TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1304913

[redacted]
51 Redington Road
London
NW3 7RP

Prepared for

[redacted]
The Square, Gloucester Business Park, Brockworth, Gloucester

Claim Reference 5933839V

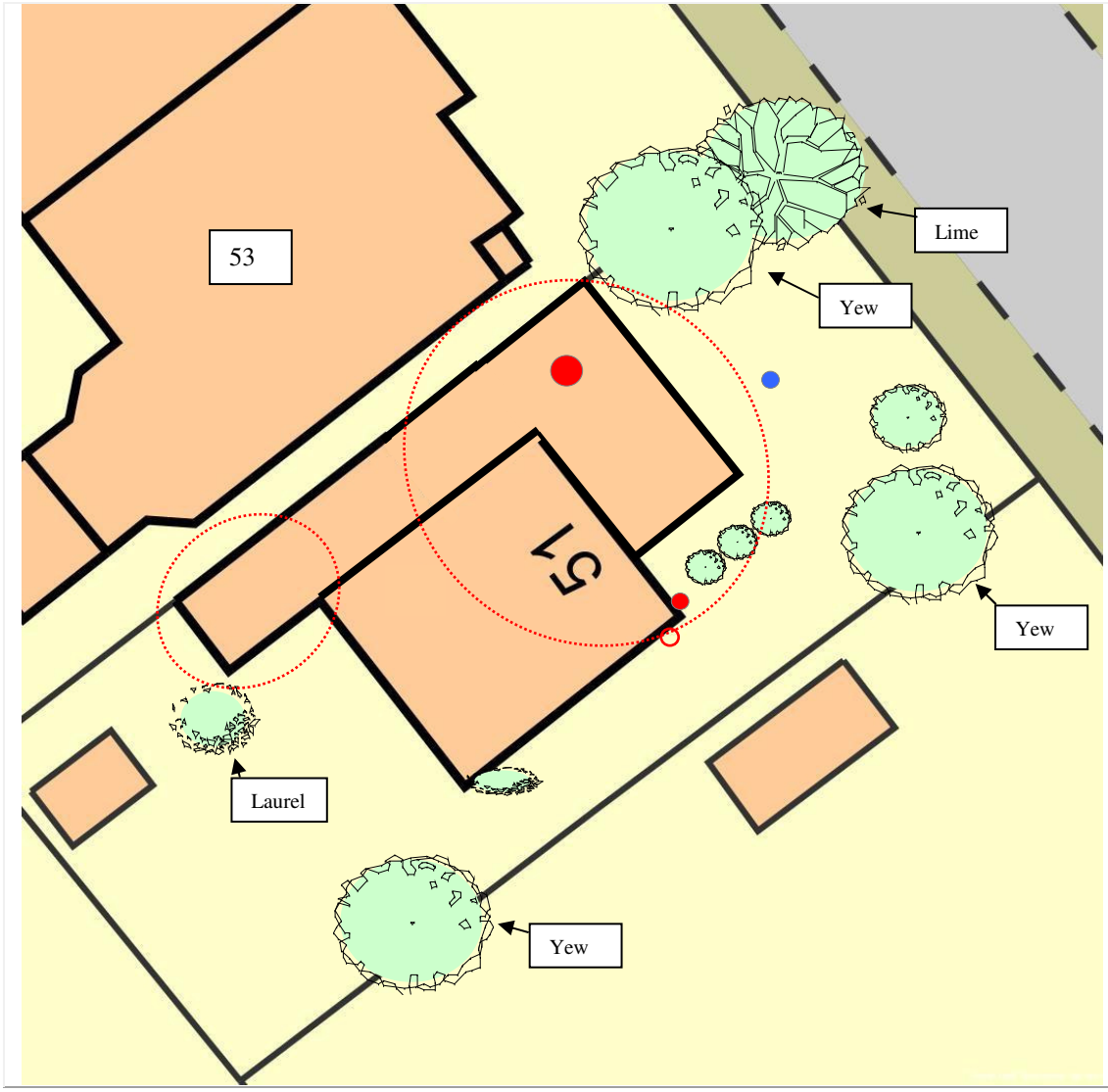
SUBSIDENCE CLAIM

DATE 17 December 2013

Specialist Property Services – Subsidence Division
Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8260
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		

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INTRODUCTION

We have been asked by [redacted] 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 2007. 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.

