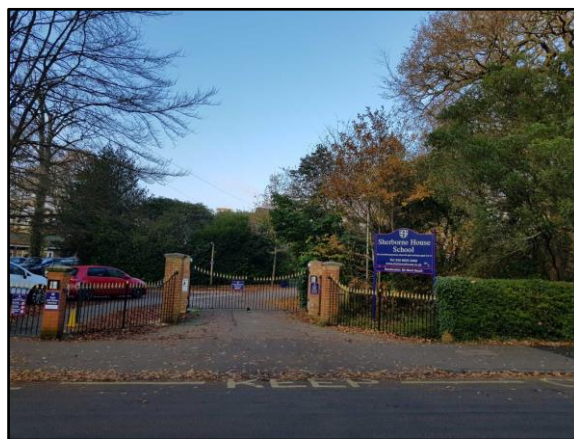


Arboricultural Appraisal Report

Subsidence Damage Investigation at:

39 Lakewood Road
Chandler's Ford
Eastleigh
SO53 1EU



CLIENT:	Auger
CLIENT REF:	140472.3.ARB
MWA REF:	SUB221111-11209
MWA CONSULTANT:	Mark Bisley (BSc Hons)
REPORT DATE:	12/12/2022

SUMMARY

Statutory Controls		Mitigation (Current claim tree works)	
TPO current claim	Yes – T1, T3	Policy Holder	Yes
TPO future risk	Yes – T2, T4, T5	Domestic 3 rd Party	No
Cons. Area	No	Local Authority	No
Trusts schemes	No	Other	No
Local Authority: -	Eastleigh Borough Council		

Introduction

Acting on instructions from Auger, the insured property was visited on 09/12/2022 to assess the potential role of vegetation in respect of subsidence damage. Our assessment is limited to that vegetation likely to affect the kitchen.

We are instructed to provide opinion on whether moisture abstraction by vegetation is a causal factor in the damage to the property and give recommendations on what vegetation management, if any, may be carried out with a view to restoring stability to the property. The scope of our assessment includes opinion relating to mitigation of future risk. Vegetation not recorded is considered not to be significant to the current damage or pose a significant risk in the foreseeable future.

This is an initial appraisal report and recommendations are made with reference to the technical reports and information currently available and may be subject to review upon receipt of additional site investigation data, monitoring, engineering opinion or other information.

This report does not include a detailed assessment of tree condition or safety. Where indications of poor condition or health in accessible trees are observed, this will be indicated within the report. Assessment of the condition and safety of third-party trees is excluded and third-party owners are advised to seek their own advice on tree health and stability of trees under their control.

Property Description

The property is a school with a number of separate buildings of mixed age and construction.

The site is generally level with no adverse topographical features.

Damage Description & History

The area affected is a single storey element used as a kitchen, attached to a two-storey building to the right. Internal and external cracking was present but has been temporarily repaired to ensure a hygienic food preparation area. It was first noticed in the summer of 2022.

At the time of the engineer's inspection the likely cause of the damage was determined to be subsidence due to moisture abstraction by vegetation.

For a more detailed synopsis of the damage please refer to the building surveyor's technical report.

Site Investigations

Site investigations were carried out by Auger on 28/09/2022, when three trial pits were hand excavated to reveal the foundations, each with a borehole sunk through the base of the trial pit to determine subsoil conditions. A drainage survey was also undertaken.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TH1	Concrete	650
TH2	Concrete	600
TH3	Concrete	800

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TH1	Gravelly, silty CLAY to 1.65m. Slightly sandy, gravelly, silty CLAY to 2.15m. Gravelly, silty CLAY to 2.65m. Slightly sandy, gravelly, silty CLAY to 3.00m. Terminated at 3.00m.	42.8 – 49.0	High
TH2	Gravelly, silty CLAY to 3.00m. Terminated at 3.00m.	41.8 – 49.0	High
TH3	Gravelly, silty CLAY to 3.00m. Terminated at 3.00m.	37.6 – 44.6	Medium - High

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TH1	1150	<i>Quercus spp.</i>	Present
TH2	600	<i>Quercus spp.</i>	Present
TH3	800	<i>Quercus spp.</i>	Present

Quercus spp. are oaks.

Drains: The drains have been surveyed and defects identified, although leaking drains are concluded not to be a cause of the current damage.

Monitoring: No information available at the time of writing.

Discussion

Opinion and recommendations are made on the understanding that Auger are satisfied that the current building movement and the associated damage is the result of clay shrinkage subsidence and that other possible causal factors have been discounted.

Site investigations and soil test results have confirmed a plastic clay subsoil 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 at the time of sampling in all excavations at depths beyond normal ambient soil drying processes such as evaporation indicative of the soil drying effects of vegetation.

Roots were observed to a depth of 1150mm bgl in TH1 and recovered samples have been positively identified (using anatomical analysis) as *Quercus spp.*, the origin of which will be T1 or T3, confirming their influence on the soils below the foundations.

