

# **TFL\_PSF\_9131 SITE INVESTIGATIONS: SMALL SITES INITIATIVE LAND AT BRIDGE VIEW ROAD, HAMMERSMITH AND FULHAM, W6 9LQ**

**Site Ref: 310**

## **Preliminary BS5837:2012 Tree Survey Report**

OCTOBER 2017

## Land at Bridge View Road, Hammersmith and Fulham, W6 9LQ Preliminary BS5837:2012 Tree Survey Report

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### VERSION CONTROL

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# 1 Introduction

## 1.1 Overview

Arcadis Consulting (UK) Limited (Arcadis) has been commissioned by Transport for London (TfL), 'the Client' to undertake a number of technical surveys for a Site on Land at Bridge View Road (Aspen Place) ('the Site').

TfL is aiming to divest a number of small Sites to enable prospective regeneration. The objective of the Small Sites Initiative is to provide robust and pragmatic advice that sensibly de-risks each of the sites such that unreasonable "abnormal" development costs are not included by developers.

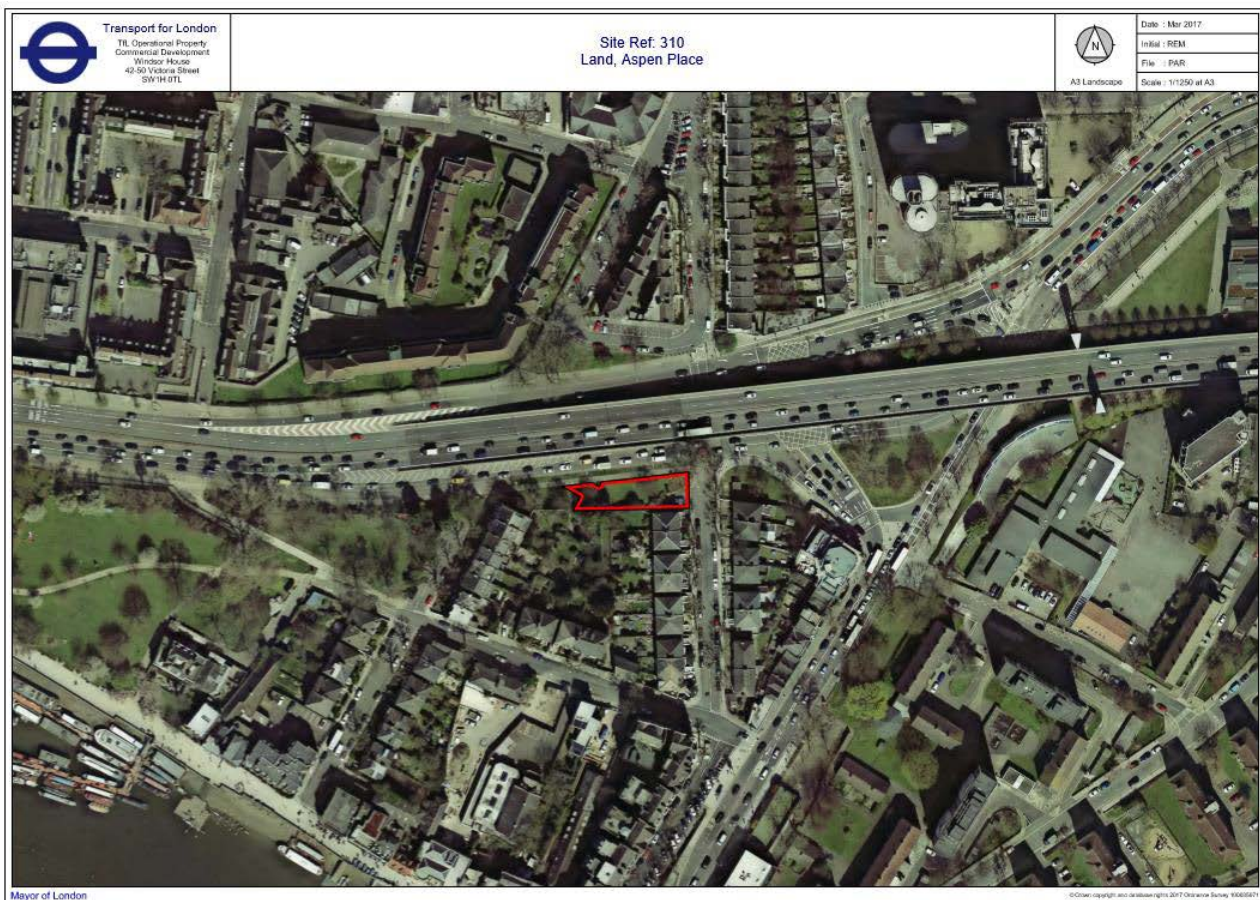
The objective of this assessment is to present the potential constraints and future survey requirements with regards to trees and any proposed future development.

## 1.2 Site Location and Setting

The Site is located within the London Borough of Hammersmith and Fulham (Grid Reference 523025, 178350) this is located approximately 0.45 km east off Hammersmith Tube Station. The Site is an area of highway verge opposite the slip road for the A4 Hammersmith Flyover Great North, situated on level ground, the area is approximately 0.05 hectares. The majority of it comprises closely mown amenity grass, groups of informally planted trees, mature shrubs within a shrub bed and an area hard standing parking bays within the adopted highway. The Site adjoins a public footpath to the north, east and west, along the southern boundary is a brick boundary wall for several rear gardens of neighbouring domestic dwellings.

An aerial screen shot illustrating the Site boundary is presented in Image 1-1. Photographs of the Site and trees can be found in Appendix D - Photographs.

