Arboricultural Consultancy

Ecology & Habitat Consultancy

Land, Building & Engineering Surveys

Utility Mapping, Tracing & Radar Surveys



CHRISTIANS ENVIRONMENTAL

Site Report, Appraisal & Plans

"BS 5837: 2012 Trees in relation to design, demolition and construction"

Project: 229 Withington Road
Date: March 2014
Ref: WR-BS-001
Revision: Revision A

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1. Introduction

1.1 Instruction

Christians Environmental have been instructed to inspect all trees within the site boundary and trees in adjacent land that may be affected by the proposed development, the aim of which is to prepare the following information to accompany a planning submission for the site:

- Schedule of the relevant trees to include basic data and a condition assessment
- Appraisal of the impact of the proposed development on the trees and any resulting impact that it has on local amenity.
- Arboricultural method statement setting out appropriate protective measures and management for trees to be retained.

1.2 Purpose of the Report

This report provides an analysis of the impact of any proposed development on trees and local amenity with additional guidance on appropriate management and protective measures. Its primary purpose is for the Local Authority to review any tree issues associated with any future planning applications and use as a basis for issuing a planning consent or engaging in further discussions towards that end. During the planning process, this document and accompanying data will be available for inspection by people including the general public; therefore we aim to present the information in a format that is easily understandable to people without a general knowledge of the subject area.

1.3 Provided Documents

The following plans have been provided.

- Land Survey, provided in dwg format
- Landscape Master Plan

1.4 Tree Data Collection

All Trees on site which are adjacent to any proposed development areas or fall directly into these areas have been numbered and species identified. Each tree has also been inspected as described in British Standard 5837; this includes information on height, diameter, crown spread, maturity, condition and recommendations. Each tree is also classified as a category A, B, C or U (Summary in the Appendix). This categorization reflects the trees material constraint on the proposed development. Collection of information also takes into consideration any low branches, structural or physiological conditions and any remaining contribution that the tree offers to the site.

1.5 Interpretation of Tree Data

Within section 5 of the British Standard BS 5837 it recommends that the stem diameter taken at breast height is used to calculate the root protection area. This root protection area can be interpreted to identify any design constraints to the site. Once site design has taken place this data can be used to form the basis of any exclusion zone and position of protective barriers/fencing.

Also included within this report are:

- The Tree Constraints Plan which identifies any arboricultural constraints on site.
- The Tree Protection Plan which shows the location of the protective fencing and area set to exclusion zones.

These plans act as a visual aid in the planning stage and are also designed to aid and instruct contractors on site. The use of these plans should also be implemented on site visits to check on the location of the protective barrier and area.

2. Site Context

2.1. Surrounding Area

The site is located on Withington Road in Whally Range. Whalley Range was one of Manchester's first suburbs, built by Manchester banker and businessman Samuel Brooks as "a desirable estate for gentlemen and their families".



2.2. Landscape and Amenity

The site consists of a large residential property situated in the middle of a large garden area. The site is mainly surrounded by trees all the way round its edge.

2.3. Geological Details

The site consists of naturally wet very acid sandy and loamy soils. This information was taken from http://www.landis.org.uk/soilscapes/#



3. Arboricultural Impact Assessment

3.1 Summary of the Impact on Trees

Within the proposed development area and including adjacent land there is a total of 35 individual trees with the potential to be affected by any development proposals. This includes:

- **9** Category **A** trees
- **9** Category **B** trees
- **12** Category **C** trees
- **5** Category **U** trees

3.2 Detailed Impact Assessment

(Please refer to the Tree Constraints &Tree Retention Plan and Tree Data Section when reading the below information).

Category A trees and groups. (High Quality)

- **1** Category **A** trees need to be removed due to the development proposals.
- **1** Category **A** tree to be removed on request of the client due to potential overshadowing of the proposal

Tree **T17** will need to be removed to accommodate the proposals.

Tree **T35** has been requested to be removed by the client. Whilst the tree could be potentially kept with regards to conflict with the building the client feels that the height of the tree so close to the house will cause overshadowing and elevate risk of damage from said tree if it fails in bad weather conditions.

Category B Trees and Groups. (Moderate Quality)

- **1** Category **B** trees need to be removed due to the development proposals.

