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# **Tree Survey, Arboricultural Implications Assessment Report and Arboricultural Method Statement**

Relating to trees growing at 22 Elsworthy Rise, Camden, London

Client: Nathaniel Kolbe Superfusion 2 Middlefield London **NW8 6NE** 

Ref: 1624.Elsworthy.Superfusion.AIA.Rev.A

Date of Inspection: 25th February 2010

Layout Considered: 0910 PA002 - PA007 Rev.A

Prepared by: Andrew Belson Dip.Arb.RFS, M.Arbor.A, Tech.Cert.Arbor.A



### Instructions

- 1.1 This report is a slightly revised version of the February 2010 report commissioned by Nathaniel Kolbe of Superfusionlab Architects on behalf of the Client, which was found to have inaccuracies in the text due to a computer error. The original and correct version of the report is contained herein with reference to the slightly amended site layout plan. The original instructions were to carry out an arboricultural assessment of the trees on the site in line with the recommendations of BS5837: 2005 and to produce an Arboricultural Constraints Plan and Arboricultural Implications Report with tree protection details as appropriate.
- 1.2 Therefore, the objectives of this report are as follows:
  - To carry out an arboricultural assessment of the trees on the site
  - To produce an Arboricultural Constraints Plan
  - To comment on the Arboricultural Implications of the development proposed.
  - To provide details of appropriate tree protection methods as appropriate



### **Report Limitations**

- 2.1 As trees and shrubs are living organisms whose health and condition can change rapidly, conclusions and recommendations are only valid for one year. The health, condition and safety of trees should be checked regularly, preferably annually.
- 2.2 I did not examine the soil or take samples for analysis, as this is a preliminary report. Should soil samples be required, this will be highlighted in the report.
- 2.3 The trees were examined from ground level, as this is a preliminary report. Should further, more detailed information be required, this will be highlighted in the report.



### **Tree Protection**

- 3.1 Where Local Planning Authorities can assess trees as beneficial to the wider community in terms of their amenity value, they may be protected by a Tree Preservation Order (TPO). I understand this is the situation on this site where all the trees surveyed are included in a TPO.
- 3.2 Work may be permitted on a tree protected by a TPO after an application has been submitted to the LPA and written permission granted. Once an application has been made, a representative of the LPA will inspect the trees, notices will be posted so that affected parties can object or make representations and a decision will be made within an eight-week period.
- 3.3 If a decision has not been made within an eight-week period, the person making the application can apply to the DCLG for Non-Determination. If the LPA refuses the application, the appellant still has the right to appeal.
- 3.4 In certain areas classified as Conservation Areas, all trees with a stem diameter of 75mm (measured at 1.5m above ground) are protected by Conservation Area legislation. This site does not lie within a Conservation Area.
- 3.5 Trees that are dead, dying or dangerous are exempt from legislation. It is common good practice to notify the LPA of intention to carry out work to trees that fall into these categories, preferably with some notice (e.g. one working week).
- 3.6 A leaflet produced by the DCLG (Protected Trees), covers the issues raised by this legislation (enclosed).



### **Site Information**

- 4.1 The trees inspected are growing to the side of 22 Elsworthy Rise.
- 4.2 The trees can clearly be seen from outside the site.
- 4.3 The Client has provided a proposed layout for the site. This drawing has been used to produce the plan appended to this report (see Appendix A). It is this drawing that is considered at section 8.3.
- 4.4 Proposals are for a single storey extension.
- 4.5 The site is reasonably level and there have been extensive hard landscaping works within the site.
- 4.6 There is a single-storey extension to the side of the main building, which has been constructed on a traditional strip foundation



## **Tree Inspection**

### 5.1 IDENTIFICATION

There are three significant trees on the site. Their locations can be seen in the drawing appended to this document.

