BS 5837:2012 Tree Survey & Arboricultural Impact Assessment

63 Netherall Gardens
London
NW3 5RE

6th February 2024

Contents Page

Tables

Appendices

1. Tree Survey Schedule
2. Tree Survey Plan
3. Arboricultural Impact Plan

1. Instruction

Usherwood Arboriculture have been instructed to provide a tree survey and arboricultural impact assessment with regards to the "demolition of existing extension and erection of a new single-storey rear extension with roof lights, windows on side elevation, new bin and bike store, alterations to entrance and new meter cupboard"at 63 Netherall Gardens, London, NW3 5RE. 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
49111_01_P	Existing Topographical Survey	Greenhatch Group
FF23-014-PL-004	Existing Ground Floor Plan	Fraher & Findlay
FF23-014-PL-014	Proposed Ground Floor Plan	Fraher & Findlay

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

2.Executive Summary

This document looks at the potential impact of development upon 8 individual trees, 1 tree group and 5 shrubs both within and in proximity to the application site. A single category C Cherry tree and 2 category C shrubs are to be removed from the front garden in order to facilitate the construction of a bin store. Due to the location of trees and existing hard landscape features including walls and raised beds, there will be no impact on trees situated within the rear garden or nearby in surrounding properties and no tree protection measures are considered necessary for this scheme.

3.The Site

The application site comprises a Victorian semi-detached house split into 3 apartments with. The front garden has previously been landscaped with small mature trees, shrubs, and perennial garden plants growing behind a boundary wall. The rear garden is generally level with raised planters bounding the garden edge. Semi/early mature trees and shrubs grow within the raised beds whilst a higher 2.7m wall divides the site from surrounding properties.

Soil conditions.
The British Geological Survey, Geology of Britain viewer describes the local bedrock geology as Claygate Member- Clay, silt and sand. There is no specific information on local superficial geology.

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 Fitzjohns/Netherall Conservation Area, we have not carried out a check with regards to tree preservation orders.

