

## Addendum Engineer's Report

|                             |                           |
|-----------------------------|---------------------------|
| <b>Risk Address</b>         | <b>5 Westfield Court</b>  |
|                             | <b>Mirfield</b>           |
|                             | <b>West Yorkshire</b>     |
|                             | <b>WF149PT</b>            |
| <b>360 Reference</b>        | <b>DLG-SN-22-005272</b>   |
| <b>Insurer Reference</b>    | <b>084495365</b>          |
| <b>Policy Holder</b>        | <b>Mr. Paul Moorhouse</b> |
| <b>Date Notified</b>        | <b>15.08.2022</b>         |
| <b>Addendum Report Date</b> | <b>08.01.2025</b>         |



### **Description of Premises**

The insured property is a 4-bedroom, 2-storey detached house, constructed circa 1960's, with external brick faced cavity walls under a pitched, concrete tile covered roof. There is an attached double garage at the left-hand side, with an old utility projection to the rear left corner of the property. This has at some stage been opened up to extend the kitchen within the main house.

No recent structural alterations appear to have been undertaken to the property.

The property is located within a residential area of similar style properties, on a slightly sloping site, with no obvious adverse features.

### **Discovery of Damage / Claim History**

We understand cracking was initially noticed internally and externally towards the rear left of the house, during the dry summer period of 2022. Consequently, a subsidence claim was notified to insurers and following our assessment and investigations, it was confirmed that the damage was due to subsidence as a result of shrinkage of the clay soil, due to the moisture demand of the adjacent vegetation. It was initially suspected that the damage was due to a Sycamore tree in the rear neighbour's garden, and this was subsequently removed (following lifting of the Tree Preservation Order). Unfortunately, movement has continued, and it has now been confirmed that a further Oak tree needs to be removed in order to stabilise the property. As this tree is also protected, a further application will need to be submitted to the Local Authority. This report summarises the available evidence and provides the options for stabilising the property.

### **Focus of Damage and Report**

This document addresses damage notified to insurers in relation to cracking orientated towards the rear left-hand side of the house. All directions are stated when viewing the property from the front.



Damage has appeared internally, and externally around the rear and left-hand side of the house. Cracking, up to approximately 5mm wide, is evident. The cracking is stepped / diagonal and tapered, generally increasing in width with height, being orientated towards the rear left of the house.



External cracking at rear left corner



External cracking to LHS of property



External cracking to rear elevation



Internal cracking to rear left bedroom



Cracking to rear left corner of kitchen



## Indicative Site Geology and Ground Conditions

### Indicative Site Geology and Soils Data for:

**5 Westfield Court, Mirfield, WF14 9PT**

Ref: DLG-SN-22-005272

|                                                                                                        |           |
|--------------------------------------------------------------------------------------------------------|-----------|
| No of SI's within 2.3km from address on identical lithology. (See comments)                            | 2         |
| Closest - Furthest distance of a site investigation from the address (km).                             | 1.6 - 2.3 |
| Total number of boreholes.                                                                             | 4         |
| Percentage of site investigations where root samples were taken.                                       | 50%       |
| Percentage of site investigations where drainage was recorded.                                         | 0%        |
| Number of samples tested at greater than 0.5m depth.                                                   | 13        |
| BRE Digest 240, "Volume change potential" from Av. Modified Plasticity Index (I <sub>p</sub> ) of 24%. | Medium    |

| Previous Soils Data<br>nr = Non recorded | Depth<br>m. | M.C.<br>(%) | L.L.<br>(%) | P.I.<br>(%) | P.L.<br>(%) | 425um<br>(%) | Suction<br>kPa | Oed<br>Strain |
|------------------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|----------------|---------------|
| <b>Sample population</b>                 | 13          | 13          | 13          | 13          | 13          | 13           | 8              | 0             |
| ~ Minimum (Av - 1 StdDiv)                | 0.5         | 15          | 46          | 22          | 21          | 78           | 14             | nr            |
| ~ Maximum (Av + 1 StdDiv)                | 2.8         | 28          | 56          | 32          | 25          | 92           | 693            | nr            |
| <b>Average</b>                           | 1.5         | 21          | 51          | 27          | 23          | 85           | 316            | nr            |

