Transport for London – Cycle Hire Scheme

Coram Street – CA169

BS5837 Tree Survey Report

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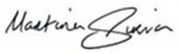
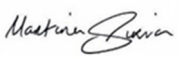
Checker	Martina Girvan	
Approver	Martina Girvan	

Report No	UA007654-01- CA169
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SUMMARY

This report presents the results of an Arboricultural Survey conducted in line with BS 5837: 2012. It was undertaken by Hyder Consulting (UK) Limited for Transport for London.

The aims of the study were to assess the condition and value of trees that would constitute potential constraints to the proposals to install a docking station within the highway at the Coram Street, Camden WC1H 0JR site. The findings of the survey are presented in a format intended to identify areas where existing and potential arboricultural constraints exist, thus informing site layout design considerations which shall make appropriate provision for the integration of existing trees.

A total of 3 individual trees were surveyed and classified according to the BS 5837 valuation criteria. Of the individual trees surveyed all three were identified as Category C, which represents trees of low quality, due to the trees over all condition.

An Arboricultural Impact Assessment and Arboricultural Method Statement has been supplied providing guidance on tree protection measures and mitigation.

1 INTRODUCTION

1.1 Background

Transport for London (TfL) is coordinating the implementation of a comprehensive Cycle Hire Scheme – within London on behalf of the Mayor of London. The Cycle Hire Scheme was launched in July 2010. The current phase of the project, known as the Queen Elizabeth Olympic Park and Intensification, extends the scheme further to the east with the installation of new docking stations, as well as increasing coverage within current operating areas.

Hyder Consulting Ltd was commissioned by Transport for London in April 2015 to undertake a 'Tree Survey in line with British Standard BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations' henceforth referred to as BS 5837: 2012 and provide a baseline Arboricultural report to identify the arboricultural features and impacts associated with the area (hereafter known as "the Site") at Coram Street, Camden WC1H 0JR.

1.2 Site Location and Setting

The proposed site is located to western end of Coram Street close to the junction with Woburn Place. The trees are located within the public footway on the north of the street. The local area is made up of retail and residential buildings. The approximate centre of the site is at Ordinance Survey grid reference TQ 30061 82225.

This report presents the results of the tree survey which recorded the nature, extent and condition of existing tree cover. It contains an Arboricultural Impact 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 the construction of the Cycle Hire Scheme docking station.

1.3 Brief Description of the Proposal

The proposal for the site is to construct a Cycle Hire Scheme docking station, incorporating a terminal and up to 30 cycle docking points. The site dimensions, including the size and position of both docking points and terminal, are shown on the Tree Protection Plan (Figure 1). Detailed site-specific designs are included within the Planning, Design and Access Statement which accompanies this application.

1.4 Quality Assurance

All Hyder Consulting Ltd arboriculturist are members of The Arboricultural Association at the appropriate level and follow their code of professional conduct when undertaking arboricultural work.

2 METHODOLOGY

2.1 Tree Survey Methodology

The survey was undertaken by Darren Hood (Principal Arboriculturist FdSc MArborA) in September 2015 in accordance with 'British Standard BS 5837:2012. The survey is in relation to the condition of the trees growing within, or within close proximity to the boundary of the Site only, the extents of which are presented on the 'Tree Survey and Tree Protection Plan' which can be found in Figure 1.

Base mapping (drawing number: 02-615519-GA) was provided by the client and as such the exact position of the trees is believed to be accurate.

Observations were conducted from ground level, utilizing the "Visual Tree Assessment" system (VTA by Mattheck and Breloer, H 1994) and the body Language of trees, Research for Amenity Trees No 4 Department of the Environment) with the aid of binoculars. For reference individual trees have been identified with the letter 'T' and an associated number on the associated schedules and plans. The stem diameters were recorded using a rounded down diameter tape in centimetres at 1.5m above ground level. The height of the subject trees were estimated to the nearest metre using a digital clinometer. Maximum crown spreads of the subject trees 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 in meters using a ground tape.

Tree age was estimated from visual indicators and should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records and local knowledge.

In compliance with Table 1 of BS 5837: 2012 all trees surveyed in this report have been categorised according to their arboricultural quality and value. A glossary of Survey Terms can be found in Appendix 1.

2.2 Root Protection Area (RPA)

The RPA is a recommendation in BS 5837, and is based upon a minimum area (in m^2) calculated from the measurement of the stem diameter. The resulting area is usually recorded as a generalised circle surrounding the tree on the Tree Survey and Protection Plan. In this study, the RPA is represented by pink-shaded areas.

