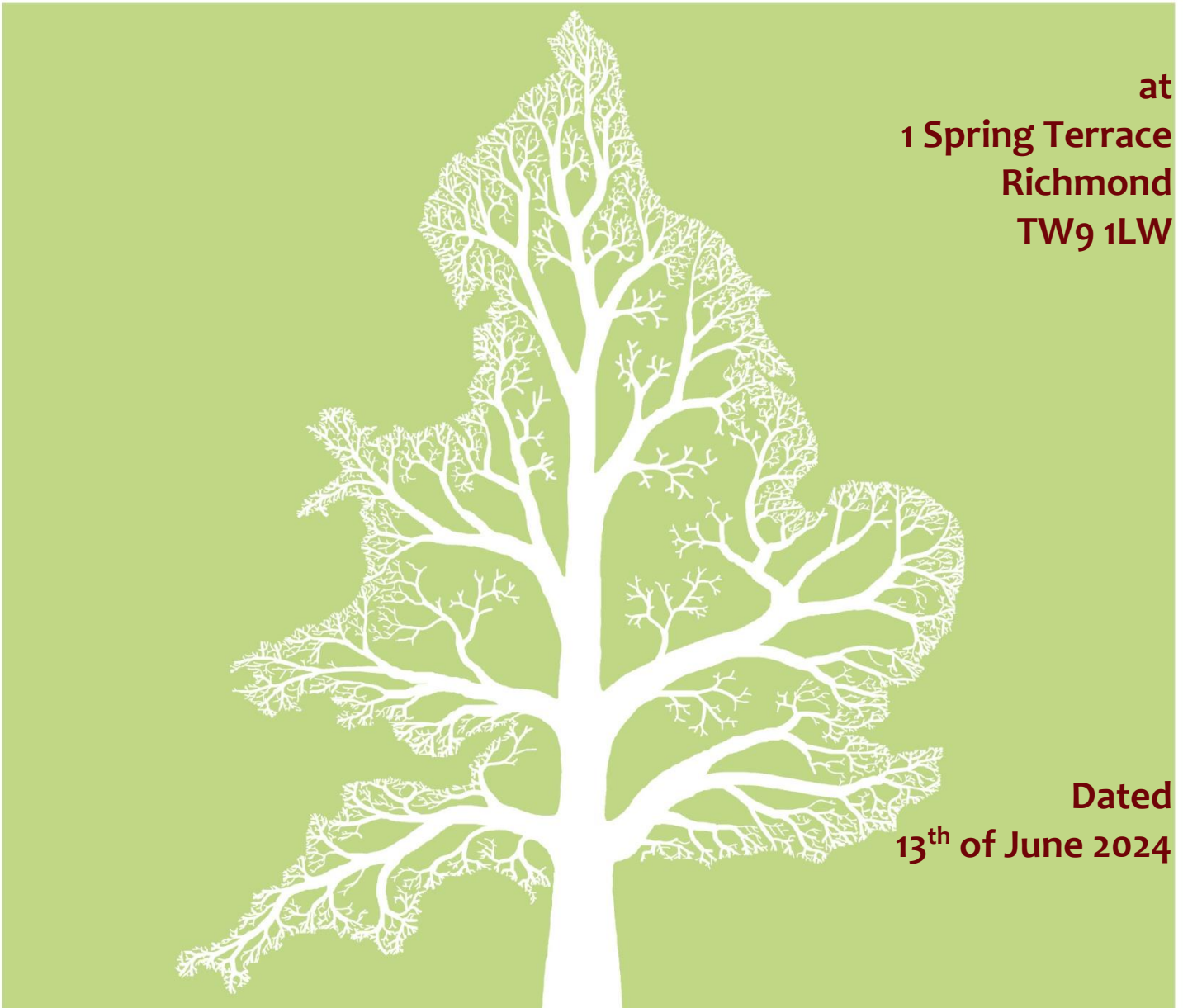


# BS 5837 Arboricultural Report

& Impact Assessment



at  
**1 Spring Terrace**  
**Richmond**  
**TW9 1LW**

Dated  
**13<sup>th</sup> of June 2024**



**CROWN**  
Tree Consultancy

Branching out through England and Wales

# Contents

<b>1.</b>	<b>Introduction</b>	<b>3</b>
1.1.	Instruction	3
1.2.	Purpose of this Report	3
1.3.	References	3
1.4.	Survey Details	3
1.5.	Author	3
<b>2.</b>	<b>Site Overview</b>	<b>4</b>
2.1.	Brief Site Description	4
2.2.	Coordinates	4
2.3.	Survey Extent	4
<b>3.</b>	<b>Vegetation Overview (independent of proposals)</b>	<b>5</b>
3.1.	Preliminary Management Recommendations	5
3.2.	Work Priority and Future Inspections	5
3.3.	Species Present – Additional Information	6
<b>4.</b>	<b>Statutory Protection – TPOs and Conservation Area Status</b>	<b>7</b>
4.1.	Desktop Research	7
<b>5.</b>	<b>Arboricultural Impact Assessment</b>	<b>8</b>
5.1.	Overview	8
5.2.	Tree Removal	8
5.3.	Tree Pruning	8
5.4.	Reduce Existing Wall Opening	8
5.5.	Demolition of Existing Wall	9
1.2.	Impact of Pier Foundations	9
5.6.	Changes in Ground Levels:	9
5.7.	Impact of Surfacing	9
5.8.	Underground Services:	9
5.9.	Waste and Materials Storage	9
5.10.	Cabins and Site Facilities	10
5.11.	Impact of Retained Trees on the Development	10
5.12.	Arboricultural Method Statement	10
<b>6.</b>	<b>Photographs</b>	<b>11</b>
	<b>Appendix 1: BS 5837: 2012 – Guidance Notes</b>	<b>12</b>
	<b>Appendix 2: Survey Methodology</b>	<b>13</b>
	<b>Appendix 3: Glossary of Tree Data</b>	<b>14</b>
	<b>Appendix 4: Author’s Qualifications</b>	<b>15</b>
	<b>Appendix 5: Further Information</b>	<b>16</b>
	<b>Appendix 6: Tree Data Schedule and Drawings</b>	<b>17</b>

# 1. Introduction

## 1.1. Instruction

1.1.1. We are instructed by James Forrest-Lines of LXA to:

- Undertake a Tree Survey to BS 5837 at 1 Spring Terrace 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 our client to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals and to specify suitable tree protection measures.

