Project: 21_5837_04_26
Site: 201 Petersham Road, Richmond, TW10 7AW
Client: Natalie Locherer

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Summary:

The tree survey for 201 Petersham Road contains the details of six individual trees that are all located in the rear garden of the site. Our brief has been to obtain details of the tree population on-site with a view to assessing any arboricultural constraints.

This report was commissioned in relation to the proposed development at 201 Petersham Road, Richmond, TW10 7AW.

The report details all trees over 75mm at 1.5m above ground level that are relevant to the siting of the proposed development. The position of the trees on the site is illustrated on the tree constraints plan and information about the tree stock and its current condition is given within the arboricultural data tables. It will assist the planning process by discussing the impact that the proposals will have on the existing tree stock.

An Arboricultural Impact Assessment is included at Section 8 which details the constraints placed on the proposed development from the rooting area of the trees below ground and above ground by virtue of their size and position.

The site is to be redeveloped with the construction of a new garden room towards the rear of the site.

The proposed garden room is within close proximity to the stem of tree T3, thus, retention is not considered to be achievable and removal is recommended.

The stem of tree T4 is leaning heavily and runs linear to the proposed steps, thus, will likely restrict access and egress if retained. Furthermore, the tree will require an excessive crown reduction to facilitate the proposal. Therefore, it is advised to consider removal.

The proposed garden room should be constructed with raised foundations, which will minimise impact to the roots of tree T1. The tree will require a crown raise to clear the roof of the proposed outbuilding. The works required are considered to be minimal, and therefore, unlikely to impact the tree.

In order to mitigate tree loss and provide a biodiversity net gain to development, new tree planting is recommended.

Report Author.

ROAVR Environmental (ROAVR Group)was formed in 2010 and since then has carried out arboricultural consultancy Nationwide with directly employed consultants. Our consultants are all individual members of the Arboricultural Association and the report author is listed in the document control sheet.

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Arboricultural implications assessment to BS 5837 2012 of trees at: 201 Petersham Road, Richmond, TW10 7AW.

1 Scope

1.1 We have recently been instructed to undertake an appraisal of mature tree cover at 201 Petersham Road, Richmond, TW10 7AW.

1.2 The data was collected to the British Standard BS5837 'Trees in Relation to Design, Demolition and Construction - Recommendations' 2012.

1.3 The survey has been commissioned to offer guidance on the arboricultural constraints with a view to the future development of the site.

1.4 The trees were inspected on the 26/04/2021 following the guidance in the British Standard by ROAVR. The crowns and stems were inspected from the ground using the 'Visual Tree Assessment (VTA)' method; non invasive techniques were used at this stage. Although a sounding hammer was used to determine the presence of any decay.

1.5 The site was assessed and data was collected on six individual trees.

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Photographic Plates.

Photographic plate showing tree T1, a mature Black Locust.

Photographic plate showing fungal brackets on the stem of tree T1.

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Photographic plate showing tree T3, a semi-mature Hazel.

Photographic plate showing tree T4, a mature Apple tree.

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Photographic plates showing a large cavity on the stem of tree T4.

Photographic plate showing trees T5 and T6, mature fruit trees.

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Photographic plate showing an aerial image of the survey site.

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2. Site Conditions & Site Surroundings

2.1 The site is situated in Richmond in the London Borough of Richmond upon Thames control area. The site is located on the southwest side of the city and has a suburban feel.

2.2 The site is home to a detached residential dwelling house with associated hard and soft landscape.

2.3 The wider locality is predominantly residential. The site is accessed via a private driveway, off from the adjacent public highway.

2.4 A desktop assessment has highlighted that the site is within the Petersham Conservation Area. However, there are no TPO protected trees on-site.

2.5 All desktop assessment data was cross-checked and validated on the 04/05/2021 using the web portal provided by the local planning authority and cross-checked with the DEFRA MAGIC database.

https://www.richmond.gov.uk/media/13282/conarea6_a3_rgb.pdf

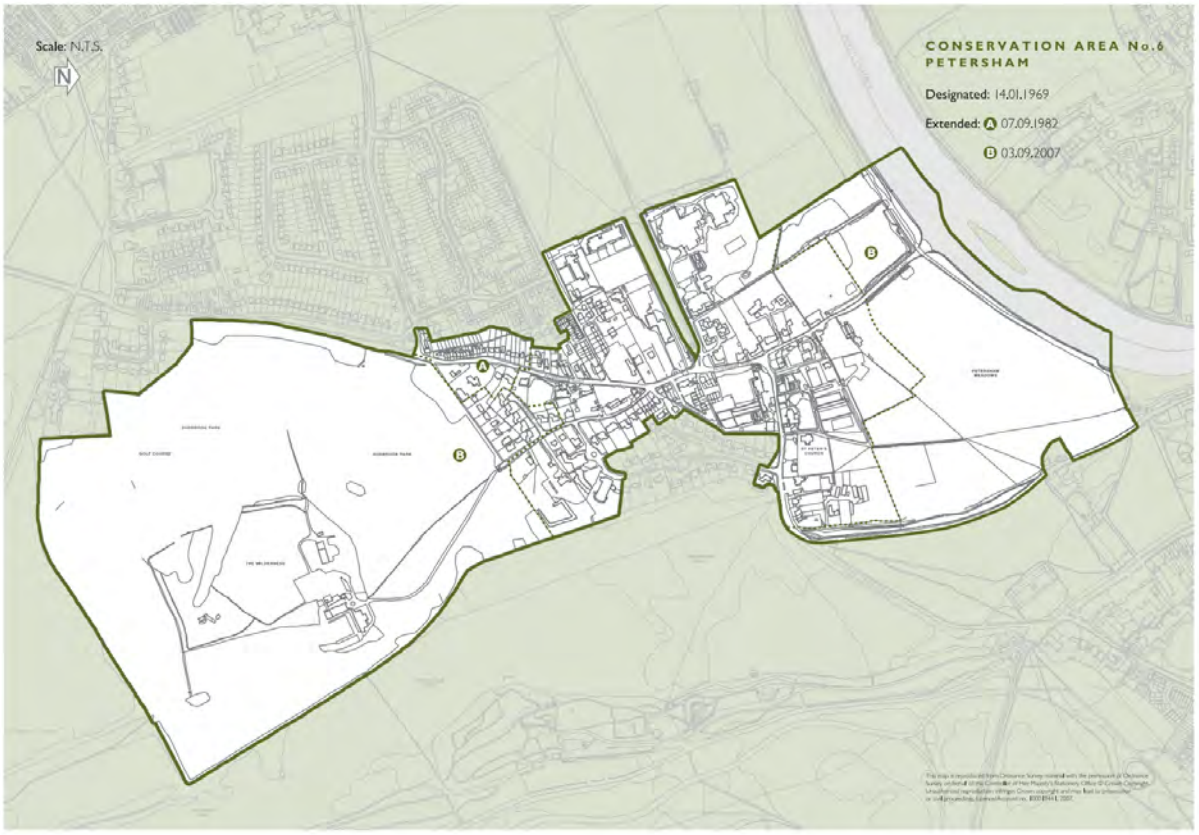

Image plate showing the desktop analysis results of the surveyed plot.

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2.6 Works to protected trees require consent from the local planning authority. In the case of TPO's an application must be made. In the case of conservation areas a notification must be made. TPO applications take up to eight weeks, conservation area notifications take six weeks.

2.7 Certain exemptions apply; for example the removal of deadwood. In the case of dangerous trees 5-days written notice should be given to the local authority (in the cases of immediate danger the work should proceed, but the local authority contacted as soon as possible afterwards) with the works evidenced by photographs and video where possible. You should also check to ensure the works are exempt from the requirements of a felling licence.

2.8 It should be noted that planning consent overrides protected trees, where the works or removal are necessary for development to proceed and have been highlighted in the tree survey documents.