Image 1-1 Site Location Plan



## **2 Methodology**

### **2.1 Tree Survey Methodology**

An Arboricultural Survey was undertaken by Callum Henderson BSc (For) M. ArborA (Principle Arboriculturist) on 13<sup>th</sup> June 2017 in accordance with BS 5837:2012.

Observations were conducted from ground level, utilising the “Visual Tree Assessment” (VTA) system as outlined in The Body Language of Trees, A Handbook for Failure Analysis Research for Amenity Trees No.4 (Department of the Environment, 1994) with the aid of binoculars.

The Site and its immediate surroundings were surveyed. This area is referred to as the ‘study area’.

### **2.2 Individual Trees and General Data Capture**

For reference, individual trees are identified with the letter T and associated number on the Tree Schedules and a Tree Constraints Plan. The stem diameter of the trees on Site was recorded using a rounded down diameter tape at 1.5m above ground level. Measurements were taken in millimetres. The height of the subject trees was estimated to the nearest metre using a digital clinometer.

Maximum crown spread of the subject tree was measured from the centre of the trunk to the tips of the live lateral branches taken at four compass points (N-E-S-W) using a ground tape. Crown spread measurements were taken in metres.

Tree age was estimated from visual indicators (such as tree size and appearance of bark) which was taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records and local knowledge.

If direct access to the tree was not possible, estimations from appropriate vantage points were taken, any limitations or estimations are presented within the survey limitations section and noted in the associated schedules.

### **2.3 Groups of Trees**

Groups of trees are identified with the letter G and number on the associated Tree Schedules and Tree Constraints Plan. Stem diameter of groups of trees was set as an average stem diameter of the trees within these individual groups and a maximum height of the tallest tree within the group.

### **2.4 Amenity Hedge**

Amenity hedges are identified with the letter H and number on the associated Tree Schedules and Tree Constraints Plan. The amenity hedge has been surveyed recording the number of species, average stem diameter, and the maximum height. Amenity hedge is defined by a closely growing group of trees and or shrubs that have similar attributes that forms a liner barrier normally along a boundary feature. Any individual trees present within the amenity hedge are recorded as individual trees.

### **2.5 Categorisation**

In compliance with Table 1 of BS 5837: 2012 the trees surveyed have been categorised according to their arboricultural quality and value. A glossary of survey terms can be found in Appendix A - Explanation of Terms.

### **2.6 Root Protection Area**

The Root Protection Areas (RPA) of the trees were calculated in accordance with Section 4.6.1 in BS: 5837:2012. This is calculated from the measurement of the stem diameter at 1.5m above ground level or at ground level if the tree is multi-stemmed. These are recorded in Table B2 in the appendix and as a circle on the initial Tree Protection Plan (TPP) and form the initial Construction Exclusion Zone (CEZ) to protect the trees within and adjoining the Site. The RPA is represented by pink-shaded areas in the Tree Constraints Plan. The shape and size of RPAs can be amended in accordance with Section 4.6.3 in BS: 5837:2012.

Within Section 5.3.1 in BS : 5837:2012 it is stated the default position is that proposed development should not be within the RPA of retained trees, however, where there is an overriding need for construction and associated activity with the RPA of trees arboricultural mitigation should take place to protect the trees.

## 2.7 Survey Limitations

Topographical base mapping was provided. For the purposes of BS 5837: 2012, only trees with a stem diameter greater than 75mm, (measured at 1.5m above ground level), have been included within the survey. However, it should be noted that a number of individual trees and shrubs with a stem diameter of less than 75mm were present within the study area.

Only trees within the study area as defined above were assessed. The RPAs are based on a given tree stem diameter taken at 1.5m above ground level with each RPA (see Appendix B - Tree Schedules) being calculated from the above ground portions of the tree. It should be recognised that the RPA may not entirely encompass all of the tree's rooting material.

Some areas of the study area were off-Site within neighbouring properties, preventing a full assessment and an accurate measurement of some trees. Where tree survey data has been estimated (based on assessments from the nearest safe vantage points). These trees are denoted by a # in the associated Schedules.

Trees are living organisms and as such their health and condition are naturally subject to change over time. Unforeseen future circumstances such as neglect, wilful damage or severe/extreme weather conditions may affect the future health and condition of the trees included in this report.

## 2.8 Statutory Tree Protection

A search was undertaken on the LPA on 14<sup>th</sup> June 2017. According to the Hammersmith and Fulham Council Websites <https://www.lbhf.gov.uk/planning/urban-design-and-conservation/conservation-areas/map-conservation-areas> and <https://www.lbhf.gov.uk/planning/trees-and-tree-preservation-orders> the Site and the area of land where all the off-Site trees are located is within The Mall Conservation Area. None of the trees within the Site or adjacent to the Site are protected by an individual Tree Preservation Order (TPO) and there are no Planning Application Conditions protecting the trees.

When tree maintenance works are undertaken by a Highway Authority within a Conservation Area it is considered an exception within the Town and Country Planning (Tree Preservation) (England) Regulations (2012). However, all non-routine tree works including works to enable development must have Conservation Area Consent or Full Planning Consent from the LPA before the tree works take place.



### 3 Tree Survey Results

#### 3.1 Tree Assessment and Categorisation

A total of 12 arboricultural items were recorded within the study area. Within the Site there are four individual trees (T4, T7, T8 and T9). Adjacent to the Site there are six individual trees (T1, T2, T3, T5, T6 and T10), one group of trees (G1) and one group of trees forming an amenity hedge (H1). Full details of the survey data are presented within the Tree Schedules in Appendix B and Figure 1 Tree Constraints Plan.

