Engineers Report

Risk Address	**2 Convent Avenue South Kirkby Pontefract West Yorkshire WF9 3NX**
360 Reference	**DLG-SN-21-003542**
Insurer Reference	**079598843**
Policy Holder	**Miss Claire Hibbert**
Date Notified	**04.08.2021**
Date Instructed	**17.09.2021**
Report Date	**24.09.2021**

Description of Premises

The risk address is a semidetached house with three bedrooms over two storeys which was built in circa 1950. It has been constructed with cavity brick and block walls supporting a pitched timber roof structure with tiled covering, whilst internally the ground floor is solid concrete, and the first floor is suspended timber with joists and floorboards. There is an attached single garage to the right-hand side which was built approximately 30 years ago and has been constructed with brick walls supporting a mono pitched timber roof structure with tiled covering, whilst internally the floor is solid concrete. The garage is accessed from the concrete drive.

The property is situated on a generally level site and is located within a residential area of similar type properties, with no apparent adverse site features. The combined drainage system is found to the rear and right-hand side, and there are 2no large mature Oak trees growing in public open space to the front of the property, both of which are believed to be within influencing distance of the damage.

The property is owned and occupied by Miss Hibbert, her partner Mr Jason Carter and their two children, and has been since 2011.

There is a mortgage on the property with Halifax.

Discovery of Damage

We spoke to Miss Hibbert who advised that she has been aware of minor cracking to the garage for several years but was not initially concerned about the damage however, since then the cracks have become wider and more have appeared elsewhere within the property.

Focus of Damage and Report

This document addresses damage notified to insurers to the property. All directions are stated when viewing the property from the front.

External damage

Front elevation

To the front there is 2mm wide stepped and vertical cracking to the mortar joints of the brickwork adjacent to the top right corner of the front entrance door. There is a 5mm wide vertical separation crack at the joint between the garage and the right-hand gable elevation of the main building which becomes wider with height indicating that the garage has rotated away to the right.

There is evidence of ground movement adjacent to the front of the property with the ground level having dropped causing the concrete doorstep to move away from the front elevation.

Rear elevation

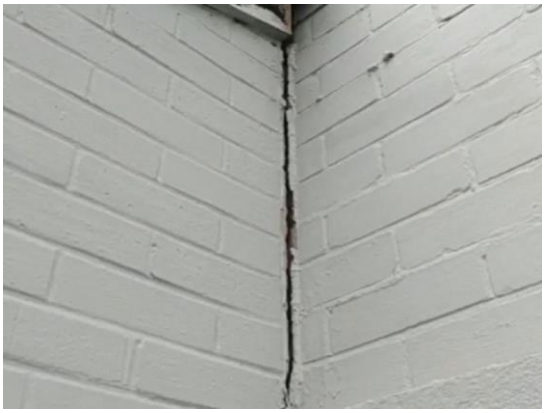
To the rear there is 3mm wide stepped cracking to the mortar joints of the brickwork to the rear of the garage, whilst there is a 10mm wide vertical separation crack at the joint between the garage and the right-hand gable elevation of the main building which becomes wider with height indicating that the garage has rotated away to the right. There are 3mm wide stepped cracks above the kitchen window. The boundary garden wall to the right-hand side has also sustained movement and is out of alignment in various areas.

Internal damage

Lounge

Whilst we have not seen evidence of internal damage, we were advised by Miss Hibbert that there are various cracks in most rooms, although the lounge seems to be the worst affected, with the internal door also sticking.

Picture 1: Crack between house and garage



Picture 2: Crack between house and garage

Picture 3: Cracking to rear elevation

Picture 4: Cracking to rear of garage

Non-Subsidence Related Damage

There is no other damage of significance elsewhere within the property.

Classification of Damage

It is common practice to categorise the damage in accordance with B.R.E. Digest 251 "Assessment of Damage in Low-Rise Buildings". In this case, the damage falls into Category 3 "Moderate" as there is cracking up to approximately 10mm wide.

Category	Crack Width	Degree of Damage
0	Hairline cracks of less than 0.1 mm	Negligible
1	Typical crack widths are 0.1 to 1mm.	Very slight
2	Typical crack widths are 1 to 5mm.	Slight
3	**Typical crack widths are 5 to 15mm, or several of, say, 3 mm.**	**Moderate**
4	Typical crack widths are 15 to 25mm, but also depends on number of cracks.	Severe
5	Typical crack widths are greater than 25mm but depends on number of cracks.	Very Severe

Site Geology and Ground Conditions

The geological data indicates the ground to be firm sandy clay with silt and gravel which is vulnerable to subsoil shrinkage changes, particularly when influenced by tree roots.

