TECHNICAL REPORT ON A SUBSIDENCE CLAIM

Crawford Reference: SU1502007

Alan Bernard Jones

33 Gloucester Crescent
London
NW1 7DL

prepared for

Aviva - Commercial
Commercial Claims Dept., Northfield House, 110-114 Baxter Avenue, Southend On Sea, SS2 6FF

Claim Reference 8834613

SUBSIDENCE CLAIM

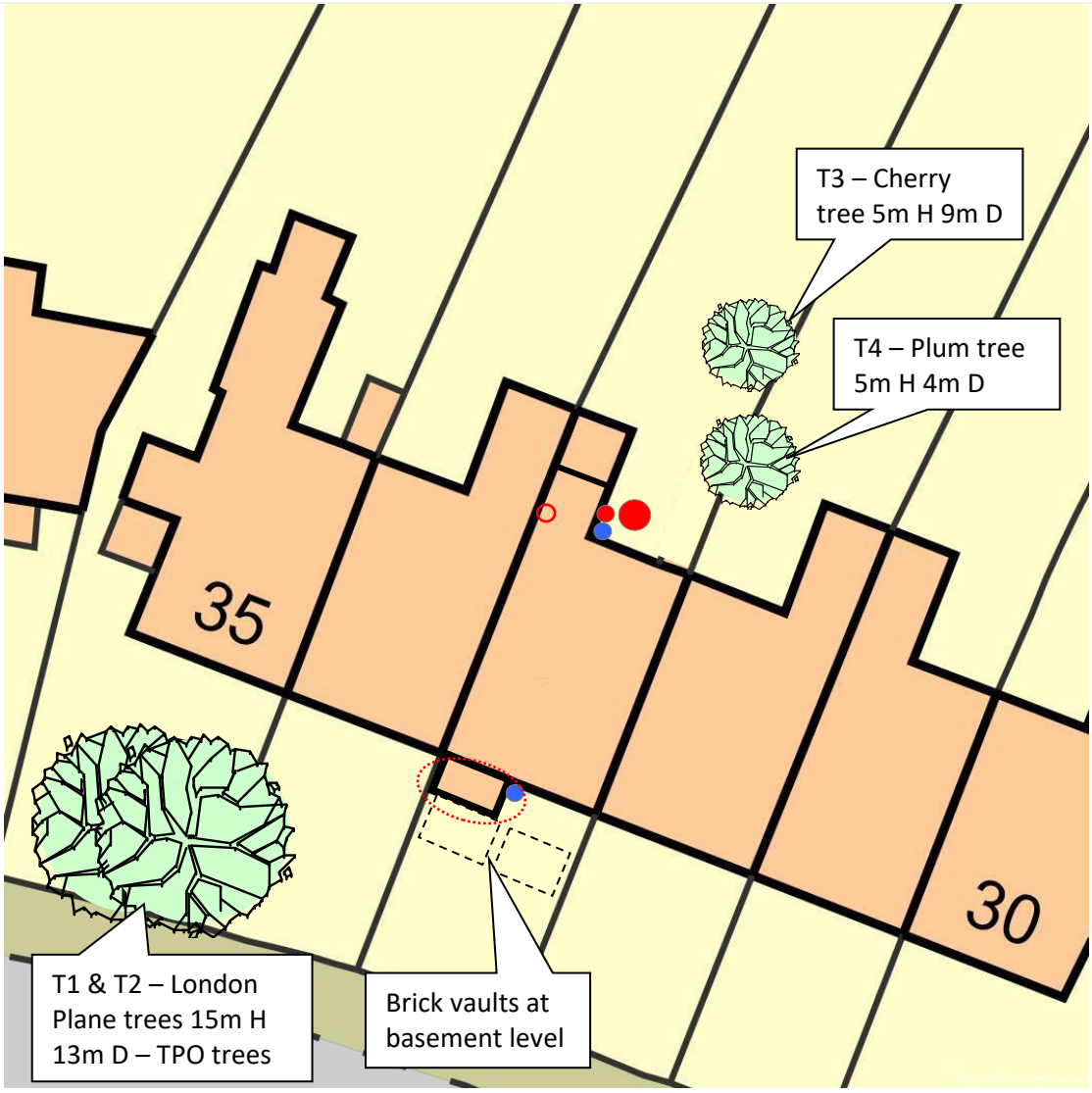
DATE 17 July 2015

Specialist Property Services UK
2nd Floor, Sunningdale, The Belfry Business Park,
Colonial Way, Watford,
WD24 4WH
Tel: 01923 471755
Fax: 01923 471720

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.



