Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

69 Avenue Road

London

NW8 6HP

INSTRUCTING PARTY:

Mr Nicholas Goulandris

c/o KSR Architects

14 Greenland Street

Camden Town

London

NW1 0ND

REPORT PREPARED BY

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MSc ARB MICFor FArbor A MRICS C Env

Ref: KSR/69AVR/AIA/02a

Date: 28th February 2020

PART 1: MAIN TEXT

PART 2 - APPENDICES

PART 3 - PLANS

1. SUMMARY

1.1 There are 28 trees on and adjacent to the application boundary that are within close proximity and need to be assessed.

1.2 Of these 28 trees, 5 are A category *(High Quality), 6 are B category *(Moderate Quality), 14 are C category *(Low Quality) and 2 are U category *(Unsuitable for Retention). In theory, only moderate quality trees and above are significant material constraints on development. The majority of the trees are growing within the application site. The key off-site constraint tree, a category B false acacia has been the subject of a ground penetrating radar study which found only low density rooting on site.

1.3 The report has assessed the impacts of the development proposals and concludes there would be at most a medium-low impact on trees: The positioning of the basement largely beneath the existing built footprint means that there are only theoretical impacts to the majority of trees affected on plan.

1.4 Notwithstanding the above assurances, the report sets out a series of recommendations prior and during construction detailed in sections 6.3 and 8 of this report.

1.5 In conclusion, the proposal, through following the above recommendations, will have no, or very limited, impact on the existing trees and is acceptable.

* 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 This Arboricultural Impact Assessment report has been prepared by Landmark Trees (LT) on behalf of Mr Nicholas Goulandris (the Applicant), to support an application submission to the London Borough of Camden ('LBC').

2.1.2 The application relates to the development of the existing property by re-modelling internally, the creation of a basement under the existing house, alterations to the roof at the rear extending the rear dormer at second floor level and construction of a green roofed side extension at LG/G and 1st floors.

2.1.3 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.

2.1.4 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:

Existing site survey: Scheme retaining tree

Proposals: 18030_69 Avenue Road_-Sheet - P009 - Proposed Site Plan, 18030_69 Avenue Road_-Sheet - P090 – Basement & 18030_69 Avenue Road_-Sheet - P100 - Ground Floor Plan

2.3 Scope & Limitations of Survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, Kim Dear surveyed the trees on site on 22nd January 2020, 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. General husbandry recommendations are provided within Appendix 2. Planning considerations notwithstanding, we trust these necessary recommendations are passed on to relevant parties with due diligence and the trees be managed appropriately.

2.4.2 A site plan identifying the surveyed trees, based on the Instructing Party's drawings / topographical survey is provided in Part 3 of this report. 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 Instructing Party's proposals to create a second Arboricultural Impact Assessment Plan in Part 3. General observations and discussion follow, below.

3.0 OBSERVATIONS

3.1 Site description

Photograph 1: Aerial photograph of 69 Avenue Road, London NW8 6HP (Source: Google Maps)

3.1.1	The site comprises a large detached dwelling of some 890sqm size. It stands in large grounds with several protected trees to the front. Avenue Road is characterised by large, detached residences and blocks of flats.
3.1.2	The site is relatively flat although there are a number of level changes in line with the existing landscaping.
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.

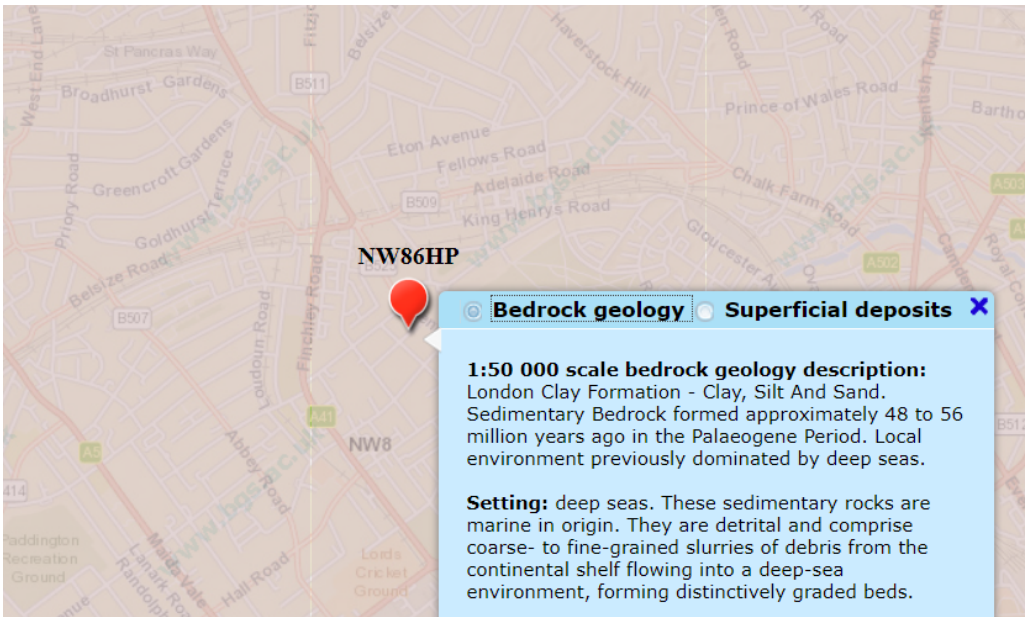


Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject trees

3.2.1	Of the 28 surveyed trees, 5 are A category *(High Quality), 6 are B category *(Moderate Quality), 14 are C category *(Low Quality) and 2 are U category *(Unsuitable for Retention).
3.2.2	The tree species found on site comprise tree of heaven, pear, gingko, apple, London plane, common lime, Japanese maple, southern magnolia, common yew, small-leaved lime, horse chestnut, sycamore, laburnum, western red cedar and false acacia. The key off-site constraint tree, a category B false acacia has been the subject of a ground penetrating radar study which found only low density rooting on site.
3.2.3	In terms of age demographics there is a broadly even mixture of semi-mature, early mature and mature specimens on or adjacent to the site.

