

BS 5837:2012 Tree Survey, Arboricultural Impact Assessment, Method Statement & Tree Protection Plan



19 Church Road
Barnes
SW13 9RE

14th February 2024

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1. Instruction

Usherwood Arboriculture have been instructed to provide a tree survey, arboricultural impact assessment, draft arboricultural method statement and draft tree protection plan in support of an application to carry out the following construction works at 19 Church Road, Barnes, SW13 9HE. Replacement of existing ground floor rear and side extension to rear of property. Widening of existing front boundary wall, similar to adjacent properties, with introduction of automated car gate; Replacement of existing cherry tree to front garden. The survey has been carried out in accordance with BS5837:2012, Trees in relation to design, demolition and construction-Recommendations.

Drawing No.	Title	Drawn/Written by
HA-1016-002-PP-GF-2	Existing Ground Floor Plan	HOEG Architects
HA-1016-002-PP-GF-G	Existing and Proposed Garden Plan	HOEG Architects
HA-1016-002-PP-GF	Proposed Ground Floor Plan	HOEG Architects

Table 1. Key drawings and documents supplied for consideration within this report

2.Executive Summary

This document considers the impact of proposed development upon 9 individual trees located within the application site. 3 category C trees are proposed for removal including a protected ornamental Cherry located within the front garden. Remaining trees will be adequately protected throughout development, whilst the front garden Cherry will be subject to suitable replacement.

3.The Site

The application site comprises a 5 storey house located on on the north side of Church Road within the Barnes Green Conservation Area. Two trees located within brick planters bound the existing vehicular access with the remainder of the frontage consisting of gravel driveway. A Griselinia hedge divides the application site with the neighbouring property. The rear garden comprises a paved patio leading to level lawn bounded by a mixture of trees and shrubs.

Soil conditions.

The British Geological Survey, Geology of Britain viewer describes the local bedrock geology as London Clay Formation-Clay, silt and silt and local superficial deposits as Kempton Park Gravel Member- Sand and gravel.

Legal Constraints

Trees can sometimes be the subject of a Tree Preservation Order (TPO) or a property may be situated within a designated conservation area. Both a TPO and conservation area designation require the owner/occupier or those wishing to work on trees to seek the Council's consent or provide written notice prior to carrying out any works. It is a criminal offence to carry out any works to protected trees without the Council's consent. The site is

situated within the Barnes Green Conservation Area and a single Cherry located within the front garden is subject to a TPO.



Image above, courtesy of Google Maps with the application site outlined in red.

4. Tree Survey

Trees were assessed in accordance with recommendations and guidelines contained within British Standard 5837:2012 - 'Trees in relation to design, demolition and construction- Recommendations' henceforth referred to as BS5837. The survey was carried out in relation to the condition and quality of trees growing either within or near the boundary of the site. Where details have been omitted including the heights of crown break and the direction of the first major lateral branch, these details were not seen as being relevant to this application. Where access allowed, tree heights were measured with a Haglof electronic clinometer and trunk diameters with a diameter tape measure. Crown spreads were measured with a tape measure or paced out at the four cardinal points.

All trees were assessed from the ground utilizing the Visual Tree Assessment method as developed by Mattheck and Breloer (The Body Language of Trees, Research for Amenity Trees No 4 Department of the Environment).

This tree survey should not be treated as a hazard assessment, it has been carried out to inform the planning process with regards to the appropriate retention and protection of trees as visual and ecological assets within the landscape. However, where clear and obvious defects are observed, the relevant parties will be informed.

Tree Assessment and Categorization

Tree quality ratings have been assessed in accordance with BS5837's Table 1, Cascade chart for tree quality assessment.

U = 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 management. (Trees that have serious, irreparable structural defects, such that their early loss is expected due to collapse or ill health including trees that will become at risk due to the loss of other U category trees).

A = Trees of high amenity quality and value in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

- 1) Trees that are particularly good examples of their species if rare, unusual or essential components of groups or formal or semi-formal arboricultural features.
- 2) Trees, groups of trees or woodland which provide a definite screening or softening effect to the locality in relation to views in or out of the site, or those of particular visual importance.
- 3) Trees groups or woodlands of significant conservation, historical, Commemorative or other value (e.g. veteran tree or wood pasture).

B = Trees of moderate quality and amenity value: those in such a condition as to be able to make a significant contribution (a minimum of 20 years is suggested).