2.9 Bats. Under current legislation it is an offence to 'intentionally or recklessly disturb a bat' or 'damage, destroy or block access to the resting place of any bat'. For further details consultation must be made with the Statutory Nature Conservancy Organisation. Where relevant any current ecological surveys for the site will take precedence in this matter.

2.10 Birds. It is an offence to kill, injure or take any wild bird; or take, damage or destroy the nest of any wild bird while it is in use or being built. Therefore work likely to disturb nesting birds must be avoided from late March to August.

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3. Drawings

3.1 Appended to this report are the tree constraints plan, tree assessment plan and tree protection plan drawings.

3.2 The tree constraints plan has been produced using an OS supplied .dwg (AutoCAD) base plan as no topographical survey was available. Tree positions and data have been applied using our survey handset as an onsite exercise with the constraints plan being produced as a PDF through Auto CAD.

3.3 An autoCAD .dwg file of the tree constraints is available on request for project stakeholders to utilise.

3.4 The *Tree Constraints Plan* shows the existing layout. For each tree the stem location is indicated and scaled according to its diameter, the canopy is indicated according to measurements taken along the four cardinal points of the compass. Root protection areas (RPAs) are indicated which are calculated according to the guidelines within BS 5837 (2012).

3.5 Where appropriate, the shapes of the RPAs have been amended to reflect actual site conditions or where trees have been heavily pruned. The 'original' RPAs are indicated as a dashed line whereas the amended RPAs are indicated as a solid line. Any variation to this approach will be highlighted on the appropriate plans.

3.6 The *Tree Assessment Plan* indicates the tree constraints with the proposals overlaid. Where applicable, this plan shows where works are proposed in Root Protection Areas and which trees are to be pruned or removed. This plan accompanies the Impact Assessment which is to be found in Section 8.

3.7 The *Tree Protection Plan* shows the protection measures that are to be installed during the construction phase. This plan accompanies the Method Statement which is to be found in Section 9.

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4. The Tree Population

4.1 BS5837: 2012 Tree Categorisation:

BS5837: 2012 sets out the methodology for surveying trees on potential development sites in order to identify them within a prioritised system of retention categories, as summarised below and given in full within the BS5837: 2012 Cascade Chart for Tree Retention.

A Category Trees of high quality and value in such a condition as to be able to make a substantial contribution for a minimum of 40 years.

B Category Trees of moderate quality and value in such a condition as to make a significant contribution for a minimum of 20 years.

C Category Trees of low quality and value currently in adequate condition to remain until new planting could be established and expected to remain for a minimum of 10 years, or young trees with a stem diameter less than 150mm measured at 1.5 meters above ground level.

U Category Trees in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural or forestry management.

4.2 Additionally, BS5837: 2012 provides subcategories 1-3 within the category system outlined above which indicate the area(s) in which a tree or group retention value lies. An explanation of these values is given within the BS5837: 2012 Cascade Chart for Tree Retention.

1 - Retention values that are mainly arboricultural
2 - Retention values that are mainly landscape.
3 - Retention values that are mainly cultural, including conservation.

4.3 In line with BS5837: 2012, A and B category trees should be considered as a constraint on site and provide a substantial contribution to the site. As a result, A and B category trees should be retained and incorporated into the scheme where possible.

4.4 Generally C and U category trees are considered to be of low quality or are young specimens that can be readily replaced and therefore should not be a constraint in terms of future development.

4.5 However, it is generally considered desirable to retain trees wherever reasonably possible to ensure continuity of tree cover and to provide a mature landscape to the development.

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4.6 The survey contains details of a number of trees. The comments including species, age, condition and the BS5837:2012 retention category for each individual tree and group of trees are provided in detail in the Tree Schedule (data tables). The full data collection methodology is appended behind the data tables.

4.7 The location of each individual tree and their associated constraints are illustrated on the appended Tree Constraints Plan.

Preliminary Management Recommendations - Regardless of the proposals.

4.8 Management recommendations within the appended data tables are regardless of any new developments.

Future Management Recommendations - Regardless of the proposals.

4.9 Trees should be inspected every three years.

4.10 The trees should be inspected sooner if there is a noticeable decline in their condition, or following extreme weather events.

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5. Trees & Construction - General Issues

5.1 This report has been prepared to inform the design layout of potential development and should be submitted with a planning application.

5.2 Due to the changing nature of trees and other site circumstances this report and recommendations are limited to a one year period. Similarly, this report could be invalidated if any alterations are made to the site that could change the conditions as seen at the time of inspection.

5.3 Under certain circumstances, roots can affect foundations, drains and other underground services. These issues have not been addressed by this report. Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer occasional damage under only average weather conditions. A lack of recommended work does not imply that a tree will never suffer damage.

5.4 Typically, about 80% of roots will be found in the upper 500mm of soil and often extending well beyond the canopy spread. The threat to the trees by development comes from:

A. root severance or fracture
B. compaction of the soil, preventing gaseous exchange and moisture percolation
C. possible change to moisture gradients due to surface water run-off or interception
D. physical damage to low branches and trunk.
E. damage from chemical run-off from construction activities

The consequences for the tree of such damage are:

A. instability, if severe enough
B. entry points for pathogenic fungi at wounds / fractures
C. loss of vitality due to reduced oxygen, mineral and moisture take-up; all leading to root death, and a general decline or possible death of the tree.

5.5 Within a short distance of the stem, the roots of trees are highly branched, so as to form a network of small-diameter woody roots, which can extend radially for a distance much greater than the height of the tree, except where impeded by unfavourable conditions.

5.6 All parts of this system bear a mass of fine, non-woody absorptive roots, typically concentrated within the uppermost 600mm of the soil. The root system tends to develop sufficient volume and area to provide physical stability.

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5.7 The uptake of water and mineral nutrients by the root system takes place via the fine non-woody roots and associated beneficial fungi. Their survival and functioning, which are essential for the health of the tree as a whole, depend on the maintenance of favourable soil conditions. All parts of the root system, but especially the fine roots, are vulnerable to damage.

5.8 BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations' gives information on determining a root protection area (RPA). This is the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

5.9 The default position should be that structures (section 3.10 of BS5837) are located outside the RPAs of trees to be retained. However, If structures (including hard surfacing) are proposed within the root protection area of a retained tree it will require an overriding justification (5.3.1 of BS5837). The project arboriculturist needs to demonstrate that the trees can remain viable, the area lost to encroachment can be compensated for elsewhere contiguous with the RPA and mitigation measures to improve the soil environment of the tree can be implemented.

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6. Tree Constraints - Information

6.1 Constraints imposed by trees during development, both above and below ground need to be considered within the site layout design. Protection is afforded to the tree by defining a Root Protection Area (RPA) within which no development activity should take place. The size of the RPA is defined in the British Standard and relates to trunk diameter. The RPA is normally the minimum position for placement of tree protective fencing. The data tables hold a column figure as an offset in meters from the stem that the root protection area extends to.

6.2 Nominally the RPA is represented by a circle around the tree. The area of the RPA may, however, subject to the consideration of the arboricultural consultant, and be altered to a polygon in order to reflect the site conditions and requirements. For example, existing hard surfaces and foundations are likely to restrict or limit root growth while good quality soil may promote and extend root growth.

