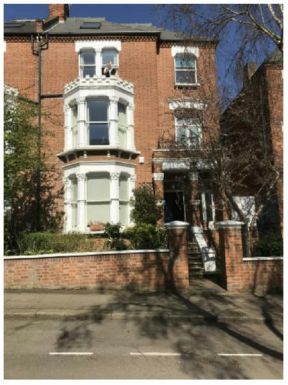
TECHNICAL REPORT ON A SUBSIDENCE CLAIM

[redacted]

[redacted]

16 Nassington Road
Hampstead
London
NW3 2UD



Prepared for

[redacted]

SUBSIDENCE CLAIM

14th April 2021

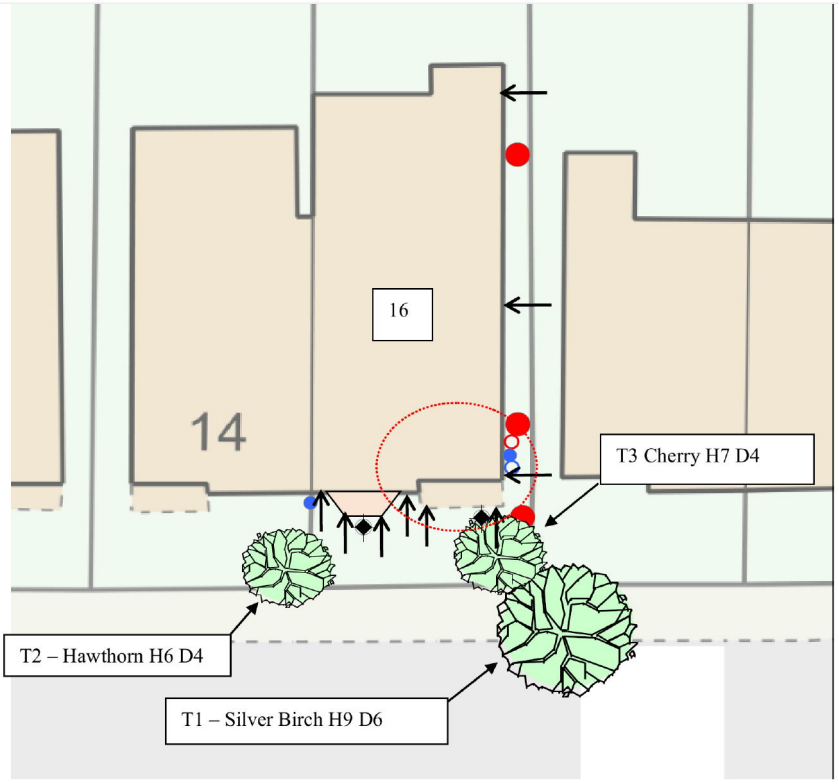
[redacted]

Chartered Loss Adjusters

[redacted]

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.



© 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 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		

[redacted]

INTRODUCTION

We have been asked by RSA - MORE TH>N 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 Policyholder advised that over the last three months they have had several visits by a builder attending to a problem with a small balcony for the first floor left front corner room. The balcony was not watertight and the underside plaster had fallen exposing rotting timber floor joists. The builder has repaired part of the balcony floor and frame introducing new timbers and possibly lintels.

About a week ago the builder has expressed concern about cracking seen in various front elevation areas and advised the Policyholder that they may have a problem that required investigation, concerned the Policyholder notified Insurers.

PROPERTY

The risk address is a three storey plus a small part front basement semi-detached dwelling of solid loadbearing brickwork supporting suspended wooden floors and pitched roof elevations overlaid with slates. A single storey rear flat roof extension was added before the insureds purchase and 20 years ago the insured converted part of that extension to a conservatory by adding extensive skylights. A Velux window partial loft conversion was also added 20 years ago.

HISTORY & TIMESCALE

We are proceeding with site investigations and a period of level monitoring in the first instance.

Date of Construction	Circa 1880
Purchased	1996
Policy Inception Date	11/11/2005
Damage First Noticed	March 2021
Claim Notified to Insurer	24/03/2021
Date of our Inspection	06/04/2021
Issue of Report	14/04/2021
Anticipated Completion of Claim	January 2023

[redacted]

TOPOGRAPHY

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

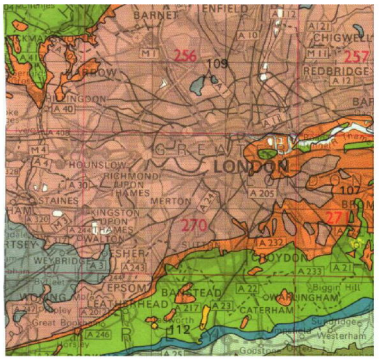
GEOLOGY

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 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

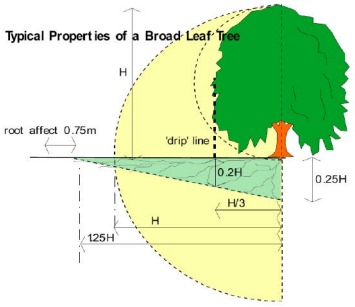
There are several trees and shrubs nearby, some with roots that may extend beneath the house foundations. The following are of particular interest:-

Type	Height	Distance	Ownership
Birch	9 m	6 m	Council
Hawthorn	6 m	4 m	Neighbour 1
Cherry	7 m	4 m	Owners

[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.

