BS 5837 Arboricultural Report

Impact Assessment & Arboricultural Method Statement

at
133 King Henry's Road
Primrose Hill
London
NW3 3RD

Dated
29th November 2023

CROWN
Tree Consultancy
Branching out through England and Wales

Contents

1. Introduction

1.1. Instruction

1.1.1. We are instructed by Joe Ibbotson to:

- Undertake a Tree Survey to BS 5837 at 133 King Henry's Road and assess all trees potentially within influencing distance of proposed development within the site.
- Plot the trees on a Tree Constraints Plan and record the data in a Tree Data Schedule.
- Provide an overview of the site and any management recommendations.
- Determine if any trees are growing within a conservation area or are protected by a tree preservation order.
- Assess the potential impact of the development proposals and provide guidance as to appropriate mitigation measures.
- Produce an Arboricultural Impact Assessment for submission to the local authority.
- Produce a Tree Protection Plan and Arboricultural Method Statement specifying how the retained trees will be protected from accidental damage by demolition or construction activity.

1.2. Purpose of this Report

1.2.1. This report is produced according to the guidance and recommendations within *BS 5837: 2012 - Trees in Relation to Design, Demolition, and Construction.* It is tailored to accompany a planning application. It assesses the impact of all proposed construction works on the tree population. Tree removal, canopy pruning, and the impact upon roots from various groundworks are all considered in detail. Best practice mitigation is specified wherever appropriate.

1.2.2. The accompanying Arboricultural Method Statement specifies how the trees shall be protected from accidental damage by demolition and construction activities. It is designed to be enforceable and may be conditioned upon the granting of planning permission.

1.2.3. This document should not be used to inform management decisions relating to liability or risk management. Such decisions should be based on a more detailed inspection of the trees than was carried out for this report.

1.3. References

1.3.1. We have liaised with the project architect and our client to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals.

1.4. Survey Details

1.4.1. A visual ground-level assessment of all trees was undertaken on the 28th of May 2021 by Emma Hoyle. No climbed inspections or specialist decay detection were undertaken. Details of how the survey was undertaken can be found in Appendix 1.

1.4.2. The tree locations shown on the accompanying drawings are based on a measured drawing of the site supplied to Crown Tree Consultancy. This drawing had the tree positions already plotted. Where applicable, additional trees have been plotted by us according to measurements taken on-site.

1.5. Author

1.5.1. This report was compiled by Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A. Details of the author's experience that qualify her to produce such a report are detailed in Appendix 4.

2. Site Overview

2.1. Brief Site Description

2.1.1. Number 133 King Henry's Road is a detached, residential property with a landscaped garden at the rear and a paved area at the front.

2.1.2. The front garden is occupied by paving with a small mixed hedge along the front boundary and a Retention Category B Sycamore tree (T1) growing within a small planter. The front of the property has steps leading to the upper ground floor entrance and steps leading down to a lower ground floor entrance.

2.1.3. The rear garden is generally flat and occupied by a patio at the rear of the dwelling and a rectangular lawn. Planting beds run parallel to the eastern and western boundaries within trees and shrubs growing within. Trees within the rear garden of the property include six Retention Category C trees (T3, T4, T5, T7 and G9) and a Retention Category B Yew tree (T12).

2.1.4. In the adjacent rear gardens is a Retention Category A tree (T10), two Retention Category B trees (T8 and T11), a Retention Category C tree (T6) and a Retention Category U tree (T13). A Retention Category B Horse Chestnut tree (T2) also grows in the neighbouring property at the front. The roots of these trees may extend into the site.

2.1.5. The Tree Constraints Plan and Tree Data Schedule (see Appendix 6) should be referred to for descriptions and locations of all trees.

2.2. Coordinates

2.2.1. The site coordinates are 51°32'30.37"N 0°10'3.18"W, and the altitude is approximately 49m above sea level[1].

2.3. Survey Extent

2.3.1. The area indicated below[2] shows the extent of our survey.

[1] To access satellite imagery and street views of the site these co-ordinates may be entered into: http://maps.google.co.uk/

[2] Image taken from Google Earth and may not be current.

3. Vegetation Overview (independent of proposals)

This section summarises all the recommendations within the Tree Data Schedule regardless of whether trees are to be retained, felled or pruned to facilitate the proposed development. It does not specify works that may be required to facilitate the development proposals.

3.1. Preliminary Management Recommendations

3.1.1. The following recommendations are made in order to maintain the trees in an acceptable condition:

3.1.2. T11 is a mature Oak located in the neighbouring garden to the east. This tree was observed to have small scattered dead branches throughout its canopy and one significant dead branch which overhangs the garden of the subject property (133 King Henrys Road). We recommend the deadwood is removed from the trees canopy to prevent it from falling in windy weather conditions.

3.1.3. T13 is a small dead tree also located within the adjacent neighbouring garden. We recommend this dead tree is removed.

3.1.4. All other trees were deemed to be in satisfactory condition.

3.2. Work Priority and Future Inspections

3.2.1. The table below suggests a schedule for completing the works recommended in the Tree Data Schedule based on the perceived risk:

Work Priority	Definition	Tree Number
Urgent	As soon as possible	None
Very High	Within 1 Month	None
High	Within 3 Months	None
Moderate	Within 1 year	T11 and T13
Low	Within 3 years	None

3.2.2. The table below suggests a schedule of future inspections based on the condition and location of each tree:

Inspection Frequency (years)	Tree Number
0.5	None
1	None
1.5	T4 and T11
3	T1, T2, T3, T5, T6, T7, T8, G9, T10 and T12

3.2.3. The trees should be inspected sooner if there is a noticeable decline in their condition or following extreme weather events.

3.3. Species Present – Additional Information

3.3.1. The table below contains general information about the tree *species* (rather than the actual tree *specimens*) included in the survey. Its purpose is to assist readers who are unfamiliar with the characteristics of the various species.

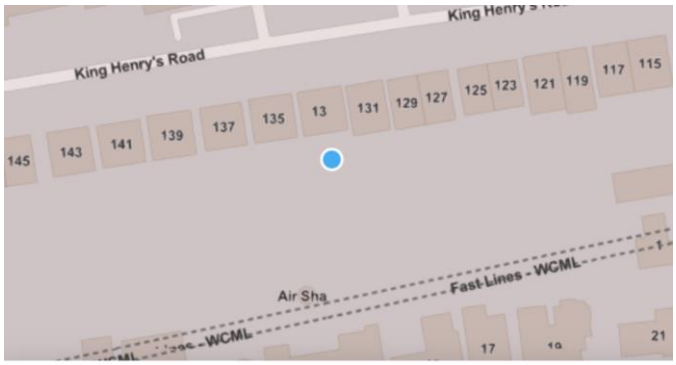
Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Copper Beech	27	20	Purple variety of the common beech. A majestic tree with grey bark and purple leaves. The best forms are grafted though this species does occasionally appear in the wild. Visit http://en.wikipedia.org/wiki/Fagus_sylvatica for more info.
Hawthorn	6	6	Arguably Britain's most common tree due to its abundance in field and roadside hedges. Deciduous, prickly and one of our most hardy trees, it will tolerate almost all conditions including drought, pollution and coastal winds. Also known as Mayflower because of its abundance of white flowers in May. Red 'haws' ripen from September to November and have only one pip (unlike Midland hawthorn which contains 2 pips). Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Crataegus+monogyna for more info.
Horse Chestnut	25	18	Deciduous tree native to Albania and N Greece. Naturalised throughout the UK. Iconic landscape tree. Susceptible to attack by Bleeding Canker, as well as Leaf Miner and Leaf Blotch. Should be inspected regularly if located close to high public use areas. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Aesculus+hippocastanum for more info.
Oak	22	18	Deciduous, long lived tree native and common throughout Europe with very durable timber. Excellent habitat tree - provides food and shelter for thousands of native species. Can be very attractive as a mature open grown specimen though not particularly ornamental, having no autumn colour or showy flowers. Responds well to pruning. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Quercus+robur for more info.
Pear	8	8	Deciduous tree native across Europe and W Asia. Hundreds of cultivars available due to its popular fruit. White flowers in spring along with bright green foliage. More upright growth habit than most apples.
Plum	6	8	Small fruit tree. Many varieties available. Usually white flowering. Fruits may be green, yellow, red or dark purple. Often quite an untidy looking tree.
Sycamore	25	16	Deciduous tree native to S. Europe, widely naturalised in the UK. Often regarded as a weed species due to its invasive nature and ability to tolerate most conditions. Responds well to pruning. Not a good tree to park beneath in summer due to the sticky sap secreted by aphids. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Acer+pseudoplatanus for more info
Yew	14	12	Evergreen species native throughout Europe. Commonly planted in churchyards. Once revered by ancient Britons and though to be the inspiration for our Christmas tree. Capable of remarkable regeneration and extreme longevity. Poisonous foliage and seeds. Slow growing. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Taxus+baccata for more info.

The figures quoted regarding typical height and canopy spread should be treated as approximate. Actual heights and spreads vary according to several environmental factors such as soil conditions, climate, and the presence of competing vegetation. The figures quoted are not the maximum dimensions that the species may attain.