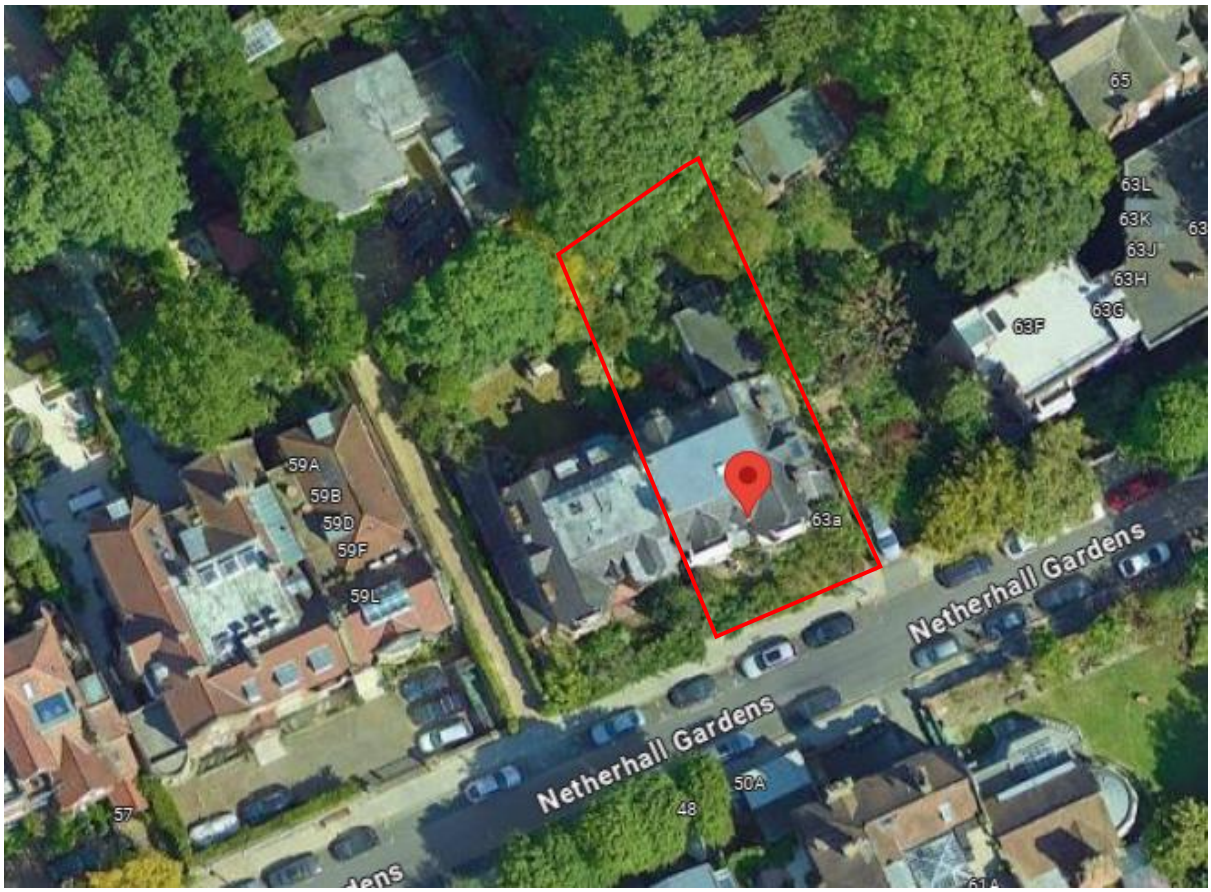


Image above, courtesy of Google Maps with the application site outlined in red.

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 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 8 individual trees, 1 tree group, and 5 shrubs, 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.
3 trees have been graded as category B (trees of moderate quality) as part of this survey.

Category C individual trees and groups of trees.
5 individual trees, 1 tree group, and 5 shrubs 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.

11 tree and shrub 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
Berberis	Berberis sp.
Cherry	Prunus sp.
Chinese Tree Privet	Ligustrum lucidum
Common Holly	Ilex aquifolium
Elder	Sambucus nigra
False Acacia	Robinia pseudoacacia
Horse Chestnut	Aesculus hippocastanum
Maple	Acer sp.
Mock Orange	Philadelphus sp.
Privet	Ligustrum vulgare
Turkey Oak	Quercus cerris

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

Front garden trees mainly comprise mature shrubs with 2 small category C trees of low quality.

Rear garden trees are confined to a raised walled bed on the site's west boundary, with 3 large mature trees located off-site in gardens to the northwest and north east. Off-site trees grow beyond the site's boundary walls limiting a more detailed inspection.

Importantly, it is expected that root growth from the large off-site mature trees will be restricted by the boundary walls and inner lower retaining walls.

Site Photos- Front garden.

Photo above showing front garden trees and shrubs, 2 shrubs and a single tree, T2 Cherry will require removal in order to install a bin area.

Photo above showing 2 shrubs and a smal category C Cherry tree to be removed in order to install a bin area.

Site Photos- Rear garden and beyond.

Photo above of semi-mature-early-mature trees on the western site boundary, root systems are unlikely to have grown beyond the retaining wall.

Photos above showing the three category B off-site trees. Boundary and retaining walls are likely to have curtailed any significant root growth within
the application site.

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 proposed development requires the removal of a single category C Cherry tree and 2 shrubs.

Removal is required in order to facilitate the installation of a new bin store.

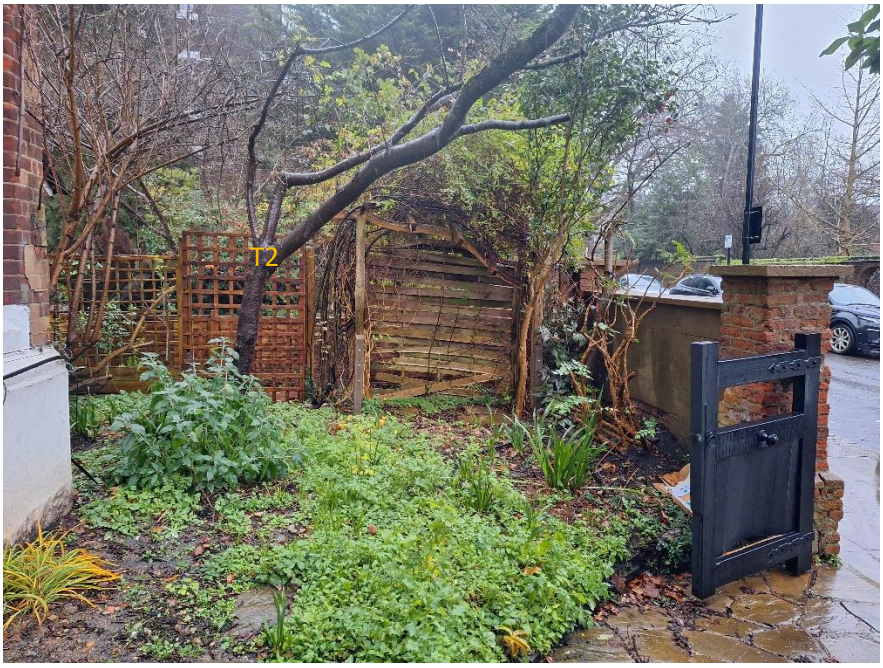


Photo above of T2 Cherry to be removed to facilitate the installation of bin store.

