BS5837:2012 Tree Survey Report, incorporating Arboricultural Implications Assessment and Method Statement

In support of an application for a docking station on the footway on:

Camden Street, north of the junction with St Martin's Close, NW1

Site Ref: 02/615507
Status: FINAL
Version: A
Date: 14 February 2013

MAYOR OF LONDON

Transport for London

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1 INTRODUCTION

1.1 Background

Transport for London (TfL) is coordinating the implementation of a comprehensive cycle hire scheme – Barclays Cycle Hire (BCH) – within London on behalf of the Mayor of London. BCH was launched in July 2010. The current phase of the project, known as the Cycle Hire Expansion and Intensification (CHEI) extends the scheme further to the west with the installation of new docking stations, as well as increasing coverage within current operating areas.

1.2 Instructions and scope of report

Hyder Consulting (UK) Limited have been instructed by TfL to conduct a tree survey in accordance with BS5837:2012 at the site of a proposed BCH docking station on:

Camden Street, north of the junction with St Martins Close, NW1

The docking station is made up of a double row of docking points and a terminal, located on the footway.

This report presents the results of the tree survey which recorded the nature, extent and condition of existing tree cover. It contains an Arboricultural Implications Assessment (AIA) which identifies, evaluates and, where appropriate, provides recommendations to mitigate adverse impacts on trees that may arise as a direct result of the proposed development. It also contains an Arboricultural Method Statement (AMS), which details the protection measures to be adopted to protect the trees during construction.

The report is provided in support of an application for full planning consent for construction of the BCH docking station.

2 SURVEY METHODOLOGY

The tree survey included all trees with the potential to be affected by the proposed development, as detailed in **Section 1.2**. Trees were visually surveyed from ground level using the Visual Tree Assessment (VTA) technique developed by Mattheck and Breloer (1994). Tree data was collected in accordance with BS5837:2012 and is presented in the Tree Data Schedule (**Appendix 3**). An explanation of the categories and definitions used in producing the Tree Data Schedule is provided in **Appendix 1**.

The tree survey has been undertaken with specific reference to the planning submission requirements for the BCH scheme. As such, this report makes no attempt to provide a safety inspection of the trees surveyed. It should not be seen as a substitute for a Tree Safety Survey or Management Plan, which are specifically designed to minimise risk and liability associated with responsibility for trees. Potentially hazardous trees have been highlighted and appropriate recommendations made only where urgent action is required in the interests of public safety. No climbed inspections or specialist decay detection was undertaken.

Where trees were located on third party land, detailed inspection using the VTA methodology outlined above was not possible. In these instances, measurements of stem diameter and crown spread have been estimated, and the RPA plotted accordingly.

Surveys have been undertaken with reference to a supplied plan, showing the location and extent of the proposed development (the 'General Arrangement', drawing number: 02_615507_GA Rev A, provided by TfL). Tree positions in the vicinity of the site have been plotted in accordance with this plan.

3 SITE DESCRIPTION

The existing site is located on the western side of the footway on Camden Street, north of the junction with St Martin's Close. The site is flanked by Our Lady Roman Catholic Primary School to the east and St Martin's Gardens (a park) to the west.

One tree occurs in the vicinity of the site. Further details, including the position of each tree in relation to the site, are provided in **Section 4**.

Any additional trees in the vicinity of the site which shall not be affected by the proposals have not been surveyed.

4 RESULTS

4.1 Date of survey

A site visit was conducted by Stuart Harris on 10 October 2012. A statement of the Author's Qualifications and Experience is included as **Appendix 2**.

4.2 Surveyed trees

The following trees were inspected during the survey:

- One Italian Alder tree (T1) situated on the public footway adjacent to the site.

Any additional trees in the vicinity of the site which shall not be affected by the proposals have not been surveyed.

During the survey, minor surface distortion was noted within footway at the northern end of the proposed site footprint; indicating some minor roots may be located at required excavation depth within this area.

The results of the tree survey are detailed in the Tree Data Schedule (**Appendix 3**) and illustrated on the Tree Protection Plan (**Appendix 4**).

4.3 Tree condition and observed defects

At the time of survey, T1 was deemed to be in an acceptable condition and no significant defects were identified.

4.4 Tree protection status

It is understood that T1 is not likely to be the subject of a Tree Preservation Order since it is a Local Authority owned street tree.

5 ARBORICULTURAL IMPLICATIONS ASSESSMENT

5.1 Proposed development

The proposal for the site is to construct a BCH docking station, incorporating a terminal and a number of docking points. The development consists of a series of docking points and a terminal, located on the footway, which is surfaced with concrete paving slabs.