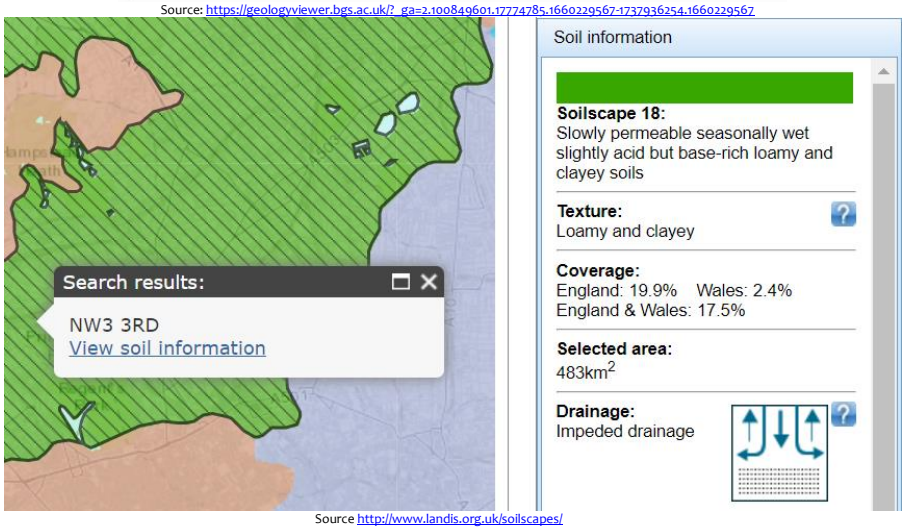
4. Local Geology and Soils

4.1. Desktop Research

4.1.1. Desktop research into local geology based on the postcode **NW3 3RD** obtained the following results:



Source: https://geologyviewer.bgs.ac.uk/?_ga=2.100849601.17774785.1660229567-1737936254.1660229567



Source http://www.landis.org.uk/soilscapes/

4.2. Site Investigations

4.2.1. We are unaware of any specific investigations into soil properties at the site.

4.3. Conclusion and Relevance

4.3.1. Based on the information reproduced in Section 3.1, local soils are assumed to have a loamy & clayey texture.

4.3.2. Loamy soils contain a mixture of clay and sand. Soil compaction may occur due to vehicular activity on building sites, so ground protection is recommended wherever vehicles operate. Most tree species will grow well in loamy soils.

4.3.3. Clay soils may be especially prone to compaction and slurrying caused by general construction activity. Both of which significantly impair root function. This must be guarded against using boards to protect any soils where roots are growing. When planting new trees, species should be selected that can tolerate heavy soils.

4.3.4. Trees of most species are less likely to root deeply in clay soils. Any new surfacing over tree roots should avoid deep excavation and have good load-spreading properties.

5. Statutory Protection – TPOs and Conservation Area Status

Before undertaking most works on trees protected by a tree preservation order[3], consent needs to be formally obtained from the local authority. Where trees are in a conservation area (but not protected by a TPO), works are generally not permitted without first giving the local authority six weeks' notice of intention[4]. Unauthorised works to protected trees, or trees in a conservation area, may result in criminal prosecution and a fine. Where works are required to implement a fully approved development, no such consent or notice is required.

5.1. Desktop Research

5.1.1. We were informed by Rav Curry of London Borough of Camden via email on the 13th of May 2021, that:

- The site lies within **Elsworthy Conservation Area**.
- There is a tree preservation order affecting a Sycamore tree at the front of the site. We believe this tree to be T1 (according to our numbering system).
- There are tree preservation orders affecting trees immediately adjacent to the site at the rear of 131 Kings Henry's Road. We believe T10 (according to our numbering system) is protected by a TPO.

5.2. Felling Licences

5.2.1. Felling licences issued by the Forestry Commission are sometimes required before removing trees. However, these licenses are aimed toward woodland and forestry management. Felling licences are NOT required for any of the following:

- Lopping, topping or pollarding.
- Removal of small trees (stem diameter less than 8cm) or fruit trees.
- Works to any trees growing within domestic gardens, orchards, or the Inner London boroughs.
- Operations involving less than five cubic meters of timber in any quarter year.
- Thinning and understorey clearing operations.
- Dangerous trees, nuisance trees, some diseased trees.
- Where removal is required to enable a fully approved development.

5.2.2. More detailed guidance can be found at https://www.gov.uk/government/publications/tree-felling-getting-permission

5.2.3. Hence a felling licence is **not** required relating to the trees surveyed.

[3] https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas

[4] During this time, the local authority may elect to create a tree preservation order or to inform the applicant that they have no objection to the proposed works. If the local authority does not respond within six weeks, then the intended work may be undertaken. Note: the local authority cannot refuse consent for works to trees within a conservation area; they may only create a tree preservation order if they wish to have further control over what works are undertaken.

6. Arboricultural Impact Assessment

6.1. Overview

6.1.1. It is proposed to construct a new single-storey rear extension as indicated on the drawings in Appendix 6. The existing layout is indicated in black, and the footprint of the proposed layout is indicated in pink.

6.1.2. The table below summarises the potential impact on trees due to various activities.

Activity	Trees Potentially Affected
Tree Removal: Retention Category A	None
Tree Removal: Retention Category B	None
Tree Removal: Retention Category C	T3, a young Buddleia and a 2m tall Amelanchier
Tree Removal: Retention Category U	None
Tree Pruning	T13
RPA: Building Foundations	None
RPA: Other Foundations	None
RPA: New Surface	T4
RPA: Replace Existing Hard Surface	None
RPA: Underground Services	None Anticipated
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent the construction area (preventable by installing tree protection measures)

6.1.1. Other potentially damaging activities often associated with construction sites include demolition or the careless use of plant machinery, hazardous materials, or fires. All of the above potential impacts are considered in detail throughout this Section.

6.2. Tree Removal

6.2.1. All trees to be removed are indicated on the Impact Assessment Plan and are listed below:

6.2.2. **Retention Category A:** It is proposed to retain all Retention Category A trees.

6.2.3. **Retention Category B:** It is proposed to retain all Retention Category B trees.

6.2.4. **Retention Category C:** It is proposed to remove T3, a young Buddleia and a 2m tall Amelanchier. T3 is a relatively small tree (height 5.5m, diameter 28cm). It is located within a rear garden and has very limited visibility from public vantage points. It is considered to have a low amenity value and its removal shall not have a significant impact on local visual amenity. The loss of the young Buddleia and Amelanchier are not considered to be material planning considerations.

6.2.5. **Retention Category U:** No Retention Category U trees are to be removed as part of this development.

6.2.6. Details specific to each tree can also be found in the Tree Data Schedule.

6.3. Mitigation Planting

6.3.1. It is proposed to implement replacement planting to mitigate the loss of T3.

6.4. Impact on Tree Canopies

6.4.1. It is proposed to prune the overhanging foliage of T13 (a dead tree) back to the boundary. Such pruning of a Retention Category U tree is not considered to be a material planning consideration.

6.4.2. All other tree canopies shall be unaffected by the proposals.

6.5. Impact on Tree Roots

Building Foundations:

6.5.1. No new building foundations are proposed within the Root Protection Area of retained trees. Consequently, no restrictions on foundation design or implementation are considered necessary from an arboricultural perspective.

New Surfaces:

6.5.2. The Impact Assessment Plan indicates where it is proposed to install a new terrace (surface) over the Root Protection Area of T4.

6.5.3. The new surface shall be located beyond the BS 5837 (section 7.4.2.7) recommended maximum distance of 0.5m from any buttress roots. The actual distance from the new surface to the tree's stem shall be 1.78m and 2.6m.

6.5.4. The portion of the RPA of T4 that shall be affected is shown below:

Tree No	Total RPA (m^2)	Area of RPA affected (m^2)	% of RPA affected
T4	59	11.39	19.3%

6.5.5. The table shows that circa 19% of the RPA of T4 will be affected. This is less than the BS 5837 recommended maximum of 20% (BS 5837 Section 7.4.2).

6.5.6. To minimise the impact on roots, the following methodology is proposed:

- A suitable load spreading surface shall be in place at all times during demolition and construction activities.
- Only hand tools shall be used to remove existing turf.
- Excavation shall be limited to a maximum depth of 150mm. If any roots in excess of 50mm are encountered, all excavation shall cease, and the new surface shall be installed above them.
- No retaining edge or structure shall be used that requires any additional excavation.
- The finished surface and sub-base shall be porous to enable the passage of oxygen and water to the soils beneath.

6.5.7. These measures accord with industry best-practice and shall ensure impact on T4 shall be minimal.

Underground Services:

6.5.8. There is ample opportunity for service and drainage provision without the need to pass through the Root Protection Areas of any retained trees. The exact position of services should be agreed, and installation engineers should be made aware of the need to keep trenches outside of RPAs.

Changes in Ground Levels:

6.5.9. No changes to ground levels are proposed over Root Protection Areas.

Soil Compaction:

6.5.10. The majority of tree roots lie within the upper soil horizons. This is because the availability of oxygen decreases with depth, and roots need to breathe to stay alive. In addition, nutrients are more readily available in the form of organic matter close to the soil surface.

6.5.11. Healthy soils contain about 25% air space between solid particles. Increased loading of the soil caused by construction activity causes air to be squeezed out as the soil becomes compacted, preventing roots from breathing. Even an increase in pedestrian activity may cause some soil compaction.

6.5.12. It is important therefore that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. This may be done by installing protective fencing and ground protection measures.

6.6. Demolition Activities

6.6.1. Tree protection measures specified within an Arboricultural Method Statement should be installed prior to the commencement of all demolition activities (including soil stripping) to prevent any detrimental impact on tree health.