Tree **T15** will need to be removed in order to accommodate the proposed driveway.

Category C Trees and Groups. (Low Quality)

- **1** Category **C** trees will need to be removed due to the proposal
- **1** Category **C** is to be removed prior to any planning application

Tree **T16** will need to be removed to accommodate the proposed driveway.

Tree **T1** is due to be removed due to the root system lifting the current driveway and should not be considered within the planning proposal.

Category U trees and groups.

- **12** Category **U** trees are recommended for removal due to poor overall condition.

Trees T2, **T12, T18, T27 and T29** will need to be removed due to poor overall condition.

For further details please see the Tree Data section.

3.3 Impact on local amenity

The majority of trees on the site are to remain and the design has tried to be as sympathetic as possible towards the trees whilst still ensuring the clients requests.

The client has also expressed the want to plant more trees of a more manageable size within the site boundary so there is scope for mitigation for the minimal tree losses.

4. Arboricultural Methods Statement and Construction Document

4.1 Introduction

This Method Statement has been drawn up to assist the Local Authority and the developer in overseeing the demolition of the existing buildings at Greenbrow Road.

This document seeks to list those trees which are proposed for removal and discuss any tree constraints and implications.

It describes the proposals for ensuring that the trees that are to remain will survive the development and thrive after the development has taken place.

The development and timing of construction operations are described, together with materials which would be used in order to maximize tree protection.

This statement will be included as part of the specification and schedule of works issued to the building contractor and will form part of the contract. The accompanying arboricultural statement plans will be available on site for inspection along with this method statement.

4.2 Programme and Phasing of Tree Management

Stage 1. Carry out agreed tree removal works

Stage 2. Implement tree protection

Stage 3. Carry out construction works

Stage 4. Remove tree protection

Stage 5. Final site meeting with law enforcement tree officer

Stage 1. Carry out agreed arboricultural works.

Tree Removal Works	
Due To The Proposal	Due To Poor Overall Condition
T15, T16, T17 and T35	**T2, T12 T18, T27 and T29**

Tree/Vegetation Removal

All trees/vegetation marked for removal, are coded on the Tree Retention Plan to aid arboricultural contractors identify the correct trees.

All arboricultural operations on site including tree removal must be carried out by an arboricultural contractor that is able to comply with British Standards 3998.

All arboricultural contractors should be insured to a minimum of £5 million and able to show competency by means of relevant certification and health and safety policy.

Because of the location of this site and characteristics of certain trees it is recommended that the arboricultural contractors have relevant experience of working with protected species, namely bats. Any qualifications or certification of competency should be sought at the tender stage.

Stage 2. Implement tree protection

Following the completion of any tree works and prior to machinery entering the site for any building, levelling or site clearance purposes, all trees within the site must be adequately protected.

A fence must be installed to protected the remaining trees on site that meets the tree fencing specifications listed below then this will be sufficient protection.

Locations of the proposed fencing can be seen in Appendix 4. Note that if each building is to be demolished at separate times, tree protection need only be erected for trees that can potentially be affected by works during the demolition process.

Fencing Specification

The fencing will be constructed with a framework of scaffolding poles driven 600mm into the ground and braced together. Backstays will then be added at 3m centres. Onto this will be attached a continuous line of welded mesh panels (alternatively ply or corrugated sheet metal panels may be used) to be securely fixed with wire or scaffold clamps in accordance with British Standard 5837:2005. For sample see Appendix 6: Tree Protection Fencing.

Site Notices on fencing will be used in the form of pre-printed laminated waterproof signs A3 in size and fixed securely to fencing panels on each enclosure at 9m intervals.

The signs will clearly read: **Protected Tree Zone, no storage or operations within fenced off areas**

Failure to comply with the above requirements could lead to enforcement action, including the issuing of a Stop Notice, until the matter has been remedied. Where damage has occurred to legally protected trees, the owner of the site may be liable for prosecution.

A copy of an appropriate tree protection sign is included within the Appendix; a copy can be supplied direct from Christians Arboriculture upon request.

A diagram/plan of fencing design is included within the Appendix.

Works near Trees

Prior to the commencement of works in the vicinity of retained trees a meeting will be called, to which the local authority's tree officer will be invited. This is in order to agree that the methods and new position of the tree protection fencing are adequate and meet with the local authority's approval.

