

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



62 Marmora Road  
London  
SE22 0RY

11<sup>th</sup> July 2024

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# 1. Instruction

Usherwood Arboriculture have been instructed to provide a tree survey, arboricultural impact assessment, arboricultural method statement and tree protection plans in support of an application for the erection of a “two storey rear side infill extension, lower ground floor front extension, roof dormers and external opening alterations” at 62 Marmora Road, London, SE22 0RY. 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
10020-1-001	Floor Plans as existing	Planstudio Architecture
	Proposed Site Plan	Planstudio Architecture

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

## 2.Executive Summary

This document considers the impact of development upon 4 individual trees located within and close to the application site. A single category C Crab apple tree is to be removed due to its declining condition and to provide space for proposed construction. Standard tree protection measures will ensure that the remaining trees are adequately protected throughout all stages of construction.

## 3.The Site

The application site comprises an attractive Victorian semi-detached house on the northwest side of Marmora Road. The front garden comprises an attractive planting bed stepping down to a lower ground floor. The rear garden is at the level of the lower ground floor, is quite overgrown and unkempt, comprising of mainly woody shrubs and perennials with a few ornamental trees. The area of proposed construction is largely confined to the rear paved patio.

### Soil conditions.

The British Geological Survey, Geology of Britain viewer describes the local bedrock geology as London Clay Formation – Clay and silt. There is no information on local superficial deposits.

### 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 not situated within a conservation area or subject to a tree preservation order.





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, irremediable 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 4 individual trees, full details of the survey data can be found in the Tree Survey Schedule at **Appendix A**. 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.

3 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.

3 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
Chusan Palm	Trachycarpus fortunei
Crab apple	Malus sylvestris
Elder	Sambucus nigra

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

The site also includes many other large shrubs and a few young trees with trunk diameters below 50mm. None of the small trees or shrubs are of such significance as to require inclusion within this survey.

The front garden comprises a densely planted bed of small palms, evergreen shrubs, ferns and climbing plants. A single Chusan palm has been singled out within the survey, although with a small fibrous root system, we do not believe it requires any specific protection in relation to this application.



### T1 Off-site Elder & T2 Crab apple



Photos above of T1, a self-set, category C off-site Elder growing on the site boundary, and T2, a declining category C Crab apple. The Elder will be cut back to the boundary line and the Crab apple removed due to its condition and to provide space for construction.

### T3 Off-site Crab apple & T4 Chusan palm



Photos above of T3, a category B off-site Crab apple located in the neighbouring garden. A section of tree protective fencing has been shown in the rear garden to keep proposed construction related activities away from the root protection area of the off-site tree. T4 palm grows within an enclosed bed in the front garden. Construction will be carried out finishing at the bed frontage with no space for tree protection.

## 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. In this instance, a single category C Crab apple tree (**T2**) in declining condition will be removed for sound arboricultural reasons. The remainder of the rear garden is well stocked with young trees and mature shrubs and the removal of T2 will have no impact beyond the immediate rear garden.

### Impacts upon existing retained trees

**T1** Elder grows on the site boundary. T1 is a small, self-set category C tree with much of the growth over the application site. Removal of the tree is out of the applicants control, however, the tree will be cut back to the boundary to provide space for construction.

Below ground, the root protection area (RPA) is directly beneath existing paving and will be further protected with the installation of plywood boards directly upon the paving.

**T3** Crab apple grows in the neighbouring garden and a precautionary approach will be taken with the installation of tree protective fencing extended across the garden as shown on the Tree Protection Plan at **appendix D**.

**T4** Chusan palm grows within an attractive plant bed in the front garden. The tree is under planted with much smaller palms, evergreen shrubs and ferns. Construction will occur directly up to the plant bed edge and some of the shrubs may be damaged. It is the applicant's wish to maintain this shrub bed carry out any replanting following completion of works. The existing underplanting provides sufficient protection to the front garden palm and any attempt to provide further protection would be detrimental to the existing bed.





Photo above of the front garden planting bed. Construction will extend to the low front wall highlighted in red.

The rear garden contains many other woody plants including Acer, Fig, Goat willow, Laurel, Photinia and Plum, although none of the plants are of such a size as to be included in this document.

#### **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, therefore the risk of soil compaction is considered to be high. 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. We do not expect to encounter any exposed roots from subject trees with regards to this application.

## 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.

- Contractor to cut back **T1** Elder to boundary line and to remove **T2** Crab apple, as well as the removal of any shrubby vegetation in the immediate vicinity of construction.
- Contractor to install tree protective fencing as set out below.

### Phase 2- Installation of protective fencing and ground protection

- Erect protective barrier fencing in locations shown on the tree protection plan at **appendix D**. A protective fencing diagram can be found at **appendix E**. 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 construction activities.