6.7. Waste and Materials Storage

6.7.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement spillage avoids all Root Protection Areas.

6.7.2. Areas designated for the storage of building materials and waste products will need to be approved by the local authority. Root Protection Areas should be avoided. Where this is not possible, suitable ground protection measures will need to be installed.

6.8. Cabins and Site Facilities

6.8.1. Consideration should be given to the location of any site welfare facilities in terms of potential impact on trees. Where it is proposed to install cabins or site facilities in Root Protection Areas, the project arborist should be consulted, and approval obtained from the local authority.

6.8.2. There is limited room for the siting of cabins and storage of materials / spoil during the construction phase so the logistics of the development shall need to be well organised to ensure that there is adequate space outside of the Tree Protection Zones for construction activity.

6.9. Boundary Treatments

6.9.1. We are not aware of any changes proposed to the existing boundary features that might impact upon trees.

6.10. Impact of Retained Trees on the Development

6.10.1. The foundations and any new surfaces should be designed to accommodate all potential impacts due to future tree rooting activity. These include potential vegetation related subsidence, vegetation related heave, and lifting of surfaces / light structures due to direct root pressure.

6.11. Summary

6.11.1. To enable the development, it is proposed to remove one Retention Category C Hawthorn (T3) and two small specimens from within the rear garden. The impact of tree removal on local amenity levels shall be minimal.

6.11.2. The canopy of a dead tree requires pruning back to the boundary.

6.11.3. No building foundations are to be installed within Root Protection Areas.

6.11.4. A new surface is proposed within the RPA of T4. A porous surface is proposed and is in accordance with BS 5837 recommendations. The new surface shall be installed sympathetically and with minimal excavation.

6.11.5. Adequate space has been allowed between the proposal and retained trees such that no future pressure to overly-prune or remove trees shall occur as a consequence of the proposal.

6.11.6. So long as suitable protection measures are implemented prior to construction, and mitigation planting is implemented, I see no arboricultural reasons why the proposal should not proceed.

6.12. Arboricultural Method Statement

6.12.1. BS 5837 recommends that a detailed methodology is agreed in the form of an Arboricultural Method Statement, which shall ensure that trees are well protected during the construction phase. This should detail all tree protection measures and limitations on construction activity. All of the issues raised within this Impact Assessment should be covered by the Method Statement.

7. Photographs

Refer also to the Tree Constraints Plan for photo locations.

Photo 1.

Photo 2.

Photo 3.

Photo 4.

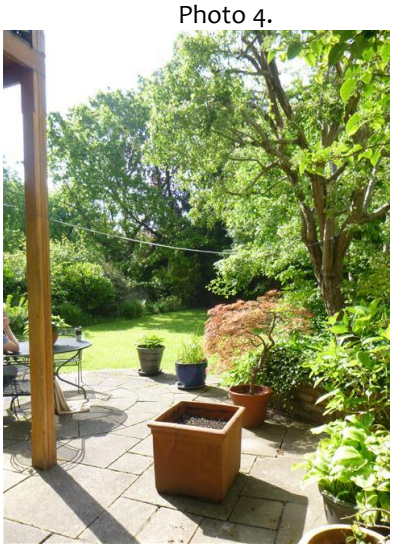


Photo 5.

Photo 6.

Photo 7.

Photo 8.

Appendix 1: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three-stage approach to ensure best practice is followed when developing close to trees:

A1.1 Stage 1: Survey Details and Notes

A ground level visual survey was undertaken. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm, which lie within the site boundary or relatively close to it, were included.

Where applicable, trees with significant defects have been highlighted and appropriate remedial works have been recommended. However, this report should not be seen as a substitute for a full *Safety Survey* or *Management Plan* which are specifically designed to minimise risk and liability associated with responsibility for trees.

Wherever practicable dimensions were obtained using diameter tapes, logger's tapes, distometers and clinometers. Where obstacles prevent accurate measurement, dimensions are estimated. Trees on privately owned third party are surveyed from the best available vantage point and observations relating to the condition of these trees should be treated accordingly. All height measurements should be regarded as approximate.

Data is recorded for each tree and is presented in a Tree Data Schedule. Each tree is allocated a ***Retention Category*** according to its size, amenity value, condition and safe useful life expectancy. The categories are allocated independently of development proposals. Our interpretation of the Retention Categories is explained below:

A1.1.1 Retention Categories

A Category: Trees of high quality and amenity value. Usually, mature trees with a significant life expectancy which would enhance any development. Retention of these trees is strongly encouraged.

B Category: Trees of moderate quality and amenity value. Usually these are maturing trees or younger trees with exceptional form. Retention of these trees is desirable though the removal of occasional specimens may be acceptable.

C Category: Trees of low quality or small specimens with a relatively low amenity value. These trees are not considered to be a material planning constraint and their removal will generally be seen as acceptable in order to facilitate development.

U Category: Trees of such low quality that their removal is recommended regardless of development proposals.

Occasionally trees are borderline and do not fall neatly into one of the categories A, B or C. In such cases we apply a superscript (**+/-**) such that:

C^{+} Indicates borderline C/B, though Category C is deemed to be most appropriate.

B^{-} Indicates borderline C/B, though Category B is deemed to be most appropriate.

The British Standard suggests that each of the A, B and C categories may be further subdivided (A1, A2, A3, B1, B2, B3 etc) such that subcategory 1 denotes mainly arboricultural values, subcategory 2 denotes mainly landscape values and subcategory 3 denotes mainly cultural values (including conservation). Multiple subcategories may be used.

Our experience suggests that these subdivisions lack clarity and can be confusing. Within this report subcategories are **not** denoted. Where appropriate, the use of phrases such as '*Part of a formal group'*, or '*Has a high ecological value'*, or '*Offers good screening to the site'* are incorporated into the observation section of the Tree Data Schedule. We believe this conveys all relevant landscape and cultural information without any confusion.

Tree Constraints Plan (TCP). This indicates the position, crown spread, Retention Category and Root Protection Area of each tree. It is used to inform where development may proceed without causing damage to trees.

Root Protection Area (RPA). This is the area around each tree likely to contain the majority of roots. It should ideally remain undisturbed to avoid a detrimental impact on tree health. For single stemmed trees It is calculated according to the formula "radius of RPA" = "12 x stem diameter". Where a tree has more than one stem, the equivalent-single-stem diameter is usually recorded. This is calculated by adding the squares of the stems and then finding the square root of this total. The radius of the Root Protection Area is then calculated by multiplying the equivalent-stem-diameter by 12.

Shade Constraints. The previous Standard (BS 5837 2005) suggested that shade constraints should be indicated on the TCP. This are denoted as a circle-segment drawn northwest to due east with a radius equal to the height of the tree. These do not represent the actual shade pattern which varies through the seasons. Rather, they indicate the area most shaded by the tree throughout the course of the year. Ideally habitable room windows should be located outside of these shade constraints. Where we consider it appropriate, we will include shade constraints information on our Impact Assessment Plan or Proposed Layout Plan.

A1.2 Stage 2: Arboricultural Impact Assessment

After the initial survey and the production of the Tree Constraints Plan, arborists and designers are encouraged to work together to establish a design proposal with minimal impact on the high quality trees. An assessment should be made of all possible impacts including the impact that the trees may have upon the proposal. The arborist may recommend mitigation strategies to minimise these impacts and help achieve a more harmonious juxtaposition between buildings and trees.

A1.3 Stage 3: Arboricultural Method Statement

This type of report specifies the measures necessary to protect trees against damage from construction activity. The Method Statement should be written in a manner that it may be conditioned and enforced by the local authority upon granting of planning permission. The site manager should be familiar with all aspects of the Method Statement and should ensure that all persons working on the site are aware of those aspects which appertain to their work. This includes service installation engineers and operators of plant machinery.

Appendix 2: Survey Methodology

Ground level visual surveys are carried out using the *Visual Tree Assessment* technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).

Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem-base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.

The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.

Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.

Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.

Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

Finally, a *Retention Category* is allocated as described in Appendix 1.1.1.

Appendix 3: Glossary of Tree Data

This section explains the terms used in the **Tree Data Schedule** (see Section 3 and Appendix 6).

A2.1 General Observations

Numbering System: Each item of vegetation has its own unique number prefixed by a letter such that T1=Tree 1, G2=Group 2, H3=Hedge 3 and W4=Woodland 4, S5=Shrub 5.

Age Categories:

Young	Usually less than 10 years old.
Semi-Mature	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
Early-Mature	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
Mature	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
Veteran	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
Over Mature	As for veteran except management is not considered worthwhile.

Species: Common names and Latin names are given.

Height: Measured from ground level to the top of the crown.

Stem Diameter: Taken at 1.5m above ground level where possible. On multi-stemmed trees this measurement may be taken at ground level, though usually an indication of the number of stems and average diameter is given, e.g. 3 x 30cm.

Crown Height: Measured from ground level to the height at which the main crown begins. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.

Tree Diagram: This scaled drawing is computer generated based on measurements taken for stem diameter, crown height and spread, and overall height. It is designed to help the reader rapidly assess the data. It is not an accurate representation of the form of the tree.

Crown Spread: Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.

Observations: If a tree's position is considered to be relevant it will be commented upon (e.g. overhanging a children's play area). Tree form and pruning history are also recorded along with an account of any significant defects. Defects and descriptive terms are dealt with in more detail at the end of this section.

Recommendations: Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.

