TECHNICAL REPORT ON A SUBSIDENCE CLAIM

[redacted]

Negrar UK Ltd
7 & 9 Pond Street
London
NW3 2PN

Prepared for

Arch Insurance
40 Mitre Street, London, EL3A 5DE

[redacted]

SUBSIDENCE CLAIM

DATE: 29th September 2023

[redacted]

Chartered Loss Adjusters

[redacted]

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.

Key:

	Tree: Deciduous		Tree: Conifer		Shrub
	Hedge		Area of Damage		Bore Hole
	Trial Hole		Trial & Bore Hole		Level Monitoring
	Rain Water Manhole		Rain Water Gulley		Rain Water Pipe
	Waste Water Manhole		Waste Water Gulley		Toilet Pipe
	Rain Water Drain		Waste Water Drain		Electricity Cable
	Water Supply Pipe		Gas Supply Pipe		Incoming Gas Pipe
	Incoming Water		Incoming Electrics		

[redacted]

INTRODUCTION

We have been asked by Arch Insurance 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 occupiers and residents of the property noticed the damage internally within the rear, left-hand side, WC and hallway. They became concerned when they noticed the damage externally around the rear projection and notified their managing agent. The managing agent appointed a structural engineer to report on the damage where they suspected it could be related to subsidence, hence a claim was notified to insurer. Whilst there's been a previous claim made at number 9, which is the adjacent property there have no previous subsidence claims made for number 7, which is the property in question.

PROPERTY

The property is a four storey mid-terrace house converted into a commercial building internally of traditional construction with brick walls surmounted by a ridged tiled roof.

HISTORY & TIMESCALE

Date of Construction.....1800's
Purchased.....2012
Policy Inception Date 30/07/2022
Damage First Noticed 24/07/2023
Claim Notified to Insurer.....30/08/2023
Date of our Inspection 27/09/2023
Issue of Report 04/10/2023
Anticipated Completion of Claim .....December 2024

TOPOGRAPHY

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

[redacted]

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). Tomlinson[1] describes it as a 'fat' clay with high loadbearing characteristics due to pre-consolidation pressures in its geological history.

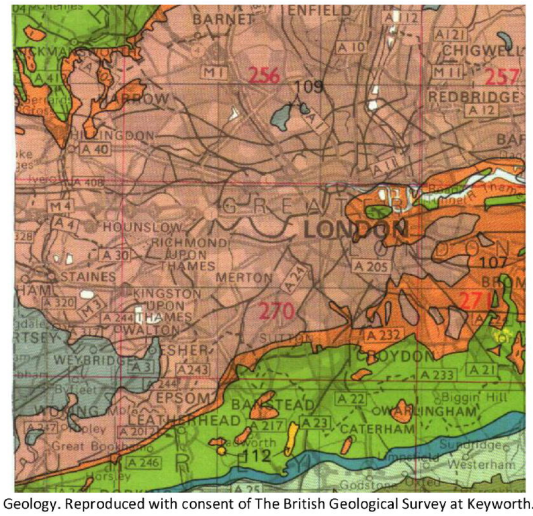
The upper horizon is often encountered at shallow depth, sometimes just below ground level. They have high shrink/swell potentials[2],[3] and can be troublesome in the presence of vegetation.

The superficial deposits are thought to be Silts.
Silts occur as glacial, alluvial or windblown deposits. They are water bearing and soft in consistency, and therefore amongst the most troublesome soils in excavation work since they are vulnerable to slumping and 'boiling'.

They can also suffer from frost heave[4]. In the south-east of England they are known as Brickearth, which are generally firm to stiff, where they are less troublesome.

They do not suffer volumetric changes in the presence of vegetation in the way of clay soils, but can be a problem where there are leaking drains, water services or fluctuations in the water table, when consolidation settlement can occur.

They can also suffer localised erosion and softening in the presence of water.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.

[1] Tomlinson M.J. (1991) *"Foundations Design & Construction"* Longman Scientific Publishing.
B.S. 5930 (1981) *"Site Investigations"*
[2] DriscollL 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.
[4] Tomlinson M.J. (1991) *"Foundation Design & Construction"* LONGMAN SCIENTIFIC

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
SG1 Shrubs	4 m	4 m	Owners
T1 Birch	5 m	8 m	Neighbour 1
T2 Ash	15 m	11 m	Owners

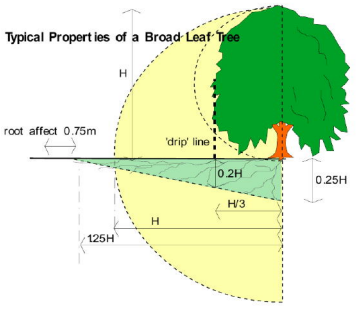
See sketch. Tree roots can be troublesome in cohesive (clay) soils because they can induce volumetric change. They are rarely troublesome in non-cohesive soils (sands and gravels etc.) other than when they enter drains, in which case blockages can ensue.

Shrubs. Sometimes even small shrubs can cause localised subsidence damage. In the Kew Garden Survey data was collected between 1979 - 86 to record the number of roots of each species received for identification. Of the 1009 roots identified, 367 (36%) belonged to the family *Rosoideae* or Rose. Next came the family *Oleaceae* (Forsythia, Jasmin, Privet and Lilac) with 354 (35%) enquiries.