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 16 trees. These are listed in Appendix 2.

3.3 Planning Status

3.3.1	We understand that the site does not fall within any Conservation Area but that 2 trees to the front of the property (T1 and T3) are subject to Tree Preservation Order No. 38, which was made in 1957, which will affect the subject trees: it is a criminal offence to prune, damage or fell such trees without permission from the local authority.
3.3.2	Relevant local planning policies comprise Policy 7.21 of the London Plan 2016 and Policies A3, A5 and D1 of the Camden Local Plan (adopted 3rd July 2017).

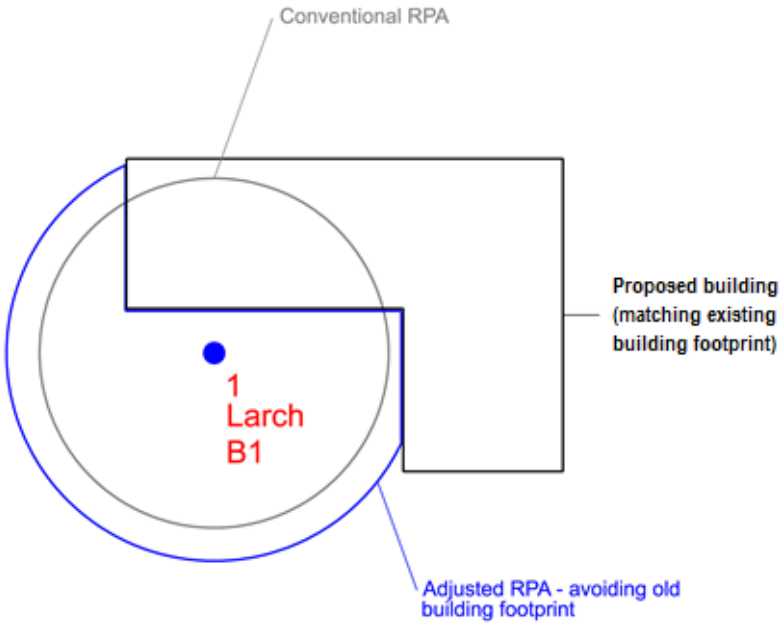
4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary Constraints

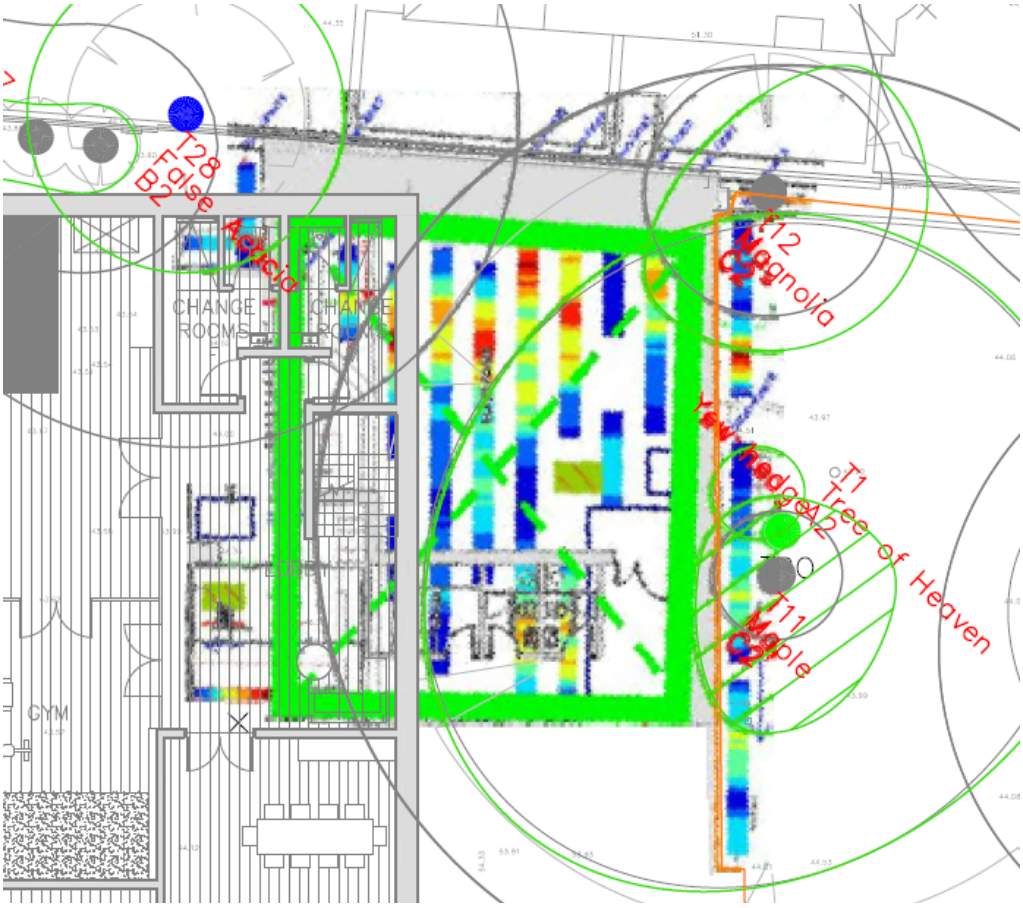
4.1.1 BS5837: 2012 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is 12-x stem diameter at 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.