The RPA presents an exclusion zone for activity to protect the health of the tree.

2.3 Survey Limitations

For the purpose of this report, only trees within potential influence of the proposed site have been included in this report. Any additional trees in the vicinity of the site have been deemed to not be affected by the proposals and have not been surveyed.

Trees are living organisms and as such their health and condition are naturally subject to change over time. This report cannot cover unforeseen circumstances such as neglect, wilful damage or severe/extreme weather conditions.

3 SURVEY RESULTS

3.1 Tree Assessment and Categorisation

The following trees were inspected during the survey:

- Three Crimson Norway maples (T1-T3) situated on the public footway located to the north of the proposed site.

Full details of the tree survey are detailed in the Tree Schedule (Appendix 2) and illustrated on the Tree Survey and Protection Plan (Figure 1).

- Category A individual trees: No category A (high quality) individual trees, groups or woodlands have been identified as part of this survey.
- Category B Individual trees: No category B (trees of moderate quality) individual trees have been identified as part of this survey
- Category C Individual trees: Three individual trees were identified as category C (trees of low quality) as part of this survey. This being due to the trees age class and the trees over all condition.
- Category U Individual trees: No trees were identified as being category U (trees of unsuitable quality) as part of this survey.

3.2 Statutory Tree Protection

No liaison was undertaken with the local authority tree officer as to the presence of Tree Preservation Orders or other statutory tree protection as part of the survey.

4 Arboricultural Impact Assessment

4.1 Arboricultural Impacts and Mitigation

Development can have an adverse impact on trees and other woody vegetation within a site. This can result in: (1) immediate vegetation removal to facilitate the footprint of a new development; (2) potential future tree loss through the early decline of trees due to soil compaction; and (3) root disturbance and damage within a trees rooting area.

The proposed development is low impact and non-residential and as such there will be no future pressures placed on the retained tree stock resulting from excessive shading of dwellings or gardens or other pressures associated with residential developments and future tree growth. The design of terminal and docking point foundations are expected to withstand any impacts from any future root growth or secondary thickening within the operational life of the proposed design. However it is likely that tree produced debris such as leaf fall and the dropping of fruit and seeds will have a limited influence on the proposed end use of the site but as this is a natural phenomenon it should be treated as a regular maintenance issue.

The only potential impacts therefore are construction impacts which are described per tree. Mitigation is presented per tree below in section 4.2 to 4.5 and in the Arboricultural Method Statement presented in Section 5.

4.2 T1 - Category C

Norway maple (*Acer platanoides* 'Crimson King') located on the northern end of the proposal. Approximately 30% of the tree's RPA on the southern side of the crown is within the footprint of part of the design with the proposed terminal base plate being located within the RPA. Excavation works to install the terminal base plate within the RPA does have the potential to impact the trees root system. However as the site of the proposed excavation is located on recently constructed paving it is unlikely that large tree roots, roots in access of 25mm, would be encountered.

There is potential that minor tree roots of up to 25mm could be encountered during excavation works within the RPA. Any minor roots encountered could be trimmed back neatly in line with the edge of the trench using secateurs, bypass loppers or a sharp saw.

In the unlikely event that any tree 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.

Due to the hard standing surface type there will be no additional impacts from ground compaction.

The crown of this tree overhangs the design proposal and there is potential for damage to the branch framework and main stem of this tree as a result of direct contact by works vehicles and machinery, however this can be mitigated by the installation of protective fencing as per the Arboricultural Method Statement.

4.3 T2 – Category C

Norway maple *(Acer platanoides* 'Crimson King') located on the northern western end of the proposal. Approximately 25% of the tree's RPA on the southern side of the crown is within the footprint of part of the design with the proposed terminal base plate being located within the

RPA. Excavation works to install the terminal base plate within the RPA does have the potential to impact the trees root system. However as the site of the proposed excavation is located on recently constructed paving it is unlikely that large tree roots, roots in access of 25mm, would be encountered.

There is potential that minor tree roots of up to 25mm could be encountered during excavation works within the RPA. Any minor roots encountered could be trimmed back neatly in line with the edge of the trench using secateurs, bypass loppers or a sharp saw.

In the unlikely event that any tree 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.

Due to the hard standing surface type there will be no additional impacts from ground compaction.

