TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU2003018

38 Holyrood Close
Reading,
RG4 6PZ

prepared for

RSA - Nationwide
3rd Floor, Bowling Mill, Dean Clough, Halifax, HX3 5WA

Claim Reference 202008010011

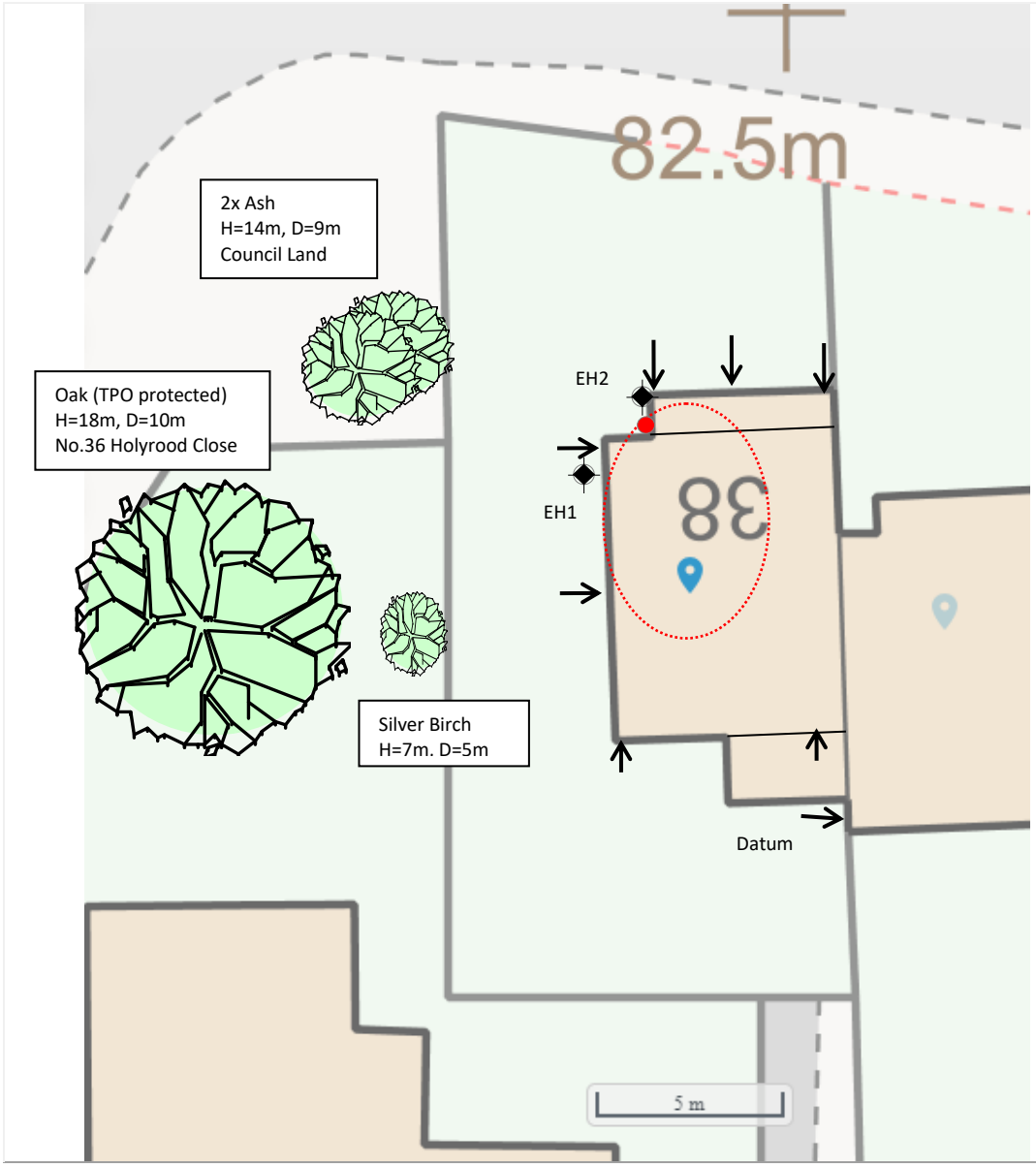
SUBSIDENCE CLAIM

DATE 24th September 2020

Crawford Claims Solutions – Subsidence
Cartwright House, Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8230

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

INTRODUCTION

We have been asked by RSA - Nationwide 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 property was bought in April 2020 with a pre-purchase survey indicating no evidence of subsidence. Your Member has redecorated the house and then noticed cracks developing in July 2020 which have gradually worsened. Suspecting subsidence, he notified a claim.

PROPERTY

Two storey link detached house with integral garage of traditional construction with cavity brick walls surmounted by a ridged tiled roof. The porch and front section of garage form a single storey section at the front.

