# Harper tree consulting



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Arboricultural Report BS5837:2021 (Trees in Relation to Design, Demolition & Construction)

Client: Barbarella Studio Site: 111a Foxley Lane, Purley Date of report: April 05th 2023 Surveyor: Jon Harper cert.Arb (RFS) Report reference: 2023022 v1.0

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## 1. INTRODUCTION

## 1.1. BS5839:2012

The current British Standard for trees in relation to design, demolition, and construction is BS5837:2012. This became current in May 2012, and supersedes the old 2005 standard.

## **1.2.** Terms and Definitions

## 1.2.1. Access Facilitation Pruning

One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.

## 1.2.2. Arboricultural Method Statement (AMS)

Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in the loss of, or damage to a tree to be retained.

## 1.2.3. Arboriculturist

Person who has through relevant education training and experience, gained expertise in the field of trees in relation to design, demolition, and construction.

## 1.2.4. Competent Person

Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task which is being approached.

## 1.2.5. Construction

Site-based operations with the potential to affect existing trees.

## **1.2.6. Construction Exclusion Zone (CEZ)**

Area based on the root protection area (2.7) from which access is prohibited for the duration of the project.

## 1.2.7. Root Protection Area (RPA)

Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain a tree's viability, and where the protection of roots and soil structure is treated as a priority.

## 1.2.8. Services

Any above or below-ground structure or apparatus required for utility provision.

## 1.2.9. Stem

Principal above-ground structural component(s) of a tree that supports its branches.

## 1.2.10. Structure

Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork.

## 1.2.11. Tree Protection Plan

Scale drawing, informed by descriptive text where necessary, based on the finalised proposals, showing trees for retention, and illustrating the tree and landscape protection measures.

## 1.2.12. Veteran Tree

Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

## 1.3. The Proposal/Relevant History

The proposal, in this instance, is to divide the existing dwelling into two dwellings with parking at the front and to construct two new bungalow type dwellings at the rear as shown using the purple colour on the tree constraints plan (2023022/TCP001) in this report. Please note that the existing dwelling will be extended to the rear of the building.

## 1.4. Brief and Purpose

This report has been commissioned by Barbarella Studio to;

- Survey the trees on site in accordance with BS5837:2012.
- Detail the arboricultural implications of the proposed project.
- Present an effective tree protection strategy for the duration of the development.
- Provide the necessary arboricultural information to accompany a planning application to Croydon Borough Council.

## 1.5. Scope

The trees have been surveyed in accordance with the BS. Trees on and immediately adjacent to the site with a stem diameter over 75mm have been included.

A full hazard assessment of the trees (including the assessment of decay or defects and their implications), has not been undertaken as this is considered beyond the scope of this report. Any obvious hazards and defects have, however, been identified in the Tree Survey Schedule and appropriate works recommended for action.

## 1.6. Documents Supplied/Used

Document	Supplied by	Format/Reference
2205.B1.B-111 Foxley Lane	Barbarella Studio	DWG

## 1.7. Executive Summary

The application site is a large residential site. There are several tree at the front of the site that are subject to tree preservation orders, and it seems that these have been duly considered when designing the proposed scheme. Although the revised parking area at the front of the site does mean that there is nominal further incursion into the root protection areas of these trees, a cellular confinement system with a permeable finishing layer is specified. This should result in a net environmental improvement for this trees as the current surfacing is a lot less tree friendly.

At the rear of the site are a significant number of small fruit trees that are not in the best of condition. These will be removed to make way for the two bungalows. As these trees have all been identified as BS5837 Category C they should not be considered a constraint to development.

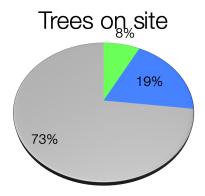
There are also several larger Category B trees in neighbouring gardens that have to be taken into account regarding the current proposal. One of these will have a footpath over its RPA. In this case a cellular confinement system with a permeable finishing layer will be used once again.