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

- Ground protection will be installed prior to commencement of any works and comprise of 18mm thickness closely abutted plywood boards. Due to the retention of existing paving slabs, ground protection will be laid directly upon the slabs without the requirement for a compressive layer such as woodchip mulch.
- Ground protection will remain in place until construction is complete.



### **Phase 3- Construction of extension.**

- Once tree protection measures have been installed, the extension may be constructed without the need for a specific arboricultural methodology.

### **Pre-commencement meeting & site supervision.**

The contractor will provide the project arboriculturalist with photos or video evidence of the tree protection measures in order to confirm their correct installation. This information may also be provided to the LPA tree officer.

No further site supervision is considered necessary at this 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 retained 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

This application proposes the removal of a single declining category C Crab apple tree. The remainder of the garden is well stocked with mature shrubs and young trees. Adherence to the Arboricultural Method Statement and Tree Protection Plan will ensure that existing retained on and off-site trees will be adequately protected throughout the duration of development.

## 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.

Lawrence Usherwood  
Usherwood Arboriculture

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## Appendix A: 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

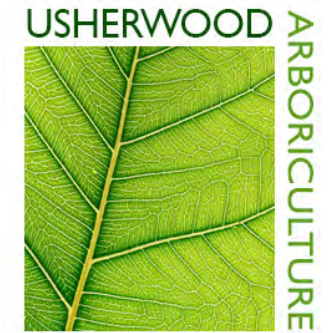
**Post-mature** – Trees having reached full life expectancy and trees in natural decline