|                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General soils description</b>                                                                                                                                                                | Firm brown/grey sandy CLAY with some fine gravel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>BGS 1:50 000 maps as a:<br/>Bedrock Geology</b>                                                                                                                                              | <b>1:50 000 scale bedrock geology description:</b><br>Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone. Sedimentary Bedrock formed in the Carboniferous period. Local environment previously dominated by swamps, estuaries and deltas.<br><b>Setting:</b> 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). |
| <b>BGS 1km Hexagonal Superficial Deposit Depth Data</b><br>Mean Depth = 1m<br>Max Depth = 1m<br>Coverage = 8%<br><b>Note:</b> The BGS only record superficial deposits greater than 1m in depth | <b>1:50 000 scale superficial geology description:</b><br>None recorded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>BGS 1:50,000 Artificial Ground</b>                                                                                                                                                           | Non recorded                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| BGS "GeoSure" 5km Hexagonal Hazard Ratings |                                                      |
|--------------------------------------------|------------------------------------------------------|
| <b>Shrink/Swell</b>                        | Low                                                  |
| <b>Collapsible Deposits</b>                | Low                                                  |
| <b>Compressible Ground</b>                 | Low with areas of localised significant rating.      |
| <b>Landslides</b>                          | Moderate with areas of localised significant rating. |
| <b>Running Sand</b>                        | Low                                                  |
| <b>Soluble Rocks</b>                       | Low                                                  |
| <b>Mining (not coal) 1km hx grid</b>       | No record of activity.                               |

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Government Coal Authority Data</b><br>(<25m = found within 25m)                  | Reporting area/ Surface Resource Area/ Development High Risk Area/ Abandoned Mines Catalogue. No-10527/ Probable shallow workings                                                                                                                                                                                                                                                                  |
|  | <p><b>Mine Entry</b></p> <ul style="list-style-type: none"> <li>✗ Adit</li> <li>✗ Gutter Pit</li> <li>✗ Shaft</li> </ul> <p><b>Mine Entry Potential Zone of Influence</b></p> <ul style="list-style-type: none"> <li>Surface Mining (Past and Current)</li> <li>Past Shallow Coal Mine Workings</li> <li>Probable Shallow Coal Mine Workings</li> <li>Coal Outcrops</li> </ul> <p>1000m Sq. Ma</p> |

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

### **Site Investigations**

An initial site investigation was undertaken in November 2022 – for full details refer to the report dated 13 January 2023 by The Drainage Repair Company.

A trial pit was excavated to the rear left-hand corner, and this revealed a 400mm thick concrete foundation bearing at 1 metre below ground level on soft to firm, slightly sandy / silty clay and this continued until the ground could not be penetrated below 3.5 metres. Live roots were evident to a depth of 1.8 metres, and these were identified as Acer (Maple or Sycamore).

The clay was of medium shrinkability and was desiccated, with moisture contents close to the plastic limit and with a heave potential of 16mm.

A further site investigation was undertaken in November 2024 – for full details refer to the report dated 02 January 2025 by The Drainage Repair Company.

Two trial pits were excavated to the rear wall. A trial pit to the rear left-hand corner again confirmed that the foundation was 1 metre deep and bearing on soft to firm clay to 3.5 metres. Roots were evident to a depth of 2 metres however, these were found to be dead Acer roots.

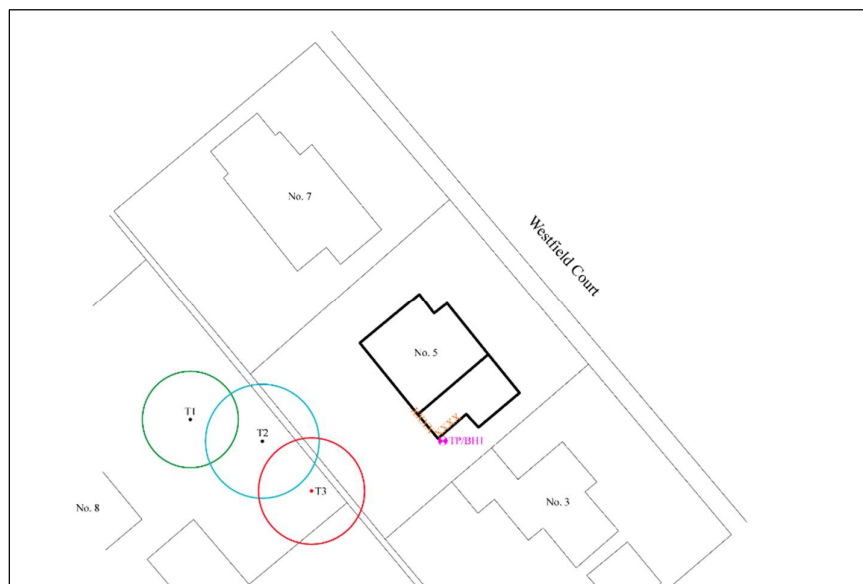
A trial pit to the centre of the rear wall found that the foundations were 1.5 metres deep and also bearing on soft to firm clay to 3.5 metres. Live roots were evident to a depth of 2 metres, and these were identified as Quercus (Oak). A dead Acer root was also found.

