused by shallow footings (for instance during a very hot/dry summer such as 2018) or due to the influence of vegetation extracting moisture from the clay. However, it would be prudent to monitor the property first to check that the movement is to this section.

The snagging areas of remedial work all relate to the previous underpinning works.

RECOMMENDATIONS

A site investigation is recommended which will comprise of a trial pit/borehole at the front right of the property together with a separate borehole to install a deep datum for the monitoring. Level monitoring will also be carried out, relative to this datum, to confirm which part of the property is moving.

Further recommendations will be dependent on the results of these initial investigations but this may involve some further vegetation management, subject to the recommendations of a specialist arboricultural report. Level monitoring will need to continue at least over the next summer period.

There is no need to delay the further snagging works and we are currently asking Insurers whether these should be arranged through us or to revert back to the Engineer/Contractors who were previously involved.

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

PHOTOGRAPHS



Below half-landing window on rear



Right reception - above left side of window



Half landing - above window on rear wall



Right bedroom

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Right bedroom



Conservatory



Oak T1



Shrubs S1 inc Olive with Oak T2 in background