TFL_PSF_9131 SITE INVESTIGATIONS: SMALL SITES INITIATIVE
LAND AT ARBUTHNOT LANE

Preliminary BS5837:2012 Tree Survey Report

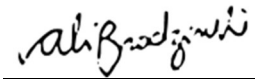
FEBRUARY 2019



Incorporating
EC HARRIS BUILT ASSET CONSULTANCY
Hyder

LAND AT ARBUTHNOT LANE

Preliminary BS5837:2012 Tree Survey Report

Author	Martin Dilworth	
Checker	Aline Brodzinski	
Approver	Martina Girvan	
Report No	10024781-ARC-03-XXRP-YY-0001-01-Arboricultural Report	
Date	FEBRUARY 2019	

VERSION CONTROL

Version	Date	Author	Changes
01	February 2019	Martin Dilworth	1st Issue

This report dated 25 February 2019 has been prepared for Transport for London (TfL) (the "Client") in accordance with the terms and conditions of appointment (the "Appointment") between the Client and Arcadis Consulting UK Limited ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

CONTENTS

1 INTRODUCTION 1
1.1 Overview 1
1.2 Site Location and Setting 1
2 METHODOLOGY 2
2.1 Tree Survey Methodology 2
2.2 Individual Trees and General Data Capture 2
2.3 Hedgerows 2
2.4 Categorisation 2
2.5 Root Protection Area 2
2.6 Survey Limitations 2
2.7 Statutory Tree Protection 3
3 TREE SURVEY RESULTS 4
3.1 Tree Assessment and Categorisation 4
3.2 Tree Species Diversity 4
3.3 Age Diversity 4
4 DISCUSSION AND CONCLUSIONS 6
5 FURTHER WORK 7
6 REFERENCES 8
FIGURE 1. TREE CONSTRAINTS PLAN 9
APPENDIX A. EXPLANATION OF TERMS 10
APPENDIX B. TREE SCHEDULES 12
APPENDIX C. PRELIMINARY ARBORICULTURAL METHOD STATEMENT 14
APPENDIX D. PHOTOGRAPHS 19

1 Introduction

1.1 Overview

Arcadis (UK) Limited (Arcadis) was commissioned by Transport for London (TfL) to undertake a number of technical assessments to support the feasibility for potential development at Land at Arbuthnot Lane, Blendon, DA5 1HE hereafter referred to as “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 survey is to present the potential constraints and future requirements with regards to trees and any future development.

1.2 Site Location and Setting

The Site is located to the north of the A2 East Rochester Way and to the south of Arbuthnot Lane, in the London Borough of Bexley. The Site is centred at grid reference of TQ 48583 74350 and around the postcode of DA5 1HE.

It is approximately 0.124ha in area and is currently comprised of heavily managed amenity grassland (less than 5cm sward), scattered broadleaved and coniferous trees, scattered scrub and an intact species-poor hedge. A small patch of hardstanding is present in the western corner of the site.

The immediate surrounding residential area is characterised by detached housing. To the immediate south of the Site is the A2 main road. A golf course and areas of park and sports pitches are present nearby to the north and west.

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 Martin Dilworth FdSc MArborA (Senior Arboriculturist) on 12 February 2019 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 Hedgerows

Hedgerows were identified with the letter H and number on the associated schedules and plans. A 30m section of hedgerow was surveyed, recording the number of species, average stem diameter, and the maximum height. Any individual trees present within the hedgerow were recorded as individual trees.

2.4 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.

2.5 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.

2.6 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.

2.7 Statutory Tree Protection

A review of London Borough of Bexley's online database on the 25 February 2019 has established the site is not located within a Conservation Area, nor are there any trees subject to a Tree Preservation Order (TPO) within the study area.

3 Tree Survey Results

3.1 Tree Assessment and Categorisation

A total of 18 arboricultural items were recorded within the study area as follows:

- Sixteen individual trees on-Site (T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T13, T14, T15, T16 and T17);
- Two hedgerows (H12 and H18) in the east and south east side of the Site.