T2 Cherry is a generally low quality tree with poor structural form, its removal will have a minimal impact upon the verdant character of the Conservation Area.

Mitigation for tree loss may include the planting of suitable replacement trees, Usherwood Arboriculture can recommend suitable species for a constrained front garden location on clay soil.

Works in proximity to rear garden trees.

Proposed works include the demolition of the existing rear extension and erection of a replacement single-storey rear extension.

The footprint for the proposed extension is similar to existing with no expected impact upon nearby trees.

Photo above of the existing extension to be demolished and replaced.

Rear garden and off-site trees-

A number of trees and shrubs are situated within the rear garden and growing in raised beds. The trees are within the semi-mature-early mature age category and we suggest that significant root growth does not extend beyond the confines of the beds.

Photos above showing trees and shrubs within the raised beds that are likely to have curtailed significant root growth.

T12 Oak**, T13** Horse chestnut & **T14** Chinese Privet are all large, mature, category B trees growing in gardens directly outside of the site.

The 3 trees are located beyond a 2.7 metre high boundary wall which in turn is located behind the aforementioned raised beds, therefore, we have interpreted the root protection areas (RPAs) as modified shapes curtailed by boundary wall foundations.

We accept that some roots may extend beneath the boundary wall foundations although these are likely to be few in number and not of a significant size.

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 Claygate Member-Clay, silt and sand, therefore the risk of soil compaction is considered to be high. However, due to existing site conditions and the nature of the proposed development, the risk of compaction damage to existing tree roots is low to non-existent.

Root severance

As previously mentioned, 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 discover or expose any roots from existing trees within the application site.

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.

In this instance, an arboricultural method statement is not required beyond the prosed removal of T2 Cherry and adjacent shrubs.

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

- Tree surgeon to remove T2 Cherry and adjacent shrubs.
- No further specific arboricultural measures required.

8. Conclusion

The proposal requires the removal of a single category C tree of low quality along with 2 adjacent shrubs. We suggest that a more suitable replacement tree is specified to be planted elsewhere within the front garden. Remaining rear garden and off-site trees are adequately protected by existing hard landscape features hence the absence of a detailed Arboricultural Method Statement.

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

Phone: 07753 211306
email: lawrence@usherwoodarboriculture.co.uk
http://usherwoodarboriculture.co.uk/

