Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT:

87 Redington Road

London

NW3 7RR

REPORT PREPARED FOR:

Mr Davis

87 Redington Road

London

NW3 7RR

REPORT PREPARED BY

Adam Hollis

MSc ARB MICFor FArbor A MRICS C Env

Ref: DFT/87RR/AIA/02

Date: 22nd October 2014

Appendices

Caveats

This report is primarily an arboricultural report. Whilst comments relating to matters involving built structures or soil data may appear, any opinion thus expressed should be viewed as qualified, and confirmation from an appropriately qualified professional sought. Such points are usually clearly identified within the body of the report. It is not a full safety survey or subsidence risk assessment survey. These services can be provided but a further fee would be payable. Where matters of tree condition with a safety implication are noted during a survey they will of course appear in the report.

A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

Tree works recommendations are found in the Appendices to this report. It is assumed, unless otherwise stated ("ASAP" or "Option to") that all husbandry recommendations will be carried out within 6 months of the report's first issue. Clearly, works required to facilitate development will not be required if the application is shelved or refused. However, necessary husbandry work should not be shelved with the application and should be brought to the attention of the person responsible, by the applicant, if different. Under the Occupiers Liability Act of 1957, the owner (or his agent) of a tree is charged with the due care of protecting persons and property from foreseeable damage and injury.' He is responsible for damage and/or nuisance arising from all parts of the tree, including roots and branches, regardless of the property on which they occur. He also has a duty under The Health and Safety at Work Act 1974 to provide a safe place of work, during construction. Tree works should only be carried out with local authority consent, where applicable.

Inherent in a tree survey is assessment of the risk associated with trees close to people and their property. Most human activities involve a degree of risk, such risks being commonly accepted if the associated benefits are perceived to be commensurate.

Risks associated with trees tend to increase with the age of the trees concerned, but so do many of the benefits. It will be appreciated, and deemed to be accepted by the client, that the formulation of recommendations for all management of trees will be guided by the cost-benefit analysis (in terms of amenity), of tree work that would remove all risk of tree related damage.

Prior to the commencement of any tree works, an ecological assessment of specific trees may be required to ascertain whether protected species (e.g. bats, badgers and invertebrates etc.) may be affected.

Tree Constraints & Protection Overview

Client:	Mr Davis	**Case Ref:**	DFT/87RR/AIA/02
Local Authority:	LB of Camden	**Date:**	22/10/14
Site Address: 87 Redington Road, London NW3 7RR			
Proposal: S78 Application for proposed minor amendments to existing planning permission Ref: 2009/4910/P			

Report Checklist	**Y/N**		**Y/N**
Arboricultural constraints on site	Y	Trees removal proposed	N
Tree Survey	Y	Topographical Survey	Y
BS5837 Report	Y	Conservation Area	Y
Tree Preservation Orders	N		
Tree Protection Plan:	N/a	(Include in future method statement)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		

Site Layout				
Site Visit	Y	Date: 23/09/09 (updated with desk-based study only)	Access Full/Partial/None	F
Trees on Site	Y		Off-site Trees	Y
Trees affected by development	Y		O/s trees affected by development	N
Tree replacement proposed:	Y		On or off-site trees indirectly affected by development	N

Trees with the potential to be affected

Minor encroachment to RPA/canopy of T24 – low impact mitigated by pre-emptive root pruning; remedial tree works required & to be maintained on cyclical basis. No further impact to T11 or T16.

Comments

Updated survey recommended for construction H & S purposes (maintaining a Safe Site of Work).

Recommendations		
1	Proposal will mean the loss of important trees (TPO/CA)	N
2	Proposal has sufficient amelioration for tree loss	N/a
3	Proposals provide adequate tree protection measures	Y
4	Proposal will mean retained trees are too close to buildings	N
5	Additional specialist demolition / construction techniques required	N
6	The amendments to proposal will result in significant root damage to retained trees	N
7	Further investigation of tree condition recommended	NK

RPA= Root Protection Area
TPP= Tree Protection Plan
AMS= Arboricultural Method Statement
AIA = Arboricultural Implication Assessment
BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations'

1. SUMMARY

1.1 This report comprises an arboricultural impact assessment of the minor amendments to the proposals for 87 Redington Road, London NW3 7RR, reviewing any conflicts between the proposed amendments and material tree constraints identified in our survey. The report will accompany a Section 73 Application, which has been submitted following the up-rooting of one of the retained ash trees (T23 in our October 2009 report CLA/HLH/AIA/01) in the 2013 October storms. This tree was situated to the front of the property; therefore it is proposed to move the proposed building forward by 2 – 3 metres with other minor amendments.