The clay was of medium shrinkability and was desiccated in both boreholes with heave estimates of 11 and 16mm.

### **Arboricultural Report**

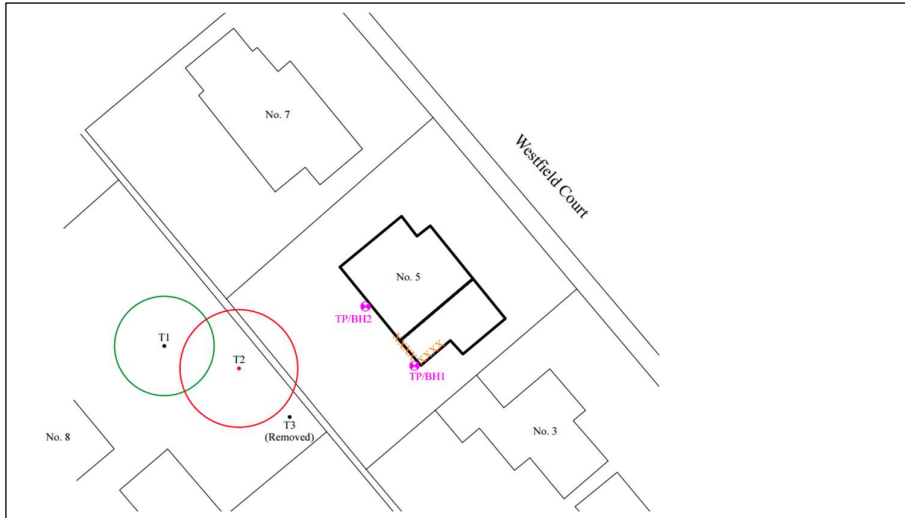
An arboricultural assessment was undertaken in September 2022 – for full details refer to the report by JCA Ltd.

In summary, they recommended the removal of the closest Sycamore tree (T3 – 20 metres tall and 12.7 metres away). The other trees (T1 Sycamore – 17 metres tall and 17 metres away and T2 Oak – 17 metres tall and 13.8 metres away) were recommended to be maintained. All trees are subject to a Tree Preservation Order.



After consultation with the neighbouring owner and the Local Authority, the Preservation Order was lifted and the Sycamore T3 was removed in March 2024.

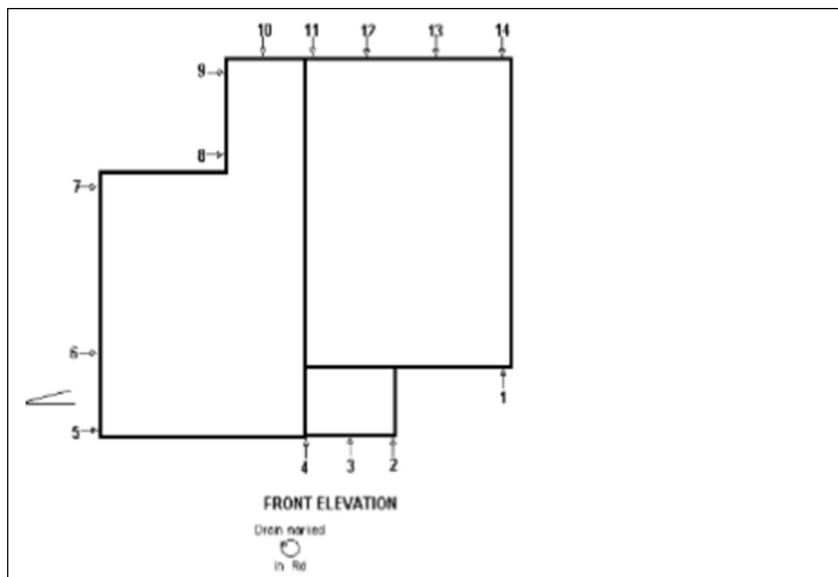
Due to further movement occurring, a revised Arboricultural Report was provided in January 2025, and this has now recommended the removal of the Oak T2.

