BS 5837 Arboricultural Report

Impact Assessment & Method Statement

at
84a Kings Road
Richmond
TW10 6EE

Dated
6th December 2021

CROWN
Tree Consultancy
Branching out through England and Wales

Contents

1. Introduction

1.1. Instruction

1.1.1. We are instructed by Colm Friel to:

- Undertake an Tree Survey to BS 5837 at 84a Kings 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. Consideration is also given to the impact of the changed juxtaposition between trees and buildings and how that may influence future tree management.

1.2.3. 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.

1.2.4. 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. Survey Details

1.3.1. A visual ground-level inspection of all trees was undertaken on the 6th October 2021 by Joe Taylor. No climbed inspections or specialist decay detection were undertaken. Details of how the survey was undertaken can be found in Appendix 1.

1.3.2. The tree locations shown on the accompanying plans have been plotted according to measurements taken on site.

1.4. Author

1.4.1. 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 84 Kings Road is a residential property with a small garden to the front and a large rectangular rear garden. The site is approximately flat with no abrupt level changes.

2.1.2. The front garden (see Photographs 1 to 10) measures approximately 8m x 12m and contains one sweet chestnut tree, T19.

2.1.3. The rear garden (see Photographs 11 and 12) measures approximately 12m x 63m. The vast majority of the rear garden is beneath tree canopies. The rear garden is separated into three sections with timber fencing.

2.1.4. Our survey identified Retention Category A, Retention Category B and Retention Category C trees. Tree species present include Elm, Lawson Cypress, Lime, London Plane, Plum, Poplar, Robinina, Sycamore, Sweet Chestnut and Yew.

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°27'39.17"N 0°17'35.35"W and the altitude is approximately 17m above sea level[1].

2.3. Survey Extent

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

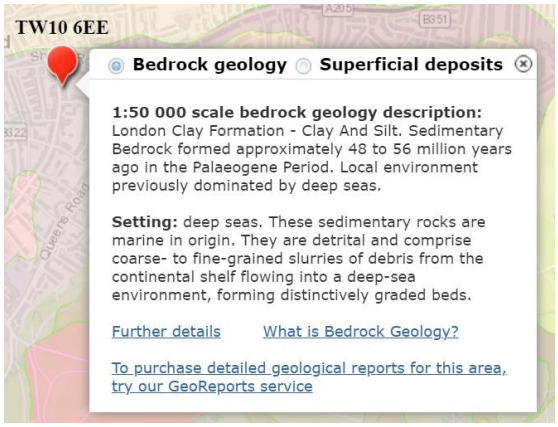
[1] To access satellite imagery and street views of the site these co-ordinates may be entered into: http://maps.google.co.uk/

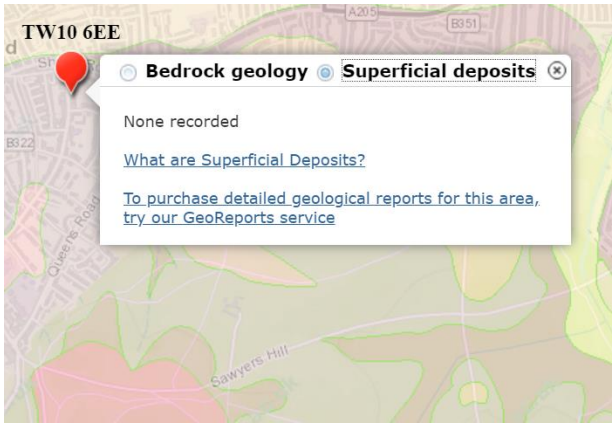
[2] Image taken from Google Earth and may not be current

3. Local Geology and Soils

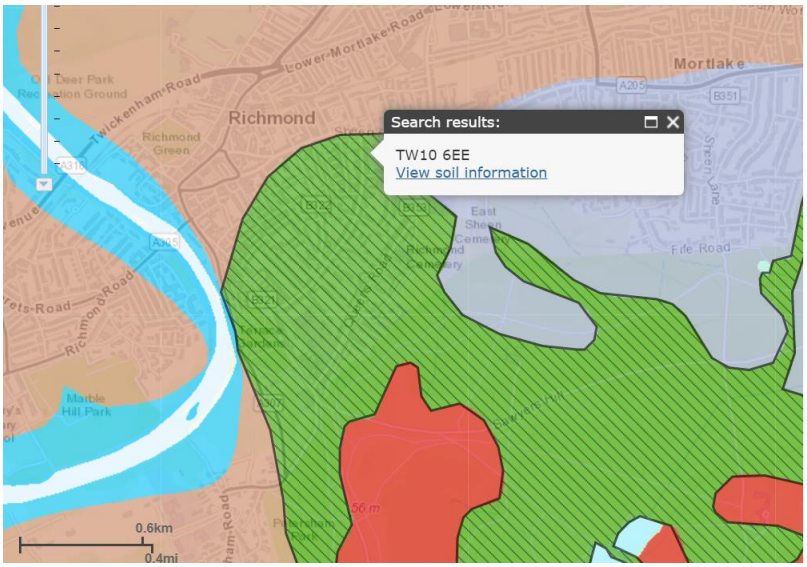
3.1. Desktop Research

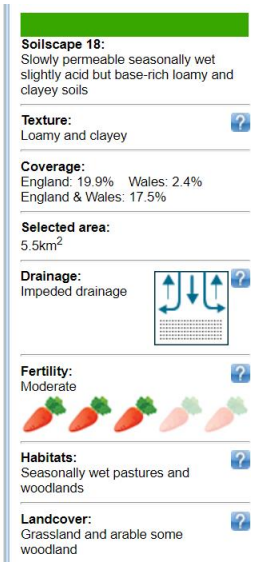
3.1.1. Desktop research into local geology based on the postcode TW10 6EE obtained the following results:





Source: https://mapapps.bgs.ac.uk/geologyofbritain/home.html





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

3.2. Site Investigations

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

3.3. Conclusion

3.3.1. Based on the information reproduced in Section 3.1, local soils are assumed to have a clay-loam texture.

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

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

4. 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. Preliminary

4.1. Management Recommendations

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

- The mature Robinia, T18, has several large dead branches and decay within its southern stem. We recommend removing the ivy and dead branches, and more closely inspecting the tree to determine the extent of the decay.
- T16 requires a climbed inspection to better investigate defects not fully apparent from ground level.

