

TFL_PSF_9131 SITE INVESTIGATIONS: SMALL SITES INITIATIVE 286 LONG LANE, BARNET, N2 8JP

Site Ref: 466

Preliminary BS5837:2012 Tree Survey Report

FEBRUARY 2019

Incorporating

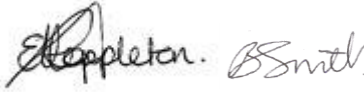
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286 Long Lane, Barnet, N2 8JP

Preliminary BS5837:2012 Tree Survey Report

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01	September 2017	Ellen Poppleton/ Beverly Smith	1 st Issue
02	October 2017	Ellen Poppleton/ Beverly Smith	Final Issue
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This report dated February 2019 has been prepared for Transport for London (TfL) (the "Client") in accordance with the terms and conditions of appointment dated 02 May 2017 (the "Appointment") between the Client and **Arcadis (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

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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 at 286 Long Lane, Barnet, N2 8JP ('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 south of the North Circular Road (A406) and west of Long Lane, in the London Borough of Barnet. The Site is centred around the postcode of N2 8JP. It is currently comprised of dense scrub, introduced shrubs, amenity grassland, bare ground and scattered trees. The area of the site is approximately 0.04 hectares.

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 Beverley Smith, FDSoc. Tech.Arbor.A on 25th August 2017 in accordance with BS 5837:2012. This survey was updated by Ewan Gibson in February 2019.

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 unique number on the associated Tree Schedules and 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.

The maximum crown spread of each 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 were taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records and local knowledge.

Where 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 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 form the initial Construction Exclusion Zone (CEZ) to protect the trees within and adjoining the Site. The RPA is represented by pink-shaded areas. 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.

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 TPO information request was submitted to the Development and Regulatory Services department of the London Borough of Barnet by TfL on 4 September 2017. A response was received on the 24 September 2017 which confirmed that the Site is not within a Conservation Area and no trees on Site have an applicable Tree Preservation Order.

An updated TPO search was undertaken on 8th February 2019 [source: <https://open.barnet.gov.uk/dataset/tree-preservation-orders-within-the-london-borough-of-barnet>] which found the results to be consistent with the initial assessment.

3 Tree Survey Results

3.1 Tree Assessment and Categorisation

A total of nine arboricultural items were recorded within the study area. These include seven individual trees and two groups of trees. 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: No arboricultural items were graded as Category A (trees of high quality) as part of this survey;
- Category B individual trees, groups of trees: Three individual trees were graded as Category B (trees of moderate quality) as part of this survey;
- Category C individual trees, groups of trees: Four individual trees and two groups of trees 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: No trees have 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

Eleven 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 Table 1 Tree Species Recorded. The numbers below include species of individual trees and groups of trees.

Table 1 Tree Species Recorded

Tree Species	Number of Individual Stems	Approximate Percentage
Birch sp. (<i>Betula</i> sp.)	2	6.25
Goat willow (<i>Salix caprea</i>)	1	3.125
Sycamore (<i>Acer pseudoplatanus</i>)	2	6.25
Cotoneaster (<i>Cotoneaster</i> sp.)	5	15.625
Field maple (<i>Acer campestre</i>)	1	3.125
Elder (<i>Sambucus nigra</i>)	2	6.25
Hazel (<i>Corylus avellana</i>)	10	31.25
Ash (<i>Fraxinus excelsior</i>)	4	12.5
Common alder (<i>Alnus glutinosa</i>)	4	12.5
Mountain ash (<i>Sorbus aucuparia</i>)	1	3.125

Tree Species	Number of Individual Stems	Approximate Percentage
Small leaf lime (<i>Tilia cordata</i>)	2	6.25
Totals	32	100%

3.3 Age Diversity

Analysis of the data identified that the majority of the trees within the study area were within the semi-mature age classification set by BS 5837: 2012 being in the second fifth of full life expectancy, as illustrated in Table 2.

Table 2 Age Diversity

Age Class	Number of Individual Stems	Approximate Percentage
Young	0	0
Early-mature	1	3.125%
Semi-mature	31	96.875%
Mature	0	0
Over-mature	0	0
Totals	32	100%

3.4 Root Protection Area

The RPAs are shown in Figure 1 Tree Constraints Plan.

4 Conclusions

A total of nine arboricultural items were recorded during the survey as seven individual trees and two groups of trees.

No trees on Site were found to be within a Conservation Area and no trees on Site have an applicable Tree Preservation Order.

