TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1604808

Gilling Court (Hampstead) Ltd
Flat 2 Gilling Court
Belsize Grove
Hampstead
London
NW3 4UY

prepared for

Aviva - Commercial
Commercial Claims Dept., Northfield House, 110-114 Baxter Avenue, Southend On Sea, SS2 6FF

Claim Reference 8945388

SUBSIDENCE CLAIM

Crawford®
Specialist Property Services UK

[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 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.

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 understand from the managing agents for Flat 28 that the cracks started about 2-3 months ago, and that there has been a further deterioration over the last month.

The insured commissioned a report from Guardian Surveyors LLP regarding the cracking to Flat 2. Their report is dated 20th October and considers the movement to be due to a leaking water main or other pipe. Their recommendations include testing the stop tap in the road and excavating at the front left corner of the front entrance projection.

They also advise that Cunningham Lindsey dealt with a claim in the same area in 2008, followed by repairs to Flat 2. The leaseholder of Flat 2 advised that cracks reappeared about 8 months later.

PROPERTY

The property comprises a 4 storey purpose built block with brick internal and external walls, concrete floors, surmounted by a flat roof. It is most likely that the construction is traditional with loadbearing masonry, but it is also possible that the floors are supported on a steel frame.

[redacted]

HISTORY & TIMESCALE

Site investigations are being organised and level monitoring established

Date of Construction	1933
Purchased	Various
Policy Inception Date	25/04/2016
Damage First Noticed	October 2016
Claim Notified to Insurer	21/11/2016
Date of our Inspection	03/01/2017
Issue of Report	10/01/2017
Anticipated Completion of Claim	September 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[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.

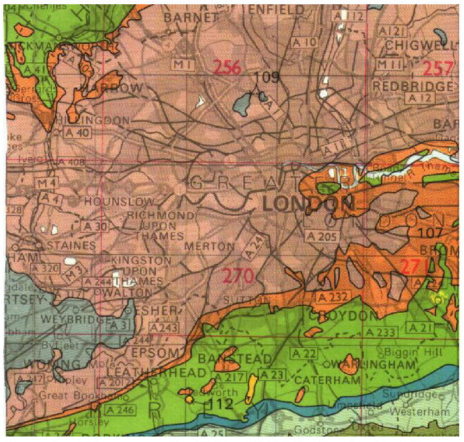
The superficial deposits are thought to be Clay Soils.

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 vegetation[4] 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.

[1] Tomlinson M.J. (1991) *"Foundations Design & Construction"* Longman Scientific Publishing.
[1] 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] DriscollL R. (1983) *"Influence of Vegetation on Clays"* Geotechnique. Vol 33.

[redacted]



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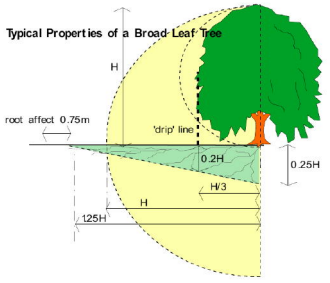
VEGETATION

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
Deciduous x5	20 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.
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.

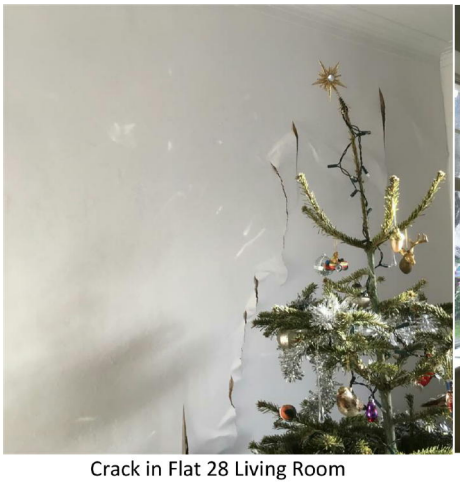
[redacted]

OBSERVATIONS

The damage appears to be limited to the front centre of the building

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

INTERNAL



Crack in Flat 28 Living Room

Crack in the ground floor entrance lobby

FLAT 2 (Ground floor, left of entrance)

Right hand end bedroom:
10mm diagonal crack to the right flank wall
5mm crack over the window
3mm crack over the hall door, extending along the top of the left flank wall

Hall:
3mm crack over the door to the right hand end bedroom

Left hand end bedroom:
2mm crack over the hall door, extending along the top of the right flank wall
2mm crack in the front left corner

FLAT 28 (First floor, left of stairs)

Living room:
Diagonal crack to right flank wall, possibly 15mm width with significant disturbance of plaster
2mm cracks over the door to the hall
3mm crack over the window

Right hand end bedroom:
Crack behind wardrobe against left flank wall, possibly 10mm width

[redacted]

Hall:
3mm diagonal crack over door to the living room:

Kitchen:
3mm diagonal crack to the rear right corner, high level, extending along the top of the right flank wall

COMMUNAL AREAS:

Ground floor entrance lobby:
8mm diagonal crack to the wall to Flat 2, extends over front window
2 no 2mm diagonal cracks under the left hand window
Staining and water penetration over the entrance door
1mm vertical cracks to both flank walls of the entrance projection
2mm diagonal crack to the wall to Flat 3
1mm diagonal crack under the right hand window

First floor landing:
2mm vertical and diagonal cracks to the walls to Flats 28 and 29

Second floor landing:
1mm vertical and diagonal cracks to the walls to Flats 54 and 55

[redacted]

EXTERNAL

Cracks to front elevation

Cracks to front elevation

Front elevation:
Series of short cracks, up to 3mm width to the rendered areas at first floor and below. These cracks are predominately to the left of the main entrance.
Cracking and movement of the front steps.

CATEGORY
In structural terms the damage falls into Category 4 of Table 1, Building Research Establishment[5] 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.

[5] Building Research Establishment, Garston, Watford. [redacted]

[redacted]

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.

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, we note the vegetation is in a Conservation Area and may be subject to Preservation Orders. Unfortunately, current legislation requires certain investigations to be carried out to support an application for the tree works.

Typically, these investigations would involve trial pits 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.

Philip Gardner BSc, MIStructE, CEng, Cert CILA
Specialist Property Services - Subsidence Division
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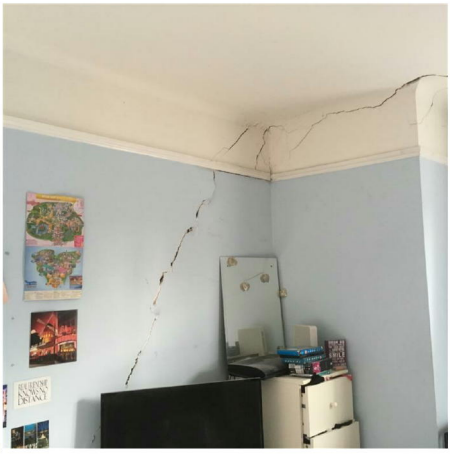
PHOTOGRAPHS

Crack in Flat 28 living Room



Crack in Flat 2 Right hand end bedroom

Crack in Fla2 Right hand end bedroom

Close up of crack in the entrance lobby showing evidence of past repair

[redacted]

Trees to the front of the building.

Damage to front steps at main entrance

Cracking in Flat 28 Right hand end bedroom

Cracking in Flat 2

[redacted]