



Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT:

55 Gloucester Avenue
Primrose Hill
London
NW1 7BA

REPORT PREPARED FOR:

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Ref: JWA/55GLA/AIA/02

Date: 26th Aug 2014

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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:	James Wyman Architects	Case Ref:	JWA/55GLA/AIA/02
Local Authority:	LB Camden	Date:	26 th July 2014
Site Address: 55 Gloucester Avenue, Primrose Hill, London, NW1 7BA			
Proposal: Basement extension below garage and within vault, with light well alterations			
Report Checklist	Y/N		Y/N
Arboricultural constraints on site	Y	Trees removal proposed	N
Tree Survey	Y	Topographical Survey	N
BS5837 Report	Y	Conservation Area	Y
Tree Preservation Orders	Y		
Tree Protection Plan:	N/a	(Include in future method statement)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		
Site Layout			
Site Visit	Y	Date: 23/05/14	Access Full/Partial/None F
Trees on Site	Y	Off-site Trees	N
Trees affected by development	Y	O/s trees affected by development	N
Tree replacement proposed:	N	On or off-site trees indirectly affected by development	N
Trees with the potential to be affected			
Category A lime trees (T1 & T2): 8.5% and 3.2% of modified RPA respectively affected by demolition/removal of hardstanding; construction of extension on garage & vault sites. The overall impact is rated very low, as trial pits have shown negligible root colonisation from trees within proposed footprint: footprints have been set back to avoid occasional roots of 30-50mm diameter in vicinity. Manual working to 1m depth proposed to ensure all potential impacts are minimised. Similar considerations apply to light well alterations.			
Comments			
Recommended works for both tree regardless of development, but also pertinent to maintaining a safe work site.			
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	Specialist demolition / construction techniques required		Y
6	The Proposal will result in significant root damage to retained trees		N
7	Further investigation of tree condition recommended		N

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'

Arboricultural Impact Assessment Report: 55 Gloucester Avenue, Primrose Hill, London, NW1 7BA

Prepared for: James Wyman Architects, Studio 100 Woodstock Road, Oxford OX2 7NE

Prepared by: Adam Hollis of Landmark Trees, 20 Broadwick Street, London W1F 8HT

1. SUMMARY

- 1.1 This report comprises an arboricultural impact assessment of the proposals for 55 Gloucester Avenue, Primrose Hill, London, NW1 7BA, reviewing any conflicts between the proposals and material tree constraints identified in our survey.
- 1.2 There are 2 trees surveyed on or around the site, both of which are A (High Quality) lime trees. 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.
- 1.3 The principal primary impacts in the current proposals are very low; comprising potential 8.5% & 3.2% encroachments of T1 & 2's modified RPA from the garage and vault demolition/removal of hardstanding. Basement construction / extension would occur within the on the existing garage and vault sites, where colonisation of significant roots from T1 & 2 is unlikely. The greater part of the roots are likely to lie within the soft verge. Trial pits have shown negligible root colonisation from trees within the proposed footprint: footprints have been set back to avoid the occasional roots of 30-50mm diameter uncovered in the vicinity. Precautionary mitigation has been recommended to further reduce the potential impact; these comprise the manual 'pull-back' demolition of the existing buildings and hard surfaces, with supervised manual excavation of the new foundations and pre-emptive root pruning of smaller roots (<25mm diameter) where necessary. Similar considerations apply to light well alterations, which have been aligned to avoid significant roots.
- 1.4 As per our previous report JWA_55GLA_AIA_01, The survey has identified tree works for both T1 and T2, including crown-lifting both trees to 5m (over highway and garden). T2 requires further works to cut-back the crown from the guttering on the main house. This unilateral cutting back should be balanced with an overall 10% crown reduction, which will also help maintain uniformity of canopy / wind profile: T1 in particular exhibits breakaway lateral branching (see Photograph 1). These works will need to be maintained on a 5-year pruning cycle. The existing recommendations will reduce the secondary impacts affecting the proposed extension / alterations (by permitting more light beneath the canopy and lessening direct organic deposition), although there will always be marginal secondary impacts of honeydew / litter deposition and partial shade on this site, regardless of development: the proposals do not change the status quo vis a vis the trees. The proposed roof light / light wells will continue to require simple maintenance to reduce these minimal secondary impacts.
- 1.5 A site meeting was held with Camden Tree Officer, Nick Bell on 14/8/14; the trial pits were inspected and the footprints with setbacks were agreed, along with the crown-lifting pruning works. The site has potential for development without impacting significantly on the wider tree population or local landscape. Thus, 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 James Wyman Architects to provide a survey and an arboricultural impact assessment of proposals for the site: 55 Gloucester Avenue, Primrose Hill, London, NW1 7BA. The report is to accompany a planning application.
- 2.1.2 The proposals are for basement extension below garage and within vault, with light well alterations. 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 endeavoured 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 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:
- Existing site survey: Existing Plans 0037_A_03_03_001_A *
- Proposals: 55 Gloucester Avenue - CAD-A3

