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Subsidence damage investigation report for [REDACTED] Sutton Road, Waterloooville, PO8 8PT

Prepared by **Trevor Heaps** BSc, MICFor, M. Arbor.A.

Prepared for: Trinity Claims

Insured: Ms Lisa Sheppard



Date: 20th December 2023 (previously 22nd September 2022)



Summary

Cracks have developed within the house and conservatory of 95 Sutton Road. Trees are suspected of contributing to the damage.

Expert geotechnical information has been provided, and this report outlines the findings; which concludes that the rear garden Oaks (two at 95 and one in the neighbouring rear garden) are likely to have contributed.

Remedial works have been recommended.

Note: Our responsibility is to provide objective advice on the most effective means to allow stability to be restored to a property. It is the responsibility of the tree owner/s and local authorities to determine whether or not the suggested work is justified.

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1.0 Qualifications and Experience

1.1 I am Trevor Heaps, Director of Trevor Heaps Arboricultural Consultancy Ltd. I have experience and qualifications in the field of Arboriculture. Further information is provided in Appendix 1.

2.0 Introduction

2.1 Most trees growing near buildings do not cause any damage. However, in some cases, subsidence and structural damage can be linked to tree roots. Blocked drains and lifted paving may also be a problem. Understanding the factors involved in how trees damage buildings, including soil type and depth of foundations, will help both tree and house owners determine what action to take and when to get professional helpⁱ.

3.0 Instruction

3.1 I have been instructed to visit the damaged property, survey all significant vegetation growing within influencing distance of it, appraise all available supporting documentation and then determine which, if any, vegetation is likely to have caused or contributed to the damage.

3.2 I am then to provide recommendations for remedial action that will provide on-going and long-term stability, allowing repairs to be undertaken.

3.2 Contact details:

Who	Name	Organisation	Details
Arboricultural consultant	Trevor Heaps	THAC Ltd. 12 Plover Drive, Milford-on-Sea, Hampshire, SO41 0XF	Tel: 07957 763 533 E-mail: trevor@trevorheaps.co.uk
Client		Trinity Claims	
Havant Borough Council - LPA	Tree Officer	Public Service Plaza, Civic Centre Road, Havant, PO9 2AX	Tel: 023 9244 6015 E-mail: planning.development@havant.gov.uk

4.0 Limitations

4.1 I am an arboricultural expert and not qualified to comment on structural or geotechnical matters.

4.2 This report assesses all of the currently available information (provided by third-party experts) against the data collected at the tree survey in order to provide professional tree management advice.

4.3 This report is a best assessment of the trees and their setting at the time of the survey; any subsequent building works or changes to landform in the proximity of the trees may invalidate the advice given.

4.4 It is assumed that the current building movement and associated damage is the result of clay shrinkage subsidence and that other possible causal factors have been discounted.

4.5 This is in an initial appraisal report and recommendations are made based on the information provided. The report may be subject to review upon receipt of further information being made available.

5.0 Information provided

5.1 The following technical information was provided to assist our assessment:

Technical information	Provided?
Description of damage (i.e. is structure falling towards implicated vegetation)	Y
Engineer's report (background and description of damage)	N
Borehole log (foundation depth)	Y
Soil testing adjacent to foundations (plasticity index & moisture content etc.)	Y
Soil testing in area away from influence of vegetations (control)	N
Root analysis (identification of roots found beneath damaged structure)	Y
Drain survey (to check whether drains damaged and leaking)	N
Level monitoring (to demonstrate seasonal movement)	N
Crack monitoring (to demonstrate seasonal movement)	N
Heave Assessment	N
Other?	N

6.0 Statutory tree protection

6.1 The PH advised that the rear garden Oaks (T7 & T9) are protected by a Tree Preservation Order (TPO).

7.0 Ecological constraints

7.1 The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) provides statutory protection to birds, bats and other species that inhabit trees.

7.2 In addition to any tree matters considered in this report, these animals could impose significant constraints on the timing of recommended tree works.

8.0 The tree survey

8.1 The property was visited by Trevor Heaps on the 21st September 2022.

8.2 The trees were inspected from ground level, in accordance with the Visual Tree Assessment (VTA) methodology, developed by Mattheck & Breloer (The Body Language of Trees, 1994).

