Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

95 Avenue Road

London

NW8 6HY

INSTRUCTING PARTY:

Private Client c/o Hub Architects

1 Burwood Place

London

W2 2UT

REPORT PREPARED BY

David Gardner

MSc MArborA

&

Adam Hollis

MSc ARB MICFor FArbor A MRICS C Env

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PART 1: MAIN TEXT

PART 2 - APPENDICES

PART 3 - PLANS

DOCUMENT HISTORY

Revision	Status	Comments	Date
Rev 0	DRAFT	For Internal Review (Client / Design Team)	28/1/22
Rev 1a	Approved	For External Issue	05/07/22

1. SUMMARY

1.1 The existing site is a residential property with substantive rear garden containing a number of trees potentially constraining development. The proposal includes the formation of new lightwells around the property.

1.2 There are 25 trees on the property and adjoining land outside of the application boundary that are within proximity to the development and need to be assessed. These are judged mostly moderate and low-quality trees, but with high quality trees T1, T3, T4 and T23 as standout high quality specimens. All trees are material constraints on development, but these latter require particular consideration. At the other end of the spectrum, the removal of T6 is recommended regardless of development.

1.3 Our preliminary report assessed the impacts of the development proposals as having potential impacts on the resource: whilst no trees needed to be removed to facilitate the scheme and pruning of only one tree was required, there were two >10% basement encroachments of the theoretical Root Protection Area* (RPA) of trees to be retained with the potential to impact their ongoing viability. Trial pit investigations were carried out to establish whether the trees were in fact rooting in or close to the proposed footprint, given the presence of intervening structures / foundations. Findings determined no significant rooting within the proposed construction area. On this basis the proposals remain unaltered as the impact is now assessed as low. The trial pit investigation report is included here at Appendix 4.

1.4 In addition to the above, the report sets out a series of recommendations prior and during construction. This includes the need for a Full Arboricultural Method Statement with Tree Protection Plan to reconcile construction activities with the tree protection measures.

1.5 In conclusion, further site investigations are required to confirm that the proposal, will have no, or very limited, impact on the existing trees and be acceptable 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 Hub Architects instructed Landmark Trees (LT) to prepare this Arboricultural Impact Assessment on behalf of their client, to support a full planning application submitted to the London Borough of Camden ('LBC').

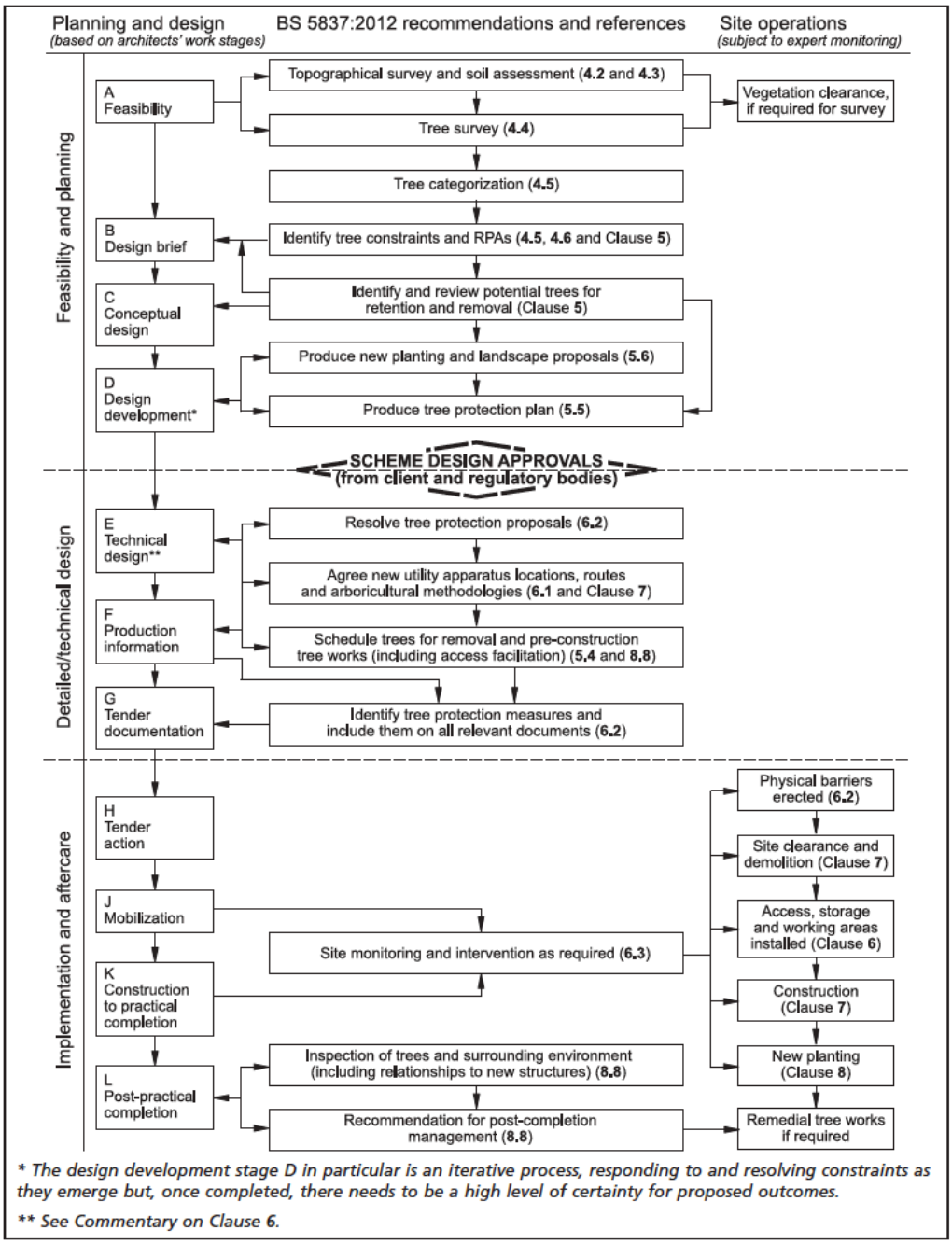
2.1.2 The application relates to the conversion of the existing lower ground floor into two self-contained flats. This will include the formation of new light wells to enable natural light into the newly converted apartments within the lower ground floor.

2.1.3 This report will assess the impact on 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. The purpose of the report is to provide guidance on how trees and other vegetation can be integrated into construction and development design schemes. The overall aim is to ensure the protection of amenity by trees which are appropriate for retention.

2.1.4 Trees are a material consideration for a Local Planning Authority when determining planning applications, whether or not they are afforded the statutory protection of a Tree Preservation Order or Conservation Area. British Standard BS 5837:2012 Trees in Relation to Design, Demolition and Construction sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and new developments. The Standard recommends a sequence of activities (see Fig.1 overleaf) that starts in the initial feasibility and design phase (RIBA Stage 2 'Concept Design' [as correct in 2012]) with a survey to qualify and quantify the trees on site and establish the arboricultural constraints to development (above- and below-ground) to inform the design in an iterative process, and continues with an assessment of the arboricultural impacts of the final design and measures to mitigate such impacts should they be negative. Detailed technical specifications for mitigation and protection measures are devised in the design phase that follows (RIBA Stage 3-4 'Developed and Technical design'), and the sequence ends with the Implementation and Aftercare phase (RIBA Stages 5-7) with the implementation of those measures once planning permission is granted, guided by Arboricultural Method Statements (RIBA Stage 4-5, 'Technical Design and Construction) and professional guidance where appropriate.

