Addendum Arboricultural Report

Subsidence Damage Investigation at:

60 Smithbarn
Horsham
RH13 6DU



CLIENT:	Crawford & Company
CLIENT REF:	SU2206852
MWA REF:	SUB230208-12272Rev01
MWA CONSULTANT:	Mark Johnson (FdSc ;MArborA)
REPORT DATE:	03/01/2023

SUMMARY

Statutory Controls			Mitigation (Current claim tree works)	
TPO current claim	Yes - T1, T2 and T3		Policy Holder	Yes
TPO future risk	Yes - TG1		Domestic 3rd Party	No
Cons. Area	No		Local Authority	No
Trusts schemes	No		Other	Yes
Local Authority: -	Horsham District Council			

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Introduction

This is an addendum to our initial report dated 18/04/2023 following receipt of a site investigation report and level monitoring.

Acting on instructions from Crawford & Company, the insured property was visited on 06/04/2023 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.

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 2 storey detached house built in 1961. It has been extended with a single-storey addition to the rear which was present in 1985 and was extended to the left in 1987 with a porch addition to the front built c.2003. External areas comprise gardens to the front and rear.

The site is generally level with no adverse topographical features.

Damage Description & History

Damage is throughout the property although principally to the rear. There is cracking internally in multiple rooms across both stories.

At the time of the engineer's inspection (17/01/2023) the structural significance of the damage was found to fall within Category 2 (slight) of Table 1 of BRE Digest 251. For a more detailed synopsis of the damage please refer to the building surveyor's technical report.

We have not been made aware of any previous claims.

Site Investigations

Site investigations were carried out by Fastrack on 28/01/2023, when a single trial pit was hand excavated to reveal the foundations, with a borehole sunk through the base of the trial pit to determine subsoil conditions.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP/BH1	Concrete	1100

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TP/BH1	Silty CLAY	15 - 22	Low - Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	1500	*Quercus* spp. or *Castanea* spp.	Present

Quercus spp. are oaks. *Castanea* spp. include sweet chestnut.

Drains: No information available at the time of writing.

Monitoring: Level monitoring readings are available for the period 10/02/2023 to 22/01/2024.

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.

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 at depths beyond normal ambient soil drying processes, such as evaporation, which is indicative of the soil drying effects of vegetation.

Roots were observed to a depth of 1.5m bgl in TP/BH1 and recovered samples have been positively identified (using anatomical analysis) as Oak the origin of which will be T2 confirming its influence on the soils below the foundations.

Level monitoring has recorded seasonal movement consistent with the influence of T2 on soil moisture and volumes below foundation level.

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 T2 is the primary cause of the current subsidence damage with a potential contribution from T3 (Oak).

T1 is in poor physiological condition. There is major bark delamination on its southern aspect to 4.5m. 3.5mm 'D'-shaped beetle exit holes were observed in the dead and dying bark, these are consistent with colonisation by *Agrilus bigttatus*. Fungal fruiting bodies of *Trametes versicolor* were present on the buttress roots of the southern aspect of the stem. It is considered that this tree is in a terminal state of decline and is recommended for removal based on its condition alone.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that T2 is removed.

Recommended tree works may be subject to change upon receipt of additional information.

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	9	1100 *	5	7.25	Older than Property	Policy Holder
Management history		Subject to past management. Pollarded 2019. Major bark delamination from ground level to 4.5m height (S). Visible 'D' shaped c.3.5mm beetle exit holes in dead bark which appear to be consistent with colonisation by Agrilus bigttatus (S). Tramates versicolor fruiting bodies evident on buttress roots (S).					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					
T2	Oak	20.5	1110	18	9	Older than Property	Croudace Homes Limited Croudace House Caterham CR3 6XQ and Croudace House Letchworth Garden City SG6 3HL
Management history		No significant recent management noted.					
Recommendation		Remove (fell) to near ground level and remove and regrowth.					
T3	Oak	15	1260	24	18.25	Older than Property	Croudace Homes Limited Croudace House Caterham CR3 6XQ and Croudace House Letchworth Garden City SG6 3HL
Management history		No significant recent management noted.					
Recommendation		No works required at present (subject to review if movement persists).					