	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

INTRODUCTION

We have been asked by Aviva - 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 damage was first noticed on 29 October 2014. The Insured obtained a report on the damage from a structural engineer on 13 January 2015, following which a claim was notified to Insurers on 28 May 2015.

PROPERTY

Five storey mid-terrace house of traditional construction with brick walls surmounted by a valley slated roof. There is a 5 storey back addition and a further two storey back addition abutting the rear, which is of similar construction. The property was converted into five self-contained flats in circa 1950. The risk address is Grade II listed and is in a Conservation Area.

HISTORY & TIMESCALE

Site investigations are being organised and level monitoring being established to determine the precise cause of damage to the risk address.

Date of Construction	Circa 1860
Purchased	1991
Policy Inception Date	03/05/2010
Damage First Noticed	29/10/2014
Claim Notified to Insurer	28/05/2015
Date of our Inspection	13/07/2015
Issue of Report	05/08/2015
Anticipated Completion of Claim	August 2017

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

TOPOGRAPHY

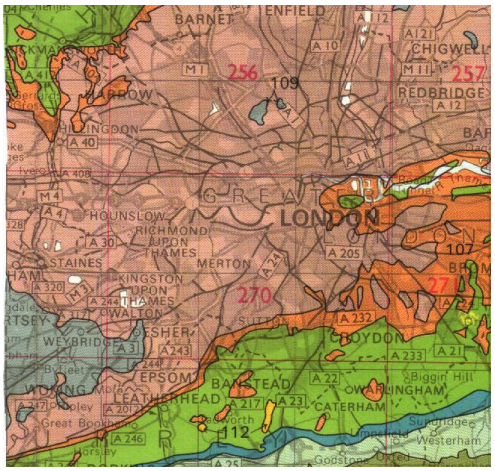
The property occupies a reasonably level site with no unusual or adverse topographic features.

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.



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:-

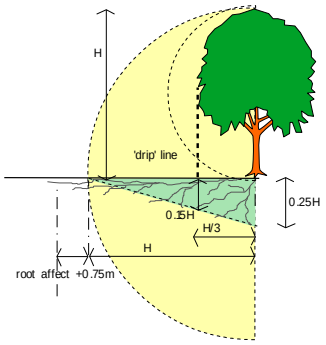
Type	Height	Distance	Ownership
T1 Plane	15 m	12 m	Neighbour 1
T2 Plane	15 m	12 m	Neighbour 1
T3 Cherry	5 m	9 m	Owners
T4 Plum	m	4 m	Neighbour 2

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.

[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.

Planes (Platanus) are deciduous and can reach heights in excess of 30m depending on health, environment and soil conditions. They have a medium growth rate of around 300mm per year and medium root activity[5].

Maximum tree-to-damage distance recorded in the Kew survey was 15mtrs, with 50% of all cases occurring within 5.5mtrs[6]. Planes are moderately deep rooted, and are predominantly street trees.

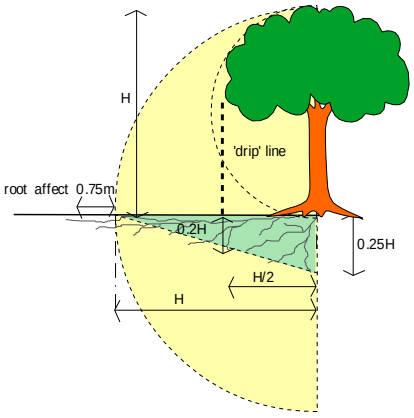


Typical proportions of a Plane tree, showing the potential root zone.

Life expectancy > 100 years and both young and old trees tolerant of pruning and crown thinning. Urban trees are prone to infection by anthracnose, a fungal foliage disease, which can be disfiguring, if not lethal. There is also concern about canker stain disease, which can also be lethal, spreading from Europe into Britain.

Cherries, Prunus species, include Japanese flowering species, which are mainly small growing short lived moderate water demanders and the native wild cherry, P.avium, which is generally longer lived and capable of reaching over 20m.