T17 has a moderate RPA incursion caused by one of the two bungalows. This has been mitigated by the use of a specially engineered foundation. Because these are only very light weight structures by design, the foundation will be a suspended floor beam on a plinth type support. These are considered to be minimally invasive and require no wet concrete, reducing risk to tree roots. The crown of T17 will have to be pruned back and holistically shaped so that the overhang over the proposed bungalow is eliminated. My opinion is that the arboricultural constraints of this site have been considered and mitigated to a level that is acceptable within the suburban setting where development is now required.

## 2. TREE SURVEY

## 2.1. Survey Summary

Total number of trees	26
Category A	2
Category B	5
Category C	19
Category U	0





## 2.2. Survey Method

Locations of the trees were plotted using the topographical survey provided by Barbarella Studio. All trees were inspected from ground level only using widely accepted Visual Tree Assessment techniques, and no trees were climbed during the survey.

No trees were internally investigated. Should a more detailed inspection be required then this will be pointed out in the recommendations on the survey schedule.

## 2.3. Tree Details

With regard to their desirability for retention, the trees surveyed have been graded with their trunks colour coded on the tree constraints plan, and tree protection plan using the criteria contained in BS5837:2012. A summary of this grading is as follows.

A= Light Green. Trees of high quality and value, in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested in the British Standard). Usually worthy of consideration as a material constraint to any proposed development.

B= Mid Blue. Trees of moderate quality and value in such a condition as to make a significant contribution (a minimum period of 20 years is suggested in the British Standard). Usually worthy of consideration as a material constraint to any proposed development.

C= Grey. Trees of low quality and value, in adequate condition condition to remain until new planting could be established (a minimum of 10 years is recommended in the British Standard), or trees with a stem diameter below 150mm. Not usually worthy of consideration as a material constraint to any proposed development. U= Red. Trees in such a condition that they cannot be realistically be retained as living specimens in the context of the current land use for longer than 10 years.

In our survey schedule, the RPA for each tree is indicated as the radius of a circle as well as in M<sup>2</sup>. This is also plotted on the tree constraints plan and tree protection plan denoted by a heavy black line which merges the individual RPAs together where there is more than one tree.

Section 4.6 of BS5837:2012 provides for the shape of the RPA to be modified from the starting point of a circle to account for site features such as hard surface treatments where root growth may be restricted, as long as the total remains the same. In this case, no RPAs were modified. **Please Note:** The facility for offsetting an RPA by 20% for open grown trees was withdrawn on May 01<sup>st</sup> 2012.

## 2.4. Legal Protection Status of Trees.

Type of Protection	Details/Reference
Conservation Area	No
Tree Preservation Order	Yes (T22, T23, T24 & T25)
Planning conditions requiring tree retention	No

## 3. ARBORICULTURAL IMPACT ASSESSMENT

## 3.1. Summary of Impact Assessment

Total number of trees surveyed	26
Number of trees to be removed	16
Number of trees to be pruned	2
Number of trees with RPA incursions	4

## 3.2. Removal of trees

Category A Trees	Category B Trees	Category C Trees	Category U Trees
(High Grade)	(Moderate Grade)	(Low Grade)	(Unretainable)
N/A		T2, T3, T4, T5, T6, T7, T8,T9, T10, T11, T12, T13, T14, T15, T16 & T20	N/A

The trees in the table above will be felled to the ground and the stumps will be ground out to prevent damage to the roots of retained trees nearby. The reason for removal may be for either of the reasons below.

A. There may be a direct conflict with the proposed development.

B. The trees may not be in a condition that makes them desirable for retention.

Trees to be removed	Impact on the character of the local area.	Mitigation (if any)		
T21	Low to moderate: Although fairly large, this tree is only visible from the rear gardens.	None Required		
, _, , _, _, _, _, _,	Low to none: All small trees in poor condition.	None Required		

## 3.3. Tree Works

T1 will be pruned back toward the boundary by 2m.

