Arboricultural Assessment Report

Detailed Report on Trees

For:	**Client:**	Oriel Services Limited
	Insurer:	Zurich - UKPL
Site:	**Policyholder:**	Mr. Hitchiner
	Risk Address:	18 Crystal Way, Waterlooville, Hants, PO7 8NB
Refs:	**OCA Ref:**	55556
	Client Ref:	7562075
	Insurer Ref:	10/1148334

Survey By:	Michael Lawson		
Title:	Principal Consultant	**Date:**	14 January 2014
Report By:	Sue Lawson		
Title:	Consulting Arborist	**Date:**	12 February 2014

OCA UK Limited

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1 Cunningham Lindsey Engineering Appraisal Report' dated 31/12/13

2 CET Safehouse Limited 'Factual Report of Investigation' dated 14/11/13

Cunningham Lindsey Recovery Engineering Appraisal Report dates 08/02/14

1.0 Introduction & Brief

1.1 OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 18 Crystal Way, Waterlooville, Hants, PO7 8NB (the insured property). We have been advised by our client 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.

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3.0. Description of the Site and Surroundings

3.1 The insured property is a detached house situated in a residential estate adjacent the A3(M). The property dates from around the 1980s and is situated within a cul-de-sac. Other similar houses are situated within the cul-de-sac and the estate in general contains various detached and semi-detached houses of a similar age. The gardens of the properties contain various ornamental trees and shrubs. Groups of mature trees are located within the estate and around the boundaries.

3.2 The property has gardens to the front and rear which are of a size typical of an estate of this age. The front garden of the property contains a Lawson Cypress hedge (G1) which, although pruned in the past, does not appear to have undergone any significant recent pruning. The rear garden contains a number of trees which are not relevant to the current claim.

3.3 To the right hand side of the property, there are three trees Oak T1, Oak T2 and Beech T3 which are growing on land maintained by Havant Borough Council. These trees have significant further growth potential and appear to have undergone no significant recent pruning. Also to the left hand side are two trees Oaks T4 and T5 which are situated within a third party garden (provisionally identified as No. 50 Topaz Grove). These trees are not yet fully mature and appear to have undergone no significant recent pruning. We understand, from speaking to the Policyholder, that T4 and T5 may be subject to a Tree Preservation Order.

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4.0 Evidential Assessment

Circumstances of discovery	The Engineer has advised that damage was discovered in October 2013.
Engineer's brief description of main damage	The Engineer describes the main area of damage to the front right corner. The Engineer states that this damage takes the form of tapering diagonal cracks.
Engineer's brief description of the mechanism of movement	The Engineer has advised that the pattern of movement indicates a mechanism of downwards movement to front right corner.
Engineer's BRE 251 numerical category	The Engineer has classified the damage as category 3 (moderate) in accordance with the BRE Digest 251 – Assessment of damage in low-rise buildings.
Engineer's assessment of onset and progression of damage	The Engineer considers that damage has occurred recently and that it is likely that movement will be of a cyclical nature with cracks opening in the summer and closing in the winter.
Engineer's conclusion as to cause of damage	The Engineer has concluded that the damage has resulted from vegetation-related clay shrinkage subsidence.
Foundations	Site investigations comprised of one trial pit and borehole that was excavated adjacent the front right corner of the insured property. The excavations revealed foundations at this point to be constructed at a depth of 1800mm below ground level.
Trial Pit / Borehole, soil characteristics description	Soils at the underside of the foundations are described as: Stiff, silty clay with partings of silt and fine sand to a depth of 1.8m and very stiff clay beneath this to a depth of 3.0m. The borehole terminated at 3m depth.
Soil plasticity	At this stage, we have not been provided with results of laboratory testing of the soil.
Desiccation	See above. However the Engineer has confirmed that soil analysis reveals no signs of desiccation probably due to the fact that soils had rehydrated when samples were taken.
Heave Potential	The Engineer has confirmed that he does not consider there to be a significant risk of heave should the adjacent vegetation be removed.
Roots as described in Trial Pit / Borehole Log	Roots of up to 2mm in diameter were noted at the underside of foundations in Trial Pit 1 and within Borehole1.
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) – *Quercus* (Oak) root 1.5mm in diameter. TP1 (underside) – Broadleaf, too juvenile for positive identification, less than 1mm in diameter. BH1 (to 2.5m depth) – *Quercus* (Oak) less than 1mm in diameter.