The remainder of the tree removal, excavation, and landscaping works including installation of paths and minor structures within the Root Protection Areas shall be monitored by the developer's arboriculturalist on a regular and frequent basis. Depending on the length of time required to carry out works this may not require a permanent presence but as a minimum they shall be present at the commencement of the following stages of work: (i) tree removal, (ii) excavations, (iii) landscaping, installation of paths and minor structures.

Any pre-approved excavation works within the Root Protection areas should only be carried out with consent and instruction from both the developer's arboriculturalist and the local authority's tree officer.

Stage 3. Carry out construction works.

Once the tree protection is in place and assessed and the access roads near to trees are constructed the general construction works can begin once the tree protection is deemed correct by the arboricultural consultant.

During the construction phase it is important that all staff are aware of the tree protection areas and their importance.

If any breach in the tree protection occurs it is the site manager's responsibility to report this urgently to the arboricultural consultants so the appropriate measures can be taken.

It is recommended that all staff are made aware of the tree protection measures and procedures during a site induction

Stage 4. Remove stem/tree protection.

When the development is complete, all drainage and service runs are in place and the main site machinery has been removed, temporary protective fencing will be dismantled. This must be done with great care and will need to be supervised to avoid heavy machinery being used.

Stage 5. Final site meeting with local authority tree officer.

Upon completion of all the works specified above and procedures also specified, the developer's arboriculturist will invite the local authority's tree officer to meet on site to discuss the process and to agree any final remedial works which may be required.

4.3 Additional Notes

4.3.1 Site Storage, Cement Mixing and Washing Points

All site storage areas, cement mixing and washing points for equipment and vehicles must be outside the RPA and it is recommended that this area is extended to 10 metres away from the protective fencing in respect to the above. Where there is a risk of polluted water runoff into RPA's, heavy duty plastic sheeting and sandbags must be used to contain any spillages and prevent contamination.

4.3.2 Services

All service runs will be aligned to pass outside the RPA's of the trees so they will have no effect on the trees.

In the rare chance that the need arises to dig within the protective fence lines at any time, the developer's arboriculturist will liaise with the local authority's tree officer in order to implement non-destructive trenching methods (open trenching by use of air spade or a mole dig system).

All work to services on site will be undertaken in line with the NJUG "Guidelines for Planning, Installation and Maintenance of Utility Services in Proximity to Trees".

Within this section is the tree survey data. Also included is a chart explaining how trees are classed when carrying out a BS 5837:2012 "trees in relation to design demolition and construction" report. Within the appendix is also a glossary of arboricultural terms.

Category A	Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)
Category B :	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)
Category C :	Those trees of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested)
Category U :	Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management