*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 on 23 rd May 2014, recording relevant qualitative data in order to assess both their suitability for retention and their constraints upon the site, in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations [BS5837:2012]. |
| 2.3.2 | Our survey of the trees, the soils and any other factors, is 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. |
| 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 survey does not cover the arrangements that may be required in connection with the laying or removal of underground services. |

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. |
| 2.4.3 | This plan also serves as the Tree Constraints Plan with the theoretical Recommended Protection Areas (RPA's), tree canopies and shade constraints, (from BS5837: 2012) overlain onto it. These constraints are then overlain in turn onto the client's proposals to create an Arboricultural Impact Assessment Plan in Appendix 3. General observations and discussion follow, below. |

3.0 OBSERVATIONS

3.1 Site description



Photograph 1: 55 Gloucester Avenue, Primrose Hill, London NW1 7BA (Source: Google Maps)

- | | |
|-------|---|
| 3.1.1 | The site comprises and end of terrace residential property, which occupies a corner site on Gloucester Road at the end of St. Mark's Crescent. The site has a front garden and a garage. |
| 3.1.2 | The site is relatively level. |
| 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. |
| 3.1.4 | Clay soils are prone to compaction during development with damage to soil structure potentially having a serious impact on tree health. The design of foundations near problematic tree species will also need to take into consideration subsidence risk. Further advice from the relevant experts on the specific soil properties can be sought as necessary. |