8.3 No soil or root samples were taken for analysis and no drain covers were lifted.

8.4 Tree heights, crown spreads and stem diameters were estimated. Distances between trees and the property/structures were determined using a laser distance finder.

9.0 Tree damage in context

9.1 In order for a structure to be damaged by a tree (due to subsidence), the following conditions must exist:

1. The structure should be situated on shrinkable clay soil.
2. The structure should have live tree roots growing beneath its foundations
3. The live tree roots should belong to a tree that has the potential to desiccate clay.
4. The clay beneath the foundation should be desiccated enough for it to lose its ability to support the damaged structure.

10.0 The damaged structure

10.1 The original building is a semi-detached house. A conservatory has been constructed to the rear. The conservatory has foundations that are 450mm deep.

10.2 Cracks have developed within the house and conservatory, and were noticed by the PH in early September, after the week of heavy rainfall.

11.0 The Soils and Topography

11.1 The property occupies a level site with no adverse topographical features

11.2 The soil was found to contain clay with intermediate-to-high plasticity indexes (i.e. they are highly shrinkable clay soils).

12.0 The trees

12.1 The relevant trees' locations are shown in the Site Plan (Appendix 5). Further information can be found in appendices 2 & 3.

12.2 To help categorise the general condition of the trees in the Site Plan, they are color-coded as follows:

Coloured green – Acceptable - These are in a normal condition with no significant defects.

Coloured amber – Be aware - These trees are either within influencing distance of the property, or defects have been noted that could lead to future problems.

Coloured red – Take action - These are hazardous to life and property and cannot be made safe by remedial works alone. These will need to be removed.

13.0 Discussion

13.1 The property is situated on highly shrinkable clay soils.

13.2 The conservatory's foundations are not considered deep enough to be deflecting tree roots.

13.3 Oak roots were found in the trial pits.

13.4 There are three Oaks situated within this and the neighbouring rear garden. All are within influencing distance of the areas of damage.

13.5 Oaks are high water demand trees, and these are considered to be large enough to be extracting significant amounts of water from the sub-soils.

13.6 The soils were found to be desiccated; which is significant as the soils were tested in November and so should have recovered (they are likely to have been much more desiccated during the summer months).

13.7 The Oaks pre-date the houses by several decades and so there is a risk of heave occurring if the trees were to be heavily pruned / removed.

13.8 There are other small trees growing within the rear garden, but they are not large enough to be having a significant effect.

13.9 Third-party tree owners can sometimes be held liable for tree-related damage – if the damage is reasonably foreseeable, and if no action is taken to prevent it.

14.0 Conclusions

14.1 It is more likely than not that Oaks T7, T9 & T10 have contributed to subsidence damage.

14.2 For the majority of the trees, pruning / re-pollarding may contain their size, but will not provide long-term stability (as management regimes can quickly lapse) and so, to allow ground conditions to stabilise, these trees should be removed (subject to a heave risk assessment being undertaken). Alternatively, the damaged structure should be under-pinned to ensure the foundations extend to beneath the influencing depth of any nearby trees.

14.3 The tree owner/s should be contacted and provided with a copy of this report, to make them aware of the damage and to give them an opportunity to take remedial action.

14.5 If further evidence is required to confirm or rule out tree-related subsidence, then level / crack monitoring should be undertaken to determine whether there is seasonal movement.

15.0 Other useful information

15.1 The appearance of any building defects should always be investigated promptly. If vegetation is implicated, then early removal of suspected trees may stabilise the situation at relatively little cost. Always contact a qualified structural engineer and arboriculturist before considering removal.

15.2 If a drainage system is damaged in anyway, this can allow roots to penetrate and proliferate; however, if a drainage system is watertight, roots have little capacity to gain access and cause damage. If further information is required, a drainage expert should be consulted.

15.3 Trees (and their roots) do not respect property boundaries and therefore trees on third-party land may be included in this report. If neighbouring trees are suspected of causing damage (or have the potential to cause damage) and you need to contact a tree owner about their tree, a sensible and non-confrontational approach (to request that appropriate action be taken) is advised. If the tree owner is uncooperative, then you should write to them by recorded delivery (i.e. put them on notice in case of any future problems) and keep a copy of the letter. You may also send them a copy of this report.