## 1.4. Survey Details

- 1.4.1. A visual ground-level assessment of all trees was undertaken on the 7<sup>th</sup> of June 2022, by Carl Lothian. 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 Joe Taylor - FdSc (Arboriculture), M. Arbor A. Details of the author's experience that qualify him to produce such a report are detailed in Appendix 4.

## 2. Site Overview

### 2.1. Brief Site Description

- 2.1.1. Number 1 Spring Terrace is a residential property with a driveway to the front and a garden to the rear.
- 2.1.2. A flat, paved driveway covers most of the front garden, containing a mature London plane tree. This is an exceptionally large specimen. Brick walls run along the boundary of the site.
- 2.1.3. The rear garden contains a variety of small-to-medium-sized trees and large shrubs. These trees are mostly located towards the bottom of the garden, uninfluenced by the development.
- 2.1.4. 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°27'37.65"N 0°18'0.15"W, and the altitude is approximately 16m above sea level<sup>1</sup>.

### 2.3. Survey Extent

- 2.3.1. The area indicated below<sup>2</sup> shows the approximate extent of our survey. Our survey included all trees within the curtilage of the property and those adjacent to it.



---

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

<sup>2</sup> 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. T2 has had several structural roots severed close to its base. We, therefore, recommend this tree is reduced.
- 3.1.3. T3 is in an acceptable condition at present; however, the smallest stem of the tree is pressing against and displacing a boundary wall. We recommend that this smallest stem be removed.
- 3.1.4. T5 has major decay at its base and requires removal to prevent the potential of tree failure. Similarly, G6 are two trees growing on a decaying stump. Thus, their structural integrity will continue to degrade over time as the stump rots away. Therefore, we recommend these trees be removed.
- 3.1.5. 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
<b>Urgent</b>	As soon as possible	None
<b>Very High</b>	Within 1 Month	None
<b>High</b>	Within 3 Months	T12
<b>Moderate</b>	Within 1 year	T2, T5 and G6
<b>Low</b>	Within 3 years	T3

- 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
<b>0.5</b>	None
<b>1</b>	None
<b>1.5</b>	T2 and T7
<b>3</b>	T3, T4, T8, T9, T10 and H11

- 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
Ash	25	18	Large deciduous tree with a straight bole and a high open domed crown. Native to Britain and commonly found in woodlands and adjacent roadsides. Not suitable for small gardens. Easily identified by its oppositely arranged pinnate leaves and black buds. Branches are relatively brittle resulting in a fairly high incidence of small branch failure in windy conditions. Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Fraxinus+excelsior">http://www.pfaf.org/user/Plant.aspx?LatinName=Fraxinus+excelsior</a> for more info.
Black Locust	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 <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Robinia+pseudoacacia">http://www.pfaf.org/user/Plant.aspx?LatinName=Robinia+pseudoacacia</a> for more info.
Cabbage Palm	14	4	Native to New Zealand. Abundant in milder coastal areas of the UK. May die back in severe winters in the North. On of the few monocot trees (i.e. with parallel leaf veins like grasses and lilies). Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Cordyline+australis">http://www.pfaf.org/user/Plant.aspx?LatinName=Cordyline+australis</a> for more info.
Holly Oak	25	20	Also called Holm Oak or Evergreen Oak. So named because of its evergreen vaguely holly-like leaves. Originating in the Mediterranean region. Mulched leaves are said to repel slugs and grubs. Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Quercus+ilex+ballota">http://www.pfaf.org/user/Plant.aspx?LatinName=Quercus+ilex+ballota</a> for more info.
Hornbeam	25	14	Deciduous tree native to Southeast England and across Europe. Bark is smooth and grey on a stem which is often twisted and sinewy. Leaves sharply toothed and deeply veined. Tolerant of heavy clay soils. Formerly coppiced and prized for its durable timber which was used in wheel hubs, piano hammers, mill wheels and chopping blocks. Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Carpinus+betulus">http://www.pfaf.org/user/Plant.aspx?LatinName=Carpinus+betulus</a> for more info.
Norway Maple	25	16	Deciduous tree native to S. Norway, S. Sweden and across Europe. Red buds and light brown grooved bark distinguish it from sycamore in winter. Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Acer+platanooides">http://www.pfaf.org/user/Plant.aspx?LatinName=Acer+platanooides</a> for more info.
Yew	14	12	Evergreen species native throughout Europe. Commonly planted in churchyards. Once revered by ancient Britons and thought to be the inspiration for our Christmas tree. Capable of remarkable regeneration and extreme longevity. Poisonous foliage and seeds. Slow growing. Visit <a href="http://www.pfaf.org/user/Plant.aspx?LatinName=Taxus+baccata">http://www.pfaf.org/user/Plant.aspx?LatinName=Taxus+baccata</a> 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. Statutory Protection – TPOs and Conservation Area Status

Before undertaking most works on trees protected by a tree preservation order<sup>3</sup>, 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<sup>4</sup>. 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.

### 4.1. Desktop Research

4.1.1. We are informed, by Amber Theobalds of London Borough of Richmond upon Thames, via email correspondence on the 8<sup>th</sup> of June 2022 that:

- The site is within a conservation area.
- There is one tree preservation order affecting a tree within the site. This tree is believed to be the mature London plane tree to the front.
- There is a tree preservation order affecting a tree immediately adjacent to the site. This tree is believed to be a mature horse chestnut adjacent to the northeast boundary.

