

**TECHNICAL REPORT ON A SUBSIDENCE CLAIM**

Crawford Reference: [REDACTED]

**Welford House  
13 Arkwright Road  
London  
NW3 6AA**



prepared for

[REDACTED]

[REDACTED]

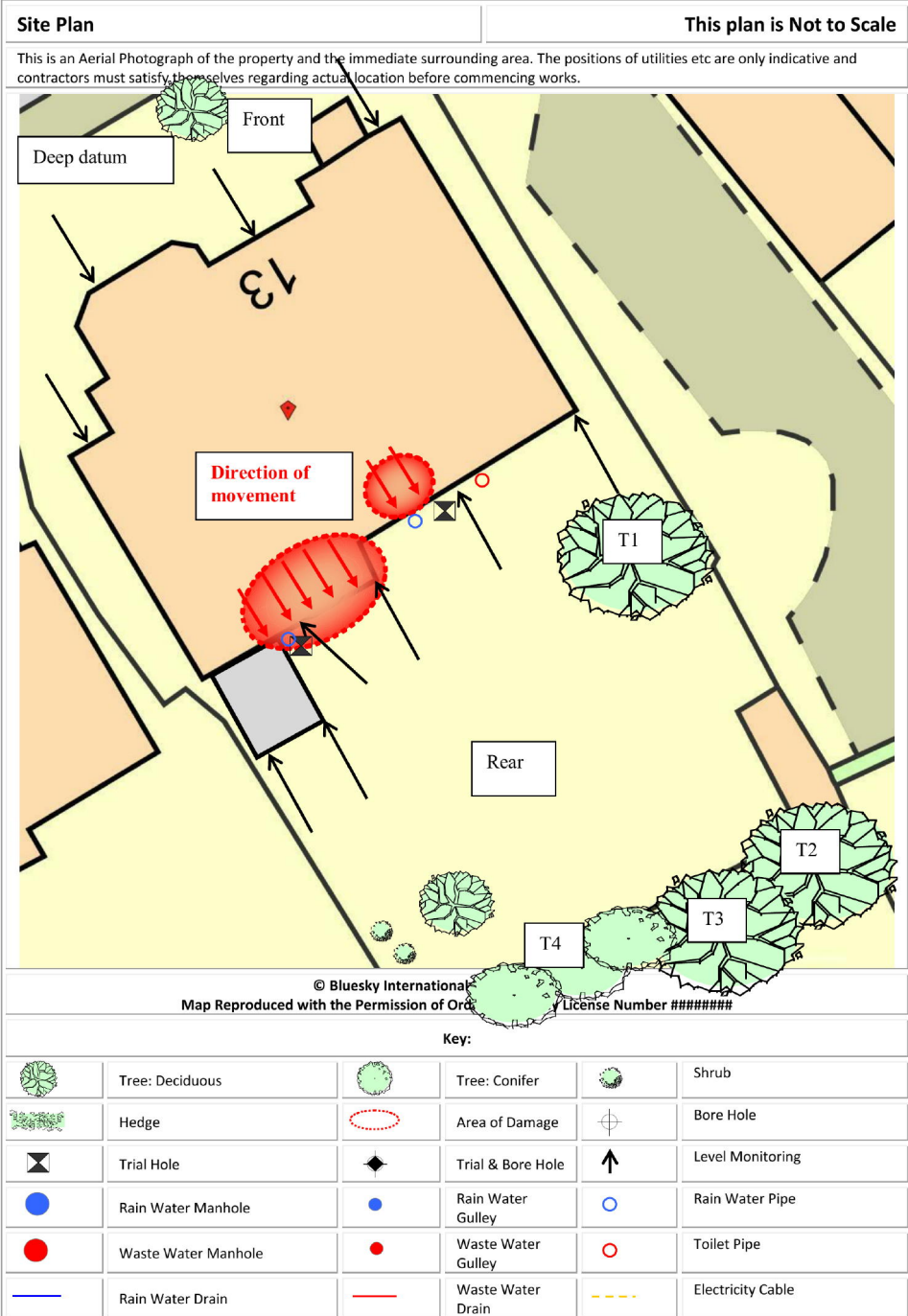
[REDACTED]

DATE 30 November 2018



**Crawford**<sup>®</sup>

[REDACTED]



**INTRODUCTION**

We have been asked by Allianz 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.

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 property is divided into 8 flats, and the only damage is to basement flat no. 2 which is to the rear of the property. The tenant moved out in the month of August 2018 and the builders have since discovered cracks in the bedroom, living room and kitchen with external damage around the bay structure and junction of conservatory and main building.

We met the builders at the property and the works are underway to refurbish the whole flat as the outgoing tenant left the property in very poor condition with major issues with damp. The property is due to be rented to a new tenant and attempts are made by the builders to complete the internal structural repairs and redecorations.

The previous tenants occupied the flat for approximately 7 years and they never allowed access therefore it is unclear when the structural cracks first appeared.

The property was inspected when it was on risk with Allianz commercial but claim a claim was declined due to pre-inception damage and referred back to LV as the property was on risk since 14<sup>th</sup> of June 2013.

**PROPERTY**

Five storey multi-occupied detached property of traditional construction with brick walls surmounted by a pitched roof.

