

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1700265

**Ms Penelope Dormer
Gutner Lane
Hayling Island
Hampshire
PO11 0RN**



Prepared for

**RSA
3rd Floor
Bowling Mill
Dean Clough
Halifax
HX3 5WA**

Claim Reference 201701035088

SUBSIDENCE CLAIM

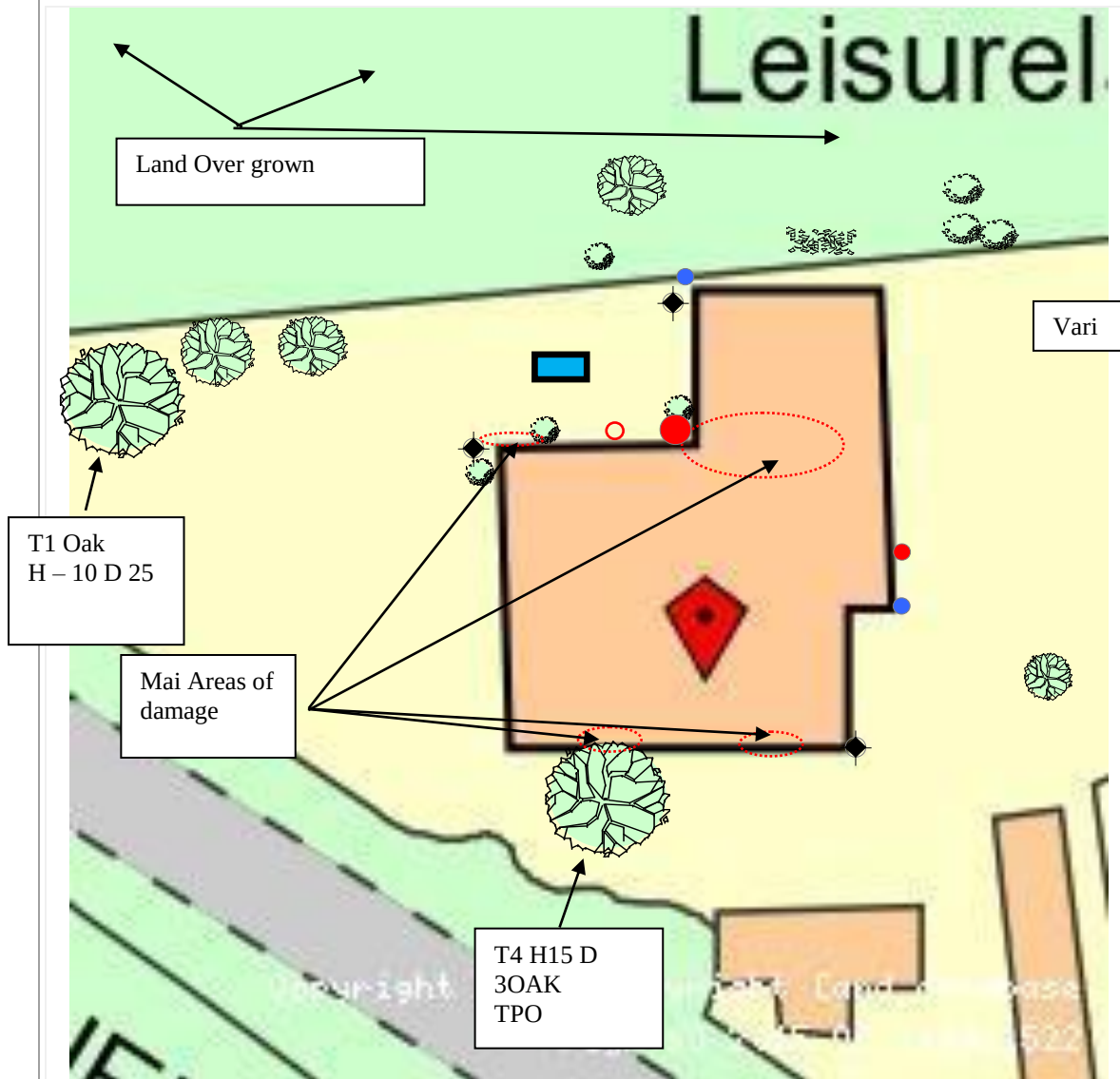
20 April 2017



**Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8230
Fax: 0121 200 0309**

Site Plan**This plan is Not to Scale**

This is an Aerial Photograph of the property and the immediate surrounding area. The positions of utilities etc are only indicative and contractors must satisfy themselves regarding actual location before commencing works.