#### 5.2 ASSESSMENT

The trees were assessed on the following criteria, which relates directly to BS5837: 2005

- Species gives information on expected growth, habit, life expectancy and suitability for situation
- Age Class Indicates the tree's stage of growth in a normal life span.
- Remaining contribution (in years) information used to assess the retention category of the tree and potential future growth.
- Diameter of main stem at 1.5 metres above ground information to use in calculating the Root Protection Area (RPA). Where a tree is multi-stemmed, its RPA is calculated based on its diameter above the root flare.
- Physiological and structural condition
- Category grading in accordance with Table 1 BS5837: 2005, reflecting the tree's landscape function and condition.

#### 5.3 FINDINGS

Tree 1 Lime (Tilia x europea)

Height in Metres	10.5m			
Main stem diameter (at 1.5m)	530mm			
Vigour	Normal vigour.			
Age Class	Mature.			
Crown Spread (north)	3.8m			
Crown Spread (south)	5.0m			
Crown Spread (east)	4.6m			
Crown Spread (west)	1.7m			
Crown Height above Ground 6.0 Metres				
Remaining Contribution	40+ years			
BS5837: 2005 Grade	B2			
<b>Root Protection Area Required</b> 129m <sup>2</sup> (Achieved through a of 6.4 metres)				

#### **Observations**

The root system of the tree was not inspected but appears to be functioning adequately. It is likely that there has been historical disturbance in at least the upper region of the soil through the laying of paving and around 20% of the RPA is covered with building or paving.

The tree has a single main stem which was historically pollarded at around 4.5m. There is moderate decay at the oldest pollard points.

There are several stems emanating from each pollard point. I estimate that it is less than 10 years since the tree was last pollarded.

#### Tree 2 Lime

Height in Metres	9.0m			
Main stem diameter (at 1.5m)	540mm			
Vigour	Normal vigour.			
Age Class	Mature.			
Crown Spread (north)	4.0m			
Crown Spread (south)	3.5m			
Crown Spread (east)	3.0m			
Crown Spread (west)	2.4m			
Crown Height above Ground 3.0 Metres				
Remaining Contribution	40+ years			
BS5837: 2005 Grade	B2			
Root Protection Area Required	133m <sup>2</sup> (Achieved through a radial distance of 6.5 metres)			

#### **Observations**

The root system of the tree was not inspected but appears to be functioning adequately. The root system will have been compromised through the construction of the single storey extension but this does not appear to have affected the health or vigour of the tree. The wall of the extension is within 0.7m of the main stem and covers around  $12.5m^2$  of the toal RPA with a further  $10m^2$  covered by paving.

There is a pocket of decay at the base of the main stem.

The tree has a single main stem which was historically pollarded at around 6m. There is moderate decay at the oldest pollard points.

There is extensive adventitious growth at each pollard point. I estimate that it is less than 5 years since the tree was last pollarded.

### Tree 3 Lime

Height in Metres	8.0m		
Main stem diameter (at 1.5m)	600mm		
Vigour	Normal vigour.		
Age Class	Mature.		
Crown Spread (north)	3.3m		
Crown Spread (south)	4.0m		
Crown Spread (east)	3.0m		
Crown Spread (west) 3.0m			
wn Height above Ground 4.5 Metres			
Remaining Contribution	40+ years		
BS5837: 2005 Grade	B2		
Root Protection Area Required	163m <sup>2</sup> (Achieved through a radial distance of 7.2 metres)		

### **Observations**

The root system of the tree was not inspected but appears to be functioning adequately. The root system is likely to have been compromised through the extensive hard landscaping of the rear garden but this does not appear to have affected the health or vigour of the tree.

The tree has a single main stem which was historically pollarded at around 4m. There is a moderate ivy covering to the main stem.

There is extensive adventitious growth at each pollard point. I estimate that it is less than 5 years since the tree was last pollarded.



### **Potential Impact of Development on Trees**

6.1 Construction can impose enormous strain on trees through damage to, or loss of root mass. The root system is the part of the tree most susceptible to damage during construction.

