

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

9 The Laurels
Markfield Court Retirement Village
Markfield
Leicestershire
LE67 9HA



CLIENT:	Crawford & Company
CLIENT REF:	SU1800214
MWA REF:	SUB180419-2267
MWA CONSULTANT:	David Mahon (B.Sc Hons MICFor MArborA)
REPORT DATE:	30-04-2018

SUMMARY

Statutory Controls		Mitigation (Current claim tree works)	
TPO	Yes – T1, T2 (current claim) Yes – T3 (future risk)	Policy Holder	Yes
Cons. Area	No	3 rd Party	Yes
Trusts schemes	N/A	Local Authority	No
Planning	N/A	Other	No
Local Authority:	Hinckley & Bosworth Borough Council		
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Introduction

Acting on instructions from Crawford & Company, the insured property was visited on 27/04/2018 for the purpose of assessing 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 right-hand semi-detached bungalow built in circa 1990. There is a conservatory addition to the rear built around 1980.

External areas comprise gardens to the front and rear.

The site is generally level with no adverse topographical features.

Damage Description & History

The current damage affects the conservatory and was first noticed in October 2017. There is stepped cracking on the right hand wall and separation at the junction with the main building. There is signs of previous repointing.

At the time of the engineers' inspection (06/02/2018) the structural significance of the damage was found to fall within Category 3 (moderate) of Table 1 of BRE Digest 251.

Site investigations

Property: 9 The Laurels,
Markfield Court Retirement Village,
Markfield, LE67 9HA

Client Ref: SU1800214
MWA Ref: SUB180419-2267

Site investigations were carried out by CET on 15/02/2018 when two trial pits were hand excavated to reveal the foundations, with a borehole sunk through the base of each trial pit to determine subsoil conditions. A drains survey was also undertaken.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TH1 (conservatory)	Concrete	350
TH2 (bungalow)	Concrete	1200

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TH/BH1	MADE GROUND: Medium compact dark brown sandy silty clay with brick fragments and clinker to 1.0m Stiff brown silty CLAY. BH ends at 2.2m, too stiff /too hard to hand auger.	20 - 32	Medium
TH/BH2	Stiff brown silty CLAY. BH ends at 2.3m, too stiff /too hard to hand auger.	33 - 37	Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TH/BH1	2200	Quercus spp. (oak)	Present
TH/BH2	2300	Quercus spp. (oak)	Present

Drains: No information available at the time of writing.

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 of medium volume change potential (NHBC Classification) susceptible to undergoing volumetric change in relation to changes in soil moisture.

A comparison between moisture content and the plastic and liquid limits suggests possible desiccation at the time of sampling in TH/BH1 & 2 at depths beyond normal ambient soil drying processes such as evaporation indicative of the soil drying effects of vegetation.

Shear vane testing of the substrate indicates that it is sufficiently consolidated to bear the imposed load and as such the damage cannot be attributed to consolidation settlement. This is borne out by the relative age of the building and the recent appearance of damage.

Roots were observed to a depth of 2.2m and 2.3m and recovered samples from both boreholes have been positively identified (using anatomical analysis) as oak, the origin of which will be T1 and T2 confirming their influence on the soils below the foundations.

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 both T1 and T2 are causal factors of the current subsidence damage.

If an arboricultural solution is to be implemented both trees will need to be 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.

The large oak T3 may also be contributory being within influencing distance of the property however the tree is significantly older than the properties and the removal of T1 & T2 offers the potential to restore stability. If movement persists the management of T3 may need to be reviewed.

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.

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, twin stems	*17.0	*500	*15.0	5.0	Older than property	Policy Holder
Management history		No recent management.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth					
T2	Oak, twin stems	*16.0	*600	*15.0	5.0	Older than property	Policy Holder / 3rd Party:- 7 The Laurels
Management history		No recent management.					
Recommendation		Remove (fell) to near ground level and treat stump to inhibit regrowth					