6.3 Root Protection Areas primarily relate to below ground constraints (root protection). Other constraints that must be considered include:

- The current as well as ultimate height and spread of a tree
- Large trees close to a building, particularly a dwelling, can cause apprehension to owners/occupiers that result in pressure for tree removal or inappropriate pruning.
- Buildings should be sited allowing for the species height, spread and overall habit
- Species characteristics; i.e. density of foliage, fruit-fall, susceptibility to honeydew drip, or branch drop. Trees are shedding organisms. The leaves of some species may cause problems with blocking of gullies and gutters. Fruit may cause slippery patches and honeydew drop can affect surfaces (particularly cars). If conflicts may arise, detailed design may address such issues, such as non-slip paths, use of car-ports, provision of leaf guards or grilles etc.
- The potential impact on direct and diffuse light of a particular location of land; shading of buildings by trees can be a problem, especially where rooms require natural light, in addition, open spaces such as gardens and sitting areas should be designed to meet requirements for direct sunlight (for at least part of the day)
- Infrastructure requirements in relation to trees e.g. easements for underground or above ground apparatus and visibility splays
- Space for the provision of new planting or landscaping
- The proposed end use of space within Root Protection Areas
- The requirement to protect overhanging canopies of trees that overhang or extend beyond Root Protection Areas

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7. Structures within the RPA of trees - Information

7.1 In the development layout design structures should be positioned outside of RPAs as far as practicable (5.9). In some exceptional instances, there may be an overriding justification for construction within the RPA. In such cases, technical solutions may be available to minimise to an acceptable level of disturbance to the tree or trees. Where such technical solutions may be relied upon full details will need to be included within a method statement. Advice must be sought from a suitably qualified arboriculturalist to develop a solution.

7.2 In some cases it may be unavoidable to place permanent hard surfacing within an RPA (for example the placement of an access driveway or parking area). In such cases, the following should apply:

- No excavation of the soil should take place, other than scraping of the turf/ vegetation layer
- Any design must avoid compaction, allowing an even distribution of weight
- New hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA
  If the proposed surface is likely to require de-icing salt then run-off should be directed away from the RPA
- Permeable hard surfacing can result in soil moisture saturation for long periods (resulting in root death). Where there is a risk of water-logging a design should incorporate land drainage

7.3 Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems (cell-web). Piles, pads or elevated beams can support bridges over RPAs. In all cases, full specifications and methodology must be included within a supporting method statement.

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8. Arboricultural Impact Assessment - Site Specific

8.1 Description of The Proposed Development

8.1.1. It is proposed to redevelop the site with the construction of a new garden room towards the rear of the existing property.

8.1.2. The table below summarises the potential impact on trees due to various activities.

Trees Potentially Affected:

Tree no.	Impacts
Tree T1	The proposed garden room conflicts with RPA of tree T1. Thus, it is recommended to construct with raised foundations. The tree will require a crown raise to clear the roof of the proposed garden room
Tree T2	Unaffected
Tree T3	Trees T3 is within close proximity to the proposed garden room, thus, retention is not considered to be achievable and removal is recommended
Tree T4	The stem of tree T4 leans heavily and runs linear to the proposed steps, thus will likely hinder access and egress. Therefore, it is recommended to consider removal. If retained, the tree will require a crown reduction to ease encroachment upon the steps
Tree T5	Unaffected
Tree T6	Unaffected

8.1.6. Section 9 specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

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8.2 Tree Removal.

8.2.1. All trees to be removed are indicated on the Tree Removal Plan and are listed below:

Tree no.	Cause For Removal
Tree T3	If retained, tree T3 would likely come under increased pressure for unsympathetic pruning, thus removal is recommended. The tree is are in a poor condition, therefore, removal would be considered justifiable

8.2.2. Details specific to each tree can also be found in the Tree Data Schedule.

8.3 Mitigation Planting.

8.3.1. The tree to be removed is of poor quality and situated in the rear garden, thus, impact on local amenity value will be low.

8.3.2. Nonetheless, it is recommended to plant two new garden ornamental trees on-site, in order to mitigate against tree loss and provide a biodiversity net gain to development.

8.3.3. Any such planting should be chosen carefully, with consideration to species, location and future management.

8.4 Impact on Tree Canopies.

8.4.1. Tree T1 will require a crown raise to clear the roof of the proposed garden room. The works required are considered to be minimal, and therefore, unlikely to impact the trees.

8.4.2. If retained, tree T4 will require a crown reduction to ease encroachment upon the proposed steps. Unsympathetic pruning will likely result in decline.

8.5 Impact on Tree Roots.

8.5.1. The proposed built footprint conflicts with the Root Protection Area of trees T1 and T4. Thus, it is recommended to construct with raised foundations, which will minimise impact to the tree roots. For example helical screw piles and beams.

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8.6 New Surfaces.

8.6.1. In order to facilitate the addition of new hard surfaces within the Root Protection Area of trees T1 and T4, it is recommended to construct with raised foundations.

8.7 Underground Services.

8.7.1. No underground services are to be installed through any Root Protection Areas.

8.8 Changes in Ground Levels.

8.8.1. Changes in ground levels are not required within the Root Protection Areas of any trees.

8.9 Soil Compaction.

8.9.1. The majority of tree roots lie within the upper soil horizons. This is because the availability of oxygen decreases with depth and roots need to breathe to stay alive. In addition, nutrients are more readily available in the form of organic matter close to the soil surface.

8.9.2. Healthy soils contain about 25% air space between solid particles. Increased loading of the soils caused by construction activity causes air to be squeezed out as the soil becomes compacted preventing roots from breathing. Even an increase in pedestrian activity may cause some soil compaction.

8.9.3. It is important therefore that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. This may be done by installing protective fencing and ground protection measures as recommended within the tree protection plan.

8.10 Demolition Activities.

8.10.1. The tree protection measures specified within the TPP should be installed prior to the commencement of all demolition activities (including soil stripping) to prevent any detrimental impact on tree health. Where this is not practicable, demolition of structures within Construction Exclusion Zones shall be undertaken very early on in the demolition phase and the protective barriers installed immediately thereafter.

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8.11 Hazardous Materials.

8.11.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement and cement run-off are contained outside of all Root Protection Areas.

8.12 Cabins and Site Facilities.

8.12.1. Consideration should be given to the location of any site welfare facilities in terms of potential impact on trees. Where it is proposed to install cabins or site facilities in Root Protection Areas, the appointed arborist should be consulted and approval obtained from the local authority.

8.13 Boundary Treatments.

8.13.1. No changes are proposed to the existing boundary features that might impact on trees.

8.14 Impact of Retained Trees on the Development.

8.14.1. If retained, tree T4 will likely come under increased pressure for unsympathetic pruning due to proximity to the proposed steps. Therefore, removal should be considered.

8.15 Summary.

8.15.1. Tree T3 is within close proximity to the proposed built footprint, thus, retention is not considered to be achievable and removal is recommended.

8.15.2. The stem of tree T4 is leaning heavily and runs linear to the steps, thus, retention will likely restrict access and egress to the proposed garden room. Therefore, it is advised to consider removal.

8.15.3. As the proposed built footprint conflicts with the Root Protection Area of trees T1 and T4, it is recommended to construct with raised foundations, which will minimise impact to the tree roots. For example helical screw piles and beams.

8.15.4. Tree T1 will require a crown raise to clear the roof of the proposed garden room. If retained, tree T4 will require a crown reduction to ease encroachment upon the proposed steps.

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8.15.5. Tree protection fencing will be required around the retained trees before any works commence on site.

8.15.6. Ground protection boarding will be required within the Restricted Activity Zone, in order to facilitate construction access within the RPA of trees T1, T4 and T5.

8.15.7. It is recommended to plant two new garden ornamental fruit trees within the rear garden to mitigate tree loss and provide a biodiversity net gain to development.

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Appendix: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three stage approach to ensure best practice is followed when developing close to trees:

Stage 1: Survey Details and Notes

A ground level visual survey was undertaken. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm, which lie within the site boundary or relatively close to it, were included.

Where applicable, trees with significant defects have been highlighted and appropriate remedial works have been recommended. However, this report should not be seen as a substitute for a full Safety Survey or Management Plan which are specifically designed to minimise risk and liability associated with responsibility for trees.

Wherever practicable dimensions were obtained using diameter tapes, logger's tapes, distometers and clinometers. Where obstacles prevent accurate measurement, dimensions are estimated. Trees on privately owned third parties are surveyed from the best available vantage point and observations relating to the condition of these trees should be treated accordingly. All height measurements should be regarded as approximate.

