TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1505185

Deauville Securities Limited
Somerset House
31 Dartmouth Park Hill
London
NW5 1HR

prepared for

RSA - Commercial
1st Floor, 17 York Street, Manchester, M2 3RS

Claim Reference 201512003105

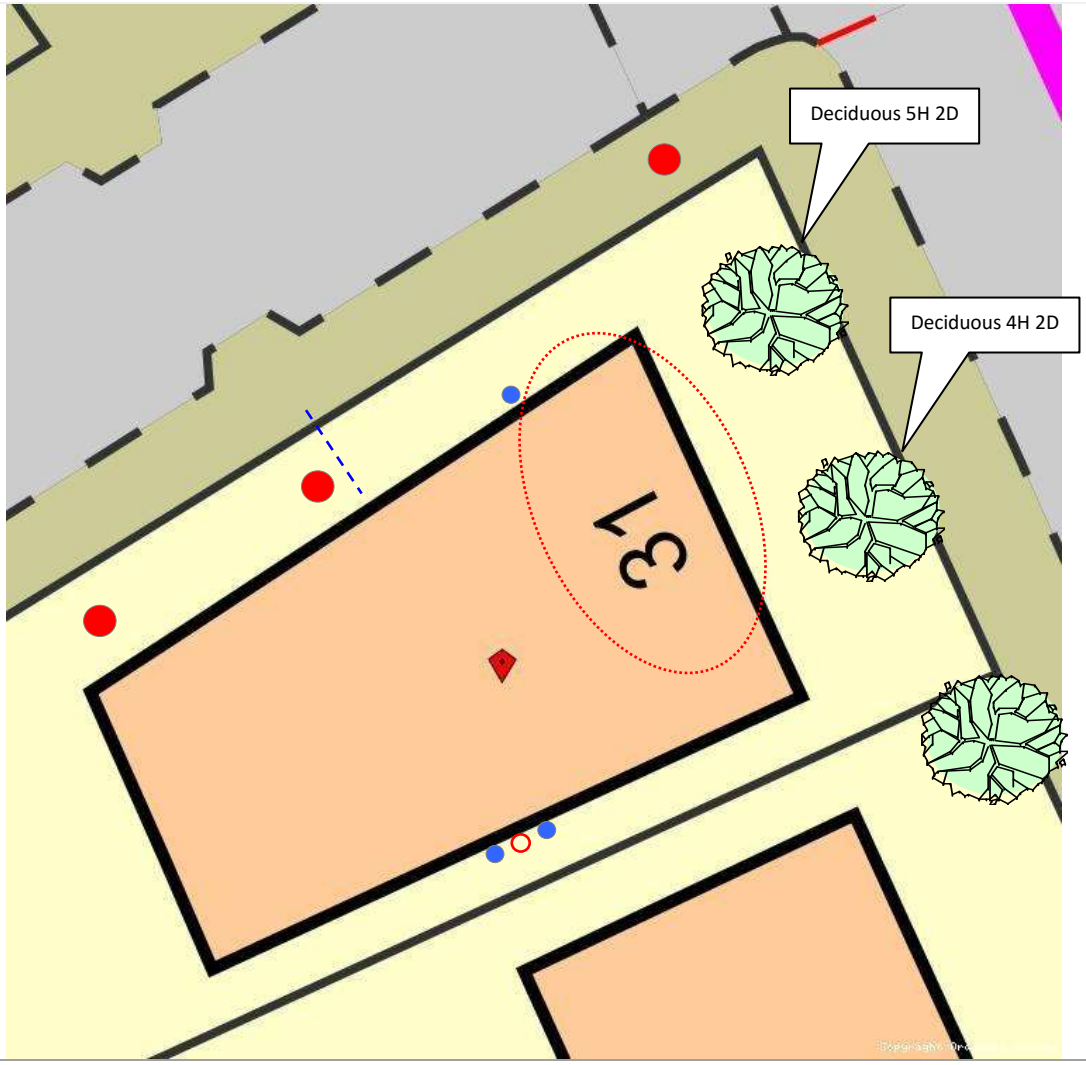
SUBSIDENCE CLAIM

DATE 22 January 2016

Specialist Property Services – Subsidence Division
Cartwright House,
Tottle Road,
Riverside Business Park, Nottingham, NG2 1RT
Tel: 0115 943 8244
Fax: 0121 200 0309

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
	Incoming Water		Incoming Electrics		

INTRODUCTION

We have been asked by RSA - Commercial 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 2007. 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.

Investigations have been carried out in accordance with the requirements of The Institution of Structural Engineers[1].

We have not commented on any part of the building that is covered or inaccessible.

TECHNICAL CIRCUMSTANCES

The leaseholder of the ground floor flat has been aware of cracking for approximately 18 months. The damage was minor and of no cause for concern. Damage worsened and became of concern by September 2016 and hence Insurers were notified. The leaseholder was aware of previous underpinning but had been unable to acquire details.

PROPERTY

The property comprises a four storey purpose built block of traditional construction with brick walls surmounted by a hipped, tiled roof.

HISTORY & TIMESCALE

Site investigations are being organised.

Date of Construction	Circa 1900
Purchased	June 2011
Policy Inception Date	01/07/2000
Damage First Noticed	September 2014
Claim Notified to Insurer	16/12/2015
Date of our Inspection	20/01/2016
Issue of Report	16/02/2016
Anticipated Completion of Claim	Autumn 2016

TOPOGRAPHY

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

[1] Institution of Structural Engineers (1994) *"Subsidence of Low Rise Buildings"*

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.

