

TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: [REDACTED]

**24 Langbourne Avenue
London
N6 6AL**



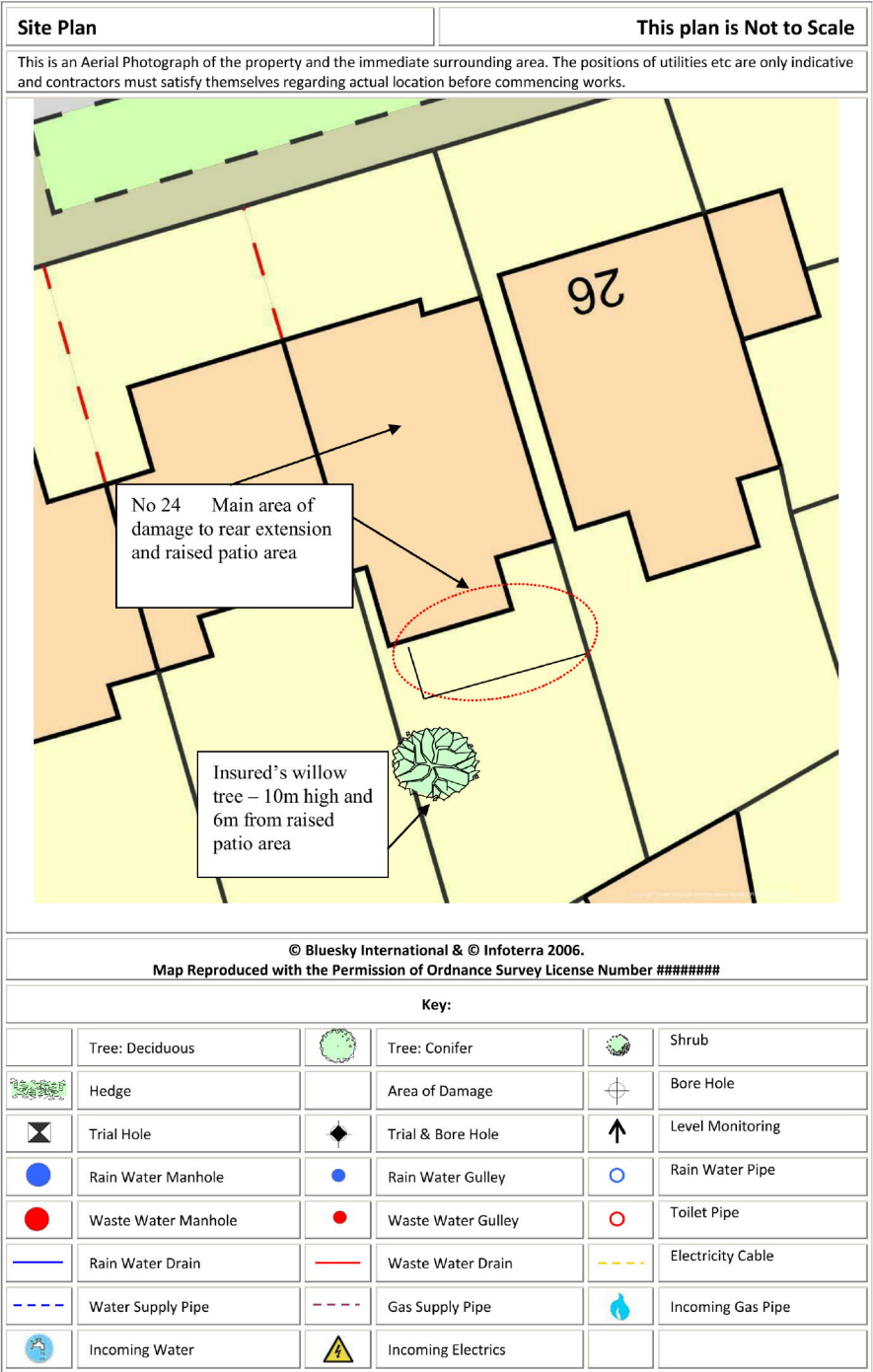
Prepared for



SUBSIDENCE CLAIM

DATE 22 January 2019





INTRODUCTION

We have been asked by RSA 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 significant damage was first noticed in the month of August 2018. Prior to this minor cracks had been noted around the edges of the raised patio area but were not considered significant. A gap opened up where the floor of the external extension met the rear patio doors and window towards the end of August 2018. On investigation matters further, it was noted that there were a number of significant cracks around the raised patio area which indicated that it was pulling away from the rear extension. Insurers were notified during September 2018

PROPERTY

Three storey semi-detached house of traditional construction with pebble-dashed walls surmounted by a hipped, tiled roof.

HISTORY & TIMESCALE

Remove rear tree and allow property to recover over winter and spring months

Date of Construction	Circa 1920
Purchased	2012
Policy Inception Date	28/06/2016
Damage First Noticed	31 August 2018
Claim Notified to Insurer.....	26/09/2018
Date of our Inspection.....	14/11/2018
Issue of Report	22/01/2019
Anticipated Completion of Claim	Winter 2019

TOPOGRAPHY

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

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.