Priority Scale: Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:

Urgent	To be carried out as soon as possible.
Very High	To be carried out within 1 month.
High	To be carried out within 3 months.
Moderate	To be carried out within 1 year.
Low	To be carried out within 3 years.

Inspection Frequency: An interval of 6 months, 1 year, 1.5 years or 3 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.

Vigour: An indication of growth rate and the tree's ability to cope with stresses:

High	Having above average vigour.
Moderate	Having average vigour.
Low	Having below average vigour.
Very Low	Tree is struggling to survive and may be dying.

Physiological Condition:

Good	Healthy and with no symptoms of significant disease.
Fair	Disease present or vigour is impaired.
Poor	Significant disease present or vigour is extremely low.
Very Poor	Tree is dying.

Structural Condition:

Good	Having no significant structural defects.
Fair	Some defects observed though no high priority works are required.
Poor	Significant defects found. Tree requires monitoring or remedial works.
Very Poor	Major defects which will usually require significant remedial works or tree removal.

Amenity Value:

Very High	Exceptional specimen, observable by a large number of people.
High	Attractive specimen, observable by a significant number of people.
Moderate	One of the above factors is not applicable.
Low	Unattractive specimen or largely hidden from view.

Life Expectancy: The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).

Retention Category: These are explained in detail in Appendix 1.

A2.2 Evaluation of Defects

Cavities, wounds, deadwood etc are all evaluated as follows:

Major	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
Significant	A defect that may over time become a major defect, though not necessarily so. This will depend on the vigour of the tree and its ability to deal with decay etc.
Minor	A defect thatis unlikely to develop into a major defect.

Appendix 4: Author's Qualifications

Qualifications & Experience of Ivan Button N.C.H. (Arb), FDSc (Arb), BSc (Hons), P.G.C.E., M. Arbor. A.

Early Career

Before and whilst attending college and university (1983 – 1990) Ivan worked as a gardener and also within the building industry where he received training in a broad range of building skills. In 1989 Ivan obtained a BSc (Hons) in psychology at Leeds University followed by a P.G.C.E at The University of Wales in 1990. After one year of teaching he returned to the construction activity and worked on new builds, refurbishments and groundworks until 1995.

Arboriculture

In 1996 Ivan obtained a NCH (Arboriculture) at the University of Lincoln and became a member of the Arboricultural Association. He then received further arboricultural consultancy training with Peter Wynn Associates for one year before establishing a tree surgery and landscaping business in 1998.

In 2005 Ivan commenced full time employment with JCA Ltd, an Arboricultural Association registered consultancy where he soon adopted a senior role responsible for five consultants. During this time he obtained a FDSc (Arboriculture) at the University of Lancashire, which he passed with distinction.

Since 2013, Ivan has been the Director and Principal Consultant of Crown Consultants Ltd which provides Arboricultural Reports for the purposes of Development, Safety, Management, Mortgage, Subsidence, Mitigation and Litigation. In 2015, he acted as tree officer for Barnsley Council and has since provided consultancy services to other local authorities.

He has obtained the LANTRA *Professional Tree Inspector* Qualification promoted by the Arboricultural Association and recognised as appropriate for all levels of tree inspection.

He is a long-standing member of the Consulting Arborist Society and has obtained CAS accreditations for Tree Inspection, Planning, Mortgage Reports (Subsidence Risk Assessment) and for his expert witness work.

At the time of writing, he has written approximately thirty CPR compliant reports (civil and criminal) covering a range of subjects including Subsidence Damage, Personal Injury, Direct Root Damage, Professional Negligence, TPO Breaches.

He has given written and oral evidence.

Ivan is a long-standing professional member of the Arboricultural Association and the International Society of Arboriculture.

He is a licensed Quantified Tree Risk Assessment user.

Ivan has undertaken Bond Solon expert witness training and has obtained the University of Cardiff Expert Witness certificate.

Between 2008 and 2017 he was registered as a Sweet and Maxwell Checked Expert Witness.

Qualifications & Experience of Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A.

Emma is a qualified Arboricultural Consultant educated to Level 5 in Arboriculture at Askham Bryan College, is a professional member of the Arboricultural Association and is a LANTRA accredited *Professional Tree Inspector*. She has worked for Crown Consultants since 2015 and has since written numerous reports relating to all aspects of arboriculture including; planning and development, vegetation related subsidence, tree preservation orders and tree risk assessment. Emma regularly attends seminars and events in order to keep abreast with current knowledge and best practise in Arboriculture.

Prior to becoming an arboricultural consultant, Emma worked for two reputable tree surgery firms from 2008 and became an NPTC Qualified tree surgeon after completing a Level 3 Extended Diploma in Forestry and Arboriculture at Askham Bryan College. Emma also has experience in other areas of arboriculture such as forest clearance, tree planting, tree maintenance and landscaping.

Qualifications & Experience of Joe Taylor - MArborA, FdSc (Arboriculture)

Joe began his career in Arboriculture as a tree surgeon/climber. During his time as a tree surgeon, Joe has achieved City & Guilds NPTC qualifications in Chainsaw Maintenance and Cross Cutting, Tree Climbing and Rescue, Safe Use of Manually Fed Wood-chipper and Supporting Colleagues Undertaking Tree Related Operations.

Joe obtained a Foundation Degree in Arboriculture at Askham Bryan College in 2015 which he passed with merit. Joe is a professional member of the Arboricultural Association, the International Society of Arboriculture and the Royal Forestry Society and regularly attends industry related seminars in order to keep abreast of industry best practice.

Studying at Askham Bryan College reinforced Joe's passion for trees and drove his enthusiasm to learn more. Learning how trees interact with their surrounding environment and their importance within our urban and rural landscapes highlighted an interest in pursuing a career in consultancy.

Since working for Crown Consultants Joe has undertaken numerous surveys and produced numerous reports for the purpose of planning (BS 5837), tree condition surveys, subsidence risk assessments, root surveys and decay detection investigations.

Appendix 5: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf*

NHBC Standards Chapter 4.2., *Trees and Buildings.*

Horticulture LINK project 212. (*University of Cambridge,* 2004), *Controlling Water Use of Trees to Alleviate Subsidence Risk.*

Tree Planting and aftercare

See www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards

BS 5837: 2012. Trees in Relation to Design, Demolition and Construction – Recommendations.
Bs 3998: 2010. Recommendations for Tree Work.
BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs.
BS 3936: 1992. Nursery Stock. Part 10: Specification for Groundcover Plants.
BS 4043: 1989. Transplanting Root-balled Trees.
BS 8004: 1986. Foundations.
BS 8103: 1995. Structural design of Low-Rise Buildings.
BS 8206: 1992. Lighting for Buildings.
BS 8545:2014. Trees: From nursery to independence in the landscape – Recommendations
BS 3882: 2015. Topsoil.
BS 4428: 1989. General Landscaping Operations (excluding hard surfaces).

Permission to do Works to Protected Trees / Tree Law

Forestry Commission (Edinburgh, 2003), *Tree Felling – Getting Permission*. Country Services Division - Forestry Commission. Downloadable at www.forestry.gov.uk/website/pdf.nsf/pdf/wgsfell.pdf/$FILE/wgsfell.pdf

Transport and the Regions (Department of the Environment, 2000), *Tree Preservation Orders, A Guide to the Law and Good Practice*. Downloadable at www.communities.gov.uk/publications/planningandbuilding/tposguide

C. Mynors, *The Law of Trees, Forests and Hedgerows* (Sweet and Maxwell, London, 2002)

Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

Lighting Levels

P.J. Littlefair, *B.R.E. 209: Site layout planning for daylight and sunlight A guide to good practice.* B.R.E. Bookshop, London.

British Standards Institution. Code of practice for day lighting. *British Standard* BS 8206: Part 2 (1992).

Chartered Institution of Building Services Engineers. *Applications manual: Window Design* (London, 1987).

NBA Tectonics. A study of passive solar housing estate layout. *ETSU Report* S-1126. Harwell, Energy Technology Support Unit (1988).

I.P. Duncan; D. Hawkes, Passive solar design in non-domestic buildings. *ETSU Report* S-1110. Harwell, Energy Technology.