2.1.5 **This report is produced to support the Design Team to the Scheme Design Approvals stage in the process chart overleaf.**

Figure 1 The design and construction process and tree care



** The design development stage D in particular is an iterative process, responding to and resolving constraints as they emerge but, once completed, there needs to be a high level of certainty for proposed outcomes.*

*** See Commentary on Clause 6.*

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: 27798A-1(Land Survey)

Proposals:1289-PP2-103 & 104 Rev(as noted) Proposed Lower Ground & Ground Floor Plans

2.3 Scope & Limitations of Survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, Ross Gamblin surveyed the trees on site on 17 January 2022, 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 The results of the tree survey, including material constraints arising from existing trees that merit retention, should be used (along with any other relevant baseline data) to inform feasibility studies and design options. For this reason, the tree survey should be completed and made available to designers prior to and/or independently of any specific proposals for development. Tree surveys undertaken after a detailed design has been prepared can identify significant conflicts: in such cases, the nature of and need for the proposed development should be set against the quality and values of affected trees. The extent to which the design can be modified to accommodate those trees meriting retention should be carefully considered. Where proposed development is subject to planning control, a tree survey should be regarded as an important part of the evidence base underpinning the design and access statement

2.3.4 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.

2.3.5 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. General husbandry recommendations are distinguished at Appendix 2 from minimum requirements to facilitate development which form part of the planning application at Appendix 3. The former may still be relevant to providing a safe site of work, of course. Planning considerations notwithstanding, we trust these necessary recommendations are passed on to relevant parties with due diligence and the trees to 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. Physical measures required to protect trees during construction are then added to this plan to create an Outline Tree Protection Plan. General observations, discussion, conclusions and recommendations follow, below.

3. SITE CHARACTERISTICS

3.1 Property Description & Planning Context

Photograph 1: Aerial view of application site (Source: Google Maps)

3.1.1	The site comprises an eight-storey apartment block that is situated on the junction of Avenue Road, Adelaide Road and St John's Wood Park
3.1.2	The site is relatively level throughout.
3.1.3	We are not aware of the existence of any Tree Preservation Orders*, but understand the site stands outside any Conservation Area.
3.1.4	Relevant local planning policies comprise Policies G1 and G7 of the London Plan 2021 and Policies A3, A5 and D1 of the Camden Local Plan (adopted 3rd July 2017).

* If the client is aware of such, we ask that they confirm these details with us. A purchaser of a site will be informed of the existence of any TPO's during the conveyancing process; an existing owner of a site must be served with a copy of any TPO's made during their ownership. Landmark Trees can investigate the matter further on instruction from the client, but this is beyond our normal scope of instruction as it can take c. 28 days to fully discover this information (which is beyond our standard turnaround and will substantially delay the issue of the instructed report). Some LPA's maintain registers online and / or offer a more rapid telephone or email response. These services though are not wholly reliable and we have had experience of receiving incorrect advice.

3.2 Soil Description

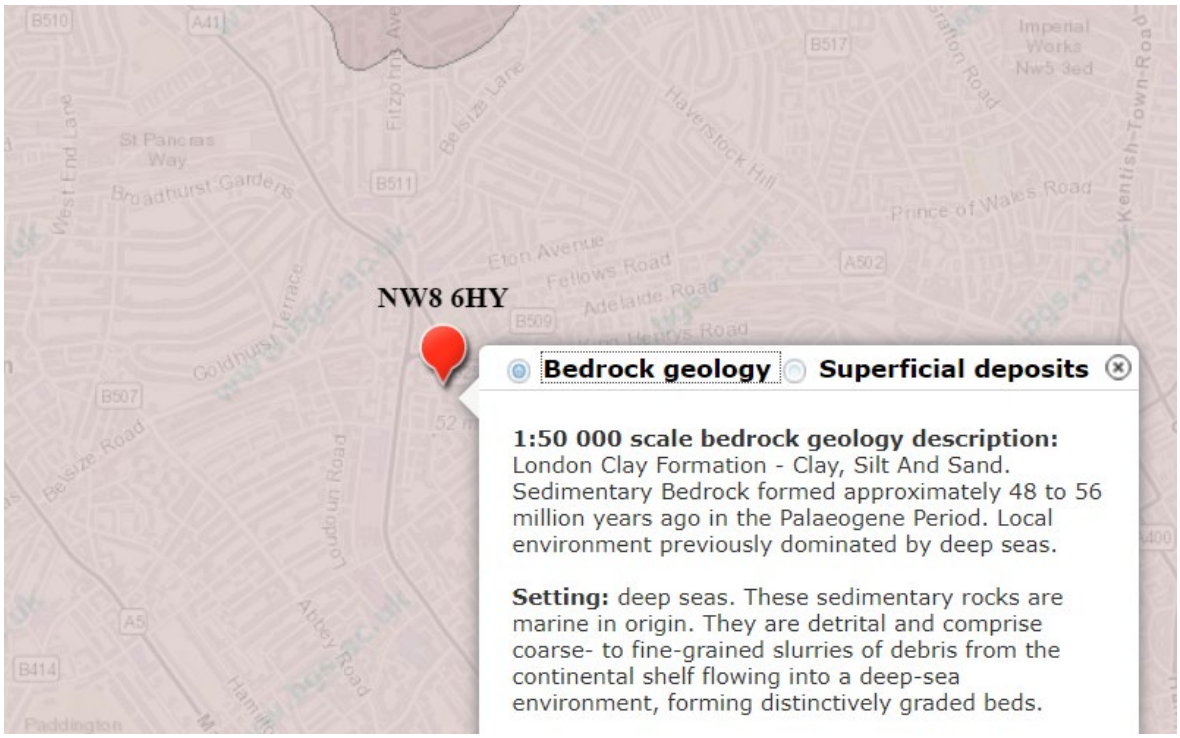


Figure 2: Extract from the BGS Geology of Britain Viewer

3.2.1	In terms of the British Geological Survey, the site overlies the London Clay Formation (see indicated location on Fig.1 plan extract above). 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.
3.2.2	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.

3.3 Subject Trees

3.3.1	Of the 25 surveyed trees, 4 are category* A (High Quality), 10 are category B (Moderate Quality) and 11 are category C (Low Quality); none are category U (Poor Quality).
3.3.2	The tree species found on the site comprise London plane, common lime, Lawson cypress, bird cherry, sycamore, ornamental cherry, Norway maple, crab apple, Caucasian lime, false acacia, mountain ash, willow and horse chestnut.
3.3.3	In terms of age demographics there is a broadly even mix of semi-mature, early mature and mature specimens present.

*page 9 of: British Standards Institute: Trees in relation to design, demolition and construction BS 5837: 2012 HMSO, London

3.3.4	Full details of the surveyed trees can be found in Appendix 1 of this report.
3.3.5	There are recommended works for 5 on-site trees (T11) and 1 off-site tree (T4 – LBC tree). These are listed in Appendix 2.