1.2 The current survey is now 5 years old and relatively out of date. However, the changes to the proposals would have negligible (additional) implications for tree protection. Therefore, unless otherwise directed by planning, it was deemed by the client and his advisors unnecessary to commission a fresh survey in support of the application. Clearly this has no bearing on the owner's liability to maintain his property and boundaries in safe condition, and the would-be developer's requirement to maintain a safe site of work. We would recommend that a current survey is undertaken for these purposes, as soon as possible.

1.3 There are 11 retained trees from the 2009 survey on or around the site, of which 10 are B category *(Moderate Quality) and 1 is C category *(Low Quality). In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate. In this instance, no such collective impact is proposed.

1.4 The proposed minor amendments will only affect three of the retained trees, the category B oaks, T11 & T16, in addition to category B cherry, T24. The proposed amendments will result in an additional minor encroachment to the theoretical RPA of T24, with minor encroachment of the canopy as surveyed in 2009. These low impacts can be mitigated by pre-emptive root pruning and remedial tree works to facilitate construction. There are no further impacts to T11 or T16 to those consented.

1.5 Secondary impacts from the new elevation require the maintenance of convenient canopy clearance from T24. A 25% crown reduction would create an adequate 2m clearance, to be maintained on a 5-year pruning cycle. The current requirement to maintain canopy clearance from T11 and T1 would not change. Thus, the proposed elevations only slightly more demanding than the current elevations.

1.6 There will always be marginal secondary impacts of litter deposition and partial shade on this site, regardless of development. The status quo is unlikely to change with the proposed amendments, which is the salient point for planning to consider. Thus, the secondary impacts are minimal.

1.7 The site has potential for the minor amendments to the development permitted without impacting significantly on the wider tree population or local landscape. Therefore, with suitable mitigation and supervision the scheme is recommended to planning.

* British Standards Institute: Trees in relation to design, demolition and construction BS 5837: 2012 HMSO, London

2. INTRODUCTION

2.1 Terms of reference

2.1.1 LANDMARK TREES were asked by Mr Davis, C/o DFT Property Management Limited, to provide a survey and an arboricultural impact assessment of proposals for the site: 87 Redington Road, London NW3 7RR. The report is to accompany a planning application.

2.1.2 The proposals are for Section 78 Application for proposed minor amendments to existing planning permission Ref: 2009/4910/P, including moving the footprint of the building forward following the demise of the ash tree T23 after the October 2013 storms. This report will assess the impact on the trees and their constraints, identified in our survey. Although the proposals were known at the time of the survey, Landmark Trees endeavour to survey each site blind, working from a topographical survey, wherever possible, with the constraints plan informing their evolution.

2.1.3 I am a Registered Consultant and Fellow of the Arboricultural Association and a Chartered Forester, with a Masters Degree in Arboriculture and 25 years' experience of the landscape industry - including the Forestry Commission and Agricultural Development and Advisory Service. I am a UK Registered Expert Witness, trained in single and joint expert witness duties. I am also Chairman of the UK & I Regional Plant Appraisal Committee, inaugurated to promote international standards of valuation in arboriculture.

2.2 Drawings supplied

2.2.1 The drawings supplied by the client and relied upon by Landmark Trees in the formulation of our survey plans are:

Proposals: HHH1 504 revB (2)-PDF*

*In the absence of a full topographical survey, tree positions may be approximate only.

2.3 Scope of survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, I surveyed the trees on site in 2009 with subsequent discussions and updates in October 2014. The original survey of the trees, the soils and any other factors, was of a preliminary nature. The trees were SURVEYED on the basis of the Visual Tree Assessment method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994). LT have not taken any samples for analysis and the trees were not climbed, but inspected from ground level. The 2009 survey did not cover the arrangements in connection with the laying or removal of underground services.

2.3.3 A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

2.3.4 The current survey is now 5 years old and therefore relatively out of date. However, the changes to the proposals would have negligible (additional) implications for tree protection. Therefore, unless otherwise directed by planning, it was deemed by the client and his advisors unnecessary to commission a fresh survey in support of the application. Clearly this has no bearing on the owner's liability to maintain his property and boundaries in safe condition, and the would-be developers requirement to maintain a safe site of work. We would recommend that a current survey is undertaken for these purposes, as soon as possible.

2.4 Survey data & report layout

2.4.1 Detailed records of individual trees are given in the survey schedule in Appendix 1 to this report.

2.4.2 A site plan identifying the surveyed trees, based on the client's drawings / topographical survey is provided in Appendix 3. As the existing tree constraints were known, this plan has been prepared as the Arboricultural Impact Assessment Plan. Accordingly, the theoretical Recommended Protection Areas (RPA's), tree canopies and shade constraints of the retained trees have been overlain onto it. General observations and discussion follow, below.