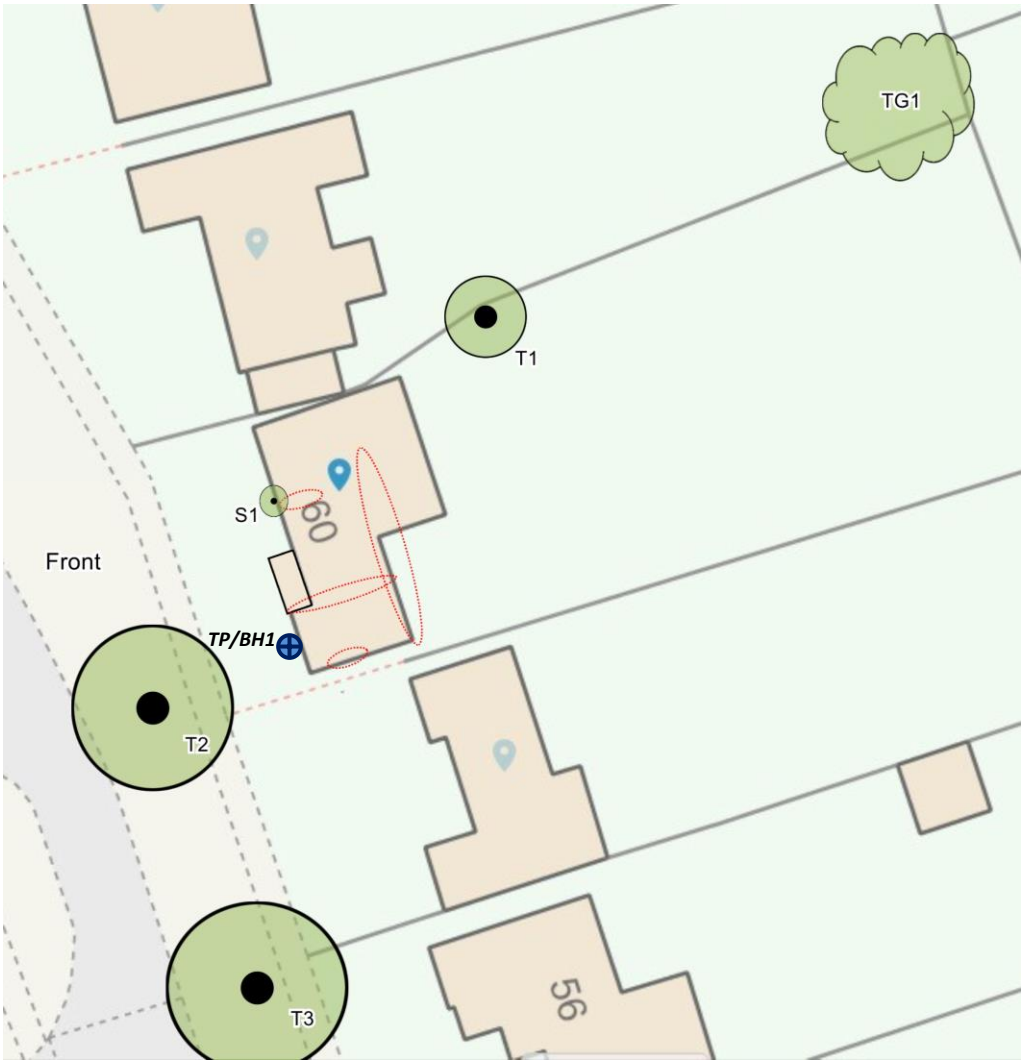
Ms: multi-stemmed * Estimated value

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

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
TG1	Oak	17	900 *	16	37	Older than Property	Third Party 62 Smithbarn RH13 6DU
Management history		No significant recent management noted.					
Recommendation		None at present.					
S1	Pyracantha	1.5	Ms	2.5	0.1	Younger than Property	Policy Holder
Management history		Subject to past management/pruning - appears regularly trimmed.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth.					

Ms: multi-stemmed * Estimated value

Site Plan



Plan not to scale – indicative only

Approximate areas of damage

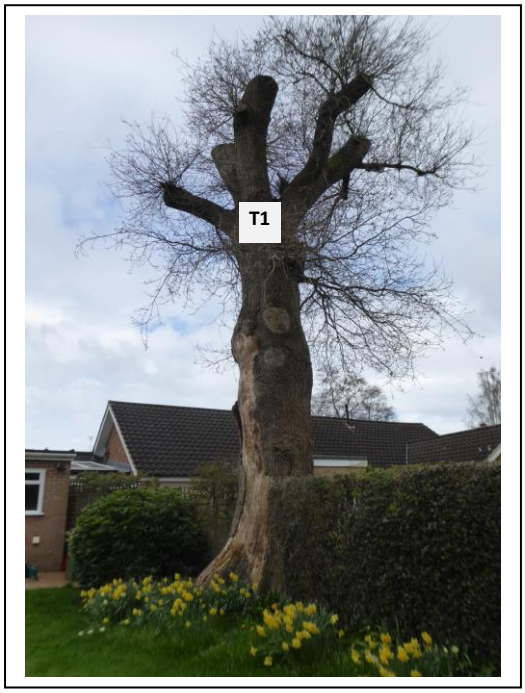
Images



View of T1 and TG1



View of T2 and T3



View of T1



View of T1 beetle exit hole



View of T1 bark delamination and fungal fruit bodies



View of S1

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.