Figure 2 –



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. W**e previously adopted a prudent principle of modification whereby the priority area for root protection is not distributed beneath the existing dwelling and thus showed a modified RPA for T1. However, ground penetrating radar (see Extract 1 below) has since shown that it is rooting beneath a lighter part of the building and therefore we have not adopted the modified RPA in this assessment.**



Extract 1: Root densities beneath existing structure

4.1.4	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.
4.1.5	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."

4.1.7	Only moderate quality trees and above are significant material constraints on development. However, low quality trees comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting is generally considered appropriate.
4.1.8	In this instance, the high and moderate quality trees present have the potential to pose significant constraints upon the development of the site although it should be noted that these trees are generally not well-placed in the context of the existing built infrastructure.

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.

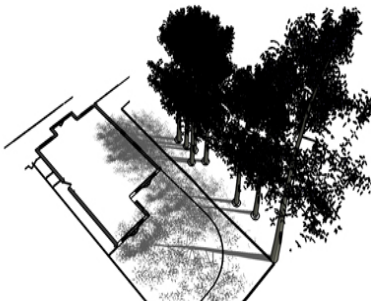


Figure 3 –
Generic Shading Constraints

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.

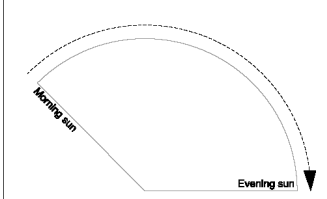


Figure 4 – Shading Arc

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 Assuming that they will be retained, the orientation of the on- and off-site trees means they 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 which is considered below (in Sections 5 & 6). As specified by BS5837, this section (4) of the report considers only the site as it is, not in the light of pending proposals.

Note: Sections 5 & 6 below will now assess the impacts of the proposals upon constraints identified in Section 4 above. 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.

INSERT TABLE HERE – PREVIOUSLY SECTION 5

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: LGA_35TPW_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
B	1	Chestnut, Horse	LGF Construction within RPA	14.6 m^2 10.29 %	Mature	Moderate	Moderate	Low	Low	Hand dig top 750mm of basement line thro' RPA
A	2	Oak	LGF Construction within modified RPA	12.7 m^2 4.28 %	Mature	Normal	Moderate	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA
B	4	Plane, London	LGF Construction within modified RPA Note: impact occurs >1.5m from stem	18.7 m^2 7.16 %	Mature	Normal	Good	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA
C	h6	Yew	Felled to Facilitate Development	m^2 N/A %	Semi-mature	Moderate	N/A	Very Low	Very Low	New planting / landscaping
C	8	Fir, European silver	LGF Construction within RPA	1.1 m^2 5.02 %	Semi-mature	Normal	Moderate	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA
B	11	Pine, Bhutan	Felled to Facilitate Development Note: removal consented under application 2017/4498/P	m^2 N/A %	Semi-mature	Normal	N/A	N/A	Medium	New planting / landscaping
U	12	Acacia	Felled to Facilitate Development Note: removal consented under application 2017/4498/P	m^2 N/A %	Young	Poor	N/A	N/A	Very Low	New planting / landscaping

5.0

Hide irrelevant | Show All Trees

Table 1: Arboricultural Impact Assessment

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

Ref: LGA_35TPW_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
C	G13a	Eucalyptus	Felled to Facilitate Development Note: removal consented under application 2017/4498/P	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping
C	G13b	Eucalyptus	Felled to Facilitate Development Note: removal consented under application 2017/4498/P	m^2 N/A %	Early Mature	Moderate	N/A	N/A	Low	New planting / landscaping
C	14	Hornbeam	LGF Construction within RPA	1.4 m^2 4.95 %	Semi-mature	Normal	Moderate	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1	The principal impacts in the current proposals are the removal of G15 (category B) and part of G27 (category C). In terms of resource management, these comprise a relatively small portion of the whole and it should be noted the pollarding of G15 is recommended regardless of development. Their loss can be mitigated with new planting, bringing its own benefits of enrichment and diversification to a relatively unmanaged and subsisting resource. Similarly, though pruning of 7 trees is required here to serve development, undertaken to best practice, the scale envisaged should not be altogether untoward in a more managed and occupied site. The immediate reduction in canopy cover through felling and / or pruning is therefore is rated as a low impact unlikely to harm either the resource of the wider conservation area.
6.1.2	The principal impacts in the current proposals arises from the encroachment of the theoretical RPA of 7 trees by the likely basement footprint. The majority of these encroachments occur largely beneath or beyond the existing building's footprint and therefore only those parts of the basement outside this footprint are considered likely to be of impact to the subject trees.
6.1.3	Of these 7 encroachments, 6 comprise less than 5% of the total area and are accordingly assessed as being likely to be of very low impact. The impact to T28 is more significant on plan, comprising 14.9% of the total area. It is likely however that the RPA shown on our plans is an overstatement of the actual minimum area required to maintain the viability of the tree given its previous management history and small leaf area compared to stem diameter. The radar scan at Extract 1 would support this assessment.
6.1.4	The impacts to all trees from the basement excavation will be mitigated by the hand digging of the top 1m of the basement line through RPAs in conjunction with pre-emptive root pruning under arboricultural supervision.
6.1.5	The ground penetrating radar findings indicate the presence of potentially significant rooting beneath the proposed garage necessitates the use of low-invasive foundations such as discontinuous piles with an above ground beam in this area.
6.1.6	The setting back of the first-floor side extension means that sufficient clearance is provided to T1.
6.1.7	The new rear terrace will require a no-dig construction method within RPAs.
6.1.8	The minor cutting back of the 7 trees listed in Appendix 3 in order to facilitate the construction of the basement is assessed as being of very low impact provided it is carried out in accordance with good arboricultural practice.

