

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



31 Downside Crescent
London
NW3 2AN

10th January 2022

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1. Instruction

Usherwood Arboriculture have been instructed to provide a tree survey, arboricultural impact assessment, method statement and tree protection plan with regards to the proposed erection of a single storey timber garden outbuilding at 31 Downside Crescent, London, NW3 2AN. 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
2132.PL.01	Existing Site Location & Block Plan	ecospace
2132.DAS.01	Design & Access Statement	ecospace
2132.PL.02	Proposed Floor Plan	ecospace
ECO.SWF.02	Proposed Foundations	ecospace
SHA.SO.01	Setting Out	ecospace

Table 1. Drawings and documents supplied for consideration within this report

2.Executive Summary

This document takes into account the potential impact of development upon trees both within and in close proximity to 31 Downside Crescent. A total of 4 individual trees have been surveyed, 1 individual tree within the adjacent open space to the immediate north and 3 within the site itself. A single small category C Yew tree will require removal in order to facilitate the proposed development whilst the building footprint will impinge upon under 5% of the root protection area of a mature Oak. Details within the arboricultural method statement and tree protection plan will ensure that all remaining trees are afforded maximum protection throughout the development.

3.The Site

The application site is located on the north side of Downside Crescent and within the Park Hill and Upper Park conservation area. The site is level and currently laid to grass with patio area. The rear garden is bounded by wooden fences to the east and west with a brick wall forming the rear northern boundary. A number of small trees and shrubs grow on the site perimeters with a large mature category A Oak tree dominating the garden landscape.

Soil conditions.

The British Geological Survey, Geology of Britain viewer describes the local bedrock geology as London Clay formation- clay, silt and sand, there are no details of the superficial material.

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 located within the Park Hill and Upper Park conservation area, however, Usherwood Arboriculture has not carried out a statutory check with regards to tree preservation orders.



Aerial image above, courtesy of Google Maps, showing 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 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 have been observed, the relevant parties have been 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 1**. An explanation of Tree Quality category ratings is set out on the previous page.

Category A individual trees and groups of trees.

1 individual tree has been graded as category A (trees of high quality) as part of this survey.

Category B individual trees and groups of trees.

No individual trees have been graded as category B (trees of moderate quality) as part of this survey.

Category C individual trees and groups of trees.

3 individual 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 individual trees have been graded as category U (trees unsuitable for retention) as part of this survey.

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

Common Name	Botanical Name
Cherry sp	Prunus sp
Common Ash	Fraxinus excelsior
Common Yew	Taxus baccata
Pedunculate Oak	Quercus robur

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

T1 Oak & T2 Off-site Ash



Images above of the mature category A Oak tree situated in the north-east corner of the garden and the second image of T2 off-site category C Ash, recently topped to a 5m high monolith with no remaining vegetative growth, so no longer considered a constraint to the proposed development.

T3 Common Yew & T4 Ornamental Cherry



Images above of the category C Common Yew to be removed to facilitate construction and T4 early mature Cherry that will remain in situ alongside the proposed garden outbuilding.

6. Arboricultural Impact Assessment

The term Arboricultural Impact Assessment is self-explanatory. It 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 proposal to construct a timber garden outbuilding upon a system of 12 pads should have no impact upon nearby trees.

A single category C Yew tree (T3) will require removal but could easily be replaced elsewhere within the subject garden.

T1 category A mature Oak grows in the north-east corner of the garden which is largely level and laid to lawn. The proposed building will be situated on the opposite side of the garden in a location approximately 400mm lower than the surrounding ground as shown below.



Images above showing the proposed location for the garden building, set at a lower level than the main part of the garden and divided with a stepped sleeper arrangement. The lower section of garden is currently laid to a small section of hardstanding and rubber tiles, to be removed prior to construction. The yellow dashed lines represent the potential area of ground to be cut back.

