

Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT FOR:

The Hoo
17 Lyndhurst Gardens
Hampstead
NW3 5NU

INSTRUCTING PARTY:

Private Client c/o c/o Jaga Developments (London) Ltd
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DOCUMENT HISTORY

Revision	Status	Comments	Date
Rev 03	DRAFT	For Internal Review (Client / Design Team)	1/11/22
Rev 03a	Approved	For External Issue (Planning)	21/12/22

1. SUMMARY

- 1.1 The existing site contains a large detached property with substantive gardens containing a number of trees potentially constraining development. The proposal includes the replacement of the existing southern boundary wall.
- 1.2 There are 17 individual and small groups of trees on or around the site, with most being distributed around its periphery. These are judged mostly as low-quality trees, but with high quality groups G6 and G11 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, T's 3, 5 and 9 are assessed as being poor-quality specimens with T9 requiring prompt attention.
- 1.3 The report has assessed the impacts of the development proposals and concludes there would no immediate impact on the resource as no tree pruning or removal is necessary beyond that already consented.
- 1.4 Whilst the default position is that structures be located outside the Root Protection Area* (RPA) of trees to be retained, the existing wall lies within the RPA of G11 and thus its replacement must also. The report has demonstrated that the tree(s) can remain viable and that the constructional variances proposed obviate the need to show that the area lost to encroachment can be compensated for elsewhere, contiguous with the RPA. Net impacts are assessed therefore as being very low.
- 1.5 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 of this report.
- 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.

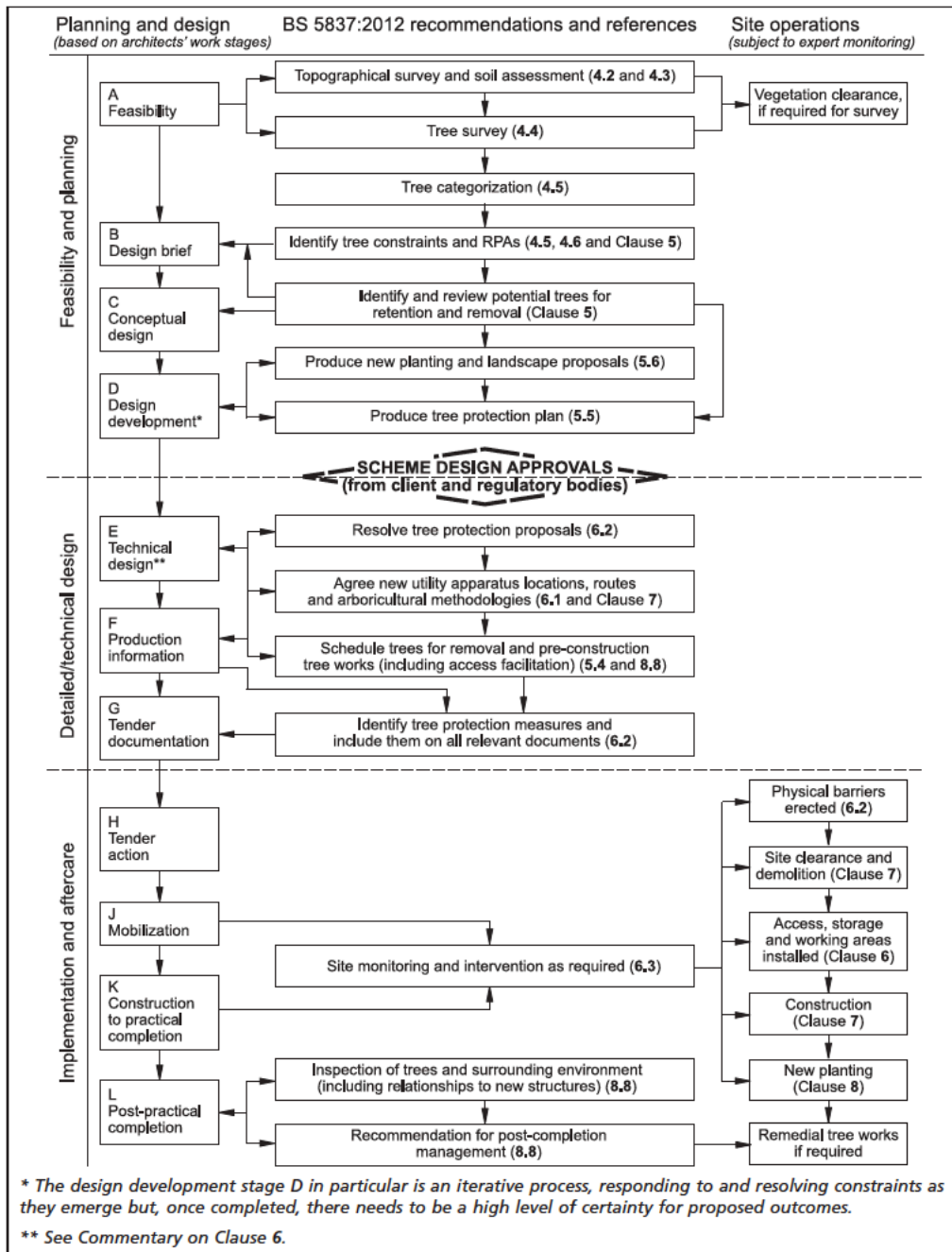
* British Standards Institute: Trees in relation to design, demolition and construction BS 5837: 2012 HMSO, London

2. INTRODUCTION

2.1 Terms of Reference

- 2.1.1 Jaga Developments (London) Ltd 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 replacement of the existing southern boundary wall.
- 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 defined 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



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: 53583_01_2D Topo Survey (24-05-19) REV A

Proposals: 1130

2.3 Scope & Limitations of Survey

- 2.3.1 As Landmark Trees' (LT) arboricultural consultant, Adam Hollis surveyed the trees on site on 24th July 2019, 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 provided within Appendix 2. 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

- 3.1.1 The site fronts onto Lyndhurst Gardens, Hampstead with gated access into its grounds. It is bounded by considerable retaining structures on the North and West boundaries and sits elevated over the Southern boundary. There are trees within and adjoining the sites boundary on all sides. The southern boundary wall is in a state of dilapidation and is a 9-12 inch brick, retaining wall in a Flemish Garden wall bond.
- 3.1.2 There are a number of significant level changes throughout the site.
- 3.1.3 We are not aware of the existence of any Tree Preservation Orders, but understand the site stands within the Fitzjohns Netherhall 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 and G7 of the London Plan 2021 and Policies A3, A5, D1, and D2 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

