

Arboricultural Appraisal Report

Subsidence Damage Investigation at:

Leisurelands
Gutner Lane
Hayling Island
Hampshire
PO11 0RN



CLIENT:	Crawford & Company
CLIENT REF:	SU1700265
MWA REF:	SUB170613-1561
MWA CONSULTANT:	Mark Bisley (BSc Hons)
REPORT DATE:	19-07-2017

SUMMARY

Statutory Controls		Mitigation (current claim)	
TPO	Yes – T1	Insured	Yes
Cons. Area	No	3 rd Party	Yes
Trusts schemes	N/A	Local Authority	No
Planning	N/A	Other	No
Local Authority: -	Havant Borough Council		

Introduction

Acting on instructions received from Crawford & Company, the insured property was visited on 07/07/2017 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 detached bungalow built c. 1910. There is an extension to the rear.

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 main building and extension and was first noticed some time ago but was not a cause for concern. The cracking is widespread affecting several rooms and recently grew worse prompting a claim in January 2017.

At the time of the engineers' inspection (24/02/2017) the structural significance of the damage was found to fall within Category 2 (slight) of Table 1 of BRE Digest 251.

Site investigations

Site investigations were carried out by CET on 27/04/2017 when three trial pits were hand excavated to reveal the foundations, each with a borehole being sunk through the base of the trial pit to determine subsoil conditions.

Foundations:

Ref	Foundation type	Depth at Underside (mm)
TP1	Concrete (on rubble)	550 (750)
TP2	Concrete	800
TP3	Concrete	400

Soils:

Ref	Description	Plasticity Index (%)	Volume change potential (NHBC)
TH/BH1	MADEGROUND soft silty sandy clay with brick pieces to 1.00m. Firm moist silty CLAY to 1.50m. Stiff silty CLAY to 2.6m. Firm Wet silty CLAY to 3.00m. Terminated at 3.00m	23 - 36	Medium
TH/BH2	Stiff moist grey silty CLAY to 1.50m. Firm moist silty CLAY to 3.00m. Terminated at 3.00m.	17 – 29 16 – 29 modified	Low – Medium Low – Medium
TH/BH3	Firm moist silty CLAY to 1.50m. Stiff silty CLAY to 2.30m. Stiff moist silty CLAY to 3.00m. Terminated at 3.00m.	22 – 30 21 – 28 modified	Medium Medium

Roots:

Ref	Roots Observed to depth of (mm)	Identification	Starch content
TH/BH1	2500	Too juvenile for identification	Absent
TH/BH2	-	-	-
TH/BH3	2500	<i>Quercus</i> spp. <i>Salix</i> spp.	Present Present

Drains: The drains have been surveyed and defects identified including obstructions by silt and a root mass near a displaced joint.

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 low to 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 desiccation in BH1 and BH3, despite standing water being present in BH1 upon completion. The site investigation was conducted in April when soil moisture levels will have had the entire winter to recover and vegetation should not yet be removing significant levels of moisture from the soil.

Comparison of soil suction data with Table 1 of BRE Digest 412 however shows very slight desiccation in BH1 and very slight to slight desiccation in BH2 and BH3.

There is desiccation 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 2500mm bgl in BH1 and BH3. Recovered samples from BH3 have been positively identified (using anatomical analysis) as *Quercus* spp. (Oaks) and *Salix* spp. (Willows), the origin of which will be T1 and T3 respectively, confirming the influence of these trees on the soils below the foundations. Samples from BH1 were too juvenile for identification and did not contain starch, suggesting that they were not alive.

T1 and T3 are both of species often implicated in subsidence but both are located to the right of the property. The left side of the property is within influencing distance of T1 and this, combined with the varied nature of the foundations across the building may explain the damage here. However, drains containing silt are present adjacent to the damaged areas and soil from BH2 was not desiccated.

It is therefore possible that leaks from the drains are masking desiccation in this area.

