Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

31 Elsworthy Road

London

NW3 3BT

INSTRUCTING PARTY:

BB Partnership

33-34 The Studios

10 Hornsey Street

London

N7 8EL

REPORT PREPARED BY

Ann Currell

BSc(Hons) DipLP DipArb(RFS) MA MCIHort(Rtd) FArborA(Rtd) MRTPI

&

Adam Hollis

MSc ARB MICFor FArbor A MRICS C Env

Ref: BBP/31EWR/AIA/02

Date: 9th November 2022

PART 1: MAIN TEXT

PART 2 - APPENDICES

PART 3 - PLANS

DOCUMENT HISTORY

Revision	Status	Comments	Date
Rev 02	DRAFT	New front boundary wall For Internal Review (Client / Design Team)	7/11/22
	Approved	For External Issue	9/11/22

1. SUMMARY

1.1 The existing site is a residential property with small front and substantial rear gardens containing a number of trees potentially constraining development. There are also Council owned / maintained street trees in proximity to the front of the site. The proposal includes a new boundary wall to the front garden.

1.2 This report has been prepared in the light of an application for a new front boundary wall - which is separate from our previous report BBP/31EWR/AIA/01d that assessed the impacts of proposals at the site including a basement extension into the rear garden.

1.3 Application 2021/1527/P for "New basement extension to include a pool and rear lightwell, alteration and retention of balconies at second floor rear, alterations to window openings to side elevation, new garage doors and changes to the rear elevation, all to dwelling" has now been granted conditional planning permission subject to signing a s106 agreement, which is currently in preparation.

1.4 At the time of our earlier report, there were 21 trees on the property and adjoining land outside of the application boundary within close proximity to the development that needed to be assessed. These were judged mostly moderate and low-quality trees, but with T17 and T18 as standout high quality specimens. All trees are material constraints on development, but these latter required particular consideration.

1.5 This report confines itself to five trees, T14, T15, T16, T17, and T18 at and adjacent to the front of the property and also identifies, where relevant, the implications of the previous application thereon.

1.6 This report has assessed the impacts of the development proposals and concludes that, although the removal of Bhutan pine T16 was necessary as part of the previous application (LBC ref. 2021/1527/P), the proposed new boundary wall poses at most a low impact on the resource: no tree removal would be required but, where it is not possible to use the existing boundary wall foundations, some minor root pruning may be necessary to facilitate construction. However, though such pruning here would be to serve development, if undertaken to best practice, the scale envisaged should not be altogether untoward in an occupied site.

1.7 Whilst the default position is that structures be located outside the Root Protection Area* (RPA) of trees to be retained, as the proposed new boundary wall largely replaces an existing one, there are some modest encroachments that could not be avoided in the design of the scheme. The report has demonstrated that the tree(s) can remain viable and the report also proposes a series of mitigation measures to improve the soil environment that is used by the tree(s) for growth. Net impacts are assessed thus as being low.

1.8 Notwithstanding the above assurances, the report sets out a series of recommendations prior and during construction that will ensure impacts to trees are minimised - these are detailed in sections 6.3 and 8.

1.6 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 BB Partnership (the Applicant's agent), to support a full planning application submitted to the London Borough of Camden ('LBC').

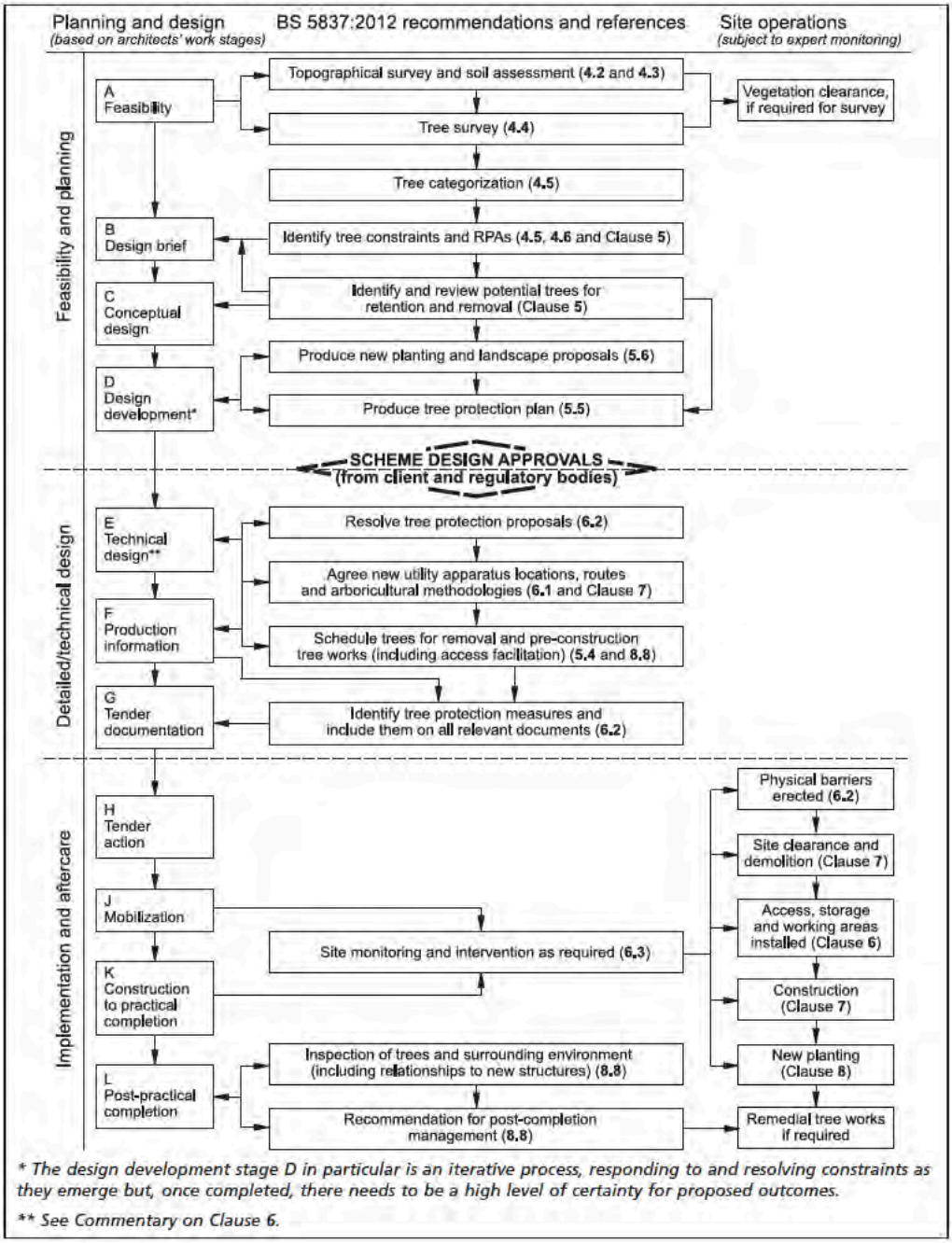
2.1.2 The application relates to the construction of a new front boundary wall, replacing that currently in situ.

