



TECHNICAL REPORT ON A SUBSIDENCE CLAIM

[REDACTED]

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9 Chalcot Gardens
London
NW3 4YB



Prepared for

AXA Household

[REDACTED]

SUBSIDENCE CLAIM

28th January 2020

Crawford Claims Solutions – Subsidence

[REDACTED]

Chartered Loss Adjusters

[REDACTED]



INTRODUCTION

We have been asked by AXA Household 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

We met Mrs King who is freeholder of the property and also recently owned the basement flat but sold this a few months ago. She also owns the adjoining property, No.10. The damage was reported by the leaseholder of the ground/1st floor flat in Autumn 2019.

PROPERTY

Four storey large semi-detached house of traditional construction with brick walls surmounted by a ridged slated roof converted into 3 flats. The front elevation and 6m of the left flank elevation has been previously underpinned by the beam and base method to a depth shown on the drawings of 3.5m. The front Entrance steps have also been underpinned at an earlier time.

HISTORY & TIMESCALE

Removal of the Willow tree to be carried out.

Date of Construction.....	c.1870
Purchased.....	1972
Policy Inception Date.....	01/10/2013
Damage First Noticed	30/12/2019
Claim Notified to Insurer.....	30/12/2019
Date of our Inspection	21/01/2020
Issue of Report	28/01/2020
Anticipated Completion of Claim	Summer 2020

TOPOGRAPHY

The property occupies a reasonably level site.

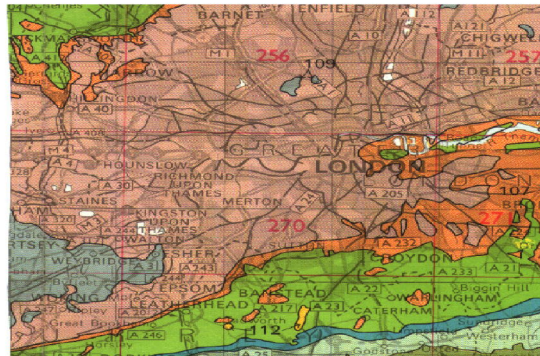
GEOLOGY

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

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



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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
Plane	24 m	10 m	No.9 & No.10
Willow	9 m	8 m	No. 11

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.

Planes (Platanus) are deciduous and can reach heights in excess of 30m depending on health, environment and soil conditions. They have a medium growth rate of around 300mm per year and medium root activity⁴.

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

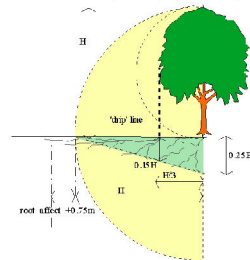
² B.S. 5930 (1981) "Site Investigations"

³ Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique, Vol 33.

⁴ Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

⁵ Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

Maximum tree-to-damage distance recorded in the Kew survey was 15mtrs, with 50% of all cases occurring within 5.5mtrs⁵. Planes are moderately deep rooted, and are predominantly street trees.

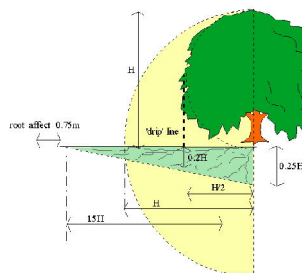


Typical proportions of a Plane tree, showing the potential root zone.

Life expectancy > 100 years and both young and old trees tolerant of pruning and crown thinning. Urban trees are prone to infection by anthracnose, a fungal foliage disease, which can be disfiguring, if not lethal. There is also concern about canker stain disease, which can also be lethal, spreading from Europe into Britain.

Willows (*Salix*) are deciduous and can reach heights in excess of 25m depending on health, environment and soil conditions. They have a fast growth rate of around 500mm per year and strong root activity⁶.

Maximum tree-to-damage distance recorded in the Kew survey was 40mtrs, with 50% of all cases occurring within 7mtrs⁷. They root moderately deeply in clay soils and have a life expectancy of between 50 and 100 years.



Typical proportions showing possible root zones in relation to height.

Both old and young trees are tolerant of quite heavy pruning and crown thinning.

⁵ Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

⁶ Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications

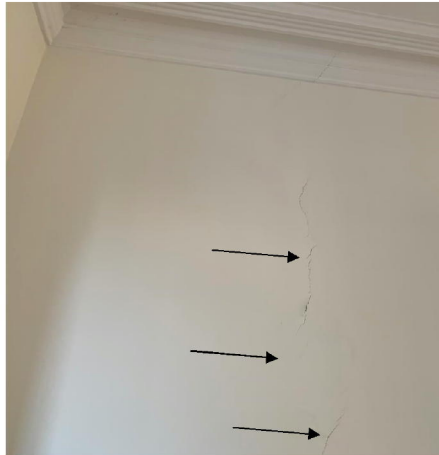
⁷ Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

OBSERVATIONS

The area of damage is the front elevation.

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

INTERNAL



Dining Room



Dining Room

Ground Floor Flat

Dining Room

Vertical crack on spine wall with entrance hall.

Front Bedroom

Stepped crack in stud wall above door.

En-Suite Bathroom

Stepped crack in stud wall above door (reflection of bedroom crack).

Not Subsidence

Shrinkage crack in rear hall area at junction of wall with ceiling.

Shrinkage crack in rear bedroom at junction of stud wall with party wall.

Doors sticking in 1st/2nd Floor Flat at front - swelling of doors due to moisture.

