

Arboricultural Assessment Report

Detailed Report on Trees

For:	Client:	Oriel Services Limited
	Insurer:	
Site:	Policyholder:	
	Risk Address:	16 Downside Crescent, London NW3 2AP
Refs:	OCA Ref:	
	Client Ref:	
	Insurer Ref:	

Survey By:	Chris Davies		
Title:	Consulting Arborist	Date:	24 April 2012
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Title:	Senior Consulting Arborist	Date:	21 June 2013



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References

Reference

- 1** Cunningham Lindsey 'Engineering Appraisal Report' dated 20 March 2012
- 2** CET Safehouse Limited 'Factual Report of Investigation' dated 14 March 2012
- 3** Level Monitoring for the period 13 March 2012 to 06 May 2013.
- 4** Crack Monitoring for the period 13 March 2012 to 06 May 2013.

1.0 Introduction & Brief

- 1.1 OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 16 Downside Crescent, London NW3 2AP (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.
- 1.3 The vegetation growing adjacent the risk address 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.

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 first discovered in 2006. The damage was reported to insurers in 2008 and investigations were undertaken. Superstructure repairs were proposed but these were not undertaken. The claim was then notified again in October 2011.
Engineers brief description of main damage	The Engineer describes the main area of damage is at the junction of the rear extension and the main house. The Engineer states that this damage takes the form of cracking.
Engineers brief description of the mechanism of movement	The Engineer has advised that the pattern of movement indicates a mechanism of downwards movement to the rear wall of the rear elevation and rotation of the rear extension towards the rear.
Engineers BRE 251 numerical category	The Engineer has classified the damage as category 2 (slight) 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 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 one trial pit and borehole that was excavated adjacent the rear left corner of the extension and adjacent to the rear wall at the insured property. The excavations revealed foundations at this point to be constructed at a depth of 900mm below ground level.
Trial Pit / Borehole, soil characteristics description	Soils at the underside of the foundations are described as: made ground to a depth of 1.10m; firm silty Clay to a depth of 2m and stiff silty Clay to a depth of 8m. The borehole also formed the datum point and ended at 8m.
Soil plasticity	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 adjacent the rear left corner of the extension and adjacent to the rear wall at the insured property have modified plasticity indices ranging between 24% and 58%. This confirms that underlying soils have a moderate to high potential for volume change due to their moisture content.
Desiccation	The soils analysis data is inconclusive in relation to whether underlying soils are in a desiccated condition or not.
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. Roots of up to 1mm in diameter were noted to a depth of 2.7m in Borehole 1.
Laboratory analysis of roots	<p>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:</p> <p>TP1 (underside) – <i>Fraxinus</i> spp. (Ash) 5 roots of up to 1.5mm in diameter.</p> <p>BH1 (2.7m depth) – <i>Taxodiaceae</i> (include Coast Redwood, Dawn Redwood, Wellingtonia and Japanese Red Cedar) 2 roots of up to 3mm in diameter.</p>
Drainage	Engineers do not consider leaking or damaged drains to be a factor in current damage. The high shear vane readings appear to support this opinion.
Monitoring	<p>A programme of precise level monitoring is currently being undertaken at the insured property. Readings are available for the period 13 March 2012 to 16 May 2013 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at points 1 and 2. I note that these points are closest to Swamp Cypress T3, Ash T5 and Ash T6.</p> <p>Crack monitoring is also being undertaken at the insured property and readings are available for the period 13 March 2012 to 16 May 2013. The readings predominantly show a pattern of seasonal movement consistent with vegetation related subsidence.</p>
Estimated cost of superstructure and repair works if tree removed	£20,000.00
Estimated cost of works if trees retained	

4.0 Conclusions

From the evidence summarised above we consider that we 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 TP1 and to a maximum depth of 2.7m in BH1.

Samples of these roots have been tested using light microscopy techniques and have been formally identified as *Fraxinus* and *Taxodiaceae*.

With reference to the *Fraxinus* roots recovered, given their size, species and proximity to the location of the trial pit/borehole, we consider that these roots have probably emanated from two sources which include Ash T5 and Ash T6.

With reference to the *Taxodiaceae* roots recovered, given its size, species and proximity to the location of the trial pit/borehole, we consider that these roots have emanated from Swamp Cypress T3.