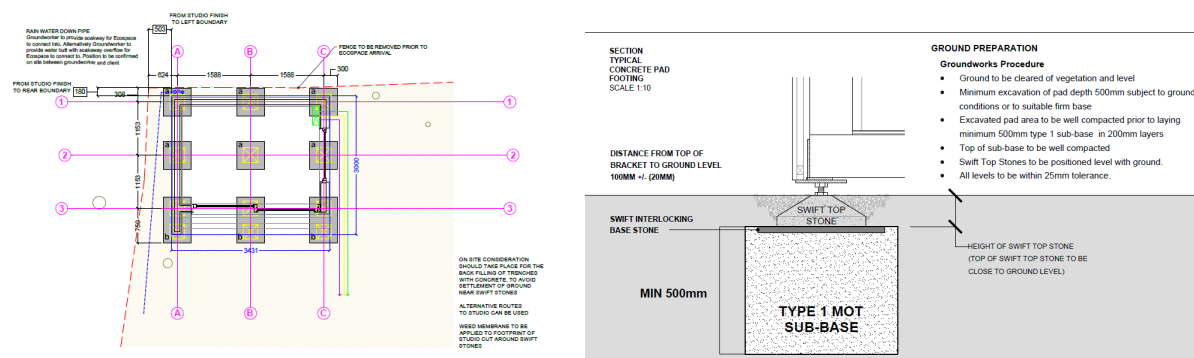
The proposed building will extend a small distance into the higher ground, requiring careful hand excavation of a small section of ground within the root protection area of T1 as shown on the arboricultural impact plan at appendix 3.

At a distance of over 11 metres from T1, the careful excavation and pad construction should have no impact upon the category A Oak tree.

The category C off-site Common Ash tree (T2) would previously have been considered a constraint to development, however, the tree has recently been ‘topped’ to a five metre high standing monolith with little potential to develop a meaningful crown, therefore, a root protection area has not been shown for T2.

Proposed construction detail

The timber garden building will be constructed upon a series of pads, dimensions 500mm x 500mm x 600mm depth.



The image above is an extract from ecospace documents SHA.20.01 and ECO.SWF.02 showing foundation layout and section detail.

The pads will be hand dug and any exposed roots carefully cut back to the excavation edge as set out within the arboricultural method statement.

The pads will comprise compacted type 1 with no leachates.

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 elongate with new extension growth.

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 of London Clay. therefore the risk of soil compaction is considered to be moderate. However, due to the proximity of the subject tree to the proposal, the risk has been reduced to low to non-existent.

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. It is not expected that significant roots will be encountered as sufficient distance has been allowed between the RPA's of retained trees and the proposed outbuilding, however, where roots are encountered, a protocol for root pruning has been included within the arboricultural method statement.

Proposed services

The outbuilding will require an electrical and water supply, as well as a foul water connection. There are currently no details of the proposed service routes, however, we recommend that services are installed along the eastern site boundary away from the root protection area (RPA) of T1 Oak.

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) should be described within an arboricultural method statement, to demonstrate that the operations can be undertaken with minimal risk of adverse impact to retained trees.

The methodology will provide sufficient protection to the rooting environments of all trees within the vicinity of the proposed construction throughout the duration of works.

Phase 1-Access facilitation and pre start tree works.

- Remove T3 Yew and reduce lateral branch spread of T4 Cherry in the northerly direction.
- Project arboriculturalist to mark out location of tree protective fencing.
- Fencing has been positioned to allow sufficient space to excavate additional ground and construct the timber outbuilding.

Phase 2- Installation of protective fencing.

- 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 stabelizer strut. Two clamps either end of each section will ensure the area within the fence (CEZ) remains out of bounds to demolition activities throughout the duration of works.



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

Phase 3- Excavation and construction of outbuilding

- Once the tree protection measures have been implemented, construction works may commence.
- The existing concrete pad will be broken up with the use of hand held machinery only. Rubber tiles will be removed along with any subbase.
- A precautionary approach should be taken during the start of the excavation, especially in proximity to the tree protective fencing.
- Ground workers will remove the existing railway sleeper edging and dig the exposed ground back to the lower adjacent level in 200mm sections.
- If any significant roots are encountered, they should be dealt with as set out within box 1 below.

If any tree roots are encountered during the excavation process, roots up to 25mm shall be cut back with a sharp pair of by-pass loppers, except where they occur in clumps. Roots occurring in clumps or of 25mm diameter and over should be severed only following consultation with the project arboriculturalist or Local Authority tree officer.

If substantial tree roots are to be left exposed for any length of time, these must be covered with a damp hessian rap to minimize desiccation. Hessian should be removed immediately prior to backfilling with a suitable soil or sharp sand, not builders sand which contains sodium, detrimental to tree roots.