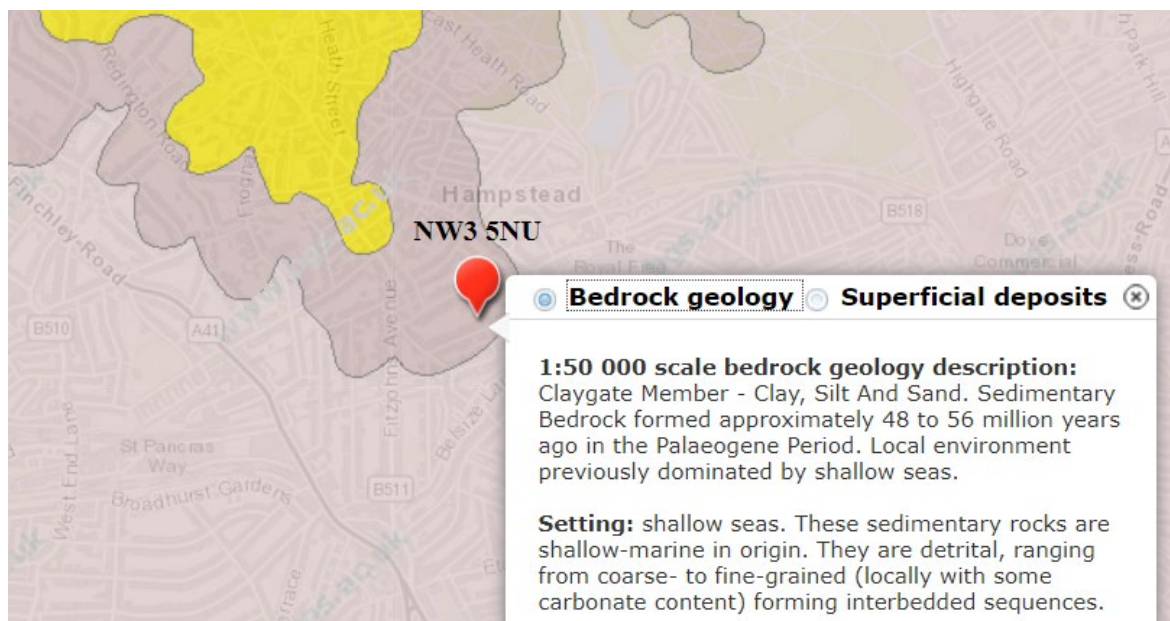


Figure 2: Extract from the BGS Geology of Britain Viewer

- 3.2.1 In terms of the British Geological Survey, the site overlies the Claygate Member / Beds (see dark area on plan extract above). As the youngest part of the London Clay, they form a transition between the clay and the sandier Bagshot Beds above (shown in yellow). Unlike the Bagshot Beds, more typical of Hampstead Heath, 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.
- 3.2.2 The actual limits of soil series are not as clearly defined on the ground as on plan and there may be anomalies between them. Further advice from the relevant experts on the specific soil properties can be sought as necessary.
- 3.2.3 Clay soils are prone to compaction during development. Damage to soil structure can have a serious impact on tree health. Design of foundations near problematic tree species will also need to take into consideration subsidence risk.

3.3 Subject Trees

- 3.3.1 Of the 17 surveyed trees and small groups of trees, 2 are category* A (High Quality), 1 is category B (Moderate Quality), 9 are category C (Low Quality) and 3 are category U (Poor Quality). The remaining 2 specimens do not qualify for a category of retention and are included for information only. The tree species found on the site comprise xxx.
- 3.3.2 The tree species found on the site comprise ash, pride of India, viburnum, wild cherry, common lime, buddleia, Leyland cypress, chestnut, sycamore, yew, Holm oak, laurel and London plane.
- 3.3.3 In terms of age demographics there is a broadly even mix of all age classes present.
- 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 2 on-site trees (T1 and T9). These are listed in Appendix 2.

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

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.

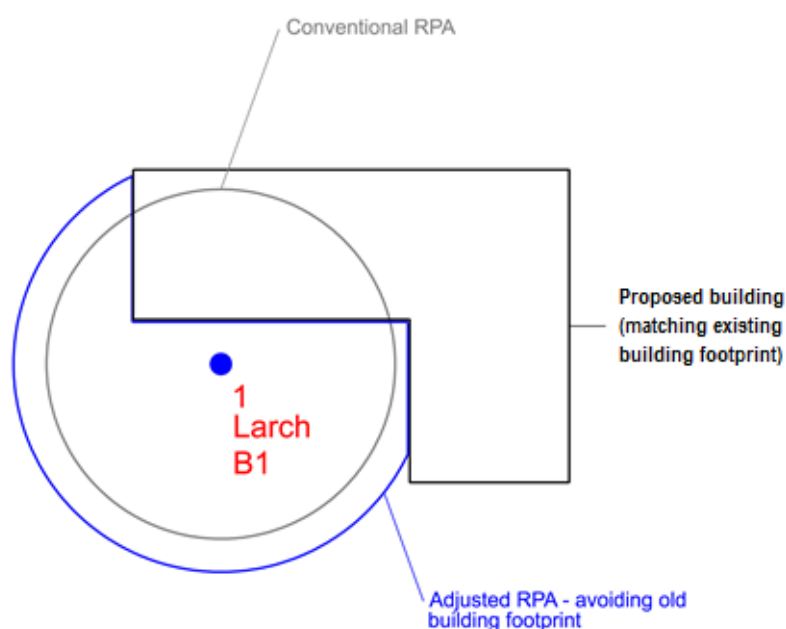


Figure 2 – Generic BS 5837 RPA Adjustments

- 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. **In this instance, the RPA of G11 has been modified in light of the trial pit findings detailed in Appendix 5. In short, despite the presence of occasional pioneering roots, G11 is not rooting significantly into the application site.**
- 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, there are no internal site trees and with a category B street tree at the frontage and another category C tree in the neighbouring rear garden. There are few significant primary constraints upon development, provided both trees are adequately protected and the appropriate methodologies are employed during development.

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.

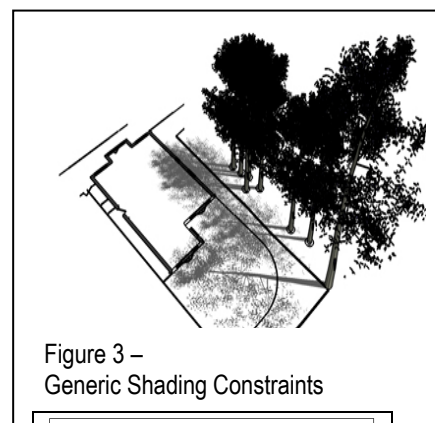


Figure 3 –
Generic Shading Constraints

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.

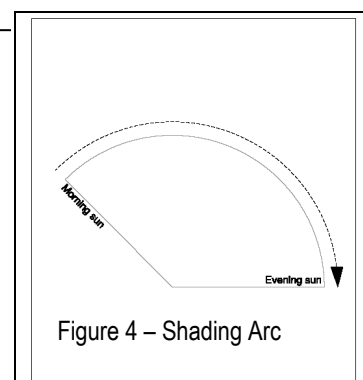


Figure 4 – Shading Arc

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 means they have the potential to provide a variety of secondary constraints, including shading, organic deposition and the potential need to maintain crown clearance in the future. The significance of these constraints will vary depending on the location and proximity to the proposed re-development which is considered below (in Sections 5 & 6). As specified by BS5837, this section (4) of the report considers only the site as it is, not in the light of pending proposals.

