Arboricultural Assessment Report

Detailed Report on Trees

For:	**Client:**	Oriel Services Limited
	Insurer:	[redacted]
Site:	**Policyholder:**	[redacted]
	Risk Address:	11 Wallis Gardens, Waterlooville, Hants, PO7 7SA
Refs:	**OCA Ref:**	46400
	Client Ref:	3795722
	Insurer Ref:	1-90/12/1113709

Survey By:	Dan Kemp		
Title:	Consulting Arborist	**Date:**	20 January 2010
Report By:	Andrew Graham		
Title:	Senior Consulting Arborist	**Date:**	14 July 2011

OCA UK Limited
Consulting Arboriculturists

4 The Courtyards, Phoenix Square, Severalls Park, Wyncolls Road, Colchester, Essex CO4 9PE
Tel.No: 01206 751626 Fax.No: 01206 855751

Email: info@oca-arb.co.uk www.oca-arb.co.uk

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References

Reference	
1	Cunningham Lindsey ' Engineering Appraisal Report' dated 15th February 2011
2	CET Safehouse Limited 'Factual Report of Investigation' dated 30th September 2010
3	Level Monitoring for the period 09/11/10 – 14/06/11

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1.0 Introduction & Brief

1.1 OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 11 Wallis Gardens, Waterlooville, Hants, PO7 7SA (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 the summer of 2009. Drain repairs were undertaken; however, damage returned in the same location during the summer of 2010.
Engineers brief description of main damage	The Engineer describes the main area of damage as taking the form of cracking and movement to the right hand external wall and ground floor bathroom.
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 of the property.
Engineers BRE 251 numerical category	The Engineer has classified the damage as category 2 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 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.
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 vegetation.
Foundations	Site investigations comprised of one trial pit and borehole that was excavated adjacent the rear right corner of the Insured Property. The excavations revealed foundations at this point to be constructed at a depth of 650mm below ground level.
Trial Pit / Borehole, soil characteristics description	Soils at the underside of the foundations are described as: stiff silty Clay to a depth of 1.3m; very stiff silty Clay to a depth of 5m. The borehole ended at 5m.
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 rear right corner of the Insured Property have modified plasticity indices ranging between 38% and 54%. This confirms that underlying soils have a moderate/very high potential for volume change due to their moisture content.
Desiccation	The Moisture Content & Shear Strength Profiles are indicative of desiccation to a depth of 2m, which is consistent with observed rooting. In addition, soils are described as very stiff and the shear strength values are close to their maximum throughout the profile.
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 5mm 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 2.2m in Borehole 1.

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) 3 roots of up to 3mm in diameter. BH1 (depth 2.2m) – Quercus (Oak) 3 roots of up to 1mm in diameter.
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. Drain repairs were completed in 2009.
Monitoring	A programme of precise level monitoring is currently being undertaken at the Insured Property. Readings are available for the period 09/11/10 – 14/06/11 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at point 10 with an amplitude of 10mm of movement. I note that this point is closest to English Oak T3.
Estimated cost of superstructure and repair works if tree removed	£12,000
Estimated cost of works if trees retained	£25,000

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 TP1 and to a maximum depth of 2.2m in BH1.

Samples of these roots have been tested using light microscopy techniques and have been formally identified as Quercus (Oak).

Given its size, species and proximity to the location of the trial pit/borehole I consider that these roots have emanated from English Oak 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 English Oak T3.

Shrinkable clay soils have been encountered beneath foundations at the rear right corner of the Insured Property. 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. Readings are available for the period 09/11/10 – 14/06/11 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at point 10 with an amplitude of 10mm of movement I note that this point is closest to English Oak 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, English Oak T3 is the material cause of the current subsidence damage.

There is no other vegetation within 'normal' rooting influence of the Insured Property, where tree root trespass has been demonstrated and is consistent with the mechanism of movement and current level monitoring.

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 its close proximity to the Insured Property I do not consider that undertaking pruning works to English Oak T3 will provide either an effective or sustainable means of controlling its water use. Therefore and in order to provide a long-term solution to the current subsidence damage I recommend this tree be removed.