Photograph 2: 95 Avenue Road viewed from St Johns Wood Park

Photograph 3: Cavity in base of T6

Photograph 4: Category A horse chestnut T23

4. 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.

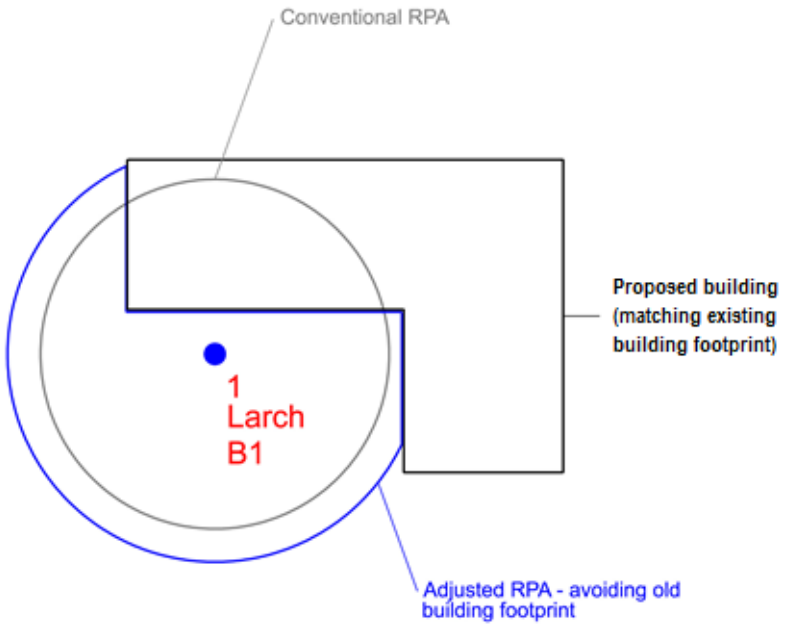


Figure 2 – Generic BS 5837 RPA Adjustments

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. This can be done as a desktop / theoretical exercise but is not altogether (scientifically) reliable and may also invite disagreement / differences of opinion as to that distribution.

4.1.4	LT prefer where possible and practical to raise the issue of modification but suspend judgment until such time as more reliable site investigations have been undertaken (Tree Radar scans and / or trial pits). Of course, the justification for these investigations will depend upon whether trees are (or are likely to be once modified) subject to impacts and also upon their quality / condition: it is generally not worth commissioning a radar study to locate the roots of a poor- or low-quality tree. On other occasions, there may not be the opportunity to commission investigations, either because the access is restricted by ownership / tenancy or the report's turnaround simply does not allow it, and they may need to follow on or be conditioned. **No a priori RPA modifications have been made in this instance on account of the short turnaround and low quality of tree involved.**
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 useful life expectancy. 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."

4.1.7	In theory, 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 have the potential to pose significant constraints to development of the site.

4.3 Secondary Constraints

4.3.1 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.

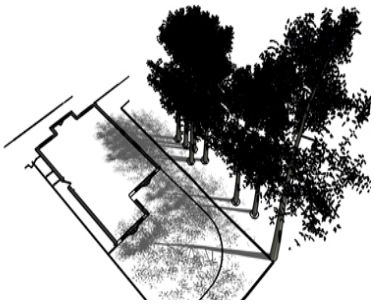


Figure 3 –
Generic Shading Constraints

4.3.2 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.

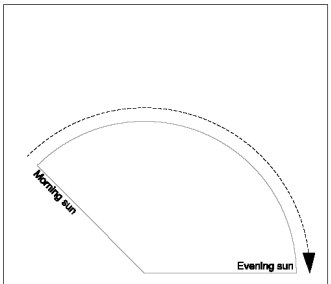


Figure 4 – Shading Arc

4.3.3 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.

4.3.4 Assuming that they will be retained, the orientation of the on- and off-site trees will generally ensure that shading constraints are minimal, with leaf deposition and honey-dew likely to be as it is today. 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.

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: HUB_95AVR_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	4	Plane, London	Basement Construction within RPA	2.7 m^2 .56 %	Mature	Normal	Good	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA
C	5	Cypress, Lawson variety	Basement Construction within RPA	1.6 m^2 2.1 %	Semi-mature	Normal	Moderate	Very Low	Very Low	Hand dig top 750mm of basement line thro' RPA
B	19	Lime, Common	Basement Construction within RPA	12.5 m^2 11.05 %	Mature	Normal	Good	Unknown	Unknown	Trial pits / further investigation
B	20	Lime, Common	Basement Construction within RPA Basement Construction within Canopy	15.8 m^2 12.43 %	Mature	Normal	Good	Unknown	Unknown	Trial pits / further investigation Remedial tree surgery (see Rec. Works)

6. ARBORICULTURAL IMPLICATIONS

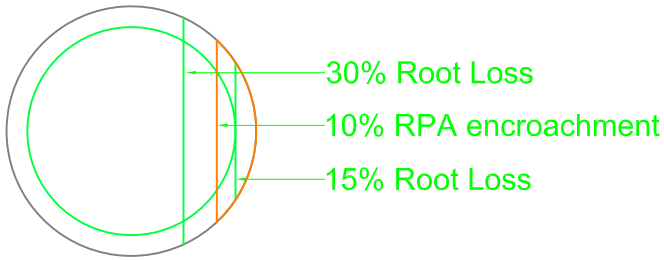
6.1 Rating of Primary Impacts

6.1.1 The principal impact in the current proposals comprises the encroachment of the theoretical RPA of T19 and T20 by the new lightwell. In gross terms, the encroachments comprise 11% and 12% of the respective total areas but the proximity of the lightwell to the trees means that impacts may be more significant. Further investigations (trial pits) though confirm there are no significant roots in the affected area and the viability of the trees will be not affected. The minor encroachment of the RPAs of T4 and T5 are not considered likely to be of significance to the ongoing health of those trees.

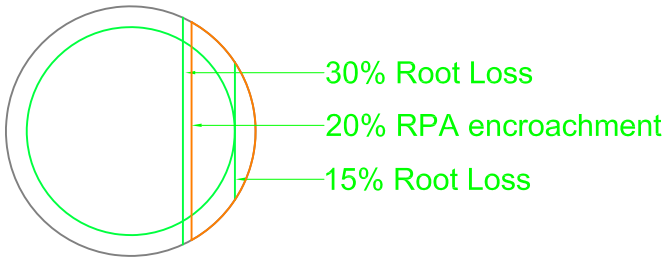
6.1.2 Though pruning of T20 is required here to serve development, undertaken to best practice, the scale envisaged should not be altogether untoward in a more managed and occupied site and is arguably necessary regardless of development. The immediate reduction in canopy cover through pruning is therefore is rated as a low impact unlikely to harm either the resource or the wider area.