Box 1. Dealing with tree roots found during excavation works.

- Excavated material will be removed to the front of site via the side garden access.
- Pad holes will be excavated with the use of hand tools only and back filled with MOT type 1 material.
- Once the pads are in place, the timber framed building may be constructed in the normal manner without the need for specific arboricultural measures.
- The project arboriculturalist will be available at all times to advise on any issues that may arise should further tree roots be encountered.

Site supervision and pre-commencement meeting

- The pre-commencement meeting should take place following the erection of protective fencing, this is in order for the project arboriculturalist to clarify that tree protection measures have been correctly implemented prior to the commencement of construction works. There should be no requirement for further arboricultural supervision on this particular scheme.

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 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.

8. Conclusion

It is my opinion that provided the measures set out within this document are adhered to, there should be no adverse impacts upon any of the retained trees, I therefore suggest that this application should be regarded as being arboriculturally acceptable.

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 fifteen 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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Usherwood Arboriculture

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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

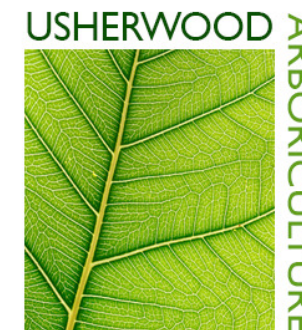
Mature - Trees in the fourth fifth of full life expectancy

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.