P. J. Littlefair, Measuring Daylight, *BRE Information Paper 23/93 f3.50.* (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges

Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

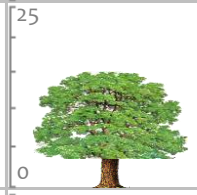
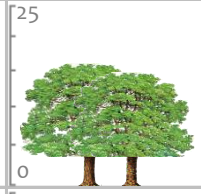
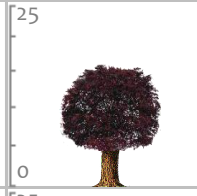
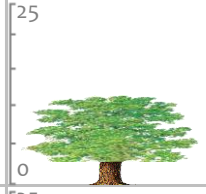
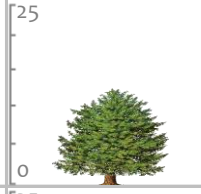
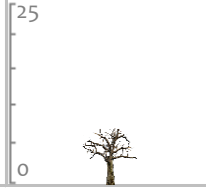
Tree Specific Websites

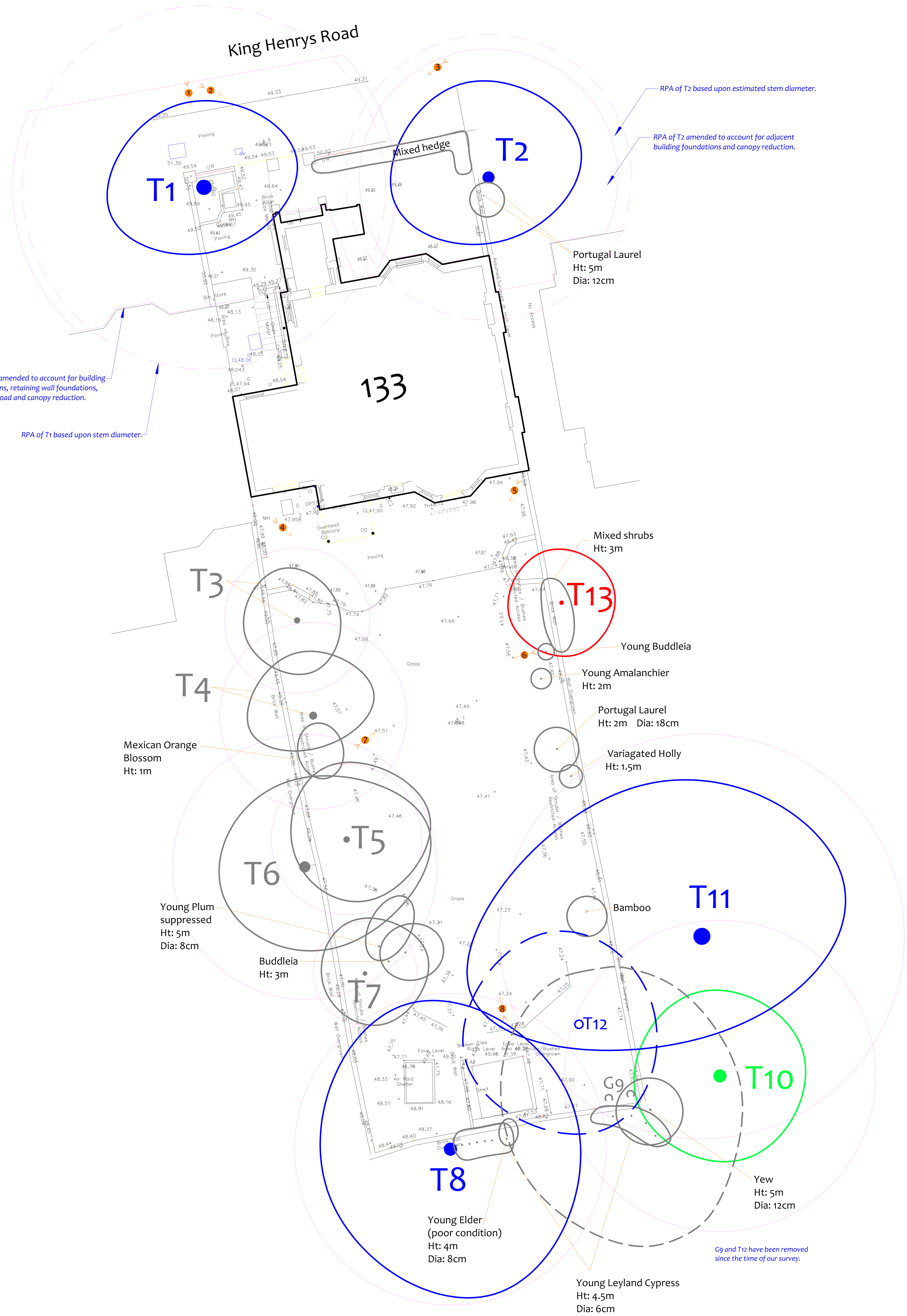
www.crowntrees.co.uk	Crown Consultants site containing useful information
www.trees.org.uk	Arboricultural Association
www.rfs.co.uk	Royal Forestry Society of England, Wales and N. Ireland
www.treehelp.Info	The Tree Advice Trust
www.woodland-trust.org.uk	The Woodland Trust
www.treecouncil.org.uk	The Tree Council

Appendix 6: Tree Data Schedule and Drawings

The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect Freq (yrs)	Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
T1	Early-Mature **Sycamore** Acer pseudoplatanus.	11	4	70	N 4 W 4.5 E 4.5 S 3		Position: Situated within the front garden in a small raised planter. Form: Twin-stemmed at 1m with a compact crown. History: Previously crown reduced. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 2 stems (48cm & 51cm).	No action required.	n/a	3	Moderate / Good / Good	High / 40+ / **B**
T2	Early-Mature **Horse Chestnut** Aesculus hippocastanum.	12	4.5	55	N 4.5 W 4.5 E 4.5 S 3		Position: Situated on third party land. Form: Twin-stemmed at 3m with a slightly unbalanced crown. History: Previously crown reduced. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	3	Moderate / Good / Fair	High / 20-40 / **B**
T3	Early-Mature **Hawthorn** Crataegus monogyna.	5.5	1.5	28	N 2.5 W 2.5 E 2 S 2.5		Position: Situated within the rear garden. Form: Multi-stemmed at 2m with a balanced crown. History: Previously crown reduced. **Defects: No significant defects observed.**	No action required.	n/a	3	Moderate / Good / Good	Low / 20-40 / C
T4	Early-Mature **Pear** Pyrus sp.	5.5	2	36	N 3 W 3 E 3 S 1.5		Position: Situated within the rear garden. Form: Triple-stemmed at 0.5m with a slightly unbalanced crown. History: Occasional pruning wounds due to crown lifting and previously crown reduced. **Defects: Dead branch to upper crown, significant cavity developing to north east stem at 1m above ground level (acceptable condition at present).** Other: Recorded stem diameter is equivalent for 3 stems (19cm, 20cm, 23cm).	No action required.	n/a	1.5	Moderate / Fair / Good	Low / 10-20 / C
T5	Semi-Mature **Hawthorn** Crataegus monogyna.	7.5	2	29	N 3.5 W 2.5 E 4 S 3		Position: Situated within the rear garden. Form: Single stemmed and vertical with an unbalanced crown with a co-dominant stem at 0.3m. History: Occasional pruning wounds due to crown reduction. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 2 stems (11cm and 27cm).	No action required.	n/a	3	Moderate / Good / Good	Low / 20-40 / C
T6	Early-Mature **Plum** Prunus sp.	7	3.5	51	N 4 W 4 E 6 S 4		Position: Situated on third party land. Form: Triple-stemmed specimen. History: Occasional pruning wounds due to crown reduction. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 3 stems at 28cm, 30cm, 30cm. Limited inspection, dimensions estimated.	No action required.	n/a	3	Moderate / Good / Fair	Low / 20-40 / C
T7	Semi-Mature **Plum** Prunus sp.	8	1.5	20	N 2.5 W 2 E 3 S 2.5		Position: Situated within the rear garden. Form: Single stemmed with a slight lean and a slightly unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required.	n/a	3	Moderate / Good / Good	Low / 20-40 / C

Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N / W / E / S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
								Priority	Inspect Freq (yrs)		
T8	Mature **Sycamore** Acer pseudoplatanus.	15	4.5	60	N 7, W 6, E 6, S 7		Position: Situated on third party land, adjacent rear boundary. Form: Multi-stemmed at 4m with a slightly unbalanced crown. History: Occasional pruning wounds due to crown lifting. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated, ivy growing up stem.	No action required.	n/a / 3	Moderate Good Fair	Moderate 20-40 **B**
G9	Semi-Mature **Sycamore** Acer pseudoplatanus.	av 16	av 4	av 33	N av 6, W 5, E 5, S 7 each		Position: Situated within the rear garden adjacent rear boundary. Form: Two close growing specimens both single stemmed and vertical with slightly unbalanced crowns. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Significant damage to low boundary wall adjacent.	No action required.	n/a / 3	Moderate Good Good	Moderate 20-40 **C**
T10	Early-Mature **Copper Beech** Fagus sylvatica 'purpurea'.	16	5	60	N 4, W 4, E 4, S 4		Position: Situated on third party land. Form: Twin-stemmed at 3m with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a / 3	Moderate Good Fair	Moderate 40+ **A -**
T11	Mature **Oak** Quercus robur.	11	3	78	N 7.5, W 11, E 7, S 4.5		Position: Situated on third party land. Form: Twin-stemmed at ground level with an unbalanced crown. History: Multiple pruning wounds due to crown lifting and crown reduction. **Defects: Cavities developing at old pruning wounds, small scattered deadwood throughout, significant dead branch overhanging garden of number 133.** Other: Two stems estimated, one at 50cm, and the other at 60cm. Limited inspection, dimensions estimated.	Remove deadwood.	Moderate / 1.5	Moderate Good Fair	Moderate 20-40 **B -**
T12	Semi-Mature **Yew** Taxus baccata.	12	0.5	38	N 4.5, W 5.5, E 3.5, S 5		Position: Situated within the rear garden. Form: Twin-stemmed at 4m with a slight lean. History: No evidence of significant pruning. **Defects: Minor dead branches to lower crown.**	No action required.	n/a / 3	Moderate Good Good	Moderate 40+ **B**
T13	**Dead** **Dead Tree** Dead tree.	6	3	20	N 2.5, W 2.5, E 2.5, S 2.5		Position: Situated on third party land. Form: Dead. **Defects: Dead.**	Remove.	Moderate / N/A	Dead **Dead** **Dead**	Dead Dead **U**



