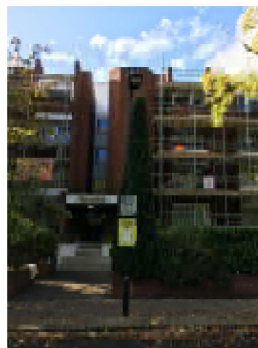
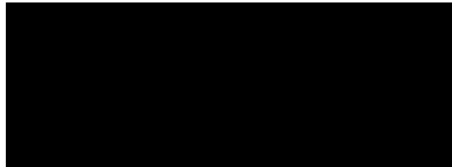




**TECHNICAL REPORT ON A SUBSIDENCE CLAIM**

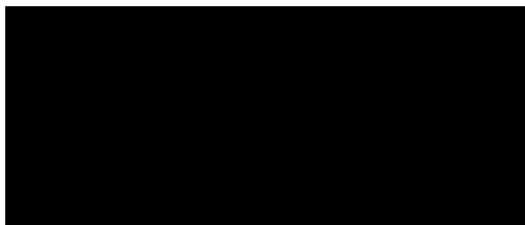


Prepared for



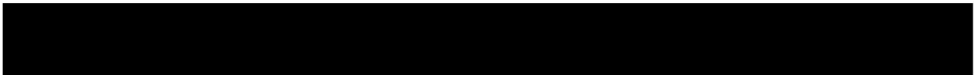
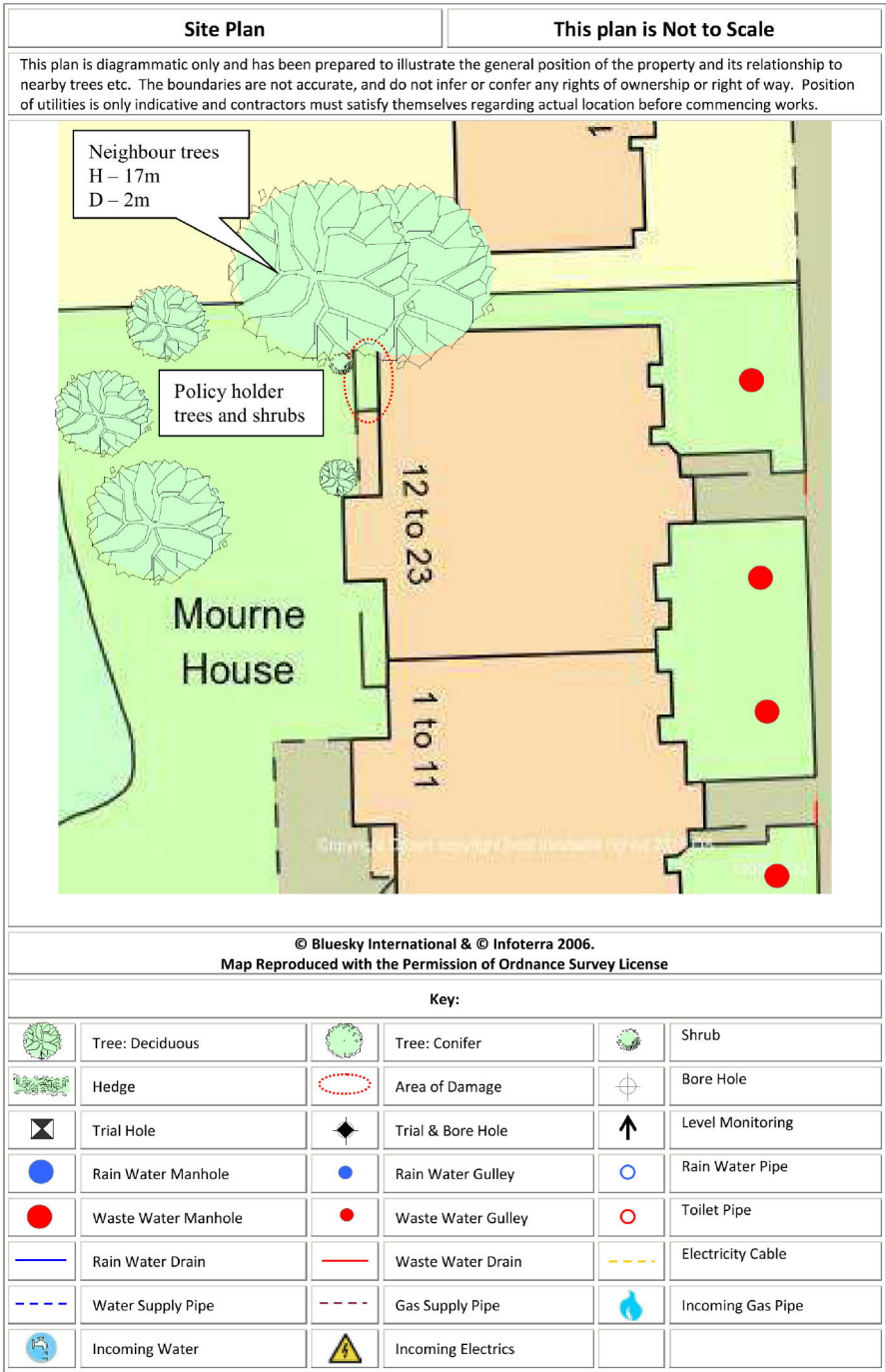
**SUBSIDENCE CLAIM**