---

<sup>3</sup> <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>

<sup>4</sup> 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.

## 5. Arboricultural Impact Assessment

### 5.1. Overview

5.1.1. It is proposed to reduce the existing 2300mm wide access opening in the existing garden wall to maintain a 1.2m wide full height opening and convert sections of the existing wall to a 215mm fully bonded wall. In addition, the boundary wall to the southwest is proposed to be demolished and rebuilt with a new pier to match the existing adjacent pier. The existing layout is indicated in black, and the footprint of the proposed layout is indicated in pink, as indicated on the drawings in Appendix 6.

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

Activity	Trees Potentially Affected
Tree Removal	None
Tree Pruning	None
RPA: Reduce Existing Wall Opening	T4
RPA: Conversion of Existing Wall	T4
RPA: Demolition of Existing Wall	T7
RPA: New Pier Foundations	T7
RPA: New Surface	None
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent to proposed works (preventable by installing tree protection measures)

5.1.1. 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.

5.1.2. 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.

### 5.2. Tree Removal

5.2.1. All trees are to be retained.

### 5.3. Tree Pruning

5.3.1. The retained tree canopies are sufficiently far from proposed building works and high over access routes such that they should not be impacted by construction activity. Consequently, no pruning works are required to enable the build. The accompanying Arboricultural Method Statement specifies protection measures throughout the site to ensure that no canopies are accidentally damaged.

### 5.4. Reduce Existing Wall Opening

5.4.1. It is proposed to reinstate part of the existing wall within the Root Protection Area of T4 that has been previously used as a temporary access. The existing 2300mm wide opening is to be reduced; a 1200mm wide, full-height opening will be retained. Existing wall foundations shall be reused, and no excavation or machinery is required; consequently, there will be no impact on T4.

5.4.2. Sections of the existing wall are also to be converted to a 215mm fully bonded wall. No excavation is required; consequently, there shall be no impact on T4.



## 5.5. Demolition of Existing Wall

- 5.5.1. Where it is proposed to demolish the boundary wall to the southeast, only a very small portion of the Root Protection Area shall be affected (see the Impact Assessment Plan). However, to minimise the impact, the following restrictions are proposed:
- Wherever practicable, hand tools shall be used.
  - Otherwise, plant machinery may be used so long as it operates from outside Root Protection Areas (or on a suitable load-spreading surface).

## 1.2. Impact of Pier Foundations

- 5.5.2. The foundations for the new pier will extend into the edge of the theoretical Root Protection Area of T7. However, only a very small portion of the Root Protection Area shall be affected (see the Impact Assessment Plan).
- 5.5.3. Because such a small portion of the Root Protection Area shall be affected, the impact is considered to be negligible and no restrictions on foundation design are considered necessary.

## 5.6. Changes in Ground Levels:

- 5.6.1. No changes in ground levels are proposed.

## 5.7. Impact of Surfacing

- 5.7.1. No new hard surfaces are proposed within the Root Protection Areas of any trees.

## 5.8. Underground Services:

- 5.8.1. The proposal requires no underground services to be excavated through any Root Protection Areas.

### Soil Compaction:

- 5.8.2. 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.
- 5.8.3. 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.
- 5.8.4. It is important therefore that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. Where access is required over Root Protection Areas, suitable ground protection measures must be installed.



## 5.9. Waste and Materials Storage

- 5.9.1. 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.
- 5.9.2. 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.

## **5.10. Cabins and Site Facilities**

- 5.10.1. Any cabins and welfare facilities should be located outside of Root Protection Areas wherever possible. Otherwise, the project arborist should be consulted, and approval obtained from the local authority.

## **5.11. Impact of Retained Trees on the Development**

- 5.11.1. The proposal does not alter the current juxtaposition between the wall and retained trees, so there shall be no post-development pressure to overly prune or remove them.

## **5.12. Arboricultural Method Statement**

- 5.12.1. 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.

## 6. Photographs

Refer also to the Tree Constraints Plan for photo locations

Photo 1.



Photo 2.



Photo 3.



Photo 4.



Photo 5.



## 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<sup>+</sup>** Indicates borderline C/B, though Category C is deemed to be most appropriate.

**B<sup>-</sup>** 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

<b>Numbering System:</b>	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.
<b>Age Categories:</b>	
<b>Young</b>	Usually less than 10 years old.
<b>Semi-Mature</b>	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
<b>Early-Mature</b>	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
<b>Mature</b>	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
<b>Veteran</b>	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
<b>Over Mature</b>	As for veteran except management is not considered worthwhile.
<b>Species:</b>	Common names and Latin names are given.
<b>Height:</b>	Measured from ground level to the top of the crown.
<b>Stem Diameter:</b>	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.
<b>Crown Height:</b>	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.
<b>Tree Diagram:</b>	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.
<b>Crown Spread:</b>	Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.
<b>Observations:</b>	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.
<b>Recommendations:</b>	Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.
<b>Priority Scale:</b>	Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:
<b>Urgent</b>	To be carried out as soon as possible.
<b>Very High</b>	To be carried out within 1 month.
<b>High</b>	To be carried out within 3 months.
<b>Moderate</b>	To be carried out within 1 year.
<b>Low</b>	To be carried out within 3 years.
<b>Inspection Frequency:</b>	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.
<b>Vigour:</b>	An indication of growth rate and the tree's ability to cope with stresses:
<b>High</b>	Having above average vigour.
<b>Moderate</b>	Having average vigour.
<b>Low</b>	Having below average vigour.
<b>Very Low</b>	Tree is struggling to survive and may be dying.
<b>Physiological Condition:</b>	
<b>Good</b>	Healthy and with no symptoms of significant disease.
<b>Fair</b>	Disease present or vigour is impaired.
<b>Poor</b>	Significant disease present or vigour is extremely low.
<b>Very Poor</b>	Tree is dying.
<b>Structural Condition:</b>	
<b>Good</b>	Having no significant structural defects.
<b>Fair</b>	Some defects observed though no high priority works are required.
<b>Poor</b>	Significant defects found. Tree requires monitoring or remedial works.
<b>Very Poor</b>	Major defects which will usually require significant remedial works or tree removal.
<b>Amenity Value:</b>	
<b>Very High</b>	Exceptional specimen, observable by a large number of people.
<b>High</b>	Attractive specimen, observable by a significant number of people.
<b>Moderate</b>	One of the above factors is not applicable.
<b>Low</b>	Unattractive specimen or largely hidden from view.
<b>Life Expectancy:</b>	The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).
<b>Retention Category:</b>	These are explained in detail in Appendix 1.