- 1) Trees that might be included in the high category but are down-graded because of impaired condition (e.g. remediable defects).
- 2) Trees, groups of trees or woodland that form distinct landscape features but do not form essential components of the landscape.
- 3) Trees with clearly identifiable conservation or other cultural benefits.

C = Trees of low quality and amenity value currently in adequate condition to remain until new planting is established (a minimum of 10 years is suggested) or trees under 150 mm stem diameter.

- 1) Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
- 2) Trees presenting groups or woodlands but not with a significantly higher landscape value and or offering low or temporary/transient screening benefit.
- 3) Trees with no conservation or other cultural benefits.

Note: Category C trees are the least suitable for retention, where they would impose a significant constraint on the development their removal for development purposes may be considered acceptable by the LPA.

5. Tree Survey Data & Appraisal

This survey concerns 9 individual trees, full details of the survey data can be found in the Tree Survey Schedule at **Appendix 1**. An explanation of Tree Quality category ratings is set out on the previous page.

Category A individual trees and groups of trees.

No trees have been graded as category A (trees of high quality) as part of this survey.

Category B individual trees and groups of trees.

1 tree has been graded as category B (trees of moderate quality) as part of this survey.

Category C individual trees and groups of trees.

8 trees have been graded as category C (trees of low quality) as part of this survey.

Category U individual trees and groups of trees.

No trees have been graded as category U (trees unsuitable for retention) as part of this survey.

6 tree species have been recorded as part of this survey, their common and botanical names are set out within the table below.

Common Name	Botanical Name
Bay Tree	Laurus nobilis
Cherry	Prunus sp.
Evergreen magnolia	Magnolia grandiflora
Fig	Ficus carica
Japanese maple	Acer palmatum
Olive	Olea europaea

Table 2. Tree species recorded on site and their botanical names.

The subject trees include a category C Cherry tree (**T9**) located within the property frontage. We understand that **T9** is subject to protection from a tree preservation order, however, the tree has been assessed on its own merits, based on its current condition, quality and potential life expectancy.

T1 Evergreen Magnolia & T7 Bay.



Photos above showing T1 category C Magnolia and T7 category C Bay tree, both growing directly next to the existing conservatory. The trees will need to be removed in order to facilitate the erection of the rear extension.

T6 Cherry



Photos above of T6, category B Cherry, subject to recent crown reduction. A small portion of the root protection area of T6 may be exposed during the removal of existing paving and installation of decking.

T8 Olive



Photos above of T8, category C Olive growing within the confines of a raised planter. The tree makes an attractive contribution to the site's frontage and will be retained within the proposed development.

T9 Cherry



Photos above of T9, a category C top and bottom grafted Cherry, the remaining tree from a previously protected group of 3 Cherry trees. The proposal requires the removal and replacement of T9 in order to widen the driveway entrance.

6. Arboricultural Impact Assessment

The Arboricultural Impact Assessment (AIA) sets out the potential risks and threats associated with proposed construction to trees both within and near to an application site and seeks to minimise those risks through the implementation of a sound and recognised methodology set out within an arboricultural method statement.

Construction and development in general can impact trees in a number of ways, the most notable being damage to the tree's root system leading to decline and potential structural instability. BS5837 recognises this and accordingly sets out recommendations to minimise damage associated with the effects of soil compaction and root severance.

The AIA also considers the effects of tree removal on the immediate and wider environment and seeks to mitigate removal with suitable replacement planting.

The proposal requires the removal of 3 category C trees.

T1 Magnolia- Requires removal in order to demolish the existing and erect a new extension.

T7 Bay tree- Requires removal in order to demolish the existing and erect a new extension.

T9 Cherry- Requires removal in order to remove the existing planter and widen driveway entrance. The planter will be reconstructed as part of the proposed works and a replacement tree planted with a minimum stem girth of 10-12cm, Select-standard size.

A further 2 small trees may be planted in the rear garden in order to mitigate the loss of **T1** and **T7**.

Existing retained trees

The majority of the subject trees will be sufficiently protected throughout all stages of construction, however, the root protection area (RPA) of **T3** Cherry may suffer minor encroachment from construction activities at the rear of the building. A detailed method statement will be provided to ensure minimal disturbance within no more than approximately 7% of the total RPA.

A combination of tree protective fencing and ground protection will ensure that the majority of the RPAs of **T3** and **T6** are adequately protected throughout all stages of demolition and construction.

Above ground impacts

T8 Olive grows within a raised planter in the front garden. Below ground, the RPA of **T8** will be safely protected due to its containment within the existing and retained planter, however, the stem, branches and immediate soil area within the planter will be protected with carefully erected plywood hoarding to avoid inadvertent construction damage.