DATE 22 October 2019



Chartered Loss Adjusters





## INTRODUCTION

We have been asked by AXA Commercial - Direct Claims 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

External repairs were scheduled to be carried out at the building and before works commenced on site the contractor noticed an external staircase at the rear had moved away from the main building. The issue was raised in the Pre-Start meeting and so the managing agents thought it best to contact insurers for further investigation.

## PROPERTY

The insured property is a four storey purpose built block of traditional construction with brick walls surmounted by a flat roof. There is a car park at basement level.

## HISTORY & TIMESCALE

Date of Construction .....	1976
Purchased .....	1976
Policy Inception Date .....	21/08/1999
Damage First Noticed .....	24/09/2019
Claim Notified to Insurer.....	25/09/2019
Date of our Inspection.....	15/10/2019
Issue of Report .....	22/10/2019
Anticipated Completion of Claim .....	March 2021

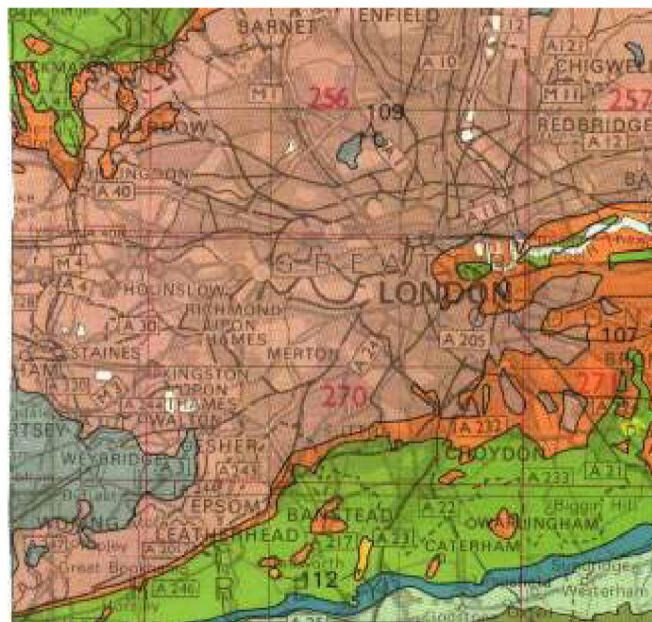
## TOPOGRAPHY

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

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.

The upper horizon is often encountered at shallow depth, sometimes just below ground level. They have high shrink/swell potentials<sup>2,3</sup> 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.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.  
Licence IPR/34-7C CSL British Geological Survey. ©NERC. All rights Reserved.

<sup>1</sup> Tomlinson M.J. (1991) *"Foundations Design & Construction"* Longman Scientific Publishing.

<sup>1</sup> B.S. 5930 (1981) "Site Investigations"

<sup>2</sup> Driscoll L. R. (1983) "Influence of Vegetation on Clays" *Geotechnique*. Vol 33.

<sup>3</sup> Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

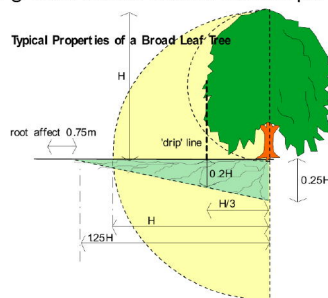
## VEGETATION

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	17 m	2 m	Neighbour 5
Deciduous	17 m	2 m	Neighbour 5
Broadleaf	7 m	6 m	Owners
Birch	15 m	10 m	Owners
Birch	12 m	12 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.

**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 activity<sup>4</sup>.



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 9.5mtrs<sup>5</sup>. 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.

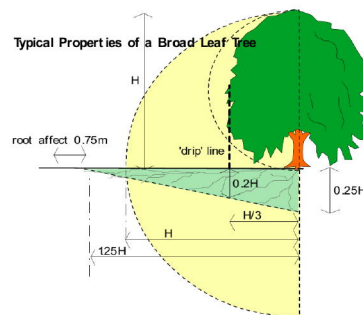
Oaks are, in my experience, worthy of considerable respect when dealing with subsidence claims. Their root system extends for surprising distances and can be associated with particularly high soil suctions.

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.

<sup>4</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

<sup>5</sup> Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific

**Broadleaf trees** typically have wider spreading roots and higher water demands than coniferous species and many are better adapted to growing on heavy clay soils. Some are capable of sprouting from cut stumps or bare wood and most will tolerate pruning better than conifers.