Drainage	The CCTV survey which was undertaken to assess the condition of the drains revealed some displaced joints and root intrusion however the Engineer has confirmed that damage is consistent with vegetation-related clay shrinkage subsidence.
Monitoring	I understand that a programme of monitoring is being undertaken at the property. However, no comparative readings are available to date.
Estimated cost of superstructure and repair works if trees removed	£5,000.
Estimated cost of works if trees retained	£80,000.

5.0 Conclusions

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

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

Roots have been noted throughout TP1 and to a maximum depth of 2.5m in BH1.

Samples of these roots have been tested using light microscopy techniques and have been formally identified as *Quercus* (Oak). Starch content was found to be positive.

Given their size, species, and proximity to the location of the trial pit/borehole we consider that the roots formally identified as *Quercus* are most likely to have emanated Oak T1 or Oak T2. Both of these trees are situated within 12m of the property and their positions are consistent with the area of damage. Oaks T4 and T5 are also situated within potential influencing distance of the property although their positions are slightly less consistent with the area of damage. All of these Oak trees have significant further growth potential.

No roots relating to Beech or Cypress were recovered during investigations. However, given their size and proximity to the insured property we consider that it is likely that roots from Beech T3 and Lawson Cypress G1 have also extended beneath the depth of foundations. These trees have further significant growth potential.

5.2 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 consistent with the location of T1, T2, T3 and G1 and slightly less consistent with the positions of T4 and T5.

Stiff/very stiff clay soils have been encountered beneath foundations at TPBH1. These soils will be subject to volumetric changes due to fluctuations in their moisture content.

Engineers have confirmed that, despite some defects within the drainage system, the damage is consistent with vegetation-related clay shrinkage subsidence.

Therefore it is our opinion that sufficient information has been provided to demonstrate that, on the balance of probabilities, Oak T1, Oak T2, Beech T3, Oak T4, Oak T5 and Lawson Cypress G1 are the material cause of the current subsidence damage

We do not consider that there is any other vegetation growing adjacent the insured property that could be considered to be a significant factor in current damage.

6.0 Recommendations

Given their close proximity to the insured property we do not consider that undertaking pruning works to the trees in question 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 we recommend T1, T2, T3, T4, T5 and G1 be removed.

6.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T1	Oak	Fell and grind stump
T2	Oak	Fell and grind stump
T3	Beech	Fell and grind stump.
T4	Oak	Fell as close as possible to ground level and treat stump with appropriate herbicide to prevent future growth.
T5	Oak	Fell as close as possible to ground level and treat stump with appropriate herbicide to prevent future growth.
G1	Lawson Cypress	Fell all trees as close as possible to ground level.

