Arboricultural Appraisal Report

SUMMARY OF

ARBORICULTURAL MATTERS

Significant Vegetation:	T2
Third Party works:	No
Local Authority:	Havant Borough Council
Statutory protection:	Yes - TPO
Heave Risk:	Within acceptable limits
Roots:	*Quercus spp.* (oak)
Soils:	Highly shrinkable and desiccated
Tree Work Reserve:	Quotation required
Report Date:	16.12.2010

HAVANT BOROUGH COUNCIL
09 MAY 2011
RECEIVED

Property:	22 Oakmont Drive Waterlooville Hampshire PO8 8TH	Client Ref:	NA100336RL/EPL/AGS
		Our Ref:	PO021210.01SJ
		MWA Tel:	0844 243 7899

Arboricultural Appraisal Report

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1.0 Introduction

Acting on instructions received from Riley Larkin the insured property was visited on Thu 09 Dec 2010 for the purpose of assessing the potential role of vegetation in respect of clay-shrinkage subsidence damage.

The scope of our assessment includes opinion relating to mitigation of future risk. Trees, shrubs and hedges not recorded were not judged to be a foreseeable threat to the insured dwelling at the time of our inspection.

Recommendations may be subject to review upon receipt of additional site investigation data and engineering opinion.

2.0 Property Description

The insured property comprises a two storey detached dwelling dating back to circa 1970 added to which are extensions to the rear of the two integral garages.

Externally, to the front is an open garden area dominated by the tarmac driveway and to the rear is an enclosed garden area with a large oak tree located close to the rear boundary.

The property backs onto the adjacent main road and occupies a predominantly level plot.

3.0 Damage Description & History

The damage relevant to this report relates to the rear right-hand corner and structural engineers, Riley Larkin Ltd, describe the damage in their report dated 02.08.10 as follows:

- *Externally, there is cracking around the rear right hand bay and the right hand corner of the property at high and low level, with cracks up to 5mm. The damage is indicative of a downward movement to the rear right corner of the property.*

Engineers have categorised the structural significance of the damage in accordance with the classification given in Table 1 of Digest 251 produced by the Building Research Establishment. In this instance, the damage falls into Category 2 ("slight").

4.0 Site investigations

Site investigations were carried out on 26th July 2010 when a single trial pit was hand excavated to reveal the foundations, with a borehole being sunk through the base of the trial pit to determine subsoil conditions.

Trial Pit & Borehole Locations:

TP/BH1 - Rear RH corner (rear elevation)

Foundations:

TP/BH1 - 1100mm deep 300mm thick concrete foundation

Soils:

TP/BH1 - Stiff brown CLAY becoming firm/stiff after 2.25m below ground level. Plasticity indices range from 48.0% to 53.0% (highly plastic NHBC 4.2).

Roots:

TP/BH1 - *Quercus spp.* (oak) 19no roots recovered down to 2.5m below ground level

Monitoring :

Crack monitoring between July and November 2010 records significant crack closure into the autumn and winter. Level monitoring between August and October 2010 records significant upward vertical movement focused around the rear right-hand corner.

Drains:

Drains are remote from the area of damage and hence were not inspected.

5.0 Discussion

Opinion and recommendations are offered on the understanding that structural engineers are confident that the current building movement is the result of vegetation induced shrinkage and swelling of a cohesive sub strata supporting the structure.

Extensive site investigations to date strongly support engineers views in terms of causation and level monitoring in particular should be regarded as primary evidence when the drying role of trees needs to be proven.

Soil analysis data records significant desiccation of the clay sub strata and moisture depletion peaks at around 1.75m below ground level which is well below the influence of normal ambient drying processes associated with evaporation.

Oak trees are known for their ability to extend their influence to significant depths in clay soils and significant distances from the tree base and the insured oak tree, T2, will be exerting a significant influence on the moisture status of the clay sub strata supporting the rear RH corner. Analysis of roots recovered from TP1 confirms the influence of T2 beneath the rear RH corner.