Tree Constraints Plan

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

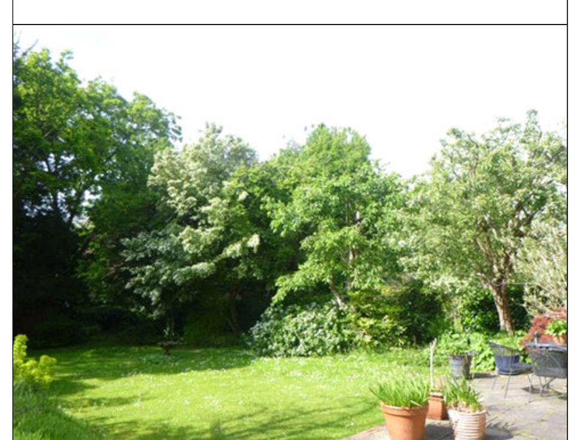


Photo 6

Photo 7

Photo 8

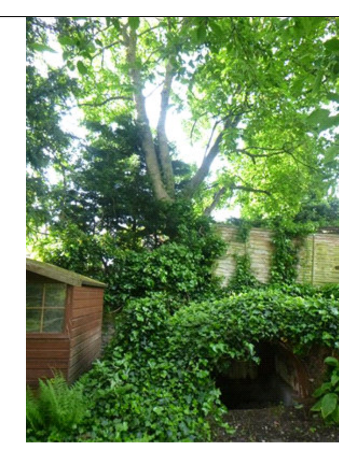


Photo 9

See the accompanying report for more photographs

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Sycamore	11	8.4	222	14.9
T2	Horse Chestnut	12	6.6	137	11.7
T3	Hawthorn	5.5	3.4	35	6.0
T4	Pear	5.5	4.3	59	7.7
T5	Hawthorn	7.5	3.5	38	6.2
T6	Plum	7	6.1	118	10.8
T7	Plum	8	2.4	18	4.3
T8	Sycamore	15	7.2	163	12.8
G9	Sycamore	16	4.0	49	7.0
T10	Copper Beech	16	7.2	163	12.8
T11	Oak	11	9.4	275	16.6
T12	Yew	12	4.6	65	8.1
T13	Dead Tree	6	2.4	18	4.3

Drawing No: CCL 10812 / TCP Rev: 2

Title: Tree Constraints Plan (Existing Layout)

Site: 133 King Henrys Road, London, NW3 3RD

Scale: 1:100 Paper Size: A1

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Arboricultural Consultants
01422 316660

Tree Retention Categories
Stems & canopies shown

- Category A tree — Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
- Category B tree — Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees
- Category C tree — Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
- Category U tree — Trees unsuitable for retention due to their very poor condition.

Tree Constraints Plan

Existing Layout

BS 5837 Root Protection Area (radius = 12xstem diameter)

Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

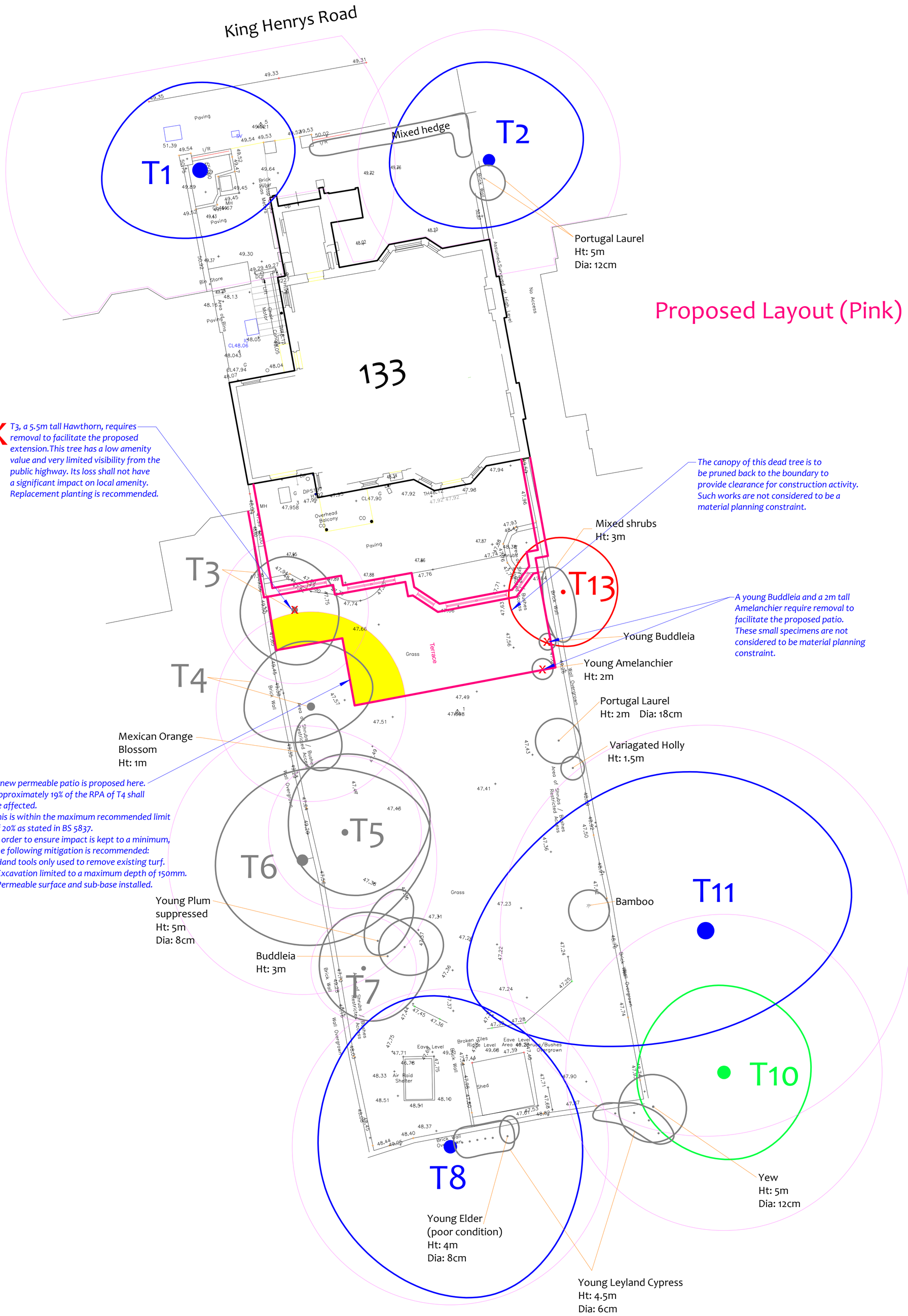
1 Photo 1

MN = Measured North:

Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

Impact Assessment Plan

(Existing Layout with Proposals Overlaid)



Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Sycamore	11	8.4	222	14.9
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T3	Hawthorn	5.5	3.4	35	6.0
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T5	Hawthorn	7.5	3.5	38	6.2
T6	Plum	7	6.1	118	10.8
T7	Plum	8	2.4	18	4.3
T8	Sycamore	15	7.2	163	12.8
G9	Sycamore	16	4.0	49	7.0
T10	Copper Beech	16	7.2	163	12.8
T11	Oak	11	9.4	275	16.6
T12	Yew	12	4.6	65	8.1
T13	Dead Tree	6	2.4	18	4.3

Drawing No: CCL 10812B / IAP Rev: 1
Title: Impact Assessment Plan (Existing Layout with Proposals Overlaid)
Site: 133 King Henrys Road, London, NW3 3RD
Scale: 1:100 Paper Size: A1

CROWN
Arboricultural Consultants
01422 316660

Tree Retention Categories
Stems & canopies shown

- Category A tree — Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
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- Category C tree — Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
- Category U tree — Trees unsuitable for retention due to their very poor condition.

BS 5837 Root Protection Area (radius = 12xstem diameter)

Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

X — Tree to be removed to facilitate the proposal

X — Tree to be removed due to its low quality

Proposed pruning

MN = Measured North:

Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

Arboricultural Method Statement

CROWN Tree Consultancy 08000 14 13 30

Site: 133 King Henry's Road, London, NW3 3RD

Author: Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A

Date: 29 / 11 / 2023 Revision: 1 CCL ref No: 10812B

Client: Joe Ibbotson

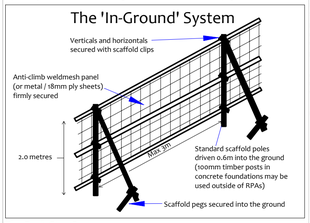
Tree Protection Barriers

The purpose of tree protection barriers is to keep construction activity away from Restricted Activity Zones or Construction Exclusion Zones. They must be appropriate to the nature and proximity of activity within the site. The barriers must be erected prior to the commencement of all activity including demolition, soil stripping and delivery of materials and demolition (except where existing structures require demolition to enable the barriers to be installed). Barrier systems are specified below and are to be installed according to the legend on the Tree Protection Plan.

The In-Ground System — OR

This system will be installed where indicated by a solid purple line on the Tree Protection Plan. It will be robust enough to withstand occasional knocks by plant machinery and, once installed, will remain in place throughout the entire construction phase.

Vertical scaffold poles are driven into the ground, onto which are affixed horizontal scaffold poles and diagonal bracing struts. Weldmesh panels (or similar – e.g. Heras type fencing panels, or 18mm+ plywood boards) are secured to this scaffold framework using sturdy clips e.g. standard scaffold clips. The system is illustrated in the diagram below and is based on BS 5837 guidelines.