EXTERNAL



Front Elevation

Stepped crack on right splay of bay between lower ground & ground and between ground and 1st floor.

Fine stepped crack above central bay section at ground floor.

CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁸ 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.

⁸ Building Research Establishment, [REDACTED]
Chartered Loss Adjusters



DISCUSSION

The house, and the adjoining at No.8, have previously suffered subsidence to the front caused by root-induced clay shrinkage. Whilst we have seen limited documentation, the size and proximity of the Plane tree would clearly indicate that this was the main factor. As a consequence, the front elevation and left flank elevation of No.9 was underpinned by beam and base methods to a depth of 3.5m. This would have been beyond the depth of root influence at the time. We note that No.8 was underpinned by a piling method.

The mature Plane tree is owned/managed 2/3 to 1/3 contribution by No.8 and No.9 respectively. It requires pruning on a 2-yearly cycle to restrict its moisture demand and minimise the risk of future occurrences of subsidence. This tree management is an important part of the subsidence repair. We understand it was last pruned in 2018 before the main hot summer and is due further pruning this year.

There is also a Willow tree in the front garden of No.10 which is also owned by Mrs King. This is about 20 years old and has been steadily growing. Willows are high moisture demand trees.

The timing of the damage (late Summer 2019) indicates that the combined influence of the moisture demand from both trees is just starting to cause slight movement between the underpinned and non-underpinned sections of the property. The main crack is on the spine wall just to the rear of one of the main underpin bases. Summer 2018 was particularly hot and dry and resulted in a large increase in this type of subsidence. Summer 2019 also had dry spells which were sufficient to cause movement if any trees/vegetation had not been managed in the intervening period.

RECOMMENDATIONS

Fortunately, the cause of the problem (dehydration) is reversible. Clay soils will re-hydrate in the winter months, causing the clays to swell and the cracks to close. Provided the cause of movement is dealt with (in this case, trees) there should not be a recurrence of movement.

The Plane tree is already subject to pruning every 2 years and this has been effective. We consider the additional influence of the Willow tree is the main issue and therefore recommend it is removed. This will stop the two trees competing for moisture allowing the Plane tree management to be effective once again.

There is also a smaller specimen Acer tree close to the front. This is not of sufficient size yet to be causing an issue but should be managed to ensure that it maintains its current dimensions.

Provided the tree management works are completed expeditiously, consideration may then be given to carrying out the appropriate repairs to the property. This will include structural repairs to the bay and internal repairs/decorations to the Dining Room, Bedroom and bathroom in the Ground/1st Floor Flat.

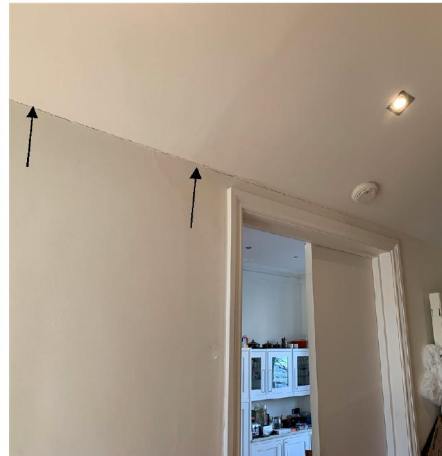
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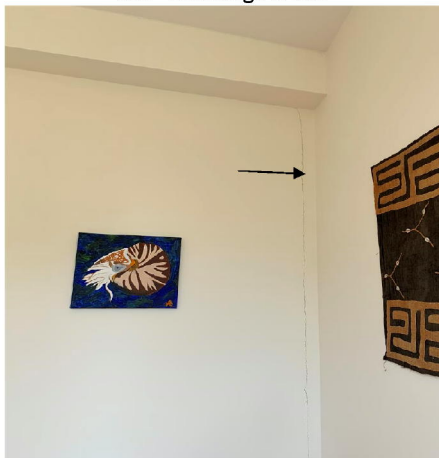
PHOTOGRAPHS



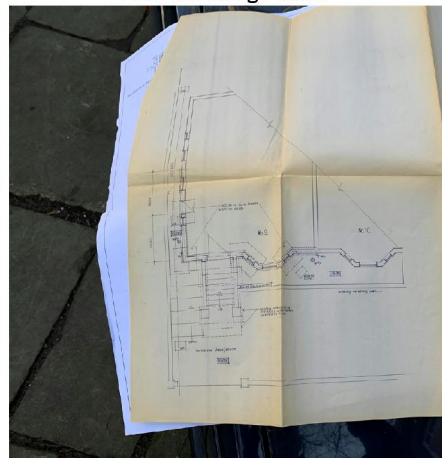
Hall - shrinkage crack



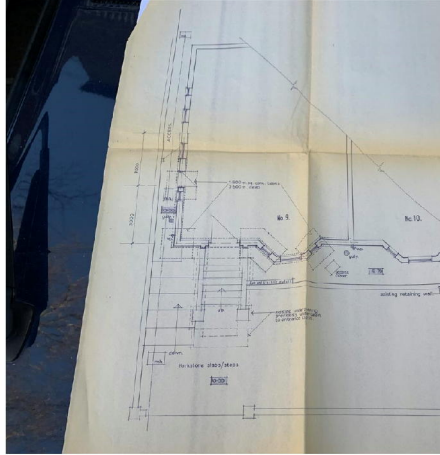
Hall - shrinkage crack



Rear bedroom - shrinkage crack



Underpinning Plan



Underpinning Plan



Bay



Willow



Plane

