



TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: [REDACTED]

**2 Greenside
Crowthorne
Berkshire
RG45 6EX**

Prepared for

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

[REDACTED]

SUBSIDENCE CLAIM

DATE 2 March 2023



Crawford Claims Solutions – Subsidence
Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8260
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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 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 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 damage was noticed in July 2022.

PROPERTY

Two storey detached house of traditional construction with brick walls surmounted by a gabled, tiled roof.

HISTORY & TIMESCALE

Date of Construction	c.1960s
Purchased	23/06/21
Policy Inception Date.....	23/06/2022
Damage First Noticed	01/08/2022
Claim Notified to Insurer.....	27/08/2022
Date of our Inspection.....	22/09/2022
Issue of Report.....	29/09/2022
Anticipated Completion of Claim	Autumn 2024

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TOPOGRAPHY

The property occupies a site which slopes gently up from front to rear.

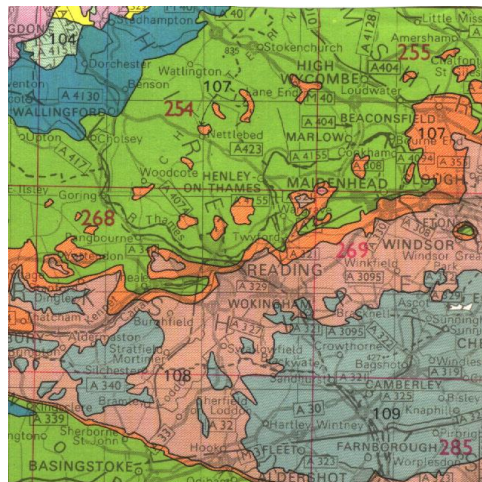
GEOLOGY

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

Previously grouped along with the Bagshot beds being termed the Lower Bagshot, and the Bracklesham referred to as the Middle Bagshot¹. Sandy and loamy superficially, sandier with depth and then containing laminations of green clay.

The superficial deposits are thought to be None - Solid Outcropping.

The solid geology appears to outcrop in this location, although we cannot rule out the presence of superficial deposits at shallow depth.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.
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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
Oak	22 m	5 m	Owners
Pine	25 m	5 m	Owners
Cherry	5 m	8 m	Owners
Pine	25 m	3 m	Neighbour 1
Oak	20 m	8 m	Neighbour 1

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

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	Scots pine	16	425 *	9 *	2.5	Similar Age to Property	Third Party 4 Greenside RG45 6EX
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level.					
T2	English Oak	23	850 *	18	7	Older than Property	Policy Holder
Management history		No significant recent management noted.					
Recommendation		Reduce height to 20m and spread to 15m leaving balanced crown. Prune on a triennial cycle to maintain at broadly reduced dimensions.					
T4	English Oak	21	770	22 *	5	Older than Property	Joint Policy Holder & 1 Badgers Sett RG45 6EY
Management history		No significant recent management noted.					
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

Table 2 **Future Risk - Tree Details & Recommendations**

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T3	Birch	22	675 *	11	8	Older than Property	Policy Holder
Management history		No significant recent management noted.					
Recommendation		No works required.					
T5	English Oak	10	225 *	6.5 *	6 *	Younger than Property	Third Party 1 Badgers Sett RG45 6EY
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level. Owner to physically remove any regrowth (no chemical treatment due to translocation risk).					
T6	English Oak	15 *	225 *	6.5 *	8.5 *	Younger than Property	Third Party 1 Badgers Sett RG45 6EY
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level. Owner to physically remove any regrowth (no chemical treatment due to translocation risk).					
T7	Scots pine	22	580	6	5	Younger than Property	Policy Holder
Management history		No significant recent management noted.					

Table 2 **Future Risk - Tree Details & Recommendations Cont'd**

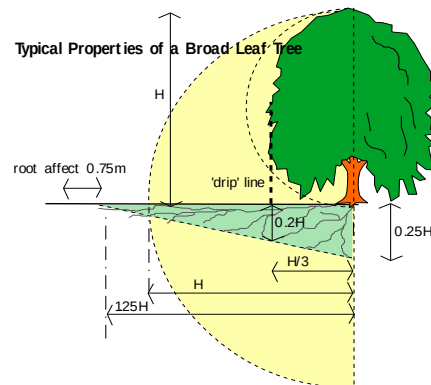
Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
SG1	Includes Camelia, Hypericum, Privet	2	15 Ms *	2	0	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Do not allow to exceed current dimensions.					
G1	Yew, Cherry-laurel, Rhododendron	5 *	200	7	4	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Do not allow to exceed current dimensions.					

Ms: multi-stemmed

* Estimated value

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.

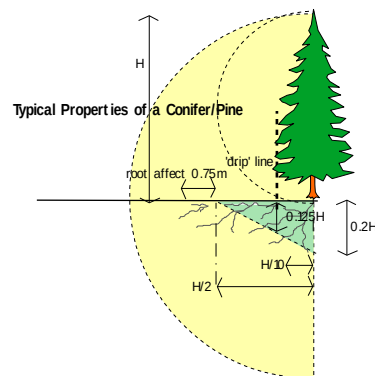
² Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

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

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.

