



TECHNICAL ADDENDUM REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU2203818

**11 Ferndale
Southampton
Hampshire
SO30 0PP**

Prepared for

**AXA Retail
PO Box 7073
Willenhal
WV1 9ZW**



SUBSIDENCE CLAIM

DATE 24 October 2023



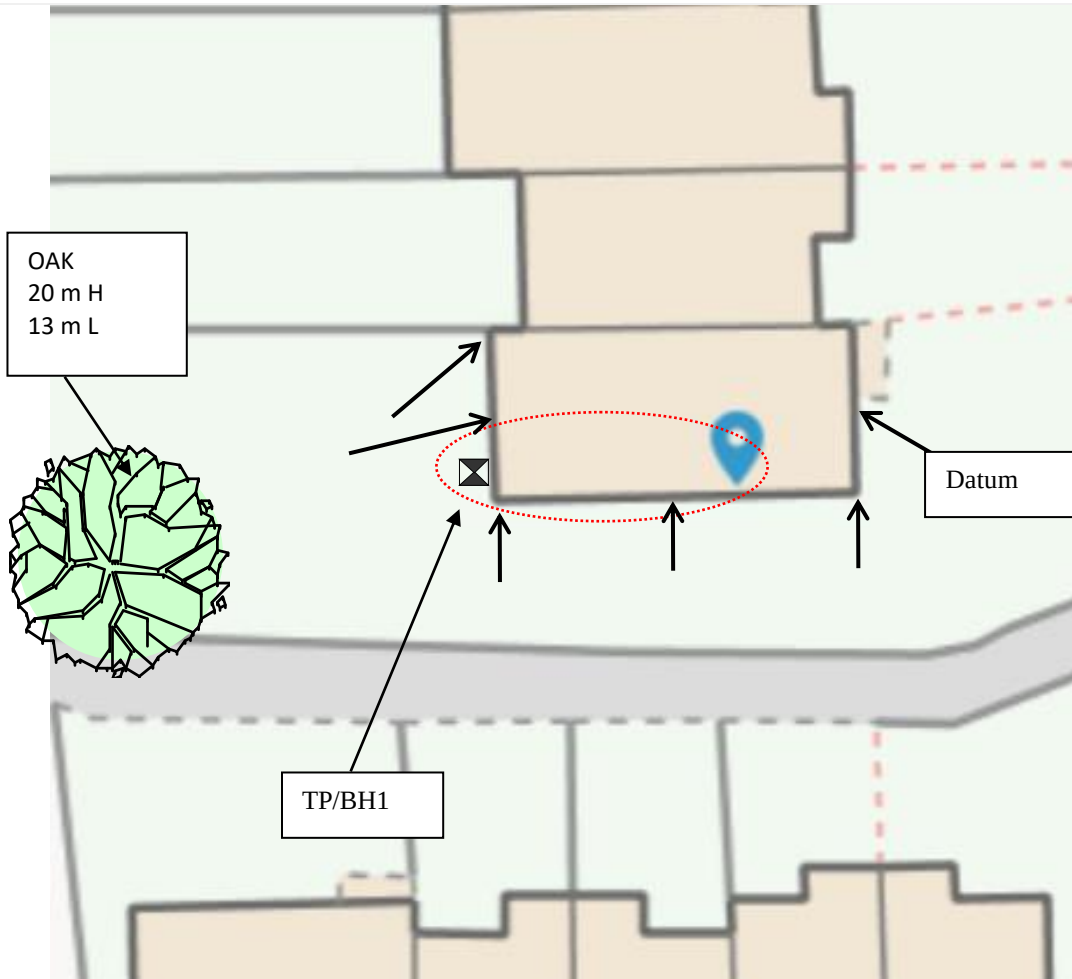
Crawford Claims Solutions – Subsidence
Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8260
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Site Plan

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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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

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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 policyholder first noticed the flooring in the Kitchen had dropped and upon inspection noticed external cracks and some doors were sticking. He therefore notified Insurers.

PROPERTY

The property is a circa 1990's two storey end-terrace house of traditional construction with brick walls surmounted by a pitched tiled roof.

HISTORY & TIMESCALE

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Date of Construction..... 1990s
Damage First Noticed 18/08/2022

TOPOGRAPHY

The property occupies a flat site with no unusual or topological features.