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Appendix: Survey Methodology

Ground level visual surveys are carried out using the Visual Tree Assessment technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).

Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem- base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.

The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.

Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.

Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape.

Where this is not practical measurements are estimated.

Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

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9. Method Statement

Section A: Introduction and Overview

9.1 Definition of Terms

9.1.1. Some terms used within the Arboricultural Method Statement have very specific meanings. These are defined below:

9.1.2. Root Protection Area (RPA). This is a theoretical area of ground around a tree where the roots are likely to proliferate. Ground disturbance in this area should be minimised in order to avoid significant impact on tree health. RPAs are indicated on all plans accompanying this report as a pink line.

9.1.3. Construction Exclusion Zone (CEZ). These zones are created to protect roots and canopies form inadvertent damage by construction activity – see Section 9.6. -Construction Exclusion Zones. They are usually fenced off by protective barriers throughout the entire construction phase. No works are permitted in these zones other than minor landscaping works which do not require a change in ground level. Where practicable the entire Root Protection Area and the area beneath the tree canopy shall be treated as a Construction Exclusion Zone. These zones are shaded purple on the Tree Protection Plan.

9.1.4. Restricted Activity Zone (RAZ). It is not always possible to create a Construction Exclusion Zone over the entire RPA. This is because access may be required or some works may be proposed within the RPA. In such circumstances a Restricted Activity Zone is created where limitations are placed on construction activity. Ground protection measures may be specified or the Restricted Activity Zone may be fenced off throughout part of the construction phase. See the legend on the Tree Protection Plan to identify these zones.

9.2 Tree Protection Barriers - Overview

9.2.1. The Tree Protection Plan indicates the location of all proposed tree protection barriers.

9.2.2. The barriers shall be installed prior to the commencement of any localised construction activity including soil stripping and delivery of materials. A detailed specification of the barriers can be found in sections below.

9.2.3. The tree protection plan also indicates where ground protection measures shall be installed / maintained as specified in sections 9.7 onwards (Restricted Activity Zones).

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9.3 Planning Status

9.3.1. Tree protection measures specified within this report should be agreed with the local authority so that they may be conditioned upon planning consent.

9.3.2. The site manager must be familiar with all aspects of this Method Statement and should liaise with the author of this report for clarification, or regarding any unforeseen issues where trees may be impacted upon.

9.3.3. A copy of this Method Statement shall be available on-site at all times. All personnel working on the site shall be made aware of any sections appertaining to their work. This includes short term contractors and persons responsible for deliveries and installation of services.

9.4 Overview of Protection Measures

9.4.1. Below is a list of potential arboricultural impacts and a summary of the proposed protection measures:

Tree no.	Protection Measures	Timeline.
T1	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T2	Protected from the site by braced HERAS protection fencing as per the appended plan	Pre-start
T3	Tree T3 is to be removed prior to the installation of tree protection measures	Pre-start
T4	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T5	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T6	Protected from the site by braced HERAS protection fencing as per the appended plan	Pre-start

9.4.2. The above measures are described in more detail throughout the remainder of this section.

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9.5 Timing of Operations

9.5.1. Activity within the site shall be phased according to the following chronology:

Order Phase Activity	Phase Name	Works required
1st Phase	Pre-construction phase	Undertake any specified tree removals and pruning work
2nd Phase	Protection phase	Install HERAS tree protection fencing and signage as highlighted on the TPP
3rd Phase	Ground Protection	Install any specified ground protection boarding as highlighted on the TPP
4th Phase	Construction phase	Construction works commence with regular ACoW visits and updates
5th Phase	Post Construction Phase	Remove tree protection measures and carryout any remedial works such as alleviation and radial mulching

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Section B: Restrictions on Activities – Specific Zones

9.6 Construction Exclusion Zones

9.6.1. Within Construction Exclusion Zones (shaded purple on the Tree Protection Plan) the following restrictions shall apply:

Tree Protection Barriers shall be erected and maintained throughout the entire project as indicated on the Tree Protection Plan and specified in Section 12 (Tree Protection Barriers).

No construction activity whatsoever shall occur.

No vehicles or plant machinery shall be driven or parked.

No tree works, other than those specified in this report shall be undertaken.

No alterations of ground levels or conditions.

No chemicals or cement washings permitted.

No excavation whatsoever shall occur.

No temporary structures.

No spoil shall be stored.

No fires shall be permitted.

All hazardous materials (including non-essential cement products) shall be forbidden.

9.6.2. Where hard surfaces are to be removed, this shall be done using hand tools or mechanical excavators operating from outside the Construction Exclusion Zone and marshalled by the appointed arborist.

9.6.3. Any structures shall be removed manually and without mechanical excavation.

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9.7 Restricted Activity Zones

9.7.1. Within these zones (shaded in yellow on the Tree Protection Plan) trees roots are likely to be present. Access will be required to facilitate construction and some resurfacing works may be required. The following restrictions shall apply:

Any resurfacing shall be done strictly in accordance with the Guidelines in APN12 New Surfaces.

Removal of existing structures such as walls, steps and hard surfaces shall be undertaken using hand tools or a mechanical excavator operating from outside the Restricted Activity Zone and carefully marshalled by an appointed arborist.

A suitable load spreading surface shall be installed and/or maintained as specified in Section 13 (Ground Protection Measures). This shall remain in place throughout the entire construction phase.

No excavation shall occur in this zone without consulting the appointed arborist and obtaining approval from the local authority.

Storage of materials shall be limited to that which is required for the task in hand. Heavy materials that require storage for more than two days shall be stored outside the Restricted Zone.

No spoil shall be stored.

No fires shall be permitted.

All hazardous materials (including non-essential cement products) shall be forbidden.

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Section C: Restrictions on Activities – Throughout the Site

9.8 Canopy Protection

9.8.1. In order to protect tree canopies the following restrictions shall apply throughout the site:

No machinery shall pass beneath the crowns of trees without being carefully marshalled in order to ensure that no branches are damaged.

If materials require installation or delivery beneath tree canopies, this shall be done without the use of overhead cranes.

If materials are to be installed or delivered close to tree canopies (but not beneath them) and a crane is required, they shall be carefully marshalled in order to ensure that branches are not accidentally damaged.

9.9 Initial Ground Works

9.9.1. No removal of surfaces, or soil stripping shall commence until the protective fencing and ground protection measures are installed to the satisfaction of the local authority.

9.10 Underground Services

9.10.1. No underground services (including soak-aways) shall be located in any part of the Construction Exclusion Zones or Restricted Activity Zones unless done so in a manner detailed in a specific Method Statement and approved by the local authority.

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9.11 Lighting, CCTV and associated Cables

9.11.1. If any of the above are to be installed close to tree canopies or within Root Protection Areas of retained trees, installation methods shall be detailed in a specific Method Statement and approved by the local authority. Consideration should be given to the following:

Pruning of branches to enable sufficient clearance for light and views. Branches should be removed to the branch collar as per British Standard 3998 (2010).

Post holes must be excavated by hand or using an appropriate sized auger. No other form of mechanical excavation may be used.

Wherever possible, cables should be routed in a direction directly away from the tree stem rather than tangentially across the rooting zone. The location of all such cables shall be determined after consultation with the appointed arborist and approval by the local authority.

9.12 Use of Heavy Plant

9.12.1. All machinery operatives are to be made aware of any Construction Exclusion Zones and Restricted Activity Zones that apply to this site (see the Tree Protection Pla).

9.12.2. All machinery operatives are to respect these zones and ensure that no damage occurs to trees due to the careless use of machinery.

9.12.3. Mechanical excavators should have tracks rather than wheels to help spread their load. They should be carefully marshalled when working close to tree canopies.

9.13 Scaffolding

9.13.1. If scaffolding is required in areas containing ground protection measures, the protective boards shall need to remain in-situ and be strengthened and stabilised to bear the weight of scaffold poles.