Root Protection Areas- General information

BS 5837 describes the root protection area (RPA) as a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

The **Root Protection Areas (RPA)** have been calculated in accordance with Table D1 of BS5837:2012. Notional RPA's are plotted on the arboricultural impact assessment plan at **appendix 3**. The RPA is defined by the formula in paragraph 4.6 from the British standard and may be refined by considering current on-site constraints to root activity such as buildings, walls, earthworks, hard paving and services.

Root Systems and compaction

Root systems can easily be damaged during construction works, leading to the sometimes-rapid decline of valuable trees. The biggest problem for trees on or close to construction sites is the compaction of soil caused by inappropriate vehicular movement and storage of materials especially where the site is founded on a compressible clay.

Numerous surveys have shown that a significant proportion of a tree's roots proliferate in the top 600-1000mm of soil. There will of course be roots that may go down to depths of 3 metres or more although these will be in the minority. Roots in the upper soil surface find it far easier to intercept moisture, acquire oxygen and perform gaseous exchange. You also find that as soil depth increases so does its strength or compaction, making it harder for roots to exploit.

Root morphology differs from species to species and is largely dependent on the soil type and ground conditions, however the fine roots responsible for moisture and nutrient uptake can last anything from 10 days to over a year (Eissenstat and Yanai, 1997), with the tree producing new fine roots on a regular basis. The larger and more structural roots are a permanent feature of the tree and convey moisture and nutrients from the soil via the fine roots, into the trunk and canopy. The larger roots are of course responsible for the tree's stability as well as being areas of carbohydrate storage. Younger trees are more able to adapt to change and have more potential energy to explore alternative rooting environments whereas more mature trees are slower to react to a changing soil environment and are adapted to expend their energy on other important functions.

The National Geology of Britain Viewer advises that the local soil comprises a bedrock geology of London clay and superficial layer of sand and gravel, therefore the risk of soil compaction is considered to be low-moderate. However, The risk of soil compaction will be mitigated with the correct installation of tree protective fencing and ground protection.

Root severance

As mentioned above, the roots are responsible for a number of functions including stability and the transport of water and nutrients. Studies have shown that trees can withstand and recover from the loss of a proportion of their root systems, especially where those roots have been removed in a single direction. This applies specifically to **T3** Cherry where roots growing in a southerly direction may be encountered.

7. Arboricultural Method Statement (AMS)

The arboricultural method statement sets out a precautionary approach towards tree protection. Any operations including access, proposed within the RPA (or crown spread where this is greater) will be described within an arboricultural method statement, to demonstrate that the operations can be undertaken with minimal risk of adverse impact to retained trees.

Phase 1-Access facilitation and pre-start tree works.

- Tree surgeon or contractor to remove **T1, T7, and T9**.
- Project arboriculturalist to mark out locations for tree protective fencing and ground protection.

Phase 2- Installation of protective fencing and ground protection

- Erect protective barrier fencing in locations shown on the tree protection plan at **appendix 4**. Tree protection positions will have already been marked out by the project arboriculturalist during phase 1. A protective fencing diagram can be found at **appendix 5**. Barriers will consist of a heras type panel inserted into rubber 'elephants feet' and reinforced with a stabiliser strut. Two clamps either end of each section will ensure the area within the fence (CEZ) remains out of bounds during demolition activities. Tree protective fencing will be partially relocated prior to construction.



Images above show protective fencing installed as per BS5837:Fig 3A with rubber feet and stabilizer struts.

- Ground protection will comprise of either a proprietary ground protection mat such as TrakMat or if approved by the Local Planning Authority, closely abutted ply boards of 18mm thickness installed upon scaffold boards as shown in figure 1 over page and in the location shown within the Tree Protection Plan at **appendix 4**.

