Cunningham Lindsey

Subsidence Scanning Centre, Woodhead House, Centre 27 Business Park, Woodhead Rd, Birstall, WF17 9TD
Telephone 01489 567700 Facsimile 01489 565816

Policyholder: [redacted]

Subject Property Address:

16, Downside Crescent

LONDON

NW3 2AP

INSURANCE CLAIM

CONCERNING SUBSIDENCE DAMAGE

ENGINEERING APPRAISAL REPORT

This report is prepared on behalf of [redacted] 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: 20/03/2012

Cunningham Lindsey Ref: SOHPC/KLN/2893347

INTRODUCTION

This report has been prepared by our Chartered Engineer, Richard Fox CEng MICE ACILA, 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 detched three storey house which is located in a residential location on a plot that is level. The house has solid brick walls which support a pitched and slated roof with a front gable. The house has been converted into three self contained flats and the ground floor flat is occupied by [redacted]. A single storey rear extension has been added in approximately 1960 and part of the rear wall of the original house has been demolished to form open plan accommodation at ground floor level.

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

There are trees within influencing distance of the property and the most significant are a swamp cypress and an ash which are approximately 20 m tall and 15 from the rear left corner of the extension. Both of these trees are situated in gardens to the rear of the rear boundary of the premises and we understand that these trees are protected by Tree Preservation Orders. There are also tree within the rear garden of the premises which included two deciduous trees close to the left side boundary and a pine tree in the rear right corner which is approximately 20 m tall and 15 m from the rear extension.The drainage system is a combined system which is located alongside the right flank wall of the main house.

CIRCUMSTANCES OF DISCOVERY OF DAMAGE

The policyholder and homeowner, [redacted], first discovered the damage in 2006 and a firm of surveyors were then appointed to compile a report. The damage was reported to insurers in 2008 and investigations were undertaken. Superstructure repairs were proposed but these were not undertaken. The claim was then re-notified in October 2011.

NATURE AND EXTENT OF DAMAGE

Sketches showing the layout of the site and the damage are attached.

Description and Mechanism

The principal damage takes the form of cracking at the junction of the rear extension and the main house.

The most significant internal damage is at the junction of the house and the extension on the left side party wall in a rear pier where there is a 1 – 2 mm wide vertical crack. There is also ceiling cracking at the junction of the house and the rear extension. In the front wall of the lounge there is vertical cracking which also is apparent in the front bedroom.

In the first and second floor flats there are crack in the rear walls of the rear lounges.

There is also cracking evident to the exterior walls and this is centered around window openings on the rear elevation at first and second floor levels

The indicated mechanism of movement is downward movement of the rear wall of the rear elevation and rotation of rear extension towards the rear.

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

[redacted] has advised that damage first commenced in 2006.

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

SITE INVESTIGATIONS

The Geological Drift map of the area indicates that the subsoil comprises London Clay.

The ground investigation was carried out by CET Safehouse Ltd on 28 February 2012 and 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 close to the rear left corner of the extension and adjacent to the rear wall.

The underside of the foundation to the extension is at a depth of 900 mm below ground level with the foundation comprising 240 mm concrete strip footing with a horizontal projection of 90 mm. The subsoil beneath the extension foundations has been identified being made ground to a depth of 1.1m and a borehole extended through the base of the trail pit confirmed clay to extend from 1.1 m to at least 8 m, at which depth the borehole was terminated. This borehole was converted into a deep datum for monitoring purposes.

4 mm diameter roots were found beneath the footings, 2 mm diameter roots were present to 2 m and 1 mm diameter roots were found to a depth of 2.7 m. Samples were sent for laboratory analysis and this confirmed that five of the roots emanated from the ash species and two samples from the Taxodiaceae species and there are trees, which we believe to be of this variety, growing in the privately owned gardens to the rear of the curtilage.

Clay samples have been sent away for laboratory analysis and the clay has been determined to be highly shrinkable which means that the clay is highly susceptible to variations in volume with fluctuation in moisture content.

In situ shear strengths of the clay have been measured at intervals of 1.0 m and the results show high readings throughout the borehole.

Soil samples have been sent away for laboratory analysis and the moisture contents and soil suction pressures have been determined. These results do not show the clay to be in a state of desiccation but the soil suction pressures are high at a depth of 2.5 m which may be an indicator of some dry conditions.

No drainage Investigations have been undertaken as the drains are a significant distance from the area of damage and the site investigation has shown the borehole to be dry throughout which suggests the drains have not adversely affected the soils

Further investigations were considered and were discounted as they were not considered necessary.

MONITORING

Crack width monitoring has been underway since March 2008 with the last reading taken in November 2008 and these results show a slight opening to the main crack in the lounge on the left side. Further readings will be taken using the same monitoring stations and also level monitoring will be commenced relative to a deep datum.

CAUSE OF DAMAGE

Taking an overview of all the site investigation results referred to above, it is my opinion that the most likely cause of damage results from clay shrinkage subsidence brought about by the action of roots from the two large trees located in the private garden beyond the rear boundary.

I base this view on the timing of the damage and the fact that the foundations of the property in the area of damage have been built at a relatively shallow depth, 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 tree roots are present in the clay subsoil beneath the foundations. In this case, the indications are that the damage has been caused by clay shrinkage subsidence following moisture extraction by the trees to the rear of the single story extension.

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

RECOMMENDATIONS

It is recommended that the two trees located in private gardens beyond the rear boundary to the property are removed to mitigate against further movement. The Mitigation Centre of Oriel Services Ltd will liaise with the Local Authority in this regard {and a copy of OCA UK Limited's report is attached herewith}.

In the meantime crack width and level monitoring will continue in order to check for stability. A detailed scope of repairs will be finalised upon conclusion of the monitoring.

I have considered the risk of clay heave in respect of the recommended tree removal works and it is my view that the risk is minimal on the basis of the site investigation results.

REPAIRS

If the two implicated trees are removed and the monitoring confirms a return to stability, then I consider that works including structural crack repair and redecoration at an approximate cost of £20,000 will be appropriate in order to repair the damage in this case.

If the two trees are not removed and the monitoring shows further movement, 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 £40,000.

For Cunningham Lindsey

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