6.1.9 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.

6.1.10 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 in general (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.

6.1.11 "**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 (or by extension, the *pro rata* RPA); 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.*

6.1.12 BS5837 recommends (at 5.3.a) that if operations within the RPA are proposed, the project arboriculturist should demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA. On the basis of Thomas et al, above, it is possible to demonstrate that the tree can remain viable, and on the basis that the tree will be rooting no less freely in the garden / lawn / border /pavement than within the proposed footprint, with the RPA encroachment compensated elsewhere on contiguous land. The guide also recommends (at 5.3.b) the arboriculturist propose a series of mitigation measures (to improve the soil environment that is used by the tree for growth). These are provided at 6.3 below.

6.2 Rating of Secondary Impacts

6.2.1 The predominantly subterranean nature of the proposals and green roof of the side extension mean that post-development conflict is highly unlikely to arise.

6.2.2 Some shade will be cast over the side extension by the oversailing T1 but given the nature of the species and its juxtaposition to the extension, this is not likely to be significant.

6.3 Mitigation of Impacts

6.3.1	The replanting scheme will offer considerable enhancement with replacement trees having the advantage of being specifically selected for the proposed site, healthy and fit-for-purpose. Design can provide for a diverse range of native and ornamental species that will compliment rather than conflict with the proposals, so providing a more sustainable long-term resource for the future. A selection of tree species and cultivars for open and constricted sites is provided in Appendix 4.
6.3.2	The path of foundations through RPAs will be manually excavated to 1m depth under arboricultural supervision; any roots encountered within the trenches 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.

6.3.2	Nuisance deposition can be further mitigated with routine maintenance, light pruning / deadwooding and the fitting of filtration traps on guttering (see Figure 5 below).
6.3.3	The shading impacts can be mitigated by building design, with the provision of dual aspect windows and choice of room layout. Some minor crown reduction may be necessary, but not such as to impose a burden of frequent, repetitive management.

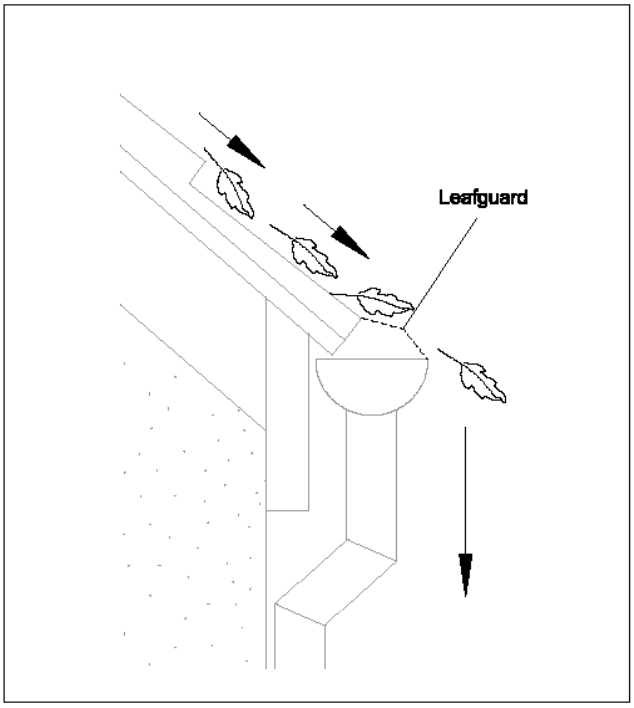


Figure 5: Filtration traps, as shown above, could be fitted on the gutters which can easily be maintained at 2-3m above ground.

7.0 CONCLUSION

7.1	The potential impacts of development are all relatively low in terms of both quality of trees removed and also RPA encroachments of trees retained.
7.2	The full potential of the impacts can thus be largely 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 / crown reduction and the retained trees are generally in good health and capable of sustaining these reduced impacts.
7.4	The trees that are recommended for felling are of little individual significance, such that their loss will not affect the visual character of the area.
7.5	Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape thereby complying with Policy 7.21 of the London Plan 2016 and Policies A3, A5 and D1 of the Camden Local Plan (adopted 3rd July 2017). Thus, with suitable mitigation and supervision the scheme is recommended to planning.

8.0 RECOMMENDATIONS

8.1 Specific Recommendations

8.1.1 Tree works recommendations in Appendix 2 are not part of the current application, but requirements of general maintenance that will need to be applied for (subject to para. 3.3 of this report and any other relevant constraints in planning or leasehold) by the client separately. Consent for the current planning application does not impart any consent for the Appendix 2 maintenance works. Please note, though, the owner and / or manager of a property have a duty to maintain a safe site of work and to protect occupiers of the surrounding land / members of the public from tree hazards. Works recommended in this report should be enacted in a timely fashion by the relevant party regardless of the progress of the development.

8.1.2 Recommendations for works required to facilitate development are found in Appendix 3 and a selection of columnar tree species cultivars for constricted sites provided in Appendix 4. Any tree removals recommended within this report should only be carried out with local authority consent.

8.1.3 Excavation and construction impacts within the RPA's of trees identified in Table 1 above, will need to be controlled by method statements specifying mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. These method statements can be provided as part of the discharge of conditions.

