



2 The Boulevard, City West One Office Park, Gelderd Road, Leeds, LS12 6NY  
01924 428691

Subject Property Address:

133 Long Lane  
Hillingdon  
Uxbridge  
Middlesex  
UB10 0AT

**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: 02/10/2020

Our Ref: 6891233

**INTRODUCTION**

This report has been prepared by our Surveyor, Chris Taylor BSc Building Surveying, BDMA InsTech, 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 detached house in a residential estate on a plot that is level. The overall layout is recorded on our site plan.

The property also has been extended to the right-hand side.

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

There are trees within influencing distance of the property. These are as listed below:

T1 Oak – 18.1m tall, located 14m from the front right-hand corner of the house, within the policyholder's ownership

T2 Oak – 17m tall, located 17m from the front right-hand corner of the house, within the neighbouring property No 135 Long Lane

T3 Oak - 16.5m tall, located 18m from the front right-hand corner of the house, within the neighbouring property No 135 Long Lane

T4 Willow – 13m tall, located 31m from the front right-hand corner of the house, within a neighbouring property No 135a Long Lane

The drainage system is shown on the attached plan.

**CIRCUMSTANCES OF DISCOVERY OF DAMAGE**

The policyholder and homeowner, first discovered the damage during the summer of 2018

The policyholder noticed cracks appear, which quickly worsened.

The policyholder notified their building insurer.

**NATURE AND EXTENT OF DAMAGE****Description and Mechanism**

The main area of damage is to the right-hand side extension and takes the form of slight vertical cracking to the front elevation of the extension was where it meets the main house. There is a horizontal crack to the top right of the entrance door. Cracking is present within the main lobby within the extension to the right-hand wall, where there is a vertical crack, up to 15mm in width, mid-way along this wall which continues across the ceiling to the opposite wall. -Cracking is also present to the left-hand wall to the top front corner of the small window. Further cracking extends along the coving / ceiling junction. There is a diagonal crack in the office to the front to above and below the high-level access door. Slight cracking is also present to the right-hand wall and rear wall. Cracking is present at the wall/ceiling junction to the landing.

Stepped cracking, up to 1.5mm in width, is present to the boundary wall.

The indicated mechanism of movement is downwards movement of the right-hand extension foundations towards the front right-hand corner.

#### 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

has advised that damage first commenced in September 2018.

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

The ground investigation was carried out by CET Structures Ltd on 15 February 2019 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 right-hand corner of the front bay window

The underside of the foundation is at 900mm below ground level with the foundation comprising concrete strip. The soil beneath the property foundations has been identified as medium compact made ground comprised of a clay/silt mixture. Shear vane readings are high. The made ground is underlain by stiff clay at 1000mm below ground level and proven for the remainder of the borehole, which was terminated at 3.7m below ground level. The clay soil has is highly shrinkable and shear vane readings are high, exceeding the parameter of the measuring instrument. Moisture content is higher than the plastic limit and slightly above 40% of the liquid limit.

Samples of root taken from beneath the foundations and to a depth of 2.7m below ground level have been analysed and originate from an oak tree. There are oak trees located to the front right-hand side of the property.

##### Trial Pit 2/Borehole 2

This was located at the front right-hand corner of the right-hand extension, adjacent to the right-hand boundary wall

The underside of the foundation is at 400mm below ground level with the foundation comprising concrete. The soil beneath the property foundations has been identified stiff clay. The boundary wall is founded 350mm below ground level. Shear vane readings are normal. The stiff clay is proven for the full depth of the borehole, which was terminated at 5.0m below ground level. The clay soil has is highly shrinkable and shear vane readings are high, exceeding the parameter of the measuring instrument. Moisture content is higher than the plastic limit, except at 1.5m where the moisture content is less than the plastic limit. The moisture content compared to the liquid limit decreases in depth from the underside of the foundation until it reaches 1.5m below ground level, where it is less than 40% and then increases with depth, being 40% at 2.5m and above 40% below this depth..

Samples of root taken from beneath the foundations and to a depth of 3.5 below ground level have been analysed and originate from an oak tree. There are oak trees located to the front right-hand side of the property.

The site investigation results confirm clay soil below the foundations, with tree roots present, belonging to oak tree/s. Despite the investigation being carried out in February, where moisture content will be elevated from summer levels, the moisture content is only slightly above levels considered to indicate desiccation.

Camera survey of drains located to the front left-hand side of the property showed defects.

## **MONITORING**

Level monitoring has been underway since June 2019

In summary, the results to date show a pronounced cyclical pattern to the front right-hand corner of the right-hand extension. There is a 9mm swing between downward movement between late summer/autumn and recovery in late winter/spring. This is also evident to the rear of the extension but to a much lesser extent. Monitoring continues to show a pronounced downward movement to the front right-hand corner of the extension.

The monitoring also shows steady downward progressive movement to the front left-hand side of the property, which led to a camera survey in this area. This revealed defects to the drains in this area, which have now been repaired, however the defects are too remote from the right-hand side of the property to be influencing the foundation to the right-hand extension. Since repair of the drain the downward movement has ceased and remained stable.

There is a reduced cyclical pattern of movement along the rear elevation, which is an extension, and there is minimal movement to the front elevation of the main house, which we understand was underpinned in 1992.

Results of the level monitoring carried out to date are attached in table/graphical format together with a plan showing the location of the monitoring studs within the insured property.

## **CAUSE OF DAMAGE**

Taking an overview of all the site investigation and monitoring 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 oak trees to the front right hand side of the property located in the front garden of the subject property and the neighbouring property.

I base this view on 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 analysis of the site investigation results indicates that the soil has been affected by shrinkage. Oak tree roots are present in the clay subsoil beneath the foundations and the monitoring shows a cyclical pattern, consistent with clay shrinkage, with its greatest magnitude at the front right-hand corner of the house, closest to the oak trees. In this case, I am satisfied that the damage has therefore been caused by clay shrinkage subsidence following moisture extraction by the oak trees.

I have also considered whether there could be any other influencing factors such as leaking drains. Leaking drains were found to the left-hand side of the property, but these are too remote from the area of movement to be influencing the foundations of the right-hand extension. The drains have been repaired in July 2020 and since the drain repair the front left-hand side of the house has become stable.

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

## **RECOMMENDATIONS**

It is recommended that the oak trees (T1, T2 and T3) located to the front right of the property are removed to mitigate against further movement.

## **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.

I am not of the opinion that heave of the clay subsoil is a threat to adjacent property.

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.

## **REPAIRS**

If the trees are removed, then I consider that works including structural crack repair and redecoration at an approximate cost of £25,000.00 will be appropriate in order to repair the damage in this case.

If the street tree is not removed 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 £80,000.00

For Sedgwick International UK,

Chris Taylor BSc Building Surveying, BDMA InsTech, Cert CII  
*Building Consultant*

Victoria Mion Pivetta  
*Claims Technician*  
Direct dial: 01924 428711  
E-mail: Victoria.Mion@uk.sedgwick.com