



TECHNICAL REPORT ON A SUBSIDENCE CLAIM



1C Spencer Rise
London
NW5 1AR



prepared for



DATE 17th January 2020

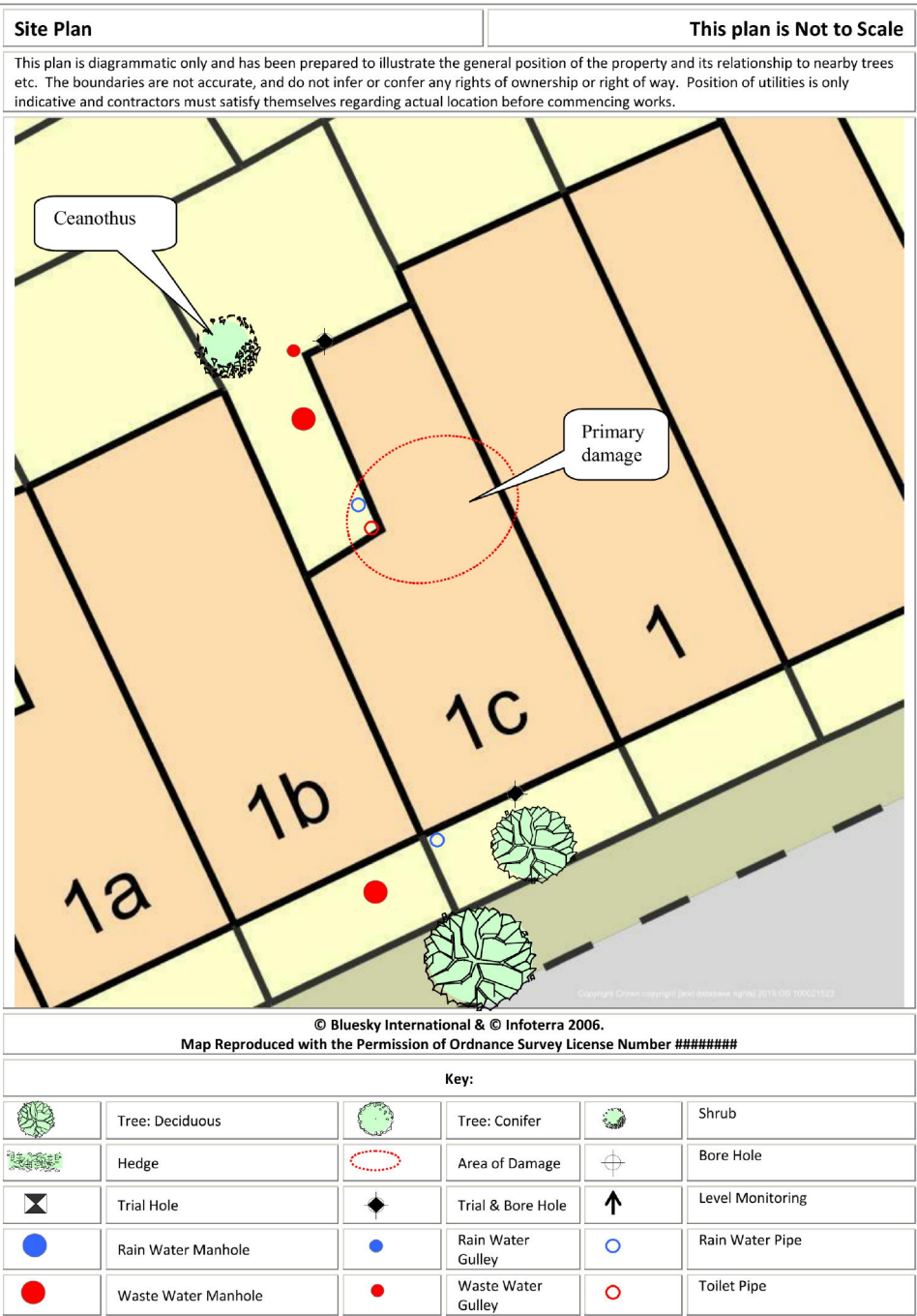


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TECHNICAL REPORT



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	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 [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

The insured noted damage in autumn 2018. However, there was deterioration in summer 2019 with cracks developing in other areas of the property. The insured arranged for an inspection by chartered surveyors in November, who advised the damage was subsidence related caused by the street tree.

PROPERTY

The property comprises a three storey mid-terrace house of traditional construction with brick walls surmounted by a ridged tiled roof. To the rear is a two storey back addition. The ground floor is a separate flat although there is no dividing front door. The ground floor has a kitchen, bathroom, kitchen and bathroom and is occupied by a friend of the insured. There is another bathroom, kitchen etc on the upper floors used by the insured.

HISTORY & TIMESCALE

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

Date of Construction Circa 1900
Damage First Noticed Summer 2018

TOPOGRAPHY

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

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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.