Roots were observed to a depth of 600mm bgl in TH2 and recovered samples have been positively identified (using anatomical analysis) as *Quercus spp.*, the origin of which will be T3, confirming its influence on the soils below the foundations.

Roots were observed to a depth of 800mm bgl in TH3 and recovered samples have been positively identified (using anatomical analysis) as *Quercus spp.*, the origin of which will be T3 or T5, confirming their influence on the soils below the foundations.

Irrespective of the identification of recovered root samples, the roots of T2 are also likely to be present below foundation level in proximity to the area of movement/damage and influencing soil moisture and volumes.

We note that some of the trees have been subject to crown reduction in the past but those works would not have removed sufficient leaf volume to be significant in respect to subsidence.

Based on the technical reports currently available, engineering opinion and our own site assessment we conclude the damage is consistent with shrinkage of the clay subsoil related to moisture abstraction by vegetation. Having considered the information currently available, it is our opinion that T1 and T3 are the principal cause of or are materially contributing to the current subsidence damage.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that T1 and T3 are removed.

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 responsible vegetation.

Recommended tree works may be subject to change upon receipt of additional information. Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended.

Conclusions

- Conditions necessary for clay shrinkage subsidence to occur related to moisture abstraction by vegetation have been confirmed by site investigations and the testing of soil and root samples.
- Engineering opinion is that the damage is related to clay shrinkage subsidence.
- There is significant vegetation present with the potential to influence soil moisture and volumes below foundation level.
- Roots have been observed underside of foundations and identified samples correspond to vegetation identified on site.
- Replacement planting may be considered subject to species choice and planting location.

Table 1 **Current Claim - Tree Details & Recommendations**

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T1	Oak	20 *	650 *	14 *	4.5	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Remove (fell) to near ground level. Owner to physically remove any regrowth (no chemical treatment due to translocation risk).					
T3	English Oak	21	890	12 *	3.5	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Remove (fell) to near ground level. Owner to physically remove any regrowth (no chemical treatment due to translocation risk).					

Ms: multi-stemmed

* Estimated value

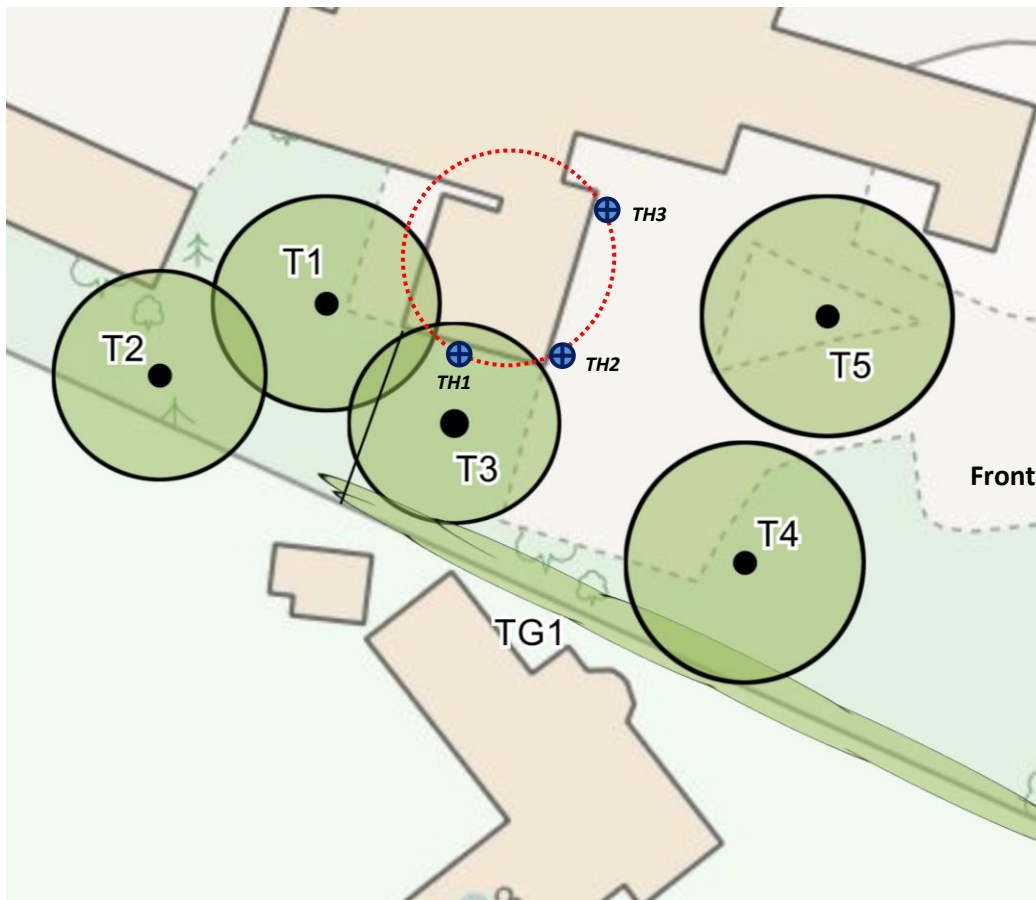
Table 2 **Future Risk - Tree Details & Recommendations**