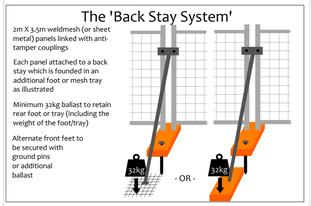


The Back-Stay System — OR

This system will be installed where indicated by a dashed purple line on the Tree Protection Plan. It is more practical over existing hard surfaces or where the fencing needs to be moved to enable permitted activities within a Restricted Activity Zone. This system is able to withstand occasional knocks by machinery and must not be relocated except with the consent of the site manager and the approval of the local authority.

Within this system, weldmesh fencing panels (minimum height 2m) are affixed into rubber or concrete feet and clipped together with anti-tamper couplers. Two couplers should be used, spaced at least 1m apart. Alternate panels will be attached to a diagonal back stay connected to an additional foot or baseplate secured with ground pins or additional ballast. Where ground pins are not used, the total weight of the foot/plate plus ballast must total no less than 32kg.

Where it is not possible to install diagonal struts (such as very close to a hedge) then the front feet will be secured using ground pins or ballast.



Notices

Suitable weather-proof notices are to be displayed to identify tree protection zones. They must state the purpose of the fencing and that it will not be moved, or traversed, other than by authorised personnel.

Removal of Tree Protection Barriers

Removal of protective fencing or ground protection measures will only be done after all major construction work is complete and their removal has been approved by the appointed arborist.

Ground Protection Measures

Within Restricted Activity Zones, soils containing roots may be subject to compaction due to general construction activity (including pedestrian activity and use of plant machinery). In order to minimise compaction, it is proposed to ensure that a suitable load-spreading surface is in place at all times.

Any existing hard surfacing may be retained where engineers consider it adequate to spread the load of construction traffic. Otherwise, it will be reinforced or replaced with adequate ground protection measures.

Unless specified otherwise, ground protection will consist of 24mm OSB boards laid at double thickness and screwed together to prevent slippage. The ground will be made even by raking, and by adding a 100mm of sand or woodchip, wherever vehicular access is proposed. Where only pedestrian traffic will occur, boards or planks may be laid directly onto the ground, laid at double thickness and screwed together to prevent slippage.

If engineers consider OSB boards to be inadequate (e.g. for large plant machinery where the tracks may chew up the timber) sturdier ground protection measures will be installed such as road plates, or 100mm of 7–40mm angular gravel installed in 3D cellular confinement system (e.g. CellwebTM).

If a piling mat is required, specifications will be agreed between engineers and the project arborist.

The ground protection measures will be installed and approved before the commencement of demolition and construction activity and before the arrival of plant machinery or materials. They shall remain in place until all heavy construction activity is complete or until they are due to be replaced with a new hard surface.

Construction Exclusion Zones

Within Construction Exclusion Zones the following restrictions apply:

- Tree Protection Barriers will be erected and maintained throughout the entire project as indicated on the Tree Protection Plan and under the header *-Tree Protection Barriers.*
- These will remain in place at all times except when any authorised landscaping works are being undertaken. At such times, adequate ground protection measures will be installed, and excavation shall be limited to that required for new planting. Furthermore, the project arborist will be consulted prior to any works being undertaken in these zones.
- No construction activity or excavation will occur unless agreed otherwise by the project arborist and local authority.
- No vehicles or plant machinery will be driven or parked.
- No tree works, other than those specified on this document will be undertaken.
- No alterations of ground levels or conditions will occur.
- No chemicals or cement washings will be permitted.
- No temporary structures will be installed.
- No spoil will be stored.
- No fires will be permitted.
- All hazardous materials (including non-essential cement products) will be forbidden.

Tree Works Specification

The following table specifies the tree works which will be required prior to the commencement of construction activity:

Tree Reference	Action Required	Notes
T3	Remove.	n/a
T13	Prune the canopy overhanging the garden back to the boundary.	Pruning not to exceed the boundary.

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Restrictions in Specific Zones

Restricted Activity Zone A

Within this zone, tree roots are likely to be present where access will be required to facilitate construction. The following restrictions shall apply:

- No vehicles or plant machinery will park or operate unless a suitable load-spreading surface is in place. The load spreading surface will be installed specified under the heading ***Ground Protection Measures***. This will remain in place throughout the entire demolition and construction phase.
- Removal of any existing surfaces will be lifted and removed using hand tools only.
- No excavation will occur in this zone without consulting the project arborist and obtaining approval from the local authority.
- Existing ground levels will remain undisturbed.
- No new permanent or temporary structures will be erected.
- Underground services will not be installed in this area.
- Storage of materials and spoil will be avoided in this zone unless it has been agreed with the project arborist that the ground protection measures are adequate to ensure no soil compaction or contamination occurs.
- All hazardous materials (including non-essential cement products) will be forbidden.
- No fires will be permitted.
- Vehicles or plant machinery in excess of 2 tonnes will not be permitted in this area.

Restricted Activity Zone B

When installing the new surface over the Root Protection Area of T4, the following restrictions will apply:

- Prior to the new surface being installed, no vehicles or plant machinery will drive, operate or park until unless ground protection measures are implemented as specified under the heading ***Ground Protection Measures***.
- Excavation will be undertaken using hand tools only.
- Excavation depth will be limited to 150mm.
- The new surface and sub-base will be permeable.

Timing of Operations

Activity within the site shall be phased according to the following chronology

Order	Phase	Activity
1st.	Pre-Construction Phase	Planning conditions relating to trees to be identified and discussed with the Project arborist and site manager.
2nd.		All specified tree removal and pruning to be undertaken (see Header -*Tree Works Schedule*).
3rd.		Install the tree protection barriers (fencing and ground protection boards - see Headers -*Tree Protection Barriers* and *Ground Protection Measures*).
4th.		Pre-Commencement site meeting: Tree protection barriers inspected. Additional protection measures to be agreed. Variances to be agreed. Location of underground services to be agreed. Boundary treatments to be agreed. Extents of excavation to be agreed. Scaffold restrictions to be agreed. Exact specification for foundations to be agreed. Exact specification for new surfaces to be agreed. Scope of future inspections / monitoring to be agreed.
5th.		Arboricultural Method Statement to be revised and approved (if necessary).
	Protection measures confirmed acceptable by the local authority	
6th.	Construction Phase	Demolish existing structures and remove existing surfaces where applicable.
7th.		Install new buildings, hard surfaces and services taking into account restricted activities as specified in this Arboricultural Method Statement.
8th.		Site meeting with project arborist. Landscaping restrictions to be agreed. Condition of retained trees to be assessed and mitigation agreed. Ground conditions to be assessed and ground remediation to be agreed.
9th.		Remove protective barriers (fencing and ground protection measures as applicable).
10th.	Post-Construction Phase	Undertake restricted landscaping operations within Root Protection Areas, including (where applicable) boundary treatments, pedestrian surfaces and proposed tree planting.

General Restrictions - Throughout the Site

Preparatory Works

No demolition, removal of surfaces, or soil stripping will commence until the protective fencing and ground protection measures are installed to the satisfaction of the local authority.

Fires

No fires will be permitted beneath any tree canopy or within 5m of any tree stem, branch or foliage. No fires will be permitted within any Construction Exclusion Zone or Restricted Activity Zone. No fires will be permitted in the vicinity of any exposed tree roots.

Canopy Protection

In order to protect tree canopies the following restrictions will apply throughout the site:

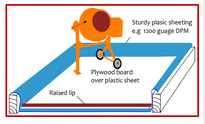
- No machinery in excess of 2m will pass beneath the canopy of any tree without being carefully marshalled in order to ensure that no branches are damaged.
- If materials require installation or delivery beneath tree canopies, this will be done without the use of overhead cranes.
- If materials are to be installed or delivered close to tree canopies (but not beneath them) and a crane is required, they will be carefully marshalled in order to ensure that branches are not accidentally damaged.

Storage of Spoil and Materials

Storage of materials and spoil will be avoided in any Construction Exclusion Zones and Restricted Activity Zones unless it has been agreed with the project arborist that the ground protection measures are adequate to ensure no soil compaction or contamination occurs. All hazardous materials (including non-essential cement products) will be forbidden.

Hazardous Materials

Any mixing of cement based materials will take place outside the Construction Exclusion Zones and Restricted Activity Zones. Where cement is to be mixed at considerable distances from trees and water run-off cannot enter Root Protection Areas, then no further special measures are required. Otherwise, provision will be made to ensure that the mixing area is contained so that no water run-off enters the Root Protection Area of any trees (see diagram for example). Mixers and barrows will be cleaned within this area.



All other chemicals hazardous to tree health, including petrol and diesel, will be stored in suitable containers as specified by current COSHH Regulations, and kept away from Root Protection Areas.

Underground Services

No underground services (including soak-aways) will be located in any part of the Construction Exclusion Zones or Restricted Activity Zones unless done so in a manner detailed in a specific Method Statement and approved by the local authority.

Site Hoarding

If site hoarding shall be installed over the Root Protection Area of any tree, the following restrictions will apply:

- Ground levels will be maintained as existing.
- Post holes will not exceed 300mm x 300mm.
- No post hole will be excavated within 1.5m of any tree stem.
- Post holes will be excavated using hand tools or by a post-hole auger attached to plant machinery sited outside of Root Protection Areas.
- Roots in excess of 25mm will be retained wherever possible.
- Roots in excess of 10mm will be pruned with sharp secateurs.
- Pruning will be minimal and only undertaken where absolutely necessary to facilitate the site hoarding. It will be undertaken by a reputable tree surgeon working to BS 3998 (2010).