### A2.2 Evaluation of Defects

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

<b>Major</b>	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
<b>Significant</b>	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.
<b>Minor</b>	A defect that is unlikely to develop into a major defect.

## Appendix 4: Author's Qualifications

### 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](http://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#](http://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/wgfsfell.pdf/\\$FILE/wgfsfell.pdf](http://www.forestry.gov.uk/website/pdf.nsf/pdf/wgfsfell.pdf/$FILE/wgfsfell.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](http://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

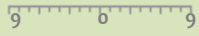



<a href="http://www.crowntrees.co.uk">www.crowntrees.co.uk</a>	Crown Consultants site containing useful information
<a href="http://www.trees.org.uk">www.trees.org.uk</a>	Arboricultural Association
<a href="http://www.rfs.co.uk">www.rfs.co.uk</a>	Royal Forestry Society of England, Wales and N. Ireland
<a href="http://www.treehelp.info">www.treehelp.info</a>	The Tree Advice Trust
<a href="http://www.woodland-trust.org.uk">www.woodland-trust.org.uk</a>	The Woodland Trust
<a href="http://www.treecouncil.org.uk">www.treecouncil.org.uk</a>	The Tree Council



## Appendix 6: Tree Data Schedule and Drawings

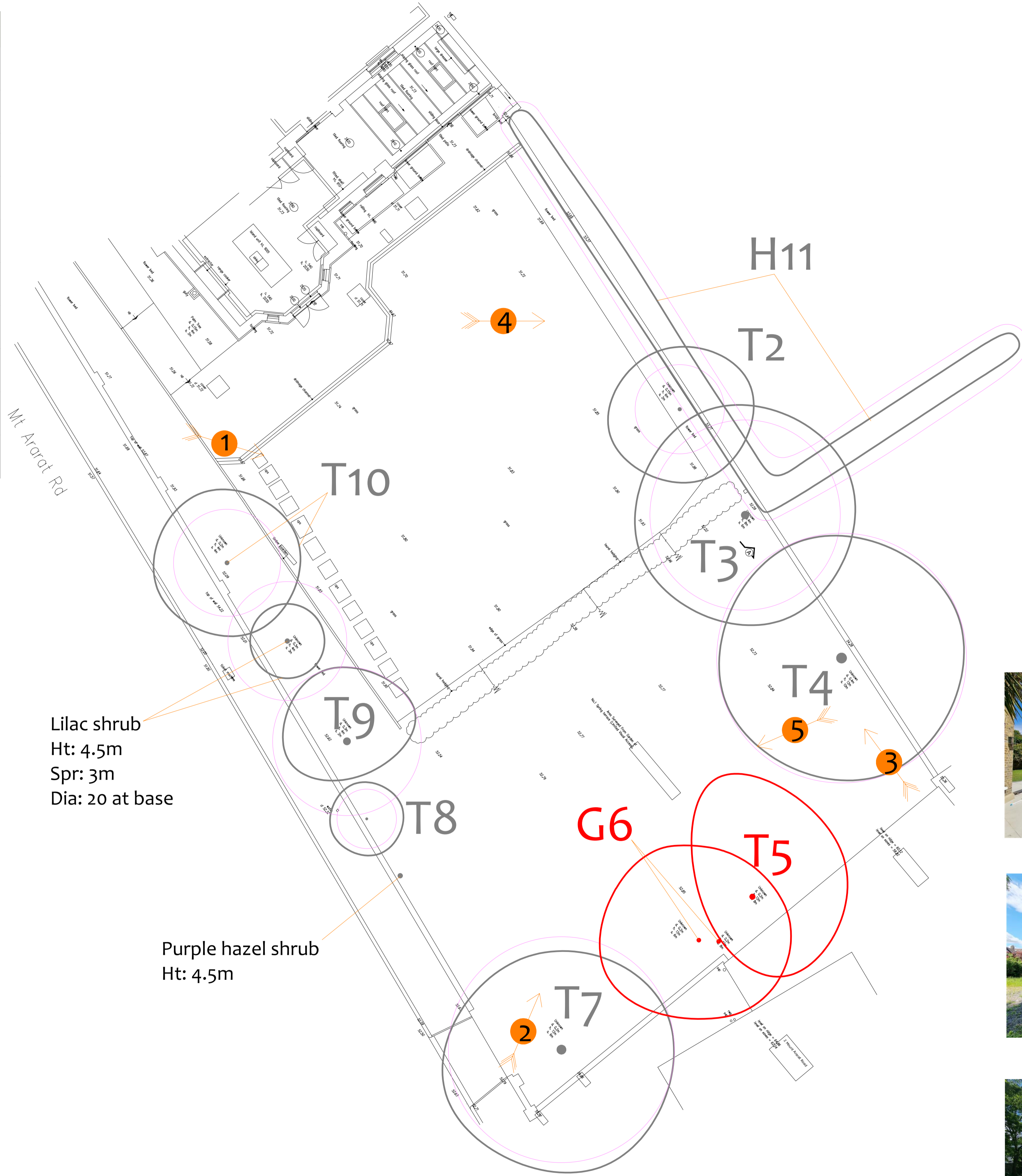
The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals)		Vigour		Amenity Value	
					W	N	E			Priority	Inspect Freq (yrs)	Physiological Condition	Structural Condition	Life Expectancy (yrs)	Retention Category
					S										
T2	Semi-Mature <b>Ash</b> <i>Fraxinus excelsior.</i>	9.5	2	15	2.5	3	3		Form: Twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: <b>Historic level change with some structural roots pruned.</b> Other: Growing adjacent boundary wall.	Reduce height and radial spread by 2m.		Moderate	Low		
					3					Moderate	1.5	Good	10-20	C -	
T3	Semi-Mature <b>Holly Oak</b> <i>Quercus ilex.</i>	8.5	2	32	4.5	4.5	4.5		Form: Twin-stemmed at 0.5m with a balanced crown. History: Occasional pruning wounds due to crown lifting. Defects: <b>No significant defects observed.</b> Other: Stem pressing against and displacing boundary wall. Recorded stem diameter is equivalent for two stems (26cm & 19cm).	Remove smallest stem.		Moderate	Moderate		
					4.5					Low	3	Good	40+	C	
T4	Semi-Mature <b>Norway Maple</b> <i>Acer platanoides.</i>	12	1.5	42	5	5	5		Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: <b>No significant defects observed.</b> Other: Growing adjacent to and beginning to displace boundary wall.	No action required.		Moderate	Moderate		
					5					n/a	3	Good	20-40	C +	
T5	Semi-Mature <b>Black Locust</b> <i>Robinia pseudoacacia.</i>	13	2	23	5	4	3.5		Form: Twin-stemmed at 4m with an unbalanced crown. History: No evidence of significant pruning. Defects: <b>Scattered dead twigs. Major decay at base of stem.</b> Other: Growing on slope.	Remove.		Moderate	Moderate		
										Moderate	N/A	Fair	<10	U	
G6	Semi-Mature <b>Black Locust</b> <i>Robinia pseudoacacia.</i>	av 13	av 2	av 17	av 4	3	3		Form: Re-growth from felled, decaying stump. Defects: <b>Decaying stump on a slope.</b>	Remove.		Moderate	Moderate		
					each					Moderate	N/A	Fair	<10	U	
T7	Semi-Mature <b>Black Locust</b> <i>Robinia pseudoacacia.</i>	13	2	38	4	4.5	5		Form: Twin-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: <b>Scattered dead twigs. Tight 'v' shaped union with included bark at primary fork. Dead wood to 5cm diameter 5m above ground level on north side.</b> Other: Vegetation prevented detailed inspection.	No action required.		Moderate	High		
					5					n/a	1.5	Fair	40+	C +	