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: No items have been identified as Category A (trees of high quality) as part of this survey;
- Category B individual trees: Three individual trees (T1, T11 and T15) were graded as Category B (trees of moderate quality) as part of this survey;
- Category C individual trees: Twelve individual trees (T2, T3, T4, T5, T6, T7, T9, T10, T13, T14, T16, T17) and two hedgerows (H12 and H18) were graded as Category C (trees of low quality) as part of this survey due to poor form or inappropriate past management;
- Category U individual trees: One individual tree (T8) has been identified 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

Seven different tree species 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 but do not include percentages of hedgerows, these are presented in the accompanying schedules in Appendix B.

Table 1 Tree Species Recorded

Tree Species	Number of Individual Stems	Approximate Percentage
Field maple (*Acer campestre*)	1	6.25%
Hawthorn (*Crataegus monogyna*)	5	31.25%
Scots pine (*Pinus sylvestris*)	3	18.75%
Silver birch (*Betula pendula*)	6	37.5%
Wild cherry (*Prunus avium*)	1	6.25%
Totals	**16**	**100%**

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	9	50%
Semi-mature	7	38.89%
Early-mature	2	11.11%
Mature	0	0%
Over-mature	0	0%
Totals	**18**	**100%**

4 Discussion and Conclusions

A total of 18 arboricultural items were recorded within the study area as follows:

- Sixteen individual trees on-Site (T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T13, T14, T15, T16, T17);
- Two hedgerows (H12 and H18) on the east and south east side of the site.

Three individual trees (T1, T11 and T15) were graded as Category B (trees of moderate quality). Twelve individual trees (T2, T3, T4, T5, T6, T7, T9, T10, T13, T14, T16, T17) and two hedgerows (H12 and H18) have been identified as Category C (trees of low quality). One individual tree (T8) has been graded as Category U (trees of poor quality unsuitable for retention).

There is currently no proposed design layout and therefore it is not possible to say whether the trees would need to be removed and if there is space for any new trees to be re-provisioned on the Site. This can be determined once designs are developed.

The dominant tree species within the Site are Silver birch (*Betula pendula*) and Hawthorn (*Crataegus monogyna*).

No trees are subject to Tree Preservation Orders or located within a Conservation Area.

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 B grade.

The main development considerations for the trees are:

- Adjacent third-party hedge;
- The Root Protection Area RPA of the trees within the Site; and
- The retention and/or replacement of trees within the Site.

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) (Appendix C) 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.