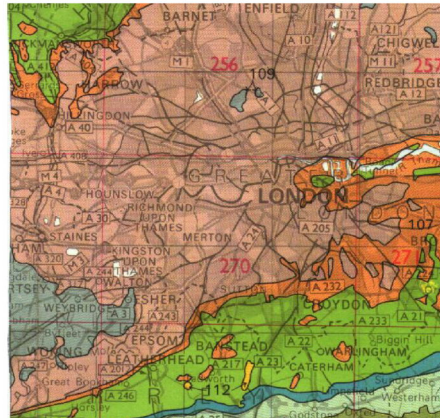
London Clays are marine deposits characterised by their silty, sandy composition. They are typically stiff, dark or bluish grey, weathered dark to mid-brown superficially with fine particle size (less than 0.002mm). Tomlinson¹ describes it as a 'fat' clay with high loadbearing characteristics due to 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 vegetation⁴ 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.



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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:-

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

² B.S. 5930 (1981) "Site Investigations"

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

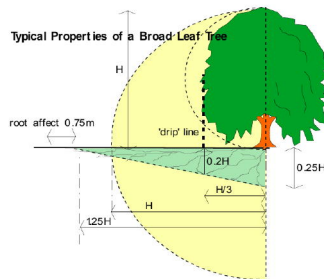
⁴ Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

⁵ Driscoll R. (1983) "Influence of Vegetation on Clays" Geotechnique. Vol 33.

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Type	Height	Distance	Ownership
Deciduous	8 m	3 m	Council
Deciduous	2.5 m	1.5 m	Owners (front)
Ceanothus	4 m	2 m	Owners (rear)

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.

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.

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OBSERVATIONS

The primary damage is at the join between the main body of the building and the back addition

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

INTERNAL



Crack in the hall



Crack in the ground floor rear kitchen

Hall -

3mm vertical crack over the door to the ground floor front room, together with hairline parallel crack

Ground Floor Front Room -

3mm crack over the door

Series of diagonal cracks close to the ceiling and along the hall wall

2mm vertical crack under the left side of the front window, with a hairline crack under the right hand side

Ground Floor Middle Room -

1mm crack over the door

Ground Floor Kitchen -

3mm vertical crack to the party wall

2mm crack across the top of the front wall

Landing -

3no 1mm vertical cracks over the doors

6mm vertical crack to the party wall and down the side of the timber lining, located at the head of the stairs

Vertical crack to the party wall and extends across the ceiling



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First Floor Kitchen -

2mm crack in the front left corner
1mm horizontal crack along the top of the left hand wall

First Floor Toilet -

3mm diagonal crack over the door

First Floor Front Room -

1mm vertical crack over the door
2mm crack along the top of the front wall, with damp staining
1mm horizontal crack to the rear wall adjacent to the door

First Floor Middle Room -

2mm vertical crack in the rear right corner
2mm crack along the top of the rear wall

Second Floor Landing -

2mm diagonal crack to the party wall
1mm diagonal crack across the ceiling

Second Floor Rear Room -

½mm crack to the ceiling

Second Floor Front Bathroom -

1 cracked tiled

Second Floor Front Right Bedroom -

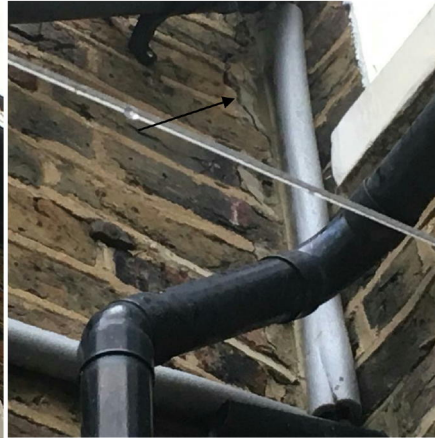
2mm horizontal crack at the bottom of the window

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EXTERNAL



Cracking at the mid length of the flank wall of the back addition



Crack in the corner of the back addition and the main house

Left flank wall of the back addition:

1mm vertical crack at infilled door

3mm vertical crack under the kitchen window, extending up the side of the window frame, up the window above, and then to the eaves.

3mm vertical crack in the corner between the main body of the house and the back addition. there is evidence of previous repairs.

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment⁵ 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.

⁵ Building Research Establishment, [REDACTED]

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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, we note the involvement of a Local Authority tree.

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.

These investigations will also identify if there is subsidence towards the rear due to the influence of the Ceanothus.

We will report further once these investigations have been completed.

Philip Gardner BSc, MIStructE, CEng, Cert CILA
Crawford Claims Solutions – Subsidence

15 January 2020

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PHOTOGRAPHS



Street tree



Vegetation in the front garden



Rear elevation

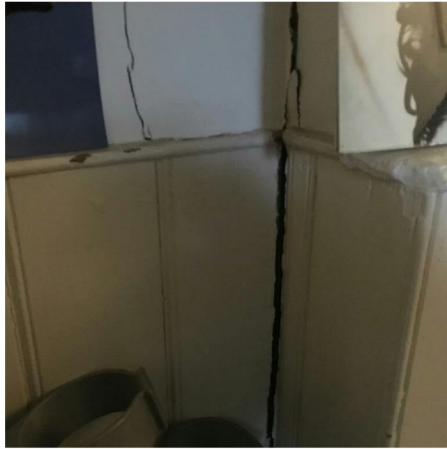


Ceanothus in the rear garden

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Cracking on the first floor landing



Cracking in the first floor kitchen



Cracking on the first floor landing



Cracking on the first floor landing

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