



TECHNICAL REPORT ON A SUBSIDENCE CLAIM



Flats 1 - 9
8 Compayne Gardens
NW6 3DH

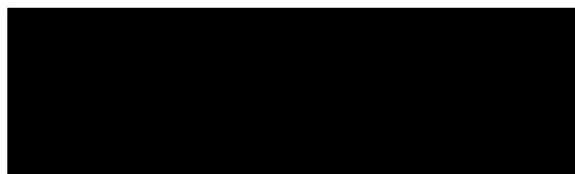


Prepared for

Allianz Commercial



4th May 2021



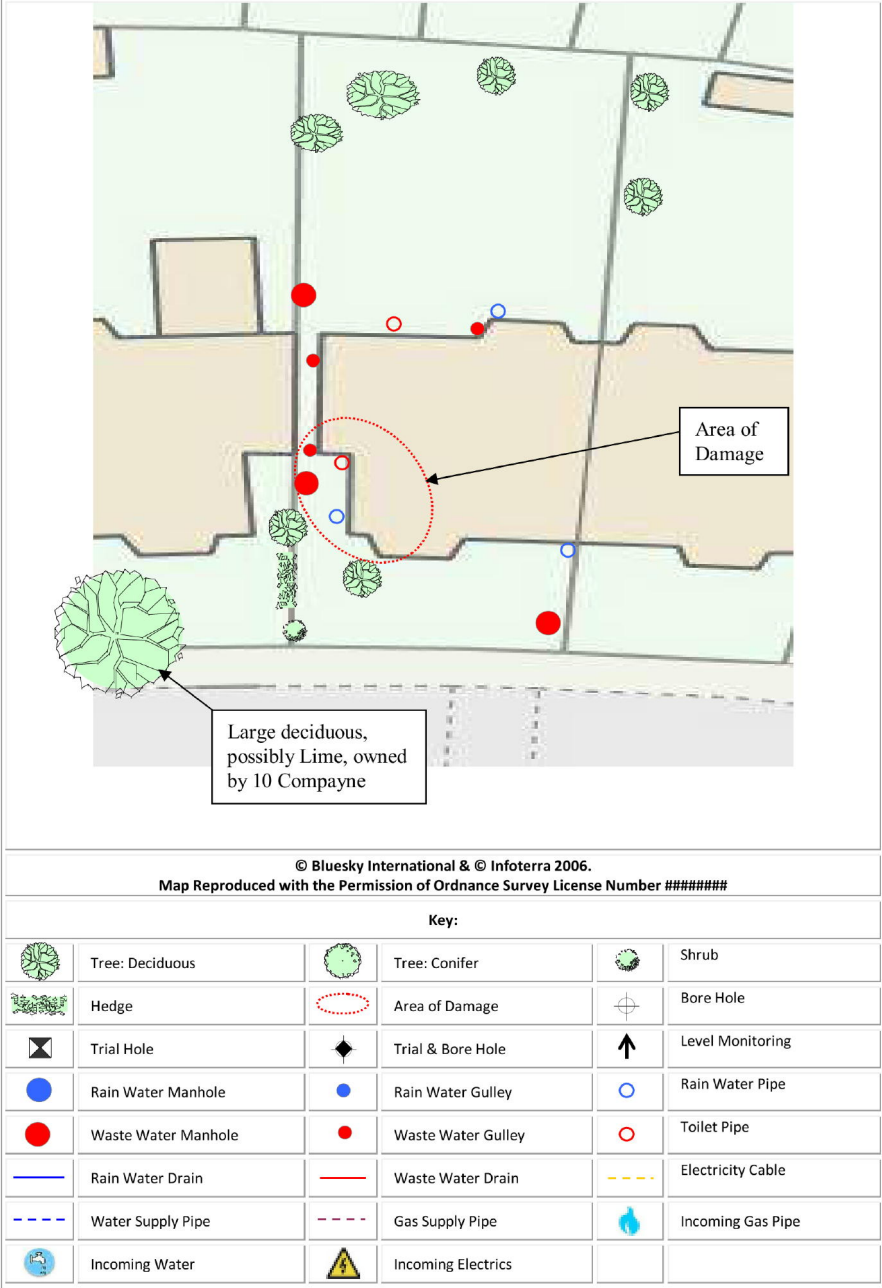
Chartered Loss Adjusters



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.



INTRODUCTION

We have been asked by Allianz 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 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

At the time of our visit we inspected all 9 flats and were provided with information regarding the history of the property and the damage. A surveyor provided a report which recorded some signs of subsidence damage and accordingly Insurers were notified of a possible claim.

PROPERTY

The subject property was converted many years previously from one dwelling to 9 separate dwelling flats and comprises a four storey semi-detached multi occupancy building of traditional construction with brick walls with a pitched slated roof. To the rear left corner of the property is a small basement.

