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01622 608810

Policyholder:

Subject Property Address:

Sweetcroft Residential Care Home  
53 Sweetcroft Lane  
UXBRIDGE  
Middlesex  
UB10 9LE

## **INSURANCE CLAIM**

## **CONCERNING SUBSIDENCE DAMAGE**

## **ENGINEERING APPRAISAL REPORT**

This report is prepared on behalf of  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: 26/02/2024

Our Ref: 9649924

## INTRODUCTION

This report has been prepared by our Chartered Builder, Gavin Catheline MCIOB, 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 detached house constructed 1950, in a mature residential area and on a plot that is generally level. The property has been extended and altered to form a residential care home for the elderly.

The claim concerns damage to the front left corner of the building.

## CIRCUMSTANCES OF DISCOVERY OF DAMAGE

The policyholder and homeowner, [REDACTED] first discovered the damage in August 2022.

One of the care home workers suddenly discovered cracking at the front of the building in August 2022. Additional areas of cracking and problems with doors sticking developed over August and September 2022. The damage was seen to get progressively worse over the summer and the owner then notified Insurers of a possible claim..

The policyholder obtained an engineer's report and then Insurers were notified of a claim.

## NATURE AND EXTENT OF DAMAGE

### Description and Mechanism

The principal damage takes the form of vertical and diagonal tapered cracking, sloping windows and sloping doors.

The indicated mechanism of movement is downward towards the front left corner of the building.

### Significance

The level of damage is moderate, and is classified as category 3 in accordance with BRE Digest 251 - Assessment of damage in low-rise buildings.

### Onset and Progression

[REDACTED] has advised that damage first commenced in Summer 2022.

We consider that the crack damage has occurred recently, but that distortions are historic.

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

## SITE INVESTIGATIONS

Site investigations were carried out by CET Property Assurance Ltd on 28<sup>th</sup> November 2022 and for details of the trial pit and borehole locations, together with test results, please refer to the attached CET factual report.

### Trial Pit 01/Borehole 01

This was located adjacent to the front left corner of the main house, within the area of damage and this revealed a concrete foundation with an overall founding depth of 1.1m below ground level. The founding subsoil is described as firm, mid brown / orange, silty CLAY. Numerous roots up to 1mm in diameter were observed beneath the foundations. At 1.3m below ground level the clay became stiff with roots and from 1.7m very stiff, dry and fragmented with roots. From 3.5m below ground level the clay returned to stiff which extended throughout the remainder of the borehole to a depth of 5.0m below ground level. Roots were observed within the subsoil samples to a depth of 2.5m. The borehole was dry and open on completion.

### Trial Pit 02/Borehole 02

This was located adjacent to the front left corner of the front single storey extension, within the area of damage and this revealed a concrete trench fill foundation with an overall founding depth of 1.5m below ground level. The founding subsoil is described as stiff, mid brown / orange, silty CLAY. At 1.7m below ground level the clay became very stiff, dry and fragmented with roots. From 3.5m below ground level the clay became very stiff which extended throughout the remainder of the borehole to a depth of 5.5m below ground level. Roots were observed within the subsoil samples to a depth of 2.5m. The borehole was dry and open on completion and a datum was installed at the base of the borehole at 5.5m as a reliable TBM for level monitoring.

The subsoil samples retrieved from borehole 01 and borehole 02 were sent to a laboratory for analysis. This has revealed that the clay subsoil is of very high plasticity index, meaning that the material is very susceptible to movement due to shrinkage and swelling with variations in moisture content. This is to say that if moisture is withdrawn from the subsoil, for example due the action of roots, then shrinkage i.e. a volumetric reduction will occur.

Analysis of the subsoil moisture content profiles and in-situ shear strength values indicate that the subsoil in borehole 01 and borehole 02, within the area of damage to the property has a moisture deficit at a depth of 2.0m below ground level. This indicates that the subsoil in borehole 01 and borehole 02 has been affected by shrinkage due to the action of the roots found beneath the foundations and to a depth of up to 2.5m below ground level.

The roots have been analysed in the laboratory and have been identified as *Quercus* – which are Oaks. These roots clearly emanate from the Oak tree(s) to the front of the property.

## **MONITORING**

Precise level and crack width monitoring has been undertaken over the period 21/02/2023 to 22/01/2024 and the results are attached for your assistance.

The level monitoring readings have shown a pattern of movement consistent with the operation of a tree root induced clay shrinkage subsidence mechanism. The readings indicate downward movement in the summer and upward movement in the winter. The level of movement within the area of damage is up to +/-10mm which is considered to be significant enough to cause structural damage of the kind evident to the property.

Furthermore, the results of the crack width monitoring confirm opening of the crack widths during the summer and closure of the crack widths in the winter.

In summary, the results of the programme of monitoring confirm the operation of a root exacerbated clay shrinkage subsidence mechanism and the involvement of the Oak tree (T2) as identified in the attached Arboricultural Report.

## **CAUSE OF DAMAGE**

Based on the information detailed above, we are of the opinion that damage has occurred due to clay shrinkage subsidence. This has been caused by moisture extraction by roots altering the moisture content of the clay subsoil, resulting in volume changes, which in turn have affected the foundations.

Based on the results of the combined site investigations, monitoring data, expert arboricultural advice and root identification, we consider that Oak tree T2 is the main influencing tree.

## **RECOMMENDATIONS**

Our recommendation is that mitigation measures are undertaken to address the cause of damage and restore stability to the subsoil and building foundations. Consideration can then be given to the required building repairs.

## **MITIGATION**

We consider the damage will not progress if appropriate measures are taken to remove the cause. In this instance it is likely that vegetation for which the policyholder and other private owners are responsible is contributing toward the cause of damage.

We have obtained expert arboricultural advice regarding the trees and vegetation considered to be within influencing distance to the area of damage. We refer to the attached Arboricultural Report which recommends removal of the following items of vegetation to mitigate the damage:

H1 – Mixed Species Hedge – 1.7m high, 0.5m distance to building

Remove section of hedge from front of property (8 stems) and treat stumps with eco plugs to give a minimum clearance of 5 metres from the front of the property.

T1 – Birch – 9.0m high, 6.0m distance to building

Fell and treat stump with eco plugs (broadleaved).

T2 – Oak – 16.0m high, 18.0m distance to building

Fell and treat stump with eco plugs (broadleaved).

## **REPAIR**

We have not yet decided on the final type of repair required but have produced an outline of the most likely requirements. This involves undertaking superstructure repairs and redecoration. This decision has been taken based on our knowledge and experience of dealing with similar claims. In addition, the results of the site investigation, laboratory testing and monitoring will be taken into account.

## **HEAVE ASSESSMENT**

We have assessed whether significant heave will occur should the vegetation as referred to above be removed.

The site investigation has been undertaken during the summer months with desiccation suggested by the shear vane and moisture content readings at 2m below ground level. The amount of desiccation is minor and, in our opinion, represents purely seasonal desiccation rather than a persistent soil moisture deficit.

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

## **REPAIR COSTS**

If the recommended tree removal work is undertaken, then we consider that works including structural crack repair and redecoration at an approximate cost of £20,000.00 will be appropriate in order to repair the damage in this case.

If the recommended tree removal work is not undertaken, 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 £250,000.00.

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