Diagram showing Ply boards set upon scaffold boards to reduce compaction

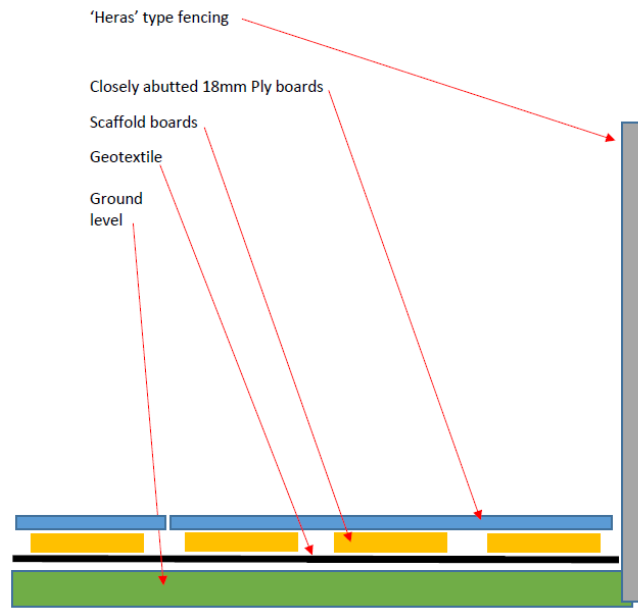


Figure 1 above showing an alternative method for ground protection where construction is less intense.

- The above system will be installed following demolition of the existing rear extension. The ground protection will replace the existing patio until construction is complete.

Additional protection to T8 Olive.

- Plywood hoarding will be erected to avoid inadvertent damage to **T8 Olive** as suggested below.

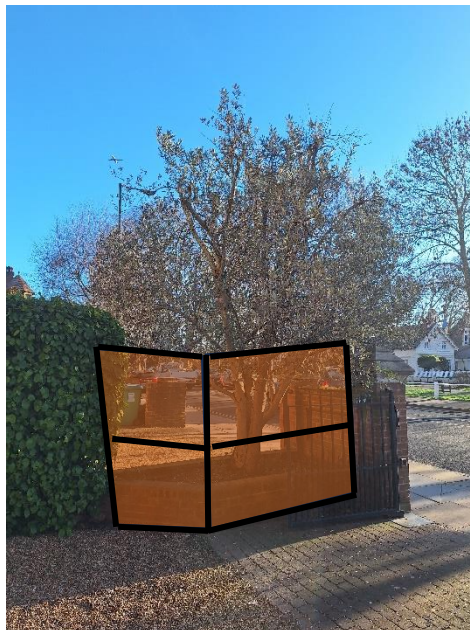


Image above showing braced plywood hoarding around T8 and associated planter.

Phase 3- Construction of extension and other exterior operations

Removal of existing patio-post demolition.

- Prior to the installation of ground protection, the existing rear patio will be removed with the use of hand tools only and replaced with ground protection.
- If roots from **T3** are exposed they will be suitably protected as set out below.
- Suitable protection may include the following methodologies-

Covering exposed roots with damp hessian sacking to lessen the immediate impact of dessication due to exposure.

Covering the roots with sharp sand or good quality soil to lessen the impact of dessication due to exposure.

When backfilling in proximity to roots, be sure to remove hessian sacking.

- Following construction of the rear extension a new surface treatment will be installed in place of the previous paving. This is likely to comprise decking set upon the existing ground level.

Construction.

- Following the installation of tree protective fencing and ground protection, construction may commence in the standard manner without requiring specific arboricultural measures.

Site supervision and pre-commencement meeting

- A pre-commencement meeting will be held via video call and the chosen contractor will be required to share photos to ensure that tree protection measures have been correctly installed prior to commencement of works.
- No further site supervision is necessary on this particular site.

General measures to be adopted in proximity to trees-

- All tree protection measures will be set in place prior to commencement of any works relating to the approved planning consent.
- No bonfires on site.
- No storage of products or mixing of materials within the RPA's of trees.
- No materials are to be stored within the confines of the protective fencing (CEZ).

- Storage of materials on soft ground in proximity to any other trees and hedges away from construction is to be avoided.
- No discharging of any products associated with construction near trees or hedges
- No refueling/topping up of hydraulic fluids etc. on plant machinery within or close to the RPA of trees.
- There will be no lowering or raising of soil levels within the root protection areas of retained trees except where specified and agreed by the LPA.
- There will be no excavation or trenching for the installation of services within the root protection areas of retained trees except where specified and agreed by the LPA.

8. Conclusion

The application proposes the removal of 3 category C trees, one of which is subject to a tree preservation order. A replacement tree will be planted within the front garden with further scope to plant 2 small trees within the rear garden. This document demonstrates that the proposed development can adequately protect remaining trees in a safe and healthy condition.

9. Qualifications & Experience

I have been involved in the horticultural and arboricultural industries for over 35 years, firstly as a contractor and for the last 20 years as a Local Authority tree officer and consultant. I hold the AA Tech cert arb, and ND Arb (RFS) as well as being a Lantra accredited Professional Tree Inspector. I am also a technical member of the Arboricultural Association and professional member of the Consulting Arborists Society.

