

PERMIT

Arboricultural Assessment Report

Detailed Report on Trees

For:	Client:	Oriel Services Limited
	Insurer:	
Site:	Policyholder:	
	Risk Address:	52 Hulbert Road, Havant, Hants PO9 3TF
Refs:	OCA Ref:	44406
	Client Ref:	3422730
	Insurer Ref:	09NU608101

Survey By:	Paul Cook		
Title:	Consulting Arborist	Date:	14 January 2010
Report By:	John Hall		
Title:	Senior Consulting Arborist	Date:	12 October 2010



Consulting Arboriculturists

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References

Reference

- 1 Cunningham Lindsey 'Engineering Appraisal Report' dated 04 October 2010
- 2 CET Safehouse Limited 'Factual Report of Investigation' dated 09 November 2009
- 3 Level Monitoring for the period 28 October 2010 to 06 September 2010.

1.0 Introduction & Brief

- 1.1** OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 52 Hulbert Road, Havant, Hants PO9 3TF (the Insured Property). We have been advised by Oriel Services Limited that the Insured Property has suffered differential movement and damage which is considered to have been caused by trees growing adjacent the property influencing soils beneath its foundations.
- 1.2** We have been instructed to undertake a survey of the vegetation growing adjacent the Insured Property, to provide our opinion as to whether, based on the available information any of this vegetation is likely to be influencing soil moisture levels beneath the foundations of the property and if so to provide recommendations as to what tree management could be implemented to effectively prevent damage continuing.

2.0 Limitations

- 2.1** Recommendations, with respect to tree management, are associated with the risk address following consultation with Engineers. In relation to the possibility of heave damage, the owners of any trees in third party control must obtain their own advice in respect of the possibility of any damage to their own or other structures outside of the control of the insured.
- 2.2** Recommendations do not take account of any necessary permission (statutory or otherwise) that must be obtained before proceeding with any tree works.

3.0 Evidential Assessment

Circumstances of discovery	The Engineer has advised that damage was discovered in August 2009.
Engineers brief description of main damage	The Engineer describes the main area of damage is to the rear, left and right elevations of the two storey projection to the rear. The Engineer states that this damage takes the form of tapering diagonal and vertical cracks.
Engineers brief description of the mechanism of movement	The Engineer has advised that the pattern of damage indicates a mechanism of downwards movement of the rear two storey projection and also to the rear right-hand corner.
Engineers BRE 251 numerical category	The Engineer has classified the damage as category 2-3 (slight to moderate) in accordance with the BRE Digest 251 – Assessment of damage in low-rise buildings.
Engineers assessment of onset and progression of damage	The Engineer considers that damage has occurred during the summer months of 2009 and that it is likely that movement will be of a cyclical nature with cracks opening in the summer and closing in the winter.
Engineers conclusion as to cause of damage	The Engineer has concluded that the damage has resulted from clay shrinkage subsidence. This has been caused by the action of roots from trees.
Foundations	Site investigations comprised of two trial pits with associated boreholes (TP/BH 1 and 2). TP/BH 1: That was excavated adjacent the rear right hand corner of the Insured Property. The excavations revealed foundations at this point to be constructed at a depth of 570mm below ground level. TP/BH 2: That was excavated adjacent the rear left hand corner of the Insured Property. The excavations revealed foundations at this point to be constructed at a depth of 800mm below ground level.
Trial Pit / Borehole, soil characteristics description	TP/BH 1: Soils at the underside of the foundations are described as stiff silty Clay to a depth of 4.6m. The borehole ended at a depth of 4.6m as the soil was too stiff to hand auger. TP/BH 2: Soils at the underside of the foundations are described as stiff silty Clay to a depth of 5m. The borehole ended at 5m.