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') 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: L10058 - T

Proposals: GEO_225 Proposed Front Boundary

2.3 Scope & Limitations of Survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, Kim Dear surveyed the trees on site on 24th November 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 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

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

2.3.4 The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

2.4 Survey Data & Report Layout

2.4.1 Detailed records of individual trees are given in the survey schedule in Appendix 1. Although details would usually be provided of recommendations for tree works in the interests of good husbandry plus those that comprise the minimum requirements to facilitate development which form part of the planning application, at this stage no tree works are specified as being appropriate or necessary.

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, discussion, conclusions and recommendations follow, below.

3.0 SITE CHARACTERISTICS

3.1 Property Description & Planning Context

Photograph 1: Photograph of front of application site (Source: Google Street View – Image capture Jul 2014)

3.1.1	31 Elsworthy Road is a large, detached dwelling house located on the southern side of Elsworthy Road and has direct access onto Primrose Hill via a gate in the rear garden. This report is concerned with the front garden boundary.
3.1.2	The site is relatively level throughout.
3.1.3	There are no Tree Preservation Orders on the property, but it is understood the site stands within the Elsworthy Road Conservation Area, which will affect the subject trees: it is a criminal offence to prune, damage or fell such trees without permission from the local authority.
3.1.4	Relevant local planning policies comprise Policies G1, G5 and G7 of the London Plan 2021 and Policies A3, A5, D1, and D2 of the Camden Local Plan (adopted 3rd July 2017).