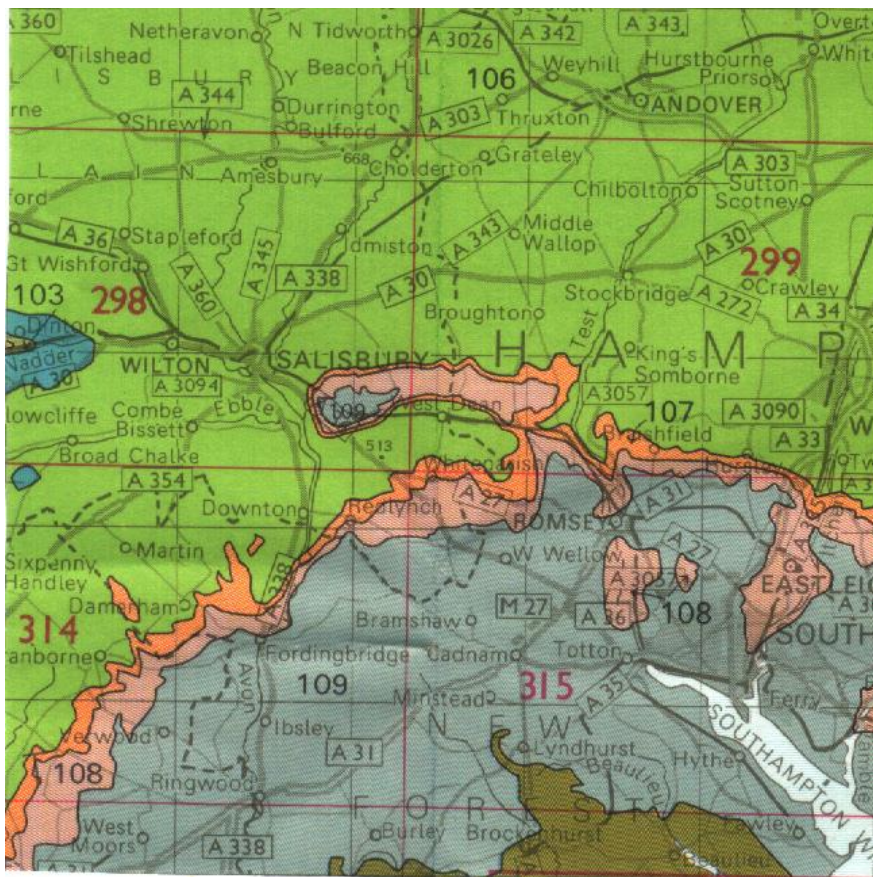
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GEOLOGY

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

London Clays are marine deposits characterised by their silty, sandy composition. They are typically stiff, dark or bluish grey, weathered dark to mid-brown superficially with fine particle size (less than 0.002mm). Tomlinson¹ describes it as a 'fat' clay with high loadbearing characteristics due to pre-consolidation pressures in its geological history.

The upper horizon is often encountered at shallow depth, sometimes just below ground level. They have high shrink/swell potentials^{2,3} and can be troublesome in the presence of vegetation.



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¹ Tomlinson M.J. (1991) "Foundations Design & Construction" Longman Scientific Publishing.

¹ B.S. 5930 (1981) "Site Investigations"

² Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

³ Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

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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:-

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

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T2	English Oak	16	735	20	13	Older than Property	Policy Holder
Management history		No significant recent management noted. Closely adjacent oak to left appears entirely dead.					
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

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.

OBSERVATIONS

The main area of damage affects the main house.

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

INTERNAL

KITCHEN

- The floor dropping in corner by 10 mm.
- Horizontal cracking at the junction of the coving and the ceiling. Maximum crack, width 1mm.

LOUNGE

- The coving has crack damage at the junction below with the wall, as well as through, which continues to the ceiling junction. Maximum crack width 5mm.
- There is vertical cracking above the window, which continues through the coving and along the junction with the ceiling and the wall.

REAR BEDROOM

- There is crack below the window
- The coving has cracks.

EXTERNAL**REAR ELEVATION**

- 2.0 mm wide stepped cracking above and below windows.

SIDE ELEVATION

- There are stepped cracks above the window.

CATEGORY

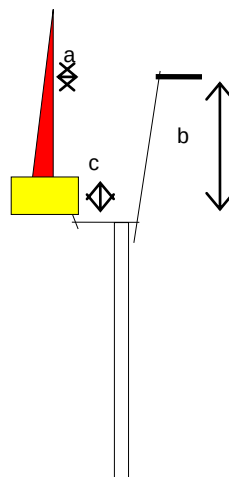
In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁴ Digest 251, which describes it as **"slight"**.

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.

INVESTIGATIONS

The following investigations were undertaken to identify the cause of movement. Two trial holes were excavated to expose the foundations. Two 50mm diameter hand augers were sunk through the base of the trial holes to confirm the soil profile beneath the foundations and provide soil and root samples for laboratory testing - see site plan for location and the diagram below for details.



Foundation Details

No.	Borehole Depth	Footing (a)	Underside (b)	Thickness (c)
TH1	3.00 m.	350 mm.	1100 mm.	400 mm.

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

SOIL SAMPLES

Soil samples were retrieved from the bore, wrapped in clingfilm before being bagged and deposited with a testing laboratory the same day. The laboratory have instructions to test the samples to determine if there is evidence of root induced desiccation.

ROOTS

Roots were retrieved from the trial hole and have been submitted to a botanist for identification.