**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

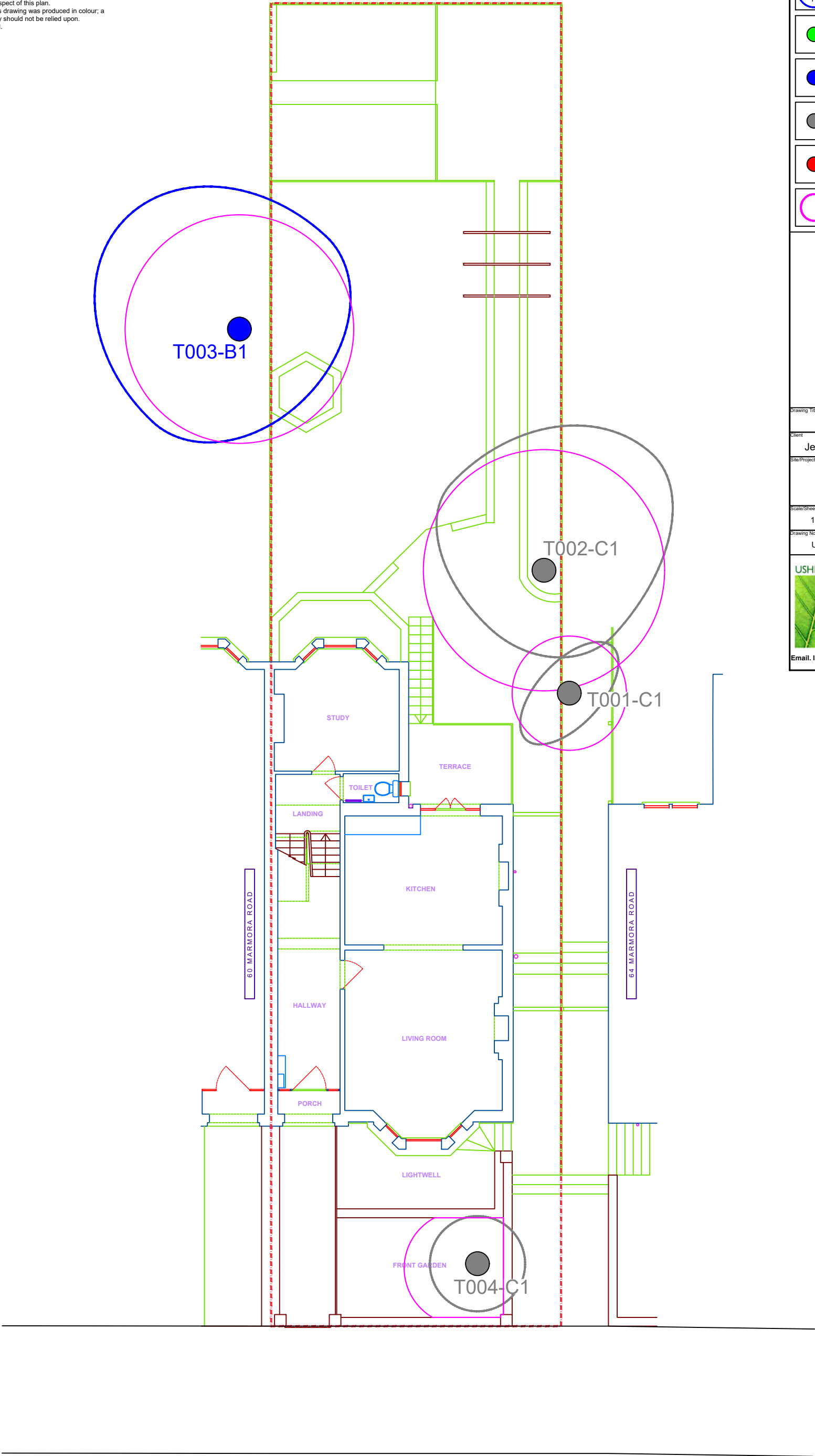


Ref.	Species	Measurements	General Observations	Category	Recommendations
T001	Elder (Sambucus nigra)	Height (m): 4 Stem Diam(mm): 150 Spread (m): 2N, 1E, 2S, 1W Life Stage: Mature Rem. Contrib.: 10+ Years	Unremarkable off-site multi-stemmed tree growing on fence line.	C1  RPA Radius: 1.8m. Area: 10 sq m.	Install ground protection mats upon existing concrete. Cut back overhanging branches.
T002	Crab apple (Malus sylvestris)	Height (m): 7 2 stems (mm): 190,250 Spread (m): 5N, 3E, 2.5S, 4W Life Stage: Mature Rem. Contrib.: 10+ Years	Twin-stemmed tree leaning north. Smaller stem decaying, sparse suckering growth. Tree in gradual decline with limited amenity value.	C1  RPA Radius: 3.8m. Area: 45 sq m.	Remove due to declining condition and to provide space for development.
T003	Crab apple (Malus sylvestris)	Height (m): 7 Stem Diam(mm): 300 Spread (m): 4N, 3E, 4S, 5W Life Stage: Mature Rem. Contrib.: 20+ Years	Attractive off-site garden tree, 3 stems from 1.5m.	B1  RPA Radius: 3.6m. Area: 41 sq m.	Protect RPA with tree protective fencing.
T004	Chusan Palm (Trachycarpus fortunei)	Height (m): 4 Stem Diam(mm): 250 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Mature Rem. Contrib.: 20+ Years	Attractive front garden palm, clad in jasmine climber and growing among a palm and evergreen shrub understorey.	C1  RPA Radius: 3.0m. Area: 28 sq m.	No action required.

## **Appendix B: Tree Survey Plan-**

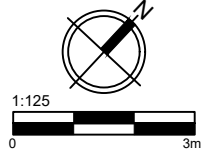
**General Notes**  
Do not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.  
Depictions of tree canopies are based on measurements taken to four cardinal compass points.  
No liability of any kind is accepted for any omissions or inaccuracies in respect of this plan.  
The original of this drawing was produced in colour; a monochrome copy should not be relied upon.  
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Ground Floor