3.2 Soil Description

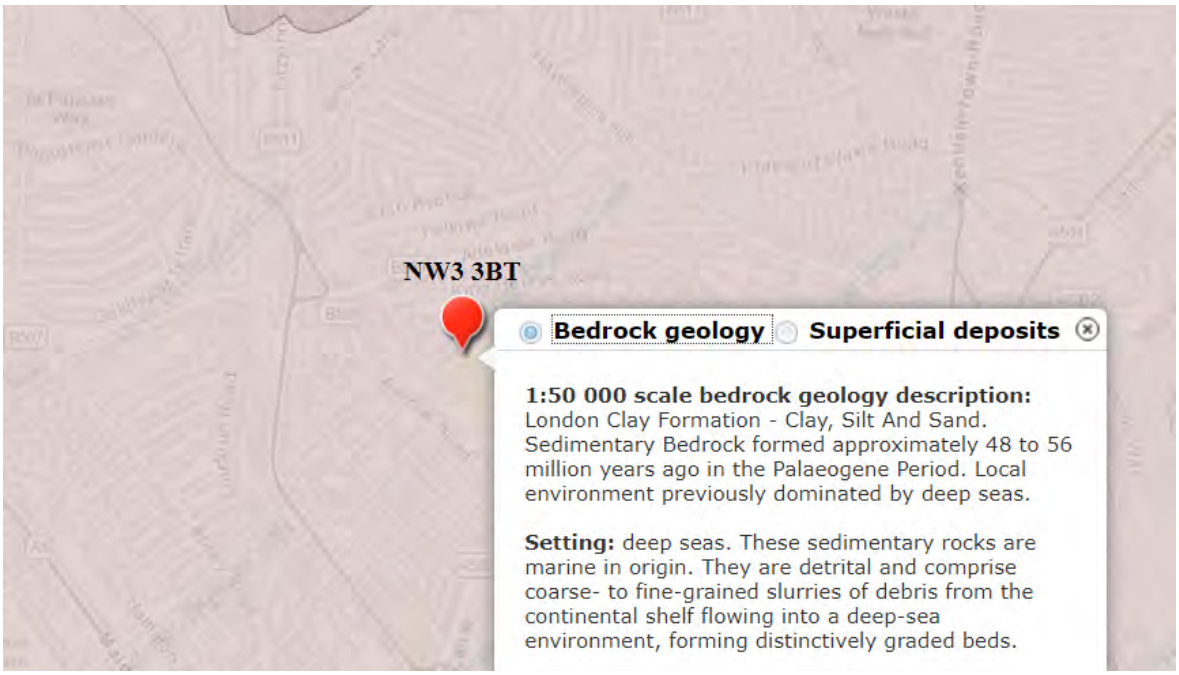


Figure 2: Extract from the BGS Geology of Britain Viewer

3.2.1	In terms of the British Geological Survey, the site overlies the London Clay Formation (see indicated location on Fig.2 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 total 21 surveyed trees, 2 are category* A (High Quality), 7 are category* B (Moderate Quality) and 12 are category C (Low Quality); none are category U (Poor Quality).
3.3.2	Of the five trees relevant to the current application, 2 are category* A (High Quality), 1 is category* B (Moderate Quality) and 2 are category C (Low Quality); none is category U (Poor Quality).
3.3.3	The tree species found on the site comprise olive, false acacia, Himalayan birch, Southern magnolia, elder, Lawson cypress, Chinese privet, corkscrew hazel, willow-leaved pear, common ash, river birch, Bhutan pine, London plane and plum.
3.3.4	Of the five trees relevant to the current application, two are river birch, two are London plane, and the other is a Bhutan pine.
3.3.5	In terms of age demographics there are predominantly young and early mature specimens present with a few semi-mature and mature trees present.
3.3.6	In terms of the current application, the river birch are early mature, the London plane are mature, and the Bhutan pine is young.

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

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

Photograph 2: The front boundary viewed from within the site , showing T14, T15 and part of T17

Photograph 3: Existing front boundary wall with flank boundary wall in background

Photograph 4: Existing front driveway surface, flank boundary wall in background

4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary Constraints

4.1.1 BS5837: 2012 gives Recommended Protection Areas (RPAs) for any given tree size. The individual RPAs 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 RPAs 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 3). Alternatively, one need principally remember that RPAs are area-based and not linear – notional rather than fixed entities.

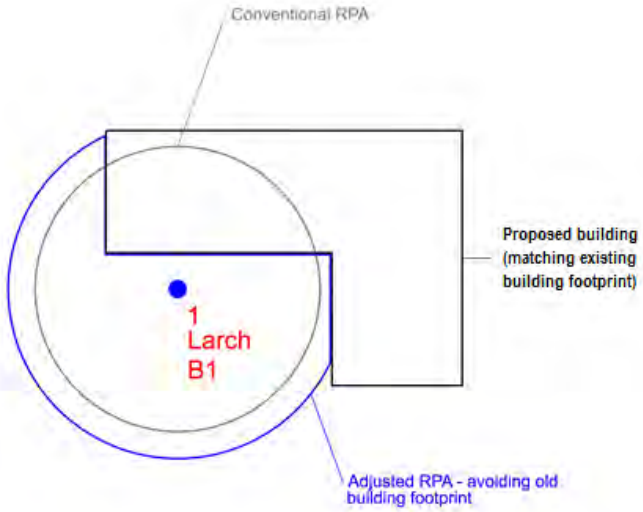


Figure 3– Generic BS 5837 RPA Adjustments (for fictitious site)

4.1.3 In BS5837, paragraph 4.6.2 states that RPAs 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). In this instance, it may be noted that although Tree Radar scans were undertaken at various points within the rear garden (the findings of which were provided in BBP/31EWR/AIA/01d), there were none in the front garden area. Although it is possible that the existing boundary wall may slightly have affected root distribution, **no a priori RPA modifications have been made in this instance.**

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 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 upon development. It should though be noted that the proposed new boundary wall is on largely the same footprint as the existing one.

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 4), honeydew deposition or perceived risk of harm.

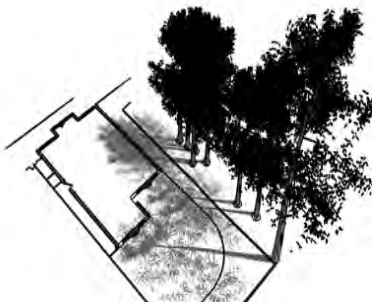


Figure 4 –
Generic Shading Constraints

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.

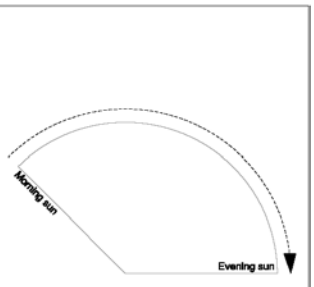


Figure 5 – Shading Arc

4.2.3 This arc (see Figure 5) 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 will 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: ETN_CTF_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	14	Birch, river	Wall Construction within RPA	m^2 N/A %	Early Mature	Normal	Moderate	Low	Low	No-dig construction
C	15	Birch, river	Wall Construction within RPA	m^2 N/A %	Early Mature	Normal	Moderate	Low	Low	No-dig construction
A	17	Plane, London	Wall Construction within RPA	m^2 N/A %	Mature	Normal	Good	Very Low	Very Low	No-dig construction
A	18	Plane, London	Wall Construction within RPA	m^2 N/A %	Mature	Normal	Good	Very Low	Very Low	No-dig construction

6.0 ARBORICULTURAL IMPLICATIONS

6.1 Rating of Primary Impacts

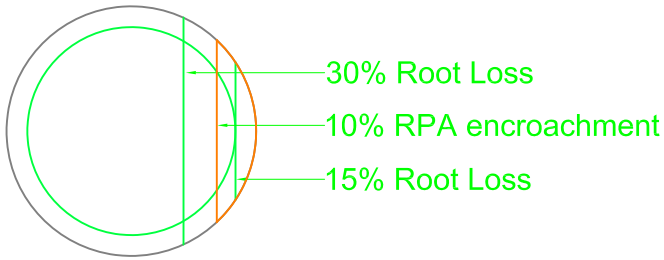
6.1.1 Although the Bhutan pine T16 is to be removed as part of the conditionally consented scheme, 2021/1527/P, no trees need to be removed to facilitate the construction of the proposed new boundary wall. No canopy pruning is required, however, where it is not possible to use the existing boundary wall foundations, some minor root pruning may be necessary. In terms of resource management, the potential limited root pruning of T14, T15, T17 and / or T18 to the scale envisaged required here to serve development, undertaken to best practice, should not be altogether untoward in a more managed and occupied site - it is therefore rated as a low impact unlikely to harm either the resource or the wider conservation area.