Pines, *Pinus* species, include the native Scots pine and a wide range of imported species, of which Corsican and Austrian pines are particularly common as shelterbelts and Monterey pines in coastal areas. They are typically fast growing large trees, but have moderate water demands for conifers and, as they generally prefer light sandy soils are not normally a major problem near buildings.

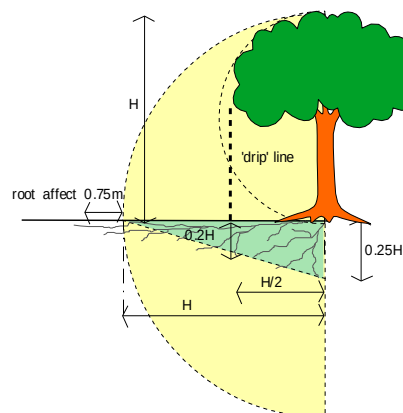


Typical proportions of a pine tree, showing the potential root zone.

They cannot grow new shoots from bare wood or cut stumps, so do not tolerate pruning well, though they can be crown thinned or have lower branches removed without too many problems. They will sometimes stand being topped provided they are cut down to live branches, but the result is usually so disfiguring as to make the exercise pointless.

Cherries, *Prunus* species, include Japanese flowering species, which are mainly small growing short lived moderate water demanders and the native wild cherry, *P. avium*, which is generally longer lived and capable of reaching over 20m.

The growth rate is 300mm a year and they have medium root activity. They can be associated with subsidence, although they are not regarded as a particularly aggressive tree.



Typical proportions of a Cherry tree. Note the potential root zone.

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Most Prunus species have wide spreading roots and a tendency to send up sucker shoots, often a long way from the parent tree. The genus includes plums, laurels, Portugal laurel, the roots of which are indistinguishable from each other.

OBSERVATIONS

The area of damage is the front right.

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

INTERNAL

There is no internal damage since the movement has occurred to the external walls below ground floor level.

EXTERNAL

Front Elevation

Horizontal crack 7 brick courses below dpc, extending from left corner of gable elevation tapering open to front right corner, max opening c.14mm, One vertical crack below this main horizontal crack about 2m from corner.

Right Flank Elevation

The horizontal crack noted above continues down the flank elevation, tapering to closure towards the rear but still open where the crack disappears below ground level (due to the sloping ground). The crack also shows there has been lateral movement to the right of c.5mm at the corner, tapering less to rear.

Garage

Stepped crack on rear wall at low level. Laser level indicates brick bed joints are level.

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment⁴ 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.

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

INVESTIGATIONS

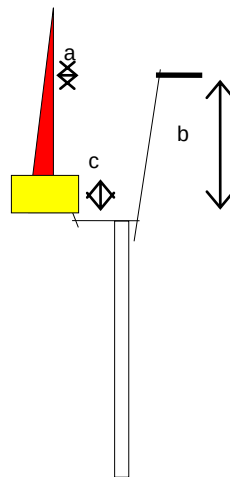
The following investigations were undertaken to identify the cause of movement.

TRIAL HOLES

A trial hole was excavated to expose the foundations - see site plan for location and the diagram below for details.

Trial hole 1 shows the foundation bares onto Grey/brown silty sandy CLAY containing gravel.

Trail hole 2 shows the foundation bares onto Grey/brown silty sandy CLAY containing gravel.



Foundation Details

No.	Borehole Depth	Footing (a)	Underside (b)	Thickness (c)
TH1	3.00 m.	200 mm.	600 mm.	300 mm.
TH2	3.00 m.	170 mm.	810 mm.	550 mm.

AUGERED BOREHOLES

A 50mm diameter hand auger was sunk - see site plan for location(s).

Borehole 1 shows that the soil is found to be dark brown Sand contain gravel at 0.10m it the changes to grey/brown silty sandy CLAY at 0.70 back to grey/ brown silty clayey SAND at 1.30m then back to grey/brown silty sandy CLAY at 1.60m and finally Brown clayey SAND at 1.90m and that continues to 3.0m. Roots are at foundation level, 1.50m, and 2.00m and at 2.50m. The KPA at foundation level shows reading of 96-98.

Bore hole2 shows the soil type of Dark brown silty SAND containing gravel this changes to grey/brown silty sandy CLAY at 0.70m and changes to grey/brown silty clayey SAND at 1.40 and this continues down to 3m. Roots are found at foundation level, 1.50m, 2.00m, 2.20m and 2.50m.

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.

DRAINS

The drain survey has not revealed any damage or defects to the underground drainage system in the area of subsidence damage. Therefore, an escape of water has been dismissed as a possible cause.

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 810 & 600 mm which is below the level that normal seasonal movement would be expected to occur.
- Atterberg limit testing indicates that the soil has an intermediate-high plasticity and hence will shrink and swell with changes in moisture content.
- Roots were found to the underside of the foundation and were identified as Oak and Pine. 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.
- Monitoring evidence will be provided to support our conclusions and recommendations once sufficient readings have taken place.

RECOMMENDATIONS

As per the recommendations of the Arboricultural Report T1, T5, T6, S1 require removal and T2, T4 should be reduced to allow the property to stabilise. The trees can be felled without risk of heave related damage occurring.

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