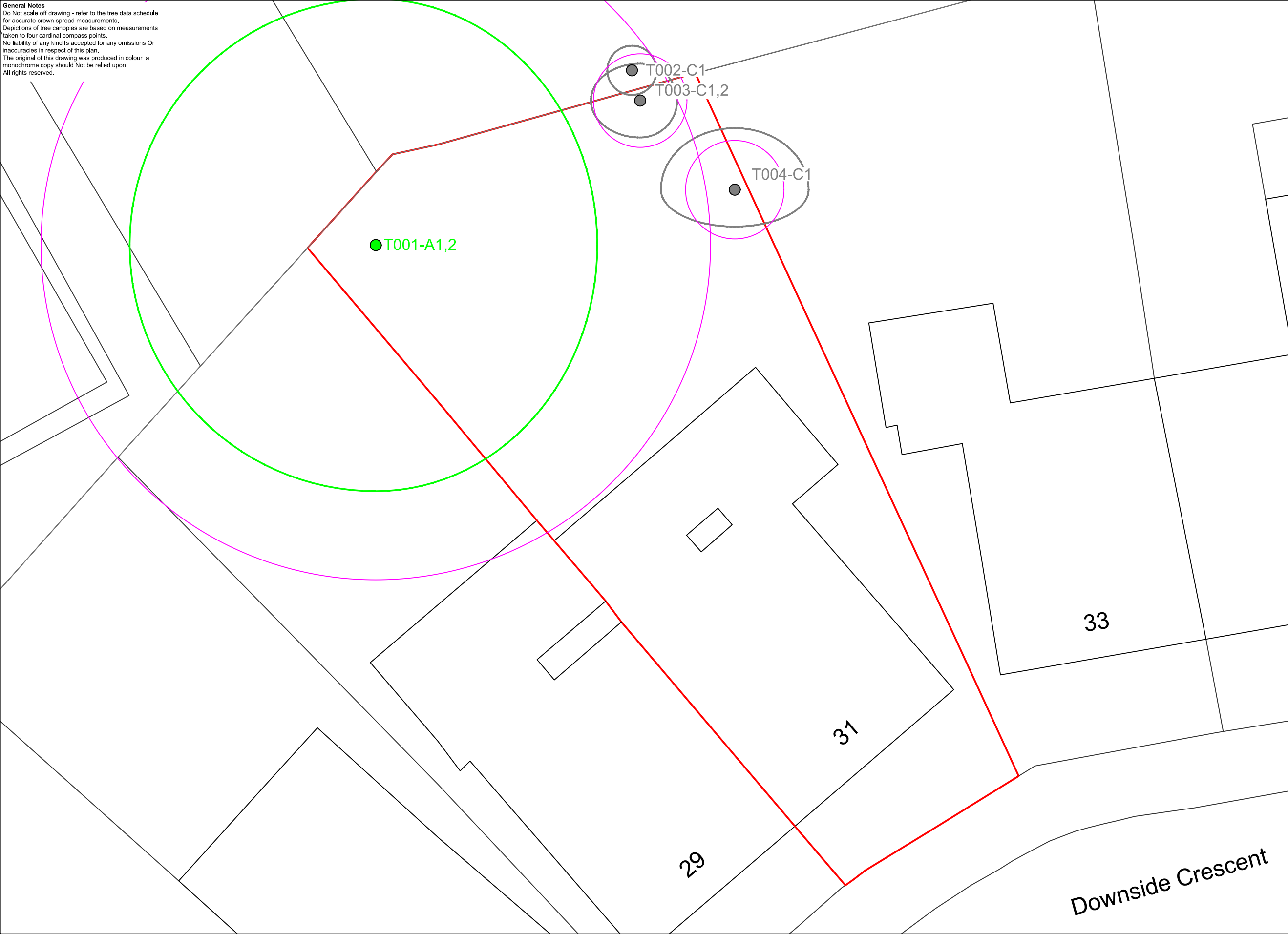
BS5837 Survey Data



Ref.	Species	Measurements	General Observations	Category	Recommendations
T001	Pedunculate Oak (<i>Quercus robur</i>)	Height (m): 25 Stem Diam (mm): 1130 Spread (m): 10N, 9E, 10S, 10W Life Stage: Mature Rem. Contrib.: 40+ Years	Impressive garden tree with excellent crown structure in generally good condition.	A1,2 RPA Radius: 13.6m. Area: 581 sq m.	Protect RPA with tree protective fencing.
T002	Common Ash (<i>Fraxinus excelsior</i>)	Height (m): 5 Stem Diam (mm): 550 Spread (m): 1N, 1E, 1S, 1W Life Stage: Mature Rem. Contrib.: <10 years	A previous survey (2017) suggested the off-site tree had been recently pruned with a height of 15m. The tree has since been topped at a height of 5 metres with no remaining vegetative growth.	C1 RPA Radius: 6.6m. Area: 137 sq m.	No protection required.
T003	English Yew (<i>Taxus baccata</i>)	Height (m): 5 Stem Diam (mm): 160 Spread (m): 1.5N, 1.5E, 1.5S, 2W Life Stage: Semi Mature Rem. Contrib.: 40+ Years	Poor quality asymmetric tree growing on rear boundary.	C1,2 RPA Radius: 1.9m. Area: 11 sq m.	Remove prior to commencement.
T004	Cherry (<i>Prunus</i> sp. 'Cherry')	Height (m): 6 Stem Diam (mm): 170 Spread (m): 2.5N, 3E, 1.5S, 3W Life Stage: Early Mature Rem. Contrib.: 20+ Years	Unremarkable tree growing on east site boundary in close proximity to boundary fence. The tree will probably require removal in the medium term when it conflicts with the fence.	C1 RPA Radius: 2.0m. Area: 13 sq m.	Reduce lateral north facing growth to allow space between tree canopy and proposed building.

Appendix 2: Tree Constraints 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).

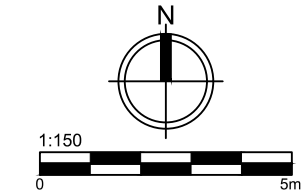
Category A
Trees of high quality with an estimated remaining life expectancy of at least 40 years.


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.