6.1.2 Thus, the principal impacts to retained trees comprise the encroachments into the RPAs of T14, T15, T17 and T18. However, this must be considered in the context of the existing walls across the front and along the flank boundaries. As far as possible, the existing foundations will be re-used for the new wall and low-invasive foundations used otherwise – thus the impact of the encroachment in practice would be only a fraction of that indicated on the plan, with there being only very limited additional excavation which would be undertaken under arboricultural supervision. Demolition of the existing wall would also need to be implemented with appropriate care. In our view, the affected trees are of a species, age and condition sufficient to remain viable in the circumstances, provided the series of mitigation measures outlined below are followed to both reduce the immediate impact of working methods and also improve the soil environment that is used by the trees for growth. Supervision and monitoring of such measures will also be essential. Subject to these provisos the net impacts are assessed as being low.

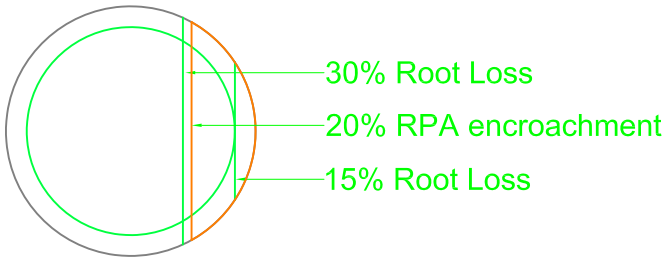
6.1.3 The conditionally consented scheme, 2021/1527/P, included the replacement of the front driveway which also encroaches within the RPA of the retained trees on the site's frontage. It will therefore be necessary to ensure that the tree protection measures for both schemes are appropriately co-ordinated.

6.1.4 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 theoretical impacts would be somewhere between these two parameters** as can be seen in Plan 2 in the Appendix or where more irregular in profile, can be gleaned from the percentage RPA encroachments in Table 1 – albeit making no allowance for the extant walls. 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))

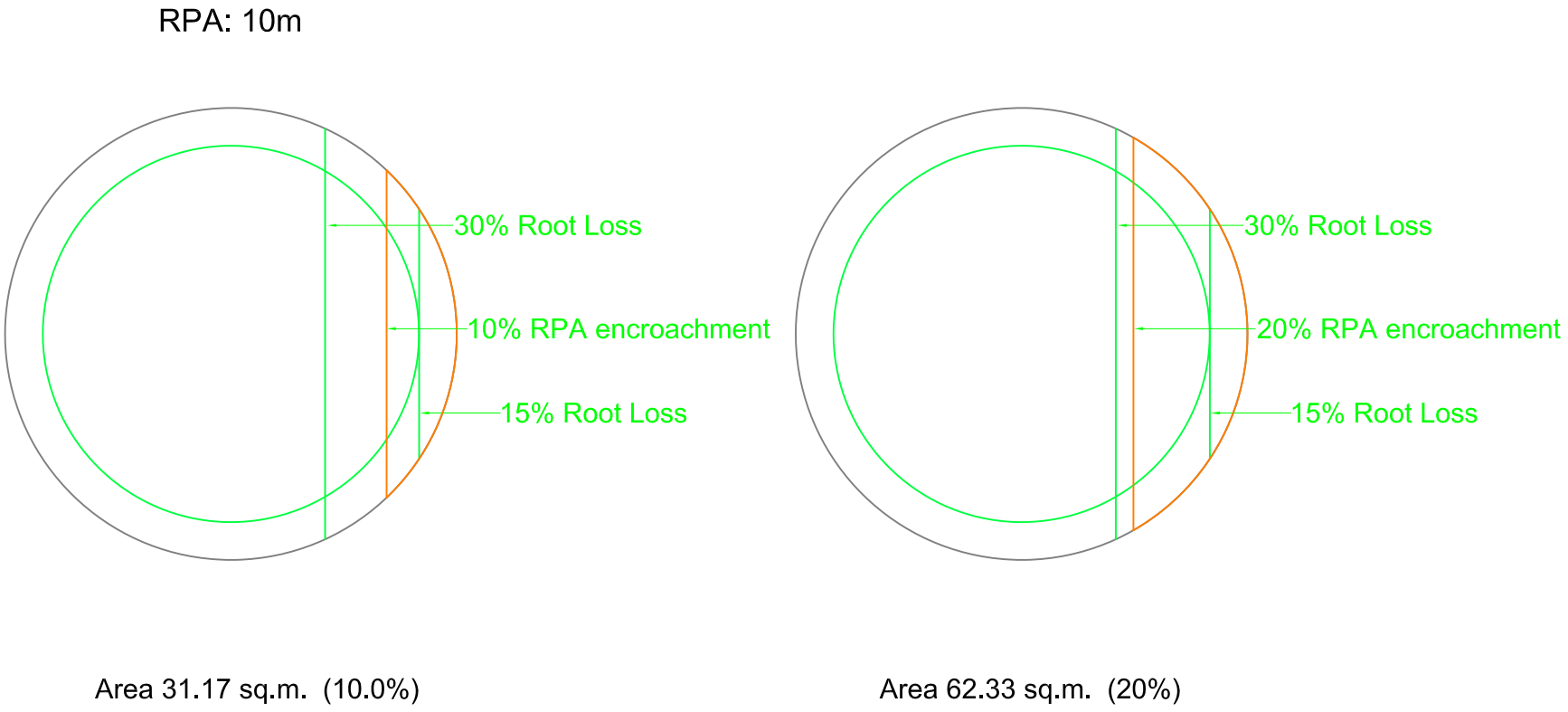


Figure 5b: approximate correlation between RPA encroachment and actual root loss on a free-grown tree of 10m RPA radius (after Thomas (2014))

