

ADDENDUM ARBORICULTURAL REPORT

SUBSIDENCE CLAIM

**Crawford Reference: 1784480
Insurer Claim Reference: 12562946G**

23a Crows Nest Lane, Botley, Southampton, SO32 2DD



Prepared for

**AXA Retail
AXA Direct House
Northgate
Morecambe
LA3 3PA**

02 September 2024

Crawford Claims Solutions – Subsidence

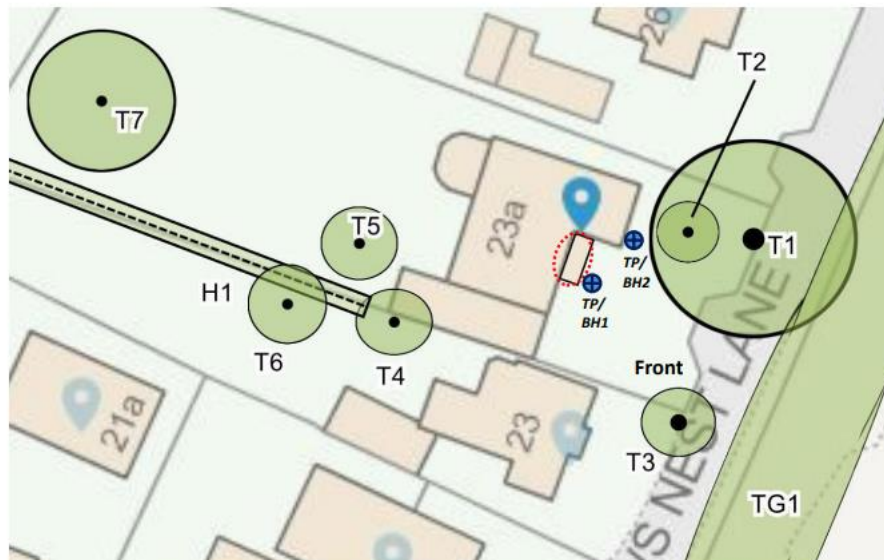
Cartwright House,

Tottle Road,

Riverside Business Park, Nottingham, NG2 1RT

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Site Plan



Plan not to scale – indicative only

 Approximate areas of damage

INTRODUCTION

We have been asked by Axa Retail to comment on movement that has taken place to the above property. This report outlines the arboricultural issues and should be read in conjunction with the MWA Arboricultural Report dated 10 November 2023 and the site investigations including soil and root testing and level monitoring, which are summarised within this report.

TECHNICAL CIRCUMSTANCES

The insured noticed the front door was becoming stuck and were unable to it. There insured started to notice cracking internally. The floor in the lounge appears to have dropped to the exterior wall. The tarmac drive appears to have dipped and cracked with the concrete sub base creating a ridge. Some brickwork on the porch has dropped. The pea shingle to the path appears to have a gap to the wall.

PROPERTY

Two storey dormer bungalow of traditional construction with brick walls surmounted by a pitched tiled roof. The front porch, which is the affected structure, appears to date from at least 1999.

HISTORY & TIMESCALE

Date of Construction Circa 1969

Damage First Noticed August 2022

TOPOGRAPHY

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

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OBSERVATIONS

Following our initial inspection it was established that the damage to the property was caused by subsidence, believed to be as a result of root induced clay shrinkage. The damage of concern affects the front porch, The internal damage to the main house is attributed to thermal movement.

INTERNAL DAMAGE

Lounge 5.37 x 4.95 x 2.35

Painted plaster walls and ceiling.

Bare floorboards, varnished and sealed

The flooring below the window area appears to have dropped leaving a gap of around 5 mm.

There is cracking to the plaster finish around the window and door frame.

Hallway 3.00 x 2.47 x 2.35

Painted plaster walls and ceiling.

Cracking to the painted plaster finish mainly to the right hand side of the door leading into the porch.

Bedroom 1 4.96 x 3.99 x 2.35

Painted plaster walls and ceiling.