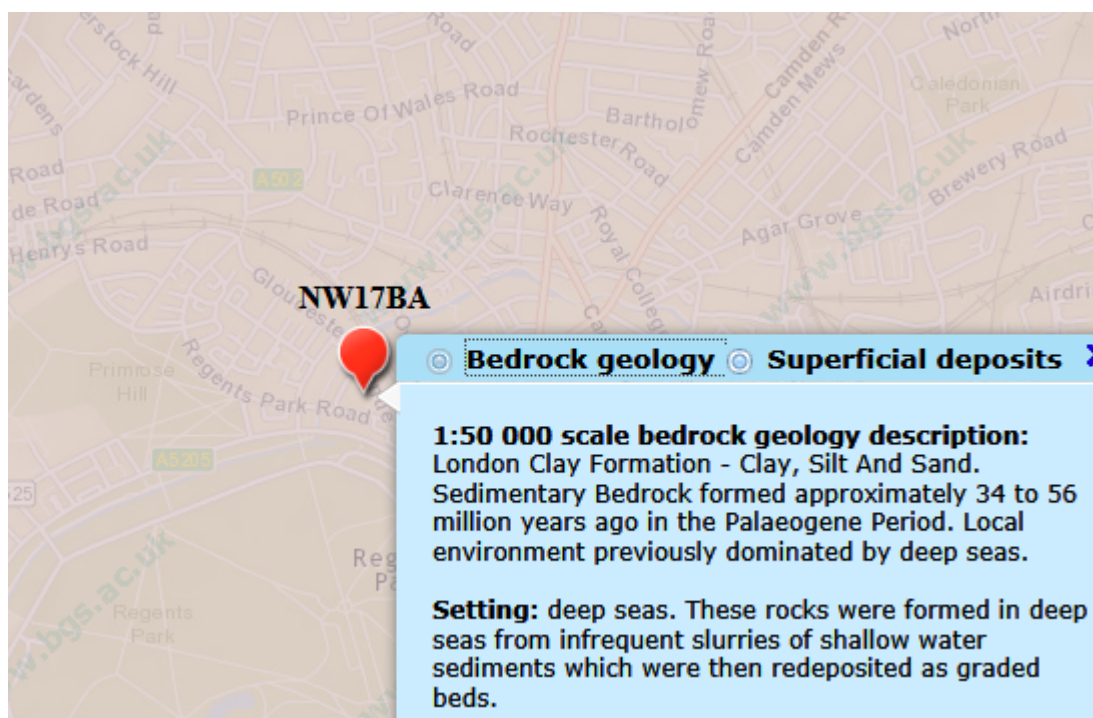


Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject trees

3.2.1 Of the 2 surveyed trees both are category A (High Quality) mature lime trees.

3.2.4 Full details of the surveyed trees can be found in Appendix 1 of this report.

3.2.5 There are recommended works for both of the trees, including crown-lifting both trees to 5m to allow more light into the existing lightwells, crown reduction by 10% and removing deadwood from the crowns. These are listed in Appendix 2.

3.3 Planning Status

3.3.1 The trees on site are protected by a Tree Preservation Order; the site also stands within the Primrose Hill 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.

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. **The RPA's of both surveyed trees have been modified (please see overleaf and relevant TCP plan in Appendix 3).**

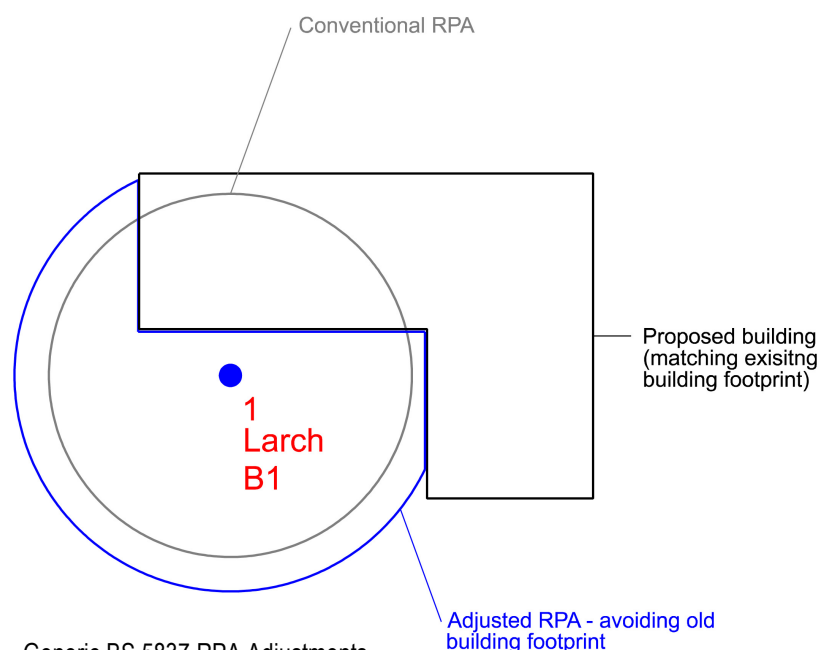


Figure 2 – Generic BS 5837 RPA Adjustments

- 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 The RPA's for the surveyed trees T1 and T2 have been modified to reflect the existing hard standings and the foundations of the main house. However, it is important to note that lime trees are not an aggressive rooting species; therefore it is unlikely that there is significant root colonization beneath the garage building. Ultimately, the point of the RPA is to illustrate areas of concern.
- 4.1.5 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.
- 4.1.6 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.
- 4.1.11 In this instance, both of the surveyed trees will potentially provide significant primary constraints upon development; although root colonisation is likely to have been restricted under existing structures.

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.

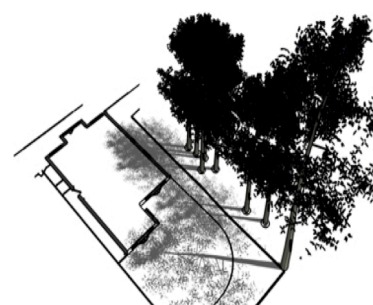
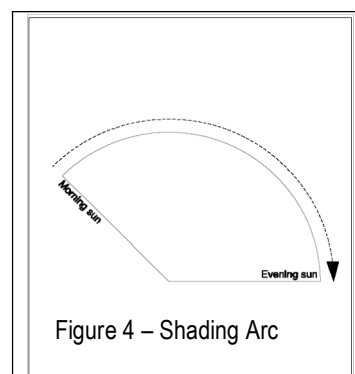


Figure 3 –
Generic Shading Constraints

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.