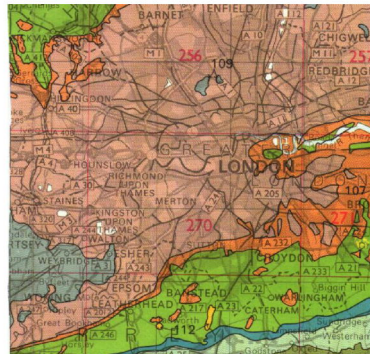
London Clays are marine deposits characterised by their silty, sandy composition. They are typically stiff, dark or bluish grey, weathered dark to mid-brown superficially with fine particle size (less than 0.002mm). Tomlinson¹ describes it as a 'fat' clay with high loadbearing characteristics due to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



Geology. Reproduced with consent of The British Geological Survey at Keyworth.
Licence IPR/34-7C CSL British Geological Survey. ©NERC. All rights Reserved.

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
Willow	10 m	6 m	Owners

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.

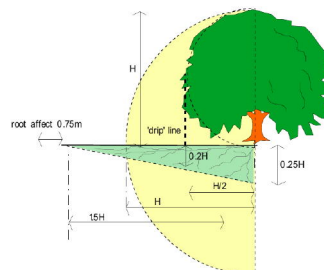
⁴ Table 1, Chapter 4.2, Para. 2.3 of N.H.B.C. Standards, 1986.

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

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.

Willows (*Salix*) are deciduous and can reach heights in excess of 25m depending on health, environment and soil conditions. They have a fast growth rate of around 500mm per year and strong root activity⁵.

Maximum tree-to-damage distance recorded in the Kew survey was 40mtrs, with 50% of all cases occurring within 7mtrs⁶. They root moderately deeply in clay soils and have a life expectancy of between 50 and 100 years.



Typical proportions showing possible root zones in relation to height.

Both old and young trees are tolerant of quite heavy pruning and crown thinning.

⁵ Richardson & Gale (1994) *"Tree Recognition"* Richardson's Botanical Identifications

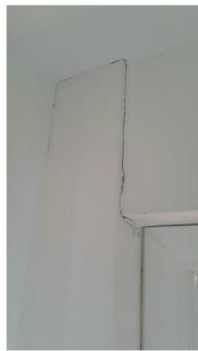
⁶ Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

OBSERVATIONS

The main area of damage affects the raised patio area attached to the rear single story extension, which is pulling away from the main house causing damage to the rear extension, as well as to the concrete pad on which the rear patio is laid.

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

INTERNAL



Cracking in rear side utility room



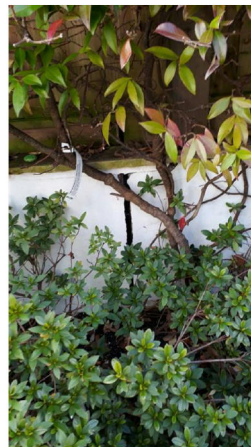
Distorted wooden flooring in rear extension

Distortion of door/window openings of the patio doors to rear extension. A section of the wooden flooring in the extension room is being pulled away leaving a gap beneath the patio window and doors. In addition minor cracking, less than 1mm, was noted in some of the areas of the rear extension room and side rear utility room.

EXTERNAL



12mm crack where raised patio area pulling away from rear extension



20mm crack in garden wall on right of patio area when viewed from rear garden

Where the raised patio area meets the rear extension is a 12mm wide vertical crack. In the pebbledash wall of the rear elevation below the patio doors and window are diagonal cracks up to 6mm wide. There is a large 10-12mm wide crack running horizontally the full width of the external supporting wall to the raised patio area. There is a large 20mm wide vertical crack in an external wall at right angles to patio area. Overall, the raised patio area is slipping slightly down the rear sloping back garden away from the main house.

CATEGORY

In structural terms the damage falls into Category 4 of Table 1, Building Research Establishment⁷ 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.

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.

No structural changes to the building have been carried out which has contributed to the current subsidence related damage under investigation. Furthermore we are not aware of any previous underpinning.

RECOMMENDATIONS

The cause of the movement needs to be dealt with first. We have completed a Soil Risk Analysis (VISCAT Assessment) and we are satisfied that your willow tree is the source of the damage.

However, we have noted your property falls within a conservation area and as such our mitigation team will be in contact with you to discuss next steps.

⁷ Building Research Establishment, Garston, Watford. Tel: 01923.674040

TECHNICAL REPORT



Paul Richardson BA(Hons), ACII, FCILA
Subsidence Division

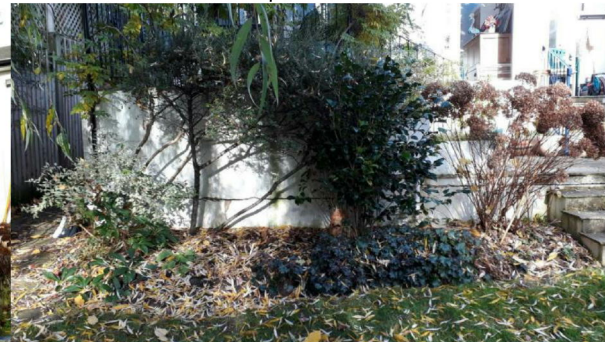
PHOTOGRAPHS



6mm cracks underneath rear extension
patio doors and window



Close up of 10-12mm horizontal cracks in
rear wall of raised patio area



Close up of 10-12mm horizontal cracks in
rear wall of raised patio area

Chartered Loss Adjusters

TECHNICAL REPORT



Patio doors and windows pulling away as seen by gap in floor edge



Storage area below rear single story extension-- No damage noted