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Appendix 1: Tree Survey Schedule

Trees have been listed on the schedule with both their common and scientific names.

Tree height is normally measured and rounded up to the nearest metre for trees above 10 metres in height using a Haglof electronic clinometer.

Stem or trunk diameters were measured using a diameter tape in mm at 1.5 metres above ground where access allowed, otherwise diameters have been estimated.

Crown spread has been measured in metres from the trunk to the tips of the live lateral branches taken at the four-cardinal points N-E-S-W using a ground tape.

Age Class

Young - Trees in the first fifth of full life expectancy

Semi-mature - Trees in the second fifth of full life expectancy

Early-mature - Trees in the third fifth of full life expectancy

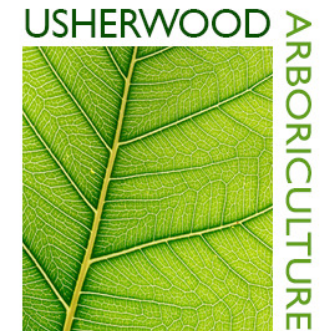
Mature - Trees in the fourth fifth of full life expectancy

Post-mature – Trees having reached full life expectancy and trees in natural decline

Veteran - Trees of interest biologically, culturally and aesthetically due to certain features and/or age.

ERCY-The estimated remaining contribution in years calculated considering the tree's species, location, current age and physiological and structural condition at the time of the survey.

