Arboricultural Assessment Report

Detailed Report on Trees

For:	**Client:**	Oriel Services Limited
	Insurer:	[redacted]
Site:	**Policyholder:**	[redacted]
	Risk Address:	12, Glenilla Road, London NW3 4AS
Refs:	**OCA Ref:**	46485
	Client Ref:	3796673
	Insurer Ref:	10SQ613880

Survey By:	Gemma Holmes		
Title:	Arboricultural Technician	**Date:**	15 December 2010
Report By:	Andrew Graham		
Title:	Senior Consulting Arboriculturist	**Date:**	21 September 2011

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Contents

References

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

1.0 Introduction & Brief

1.1 OCA UK Limited has been instructed by Oriel Services Limited on behalf of the building insurers of 12, Glenilla Road, London, NW3 4AS (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. Damage was not considered significant at that time but following the advice of an architect insurers were notified.
Engineers brief description of main damage	The Engineer describes the main area of damage as being to the single storey dining room and the rear of the main building damage takes the form of 18mm to 1mm vertical detachment cracking. Internal junction damage takes the form of 18mm to 1mm cracking to the wall abutment area.
Engineers brief description of the mechanism of movement	The Engineer has advised that the pattern of movement indicates a mechanism of downwards movement to rear of the rear of the property.
Engineers BRE 251 numerical category	The Engineer has classified the damage as category 4 (severe) 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 which is the responsibility of the neighbouring property.
Foundations	Site investigations comprised of one trial pit and borehole that was excavated adjacent the rear left corner of 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: very stiff silty Clay to a depth of 1.5m; firm silty Clay to a depth of 1.7m; pungent silty Clay to a depth of 2m; and stiff silty Clay to a depth of 6m.
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 left corner of the Insured Property have modified plasticity indices ranging between 49% and 53%. This confirms that underlying soils have a high/very 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 2mm 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 1.7m 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) – *Salix (Willow) or Populus* (Poplar) 3 roots of up to 1mm in diameter. BH1 (depth 1.7m) – *Salix (Willow) or Populus* (Poplar) 1 root of up to 0.5mm in diameter.
Drainage	Engineers do not consider leaking or damaged drains to be a factor in current damage. The 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 11/10/10 – 08/08/11 and shows a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at point 5 (rear left corner) at 3.8mm amplitude of movement. I note that this point is consistent with Black Poplar T3 and Lombardy Poplar T9.
Estimated cost of superstructure and repair works if tree removed	£8,000
Estimated cost of works if trees retained	£24,000

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 1.7m in BH1.

Samples of these roots have been tested using light microscopy techniques and have been formally identified as either Poplar or Willow.

Given the absence of any source of Willow tree and the size, species and proximity to the location of the trial pit/borehole, I consider that these roots have emanated from Black Poplar T3 and Lombardy Poplar T9.

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 Black Poplar T3 and Lombardy Poplar T9.

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

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 11/10/10 – 08/08/11 and shows a clear pattern of seasonal movement. The greatest amplitude of movement is recorded at point 5 (rear left corner) at 3.8mm amplitude of movement. I note that this point is consistent with Black Poplar T3 and Lombardy Poplar T9.

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, Black Poplar T3 and Lombardy Poplar T9 are the material cause of the current subsidence damage

All other vegetation located to the rear of the Insured Property is significantly beyond what is generally accepted to be their 'normal' rooting influence, with the exception of Mixed Species G3. However, G3 is clearly 'Young' and on the balance of probability unlikely to be able to cause foundation movement.

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

I note that T3 and T9 have been subject to regular 'topping' works in the past but that these works have not prevented current damage occurring.
I therefore consider that to continue 'topping' as a 'remedy' in respect of Black Poplar T3 and Lombardy Poplar T9 will not 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 these trees be removed.

I also consider that on the balance of probability Black Polar T3 is the more likely source of the Poplar/Willow roots formally identified. However, with such little distance between T3 and Lombardy Poplar T9 the implication of both is a reasonable conclusion. Lombardy Poplar T9 is scheduled for removal on the 29 September 2011.

5.1 Recommended vegetation management to address the current subsidence:

Tree No:	Species	Works Required
T3	Black Poplar	Fell to ground level and grind out the stump
T9	Lombardy Poplar	Fell to ground level and grind out the stump

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	Cherry	SM	F	6.5	3.5	280	14	Reduced 3 years ago	No work required.			PH
T2	Yew	EM	F	7.5	6	350	16	No significant past tree works	No work required.		All measurements estimated. Tree off site.	P3P
T3	Black Poplar	MA	F	19	9	1000	19	Pollard. 2 years' regrowth.	Fell and grind stump.		Poplar tree leaning towards house. All measurements estimated due to access constraints. Located at 1-10 Sussex House.	P3P
T4	Elder	YO	P	4	0.5	50	19	No significant past tree works	No work required.			PH
T5	Elder	YO	P	5	2	75	19	No significant past tree works	No work required.			PH
T6	Cherry	SM	F	4.5	2	250	15.5	No significant past tree works	No work required.			PH
T7	Cherry	SM	F	5	2	220	10.5	No significant past tree works	No work required.			PH
T8	London Plane	MA	F	23	15	1000	30	Reduced >5 years ago	No work required.		All measurements estimated due to access constraints.	P3P
T9	Lombardy Poplar	MA	P	19	8	700	21	Reduced >5 years ago	Fell and grind stump.		Ivy clad. Tree in poor condition. Measurements estimated due to access. Located at 1-10 Sussex House.	P3P
ST1	Stump	OM	D	0	0	0	1	Felled	No work required.			PH