T8	Young <b>Holly Oak</b> <i>Quercus ilex.</i>	7	1.5	10	1.5	1.5	1.5		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: <b>No significant defects.</b> Other: Growing adjacent boundary wall.	No action required.		Moderate	Moderate		
										n/a	3	Fair	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	Amenity Value
								Priority	Inspect Freq (yrs)	Physiological Condition	Life Expectancy (yrs)
										Structural Condition	Retention Category
T9	Mature <b>Smoke Bush</b>  Cotinus sp.	4.5	1	30 @ Base	3 2.5 3 1.5		Form: Mature shrub with significant limbs. History: No evidence of significant pruning. Defects: <b>No significant defects.</b> Other: Limited inspection, dimensions estimated.	No action required.		Moderate	Low
	n/a							3	Good	20-40 C	
T10	Semi-Mature <b>Yew</b>  Taxus baccata.	6	2	18	3 3 3 3		Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: <b>No significant defects.</b> Other: Limited inspection, dimensions estimated.	No action required.		Moderate	Moderate
	n/a							3	Good	40+ C	
H11	Young <b>Hornbeam</b>  Carpinus betulus.	5	2	7	0.5 0.5 0.5 0.5		Position: Situated on third party land. Form: Pleached hedgerow. Other: Limited inspection, dimensions estimated.	No action required.		Moderate	Low
	n/a							3	Good	40+ C	

Tree Data Schedule

Reference	Age & Species	Height (m)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes	Recommendations		Priority	Vegetation Condition	Structural Condition	Amenity	Life Expectancy (yr)	Retention Category
			W	N	E			Priority	Structural Condition						
T2	Semi-Mature Ash Fraxinus excelsior.	9.5	2	15	3	15	Form: Twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Historic level change with some structural roots pruned. Other: Growing adjacent boundary wall.	Reduce height and radial spread by 2m.	Moderate	Good	Poor	Low	10-20	C-	
T3	Semi-Mature Holly Oak Quercus ilex.	8.5	2	34	4.5	15	Form: Twin-stemmed at 0.5m with a balanced crown. History: Occasional pruning wounds due to crown lifting. Defects: No significant defects observed. Other: Stem pressing against and displacing boundary wall. Recorded stem diameter & equivalent for two stems (d1cm & r1cm).	Remove smallest stem.	Moderate	Good	Fair	Moderate	40+	C	
T4	Semi-Mature Norway Maple Acer platanoides.	12	1.5	41	5	15	Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Growing adjacent to and beginning to displace boundary wall.	No action required.	Moderate	Good	Fair	Moderate	20-40	C+	
T5	Semi-Mature Black Locust Robinia pseudoacacia.	13	2	23	3	15	Form: Twin-stemmed at 2m with an unbalanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Major decay at base of stem. Other: Growing on slope.	Remove.	Moderate	Fair	Poor	Low	<10	U	
G6	Semi-Mature Black Locust Robinia pseudoacacia.	2V	2V	4V	4	15	Form: Re-growth from felled, decaying stump. Defects: Decaying stump on a slope.	Remove.	Moderate	Fair	Poor	Low	<10	U	
T7	Semi-Mature Black Locust Robinia pseudoacacia.	13	2	38	5	15	Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Tight 'V' shaped union with included bark at primary fork. Dead wood to stem diameter 2m above ground level on north side. Other: Vegetation prevented detailed inspection.	No action required.	Moderate	Fair	Fair	High	40+	C+	
T8	Young Holly Oak Quercus ilex.	7	1.5	10	1.5	15	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Growing adjacent boundary wall.	No action required.	Moderate	Fair	Fair	Moderate	10-20	C	
T9	Mature Smoke Bush Cotinus sp.	4.5	1	3	3	15	Form: Mature shrub with significant limbs. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Good	Low	20-40	C	
T10	Semi-Mature Yew Taxus baccata.	6	2	18	3	15	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Good	Moderate	40+	C	
H11	Young Hornbeam Carpinus betulus.	5	2	7	0.5	15	Form: Situated on third party land. History: Fenced hedgeform. Defects: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Good	Low	40+	C	