BS5837 Survey Data

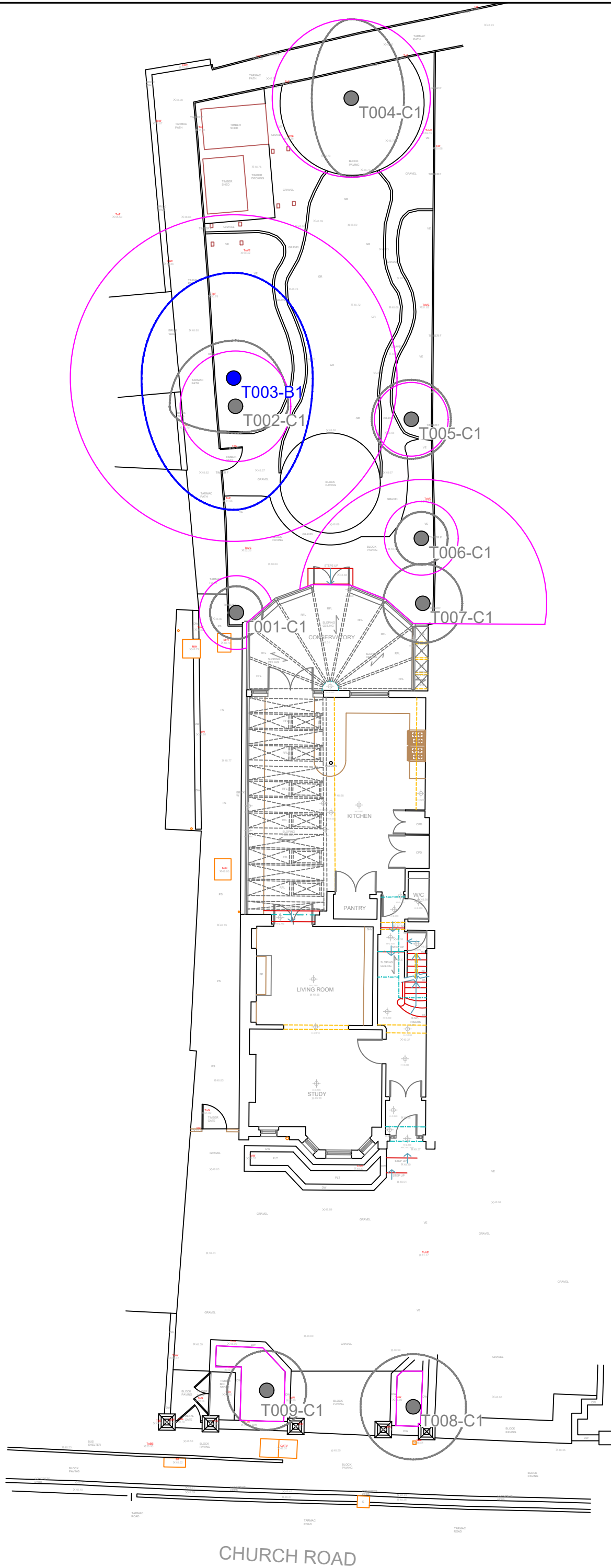


Ref.	Species	Measurements	General Observations	Category	Recommendations
T001	Evergreen magnolia (Magnolia grandiflora)	Height (m): 5 Stem Diam(mm): 100 Spread (m): 1N, 1E, 1S, 1W Life Stage: Young Rem. Contrib.: 20+ Years	Young tree growing in close proximity to existing conservatory.	C1 RPA Radius: 1.2m. Area: 5 sq m.	Remove to facilitate development.
T002	Japanese maple (Acer palmatum)	Height (m): 3 3 stems (mm): 80,100,120 Spread (m): 2.5N, 2E, 1S, 2.5W Life Stage: Semi Mature Rem. Contrib.: 20+ Years	Attractive twin-stemmed ornamental tree.	C1 RPA Radius: 2.1m. Area: 14 sq m.	Protect with tree protective fencing.
T003	Cherry (Prunus sp. 'Cherry')	Height (m): 8.5 Stem Diam(mm): 520 Spread (m): 4N, 3E, 5S, 3.5W Life Stage: Mature Rem. Contrib.: 20+ Years	Previously reduces tree comprising 3 stems from 2.5m.	B1 RPA Radius: 6.2m. Area: 121 sq m.	Protect RPA with tree protective fencing and ground protection.
T004	Fig (Ficus carica)	Height (m): 4 Stem Diam(mm): 250 Spread (m): 3N, 2E, 3S, 1.5W Life Stage: Mature Rem. Contrib.: 20+ Years	Multi-stemmed Fig trained on rear fence.	C1 RPA Radius: 3.0m. Area: 28 sq m.	Protect RPA with tree protective fencing.







Ref.	Species	Measurements	General Observations	Category	Recommendations
T005	Japanese maple (<i>Acer palmatum</i>)	Height (m): 2.5 Stem Diam(mm): 120 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Early Mature Rem. Contrib.: 20+ Years	Small twin stemmed garden tree.	C1 RPA Radius: 1.4m. Area: 6 sq m.	Protect RPA with tree protective fencing.
T006	Cherry (<i>Prunus</i> sp. 'Cherry')	Height (m): 3 Stem Diam(mm): 120 Spread (m): 1N, 1E, 1S, 1W Life Stage: Early Mature Rem. Contrib.: 20+ Years	Small unremarkable twin stemmed tree.	C1 RPA Radius: 1.4m. Area: 6 sq m.	Protect RPA with ground protection boards.
T007	Bay tree (<i>Laurus nobilis</i>)	Height (m): 5.5 Stem Diam(mm): 280 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Mature Rem. Contrib.: 20+ Years	3 stemmed tree growing in close proximity to the existing conservatory. Previously cut back and maintained with a reduced form.	C1 RPA Radius: 3.4m. Area: 36 sq m.	Remove to facilitate development.
T008	Olive (<i>Olea europaea</i>)	Height (m): 3.5 4 stems (mm): 140,140,120,120 Spread (m): 2N, 2E, 2S, 2W Life Stage: Mature Rem. Contrib.: 20+ Years	Previously pruned attractive front garden tree growing within raised bed.	C1 RPA Radius: 3.1m. Area: 30 sq m.	Protect trunk, branches and immediate rootzone with plywood hoarding. See AMS & TPP
T009	Cherry (<i>Prunus</i> sp. 'Cherry')	Height (m): 3.5 Stem Diam(mm): 220 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Mature Rem. Contrib.: 10+ Years	Top grafted Cherry, remaining TPO tree from a previous group of 3. Grows within raised bed, many girdling surface roots.	C1 RPA Radius: 2.6m. Area: 21 sq m.	Remove to facilitate development.

