TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1605138

Society of Inner Light
38 Steele's Road,
Hampstead,
London
NW3 4RG

prepared for

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

Claim Reference [redacted]

SUBSIDENCE CLAIM

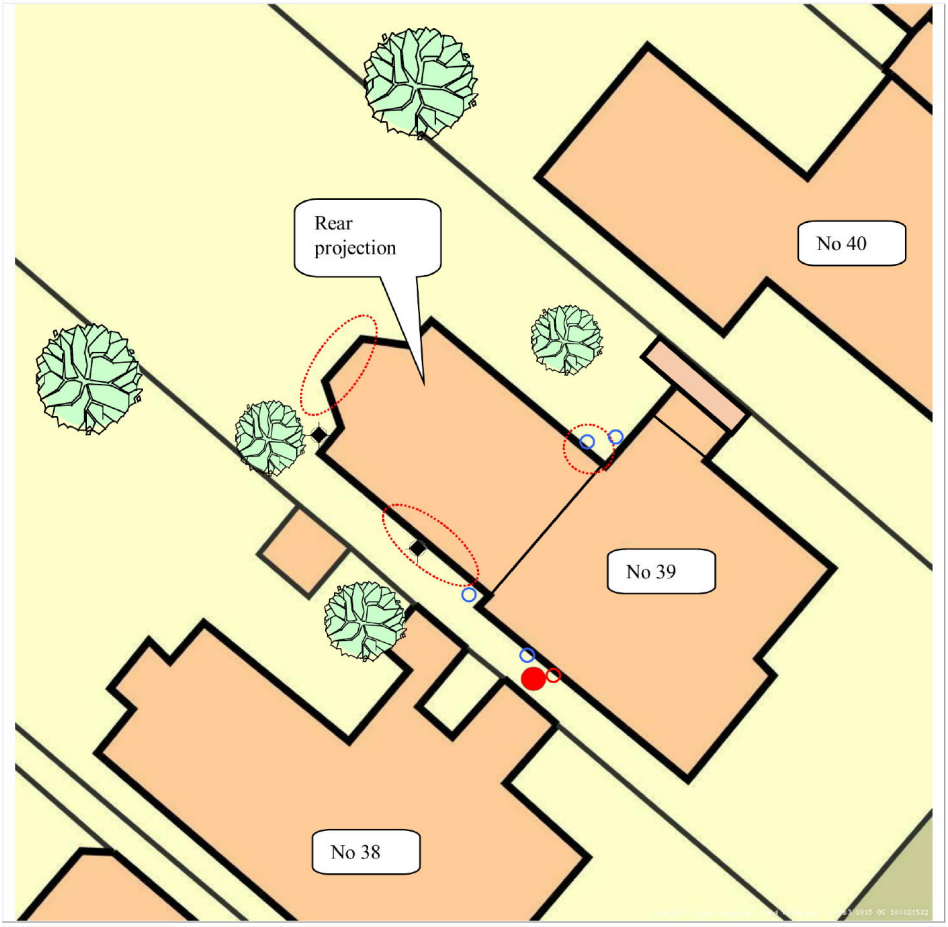
DATE 2 February 2017

Crawford®
Specialist Property Services UK - Subsidence
First Floor,
Cassiobury House
11-19 Station Road
Watford
Herts WD17 1AP.
Tel: 01923 471755

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.



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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

Chartered Loss Adjusters

First Floor, Cassiobury House, 11-19 Station Road, Watford, WD17 1AP. Tel 01923 471755
www.crawfordandcompany.com
Registered Office Crawford & Company Adjusters (UK) Ltd, 70 Mark Lane, London, EC3R 7NQ Registered in England No 2908444

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

The insured advised the damage was first noted in October. A report was commissioned from Construction Centre Ltd who identified the damage as subsidence related and recommended underpinning. A claim was immediately submitted.

PROPERTY

The property comprises a four storey large detached house of traditional construction with brick walls surmounted by a ridged tiled roof. To the rear is a projection comprising a meeting room on the ground floor, and a prayer room on the upper floor which is formed within a timber framed mansard roof. The meeting room floor of the projection is suspended timber. It is this projection that is the subject of a claim.