Lilac shrub  
Ht: 4.5m  
Spr: 3m  
Dia: 20 at base

Purple hazel shrub  
Ht: 4.5m

Photographs



Drawing No: CCL 11180B / TCP Rev: 1  
Title: Tree Constraints Plan (Existing Layout)  
Site: 1 Spring Terrace TW9 1LW  
Scale: 1:100 Paper Size: A1



Tree Retention Categories  
Stems & canopies shown

- Category A tree
- Category B tree
- Category C tree
- Category U 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.

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.

Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.

Trees unsuitable for retention due to their very poor condition.

Tree Constraints Plan  
Status: Final

BS 5837 Root Protection Area (radius = 1xstem 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 site conditions

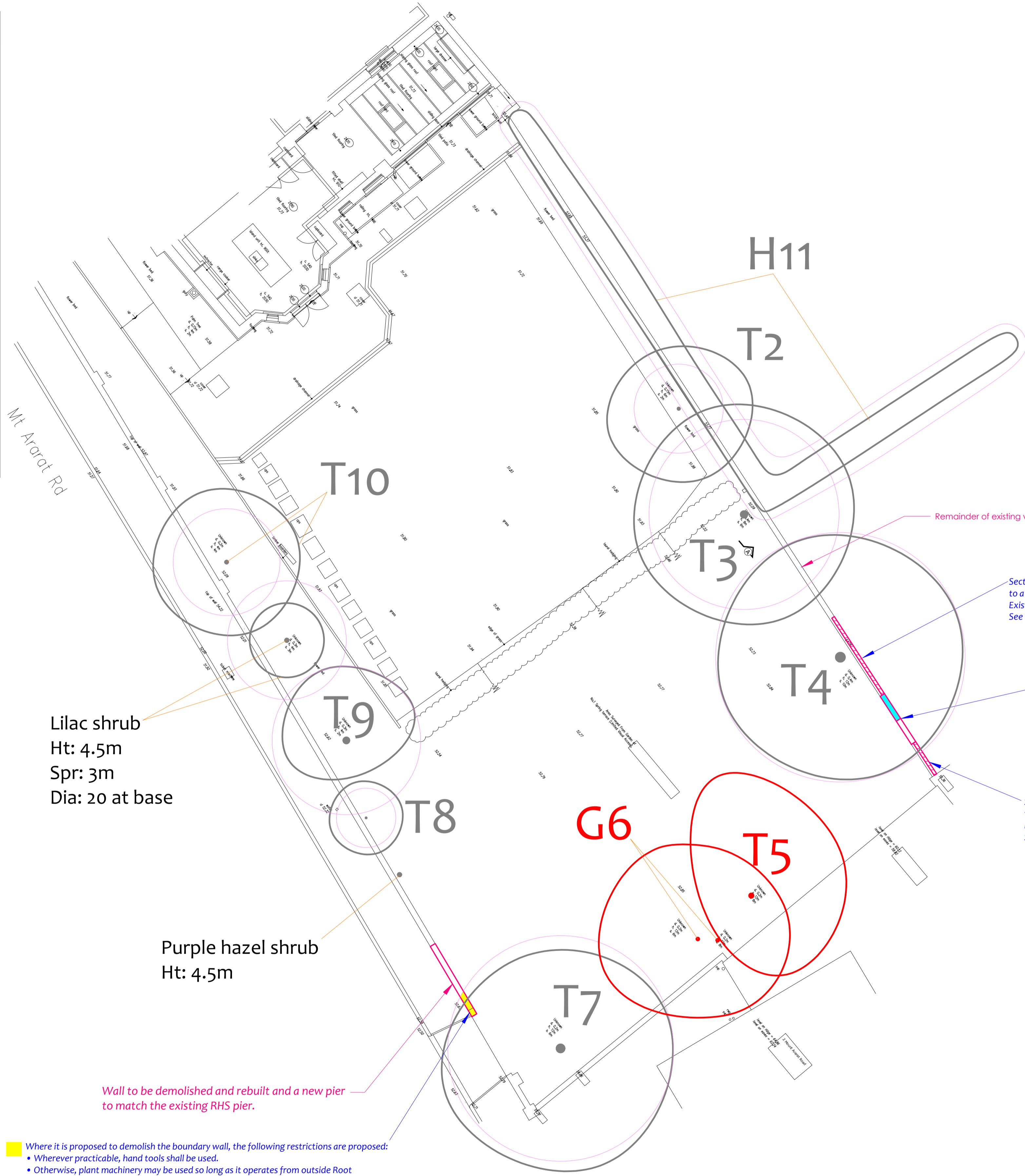
T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

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.