HISTORY & TIMESCALE

Site investigations are to be instructed to confirm the cause of the damage and assist recommending appropriate mitigation. In conjunction with this a period of precise level monitoring will be undertaken to assess whether the problem is progressive or not and to confirm the direction of any ongoing movement.

Date of Construction.....	1900
Damage First Noticed	06/10/2020
Date of our Inspection	27/04/2021
Issue of Report	04/05/2021

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 Clay Soils.

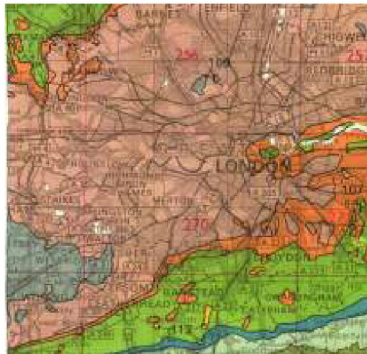
Clay soil superficial deposits are a cohesive soil characterised by their fine particle size and are usually derived from weathering of an underlying “solid geology” clay soil such as London Clay or Oxford Clay.

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 vegetation¹ 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.

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 vegetation² 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
Lime	9 m	11 m	Neighbour 1
Bay	3 m	1 m	Owners
Shrubs	3 m	2 m	Owners

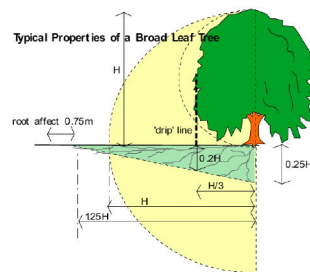
¹ Driscoll R. (1983) “Influence of Vegetation on Clays” Geotechnique. Vol 33.

² 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.

Limes (*Tilia*) are deciduous and can reach heights between 25-30m depending on health, environment and soil conditions.

They have a medium growth rate of around 300mm per year and medium root activity³. Maximum tree-to-damage distance recorded in the Kew survey was 20mtrs, with 50% of all cases occurring within 6mtrs⁴.



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

Lime roots can be moderately deep on clay soils. They have a life expectancy > 100 years and both old and young trees withstand quite heavy pruning and crown thinning.

Older trees frequently develop shoots around the base of the trunk. They are vulnerable to aphid attack that produces sticky exudates of honeydew.

The Bay (*Laurus*) is an evergreen that can reach heights of between 10 – 14mtrs. It's a slow growing tree (150mm p.a.) with weak root activity.

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.

OBSERVATIONS

The area of damage is the front bay and front left corner of the main building.

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

INTERNAL

³ Richardson & Gale (1994) "Tree Recognition" Richardson's Botanical Identifications

⁴ Cutler & Richardson (1991) "Tree Roots & Buildings" Longman Scientific



Cracking beneath the front window in flat 3



Cracking to the bathroom in flat 4

FLAT 1 (Ground Floor Front Left Corner)

Bathroom (2.0 x 1.8 x 1.9m high)

Crack below right hand corner of side window at a width of 1.5mm.

Sitting Room (5.0 x 5.0 x 3.3m high)

Cracking below left hand corner of front bay approximately 0.5mm wide.

Crack to front left corner and to ceiling at high level width 1mm.

FLAT 2 (Ground Floor Rear)

Front Left Bedroom (2.0 x 3.5 x 2.9m high)

Crack to right corner of window extending to junction with front projection at a width of 0.5mm.

FLAT 3 (First Floor Front)

Living Room (5.0 x 4.7 x 3.1m high)

Crack to left hand side of bay window below cill extending through the skirting board approximately 3mm width and hairline crack over window.

Crack over right corner of bay window extending to right hand return wall at a width of 3/4mm.

Hairline crack over door to bedroom.

Crack to right flank wall vertically approximately 1mm width mid-way along the elevation.

Bedroom (2.8 x 2.7 x 3.1m high)

Crack to coving and wall ceiling junction, and to wall junction with hallway partition. Approximately 1mm wide.

Hall/Kitchen (2.8 x 1.7 x 3.1 m high)

Crack over door to living room and to partition with hallway - width 1mm.

FLAT 4 (First Floor Rear Left Corner)

Hall (1.7 x 2.0 x 3.1m high)

Vertical crack to side of partition entering bathroom and hallway (at front projection junction) - 2mm width.

Bathroom (1.6 x 2.6 x 3.1m high)

Vertical crack approximately 5mm wide from floor to ceiling and around wall ceiling junction to front corner (at front projection junction).

Living Room/Kitchen (5.3 x 4.0 x 3.1m high)

Hairline crack to chimney breast and left hand wall extending across the ceiling.