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

4.2. Work Priority and Future Inspections

4.2.1. 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	T18
High	Within 3 Months	T16
Moderate	Within 1 year	None
Low	Within 3 years	None

4.2.2. 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	T16 and T18
1.5	T1 and T4
3	T2, T3, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T17 and T19

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

5. Statutory Protection – TPOs and Conservation Area Status

5.1.1. Before undertaking most works to trees protected by a tree preservation order[3], consent needs to be formally obtained from the local authority. Where trees are located 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.

5.1.2. On the 4th of October 2021, we were informed by Sunaina McCarthy of the London Borough of Richmond, via email correspondence that:

5.1.3. The site lies within CA30 St Matthias Richmond Conservation Area.

5.1.4. There are no tree preservation orders affecting trees within the site.

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 towards woodland and forestry management. Felling licences are NOT required for any of the following:

- Lopping, topping or pollarding.
- Removal of small trees (stem diameter lesss then 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.
- Thining 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 this development.

5.3. Species Present – Additional Information

5.3.1. 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
Elm	25	14	Several species of elm may be found in the UK. The most common being Wych Elm, English Elm and the Narrow-Leafed Elm. Many specimens are likely to be a cross as they freely hybridise. Attractive golden varieties are occasionally seen. The English Elm was once a common feature of the British landscape but has been decimated by Dutch Elm Disease. Visit http://en.wikipedia.org/wiki/Elm for more info.
Lawson Cypress	40	10	Erect, narrowly conical evergreen tree native to Southwest Oregon and N. W. California. Introduced to Britain in the 1850's and now a common tree in gardens and parks. Makes an excellent dense hedge. Many varieties are available including golden and miniature varieties. Easily distinguished from Leyland cypress by the presence of small cones. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Chamaecyparis+lawsoniana for more info.

[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.

Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Lime	25	12	Very common street tree. Several species exist; the one most often found in woods is 'common lime' which produces a mass of suckers at the stem base, making it very cheap to propagate. Limes have non-symmetrical heart shaped leaves which are much loved by aphids (hence the sticky honeydew on cars parked beneath). Limes are tolerant of heavy pruning and are often managed as pollards. Old limes tend to support a lot of small dead branches. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Tilia+x+europaea for more info.
London Plane	30	20	Deciduous tree arisen in cultivation probably as a cross between the Oriental Plane and the American Buttonwood. Has attractive bark which peels off in small plates leaving a multicoloured flecked pattern. Very common as a street tree, especially throughout London where it dominates the streetscape. Often managed as a pollard in order to constrain its large size to more manageable proportions, especially where there are clay soils and adjacent buildings. Somewhat susceptible to the decay fungus Innonotus hispidus. Visit http://en.wikipedia.org/wiki/Platanus for more info.
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.
Poplar	30	18	Rapidly growing deciduous genus of predominantly large trees. Mostly introduced to Britain, excepting the native Black Poplar. Tolerant of heavy pruning. Timber makes poor firewood. Not suitable for small gardens.
Robinia	20	12	Deciduous fast growing tree native to the US. Part of the pea family and its roots fix nitrogen. Bright yellow 'Frisia' cultivar is widely planted in gardens. All parts are toxic except the flowers which appear in June. Seed pods ripen in winter. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Robinia+pseudoacacia for more info.
Sweet Chestnut	30	20	Deciduous tree native to the Mediterranean. Produces the sweet chestnuts to roast by the Christmas fire, though these often do not ripen in the north of England. Many large unmanaged old coppices can be found across Southern Britain. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Castanea+sativa for more info.
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.

6. Arboricultural Impact Assessment

6.1. Overview

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

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

Activity	Trees Potentially Affected
Tree Removal	Mixed shrubs
Tree Pruning	T3 and T4
RPA: Building Foundations	T1, T3 and T4
RPA: New 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.

6.1.2. The accompanying Arboricultural Method Statement (duplicated in Appendix 6) specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

6.2. Tree Removal

6.2.1. A group of mixed shrubs require removal to facilitate the outbuilding. All trees are to be retained.

6.3. Mitigation Planting

6.3.1. The trees/shrubs to be removed are of such low amenity value that no mitigation planting is considered necessary.

6.4. Impact on Tree Canopies

6.4.1. It is proposed to trim the lower hanging foliage of T3 and T4 to a height of 3.5m where it overhang the proposed outbuilding. This shall ensure adequate clearance to prevent any accidental damage to branches and suitable clearance for construction of the outbuilding. The pruning works should be undertaken sympathetically (working to BS 3998: 2010 guidelines).

6.4.2. The proposed pruning shall have very little impact on the health or amenity value of the trees. Hence, these works are not considered to be a material planning consideration.

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

6.5. Impact on Tree Roots

Foundations:

6.5.1. The foundations for the new outbuilding will extend into the outer portions of the theoretical Root Protection Areas of T1, T3 and T4. A shallow concrete slab foundation is proposed which shall require minimal excavation. Such a tiny portion of the RPA of T1 shall be affected, the impact shall be negligible. Just less than 6% of the RPA of T3 shall be affected and 4.5% of the RPA of T4 shall be affected by the proposed foundations. Such an incursion is considered to be minor and within tolerable limits.