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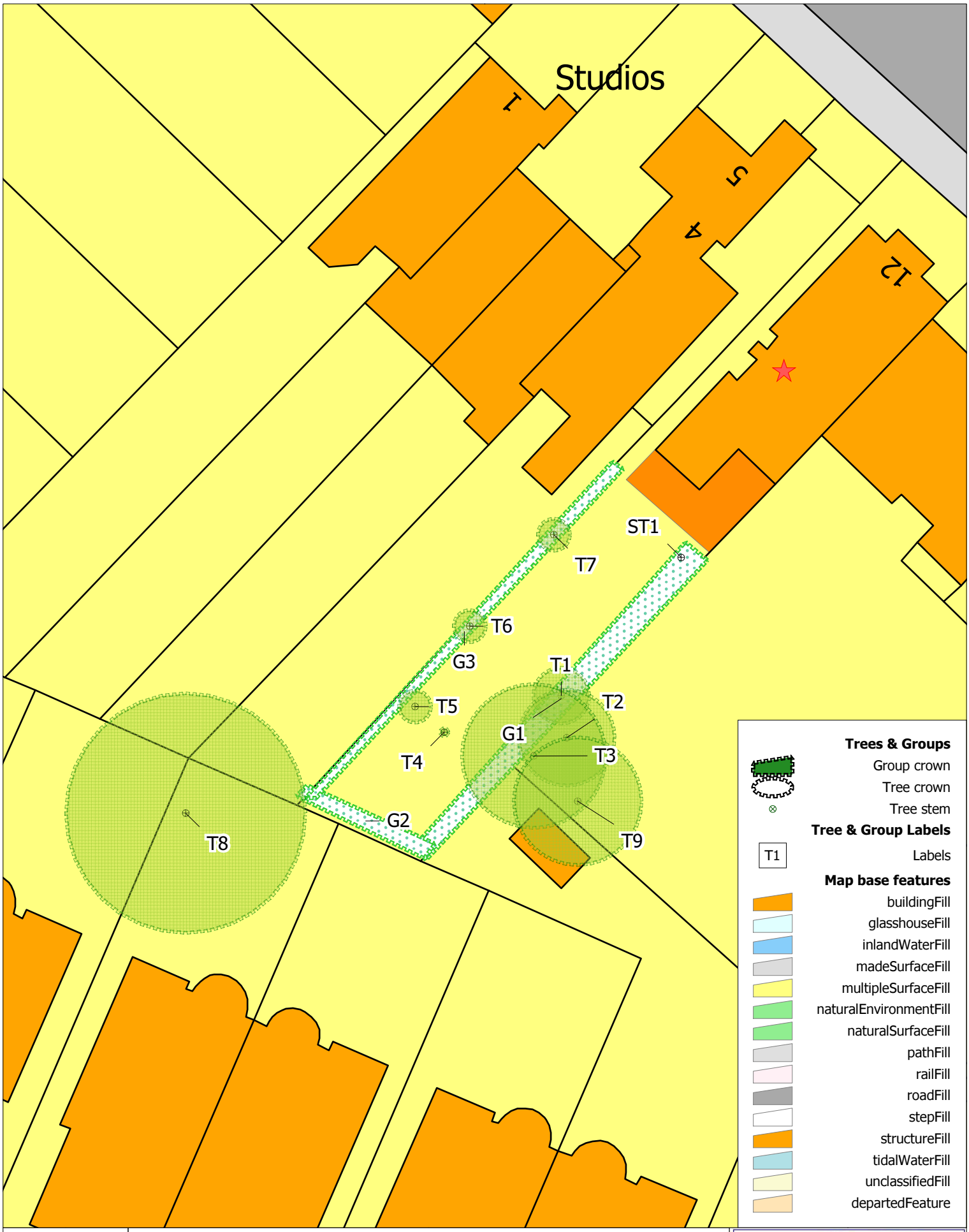
Tree No	Common Name	Age Class	Condition	Height (m)	Crown Spread (m)	Stem diam. (mm)	Dist to bldg (m)	Pruning history	Recommendation	Tree work constraints	Notes	Owner
G1	Mixed Species	YO	F	2	0.5	50	2	No significant past tree works	No work required.		Comprises of Ivy, Box and Privet	PH
G2	Leyland Cypress	YO	F	8.5	6	230	22	No significant past tree works	No work required.		Boundary feature	PH
G3	Mixed Species	YO	P	2	1	50	1	No significant past tree works	No work required.		Comprises of Box, Privet, Ivy, Cherry and Elder	PH



Location:	12 GLENILLA ROAD, LONDON, NW3 4AS
Job Ref.:	46485
Survey Date:	15/12/2010
Scale:	1:300 @ A4

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