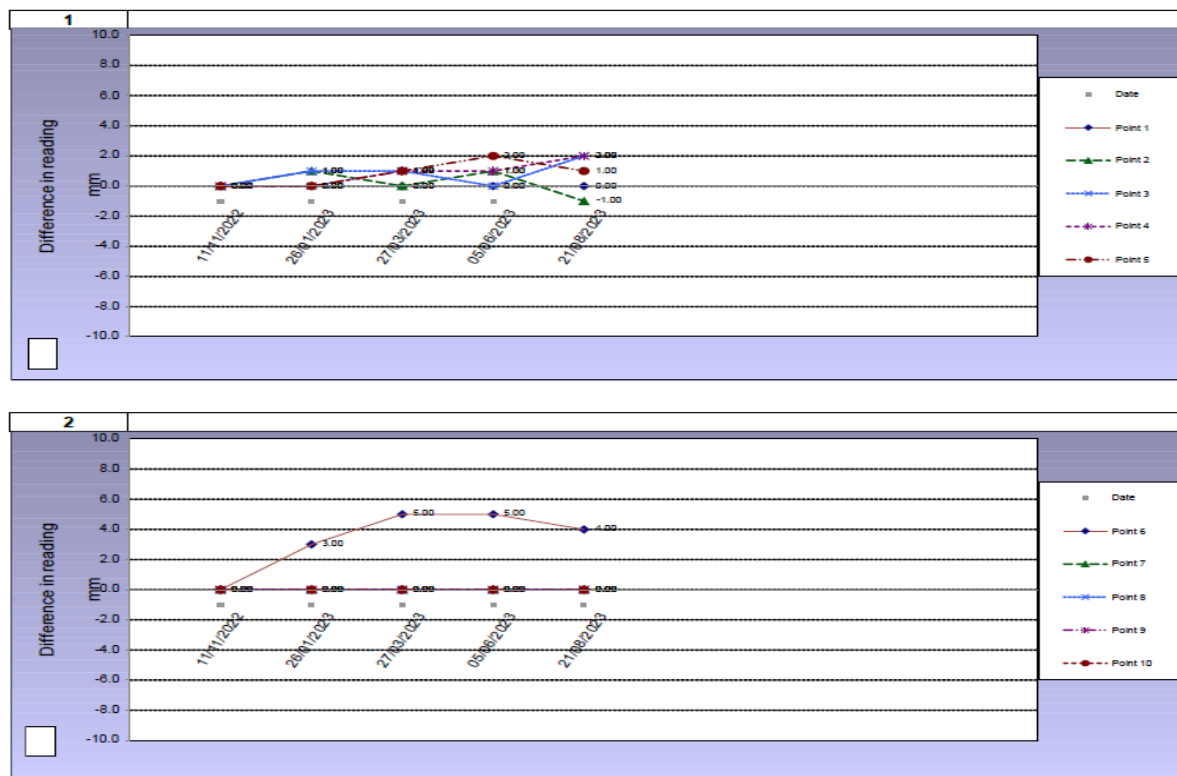
ARBORIST REPORT

We appointed MWA (Arboricultural Consultants) to provide their recommendations in relation to necessary tree management works to be undertaken in order to return long stability to the property.

It is their opinion that T2 is judged to be exerting the principal vegetative influence in respect of the current damage and are, by virtue of their size and proximity, having a significant influence on soil volumes below the insured property. They have recommend removal of T2. The report also includes recommendations for 'Future Risk' and the relevant parties have been informed to request these works are implemented.

MONITORING

Level monitoring has been implemented to provide further evidence to support our conclusions. The initial Level monitoring reading was taken on 11th November 2022, with the last readings being taken on 21st august 2023. The readings have shown that the property is suffering from subsidence movement with recovery in the winter months and further subsidence movement occurring in the summer and autumn months. The monitoring has been extended to continue through the autumn and winter months, to continue to capture the rate of movement on the property, whilst the tree is in place.



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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, thus causing differential foundation movement to occur. This is supported by the following investigation results:-

- The foundations are at a depth of 1100mm which is below the level that normal seasonal movement would be expected to occur.
- The moisture content profile indicates a reduction in moisture content between a depth of 1.5m and 3.0m in borehole 1, which is indicative of desiccation caused by root induced moisture extraction.
- Roots were found to the underside of the foundation and were identified as Oak. Starch was present which indicates that the roots were alive at the time of retrieval.
- An expert Arboricultural report has confirmed that nearby vegetation is the cause of the subsidence related damage to the property and identified tree management works required to stabilise the property, which includes the policyholder Oak tree which currently has a Tree Preservation Order attached..
- Level monitoring has confirmed subsidence movement with downward recording readings in the summer and recovery during the winter.

RECOMMENDATIONS

As per the recommendations of the Arboricultural Report T2 requires removal to allow the property to stabilise. The trees can be felled without risk of heave related damage occurring.

If Mitigation is agreed and achieved, localised superstructure repairs can be implemented following completion of the required tree management works.

We envisage superstructure repairs to be **£8,000.00**.

However, should Mitigation not be agreed/granted and the trees remain, an engineered stabilisation solution will be required in the form of localised Underpinning.

We envisage an engineered ground stabilisation scheme of localised Underpinning and superstructure repairs to be **£70,000.00**.

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