Soil plasticity	TP/BH 1: Soil samples were taken from the trial pit and borehole and were subjected to laboratory testing. The results of these tests indicate that soils beneath the rear right hand corner of the Insured Property have modified plasticity indices ranging between 48% and 53%. This confirms that underlying soils have a high potential for volume change due to their moisture content. TP/BH 1: Soil samples were taken from the trial pit and borehole and were subjected to laboratory testing. The results of these tests indicate that soils beneath the rear left hand corner of the Insured Property have modified plasticity indices ranging between 44% and 57%. This confirms that underlying soils have a high potential for volume change due to their moisture content.
Desiccation	TP/BH 1: The Soil Suction Profile is indicative of desiccation at around a depth of 1m. This is demonstrated by the suction values increasing from 150 kPa at a depth of 0.57m to 335 kPa at 1m. Suction values then decrease beneath this depth. TP/BH 2: The Soil Suction Profile is indicative of desiccation at around a depth of 1.5m. This is demonstrated by the suction values increasing from 230 kPa at a depth of 1m to 250 kPa at 1.5m. Suction values then decrease beneath this depth.
Heave Potential	The Engineer does not consider heave to be a consideration should the adjacent vegetation be removed.
Roots as described in Trial Pit / Borehole Log	Roots of up to 3mm in diameter were noted at the underside of foundations in Trial Pit 1 and 2. Roots of up to 1mm in diameter were noted to a depth of 2m in Borehole 1 and roots of up to 2mm in diameter were noted to a depth of 2m in Borehole 2.
Laboratory analysis of roots	Root samples were taken from the trial pit and borehole and have been subject to laboratory testing using light microscopy techniques. The results of these tests are as follows: TP1 (underside) – a member of the group <i>Pomoideae</i> (members include Apple, Pear, Hawthorn, Rowan and Whitebeam, <i>Cotoneaster</i> and <i>Pyracantha</i>) 2 roots of up to 1mm in diameter. TP2 (underside) – <i>Salix</i> or <i>Populus</i> (Willow or Poplar) 1 root of up to 0.5mm in diameter. BH2 (2m depth) – <i>Salix</i> or <i>Populus</i> (Willow or Poplar) 1 root of up to 1mm in diameter.

Drainage	Engineers do not consider leaking or damaged drains to be a factor in current damage.
Monitoring	A programme of precise level monitoring is currently being undertaken at the Insured Property. Readings are available for the period 28 October 2010 to 06 September 2010 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at points 6, 7, 8, 9, and 10. I note that these points are closest to Grey Poplar T1, Grey Poplar T2 and Sycamore T3.
Estimated cost of superstructure and repair works if tree removed	£14,000.00
Estimated cost of works if trees retained	£45,000.00

4.0 Conclusions

From the evidence summarised above I consider that I have demonstrated that on the balance of probabilities:

4.1 Tree Roots have extended beneath the foundations of the risk address

Roots have been noted throughout TP 1 and 2 and to a maximum depth of 2m in BH 1 and 2.

Samples of these roots have been tested using light microscopy techniques and have been formally identified as *Pomoideae* and *Salix* or *Populus*.

With reference to the *Salix* or *Populus* roots recovered, given their size, species and proximity to the location of the trial pit/borehole and the absence of any Willow within the immediate vicinity, I consider it possible that these roots have emanated from Grey Poplar T1 and Grey Poplar T2.

With reference to the *Pomoideae* root recovered, during our Site Survey no significant vegetation relating to this was noted within the immediate vicinity and it is believed that these roots have emanated from vegetation previously removed.

No roots relating to Sycamore were recovered during investigations. However, given its size and proximity to the Insured Property I consider that it is likely that roots from Sycamore T3 have also extended beneath the depth of foundations.

4.2 Damage to the risk address has resulted due to the presence of these roots

The timing of damage is consistent with a time of year when soil moisture deficits due to the influence of adjacent vegetation would be at or reaching their peak.

The mechanism of movement as described by the Engineer is entirely consistent with the location of Grey Poplar T1, Grey Poplar T2 and Sycamore T3.

Shrinkable clay soils have been encountered beneath foundations at the rear right hand corner and rear left hand corner. These soils will be subject to volumetric changes due to fluctuations in their moisture content.

The soils analysis results indicate that underlying soils are in a desiccated condition.

Level monitoring demonstrates a seasonal pattern of movement that I can only attribute to the influence of adjacent vegetation. I note that the greatest amplitude of movement is consistent with the location of Grey Poplar T1, Grey Poplar T2 and Sycamore T3.

Engineers have confirmed that other potential causes of damage such as leaking or damaged drains have been discounted as a cause of the current damage.