Each arboricultural item was assigned to one of four categories, as listed below:

- Category A individual trees, groups of trees: One individual tree was graded as Category A (trees of high quality) as part of this survey;
- Category B individual trees, groups of trees: One individual tree was graded as Category B (trees of moderate quality) as part of this survey;
- Category C individual trees, groups of trees: Seven individual trees, one group of trees and one hedge have been identified as Category C (trees of low quality) as part of this survey due to poor form or inappropriate past management;
- Category U individual trees, groups of trees: One individual tree was graded as Category U (trees of poor quality unsuitable for retention) as part of this survey due to poor structural and physiological condition.

#### 3.2 Tree Species Diversity

Five different tree species and cultivars were recorded during the survey and are represented throughout the study area. A summary of the species surveyed can be found within the Tree Schedule in Appendix B and also provided in Table 1. The numbers below include species of individual trees, the hedge and groups of trees.

Table 1 Tree Species Recorded

Tree Species	Number of Individual Stems	Approximate Percentage
Cider gum ( <i>Eucalyptus gunnii</i> )	2	12.5%
Double pink cherry ( <i>Prunus</i> 'Kanzan')	1	6.25%
Field maple ( <i>Acer campestre</i> )	1	6.25%
Leyland cypress (x <i>Cupressocyparis leylandii</i> )	3	18.75%
London plane ( <i>Platanus x hispanica</i> )	1	6.25%
Silver birch ( <i>Betula pendula</i> )	5	31.25%
Spruce ( <i>Picea</i> sp.)	1	6.25%
Sweetgum ( <i>Liquidambar styraciflua</i> )	1	6.25%
Wild cherry ( <i>Prunus avium</i> )	1	6.25%
<b>Totals</b>	<b>16</b>	<b>100%</b>



### 3.3 Age Diversity

Analysis of the data identified that the majority of the trees within the study area were within the young age classification set by BS 5837: 2012 with an estimated useful life expectancy of over 20 years, as illustrated in Table 2.

*Table 2 Age Diversity*

Age Class	Number of Individual Stems	Approximate Percentage
Young	1	6.25%
Early-mature	5	31.25%
Semi-mature	3	18.75%
Mature	6	37.5%
Over-mature	1	6.25%%
<b>Totals</b>	<b>16</b>	<b>100%</b>

### 3.4 Bat Roosting Potential

While undertaking the Arboricultural Survey, an assessment of the trees potential to support roosting bats was undertaken in accordance with Bat Conservation Trust (BCT), Bat Surveys for Professional Ecologists: Good Practice Guidelines, 2016. All trees that were surveyed within this Tree Survey had negligible potential to support bats.

## 4 Conclusions

A total of 12 arboricultural items were recorded during the survey as follows:

- Four individual trees (T4, T7, T8 and T9) within the Site; and
- Six individual trees (T1, T2, T3, T5, T6 and T10), one group of trees (G1) and one group of trees forming an amenity hedge (H1) adjacent to the Site.

One individual off-Site tree (T10) has been identified as Category A (trees of high quality). One individual tree on-Site (T4), has been identified as Category B (trees of moderate quality). Two individual trees on Site (T7 and T8), four individual trees off-Site (T1, T2, T3 and T6), one off-Site group (G1) of trees and one off-Site amenity hedge (H1) that have been identified as Category C (trees of low quality). One individual on-Site tree (T9) has been identified as Category U (trees of poor quality unsuitable for retention) given it is standing dead-wood.

The dominant tree species within and adjacent to the Site is Silver birch (*Betula pendula*). T2 and G1 form a landscape feature but given that the trees are set back along on the southern edge, the trees are incidental within the streetscape and they provide limited public visual amenity value to the immediate and surrounding areas within the Conservation Area. It is considered that none of the silver birches are likely to be a significant constraint to any future development of the Site.

The on-Site cherry trees (*Prunus* sp.) T7 and T8 have been planted along the edge of the Site in close proximity to the tall mature leylandii hedging which restricts the trees from being prominent within the imminent and wider streetscape of the Conservation Area. Therefore, it is considered that the cherry trees are unlikely to be a significant constraint to any future development of the Site.

The off-site sweetgum (*Liquidambar styraciflua*) T1, cider gums (*Eucalyptus gunnii*) T3 and T5, spruce (*Picea* sp.) T7 and the three Leyland cypress (x *Cupressocyparis leylandii*) that form the hedge H1 are located within rear gardens of neighbouring domestic dwellings to the south and southwest of the Site. These trees have been planted next to the brick boundary wall, the stems and or the crowns of the trees are in contact with this structure. There is a high possibility that the trees will cause damage to the statutory protected wall which is a low-rise structure in the future. The wall also acts as screen for the trees hiding them from the imminent and wider streetscape within the Conservation Area. Therefore, it is considered that these off-Site trees are unlikely to be a significant constraint to any future development of the Site.

The off-Site London plane (*Platanus x hispanica*) T10, has been identified as Category A (trees of high quality), mature age-class, good physiological health, good structural condition and good vitality. It is planted within a strip of close mow grass verge that form part of the TfL public footpath to the north-east of the Site. Given that the tree is approximately 30m tall, it is easily visible from the immediate and wider area within The Mall Conservation Area. The tree dominates the immediate streetscape of the slip road leading to the A4, Great North, Bridge View Road and Hammersmith Bridge Road. It is also a principle member of the wider population of London plane street trees within the highway controlled by TfL and the London borough of Hammersmith and Fulham. Within the Conservation Area Character Profile of The Mall it was noted that London plane trees are indicative of the landscape character of the Conservation Area. Given this it is considered that London Plane tree has high public visual amenity and landscape value and any future development should seek to retain this tree and its visibility within the public realm.