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

Table 1: Arboricultural Impact Assessment

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

Hide irrelevant

Show All Trees

Ref: JDL_17LDG_TCR

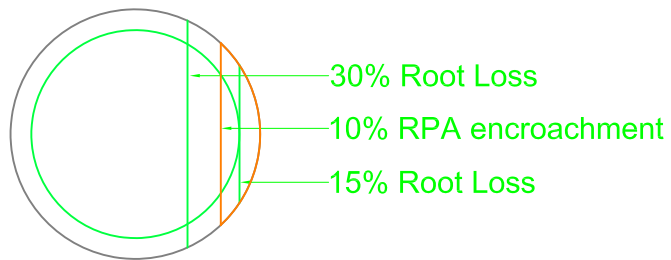
B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
A	11	Lime, Common	Retaining Wall Replacement adjacent to RPA	m ² N/A %	Mature	Normal	Good	Very Low	Very Low	Low-invasive foundation design

6. ARBORICULTURAL IMPLICATIONS

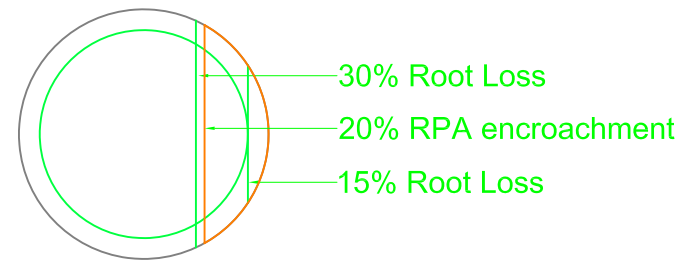
6.1 Rating of Primary Impacts

- 6.1.1 As detailed in paragraph 4.1.4, site investigations have confirmed that the existing boundary wall forms a significant barrier to rooting from the adjacent G11. This is not to say that occasional roots have not penetrated through the wall or undermined it however and it is likely that significant roots are running along the southern face of the wall. Accordingly, the removal and rebuilding of the wall must be undertaken in a controlled manner
- 6.1.2 In our view, the tree(s) are of a species, age and condition sufficient to remain viable in the circumstances, given that the working methods and constructional variations proposed mean there is no need to compensate for the area lost to the encroachment arising from the rebuilding of the wall. Supervision and monitoring of such measures will be essential. Subject to these provisos the net impacts are assessed as being very low.
- 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 would be below the lower of 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. 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



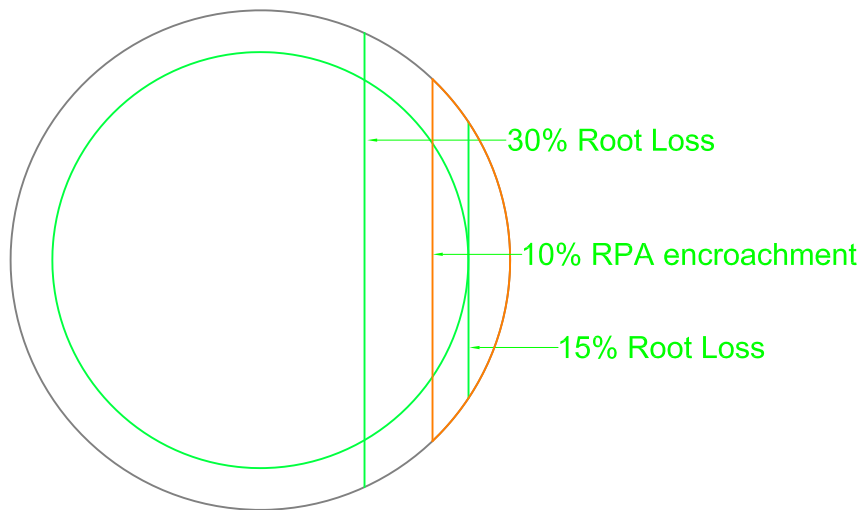
Area 7.98 sq.m. (10.0%)



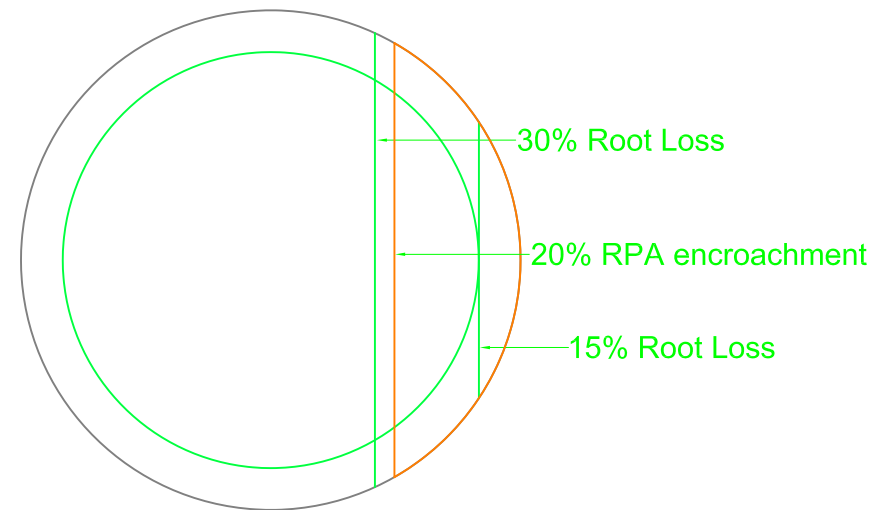
Area 15.96 sq.m. (20.0%)

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

RPA: 10m



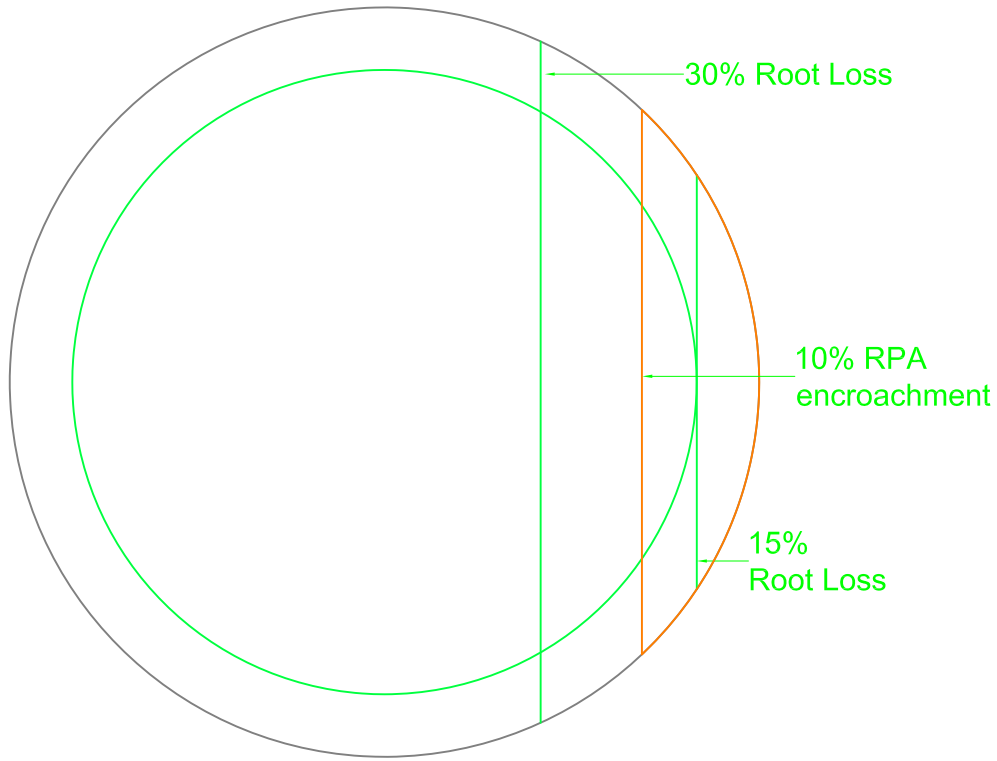
Area 31.17 sq.m. (10.0%)