9.13.2. Prior to the installation of any scaffolding within 0.5m of any tree branches, the appointed arborist shall be consulted to specify any pruning works that may be required.

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9.14 Siting of Cabins and Storage of Materials

9.14.1. Cabins and heavy building materials may be located or stored anywhere outside of Construction Exclusion Zones and Restricted Activity Zones.

9.14.2. Any proposal to install cabins or materials within these zones shall be agreed in writing with the local authority prior to installation.

9.14.3. It may be acceptable to locate site cabins such that they act as a tree protection barrier and replace the specified protective fencing. Where this is being considered, written approval must be sought from the local authority.

9.15 Hazardous Materials

9.15.1. Any mixing of cement based materials shall take place outside the Construction Exclusion Zones and Restricted Activity Zones. Where cement is to be mixed on sturdy plastic sheeting e.g 1200 gauge DPM considerable distances from trees and water run-off cannot enter Root Protection Areas.

9.15.2. All other chemicals hazardous to tree health, including petrol and diesel, shall be stored in suitable containers as specified by current COSHH Regulations, and kept away from Root Protection Areas.

9.16 Removal of Tree Protection Barriers

9.16.1. This will be done after all major construction work is complete. Vehicular access will not be permitted within the Construction Exclusion Zones.

9.16.2. The local authority tree officer shall be made aware that the fencing is to be removed.

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10. Site Inspection

10.1 Inspection Schedule

10.1.1. In order to ensure that the trees are adequately protected it shall be necessary to periodically monitor the works. This will be done by the local authority tree officer or an appointed arborist who will provide the tree officer with a copy of inspection details.

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SITE SUPERVISION FORM - ARBORICULTURAL CLERK OF WORKS

DATE	
CLIENT	
TELEPHONE NUMBER	
E-MAIL	

TERMS AND CONDITIONS FOR THE PROVISION OF ARBORICULTURAL CONSULTANCY

Site:	
Inspected by:	
Site Manager:	
Date of Inspection:	
Tree Protection Fencing.	
Comments/Actions:	
Ground Protection.	
Comments/Actions:	
Additional Comments.	
Remarks:	
I am aware of the tree protection requirements for this site and understand no retained trees must be damaged.	
Signed:	Dated:
Name:	Company: T

Example inspection sheet.

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11. Tree Works Schedule

11.1 Tree Works Specification

11.1.1. The following table specifies the tree works which will be required prior to the commencement of construction activity:

Tree no.	Works Required
T1	Crown raise to clear the roof of the proposed garden room
T3	Fell
T4	Crown reduction to clear the proposed steps

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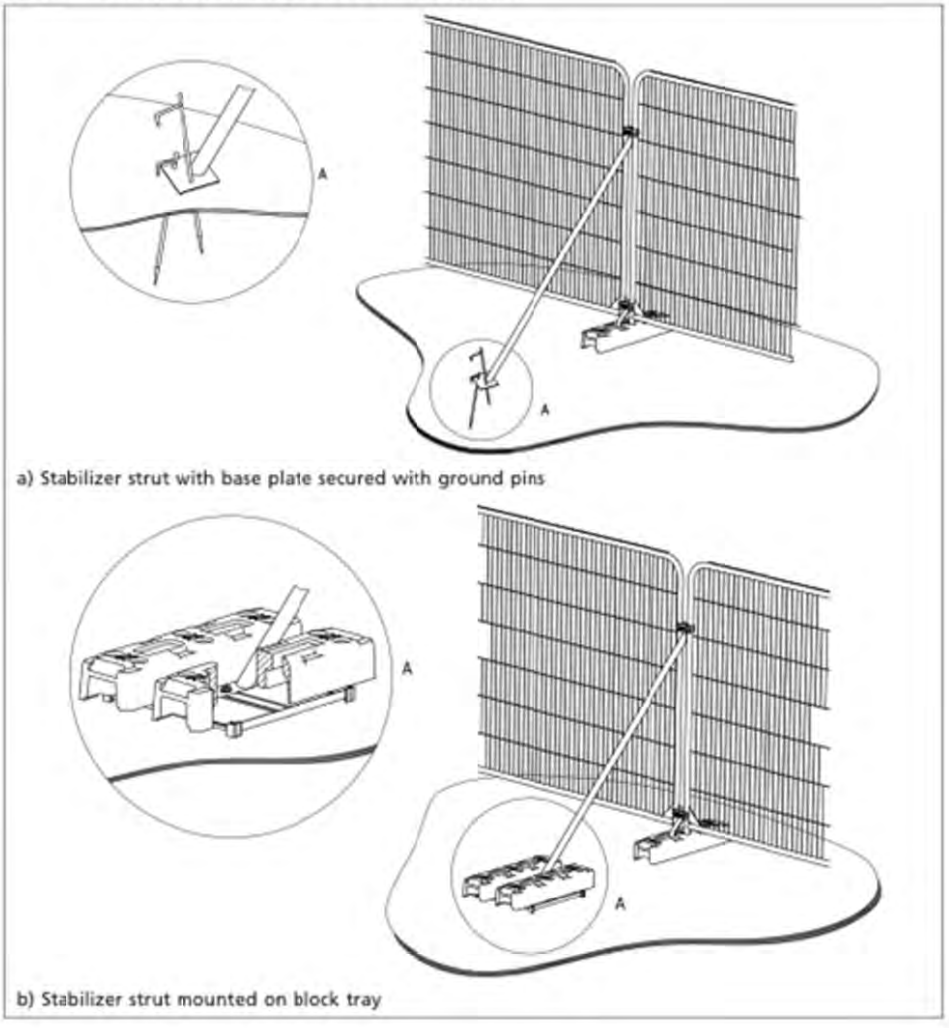
12. Tree Protection Barriers Detailed Specification

12.1.1. The purpose of tree protection barriers is to keep construction activity away from Construction Exclusion Zones or Restricted Activity Zones. They should be appropriate to the nature and proximity of activity within the site. The barriers should be erected prior to the commencement of all activity including demolition, soil stripping and delivery of materials and demolition (except where existing structures require demolition to enable the barriers to be installed). Barrier systems are specified below and should be installed according to the legend on the Tree Protection Plan.

12.1.2. Suitable weather-proof notices should be displayed to identify tree protection zones. They should state the purpose of the fencing and that it should not be moved, or traversed, other than by authorised personnel.



Examples of above-ground stabilizing systems.

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Example signage.

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13. Ground Protection Measures Detailed Specification

13.1.1. Where indicated on the Tree Protection Plan (Restricted Activity Zone), soils containing roots may require ground protection where Root Protection Areas are outside the Construction Exclusion Zone be subject to compaction due to general construction activity (including pedestrian activity and use of plant machinery). In order to minimise compaction, it is proposed to ensure that a suitable load-spreading surface is in place at all times.

13.1.2. Any existing hard surfacing may be retained and reinforced (where Construction activity is applicable and adequate), otherwise suitable new ground protection fencing measures shall be installed. The ground protection shall need to be able to adequately spread the load of construction traffic. Where existing hard surfacing is to be retained, it shall not be necessary to install additional ground protection measures. However, the hard surfacing must be firm enough to spread the load of any traffic passing overhead.

13.1.3. Where only pedestrian traffic will occur, the ground protection measures may be as simple as timber boards, or scaffold planks installed directly onto a geotextile fabric on the ground. The ground should first be made even by raking, or by adding a few centimetres of sand or woodchip. Alternatively, the boards may be supported by a scaffold framework. The scaffold may be founded on poles driven into the ground and/or onto blocks (to raise the scaffold) with additional couplings to make the framework secure.

13.1.4. Where only light vehicles are to operate (e.g. barrows, trolleys or occasional cars), thick wooden boards or scaffold planks should also suffice, though at least 150m of compressible woodchip will need to be installed first to help spread the load. Sturdier systems are specified below:

13.1.5. Where cars will regularly park or heavier vehicles/plant machinery will occasionally operate, sturdier ground protection measures will be required such as metal road plates, or purpose built synthetic road mats over a compression resistant layer such as 150mm of woodchip or 100mm of a 3D cellular confinement system in-filled with 7–40mm angular gravel (e.g. Cellweb™).

