

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1505084

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Prepared for

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

Claim Reference 8886968

SUBSIDENCE CLAIM

DATE 6 January 2016

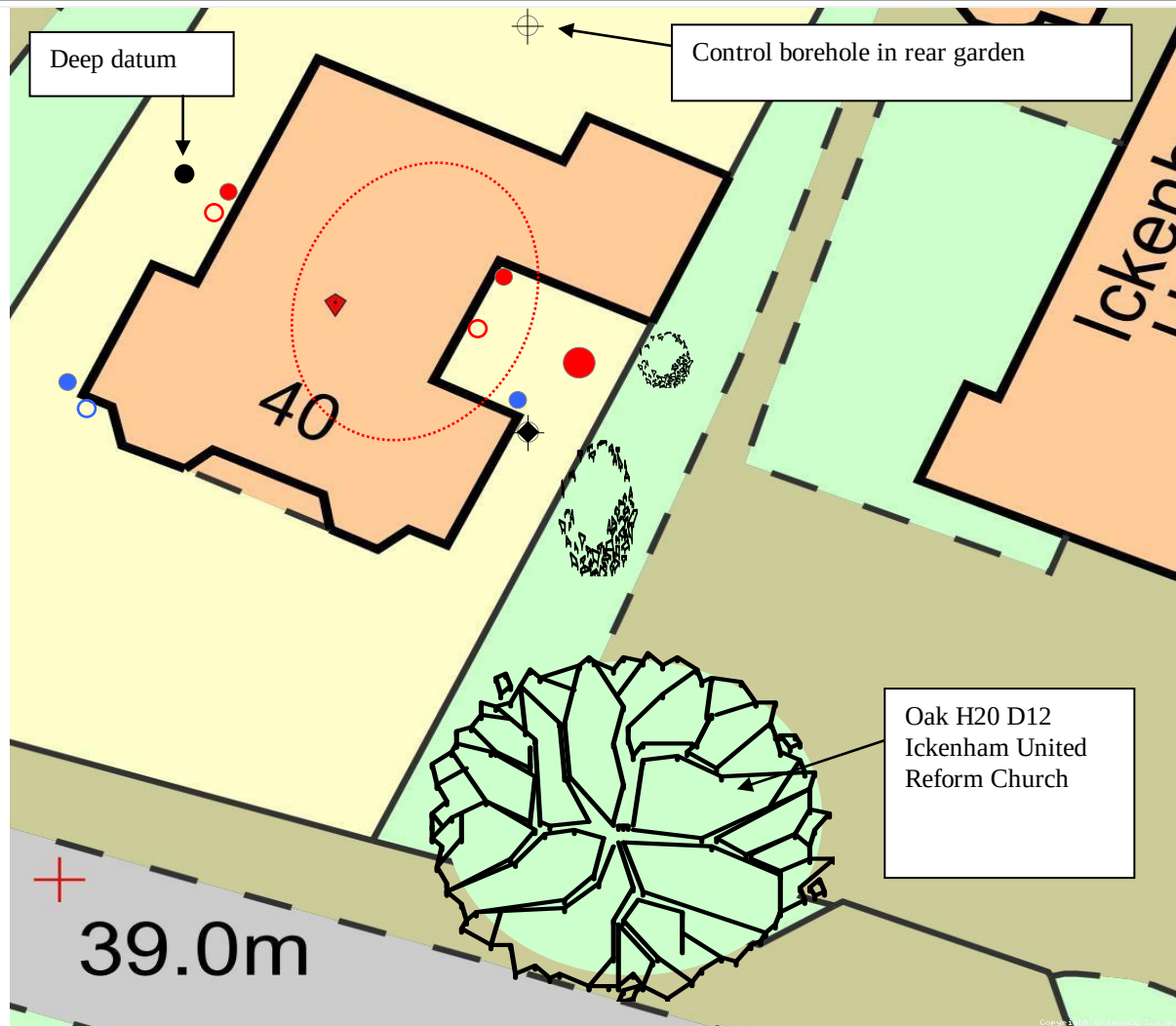


Crawford®

**Specialist Property Services – Subsidence Division
Second Floor Sunningdale
The Belfry Business Park
Colonial Way
Watford
WD24 4WH**

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
	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		

Chartered Loss Adjusters

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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.