Investigations have been carried out in accordance with the requirements of The Institution of Structural Engineers[1].

We have not commented on any part of the building that is covered or inaccessible.

TECHNICAL CIRCUMSTANCES

The property was the subject of a previous subsidence claim which was repaired in 2000. The insured advised that she noted cracking returning about a year ago but was not overly concerned by this. The cracking has progressed since and insurers were contacted after the insured received a letter from Davies Loss Adjusters requesting her co-operation in removing some vegetation implicated in her neighbours current subsidence claim.

PROPERTY

The risk address is a two storey detached house of traditional construction with part rendered brick walls surmounted by a ridged tiled roof.

HISTORY & TIMESCALE

Subject to acceptance of the claim we propose to instruct site investigations and establish level monitoring.

Date of Construction	Circa 1900
Purchased	1974
Policy Inception Date	17/08/1992
Damage First Noticed	December 2012
Claim Notified to Insurer	04/12/2013
Date of our Inspection	16/12/2013
Issue of Report	23/12/2013
Anticipated Completion of Claim	November 2015

TOPOGRAPHY

The property occupies a site sloping from right down to the left.

[1] Institution of Structural Engineers (1994) *"Subsidence of Low Rise Buildings"*

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GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number TQNW suggests the underlying geology to be Claygate Beds.

Claygate Beds are a sandy transition strata at the top of the London Clays and derive their name from Claygate in Surrey[2]. They are well defined alternations of sand and clay, with sand predominating above the clay below.

The formation, where present is about 45m thick. It forms much of the elevated ground in the middle of the London Basin, including Brentwood, Kelvedon Hatch and Havering-atte-Bower.

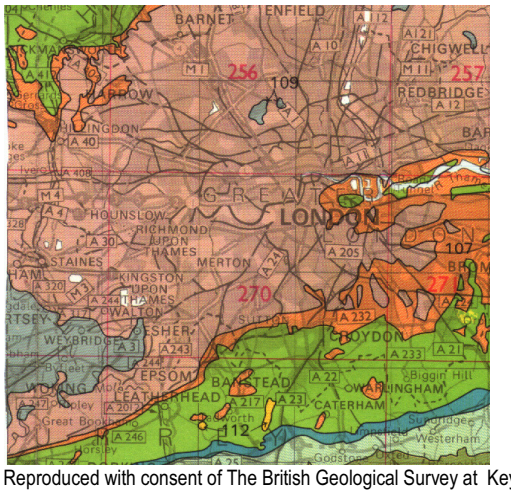
To determine the index properties of a heterogenous soil, it is recommended[3] that the index property of the clay sample should be multiplied by the clay fraction (that is, soil particles finer than 425µm[4]) of the sample.

The modified Plasticity Index would therefore be:-

$$I_p = I_p x \ (\%<425\mu m/100)$$

If the soil sample contains 50% clay (by dry weight), and that clay sample has an index property of 40%, the modified value for I_p would be 40% x 50% = 20%.

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
Conifers	12 m	4 m	Owners
Lime	12 m	7 m	Owners
Yew	4 m	2 m	Owners
Yew	8 m	6 m	Owners
Laurel	2 m	2 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.

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[2] SHERLOCK R.L. (1962) *"LONDON & THAMES VALLEY"* H.M.S.O.
[3] B.R.E. Digest 240 (1993). H.M.S.O.
[4] [4] B.S. 1377 (1990) *"Method of tests for Soils for Civil Engineering Purposes"* H.M.S.O.