6.1.3 There is no set RPA encroachment that is immediately permissible. However, at para 5.3.a of BS5837, the project arboriculturist is charged with demonstrating that the tree(s) will remain viable in the instance of RPA encroachment. Whilst there is little research on RPA encroachment itself, there have been various commonly cited studies of root severance (see overleaf). Whilst the RPA is not coextensive with the wider root system, one can make some correlations after Thomas (2014): in average (sic) conditions, a straight line tangential with a tree's canopy would transect 15% of the root system, for another mid-way to the trunk that figure would be 30%. In the current cases, **the impacts to T4 and T5 are well below the lower of these two parameters however the proximity of impact to T19 and T20 renders assessment via percentage of RPA lost inappropriate**. There is no precise correlation between % RPA and root impairment or loss. However, in our experience, most RPA tend to exceed the free-grown canopy spread a little (c. x 1.2 -1.5), suggesting by reference to both Thomas and Fig. 5a - 5c overleaf, RPA encroachments marginally understate the percentage root loss. The informal 20% RPA threshold may equate to c. 30% root loss, and 10% RPA encroachment to c. 20% root loss. The assumptions made here are relatively crude and apply more to open grown trees but are nonetheless illustrative.

RPA: 5m



Area 7.98 sq.m. (10.0%)



Area 15.96 sq.m. (20.0%)

Figure 5a: approximate correlation between RPA encroachment and actual root loss on a free-grown tree of 5m RPA radius (after Thomas (2014))

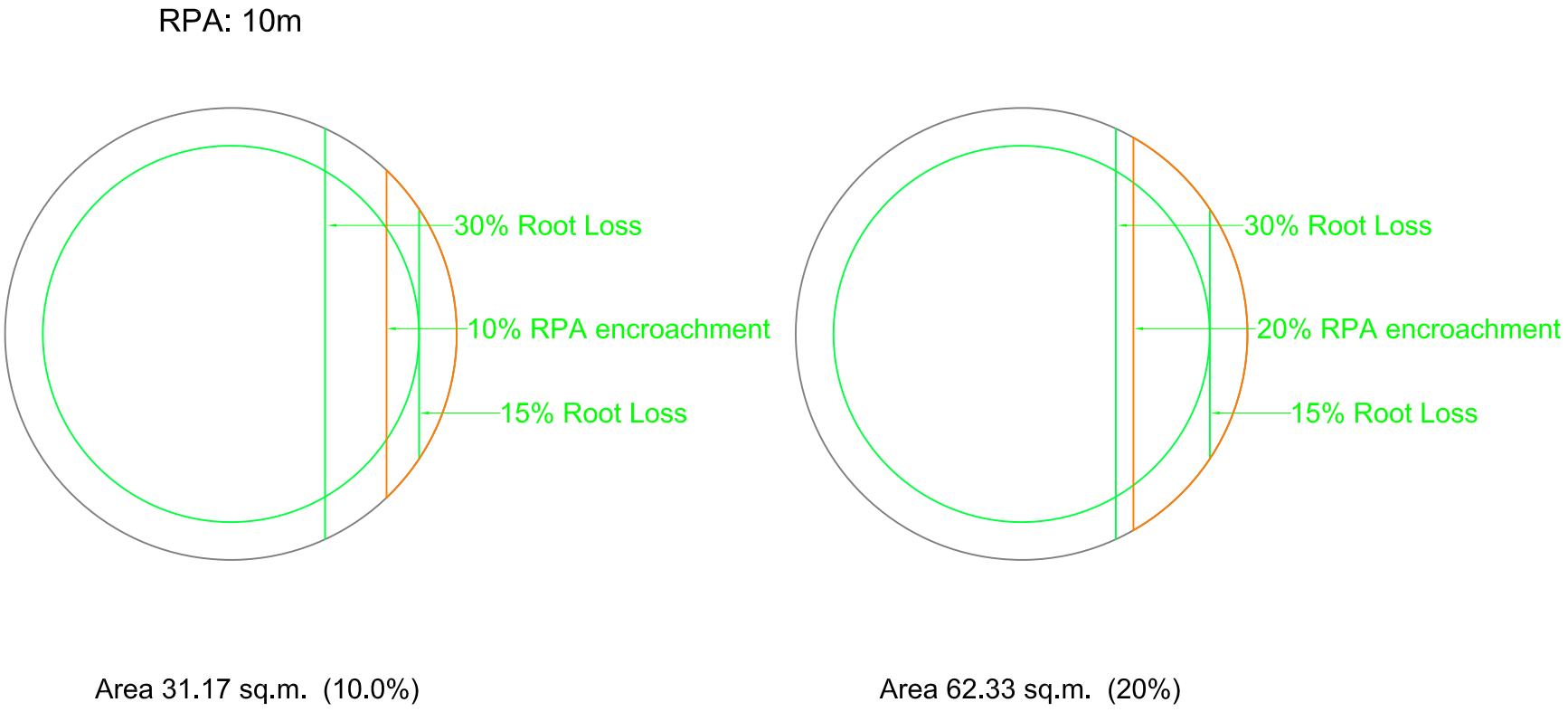


Figure 5b: approximate correlation between RPA encroachment and actual root loss on a free-grown tree of 10m RPA radius (after Thomas (2014))