The crown of T17 will also need to be pruned then holistically shaped so that it eliminates the overhang over the proposed bungalow.

## 3.4. Incursions into RPAs

In many instances, a low degree of root disturbance can be deemed to be acceptable Where incursions can be fully invasive, or low level invasion can sometimes be achieved by the use of specialist methods to limit the degree of disturbance. The table details the incursions and how they are to be dealt with.

l.	ncursions into RPAs of I	retained trees
Type of incursion	Tree number	Precautions to be taken
Hard surfacing for parking at the front of the site.	T22, T23, T24 & T25	Cellular confinement with a permeable finishing layer will replace the existing hards surfacing.
Footpath to the bungalows	T19	Cellular confinement with a permeable finishing layer will be used
Foundation for bungalow	T17	A plinth type specially engin- eered foundation will be used.

## 3.5. Light and Proximity Issues

There are no arboricultural light or proximity issues associated with the current proposal.

## 3.6. Mitigation

Although there is no statutory requirement for mitigation planting, there is scope to do so if the developer sees fit.

## 3.7. Conclusion

Assuming full compliance with the AMS in this report, the net arboricultural impact is acceptable.

## 4. ARBORICULTURAL METHOD STATEMENT

## 4.1. Introduction

During the development process, the tree protection measures set out in this method statement must be adhered to in order to safeguard the retained trees. The principles below are specifically designed to offer a significant degree of protection to both the root systems and aerial parts of the trees for the duration of the works.

A copy of this method statement must be made available on site at all times until the cessation of any demolition, construction, and landscaping work, and the site personnel will be made familiar with the key implications of this AMS.

It should be remembered that powers were granted to Local Planning Authorities in 2005, which allow them to serve Temporary Stop Notices if agreed protection measures are strayed away from before work is completed. This can be extremely costly and very time consuming.

## 4.2. Pre-commencement Meeting

If the Local Planning Authority deem it necessary, a pre-commencement meeting will be held, attended by the project Arboricultural Consultant, the Site Manager, and the LPA Tree Officer. During this meeting potential problems and protection sequencing can be discussed and it is expected that all aspects of the tree protection measures set out in this AMS will be understood and agreed. Following this meeting, all parties involved will receive an email from the Arboricultural Consultant containing a record of what was discussed and agreed.

## 4.3. Sequencing and Supervision

Sequencing of events and effective arboricultural supervision are important elements of the tree protection process.

### **Key Stages:**

- AMS issued to Site Manager/Building Company
- AMS to be read by all site personnel to ensure a full understanding of implications. Any raised issues are to be addressed to the project Arboricultural Consultant
- · Recommended and agreed tree works to be carried out
- Tree protective fencing and ground protection installed
- Existing buildings to be demolished where appropriate
- Reconfigure tree protection measures to the specification as on 2023022/TPP001
- Construction work carried out
- Tree protective fencing and ground protection removed
- Landscaping (if any) carried out

### Summary of Arboricultural Monitoring and Supervision

Activity	Level of monitoring/supervision required							
Erection of tree protective fencing	Signing off of the approved tree protection measures by the project							
Install ground protection measures	arboricultural consultant prior to any development work commencing							

It is also imperative that telephone contact between the site manager and the Arboricultural Consultant is maintained with regard to any tree protection measure issues.

## 4.4. Site Precautions

The following points will be observed at all times:

- No fires will be lit within 15m of any retained tree on or around the site
- No access will be permitted inside the tree protection fences
- No materials, equipment, or waste will be stored inside the tree protection fencing at all
- Notice boards, telephone cables, or other services will not, under any circumstances, be attached to retained trees
- Material which contaminate soil, such as concrete, diesel oil, vehicle washings and even builders sand, will not be allowed to enter the RPA of any retained tree

