

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

The Lodge
77 Chazey Road
Caversham
RG4 7DU



CLIENT:	Crawford & Company
CLIENT REF:	SU1901098
MWA REF:	SUB191011-5898
MWA CONSULTANT:	Mark Bisley (BSc Hons)
REPORT DATE:	25/11/2019

SUMMARY

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

Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 14/11/2019 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 with attic rooms built c. 1903. There is a detached garage to the front right built in 1978 and a linkage to the garage was converted to a living space in 1996.

External areas comprise gardens to the front and rear. The site is generally level with no adverse topographical features.

Only those trees likely to affect the garage were included in our survey.

Damage Description & History

The current damage affects the front right corner of the garage with internal and external cracking to the walls and cracking along the centre of the floor slab. It was first noticed by the neighbour in December 2018.

At the time of the engineers' inspection (06/03/2019) the structural significance of the damage was found to fall within Category 3 (moderate) of Table 1 of BRE Digest 251.

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 Optera on 17/07/2019, when two trial pits were hand excavated to reveal the foundations, each with a borehole sunk a short distance from the trial pit to determine subsoil conditions. A drains survey was also undertaken.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP1	Concrete	300
TP2	Concrete	300

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
BH1	MADE GROUND gravelly, clayey SAND to 0.30m. Gravelly, clayey SAND to 1.20m. Abandoned at 1.20m due to collapse.	19 – 20	Low – Medium
BH2	Gravelly, very clayey SAND to 0.50m. Stiff, slightly sandy, slightly gravelly CLAY to 1.80m. Terminated at 1.80m.	27 – 30	Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TP/BH1	1800	<i>Pomoideae gp.</i>	-
		<i>Tilia spp.</i>	-
		<i>Aesculus spp.</i>	-
TP/BH2	2500	<i>Tilia spp.</i>	-

Pomoideae gp. includes Apple, Pear, Cotoneaster, Pyracantha, Hawthorn, Whitebeam, Photinia and Rowan.

Tilia spp. are the limes.

Aesculus spp. are the horse chestnuts and buckeyes.

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 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 in TP/BH1 and TP/BH2 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 1800mm bgl in TP/BH1 and recovered samples have been positively identified (using anatomical analysis) as *Pomoideae gp.*, *Tilia spp.* and *Aesculus spp.*, the origin of which will be TG1, T2 and T1 respectively, confirming their influence on the soils below the foundations.

Roots were observed to a depth of 2500mm bgl in TP/BH2 and recovered samples have been positively identified (using anatomical analysis) as *Tilia spp.*, the origin of which will be T2.

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 T2 are the principal cause of the current damage.

T1 is a large tree in close proximity to the garage but it was pollarded c. 5 years ago and has been subject to further management since then. This is likely to have significantly reduced its influence although it remains significant. TG1 is generally smaller vegetation on the side of the garage where soils are mainly sand; as such we do not consider these to be a major factor in the damage.

If an arboricultural solution is to be implemented to mitigate the influence of the implicated trees/vegetation we recommend that T1 and T2 are removed. 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.

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.

It was noted that T3 is suffering die back and had a sparse crown where this was still present. We were unable to identify the cause but believe that the tree is likely to be in terminal decline and should be removed under sound arboricultural management. The target zone for this tree in the event of its failure includes the dwelling, garage, highway and footpath.

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	Horse Chestnut	13	700 *	7 *	3	Older than Property	Third Party The Coach House Chazey Road RG4 7DU
Management history		Subject to past management/pruning.					
Recommendation		Remove (fell) to near ground level.					
T2	Lime	25 *	910	18 *	2	Older than Property	Policy Holder
Management history		No recent management noted.					
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

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

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T3	Cypress	23 *	640	8 *	4	Older than Property	Policy Holder
Management history		Very sparse crown. No past management noted.					
Recommendation		Remove					
T4	Western Red Cedar	23 *	510	8 *	8	Older than Property	Policy Holder
Management history		No past management noted.					
Recommendation		Do not allow to exceed current dimensions.					
T5	Cypress	17	585	6	12	Older than Property	Policy Holder
Management history		No past management noted.					
Recommendation		Do not allow to exceed current dimensions.					
TG1	Cherry, Amelanchier, Japanese Maple, Elaeagnus	5 *	150 Ms *	4	2	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Do not allow to exceed current dimensions.					