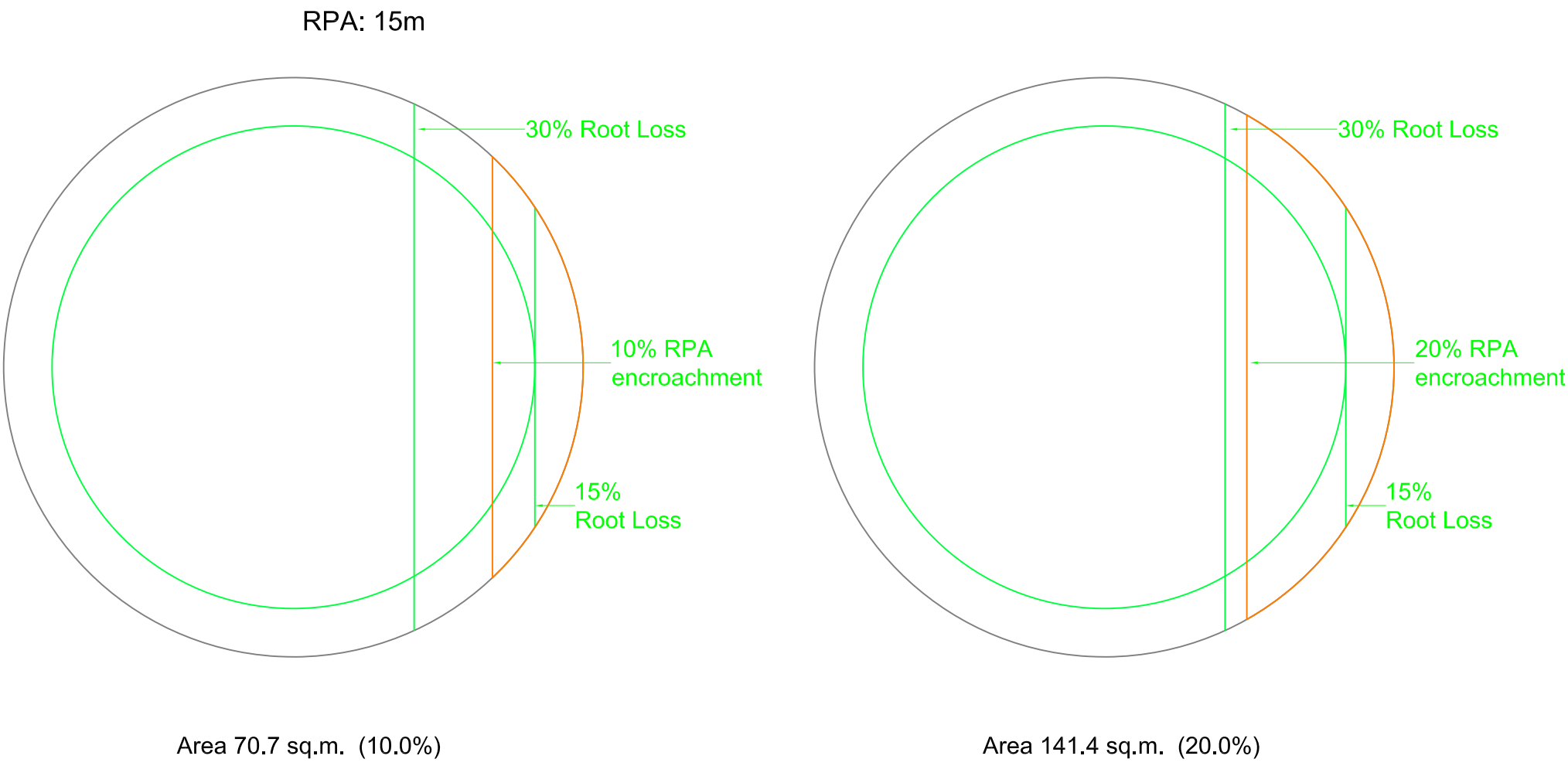


Figure 5c: approximate correlation between RPA encroachment and actual root loss on a free-grown tree of 15m RPA radius (after Thomas (2014))

6.1.4	Published references suggest healthy trees tolerating up to 30-50% root severance in general (Coder, Helliwell and Watson in CEH 2006). "**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 2014). Clearly, it is not the purpose of this report to sanction impacts to test a tree's physiological tolerance, where the guidance recommends the avoidance of impact / RPA encroachment as the default position. However, it has not proved possible at the design stage to avoid such encroachment altogether, and in that regard, the project arboriculturalist has determined that the retained trees can remain viable in the scheme before planning.
6.1.5	As per BS5837 recommendations (at 5.3.a), the equivalent hatching in Plan 2 of the Appendices demonstrates that the area(s) lost to encroachment can be compensated for elsewhere but it is not currently feasible to confirm tree viability will be maintained. 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	There will always be marginal secondary impacts of honeydew / litter deposition and partial shade on this site, regardless of development and thus the status quo is unlikely to change with further development, which is the salient point for planning to consider. Thus, the secondary impacts of development are minimal.

6.3 Mitigation of Impacts

6.3.1	Necessary site investigations like trial pits have already undertaken to conclude whether T19 & T20 have significant root system inside the site.
6.3.2	RPA encroachments of >5% area are shown in Plan 2 compensated for elsewhere on contiguous land. Soft ground within the unaffected parts of these RPAs will be treated with a 75mm deep layer of mulch to be maintained in place throughout the duration of construction activities.

6.3.3	The path of foundations through RPAs will be manually excavated to 750mm depth under arboricultural supervision; any roots encountered within the trenches / pits 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 and with the prior approval of the Local Authority.
6.3.4	The immediate canopy encroachment can be avoided with a crown lift / cutting back of lower limbs, affecting a 6-7m ground clearance.
6.3.5	Nuisance deposition can be further mitigated with routine maintenance and light pruning / deadwooding.
6.3.6	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.

7. CONCLUSION

7.1	The potential impacts of development are low in terms of RPA encroachments of trees retained. And the report does though establish that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA; the report also proposes as per paragraph 5.3.1 (b) a series of mitigation measures to improve the soil environment that is used by the tree for growth.
7.2	The full potential of the impacts can thus be largely mitigated through 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 are capable of sustaining suitably reduced impacts.
7.4	The proposals will not have any significant impact on either the retained trees or wider landscape thereby complying with Policies G1 and G7 of the London Plan 2021 and Policies A3, A5 and D1 of the Camden Local Plan (adopted 3rd July 2017).

8. 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.
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.

8.2 General Recommendations for Sites Being Developed with Trees / Outline Arboricultural Method Statement

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 day-to-day 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 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;
   - arrange with the retained arboricultural consultant an initial pre-start briefing to inspect tree protection measures and agree a schedule of monitoring thereof on an initial monthly basis to be reviewed over the duration of works.
   - give advance notice (ideally 2 weeks) to retained arboricultural consultant to arrange for supervision of any excavation (especially for services and foundations) within RPA
   - make immediate contact with the local authority and/or a retained arboricultural consultant 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. COMPLIANCE: Trees and the Planning System

9.1 Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications. Where trees are statutorily protected, it is important to contact the local planning authority and follow the appropriate procedures before undertaking any works that might affect the protected trees.

9.2 The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. Table B.1 provides advice to both developers and local authorities on an appropriate amount of information. The term "minimum detail" is intended to reflect information that local authorities are expected to seek, whilst the term "additional information" identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.

9.3 This report delivers information appropriate to a full planning application and to these specific proposals as per BS5837 Table B.1 below, providing both minimum details and further additional material in the form of general tree protection recommendations and constructional variation.

Table B.1 **Delivery of tree-related information into the planning system**

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions)	Existing and proposed finished levels
	Tree retention/removal plan (finalized)	Tree protection plan
	Retained trees and RPAs shown on proposed layout	Arboricultural method statement – heads of terms
	Strategic hard and soft landscape design, including species and location of new tree planting	Details for all special engineering within the RPA and other relevant construction details
	Arboricultural impact assessment	
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method	Arboricultural site monitoring schedule
	Dimensioned tree protection plan	Tree and landscape management plan
	Arboricultural method statement – detailed	Post-construction remedial works
	Schedule of works to retained trees, e.g. access facilitation pruning	Landscape maintenance schedule
	Detailed hard and soft landscape design	

10.0 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.
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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

Landmark Trees

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	Lime, Large-leaved	: Tilia platyphyllos
Apple, Crab	: Malus sylvestris	Maple, Norway	: Acer platanoides
Cherry, flowering	: Prunus spp	Plane, London	: Platanus acerifolia
Cherry, Bird	: Prunus padus	Rowan, Mountain Ash	: Sorbus aucuparia
Chestnut, Horse	: Aesculus hippocastanum	Spruce, Norway	: Picea abies
Cypress, Lawson	: Chamaecyparis lawsonia	Spruce, Serbian	: Picea omorika
Lime, Caucasian	: Tilia x euchlora	Sycamore	: Acer pseudoplatanus
Lime, Common	: Tilia x europea	Willow	: Salix spp

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: 95 Avenue Road

Date: 17/01/22

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Ross Gamblin

Ref: HUB_95AVR_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	Plane, London	25	7.5,9,9, 10	4.5	1020	Mature	12.2	Normal	Good	A	2	>40	A tree with insignificant defects LPA managed street tree Minor vehicle damage to surface roots E side
2	Lime, Common	26	5,4,5,5	6.0	740	Mature	8.9	Normal	Fair	B	2	>40	Pollard (Old) Deadwood (minor) throughout crown Epicormics up lower stem. Historically topped@7m
3	Plane, London	26	7.5,9,7, 9	7.0	1130	Mature	13.6	Normal	Good	A	2	>40	A tree with insignificant defects LPA managed street tree Minor static deadwood in crown
4	Plane, London	25	10,9,5,1 0.5	7.0	1030	Mature	12.4	Normal	Good	A	2	>40	LPA managed street tree A tree with insignificant defects Minor static and hanging deadwood in mid crown N side
5	Cypress, Lawson variety	10	2.5,2,2. 5,3	1.5	410	Semi-mature	4.9	Normal	Fair	C	1	20+	A tree with insignificant defects Low crown break
6	Cherry, Bird	12	4,4,3.5	3.0	430	Mature	5.2	Normal	Poor	C/U		<10	Historically reduced Leaning to SE, suppressed Cavity @ SW side probed to 30cm+ on main stem, significant compensatory thickening growth around defect