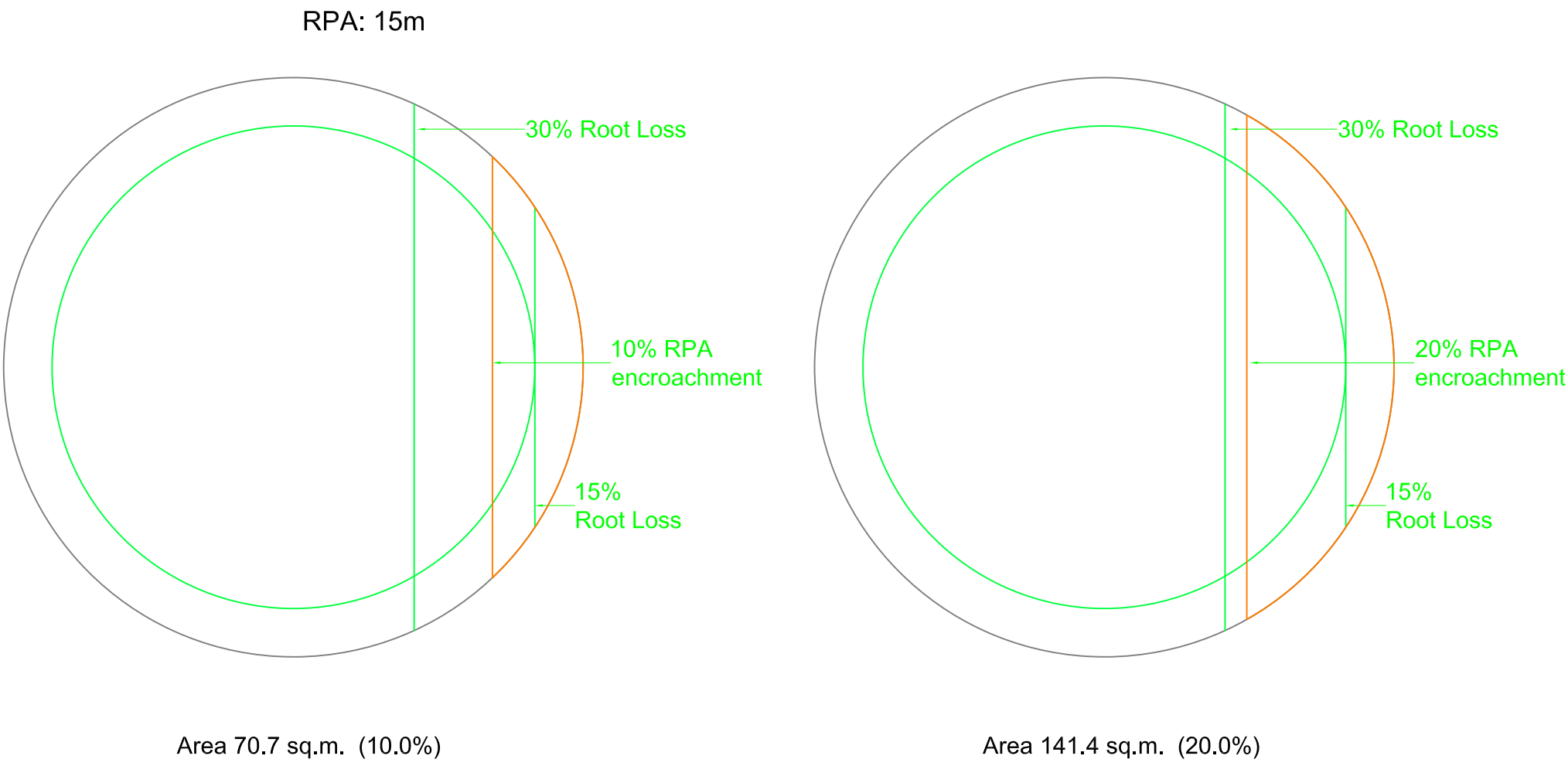


Figure 5c: approximate correlation between RPA encroachment and actual root loss on a free-grown tree of 15m RPA radius (after Thomas (2014))

6.1.5 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.

6.1.6 The trees in question are shown in Table 1 above to be healthy specimens of species with a good resistance to development impacts, and of an age quite capable of tolerating these limited impacts. Nor do the site characteristics suggest specific soil anomalies (e.g. heavy clay) having a bearing on such considerations, provided appropriate measures (e.g. ground protection) are taken.

6.1.7 As per BS5837 recommendations (at 5.3.a), the above assessment demonstrates that the tree(s) can remain viable. 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 juxtaposition of the retained tree stock to the proposals means that there will only be marginal secondary impacts of honeydew / litter deposition and partial shade on this site. The proposal is to replace an existing front boundary wall with another – given the nature of the scheme, 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 It will be essential to adequately protect the trees from potential impacts of construction access activities taking place in the vicinity and co-ordinate measures for the current proposal with those for any other consented development scheme (e.g. associated with 2021/1527/P) also being implemented at a similar time. Whilst protection measures can be elaborated in Method Statements in the discharge of planning conditions, outline details are provided below.

