

REFUSE

Arboricultural Assessment Report

Detailed Report on Trees

For:	Client:	Oriel Services Limited
	Insurer:	
Site:	Policyholder:	
	Risk Address:	32, Holman Close, Waterlooville, Hants, PO8 8DW
Refs:	OCA Ref:	46536
	Client Ref:	3786666
	Insurer Ref:	5488699W

Survey By:	Andrew Graham		
Title:	Senior Consulting Arboriculturist	Date:	02 November 2010
Report By:	Andrew Graham		
Title:	Senior Consulting Arboriculturist	Date:	28 September 2011



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Reference

- 1** Cunningham Lindsey ' Engineering Appraisal Report' dated 14 October 2010
- 2** CET Safehouse Limited 'Factual Report of Investigation' dated 6 October 2010
- 3** Level Monitoring for the period 22/10/10 – 01/08/11

1.0 Introduction & Brief

- 1.1** OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 32, Holman Close, Waterlooville, Hants, PO8 8DW (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 July 2009
Engineers brief description of main damage	The Engineer describes the main area of damage to the front wall. The Engineer states that this damage takes the form of tapering diagonal cracks
Engineers brief description of the mechanism of movement	The Engineer has advised that the pattern of movement indicates a mechanism of downward movement of the front wall, lounge floor and intersecting walls. The front door has jammed due to movement.
Engineers 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.
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 moisture abstraction by roots altering the moisture content of the clay subsoil resulting in volume changes, which in turn have affected the foundations.
Foundations	Site investigations comprised of one trial pit and borehole that was excavated adjacent the front elevation of the Insured Property. The excavations revealed foundations at this point to be constructed at a depth of 950mm below ground level. Remote BH in rear garden
Trial Pit / Borehole, soil characteristics description	Soils at the underside of the foundations are described as: stiff silty Clay to a depth of 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 front elevation of the Insured Property have modified plasticity indices ranging between 31% and 48%. This confirms that underlying soils have a moderate/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. However, soils are described as stiff and the shear strength values are confirmed by the engineer to offer more than adequate load bearing capacity for the soil beneath foundations.
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 4mm in diameter were noted at the underside of foundations in Trial Pit 1. Roots of up to 2mm in diameter were noted to a depth of 2.6m in Borehole 1. No roots observed in BH 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/BH1 (underside) – <i>Vitaceae</i> (Virginia Creeper, Boston Ivy, Grape) 1 root of up to 2mm in diameter. TP1/BH1 (underside) – <i>Quercus</i> (Oak) 1 root of up to 2.5mm in diameter. TP1/BH1 (underside)– <i>Prunus</i> (Cherry, Cherry Plum, Cherry Laurel) 1 root of up to 2mm in diameter. BH1 (depth 1m – 2.6m) – <i>Prunus</i> (Cherry, Cherry Plum, Cherry Laurel) 2 roots of up to 2mm in diameter BH1 (depth 1m – 2.6m) – <i>Quercus</i> (Oak) 2 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.
Monitoring	A programme of precise level monitoring is currently being undertaken at the Insured Property. Readings are available for the period 22/10/10 – 01/08/11 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at points 4 & 5 (front elevation 4mm). I note that these points are closest to English Oak T1.
Estimated cost of superstructure and repair works if tree removed	£10,900
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 2.6m in BH1.

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

I understand that prior to my survey in November 2010 a Cypress tree had been removed and the stump ground out from the frontage of the Insured Property. I therefore consider that the conifer roots emanate from this removed tree. No source for the Vitaceae roots was observed. Given their size, species and proximity to the location of the trial pit/borehole, I consider that the Prunus roots most likely emanate from Cherry G1, however given their comparable 'small' size to English Oak T1 I have not implicated them at this stage. The Quercus roots almost certainly emanate from English Oak T1.

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 T1.

Shrinkable clay soils have been encountered beneath foundations at front elevation. 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 22/10/10 – 01/08/11 and show a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at points 4 & 5 (front elevation 4mm). I note that these points are closest to English Oak T1.

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 T1 is the material cause of the current subsidence damage

I consider that the Prunus roots most likely emanate from Cherry G1, however given their comparable 'small' size to English Oak T1 I have not implicated them at this stage. 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 T1 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.