FLAT 5 (Rear Left Corner at First Floor Level)

In this flat there is minor cracking to the wall ceiling junction in the hallway but this is not subsidence related.

FLAT 6 (Second Floor Front)

This flat is the same layout as Flat 3 and it is reported that cracks had developed in a similar location to Flat 3 since 2019, but was all repaired in February 2021. No current cracking was evident.

FLAT 7 (Second Rear Left)**Bathroom (2.1 x 2.6 x 3.0m high)**

Crack to wall and wall ceiling junction. Similar to that in Flat 3 the width of approximately 5mm (junction with front projection).

Bedroom (5.5 x 3.6 x 3.0m high)

Crack to wall ceiling junction with left hand wall and to the wall junction with the bathroom at a width of up to 0.5mm.

FLAT 8 (Second Floor Rear)

In this flat we noted minor cracks at wall and ceiling junctions in the living room and kitchen. In the bedroom there is a diagonal crack to the rear left corner this was remote from the area of suspected subsidence to the front left corner of the house and it is not thought to be subsidence related.

FLAT 9 (Third Floor)

Sitting Room (3.0 x 4.0 x 2.7m high)

Cracking at low level at the base of roof over front bay window at a width of approximately 3mm.

Kitchen (3.8 x 2.9 x 2.4 high)

Crack below kitchen window at the front projection junction with a width of approximately 3mm.

Crack to wall ceiling junction to rear left corner of room- hairline width.

Lounge/Office (3.4 x 6.5 x 2.3m high)

Crack to right hand side of front window reveal to the wall ceiling junction (close to front projection).

Crack to wall ceiling generally around the perimeter of the room hairline width.

EXTERNAL



Cracking to the right side of the front bay



Cracking to the left elevation below the foremost window

Front Elevation

Crack below right corner of ground floor bay cill at a width of approximately 1mm.

Slight cracking to masonry arches at first and second floor levels.

Crack to right hand side of ground floor bay cill but were also noted to the first floor central bay cill.

Crack below centre of ground floor cill and below left hand corner extending to the ground at width of approximately 0.5mm.

Left Flank Wall

Crack below ground floor bathroom window at a width of 3mm extending through an air brick.

Crack above ground floor bathroom window extending past the lintel to the brickwork above at a width of approximately 3mm.

Crack at junction between front projection and main house and at first floor level and above approximately 5mm width extending behind a soil and vent pipe.

Significant historic bow in the flat wall at high level which has been historically retained by steel bars spanning between the subject property and No. 10 Compayne Gardens. This has been in place for well over 20 years.

CATEGORY

In structural terms the damage falls into Category 2 of Table 1, Building Research Establishment⁵ Digest 251, which describes it as "slight".

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

DISCUSSION

At the time of our inspection we viewed all 9 flats along with the external elevations and we observed cracking consistent with slight forward rotation of the three storey front bay and the front left corner of the main building. Some cracking was clearly longstanding, however, internally it is reported that cracks had developed since 2018/2019 and that the condition has deteriorated more significantly recently.

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.

We also noted some quite significant deflection of the flank wall at high level. This is clearly an historic problem due to lateral restraint issues with the masonry. Attempts have been made to support the deflection in the past by installing steel bracing between the subject property and the adjoining property at No. 10 Compayne Gardens.

We were advised that no structural changes to the building have been carried out which would have contributed to the current subsidence related damage under investigation. Furthermore we understand that there has been no previous underpinning installed.

RECOMMENDATIONS

We have instructed a contractor to undertake ground investigations to include trial pits and boreholes and a CCTV survey of underground drains. This will enable us to confirm the cause of the damage and recommend appropriate mitigation measures.

To assess whether movement is ongoing or not, and the direction of any movement, monitoring is required and we have instructed a contractor to commence a scheme of precise level monitoring.

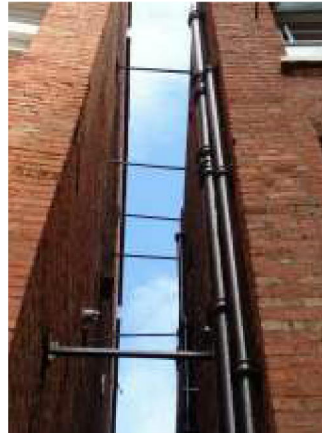
Once we are satisfied that the foundations have stabilised, recommendations will be made for the appropriate repairs.

Mark Lacy BSc (Hons) MCIQB C.Build E FCABE BDMA Tech (Ins)
Crawford Claims Solutions – Subsidence

PHOTOGRAPHS



Rear elevation



Deflection of the flank wall showing bracing bars in place



Vegetation close to the front left corner



Typical internal damage