Therefore it is my opinion that sufficient information has been provided to demonstrate that, on the balance of probabilities, Grey Poplar T1, Grey Poplar T2 and Sycamore T3 are the material cause of the current subsidence damage

I do not consider that there is any other vegetation growing adjacent the Insured Property that could be considered to be a factor in current damage.

5.0 Recommendations

Given their proximity to the Insured Property I do not consider that undertaking pruning works to Grey Poplar T1, Grey Poplar T2 and Sycamore T3 will provide either an effective or sustainable means of controlling their water use. Therefore and in order to provide a long-term solution to the current subsidence damage I recommend that Grey Poplar T1, Grey Poplar T2 and Sycamore T3 be removed.

5.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T1	Grey Poplar	Fell to ground level and remove the stump to prevent future growth
T2	Grey Poplar	Fell to ground level and remove the stump to prevent future growth
T3	Sycamore	Fell to ground level and treat stump with an appropriate herbicide to prevent future growth

5.0 Vegetation Survey

The vegetation growing adjacent the risk address has been surveyed in accordance with the Brief set out at s.1.0 of this report. All vegetation has been surveyed from the ground using digital measuring devices and/or standard tape measures. All distances are measured to the nearest point of the risk address unless otherwise stated.

Key to Abbreviations

Age Class	Y – Young, EM - Early Mature, M – Mature, FM - Fully Mature, OM - Over Mature
Condition	A – Good, B - Minor problems, C- Major problems, D – Dead, Dying or Dangerous
Stem Diameter	MS - Multi-stemmed tree
Ownership	PH - Within boundary of risk address, 3 – Within boundary of third party properties, LA – within land owned by a Local Authority, U – Within land of indeterminable ownership.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
T1	Grey Poplar	51-75	M	B	18.5	18 est	800 est	22.5	PH

Comments: Grey Poplar T1 is located to the rear right corner of the Insured Property. This tree does not appear to have been the subject of significant pruning works. However some minor crown thinning and removal of deadwood has been undertaken in the past. No defects were noted at the time of inspection.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
T2	Grey Poplar	51-75	M	B	17	15 est	800 est	15.5	PH

Comments: Grey Poplar T2 is located to the rear left corner of the Insured Property and is growing within 7m of the neighbouring property at 2a Jessie Road. This tree does not appear to have been the subject of significant pruning works. However, some minor crown thinning and removal of deadwood has been undertaken in the past. A shed structure has been built beneath the canopy of this tree, therefore limiting access to it. No defects were noted at the time of inspection.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
T3	Sycamore	11-25	EM	B	9.4	7	300 est	11 est	PH/3

Comments: Sycamore T3 is located to the rear left corner of the Insured Property and is growing on the boundary adjoining the neighbouring property at 54 Hulbert Road. This tree does not appear to have been the subject of significant pruning works however some minor pruning has been undertaken in the past. A shed structure has been built beneath the canopy of this tree, therefore limiting access to it. No defects were noted at the time of inspection.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
T4	Elm species	11-25	EM	B	5.9	6	MS to 200	12.8	PH

Comments: Elm species T4 is located to the rear of the Insured Property. This tree does not appear to have been the subject of significant pruning works however some minor pruning has been undertaken in the past. No defects were noted at the time of inspection.

