

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1903936

████████████████████
**59 Pearson Park
Hull
HU5 2TQ**



Prepared for

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████████████████████
████████████████████

SUBSIDENCE CLAIM

DATE 11th October 2019

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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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

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INTRODUCTION

We have been asked by AXA Commercial - London Property Team 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 claim was notified to Insurers on the basis of tenants/landlords notifying Managing Agents of visible internal cracks.

PROPERTY

Three storey multi-occupied Apartment Block of traditional construction with brick walls surmounted by a hipped, tiled roof.

HISTORY & TIMESCALE

Site investigations are being organised and we have appointed Arboricultural consultants to provide recommendations on the extent of tree works, which can be undertaken.

Date of Construction	Circa 1970
Purchased	1970's
Policy Inception Date.....	22/11/2017
Damage First Noticed	Tenants advised Managing Agents
Claim Notified to Insurer.....	09/09/2019
Date of our Inspection.....	08/10/2019
Issue of Report.....	11/10/2019
Anticipated Completion of Claim	April 2021

TOPOGRAPHY

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

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GEOLOGY

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

Chalk¹ is a white, fine grained, powdery, limestone formed of calcium carbonate, containing small amounts of silt and mud but predominantly microscopic organic remains and shell debris. It is a marine deposit and effervesces strongly when in contact with cold, dilute hydrochloric acid. It is finer grained than limestones.

High porosity (>40%) and variable permeability. Often associated with aquifers.

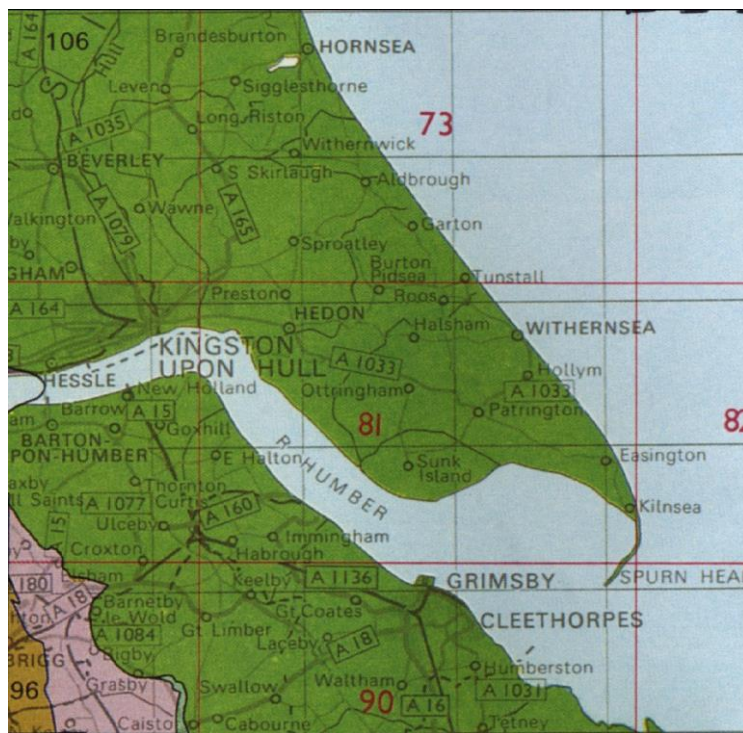
The superficial deposits are thought to be Silts.

Silts occur as glacial, alluvial or windblown deposits. They are water bearing and soft in consistency, and therefore amongst the most troublesome soils in excavation work since they are vulnerable to slumping and 'boiling'.

They can also suffer from frost heave². In the south-east of England they are known as Brickearth, which are generally firm to stiff, where they are less troublesome.

They do not suffer volumetric changes in the presence of vegetation in the way of clay soils, but can be a problem where there are leaking drains, water services or fluctuations in the water table, when consolidation settlement can occur.

They can also suffer localised erosion and softening in the presence of water.



Geology. Reproduced with consent of The British Geological Survey at Keyworth.
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¹ BS 5930 (1981) "Code of Practice for Site Investigation"

² Tomlinson M.J. (1991) "Foundation Design & Construction" LONGMAN SCIENTIFIC
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VEGETATION

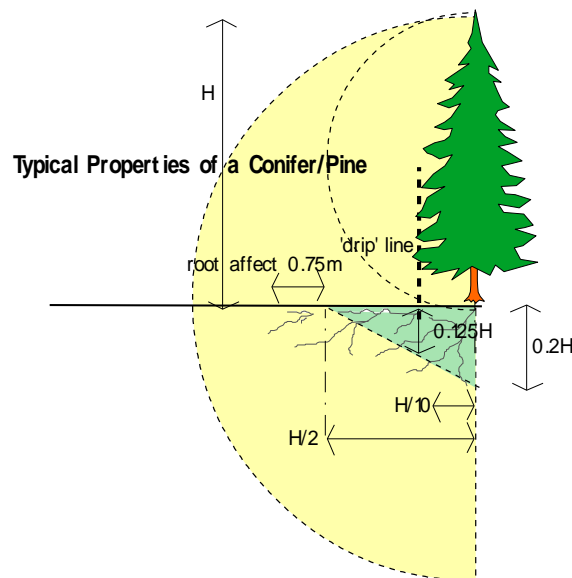
There are several trees and shrubs nearby, some with roots that may extend beneath the house foundations. The following are of particular interest:-

Type	Height	Distance	Ownership
Conifers	12 m	3 m	Owners
Conifers	16 m	6 m	Owners
Shrubs	1 m	3 m	Owners
Deciduous	30m	15m	Owners
Deciduous	9 m	3 m	Neighbour

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.