© Bluesky International & © Infoterra 2006.

Map Reproduced with the Permission of Ordnance Survey License Number #####

Key:

	Tree: Deciduous		Tree: Conifer		Shrub
	Hedge		Area of Damage		Bore Hole
	Trial Hole		Trial & Bore Hole		Level Monitoring
	Rain Water Manhole		Rain Water Gully		Rain Water Pipe
	Waste Water Manhole		Waste Water Gully		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

INTRODUCTION

We have been asked by RSA 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 damage had been present for a while but not thought to be significant. The cracking appeared to worsen and a builder was contacted in order to repair the crack. The builder recommended contacting Insurers.

PROPERTY

Single storey detached bungalow of traditional construction with rendered external walls surmounted by a pitched tiled roof. The property was extended substantially to the rear of a similar construction to the main building with half being enclosed by a flat felted roof.

HISTORY & TIMESCALE

Site investigations are being organised and level monitoring.

Date of Construction	Circa 1910
Purchased	June 2004
Policy Inception Date	03/05/2016
Damage First Noticed	02/01/2017
Claim Notified to Insurer.....	24/01/2017
Date of our Inspection.....	24/02/2017
Issue of Report	20/04/2017
Anticipated Completion of Claim	Summer 2018

TOPOGRAPHY

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

Chartered Loss Adjusters

GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number SUSE suggests the underlying geology to be a mixture of Clay, silt and sand 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.

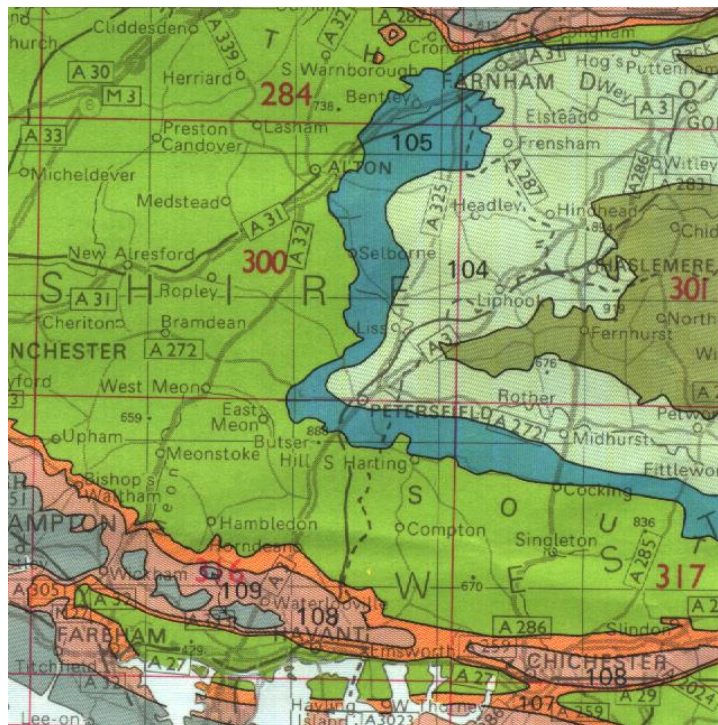
Like the solid geology sub-soil from which they are derived they shrink when dry, and swell when wet and can be troublesome when there is vegetation¹ nearby and Gypsum and selenite crystals can be encountered (particularly in the south east). Protection using Class II Sulphate Resisting cement is therefore recommended for buried concrete.

The superficial deposits are thought to be River Terrace.

River terrace is another name for the flood plain deposits. The description covers a mixture of gravels and sands, sometimes with clay intermixed. They are often numbered (River Terrace 1, 2...., with the lowest number being the lowest deposit) to follow their period of deposition.

Formerly known by their location (Boyn Hill Gravels, Taplow Gravels or Plateau Gravels for example), this terminology has largely been abandoned.

River Terraces are predominantly non-cohesive soils, are generally a good bearing medium and tend to be stable. They do not suffer the shrink/swell problems of cohesive (clay) soils, and plants and trees are rarely troublesome when near to a property - apart from root infiltration to drains and services. However, they can suffer erosion by water from leaking drainage or water mains and can be troublesome when loosely compacted.



