

Arboricultural Impact Assessment

Tree Protection Plan

187 Kentish Town Road, London NW1.

**Proposals: 5 Storey Redevelopment of 187 Kentish
Town Road**

On behalf of

Redview Properties Ltd.

Site Inspected by

Luke Fay

Arboricultural Consultant

Report Prepared by

Mike Wood

Arboricultural Consultant

December 2013

1.0 Introduction

1.1 Scope

This report was prepared by Mike Wood, an Arboricultural Consultant of Treework Environmental Practice on behalf of Redview Properties Ltd.

1.2 Purpose of the Report

1.2.1 This report is intended to accompany a Full Planning Application. The report demonstrates that the impact and implications of the proposed development, in relation to the arboricultural, landscape and cultural (conservation) value of the trees on the site have been fully considered during the initial design process.

1.2.2 This report considers the implications of a five storey re-development of the adjacent building and the potential impact on the two nearby trees.

1.2.3 This report, and the accompanying information, is supplied in order to:

- Identify any pruning requirements considered necessary to facilitate the development and prevent conflict during the construction phase
- Consider the use of tree protection measures and apply if the potential of impact to tree parts above or below ground is at risk from demolition, or construction activity associated with the project
- Identify any potential special engineering, excavation or protection measures intended to minimise the impact on the trees or breaches of Root Protection Areas, (RPAs) where this is required in the site layout design.

1.3 Plans

1.4.1 This report has been completed with reference to the following plans:

- Site Location Plan
- 130721-KTR187-TCP-WG-1.0
- 863_13115_5 Storey set

1.4 Limitations

- 1.4.1** The survey is a preliminary assessment from ground level and observations have been made solely from visual inspection for the purposes of assessment in terms relevant to planning and development. Only binoculars, trowel, mallet and fine manual metal probe have been used to aid the tree assessment. No invasive or other detailed internal decay detection devices have been used in assessing trunk condition.
- 1.4.2** The conclusions relate to conditions found at the time of inspection. The recommendations contained within this report (see Section 4.0 Tree Protection and Appendix A - Tree Schedule) are valid for a period of one year only. Any significant alteration to the site that may affect the trees that are present or have a bearing on the planning implications (including level changes, hydrological changes, extreme climatic events or other site works) will necessitate a re-assessment of the trees and the site.
- 1.4.3** It should be noted that this survey is not a tree safety inspection. It is carried out in order to inform the planning process. Where clear and obvious hazards have been observed, these have been addressed in the recommendations (see Section 4.0 Tree Protection and Appendix A - Tree Schedule). A full assessment of the levels of risk posed by trees would need to be informed by considering site use together with hazards present within a tree.

1.5 Site Visit and Tree Assessment Methodology

- 1.5.1** The first site survey was undertaken on 27th June 2013. The trees were assessed by Luke Fay, an Arboricultural Consultant, of Treework Environmental Practise. This inspection assessed the trees in accordance with BS5837: 2012.
- 1.5.2** Inspections took place from ground level aided by the Visual Tree Assessment method (Mattheck and Breloer, 1994).
- 1.5.3** While this appraisal is not a tree risk assessment it nonetheless takes into account observed structural defects of the inspected trees in order to inform conclusions with regard to their retentive worth.

- 1.5.4** Recommendations that have been provided are intended to address immediate tree hazards and / or to manage trees within the context of the site becoming a work area and a proposed development site.
- 1.5.5** Further remedial works may be required in order to address medium and long term risks associated with tree faults or with an alteration of the use of the site (i.e. proximity of new buildings or an increase in public activity adjacent to trees). It is recommended that these works will need to be assessed by a tree risk survey following completion of the development. Comprehensive long term management recommendations are not provided within this report. Comments regarding long term management options for consideration are provided within the Tree Schedule (Appendix A) as notes only.