6.3.2 The four retained trees, T14, T15, T17 and T18 will be protected by self-supporting boxed hoarding, 2m in height to protect against site access collision. This hoarding shall be at least 19mm in thickness, no part of this hoarding may be affixed to the trees themselves.

6.3.3 The demolition of the existing front boundary wall will take place under direct arboricultural supervision. The wall will be first broken up with manual power tools and then carefully lifted with caution by a skilled machine operator working away from the trees running on a temporary surface designed to protect the underlying soil structure.

6.3.4 The existing wall foundations will be used as far as possible for the new replacement wall. Where it is not possible to re-use the existing foundations, specialised techniques such as mini-piling or raised beam will be used, the pits being trial-excavated by hand using a double-headed spade ("shove-holer") or similar excavated to 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 the agreement of the Tree Officer.

7.0 CONCLUSION

7.1 The potential impacts of development are low in terms – no trees are to be removed (the removal of Bhutan pine T16 consented under 2021/1527/P is not necessary for the new front boundary wall) and the RPA encroachments of trees retained substantially replicates the existing situation. The report has demonstrated as per BS5837 paragraph 5.3.1 (a) that the tree(s) can remain viable and 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 design and precautionary measures. These measures can be further elaborated in Method Statements in the discharge of planning conditions as necessary, but are outlined below.

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 Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape thereby complying with Policies G1, G5 and G7 of the London Plan 2021 and Policies A3, A5, D1 and D2 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	Excavation and construction impacts within the RPAs 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.
8.1.2	It will be essential to co-ordinate tree protection measures for the current proposal with those for any other consented development scheme (e.g. associated with 2021/1527/P) also being implemented at a similar time.

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 removal of imported materials 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	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.

8.2.6 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) Any 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.

8.2.7 These points can be resolved and approved through consultation with the planning authority via their Arboricultural Officer.

8.2.8 The sequence of works should be as follows:

i) any 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 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.
- Centre for Ecology & Hydrology. 2006. Tree Roots in the Built Environment, HMSO, London.
- Helliwell R (1980) Provision for New Trees; Landscape Design; July/August issue
- International Society of Arboriculture (ISA). 1994. The Landscape Below Ground. ISA, Champaign, Illinois. USA.
- Lonsdale D 1999. Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management, HMSO, London.
- Matheny, N; Clark, J. R.1998. Trees and Development: A Technical Guide to Preservation of Trees during Land Development. ISA, Champaign, Illinois. USA.
- Mattheck C. & Breloer H. 1994. Research for Amenity Trees No.2: The Body Language of Trees, HMSO, London.
- Thomas P, 2000 & 2014. Trees: Their Natural History, Cambridge University Press, Cambridge.
- Trowbridge J & Bassuk N (2004) Trees in the Urban Landscape: Site Assessment, Design, and Installation; J Wiley & Sons inc. NJ USA

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	Olive	: Olea europaea
Ash, Common	: Fraxinus excelsior	Pear, Willow leaved	: Pyrus salicifolia
Birch, Himalayan	: Betula utilis	Pine, Bhutan	: Pinus wallichiana
Birch, River	: Betula nigra	Plane, London	: Platanus acerifolia
Cypress, Lawson	: Chamaecyparis lawsonia	Plum spp	: Prunus spp
Elder	: Sambucus nigra	Privet, Chinese	: Ligustrum sinense
Hazel, Corkscrew	: Corylus avellana 'Contorta'		
Magnolia, Southern	: Magnolia grandiflora		

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: 31 Elsworthy Road
Date: 24/11/20

