TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1604979

157 Gloucester Avenue Ltd
157 Gloucester Avenue
London
NW1 8LA

Prepared for

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

Claim Reference 4500061492

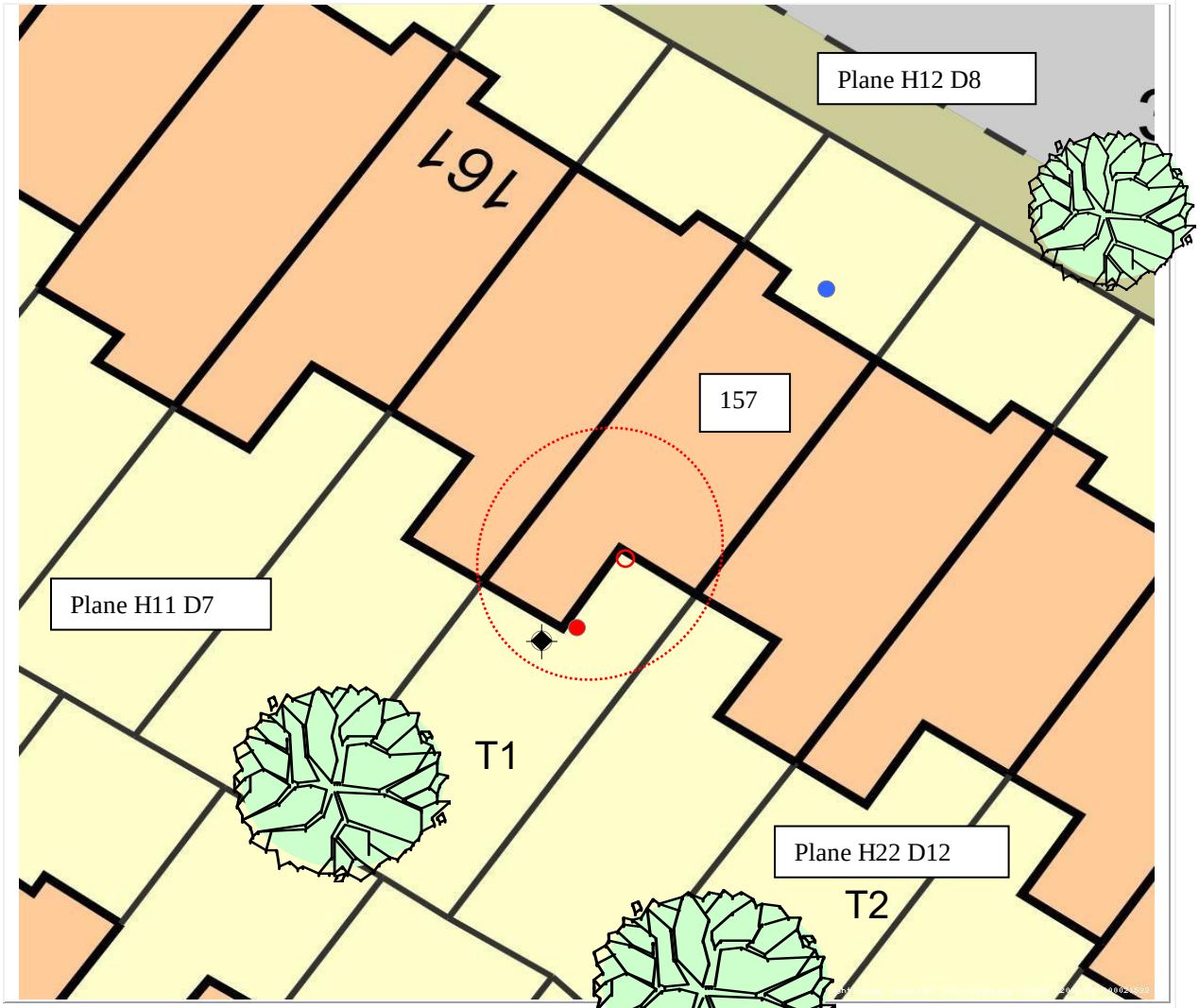
SUBSIDENCE CLAIM

Crawford®
Specialist Property Services UK - Subsidence
1st Floor, Cassiobury House
11-19 Station Road,
Watford, Herts, WD17 1AP
Tel: 01923 471755
Fax: 0121 200 0309

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		

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

A Party Wall notice was served on the owners by the right hand neighbour as they were planning to undertake some building works at their property. As part of the Party Wall Award the surveyor completed a condition survey of the risk address in August 2016 prior to the works commencing. He noted the cracking during his visit and suggested that the insured notify insurers as the damage was indicative of subsidence. The owner of the middle flat advised that no cracking was evident when she moved into the flat in March 2016.

PROPERTY

The risk address is a five storey mid-terrace property of traditional construction with part rendered brick walls surmounted by a ridged slated roof. The property has been converted to provide three, self-contained flats.