6.5.2. In order to ensure that impact is kept to the minimum amount possible, the following mitigation is proposed:

- Excavation shall be undertaken using hand tools only.
- Excavation shall be limited to a maximum depth of 250mm to facilitate the installation of the concrete slab foundation.
- If roots in excess of 25mm diameter are encountered close to the edge of the excavation, they shall be retained wherever possible and protected with damp sacking during times that they are unearthed. Any roots that need to be severed shall be pruned with secateurs.
- Ground protections measures should be in place during construction activity to minimise soil compaction.

6.5.3. By adopting such a sympathetic method of installation, the impact on the root system will be kept to a minimum and it is considered that the proposal shall have no long term detrimental impact on the health of T1, T3 or T4.

New Surfaces:

6.5.4. No new surfaces are proposed within the Root Protection Areas of any trees.

Underground Services:

6.5.5. We are not aware of any underground services that require installation

Changes in Ground Levels:

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

Soil Compaction:

6.5.7. 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.

6.5.8. 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.

6.5.9. It is important 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 as recommended within the accompanying Arboricultural Method Statement.

6.6. Demolition Activities

6.6.1. No demolition is proposed close to trees.

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. No changes are proposed to the existing boundary features that might impact upon trees.

6.10. Impact of Retained Trees on the Development

6.10.1. The outbuilding is not considered to be a living space so the shade cast by the trees is not considered to be relevant from a planning perspective.

6.10.2. The gutters will need occasional maintenance to avoid blockage. This will be relatively easy to manage as the proposal is a single storey building. The outbuilding would benefit from the installation of controlled overflow guttering to minimise the impact from leaves.

6.10.3. The foundations 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. The proposal seeks to retain all of the trees surveyed and only a small group of mixed shrubs require removal.

6.11.2. Two trees (T3 and T4) require very minimal pruning to provide suitable clearance over the proposal.

6.11.3. Foundations are proposed within the Root Protection Areas of T1, T3 and T4. However, the small extent of RPA affected coupled with the shallow foundation design shall ensure no detrimental impact on trees.

6.11.4. No new hard surfacing is proposed in Root Protection Areas.

6.11.5. So long as suitable protection measures are implemented during demolition and construction stages, I see no arboricultural reasons why the proposal should not proceed.

6.12. Arboricultural Method Statement

6.12.1. The accompanying Arboricultural Method Statement specifies restrictions on construction activities to ensure minimal impact on retained trees. All of the potential impacts noted in this section are accounted for in the Arboricultural Method Statement. So long as these protection measures are fully implemented, there shall be no long-term detrimental impact on the health of the adjacent trees.

7. Photographs

Refer also to the Tree Constraints Plan for photo locations

Photo 1.

Photo 2.

Photo 3.

Photo 4.

Photo 5.

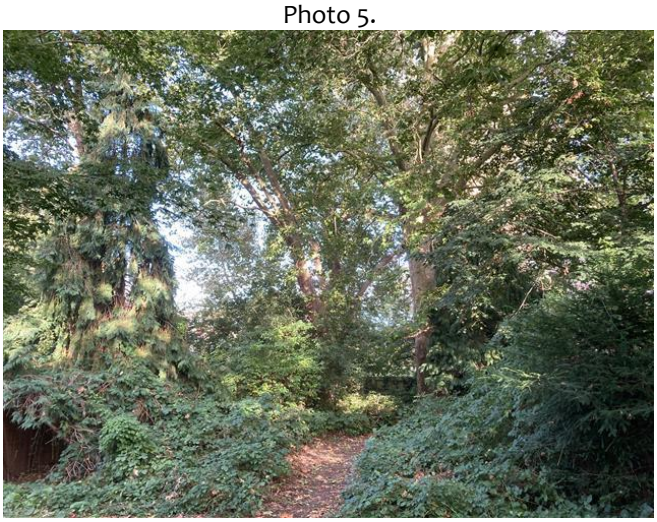


Photo 6.

Photo 7.

Photo 8.

Photo 9.

Photo 10.

Photo 11.

Photo 12.

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: Explanation of Tree Data & Glossary

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.

Qualifications & Experience of Sarah Alway - TechArborA, FdSc (Arboriculture).

Sarah recently obtained an FdSc in Arboriculture and Tree Management at the University of Central Lancashire which she passed with distinction. She is a member of the Arboricultural Association and regularly attends seminars and events to keep abreast developments in industry knowledge and current best practise in Arboriculture.
Sarah has been working closely alongside the principal consultant and managing director of Crown Consultants since the company was established in 2008. During that time, she has gained experience in all aspects of the business such as reporting, CAD, administration, accounting, and business management. Additionally, she has assisted consultants with numerous reports relating to all aspects of arboriculture including BS:5837 planning and development, vegetation related subsidence, tree preservation orders and tree risk assessment. She has also assisted with tree surveys for several years and since qualifying has been undertaking her own surveys.
In addition to working for Crown Tree Consultants Ltd producing reports, Sarah also likes to expand her knowledge of the wider Arboricultural industry by training in other areas of tree services and management. She has recently completed a training programme in tree-planting and volunteer management, including education in tree planting and natural dam building to help mitigate against the risks of heavy flooding (Natural Flood Management). Sarah also regularly volunteers with two local climate action groups who plant trees and build leaky dams.
As Sarah's career develops, she intends on focusing her attention on sustainable innovation in arboriculture and how green urban spaces could pave the way for the forests of the future.