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 Swamp Cypress T3, Ash T5 and Ash T6.

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

Level monitoring demonstrates a seasonal pattern of movement that we can only attribute to the influence of adjacent vegetation. We note that the greatest amplitude of movement is recorded at points 1 and 2. I note that these points are closest to Swamp Cypress T3, Ash T5 and Ash T6.

Crack monitoring readings show limited movement but they are predominantly consistent with a seasonal pattern of movement that we can only attribute to the influence of adjacent vegetation.

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 our opinion that sufficient information has been provided to demonstrate that, on the balance of probabilities, Swamp Cypress T3, Ash T5 and Ash T6 are the material cause of current subsidence damage.

No roots relating to any additional vegetation were recovered during investigations. Despite additional vegetation growing in close proximity of the rear of the insured property, given their current dimensions, they have a smaller leaf surface area and as such their water use will be limited. Therefore I consider that any influence they may be having on soil moisture levels beneath foundations is likely to be negligible and as such I do not consider this vegetation to be a factor in current damage.

We 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 close proximity to the insured property we do not consider that undertaking pruning works to Swamp Cypress T3, Ash T5 and Ash T6 will provide either an effective or sustainable means of controlling their water use. We note that Ash T5 and Ash T6 have been subject to regular 'topping' works in the past but that these works have not prevented current damage occurring. Therefore and in order to provide a long-term solution to the current subsidence damage we recommend Swamp Cypress T3, Ash T5 and Ash T6 be removed.

5.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T3	Swamp Cypress	Fell as close to ground level as is practicable
T5	Ash	Fell as close to ground level as is practicable and treat the stump with an appropriate herbicide to prevent future growth
T6	Ash	Fell as close to ground level as is practicable and treat the stump with an appropriate herbicide to prevent future growth

Age Class	YO – Young, SM – Semi-Mature, EM – Early Mature, MA – Mature, FM – Fully Mature, OM – Over Mature	Ownership	PH – Within boundary of risk address. P3P – Within boundary of third party properties. LA – Within land owned by a Local Authority. C3P – Commercial third party. U – Within land of indeterminable ownership.
Condition	G – Good, F – Fair, P – Poor, D – Dead, Dying or Dangerous		
Stem Diameter	MS – Multi-stemmed tree		



Tree No	Common Name	Age Class	Condition	Height (m)	Crown Spread (m)	Stem diam. (mm)	Dist to bldg (m)	Pruning history	Recommendation	Tree work constraints	Notes	Owner address	Owner
S1	Californian Lillac	MA	F	2.2	2	110	2.7	Trimmed regularly	No work required.	N/A		16 Downside Crescent, London, NW3 2AP	PH
T1	Laburnum	SM	F	7.2	4	220	6.2	Pruned regularly	No work required.	N/A		16 Downside Crescent, London, NW3 2AP	PH
T2	False Cypress	SM	F	9.2	5	270	11.4	Reduced >5 years ago	No work required.	N/A		16 Downside Crescent, London, NW3 2AP	PH
T3	Swamp Cypress	MA	F	17.5	12.5	1100	16.5	No significant past tree works	Fell close to ground level	TPO	Dimensions estimated due to restricted view.	76 Lawn Road, London, NW3 2XB	P3P
T4	Holly	MA	F	9.5	6	300	15.5	No significant past tree works	No work required.	N/A	Dimensions estimated due to restricted view.	76 Lawn Road, London, NW3 2XB	P3P
T5	Ash	MA	F	13	10	600	20	Reduced 2 years ago	Fell and treat stump.	CA	Dimensions estimated due to restricted view.	75 Lawn Road, London, NW3 2XB	P3P
T6	Ash	MA	F	9	6	500	16	Reduced 2 years ago	Fell and treat stump.	TPO	Dimensions estimated due to restricted view.	20 Downside Crescent, London, NW3 2AP	P3P
G1	Mixed Species	MA	F	9	5	270	6.2	Trimmed regularly	No work required.	N/A	Group comprises of two Cotoneaster, a Pine at the furthest end and a dwarf Cypress at nearest point.	16 Downside Crescent, London, NW3 2AP	PH