The site dimensions, including the size and position of both docking points and terminal, are shown on the Tree Protection Plan (**Appendix 4**). Detailed site-specific engineering designs are included within the Planning, Design and Access Statement which accompanies this application. The following excavations are required for the proposed development:

Docking points:

- One trench of 1200mm width x 10.30m in length x 318mm depth

Terminal:

- as a continuation of the docking point trench of 800mm width x 450mm depth x 800mm in length.

5.2 Summary of tree implications

Potential impacts arising from construction of the proposed development are summarised in **Table 1**. Appropriate mitigation measures are also detailed where required.

Activity	Tree ref.	Potential impact	Mitigation
General Construction Activity	T1	Damage to tree stems as a result of direct contact by vehicles or machinery	Protective fencing will be installed to provide adequate tree protection.
General Construction Activity	T1	Damage to tree branches as a result of direct contact by vehicles or machinery	Site tool-box talks to indicate the location of low branches. Clerk of works to ensure no damage occurs.
Footway excavation	T1	The site is located on the footway in excess of 3m from T1 (outside the defined RPA). Distortion of existing surfaces indicates some coarse roots (used for the transportation), and some fine roots (used for the uptake of water and nutrients) may be encountered during required excavation, however, given the physiological condition of T1, and also given the alignment of the proposed site to T1, the scale of potential root loss, it is unlikely to cause any significant impact.	Excavation within the site can proceed without recourse to any mitigation measures. Should minor roots be encountered the protocol detailed in Section 6.6 will be followed.
Tree pruning	None	None.	Not required.
Ground level alterations	None	No significant changes in ground level are proposed within the RPA of T1 as a result of the development, and surfaces will be reinstated in accordance with the current site conditions.	Not required.
Future tree growth	None	T1 is located in excess of 3m from the site, and is therefore unlikely to impact on the proposal as a result of future growth.	The design of terminal and docking point foundations are expected to withstand any impacts from root growth or secondary thickening within the operational life of the proposed design.

6 ARBORICULTURAL METHOD STATEMENT

6.1 Overview

This section of the report details the measures to be adopted to protect trees in the vicinity of the proposed development. The methodology should be discussed and agreed between the Local Authority Tree Officer, TfL, and the building contractor, once appointed. Any parts of the methodology which are deemed to be inaccurate or unworkable should be highlighted and addressed at an early stage, ideally before construction commences.

6.2 Pre-construction tree works

No pre-construction tree works have been recommended.

6.3 Tree fencing and protective measures

The stem and primary branches of T1 will be protected prior to commencement of any construction activity (including ground preparation) and throughout the construction process. The fencing will prevent damage to tree stems and buttress roots located in the immediate vicinity of the site by construction activity. Weldmesh panels or 18mm shuttering ply to a height of 1.8m will be positioned around the tree (a 1m x 1m tree protection fence has been specified in this case). The fencing will be robust enough to withstand occasional knocks from construction machinery and will be secured to the ground using brackets or ground pins. No excavation to secure fencing will occur.

6.4 Site fencing and site preparation

It may be necessary to fence off the site in order to make it secure and safe. No tree constraints exist in connection with the installation of site fencing, provided that either no-dig fencing is installed, or ground pins are used to secure site fencing to the ground where required.

6.5 Removal of surfaces

Since tree roots may be located beneath the existing surfaces, all surfaces will be removed using hand tools. Following surface removal, where roots are located within bedding materials outside the footprint of the installation footprint, these will be retained undisturbed and protected in accordance with the protocol detailed in **Section 6.6**.

6.6 Excavation protocol

Should minor roots (below 25mm) occur within the area of bedding course removal / excavation they will be trimmed back neatly in line with the edge of the installation footprint using secateurs, bypass loppers or a sharp saw.

In the unlikely event that any roots over 25mm diameter are exposed, excavation works will cease immediately and arboricultural advice sought from the Local Planning Authority Tree Officer or Project Arboricultural Consultant.

6.7 Installation and 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 any required mixing areas are contained so that no water runoff enters the RPAs of any trees. All mixers and barrows will be cleaned within this dedicated mixing area.

All other chemicals hazardous to tree health, including petrol and diesel will be stored in suitable containers as specified by COSHH Regulations 2002.

6.8 General construction activity

Since a proportion of the smaller branches of T1 are located in close proximity to the site, the Clerk of Works will ensure that all machinery operatives are made aware of the necessity to avoid contact with all branches during construction.

6.9 Removal of fencing

Fencing shall be removed after all construction activity is completed and without the need to excavate within the RPA of any tree.

6.10 Clerk of Works

A Clerk of Works will be appointed by TfL to oversee the installation of all Cycle Hire Scheme docking stations. Prior to the commencement of any on-site activities, the Clerk of Works will be fully briefed on all potential arboricultural issues by the consultant arboriculturalist. The Clerk of Works will ensure that the specified tree protection measures are implemented, and that all activities are conducted in accordance with the Arboricultural Impact Assessment and Arboricultural Method Statement.

