

# TECHNICAL REPORT

[REDACTED]

12 Heath Hurst Road  
London  
NW3 2RX



Prepared for

[REDACTED]

[REDACTED]

**SUBSIDENCE CLAIM**

DATE 10 December 2018

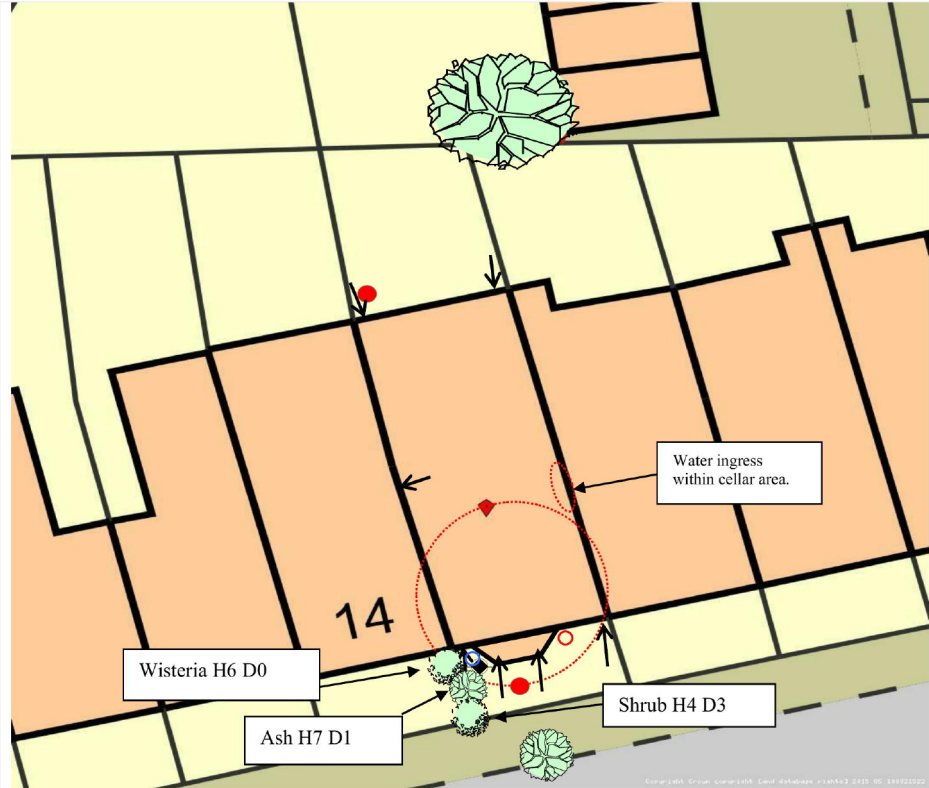
  
**Crawford**<sup>®</sup>

[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 Gully		Rain Water Pipe
	Waste Water Manhole		Waste Water Gully		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 Chubb Insurance Company of Europe SA 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 property has been the subject of two previous subsidence claims in 2012 and 2016. The most recent claim in 2016 dealt with movement to the rear of the property and repairs to the patio and doors were completed. Mrs Armstrong advised that within 6 months of these repairs the cracking to the patio had returned. Mrs Armstrong advised that minor, hairline cracking was noted to the front bay area over the last two years but this has really opened up over the summer months of 2018. Insurers were notified.

### **PROPERTY**

The risk address is a four storey mid-terrace house of traditional construction with brick walls surmounted by a ridged slated roof.



---

## ***HISTORY & TIMESCALE***

---

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

Date of Construction .....	Circa 1890
Purchased .....	2011
Policy Inception Date.....	24/03/2011
Damage First Noticed .....	September 2018
Claim Notified to Insurer.....	05/11/2018
Date of our Inspection.....	05/12/2018
Issue of Report.....	12/12/2018
Anticipated Completion of Claim .....	April 2020

## SITE DETAILS

---

### TOPOGRAPHY

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

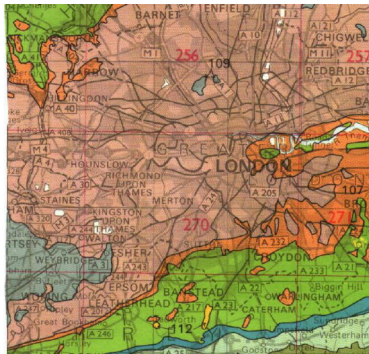
### GEOLOGY

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<sup>1</sup> 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<sup>2,3</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.