8.1.4 Replace felled trees with native ornamental nursery stock under current best practice; i.e. conforming to and planted in accordance with the following:

- BS8545: 2014 Code of Practice for Trees from Nursery to Landscape
- BS 3936-1: 1992 Nursery stock. Specification for trees and shrubs; and
- BS 5236:1975 Cultivation and Planting of Trees in the Advanced Nursery Stock Category.
- All replacement stock should be planted and maintained as detailed in BS 4428:1989 (Section 7): Recommendations for General Landscape Operations.

8.2 General Recommendations for Sites Being Developed with Trees

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 layout 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 be 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 The use of heavy plant machinery for building demolition, removal of imported materials and grading of surfaces should take place in one operation. The necessary machinery should be located above the existing grade level and work away from any retained trees. This will ensure that any spoil is removed from the RPAs. It is vital that the original soil level is not lowered as this is likely to cause damage to the shallow root systems.

8.2.4 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: felling, required pruning and new planting. 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: felling, stump grinding and pruning for working clearances;
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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- Trowbridge J & Bassuk N (2004) Trees in the Urban Landscape: Site Assessment, Design, and Installation; J Wiley & Sons inc. NJ USA

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.

Landmark Trees

PART 2 – APPENDICES

APPENDIX 1

TREE SCHEDULE

Botanical Tree Names

Acacia, False (Robinia)	: Robinia pseudoacacia	Magnolia, Southern	: Magnolia grandiflora
Apple	: Malus sp	Maple, Japanese	: Acer palmatum
Cedar, Western Red	: Thuja plicata	Pear, Common	: Pyrus communis
Chestnut, Horse	: Aesculus hippocastanum	Plane, London	: Platanus acerifolia
Gingko	: Gingko biloba	Sycamore	: Acer pseudoplatanus
Laburnum, Common	: Laburnum anagyroides	Tree of Heaven	: Ailanthus altissima
Lime, Common	: Tilia x europea	Yew, Common	: Taxus baccata
Lime, Small-leaved	: Tilia cordata		

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

Site: 69 Avenue Road

Date: 22/01/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Kim Dear

Ref: GLH/69AVR/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	Tree of Heaven	18	98,11,9	4.5	990	Mature	11.9	Normal	Fair	A	2	20+	Deadwood (minor) throughout crown Restricted rooting lifting driveway
2	Pear, Domestic	14	5664	4.5	455	Mature	5.5	Normal	Good	B	2	20+	Leaning (slightly)
3	Gingko	17	5564	4.0	700	Early Mature	8.4	Normal	Good	A	2	20+	stems crossing
4	Pear, Domestic	7	3523	4.0	315	Mature	3.8	Moderate	Fair	C	2	10+	leans south
5	Apple, Cultivated	7	2213	4.0	200	Early Mature	2.4	Poor	Poor	U		<10	lost leader at 2m
6	Plane, London	21	12,997	7.0	1150	Mature	13.8	Normal	Good	A	2	>40	roadside tree off site

Landmark Trees

Site: 69 Avenue Road

Date: 22/01/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Kim Dear

Ref: GLH/69AVR/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
7	Lime, Common	12	3615	4.0	480	Early Mature	5.8	Moderate	Fair	C	2	20+	Pollarded Suppressed by nearby tree
8	Lime, Common	7	1211	4.0	260	Early Mature	3.1	Moderate	Poor	U		10+	Suppressed by nearby tree
9	Lime, Common	11	3341	4.0	300	Early Mature	3.6	Moderate	Fair	C	2	20+	Pollarded leans east
10	Lime, Common	22	6566	7.5	800	Mature	9.6	Normal	Good	B	2	20+	occluded wound 2 m East. crown cut cack from neighbouring house
11	Maple, Japanese	4	4344	2.0	142	Early Mature	1.7	Normal	Fair	C	2	10+	Suppressed by nearby tree
12	Magnolia, Saucer	9	4442	3.0	290	Mature	3.5	Normal	Good	B	2	10+	Restricted rooting poor position against wall

Landmark Trees

Site: 69 Avenue Road
Date: 22/01/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Kim Dear
Ref: GLH/69AVR/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
13	Yew, Common	7	3232	3.0	325	Semi-mature	3.9	Moderate	Fair	C	2	20+	Remote survey only (RS)
14	Lime, Common	24	8998	7.0	950	Mature	11.4	Normal	Good	A	2	20+	Remote survey only (RS) in neighbours garden, base obscured
g15	Lime, Common	16	3111	5.5	300	Early Mature	3.6	Moderate	Fair	B	2	20+	Pollarded group of 3, pol larded at 6 m, extensive regrowth
16	Chestnut, Horse	12	3132	4.0	650	Post-Mature	7.8	Moderate	Fair	C		10+	Decay in trunk Pollard (Old) poor specimen, questionable viabilty
17	Lime, Common	15	2233	4.0	750	Mature	9.0	Moderate	Fair	C	2	20+	Pollard (Old) lifting slabs
18	Lime, Common	22	5766	5.5	560	Mature	6.7	Normal	Good	A	2	20+	

Landmark Trees

Site: 69 Avenue Road
Date: 22/01/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Kim Dear
Ref: GLH/69AVR/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
g19	Lime, Common	15	2111	4.0	300	Semi-mature	3.6	Moderate	Fair	C	2	10+	group 5 lime, northerly 2 poor, decayed
g20 a	Lime, Common	20	4255	4.5	600	Mature	7.2	Normal	Fair	C	2	10+	Decay in pollard heads 2 lime, northerly one decay in pollard heads
g20	Lime, Common	19	3411	4.5	400	Early Mature	4.8	Moderate	Fair	C	2	10+	group 3 lime
22	Sycamore	9	4312	3.5	425	Semi-mature	5.1	Moderate	Fair	C		10+	Asymmetry (minor) appears in decline
23	Laburnum	7	2312	2.0	180	Semi-mature	2.2	Normal	Fair	C	2	10+	
24	Western Red Cedar	4	1111	0.0	250	Semi-mature	3.0	Normal	Good	C	2	20+	topiary