The crown of this tree overhangs the design proposal and there is potential for damage to the branch framework and main stem of this tree as a result of direct contact by works vehicles and machinery, however this can be mitigated by the installation of protective fencing as per the Arboricultural Method Statement.

4.4 T3 – Category C

Norway maple (*Acer platanoides* 'Crimson King') located to the north of the proposal. The RPA of this tree fall outside of the footprint of the design proposal and as such there are no predicted impacts to this tree from root severance or root compaction. However there is limited potential for damage to the main stem of this tree as a result of direct contact by works vehicles and machinery, this can be mitigated by the installation of protective fencing as per the Arboricultural Method Statement.

5 Arboricultural Method Statement

5.1 Overview

This Arboricultural Method Statement provides 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.

5.2 Protective Fencing and Shuttering

Due to the nature of the site being of a highway environment with limited space, full protection in line with 'BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations' may not be possible. Fencing and protection arrangements would need to be agreed prior to the commencement of any works with the Borough Tree Officer. It may be necessary to fence off the site in order to meet health and safety requirements and no arboricultural constraints exist in connection with the installation of site fencing, provided that either no-dig fencing is installed, or other means of securing are used to secure site fencing to the ground where required.

The stems and primary branches of T1, T2 and T3 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 trees (a 1m x 1m tree protection fence has been specified in each 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.

5.3 Materials Hazardous to Tree Health

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, and kept away from the RPAs.

5.4 General Construction Activity

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

- All heavy plant will be sited outside the defined RPAs of retained trees, 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.
- 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 pruning be required the Local Authority Tree Officer and appointed Arboriculturist shall be contacted and the scope of works agreed in writing.

- All materials will be stored within designated areas outside of the RPA of the trees.
- Any minor roots (roots below 25mm diameter) uncovered during excavation works will trimmed back neatly in line with the edge of the trench using secateurs, bypass loppers or a sharp saw.
- Any roots in excess of 25mm diameter are exposed during excavation works the roots will be covered with loose soil and arboricultural advice sought from the Local Planning Authority Tree Officer or Project Arboricultural Consultant.

5.5 Removal of Protective Fencing and Shuttering

Fencing/shuttering will be removed after all construction activity is completed.

5.6 Arboricultural Supervision

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 arboriculturist. 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.

6 Conclusions

Providing the guidance and recommendations outlined within this report are followed the design proposal can be implemented with minimal impact on the existing tree stock ensuring a continued mature canopy cover within the site for future generations. However remedial actions outlined in Section 4 and detailed in the Arboricultural Method Statement will prevent any significant adverse effects.