Ms: multi-stemmed

* Estimated value

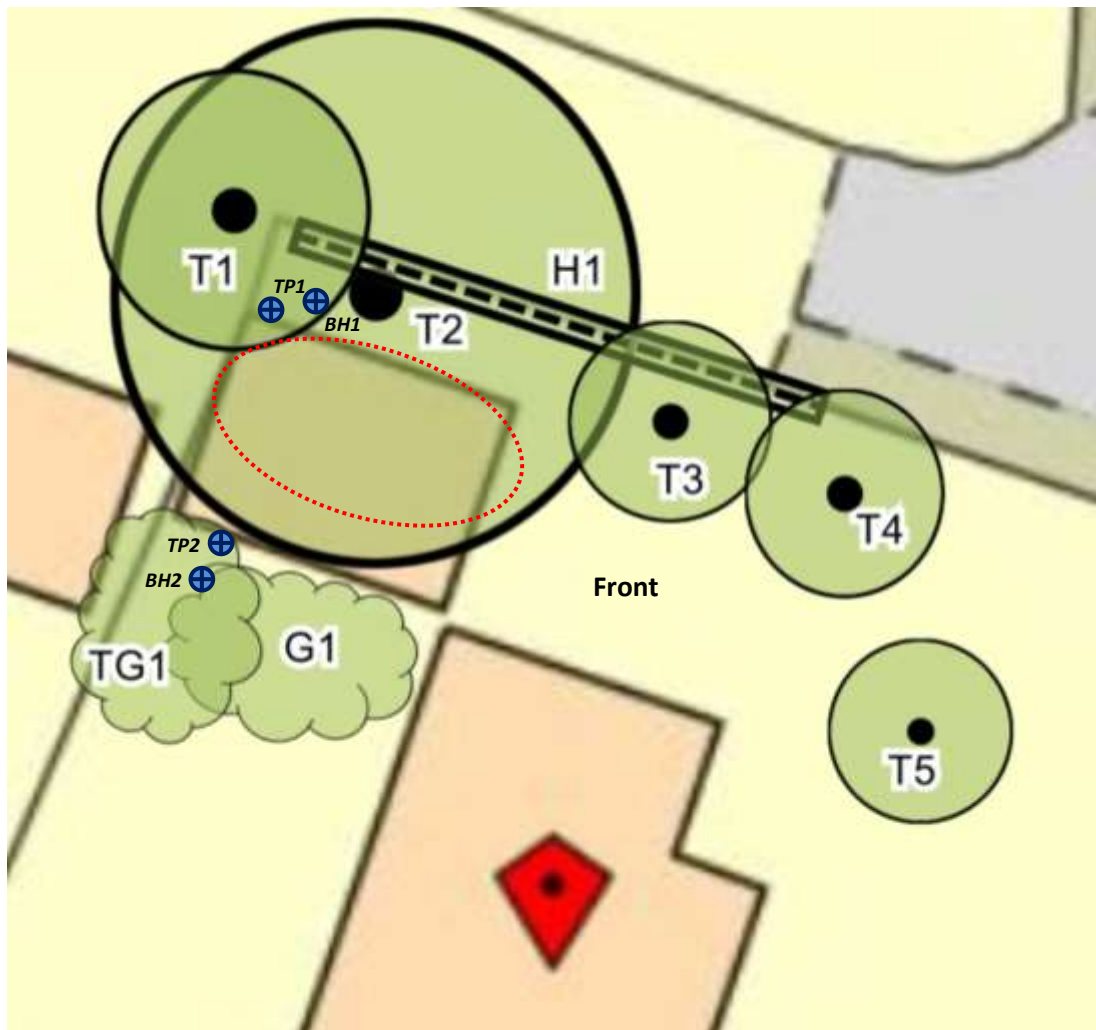
Table 2 cont. Future Risk - Tree Details & Recommendations

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
G1	Camelia, Mock Orange	2	15 *	2	1.5	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Do not allow to exceed current dimensions.					
H1	Privet	2	40 Ms *	1	3	Younger than Property	Policy Holder
Management history		Subject to past management/pruning.					
Recommendation		Do not allow to exceed current dimensions.					