## 4.5. Carrying out tree works

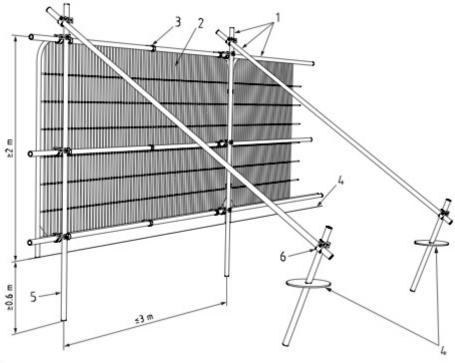
All tree works, where required, will be carried out in accordance with BS3998:2010 (Recommendations for Tree Works), and to the current arboricultural best practice. Tree works will be carried out by a suitably qualified and insured contractor. The contractor will be solely responsible for carrying out their own site risk assessment prior to the commencement of work.

If at any time during the development a need for additional tree works is highlighted to facilitate the proposed works or access for machinery/plant, the Arboricultural Consultant will be contacted to advise on appropriate works and liaise with the LPA as necessary.

## 4.6. Protective Fencing and Ground Protection

The required tree protective fencing should be installed to fence off the construction exclusion zone(s), or CEZ, shown on the tree protection plan (Figure 2). This must only be altered or moved as agreed in writing by the Local Planning Authority following advice from a competent Arboricultural Consultant.

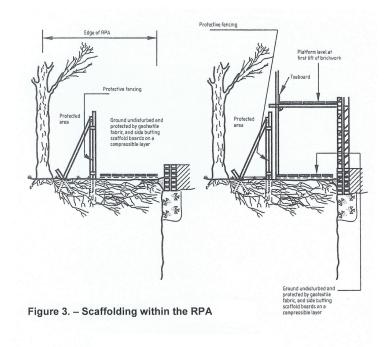
The Tree Protective fencing will be 2.4m Heras fencing as specified in the BS. The fencing will be supported by a scaffold framework with supporting struts firmed into the ground on the side of the trees. The purpose of the supports is to prevent the fencing being moved during the development. Clear signs will be attached to the fencing (e.g. Tree Protective Fencing – Keep Out).



#### Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

In this case, where the ground protection is marked in blue on the tree protection plan, it will consist of 18mm thick OSB on top of a compressible layer of wood chip or sharp sand (not builders sand) that is 100mm deep. This will be on a geotextile membrane and the depth of the compressible layer will be maintained throughout the construction process.



At the front of the site, the existing hard surfacing will be retained until the construction phase of the project has been completed. This will offer ground protection for the trees at the front of the site. Once the construction phase is over the surfacing in that area will be replaced with a no dig solution as specified in section 4.10 of this report.

## 4.7. Site Access

Site access will only be available via the existing site entrance on Foxley Lane for construction purposes

## 4.8. Demolition Work

Once the approved tree protection measures are in place, demolition will be carried out in the normal way. All waste from demolition will be stored away from the RPAs of all retained trees until it can be removed for disposal.

## 4.9. Underground Services

New underground services will be routed into the footprint of the new dwellings avoiding the RPAs of all retained trees.

Run off water will be routed into soak aways, the position of which will be agreed with the LPA before work commences.

## **4.10.** Foundations and Construction

Where the foundation of the bungalows are within the RPA of any retained tree (T17). they will be of a type that uses adjustable plinths on to of preformed concrete pads. The negates the need for any significant excavation and is suitable for this project because of the lightweight nature of the buildings. A suspended floor beam will be used on top of the plinths. The diagram below shows the type of system proposed.



While installing the foundation for the bungalows as shown in the illustration on the previous page of this report, andy roots that might be encountered from T17 will be dealt with as specified in section 7.2 of BS5837:2012. I have included an excerpt from this further down in this section of the report .

At the front of the site, the new parking facilities will use a specially engineered surface treatment of cellular confinement, 150mm deep, with a permeable finishing layer. This will replace the existing tarmac surfacing, which is not permeable. The existing surfacing consists roughly of 150mm of sub base and 50mm of binder and finishing layers. This will be removed using nothing more than hand held breakers. Should any major roots be found while removing the existing surfacing, work will stop and they will be referred to the project arboriculturist for further advice. I cases such as this, a suitable adaptation of the cellular confinement may be used to accommodate any roots with no impact.