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: 2007. 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

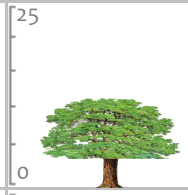
Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

Tree Specific Websites

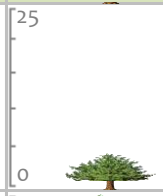
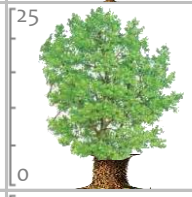
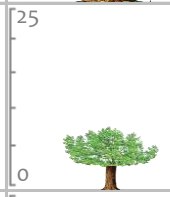
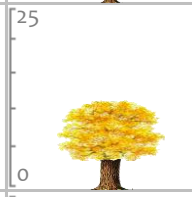
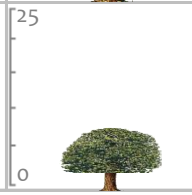
www.crowntrees.co.uk	Crown Consultants site containing useful information
www.trees.org.uk	Arboricultural Association
www.rfs.co.uk	Royal Forestry Society of England, Wales and N. Ireland
www.treehelp.Info	The Tree Advice Trust
www.woodland-trust.org.uk	The Woodland Trust
www.treecouncil.org.uk	The Tree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

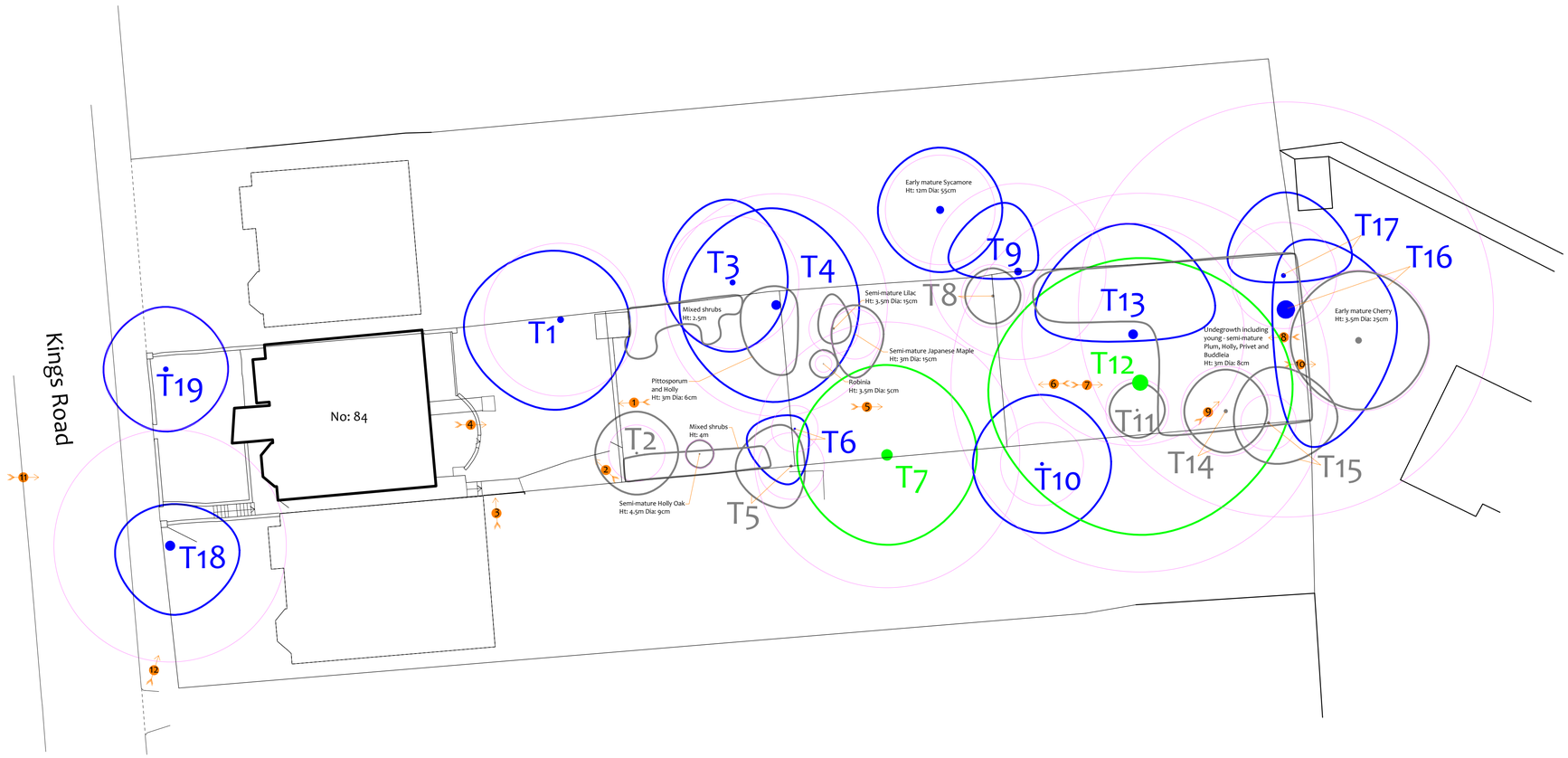
Appendix 6: Tree Data Schedule and Site Plan(s)