There are four potential constraints that the London plane T10 places on redevelopment, these are briefly listed below;

- The crown over-hangs the Site;
- The planting location, height, width and density of the crown will cast shade on to the Site;
- The RPA of the tree extends within the Site; and
- According to British Geological Survey on-line map <http://mapapps.bgs.ac.uk/geologyofbritain/home.html?location=W69DD&gobBtn=go> the Site is on London Clay. Therefore, the foundation design of any proposed new structure will have to reduce the risk of vegetation induced clay shrinkage subsidence damage occurring.

While unlikely to prevent development, tree protection for trees to be retained and tree re-provisioning for any trees lost due to development are a material consideration for planning determination. If trees cannot be replaced on-Site due to development, off-Site options for tree re-provisioning to ensure no net loss should be considered. Individual Local Planning Authorities may ask for re-provisioning in excess of 1 to 1 for trees of Category A or B grade or ask for additional re-provisioning for trees within a Conservation Area.

There is currently no proposed scheme layout and it is not possible to state specifically whether the trees would need to be removed and if there is space for any new trees to be re-provisioned on the site. Once schemes are developed then this can be determined.

The Site is within a Conservation Area and any proposals submitted to the LPA might require the support of a Landscape Character Assessment and Landscape Strategy Plan. This is because any new development will introduce new built forms and massing within areas that historically have been public green open space.

## 5 Further Work

Should any future proposed development require tree removals or RPA incursions within RPA's of the retained trees an Arboricultural Impact Assessment (AIA) will be required by the LPA in support of a planning application.

The AIA should include a tree schedule, although one is provided within this report, a review of any proposed development should be undertaken to ensure that there are no additional trees within the zone of influence of the development. For example, parking requirements often extend the zone of influence.

The AIA should state the trees to be removed due to the design and access requirements and any proposed tree facilitation pruning works. This should also be accompanied by an assessment of the likely impacts due to construction activity on the trees to be retained. Indicative arboricultural mitigation measures should be provided which would include recommendations for tree re-provisioning. The AIA should be accompanied by an updated Tree Constraints Plan and a Tree Impact and Protection Plan based on the proposed design.

The AIA should also include a Tree Replacement Strategy which should take into consideration the landscape character, local treescape and biodiversity features of the immediate and adjoining areas. The species, number, size, type of stock, location and planting aids for the compensating planting should be chosen for landscape, wildlife and arboriculture values. To ensure that appropriate and sustainable planting is achieved advice should be sought from an ecologist and arboriculturist. Furthermore, liaison with the LPA Tree Officer will be necessary during the planning process to agree an approved tree compensation and or landscape scheme plan.

All new tree planting should be in accordance with British Standard 8545: Trees: From Nursery to Independence in the Landscape – Recommendations, 2014 and all tree works must be carried out by a qualified contractor in accordance with BS3998:2010: Tree Work – Recommendations.

This document encloses a Preliminary Arboricultural Method Statement (AMS) outlining tree protection measures. However following planning determination and when full construction measures are known a bespoke AMS may be required to ensure protection of the trees to be retained on and adjoining the Site.

## 6 References

British Standards Institution (2010) BS 3998:2010, Tree Work Recommendations.

British Standards Institution (2012) BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations.

British Standards Institution (2014) BS 8545: Trees: From nursery to Independence in the Landscape – Recommendations.

Mattheck, C. and Broeler, H. DETR (1994) The Body Language of Trees: A Handbook for Failure Analysis Research for Amenity Trees No.4.

The Secretary of State for Communities and Local Government, Statutory Instruments (2012) No. 605, The Town and Country (Tree Preservation) (England) Regulations 2012.