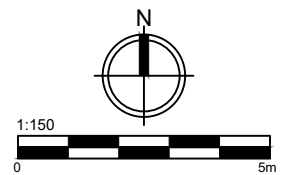
Appendix 2: Tree Survey Plan-

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.
 The original of this drawing was produced in colour, a monochrome copy should not be relied upon.
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Key

-  **Trees**
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**



Drawing Title			
Tree Constraints Plan			
Client			
Hoeg Architects			
Site/Project			
19 Church Road, London, SW13 9HE			
Scale/Sheet	Date		
1:150 - A3	23/01/2024		
Drawing No	Rev	Drawn By	Checked By
UA/TCP/1	1	CS	LU

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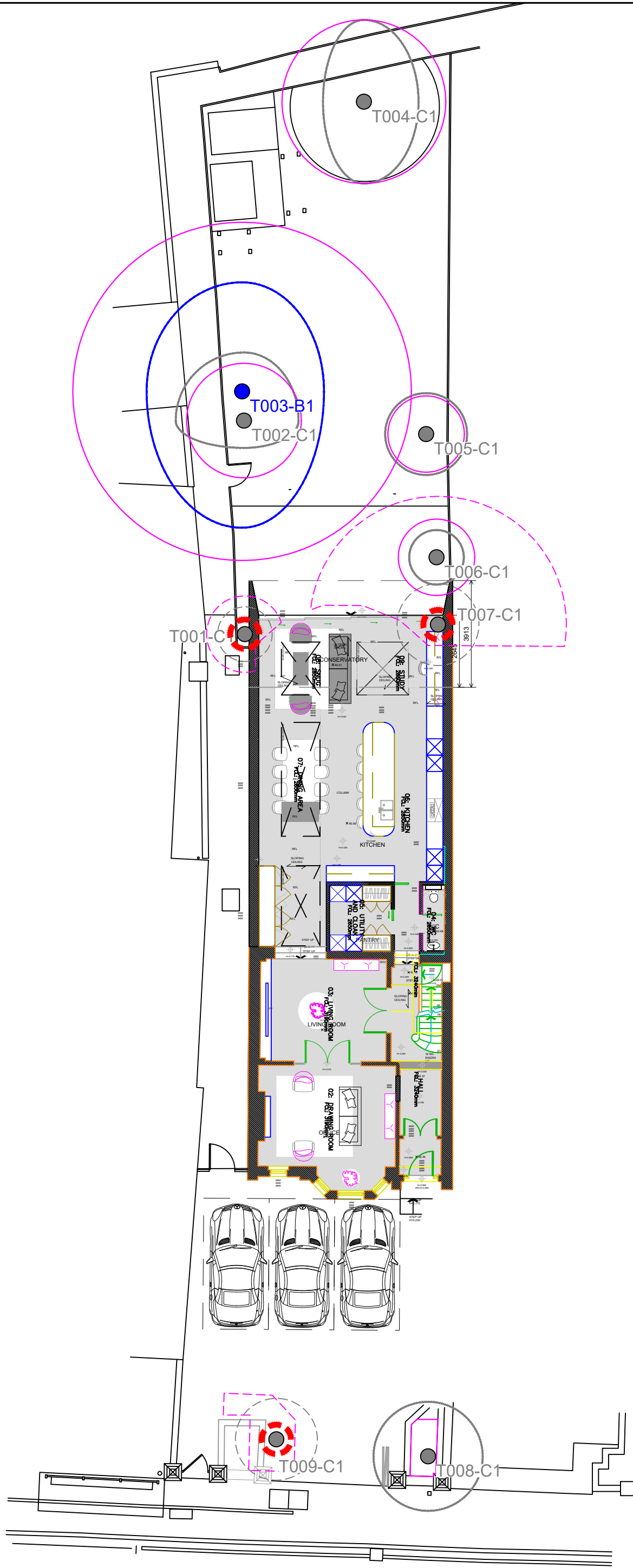


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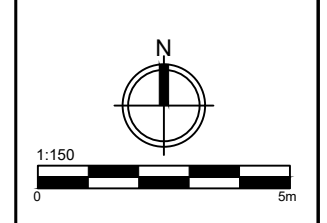
Appendix 3: Arboricultural Impact Plan