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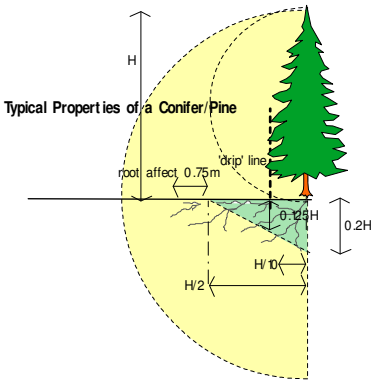
Conifers ~ The term is usually used to refer to cypresses and close relatives, but in the broader sense includes any trees that bear cones and nearly all of them have simple needle or scale like leaves, sometimes arranged into fronds as in the cypresses.

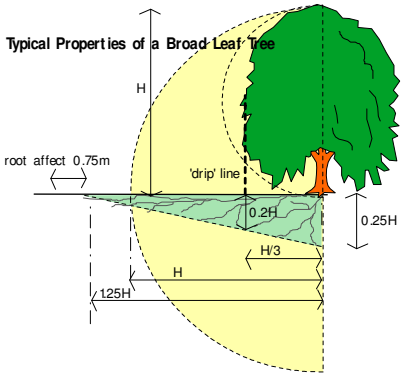


Typical tree proportions showing the root zone. This is a conservative estimate, as the zone can equal the height of the tree.

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.

Limes (Tilia) are deciduous and can reach heights between 25-30m depending on health, environment and soil conditions.

They have a medium growth rate of around 300mm per year and medium root activity[5]. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, with 50% of all cases occurring within 6mtrs[6].



Typical proportions of a Lime tree, showing the potential root zone.

Lime roots can be moderately deep on clay soils. They have a life expectancy > 100 years and both old and young trees withstand quite heavy pruning and crown thinning.

Older trees frequently develop shoots around the base of the trunk. They are vulnerable to aphid attack that produces sticky exudates of honeydew.

European yew, Taxus baccata, is common throughout the British Isles and frequently planted as a hedge. It is more closely related to conifers than broadleaves and has a relatively low water demand. It can be exceptionally long lived and has a reputation for slow growth, although young trees in good conditions can grow 30cm or more in height annually.

[5] Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications
[6] Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

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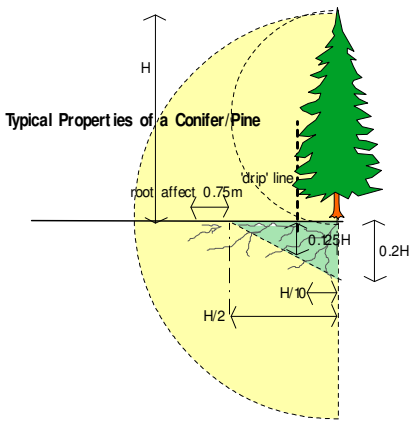


Typical tree proportions showing possible root zone.

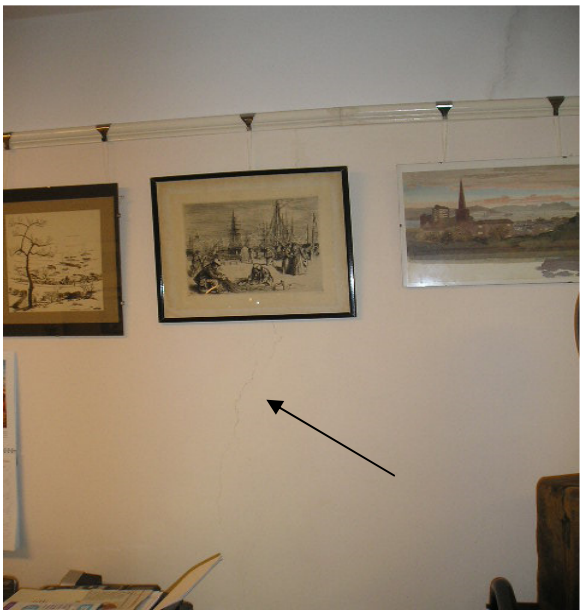
It tolerates even heavy pruning far better than most other species and the timber is naturally strong and durable, though it can become brittle in older trees.