# 7 Figures

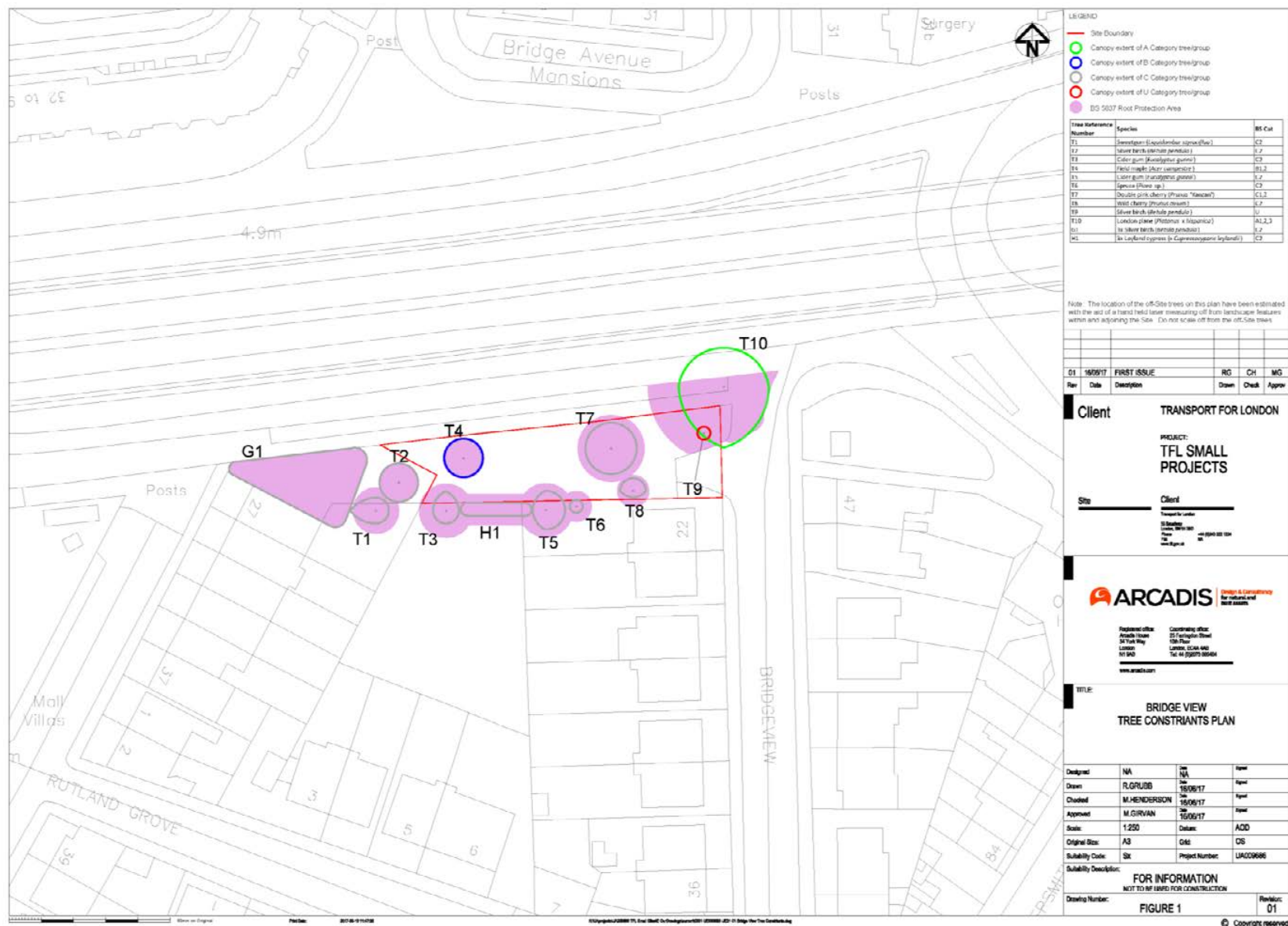


FIGURE 1. Tree Constraints Plan



## **APPENDIX A**

### **Explanation of Terms**

#### **Age Class**

Young – Trees in the first fifth of full life expectancy

Semi-mature – Trees in the second fifth of full life expectancy

Early-mature – Trees in the third fifth of full life expectancy

Mature – Trees in the fourth fifth of full life expectancy

Over Mature – Trees having reached full life expectancy and trees in natural decline

Veteran – Trees of interest biologically, culturally and aesthetically because of their age

#### **Stem Diameter**

The diameter of the stem measured in millimetres (mm) at a height of 1.5m above ground level

#### **Crown Spread**

Average measured in metres using a ground tape where possible

#### **Physiological Condition**

Good – Healthy tree with no signs of ill health and signs of good extension growth for species

Fair – Trees with signs of disease, minor defects and decreased life expectancy due to physical damage

Poor – Trees with significant disease, significantly reduced life expectancy and/or under major physiological stress

Dead – Dead tree or trees with over 70% crown dieback

#### **Structural Condition**

Good – Trees with no significant defects

Fair – Trees with remedial defects which require minor tree surgery works

Poor – Trees with remedial defects which require significant tree surgery works or felling

Dead – Trees which require felling

#### **BS 5837 Retention Category**

Each tree, group of trees or hedge is assigned to a retention category where:

*Table A1 Categorisation of trees*

Category	Description
A	Trees of high quality and value, retention is highly desirable
B	Trees of moderate quality and value where retention is desirable
C	Trees of low quality and value, or young trees with a stem diameter <150mm. Category C trees may be retained, replaced or in the case of younger trees, relocated
U	Trees of poor quality and value, unsuitable for retention or trees which should be removed

In addition, each tree, group of trees or hedge is assigned to a retention sub-category where categorisation is for:

*Table A2 Reasons for Categorisation*

Sub-category	Reason for Categorisation
1	Mainly arboricultural qualities
2	Mainly landscape qualities
3	Mainly cultural values, including conservation

**APPENDIX B**

**Tree Schedules**

Client: **Transport for London (TfL)**  
Survey date: 13<sup>th</sup> June 2017

Project: **Land at Thistlewaite Road, Hackney, E5 9QQ**  
Surveyor: **Callum Henderson BSc (For) M. ArborA**

Table B1 Tree Schedule

Tree reference number	Species	Height (m)	Stem diameter (mm)	Branch spread (m)				Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Additional Information/Bat Roosting Potential	Estimated remaining contribution (years)	Category grading
				N	E	S	W							
T1	Sweetgum ( <i>Liquidambar styraciflua</i> ) #	6	300	2	2	2	4	3	Early-mature	Fair	Poor	Negligible	10-20	C2
T2	Silver birch ( <i>Betula pendula</i> )	10	250	3	3	3	3	1	Mature	Fair	Fair	Negligible	10-20	C2
T3	Cider gum ( <i>Eucalyptus gunnii</i> ) #	8	350	3	2	2	2	2	Early-mature	Fair	Fair	Negligible	10-20	C2
T4	Field maple ( <i>Acer campestre</i> )	8	270	3	3	3	3	2	Early-mature	Good	Good	Negligible	20-40	B1,2
T5	Cider gum ( <i>Eucalyptus gunnii</i> ) #	8	350	3	3	3	2	2	Early-mature	Fair	Fair	Negligible	10-20	C2
T6	Spruce ( <i>Picea</i> sp.) #	7	200	1	1	1	1	1	Early-mature	Fair	Fair	Negligible	10-20	C2
T7	Double pink cherry ( <i>Prunus</i> 'Kanzan')	10	430	4	4	4	4	1	Mature	Fair	Poor	Negligible	10-20	C1,2
T8	Wild cherry ( <i>Prunus avium</i> )	6	210	2	2	1	2	1	Young	Poor	Fair	Negligible		C2
T9	Silver birch ( <i>Betula pendula</i> )	6	250	1	1	1	1	0	Over-Mature	Dead	Dead	Negligible	<10	U
T10	London plane ( <i>Platanus x hispanica</i> )	30	980	6	7	9.5	7	2	Mature	Good	Good	Negligible	40+	A1,2,3
G1	3x Silver birch ( <i>Betula pendula</i> )	14	320	4	4	4	4	1	Mature	Fair	Poor	Negligible	10-20	C2
H1	3x Leyland cypress (x <i>Cupressocyparis leylandii</i> ) #	6	200	1	1	1	1	1	Semi-mature	Poor	Poor	Negligible	10-20	C2