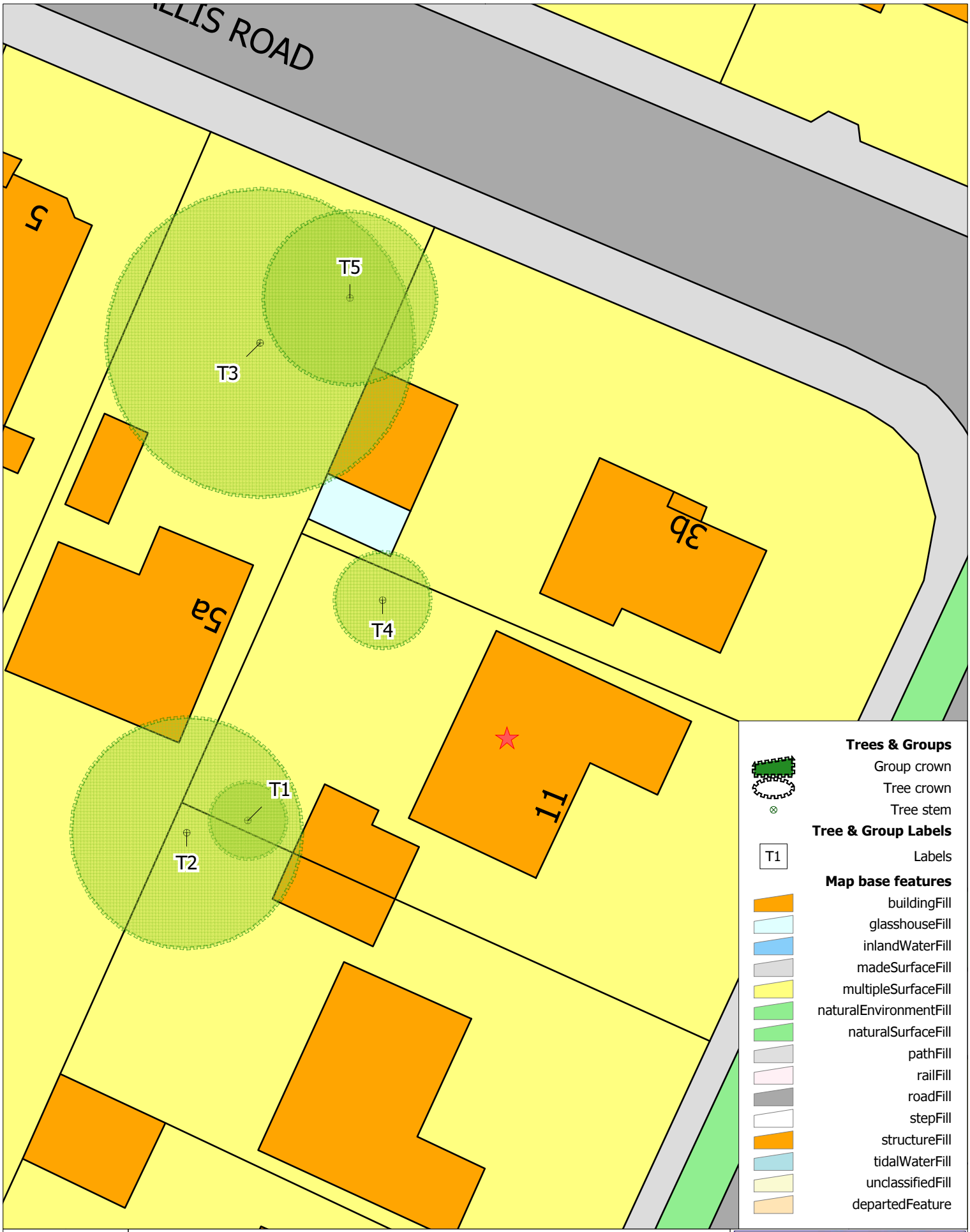
I note that T3 has been 'topped' in the past but that these works have not prevented current damage occurring.

5.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T3	English Oak	Fell to as close to ground level as is practicable and treat 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
T1	Corkscrew Willow	EM	F	6.5	4	120	7.5	No significant past tree works	No work required.			PH
T2	Horse Chestnut	MA	F	22	12	600	12	Topped 3 years ago	No work required.			P3P
T3	English Oak	MA	F	18.5	16	1000	22	Topped 2 years ago	Fell and treat			P3P
T4	Apple	EM	F	6	5	100	6.5	Topped 1 years ago	No work required.			PH
T5	Horse Chestnut	MA	F	15	9	500	18	Topped 2 years ago	No work required.			P3P



Location:	11 WALLIS GARDENS, WATERLOOVILLE, PO7 7SA
Job Ref.:	46400
Survey Date:	11/01/2011
Scale:	1:250 @ A4

4 The Courtyards
Phoenix Square
Severalls Park
Wyncolls Road
Colchester
CO4 9PE
T: 01206 751 626

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