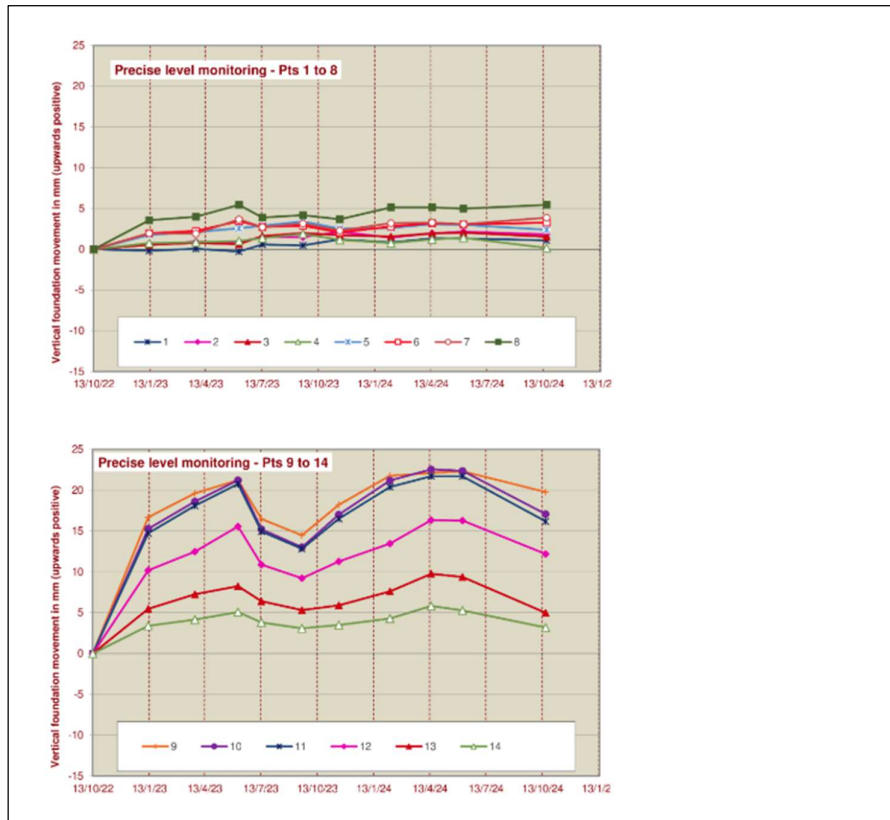


### **Level Monitoring**

The property has been monitored since October 2022 – for full details refer to the reports by Geo-Serv Ltd., the latest being dated 18 October 2024.

In summary, the rear of the property has shown a clear pattern of seasonal movement. Upward movement / recovery of 20mm occurred as the clay rehydrated over the winter and spring of 2022 / 2023 however, this was reversed over the summer and autumn of 2023 as the clay shrank again, with 8mm of downward movement occurring. Further rehydration and recovery occurred over the winter and spring of 2023 / 2024, back to a similar level to the previous year. With the Sycamore T3 being removed in March 2024, it was expected that the foundations would stabilise however, this has not occurred, with further downward movement of around 5mm occurring by October 2024 (with further movement still likely before rehydration commences).





## **Summary and Conclusions**

It is clear that the rear of the property continues to be affected by significant foundation movement as a result of clay shrinkage due to the moisture demand of the vegetation at the rear, namely the Oak tree T2.

Based on the initial site investigations, it was hoped that removal of the Sycamore tree T3 would be sufficient to stabilise the property however this has not been the case, and movement continues, with over 5mm of movement occurring, despite 2024 being a relatively wet summer. It is therefore inevitable that more significant movement will continue to occur following every drier summer.

Given the above, undertaking robust superstructure repairs only whilst the Oak tree remains insitu is not considered to be a long-term solution.

Therefore, the options for stabilising the property are as follows:

- Remove the Oak tree T2, allow the ground to rehydrate over the winter and undertake superstructure repairs in spring / early summer 2025 – estimated cost of removing Oak tree £3,000. This would be subject to the neighbour's agreement and also would need the Tree Preservation Order to be lifted.

- If consent to remove the Oak T2 is refused, then a root barrier across the rear garden appears to be feasible. This would cut off the Oak roots from the foundations. Estimated cost of barrier £50,000. This would also be subject to a root severance agreement with the Local Authority.
- If a root barrier was not feasible, or a root severance was not agreed, then the only option would be to underpin the rear wall below the influence of the Oak tree roots. Estimated cost of underpinning would be in excess of £100,000.
- For all options, the superstructure damage to the property needs to be repaired and this is estimated at £20,000.

We can confirm that insurers are willing to fund the cost of tree removal and also fund the cost of any replacement planting specified if the Tree Preservation Order is lifted. This will reduce any perceived loss of amenity value if the Oak tree was removed.

In summary, it is recommended that an application for the removal of T2 is submitted given the further evidence obtained, and that if it is refused, then the root barrier or underpinning solutions are progressed, and solicitors should be instructed to recover the stabilisation costs from the Local Authority.

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