Three individual trees have been identified as Category B (trees of moderate quality) (T2, T8, T9) and should be considered for retention where possible. Four individual trees (T1, T4, T5, T6) and two groups of trees (G3, G7) have been identified as Category C (trees of low quality). These trees should not place a constraint on the development layout but should be considered for replacement should they be removed. As there is currently no proposed design for the site, it is not possible to state whether the trees would need to be removed and if there is space for any new trees to be re-provisioned on the Site.

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 LPA may ask for re-provisioning in excess of 1 to 1 for trees of Category B.

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 the specifics of the 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.

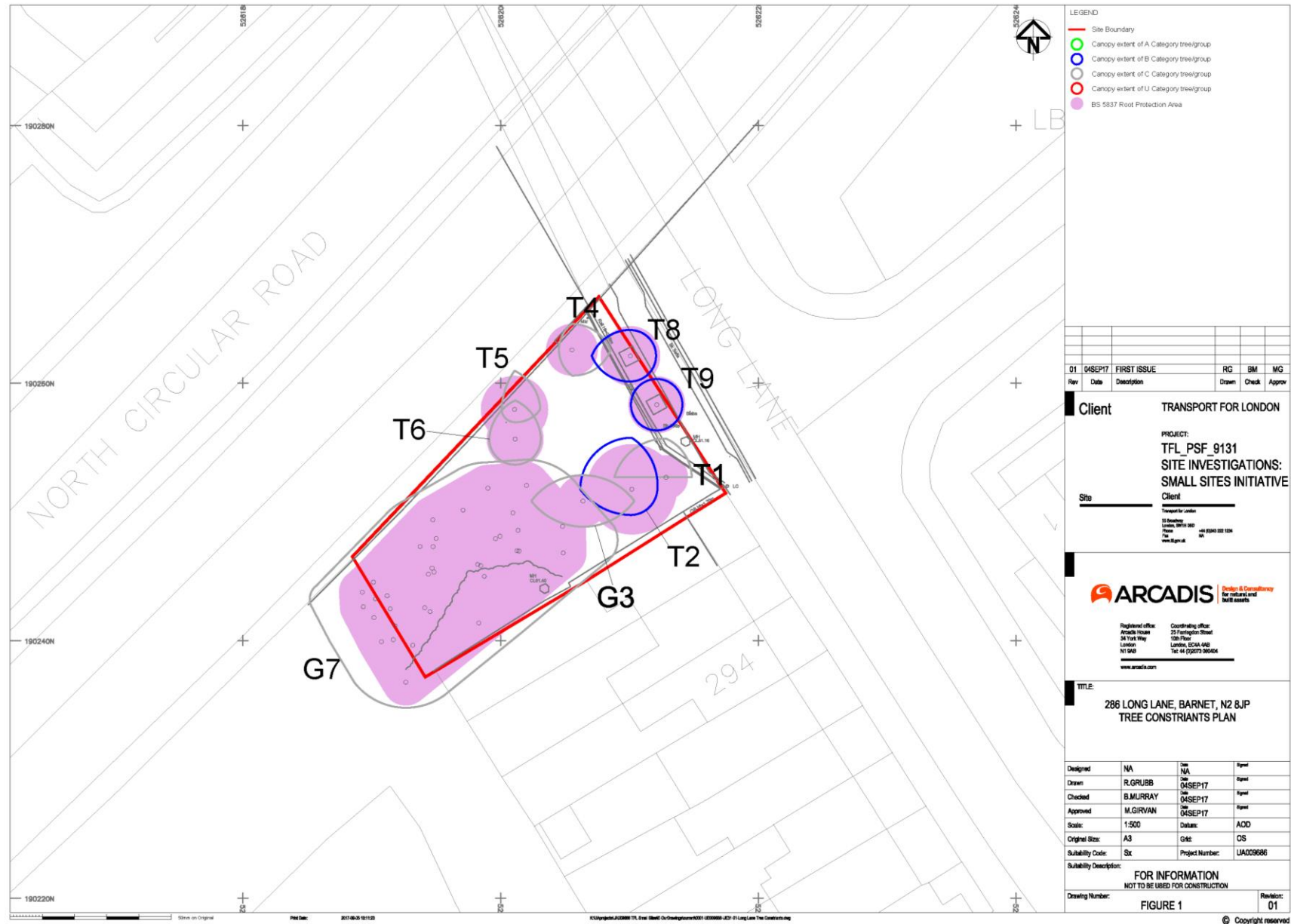


FIGURE 1. Tree Constraints Plan

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: 25th August 2017

Project: 286 Long Lane, Barnet, N2 8JP
Surveyor: Beverly Smith FDS^c. Tech.Arbor.A