The installation process is as follows:

#### STAGE 1 GROUND PREPARATION

- 1. Remove vegetation using a suitable foliar herbicide.
- 2. Fill any hollows with sharp sand or 4-20mm angular stone (note that ground levels must not be lowered).
- 3. Place geotextile membrane over area to be surfaced ensuring a 300mm overlap.
- 4. Mark out the areas to be protected with edging detail.

#### STAGE 2 INSTALLATION OF CELLULAR CONFINEMENT

- 1. Place cellular confinement web on top of geotextile membrane.
- 2. Expand cellular confinement web to required length and pin to the ground. Fix cellular confinement panels together using the manufacturers approved method.

### STAGE 3 FILLING CELLULAR CONFINEMENT

- 1. Fill cellular confinement with a 4 to 20mm washed angular stone.
- 2. Allow 25mm overfill for any settlement of stone into the cells.
- 3. If the area is to be trafficked immediately, as is the case where it will be used as ground protection during construction, increase the surcharge of stone to a maximum of 50mm over the cell walls.

#### STAGE 4 FINISHING LAYERS

- 1. Install geotextile membrane on top of stone surcharge or overfill.
- 2. Spread a maximum thickness of 50mm of sharp sand.
- 3. Install the appropriate finishing layer as specified and approved in the planning application.

In all cases, where excavation within the RPAs of retained trees is absolutely unavoidable, the following methods will be strictly adhered to: -

Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to pro tect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability. In the case of roots larger than 25mm in diameter, no further action will be taken until this has been referred to the project arboriculturist.

Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (build ers' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

## 4.11. Fencing and Landscaping

During the landscaping phase of the development (if any landscaping takes place), the following precautions will be observed:

- No compaction of soil within the RPAs (or where new tree planting is to be carried out).
- No changes in ground levels.
- Unwanted vegetation to be removed manually or using contact herbicides that will not damage existing tree roots.
- No underground irrigation or drainage pipes to be installed
- If soil has been compacted in areas where planting is proposed, measures to improve soil structure (e.g. decompaction) may be necessary to facilitate successful plant establishment.

If any fence posts are installed within the RPAs of retained trees, excavation will be carried under direct arboricultural supervision using hand tools. Posts will be re-positioned if roots in excess of 25mm in diameter are encountered. Post holes will be lined with heavy gauge polythene where concrete is used to safeguard the rooting environment of the trees from the potentially toxic effects of leaching concrete.

## 4.12.Amendments

Issues may arise on development sites that require amendments to the previously agreed tree protection details. Any amendments to this AMS will be approved in writing by the LPA prior to being implemented. Copies of paperwork relating to any amendments will be communicated by the Arboricultural Consultant to the Client and LPA.

This concludes the advice given in this report Compiled and presented by Jon Harper cert.Arb (RFS)

## TREE SURVEY SCHEDULE

Please note that the recommendations on the tree survey schedule have not been considered in relation to the design of any potential proposed development, but are derived from observations made on site.

