

# **TECHNICAL REPORT ON A SUBSIDENCE CLAIM**

**Crawford Reference: SU1300377**

**9 Rosslyn Hill  
London  
NW3 5UL**



Prepared for

**RSA - Towergate  
Towergate Underwriting, Let Property, Floor 2, The Octagon, Middleborough, Colchester,  
CO1 1TG**

## **SUBSIDENCE CLAIM**

DATE 15 February 2013

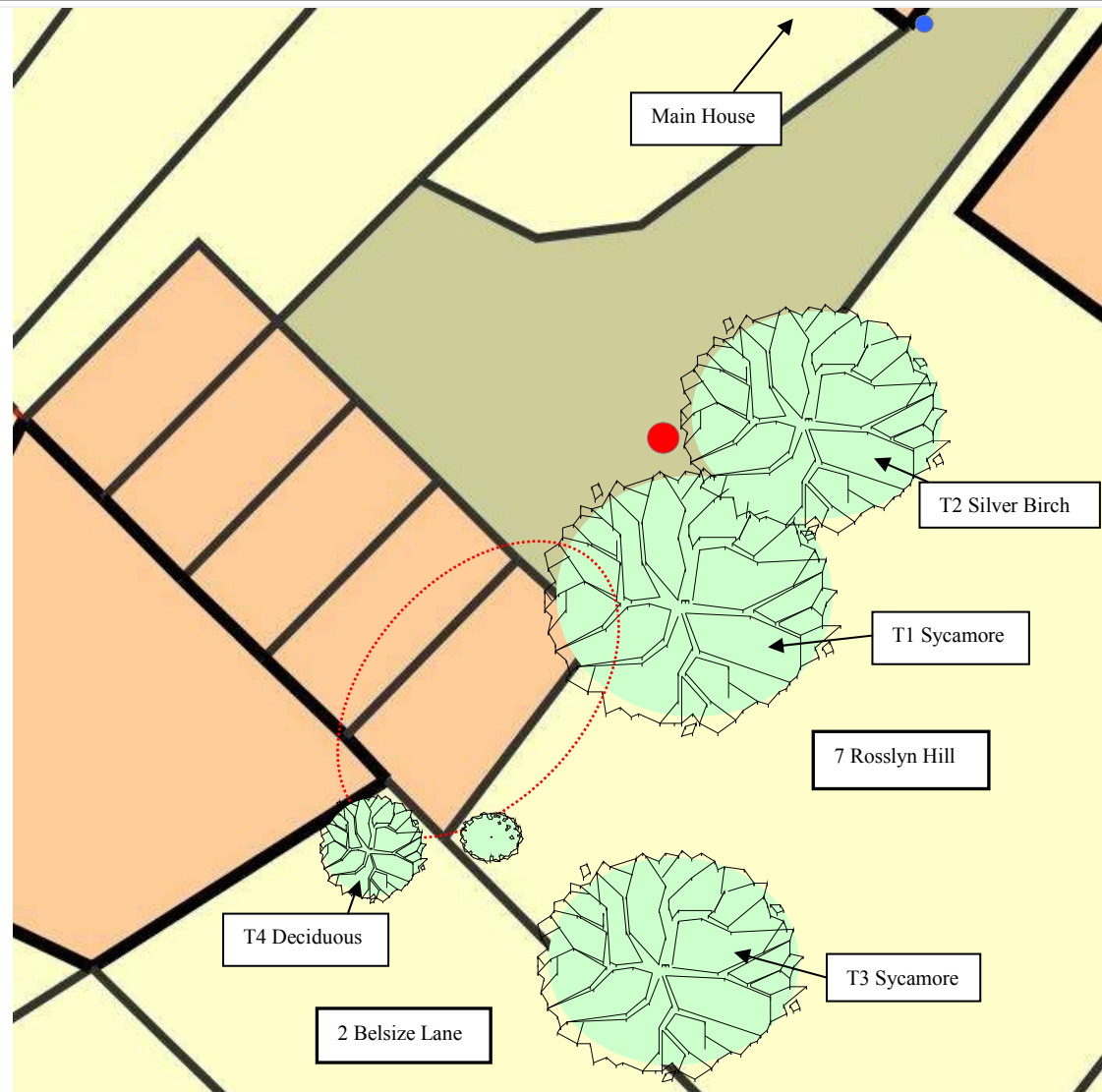


Specialist Property Services – Subsidence Division  
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Tottle Road,  
Riverside Business Park, Nottingham, NG2 1RT  
Tel: 0115 943 8260  
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**Site Plan****This plan is Not to Scale**

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 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 - Towergate 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<sup>1</sup>.