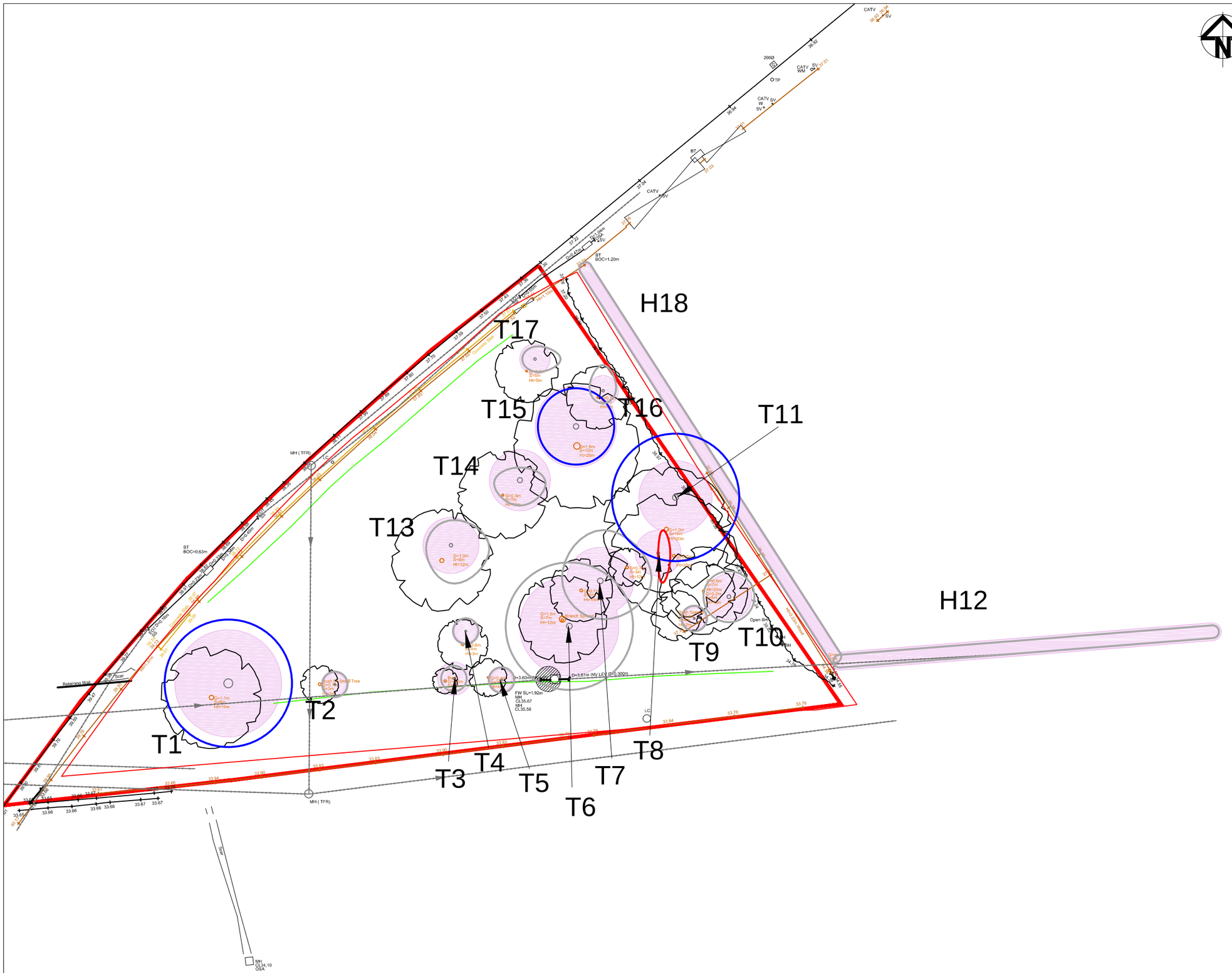
British Standards Institution (2012) BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations.

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.

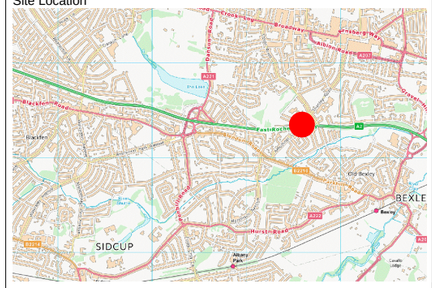
FIGURE 1. Tree Constraints Plan



Legend:

- Site Boundary
- Canopy extent of A Category tree/group
- Canopy extent of B Category tree/group
- Canopy extent of C Category tree/group
- Canopy extent of U Category tree/group
- BS 5837 Root Protection Area

Site Location



Rev	Date	Description	Drawn	Check	Approv
01	18 FEB 19		JN	MD	GS

Client

TRANSPORT OF LONDON

PROJECT:

SMALL SITES
LAND AT
ARBUTHNOT LANE

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
25 Farringdon Street
10th Floor
London, EC4A 4AB
Tel: 44 (0)2073 060404

www.arcadis.com

TITLE:

FIGURE 1
TREE CONSTRAINTS PLAN

Designed	NA	Date 18 FEB 19	Signed
Drawn	JN	Date 18 FEB 19	Signed
Checked	MD	Date 18 FEB 19	Signed
Approved	GS	Date 18 FEB 19	Signed
Scale:	1:300	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	10024781