Tree Ref.	Species	Height (m)	Root Protection Area	
			Radius (m)	Area (m <sup>2</sup> )
T2	Ash	9.5	1.8	10
T3	Holly Oak	8.5	3.8	46
T4	Norway Maple	11.5	5.0	80
T5	Black Locust	13	2.8	24
G6	Black Locust	13	2.0	13
T7	Black Locust	13	4.6	65
T8	Holly Oak	7	1.2	5
T9	Smoke Bush	4.5	3.0	28
T10	Yew	6	2.2	15
H11	Hornbeam	5	0.8	2

Tree Data Schedule

Reference	Age & Species	Height (m)	Crown Spread (m)		Notes	Recommendations (Independent of any development proposals)	View Physiological Location Structural Stability	Anxiety Risk Life Expectancy (Yr) Retention Category
			N	E				
T2	Semi-Mature Ash Fraxinus excelsior	9.5	2	15	3	Form: Twin stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Historic level change with some structural roots pruned. Other: Growing adjacent boundary wall.	Moderate Good	Low 10-20 C
T3	Semi-Mature Holly Oak Quercus ilex	8.5	2	34	4.5	Form: Twin stemmed at 0.5m with a balanced crown. History: Occasional pruning wounds due to crown lifting. Defects: No significant defects observed. Other: Stem pressing against and displacing boundary wall. Recorded stem diameter is equivalent for two stems (45cm & 19cm).	Moderate Good	Moderate 40+ C
T4	Semi-Mature Norway Maple Acer platanoides	12	1.5	41	5	Form: Twin stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Growing adjacent to and beginning to displace boundary wall.	No action required. Good	Moderate 20-40 C+
T5	Semi-Mature Black Locust Robinia pseudoacacia	13	2	23	2	Form: Twin stemmed at 6m with an unbalanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Major decay at base of stem. Other: Growing on slope.	Remove. Fair	Moderate Poor <10 U
G6	Semi-Mature Black Locust Robinia pseudoacacia	AV 13	AV 2	AV 17	4	Form: Re-growth from felled, decaying stump. Defects: Decaying stump on a slope.	Remove. Fair	Moderate Fair <10 U
T7	Semi-Mature Black Locust Robinia pseudoacacia	13	2	38	5	Form: Twin stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Tight 'V' shaped union with included bark at primary fork. Dead wood to stem diameter 2m above ground level on north side. Other: Vegetation prevented detailed inspection.	No action required. Fair	Moderate Fair 40+ C+
T8	Young Holly Oak Quercus ilex	7	1.5	10	1.5	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Growing adjacent boundary wall.	No action required. Fair	Moderate 10-20 C
T9	Mature Smoke Bush Cotinus sp.	4.5	1	14 @ Base	3	Form: Mature shrub with significant limbs. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required. Good	Moderate Good 20-40 C
T10	Semi-Mature Yew Taxus baccata	6	2	18	3	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required. Good	Moderate Good 40+ C
H11	Young Hornbeam Carpinus betulus	5	2	7	0.5	Position: Situated on third party land. Form: Pheasant hedgeform. Other: Limited inspection, dimensions estimated.	No action required. Good	Moderate Good 40+ C



- Where it is proposed to demolish the boundary wall, the following restrictions are proposed:
  - Wherever practicable, hand tools shall be used.
  - Otherwise, plant machinery may be used so long as it operates from outside Root Protection Areas (or on a suitable load-spreading surface).
- Where it is proposed to install the new pier, only a very small portion of the Root Protection Area shall be affected, so no restrictions on foundation design are considered necessary.



Tree Retention Categories	
	Category A tree
	Category B tree
	Category C tree
	Category U 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.

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.

Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.

Trees unsuitable for retention due to their very poor condition.

# Impact Assessment Plan

Status: Final - for submission

	B5 S37 Root Protection Area (radius = 1xstem 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 site conditions

Tree to be removed to facilitate the proposal

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.

Tree Ref.	Species	Height (m)	Root Protection Area	
			Radius (m)	Square (m)
T2	Ash	9.5	1.8	10
T3	Holly Oak	8.5	3.8	46
T4	Norway Maple	11.5	5.0	80
T5	Black Locust	13	2.8	24
G6	Black Locust	13	2.0	13
T7	Black Locust	13	4.6	65
T8	Holly Oak	7	1.2	5
T9	Smoke Bush	4.5	3.0	28
T10	Yew	6	2.2	15
H11	Hornbeam	5	0.8	2

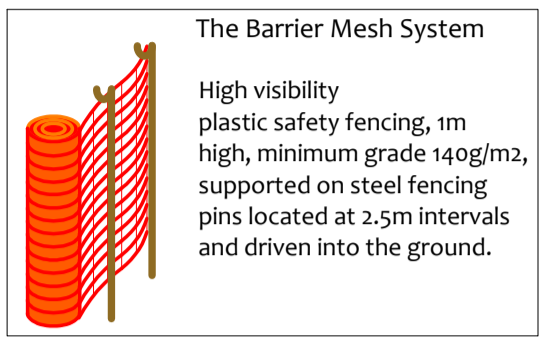
## Tree Protection Barriers

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 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 (including pedestrian activity and use of plant machinery). 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/m<sup>2</sup> is supported on steel fencing pins located at 2.5m intervals.



### Restrictions in Specific Zones

## 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 and/or maintained as specified under the heading **Ground Protection Measures**. This will 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) will also require a suitable load spreading surface.
- Removal of existing structures (where applicable) will be undertaken using hand tools only.
- No new permanent or temporary structures will be erected other than those shown on the planning application documents unless approved by the local authority.
- No excavation will occur 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 excavation will occur in this zone without consulting the project arborist and obtaining approval from the local authority.
- Ground levels to remain undisturbed.