1.6 Data Collection

- 1.6.1** Data collected includes a designated tree number, single/group categorisation, number of trees in group, tree species, height, number of stems, stem diameter, crown clearance (height of periphery of crown spread above ground level), height and orientation of lowest limb, branch spread (to N, S, E and W), age class, physiological condition, useful life expectancy, tree structural condition, site notes (where this has a bearing on the present or future health or structural condition of the tree), preliminary management recommendations and tree category.
- 1.6.2** All measurements are metric. Stem diameter is measured at 1.5m, where the stem diameter is estimated, it is shown as bold in the tree schedule (see Key at rear of Tree Schedule table in Appendix A for an explanation of the measurements and codes presented). Other measurements are recorded with the aid of measuring devices where applicable.

1.7 Presentation of the Data Collected

- 1.7.1** Data collected regarding the trees is presented in the Tree Schedule table in Appendix A in accordance with BS5837:2012 Trees in Relation to Construction – Recommendations.
- 1.7.2** The data significant to the proposed site layout is also presented on the Tree Protection Plan (Drawing Number: 131202-KTR5-TPP-NC-1.0, Appendix C).

1.7.3 All other relevant data are presented within the main body of this report.

1.7.4 Trees have been allocated an individual tree number. This number is used to identify individual trees and groups throughout this report, within the Tree Schedule and on all Plans presented in the appendices of this report. Trees have not been identified on site physical tags in this instance.

2.0 Site Description

2.0.1 The trees are Local Authority owned street trees. T1 (Silver birch) is located within the pavement of Kentish Town Road and T2 (Ash) is located in the pavement of Prince of Wales Road.

2.0.2 T2 has been recently heavily reduced as a management exercise, in uniform with trees along this road. T1 does not appear to have had any recent pruning work undertaken.

3.0 Arboricultural Constraints

3.1 Consideration of Tree Constraints within the Design Process

3.1.1 Tree constraints information included Root Protection Areas (RPAs) and crown extents measured to four cardinal points for the trees. The RPAs represent a precautionary area in m² which should be left undisturbed around each tree that is to be retained.

3.1.2 A process for making decisions in relation to potential conflicts between design proposals and retained trees has been followed. This process is informed by knowledge of the potential for site operations to cause damage to trees, requirements for minimum clearance between buildings and trees and options for tree protection and management. A summary of this process is shown at Appendix B.

3.2 Site Proposals & Arboricultural Impact

3.2.1 The proposals are to redevelop and refurbish the existing building, whilst retaining the façade.

3.2.2 To carry out this work demolition and construction activity will need to take place. This assessment is based on the following points:

- Site access will be away from the crown spread and RPAs of trees T1 and T2
- The pavement surrounding the trees (within the RPA) will not be taken up as part of this project unless a specific Detailed Arboricultural Method Statement is prepared by an Arboricultural Consultant and followed by project personal in detail.
- No change in underground services within the RPAs will be required
- Scaffolding will need to be installed on the street adjacent the building

3.2.3 Based on the points above, the potential impact to these two trees during construction is very minimal and no protection of the RPAs is considered necessary due to the existing surrounding hard surfaces. However, precautionary above ground measures are advised, to protect the clear stem area of each tree to avoid any potential of construction related physical damage to the tree stem(s). These measures and suitable proposed inspection visits are set out in the table below.

3.2.4 Table of Precautionary Tree Protection Measures

Tree Number	Proposed Works	Reason
T1 and T2	Construct temporary timber box around clear section of stem of each tree. Construction techniques must be non-evasive to the tree. Attach sign similar to that in Appendix D.	To avoid mechanical or physical damage to lower tree parts during nearby construction activity
	Following removal of the scaffolding and completion of project the trees are to be Inspected by an Arboricultural Consultant.	<ol style="list-style-type: none">1. To assess any potentially damaged branches which may require reactive pruning works.2. To assess the general appearance of the trees and consider any further work which may be necessary, such as washing down foliage from dust.3. To assess any alterations within the

		RPA which may have occurred and propose mitigation measures.
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- 3.2.5** Any reactive pruning works will be undertaken by a qualified arborist in accordance with BS3998:2010 Recommendations for Tree Work

4.0 Recommendations Relating to Tree Protection and Construction Facilitation

- 4.0.1** All Tree Protection Fencing on this site will consist of a sufficiently robust design to protect trees throughout the period when the site is an active construction site.