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

## TECHNICAL CIRCUMSTANCES

The property was previously tenanted however the insured was downsizing and therefore the tenants moved out in March 2012 and the insured moved back in September 2012. The movement to the garage was noted in March 2012 by the insured. Some mastic repairs are evident which were undertaken by the tenant as the insured was not aware of the movement prior to the discovery. The insured instructed an Engineer to inspect in July 2012 who concluded that the third party trees were the cause of the movement.

## PROPERTY

The risk address is a two storey end-terrace house of traditional construction with brick walls surmounted by a ridged tiled roof. The flat roofed, brick built garage to the rear of the property is the focal point of this claim.

## HISTORY & TIMESCALE

We await insurer's advice on how they wish us to proceed with the claim.

Date of Construction .....	1957
Purchased .....	1957
Policy Inception Date.....	12/03/2011
Damage First Noticed .....	March 2012
Claim Notified to Insurer.....	30/01/2013
Date of our Inspection .....	11/02/2013
Issue of Report.....	15/02/2013
Anticipated Completion of Claim .....	Winter 2013

## TOPOGRAPHY

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

## 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<sup>2</sup> describes it as a 'fat' clay with high loadbearing characteristics due to pre-consolidation pressures in its geological history.

<sup>1</sup> Institution of Structural Engineers (1994) "Subsidence of Low Rise Buildings"

<sup>2</sup> Tomlinson M.J. (1991) "Foundations Design & Construction" Longman Scientific Publishing.

The upper horizon is often encountered at shallow depth, sometimes just below ground level. They have high shrink/swell potentials<sup>3,4</sup> 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 Sycamore	18 m	1 m	Neighbour 1
T2 Birch	18 m	5 m	Neighbour 1
T3 Sycamore	18 m	5 m	Neighbour 1
T4 Deciduous	7 m	1 m	Neighbour 3

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.

Sycamores (Acer) are deciduous and can reach heights between 20-30m depending on health, environment and soil conditions. They have a fast growth rate of around 600mm per year and medium root activity<sup>5</sup>.

The Sycamore is a hardy tree, and can withstand quite aggressive environments. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, with 50% of cases occurring within 6mtrs<sup>6</sup>. They are deep rooting on clay soils and have a life expectancy > 100 years.

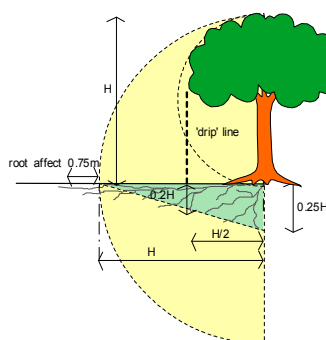
<sup>2</sup> B.S. 5930 (1981) "Site Investigations"

<sup>3</sup> Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

<sup>4</sup> Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

<sup>5</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

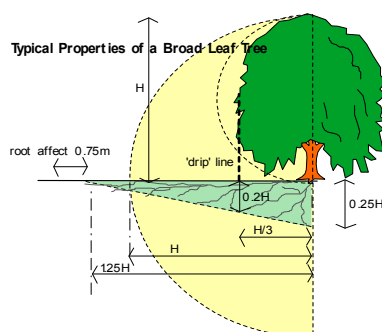
<sup>6</sup> Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific



They can usually tolerate quite heavy pruning or crown thinning, although this can create large wounds which decay rapidly.

Birches, (*Betula* species) are fast growing when young, but short lived, typically declining after 50 - 80 years.