HISTORY & TIMESCALE

Site investigations are being organised and crack monitoring established

Date of Construction.....1873
Purchased.....1961
Policy Inception Date 01/02/2016
Damage First Noticed .....October 2016
Claim Notified to Insurer..... .....13/12/2016
Date of our Inspection 31/01/2017
Issue of Report 02/02/2017
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.

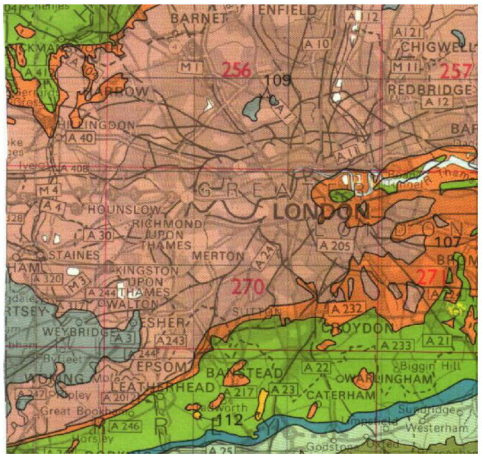
London Clays are marine deposits characterised by their silty, sandy composition. They are typically stiff, dark or bluish grey, weathered dark to mid-brown superficially with fine particle size (less than 0.002mm). Tomlinson[1] describes it as a 'fat' clay with high loadbearing characteristics due to 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.



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

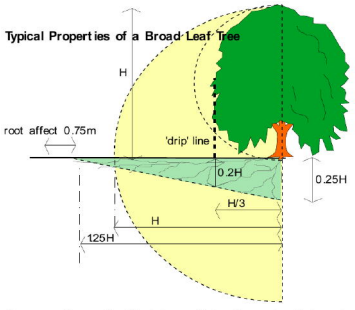
VEGETATION

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
Birch	12 m	1 m	Owners
Deciduous	12 m	3 m	No 38 Steels Road

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.
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.

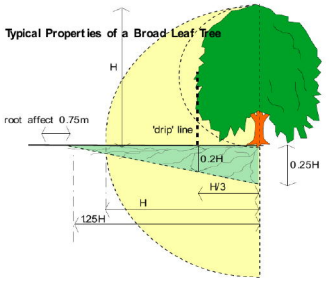


Typical proportions of a birch tree. Note the potential root zone.

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.

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.

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



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.

OBSERVATIONS

The damage is limited to the rear projection

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

INTERNAL

Crack to left flank wall of the meeting room

Crack to the right flank wall of the meeting room

Rear meeting room:

3mm diagonal cracks to the left flank wall, with 1mm parallel crack below. The focus of movement of these cracks is the mid-length of the wall

3mm diagonal crack to the right flank wall below the window

EXTERNAL

Crack to tight flank wall of the rear projection

Crack to the left flank wall of the rear projection

Rear projection:
2mm vertical crack, with 1mm diagonal crack to the right flank wall, close to the rear wall of the main building
1mm diagonal cracks to the left flank wall with evidence of repointing
2 no 2mm vertical cracks to the rear wall of the rear bay, extending from ground to upper floor window
3mm crack over, and 1mm vertical crack below the windows to the right hand splay of the rear bay.

CATEGORY
In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment[6] Digest 251, which describes it as "slight".

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.

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

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 located within a conservation Area. It is very likely that investigations will be required to support a planning application to remove the offending trees.

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.

These investigations are being arranged.

Philip Gardner BSc, MIStructE, CEng, Cert CILA
Specialist Property Services - Subsidence Division
Direct Dial : 07824 311823
subsidence@crawco.co.uk

PHOTOGRAPHS

Cracking to the left flank wall of the meeting room

Insured's tree close the rear corner of the meeting room

Insured's vegetation close to the right hand flank wall of the meeting room

Cracks over the rear bay windows

Tree (arrowed) in no 38 Steels Road

Cracking at the foot of the rear bay