**HISTORY & TIMESCALE**

Date of Construction .....	1900
Purchased .....	Multiple owners
Policy Inception Date .....	14/06/2013
Damage First Noticed .....	27 August 2018
Claim Notified to Insurer.....	06/09/2018
Date of our Inspection.....	18/09/2018
Issue of Report .....	28/11/2018

**TOPOGRAPHY**

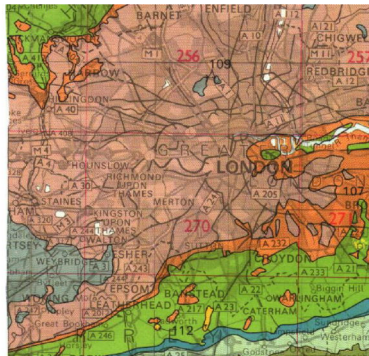
The property occupies a reasonably level site with no unusual or adverse topographic features.

**GEOLOGY**

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number TQNW suggests the underlying geology to be 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<sup>1</sup> 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<sup>2, 3</sup> and can be troublesome in the presence of vegetation.



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>2</sup> B.S. 5930 (1981) “Site Investigations”  
<sup>3</sup> Driscoll 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

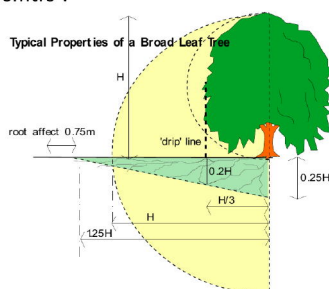
There are several trees nearby, some with roots that may extend beneath the house foundations. The following are of particular interest:-

Type	Height	Distance	Ownership
T1 Ash	20 m	8 m	Owners
T2 Sycamore	19 m	20 m	Neighbour 1
T3 Oak	18 m	20 m	Neighbour 1
T4 Group of conifers	14 m	20 m	Neighbour 2

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.

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<sup>4</sup> 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<sup>5</sup>.



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.

Sycamores (*Acer*) are deciduous and can reach heights between 20-30m depending on health, environment and soil conditions. They have a fast growth rate of around 600mm per year and medium root activity<sup>6</sup>.

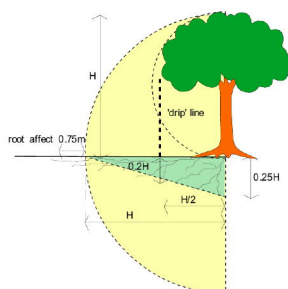
The Sycamore is a hardy tree, and can withstand quite aggressive environments. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, with 50% of cases occurring within 6mtrs<sup>7</sup>. They are deep rooting on clay soils and have a life expectancy > 100 years.

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

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

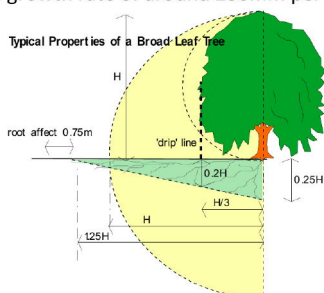
<sup>6</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

<sup>7</sup> Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific



They can usually tolerate quite heavy pruning or crown thinning, although this can create large wounds which decay rapidly.

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>8</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>9</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.

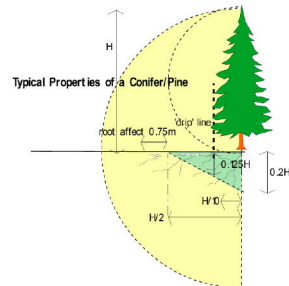
Because of difficulties in controlling the oak, and its vigorous root system, I regard it as being far more significant (in terms of a subsidence league table) than either the willow or poplar tree.

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.

<sup>8</sup> Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications

<sup>9</sup> Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific





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

### INTERNAL



Cracks around door – conservatory/kitchen area leading to the rear right lounge



Structural crack to left partition in the rear middle room

#### Conservatory/kitchen

Cracks above right of door way to rear right hand lounge

#### Rear right hand lounge

Separation to ceiling and bay mullions 6mm with various other cracks around the bay structure

#### Rear middle room

Diagonal crack to left partition 5 to 50mm

#### Rear left room

Diagonal crack to right side partition - only visible at high level due to free standing units

**EXTERNAL**



Vertical upward tapering crack at junction of the conservatory



Damage to brick arch

**Rear of property**

- Stepped diagonal cracks below the bay window structure
- Brick arch failure to left return wall to the bay
- Vertical separation at junction of conservatory and main building

**CATEGORY**

In structural terms the damage falls into Category 5 of Table 1, Building Research Establishment<sup>10</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.

<sup>10</sup> Building Research Establishment, Garston, Watford. Tel: 01923.674040





**DISCUSSION**

The pattern and nature of the cracks is indicative 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.

**RECOMMENDATIONS**

Although the cause of the movement needs to be dealt with, we note the vegetation is 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.

**Matin Abdul BSC (Hons)**  
**Specialist Property Services - Subsidence Division**



**PHOTOGRAPHS**



Rear of property



Bay structure and conservatory seen from the left – damage to brickwork at low level



Nearby tree to the rear T1



Neighbouring trees T2, T3 and T4