Site hoarding may be installed in place of the specified tree protection measures subject to the approval of the local authority with regard to its location and specification.

Siting of Cabins

Cabins will be located outside of Construction Exclusion Zones and Restricted Activity Zones unless agreed otherwise by the project arborist. Where this is being considered, the project arborist will be consulted, and specific tree protection measures agreed. The following general restrictions will apply:

- All services to and from site cabins will be installed above ground through any Root Protection Areas.
- No excavation will occur within Root Protection Areas to enable cabins to be installed.
- The cabins will be founded on a suitable load spreading surface.

Fence Posts or Decking Posts

If permanent fencing or decking is to be installed within Root Protection Areas, the following restrictions will apply:

- All post holes will be excavated by hand and kept as narrow as possible (maximum diameter 300mm).
- Exploratory post holes will be dug before committing to post / panel positions. If any roots in excess of 25mm are encountered they are to remain intact and the post hole will be relocated slightly. The fencing system must permit such flexibility (i.e. where fixed panel widths are used, all post holes must be excavated before committing to the final location).
- Any roots in excess of 10mm which are severed will be neatly pruned back with secateurs. This shall encourage healing and reduce the likelihood of infection.

Walls will be avoided over Root Protection Areas, unless their foundations are spanned over roots using a beam system.

Site Monitoring Schedule

Inspection	Site Attendees	Comments
Pre- Start Desk-top To occur prior to any works taking place on the site.	N/A.	Project Manager and Site manager to study this Method Statement & contact the Project Arborist to agree all protection measures.
Pre-Start Meeting After tree works are completed & tree protection barriers/ground protection measures are installed. Prior to any other activity, inc. demolition & soil stripping.	Site manager, project arborist. Tree Officer invited.	Tree protection fencing locations & specifications checked. Ground protection measures checked. Contractors are to be inducted to all relevant aspects of the Arboricultural Method Statement. Responsibilities checked and acknowledged. Adherence to the Arboricultural Method Statement is to be discussed and agreed. Report on findings to be sent to the local authority tree officer.
Monthly Inspection and Reporting To occur once per calendar month throughout the entirety of the project until the local authority agrees that tree protection measures may be removed.	Site manager and project arborist*	Tree protection fencing locations & specifications checked. Ground protection measures checked. Past month, present and future month – activities and adherence to Arboricultural Method Statement discussed and checked. Report on findings to be sent to the local authority tree officer within 5 working days.
Any other ground disturbance in Restricted Zones & Construction Exclusion Zones Including demolition, soil stripping, removal of hard surfaces, excavation for new surfacing, foundations, service trenches etc.	Site manager, project arborist.	Two weeks' notice is to be given prior to commencement. Excavation is to be as specified in this Method Statement. Excavations are to be recorded and photographed. Mitigation measures to be employed as specified by the project arborist.
Post-Construction Meeting Post external construction activity but prior to removal of fencing & landscaping operations.	Site manager, project arborist. Tree Officer invited.	Retained trees inspected. Ground conditions assessed and mitigation measures agreed upon where appropriate. Further landscaping operations and restrictions to be agreed.

* Where agreed with the L.A. it may be acceptable to supply photographs of the fencing to avoid the necessity for a site visit.

Personnel and Accountability

This table should be completed at the Pre-Start Meeting or earlier

Position	Name	Contact Phone & email	Roles
Project Manager	Insert Details	Insert Details	Liaising with site manager & project arborist regarding any potential issues relating to trees. Scheduling of meeting, excavations and inspections. Overseeing this monitoring schedule. Instructing the project arborist and arranging access. Liaising with local authority regarding discharge of planning conditions and variances to the Arboricultural Method Statement.
Site Manager	Insert Details	Insert Details	Day to day monitoring of tree protection measures. Fortnightly supply of site photographs showing all tree protection measures. Induction of all contractors. Reporting to the Appointed Arborist of any incidents or potential variations to the agreed tree protection measures.
Project Arborist	Crown Tree Consultancy	08000 14 13 30 0203 797 7449 info@crowntrees.co.uk	Liaising with LPA Tree Officer over all arboricultural matters. Initial inspection and signing off of tree protection barriers including ground protection measures. Monthly site visits and inspections. Reporting to the local authority following site inspections and any variation or incidents.
Local Authority	London Borough of Camden	Nick Bell	Receipt of reports from the appointed arborist. Liaising with the appointed arborist to agree suitability of tree protection measures and any variations. Enforcement. Advice and assistance with the discharge of planning conditions relating to trees.
Additional Contact	Insert Details	Insert Details	Insert Details
Additional Contact	Insert Details	Insert Details	Insert Details

Tree Data Schedule - Retained Trees only

Reference & Colour Coding	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect. Time (yrs)	Vigour: Physiological Condition	Vigour: Structural Condition	Amenity Value: Life Expectancy (yrs)	Amenity Value: Retention Category
T1	Early-Mature **Sycamore** Acer pseudoplatanus.	11	4	70	4 4.5 4.5 3	25 0 9	Position: Situated within the front garden in a small raised planter. Form: Twin-stemmed at 1m with a compact crown. History: Previously crown reduced. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 2 stems (48cm & 51cm).	No action required.	n/a	3	Moderate	Good	High 40+	B
T2	Early-Mature **Horse Chestnut** Aesculus hippocastanum.	12	4.5	55	4.5 4.5 4.5 3	25 0	Position: Situated on third party land. Form: Twin-stemmed at 3m with a slightly unbalanced crown. History: Previously crown reduced. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	3	Moderate	Good	High 20-40	B
T4	Early-Mature **Pear** Pyrus sp.	5.5	2	36	3 3 3 1.5	25 0	Position: Situated within the rear garden. Form: Triple-stemmed at 0.5m with a slightly unbalanced crown. History: Occasional pruning wounds due to crown lifting and previously crown reduced. **Defects: Dead branch to upper crown, significant cavity developing to north east stem at 1m above ground level (acceptable condition at present).** Other: Recorded stem diameter is equivalent for 3 stems (19cm, 20cm, 23cm).	No action required.	n/a	1.5	Moderate	Fair Good	Low 10-20	C
T5	Semi-Mature **Hawthorn** Crataegus monogyna.	7.5	2	29	3.5 3.5 4 3	25 0	Position: Situated within the rear garden. Form: Single stemmed and vertical with an unbalanced crown with a co-dominant stem at 0.3m. History: Occasional pruning wounds due to crown reduction. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 2 stems (19cm and 27cm).	No action required.	n/a	3	Moderate	Good Good	Low 20-40	C
T6	Early-Mature **Plum** Prunus sp.	7	3.5	51	4 4 6 4	25 0	Position: Situated on third party land. Form: Triple-stemmed specimen. History: Occasional pruning wounds due to crown reduction. **Defects: No significant defects observed.** Other: Recorded stem diameter is equivalent for 3 stems at 28cm, 30cm, 30cm. Limited inspection, dimensions estimated.	No action required.	n/a	3	Moderate	Good Fair	Low 20-40	C
T7	Semi-Mature **Plum** Prunus sp.	8	1.5	20	2.5 2 2 2.5	25 0	Position: Situated within the rear garden. Form: Single stemmed with a slight lean and a slightly unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required.	n/a	3	Moderate	Good Good	Low 20-40	C
T8	Mature **Sycamore** Acer pseudoplatanus.	15	4.5	60	7 6 6 7	25 0	Position: Situated on third party land, adjacent rear boundary. Form: Multi-stemmed at 4m with a slightly unbalanced crown. History: Occasional pruning wounds due to crown lifting. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated, ivy growing up stem.	No action required.	n/a	3	Moderate	Good Fair	Moderate 20-40	B
T10	Early-Mature **Copper Beech** Fagus sylvatica 'purpurea'.	16	5	60	4 4 4 4	25 0	Position: Situated on third party land. Form: Twin-stemmed at 3m with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	3	Moderate	Good Fair	Moderate 40+	A -
T11	Mature **Oak** Quercus robur.	11	3	78	7.5 11 7 4.5	25 0	Position: Situated on third party land. Form: Twin-stemmed at ground level with an unbalanced crown. History: Multiple pruning wounds due to crown lifting and crown reduction. **Defects: Cavities developing at old pruning wounds, small scattered deadwood throughout, significant dead branch overhanging garden of number 133.** Other: Two stems estimated, one at 50cm, and the other at 60cm. Limited inspection, dimensions estimated.	Remove deadwood.	Moderate	1.5	Moderate	Good Fair	Moderate 20-40	B -
T13	Dead **Dead Tree** Dead tree.	6	3	20	2.5 2.5 2.5 2.5	25 0	Position: Situated on third party land. Form: Dead. **Defects: Dead.**	Remove.	Moderate	N/A	Dead Dead	Dead Dead	Dead	U

Tree Protection Plan

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BS 5837 Root Protection Area (radius = 12xstem diameter)

Root Protection Area needing amendment due to site conditions, e.g. presence of existing road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

Tree Retention Categories Stems & canopies shown

Category A tree	Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.	
Category B tree	Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees	
Category C tree	Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.	
Category U tree	Trees unsuitable for retention due to their very poor condition.	

Drawing No: CCL 10812B / TPP Rev: 1

Title: Tree Protection Plan (Existing Layout with Proposals Overlaid)

Site: 133 King Henrys Road, London, NW3 3RD

Scale: 1:100 Paper Size: A1