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

If an arboricultural solution is to be implemented to mitigate the current damage and allow the soils beneath the property to recover to a position such that an effective repair solution can be implemented we recommend that T1 and T3 are removed.

Consideration has been given to pruning 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.

Replacement planting may be considered subject to species choice and planting location.

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	18	960	17	2.8	Similar age as property	Policy Holder
Management history		Decay pocket at base almost fully occluded. Lifted over adjacent garage. Cut back over dwelling.					
Recommendation		Remove and treat stump to inhibit regrowth.					
T3	Willow	18	Ms 600	10	8	Younger than property	3 rd Party:- Willowmead, Gunter Lane
Management history		Cut back to boundary to 6m in height.					
Recommendation		Fell and remove regrowth as it appears.					

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	Cypress	16	Ms 400*	9	11	Younger than property	3rd Party:- Willowmead, Gunter Lane
Management history		Lifted to 4m over property. Topped in past.					
Recommendation		Do not allow to exceed current dimensions.					
T4	Cherry	6	190	7	8	Younger than property	Policy Holder
Management history		Crown lifted.					
Recommendation		Do not allow to exceed current dimensions.					
T5 & T6	Oak	16	590 545	18	19	Younger than property	Policy Holder
Management history		Forming common crown. Lifted over garden.					
Recommendation		Do not allow to exceed current dimensions.					
T7	Plum	7	Ms 125	5	7	Younger than property	3rd Party:- Waste ground to left of property.
Management history		Clipped back over garden.					
Recommendation		Do not allow to exceed current dimensions.					
T8	Hazel	6	Ms 100*	5	5	Younger than property	Policy Holder
Management history		Coppiced tree with good regrowth.					
Recommendation		Remove and treat stump to inhibit regrowth.					