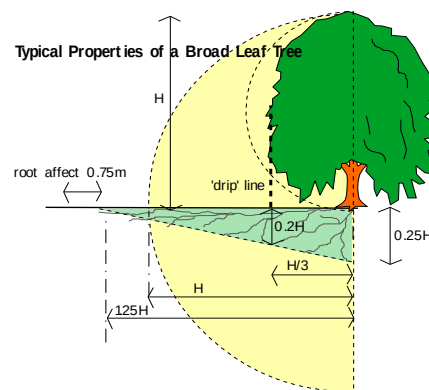
VEGETATION

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
Oak	10 m	25 m	Owners
Eucalyptus	8 m	15 m	Owners
Deciduous	10 m	10 m	Owners
Oak	15 m	3 m	Owners
Deciduous	4 m	5 m	Owners
Deciduous	4 m	5 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.

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 activity².



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 9.5mtrs³. 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.

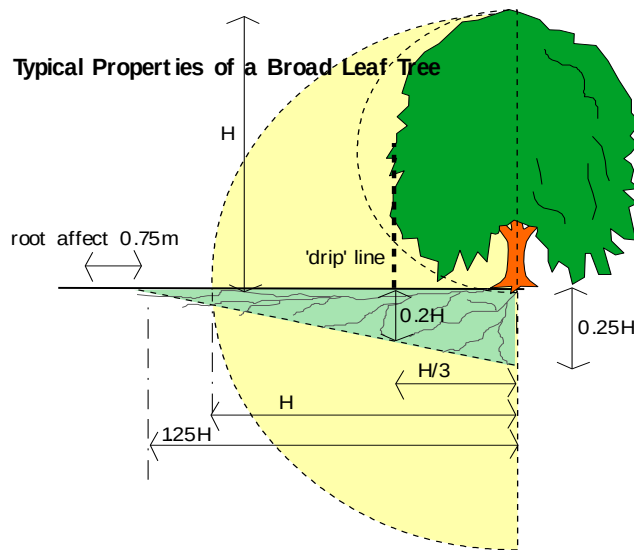
² Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

³ Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific

Eucalypts, (*Eucalyptus* species) are a large tropical genus, of which some species grow well in Britain, mainly the cider and snow gums, with the blue gum in mild coastal areas. Most are exceptionally vigorous and they all appear to be high water demanders. They will tolerate heavy pruning, and many will sprout if cut to near ground level, but regrowth is vigorous and needs to be kept under control.

They can reach heights of 15 - 25mtrs depending on climate and soil conditions, at a rate of 1000mm a year⁴ in some cases. They have strong root activity and the root system can extend to considerable depths in dry climates.

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.

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

OBSERVATIONS

The main area of damage affects the Main building and the rear extension.

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

INTERNAL

Lounge - Main crack damage to right hand elevation - junction of extension and main building



Lounge - Crack damage - towards the front elevation of the extension at the junction of the main building

The principal damage takes the form of tapering vertical and diagonal cracking up to approximately 4mm in width to right hand elevation of the Lounge. Further cracking was recorded below the windows to the left hand right hand elevations of the main building up to 3mm in width.

EXTERNAL

Rear Elevation



Left hand elevation main house - tapering diagonal crack damage

Tapering diagonal cracking was noted to the front left hand corner of the main building up to approximately 1mm in width. A further diagonal crack was noted to the right hand elevation up to 1mm in width below bedroom 3 window.

Chartered Loss Adjusters

CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁵ 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.

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.

Howard Nash BSc (Hons)
Crawford & Company
Subsidence Division
Direct Dial: 07711 378 054
subsidence@crawco.co.uk

⁵ Building Research Establishment, Garston, Watford. Tel: 01923.674040

PHOTOGRAPHS



Oak Tree TPO - Right hand side of property



Vegetation to the rear of the property



Vegetation to left hand side of property



Vegetation to the front left hand side of property



Right hand elevation - Tapering diagonal crack below Bedroom 3 window



View across workshop / conservatory



Conservatory / Workshop - Crack damage below right hand elevation window



View across Lounge towards main area of damage

Chartered Loss Adjusters

Chartered Loss Adjusters