- It is recommended that an Arboricultural Clerk of Works (ACoW) supervises the installation of tree protection measures and undertakes a second visit following completion to sign off the removal of the protective measures.

- 4.0.2** Any unforeseeable changes to the ground within the RPAs, will be designed and utilise appropriate techniques to ensure that retained trees are not damaged. These considerations will include:

- No severance of significant tree roots
- Provision for sufficient water penetration to the root environment of retained trees
- Provision for sufficient gaseous exchange between the root environment of retained trees and the surrounding environment
- Ensuring that de-icing salt will not leach into the root environment of retained trees

- 4.0.3** There will be no lowering of current soil levels within the RPAs of retained trees.

- 4.0.4** There will be no new underground services installed or existing services dug up within the RPA of retained trees without an approved Detailed Arboricultural Method Statement and appropriate supervision by an Arboricultural Consultant.

- 4.0.5** Consideration will be given to the implications of storing materials upslope of trees in order to avoid the risk of potential spillages leaching down-slope and contaminating the Root Protection Area of a tree. Such materials include:

- Oil

- Bitumen
- Cement

4.0.6 Concrete mixing will not take place within 10m of any part of each tree.

5.0 Summary

5.0.1 Providing the protective measures as detailed in this assessment, and illustrated in the Tree Protection Plan, it is unlikely that any foreseeable damage will occur to above ground parts of T1 and T2.

5.0.2 No service runs or alterations to the hard surfaces within the RPA are foreseen, however, if any works within the RPA, which result in the disturbance of the existing hard surface, including resurfacing, underground service alterations or installation are required, it is strongly recommended that a Detailed Arboricultural Method Statement is produced to minimise potential damage to below ground tree parts.

REFERENCES

Mattheck, C. and Breloer, H. (1995). The Body Language of Trees: A handbook for failure analysis. Research for Amenity Trees **4**. HMSO, London, 240pp.

Matheny, N. and Clark, J. (1997) Trees and Development: A Technical Guide to Preservation of Trees During Land Development. ISBN 1-881956-20-2

Lonsdale, D. (1999). Principles of Tree Hazard Assessment and Management. Research for Amenity Trees **7**. DETR, London.

Robers, J. Jackson, N. and Smith, M. (2006). Tree Roots and the Built Environment. Research for Amenity Trees **8**. Department for Communities and Local Government, London

STANDARDS PUBLICATIONS

Trees in Relation Design, Demolition & Construction – Recommendations. (BS5837), British Standards Institution, London (2012).

Tree Work - Recommendations. (BS3998), British Standards Institution, London (2010).

Appendix A

Tree Schedule

Final Tree Schedule with additional Immediate Recommendations in the light of site layout design.

Tree Categories

Table 1 Cascade Chart taken from BS5837:2012 Trees in Relation to Design, Demolition & Construction – Recommendations.

Tree Schedule Key

BS5837 Tree Schedule

187 Kentish Town Road, NW1 8PD



Tree / Group Reference	No. of Trees	Tree or Group Species	Height (m)	DBH (cm)	No. of Stems	Spread N (m)	Spread E (m)	Spread S (m)	Spread W (m)	Crown Clearance (m)	Age Class	Physiological Condition	Structural Condition	Tree or Group Conditions /Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	BS Category
T1	1	<i>Betula pendula</i> Silver birch	14.0	18	1	2.5	2.6	3.7	1.1	2.5	Early Mature	Fair	Fair	Root environment - Restricted. High Pruned - Historic. Epicormic growth - Bole / principal stems.	14.7	2.2	10-20	B1
T2	1	<i>Fraxinus sp.</i> Ash sp.	16.0	45	1	3.5	4.4	1.3	2.4	5.0	Early Mature	Good	Good	Root environment - Restricted. Bark wound - Major. Crown reduction - Recent. Tree bifurcates at 3.5m. Major recent crown weight reduction. Major bark wound on crown stem over road is likely to have been caused by busses.	91.6	5.4	20-40	B1