3.0 OBSERVATIONS

3.1 Site description

Photograph 1: Existing building at 87 Redington Road (Source: Google Maps)

3.1.1 The site is currently under construction, situated at the top of Telegraph Hill in Hampstead with existing buildings / dwellings to north and east and bordered by mature woodland to the west. The site interior is level relatively level, but steps up to the west by means of a bank and drops to another garden to the east.

3.1.2 In terms of the British Geological Survey, the site overlies the Bagshot Formation (shown in yellow in fig.1 overleaf)), typical of Hampstead Heath; the associated soils are generally, more sandy and less shrinkable than the surrounding Claygate member (shown in brown) and are readily permeable. Such low plasticity soils are less prone to movement: subsidence and heave. The actual limits of soil series are not as clearly defined on the ground as on plan and there may be anomalies between them. Further advice from the relevant experts on the specific soil properties can be sought as necessary.

3.1.3 In terms of the British Geological Survey, the site overlies the London Clay Formation (see indicated location on Fig.1 plan extract below). The associated soils are generally, highly shrinkable clay; e.g. slowly permeable seasonally waterlogged fine loam over clay. Such highly plastic soils are prone to movement: subsidence and heave. The actual distribution of the soil series are not as clearly defined on the ground as on plan and there may be anomalies in the actual composition of clay, silt and sand content.

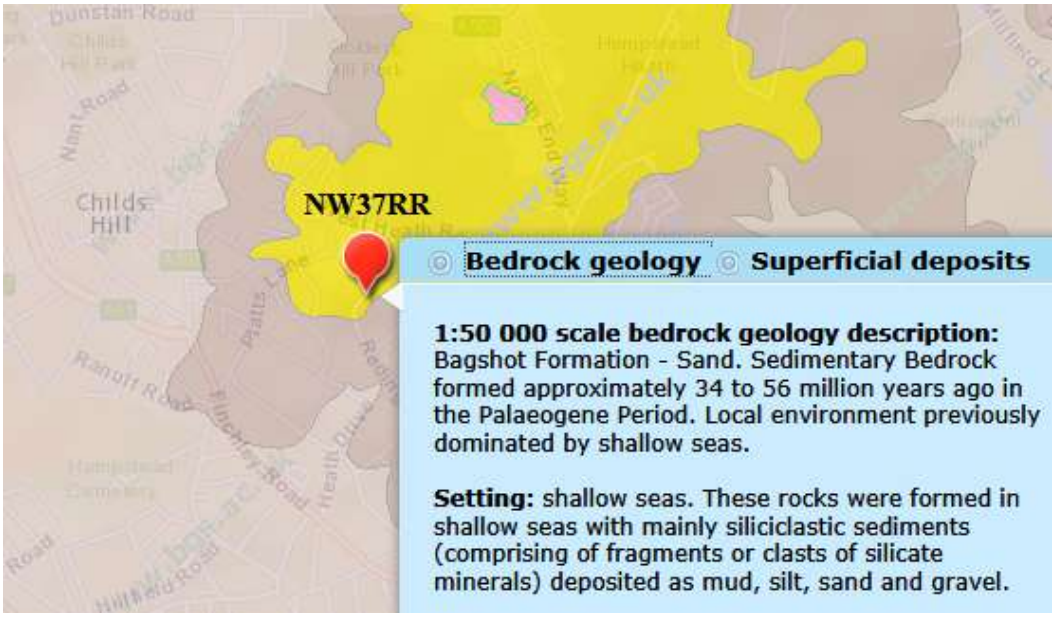


Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject trees

3.2.1	There are 11 retained trees from the 2009 survey on or around the site, of which 10 are B category *(Moderate Quality) and 1 is C category *(Low Quality).
3.2.2	The tree species found on site comprise oak, sycamore, Lombardy poplar, beech, eucalyptus and cherry.
3.2.3	In terms of age demographics there is a preponderance of mature trees on the site with one early mature tree in the population.

3.2.4	The details of the 2009 survey can be found in Appendix 1 of this report.
3.2.5	It is recommended that the survey is updated to ascertain the current arboricultural works required.

3.3 Planning Status

3.3.1	We are not aware of the existence of any Tree Preservation Orders, but understand the site stands within a Conservation Area, which will affect the subject trees: it is a criminal offence to prune, damage or fell such trees without permission from the local authority. Accordingly, recent permission was sort to reduce the crown of T11 by 2m (Ref: 2014/5251/T); these works have been undertaken.