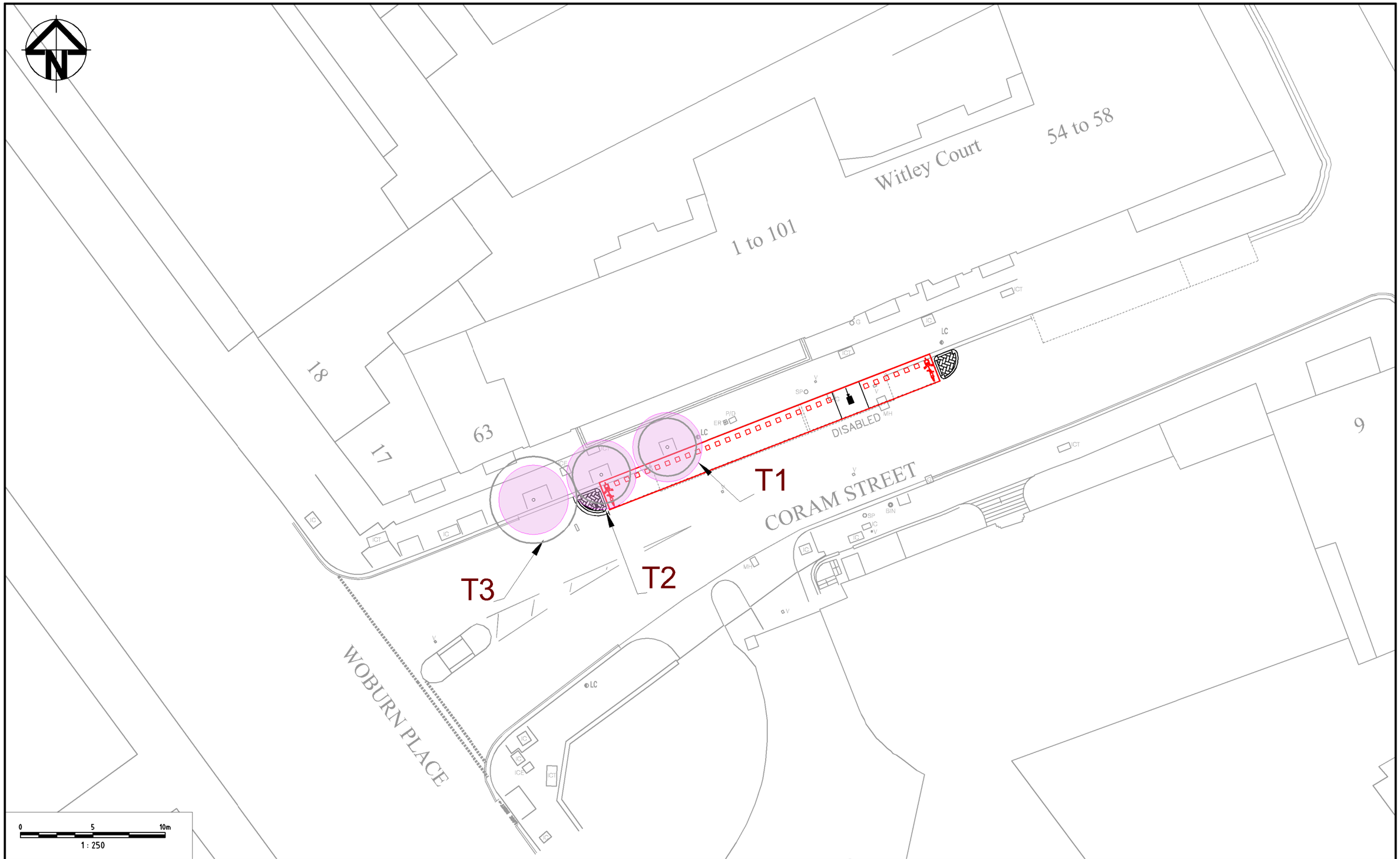
7 References

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

British Standards Institution (2010) *BS 3998:2010, Tree Work Recommendations.* BSI, London, UK.

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

Figure 1: Tree Survey and Protection Plan



Issue	Description	Date
01	FIRST ISSUE	30 SEPT 15

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

Client: Transport for London

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1:250	Author S.RAJBHAR	
Original Size	A3	Checker D. HOOD	
Height Datum	OS	Approver M. GIRVAN	
Grid	OS	© Copyright reserved	

Filename: 0010_007654_01-CORAM STREET TREE PROTECTION PLAN.DWG

Project: SANTANDER CYCLE HIRE

Title: CORAM STREET TREE PROTECTION PLAN

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Drawing No.	Project No.	Issue
0010	—UA007654 —	01

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Plot Date: 13/Oct/2015 12:01:40 PM File Location: K:\UAPROJECTS\UA007654 - TRANSPORT FOR LONDON - CYCLE SCHEME\E-OURDRAWINGS\CURRENT\TREE PROTECTION PLANS\10CORAM STREET\0010_007654_01-CORAM STREET TREE PROTECTION PLAN.DWG V1

Appendix 1: 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:

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 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:

1	Mainly arboricultural qualities
2	Mainly landscape qualities
3	Mainly cultural values, including conservation

Appendix 2: Tree Schedules

Appendix 2A: Tree Schedule

Client: **Transport for London**
Survey date**: 24th September 2015**

Project: **Coram Street CA169**
Surveyor**: Darren Hood FdSc MArborA**

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	Preliminary management recommendations	Estimated remaining contribution (years)	Category grading
				N	E	S	W							
T1	Norway maple (*Acer platanoides* 'Crimson King')	12	220	2	2	2	2	2	Y	Good	Fair	None	20>	C1,2
T2	Norway maple (*Acer platanoides* 'Crimson King')	12	210	2	2	2	2	2	Y	Good	Fair	None	20>	C1,2
T3	Norway maple (*Acer platanoides* 'Crimson King')	12	210	3	3	3	3	2	Y	Good	Fair	None	20>	C1,2

Appendix 2B: Tree Constraints Schedule – Coram Street

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m^2)
T1	Norway maple *(Acer platanoides* 'Crimson King')	220	2.40	18
T2	Norway maple (*Acer platanoides* 'Crimson King')	210	2.40	18
T3	Norway maple (*Acer platanoides* 'Crimson King')	210	2.40	18

Key to Categories

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