Landmark Trees

Site: 95 Avenue Road
Date: 17/01/22

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Ross Gamblin
Ref: HUB_95AVR_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	17	5.5,7,4.5,5	4.5	660	Mature	7.9	Normal	Fair	B	2	>40	Pollard (Old) Crossing rubbing branches, mid crown SW side
8	Sycamore	4.5	2222	1.0	120	Young	1.4	Moderate	Fair	C	2	>40	Squirrel damage in mid crown
9	Cherry, Bird	8	2333	2.5	340	Semi-mature	4.1	Moderate	Fair	C	1	10+	Historically reduced Stem bleed @1.6m NW side of middling growth form. Tree under physiological stress
10	Cherry, Ornamental	6	2.5,3,2.5,3	2.5	280	Semi-mature	3.4	Normal	Fair	C	1	20+	Historically reduced Of middling form
11	Maple, Norway	16	5.5,6,4.5,0	6.0	340	Early Mature	4.1	Normal	Fair	B	2	>40	Phototropic form Bias to E, part suppressed
12	Maple, Norway	16	7.5,6,4.5,7.5	6.0	580	Mature	7.0	Normal	Good	B	1	>40	Crown bias to N Partially suppressed by group 4 stems arise from 2.5m. Overall a well formed tree, minor mower damage to roots

Landmark Trees

Site: 95 Avenue Road

Date: 17/01/22

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Ross Gamblin

Ref: HUB_95AVR_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	Lime, Common	15	2.5,4,3,4	5.5	450	Mature	5.4	Normal	Fair	B	2	>40	Pollard (Old) Middling growth form
14	Lime, Common	14	2.5,3.5,3,4	5.5	380	Mature	4.6	Normal	Fair	B	2	>40	Pollard (Old) Decay evident @ old pollard point
15	Lime, Caucasian	11	5,3,2.5,5.5	4.5	430	Early Mature	5.2	Normal	Fair	C	2	>40	Suppressed/distorted form due to group pressure, heavy bias to N
16	Lime, Common	16	5,3,3,5	5.0	450	Mature	5.4	Normal	Fair	B	2	>40	Pollard (Old) Decay evident @ old pollard points
17	Lime, Common	16	3.5,4,4.5,4	5.0	670	Mature	8.0	Normal	Good	B	2	>40	Included bark union @3.5m N side Pollard (Old) Decay evident @ old pollard points
18	False Acacia	9	3,3,2,4.5	3.0	170	Semi-mature	2.0	Normal	Good	C	1	20+	Tear old wound@3.5m SW side Old cambium compression wound@ 2.5m SW side

Landmark Trees

Site: 95 Avenue Road

Date: 17/01/22

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Ross Gamblin

Ref: HUB_95AVR_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
19	Lime, Common	16	4,2.5,2,5	5.5	500	Mature	6.0	Normal	Fair	B	1	>40	Pollard (Old) Decay present @ old pruning points SW side, 6.5m.
20	Lime, Common	15	2.5,2,4.5,6	5.5	530	Mature	6.4	Normal	Fair	B	2	20+	Minor stem lean to W Pollard (Old) Poor growth form. Rubbing scaffold limbs @ 6m
21	Mountain Ash	6	1.5	3.0	180	Semi-mature	2.2	Moderate	Fair	C	2	<10	Historically reduced Dieback @ old pruning points Old pruning point@1.5m decaying, vertical strip of dead cambium
22	Willow	5.5	4,2.5,2.5,2.5	1.5	238	Semi-mature	2.9	Moderate	Fair	C	2	20+	Poor form Linear visual screening Multistemmed from base
23	Chestnut, Horse	18	7,7.5,7,6.5	6.0	800	Mature	9.6	Normal	Good	A	2	>40	Bifurcated@5m A tree of good form & condition
14a	Apple, Crab	5	3.5,3,3,3	1.5	170	Semi-mature	2.0	Normal	Good	C	1	20+	Bifurcated@1.6m

Landmark Trees

Site: 95 Avenue Road

Date: 17/01/22

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Ross Gamblin

Ref: HUB_95AVR_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
24	Apple, Crab	4.5	1.5,3,3.5,4	1.0	244	Semi-mature	2.9	Moderate	Fair	C	2	20+	Trifurcated from base suppressed & poor form Western stem topped & decay setting in

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 %.
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

Site: 95 Avenue Road
Date: 17/01/22

Surveyor(s): Ross Gamblin
Ref: HUB_95AVR_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
4	Plane, London	A	25	7.0	10,9,5,10.5	DWD	LPA managed street tree A tree with insignificant defects Minor static and hanging deadwood in mid crown N side Recommended husbandry 2
6	Cherry, Bird	C/U	12	3.0	4,4,3.5	Fell	Historically reduced Leaning to SE, suppressed Cavity @ SW side probed to 30cm+ on main stem, significant compensatory thickening growth around defect Recommended husbandry 2
14	Lime, Common	B	14	5.5	2.5,3.5,3,4	FInv	Pollard (Old) Decay evident @ old pollard point Recommended husbandry 3
16	Lime, Common	B	16	5.0	5,3,3,5	FInv	Pollard (Old) Decay evident @ old pollard points Recommended husbandry 3
17	Lime, Common	B	16	5.0	3.5,4,4.5,4	FInv	Included bark union @3.5m N side Pollard (Old) Decay evident @ old pollard points Recommended husbandry 3
21	Mountain Ash	C	6	3.0	1.5	DWD	Historically reduced Dieback @ old pruning points Old pruning point@1.5m decaying, vertical strip of dead cambium 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: 95 Avenue Road
Date: 17/01/22

Surveyor(s): Ross Gamblin
Ref: HUB_95AVR_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
20	Lime, Common	B	15	5.5	2.5,2,4.5,6	CB	2-3m	Minor stem lean to W Pollard (Old) Poor growth form. Rubbing scaffold limbs @ 6m To facilitate development

APPENDIX 4: Trial Pit Investigation

Root Excavation Report

95 Avenue Road

London

NW8 6HY

Undertaken by

James Abbott

Arboraeration 24th – 26th May 2022

Introduction

Site Address: 95 Avenue Road, London, NW8 6HY.

Arboraeration were instructed to undertake airspade investigations of trial pits following a tree survey of the site.