Ms: multi-stemmed

* Estimated value

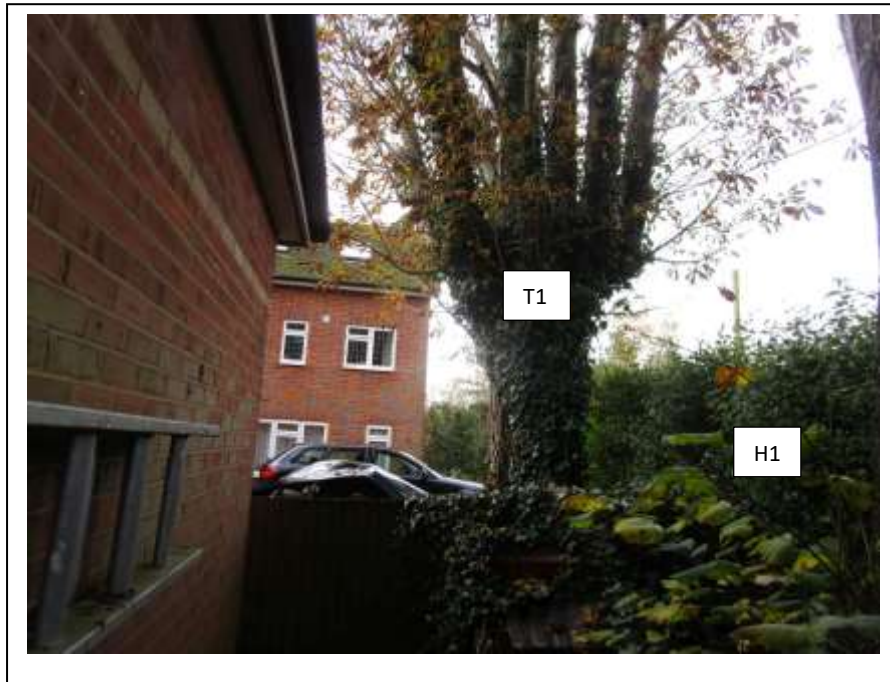
Site Plan



Plan not to scale – indicative only

 Approximate areas of damage

Images



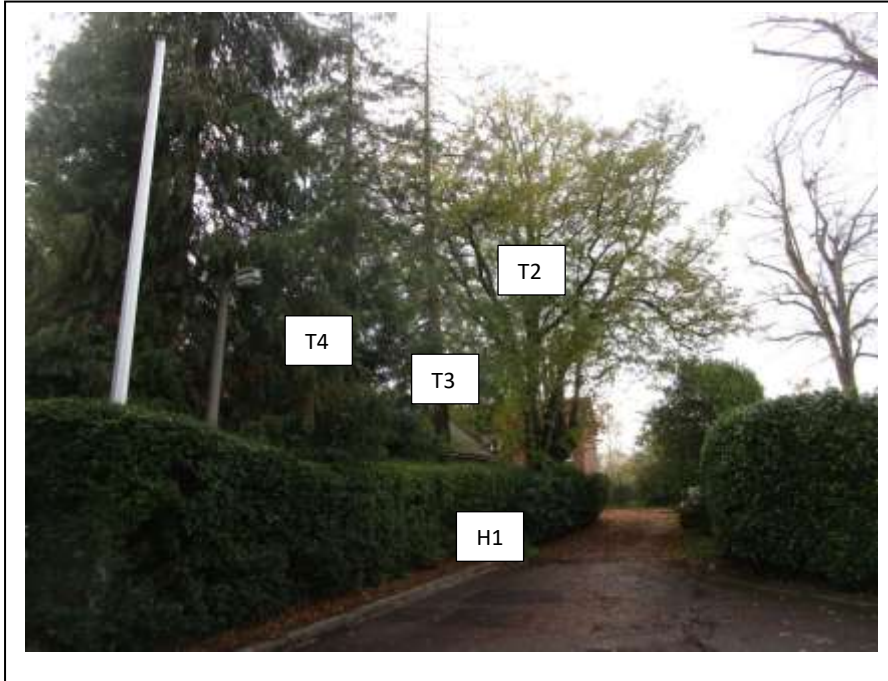
View of T1



View of front of garage

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View of front boundary



View of garage from rear