4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary constraints

4.1.1 BS5837: 2012 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is 12-x stem diameter at 1.5m above ground level, except where composite formulae are used in the case of multi-stemmed trees.

4.1.2 Circular RPA's are appropriate for individual specimen trees grown freely, but where there is ground disturbance, the morphology of the RPA can be modified to an alternative polygon, as shown in the diagram below (Figure 2). Alternatively, one need principally remember that RPA's are area-based and not linear – notional rather than fixed entities. **No modifications have been made in this instance (please see overleaf).**

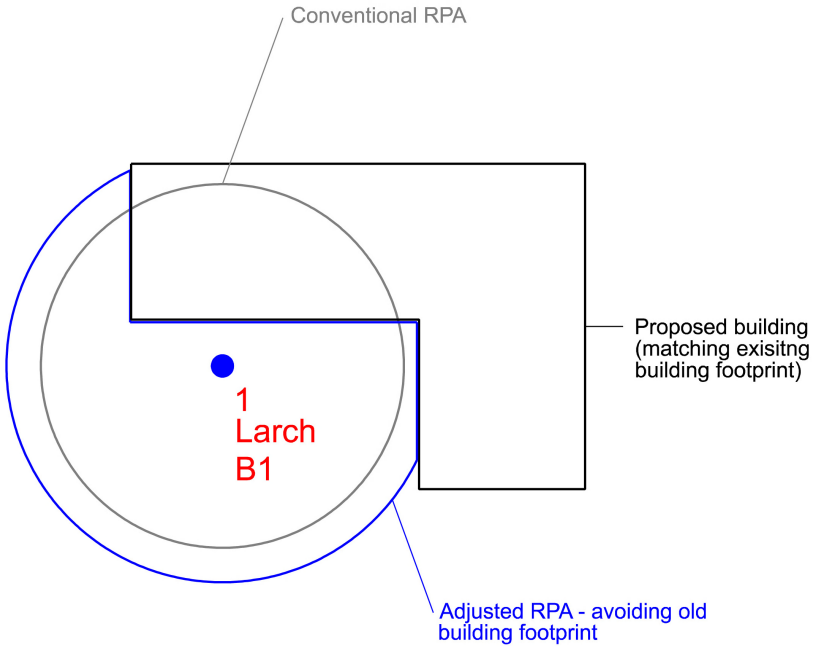


Figure 2 – Generic BS 5837 RPA Adjustments

4.1.3 In BS5837, paragraph 4.6.2 states that RPA's should reflect the morphology and disposition of the roots; where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution. Not infrequently, LT are requested by LPA Tree Officers to modify the RPA's to reflect their assumptions that e.g. a road will have drastically limited root growth.

4.1.4 Such assumptions cannot be proved without prior site investigations / trial pits. Where it is not always possible to conduct site investigations (e.g. below busy roads), we can always look to the published science. There seems little support for the popular myth that roads and services will curb root growth: research for the International Society of Arboriculture by Kopinga J (ISA 1994), found that "a constant high moisture content of the soil directly underneath the pavement surface can be considered as a major soil factor in attracting the trees' roots to develop there." By contrast, grass in lawns may actively antagonise tree roots with natural pathogens. Similarly, Professor F Miller (ISA 1994) found that service trenches at > 3m distances from trees had minimal impact on growth or crown shape.

4.1.5 A key misunderstanding, even among professionals, is that we conflate the RPA with the actual root system: RPA's are *prima facie* a notion / convention / treaty and almost entirely theoretical, but readily calculable. Conversely roots are a "known unknown," spatial entity that we predict at our folly. Yet, many are quick to do so.

4.1.6 LT favour the neutrality of a circular RPA, because in a difference of opinion, the tree officer will always have the prerogative to dictate the final modification of shape. With the best will in the world, the free allowance of modifications will tend to lead to inequitable outcomes, prejudicing the applicant and the practice is in our view, best avoided. The neutral circle dispenses with this inequity.

4.1.7 Ultimately, the point of the circular RPA is to illustrate areas of concern. The purpose of this report is to consider areas of concern (not to modify them to suit our argument or findings). Therefore, no modifications are made here to the RPA's, regardless of roads etc.

4.1.8 The quality of trees will also be a consideration: U Category trees are discounted from the planning process in view of their limited service life. Again, Category-C trees would not normally constrain development individually, unless they provide some external screening function.

4.1.9 At paragraph 5.1.1. BS5837: 2012 notes that "Care should be exercised over misplaced tree preservation; attempts to retain too many or unsuitable trees on a site are liable to result in excessive pressure on the trees during demolition or construction work, or post-completion demands on their removal."