Table B1 Tree Schedule

Tree reference number	Species	Height (m)	Stem diameters (mm)	Branch spread (m)				Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Additional Information	Estimated remaining contribution (years)	Category grading
				N	E	S	W							
T1	Birch sp. (<i>Betula sp.</i>)	5	110, 90	3	2	0	4	1.5	Semi-mature	Good	Fair	Leaning to north.	10-20	C1
T2	Goat willow (<i>Salix caprea</i>)	11	290	4	2	2	4	1	Early-Mature	Good	Good	Leaning to north.	20-40	B1
G3	Sycamore (<i>Acer pseudoplatanus</i>) x 2	10	175, 160	2	4	2	4	2.5	Semi-mature	Good	Good	Tree on east with bark damage at 1m on north.	10-20	C1
T4	Cotoneaster (<i>Cotoneaster sp.</i>)	5	165	2	3	2	1	2	Semi-mature	Good	Fair	Crown suppressed on west by wall of flyover.	10-20	C1
T5	Field maple (<i>Acer campestre</i>)	11	215	3	2	1	1	4	Semi-mature	Good	Fair	Crown suppressed on west by wall of flyover.	10-20	C1
T6	Elder (<i>Sambucus nigra</i>)	9	125, 130	3	2	2	2	4	Semi-mature	Fair	Fair	Twin-stemmed at base. Bird nest in centre of crown.	10-20	C1
G7	Hazel (<i>Corylus avellana</i>) x 10, Ash (<i>Fraxinus excelsior</i>) x 4, Common alder (<i>Alnus glutinosa</i>) x 4, Cotoneaster sp. X 4, Mountain ash (<i>Sorbus aucuparia</i>) x 1	12	150	4	5	4	5	0	Semi-mature	Good	Good	None	10-20	C1
T8	Small leaf lime (<i>Tilia cordata</i>)	9	195	2	2	2	3	2	Semi-mature	Good	Good	Metal grill around base, bricks lifting from root damage.	20-40	B1
T9	Small leaf lime (<i>Tilia cordata</i>)	9	185	2	2	2	2	2	Semi-mature	Good	Good	Metal grill around base, bricks lifting from root damage.	20-40	B1

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Table B2 Root Protection Area

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m ²)
T1	Birch sp. (<i>Betula</i> sp.)	110, 90	1.7	9.14
T2	Goat willow (<i>Salix caprea</i>)	290	3.5	38.05
G3	Sycamore (<i>Acer pseudoplatanus</i>) x 2	175, 160	2.0	N/A
T4	Cotoneaster (<i>Cotoneaster</i> sp.)	165	2.0	12.32
T5	Field maple (<i>Acer campestre</i>)	215	2.6	20.91
T6	Elder (<i>Sambucus nigra</i>)	125, 130	2.2	14.71
G7	Hazel (<i>Corylus avellana</i>) x 10, Ash (<i>Fraxinus excelsior</i>) x 4, Common alder (<i>Alnus glutinosa</i>) x 4, Cotoneaster sp. X 4, Mountain ash (<i>Sorbus aucuparia</i>) x 1	150	1.8	N/A
T8	Small leaf lime (<i>Tilia cordata</i>)	195	2.3	17.20
T9	Small leaf lime (<i>Tilia cordata</i>)	185	2.2	15.48