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

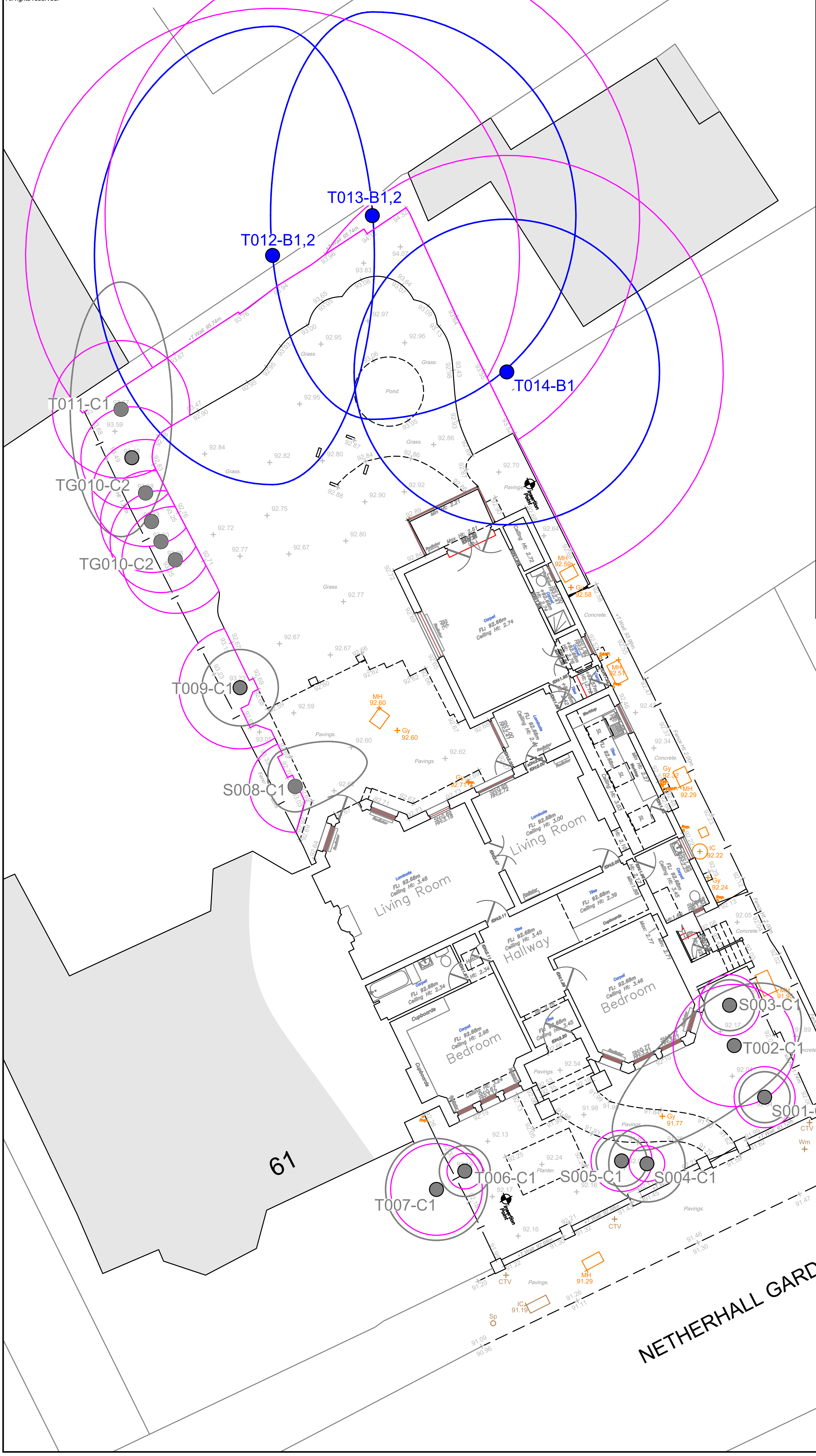
Ref.	Species	Measurements	General Observations	Category	Recommendations
S001	Holly (Ilex sp.)	Height (m): 3 Stem Diam(mm): 100 Spread (m): 1N, 1E, 1S, 1W Life Stage: Early Mature Rem. Contrib.: 10+ Years	Unremarkable Holly and Camelia.	C1 RPA Radius: 1.2m. Area: 5 sq m.	Remove to facilitate development.
S003	Mock Orange (Philadelphus sp.)	Height (m): 3 Stem Diam(mm): 100 Spread (m): 1N, 1E, 1S, 1W Life Stage: Mature Rem. Contrib.: 10+ Years	Unremarkable shrub.	C1 RPA Radius: 1.2m. Area: 5 sq m.	Remove to facilitate development.
S004	Privet (Ligustrum vulgare)	Height (m): 3 Stem Diam(mm): 60 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Early Mature Rem. Contrib.: 10+ Years	Unremarkable large shrub.	C1 RPA Radius: 0.7m. Area: 2 sq m.	No protection required.
S005	Not identified (Not identified)	Height (m): 2.5 Stem Diam(mm): 100 Spread (m): 1N, 1E, 1S, 1W Life Stage: Mature Rem. Contrib.: 10+ Years	Unremarkable member of Privet family.	C1 RPA Radius: 1.2m. Area: 5 sq m.	No protection required.

