TREE PRESERVATION ORDER: (TPO 184)

TREE WORK(S) - as referenced in the MWA Arboricultural Report:

T1 Sycamore – remove (fell) to near ground level and treat stump to inhibit regrowth.

REASONS FOR WORKS: The above tree is considered to be responsible for root induced clay shrinkage subsidence damage to 3 Somerset Terrace, NE36 0TE.

Technical and Site Investigation Evidence

Engineering opinion is that clay shrinkage subsidence is a cause of damage. Details of the damage are included in the engineering technical report(s) submitted. Investigations into the cause of damage have confirmed the following information/evidence:

Soils

- Foundations are bearing on to a cohesive clay.
- The clay subsoil has a low - medium volume change potential (NHBC Guidelines) susceptible to undergoing volumetric change in relation to changes in soil moisture.
- A comparison between moisture content and the plastic and liquid limits suggests moisture depletion/desiccation in TP/BH1 (May 2023).

Roots

- Roots were observed to a depth of 2.5m bgl in TP/BH1 and recovered samples have been positively identified (using anatomical analysis) as Acer spp with T1 being a potential source.
- The observed moisture depletion / observed desiccation is coincident with recorded root activity at depths beyond ambient soil drying effects and consistent with the soil drying effects of the implicated tree.

Monitoring

- Level monitoring for the period 04/05/2023 – 27/01/2025 has recorded a pattern of seasonal movement indicative of the soil drying effects of the subject tree below foundation level. The uplift phase of the building can only be attributable to an expanding clay soil from a desiccated (shrunken) state related to soil water extraction by the implicated tree. Crack monitoring has also recorded a pattern of crack width variation consistent with the seasonal influence of vegetation. Crack monitoring for the period 13/11/2023 – 27/01/2025 has recorded a pattern of crack movement indicative of the effects of the offending tree on soil moisture and volumes. Crack closure can only be attributable to an uplift of the building due to an expanding clay soil from a desiccated (shrunken) state due to the soil drying effects of the subject tree.

Drains

- The drains have been surveyed and no significant defects were found.

Heave

- The subject tree does not pre-date the construction of the house.

Mitigation History

- No tree works have been carried out during the period of the claim or in the recent past in relation to the damage to the building.
- No recent structural alterations or building works have been carried out. The property has not been underpinned.

Mitigation Options Considered

Tree Reduction

- Consideration has been given to pruning alone as a means of mitigating the vegetative influence, however in this case, this is not considered to offer a viable long-term solution due to the proximity of the implicated vegetation.

Root Barrier

- A root barrier has been considered as an alternative to tree removal and may be viable however this requires further appraisal to evaluate the constraints of the site. The cost of a deep barrier is currently estimated to be £15k - £25k.

Underpinning

- Superstructure repairs and decorations are currently estimated to be £8-10k should the tree works be undertaken. Costs for underpinning in the event the tree works do not proceed are currently estimated to be £60-70k.

Replacement Planting

- Replacement planting of standard size tree with agreement of Local Authority. The following species are suggested: Rowan, birch.

The evidence confirms that on the balance of probabilities the subject tree is a material cause of the subsidence damage.

SUBSIDENCE CHECK LIST

- A description of the property, including a description of the damage and the crack pattern, the date that the damage first occurred/was noted, details of any previous underpinning or building work, the geological strata for the site identified from the geological map.
  Technical Report and Site Investigation Report provided.
- Details of vegetation in the vicinity and its management since discovery of the damage. Include a plan showing the vegetation and affected building.
  MWA Arboricultural Report provided.
- Measurement of the extent and distribution of vertical movement using level monitoring. Where level monitoring is not possible, state why and provide crack monitoring data. Data provided must be sufficient to show a pattern of movement consistent with the presence of the implicated tree(s).
  Level Monitoring provided.
- A profile of a trial/bore hole dug to identify foundation type and depth and soil characteristics.
  Site Investigation Report provided.
- The sub-soil characteristics including soil type (particularly that on which the foundations rest), liquid limit, plastic limit and plasticity index.
  Site Investigation Report provided.
- The location and identification of roots found. Where identification is inconclusive, DNA testing should be carried out.
  Site Investigation Report provided.
- Proposals and estimated costs of options to repair the damage.
  Addendum Technical Report provided.