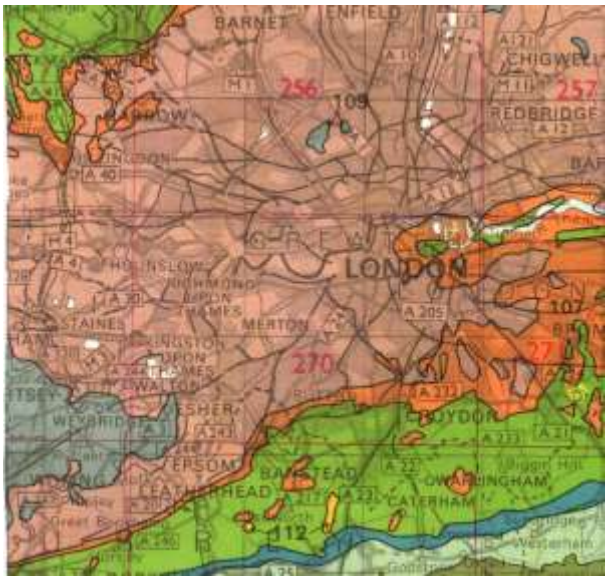
London Clays are marine deposits characterised by their silty, sandy composition. They are typically stiff, dark or bluish grey, weathered dark to mid-brown superficially with fine particle size (less than 0.002mm). Tomlinson[2] describes it as a 'fat' clay with high loadbearing characteristics due to 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[3],[4] 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[5] 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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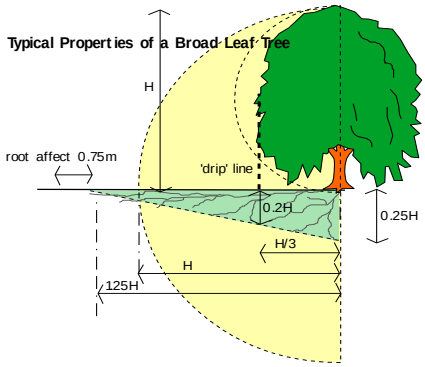
[2] Tomlinson M.J. (1991) *"Foundations Design & Construction"* Longman Scientific Publishing.
[2] B.S. 5930 (1981) *"Site Investigations"*
[3] DriscollL R. (1983) *"Influence of Vegetation on Clays"* Geotechnique. Vol 33.
[4] Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.
[5] DriscollL R. (1983) *"Influence of Vegetation on Clays"* Geotechnique. Vol 33.

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
Deciduous	5 m	2 m	Owners
Deciduous	3 m	2 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.
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 left corner of the property.

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

INTERNAL

Cracking in lounge above window

Cracking in lounge below window

Lounge

Hairline diagonal crack above window opening.
1mm vertical crack below window opening mirroring external vertical crack.
Rucking of lining paper below window opening mirroring external diagonal crack.
5mm tapering separation at abutment of external left hand wall and internal cross wall.
3mm separation between ceiling/wall junction to external left hand wall.

Left Hand Bedroom

5mm tapering separation at abutment of external left hand wall and internal cross wall.
3mm separation between ceiling/wall junction to external left hand wall.
Hairline diagonal crack below window opening.
1mm vertical crack above window opening.
Hairline diagonal crack to chimney breast.

EXTERNAL

Cracking to front left corner

Cracking below lounge window

External

Tapering diagonal crack up to 20mm in width to front left hand corner of building extending from ground level.
1mm diagonal crack below ground floor lounge window opening.
4mm vertical crack below ground floor lounge window opening.
5mm stepped diagonal cracking above either side of arch to lounge window opening.
2mm diagonal crack above kitchen window opening.

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.

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

DISCUSSION

The pattern and nature of the cracks is indicative of an episode of subsidence. We will arrange for site investigations to confirm the cause of movement. Typically, these investigations would involve a trial pit to determine the depth and type of footings and a borehole to determine the nature of the subsoil/influence of any roots.

RECOMMENDATIONS

We will report further following the results of site investigations.

Gordon McEwan BSc (Hons) Building Surveying Cert CILA
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Direct Dial : 07500 891857
subsidence@crawco.co.uk

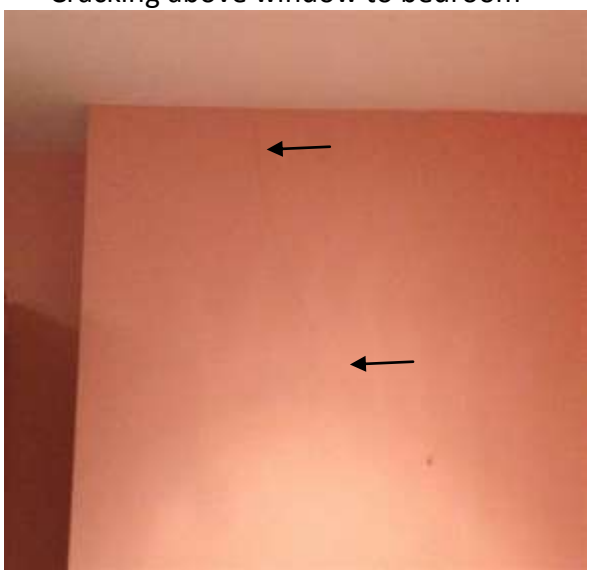
PHOTOGRAPHS

Cracking to wall junction in lounge

Cracking to wall junction in bedroom

Cracking above window to bedroom

Cracking below window to bedroom



Hairline cracking to chimney breast

Cracking below lounge window

Cracking above arch to lounge

Vegetation to left