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	3.5	46	N 5, W 7, E 5, S 6.5		Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. **Defects: Minor included bark at 2m above ground level - acceptable condition at present.**	No action required.	n/a / 1.5	Low / Good / Fair	Moderate / 20-40 / **B -**
T2	Semi-Mature **Plum** Prunus sp.	4	2	17	N 3, W 3, E 3, S 3		Position: Situated on third party land. Form: Single stemmed with a slight lean and a balanced crown. History: Occasional pruning wounds due to crown reduction. **Defects: No significant defects observed.**	No action required.	n/a / 3	Moderate / Good / Good	Low / 40+ / C
T3	Early-Mature **Sycamore** Acer pseudoplatanus.	9	3	40	N 6, W 5, E 4, S 5		Position: Situated on third party land. Form: Single stemmed and vertical 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	Low / 10-20 / B
T4	Early-Mature **Sycamore** Acer pseudoplatanus.	13	3	67	N 7, W 7, E 6, S 7		Position: Situated on third party land. Form: Twin-stemmed at ground level with a balanced crown. History: No evidence of significant pruning. **Defects: Minor included bark at base - acceptable condition at present.** Other: Recorded stem diameter is equivalent for 2 stems (45cm, 49cm).	No action required.	n/a / 1.5	Moderate / Good / Fair	Low / 20-40 / B
T5	Semi-Mature **Sycamore** Acer pseudoplatanus.	5	3	20	N 3, W 4, E 1, S 3		Position: Situated on third party land. Form: Single stemmed and vertical with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a / 3	High / Good / Fair	Low / 40+ / C
T6	Semi-Mature **Robinia** Robinia pseudoacacia.	8	2	14	N 1, W 3.5, E 1, S 4		Position: Situated on third party land. Form: Single stemmed and vertical with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required.	n/a / 3	High / Good / Good	Low / 40+ / **B -**
T7	Mature **Sycamore** Acer pseudoplatanus.	18	3	80	N 6.5, W 6.5, E 6.5, S 6.5		Position: Situated on third party land. Form: Single stemmed and vertical with a well-formed 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

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
T8	Semi-Mature **Lawson Cypress** Chamaecyparis lawsoniana.	8	0	19	N 2, W 2, E 2, S 2		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	High / Good / Good	Low / 40+ / C +
T9	Early-Mature **Sycamore** Acer pseudoplatanus.	12	4	53	N 5, W 5, E 1.5, S 0.5		Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	Moderate / Good / Good	Low / 40+ / B
T10	Semi-Mature **Lime** Tilia sp.	6	2.5	25	N 5, W 5, E 5, S 5		Position: Situated on third party land. Form: Single stemmed and vertical 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	High / Good / Fair	Low / 40+ / B
T11	Semi-Mature **Lawson Cypress** Chamaecyparis lawsoniana.	6.5	1	19	N 2, W 2, E 2, S 2		Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	High / Good / Good	Low / 40+ / C
T12	Early-Mature **London Plane** Platanus x hispanica.	22	2	114	N 9, W 11, E 11, S 11		Form: Twin-stemmed at 5.5m with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	Moderate / Good / Good	Moderate / 40+ / A
T13	Early-Mature **London Plane** Platanus x hispanica.	15	5	67	N 8, W 7, E 6, S 0.5		Form: Twin-stemmed at 4.5m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	Moderate / Good / Fair	Low / 40+ / B
T14	Semi-Mature **Elm** Ulmus sp.	7	2	27	N 3, W 3, E 3, S 3		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	High / Good / Good	Low / 10-20 / 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)		
T15	Semi-Mature **Yew** Taxus baccata.	3	0	20 @ Base	N 4 / W 2.5 / E 5 / S 3		Position: Situated on third party land. Form: Single stemmed and vertical with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a / 3	High / Good / Fair	Low / 40+ / C
T16	Mature **Poplar** Populus sp.	25	4	130	N 5 / W 1 / E 8 / S 10		Form: Twin-stemmed at 3m with an unbalanced crown. History: Eastern canopy lopped back from adjacent appartment block. **Defects: Potential for significant decay at lopping cuts where branches grew.** Other: Unable to survey eastern stem base due to timber fence and ivy.	Climbed inspection to assess decay at lopping cuts. Arrange access and re-inspect.	High / 1	High / Good / Fair	Moderate / 20-40 / B
T17	Semi-Mature **Poplar** Populus sp.	7	3	32	N 6 / W 4 / E 5 / S 0.5		Form: Twin-stemmed at 1.5m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Significant lean - acceptable condition at present. Recorded stem diameter is equivalent for 2 stems (20cm, 25cm).	No action required.	n/a / 3	High / Good / Fair	Low / 20-40 / B
T18	Mature **Robinia** Robinia pseudoacacia.	11	4	70	N 3 / W 4 / E 5 / S 5		Position: Situated on third party land. Form: Twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. **Defects: Major deadwood to central canopy. Significant decay visible to secondary stem to south.** Other: Limited inspection, dimensions estimated.	Remove deadwood and ivy and inspect stem for defects.	**Very High** / 1	Moderate / Fair / Poor	High / 10-20 / B
T19	Semi-Mature **Sweet Chestnut** Castanea sativa.	7	2	37	N 4.5 / W 4.5 / E 4.5 / S 4.5		Position: Situated on third party land. Form: Multi-stemmed at ground level with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated. Recorded stem diameter is equivalent for 5 stems (20cm, 20cm, 15cm, 15cm, 12cm).	No action required.	n/a / 3	High / Good / Fair	High / 40+ / B



Tree Constraints Plan

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Sycamore	11	5.5	96	9.8
T2	Plum	4	2.0	13	3.6
T3	Sycamore	9	4.8	72	8.5
T4	Sycamore	13	8.0	203	14.3
T5	Sycamore	5	2.4	18	4.3
T6	Robinia	8	1.7	9	3.0
T7	Sycamore	18	9.6	290	17.0
T8	Lawson Cypress	8	2.3	16	4.0
T9	Sycamore	12	6.4	127	11.3
T10	Lime	6	3.0	28	5.3
T11	Lawson Cypress	6.5	2.3	16	4.0
T12	London Plane	22	13.7	588	24.2
T13	London Plane	15	8.0	203	14.3
T14	Elm	7	3.2	33	5.7
T15	Yew	3	2.0	13	3.5
T16	Poplar	25	15.6	765	27.7
T17	Poplar	7	3.8	46	6.8
T18	Robinia	11	8.4	222	14.9
T19	Sweet Chestnut	7	4.4	62	7.9