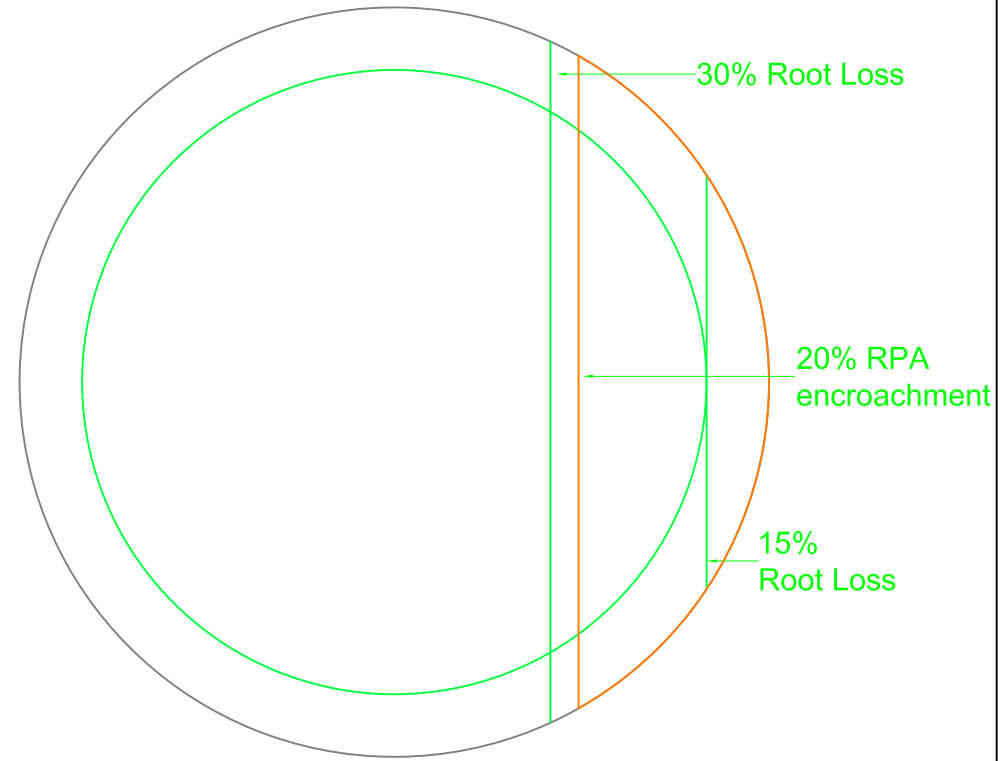
Area 62.33 sq.m. (20%)

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

RPA: 15m



Area 70.7 sq.m. (10.0%)



Area 141.4 sq.m. (20.0%)

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

- 6.1.6 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.
- 6.1.7 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.
- 6.1.8 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 arboriculturalist 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 nature of the proposals renders the assessment of secondary impacts moot.

6.3 Mitigation of Impacts

6.3.1 The existing wall will be broken out using hand tools only. The replacement wall will be founded on 200mm diameter mini-piles inserted between any significant roots that may undermine the existing wall. These piles will be linked by a concrete pile cap installed so that its lower edge is above the highest root encountered. A reinforced concrete retaining wall will be built off this cap. The concrete reinforced retaining wall will be clad to the south in a single leaf of skin of facing brickwork to match the existing, up to the level of The Hoo's garden. The rebuilt boundary wall in 9-inch brick would sit about this. This will be laid in a Flemish Garden wall bond and topped by a saddleback coping, as existing.

6.3.2 Provided the owners of the property in which G11 stands acquiesce, a compost tea will be applied to the soft ground between G11 and the existing wall to improve rooting conditions therein.

7. CONCLUSION

- 7.1 The potential impacts of development are all very low in terms with no loss of canopy cover and only theoretical RPA encroachments of trees retained. In the latter case, the report has demonstrated as per BS5837 paragraph 5.3.1 (a) that the tree(s) can remain viable and that the constructional variances proposed mean that the area lost to encroachment does not need to be compensated for elsewhere, contiguous with their RPA.
- 7.2 The full potential of the impacts can thus be largely mitigated through design and precautionary measures. These measures can be elaborated in Method Statements in the discharge of planning conditions.
- 7.3 The species affected are generally tolerant of root disturbance / crown reduction and the retained trees are generally in good health and capable of sustaining these reduced impacts.
- 7.4 Therefore, 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, 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. 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 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. Extant areas of RPA that cannot be fenced off and therefore lie outside the CEZ must be protected with fit-for-purpose ground protection. The location and type of ground protection is shown in the Tree Protection Plan in the Appendices
- 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) Tree retention/removal plan (finalized) Retained trees and RPAs shown on proposed layout Strategic hard and soft landscape design, including species and location of new tree planting Arboricultural impact assessment	Existing and proposed finished levels Tree protection plan Arboricultural method statement – heads of terms Details for all special engineering within the RPA and other relevant construction details
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method Dimensioned tree protection plan Arboricultural method statement – detailed Schedule of works to retained trees, e.g. access facilitation pruning Detailed hard and soft landscape design	Arboricultural site monitoring schedule Tree and landscape management plan Post-construction remedial works Landscape maintenance schedule

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.
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- Lonsdale D 1999. Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management, HMSO, London.
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- 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



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.¹ 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.



PART 2 – APPENDICES

APPENDIX 1

TREE SCHEDULE

Botanical Tree Names

Ash, Common	: Fraxinus excelsior	Lime, Common	: Tilia x europea
Buddleia	: Buddleia spp	Oak, Holm	: Quercus ilex
Cherry, Wild cherry /Gean	: Prunus avium	Plane, London	: Platanus acerifolia
Chestnut, Horse	: Aesculus hippocastanum	Pride of India	: Koelreuteria paniculata
Cypress, Leyland	: Cupressus x leylandii	Sycamore	: Acer pseudoplatanus
Elder	: Sambucus nigra	Yew, Common	: Taxus baccata
Laurel, Cherry	: Prunus laurocerasus		

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.