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 Assuming that they will be retained, the orientation of the on-site trees have the potential to provide a variety of secondary constraints, including shading, organic deposition and the potential need to maintain crown clearance in the future. The significance of these constraints will vary depending on the location and proximity to the proposed re-development.

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

Hide irrelevant

Show All Trees

Ref: JWA/55GLA/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
A	1	Lime, Common	Basement Construction within modified RPA - on garage site	18.2 m ² 8.21 %	Mature	Normal	Moderate	Low	N/A	Trial pits have shown no significant roots impacted Manual working within RPA to 1m depth
A	2	Lime, Common	Vault Demolition within RPA Basement Construction within modified RPA - on vault site	6.8 m ² 3.16 %	Mature	Normal	Moderate	Very Low	N/A	Trial pits have shown no significant roots impacted Manual working within RPA to 1m depth

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The principal primary impacts in the current proposals are very low; comprising potential 8.5% & 3.2% encroachments of T1 & 2's modified RPA from the garage and vault demolition/removal of hardstanding. Basement construction / extension would occur within the on the existing garage and vault sites, where colonisation of significant roots from T1 & 2 is unlikely. The greater part of the roots are likely to lie within the soft verge. Trial pits have shown negligible root colonisation from trees within the proposed footprint: footprints have been set back to avoid the occasional roots of 30-50mm diameter uncovered in the vicinity. Precautionary mitigation has been recommended to further reduce the potential impact; these comprise the manual 'pull-back' demolition of the existing buildings and hard surfaces, with supervised manual excavation of the new foundations and pre-emptive root pruning of smaller roots (<25mm diameter) where necessary. Similar considerations apply to light well alterations, which have been aligned to avoid significant roots.

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 tree in question is a healthy specimen 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 The survey has identified tree works for both T1 and T2, including crown-lifting both trees to 5m (over highway and garden). T2 requires further works to cut-back the crown from the guttering on the main house. This unilateral cutting back should be balanced with an overall 10% crown reduction, which will also help maintain uniformity of canopy / wind profile: T1 in particular exhibits breakaway lateral branching (see Photograph 1). These works will need to be maintained on a 5-year pruning cycle. The existing recommendations will reduce the secondary impacts affecting the proposed extension (by permitting more light beneath the canopy and lessening direct organic deposition), although there will always be marginal secondary impacts of honeydew / litter deposition and partial shade on this site, regardless of development: the proposals do not change the status quo vis a vis the trees. The proposed roof light / light wells will continue to require simple maintenance to reduce these minimal secondary impacts.

6.3 Mitigation of Impacts

6.3.1 The demolition of the garage and vault buildings should proceed manually and inwards in a “pull down” fashion. Hard surfacing should be lifted with caution using an airspade, ensuring to roots that may be lying beneath the surfaces are protected.

6.3.2 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 back to a junction. Roots larger than 25mm diameter may only be cut in consultation with an arboriculturalist

6.3.3 Any new hard surfaces 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.

6.3.4 Nuisance deposition can be mitigated with regular crown cleaning, as required under the existing tree works.

6.3.5 The shading impacts have been mitigated by building design, with the provision of a roof light.

7.0 CONCLUSION

- | | |
|-----|---|
| 7.1 | The potential impacts of development are all low in terms of the RPA encroachments of the surveyed trees. Trial pits may well determine they are non-existent. |
| 7.2 | Subject to the findings of trial investigations, the full potential of the impacts can be mitigated through design and precautionary measures. These measures can be elaborated in Method Statements in the discharge of planning conditions. |
| 7.3 | The species affected are generally tolerant of root disturbance / pruning, and both trees are in good health and capable of sustaining these reduced impacts. |
| 7.4 | Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape. Thus, with suitable mitigation and supervision the scheme is recommended to planning. |

8.0 RECOMMENDATIONS

8.1 Specific Recommendations

- 8.1.1 Current tree works recommendations are found in Appendix 2 to this report.
- 8.1.2 Subject to the findings of trial investigations, excavation and construction impacts within the modified RPA of T1 & 2 identified in Table 1 above, will need to be controlled either by further method statements specifying mitigation methods suggested in para 6.3 above or by general details outlined at 8.2 below, and by consultant supervision as necessary. These method statements can be provided as part of the discharge of conditions.