The location and nature of cracking to the dwelling indicates downward movement towards the oak tree; both crack and level monitoring records significant recovery (crack closure and upward vertical movement) indicative of tree induced clay-shrinkage subsidence damage. The amplitude of recovery between the summer and early winter is consistent with a large tree abstracting significant amounts of moisture from deep horizons in the summer followed the recovery driven by the change in season and increased rainfall.

There are two potential options in terms of considering an arboricultural solution. The first is the removal of a significant percentage of the trees canopy and second is the complete removal of the tree. Engineers have assessed that ground heave will not be sufficient for there to be a risk of further damage.

Pruning is usually an unreliable method of promoting long-term stability because the tree's root system remains active and the pruning itself provokes accelerated re growth from the pruning sites. This growth reaction quickly negates the benefits of canopy removal and any moisture conservation is likely to be short-term.

Removal offers an effective and predictable arboricultural solution and is the best way to promote recovery of soil volumes and a return to long-term stability. In our opinion, damage will return if the oak tree is pruned within acceptable limits i.e. in accordance with the current British Standard for Tree Work 3998.

There is space for the introduction of a replacement tree subject to careful species selection.

6.0 Conclusions

The conditions necessary for tree induced clay-shrinkage ground movement have been established through site investigations and the timing of the damage further underlines the causative role of the oak tree, T2.

Site investigations include crack and level monitoring and the data collected to date strongly supports our views in respect of the role of T2 in the current damage.

The complete removal of T2 offers the only effective and predictable long-term arboricultural solution and engineers have concluded that heave risks are within acceptable limits.

Table 1 **Tree Details**

Tree No.	Species	Ht (m)	Dia (cm)	Crown Spread (m)	Distance to building (m)	Age classification	Ownership
T1	Plum *(Prunus spp)*	6.0	18	6.5	9.8	Early mature	Local Authority
T2	Oak *(Quercus spp)*	17.0	100+	20.0	10.0	Mature	Insured