### Restricted Activity Zone B

Within this zone, the following restrictions will apply:

- Works to reinstate the existing wall will not commence until the protective barriers (including ground protection measures) are installed to the satisfaction of the local authority.
- A 1200mm wide opening in the existing wall will be retained in the location shown on the adjacent Tree Protection Plan.
- Where repairs/rebuilding of the wall are proposed, existing bricks are to be used where possible.
- Hand tools only will be used for works in this zone.
- No excavation will occur in this zone.
- Care shall be taken when working beneath tree canopies to ensure overhanging branches are not damaged.
- Any masonry to be removed/replaced shall not be permitted to fall on the same side of the wall as the trees. Instead, they shall fall on the side where the trees do not grow (to the northeast).
- The existing foundations shall be left intact.

## General Restrictions - Throughout the Site

### 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

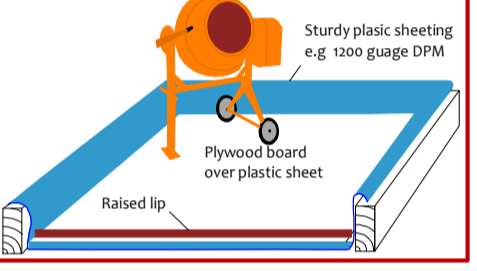
- In order to protect tree canopies the following restrictions shall apply throughout the site:
- No machinery in excess of 2m shall pass beneath the canopy of any tree without being carefully marshalled in order to ensure that no branches are damaged.
  - If materials require installation or delivery 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 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.

## Site Monitoring Schedule

Inspection	Site Attendees	Comments
<b>Pre-Start Desk-top</b> 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.
<b>Pre-Start Meeting</b> After tree protection barriers installed. Prior to any other activity, inc. demolition & soil stripping.	Site manager, project arborist. Tree Officer invited.	Tree protection fencing locations & specification 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)
<b>Post-Construction Meeting</b> Post external construction activity but prior to removal of fencing & landscaping operations.	Site manager, project arborist. Tree Officer invited.	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.

## Tree Data Schedule

Reference to tree in image	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m)	Notes	Recommendations		Vigour	Amenity Value			
							Priority	Inspect (see text)		Physiological Condition	Structural Condition	Life Expectancy (yrs)	Retention Category
T2	Semi-Mature Ash Fraxinus excelsior.	9.5	2	15	3	2.5	Form: Twin-stemmed at 2m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Historic level change with some structural roots pruned. Other: Growing adjacent boundary wall.	Reduce height and radial spread by 2m.	Moderate	Good	Low	10-20	C
T3	Semi-Mature Holly Oak Quercus ilex.	8.5	2	32	4.5	4.5	Form: Twin-stemmed at 0.5m with a balanced crown. History: Occasional pruning wounds due to crown lifting. Defects: No significant defects observed. Other: Stem pressing against and displacing boundary wall. Recorded stem diameter is equivalent for two stems (26cm & 19cm).	Remove smallest stem.	Moderate	Good	Moderate	40+	C
T4	Semi-Mature Norway Maple Acer platanoides.	12	1.5	42	5	5	Form: Twin-stemmed at 2m with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Growing adjacent to and beginning to displace boundary wall.	No action required.	Moderate	Good	Moderate	20-40	C+
T5	Semi-Mature Black Locust Robinia pseudoacacia.	13	2	23	2	4	Form: Twin-stemmed at 4m with an unbalanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Major decay at base of stem. Other: Growing on slope.	Remove.	Moderate	Fair	Moderate	<10	U
G6	Semi-Mature Black Locust Robinia pseudoacacia.	av	av	av	4	4	Form: Re-growth from felled, decaying stump. Defects: Decaying stump on a slope.	Remove.	Moderate	Fair	Moderate	<10	U
T7	Semi-Mature Black Locust Robinia pseudoacacia.	13	2	38	5	4.5	Form: Twin-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: Scattered dead twigs. Tight 'V' shaped union with included bark at primary fork. Dead wood to 5cm diameter 5m above ground level on north side. Other: Vegetation prevented detailed inspection.	No action required.	Moderate	Fair	High	40+	C+
T8	Young Holly Oak Quercus ilex.	7	1.5	10	1.5	1.5	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Growing adjacent boundary wall.	No action required.	Moderate	Fair	Moderate	10-20	C
T9	Mature Smoke Bush Cotinus sp.	4.5	1	30 @ Base	2.5	3	Form: Mature shrub with significant limbs. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Low	20-40	C
T10	Semi-Mature Yew Taxus baccata.	6	2	18	3	3	Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. Defects: No significant defects. Other: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Moderate	40+	C
H11	Young Hornbeam Carpinus betulus.	5	2	7	0.5	0.5	Form: Situated on third party land. History: Pleached hedgerow. Other: Limited inspection, dimensions estimated.	No action required.	Moderate	Good	Low	40+	C

## Timing of Operations

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

Order	Phase	Activity
1st.		Planning conditions relating to trees to be identified and discussed with the Project arborist and site manager.
2nd.	Pre-Construction Phase	Install the tree protection barriers (fencing - see Header -Tree Protection Barriers).
3rd.		Pre-Commencement site meeting: Tree protection barriers inspected. Additional protection measures to be agreed. Variances to be agreed. Scope of future inspections / monitoring to be agreed.
4th.		Arboricultural Method Statement to be revised and approved (if necessary).
Protection measures confirmed acceptable by the local authority		
5th.	Demolition and Construction Phase	Make repairs and re-build part of the existing walls and install new the pier taking into account restricted activities as specified in this Arboricultural Method Statement.
6th.	Post-Construction Phase	Site meeting with project arborist. Condition of retained trees to be assessed and mitigation agreed. Ground conditions to be assessed and ground remediation to be agreed.
7th.		Remove protective barriers.

## 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 meetings, 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	Customer Services 0208 891 1411	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

## Tree Protection Plan