Conifers ~ The term is usually used to refer to cypresses and close relatives, but in the broader sense includes any trees that bear cones and nearly all of them have simple needle or scale like leaves, sometimes arranged into fronds as in the cypresses.



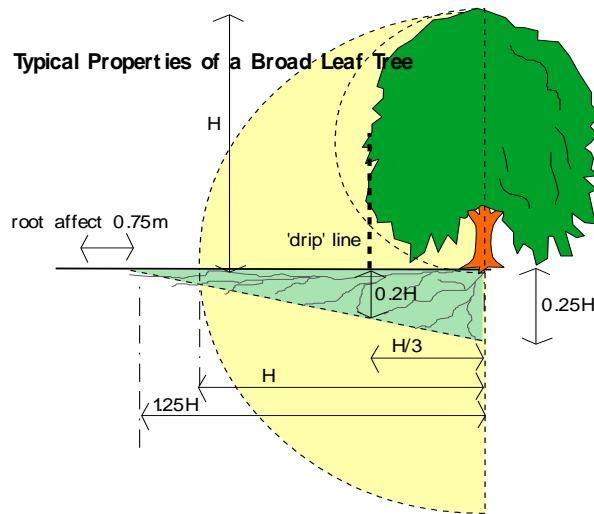
Typical tree proportions showing the root zone. This is a conservative estimate, as the zone can equal the height of the tree.

Generally they have less invasive roots and lower water demands than broadleaved species, but cypresses are often associated with subsidence as they are very fast growing, popular hedge plants that are frequently planted near houses.

Shrubs. Sometimes even small shrubs can cause localised subsidence damage. In the Kew Garden Survey data was collected between 1979 - 86 to record the number of roots of each species received for identification. Of the 1009 roots identified, 367 (36%) belonged to the family *Rosoideae* or Rose. Next came the family *Oleaceae* (Forsythia, Jasmin, Privet and Lilac) with 354 (35%) enquiries.

Berberis, *Viburnum*, *Hedera* (ivy), *Hydrangea* and *Pyracanthus* are also regularly associated with foundation movement, the latter having surprisingly large roots on occasions.

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.

OBSERVATIONS

The main area of damage affects the front right hand side of the block. This entails two properties identified as Flat 4 (ground floor) and Flat 10 (first & second floor).

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

INTERNAL

Stepped diagonal cracks sited either side of windows up to 15mm wide.
Vertical tapering cracks to masonry walls up to 15mm wide.



Flat 4 – Vertical Crack in Lounge



Flat 10 – Diagonal Crack to Lounge

Flat 4:

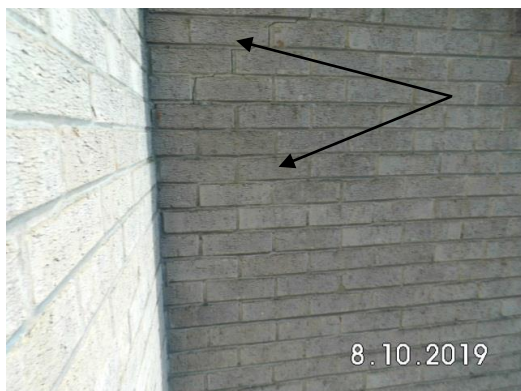
Main damage affects the lounge walls and ceiling; with cracks up to 15mm wide.
There is a minor crack to the bedroom wall; mirroring that of the lounge.

Flat 10:

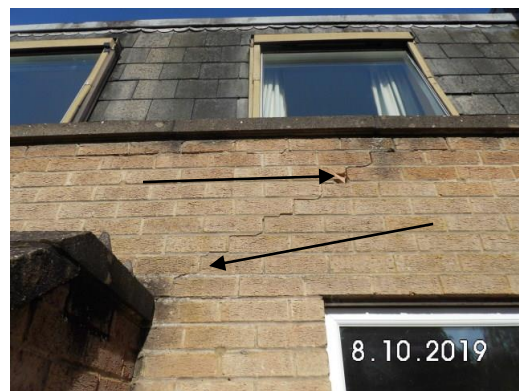
Main damage affects the lounge window wall; with visible daylight to the window frame. The uPVC door to balcony area is out of alignment with variable sized cracking.
The master bedroom above the lounge shows hairline cracking around the window head.

EXTERNAL

Stepped diagonal cracks above and below windows up to 20mm wide.
Stepped diagonal cracks to external masonry up to 20mm wide.



Flat 4 – Side Wall Stepped Cracking



Flat 10 – Stepped Cracking

CATEGORY

In structural terms the damage falls into Category 4 of Table 1, Building Research Establishment³ Digest 251, which describes it as “severe”.

³ Building Research Establishment, Garston, Watford. Tel: 01923.674040

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 first, we have completed a soil risk analysis (VISCAT Assessment) which suggests a potential heave risk should the vegetation be removed. We are therefore arranging site investigations to quantify this risk in relation to the specific soil type at the property.

Although the cause of the movement needs to be dealt with, we note the vegetation is subject to a Preservation Order (TPO). 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.

Andrew Mason MCIQB MCMI

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PHOTOGRAPHS



Flat 4 Lounge – Diagonal Crack to Sill



Flat 4 Lounge – Wall/Ceiling Crack



Flat 10 Lounge – Diagonal Crack at uPVC Door



Flat 10 Lounge – Daylight to Window Frame



Side Elevation – Stepped Masonry Cracks



Right Side Gable Elevation – Stepped Cracks



Flat 4 Side Wall – Stepped Cracks



Flat 10 Balcony – Displaced Copings

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