13.1.6. A temporary concrete slab may also be considered as a suitable load spreading platform. Where a pile driver needs to operate, a concrete slab may be the preferred option.

13.1.7. Where existing structures need to be removed, this shall be done with temporary ground protection measures in place to enable this to be achieved without compacting soils.

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13.1.8. The ground protection measures shall be installed and approved before commencement of demolition and construction activity and before the arrival of plant machinery or materials. They shall remain in place until all heavy construction activity is complete or until they are due to be replaced with a new hard surface.

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Appendix: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf

NHBC Standards Chapter 4.2., Trees and Buildings.

Horticulture LINK project 212. (University of Cambridge, 2004), Controlling Water Use of Trees to Alleviate Subsidence Risk. Tree Planting and aftercare see www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards BS 5837: 2012. Trees in Relation to Design, Demolition and Construction – Recommendations. Bs 3998: 2010.

Recommendations for Tree Work. BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs. BS 3936: 1992. Nursery Stock. Part 10:

Specification for Ground Cover Plants. BS 4043: 1989. Transplanting Root-balled Trees. BS 8004: 1986. Foundations. BS 8103: 1995.

Structural design of Low-Rise Buildings. BS 8206: 1992. Lighting for Buildings.

BS 8545:2014. Trees: From nursery to independence in the landscape – Recommendations

BS 3882: 2007. Topsoil. BS 4428: 1989. General Landscaping Operations (excluding hard surfaces). Permission to do Works to Protected Trees / Tree Law Forestry Commission (Edinburgh, 2003), Tree Felling – Getting Permission. Country Services Division - Forestry Commission. Downloadable at www.forestry.gov.uk/website/pdf.nsf/pdf/wgsfell.pdf/$FILE/wgsfell.pdf

Transport and the Regions (Department of the Environment, 2000), Tree Preservation Orders, A Guide to the Law and Good Practice. Downloadable at www.communities.gov.uk/publications/planningandbuilding/tposguide

C. Mynors, The Law of Trees, Forests and Hedgerows (Sweet and Maxwell, London, 2002)

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Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/
Lighting Levels

P.J. Littlefair, B.R.E. 209: Site layout planning for daylight and sunlight A guide to good practice. B.R.E. Bookshop, London.

British Standards Institution. Code of practice for daylighting. British Standard BS 8206: Part 2 (1992).

Chartered Institution of Building Services Engineers. Applications manual: Window Design (London, 1987).

NBA Tectonics. A study of passive solar housing estate layout. ETSU Report S-1126. Harwell, Energy Technology Support Unit (1988).

I.P. Duncan; D. Hawkes, Passive solar design in non-domestic buildings. ETSU Report S-1110. Harwell, Energy Technology. P. J. Littlefair, Measuring Daylight, BRE Information Paper 23/93 f3.50. (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/
Tree Specific

Websites

www.trees.org.uk Arboricultural Association www.rfs.co.uk Royal Forestry Society of England, Wales and N. Ireland

www.treehelp.Info The Tree Advice Trust

www.woodland-trust.org.uk The Woodland Trust www.treecouncil.org.uk The Tree Council

www.roavr-environemntal.co.uk - UK wide consultancy

www.go-roavr.co.uk - portal for booking tree surveys UK wide.

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Should you require any further information, please do not hesitate to contact us at any time.

Mr. M Harmsworth tech.arbor.a, DipRS
Consultant Arborist

Matt Harmsworth

Prepared by: Ffion Maguire.
Checked by: Matthew Harmsworth.

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Appendix 1 - Site Location

Image plate showing satellite mapping of the surveyed plot and surrounding area.

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Appendix 2 - Arboricultural Data Tables

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Tree Number	Species	Age Class	DBH	Height (crown height)	N	E	S	W	Condition	Life Expectancy	Physical Description	Comments	Managment Recommendations	RPA offset from stem.	Category Rating
T1	Robinia pseudoacacia (Black Locust)	M	600	13(4)	5	5	4	4	Poor	<10	Low vitality. Declining. Tree located within hard surface area. Decay present on stem. Fungal brackets visible on stem. Major bark wounding on stem. Stem divides above 1.5m. Mechanical Damage. Broken branches in crown. Major deadwood in crown. Branches encroaching upon building.	Fungal brackets on stem. The stem is rotting. Exposed roots.	Consider removing.	7.2	C1
T2	Ilex aquifolium (Holly)	SM	180	6(1)	2.5	1	2.5	2.5	Fair	20+	Tree located within hard surface area. Multiple stems at ground level. Mechanical Damage.	Situated offsite.	Some formative pruning.	2.16	C1
T3	Corylus avellana (Hazel)	SM	88	5(1)	3	4	3	3	Poor	10+	Poor shape & form. Tree located within hard surface area. Multiple stems at ground level. Mechanical Damage.	Substrate piled within RPA.	Monitor for further decline.	1.06	C1
T4	Malus (Apple)	M	215	4(1)	3	3	3	3	Poor	<10	Poor shape & form. Low vitality. Declining. Leaning West. Stem divides below 1.5m. Mechanical Damage. Broken branches in crown. Major deadwood in crown.	Growing within a grass matrix.	Consider removing and replacing with some new high-quality planting.	2.58	C1
T5	Malus (Apple)	M	500	5(1.5)	4	4	4	4	Poor	10+	Poor shape & form. Leaning North-West. Major bark wounding on stem. Stem divides above 1.5m. Mechanical Damage.	Growing within a grass matrix.	Monitor for further decline.	6	C1
T6	Pyrus communis (Common Pear)	M	375	5(2)	3	3	3	3	Poor	10+	Poor shape & form. Declining. Major bark wounding on stem. Stem divides above 1.5m. Mechanical Damage. Dieback in crown. Broken branches in crown.	Growing within a grass matrix.	Monitor for further decline.	4.5	C1

Arboricultural Data Tables Terms

Tree Number	Reference number (T1, T2 etc for trees / G1, G2 etc for tree groups / H1, H2 etc for hedgerows)
Species	Common name
Height	Height of tree to the nearest metre
DBH	Diameter of stem (mm) at breast height (1.5 metres above ground)
RPA radius (m)	The radial measurement of the Root Protection Area in metres indicating the minimum distance from the centre of the trees stem to the recommended position of the protective (Heras) fencing.
RPA (m2)	The Root Protection Area, measured in square metres. This measurement is directly proportional to and calculated from the trees DBH measurement as specified in section 4.6 of BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations.
Crown Spread	The maximum spread of the trees canopy measured from the stem in four directions (North, East, South, West)
Age class	The estimated age class of the tree (relative to species) o Y - Young o SM - Semi-mature o EM - Early-mature o M - Mature o LM - Late-mature
Comments	A brief description of the tree which refers to tree form, condition, health and significant defects. Comments regarding environmental conditions affecting the tree (e.g. ground conditions) will also be included where relevant.
Preliminary management recommendations	Recommendations (made with respect to the development proposals if available) for removal, retention and/or remedial arboricultural works.
Estimated remaining years	Estimated safe, usable life expectancy
Category grade	Tree categorisation based on section 4.5 of BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations. Four categories are used (A, B, C, U) with categories A, B & C being assigned one of three separate sub categories (1, 2 or 3): **A** – Trees of high quality with an estimated remaining life expectancy of at least 40 years. **B** – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. **C** – Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm **Subcategories: 1:** Mainly arboricultural & aesthetic qualities **2:** Mainly landscape qualities **3:** Mainly cultural values, including conservation **U** – Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