#. Tree located off Site within neighbouring property. Survey data has been estimated (based on assessments from the nearest safe vantage points)

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Table B2 Root Protection Area

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m <sup>2</sup> )
T1	Sweetgum ( <i>Liquidambar styraciflua</i> ) #	300	3.6	40.7
T2	Silver birch ( <i>Betula pendula</i> )	250	3.0	28.3
T3	Cider gum ( <i>Eucalyptus gunnii</i> ) #	350	4.2	55.4
T4	Field maple ( <i>Acer campestre</i> )	270	3.2	33.0
T5	Cider gum ( <i>Eucalyptus gunnii</i> ) #	350	4.2	55.4
T6	Spruce ( <i>Picea</i> sp.) #	200	2.4	18.1
T7	Double pink cherry ( <i>Prunus</i> 'Kanzan')	430	5.2	83.7
T8	Wild cherry ( <i>Prunus avium</i> )	210	2.5	20.0
T9	Silver birch ( <i>Betula pendula</i> )	250	N/A	N/A
T10	London plane ( <i>Platanus x hispanica</i> )	980	11.8	434.5
G1	3x Silver birch ( <i>Betula pendula</i> )	320	3.8	46.3
H1	3x Leyland cypress (x <i>Cupressocyparis leylandii</i> ) #	200	2.4	18.1

Table B3 Key to Categories

Tree Reference Number	Category
T/GXX	Category A
T/GXX	Category B
T/GXX	Category C
T/GXX	Category U

Table B4 Key to Bat Roost Potential\*

Bat Roost Potential Category	Reason for Categorisation
Negligible	Saplings or semi-mature trees with a small girth. No ivy cover, loose bark, cracks or fissures
Low	Small or semi-mature trees. May have small amounts of ivy present, stems of small diameter. Trees may have some loose bark but no obvious cracks, fissures or holes.
High/medium	Trees with large crack, crevices or disused woodpecker holes that can provide refuge for bats. Trees may support dense ivy with multiple stems.
Known or confirmed roost	Tree with know or confirmed roosts from previous ecology survey.

\*Bat Conservation Trust Bat Surveys for Professional Ecologists: Good Practice Guidelines, 2016

## **APPENDIX C**

### **Preliminary Arboricultural Method Statement**



## Overview

This Preliminary Arboricultural Method Statement provides generic best practice measures to be adopted in order to protect retained trees during the development process. It has been prepared in order to inform the planning and the construction/ development process.

## Protective Fencing

The purpose of this fencing is to provide protection to the RPA of retained trees/groups and to protect trees and hedgerows prior to their translocation. The type of fencing used shall be appropriate to the level of adjacent construction activity and shall be agreed with the Local Authority tree officer. Weather-proof notices shall be attached to any protective fencing located adjacent to retained trees displaying the words “Construction Exclusion Zone” and listing restrictions which apply. All personnel must be made aware of these restrictions.

It is anticipated that three specifications for fencing would be employed during construction.

### Low-use areas

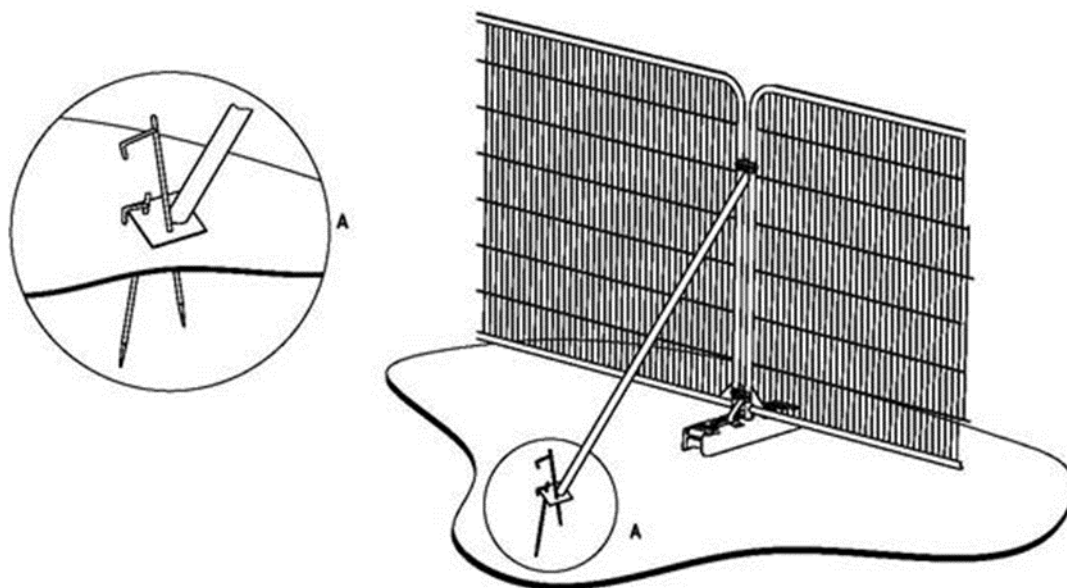
The system illustrated in Figure C1 is adequate to define areas of protected vegetation and exclude traffic, and comprises Cleft Chestnut Pale Fence in accordance with *BS 1722 Part 4: Specification for cleft chestnut pale fences (British Standards Institution, 1991)* supported by 150mm wooden stakes. Assembled with galvanized 14-gauge (2 mm) wire, four strands per row, peeled and pointed one end. Approximate spacing of pales 75 mm.



