TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: [redacted]

Kenham Property Company Limited
Flat 2
1F Oval Road
NW1 7EA

Prepared for
[redacted]

[redacted]

SUBSIDENCE CLAIM

31st December 2019

[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.

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	

[redacted]

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 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

We understand that in Summer 2019 the tenants became aware of cracking internally in the bedroom in the rear outrigger. They became concerned as the cracking progressed, and a claim was intimated to Insurers.

PROPERTY

The risk address comprises a four storey (including lower ground floor) detached tenanted dwelling dating from the 1860s of traditional construction in solid brick beneath a pitched roof. On the right hand side and wrapping round the rear is a two storey flat roofed section, and to the rear of that is a single storey flat roofed outrigger. The focal point of the current claim is the front right hand two storey section and the rear single storey outrigger. With the exception of the current damage it has been maintained in an adequate structural and decorative order.

HISTORY & TIMESCALE

We shall advise further when the investigation results are to hand.

Date of Construction	1860s
Purchased	Not known
Policy Inception Date	01/01/2018
Damage First Noticed	18/09/2019
Claim Notified to Insurer	25/09/2019
Date of our Inspection	13/11/2019
Issue of Report	20/11/2019
Anticipated Completion of Claim	11/2020

TOPOGRAPHY

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

[redacted]

GEOLOGY

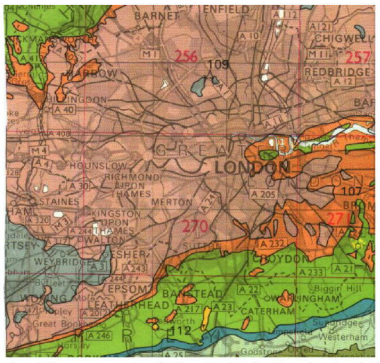
Reference to the 1:625,000 scale British Geological Survey Map (solid edition) OS Tile number TQNW suggests the underlying geology to be **London Clay**.

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 superficial deposits are thought to be Clay 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 vegetation[4] 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.



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:-

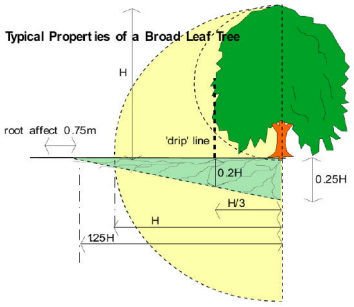
Type	Height	Distance	Ownership
Birch	12 m	3 m	Neighbour 1
Deciduous	12 m	4 m	Owners

[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.
[4] DriscollL R. (1983) *"Influence of Vegetation on Clays"* Geotechnique. Vol 33.

[redacted]

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.

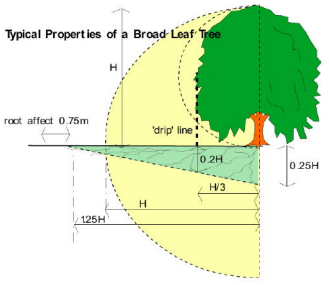
Water demand is low and they are generally a low risk species near buildings. They will tolerate heavy pruning when immature, but not when older and the timber does not resist decay which can lead to structural weakness.



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

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.

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

[redacted]

OBSERVATIONS

There is no significant damage to the original four storey section. Cracking occurs to the right hand two storey section and the rear single storey outrigger as two separate and discrete zones of damage.

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

INTERNAL

Cracking in ceiling at junction of rear outrigger with main

Separation cracking in rear outrigger at junction with two storey section

No access was possible to Bedroom 2 (ground floor front) but we anticipate comparatively minor fracture damage to the front wall to mirror the external cracking.
In Bedroom 3 on the upper floor at the front there is cracking approximately 2mm width above the window.
On the landing there is cracking 1-2mm width approximately around the skylight, and hairline vertical cracking in the end wall nearest Bedroom 3.
In Bedroom 4 at the upper rear of the two storey section there is cracking approximately 2mm width to the left of the door.
The most significant damage occurs in Bedroom 1 in the rear single storey outrigger. There is cracking across the ceiling approximately 15mm in width with pieces of plaster falling away. This cracking tracks down the side wall diminishing towards floor level. There is no damage to the adjacent en-suite bathroom to Bedroom 1 but this is in the two storey section.

[redacted]

EXTERNAL

External cracking front right hand side of two storey section

Externally on the front of the two storey section there is predominantly vertical cracking up to 3mm width approximately to the right of the window extending full height. There was no access to the rear part of the right flank wall of the two storey section but from the neighbour's front parking area stepped diagonal and vertical cracking up to3mm in width opposite the birch tree. We noted also some previous repairs in this area. To the rear of the property where the single storey outrigger abuts the two storey section there is vertical and stepped diagonal cracking on the right hand side of the French doors. It is likely that the flat roof flashing to the two storey section has pulled.

The mechanism of movement indicated by the damage is a slight rotation of the right hand area of the two storey section towards the tree located in the right hand neighbour's front parking area, with dislocation occurring to the right of the window as depicted. A more significant rotation of the rear single storey outrigger has occurred towards the trees located in the rear garden.

[redacted]

CATEGORY

In structural terms the damage falls into Category 4 of Table 1, Building Research Establishment[6] Digest 251, which describes it as **"severe".**

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.

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

RECOMMENDATIONS

The cause of the movement needs to be dealt with first. It is likely that the trees located in the rear garden are younger than the property and may safely be removed without risk of heave.
A quotation for the recommended tree works should be obtained and statutory checks for Preservation Orders or whether the tree(s) are in a Conservation Area should be undertaken.

With regards to the third party birch tree our recommendation is that this also be removed to mitigate the damage and avoid further occurrences. Our Mitigation Unit will liaise with your neighbour in this respect.

Following completion of the tree management works, we will undertake a suitable period of monitoring to confirm stability has been achieved before undertaking repairs to the property.

Jon Ford BSc(Hons) DMS CEng MICE ACIArb
Subsidence Division
[redacted]

[6] Building Research Establishment, [redacted]

PHOTOGRAPHS

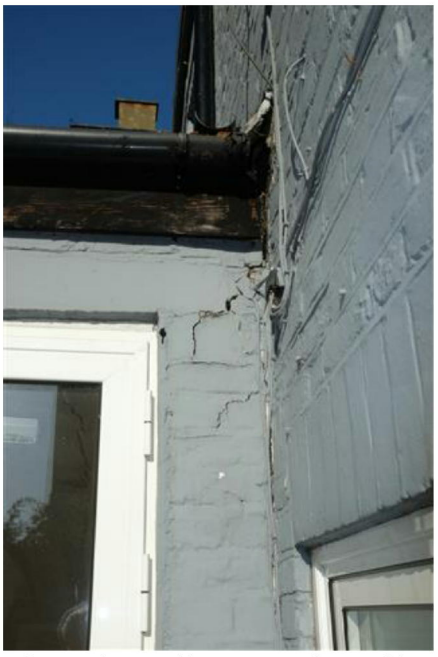
Birch tree in right hand neighbour's front drive

separation cracking in ceiling in rear outrigger

Separation cracking in rera outrigger at junction with main

Ceiling cracking in rear outrigger

[redacted]



Separation cracking rear outrigger with two storey section

[redacted]