

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

1 Hardwick Road
Toft
Cambridge
CB23 2RQ



CLIENT:	Crawford & Company
CLIENT REF:	SU2300135
MWA REF:	SUB230228-12462
MWA CONSULTANT:	Richard Percival (TechArborA)
REPORT DATE:	21/04/2023

SUMMARY

Statutory Controls		Mitigation (Current claim tree works)	
TPO current claim	No	Policy Holder	Yes
TPO future risk	No	Domestic 3 rd Party	No
Cons. Area	Yes	Local Authority	Yes
Trusts schemes	No	Other	No
Local Authority: -	South Cambridgeshire District Council		

Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 29/03/2023 to assess the potential role of vegetation in respect of subsidence damage.

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 comprises a two-storey detached house of traditional construction built c.1850. It has been extended with a single-storey addition to the rear and a further single-storey addition to the right-flank. The exact construction dates for these are unknown. External areas comprise a paved driveway with gardens surrounding the property.

The site is generally level with no adverse topographical features

Damage Description & History

Damage relates to the internal rooms of the house including the lounge, dining room, first-floor hallway and front left bedroom. For a more detailed synopsis of the damage please refer to the surveyor's technical report.

There was previous claim in around 15 years ago where several trees were removed from the right flank of the property and a section of the building was underpinned.

Geology / Soils

The online 1:50 000 scale British Geological Survey map records the bedrock geology as Gault Formation - Mudstone. Superficial deposits are recorded as Oadby Member – Diamicton which is characterised by rock fragments with subordinate lenses of sand and gravel, clay and silt. BGS records for this area include borehole logs which record soils with a clay component.

Discussion

Opinion and recommendations are made on the understanding that Crawford & Company 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.

Published soil maps indicate the underlying soils include or are likely to include a clay component susceptible to undergoing volumetric change with changes in soil moisture. Moisture abstraction by vegetation has the potential to cause soil shrinkage and consequent subsidence of the building.

Our survey has identified vegetation within influencing distance of the building with a current potential to influence soil volumes below foundation level.

The vegetation considered to be most significant in relation to the current damage is recorded in Table 1 (see below).

Based on the information currently available, engineering opinion and our own site assessment we conclude the damage appears consistent with shrinkage of the clay fraction due to the soil drying effects of vegetation.

If an arboricultural solution is to be implemented to mitigate the influence of the trees/shrubs considered to be responsible for the damage we recommend that the works specified in Table 1 are carried out. As the implicated tree T3 is owned by the local authority evidence of its involvement by way of root identification and level monitoring will be required. Other vegetation recorded presents a potential future risk to building stability and management is therefore recommended.

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.

Conclusions

- Conditions necessary for clay shrinkage subsidence to occur related to moisture abstraction by vegetation have been confirmed by reference to published soil maps.
- 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.

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	Cypress (Blue Arizona)	16 *	700 *	8	4.3	Older than extension(s)	Policy Holder
Management history		No recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T2	Cupressus family	8 *	300	2	4.5 *	Younger than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T3	Ash	18 *	500 *	15	16	Older than extension(s)	Local Authority
Management history		Innonotus spp. on west side of stem. Subject to past management/pruning.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T6	Ash	16 *	350 *	12 *	17 *	Older than extension(s)	Policy Holder
Management history		No recent management noted.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					

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
T4	Cherry	7 *	180 *	3 *	7	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T5	Box Elder	10 *	260 *	7	11	Younger than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
T7	Willow (Weeping)	12 *	450 *	16 *	22 *	Younger than Property	No Registrations
Management history		No recent management noted.					
Recommendation		Do not allow to exceed current dimensions. Subject to review if movement persists.					
TG1	Including hawthorn, cherry, elm, laburnum	8 *	90 *	3 *	10.5	Younger than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Maintain group at broadly current dimensions by periodic pruning. Subject to review if movement persists.					
SG1	Bay, viburnum	7 *	100 Ms *	7	8	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Do not allow to exceed current dimensions. Subject to review if movement persists.					