Site: 17 Lyndhurst

Date: 24/07/2019

Appendix 1

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Adam Hollis

Ref: JDL_17LDG_TCR

BS5837 Tree Constraints Survey Schedule

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	Ash	12	3355	4.0	420	Early Mature	5.0	Moderate	Fair	B	2	20+	Restricted rooting, disrupting paving, drought stressed Entry wounds on trunk
2	Pride of India	6	1	3.0	75	Young	0.9	Normal	Good	C	2	40+	New planting
3	Dead Viburnum	3	0		0		0.0			U			
4	Ash	12	4433	3.5	259	Semi-mature	3.1	Normal	Fair	C	2		Self-sown / unsuitable location
5	Cherry, Wild	10	2333	3.0	270	Semi-mature	3.2	Poor	Fair	U		<10	Bacterial canker Topped
G6	Lime, Common	10	As per plan	5.0	600	Early Mature	7.2	Normal	Good	A	2	40+	Remote survey beyond retaining wall



Site: 17 Lyndhurst

Date: 24/07/2019

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020 7851 4544

Surveyor(s): Adam Hollis

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BS5837 Tree Constraints Survey Schedule

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
G7	Buddleia	5	1				0.0						
H8	Cypress, Leyland	8	2	3.5	150	Semi-mature	1.8	Moderate	Fair	C	2	10+	Topped and patchy Remote survey only (RS)
9	Dead Chestnut	6			566		6.8			U			Rotten
10	Sycamore	10	3	4.0	490	Semi-mature	5.9	Moderate	Fair	C	2	20+	Sparse crown Remote survey only (RS)
11	Lime, Common	10	3.5 & 2	5.0	600	Mature	7.2	Normal	Good	A	2		
12	Ash	11	3121	6.0	200	Semi-mature	2.4	Normal	Good	C	2		Ivy clad Suppressed by nearby tree



Site: 17 Lyndhurst

Date: 24/07/2019

Appendix 1

Landmark Trees Ltd

020 7851 4544

Surveyor(s): Adam Hollis

Ref: JDL_17LDG_TCR

BS5837 Tree Constraints Survey Schedule

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Stem Diamete	Age Class	Protection Radius	Growth Vitality	Structural Condition	B.S. Cat	Sub Cat	Useful Life	Comments
13	Yew	4	3144		250	Semi-mature	3.0	Normal	Good	C	2		
14	Oak, Holm	10	2727	2.0	556	Mature	6.7	Moderate	Poor	C	2	40+	Sprawling regrowth from stump
15	Laurel	7	1				0.0						
16	Ash+Elder	11	1	7.0	367	Semi-mature	4.4			C	2		Sparser and sprawling
17	Plane, London	6	1	3.0	80	Young	1.0	Normal	Good	C	2	40+	

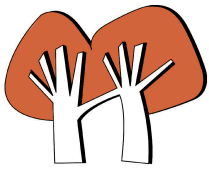
APPENDIX 2

RECOMMENDED TREE WORKS

Notes for Guidance:

Priority 1 - Urgent (ASAP), 2 - Standard (within 3 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.



Site: 17 Lyndhurst

Date: 24/07/2019

Surveyor(s): Adam Hollis

Ref: JDL_17LDG_TCR

Appendix 2

Recommended Tree Works

[Hide irrelevant](#)
[Show All Trees](#)

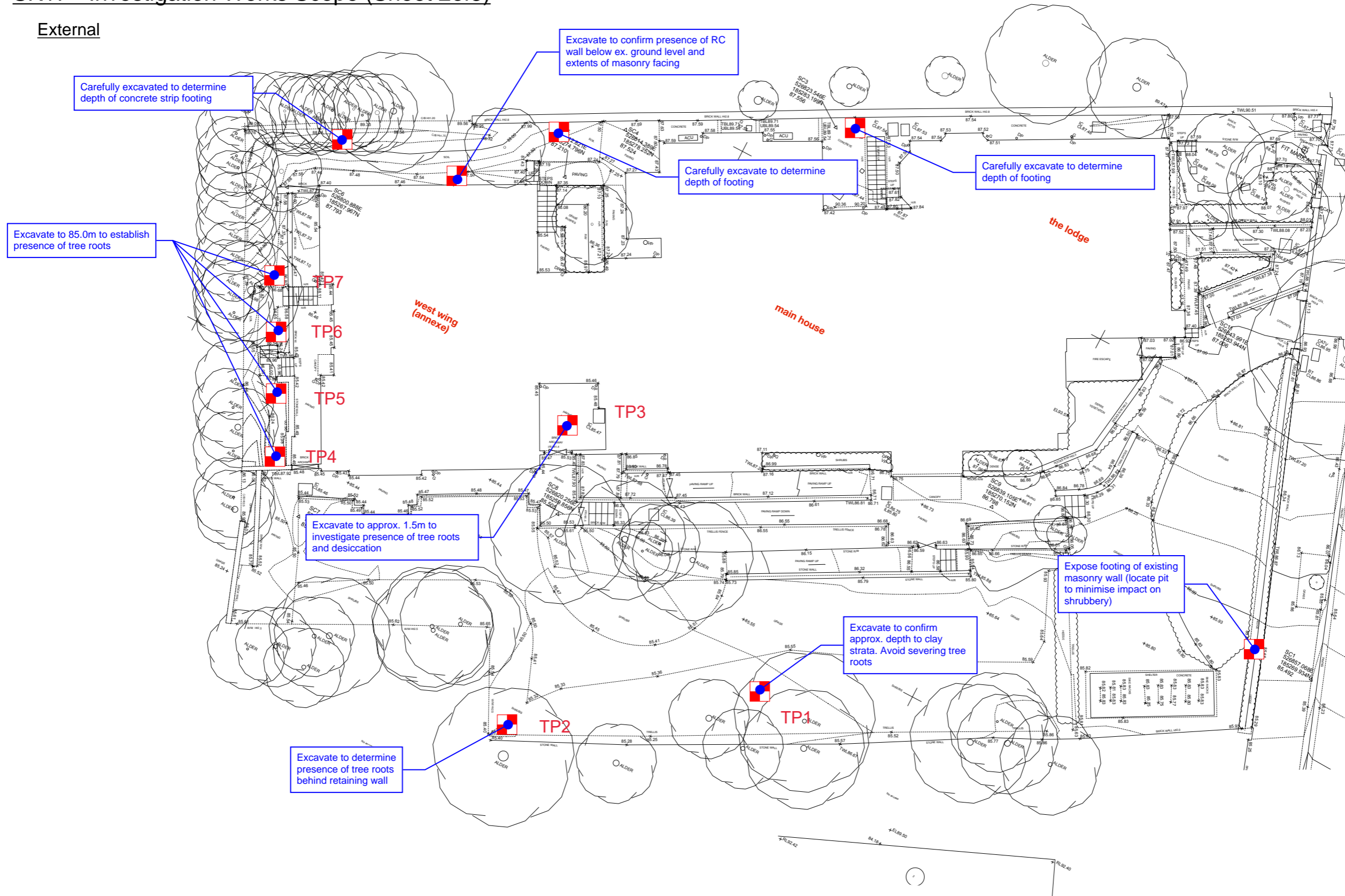
Landmark Trees

Tree No.	English Name	B.S. Cat	Height	Ground Clearance	Crown Spread	Recommended Works	Comments/ Reasons
1	Ash	B	12	4.0	3355	Mon	Restricted rooting, disrupting paving, drought stressed Entry wounds on trunk Recommended husbandry 3
9	Dead Chestnut	U	6			Fell	Rotten Recommended husbandry 2

APPENDIX 5: TRIAL PIT FINDINGS

SK17 - Investigation Works Scope (Sheet 2 of 5)

External



TP1 – Mixed brick rubble to approx. 100mm depth; potentially old paving. Soil beneath. Frequent fibrous roots observed <10mm dia. Single severed root of 18mm dia

TP2 – Mixed brick rubble to approx. 100mm depth; potentially old paving. Soil beneath. Frequent fibrous roots <10mm dia. 3 x severed roots of 20mm dia, 20mm dia and 35mm dia. All expected to originate from G11 Lime.