4.1.10 In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate.

4.1.11 In this instance, the impacts of the main proposals have been assessed as low. The minor amendments will need to have regard to the constraints provided by the retained category B trees.

4.2 Secondary Constraints

4.2.1 The second type of constraint produced by trees that are to be retained is that the proximity of the proposed development to the trees should not threaten their future with ever increasing demands for tree surgery or felling to remove nuisance shading (Figure 3), honeydew deposition or perceived risk of harm.

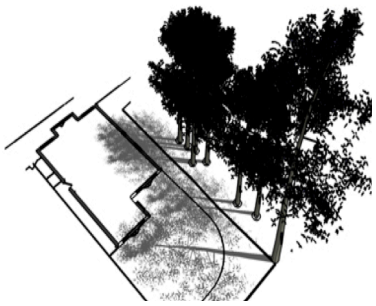


Figure 3 –
Generic Shading Constraints

4.2.2 The shading constraints are crudely determined from BS5837 by drawing an arc from northwest to east of the stem base at a distance equal to the height of the tree, as shown in the diagram opposite. Shade is less of a constraint on non-residential developments, particularly where rooms are only ever temporarily occupied.

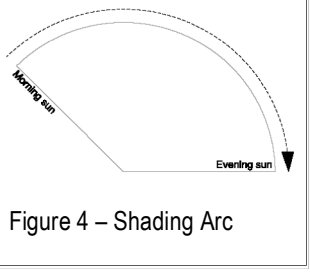


Figure 4 – Shading Arc

4.2.3 This arc (see Figure 4) represents the effects that a tree will have on layout through shade, based on shadow patterns of 1x tree height for a period May to Sept inclusive 10.00-18.00 hrs daily.

4.2.4 As above, the full impact of the shading constraints was considered during the original proposals. It was noted that the most significant, secondary constraint would be shading on to the site from trees along the south and western boundaries. However, this constraint was considered relatively slight compared to the overall developable area..

Note: Sections 5 & 6 will now assess the impacts upon constraints identified in Section 4. Table 1 in Section 5 presents the impacts in tabular form (drawing upon survey data presented in Appendices 1 & 2). Impacts are presented in terms of whole tree removal and the effect on the landscape or partial encroachment (% of RPA) and its effect on individual tree health. Section 6 discusses the table data, elaborating upon the impacts' significance and mitigation.

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	11	Oak	No additional impacts Continued maintenance of canopy clearance from elevations	m^2 N/A %	Mature	Moderate	Moderate/good	N/A	N/A	Not required
B	16	Oak	No additional impacts Continued maintenance of canopy clearance from elevations	m^2 N/A %	Mature	Normal	Moderate/good	N/A	N/A	Not required
B	24	Cherry	Basement (Consented) 2m2 (1.6% RPA) Additional encroachment from ground floors 2.9m2 (2.3%)	4.9 m^2 3.86 %	Mature	Normal	Moderate	Low	N/A	Remedial tree surgery (see Rec. Works) Pre-emptive root pruning along foundation line

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The proposed minor amendments will only affect three of the retained trees, the category B oaks T11 & T16, in addition to category B cherry T24. The proposed amendments will result in an additional minor encroachment to the theoretical RPA of T24 (2.3% of the theoretical RPA), with minor encroachment of the canopy as surveyed in 2009. These low impacts can be mitigated by pre-emptive root pruning and remedial tree works to facilitate construction. There are no further impacts to T11 or T16.

6.1.2 The principal of RPA encroachment is established within BS5837:2012 and supported by the source document, National Joint Utilities Guidelines 10 / Vol. 4 1995 / 2010. NJUG introduced the x12 diameter *Precautionary Zone* for supervised working and *Prohibited Zone* at a universal 1m from the base of the tree. RPA's are frequently confused with the NJUG Prohibited Zone, when they clearly correlate with the NJUG Precautionary Zone.

6.1.3 An RPA encroachment of <20% of RPA may be considered as low impact, given the permissive references to 20% RPA relocation and impermeable paving within BS5837:2012 and other published references to healthy trees tolerating up to 30-50% root severance (Coder, Helliwell and Watson in CEH 2006). The trees in question are healthy specimens of species with a good resistance to development impacts, and quite capable of tolerating these low impacts.