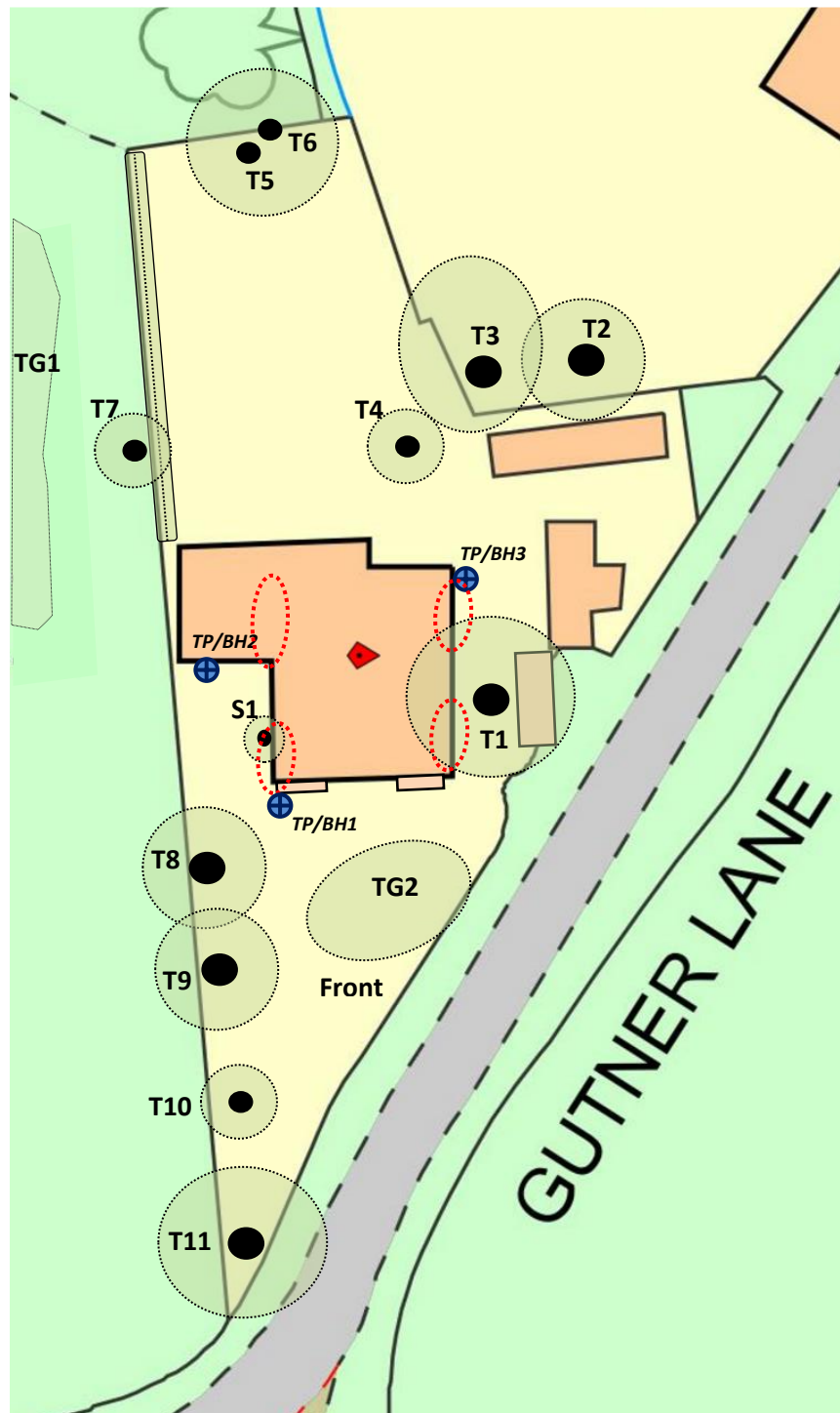
Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
T9	Willow	10	Ms 175	10	7.2	Younger than property	Policy Holder
Management history		Lifted. Coppiced tree with good regrowth.					
Recommendation		Fell and remove regrowth as it appears.					
T10	Eucalyptus	10	215	5	10.5	Younger than property	Policy Holder
Management history		Young. No recent management.					
Recommendation		Do not allow to exceed current dimensions.					
T11	Oak	14	775	15	19.3	Younger than property	Policy Holder
Management history		Lifted over drive. Reduced with significant epicormic growth.					
Recommendation		None.					
TG1	Oak	10	750*	10	10	Younger than property	3rd Party:- Unknown
Management history		Partially obscured by dense brambles. Mutually suppressed. No recent management.					
Recommendation		Do not allow to exceed current dimensions.					
TG2	Apple, Pear	6	100	5	3.3	Younger than property	Policy Holder
Management history		Established Apple to rear with line of young trees at side of drive.					
Recommendation		Do not allow to exceed current dimensions.					

Tree No.	Species	Ht. (m)	Dia. (mm)	Crown Spread (m)	Dist. to building (m)	Age Classification	Ownership
S1	Pyracantha	3	45	2	0.1	Younger than property	Policy Holder
Management history		Lifted.					
Recommendation		Remove and treat stump to inhibit regrowth.					
SG1	Privet, Euonymus	3	Ms 30	2	0.75	Younger than property	Policy Holder
Management history		Face trimmed over garden.					
Recommendation		Reduce and do not allow to exceed 1.75m in height.					