TP3 – Slabs to concrete to brick mixed with concrete throughout pit profile. No roots seen in pit

TP4 – soil only behind retaining wall. Single severed 30mm dia root with infrequent fibrous roots above

TP5 – soil only behind retaining wall. Single severed 45mm dia roots with infrequent fibrous roots above

TP6 – Concrete to approx. 100mm depth then soil below. Single root observed approx. 100mm dia, infrequent fibrous roots. All expected to originate from adjacent cypress H8

TP7 – No pit found/dug at location

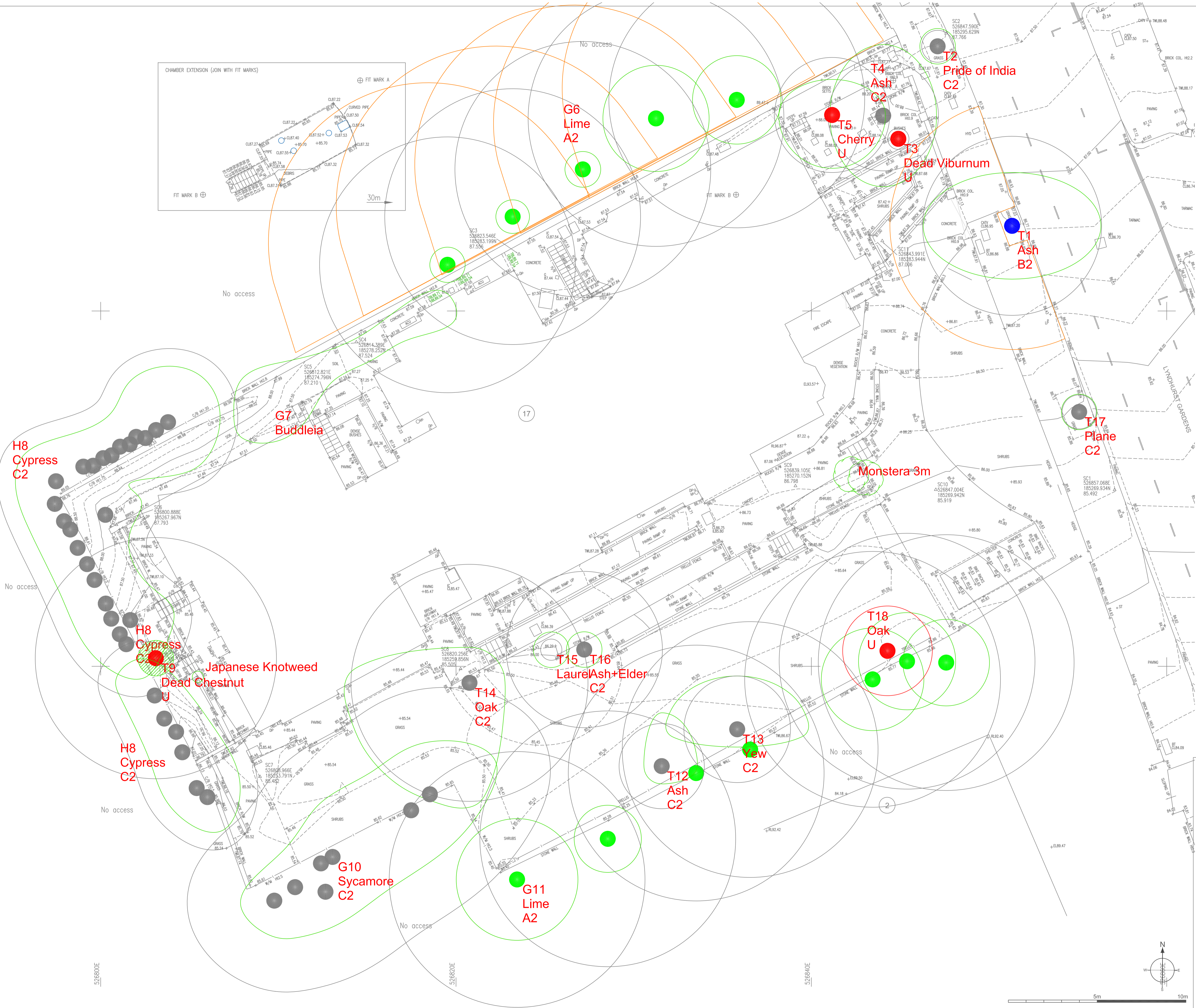
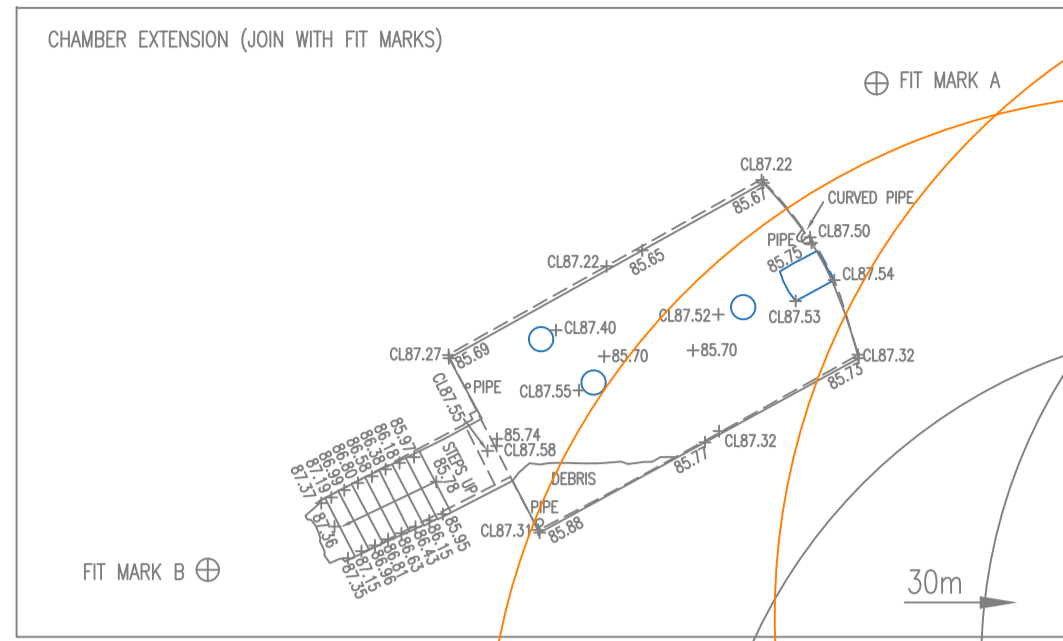


Landmark Trees

PART 3 – PLANS

PLAN 1

TREE CONSTRAINTS PLAN



NOTE:
 This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.
 Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.
 Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

Landmark Trees
 20 Broadwick Street, London, W1F 8HT
 Tel: 0207 851 4544 Mobile: 07812 969928
 e-mail: info@landmarktrees.co.uk Web: www.landmarktrees.co.uk