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none">Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)Trees that are dead or are showing signs of significant, immediate, and irreversible overall declineTrees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Tree Schedule - KEY



Tree Number

Trees are tagged with metal tags where agreed. Where this has not been agreed, tree numbers within the Tree Schedule relate to those marked on the Tree Constraints Plan and Tree Protection Plan drawings.

Single or Group

One tree within a group of trees may be tagged in order to identify trees of a relatively uniform arboricultural or landscape feature. This may include a linear screen, hedge, or group of trees not considered as appropriate to survey as a single tree.

Number in Group

Number of trees within a group. A group of trees may comprise of more than one species.

Species

Scientific or common name is presented. For trees within groups the species together with the numbers of each species within the group is presented as accurately as possible, but in circumstances where the tree groups are complex, the numbers and the species composition may be estimated by the surveyor..

Height (metres)

All heights are estimated. Where feasible or appropriate height estimation is carried out with the aid of a clinometer or similar device.

Number of Stems

A record of 1 indicates a tree with a single stem at 1.5m above ground level. Where more than 1 stem is recorded each stem will be measured at 1.5m above ground level and the RPA calculated in line with BS5837:2012.

Stem or base diameter (displayed in centimetres)

Stems are measured in accordance with BS5837:2012. The diameter of tree stems are measured at 1.5m with a diameter tape or callipers (Diameter at Breast Height). All measurements are rounded down to the nearest cm. DBH measurements shown in **bold** are estimates either due to restricted access to the tree stem or base or due to climbing plant growth about the stem restricting the accuracy of a measurement.

Crown Clearance (metres)

Distance above ground level of the lowest point of the crown periphery in order to inform access beneath crowns where appropriate or required.

Crown Spread Radius (metres)

The crown radius from bole to crown limit identified at the four cardinal points (N, S, E and W) in order to allow presentation of the above ground constraints on the Tree Constraints Plan and Tree Protection Plan. Measurements are approximate and depend on clear access about the crown. May be estimated from aerial photographs.

Age Class

(Y) Young, (MA) Middle Aged, (M) Mature, (OM) Over Mature, (A/V) Ancient / Veteran.

Physiological Condition

(G) Good, (F) Fair, (P) Poor, (D) Dead.

Structural Condition

(G) Good, (F) Fair, (P) Poor

ULE (Years)

Useful Life Expectancy. The anticipated future contribution to the amenity of the site. This may be influenced by the current or anticipated change in site use.

Notes and Recommendations

Tree structural condition / Site notes or description relevant to tree structure or future development works on site / Long term management recommendations.

Immediate Recommendations

Remedial tree works required to manage risks requiring attention within six months. Annual tree risk assessments are recommended.

Category

Tree category as defined within BS5837:2012 (Tables 1) supplied within this Appendix below. Categories A, B and C: trees identified for retention. Category U: trees identified for removal. Sub-categories 1,2 or 3 according to Table 1.

Root Protection Area (metres²)

The minimum area around each tree which should be left undisturbed (either through the erection of protective fencing or the installation of special engineering measures) calculated in accordance with BS5837:2012,

Appendix B

Tree Constraints

Summary of Design Decision Process in Relation to Tree Retention, Protection & Removal.

Damage to Trees

Many operations throughout the development process, from erecting the hoarding around the site to the grading of soils during landscaping can damage trees. Some types of damage may have an insignificant effect on the tree (e.g. snapping a small branch) while others may lead to the death of the tree (e.g. severing roots). An understanding of trees and their vulnerabilities is essential when making decisions regarding risk of damage and tree protection.