HISTORY & TIMESCALE

Next Steps:
Site Investigations & Level Monitoring

Date of Construction	c.1970
Purchased	April 2020
Policy Inception Date	15/04/2020
Damage First Noticed	August 2020
Claim Notified to Insurer	10/08/2020
Date of our Inspection	11/09/2020
Issue of Report	24/09/2020
Anticipated Completion of Claim	Winter 2022

TOPOGRAPHY

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

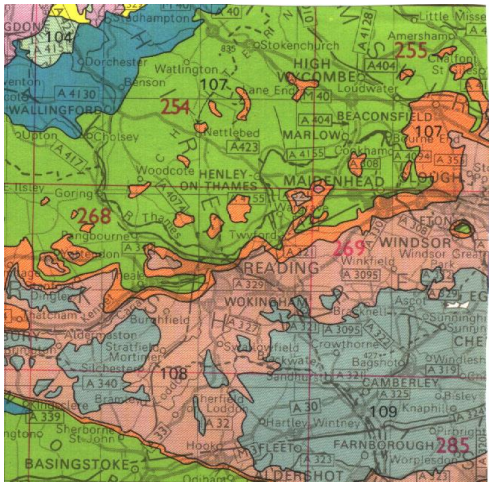
GEOLOGY

Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number SUNE 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.
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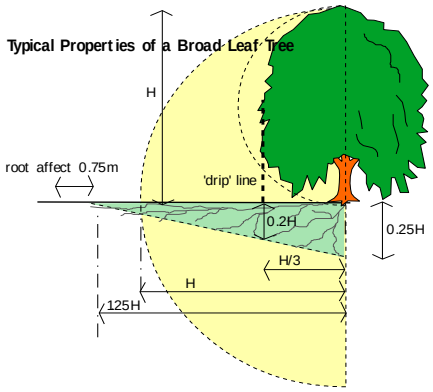
VEGETATION

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
T1 Oak (TPO)	18 m	10 m	36 Holyrood Close
T2 Ash x 2	14 m	9 m	Reading Council
Birch	7 m	5 m	36 Holyrood Close

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 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



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).

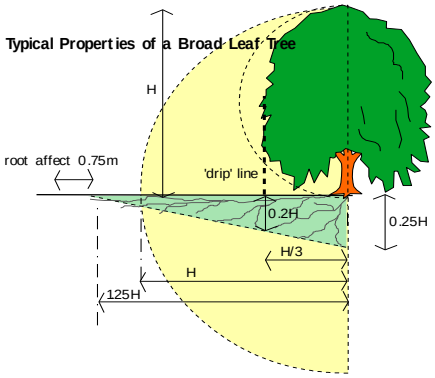
Maximum tree-to-damage distance recorded in the Kew survey was 30mtrs, with 50% of all cases occurring within 9.5mtrs[5]. Life expectancy > 100 years, although they are vulnerable to insect and fungal attack. Old and young trees are tolerant of quite heavy pruning and crown reduction, although re-growth 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 suctions.

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.

Ash (Fraxinus) are deciduous and can reach heights between 20-30m depending on health, environment and soil conditions. They have a fast growth rate of around 500mm per year, medium root activity[6] and medium water demand.

It is naturally vigorous and large growing, preferring light, fertile soils, but will grow on heavy clay. The maximum tree-to-damage distance recorded in the Kew survey was 21mtrs, and 50% of recorded cases occurred within 6mtrs[7].



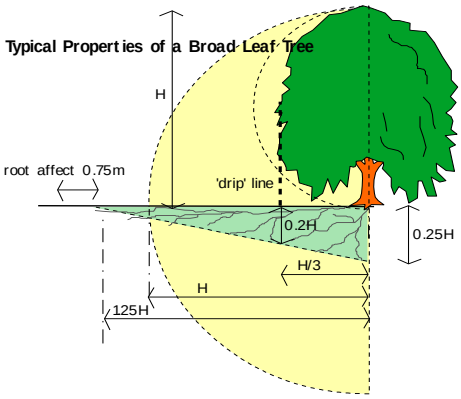
Typical proportions of an Ash. Note the potential root zone.

Young and old trees are tolerant of quite heavy pruning and crown reduction, but the timber is not particularly decay resistant and re-growth will need periodic cutting to keep weight and wind resistance down. Life expectancy > 100years. Root pruning can leave tree vulnerable to disease.

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

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[8] per year. They have weak root activity generally.

OBSERVATIONS

The area of damage is to the right side of the house.

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

INTERNAL

Front Right Bedroom

Hall

Ground floor

Kitchen

Diagonal crack above top right of window

Slight cracks at the wall/ceiling junctions

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

Hall
Diagonal crack above left side of internal door opening
Vertical crack to wall adjacent to right side of door opening
Diagonal crack on rear lounge wall at high level

Porch
Tapering vertical crack at right towards junction with front house will, open 8 mm. Previously repointed.

Lounge cupboard
Horizontal crack on stairs wall

Garage
Vertical and stepped crack at rear right corner
Slight crack at rear left corner
Stepped crack above lintel at front (below front wall)

First floor
Front left bedroom
Diagonal crack below right side of window and extending as horizontal crack on internal wall

Toilet
Vertical crack on internal wall near the front wall and crack along plasterboard joints

Bathroom
Minor stress cracks at front wall /ceiling junction
Diagonal and horizontal crack above left side of window on front wall

EXTERNAL

Porch junction crack - note previous repointing

Stepped cracking on front elevation and previous repointing

Front elevation
Stepped cracks x3 from left bedroom window to top of porch. Repointed but now slight re-opening.
Tapering vertical crack to right side of porch. Repointed but has reopened by 3 to 4 mm
Stepped diagonal crack at low-level on the right side of porch
Cracks above and below bathroom window

Rear elevation
Historic stepped crack above the lounge window (not subsidence)

CATEGORY
In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment[9] 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.

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

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, we note the involvement of Local Authority tree and a neighbour's protected tree. Unfortunately, this will require certain investigations to be carried out to demonstrate the influence of their vegetation.

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 will also be necessary to obtain a specialist Arboricultural Report.

We will report further once these investigations have been completed.

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PHOTOGRAPHS

Lounge Cupboard

Ash & Oak trees

Ash and Oak trees

Crack below right bedroom window

Crack above right bedroom window

Front elevation

Rear elevation

Oak tree