Ms: multi-stemmed

* Estimated value

SITE PLAN



Plan not to scale – indicative only

 Approximate areas of damage

Images



View of front right corner of dwelling



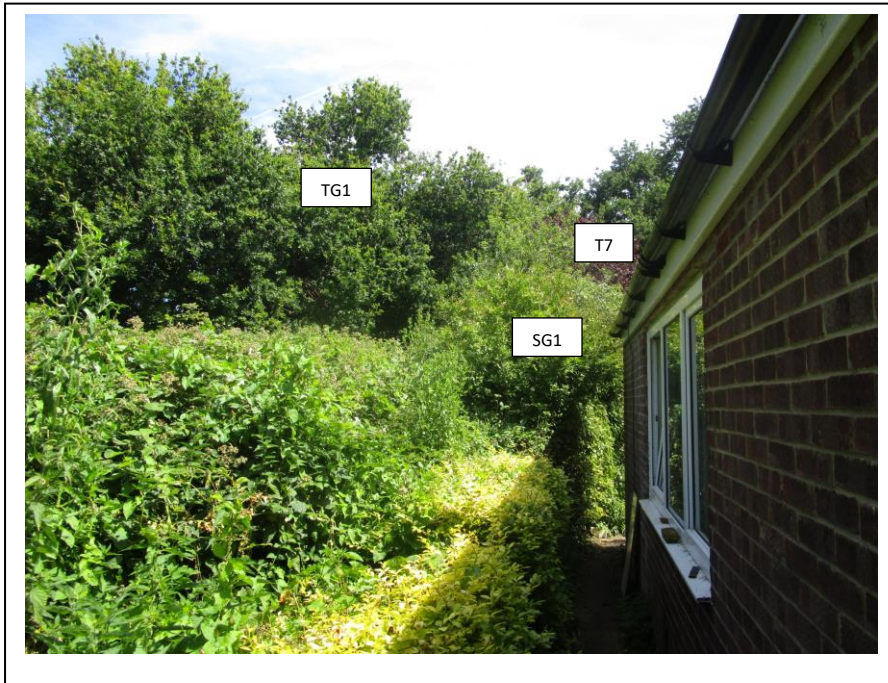
View of rear right corner of dwelling



View of rear garden from right



View of rear garden from beside rear elevation



View of left flank wall



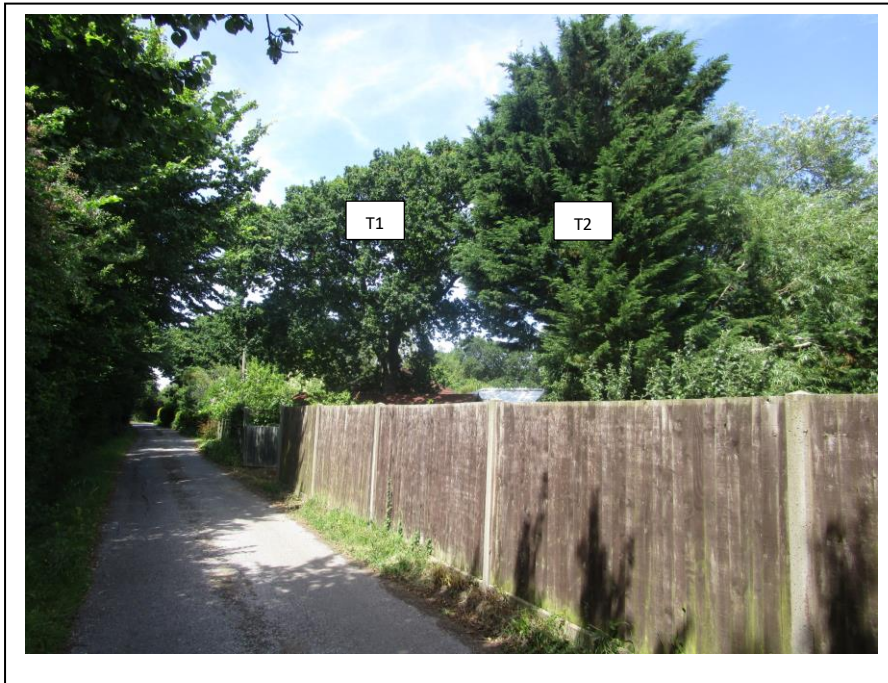
View of S1



View of left side of front garden



View of front left corner of property



View of property looking left along Gunter Lane



View of property looking right along Gunter Lane