HISTORY & TIMESCALE

Site investigations are being organised and level monitoring is to be established.

Date of Construction	Circa 1880
Purchased	Various
Policy Inception Date	27/11/2015
Damage First Noticed	September 2016
Claim Notified to Insurer	01/12/2016
Date of our Inspection	20/01/2017
Issue of Report	27/01/2017
Anticipated Completion of Claim	November 2018

TOPOGRAPHY

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

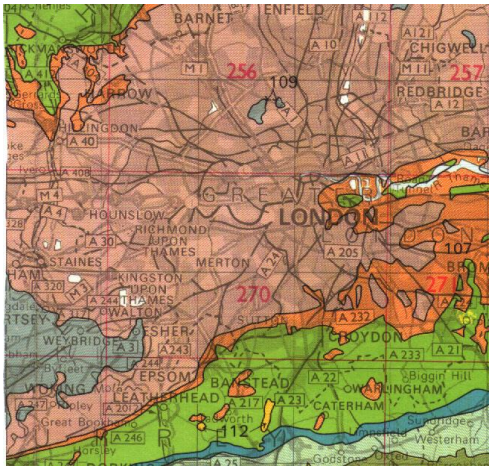
GEOLOGY

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 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.

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	11 m	7 m	Owners

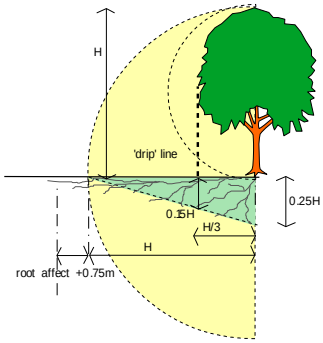
See sketch. Tree roots can be troublesome in cohesive (clay) soils because they can induce volumetric change. They are rarely troublesome in non-cohesive soils (sands and gravels etc.) other than when they enter drains, in which case blockages can ensue.

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 activity[4].

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

1st Floor, Cassiobury House, 11-19 Station Road, Watford, Herts WD17 1AP 01923 471755 ■ www.crawfordandcompany.com

Maximum tree-to-damage distance recorded in the Kew survey was 15mtrs, with 50% of all cases occurring within 5.5mtrs[5]. 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.

OBSERVATIONS

The movement, predominantly to the rear of the property is the focal point of the Insured's concerns.

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

INTERNAL

Cracking in upper flat stairway at rear addition junction

Cracking in ground floor flat kitchen

<u>Basement Flat</u> - Entrance Lobby - 1mm diagonal crack on front wall continues into ceiling, hairline diagonal crack above door to lounge, front door is sticking.

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

Lounge - Hairline diagonal tapering crack to left hand party wall front section, wall / ceiling junction cracking along front wall and right hand party wall, hairline vertical crack to chimney breast, cracking to ceiling, hairline vertical crack above door to lobby.

Hallway - 1mm vertical crack to bathroom partition continues along wall / ceiling junction, hairline vertical crack above bathroom door.

Rear Bedroom - Cracking to ceiling, hairline vertical crack to hall partition, wall / ceiling junction cracking along hall partition.

Kitchen - 2mm vertical crack on rear addition junction, cracking to ceiling, wall / ceiling junction cracking along left hand flank, 2mm diagonal crack in tiles below rear window, rear door out of alignment, door to hall catching on floor.

Ground Floor Flat - Kitchen - 3mm diagonal cracking above and below rear window, 1mm horizontal crack in rear left hand corner between windows, 1mm vertical crack below left hand side of flank window.

Hall - 1mm diagonal crack to bedroom partition, wall / ceiling junction cracking along bedroom partition, 1mm vertical crack above cupboard door.

Rear Bedroom - 2mm vertical crack down rear right hand corner junction, hairline diagonal crack to hall partition, cracking to ceiling.

Lounge - Various cracks to ceiling and coving, 1mm vertical crack down junction of bedroom partition and left hand party wall.

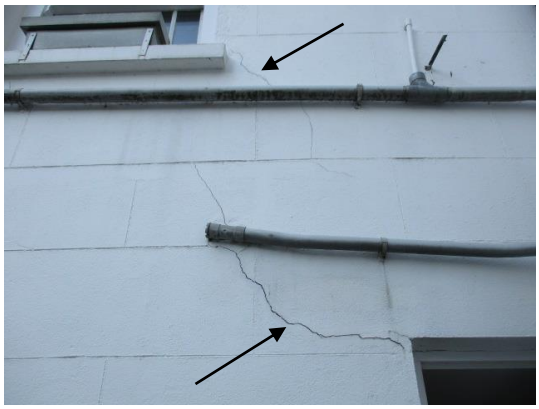
Upper Flat - Stairs and Landing - 2mm tapering separation at rear addition junction, hairline vertical crack above door to roof terrace, wall / ceiling junction cracking on rear bedroom partition.