Drawing No: CCL 10994 / TCP Rev: 1

Title: Tree Constraints Plan (Existing Layout)

Site: 84b Kings Road TW10 6EE

0 5 10m

Scale: 1:200 Paper Size: A1

CROWN
Arboricultural Consultants
01423 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

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

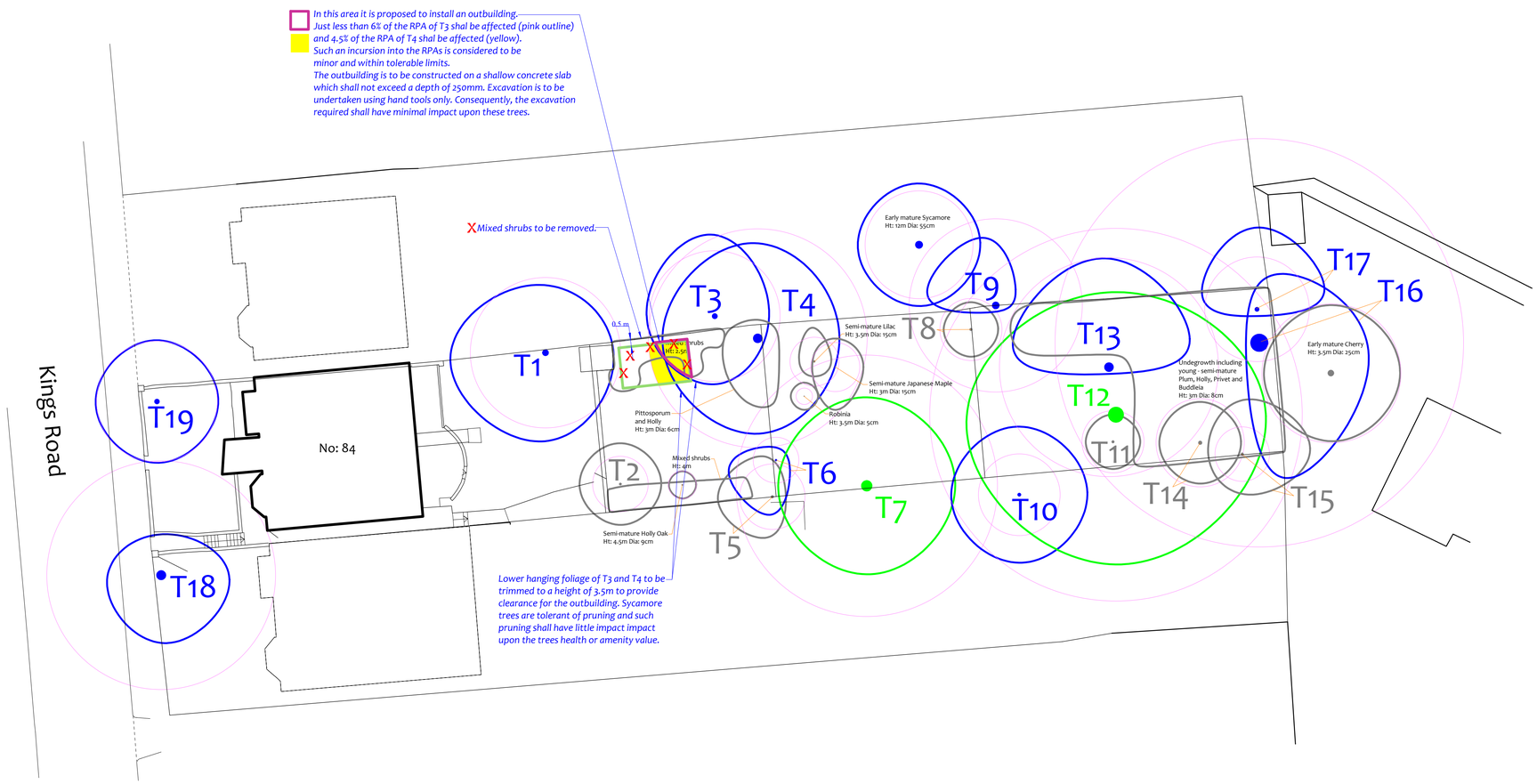
1 Photo 1

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 Assesment Plan

Proposed Layout (Pale Green)



Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Sycamore	11	5.5	96	9.8
T2	Plum	4	2.0	13	3.6
T3	Sycamore	9	4.8	72	8.5
T4	Sycamore	13	8.0	203	14.3
T5	Sycamore	5	2.4	18	4.3
T6	Robinia	8	1.7	9	3.0
T7	Sycamore	18	9.6	290	17.0
T8	Lawson Cypress	8	2.3	16	4.0
T9	Sycamore	12	6.4	127	11.3
T10	Lime	6	3.0	28	5.3
T11	Lawson Cypress	6.5	2.3	16	4.0
T12	Lawson Cypress	22	13.7	588	24.2
T13	London Plane	15	8.0	203	14.3
T14	Elm	7	3.2	33	5.7
T15	Yew	3	2.0	13	3.5
T16	Poplar	25	15.6	765	27.7
T17	Poplar	7	3.8	46	6.8
T18	Robinia	11	8.4	222	14.9
T19	Sweet Chestnut	7	4.4	62	7.9

Drawing No: CCL 10994 / IAP Rev: 1
Title: Impact Assessment Plan (Existing Layout with Proposals Overlaid)
Site: 84a Kings Road TW10 6EE
0 5 10m
Scale: 1:200 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.