Reason for trial pits

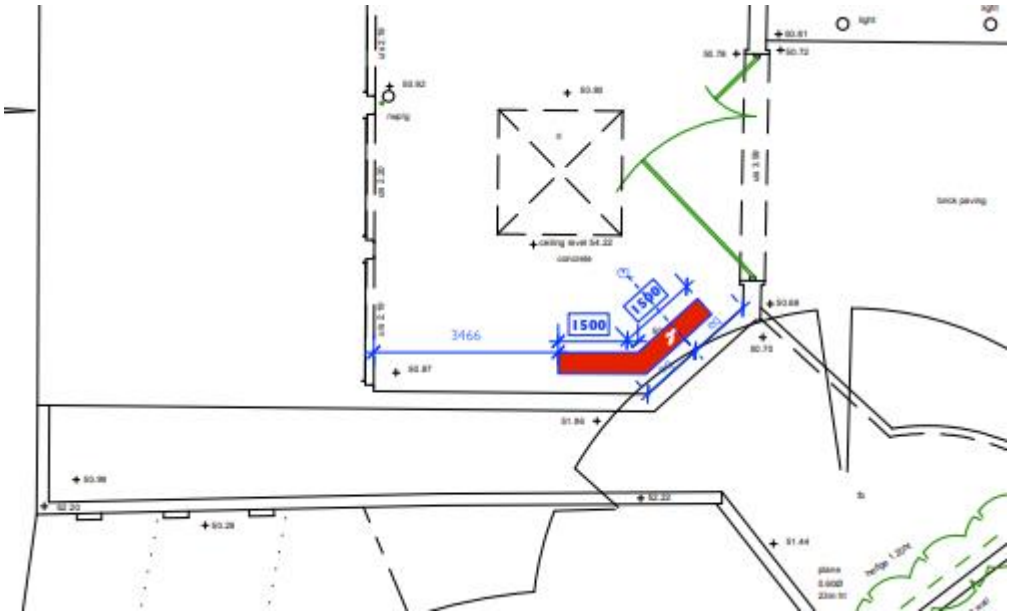
Trial pits were excavated on the property to establish the extent of rooting in relation to proposed construction works. Trial pits were excavated using an airspade and manual digging tools.

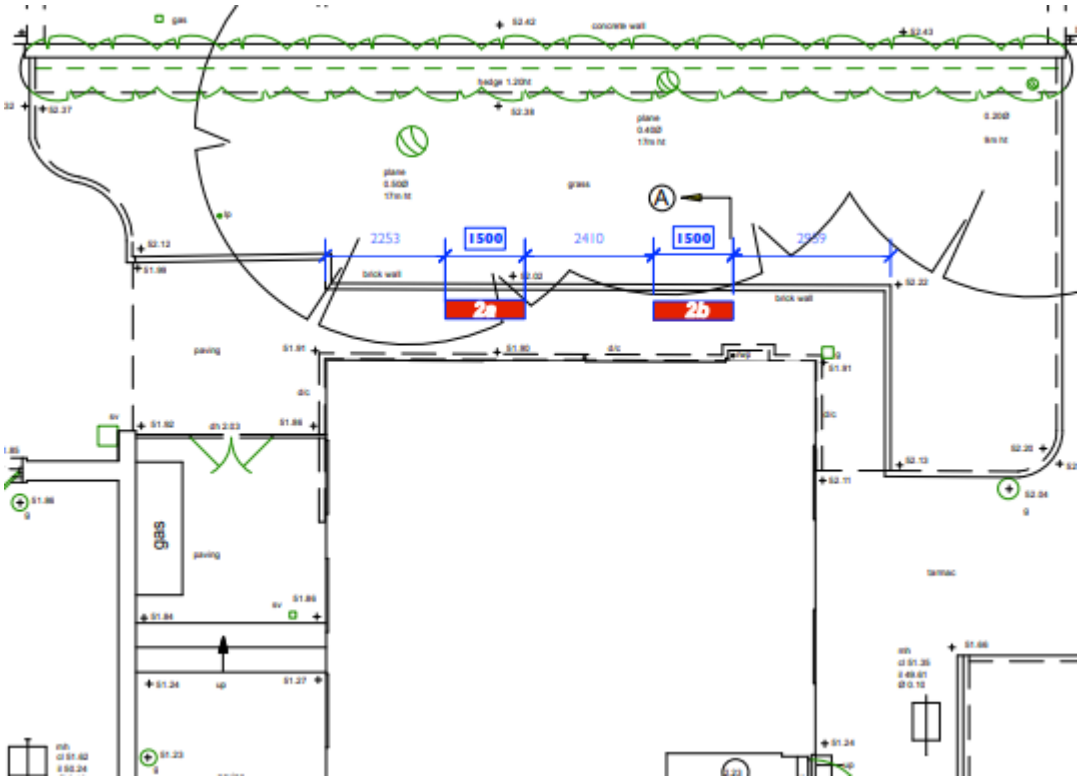
Trial Pit Results – numbered and located as per plans supplied

Trial Pit 1	3m Long x 0.4m Wide x 0.9m Deep No Significant rooting Halted at 0.9m depth due to footings.
Trial Pit 2a	1.5m Long x 0.3m Wide x 1.0m Deep No Significant roots
Trial Pit 2b	1.5m Long x 0.3m Wide x 1.0m Deep No significant roots Very small number of fibrous roots.

Further Information.

Site Layout





Photographic evidence - Trial Pit 1

Trial Pit 2a

Trial Pit 2b

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
Holden House, 4th Floor, 57 Rathbone Place, London W1T 4JU
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 95 Avenue Road	1:200@ A1
Drawing Title: Tree Constraints Plan	January 2022