Investigations have been carried out in accordance with the requirements of The Institution of Structural Engineers¹.

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

TECHNICAL CIRCUMSTANCES

The property has been the subject of two recent subsidence claims in 2009 and 2012. Mrs Gallear advised that there may have been further subsidence claims during the time her father owned the property. Both previous claims were handled by Cunningham Lindsey. In 2009 the third party oak tree was reduced by 40% and the 2012 involved the removal of the insured's cherry tree from the left hand side of the property. The current cracking was first noted around 18 months ago. Insurers were notified as the cracking was seen to be progressing.

PROPERTY

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

HISTORY & TIMESCALE

Site investigations are being organised and level monitoring is to be established. We have written to the Third Party regarding their tree.

Date of Construction.....	Circa 1930
Purchased.....	Previously owned by father
Policy Inception Date	21/12/1995
Damage First Noticed	Circa July 2014
Claim Notified to Insurer.....	11/12/2015
Date of our Inspection	04/01/2016
Issue of Report	06/01/2016
Anticipated Completion of Claim	September 2107

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

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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 Lambeth Group.

Woolwich and Reading Beds occur in three facies² comprising marine fossiliferous sand (East Kent), estuarine deposits known as Woolwich Beds (West Kent, East Surrey and Essex) and fluvial strata known as the Reading Beds (West and North). They are a sedimentary complex comprising a basal bed of glauconic sands, loams and pebbles with variable clays and sands above.

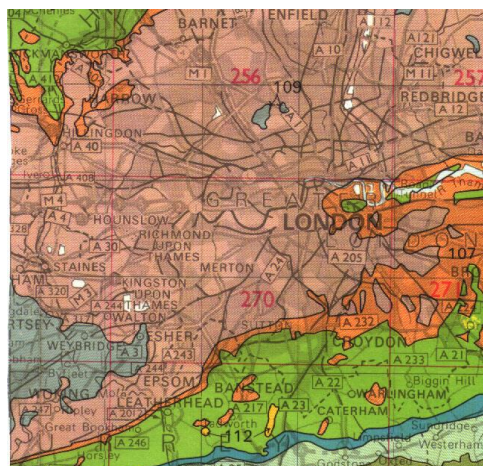
Page and Skipper³ regard them as “highly diverse – there is probably no other group of sediments within the UK that displays such a range of textures and fabrics within such a small stratigraphical thickness”.

The sands are yellow, greenish brown, containing layers of mottled clay. They have an average depth of around 15mtrs. The Reading beds consist of mottled, plastic clays and light coloured sands with thin bands of flint pebbles.

From an engineering perspective they are probably more prone to loss of fines and erosion due to flowing water (leaking drains etc.) than clay shrinkage. However, if there is a high clay content they can suffer root induced clay shrinkage (seasonal shrinkage alone is probably quite rare) although the movement is usually fairly modest, depending on the provenance of the clay in the soil matrix.

Recently redefined as a member of the Lambeth Group.

The solid geology appears to outcrop in this location, although we cannot rule out the presence of superficial deposits at shallow depth.



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² Sherlock R.L. (1962) "LONDON & THAMES VALLEY" H.M.S.O.

³ Page D. & Skipper J (2000). "Ground Engineering Journal"

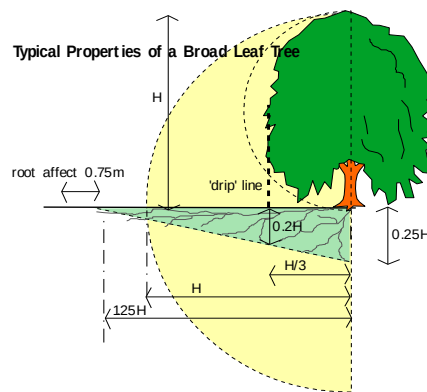
VEGETATION

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

Type	Height	Distance	Ownership
Oak	20 m	12 m	Neighbour 5

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.

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 activity⁴.



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 9.5mtrs⁵. 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 suction.

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.

⁴ Richardson & Gale (1994) "*Tree Recognition*" Richardson's Botanical Identifications

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

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OBSERVATIONS

The cracking predominantly affecting the right hand section 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 w.c.