6.1.4 "**In practice 50% of roots can sometimes be removed with little problem**, provided there are vigorous roots elsewhere. Inevitably, this degree of root loss will temporarily slow canopy growth and even lead to some dieback" (Thomas 2000). LT do not recommend annexing such high proportions of the root system; rather that within the context of the published science, planning should not be unduly concerned by impacts that are well below the subcritical threshold – *tree health is not at stake.*

6.2 Rating of Secondary impacts

6.2.1 Secondary impacts from the new elevation require the maintenance of convenient canopy clearance from T24. A 25% crown reduction would create an adequate 2m clearance, to be maintained on a 5-year pruning cycle. The current requirement to maintain canopy clearance from T11 and T1 would not change. Thus, the proposed elevations only slightly more demanding than the current elevations.

6.2.2 There will be a marginal increase in the secondary impacts of litter deposition and partial shade from the minor amendments. However these are negligible increases.

6.3 Mitigation of Impacts

6.3.1 The limits of excavation within RPAs will be undertaken manually; any roots encountered will be cleanly pruned back to an appropriate junction with a sharp pruning saw or secateurs. Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist.

6.3.2 Any additional paving/hard landscaping within the RPA of T24 will require a no-dig construction technique, either using a cellular confinement system with no fines aggregate for the sub-base or simply building upon the existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth.

6.3.3 The immediate canopy encroachment can be avoided with a 25% crown reduction of T24.

6.3.4 Nuisance deposition can be mitigated with regular crown cleaning and filtration traps on the guttering (see Figure 5 below). Alternatively, elements of green roof construction might be considered, where applicable.

6.3.5 The shading impacts can be mitigated by building design, with the provision of dual aspect windows and choice of room layout. The partial shading will also be reduced by the proposed crown reduction.

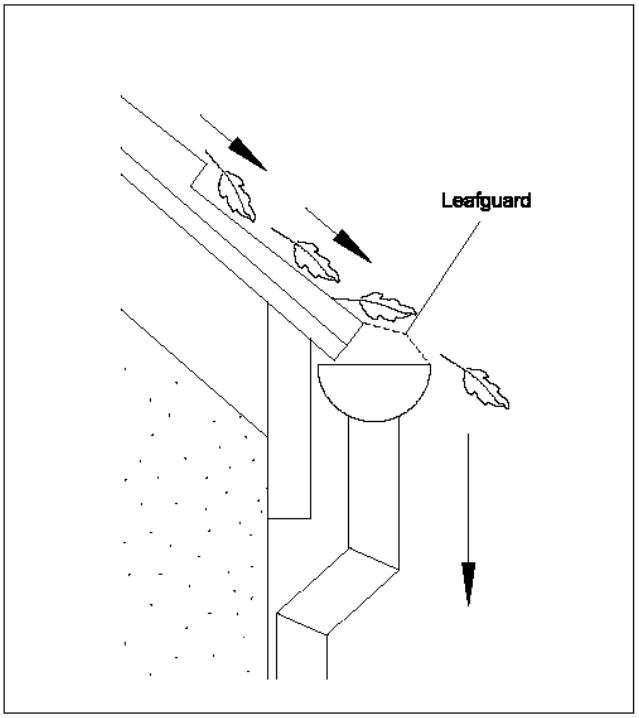


Figure 5:

Filtration traps could be fitted on the gutters which can easily be maintained at 2-3m above ground.

7.0 CONCLUSION

7.1 The potential impacts of the proposed amendments to the development that has planning permission are all very low in terms of RPA encroachments of the retained trees.

7.2 The full potential of the impacts can be mitigated through minor additional design and precautionary measures for T24, in addition to those already identified for the existing scheme.

7.3 Therefore, the amendments to proposals will not have any significant impact on either the retained trees or wider landscape. Thus, with the mitigation noted and supervision as required by the existing scheme, the proposed amendments are recommended to planning.

8.0 RECOMMENDATIONS

8.1 Specific Recommendations

8.1.1	The tree works to facilitate development are noted in Appendix 3.
8.1.2	Excavation and construction impacts within the RPA of T24 identified in Table 1 above, will need to be controlled by the mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. The existing tree protection and method statement should continue as per the 2009 Landmark Trees report (CLA/HLH/AIA/01). An updated tree survey is recommended for construction Health & Safety purposes (maintaining a Safe Site of Work).

8.2 General Recommendations

8.2.1	The existing tree protection around T24 will require minor adjustments to facilitate the amendments.
8.2.2	The pruning works must be in accordance with British Standard 3998:2010 Tree work [BS3998].
8.2.3	Where sections of hard surfacing are proposed in close proximity to trees, it is recommended that "No-Dig" surfacing be employed in accordance with BS5837:2012 and 'The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]'.