Impact Assessment Plan

(Existing Layout with Proposals Overlaid)

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: 84a Kings Road, Richmond, TW10 6EE

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

Date: 06 / 12 / 2021 Revision: 1 CCL ref No: 10994

Client: Colm Friel

Tree Protection Barriers

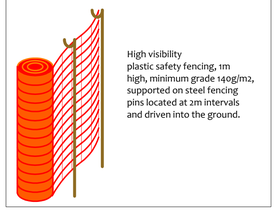
The purpose of tree protection barriers is to keep construction activity away from Restricted Activity Zones or Construction Exclusion Zones. They should be appropriate to the nature and proximity of activity within the site. The barriers should be erected prior to the commencement of all activity including 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 should be installed according to the legend on the Tree Protection Plan.

The Barrier-Mesh System

Where indicated by a thick red line (solid or dashed) on the Tree Protection Plan, it shall be acceptable to install a less robust system than those specified above. This is because of the nature of construction activity or its distance from tree protection areas. The purpose of such a system shall be to demarcate the protection zone. It is not intended that such fencing will withstand knocks by construction machinery.

In this system, high visibility plastic safety fencing, 1m high, minimum grade 140g/m2 is supported on steel fencing pins located at 2m intervals.

The Barrier Mesh System



High visibility plastic safety fencing, 1m high, minimum grade 140g/m2, supported on steel fencing pins located at 2m intervals and driven into the ground.

Notices

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

Removal of Tree Protection Barriers

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

Construction Exclusion Zones

Within Construction Exclusion Zones the following restrictions shall apply:

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

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 and T4	Trim lower hanging foliage to a height of 3.5m to provide clearance over the proposed outbuilding.	Any branches are to be pruned back to a secondary branch junction or the branch collar wherever possible. Trimming to be kept to a minimum to achieve the desired clearance of 3.5m.

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. Scope of future inspections / monitoring to be agreed.
5th.		Arboricultural Method Statement to be revised and approved.
		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.	Post-Construction Phase	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.		Undertake restricted landscaping operations within Root Protection Areas, including (where applicable) boundary treatments, pedestrian surfaces, decking and any proposed tree planting.

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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 shall be reinforced or replaced with adequate ground protection measures.

Unless specified otherwise, ground protection shall consist of 24mm OSB boards laid at double thickness and screwed together to prevent slippage. The ground shall first be made even by raking, or by adding a few centimetres of sand or woodchip. Where only pedestrian traffic will occur boards or planks may be supported by a scaffold framework. The scaffold may be founded on poles driven into the ground and/or onto blocks (to raise the scaffold) with additional couplings to make the framework secure.

Where 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, engineer's specifications should be referred to.

The ground protection measures shall be installed and approved before 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.

Restrictions in Specific Zones

Restricted Activity Zone A

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

- No vehicles or plant machinery shall park or operate unless a suitable load spreading surface is in place. The load spreading surface shall be installed as specified under the heading ***Ground Protection Measures***. This shall remain in place throughout the entire demolition and construction phase or until any new permanent hard surfacing is installed. Any pedestrian activity other than very occasional shall also require a suitable load spreading surface.
- No excavation shall occur in this zone without consulting the project arborist and obtaining approval from the local authority.
- Existing ground levels shall be retained undisturbed or raised by no more than 150mm. Ground levels may only be raised using granular topsoil (not rich in clay) or where new surfacing is proposed.
- No new permanent or temporary structures shall be erected other than those shown on the planning application documents unless approved by the local authority.
- Underground services shall not be installed in this area without prior consultation with the project arborist and a methodology agreed and approved by the local authority.
- If roots are encountered in excess of 25mm diameter, they shall be retained wherever possible and protected with damp sacking during times that they are unearthed. Any roots in excess of 10mm that need to be severed shall be pruned with secateurs.
- Storage of materials and spoil shall be avoided 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) shall be forbidden.
- No fires shall be permitted.
- Vehicles or plant machinery in excess of 2 tonnes shall not be permitted in this area.

Restricted Activity Zone B

In this zone foundations are to be installed. In order to minimise the impact on roots, it is proposed to install a Shallow Foundation. The following restrictions shall apply:

- Deep concrete strip foundations shall not be acceptable in this area. Instead, a shallow concrete slab foundation shall be installed.
- Excavation for the slab shall be limited to a maximum depth of 250mm and shall be undertaken using hand tools only.
- Roots in excess of 25mm which are located close to the bottom or the edge of the excavation are to be retained intact if possible and covered with wet sacking whilst exposed. All roots in excess of 10mm which cannot be retained shall be neatly pruned with secateurs.

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General Restrictions - Throughout the Site

Preparatory Works

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

Fires

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

Canopy Protection

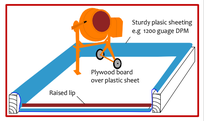
In order to protect tree canopies the following restrictions shall apply throughout the site:

- No machinery in excess of 2m shall 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 shall 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 shall be carefully marshalled in order to ensure that branches are not accidentally damaged.

Storage of Spoil and Materials

Storage of materials and spoil shall 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) shall be forbidden.

Hazardous Materials



Any mixing of cement based materials shall 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 shall 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 shall be cleaned within this area.

All other chemicals hazardous to tree health, including petrol and diesel, shall 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) shall 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 shall apply:

- Ground levels shall be maintained as existing.
- Post holes shall not exceed 300mm x 300mm.
- No post hole shall be excavated within 1.5m of any tree stem.
- Post holes shall 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 shall be retained wherever possible.
- Roots in excess of 10mm shall be pruned with sharp secateurs.
- Pruning shall be minimal and only undertaken where absolutely necessary to facilitate the site hoarding. It shall 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 shall 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 shall be consulted and specific tree protection measures agreed. The following general restrictions will apply:

- All services to and from site cabins shall be installed above ground through any Root Protection Areas.
- No excavation shall occur within Root Protection Areas to enable cabins to be installed.
- The cabins shall 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 shall apply:

- All post holes shall be excavated by hand and kept as narrow as possible (maximum diameter 300mm).
- Exploratory post holes shall 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 shall 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 shall be neatly pruned back with secateurs. This will encourage healing and reduce the likelihood of infection.