8.2 General Recommendations

- 8.2.1 Any trees which are in close proximity to the proposed development should be protected with a Tree Protection Barrier (TPB). Protective barrier fencing should be installed immediately following the completion of the tree works, remaining in situ for the entire duration of the development unless otherwise agreed in writing by the council. It should be appropriate for the intensity and proximity of the development, usually comprising steel, mesh panels 2.4m in height ('Heras') and should be mounted on a scaffolding frame (shown in Fig 2 of BS5837:2012). The position of the TPB can be shown on plan as part of the discharge of conditions, once the lay out is agreed with the planning authority. The TPB should be erected prior to commencement of works, remain in its original form on-site for the duration of works and removed only upon full completion of works.
- 8.2.2 A TPB may no longer be required during soft landscaping work but a full arboricultural assessment must be performed prior to the undertaking of any excavations within the RPA of a tree. This will inform a decision about the requirement of protection measures. It is important that all TPBs have permanent, weatherproof notices denying access to the RPA.
- 8.2.3 Any pruning works must be in accordance with British Standard 3998:2010 Tree work [BS3998].
- 8.2.5 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]'.
- 8.2.6 If the RPA of a tree is encroached by underground service routes then BS5837:2012 and NJUG VOLUME 4 provisions should be employed. If it is deemed necessary, further arboricultural advice must be sought.

- 8.2.7 Numerous site activities are potentially damaging to trees e.g. parking, material storage, the use of plant machinery and all other sources of soil compaction. In operating plant, particular care is required to ensure that the operational arcs of excavation and lifting machinery, including their loads, do not physically damage trees when in use.
- 8.2.8 To enable the successful integration of the proposal with the retained trees, the following points will need to be taken into account:
- 1) Plan of underground services.
 - 2) Schedule of tree protection measures, including the management of harmful substances.
 - 3) Method statements for constructional variations regarding tree proximity (e.g. foundations, surfacing and scaffolding).
 - 4) Site logistics plan to include storage, plant parking/stationing and materials handling.
 - 5) Tree works: all works must be carried out by a competent arborist in accordance with BS3998.
 - 6) Site supervision: the Site Agent must be nominated to be responsible for all arboricultural matters on site. This person must:
 - be present on site for the majority of the time;
 - be aware of the arboricultural responsibilities;
 - have the authority to stop work that is causing, or may cause harm to any tree;
 - ensure all site operatives are aware of their responsibilities to the trees on site and the consequences of a failure to observe these responsibilities;
 - make immediate contact with the local authority and/or a retained arboriculturalist in the event of any tree related problems occurring.
- 8.2.9 These points can be resolved and approved through consultation with the planning authority via their Arboricultural Officer.
- 8.2.10 The sequence of works should be as follows:
- i) initial tree works;
 - ii) installation of TPB for demolition & construction;
 - iii) installation of underground services;
 - iv) installation of ground protection;
 - v) main construction;
 - vi) removal of TPB;
 - vii) soft landscaping.

9.0 REFERENCES

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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 Conservation, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.



Site: 55 Gloucester Avenue

Date: 23 May 2014

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Adam Hollis

Ref: JWA/55GLA/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
1	Lime, Common	20	8946	3.0	700	Mature	8.4	Normal	Good	A	2	>40	Minor breaks in canopy profile Included bark in branch unions Minor deadwood
2	Lime, Common	21	8765	3.0	690	Mature	8.3	Normal	Good	A	2	>40	Upper crown touching down on eaves / guttering Included bark in branch unions

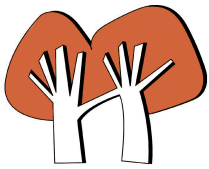
APPENDIX 2

RECOMMENDED TREE WORKS

Notes for Guidance:

Husbandry 1 - Urgent (ASAP), 2 - Standard (within 6 months), 3 - Non-urgent (2-3 years)

- 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.