Site: 17 Lyndhurst 1:100@A1
 Drawing Title: Draft Tree Constraints Plan August 2019

Key:

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

Legend:

- Category: Crown Spread
- Tree Number
- Species
- Category
- Root Protection Area
- Tree Position Approximate (not shown on original survey)

526640E

526640E

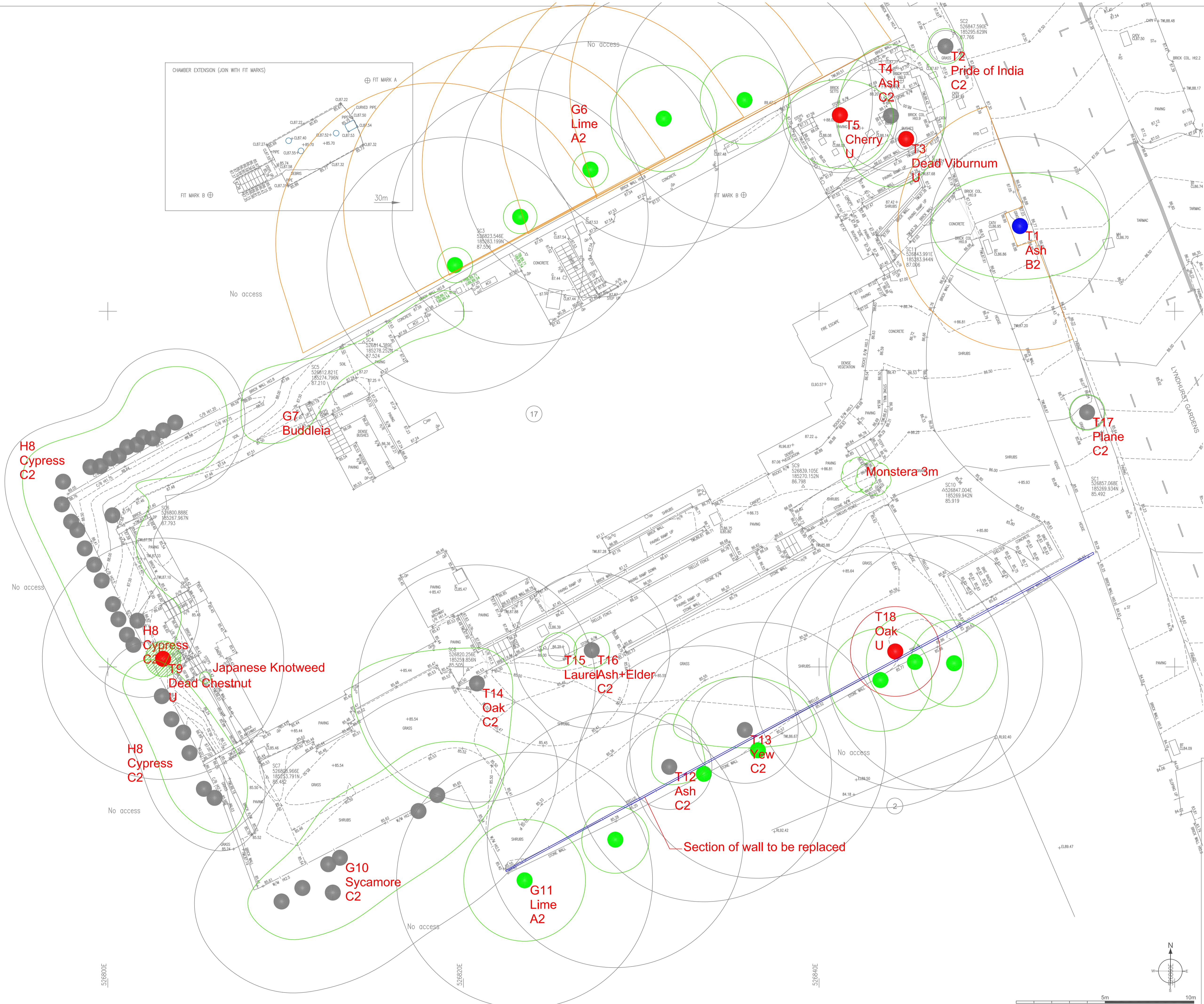
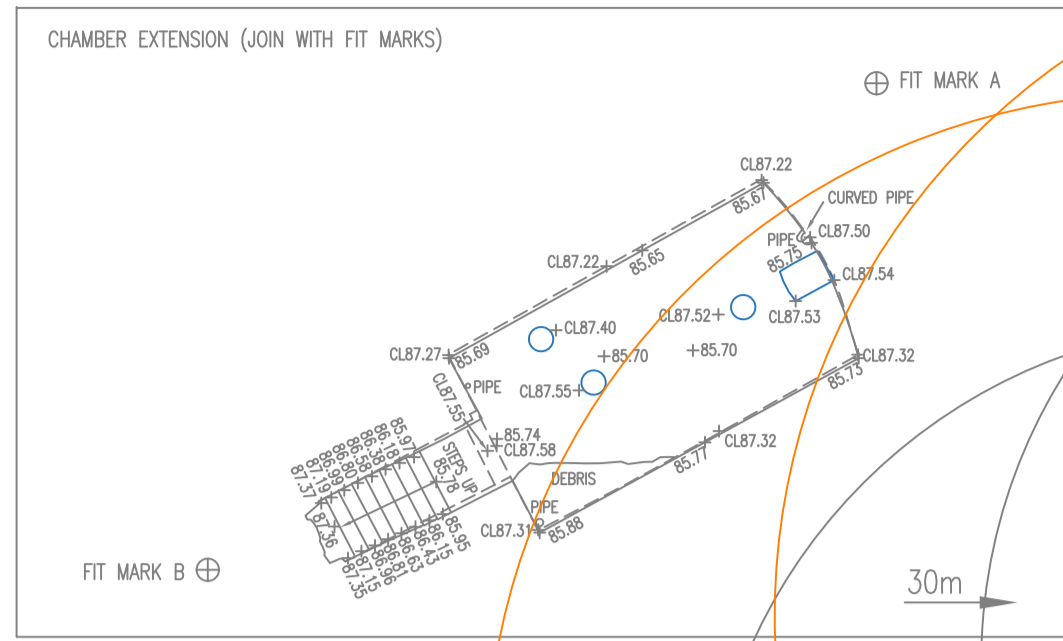
526640E



PLAN 2

ARBORICULTURAL IMPACT ASSESSMENT PLAN (S)

- i. Ground Floor



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

Site: 17 Lyndhurst
 Drawing Title: Arboricultural Impacts Assessment
 November 2022

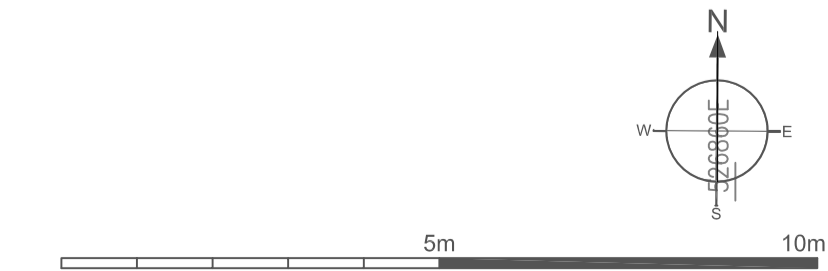
1:100@ A1

Key:

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

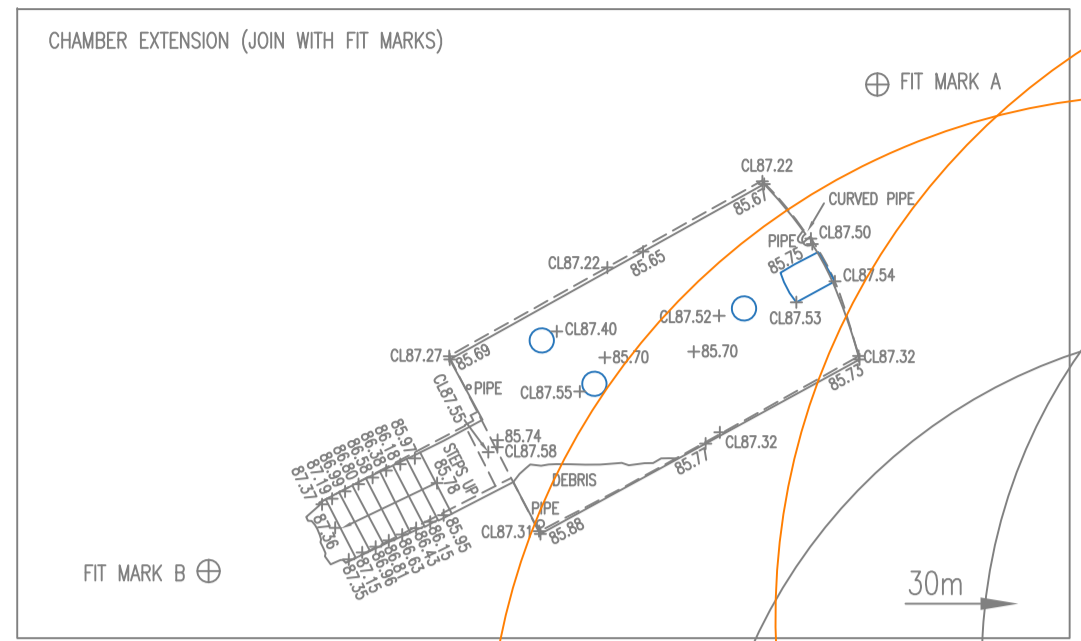
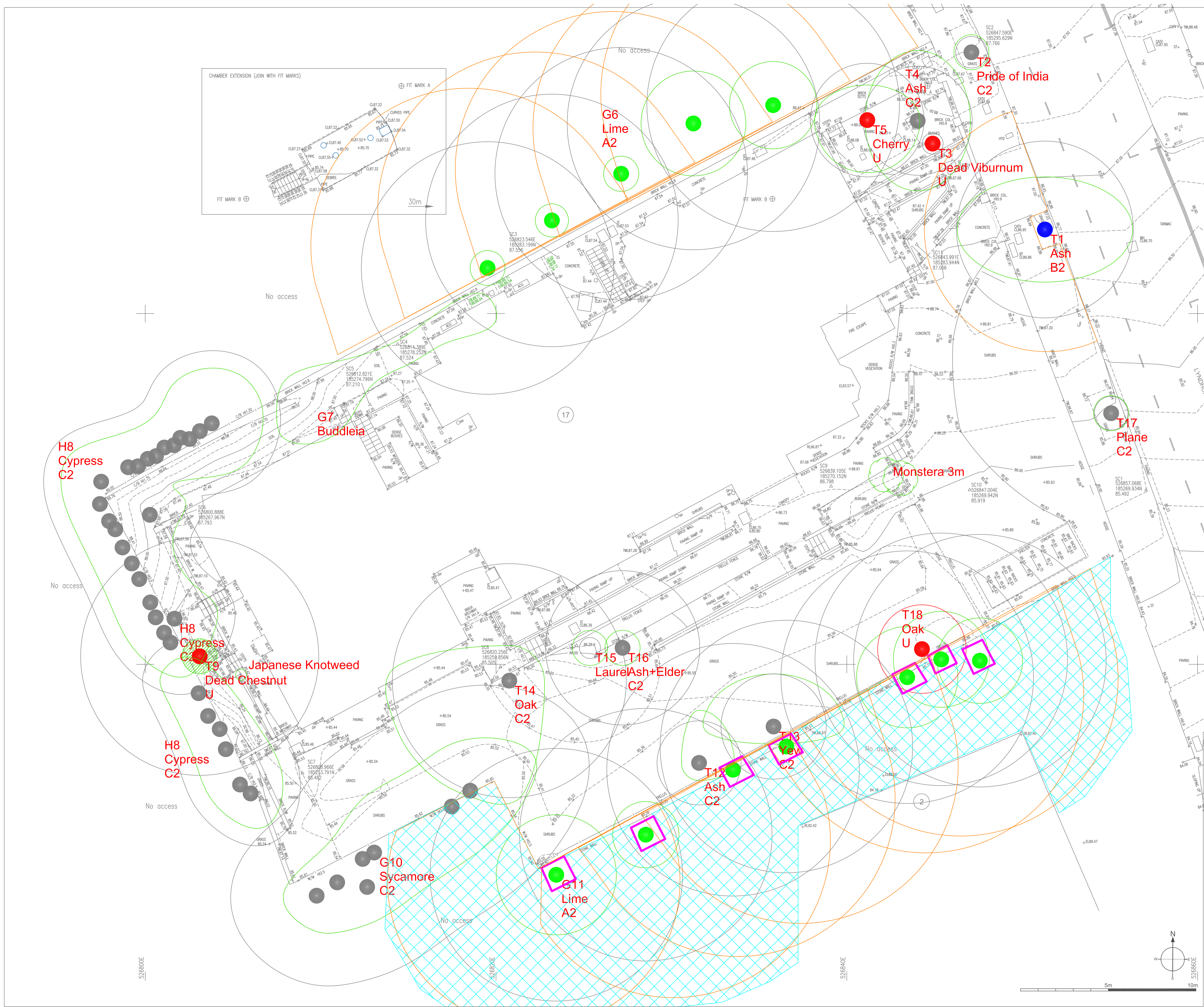
Diagram Key:

- Green circle: Crown Spread
- Red circle: Tree Number
- Blue circle: Species
- Red circle: Category
- Green circle: Tree Position Approximate (not shown on original survey)



PLAN 3

OUTLINE TREE PROTECTION PLAN



NOTE:
 This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.
 Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.
 Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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

Site: 17 Lyndhurst 1:100@ A1
 Drawing Title: Tree Protection Plan November 2022

Key:

- Category A (Green circle)
- Category B (Blue circle)
- Category C (Red circle)
- Category U (Grey circle)
- Trees Unsuitable for Retention (Red circle with slash)
- Ground Protection (Blue hatched area)
- Tree Protection Fencing (Pink line)
- Crown Spread (Green circle)
- Alternate RPA (Red circle)
- Tree Number (Number in circle)
- Species (Text label)
- Category (Text label)
- Tree Position Approximate (not shown on original survey) (Green circle with crosshair)