Any retained trees could be at risk of root damage through:

- Demolition and site clearance
- Siting of services and excavation causing root severance
- Access for plant and vehicles which may cause compaction of the root zone leading to root death through asphyxiation
- Storage of materials or spillage of damaging substances such as fuel oil, petrol or lime, which can kill roots.
- The raising of soil levels which can kill roots through asphyxiation
- The lowering soil levels which removes root mass, including many of the fine water collecting roots and beneficial humus layer
- 6.2 Construction can threaten the aerial parts of the tree through:
  - Physical damage by contact from various plant and delivery vehicles
  - The lighting of fires
  - Erection of scaffolding
- 6.3 The British Standard 5837: 2005 'Trees in Relation to Construction' gives guidance that is more detailed on the implications of constructing near to trees in Annex 'C'.
- 6.4 The symptoms that can arise from root damage as identified above can take several years to become evident
- 6.5 A development may affect the way the wind passes the retained trees, through raising its speed or direction. This may leave weakened or newly exposed trees liable to wind throw.

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### **Potential Impact of Trees on Development**

- 7.1 It is desirable to retain trees as they add maturity and structure to a site; provide shade and amenity value; screening or acoustic barrier.
- 7.2 The Root Protection Area (RPA) required for each tree may affect layout of road, footpath, housing, services and other built structures. In certain situations, it may be possible to move the RPA by up to 20% but this is rarely possible and only applies to open grown trees, i.e. not avenues, rows or groups. Additionally, up to 20% of the RPA can be paved with a sealed surface, providing no excavation takes place.
- 7.3 The shade footprint that may be cast by trees identified for retention at an expected maximum height (given their individual circumstances) has been shown on the drawings as a hatched quadrant. The shade area is based on a solar inclination of 45<sup>0</sup> shown from north west to due east, as suggested by BS5837. This simplifies the actual shade area that may affect the site but it is considered to be a good representation of the area in question. Building within the shade area can be acceptable where internal layout, fenestration or proposed use of buildings means they are not adversely affected by a lack of daylight received. Some shading may be welcomed in the summer when solar gain can make room temperatures uncomfortable. It should also be noted that deciduous trees only cast shade for seven or eight months of the year, depending on species.
- 7.4 Whilst trees may be small at the time of survey, future growth may be considerable, both in height and radial crown spread
- 7.5 Leaves falling from any of the retained trees may block the gutters of the house or may become a potential slip hazard.
- 7.6 Trees can affect the type and depth of foundations used.
- 7.7 Some trees are not suitable for retention due to brittle wood, poisonous berries or leaves, prickles and thorns.
- 7.8 Trees can add value to property.
- 7.9 Very large trees worry some people because they perceive the trees to be imposing and dangerous.



### Conclusions

### 8.1 Health, Condition and Safety

- 8.1.1 All the trees appear to be healthy and showing normal vigour for the species. The decay at old pollard points is typical of that style of management and is the primary cause of stems breaking out of the crown. Typically, once a tree has been pollarded, the management must continue. This is not true in every case but as these trees exhibit degradation at the old pruning wounds, it would be prudent to manage the trees at their old pollard points by annual or biennial cutting.
- 8.1.2 The (relatively) recent disturbance within the rootzones of T2 and T3 in particular does not appear to have had any effect on the trees' health.