General Notes
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Key

	Trees 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
	Trees for Removal

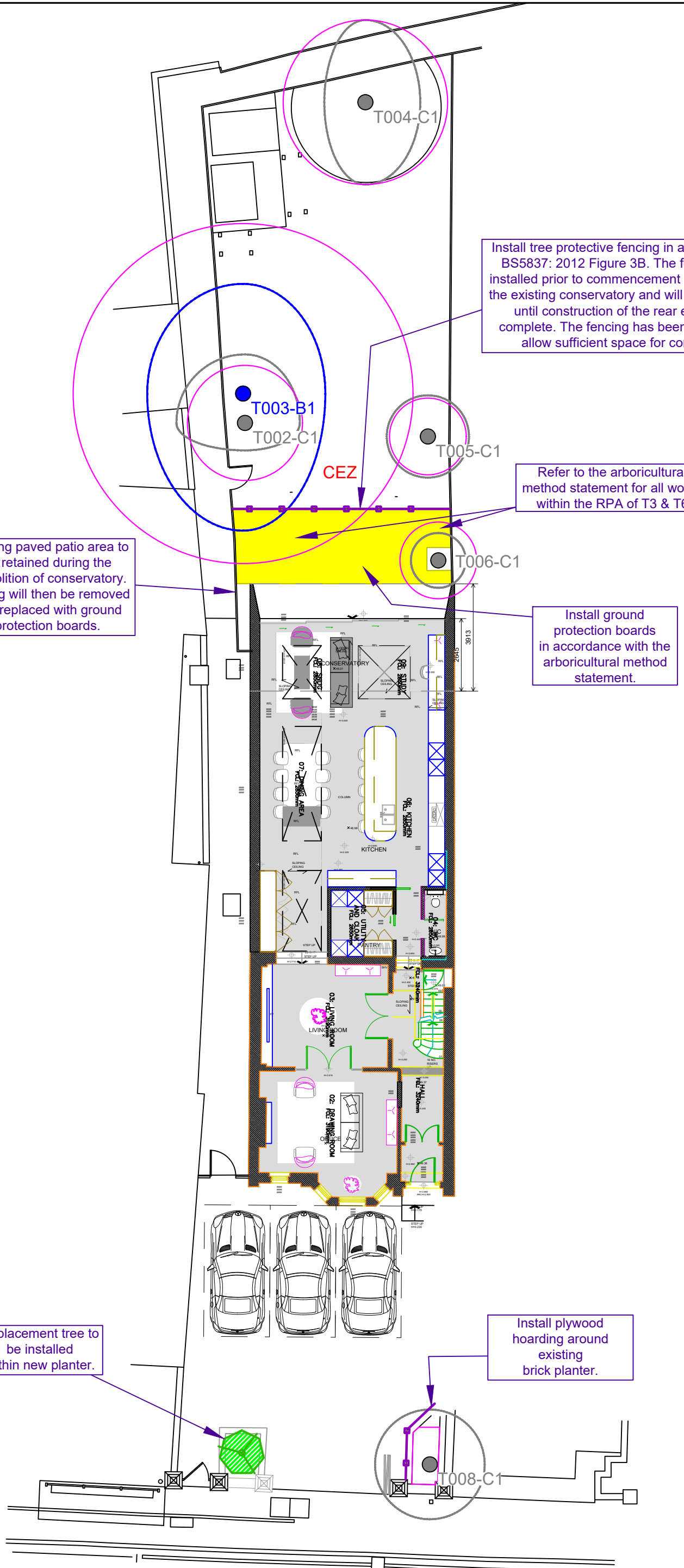


Drawing Title Arboricultural Implication Plan			
Client Hoeg Architects			
Site/Project 19 Church Road, London, SW13 9HE			
Scale/Sheet 1:150 - A3	Date 13/02/2024		
Drawing No UA/AIP/1	Rev 1	Drawn By CS	Checked By LU

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Appendix 4: Tree Protection Plan

General Notes
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Existing paved patio area to be retained during the demolition of conservatory. Paving will then be removed and replaced with ground protection boards.

Install tree protective fencing in accordance with BS5837: 2012 Figure 3B. The fencing will be installed prior to commencement of demolition of the existing conservatory and will remain in place until construction of the rear extension is complete. The fencing has been positioned to allow sufficient space for construction.

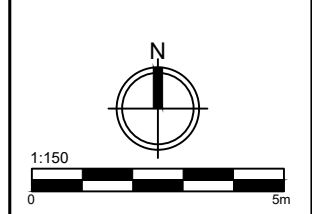
Refer to the arboricultural method statement for all works within the RPA of T3 & T6

Install ground protection boards in accordance with the arboricultural method statement.

Replacement tree to be installed within new planter.

Install plywood hoarding around existing brick planter.

Key	
	Trees 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
	Tree Protective Fencing
	Ground Protection
	Proposed Tree Planting
	CEZ Construction Exclusion Zone



Drawing Title Tree Protection Plan			
Client Hoeg Architects			
Site/Project 19 Church Road, London, SW13 9HE			
Scale/Sheet 1:150 - A3	Date 14/02/2024		
Drawing No UA/TPP/1	Rev 1	Drawn By CS	Checked By LU

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Appendix 5: Tree Protective Fencing

Figure 3 Examples of above-ground stabilizing systems