Suitability Description:

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Drawing Number: 001

Revision: 01

CROWN COPYRIGHT AND DATABASE RIGHTS [2016]
ORDNANCE SURVEY 0100031673

50mm on Original

Print Date: 2019-03-06 10:08:47

C:\10024781 TFL SMALL PROJECTS\Land at Arbutnot Lane\001-10024781-UE31D-01-Land-at-Arbuthnot-Tree-Constraints.dwg

© Copyright reserved

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**: 12 February 2019**

Project: **Land at Arbuthnot Lane, Blendon, DA5 1HE**
Surveyor**: Martin Dilworth FdSc MArborA (Senior Arboriculturist)**

Table B1 Tree Schedule

Tree reference number	Species	Height (m)	Stem diameter (mm)	Branch spread (m)				Height of crown clearance (m)	Radius of nominal circle (m)	RPA (m^2)	Age class	Physiological condition	Structural condition	Comments	Estimated remaining contribution (years)	Category grading
				N	E	S	W									
T1	Wild cherry (*Prunus avium*)	6	350	5	5	5	5	0	4.2	55.4	Early-mature	Good	Good		20+	B1
T2	Hawthorn (*Crataegus monogyna*)	3	75	1	1	1	1	0	0.9	2.5	Young	Good	Good		10+	C1
T3	Hawthorn (*Crataegus monogyna*)	3	75 75	1	1	1	1	0	1.3	5.1	Young	Good	Good	Twin-stemmed	10+	C1
T4	Hawthorn (*Crataegus monogyna*)	3	75	1	1	1	1	0	0.9	2.5	Young	Good	Good		10+	C1
T5	Hawthorn (*Crataegus monogyna*)	3	75	1	1	1	1	0	0.9	2.5	Young	Good	Good		10+	C1
T6	Field maple (*Acer campestre*)	7	220 160 130 130	5	5	5	5	1	3.9	48.8	Early-mature	Good	Good	Multi-stemmed	10+	C1
T7	Silver birch (*Betula pendula*)	8	220	4	4	3	3	2	2.64	21.9	Semi-mature	Good	Fair	Small decay cavity at base	10+	C1
T8	Silver birch (*Betula pendula*)	6	110 100	2	1	2	0	3	1.8	10.0	Semi-mature	Poor	Poor	Dead tree	<10	U
T9	Hawthorn (*Crataegus monogyna*)	2	75	1	1	1	1	0	0.9	2.5	Young	Good	Good		20+	C1
T10	Scots pine (*Pinus sylvestris*)	5	150	2	2	2	2	0	1.8	10.2	Young	Good	Good		20+	C1
T11	Silver birch (*Betula pendula*)	11	240	5	5	5	5	2	2.88	26.1	Semi-mature	Good	Good		20+	B1
#H12	Cypress (*Cupressus* sp.)	4	#100	1	1	1	1	0	1.2	4.5	Semi-mature	Good	Good	Private tree, unable to fully inspect	20+	C2
T13	Silver birch (*Betula pendula*)	8	130 130	2	3	3	2	2	2.2	15.3	Semi-mature	Good	Fair	Natural sweep in stem at base	20+	C1
T14	Silver birch (*Betula pendula*)	7	200	1	2	2	2	2	2.4	18.1	Semi-mature	Good	Fair	Tear out wound at 2m	10+	C1

Tree reference number	Species	Height (m)	Stem diameter (mm)	Branch spread (m)				Height of crown clearance (m)	Radius of nominal circle (m)	RPA (m^2)	Age class	Physiological condition	Structural condition	Comments	Estimated remaining contribution (years)	Category grading
				N	E	S	W									
T15	Silver birch (*Betula pendula*)	11	210 170	3	3	3	3	2	3.2	33.0	Semi-mature	Good	Good	Twin-stemmed	20+	B1
T16	Scots pine (*Pinus sylvestris*)	4	100	2	1	1	1	0	1.2	4.5	Young	Good	Good		10+	C1
T17	Scots pine (*Pinus sylvestris*)	3	100	1	2	1	1	0	1.2	4.5	Young	Good	Good		10+	C1
H18	Fire thorn (*Pyracanth* asp.)	3	<75	1	1	1	1	0	0.9	2.5	Young	Good	Good		10+	C2

Table B2 Key to Categories

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

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.