Reproduced Under Licence  
C03/129-CSL CSL British Geological Survey. ©NERC. All rights reserved.

---

<sup>1</sup> Tomlinson M.J. (1991) "Foundations Design & Construction" Longman Scientific Publishing.

<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.

## VEGETATION

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

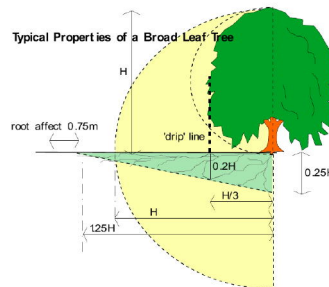
Type	Height	Distance	Ownership
Climbers	6 m	0 m	Owners
Ash	7 m	1 m	Owners
Shrubs	4 m	3 m	Owners

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.

Climbers: Can be significant in subsidence cases as they are frequently planted close to the property, trained up house walls. As their roots do not need to spread to provide support they are frequently compact, and can have an intense but localised desiccation effect. Most tolerate pruning well, but respond by sprouting vigorously and need regular maintenance. Pyracantha or firethorn is common and has roots which cannot be distinguished anatomically from apple, pear and other members of the Pomoideae group of the rose family. Wistyeria roots are similar to those of other members of the pea family, including laburnum and false acacia.

Ash (*Fraxinus*) are deciduous and can reach heights between 20-30m depending on health, environment and soil conditions. They have a fast growth rate of around 500mm per year, medium root activity<sup>4</sup> and medium water demand.

It is naturally vigorous and large growing, preferring light, fertile soils, but will grow on heavy clay. The maximum tree-to-damage distance recorded in the Kew survey was 21mtrs, and 50% of recorded cases occurred within 6mtrs<sup>5</sup>.



Typical proportions of an Ash. Note the potential root zone.

Young and old trees are tolerant of quite heavy pruning and crown reduction, but the timber is not particularly decay resistant and re-growth will need periodic cutting to keep weight and wind resistance down. Life expectancy > 100years. Root pruning can leave tree vulnerable to disease.

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.

<sup>4</sup> Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

<sup>5</sup> Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific  
Chartered Loss Adjusters



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





---

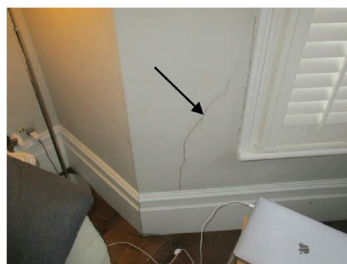
## OBSERVATIONS

---

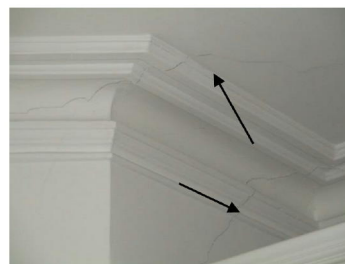
The movement to the front of the property is the focal point of the Insured's concerns.

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

### INTERNAL



Cracking to bay in lounge



Cracking in 1st floor front bedroom

**Lounge** - 5mm diagonal cracking to right hand side of bay, cracking to coving in bay area, 1mm vertical crack above left hand side of bay, cracking to ceiling and coving along left hand party wall, various plaster cracks noted to hall partition.

**Hall, Stairs and Landing** - Hairline vertical / diagonal cracking above door to lounge, swelling noted to wood panelling at foot of stairs due to damp issue in basement, unrelated damp staining and water ingress noted to right hand party wall below roof terrace area, wall / ceiling junction cracking along 2nd floor rear bedroom partition, vertical cracking down junction of right hand party wall and internal partitions to loft stairs.