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		

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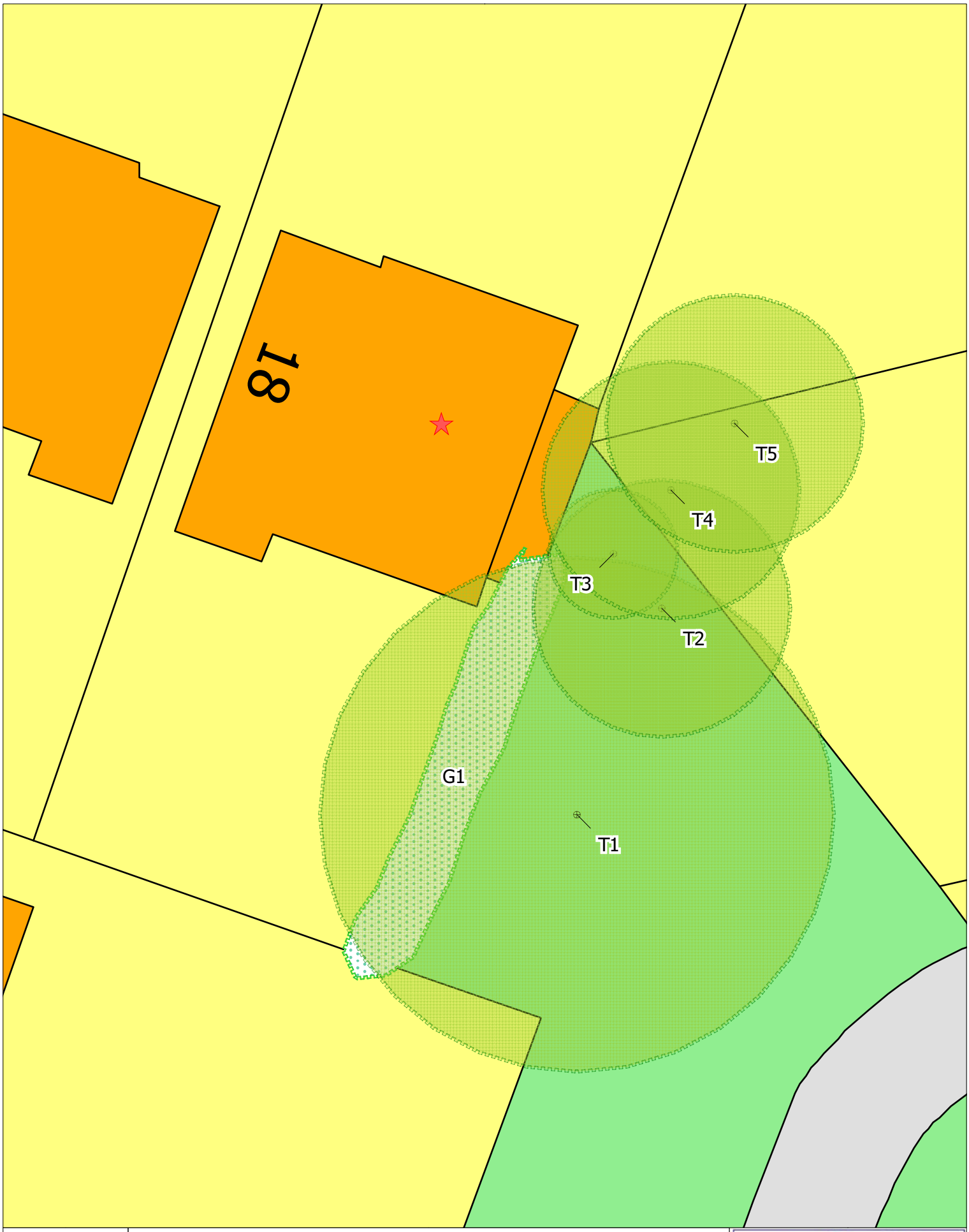
Tree No	Common Name	Age Class	Condition	Height (m)	Crown Spread (m)	Stem diam. (mm)	Dist to bldg (m)	Pruning history	Recommendation	Tree work constraints	Notes	Owner address	Owner
T1	Oak	FM	F	22	16	800	12	No significant past tree works.	Fell and grind stump	LA owned.		Havant Borough Council	LA
T2	Oak	MA	F	16	8	400	8	No significant past tree works.	Fell and grind stump	LA owned.		Havant Borough Council	LA
T3	Beech	MA	F	16	4	400	6	No significant past tree works.	Fell and grind stump	LA owned.		Havant Borough Council	LA
T4	Oak	MA	F	16	8	400	6	No significant past tree works.	Fell and treat stump	Third party vegetation.		50 Topaz Grove, Waterlooville, Hants, PO7 8ST	P3P
T5	Oak	MA	F	16	8	500	10	No significant past tree works.	Fell and treat stump	Third party vegetation.		50 Topaz Grove, Waterlooville, Hants, PO7 8ST	P3P
G1	Lawson Cypress	EM	F	12	4	100	2	Reduced >5 years ago.	Fell as close to ground level as practicable.	None		18 Crystal Way, Waterlooville, PO7 8NB	PH



Location:	18 Crystal Way, Waterlooville, PO7 8NB
Job Ref.:	55556
Survey Date:	14/01/2014
Scale:	1:150 @ A4

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Site Photographs

1. Lawson Cypress G1.

2. Rear elevation of the property with Oaks T1 and T2 and Beech T3 to the left.

3. Further view of the rear showing Oaks T1, T2, T4 and T5, and Beech T3