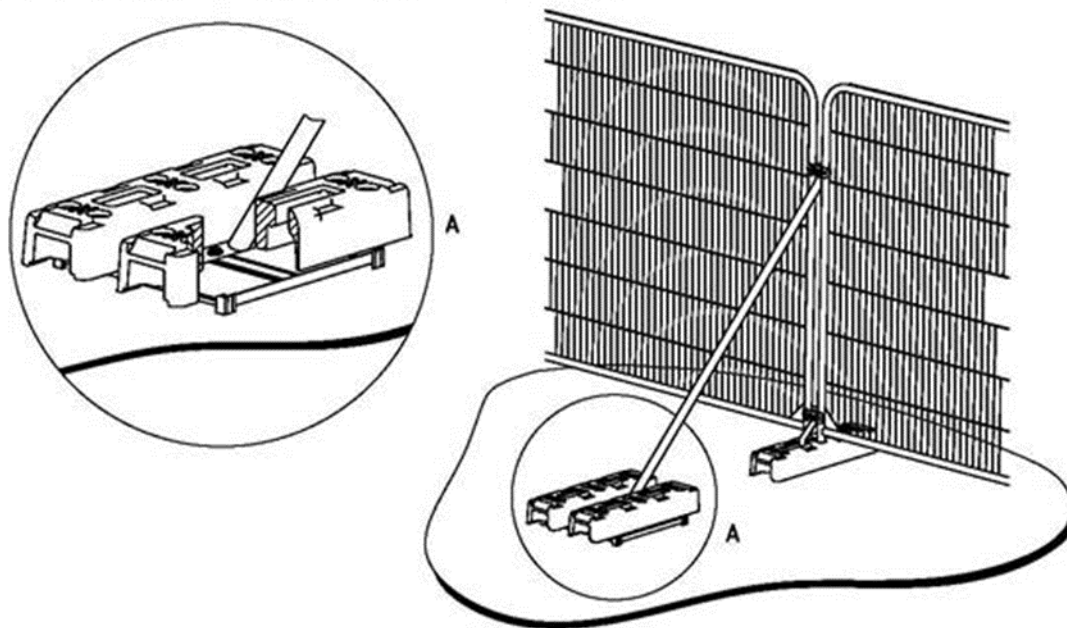
Figure C1 Tree Protection fencing example for low use areas

### Medium-use areas

This system comprises anti-climb weldmesh panels connected by clamps and supported by rubber or concrete bases and bracing struts. The system is illustrated in Figure C2 and is based on *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (British Standards Institution, 2012)* (Ref 1) guidelines. This kind of system is robust enough to withstand occasional knocks by plant machinery.



a) Stabilizer strut with base plate secured with ground pins

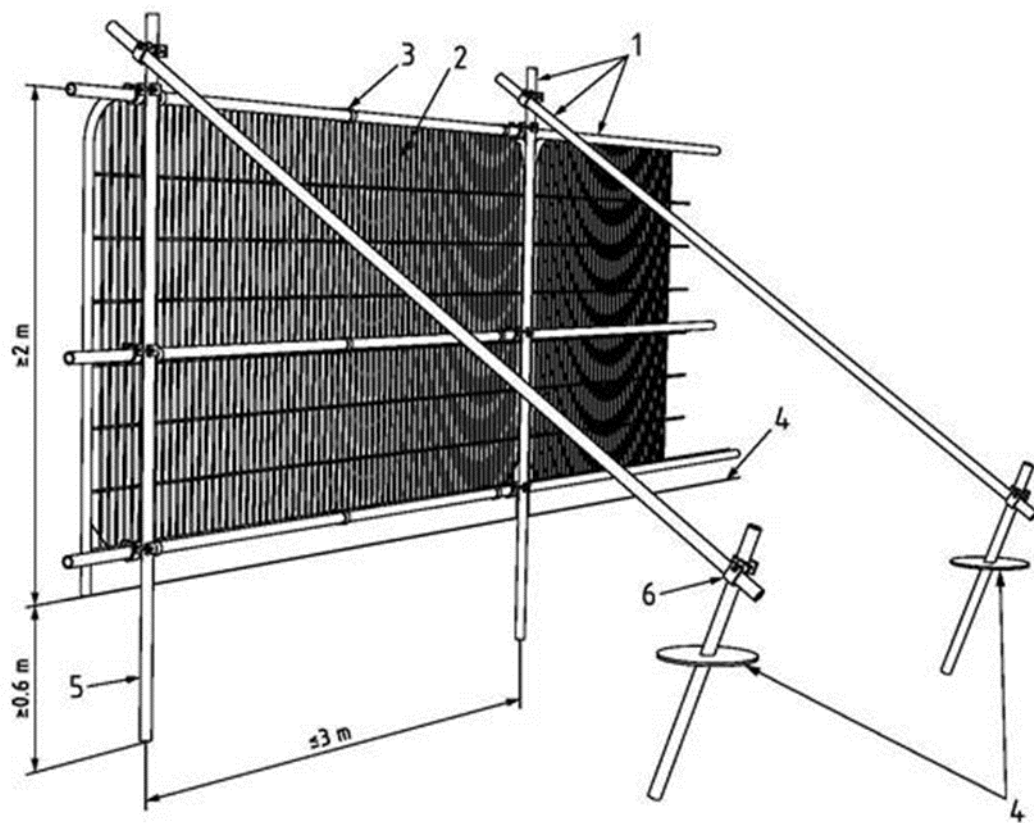


b) Stabilizer strut mounted on block tray

Figure C2 Tree Protection Fencing specification (extract from BS 5837)