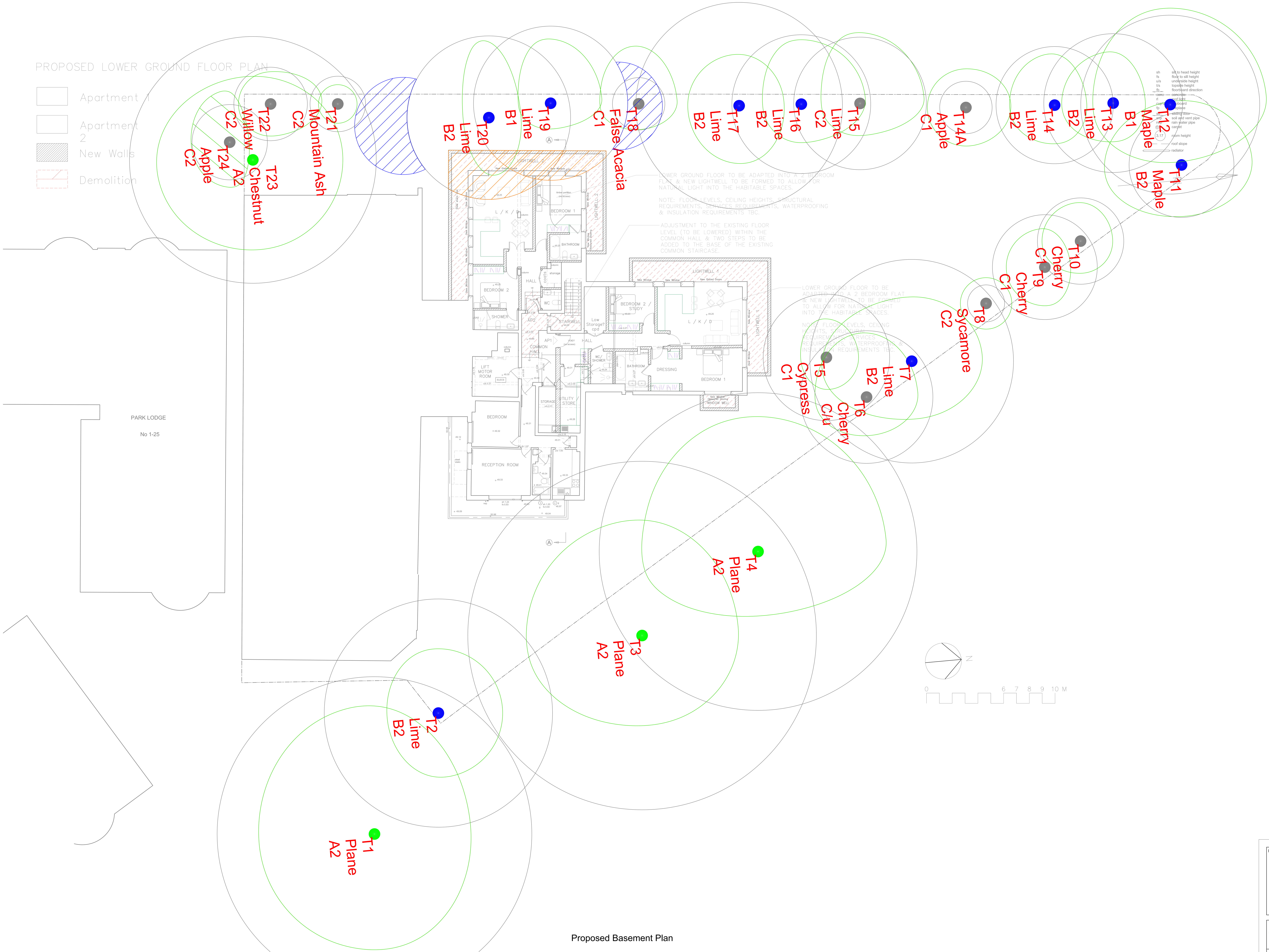
Key:
- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

Category — Crown Spread — Tree Number — Species — Category — Root Protection Area

Tree Position Approximate (not shown on original survey)

PLAN 2

ARBORICULTURAL IMPACT ASSESSMENT PLAN (S)



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).

Landmark Trees
Holden House, 4th Floor, 57 Rathbone Place, London W1T 4JU
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 95 Avenue Road	1:100@ A0
Drawing Title:Arboricultural Impacts Assessment	June 2022

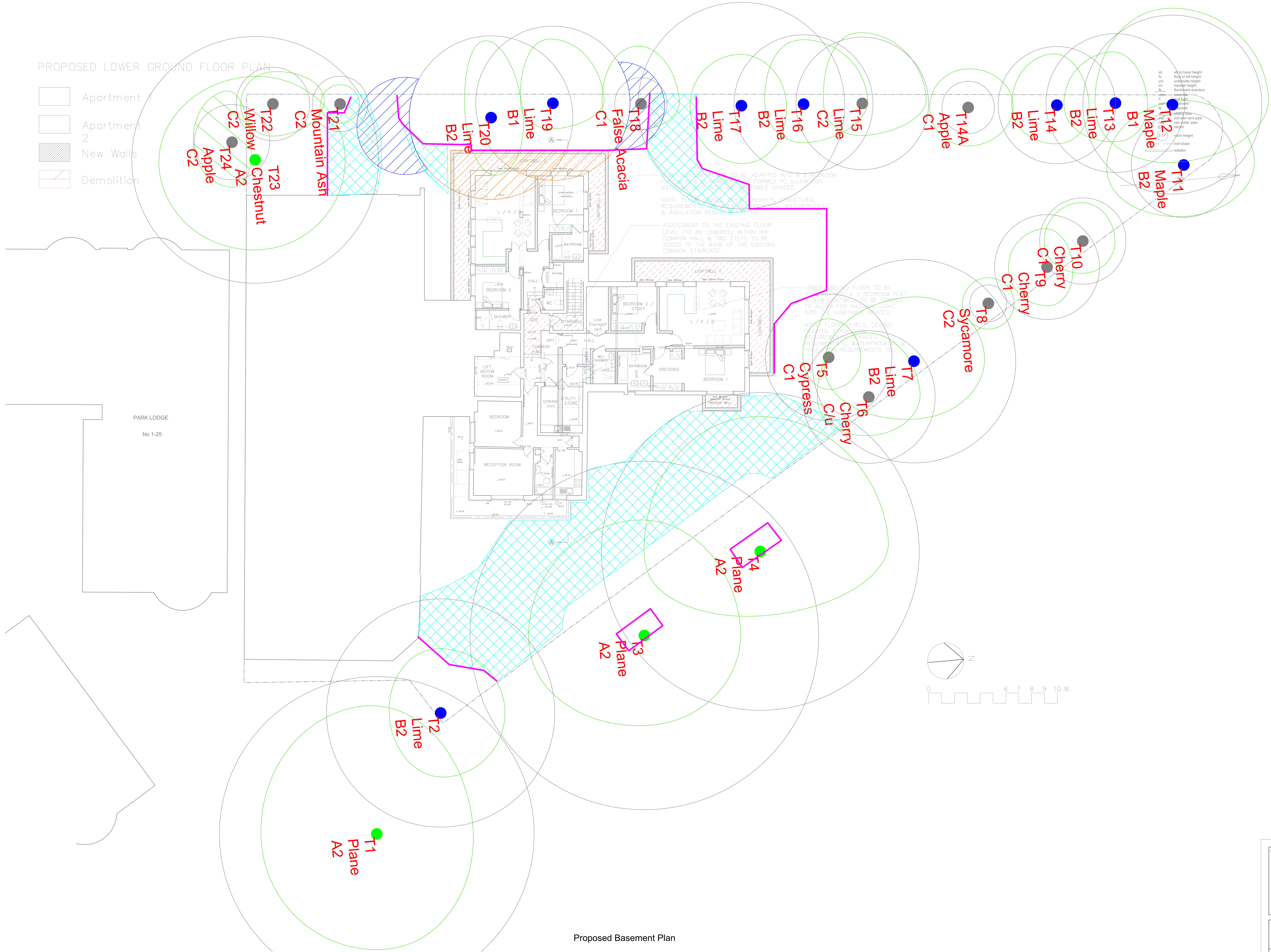
Key:
- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention

Category, Root Protection Area, Crown Spread, Tree Number, Species, Category

Tree Position Approximate (not shown on original survey)

PLAN 3

OUTLINE TREE PROTECTION PLAN



Proposed Basement Plan

Area displaced from RPA

Area from RPA redistributed

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

Holden House, 4th Floor, 57 Rathbone Place, London W1T 4JU
Tel: 0207 851 4544 Mobile: 07812 989928
e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 95 Avenue Road	1:100@ A0
Drawing Title:Tree Protection Plan	June 2022

Key:

- Category A High Quality
- Category B Moderate Quality
- Category C Low Quality
- Category U Trees Unsuitable for Retention
- Ground Protection
- Category — Crown Spread — Tree Number — Species — Category — Root Protection Area (13 Birch B2)
- Tree Position Approximate (not shown on original survey)
- Tree Protection Fencing

N E S 5m 10m