Walls shall be avoided over Root Protection Areas unless their foundations may be spanned over roots using a beam system.

Hedges may be planted within Root Protection Areas using hand tools to minimise excavation.

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Tree Protection Plan

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

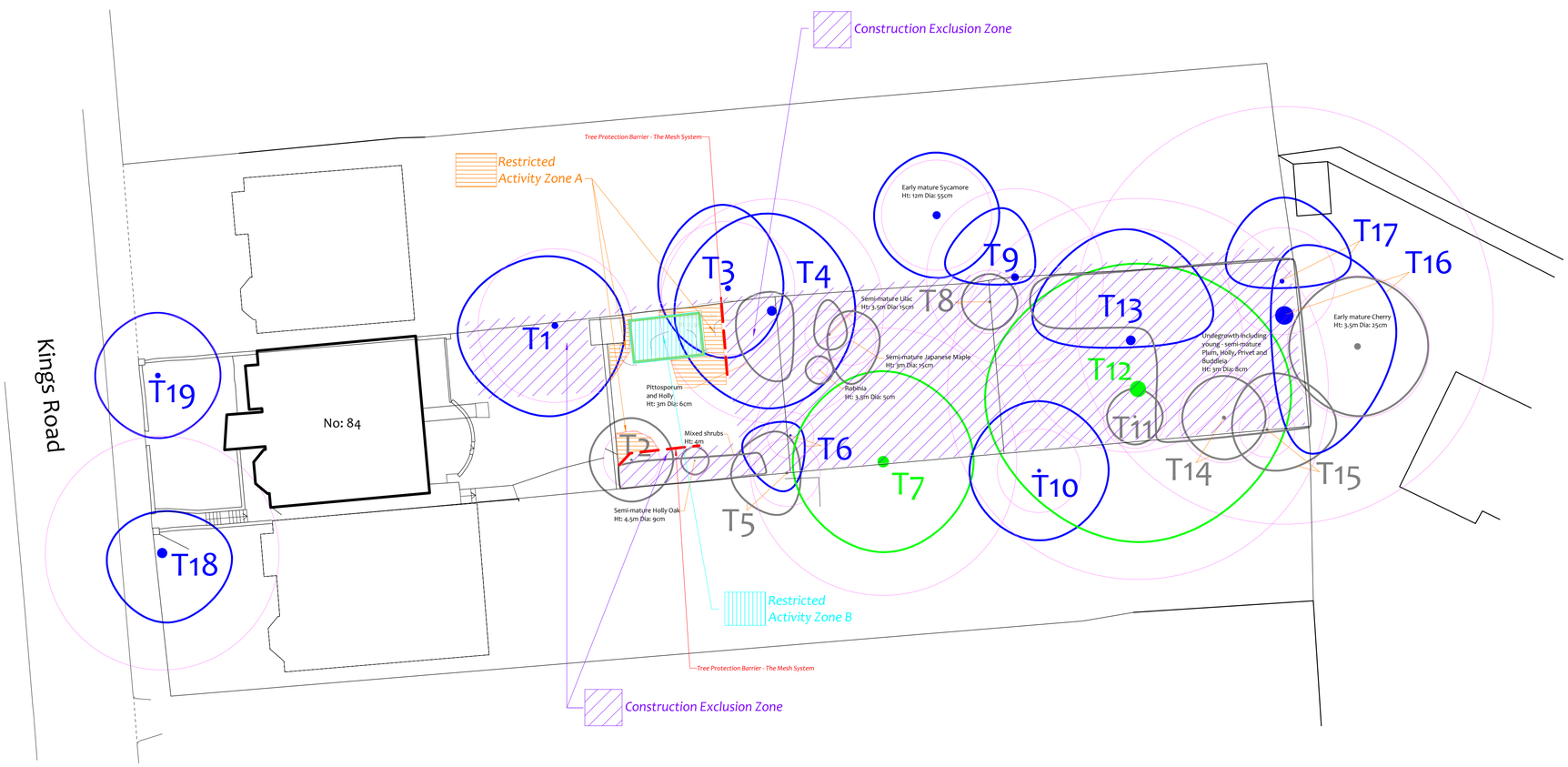
T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

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 10994 / TPP Rev: 1
Title:	Tree Protection Plan (Existing Layout with Proposals Overlaid)
Site:	84a Kings Road TW10 6EE
Scale: 1:200	Paper Size: A1

0 5 10m



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 completed & tree protection barriers / ground protection measures installed. Prior to any other activity, inc. demolition & soil stripping.	Site manager, project arborist. Tree Officer invited.	Tree protection fencing locations & specification checked. Ground protection measures checked. Contractors to be inducted to all relevant aspects of the Arboricultural Method Statement. Responsibilities checked and acknowledged. Adherence to the Arboricultural Method Statement to be discussed and agreed. Report on findings to be sent to the local authority tree officer (see accompanying reporting template)
Monthly Inspection and Reporting To occur once per calendar month throughout the entirety of the project until the local authority agree that tree protection measures may be removed	Site manager and project arborist*	Tree protection fencing locations & specification 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 week's notice to be given prior to commencement. Excavation to be as specified in this Method Statement. Excavations to be recorded and photographed. Mitigation measures to be employed 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 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. Oversight of excavation for basement down to 1.2m in Restricted Zones. Reporting to the local authority following site inspections and any variation or incidents.
Local Authority	London Borough of Richmond upon Thames	Insert Details	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