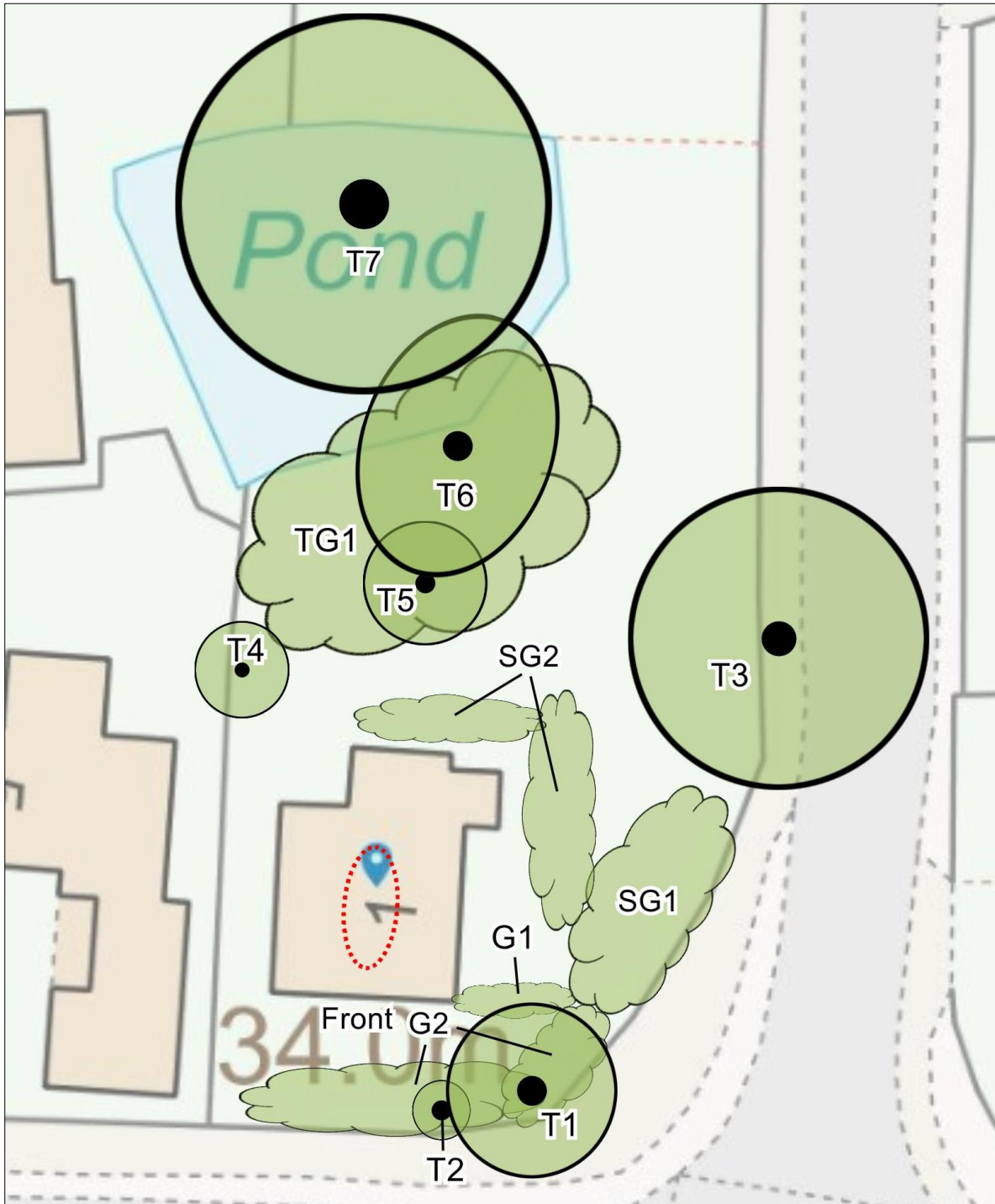
Ms: multi-stemmed * Estimated value

Table 2 Future Risk - Tree Details & Recommendations Cont'd


Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
SG2	Including box, pitosporum, rose, lilac, euonymus	2.3 *	40 Ms *	3	2 *	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning. Subject to review if movement persists.					
G1	Including box, Rose, chenomelis	2.5	15 Ms *	6	0.1 *	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					
G2	Including pitosporum, viburnum, Rose, mahonia, privet	3.5 *	50 Ms *	3	4	Younger than Property	Policy Holder
Management history		No recent management noted.					
Recommendation		Maintain broadly at no more than current dimensions by periodic pruning.					