Appendix 1

BS5837 Tree Constraints Survey Schedule

Landmark Trees Ltd
020 7851 4544
Surveyor(s): Kim Dear
Ref: BBP_31EWR_AIA

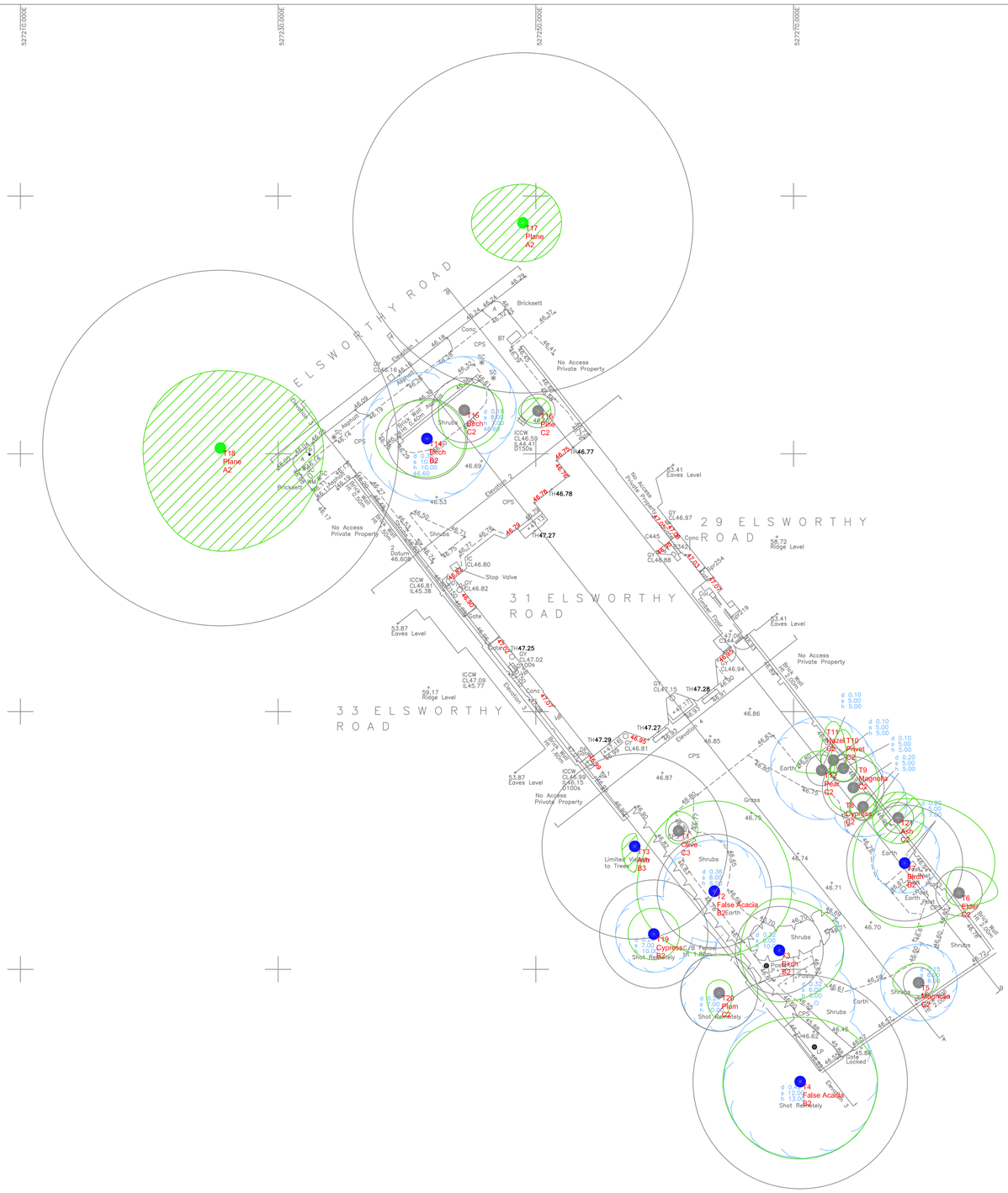
Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
14	Birch, river	9	3334	3.0	260	Early Mature	3.1	Normal	Good	B	2	20+	
15	Birch, river	7	2332	3.0	210	Early Mature	2.5	Normal	Fair	C	2	20+	Leaning (slightly)
16	Pine, Bhutan	2	111,1.5	0.5	110	Young	1.3	Moderate	Fair	C	2	20+	
17	Plane, London	12	3334	6.0	1100	Mature	13.2	Normal	Good	A	2	>40	Pollarded pollarded this year
18	Plane, London	15	6886	6.0	1150	Mature	13.8	Normal	Good	A	2	>40	last year pollard, good regrowth

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: 31 Elsworthy Road	1:200@ A1
Drawing Title: Tree Constraints Plan	December 2020

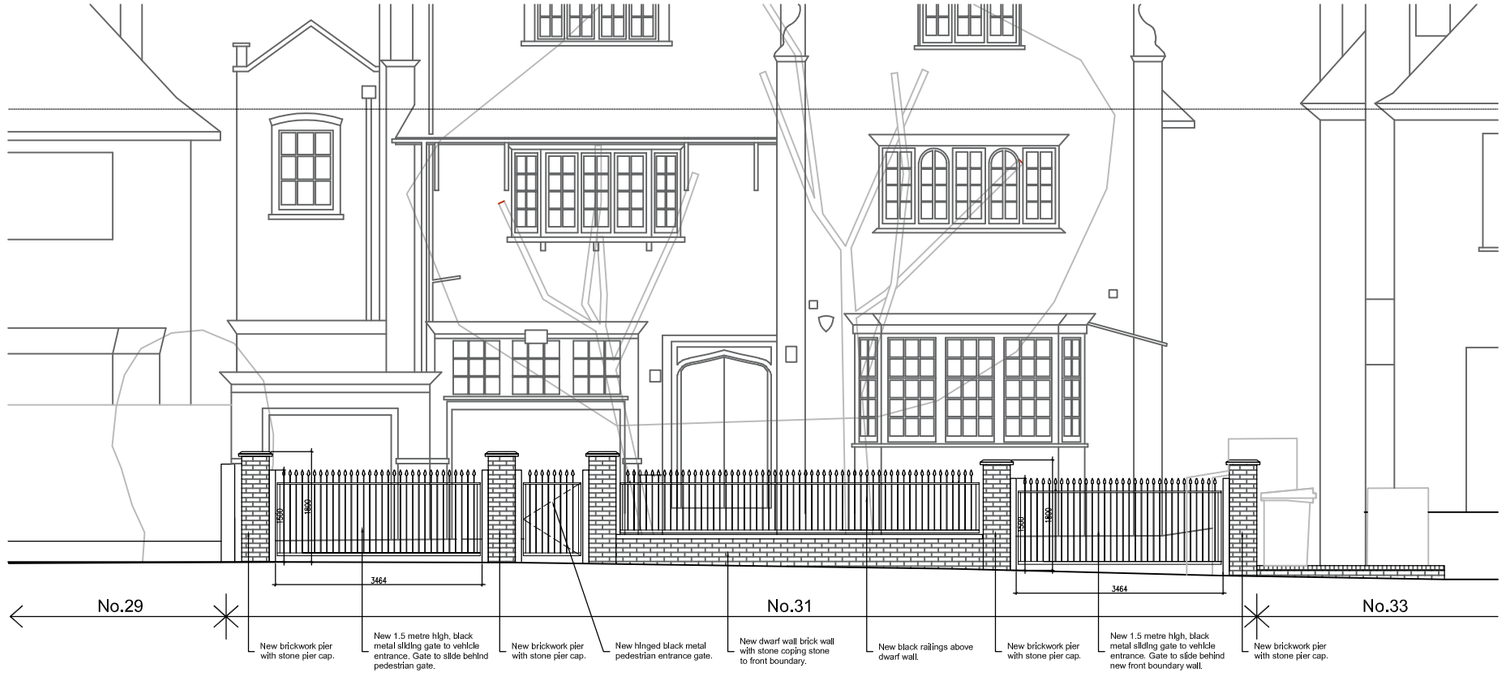
Key:

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

Category
Crown Spread
T3 Birch B2
Tree Number
Species
Category
Root Protection Area
Tree Position Approximate (not shown on original survey)

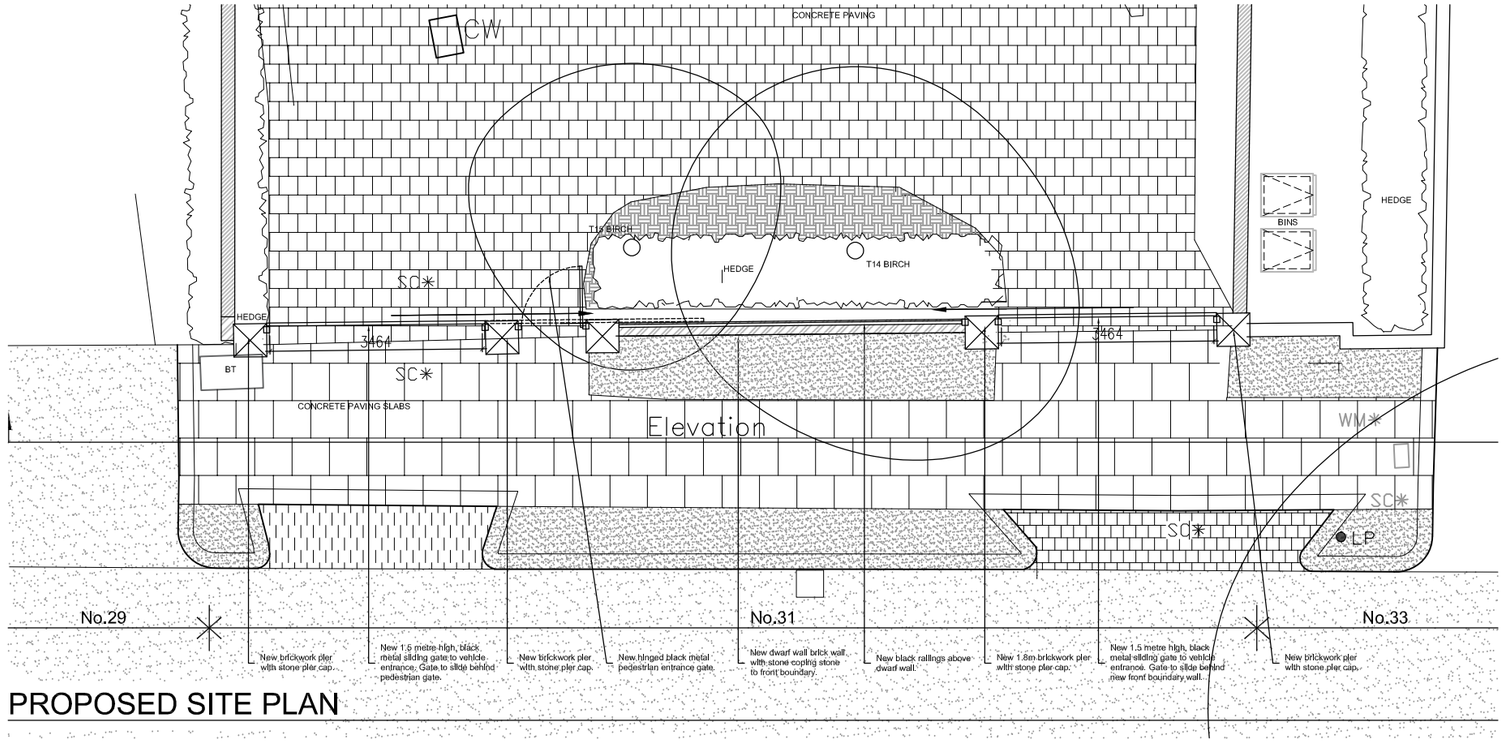
PLAN 2

ARBORICULTURAL IMPACT ASSESSMENT PLAN (S)



PROPOSED ELEVATION

Datum Line Level :44.00m



PROPOSED SITE PLAN

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

SCALE 1:100

N

BB PARTNERSHIP
CHARTERED ARCHITECTS

Studios 33-34, 10 Hornsey St, London. N7 8EL
Tel 020 7336 8555 - e-mail - architect@bbpartnership.co.uk

Client: Elsworthy Road (Investments) Ltd		
Project: 31 Elsworthy Road, London, NW3 3BT		
Drawing: Proposed Front Boundary		
Date: Oct 2022	Scale: 1:100 at A3	Drawn by: RW
drg.no.: GEO_220		Revision: -

S:\LT\GE_\GEO - 31 Elsworthy Road, London, NW3 3BT\Proposed\Front Boundary Application\GEO Boundary Gate.dwg