OBSERVATIONS

The minor cracking throughout 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 Study

Cracking in workshop

Kitchen - Hairline vertical cracking above both sides of flank window, wall / ceiling junction cracking along front wall, hairline vertical crack to chimney breast.

Hall, Stairs and Landing - Crack across hall ceiling, hairline horizontal cracking above front door at high level, cracking to coving.

Entrance Hall - 3mm vertical tapering cracking at left hand side junction with main house, 3mm vertical crack at study partition junction with front wall, cupboard doors are sticking.

Study - 1mm vertical tapering crack to garage partition, cracking to ceiling, 3mm vertical crack to entrance hall partition junction, evidence of previous flat roof leaks in front corners, 1mm vertical crack to front right hand corner.

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Shower Room - Cracking to ceiling, movement to shower tray.

Lobby by Garage - Hairline diagonal cracking above garage door, wall / ceiling junction cracking to perimeter, cracking to ceiling.

Rear Office - Wall / ceiling junction cracking to rear corners.

Garage - 2mm vertical crack to left hand wall at junction, historic cracking to ceiling boards.

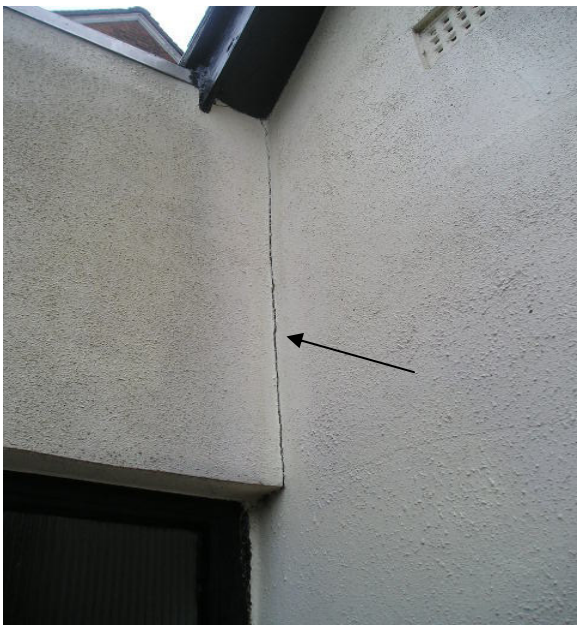
Dining Room and Lounge - Various cracks to coving - Not subsidence related damage.

Front Bedroom - Wall / ceiling junction cracking along front wall, damp problem to front wall from parapet area.

W.C. - Hairline vertical crack to right hand flank, hairline vertical cracking above both sides of door.

Rear Bedroom - Wall / ceiling junction cracking along rear wall, cracking to ceiling.

EXTERNAL



Cracking at workshop junction

Cracking to front elevation

Front Elevation - 1mm horizontal crack along dpc level.

Left Hand Flank - 2mm vertical crack to rear corner at terrace junction.

Rear Elevation - Various hairline previously repaired horizontal and vertical cracks to render - Not subsidence related damage.

Workshop Addition - 3mm vertical tapering separation at junction with main house.

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CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment[7] 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.

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.

The cracking to the coving in the lounge and Dining Room areas, the water ingress damage from the previously leaking flat roof and main roof and the render cracking affecting the rear elevation are not related to the subsidence damage affecting other parts of the property.

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, we note that some of 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.

Yours Faithfully,

Matt Deller

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Crawford & Company Adjusters (UK) Ltd
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18 December 2013

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

Photographs

Cracking in kitchen

Cracking in entrance hall

Cracking in study

Cracking in garage

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Cracking in front bedroom

Cracking to left hand flank at terrace junction

View of insured's vegetation to front of property

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