Berberis, Viburnum, Hedera (ivy), *Hydrangea and Pyracanthus* are also regularly associated with foundation movement, the latter having surprisingly large roots on occasions.

Birches, (Betula species) are fast growing when young, but short lived, typically declining after 50 - 80 years.

Water demand is low and they are generally a low risk species near buildings. They will tolerate heavy pruning when immature, but not when older and the timber does not resist decay which can lead to structural weakness.



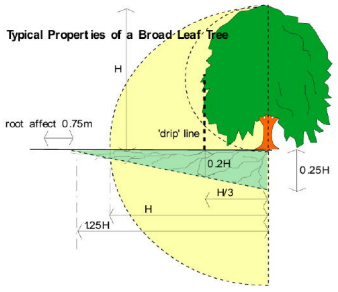
Typical proportions of a birch tree. Note the potential root zone.

They bleed profusely if cut in late winter or spring, but although this is unsightly, it does not normally do lasting harm. They reach heights of between 15 - 25mtrs, growing at a rate of 400mm[5] per year. They have weak root activity generally.

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

Ash (Fraxinus) are deciduous and can reach heights between 20-30m depending on health, environment and soil conditions. They have a fast growth rate of around 500mm per year, medium root activity[6] and medium water demand.

It is naturally vigorous and large growing, preferring light, fertile soils, but will grow on heavy clay. The maximum tree-to-damage distance recorded in the Kew survey was 21mtrs, and 50% of recorded cases occurred within 6mtrs[7].



Typical proportions of an Ash. Note the potential root zone.

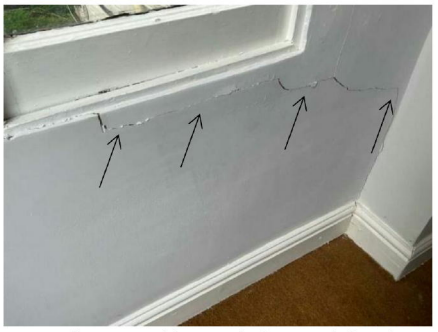
Young and old trees are tolerant of quite heavy pruning and crown reduction, but the timber is not particularly decay resistant and re-growth will need periodic cutting to keep weight and wind resistance down. Life expectancy > 100years. Root pruning can leave tree vulnerable to disease.

OBSERVATIONS

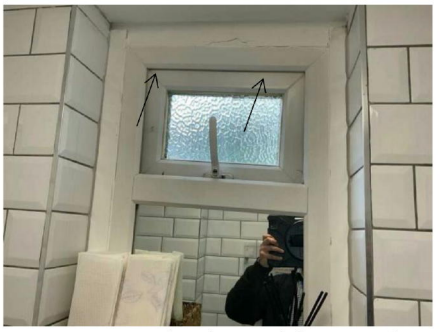
The damage of concern affects the rear left projection at ground floor level internally and externally.

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

INTERNAL



Cracking noted beneath the rear left side hallway window



Distortions noted to the rear left WC window

[6] Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications
[7] Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

Ground floor rear hallway (within projection)
There were signs of:

- Distortions found by the left side of the hallway window, which is also contained within the projection
- Vertical cracking found adjacent to the previous window
- The same cracking, then extends beneath the window in a diagonal manner
- The previous crack heading down to skirting level

Ground floor rear left WC (within projection)
There were signs of:

- Distortions confirmed internally to the WC window

EXTERNAL

Cracking to the left side of rear external door

Cracking to the left side of projection heading diagonally above and below side window

Rear projection
There were signs of:

- Multiple diagonal cracks noted above the rear left side of the external door
- Multiple cracks found below the left side of the external door
- Cracking by the left side of the rear external door
- Evidence of previous tiebars above the rear external door noted by their external rear of the projection. It is unsure when these were installed. By the condition of the tie bars, it looks like they have been present for so long that they've started to deteriorate slightly however, this is nothing to do with the damage in question which has only appeared recently. There is no evidence that the tiebar has failed as the projection is not rotating away from the property and most of the damage is contained within the projection not at junction level.
- More cracks noted by the left side of the projection at the rear
- Distortion noted to the ground floor rear WC window which is located within the projection
- Right side of projection showing vertical cracking as viewed from no.5 by the engineer appointed by the policyholder initially

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment[8] 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.

DISCUSSION

The pattern and nature of the cracks is indicative of an episode of subsidence. The cause of movement appears to be either clay shrinkage or subsoil softening/erosion due to drains leakage.

Further site investigations will be required. Typically, these would involve trial pit(s) to determine the nature of the footings and subsoil and a localised drainage survey. We have also instructed a period of level monitoring to confirm to extent of movement to the rear projection.

We will report further once these investigations have been completed.

No structural changes to the building have been carried out which has contributed to the current subsidence related damage under investigation. We are not aware of any previous underpinning.

RECOMMENDATIONS

On receipt of the Site Investigation report, we will advise on causation and the scope of mitigation works required.

Zeeshan Lodhi
Crawford Claims Solutions – Subsidence
[redacted]

[8] Building Research Establishment, [redacted]

[redacted]