The growth rate is 300mm a year and they have medium root activity. They can be associated with subsidence, although they are not regarded as a particularly aggressive tree.



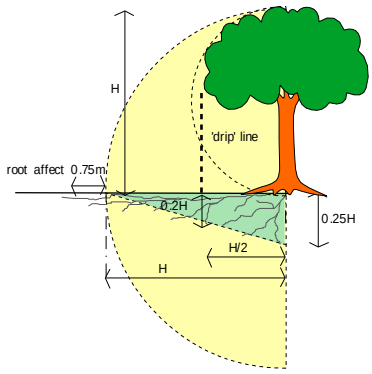
Typical proportions of a Cherry tree. Note the potential root zone.

Most Prunus species have wide spreading roots and a tendency to send up sucker shoots, often a long way from the parent tree. The genus includes plums, laurels, Portugal laurel, the roots of which are indistinguishable from each other.

Plums are members of the genus Prunus, which includes cherries, common and Portugal laurels and blackthorn. They are common in gardens and orchards and, although moderate water demanders,

[5] Richardson & Gale (1994) "*Tree Recognition*" Richardson's Botanical Identifications
[6] Cutler & Richardson (1991) *"Tree Roots & Buildings"* Longman Scientific

have wide spreading root systems that frequently send up sucker shoots a considerable distance from the original parent tree.



Typical proportions of a Plum tree showing the potential root zone.

They will tolerate light pruning when young, but heavy cutting in older trees can lead to decay and infection by the fungus that causes silver leaf disease. This risk can be reduced by pruning in summer when they are more resistant to invasion.

OBSERVATIONS

The main area of damage affects the front storm porch.

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

INTERNAL

Cracking in garden flat below porch

Cracking in garden flat below porch

Basement/ Garden Flat

There is cracking to the ceiling and walls in the front lobby which directly below the storm porch. The crack that measure up to 3 mm appear to be historic.

EXTERNAL

Cracking in storm porch

Cracking in storm porch

Front Storm Porch

The front storm porch has rotated outwards at the top. There is 10 mm wide crack running along the ceiling and the ornate run cornice. There are tapered vertical cracks along the right and left hand side where the porch abuts the main property. These cracks range from 10 mm at the top to hairline at the base. The steps leading to the entrance doorway has several horizontal cracks measuring up to 5 mm wide.

Front Paving and Boundary Walls

Stone paving slabs are uneven and cracked. There is cracking to the front garden wall and there is historic distortion the garden wall separating No. 33 and 34 Gloucester Crescent.

CATEGORY

In structural terms the damage falls into Category 3 of Table 1, Building Research Establishment[7] 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.

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

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

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 neighbour's London Plane trees can be removed. We will liaise with your neighbour in this respect.

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.

Harpal Gillar BEng (Hons), CEng, MIStructE
Specialist Property Services - Subsidence Division
Direct Dial: 07770 830038
subsidence@crawco.co.uk

17 July 2015

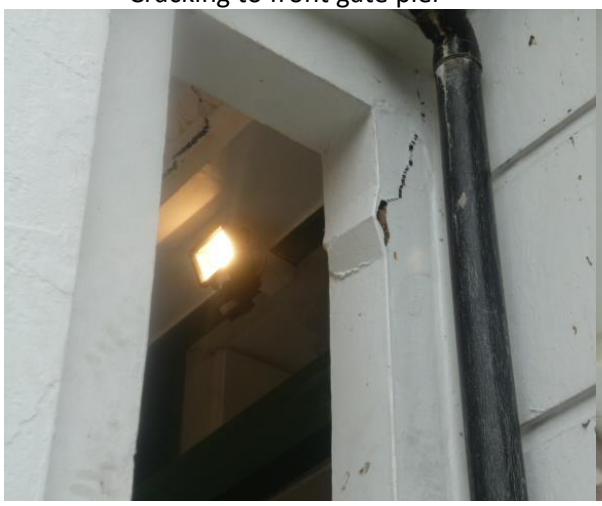
PHOTOGRAPHS

Rear elevation

London Plane trees at front

Cracking to front gate pier

Cracking to storm porch floor



Rotation cracking to storm porch

Cracking to left wall in storm porch

Cracking in storm porch

Cracking in storm porch