General Notes
Do Not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
Depictions of tree canopies are based on measurements taken to four cardinal compass points.
No liability of any kind Is accepted for any omissions Or inaccuracies in respect of this plan.
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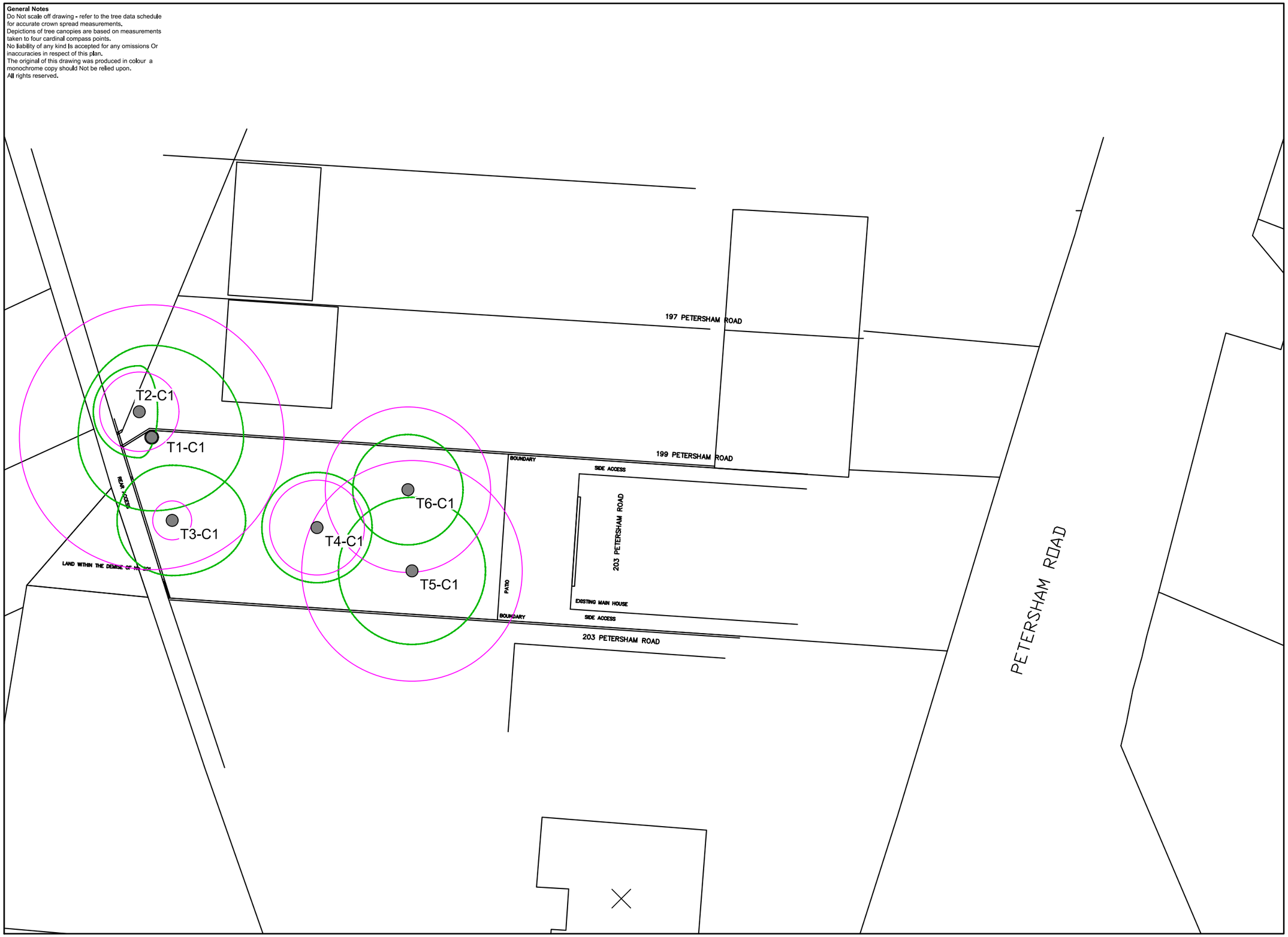

Key

Trees
Showing Canopy extents, category colour and tag number (with category).
T1-B

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

N

1:200
0 8m

Drawing Title: **Tree Constraints Plan**			
Client: Natalie Locherer			
Site/Project: 201 Petersham Road, Richmond, TW10 7AW			
Scale/Sheet: 1:200 - A3	Date: 11/05/2021		
Drawing No: 21_5837_04_26	Rev: 1	Drawn By: CS	Chked By: MH

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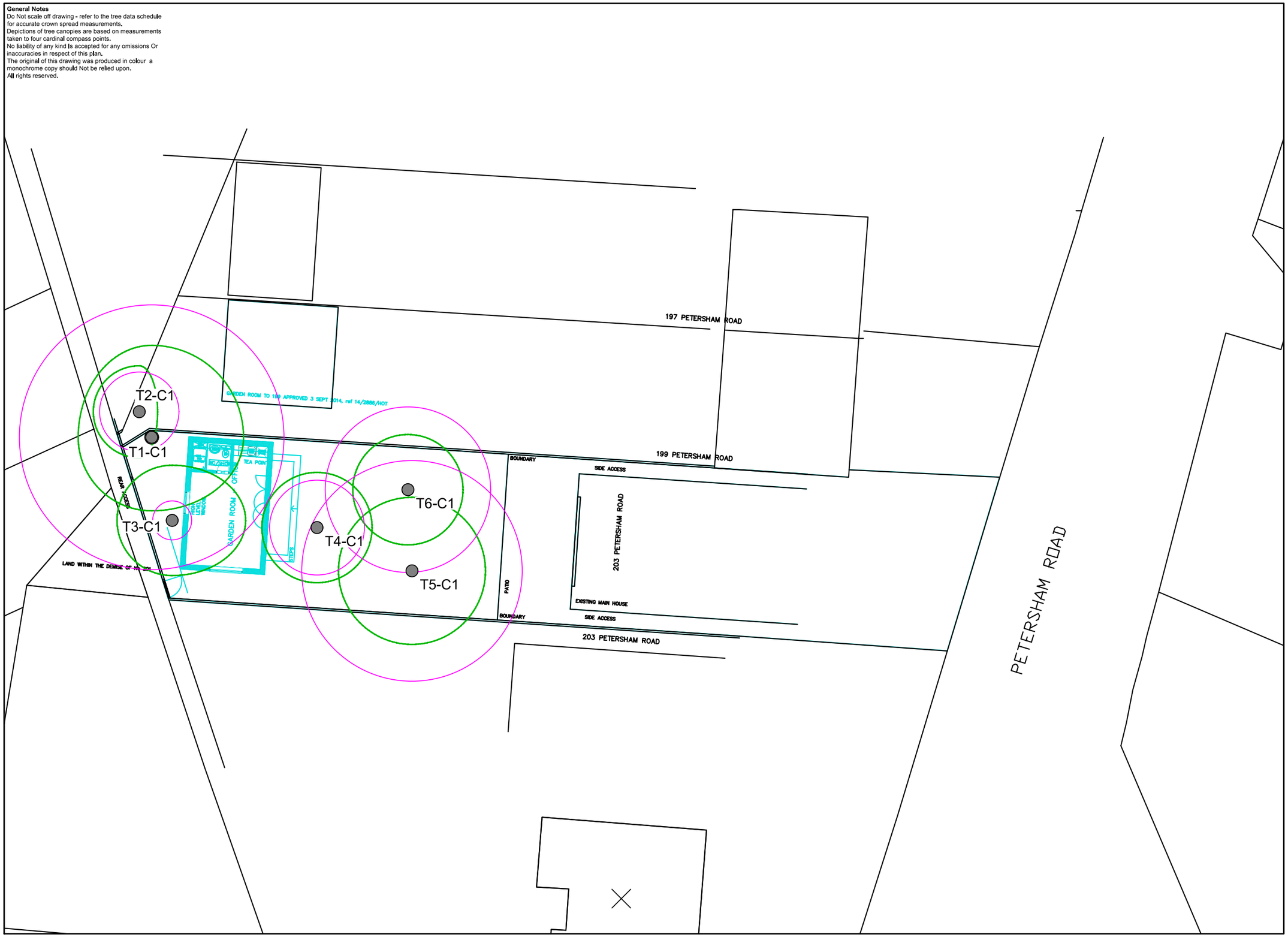