Kitchen - 1mm gap between cupboard and wall on left hand side, wall / ceiling junction cracking along rear addition junction.

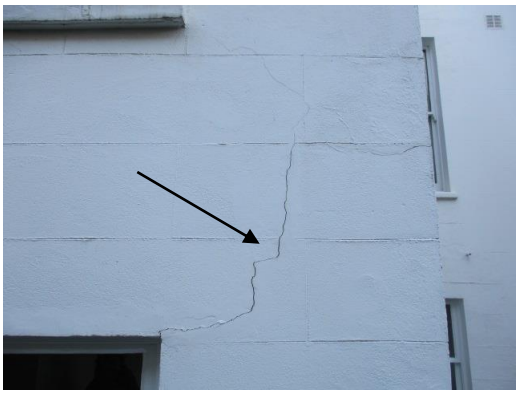
Dining Room - 1mm vertical crack down rear right hand corner junction, hairline vertical crack above left hand side of door to landing.

Lounge - Coving / ceiling junction cracking to perimeter, section of de-bonded coving in front right hand corner.

EXTERNAL



Cracking to rear addition



Cracking to rear addition

Rear Addition - 3mm diagonal crack above door to kitchen, 3mm horizontal low level crack along rear wall on projecting plinth section, 3mm diagonal cracking above both sides of rear basement window.

Upper Flat Roof Terrace - 10mm tapering separation at rear addition junction on right hand party wall, 1mm stepped cracking above doors, historic bowing noted to high level brickwork to main rear elevation.

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment[6] 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 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.

[6] Building Research Establishment, Garston, Watford. Tel: 01923.674040

Minor cracking was noted to the front section of the property. We suspect this may be due to the influence of the Local Authority Plane tree at the front of the property. This has been recently severely pollarded which should be sufficient to restore stability to this section of the property which has suffered only very minor damage. The majority of the damage affects the rear of the property.

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.

Matt Deller BSc (Hons) MCIOB Dip CII
Specialist Property Services - Subsidence Division
Direct Dial: 07919 552 684
subsidence@crawco.co.uk

PHOTOGRAPHS

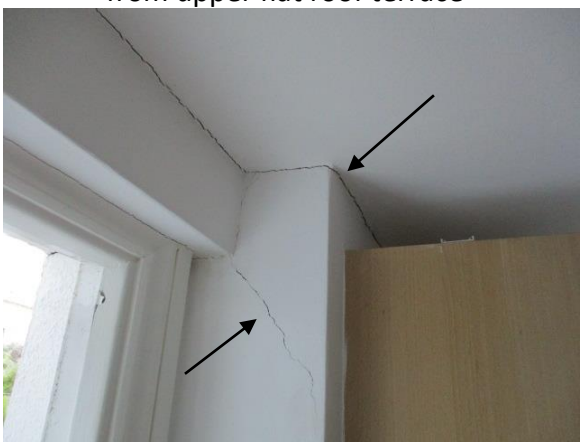
Cracking to rear addition

Cracking in ground floor flat kitchen

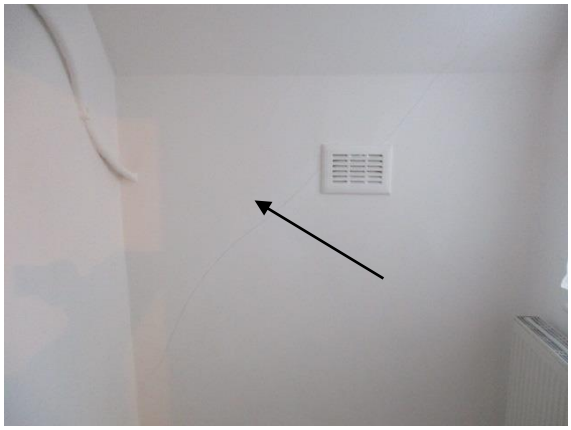
Cracking in ground floor flat hallway

Separation at rear addition junction viewed from upper flat roof terrace

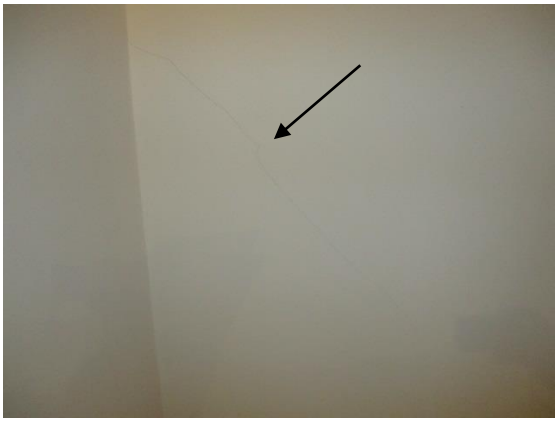
View of insured's tree to rear



Cracking in basement flat kitchen



Cracking in basement flat entrance lobby



Cracking in basement flat lounge