ms: multi-stemmed

* Denotes estimated value

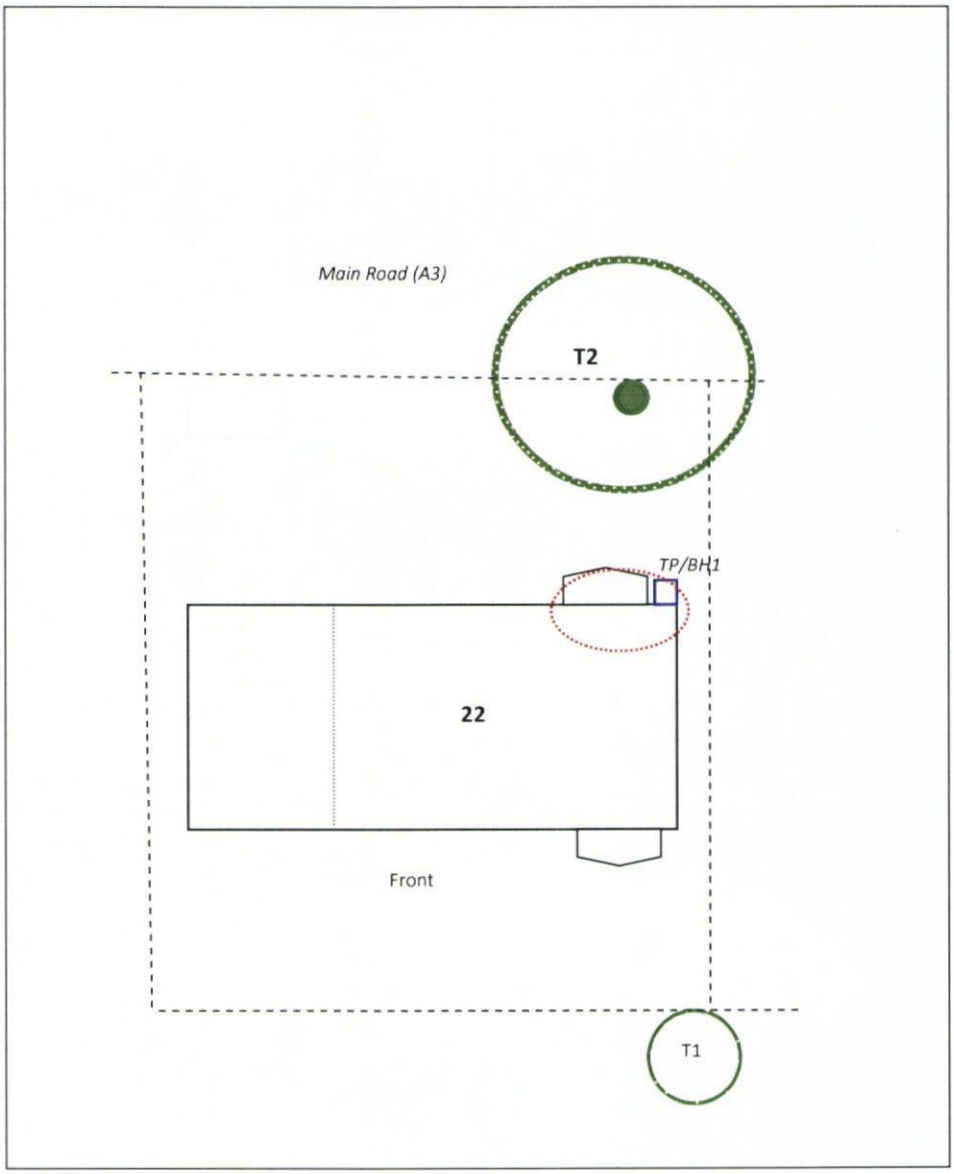
Table 2 **Recommendations – Current Claim**

Tree No.	Species	Ht (m)	Dia (cm)	Work details	Ownership
T2	Oak *(Quercus spp)*	17.0	100+	Remove. Engineers have assessed that resulting ground heave is within acceptable limits.	Insured

Table 3 **Recommendations – Future Risk**

Tree No.	Species	Ht (m)	Dia (cm)	Work details	Ownership
T1	Plum *(Prunus spp)*	6.0	18	Do not allow to exceed current dimensions	Local Authority

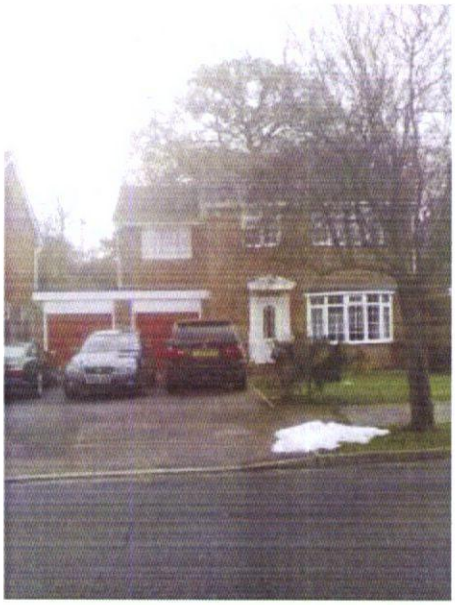
7.0 SITE PLAN



Plan not to scale – indicative only

Area of damage

8.0 Images



FRONT ELEVATION WITH T2 TO REAR



EXTERNAL CRACKING: FLANK WALL



REAR GARDEN AND T2

9.0 Tree Works Estimate

Current claim works can be arranged by a professional tree works contractor* subject to quotation.

**MWA* Arboriculture m*aintains a vetted network of professional tree works contractors throughout the United Kingdom all of which are regularly audited to ensure compliance with our service standards.*

10.0 Statutory Protection

We understand that the oak tree is subject to Tree Preservation Order (TPO).