Cracking to the painted plaster finish, mainly above the window and to the right.

Damage to main house is thermal and not covered under the policy.

EXTERNAL DAMAGE

The pointing along the front of the property at DPC, there appears to have been some movement as the cement has crumbled in various areas. The brickwork to the porch has dropped, but the gap has closed a bit since reporting.

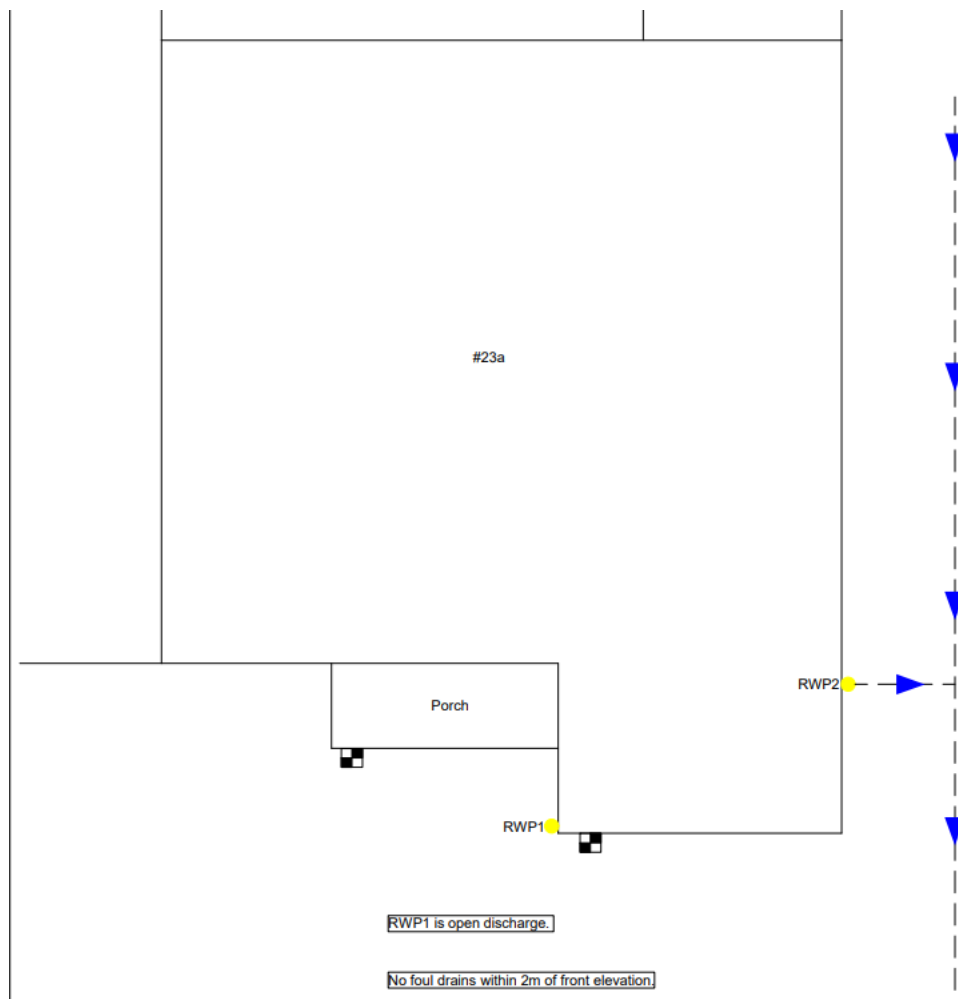
The porch appear to have moved forward, dipping to the front. The step to the porch had sunk along with the tarmac. The tarmac along the front elevation in front of the lounge has dipped. The tarmac drive away from the house appears to have also dropped. The insured has advised they were never able to see the concrete sub base previously.

CATEGORY OF DAMAGE

In structural terms, with reference to Table 1, Building Research Establishment¹ Digest 251, the damage is categorised as Slight (>1 but < 5 mm) with maximum crack widths of 5.0mm.