Indicative Site Geology and Soils Data for:

2 Convent Avenue, South Kirkby, Pontefract, WF9 3NX **Ref: DLG-SN-21-003542**

No of SI's within 5.2km from address on identical lithology. **(See comments)**	**3**
Closest - Furthest distance of a site investigation from the address (km).	**1.3 - 5.2**
Total number of boreholes.	**6**
Percentage of site investigations where root samples where taken.	**67%**
Percentage of site investigations where drainage was recorded.	**0%**
Number of samples tested at greater than 0.5m depth.	**20**
BRE Digest 240. "Volume change potential" from Av. Modified Plasticity Index (I'p) of 23%.	**Medium**

Previous Soils Data nr = Non recorded	***Depth m.***	***M.C. (%)***	***L.L. (%)***	***P.I. (%)***	***P.L. (%)***	***425um (%)***	***Suction kPa***	***Oed Strain***
Sample population	20	20	13	13	13	13	20	0
~ Minimum (Av - 1 StdDiv)	0.7	19	42	19	21	89	5	nr
~ Maximum (Av + 1 StdDiv)	2.6	33	56	27	31	97	1141	nr
Average	1.5	26	49	23	26	93	309	nr
General soils description	Firm dark brown/grey sandy CLAY with some silt / fine gravel							
BGS 1:50 000 maps as a: Bedrock Geology	**1:50 000 scale bedrock geology description:** Pennine Upper Coal Measures Formation - Sandstone. Sedimentary Bedrock formed in the Carboniferous period. Local environment previously dominated by swamps, estuaries and deltas. **Setting**: Swamps, estuaries and deltas with rivers. These sedimentary rocks are fluvial, palustrine and shallow-marine in origin. They are detrital, forming deposits reflecting the channels, floodplains and deltas of a river in a coastal setting (with periodic inundation from the sea).							
BGS 1km Hexagonal Superficial Deposit Depth Data Mean Depth = 2m Max Depth = 12m Coverage = 24% **Note**: The BGS only record superficial deposits greater than 1m in depth	**1:50 000 scale superficial geology description:** None recorded.							
BGS 1:50,000 Artificial Ground	Non recorded							

BGS "GeoSure" 5km Hexagonal Hazard Ratings	
Shrink/Swell	Low
Collapsible Deposits	Low
Compressible Ground	Low with areas of localised significant rating.
Landslides	Low with areas of localised significant rating.
Running Sand	Low
Soluble Rocks	Low
Mining (not incl coal) 1km hex g	Localised small scale mining may have occurred in the area.

Government Coal Authority Data (<25m = found within 25m)	Reporting area/ Surface Resource Area/ Abandoned Mines Catalogue. No-12974

Comments: The location is in a very low SI density area. The three SIs reported above are on exactly the same Bedrock Geology with no overlying Superficial deposits.

 17-09-21

Evidence of External Influences

Trees

There are 2no large mature Oak trees in the public open space to the front of the property which are approximately 10 metres away from the property and approximately 25m in height, and which we consider are within influencing distance of the damage. The trees are owned by Wakefield Council.

Drains

The main property is served by a combined domestic drainage system which is located predominantly to the rear and right-hand side. There are no known problems with the drainage system.

Summary and Conclusions

The pattern and orientation of damage noted to the front and rear of the property is indicative of localised subsidence. A valid claim is therefore accepted for the damage to the property, subject to the subsidence policy excess of £1000.

The cause of the localised subsidence affecting the front and rear of the property, appears to be related to subsoil shrinkage, possibly influenced by roots from the nearby Oak trees, although it is possible that nearby drains may be leaking.

In order to mitigate further subsidence damage occurring it will be necessary to remove the cause of the problem, which in this case will be to secure removal of the offending trees if they are identified as being influencing factors. If the drains are found to be leaking, then drain repairs will need to be undertaken.

Following completion of the mitigation works described above, and a period to allow the ground to stabilise, the necessary repairs to the property can proceed. A repair schedule will be drawn up and agreed in due course.

Next Steps

A valid claim arises under the terms of the insurance policy, subject to the applicable excess of £1000, for the localised subsidence damage to the front and rear of the property.

The key steps required to progress the claim are as follows:

- Contact policyholder and arrange for site investigations to be undertaken at a suitable date. These will include 2no trial hole excavations to the front and rear of the property.
- If the trees are found to be influencing the damage, then we will appoint an Arborist to provide recommendations accordingly
- Make recommendations in respect of tree management works that are required and contact the owner of the tree. Arrange for drain repairs if required.
- Following completion of the above mitigation measures, allow the ground to stabilise before proceeding with repairs to the property.

Provided that the tree management works are achieved, it is anticipated that the ground will recover, with localised remedial works being required. Likewise, if drain repairs are required then the ground should also stabilise. A repair schedule has been drawn up, although this will be finalised following completion of any mitigation measures, as applicable.

Jonathan Doyle
360Globalnet Subsidence Team