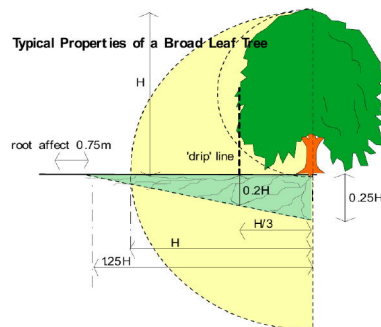


Typical proportions of a broadleaf tree. Note the potential root zone. It must be noted that every tree is different, and the root zone will vary with soil type, health of the tree and climatic conditions.

However heavy pruning of any tree should be avoided if possible, as it stimulates the formation of dense masses of weakly attached new branches which can become dangerous if not re-cut periodically to keep their weight down.

**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<sup>6</sup> per year. They have weak root activity generally.

<sup>6</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications  
Chartered Loss Adjusters



### OBSERVATIONS

The main area of damage is to an external staircase structure at the rear right hand side of the building.

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

### INTERNAL

No damage reported.

### EXTERNAL



Beneath staircase



Top of staircase

### Rear elevation

Staircase to the left hand side is showing movement away from the main building <60mm.  
Staircase to the right hand side is showing some minor (historic) movement <3mm.

### Front elevation

Path leading to front steps at entrance 12-23 Mourne House has dropped and dwarf wall has rotated outwards (to be dealt with under a separate claim).

**CATEGORY**

In structural terms the damage falls into Category 5 of Table 1, Building Research Establishment<sup>7</sup> Digest 251, which describes it as “**very 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.

**DISCUSSION**

The pattern and nature of the cracks is indicative of an episode of subsidence. The cause of movement appears to be clay shrinkage.

The timing of the event, 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.

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, vegetation) there should not be a recurrence of movement.

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

<sup>7</sup> Building Research Establishment, [REDACTED]



### **RECOMMENDATIONS**

Although the cause of the movement needs to be dealt with, we note the involvement of commercial third party trees which are potentially subject to a Preservation Order. Unfortunately, current legislation requires certain investigations to be carried out to support an application for the tree works.

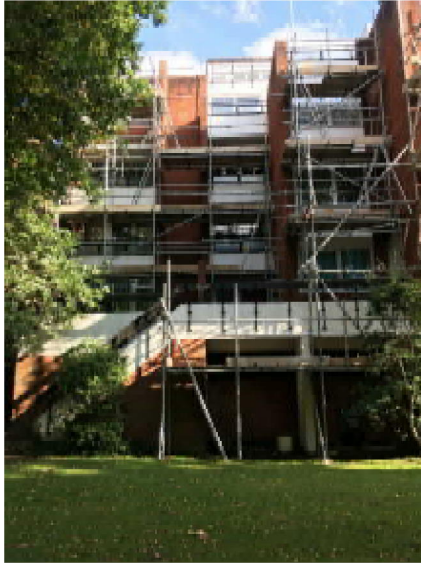
Typically, these investigations would involve trial pit(s) to determine the depth and type of footings, boreholes to determine the nature of the subsoil/influence of any roots and monitoring to establish the rate and pattern of movement. The monitoring data provided must be sufficient to show a pattern of movement consistent with the influence of the vegetation and therefore it may be necessary to carry out the monitoring for up to a 12 month period.

It will also be necessary to obtain a specialist Arboricultural Report.

We will report further once these investigations have been completed.

**David Knight BSc (Hons) MRICS**  
**Crawford Claims Solutions – Subsidence**  
[subsidence@crawco.co.uk](mailto:subsidence@crawco.co.uk)

PHOTOGRAPHS



Rear elevation showing staircase



Nearby vegetation



Junction of staircase and main building



Dwarf wall on landing of staircase





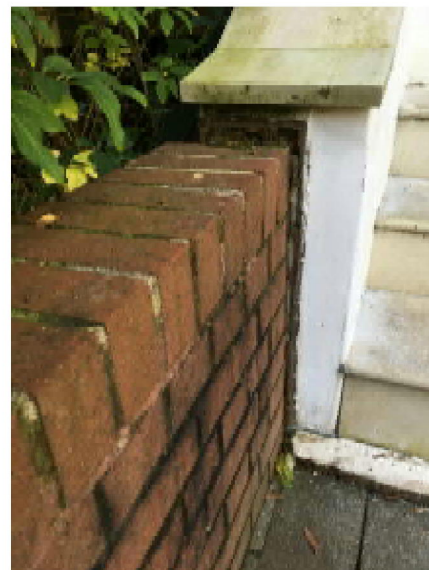
Historic movement to other staircase



Historic movement to other staircase



Rotation of dwarf wall at entrance



Rotation of dwarf wall at entrance