9.0 REFERENCES

- Barlow JF & Harrison G. 1999. Shade By Trees, Arboricultural Practice Note 5, AAIS, Farnham, Surrey.
- British Standards Institute. 2012. Trees in Relation to Design, Demolition and Construction - Recommendations BS 5837: 2012 HMSO, London.
- Centre for Ecology & Hydrology. 2006. Tree Roots in the Built Environment, HMSO, London.
- Helliwell R (1980) Provision for New Trees; Landscape Design; July/August issue
- International Society of Arboriculture (ISA). 1994. The Landscape Below Ground. ISA, Champaign, Ilinois. USA.
- Lonsdale D 1999. Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management, HMSO, London.
- Matheny, N; Clark, J. R.1998. Trees and Development: A Technical Guide to Preservation of Trees during Land Development. ISA, Champaign, Ilinois. USA.
- Mattheck C. & Breloer H. 1994. Research for Amenity Trees No.2: The Body Language of Trees, HMSO, London.
- Thomas P, 2000. Trees: Their Natural History, Cambridge University Press, Cambridge.
- Trowbridge J & Bassuk N (2004) Trees in the Urban Landscape: Site Assessment, Design, and Installation; J Wiley & Sons inc. NJ USA

APPENDIX 1

TREE SCHEDULE

Notes for Guidance:

1. Height describes the approximate height of the tree measured in metres from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter (Dm) is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees. BS 5837:2012 formula (Section 4.6) used to calculate diameter of multi-stemmed trees. Stem Diameter may be estimated where access is restricted and denoted by '#'.
5. Protection Multiplier is 12 and is the number used to calculate the tree's protection radius and area
6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2012 section 4.5) and refers to tree/group quality and value; 'A' – High, 'B' - Moderate, 'C' - Low, 'U' - Unsuitable for retention. The following colouring has been used on the site plans:
    - High Quality (A) (Green),
    - Moderate Quality (B) (Blue),
    - Low Quality (C) (Grey),
    - Unsuitable for Retention (U) (Red)
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

Landmark Trees Ltd
Tel: 020 7851 4544

Tree Survey Schedule

Site: 87 Redington Road, London NW3
Date: 28th April 2009 updated with deskbased study October 2014

Surveyor: Adam Hollis
Ref: DFT/87RR/AIA/02

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
1	Sycamore	21	4	3.5E	Mature	500E		0.0	Moderate	REMOTE SURVEY ONLY		B	2	>40	
6	Poplar, Lombardy	28	1.5	7	Mature	500	12	6.0	Normal	Fair		B	2	>40	
10	Eucalyptus	22	5	2.4	Mature	480		0.0	Moderate	Fair		B	2	>40	
11	Oak	20	10	2.5	Mature	1200	12	14.4	Moderate	Good		B	2	>40	
12	Beech	27	4	1.5	Mature	800	12	9.6	Normal	Good		B	2	>40	
13	Sycamore	26	5	2	Mature	600	12	7.2	Normal	Poor		B	2	>40	Triple stems
14	Oak	15	7	2.5	Early Mature	330	12	4.0	Normal	Poor		C	2	>40	Misshapen crown
16	Oak	15	5	2	Mature	460	12	5.5	Normal	Fair		B	2	>40	
17	Poplar, Lombardy	23	1.5	14	Mature	610	12	7.3	Moderate	Fair		B	2	>40	Remove deadwood
18	Poplar, Lombardy	23	1.5	14	Mature	610	12	7.3	Moderate	Fair		B	2	>40	

Landmark Trees Ltd
Tel: 020 7851 4544

Tree Survey Schedule

Site: 87 Redington Road, London NW3
Date: 28th April 2009 updated with deskbased study October 2014

Surveyor: Adam Hollis
Ref: DFT/87RR/AIA/02

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
23	Ash Uprooted in October 2013														
24	Cherry	17	7	1.4	Mature	530	12	6.4	Normal	Good		B	2	20-40	

APPENDIX 2

RECOMMENDED TREE WORKS TO FACILITATE DEVELOPMENT (See Table 1)

Notes for Guidance:

RP - Pre-emptive root pruning of foundation encroachments under arboricultural supervision.
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Check / monitor progress of defect(s) at next consultant inspection which should be <18 months in frequented areas and <3 years in areas of more occasional use. Where clients retain their own ground staff, we recommend an annual in- house inspection and where practical, in the aftermath of extreme weather events.
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