GEOLOGY & SOIL

Site investigations confirm 900mm deep foundations to the damaged porch bearing on clay that has high to very high plasticity, meaning it can significantly change in volume due to seasonal variations in moisture content, particularly if influenced by tree roots extracting moisture.



Laboratory tests confirm the onset of desiccation has occurred where roots were observed, the moisture contents being less than 0.5x the Liquid Limit, this indicates abnormal soil drying in the presence of tree roots.

¹ Building Research Establishment, Garston, Watford. Tel: 01923.674040



Tel: 0844 3358908

Email: enquiries@fastrackgroup.co.uk

Appendix No: 3

FSI Ref:

LABORATORY RESULTS

Property Address:

23a Crows Nest Lane, Botley, Southampton, Hampshire, SO32 2DD

Client Claim Ref:

SU2203636

BOREHOLE 1

Depth (m)	MC (%)	Corr. MC (%)	LL (%)	PL	PI (%)	Class	% Retained (425µm)	Soil Suction (kPa)	Condition of test	Soil Description
0.90	16.6	36.89					55		Natural	Brown clayey, sandy GRAVEL
1.50	37.8	39.38					4		Natural	Brown silty CLAY containing grey and orange mottle and gravel
2.00	38.6	39.05	83	30	53	CV	1.15		Natural	Brown silty CLAY containing grey and orange mottle
2.50	48.9	51.47					5		Natural	Brown silty CLAY containing grey and orange mottle and gravel
3.00	34.5	51.2	76	29	47	CV	32.62		Natural	Brown silty CLAY containing grey and orange mottle and gravel

Roots were recovered from depths of up to 1.5m

ROOTS

The recovered roots were sent for laboratory testing and the results are as follows:

ROOT IDENTIFICATION

23a Crows Nest Lane, Botley, SO32 2DD

Client Reference: 25313
Report Date: 22 November 2022
Our Ref: R48600

Sub Sample	Species Identified	Root Diameter	Starch
BH2:			
1.5m	probably <i>Quercus</i> spp. but possibly <i>Castanea</i> spp.	1	1.5 mm Low

Comments:

1 - Plus 3 others the same.

Quercus spp. are oaks. *Castanea* spp. include sweet chestnut.

Based on the above, in the absence of any *Castanea* species, the roots emanating from Oak/Chestnut species will have emanated from Oak T1 in the MWA report, thus confirming its influence on soil moisture and the slight desiccation that has occurred at rooting depth.

VEGETATION

There are trees and shrubs nearby, some with roots that may extend beneath the foundations. The following are of particular interest and recommendations have been made to provide a remedy to the damage:-

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	Oak	24	920	23	11	Older than Property	Policy Holder
Management history		No significant recent management noted. Crown largely absent over road to front.					
Recommendation		Reduce height to 15m and crown spread to 16m. Prune on a triennial cycle to maintain at broadly reduced dimensions. Review should stability not be fully restored.					
T2	Cherry	4.5	95	5.5	5	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Reduce height and crown radius to 3m leaving balanced crown. Prune on a biennial cycle to maintain at broadly reduced dimensions.					

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.

PHOTOGRAPHS



View of property from front right



View of front garden looking left

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VEGETATION INFLUENCE

According to the standard published work on the subject (Cutler, D.F. and I.B.K. Richardson, (1989) further confirmed by Mercer, Reeves & O'Callaghan (2011) in shrinkable clay soils, Oak species are capable of causing subsidence damage at distances up to 30m, with 75% of cases occurring where the tree was within 13m and occurring within 18m in 90% of cases.

The Oak T1 at only 11m, is therefore well within its species' potential rooting and influencing distance of the building and would be capable of causing seasonal soil drying beneath foundations. The site investigations confirm significant rooting beneath foundations in any event.

Roots from Cherry T2 are also likely to be present, this tree being only 5m from the property.

Oak T1 is covered by a Tree Preservation Order.