Site: 55 Gloucester Avenue

Date: 23 May 2014

Surveyor(s): Adam Hollis

Ref: JWA/55GLA/AIA

Appendix 2

Recommended Tree Works

Hide irrelevant

Show All Trees

Landmark Trees

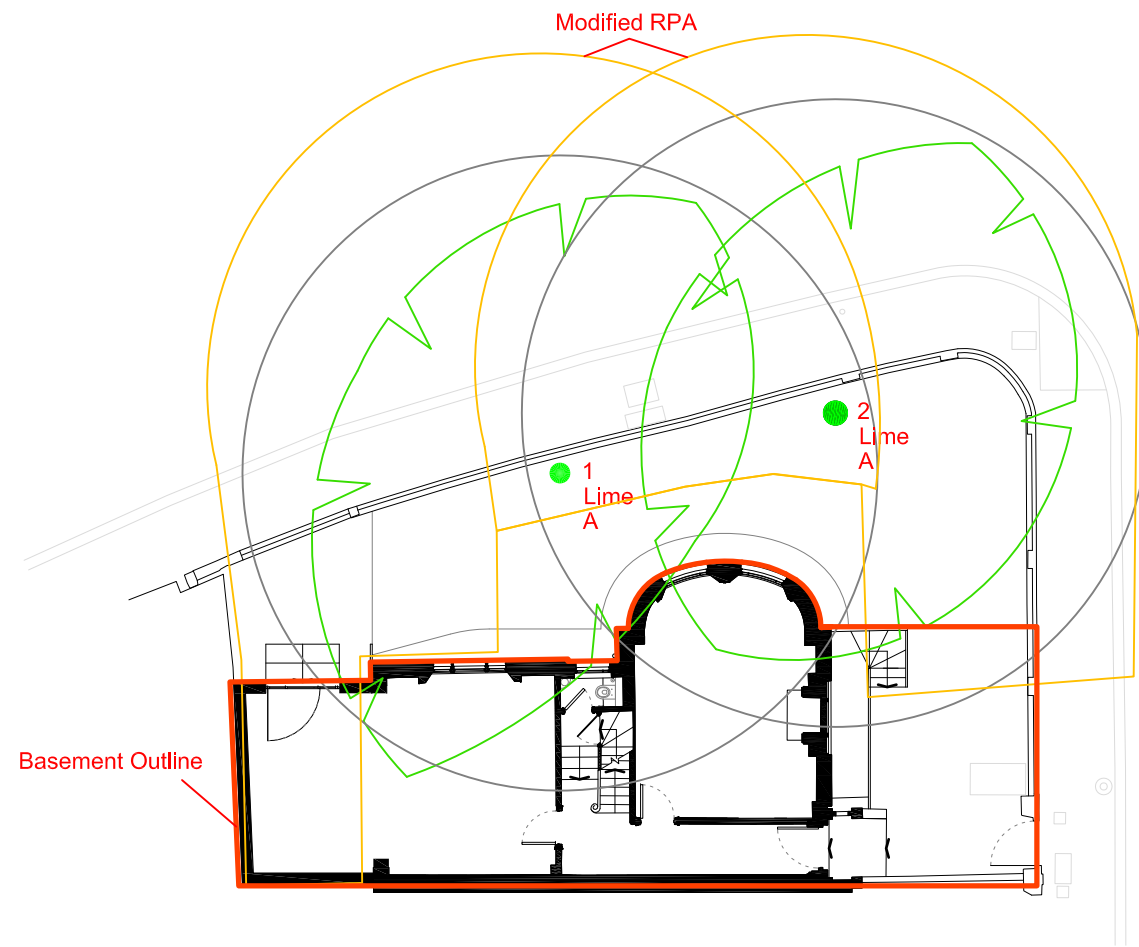
Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
1	Lime, Common	A	20	3.0	8946	CL5m CR10% DWD CL to permit light to light wells; remove secondary growth only	Minor breaks in canopy profile Included bark in branch unions Minor deadwood Recommended husbandry 2
2	Lime, Common	A	21	3.0	8765	CL5m CR10% DWD As per T1, plus lift off roof tiles / guttering by 1-2m	Upper crown touching down on eaves / guttering Included bark in branch unions Recommended husbandry 2

APPENDIX 3

TREE CONSTRAINTS PLAN

APPENDIX 4

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).



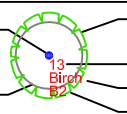
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Site: 55 Gloucester Avenue	1-200@A3
Drawing Title: Arboricultural Impacts Assessment	August 2014

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

Category



Crown Spread
Tree Number
Species
Category
Root Protection Area