Key points relating to tree damage:

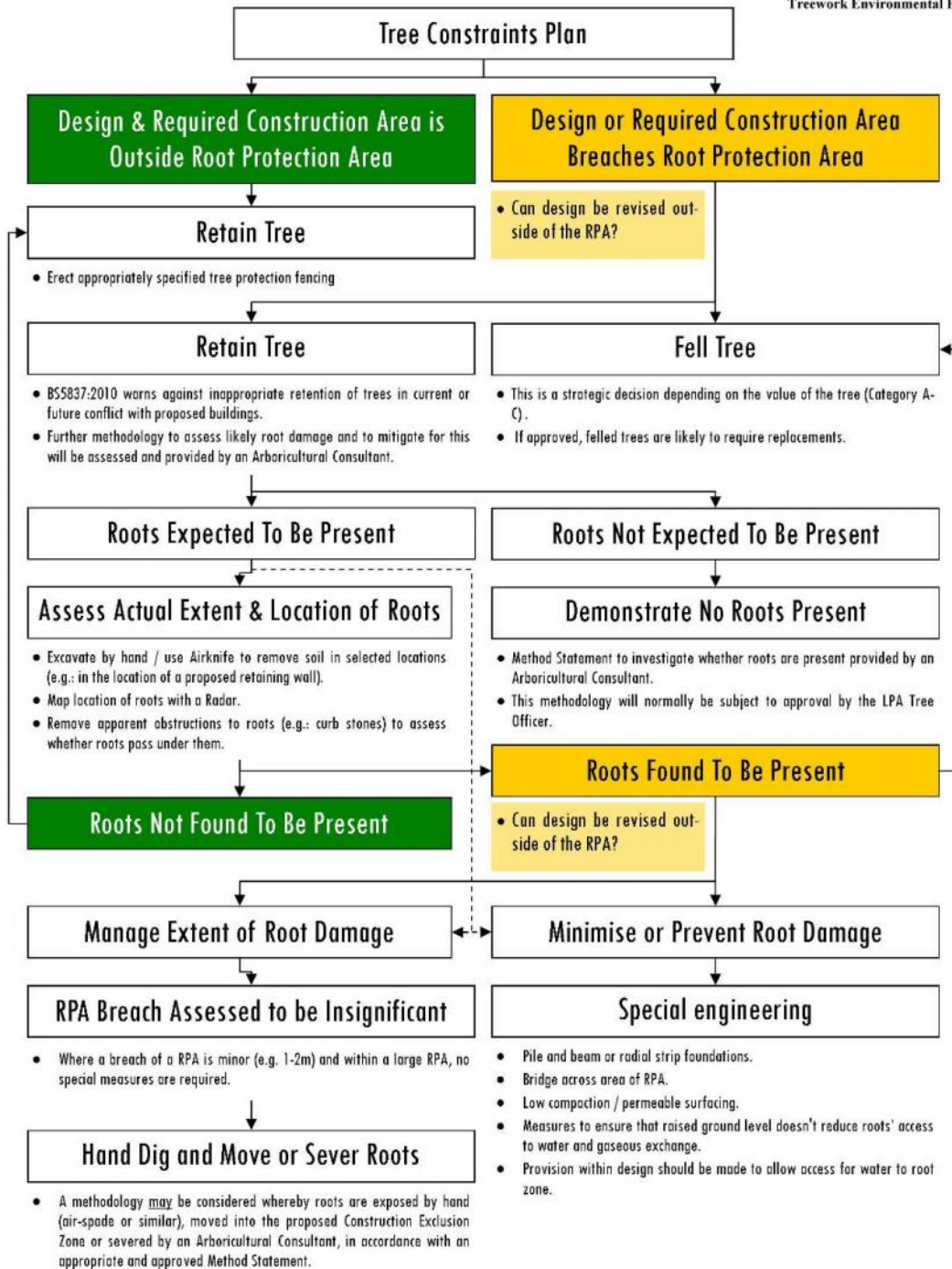
- Tree roots tend to be concentrated within the top 600mm of soil.
- It is essential to understand where tree roots are likely to be in order to make good decisions regarding tree protection.
- Tree roots can be damaged by:
 - Severance / physical damage
 - Poisoning (e.g. cement, diesel, salt, etc.)
 - Fire
 - Compaction (i.e. a weight, such as a vehicle or stored materials compress the soil so that there is no oxygen contained within it).
 - Asphyxiation (e.g. due to raised soil levels)
 - Drought and / or conditions creating drought stress
 - Poor soil condition for root growth
- Root loss or death can lead to the death of part or all of the tree and / or loss of tree stability such that the tree becomes prone to collapse.
- Tree stems may be affected by physical damage and fire
- If a significant part of the stem of a tree is damaged, this can lead to the death of part or the entire tree.
- Wounds on the tree stem can allow ingress of microorganisms (e.g. pathogens and / or decay fungi) which, in turn may lead to disease and / or the collapse of the tree.
- Tree limbs, branches and shoots can also be affected by physical damage and fire
- If a significant part of a large limb is damaged, this can lead to the death of the rest of that limb and all of the parts of the tree crown that are attached to it.
- Wounds on limbs can allow ingress of microorganisms (e.g.: pathogens and / or decay fungi) which, in turn may lead to disease and / or the collapse of the limb.