15.4 You have a common law right to cut back overhanging branches (and encroaching roots) back to a property boundary line. However, the following points should be noted:

Your common law rights are intended to allow you to carry out the minimum amount of work.

You must not trespass onto the land on which the trees are growing.

Branches or roots must not be cut back beyond the boundary in anticipation of them overhanging.

Any branches, fruit or roots that are removed must be carefully returned to the tree owner unless they agree otherwise.

All work must be carried out with due care (i.e. you should avoid damaging property or carrying out work that would leave the tree unsafe or dangerous to avoid any comeback against yourself).

You cannot reduce the height of trees or hedges on neighbouring land.

While not required under common law, it would be courteous to notify the tree owner of your intentions to help allay any misunderstanding.

15.5 If you are unsure of the location of property boundaries, you should either check with Land Registry (<http://www.landregistry-titledeeds.co.uk/>) or with the Royal Institute of Chartered Surveyors (RICS) using the link below:

<http://www.rics.org/uk/join/member-accreditations-list/dispute-resolution-service/neighbour-disputes-service/>

15.6 When appointing a tree works contractor, please only use properly qualified and experienced companies and always check that they carry Public Liability Insurance within a minimum of £2,000,000 cover, and the relevant Employers Liability Insurance. A list of contractors approved by the Arboricultural Association can be found at www.trees.org.uk or by calling 01242 522 152.

16.0 Signature

16.1 This report represents a true and factual account of the potential arboricultural impacts, and makes recommendations for appropriate remedial action, at the subject property.

Signed



Trevor Heaps

Chartered Arboriculturist

BSc (Hons), MArborA, MICFor.

Dated

20th December 2023

Appendix 1 - Professional résumé

I am Trevor Heaps, director of Trevor Heaps Arboricultural Consultancy Ltd. I am a Chartered Arboriculturist, a Professional Member of the Arboricultural Association (AA) and hold a First-Class Honours Degree in Arboriculture.

Professional training

Arboriculture and Bats: Scoping Surveys for Arborists (BCT & AA) – October 2017

Tree Science (AA) – June 2016

OPM (Oak Processionary Moth) Training (FC) – May 2016

Visual Tree Assessment (Arboricultural Association) - October 2015

Trees and the Law (Dr Charles Mynors) - June 2015

Mortgage (Home Buyers) Report Writing (LANTRA / CAS) - February 2015

Tree Preservation Orders - effective application (LANTRA / CAS) - November 2014

Professional Tree Inspection 3-day course (LANTRA / AA) - July 2014

Arboricultural Consultancy Course (AA) - May 2014

Further down the subsidence trail 1-day course (AA) - April 2013

Getting to grips with subsidence 1-day course (AA) - November 2012

AA – Arboricultural Association

BCT – Bat Conservation Trust

CAS – Consulting Arborist Society

FC – Forestry Commission

Appendix 2 - Tree data schedule

Ref	Species	Age	Height (m)	Physio. condition	Structural condition	VTA	Relative age	Growth potential	Distance to damaged structure (m)	Species water demand	Mature height (m)	Recorded tree-to-damage distance (m)	Comments	Rec's	Priority of work	When to re-inspect
T1	Amelanchier lamarckii (Snowy Mespil)	SM	4	Fair	Fair	1	Much younger than damaged part of property	Medium	14	Moderate	10	no data available		N/A	N/A	3 years
T2	Corylus avellana 'Contorta' (Corkscrew Hazel)	SM	2.5	Normal	Normal	1	Much younger than damaged part of property	Medium	10	Low	8	The maximum tree-to-damage distance recorded is 3m , C&R	Alleged to be cracking neighbours porch (assuming this is being dealt with separately)	N/A	N/A	3 years
T3	Acer palmatum (Japanese Maple)	SM	1.5	Normal	Normal	1	Much younger than damaged part of property	Medium	4	Moderate	8	The maximum tree-to-damage distance recorded is 18m. In 75% of cases, the tree was closer than 9m. In 50% of cases, the tree was closer than 6m.		N/A	N/A	3 years
T4	Malus (Apple)	SM	4	Normal	Normal	1	Much younger than damaged part of property	Medium	5	Moderate	10	The maximum tree-to-damage distance recorded is 10m. In 75% of cases, the tree was closer than 6m. In 50% of cases, the tree was closer than 4m.		N/A	N/A	3 years