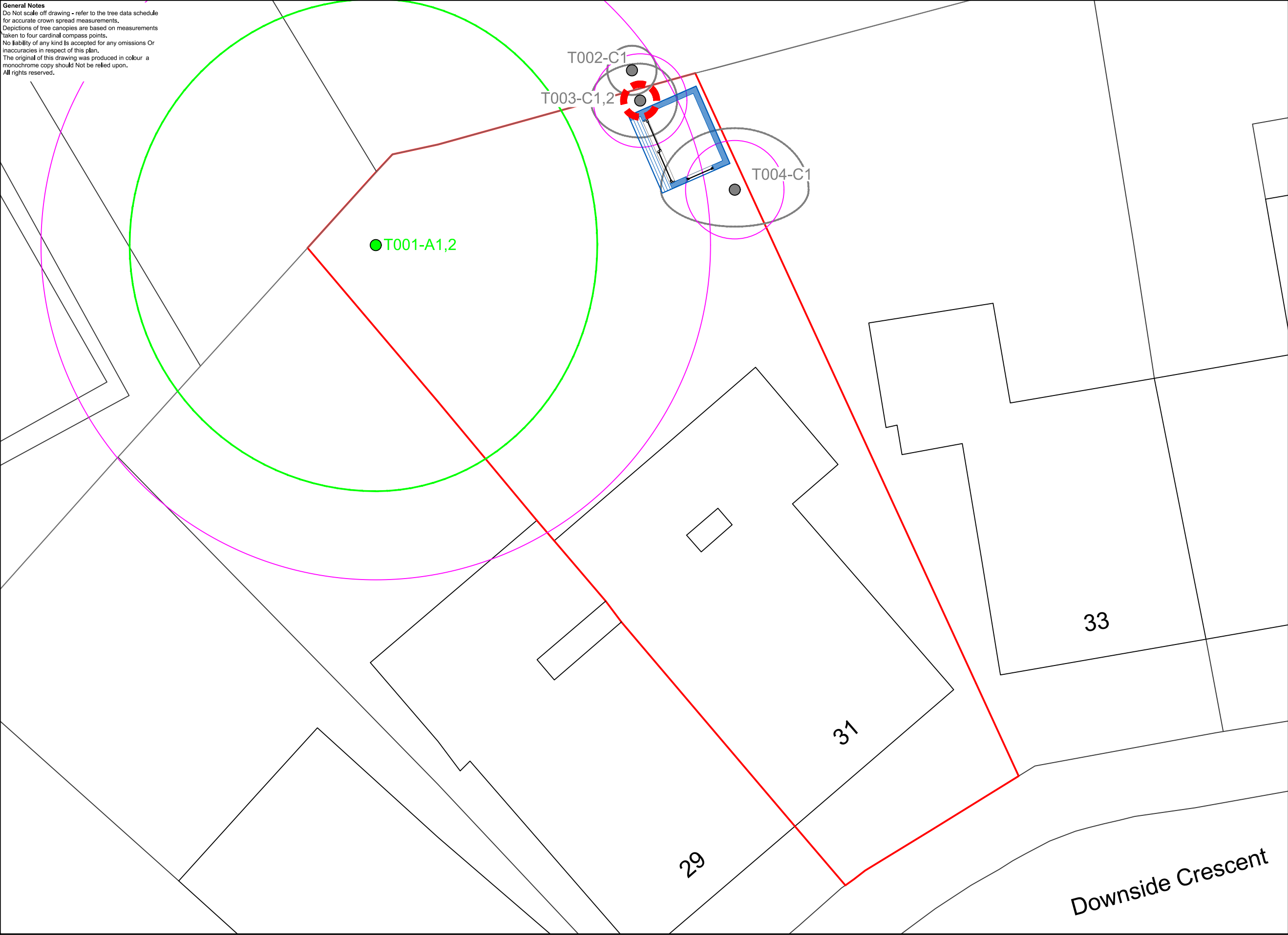
BS 5837:2012 Root Protection Area



Drawing Title				
Tree Constraints Plan				
Client				
Seema Shah				
Site/Project				
31 Downside Crescent, London, NW3 2AN				
Scale/Sheet		Date		
1:150 - A3		9/1/2022		
Drawing No	Rev	Drawn By	Chkd By	
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		Mobile 07753 211306		
		Email, lawrence@usherwoodarboriculture.co.uk		

Appendix 3: Arboricultural Impact Plan

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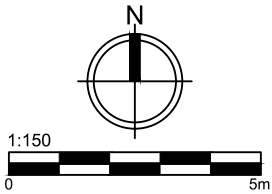
Category B
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