PATTERN OF MOVEMENT

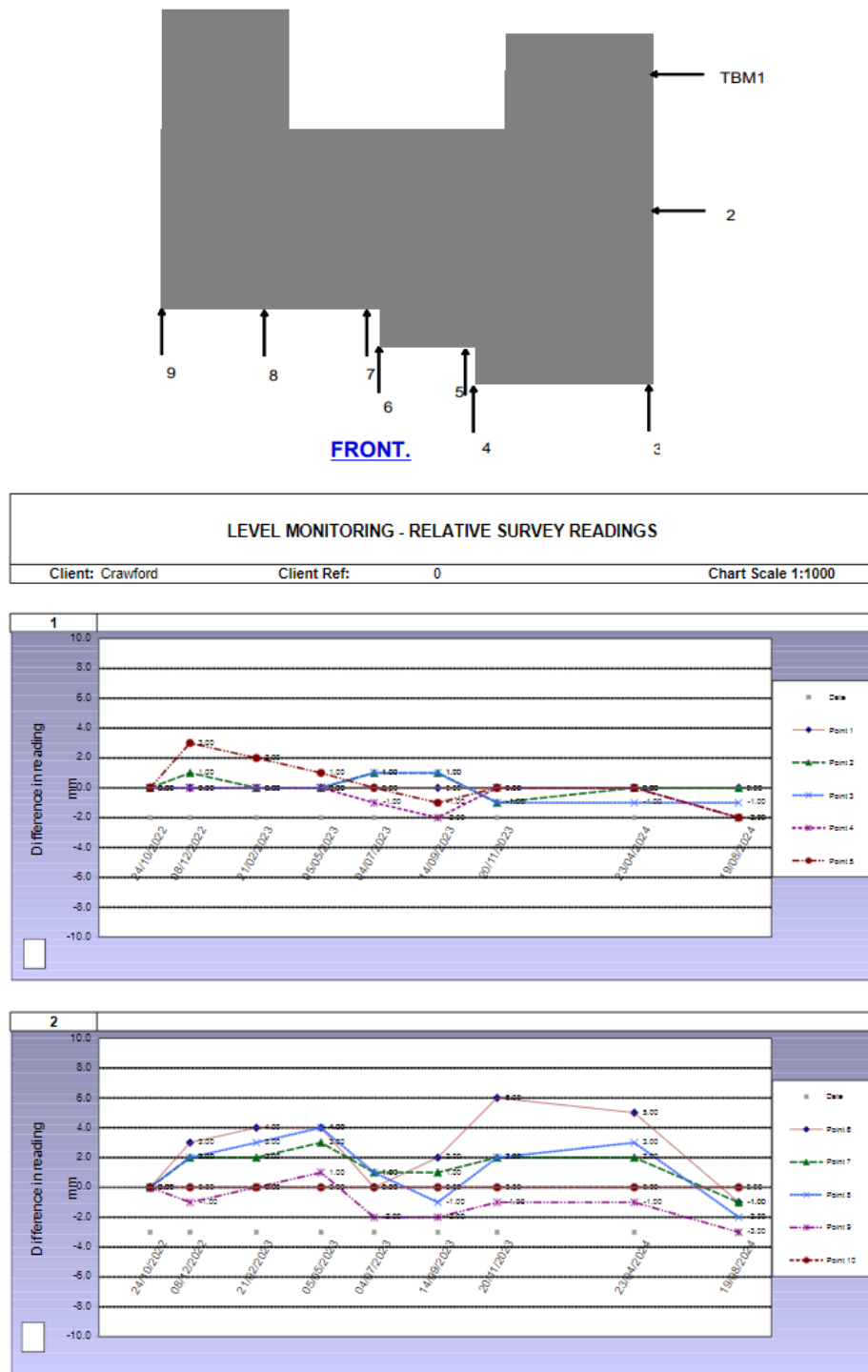
The timing of the damage was during a time of year when soil moisture deficits due to tree root activity would be reaching their peak and downward foundation movement to the porch occurred during summer 2023.