Landmark Trees Ltd
Tel: 0207 851 4544

Recommended Tree Works To Facilitate Development

Hide irrelevant

Show All Trees

Site: 87 Redington Road, London NW3 7RR

Surveyor: Adam Hollis

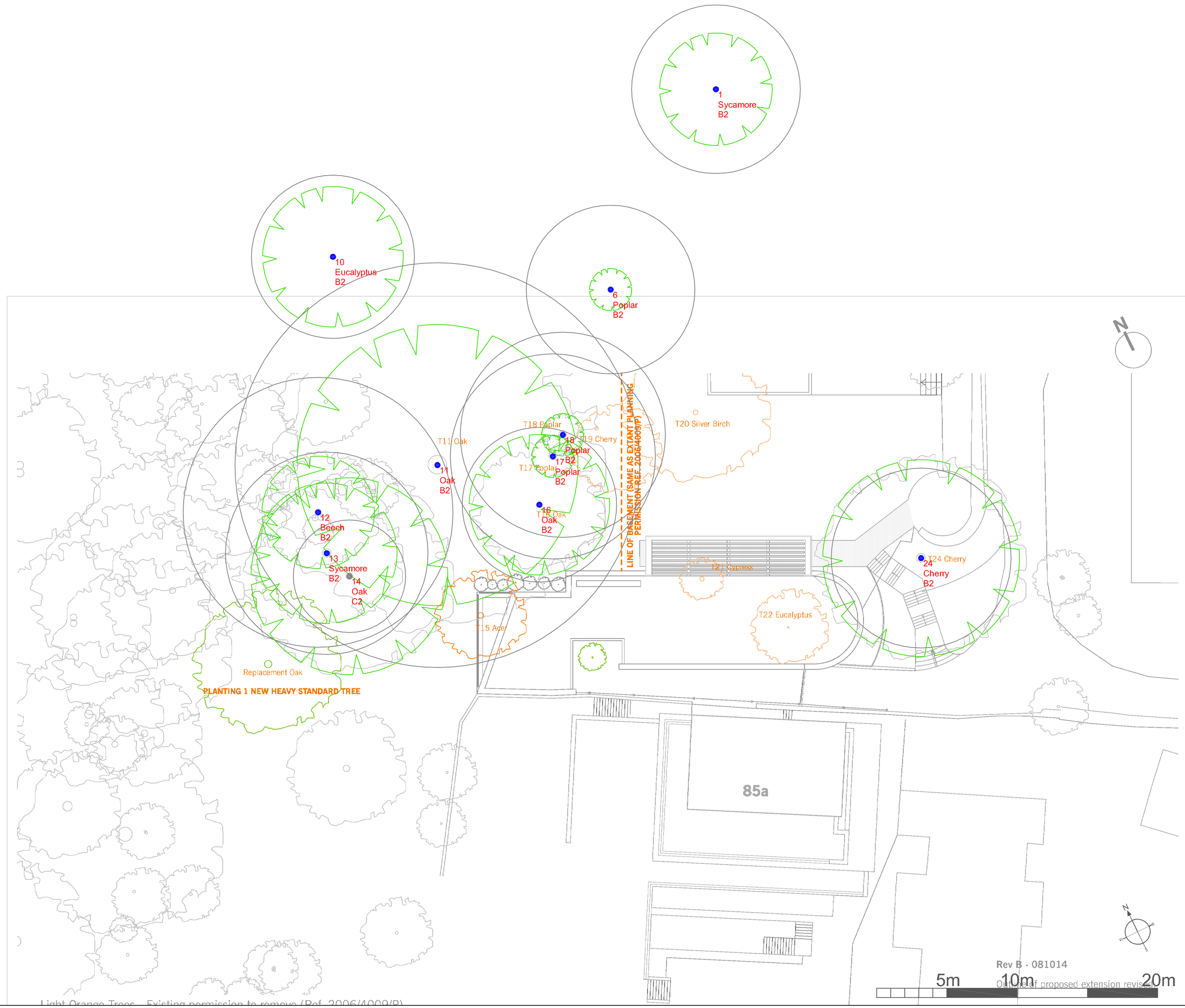
Date: 28th April 2009 updated with deskbased study October 2014

Ref: CLA/87RR/AIA

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
24	Cherry	17	530	?	CB Minor works to cut back clear from elevation	To facilitate development

APPENDIX 3

ARBORICULTURAL IMPACT ASSESSMENT PLAN



NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1,5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base) or immediately above the root flare for multi-stemmed trees.

Landmark Trees

2 Clifford Gardens, London, NW10 5JD
Tel: 0800 055 6912 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: Hill House - 87 Redington Road	1-200@A2
Drawing Title: Arboricultural Impact Assessment	October 2014

Key:

- Category A High Quality
- Category B Good Quality
- Category C Moderate Quality
- Category R Poor Quality