## High-use areas

This system involves driving scaffold poles into the ground, onto which are affixed horizontal scaffold poles and diagonal bracing struts. Anti-climb weldmesh panels are secured to this scaffold framework using standard scaffold clips or wire. The system is illustrated in diagram Figure. C3 and is based on *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* (British Standards Institution, 2012) (Ref 1) guidelines. This kind of system provides the highest level of security.



**Key**

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

Figure C3 Tree Protection Fencing specification (extract from BS5837)

## Construction Exclusion Zone (CEZ)

The Construction Exclusion Zone (CEZ) is the area identified by an arboriculturist to be protected during development, including Site clearance and construction work, through the use of barriers and/or ground protection fit-for-purpose to ensure the successful long-term retention of a tree. The area within the construction exclusion zone is to be regarded as sacrosanct and the fencing shall not be taken down or relocated at any time.

All areas excluded by protective tree fencing shall be treated as CEZs, and the following restrictions shall apply:

- No construction activity whatsoever must occur within these areas.
- No tree works, without the written consent from the Local Authority.
- No alterations of ground levels or conditions.
- No chemicals or cement washings.
- No excavation.
- No temporary structures. \*
- No storage of soil, rubble or other materials.
- No vehicles or machinery to be used or parked without appropriate ground protection measures as per BS5837 recommendations. This will require the use of a proprietary system of reinforced concrete slabs/steel road plates on a compressible layer, or side butting scaffold boards/ 18mm plywood sheets on a compressible layer. The type of ground protection used shall be appropriate for the likely loading applied.
- No fixtures (lighting, signs etc.) to be attached to trees.
- No fires within 10 metres of the canopies of any tree or hedgerow.

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*\*Sales Cabins or Site huts, provided they are of the Jack Leg type, can be sited to act as ground protection for the duration of the construction.*

## General construction activity

Since the canopies of retained trees may be in close proximity to areas of crane operation, the following restrictions will apply:

- All cranes will be sited outside the defined RPAs of retained trees / groups, and the appointed contractor will ensure all relevant personnel shall be made aware of the location of branches and the need to avoid causing damage to them.
- Prior to the implementation of lifting operations, a representative from the equipment supply company shall visit the Site and ensure all operations can be completed without causing damage to retained trees. A lifting plan will be prepared and submitted for approval prior to all lifting operations. The lifting plan will make provision for the potential for damage of retained trees.
- All lifting operations will be completed under the close direction of a qualified banksman, who will be briefed by the appointed contractor as to the need to avoid damage the stems and branches of retained trees.
- Should additional tree removal or pruning be required the Local Authority Tree Officer shall be contacted and the scope of works agreed in writing.
- All materials will be stored within designated areas and no materials shall be stored within any RPA.

## Hazardous materials

Any mixing of cement-based materials is to take place outside the RPAs of all trees. Provision shall be made to ensure that the mixing area is contained so that no water runoff enters the RPAs of any trees. All mixers and barrows shall be cleaned within this dedicated mixing area.

All other chemicals hazardous to tree health, including petrol and diesel, are to be stored in suitable containers as specified by the Control of Substances Hazardous to Health (COSHH) Regulations (2002) (Ref 4), and kept away from the RPAs.


## Example of Protective Fencing Signs



## **APPENDIX D**


### **Photographs**



Tree No.	Description	Photograph
T10	<p>From Hammersmith Bridge Road westwards. Off-Site T4T10 on the right of the image. Note northern crown of the London plane touching the Hammersmith Flyover</p>	
G1 and T10	<p>From the slip road of the A4 Great West Road eastwards. To the left of the image T10 London in the distance. To the right of the image off-Site G1 silver birch.</p>	



Tree No.	Description	Photograph
T4	From the slip road of the A4 Great West Road south eastwards. On-Site T4 field maple in the centre of the image	 A photograph showing a large, mature field maple tree with a dense green canopy. The tree is situated in a grassy area next to a paved path. A person is walking on the path in the background. The sky is blue with some clouds.
T7, T8, T9 and T10	From Bridge View Road westwards. Crown of off-Site T10 on the right of the images, on-Site T9 dead silver birch, on-Site T7 Prunus Kanzan and on-Site T8 wild cherry.	 A photograph showing a street scene. On the left is a two-story building with a stone facade and a small porch. Two cars are parked on the street. On the right, there are several trees, including a dead silver birch and a Prunus Kanzan. The sky is blue with some clouds.

Tree No.	Description	Photograph
T3, T5 and H1	<p>From the slip road of the A4 Great West Road south westwards towards southern boundary. On the left off-Site T5 cider gum, off-Site Leyland cypresses hedge and T3 off-Site cider gum</p>	 A photograph showing a grassy area with a dense line of trees and a Leyland cypress hedge in the background. The trees are tall and leafy, with a clear blue sky visible above them. In the foreground, there is a small, dark, rectangular object on the grass, possibly a survey marker or a piece of equipment.

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