REFERENCES

British Standards Institution (2012) *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations.*BSi, London, UK.

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

APPENDICES

Appendix 1: Explanation of Terms

Appendix 2: Authors Qualifications and Experience

Appendix 3: Tree Data Schedule

Appendix 4: Tree Protection Plan

Appendix 1: Glossary of Terms in the Tree Data Schedule

1) Numbering

Each tree, group of trees or hedgerow is given an individual reference, made up of sequential numbers prefixed by a letter where:

T= Individual Tree, G = Group of trees.

2) Age and Species

Age Class

Trees are assigned to one of six age classes as follows:

Young	Tree in establishment stage, normally up to 10 years old
Semi-mature	Establishing tree with potential for significant growth both in terms of tree height and crown spread.
Early-mature	Established tree, typically having attained at least 70% of likely mature height and crown spread
Mature	Approximate full height and crown spread attained
Over-mature	Extensive decline in physiological functions and/or structural integrity
Veteran	A tree that shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species

Species

Tree names and other plant names follow Stace (1997) and are provided as Common (English) and scientific names.

3) Size and Spread

Crown Height

Height of crown clearance above adjacent ground level in metres. Where this varies around the canopy, the height closest to the site is recorded.

Stem Diameter

Measured in centimetres at 1.5m above ground level (Diameter at Breast Height [DBH]). On multi-stemmed trees this measurement is taken immediately above the root flare of the tree.

Crown Spread

Radial crown spread measured in four compass directions (north, south east, and west) using magnetic north.

Height and Direction of First Significant Branch

Height measures in metres above ground level below branch in question. Direction to the eight cardinal points.

4) Notes
This section provides details, where relevant, pertaining to the tree's position, form, pruning history and an account of any significant defects observed. Any access restrictions are also noted here.

5) Recommendations
These are normally based upon remedial action to address any observed major defects. These may be recommended for tree safety reasons, or for reasons of good arboricultural practice and tree management.

Priority Scale
A priority is assigned to any works recommended in the preceding section as follows:

Urgent	Works should be carried out immediately, within 1 week maximum
Very High	To be carried out within 1 month
High	To be carried out within 3 months
Moderate	To be carried out within 1 year
Low	To be carried out within 4 years

Inspection Frequency
An interval of 6 months, 12 months, 18 months or 3 years has been allocated before the next inspection is due. Seasonal considerations should also be factored in to these guidelines for re-inspection. In summer, tree foliage colour and condition is readily observable. In winter, clear vision into the upper crown junctions may be obtained in those specimens where dense foliage obscures this view during the summer. An autumn inspection should be conducted in cases where fungal infection is suspected, when the fruiting bodies of many fungal species are more likely to be observed.

6) Condition and Value

Vigour:
An indication of growth rate and the tree's ability to cope with stresses:

High	Having above average vigour
Moderate	Having average vigour
Low	Having below average vigour
Very Low	Tree is struggling to survive and may be dying

Physiological Condition

Normal	Healthy tree with no symptoms of significant disease
Fair	Tree with early signs of disease, small defects, decreased life expectancy, or evidence of less than average vigour for the species

Poor	Significant disease present, limited life expectancy, or with very low vigour for the species and evidence of physiological stress
Very Poor	Tree is in advanced stages of physiological failure and is dying

Structural Condition

Normal	No significant structural defects observed
Fair	Some structural defects observed but these do not necessitate remedial action at present
Poor	Significant defects observed resulting in a tree which is likely to require either monitoring or remedial action
Very Poor	Major defects which compromise the safety of the tree. Remedial works or tree removal are likely to be required in the majority of target locations

Life Expectancy or Estimated Remaining Contribution (ERC)

The estimated number of years before the tree may require removal is expressed as one of the following categories: (i) <10 years; (ii) 10-20 years; (iii) 20-40 years; (iv) 40+ years.

7) BS5837 Retention Category

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

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 relocated
U	Trees unsuitable for retention