#### Tree Survey Schedule

Date: April 01st 2023

Site: 111a Foxley Lane

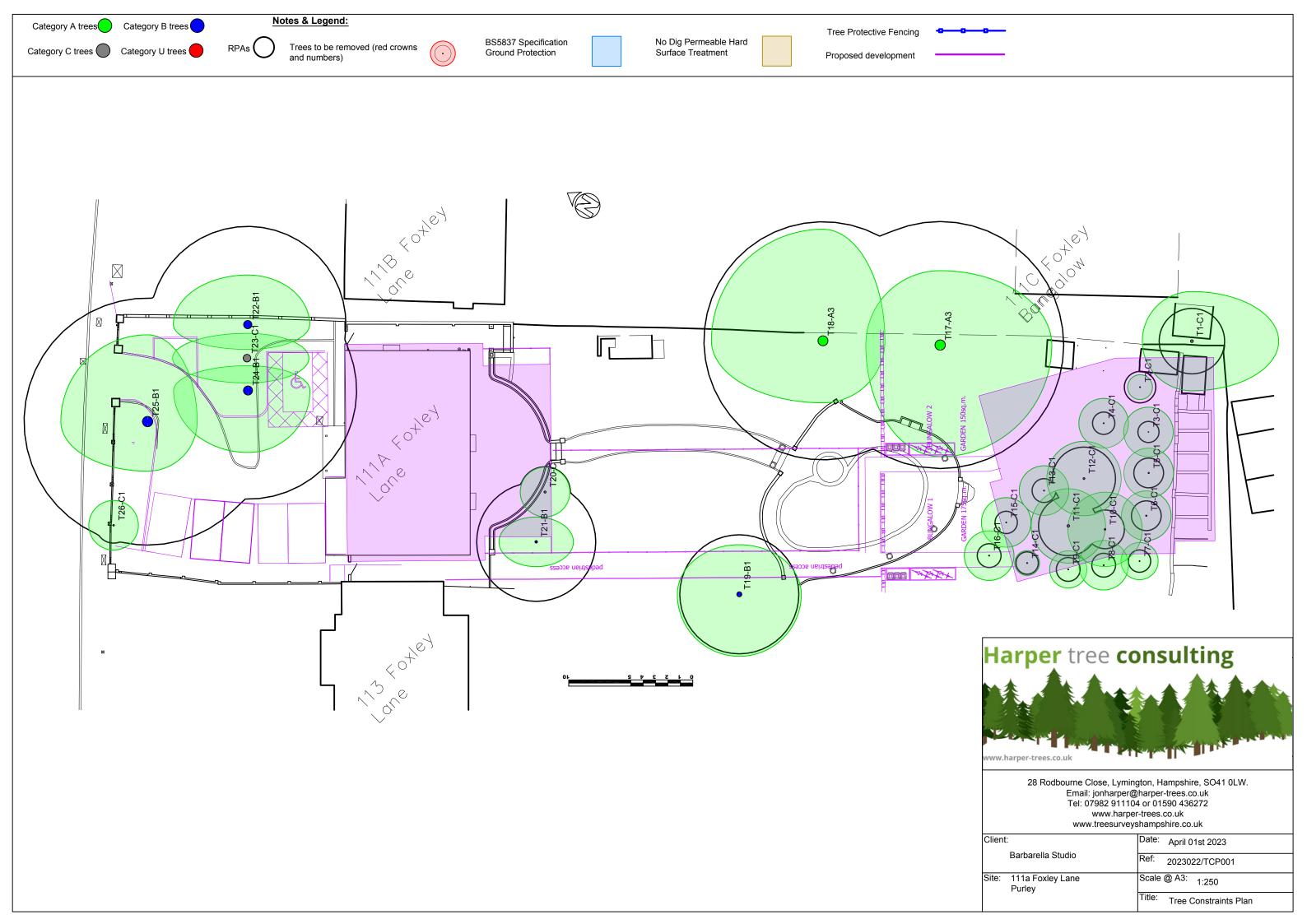
Surveyor: Jon Harper cert.Arb (RFS)