The area of movement and damage is consistent with the locations of the subject trees.

The pattern of movement is entirely consistent with the seasonal, cyclical influence of tree roots on soil moisture, foundations moving down during summer months when roots are active and extracting soil moisture, then returning to recovery and uplift as soil moisture increases during winter when tree roots are inactive.

Precise Level Monitoring

The results are as follows:



The level monitoring indicates a clear seasonal and cyclical pattern of movement consistent with root induced clay shrinkage with the greatest amplitude of movement being consistent with the locations of T1 & T2.

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This seasonal pattern of movement occurred during summer 2023 and 2024 despite these summers having been considerably wetter than summer 2022 when the damage occurred.

DISCUSSION

The pattern and nature of the cracks is indicative of an episode of subsidence. The cause of movement is clearly attributable clay shrinkage exacerbated by tree root activity.

The timing of the event, at a time of year when soil moisture deficits due to tree root activity would be reaching their peak.

The presence of shrinkable clay beneath the foundations and the proximity of vegetation where there is damage indicates the shrinkage to be root induced. This is a commonly encountered problem and probably accounts for around 70% of subsidence claims notified to insurers.

Root identification implicates Oak T1 as a cause of the damage.

MITIGATION OPTIONS

The publication “CONTROLLING WATER USE OF TREES TO ALLEVIATE SUBSIDENCE RISK” © 2004 BRE on behalf of the Link Consortium for Horticulture Link Project No. 212 concluded that:

- For practical soil moisture conservation, severe crown-reduction 70-90% of crown volume would have to be applied. Reduction of up to 50% crown volume is not consistently effective for decreasing soil drying.
- To ensure a continued decrease in canopy leaf area and maximise the period of soil moisture conservation, crown reductions should be repeated on a regular managed cycle with an interval based on monitoring re-growth.

This is reinforced in BRE IP7/06 “Pruning trees to reduce water use”.

If the subject trees are not pruned, then damage will almost certainly continue and worsen. Roots from these trees have almost certainly encroached beneath foundations and caused seasonal soil drying that has led to the damage.

Root pruning option - Root pruning as a form of mitigation is inherently unreliable as the level of excavation required could include many cubic meters of soil to be guaranteed to have removed all roots causing a nuisance, to effect such a remedy might materially make the tree unsafe or so biologically damaged as to destroy the amenity being the subject of the attempted remedy. Also, new roots will immediately seek to colonise the soil subject to the root cutting and the nuisance will recur.

Root barrier option – We have considered the feasibility of installing a root barrier however, at the present time, this would appear to be excessive due to the low amplitude of seasonal foundation movement that may be remedied by appropriate pruning.

If pruning is not possible then the only alternative solution would be underpinning.

Underpinning – if the tree remains then the only appropriate solution would be underpinning to stabilise foundations, the cost of which is currently estimated at £60,000

ADDENDUM ARBORICULTURAL REPORT

Drains - There are no apparent issues in relation to drains, and soil softening/washing by an escape of water is not considered to be a factor in the damage. This is confirmed by the desiccated condition of the soil.

Heave Potential – As only pruning has been recommended, there would be no risk of adverse soil heave occurring.

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RECOMMENDATIONS

T1 Oak – Reduce height from 24m to 15m and reduce spread from 23m to 16m (subject to consent being granted under the TPO)

Statutory Controls – Oak T1 is covered by a Tree Preservation Order administered by Eastleigh Borough Council, therefore an application is required and consent needs to be granted prior to any tree works occurring.

T2 Cherry – Reduce height and spread to 3m (No TPO) – Completed 05.12.2023

The trees are located within the insured address.

RESERVES

Superstructure repairs - **£3,000**

Estimated Engineering solutions and superstructure repairs - **£60,000**

Yours faithfully

Chris Davies Dip.Arb.(RFS), F.Arbor.A

Arboricultural Consultant - Subsidence Team

Crawford & Company

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Standard References:

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