Ms: multi-stemmed * Estimated value

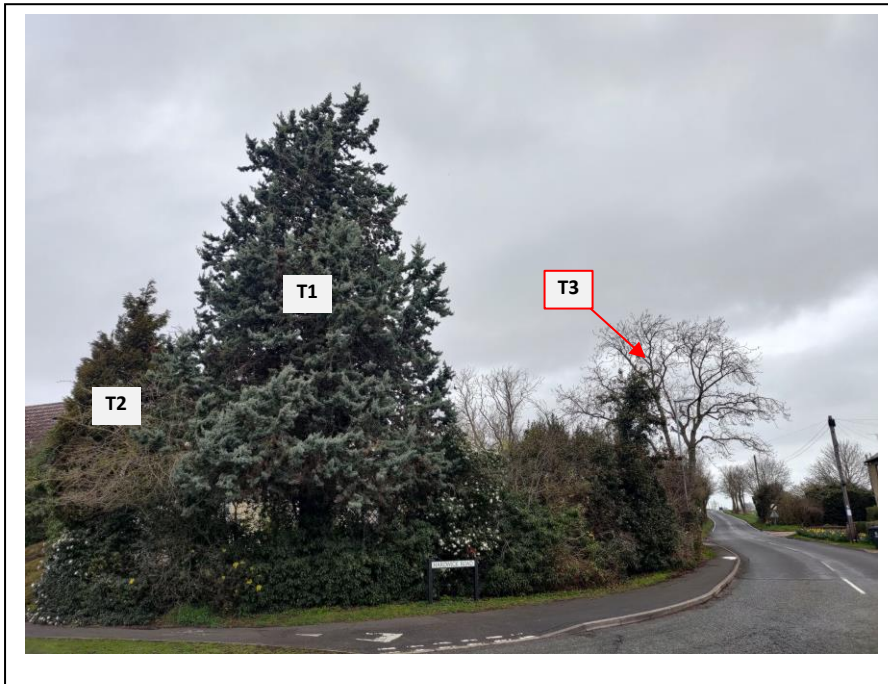
Site Plan



Plan not to scale – indicative only

 Approximate areas of damage

Images





Management of vegetation to alleviate clay shrinkage subsidence.

All vegetation requires water to survive which is accessed from the soil. Clay soils shrink when water abstracted by vegetation exceeds inputs from rainfall, which typically occurs during the summer months. When deciduous vegetation enters dormancy and loses its leaves and rainfall increases during the winter months, soil moisture increases and the clay swells. (Evergreen trees and shrubs use minimal/negligible amounts of soil water during the winter).

Buildings founded on clay are susceptible to movement as the clay shrinks and swells which can result in cracking or other damage.

Where damage does occur, pruning (reducing leaf area) can in some circumstances be effective in restoring stability however, removal of the influencing vegetation (trees, shrubs, climbers) causing the ground movement offers the most predictable and quickest solution in stabilising the clay and hence the building and for this reason is frequently initially recommended as the most appropriate solution.

Often this is unavoidable due to the size or number of influencing trees, shrubs etc and their proximity to the building. Very heavy pruning of some species to a level required to effectively control its water use can result in the trees decline and ultimately death and is one factor considered when making recommendations for remedial tree works. Pruning alone, whilst reducing soil moisture uptake is often an unpredictable management option in restoring building stability either in the short or long term.

In some circumstances however, where vegetation initially recommended for removal is subsequently pruned and monitoring indicates the building has stabilised, removal becomes unnecessary with decisions based on best evidence available at the time.