#### 8.2 ARBORICULTURAL CONSTRAINTS

- 8.2.1 The plan appended to this report (1624.AIA.Rev.A see appendix 'A') shows the constraint of the Root Protection Area (RPA) as a magenta circle around the tree. This is the area where ideally, if a tree is retained, no excavation should take place; the soil level should not be raised or lowered; no materials can be stacked; there must be no contamination and no services should be routed.
- 8.2.2 The shade footprint that may be cast by the tree has been shown as a grey hatch. The shade area is based on a solar inclination of 45<sup>0</sup> in line with the median suggested by BS5837: 2005 that covers the main daylight hours. Building within the shade area can be acceptable where internal layout, fenestration or proposed use of buildings means they are not adversely affected by a lack of daylight received. Some shading may be welcomed in the summer when solar gain can make room temperatures uncomfortable.
- 8.2.3 The height of the lower crown above ground is shown in the survey (see 5.3). Lifting (or raising) the crown to a set height above ground in order to install fences, achieve clearance over the driveway or allow access for plant and machinery would be an acceptable arboricultural practice. Crown spread may in its self be a constraint where it is greater than the RPA radius. Reference must be made to the Tree Constraints Plan in Appendix 'A' or the data in the tree survey schedule.
- 8.2.4 It is possible to use area within the RPA for footpaths and paving providing no excavation takes place. This will necessitate either the use of a cellular confinement geotextile such as 'CellWeb' (www.geosyn.co.uk) where a water and air-permeable surface is required or paving with a sealed surface that covers no more than 20% of the total RPA and no more than 3m wide. Note that the use of no-dig techniques will increase the finished level of paved surfaces.
- 8.3 <u>Arboricultural Implications of Layout 0910\_PA002 PA007 Rev.A</u>
- 8.3.1 <u>ACCESS</u>
- 8.3.1.1 Vehicular access remains as extant.

### 8.3.2 <u>LAYOUT</u>

8.3.2.1 The proposed development occupies a proportion of the circular Root Protection Areas (RPA) drawn (magenta circles) for T1, T2 and T3. It is accepted that in reality, the RPA will not be in the form of a circle as it will be modified by the extant building to the north. It could be argued therefore, that the RPA would be biased to the south east or west. On this site, there are constraints to rooting in all directions either by the boundary wall or the footpath and road beyond that or the paved/covered surfaces within the garden. Therefore, in order to represent the proposed incursions as a percentage of the more restricted environment, I reduced the RPA by the proportion of each RPA that is covered by the building. This is represented in the following table:

Tree Number	Total RPA represented as a circle	Modified RPA	Total incursion of proposal	Percentage of incursion unmodified	Percentage of incursion modified
T1	129m <sup>2</sup>	112m <sup>2</sup>	20m <sup>2</sup> (all of which is currently covered by paving or building)	16%	18%
T2	132m <sup>2</sup>	110m <sup>2</sup>	20m <sup>2</sup> (of which 12.5m <sup>2</sup> is extant)	15% (6% additional)	18%
Т3	162m <sup>2</sup>	145m <sup>2</sup>	7m <sup>2</sup> (as extant)	4%	5%

I consider that a tree can tolerate up to 20% of its RPA being covered. This is supported by the recommendation in BS5837: 2005 that up to 20% of the RPA can be covered by a sealed surface providing no excavation takes place. This is further supported by Arboricultural Practice Note 12, in which it is written that some species of trees can tolerate up to 20% root loss. On this site therefore, providing the extension can be constructed whereby root loss is minimised (through severance and other factors) then there should be no effect on the trees' health, condition or safety because the area covered by the extension is already covered by extant buildings or paving.

- 8.3.2.2 The resulting vertical wall will be around 1m of the main stems of the trees. This provides minimal space for seasonal growth from the pollard points. It has already been established in the tree survey that pollard management should be continued and the pruning cycle shortened due to the condition of the old pruning wounds. In order to maintain a satisfactory relationship between the trees and the proposed extension, I propose the trees are 'pleached', which is a simple modification to the established pollard pruning. This would involve pruning the growth to the north and south of the stems back to the main stem whilst encouraging the easterly and westerly growth to elongate horizontally, creating a high hedge-like form on long stems. (A picture of pleached trees can be seen at Appendix 'A'.) The view to the general public when viewed form the south will be little changed from the current view.
- 8.3.2.3 With the proposed extension in close proximity there will be some loss of available light to the northern side of the trees but the available light from the south is of greater importance to the tree and I do not consider that this factor would be likely to significantly affect the trees' health.

### 8.3.3 SHADE AND LIGHT LOSS

8.3.3.1 With reference to the shade footprint drawn, as there is no fenestration to the southern aspect, the proposed new buildings would be affected by shading in exactly the same way as the current situation. I do not consider that this to be a factor in this proposal.