Key

Trees
Showing Canopy extents, category colour and tag number (with category).
T1-B

Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

Category U
Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837:2012 Root Protection Area

N

1:200
0 8m

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Client: Natalie Locherer			
Site/Project: 201 Petersham Road, Richmond, TW10 7AW			
Scale/Sheet: 1:200 - A3	Date: 11/05/2021		
Drawing No: 21_5837_04_26	Rev: 1	Drawn By: CS	Chked By: MH

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General Notes
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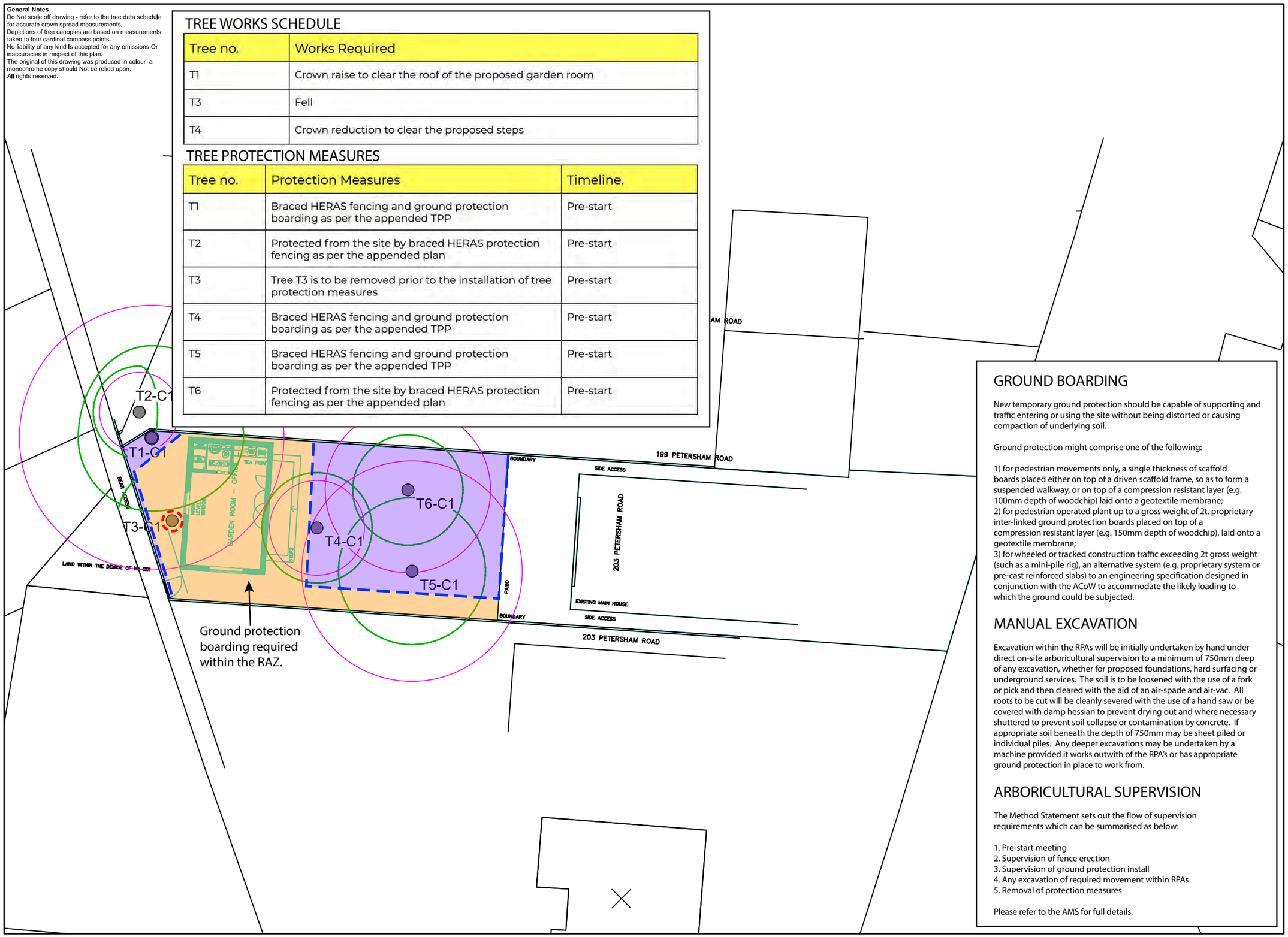
TREE WORKS SCHEDULE

Tree no.	Works Required
T1	Crown raise to clear the roof of the proposed garden room
T3	Fell
T4	Crown reduction to clear the proposed steps

TREE PROTECTION MEASURES

Tree no.	Protection Measures	Timeline.
T1	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T2	Protected from the site by braced HERAS protection fencing as per the appended plan	Pre-start
T3	Tree T3 is to be removed prior to the installation of tree protection measures	Pre-start
T4	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T5	Braced HERAS fencing and ground protection boarding as per the appended TPP	Pre-start
T6	Protected from the site by braced HERAS protection fencing as per the appended plan	Pre-start



GROUND BOARDING

New temporary ground protection should be capable of supporting and traffic entering or using the site without being distorted or causing compaction of underlying soil.

Ground protection might comprise one of the following:

1) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression resistant layer (e.g. 100mm depth of woodchip) laid onto a geotextile membrane;
2) for pedestrian operated plant up to a gross weight of 2t, proprietary inter-linked ground protection boards placed on top of a compression resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane;
3) for wheeled or tracked construction traffic exceeding 2t gross weight (such as a mini-pile rig), an alternative system (e.g. proprietary system or pre-cast reinforced slabs) to an engineering specification designed in conjunction with the ACoW to accommodate the likely loading to which the ground could be subjected.

MANUAL EXCAVATION

Excavation within the RPAs will be initially undertaken by hand under direct on-site arboricultural supervision to a minimum of 750mm deep of any excavation, whether for proposed foundations, hard surfacing or underground services. The soil is to be loosened with the use of a fork or pick and then cleared with the aid of an air-spade and air-vac. All roots to be cut will be cleanly severed with the use of a hand saw or be covered with damp hessian to prevent drying out and where necessary shuttered to prevent soil collapse or contamination by concrete. If appropriate soil beneath the depth of 750mm may be sheet piled or individual piles. Any deeper excavations may be undertaken by a machine provided it works outwith of the RPA's or has appropriate ground protection in place to work from.

ARBORICULTURAL SUPERVISION

The Method Statement sets out the flow of supervision requirements which can be summarised as below:

1. Pre-start meeting
2. Supervision of fence erection
3. Supervision of ground protection install
4. Any excavation of required movement within RPAs
5. Removal of protection measures

Please refer to the AMS for full details.

Key

- Trees (T1-B) — Showing Canopy extents, category colour and tag number (with category).
- Category A — Trees of high quality with an estimated remaining life expectancy of at least 40 years.
- Category B — Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
- Category C — Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.
- Category U — Trees in such a condition that they can not realistically be retained as living trees in the context of the current land use for longer than 10 years.
- BS 5837:2012 Root Protection Area
- Construction Exclusion Zone (CEZ)
- Restricted Activity Zone (RAZ)
- Tree Protection Fencing

N

1:200
0 8m

Drawing Title: **Tree Protection Plan**
Client: Natalie Locherer
Site/Project: 201 Petersham Road, Richmond, TW10 7AW
Scale/Sheet: 1:200 - A3
Date: 11/05/2021
Drawing No: 21_5837_04_26
Rev: 1
Drawn By: CS
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