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
Seema Shah

Site/Project
31 Downside Crescent,
London, NW3 2AN

Scale/Sheet
1:150 - A3

Date
9/1/2022

Drawing No
UA/AIP/1

Rev
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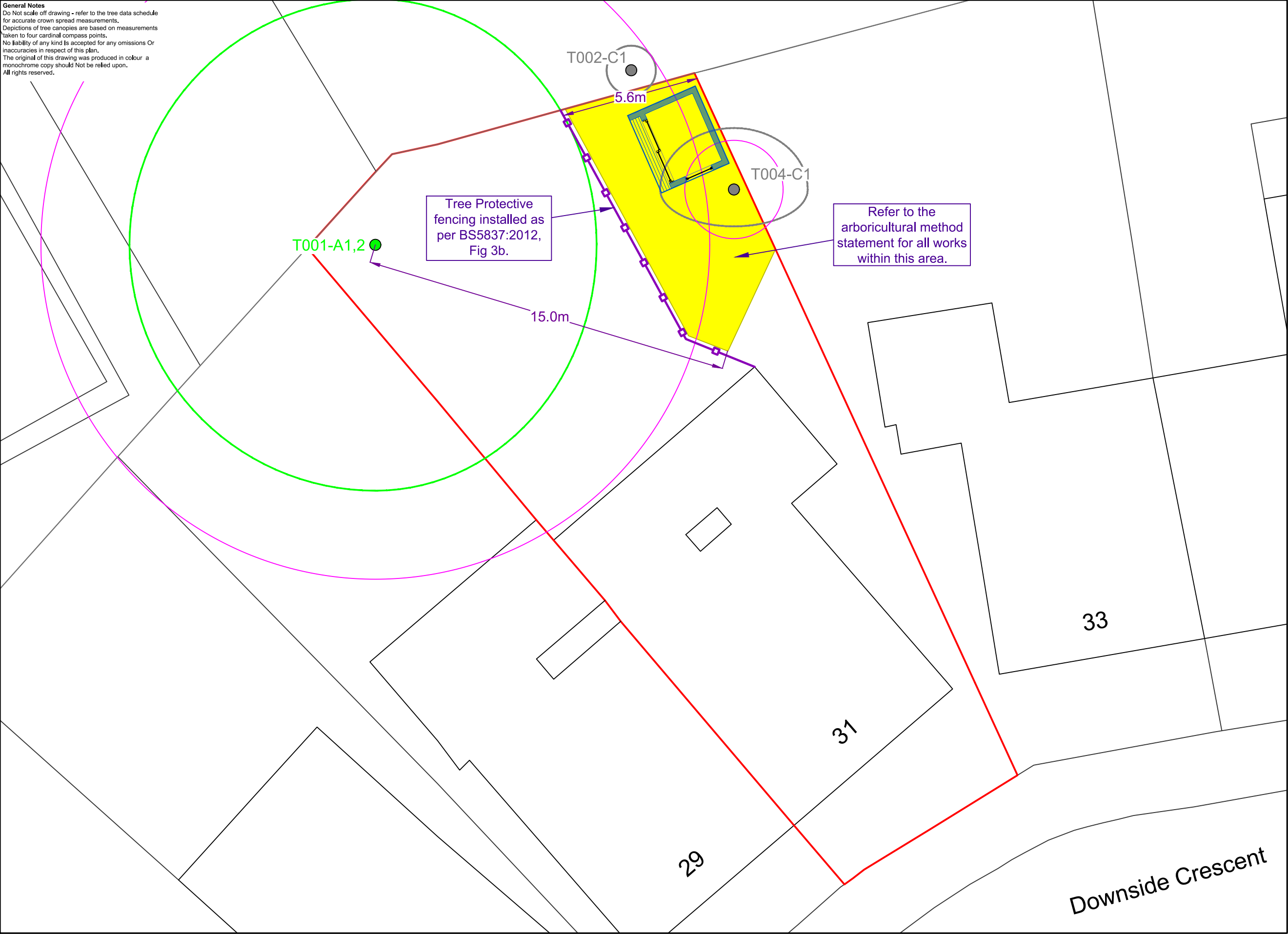
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Appendix 4: Tree Protection Plan

General Notes
Do Not scale off drawing - refer to the tree data schedule for accurate crown spread measurements.
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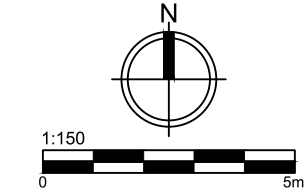
Category C
Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.

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 installed as per BS5837:2012, Fig 3b.

Refer to the arboricultural method statement for all works within this area.



Drawing Title
Tree Protection Plan

Client
Seema Shah

Site/Project
31 Downside Crescent,
London, NW3 2AN

Scale/Sheet
1:150 - A3

Date
9/1/2022

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Appendix 5: Tree Protective Fencing

Figure 3 Examples of above-ground stabilizing systems