**1st Floor Front Bedroom** - Hairline diagonal crack to right hand side of bay, cracking to ceiling and coving, 2mm diagonal crack to front wall at high level in left hand corner, hairline diagonal crack above door to en-suite.

**En-suite** - Mirrored hairline cracking above both sides of door to bedroom.

**2nd Floor Rear Bedroom** - Wall / ceiling junction cracking along landing and front bedroom partitions.

**2nd Floor Front Bedroom** - 4mm diagonal tapering cracking above and below front windows, cracking to coving, 3mm diagonal crack to bathroom partition.

**2nd Floor Bathroom** - Wall / ceiling junction cracking along right hand party wall, 1mm vertical cracking down front left hand corner junction.

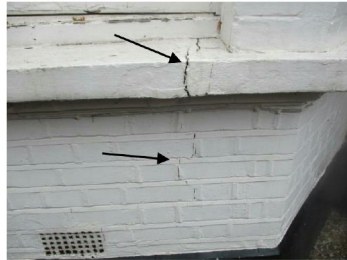
**Loft Bedroom** - 3mm vertical cracking down front left hand corner junction, wall / ceiling junction cracking along left hand party wall, cracking to ceiling around front velux, roof is leaking on front pitch due to missing roof slates.



**Kitchen** - Rear bi-fold doors are catching on frame and are difficult to open.

**Basement** - Water is running into the basement around the right hand party wall area behind the steps and pooling on the floor.

**EXTERNAL**



Cracking to front bay



Cracking to front bay

**Front Bay** - 4mm crack to centre ground floor cill, 3mm stepped crack to centre of bay below cill level, 6mm vertical separation noted to both left hand and right hand junctions, significant historic distortion noted to bay structure.

**Front Garden Area** - Paving slabs have dropped and are uneven, 4mm stepped crack to front boundary wall, left hand gate post is leaning away from the boundary wall and gate does not shut.

**Rear Garden** - 3mm stepped crack above right hand side of rear doors, cracking to patio slabs, 4mm stepped crack in step leading up to garden.

**CATEGORY**

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment<sup>6</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.

<sup>6</sup> Building Research Establishment, [REDACTED]

---

## *DISCUSSION*

---

The pattern and nature of the cracking affecting the front of the property 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.

At the time of our visit we noted some significant historic distortions to the front bay structure. These are longstanding distortions and are unrelated to the relatively minor cracking which has occurred recently. The repair of the historic distortions will fall outside the scope of the repairs on this occasion.

At the time of our visit we noted two separate issues relating to water ingress through the rear roof terrace and the front pitch of the main roof. These issues are not related to the movement noted to the property and are wear and tear / construction related issues.

The damp ingress into the basement which was noted in our 2016 report continues to be an issue. Some investigations into the cause of the ingress have been completed which have confirmed that there is no leakage from pipework under the responsibility of the insured. It is possible that there is a water mains or similar leak within the adjoining property which is seeping through the party wall.

The damage noted to the rear of the property is being investigated under the previous 2016 claim which remains open and ongoing.

## ***RECOMMENDATIONS***

---

Although the cause of the movement needs to be dealt with, we note that the property is located within a conservation area. Unfortunately, the council will require certain investigations to be carried out to demonstrate the influence of the 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.

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.

**Matt Deller BSc (Hons) MCIQB Dip CII**  
**Specialist Property Services - Subsidence Division**



---

**PHOTOGRAPHS**

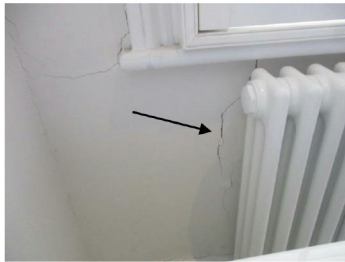
---



Cracking in lounge



Cracking in 2nd floor front bedroom



Cracking in 2nd floor front bedroom



Cracking in 2nd floor front bedroom



Cracking in loft bedroom



Cracking to front bay



View of vegetation in front garden



View of historic distortion to front bay