Key points relating to tree protection:

- Tree protection measures will include some or all of the following:
 - Assess location of roots
 - The Root Protection Area (RPA), generated in accordance with BS5837: 2012, provides a sufficient precautionary zone where rooting conditions are more-or-less open, unobstructed and level
 - Where root conditions are such that it is not possible to confidently accept the RPA as providing an more-or-less accurate illustration of the location of roots, it may be necessary to carry out soil investigations to ascertain the location of roots
 - Siting of proposed structures away from trees, where practicable (beyond the RPA and crown of the tree)
 - Planning of operations
 - Detailed Arboricultural Method Statements for specific operations near to trees
 - Training (e.g. tool box talks) in how to avoid tree damage for personnel working on the site
 - Supervision of sensitive operations by an Arboricultural Consultant
 - Regular monitoring of the site by an Arboricultural Consultant

- Facilitation pruning
- Appropriate Tree Protection Fencing and Barriers
- Appropriate Ground Protection Measures
- Engineering solutions to proposed structures close to trees to avoid tree damage
- Contingency planning

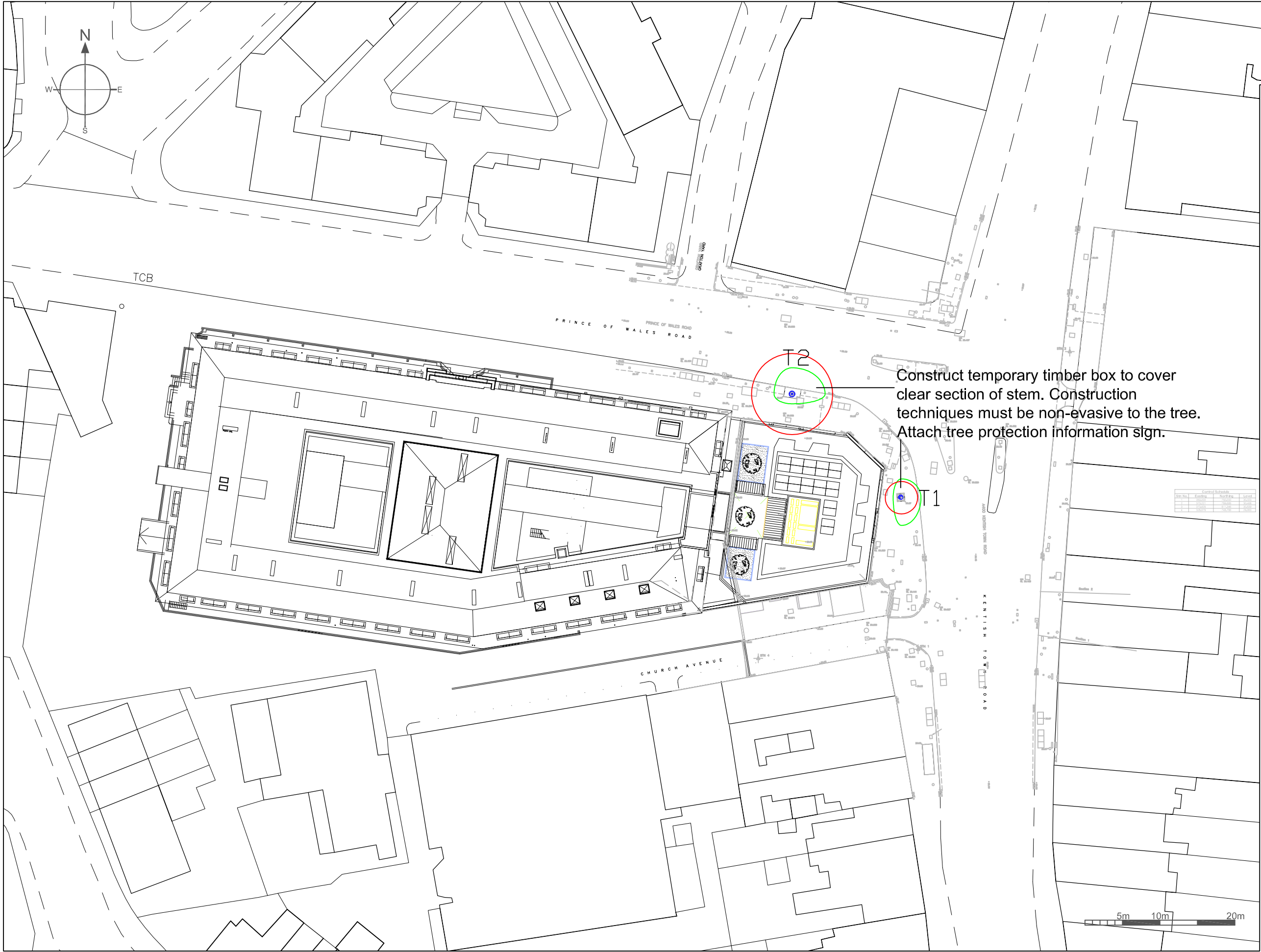
Decision Process for Tree Retention, Removal & Protection



Appendix C

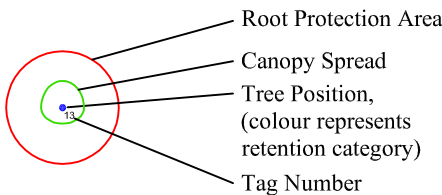
Tree Protection Plan

Plan showing dimensions and location of proposed tree protection fencing and ground protection measures that define the Construction Exclusion Zones.



Construct temporary timber box to cover clear section of stem. Construction techniques must be non-evasive to the tree. Attach tree protection information sign.

Symbol Guide



BS5837:2012 - Tree Category

- Category A Trees High Quality (Green circle)
- Category B Trees Moderate Quality (Blue circle)
- Category C Trees Low Quality (Grey circle)
- Category U Trees Poor Quality/Remove (Red circle)