Landmark Trees

Site: 69 Avenue Road

Date: 22/01/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Kim Dear

Ref: GLH/69AVR/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
25	Lime, Common	12	2331	3.5	400	Semi-mature	4.8	Moderate	Fair	C	2	20+	Ivy clad Remote survey only (RS) in neighbouring property
g26	Lime, Common	18	4533	5.0	500	Mature	6.0	Normal	Fair	B	2	20+	Ivy clad group of 2
g27	Lime, Common	9	2211	3.5	330	Semi-mature	4.0	Normal	Fair	C	2	20+	group of 7 lime, pollarded at 6 m 3-5 years ago
28	False Acacia	18	5664	7.0	600	Mature	7.2	Normal	Fair	B	2	20+	Remote survey only (RS) lost co dominant stem at 6 m.?. in neighbouring garden.

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.

*Not generally specified following BS3998:2010

Landmark Trees

Site: 69 Avenue Road
Date: 22/01/20

Surveyor(s): Kim Dear
Ref: GLH/69AVR/AIA

Appendix 2

Recommended Tree Works

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
g15	Lime, Common	B	16	5.5	3111	POL	Pollarded group of 3, pol larded at 6 m, extensive regrowth Recommended husbandry 1
g20a	Lime, Common	C	20	4.5	4255	POL	Decay in pollard heads 2 lime, northerly one decay in pollard heads Recommended husbandry 2

APPENDIX 3

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.

*Not generally specified following BS3998:2010

Landmark Trees

Site: 69 Avenue Road
Date: 22/01/20

Surveyor(s): Kim Dear
Ref: GLH/69AVR/AIA

Appendix 3

Recommended Tree Works To Facilitate Development

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
10	Lime, Common	B	22	7.5	6566	CB Cut back to provide constructional clearance	occluded wound 2 m East. crown cut cack from neighbouring house To facilitate development
g15	Lime, Common	B	16	5.5	3111	Fell	Pollarded group of 3, pol larded at 6 m, extensive regrowth To facilitate development
16	Chestnut, Horse	C	12	4.0	3132	CB Cut back to provide constructional clearance	Decay in trunk Pollard (Old) poor specimen, questionable viabilty To facilitate development
17	Lime, Common	C	15	4.0	2233	CB Cut back to provide constructional clearance	Pollard (Old) lifting slabs To facilitate development
18	Lime, Common	A	22	5.5	5766	CB Cut back to provide constructional clearance	To facilitate development
g19	Lime, Common	C	15	4.0	2111	CB Cut back to provide constructional clearance	group 5 lime, northerly 2 poor, decayed To facilitate development

Landmark Trees

Site: 69 Avenue Road
Date: 22/01/20

Surveyor(s): Kim Dear
Ref: GLH/69AVR/AIA

Appendix 3

Recommended Tree Works To Facilitate Development

Hide irrelevant
Show All Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
g20a	Lime, Common	C	20	4.5	4255	POL	Decay in pollard heads 2 lime, northerly one decay in pollard heads Recommended husbandry 2
g26	Lime, Common	B	18	5.0	4533	CB Cut back to provide constructional clearance	Ivy clad group of 2 To facilitate development
g27	Lime, Common	C	9	3.5	2211	SFell	group of 7 lime, pollarded at 6 m 3-5 years ago To facilitate development
28	False Acacia	B	18	7.0	5664	CB Cut back to provide constructional clearance	Remote survey only (RS) lost co dominant stem at 6 m.?. in neighbouring garden. To facilitate development

Landmark Trees

PART 3 – PLANS

PLAN 1

TREE CONSTRAINTS 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).

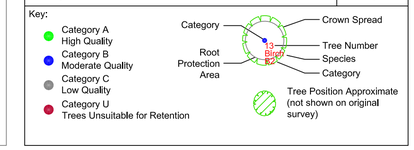
Landmark Trees

20 Broadwick Street, London, W1F 8HT
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 69 Avenue Road	1:200@ A1
Drawing Title: Tree Constraints Plan	January 2020

Key:

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

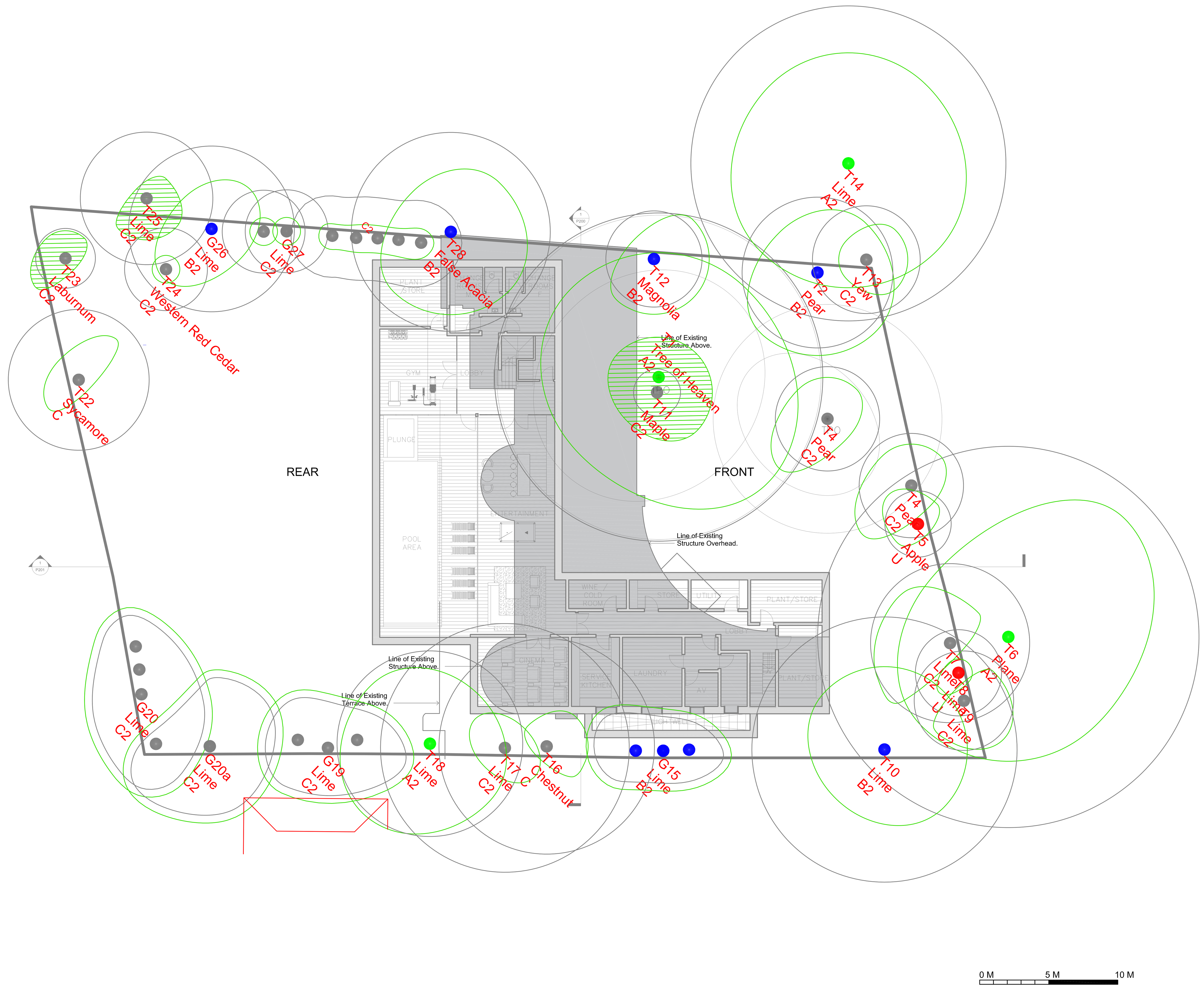


Tree Position Approximate (not shown on original survey)

PLAN 2

ARBORICULTURAL IMPACT ASSESSMENT PLAN (S)

i. Basement
ii. Ground Floor
iii. Site Plan



Proposed Basement 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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e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 69 Avenue Road	1:200@ A1
Drawing Title: Arboricultural Impacts Assessment Plan	January 2020

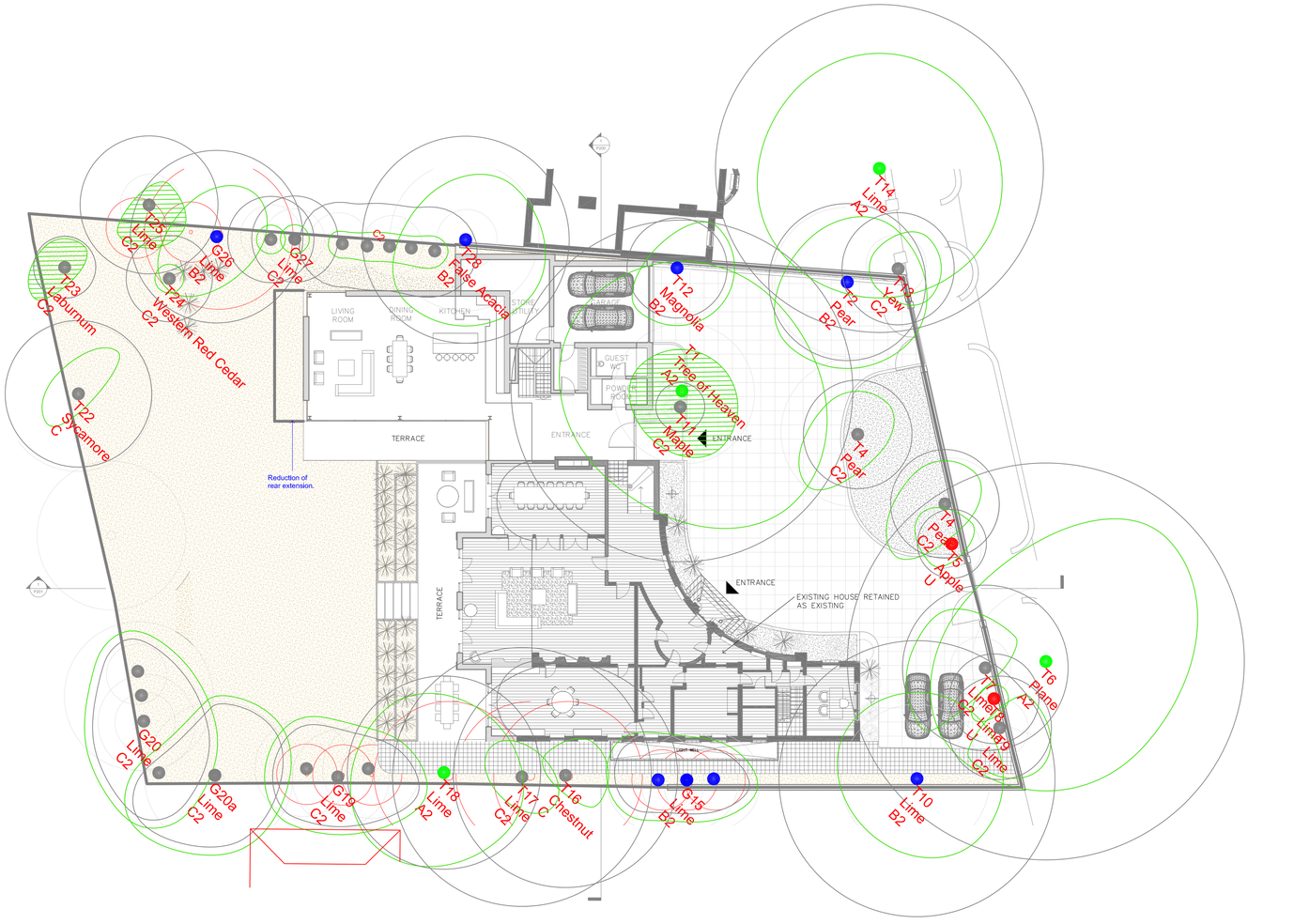
Key:

- 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 (13 Birch B2)

Tree Position Approximate (not shown on original survey)

N



Proposed Ground Floor Plan

0 M 5 M 10 M

NOTE:

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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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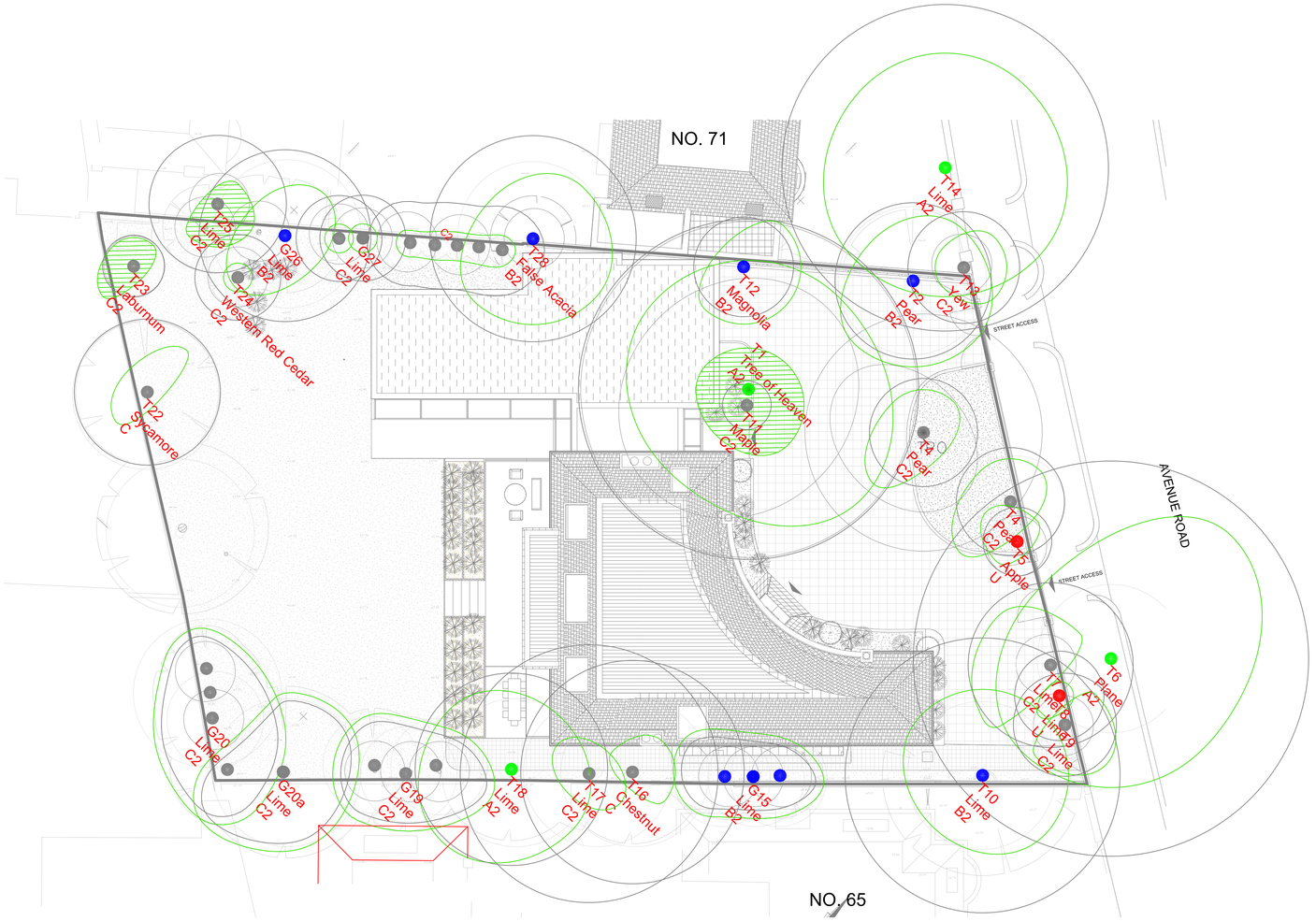
Site: 69 Avenue Road	1:200@ A1
Drawing Title: Arboricultural Impacts Assessment Plan	January 2020

Key:

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

Root Protection Area

Category
Crown Spread
Tree Number
Species
Category
Tree Position Approximate (not shown on orlginal survey)



Proposed Site 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: 69 Avenue Road	1:200@ A1
Drawing Title: Arboricultural Impacts Assessment Plan	January 2020

Key:

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