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

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

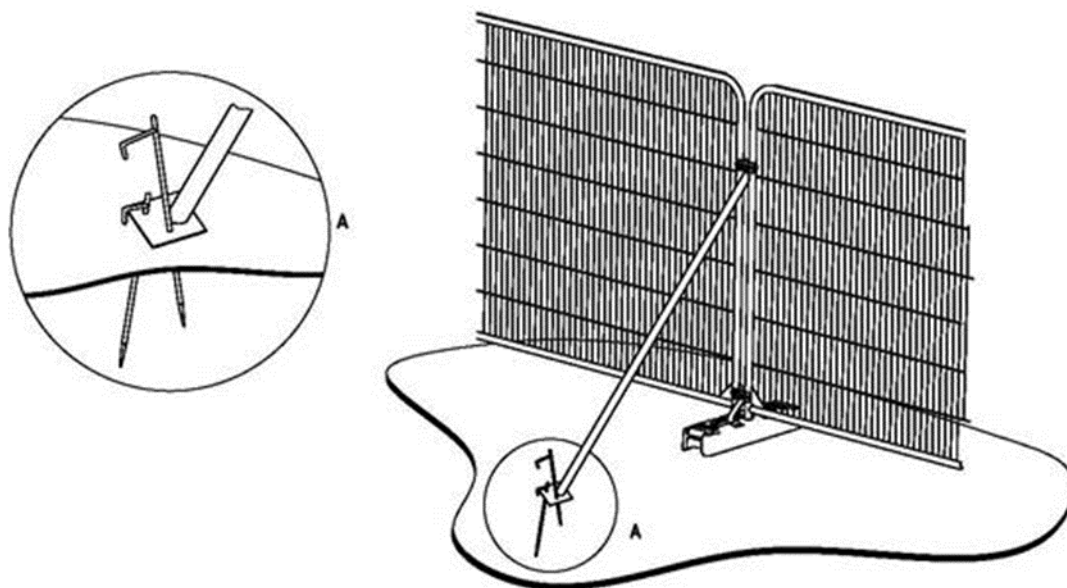
The system illustrated in Figure C1 is adequate to define areas of protected vegetation and exclude traffic, and comprises Cleft Chestnut Pale Fence in accordance with *BS 1722 Part 4: Specification for cleft chestnut pale fences (British Standards Institution, 1991)* supported by 150mm wooden stakes.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



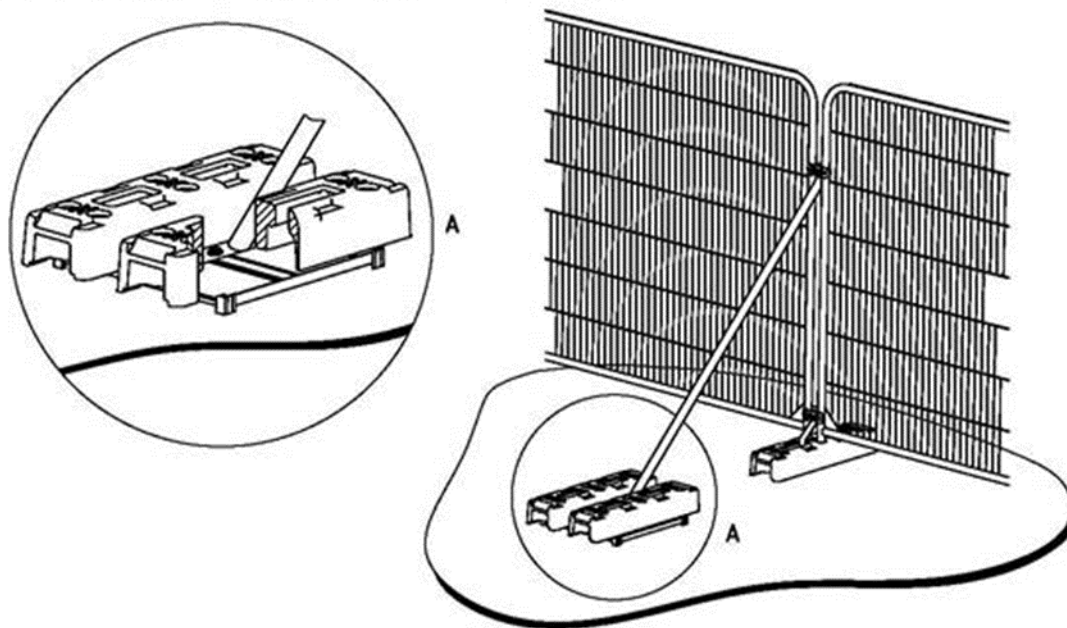
Figure C1 Tree Protection fencing example for low use areas

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)* 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) guidelines. This kind of system provides the highest level of security.