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T2	Oak	27 *	650 *	14 *	10 *	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
T4	Oak	21 *	970 *	16 *	14 *	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
T5	Oak	19 *	840	17 *	12	Older than extension(s)	Policy Holder
Management history		Subject to past management/pruning - appears regularly pruned.					
Recommendation		Do not allow to exceed current dimensions (subject to review if movement persists).					
TG1	Beech, Hazel, Bamboo	5	90 Ms *	10	8	Younger than Property	Policy Holder
Management history		Subject to periodic reduction as part of an ongoing management regime.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					

Ms: multi-stemmed

* Estimated value

Site Plan



Plan not to scale – indicative only



Approximate areas of damage

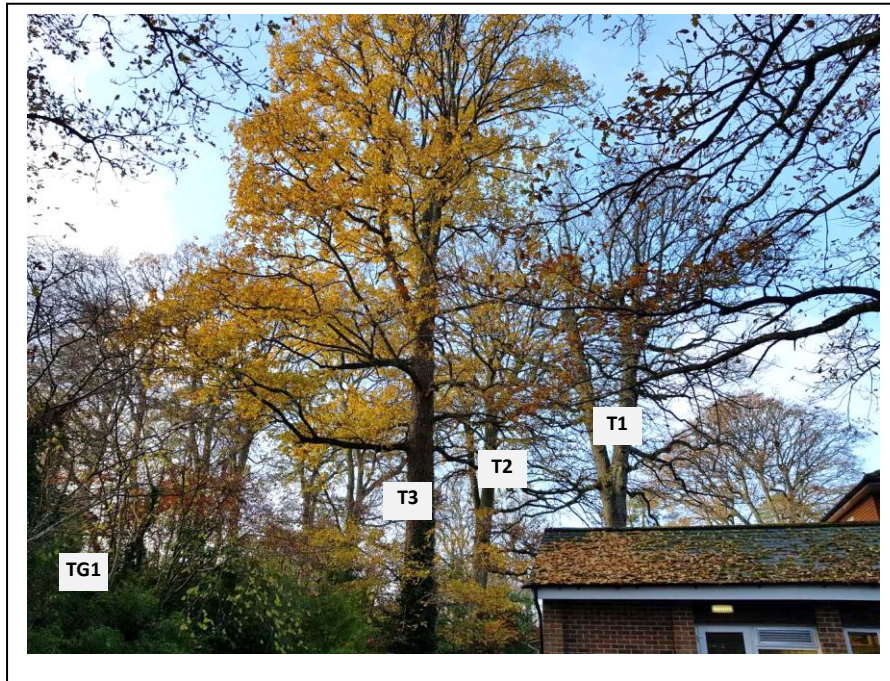
Images



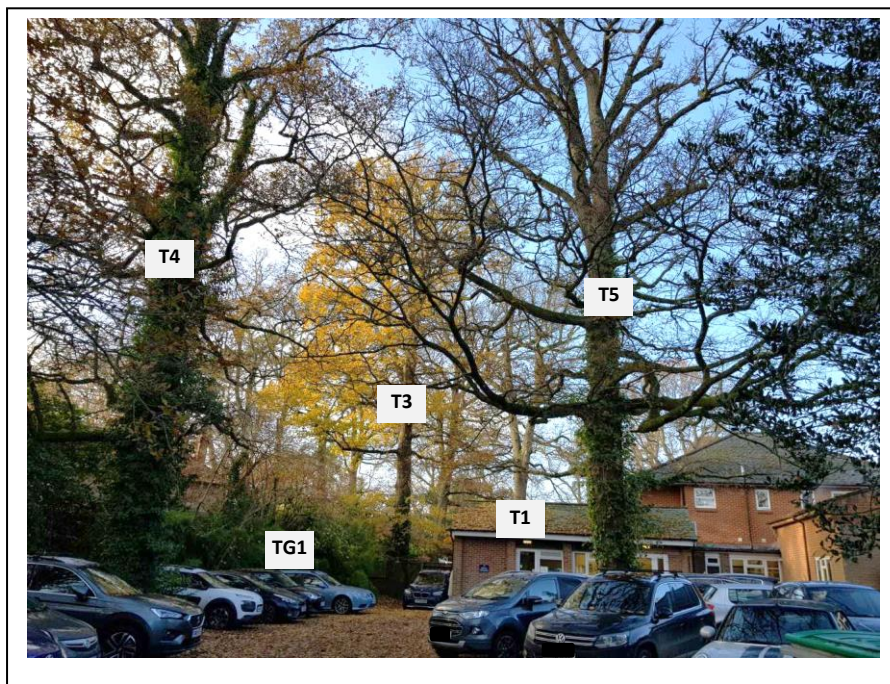
View of base of T1



View of base of T3



View of crown of T1 and T3



View of kitchen from front