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

Hawthorn (*Crataegus monogyna*) are deciduous and can reach heights up to 14m depending on health, environment and soil conditions. On shrinkable clays they rarely achieve a height greater than 10mtrs. They have a slow growth rate of around 200mm per year and medium root activity[5], although they can be deep rooted.

In the Kew Garden Survey 50% of all cases of damage occurred when the tree was within 5mtrs of the property. The maximum-recorded distance was 11.5mtrs. Interestingly they accounted for 4.6% of the total sample, and 3.5% of the tree population. In cases where the Hawthorn was implicated there was a 99% coincidence of shrinkable clays.

They were involved in 1.6% of all cases involving damage to drains.

Hawthorn's are tolerant of quite heavy pruning and crown thinning although suckering can be a problem.

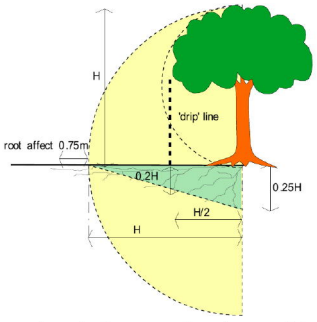
Unfortunately the roots are similar to those of the apple, pear and *Sorbus,* all belonging to the family *Pomoideae.*

They have a life expectancy of less than 50 years.

Cherries, Prunus species, include Japanese flowering species, which are mainly small growing short lived moderate water demanders and the native wild cherry, P.avium, which is generally longer lived and capable of reaching over 20m.

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

The growth rate is 300mm a year and they have medium root activity. They can be associated with subsidence, although they are not regarded as a particularly aggressive tree.



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

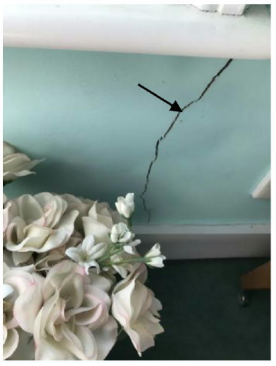
Most Prunus species have wide spreading roots and a tendency to send up sucker shoots, often a long way from the parent tree. The genus includes plums, laurels, Portugal laurel, the roots of which are indistinguishable from each other.

OBSERVATIONS

The movement to the front 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 bathroom

Cracking in bathroom

Front Entrance Hall and Stairwell

- Just inside front entrance stairwell arch leads to stairwell and central areas. 2 cracks 1-2mm in arch.
- Backing onto entrance hall is lounge. Vertical jagged wall crack at higher level.
- Over stairs at second floor landing level. Short high level only crack at junction of flank wall.

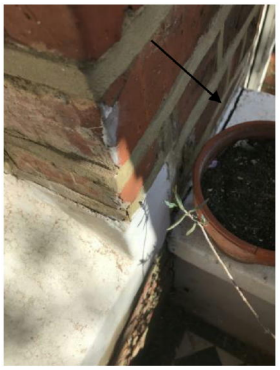
First Floor Bathroom

- Top corner of front elevation window - 2mm.
- Bottom right corner of front elevation window as viewed internally - 3mm.
- High level crack top corner of flank wall window.

Front Partial Basement

- Front of basement - vertical stepped cracks. This one is directly under front door.
- There is also a crack under window close to front corner.

EXTERNAL



Movement to front steps

Cracking to front elevation

Front Entrance Area

- Gap up to 5mm between top of steps and entrance column.
- Underside of balcony. Contractor has replaced some floor timbers and possibly introduced the concrete lintels.
- Window arch under the balcony. Cracking and movement looks old.
- Front door arch - top left corner movement.
- Left side cracking to stonework over first floor right side front elevation window - the room with the balcony.
- First floor bay cracking to high level stonework noted.

Balcony to Front Corner Bathroom

- Balcony under repair. Underside reinforced and surface reinstatement outstanding.

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.

DISCUSSION

The pattern and nature of the cracking 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.

No structural changes to the building have been carried out which has contributed to the current subsidence related damage under investigation. Furthermore we are not aware of any previous underpinning.

RECOMMENDATIONS

Although the cause of the movement needs to be dealt with, in addition to the cherry tree within the front garden of the risk address, we note the potential involvement of a Local Authority tree in the pavement to the front of the property. Unfortunately, they 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 may also be necessary to obtain a specialist Arboricultural Report.

We will report further once these investigations have been completed.

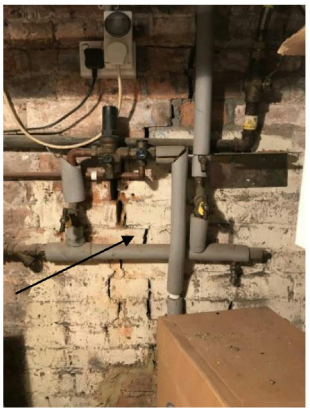
Matt Deller BSc (Hons) MCIOB Dip CII
Crawford Claims Solutions – Subsidence

[redacted]

Chartered Loss Adjusters

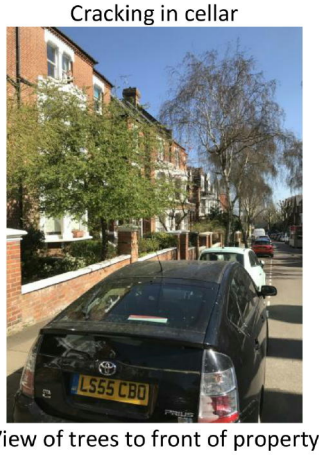
[redacted]

PHOTOGRAPHS



Cracking in cellar

Cracking above front door arch



View of trees to front of property