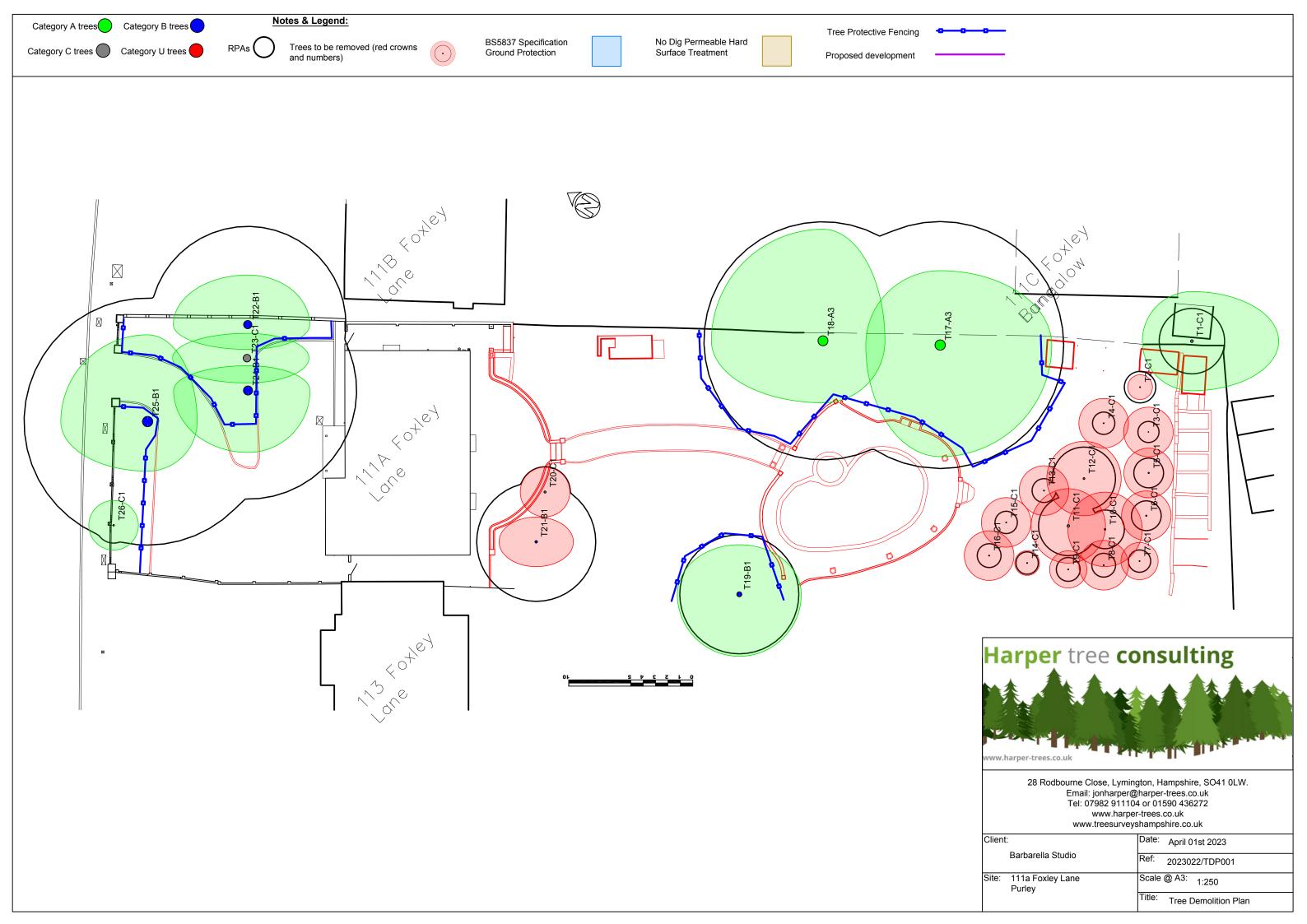


Type (Tag)	Name	Age	Category	Diameter (Stems)	Height (L/Hgt)	North	East	South	West	Condition	Life Exp	Comments	Recommendations	RPR	RPA
T1	Acer platanoides (Norway Maple)	М	C1	220(1)	12(5)	4	4	7	4	Good	10	None at present.	None at present.	2.64	21.9
T2	Malus (Apple)	М	C1	106(2)	2(0.5)	1	1	1	1	Good	10	None at present.	None at present.	1.27	5.07
Т3	Ficus carica (Fig)	М	C1	71(2)	3(0.75)	2	2	2	2	Good	10	None at present.	None at present.	0.85	2.27
T4	Malus (Apple)	М	C1	75(1)	4(1)	2	2	2	2	Good	10	None at present.	None at present.	0.9	2.55
T5	Ficus carica (Fig)	М	C1	100(1)	3(0.75)	2	2	2	2	Good	10	None at present.	None at present.	1.2	4.52
Т6	Malus (Apple)	М	C1	100(1)	4(1)	2	2	2	2	Good	10	None at present.	None at present.	1.2	4.52
T7	Malus (Apple)	М	C1	75(1)	4(1)	1.5	1.5	1.5	1.5	Good	10	None at present.	None at present.	0.9	2.55
Т8	Ficus carica (Fig)	М	C1	80(1)	4(2)	2	2	2	2	Good	10	None at present.	None at present.	0.96	2.9
Т9	Ficus carica (Fig)	М	C1	80(1)	2(1)	1.5	1.5	1.5	1.5	Good	10	None at present.	None at present.	0.96	2.9
T10	Ficus carica (Fig)	М	C1	130(1)	5(2)	3	3	3	3	Good	10	None at present.	None at present.	1.56	7.65
T11	Ficus carica (Fig)	М	C1	200(1)	6(2)	3	3	3	3	Good	10	None at present.	None at present.	2.4	18.1
T12	Ficus carica (Fig)	М	C1	212(2)	6(2)	3	3	3	3	Good	10	None at present.	None at present.	2.54	20.27
T13	Prunus domestica (Damson)	М	C1	80(1)	3(0.5)	2	2	2	2	Good	10	None at present.	None at present.	0.96	2.9