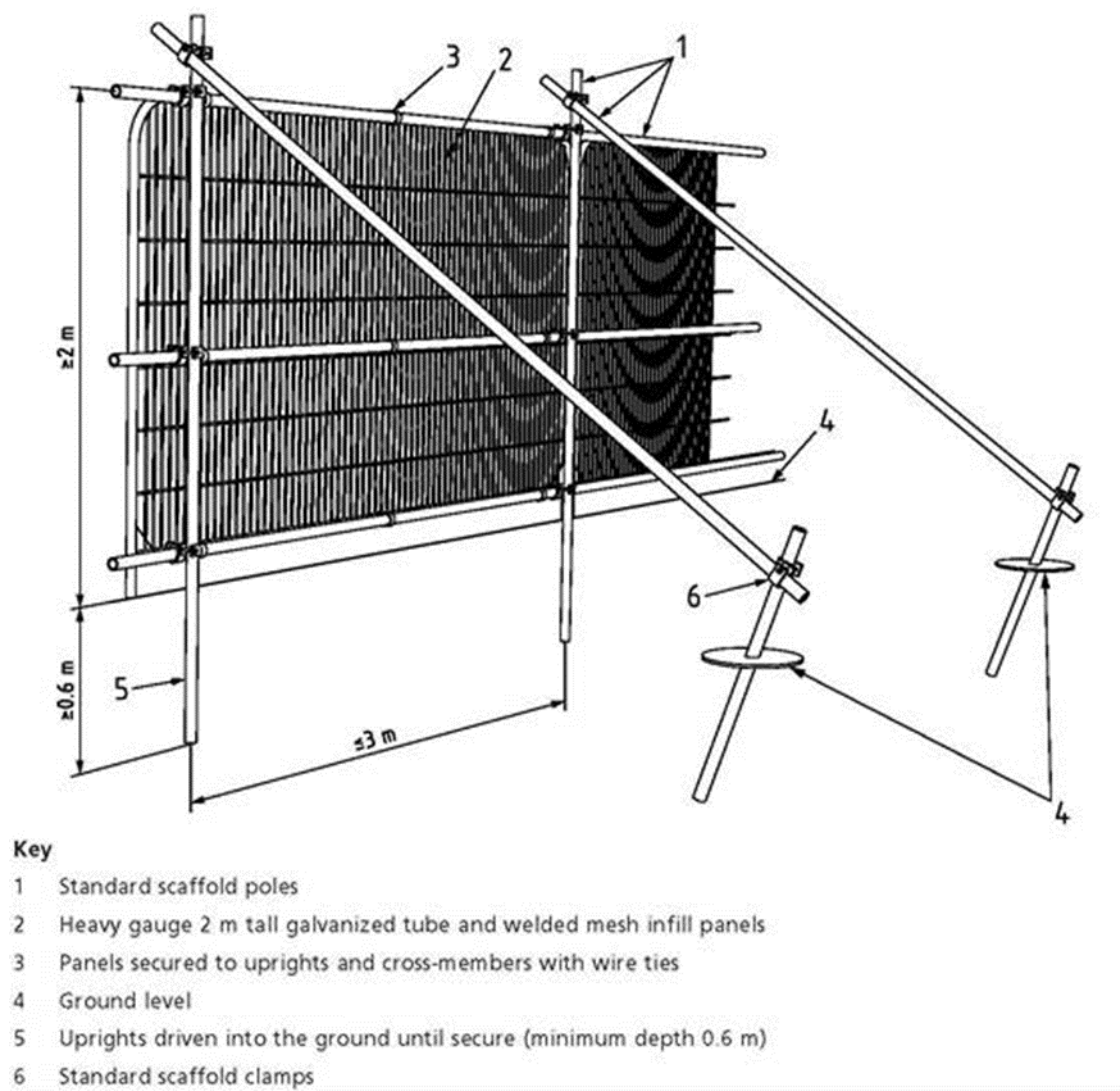


Figure C3 Tree Protection Fencing specification (extract from BS5837)

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.

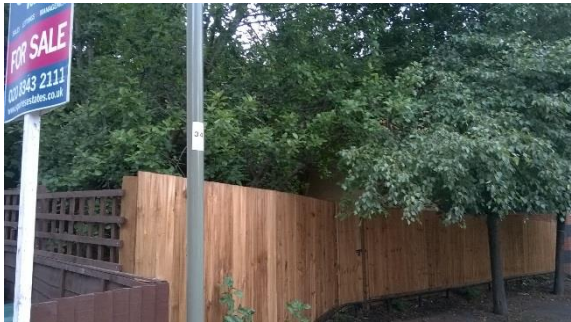
All other chemicals hazardous to tree health, including petrol and diesel, are to be stored in suitable containers as specified by the Control of Substances Hazardous to Health (COSHH) Regulations (2002), and kept away from the RPAs.

Example of Protective Fencing Signs



APPENDIX D. Photographs

Tree No.	Description	Photograph
T5, T6	Trees adjacent to A406 Flyover	
G7	Group of predominantly Hazel	

Tree No.	Description	Photograph
T8, T9	Trees visible on the right of the photograph	

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