### 8.3.4 FUTURE GROWTH

8.3.4.1 The growth of the trees would be regulated by the proposed pruning regime.

### 8.3.5 <u>SERVICES</u>

8.3.5.1 Services are not shown on the drawing but it would appear that all connections can be made to existing services without the need for excavation.



### **Recommendations**

- 9.1 Construct the foundations of the extension using screw piles spanned by beams set no deeper into the ground than the existing formation, whether that is concrete or paving.
- 9.2 Pollard the Limes and commence 'pleaching' training through the regular attendance of a suitably qualified arboist.

#### **Treework**

- Tree work is skilled and potentially dangerous work, which must be carried out by trained and certificated staff working to BS3998: 1989 and working in accordance with the various Regulations within the Health and safety at Work Act 1974
- Contractors must have Public Liability Insurance (preferably £5 million) and Employer's Liability Insurance (preferably £10 million).
- Machinery and equipment must be maintained, inspected and operated in accordance with the various Regulations within the Health and Safety at Work Act.
- 9.3 Implement a tree protection scheme before development starts on site. Details are described in 9.4 9.5 below.
- 9.4 PROTECTION OF TREES DURING WORKS

#### **Treework**

9.4.1 As the first operation, carry out works as-per 9.2 above.

#### Ground Protection

9.4.2 Once the pruning is complete, the ground between the proposed build-line and the trees and the ground between the trees will be protected using a double layer of scaffold planks, cut to suit and joined together for integrity with screws.

#### Other Protection measures

- 9.4.3 No fires to be lit on site. There is insufficient room.
- 9.4.4 The storage of materials is only practical at the front of the house. Ordering and phasing of works must reflect this
- 9.4.5 The mixing of cement and dispensing of fuel or chemicals must only occur at the front of the house
- 9.4.6 No excavation any deeper than the existing formation within the RPA
- 9.4.7 Any damage that occurs to the trees during construction must be rectified to BS3998: 1989
- 9.4.8 Trees must not be used as anchor points for winching or for supporting wires/cables.
- 9.5 FUTURE MANAGEMENT
- 9.5.1 Ground protection must only be removed once construction is complete.

I hope you find this report satisfactory, please do not hesitate to contact me at my office if I can be of further assistance.

Signed:

Date: 30<sup>th</sup> May 2010

A M Belson Dip.Arb.RFS, M.Arbor.A, Tech.Cert.Arbor.A



### **Plans and Charts**

- Page ii Tree Constraints with Layout 1624.AIA.Rev.A
- Page iii Tree Protection Plan 1624.TPP.Rev.A
- Page iv Picture of pleached Lime trees



Green tree centre Blue tree centre Grey tree centre Red tree centre Grade 'A' tree Grade 'B' tree Grade 'C' tree Grade 'R' tree (tree for removal)

Magenta line shows RPA

Grey Hatched zone shows shadow footprint.





### **Reference Material**

Tree Preservation Orders: A Guide to the Law and Good Practice (DETR 2000) (As amended October 2008)

The Town and Country Planning Act 1990, The Town and Country Planning (Trees) Regulations 1999 (As amended October 2008)

BS5837 'Trees in Relation to Construction' 2005

NHBC Chapter 4.2 'Building near Trees' 2008

NJUG Volume 4 Issue 2 (National Joint Utilities Group) 2007

Tree Roots and Buildings (Cutler and Richardson) 1997

Arboricultural Advisory and Information Service APN 5 'Shaded by Trees? 1999

Arboricultural Advisory and Information Service 'Tree Roots and Foundations' 1998

Arboricultural Advisory and Information Service 'Tree Root Systems' 1995

Arboricultural Advisory and Information Service Research Note 'Forces Exerted by Tree Roots' 1996

Principals of Tree Hazard Assessment and Management (D Lonsdale) 1999

The Health and Safety at Work Act 1974

BS3998 'Recommendations for Treework' 1989

The Law of Trees, Forests and Hedgerows. (C Mynors) 2003

Arboricultural Advisory and Information Service APN 12 'Through the Trees to Development' 2007