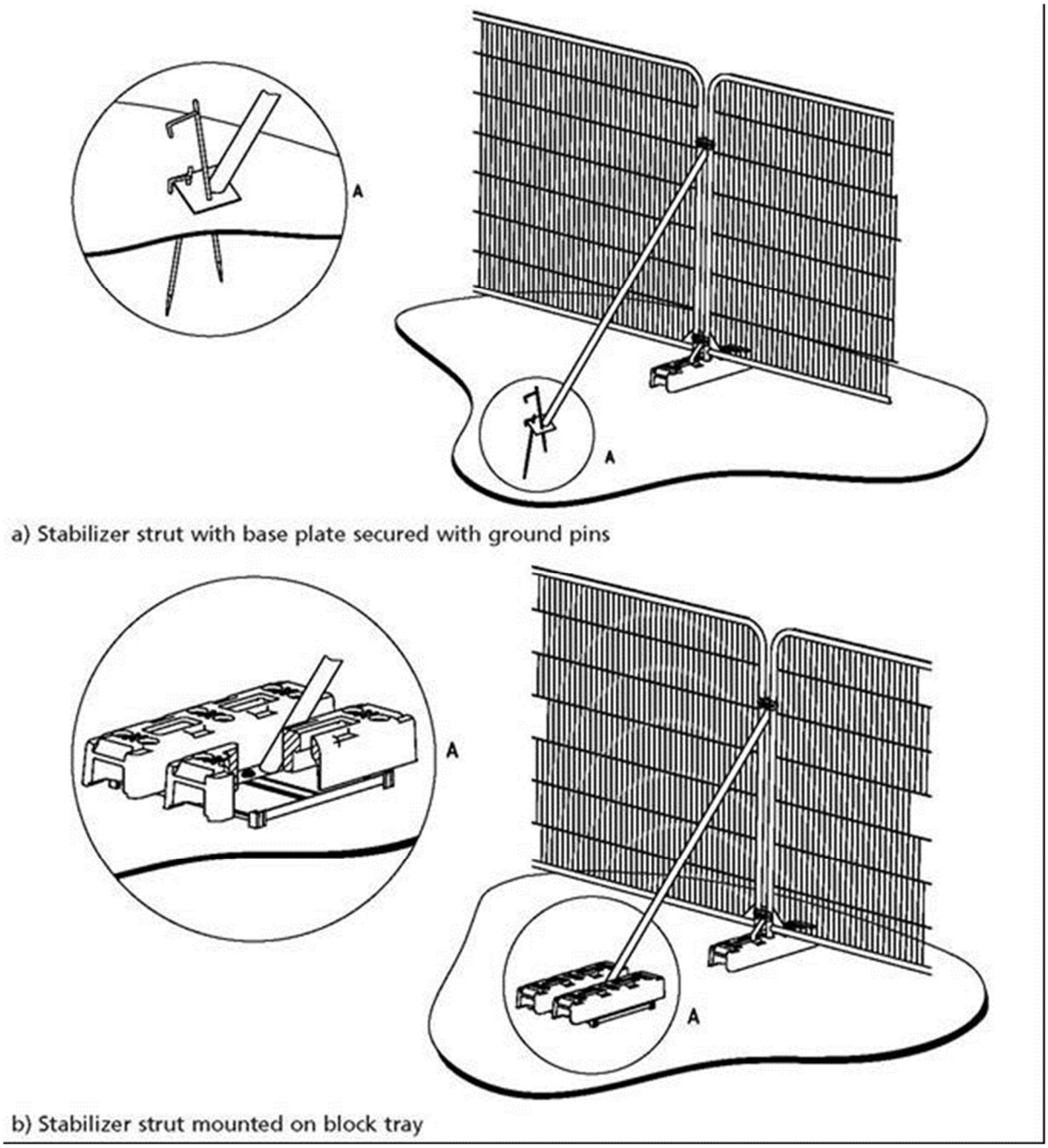
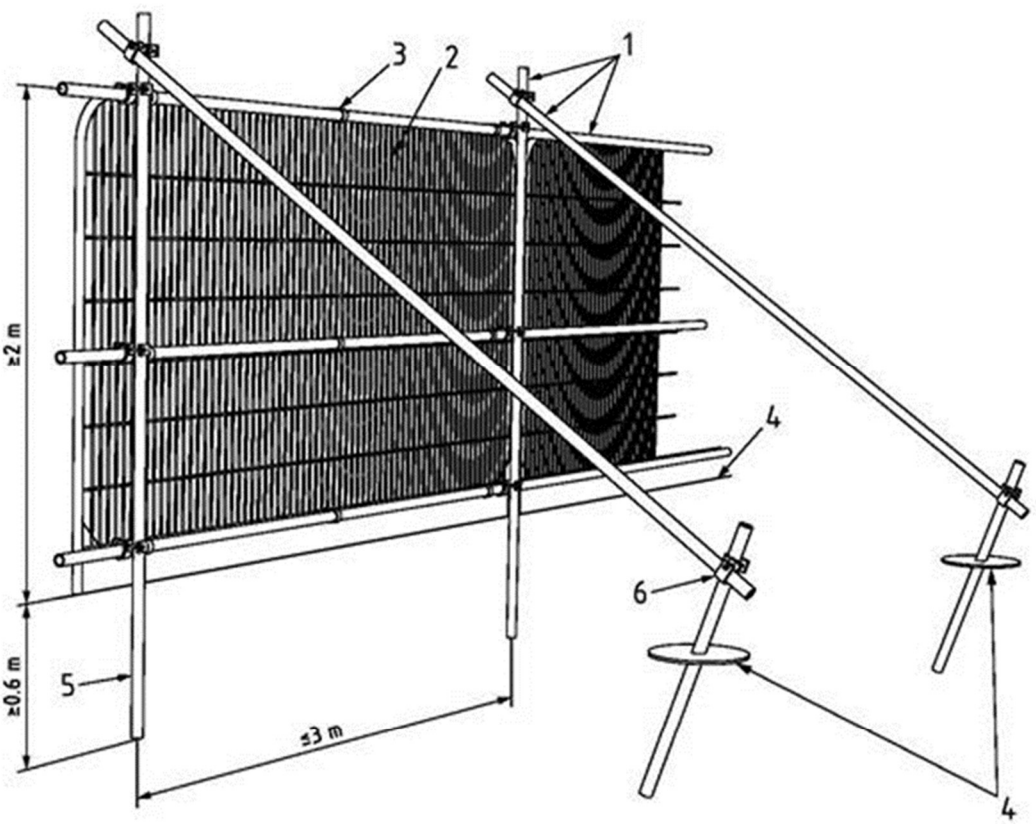


Figure C2 Tree Protection Fencing s*pecification (extract from BS 5837)*

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.

1

**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
T3, T5	Category C Hawthorn (*Crataegus monogyna*)	
T13	Category C Silver birch (*Betula pendula*) on Site	
T14, T15	Categories B and C Silver birch (*Betula pendula*)	
T15, T11	Category B Silver birch (*Betula pendula*)	

Arcadis Consulting (UK) Limited

Arcadis House,
34 York Way,
London, N1 9AB
United Kingdom

www.arcadis.com