Cracking in rear extension

Rear Extension - 1mm vertical crack to right hand partition, hairline diagonal crack above door to hall.

Kitchen - Hairline diagonal crack above right hand window - Not subsidence related damage.

Hall, Stairs and Landing - Hairline vertical crack above door to rear extension, 1mm vertical crack above door to utility room, cracking to hall ceiling, historic slope to floor down towards w.c., vertical rucking in paper below flank window on half landing, rucking and cracking to landing ceiling in various locations.

W.C. - 1mm diagonal crack to right hand flank, cracking to ceiling.

Lounge - Water staining to ceiling and walls from shower leak above, various hairline plaster cracks above picture rail level - Not subsidence related damage.

Rear Left Hand Bedroom - Various hairline plaster cracks above picture rail level on left hand flank - Not subsidence related damage.

Left Hand Middle Bedroom - 1mm vertical crack down junction of left hand flank and rear bedroom partition, hairline vertical crack to left hand flank - Not subsidence related damage.

EXTERNAL

Cracking to right hand flank below w.c.
window



View of movement to tarmac driveway

Right Hand Flank - 1mm diagonal crack below w.c. window, 1mm vertical crack above w.c. window, the tarmac driveway has lifted and cracked in several places, previous repairs and cracking noted to right hand boundary wall, paintwork is peeling above garage door.

Front Elevation - Horizontal cracking above porch canopy cement flashing - Not subsidence related damage.

Rear Elevation - Hairline - 1mm horizontal crack to parapet wall along rear elevation, paintwork is peeling at high level - Not subsidence related damage.

CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁶ 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

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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 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.

At the time of our inspection we noted damage in several areas which was not indicative of that associated with foundation movement and will therefore fall outside the scope of this claim. These areas were the front porch canopy, right hand boundary wall, peeling paintwork above the garage and to the rear elevation, cracking to the rear extension parapet wall, historic sloping to the hall floor, cracking and water leak damage in the lounge, cracking in the kitchen and left hand middle and rear bedrooms.

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, we note the involvement of a commercial third party tree. Unfortunately, they will require certain investigations to be carried out to demonstrate the influence of their vegetation. We have also completed a soil risk analysis (VISCAT Assessment) which suggests a potential heave risk should the vegetation be removed. The site investigations will also enable us to quantify this risk in relation to the specific soil type at the property.

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. It may also be necessary to obtain a specialist Arboricultural Report.

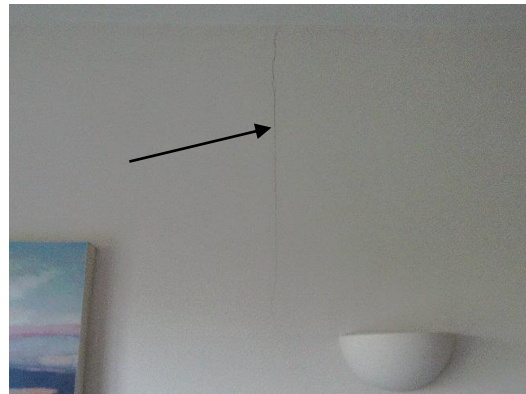
We will report further once these investigations have been completed.

Matt Deller BSc (Hons) MCIOB Dip CII
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PHOTOGRAPHS



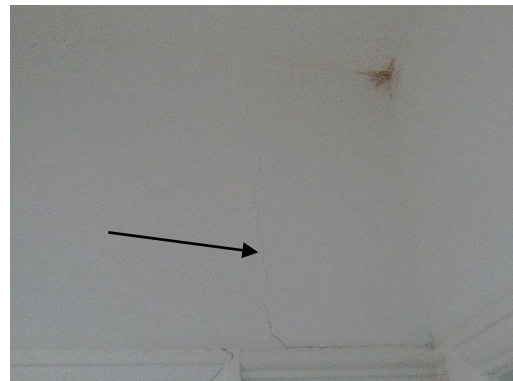
View of third party oak tree



Cracking to right hand wall in rear extension



Cracking in hallway



Cracking in hallway



Cracking in w.c.



Rucking to landing ceiling paper



Rucking below half landing flank window