T14	Ficus carica (Fig)	М	C1	75(1)	2(1.5)	1	1	1	1	Good	10	None at present.	None at present.	0.9	2.55
T15	Pyrus (Pear)	М	C1	75(1)	4(1)	2	2	2	2	Good	10	None at present.	None at present.	0.9	2.55
T16	Prunus domestica (Damson)	М	C1	80(1)	4(1)	2	2	2	2	Good	10	None at present.	None at present.	0.96	2.9
T17	Fagus sylvatica 'Purpurea' (Copper B	М	A3	830(1)	14(5)	6	6	9	9	Good	40	Ivy on tree.	Sever Ivy.	9.96	311.69
T18	Fagus sylvatica 'Purpurea' (Copper B	М	A3	800(1)	14(6)	9	9	5	5	Good	40	Ivy on tree.	Sever Ivy.	9.6	289.57
T19	Betula pendula (Silver Birch)	М	B1	400(1)	14(8)	5	4	5	5	Good	20	None at present.	None at present.	4.8	72.39
T20	Olea	М	C1	170(1)	4(1.5)	2	2	2	2	Good	10	None at present.	None at present.	2.04	13.08
T21	Chamaecyparis lawsoniana (Lawson	М	B1	400(4)	12(4)	3	2	3	2	Good	20	None at present.	None at present.	4.8	72.39
T22	Tilia X europaea (Common Lime)	М	B1	660(1)	14(4)	6	4	5	2	Good	20	Pollard.	None at present.	7.92	197.09
T23	Tilia X europaea (Common Lime)	М	C1	610(1)	14(6)	6	2	5	2	Fair	10	Pollard. Decay present on stem. Cavity on stem as well as some bark necrosis.	Monitor	7.32	168.36
T24	Tilia X europaea (Common Lime)	М	B1	730(1)	14(4)	6	2	5	5	Good	20	Pollard.	None at present.	8.76	241.11
T25	Aesculus hippocastanum (Horse Che	М	B1	830(1)	15(2)	7	7	4	4	Good	20	None at present.	None at present.	9.96	311.69
T26	Taxus baccata (Yew)	EM	C1	120(1)	2.5(0.75)	2	2	2	2	Good	20	None at present.	None at present.	1.44	6.52

## TREE CONSTRAINTS PLAN



## TREE DEMOLITION PLAN



## TREE PROTECTION PLAN