5.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T1	English Oak	Fell to as close to ground level as is practicable and treat stump with an appropriate herbicide to prevent future growth

5.2 Recommended vegetation management to address risk of future subsidence:

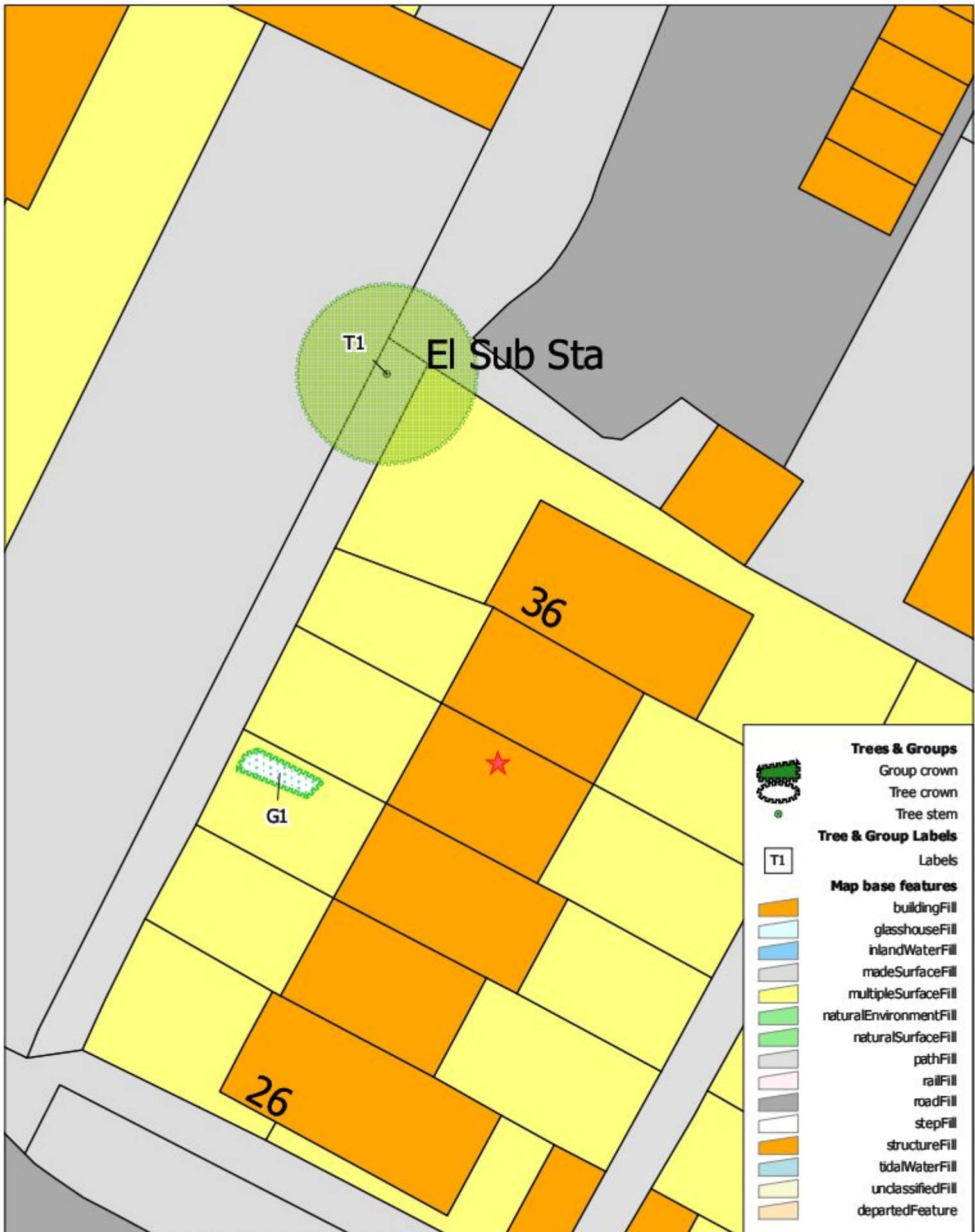
Tree No:	Species	Works Required
G1	Cherry	Fell to as close to ground level as is practicable and treat stumps with an appropriate herbicide to prevent future growth

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		



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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
T1	English Oak	MA	G	20.6	8	600	14.7	No significant past tree works	Fell and treat stump.	Lamp post underneath tree canopy	Both Council and Housing association have denied ownership.	U
G1	Cherry	EM	G	7.5	4	150	1	No significant past tree works	Fell and treat stumps. (Future)	N/A	Comprises of 2x Cherry trees.	P3P



Location: 32 HOLMAN CLOSE, WATERLOOVILLE, PO8 8DW
 Job Ref.: 46536
 Survey Date: 02/11/2007
 Scale: 1:220 @ A4

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