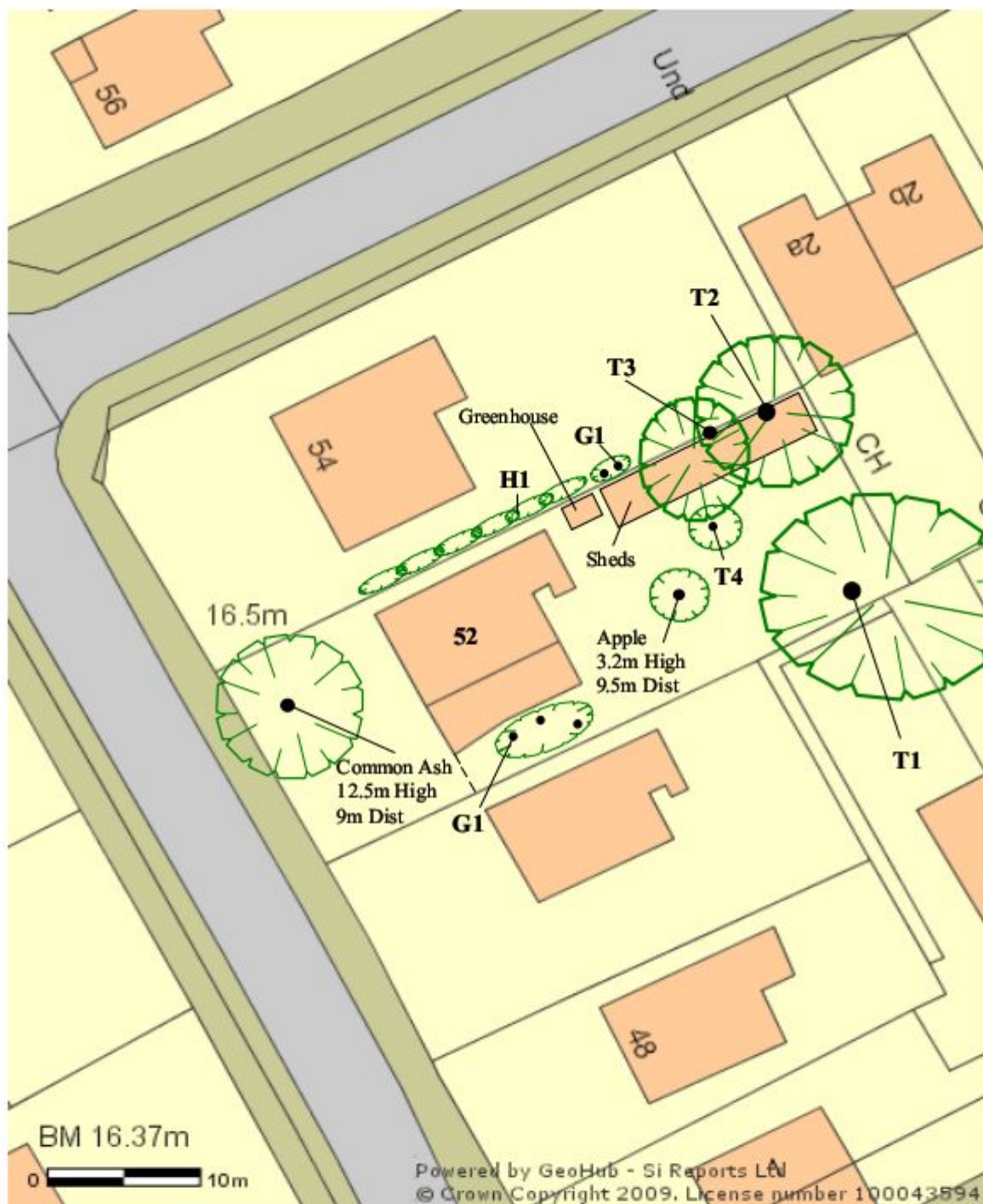
Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
G1	Common Ash	11-25	EM	C	1.8	2	2 x 130	6.2	3

Comments: Common Ash G1 is located to the rear left of the Insured Property and is growing within the neighbouring garden at 54 Hulbert Road. This group of trees has been the subject of significant pruning in the past.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
G2	Fig and Damson	11-25	EM	B	4.5	To 4	60 - 120	3.2	PH

Comments: Fig and Damson G2 is located to the right of the Insured Property. This group of trees does not appear to have been the subject of significant pruning works however some minor pruning has been undertaken in the past. No defects were noted at the time of inspection.

Tree No.	Species (Common Name)	Estimated Age	Age Class	Cond	Height (m)	Crown Spread (m)	Stem Diam (mm)	Dist to bldg (m)	Owner-ship
H1	Mixed Hedge	11-25	EM	B	1.5	to 1	MS	1.5+	3
Comments: Mixed Hedge H1 is growing along the left hand side boundary of the Insured Property and is situated within the neighbouring garden at 54 Hulbert Road. This hedge comprises of Honeysuckle, Blackcurrant and Euonymus and has been maintained in the past.									



(NB: This plan may not be a comprehensive record of site features.)

Title: 52 Hulbert Road, Havant,
Hampshire PO9 3TF

Client: Oriel

Scale: N T S

Drawn Date: 14.01.10

Job Ref: 44406

OCA
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Consulting Arboriculturists