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 Constraints Plan**

Client: Jef Shah & Lisa Boden Shah

Site/Project: 62 Marmora Road, London, SE22 0RY

Scale/Sheet: 1:125 - A3 Date: 03/07/2024

Drawing No: UA/TCP/1 Rev: 1 Drawn By: CS Checked By: LU

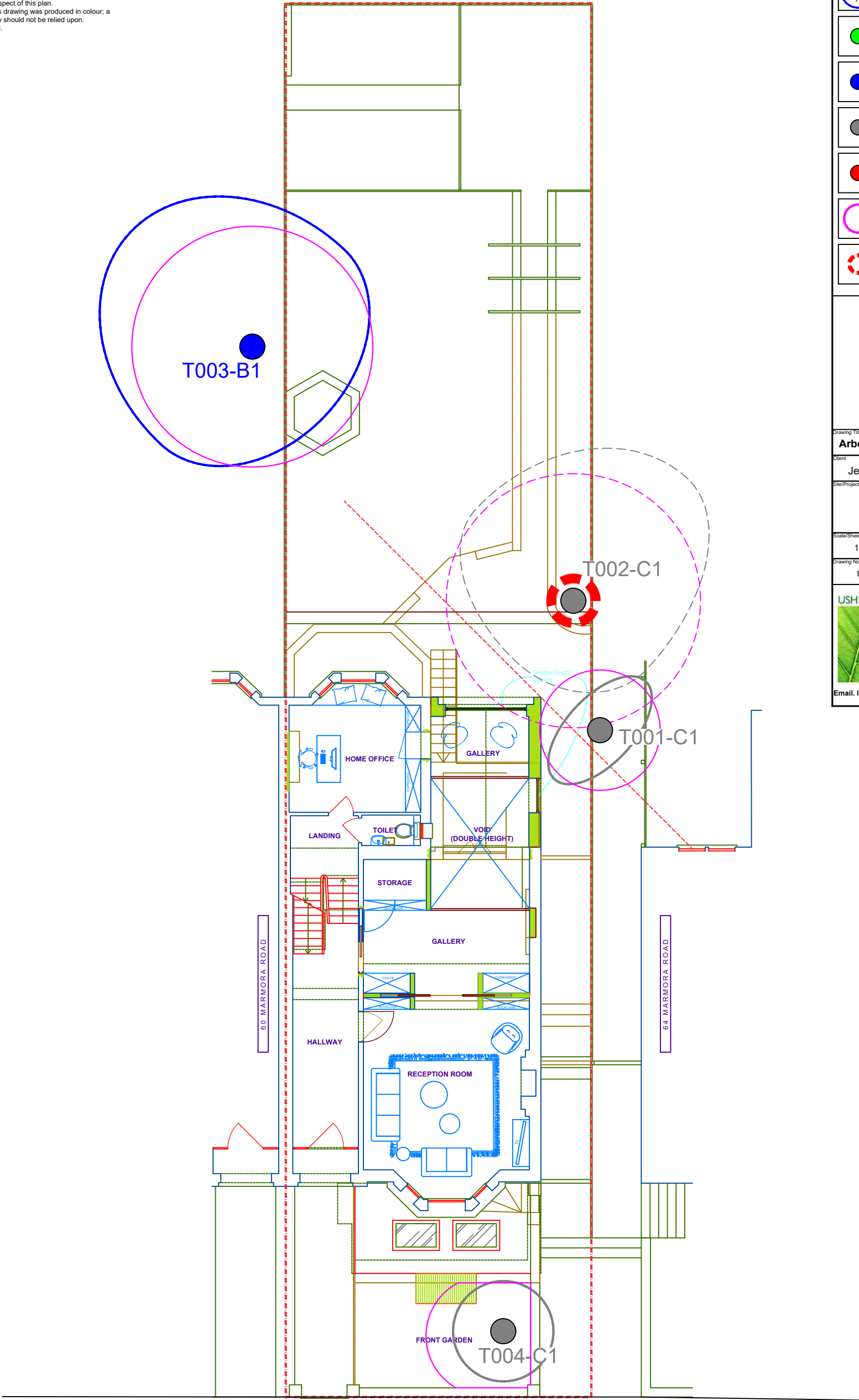
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## **Appendix C: Arboricultural Impact Plan**

**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.  
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Ground Floor



MARMORA ROAD

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.

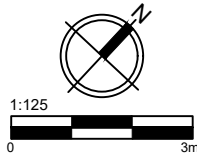
**Category B**  
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

**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**



Arboricultural Implication Plan

Client  
Jef Shah & Lisa Boden Shah

Site/Project  
62 Marmora Road,  
London, SE22 0RY

Scale/Sheet  
1:125 - A3

Date  
11/07/2024

Drawing No  
UA/AIP/1

Rev  
1

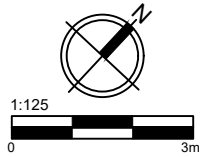
Drawn By  
CS

Checked By  
LU

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## **Appendix D: Tree Protection 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.  
All rights reserved.



## Ground Floor

### Key

	<b>Trees</b> Showing Canopy extents, category colour and tag number (with category).
	<b>Category A</b> Trees of high quality with an estimated remaining life expectancy of at least 40 years.
	<b>Category B</b> Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
	<b>Category C</b> 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.
	<b>Category U</b> 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.
	<b>BS 5837:2012 Root Protection Area</b>
	<b>Tree Protective Fencing</b>
	<b>Ground Protection</b>
	<b>CEZ</b> Construction Exclusion Zone

Install tree protective fencing in accordance with BS5837: 2012, Figure 3B. Fencing will be installed prior to the commencement of all works and will remain in place until construction is complete.

Install ground protection mats in accordance with the Arboricultural Method Statement. Ground protection will be installed prior to the commencement of all works and will remain in place until construction is complete.

Cut back overhanging growth from off-site T1 Elder.

MARMORA ROAD

Drawing Title			
Tree Protection Plan			
Client			
Jef Shah & Lisa Boden Shah			
Site/Project			
62 Marmora Road, London, SE22 0RY			
Scale/Sheet		Date	
1:125 - A3		11/07/2024	
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## **Appendix E: Tree Protective Fencing**

Figure 3 Examples of above-ground stabilizing systems