Appendix 2: Author's Qualifications and Experience

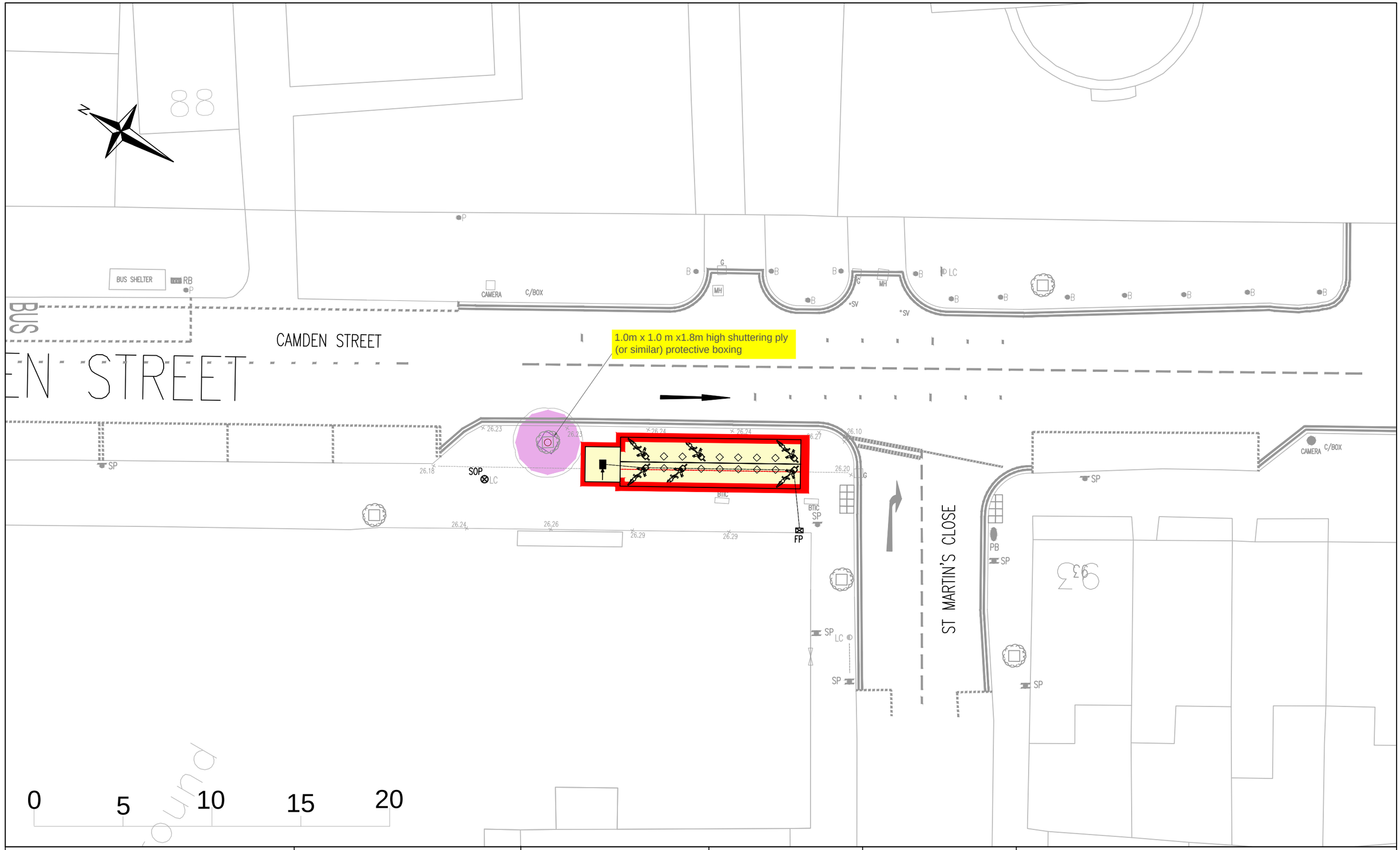
Stuart Harris N.D.Arb, N.C.H.Arb

Stuart Harris is a professional arboriculturalist with over 25 years in relation to trees and woodlands encompassing technical, strategic and practical roles in tree and woodland maintenance and management, tree surgery, and tree safety assessment, and has produced numerous technical Arboricultural Reports for the purposes of Development, Safety, Management and Mortgage Subsidence. He is accredited as a LANTRA Professional Tree Inspector. A qualification produced in association with the Arboricultural Association and generally recognised as appropriate for all levels of tree inspection. His career experience spans the public and private sectors including roles within the Royal Botanic Gardens Kew, local authorities and private consultancies.

Appendix 3: Tree Data Schedule

Tree Reference	Age	Species	Height (m)	Crown Ht (m)	Ht. & Direction of lowest branch (m)	Stem Diameter (mm) (E=Estimated)	Crown Spread N W E S	Tree Notes	Recommendations	Priority Inspection Frequency	Physiological Condition Structural Condition Life Expectancy	Retention Category & Sub-Category
T1	Semi-mature	Italian Alder *Alnus cordata*	9	2	3 N;W; S;F	150	2 2 2 2	Located within tree-pit in paved footway. Single-stemmed and vertical with a well-balanced crown. No significant pruning. No major visible defects.	No action required.	n/a 3	Normal Normal 40+	**C** 1

Appendix 4: Tree Protection Plan



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NOT TO BE USED FOR CONSTRUCTION

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Client: Transport for London

Site Name: St Martins Close

SMF Ref: 02/615507

Project: Barclays Cycle Hire

Title: Tree Protection Plan

Key

- 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
- Tree fencing
- Hand excavation area