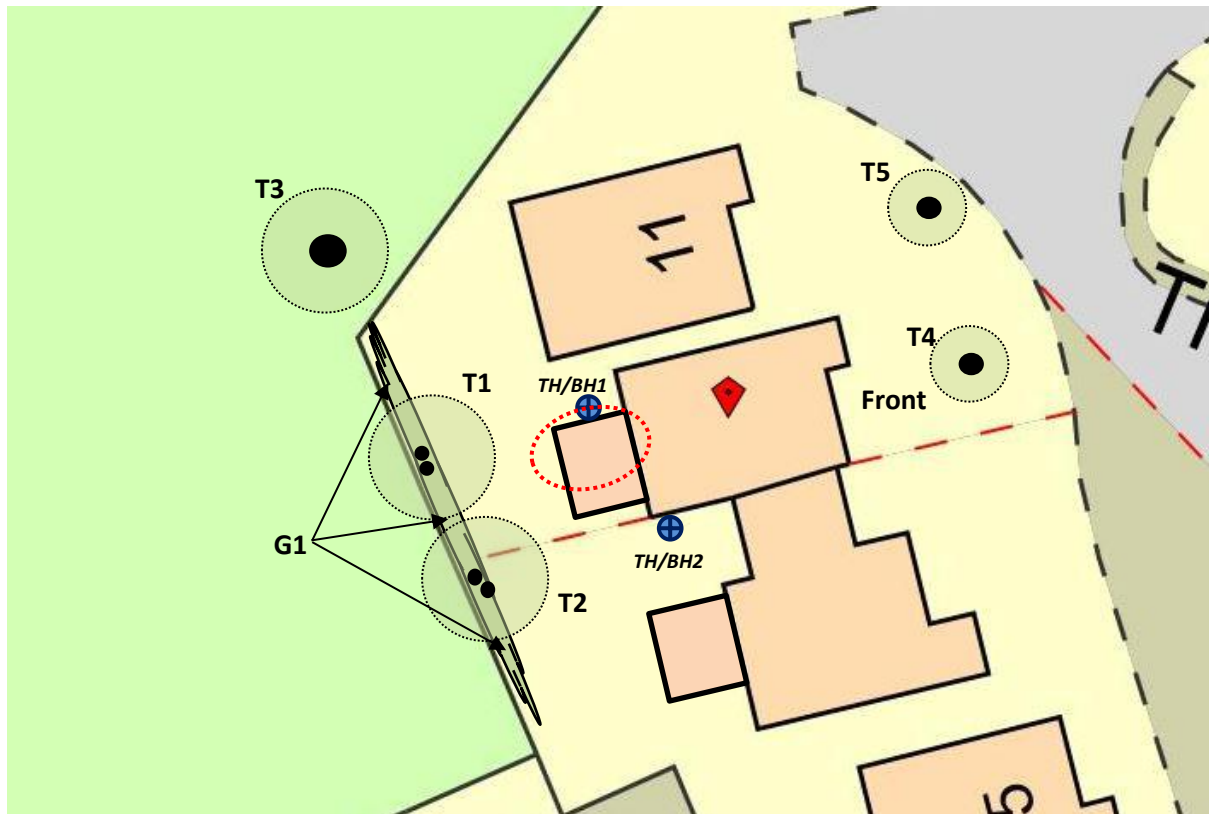
Ms: multi-stemmed * Estimated value

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

Tree No.	Species	Ht (m)	Dia (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T3	Oak	*17.0	*1000	*20	11.0	Older than property	Unknown
Management history		No recent management. Large mature tree					
Recommendation		Do not allow to exceed current dimensions					
T4	Cherry	7.0	250	4.5	6.0	Younger than property	Policy Holder
Management history		Reduced in past. Recently pruned.					
Recommendation		Do not allow to exceed current dimensions					
T5	Cherry	7.0	300	8.0	7.5	Younger than property	Policy Holder / 3rd Party:- 11 The Laurels
Management history		Reduced in past. No recent management.					
Recommendation		Do not allow to exceed current dimensions					
G1	Hawthorn, Field Maple, Holly, Shrubs	6.0 max	*13.0	*5.0	5.0	Younger than property	Policy Holder / 3rd Parties:- 7 & 11 The Laurels
Management history		No recent management.					
Recommendation		Reduce to 3.0m height and prune annually maintain at reduced dimensions					

Ms: multi-stemmed * Estimated value

SITE PLAN



Plan not to scale – indicative only



Approximate areas of damage

Images



View of oaks T1 – T3



View of trees from rear with T2 in foreground



View of T4 & T5