

## **Cunningham Lindsey**

Subsidence Scanning Centre, Ground Floor, Fountain Court, 12 Bruntcliffe Way, Morley LS27 0JG  
Telephone 01622 608810 Facsimile 0845 4252539

Policyholder:36 Frognal Ltd

Subject Property Address:

36, Frognal

London

NW3 6AG

### **INSURANCE CLAIM**

### **CONCERNING SUBSIDENCE DAMAGE**

### **ENGINEERING APPRAISAL REPORT**

This report is prepared on behalf of Zurich Commercial Broker for the purpose of investigating a claim for subsidence. It is not intended to cover any other aspect of structural inadequacy or building defect that may otherwise have been in existence at the time of inspection.

Date: 7/5/2014

Cunningham Lindsey Ref: MNHPD/SW/7149339

## **INTRODUCTION**

This report has been prepared by our Chartered Building Engineer, Mr Yiu-Shan Wong BSc ACIAT MBEng MCIOB RMaPS Cert CII, and is being investigated in accordance with our Project Managed Service.

Unless stated otherwise all directions are referred to as looking towards the front door from the outside the property.

## **DESCRIPTION OF BUILDING**

The subject property is a semi detached house in a residential estate location on a plot that is steeply sloping, sloping generally from left to right. The overall layout is recorded on our site plan.

The general layout of the site is shown on the attached sketch plan.

There are trees within influencing distance of the property. This includes a deciduous tree located to the front RH corner of the property, 8m in height and only 4m away. There are three further trees located on the RH flank elevation, two of which are 18m in height and only 5m away and the third which is 7m in height and approximately 7m away.

## **CIRCUMSTANCES OF DISCOVERY OF DAMAGE**

The policyholder and homeowner, 36 Frogna Ltd, first discovered the damage in October 2012.

The damage was discovered some time ago but was not considered to be of any significance. The policyholder then advised insurers when the damage deteriorated.

## **NATURE AND EXTENT OF DAMAGE**

### **Description and Mechanism**

The principal damage takes the form of tapering diagonal cracking to the RH section of the building.

The indicated mechanism of movement is downwards movement towards the RHS where the building is dipping downwards towards the trees.

### **Significance**

The level of damage is slight, and is classified as category 2 in accordance with BRE Digest 251 - Assessment of damage in low-rise buildings

### **Onset and Progression**

We consider that the damage has occurred recently.

It is likely that movement will be of a cyclical nature with cracks opening in the summer and closing in the winter.

## SITE INVESTIGATIONS

Reference to the solid and drift geological survey map shows the anticipated subsoil as clay.

The ground investigation was carried out by CET Safehouse Ltd on 25<sup>th</sup> April 2014 for details of the trial pit and borehole locations, together with test results, please refer to the attached CET factual report.

### Trial Pit 1/Borehole 1

This was located at the rear RH corner of the affected part of the building.

The underside of the foundation is at 1.3m below ground level with the foundation comprising of a 300mm concrete foundation. The soil beneath the property foundations has been identified as medium compact made ground to 2.3m before reaching clay. This matches the predicted soil given in the solid and drift geological survey map.

Live roots were present down to 3.3m and from there to 5.0m dead and decomposing root fragments were found. Samples of these roots taken from beneath the foundations have been analysed and originate from the Tilia family which includes the Lime tree.

Camera surveying of drains located close by the area of damage have been undertaken and reveal a section of the drain requires repair.

## MONITORING

A programme of crack width and level monitoring will be carried out and we currently await the results.

## CAUSE OF DAMAGE

Taking an overview of all the site investigation results referred to above, it is my opinion that the cause of damage results from clay shrinkage subsidence brought about by the action of roots from the adjacent trees located in the grounds of the adjacent property on the RHS.

I base this view on the fact that the foundations of the property in the area of damage are built bearing onto shrinkable clay subsoil. The soil is susceptible to movement as a result of changes in volume of the clay with variations in moisture content and analysis of the site investigation results indicates that the soil has been affected by shrinkage. Lime tree roots are present in the clay subsoil beneath the foundations. In this case, I am satisfied that the damage has therefore been caused by clay shrinkage subsidence following moisture extraction by these trees.

I have also considered whether there could be any other influencing factors and can confirm that there are none.

I am satisfied that there is no factor, other than these trees, that is causing the damage.

## RECOMMENDATIONS

It is recommended that these trees located in the RH flank and close to the property is removed to mitigate against further movement. The Mitigation Centre of Oriel Services Ltd will liaise with the relevant third party.

In the meantime I shall arrange for the drains located close by the property to be repaired.

## HEAVE ASSESSMENT

I have assessed whether significant heave/ground recovery will occur should the vegetation as referred to above be removed.

I conclude that this is not the case as no desiccation has been found in the soil samples. The reason for the lack of desiccation is that the clay subsoil has rehydrated over the wetter winter months such that the moisture deficit that would have existed last summer has been replenished, and equilibrium moisture content has returned. Consequently, as there is no desiccation then there cannot possibly be any heave/swelling of the clay subsoil.

In summary, based on the site investigation results, the timing of the investigation and the nature and extent of damage within the property, I have concluded that significant heave and/or ground recovery will not occur should the vegetation management described above be undertaken.

If these trees are removed then I consider that works including structural crack repair and redecoration at an approximate cost of £10,000.00 will be appropriate in order to repair the damage in this case.

However, if these trees are not removed or only pruned and the movement continues then it may be necessary to consider underpinning of the foundations of the property in the area of damage, in addition to structural crack repair and redecoration needed to repair the damage. The total cost of this option is estimated at £45,000.00.

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