Ref	Species	Age	Height (m)	Physio. condition	Structural condition	VTA	Relative age	Growth potential	Distance to damaged structure (m)	Species water demand	Mature height (m)	Recorded tree-to-damage distance (m)	Comments	Rec's	Priority of work	When to re-inspect
T5	Pyrus communis (Common Pear)	SM	4	Normal	Normal	1	Much younger than damaged part of property	Medium	7.2	Moderate	12	The maximum tree-to-damage distance recorded is 9m. In 75% of cases, the tree was closer than 6.5m. In 50% of cases, the tree was closer than 4m.		N/A	N/A	3 years
T6	Prunus cerasifera (Cherry Plum)	SM	4	Normal	Normal	1	Much younger than damaged part of property	Medium	8.2	Moderate	10	The maximum tree-to-damage distance recorded is 14m. In 75% of cases, the tree was closer than 6m. In 50% of cases, the tree was closer than 4m.		N/A	N/A	3 years
T7	Quercus robur (Common Oak)	M	16	Normal	Normal	2	Much older than damaged part of property	Medium	11.5	High	20	The maximum tree-to-damage distance recorded is 28m. In 75% of cases, the tree was closer than 13m. In 50% of cases, the tree was closer than 10m.	Crown reduced in past.	Remove and treat stump (subject to a heave risk assessment being carried out)	3 months	N/A
G8	Acer pseudoplatanus (Sycamore), Fraxinus excelsior (Ash), Acer campestre (Field Maple)	SM	6	Normal	Normal	1	Much younger than damaged part of property	High	14.5	Moderate	23	The maximum tree-to-damage distance recorded is 20m. In 75% of cases, the tree was closer than 10m. In 50% of cases, the tree was closer than 7m.	Growing on third-party land (dbh estimated). Small scattered group of trees.	N/A	N/A	N/A (third-party tree)

Ref	Species	Age	Height (m)	Physio. condition	Structural condition	VTA	Relative age	Growth potential	Distance to damaged structure (m)	Species water demand	Mature height (m)	Recorded tree-to-damage distance (m)	Comments	Rec's	Priority of work	When to re-inspect
T9	Quercus robur (Common Oak)	M	16	Normal	Normal	2	Much older than damaged part of property	Medium	10.75	High	20	The maximum tree-to-damage distance recorded is 28m. In 75% of cases, the tree was closer than 13m. In 50% of cases, the tree was closer than 10m.	Crown reduced in past.	Remove and treat stump (subject to a heave risk assessment being carried out)	3 months	N/A
T10	Quercus robur (Common Oak)	M	16	Normal	Normal	2	Much older than damaged part of property	Medium	15	High	20	The maximum tree-to-damage distance recorded is 28m. In 75% of cases, the tree was closer than 13m. In 50% of cases, the tree was closer than 10m.	On third-party land.	Remove and treat stump (subject to a heave risk assessment being carried out)	3 months	N/A
T11	Chamaecyparis lawsoniana (Lawson Cypress)	SM	4	Normal	Normal	1	Much younger than damaged part of property	High	11	High	18	The maximum tree-to-damage distance recorded is 17m. In 75% of cases, the tree was closer than 4m. In 50% of cases, the tree was closer than 2m.	On third-party land.	N/A	N/A	3 years
T12	Cordyline australis (Cabbage Palm)	SM	3	Normal	Normal	1	Much younger than damaged part of property	Low	8	Moderate	8	no data available		N/A	N/A	N/A (third-party tree)

Ref	Species	Age	Height (m)	Physio. condition	Structural condition	VTA	Relative age	Growth potential	Distance to damaged structure (m)	Species water demand	Mature height (m)	Recorded tree-to-damage distance (m)	Comments	Rec's	Priority of work	When to re-inspect
T13	Salix matsudana 'Tortuosa' (Corkscrew Willow)	SM	5	Normal	Normal	1	Much younger than damaged part of property	High	11	High	12	The maximum tree-to-damage distance recorded is 20m. In 75% of cases, the tree was closer than 12m. In 50% of cases, the tree was closer than 9.5m.	On third-party land.	N/A	N/A	N/A (third-party tree)

Appendix 3 - Tree data schedule explanatory notes

This section explains the terms used in the Tree Data Schedule in Appendix 2.