Client: dp9

Agent: -

Date: December 2013

Scale: 1:500 @ A3

Project Name: Kentish Town Road 5 Storey Option

Drawing Title: Tree Protection Plan

Drawing Number: 131202-KTR5-TPP-NC-1.0



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Appendix D

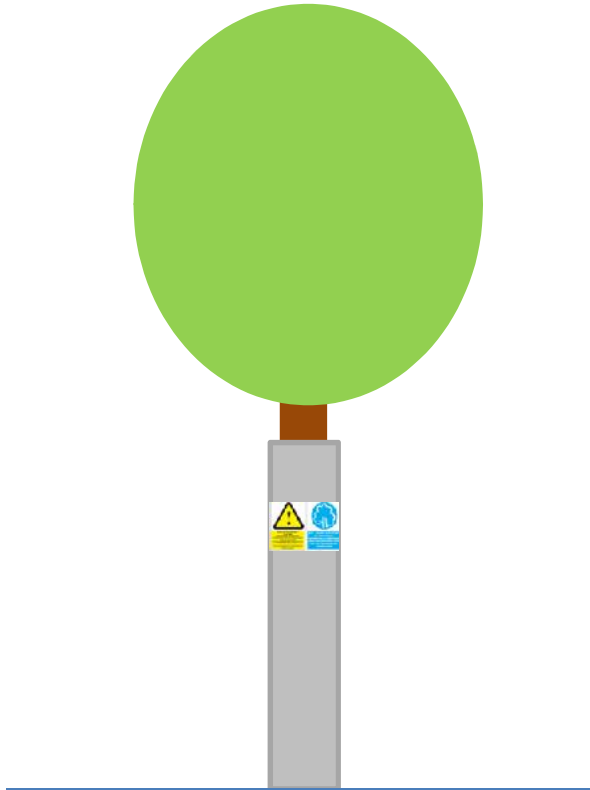
Tree Protection Measures

Includes key principals as well as Figure 2 and Figure 3 taken from BS5837:2012 Trees in Relation to Design, Demolition & Construction – Recommendations illustrating the systems to be employed for ensuring an adequate Construction Exclusion Zone about retained trees

Technical measures to prevent tree damage

Tree Protection

Tree protection will consist of a timber constructed box, to be positioned and braced in place around both of the trees. The box is not to be attached to any part of the tree at any point and should be at least 50mm away from the any part of the stem.



A sign, similar to that shown below will be firmly attached to the outside of the timber box around each tree.

- The CEZ will be clearly identified (see construction exclusion zone sign example, below)



Appendix E

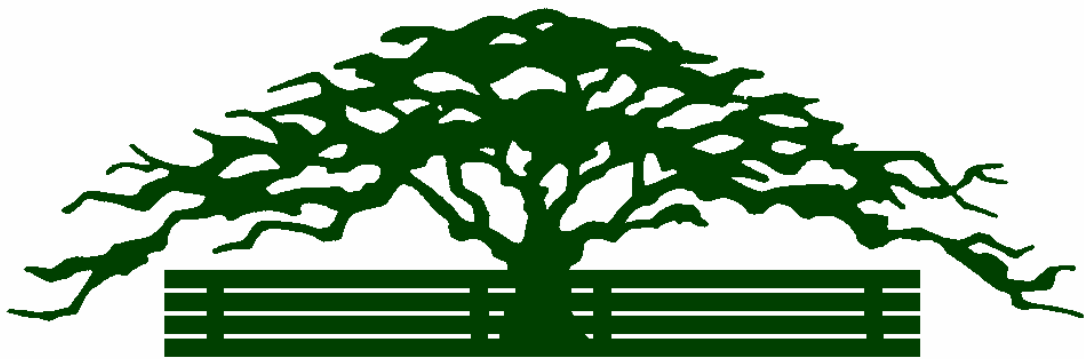
Example Site Monitoring Form

Site Inspection Report

Completion of Arboricultural Operations – Monitoring Form

Site Name:		
Site Address:		
Client Name:	Instructed By:	
Site Manager:		
Arboricultural Operation Checked By:	Date:	Approved / Not Approved
Operation Completed / Additional Works Required:		
Number of Photographs Supplied:		
Completed By (Contractor Name):		Contractor / Subcontractor
Copied to LPA	Yes / No	Contact Name:
Copied to Client	Yes / No	Contact Name:
Copied to Site Manager	Yes / No	Contact Name:

Operation Completed / Additional Works Required (Continued):



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