



TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU2206135

**Sanctuary Housing Association
154 Morley Avenue
London
N22 6NT**

prepared for

**Aviva - Commercial
Commercial Claims/Subsidence, Level 3 West, Perth, PH2 0NH**

Claim Reference 4502111922-1

SUBSIDENCE CLAIM

DATE 26 June 2023



**Crawford Claims Solutions – Subsidence
Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8260
Fax: 0121 200 0309**

Chartered Loss Adjusters

INTRODUCTION

We have been asked by Aviva - Commercial 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.

Site Plan



Plan not to scale – indicative only

 Approximate areas of damage

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.

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TECHNICAL CIRCUMSTANCES

The tenant who has lived at the property for 30 years first noted cracking 3-4 months ago. Cracking developed during summer and tenant notified Sanctuary Housing who notified Insurer.

PROPERTY

Two storey end-terrace house of traditional construction with pebble dashed walls surmounted by a pitched tiled roof.

HISTORY & TIMESCALE

Date of Construction	1920
Policy Inception Date.....	30/05/2022
Damage First Noticed	25/08/2022
Claim Notified to Insurer.....	26/10/2022
Date of our Inspection.....	01/11/2022
Issue of Report.....	10/11/2022
Anticipated Completion of Claim	Summer 2023

TOPOGRAPHY

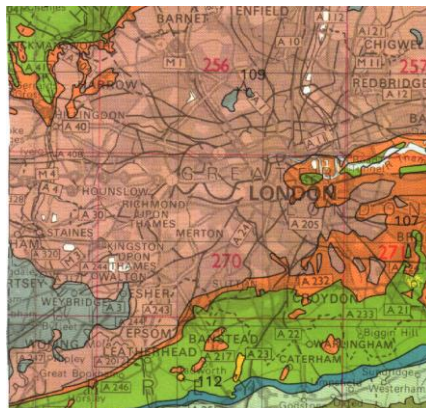
The property occupies a reasonably level site with no unusual or adverse topographic features.

GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number TQNW suggests the underlying geology 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:-

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

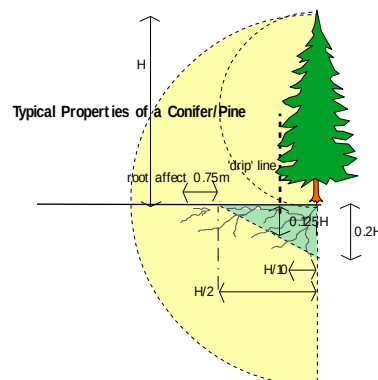
Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
TG1	Cypress, apple, elder	9.0	280	5.5	1.6	Younger than Property	Policy Holder
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
CG1	Ivy	2.5	40 Ms *	6.0	1.4	Younger than Property	Joint Policy Holder & 23 Darwin Road N22 6NS
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					

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.

Conifers ~ The term is usually used to refer to cypresses and close relatives, but in the broader sense includes any trees that bear cones and nearly all of them have simple needle or scale like leaves, sometimes arranged into fronds as in the cypresses.



Typical tree proportions showing the root zone. This is a conservative estimate, as the zone can equal the height of the tree.

Generally they have less invasive roots and lower water demands than broadleaved species, but cypresses are often associated with subsidence as they are very fast growing, popular hedge plants that are frequently planted near houses.

OBSERVATIONS

The rear of the property is the focal area of damage.

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

INTERNAL

Kitchen

Separation of ceiling from wall at junction extending width of room 12mm wide.

Bathroom

Separation of ceiling from wall at rear and return wall junctions extending width and length of room 12mm wide.

Diagonal cracking to plastered wall to return partition wall shared with WC 11-20mm wide.

WC

Sever cracking to partition wall junction aligned to the damage on opposite side of partition shared with Bathroom.

Hallway

Door to rear exit is sticking and requires adjustment for tenant.

EXTERNAL

Right Flank Wall

Vertical separation at junction of outrigger and rear extension extending 4 meters and crack width - 2mm wide.

Front Door

Door is stiff and requires easing for tenant.

CATEGORY

In structural terms the damage falls into Category 4 of Table 1, Building Research Establishment² Digest 251, which describes it as "severe".

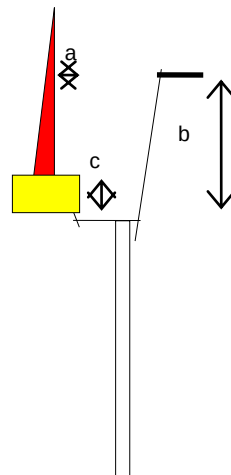
Category 0	"negligible"	< 0.1mm
Category 1	"very slight"	0.1 - 1mm
Category 2	"slight"	>1 but < 5mm
Category 3	"moderate"	>5 but < 15mm
Category 4	"severe"	>15 but < 25mm
Category 5	"very severe"	>25 mm

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.

² Building Research Establishment, Garston, Watford. Tel: 01923.674040



Foundation Details

No.	Borehole Depth	Footing (a)	Underside (b)	Thickness (c)
TH1	3.00 m.	180 mm.	700 mm.	400 mm.

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.

Site investigations and soil test results have confirmed a plastic clay subsoil susceptible to undergoing volumetric change in relation to changes in soil moisture.

Roots were observed to a depth of 1.7m bgl in TP/BH1, and recovered samples have been positively identified (using anatomical analysis) as Cupressaceae spp.; the origins of which will be the Cypress of TG1 group which surround the property rear garden.

Irrespective of the identification of recovered root samples, the roots of the Apple and Elder elements of TG1 group as well as the Ivy group CG1 are also likely to be present below foundation level in proximity to the area of movement/damage and contributing to the influence of soil moisture and volumes.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that TG1 group and CG1 Ivy growth is removed.

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

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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 800 mm which is below the level that normal seasonal movement would be expected to occur.
- Atterberg limit testing indicates that the soil has a high plasticity and hence will shrink and swell with changes in moisture content.
- Roots were found to the underside of the foundation. 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.

RECOMMENDATIONS

As per the recommendations of the Arboricultural Report TG1 and CG1 require removal to allow the property to stabilise. The trees can be felled without risk of heave related damage occurring.

Localised superstructure repairs can be implemented following completion of the required tree management works. Should consent not be granted and the trees remain partial underpinning to the property will be required to arrest the movement, with costs rising over £120k. The site constraints of the property and the proximity of the trees mean a root barrier is not considered a suitable solution in this instance.