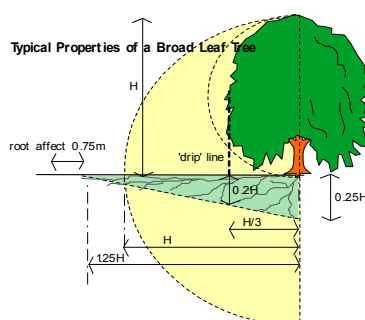
Water demand is low and they are generally a low risk species near buildings. They will tolerate heavy pruning when immature, but not when older and the timber does not resist decay which can lead to structural weakness.



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<sup>7</sup> 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.

<sup>7</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications



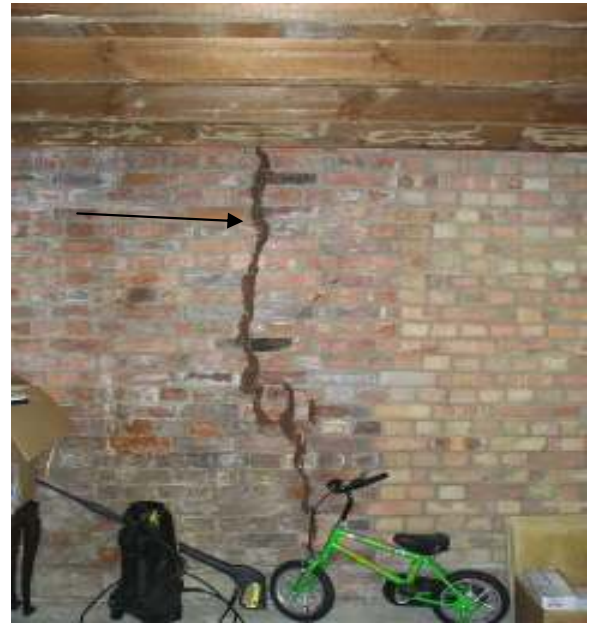
**OBSERVATIONS**

The movement to the detached garage to the rear 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 to left hand flank



Cracking to rear wall (mastic repair evident)

**Garage** - Various stepped tapering and horizontal cracks were noted to the left hand flank ranging up to 10mm in width, mastic repairs were evident to some of the cracks, 10mm vertical tapering crack to the rear wall at midpoint with mastic repair evident, 12mm gap evident between the concrete floor slab and right hand party wall.

**EXTERNAL**

View of garage



View of third party trees

No other external damage was evident however the inspection was limited by the confines of the site.

**CATEGORY**

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment<sup>8</sup> 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 however we cannot rule out that some physical damage caused by the root growth to the garage has occurred due to the proximity of the third party vegetation.

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**

The cause of the movement needs to be dealt with first. Our Mitigation Unit will liaise with your neighbours in this respect.

Provided the tree management works are completed expeditiously, consideration may then be given to carrying out the appropriate repairs to the property.

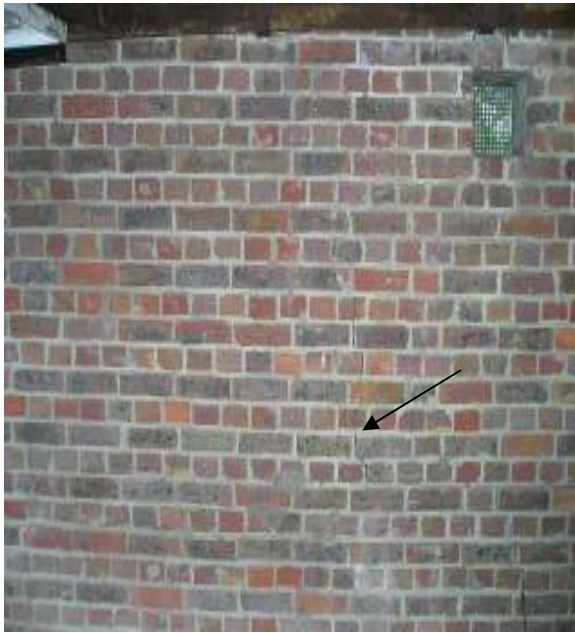
Yours Faithfully,

***Matt Deller***

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<sup>8</sup> Building Research Establishment, Garston, Watford. Tel: 01923.674040

## Photographs



Cracking to left hand flank



Cracking to left hand flank



View of movement between slab and right hand party wall