Ref: Each item of vegetation has its own unique number prefixed by a letter such that:

T1=Tree S2=Shrub or stump G3=Group H4=Hedge W5=Woodland

Species: Common names are given

Age: Indicates the estimated age the tree as one of the following categories:

Y - Young - Usually less than 10 years old

SM - Semi-Mature - Significant future growth to be expected in both height and crown spread (typically below 30% of life expectancy)

EM - Early-Mature - Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy)

M - Mature - Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy)

V - Veteran - A level of maturity whereby significant management may be required in order to keep the tree in a safe condition

OM - Over Mature - As for veteran except management is not considered worthwhile

Height (m): The estimated height of the tree, in metres, measured from ground level to the top of the crown

Physio cond.: Indicates the physiological condition of the tree as one of the following categories:

Normal - Healthy tree with no symptoms of significant disease

Fair - Tree with early signs of disease, small defects, decreased life expectancy, or evidence of less-than-average vigour for the species

Poor - Significant disease present, limited life expectancy, or with very low vigour for the species and evidence of physiological stress

Very poor - Tree is in advanced stages of physiological failure and is dying

Dead - No leaves or signs of life

Struct. cond.: Indicates the structural condition of the tree as one of the following categories:

Normal - No significant structural defects noted

Fair - Some structural defects noted but remedial action not required at present

Poor - Significant defects noted resulting in a tree that requires regular monitoring or remedial action

Very poor - Major defects noted that compromise the safety of the tree. Remedial works or tree removal is likely to be required.

Dead - No leaves or signs of life

VTA – Visual Tree Assessment

1 (tree coloured green) – No issues noted (at present) - These trees are considered to be in good condition / acceptable location with no significant defects noted

2 (tree coloured yellow) – Be aware - These trees are either within influencing distance of the property, or defects have been noted that could lead to future problems.

3 (tree coloured red) – Take action - These trees are considered to be hazardous to life and property and cannot be made safe by remedial works alone. These trees will need to be removed

Relative age: An indication of the age of the tree compared to the main building / structure

Growth potential: An indication of the future growth than can be anticipated from a tree:

High - Young and vigorous tree capable of significant enlargement in the future

Medium – (Med) - Middle-aged tree with reduced potential for future growth and enlargement

Low – Tree in terminal decline; lacking vitality or vigour with limited potential for future growth or enlargement

Dist. to nearest structure (m): Measurement is taken from the centre of the tree / shrub to the closest part of nearby significant structure(s) such as house, garage, and conservatory

Species water demand: High, Moderate (Mod.) or Low: Some trees (such as poplar, willow and oak) have high water demands and can be problematic when growing close to susceptible properties on shrinkable clay soil. Other trees (such as beech and birch) have lower water demands. This column gives an idea of where a particular species of tree may fall within this hierarchy. The information is taken from NHBC Standards - Chapter 4.2 (Building near trees)

Mature height (m): An estimation on the tree's ultimate, mature height; taken either from NHBC Standards - Chapter 4.2 (Building near trees); a Field Guide to the trees of Britain and Northern Europe (Alan Mitchell); or the author's own experiences.

Recorded tree-to-damage distance (m): This information is taken from the paper 'The Relationship between Trees, Distance to Buildings and Subsidence Events on Shrinkable Clay Soil (Mercer, Reeves O'Callaghan 2011). It gives an indication of the maximum recorded distance between trees and the buildings they have damaged. To provide more meaningful information, it also shows (where data is available) the distances between trees and the buildings they have damaged in 75% and 50% of cases.

Comments: Tree form and pruning history are recorded along with an account of any significant defects.

Rec's: Recommendations are usually based on any defects observed and intended to ensure that the tree is maintained in an acceptable condition.

Priority of work: Depending upon the threat posed by the tree, and the likelihood of failure, any recommendations made should be carried out according to the given priority scale.

When to re-inspect: An interval of 6 months, 1 year, 1.5 years, 3 years or 5 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.

Appendix 4 - References

ⁱ RHS, Trees near building. Available at <https://www.rhs.org.uk/advice/profile?pid=225>
(Accessed: 20 January 2020).

Appendix 5 - Site Plan

Aerial photo showing the approximate locations of the tree/s (Google Earth background). See Appendices 3 & 4 for an explanation of the colours used.