Ref.	Species	Measurements	General Observations	Category	Recommendations
S008	Berberis (Berberis sp.)	Height (m): 2.5 Stem Diam(mm): 100 Spread (m): 1N, 1E, 1.5S, 3W Life Stage: Mature Rem. Contrib.: 10+ Years	Multi-stemmed shrub in raised bed leaning south-west. May remove due to asymmetric canopy extending close to building.	C1 RPA Radius: 1.2m. Area: 5 sq m.	No action required although applicant may wish to remove.
T002	Cherry (Prunus sp. 'Cherry')	Height (m): 5 Stem Diam(mm): 200 Spread (m): 2N, 3E, 2S, 6W Life Stage: Mature Rem. Contrib.: <10 years	Structurally poor autumn flowering Cherry.	C1 RPA Radius: 2.4m. Area: 18 sq m.	Remove to facilitate development.
T006	Elder (Sambucus nigra)	Height (m): 3.5 Stem Diam(mm): 60 Spread (m): 1N, 1E, 1S, 1W Life Stage: Early Mature Rem. Contrib.: 10+ Years	Leaning elder with poor form.	C1 RPA Radius: 0.7m. Area: 2 sq m.	No protection required.
T007	Holly (Ilex sp.)	Height (m): 6 Stem Diam(mm): 150 Spread (m): 2N, 2E, 2S, 2W Life Stage: Early Mature Rem. Contrib.: 10+ Years	Unremarkable sparse off-site tree.	C1 RPA Radius: 1.8m. Area: 10 sq m.	No protection required.
T009	Maple (Acer sp.)	Height (m): 4 Stem Diam(mm): 150 Spread (m): 1.5N, 1.5E, 1.5S, 1.5W Life Stage: Early Mature Rem. Contrib.: 20+ Years	Attractive small garden tree growing in raised bed.	C1 RPA Radius: 1.8m. Area: 10 sq m.	No protection required.
T011	False acacia (Robinia pseudoacacia)	Height (m): 8.5 Stem Diam(mm): 220 Spread (m): 5N, 2E, 5S, 2W Life Stage: Semi Mature Rem. Contrib.: 20+ Years	Growing within raised bed at the rear of garden, asymmetry to southwest.	C1 RPA Radius: 2.6m. Area: 21 sq m.	No protection required.
T012	Turkey oak (Quercus cerris)	Height (m): 18 Stem Diam(mm): 650 Spread (m): 9N, 4E, 9S, 7W Life Stage: Mature Rem. Contrib.: 40+ Years	Off-site Ivy-clad tree situated behind 3.5m high boundary wall. Previously reduced.	B1,2 RPA Radius: 7.8m. Area: 191 sq m.	No protection required.

Ref.	Species	Measurements	General Observations	Category	Recommendations
T013	Horse chestnut (Aesculus hippocastanum)	Height (m): 18 Stem Diam(mm): 750 Spread (m): 8N, 8E, 8S, 4W Life Stage: Mature Rem. Contrib.: 40+ Years	Off-site tree growing behind 3.5m high boundary wall.	B1,2 RPA Radius: 9.0m. Area: 254 sq m.	No protection required.
T014	Chinese Tree Privet (Ligustrum lucidum)	Height (m): 13 2 stems (mm): 400,350 Spread (m): 6N, 6E, 6S, 6W Life Stage: Mature Rem. Contrib.: 20+ Years	Off-site twin-stemmed tree growing behind boundary wall making inspection difficult.	B1 RPA Radius: 6.4m. Area: 129 sq m.	No protection required.
TG010	Mixed species (Mixed species) Maple (Acer sp.) Holly (Ilex sp.)	Height (m): 5 3 stems, avg.(mm): 150 Life Stage: Early Mature Rem. Contrib.: 20+ Years	Mixed linear tree group growing within raised bed.	C2 RPA Area: 42 sq m.	No protection required.

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.



Key

T1-B	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

N

1:150
0 5m

Drawing Title
Tree Constraints Plan

Client
Fraher & Findlay

Site/Project
63 Netherhall Gardens,
London, NW3 5RE

Scale/Sheet	Date		
1:150 - A3	03/01/2024		
Drawing No	**Rev**	**Drawn By**	**Chked By**
UA/TCP/1	1	CS	LU

USHERWOOD ARBORICULTURE
© Copyright
Lawrence Usherwood
Tel. 01883 340398
Mobile 07753 211306
Email. lawrence@usherwoodarboriculture.co.uk

Appendix 3: 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.
The original of this drawing was produced in colour; a monochrome copy should not be relied upon.

T013-B1,2
T012-B1,2
T014-B1
T011-C1
TG010-C2
TG010-C2
T009-C1
S008-C1
T006-C1
T007-C1
S005-C1
S004-C1
S003-C1
T002-C1
S001-C1
Fence height: 1.05m
Wall height: 2.7m
Fence height: 2m
Powed path
61
NETHERHALL GARDENS

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/Shrubs for Removal

N

1:150
0 5m

Drawing Title
Arboricultural Implication Plan

Client
Fraher & Findlay

Site/Project
63 Netherhall Gardens,
London, NW3 5RE

Scale/Sheet	Date		
1:150 - A3	06/02/2024		
Drawing No	Rev	Drawn By	Chked By
UA/AIP/1	1	CS	LU

USHERWOOD ARBORICULTURE
© Copyright
Lawrence Usherwood
Tel. 01883 340398
Mobile 07753 211306
Email. lawrence@usherwoodarboriculture.co.uk