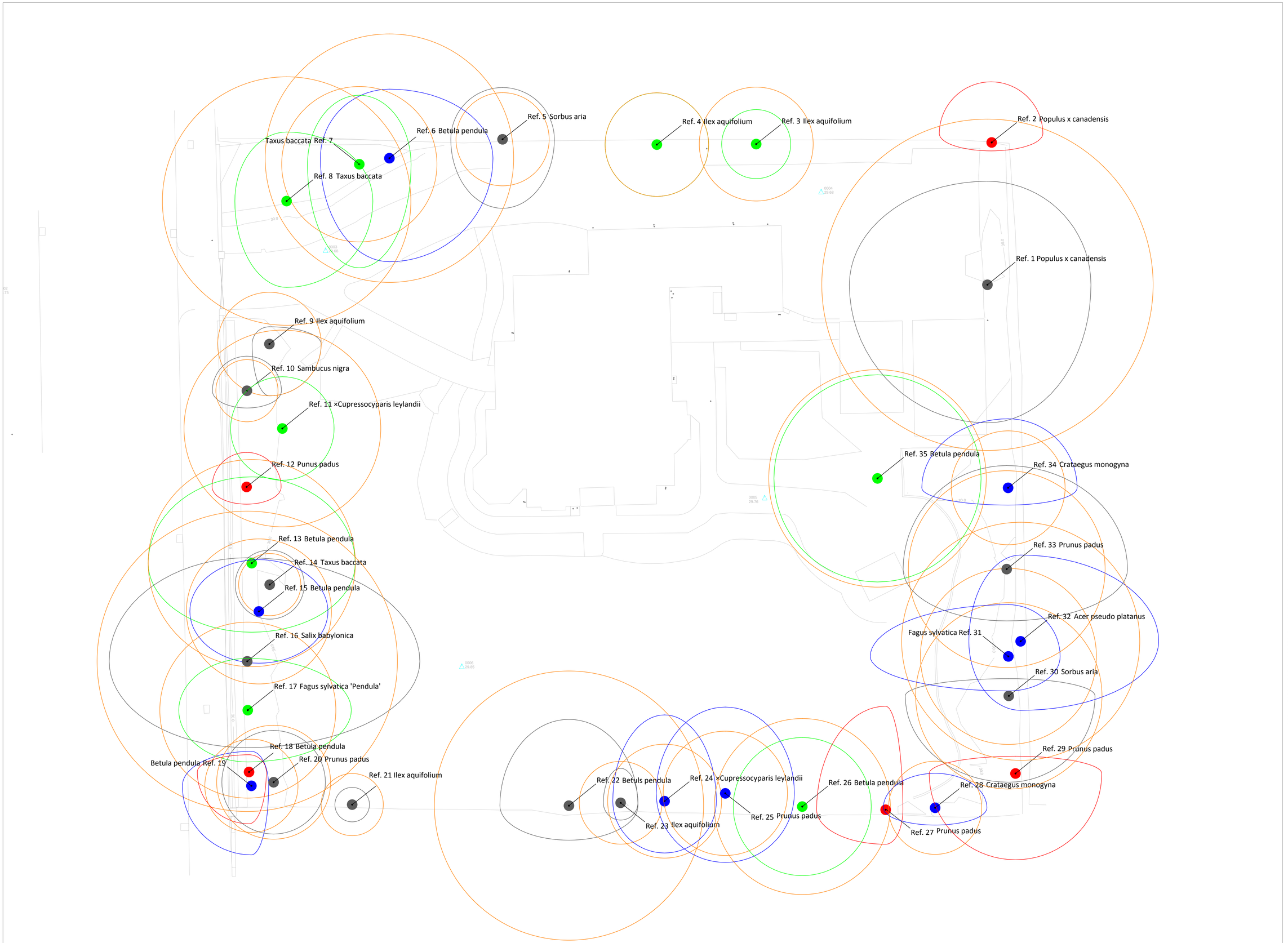
KEY:

Tree Numbers/Tags	*Individual tree = T + number*
	Group of trees = G + number
Species	*Common and or scientific names where appropriate*
Height	*Overall tree height*
Crown Clearance	*Overall height of lowest branches from the ground level*
Diameter at breast height	*Measurement of tree stem*
Canopy spread	*Extents of tree branches taken in compass points*
Age Class	*(Y=Young) (SM= Semi Mature) (M=Mature) (OM=Over Mature) (V=Veteran)*
Tree Condition	*Comments on trees overall health etc.*
Comments	*Any further details that may be of importance*
Management recs	*List of urgent works or further investigation that may be needed*
Remaining contribution	*How long the tree will offer a contribution*
Category Rating	*See opposite table*

Tree no.	Species	Height (m)	Crown clearance (m)	No. of stems	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition comments	Preliminary management recommendations	Remaining contribution (years)	Category
1	Populus canadensis	18	5	2	50, 64	6	6	8	8	M	Good	Moderate	-co-dominant stem -very close to building -lifting driveway -severed ivy	due to be removed because its destroying the driveway	21-30	C.1
2	Populus canadensis	7	2	1	36	3	3	1	3	M	Good	Moderate	-severely included fence -chain link fence included up structural limb	No Recommendations	<10	U
3	Ilex aquifolium	7	2	1	27	2	2	2	2	M	Good	Good	-stem damage from chainsaw	No Recommendations	40>	A.1
4	Ilex aquifolium	9	2	1	26	3	3	3	3	M	Good	Good	-stem damage from chain saw	No Recommendations	40>	A.1
5	Sorbus aria	8	2	1	23	3	3	4	3	M	Good	Good	-included union	No Recommendations	21-30	C.1

Tree no.	Species	Height (m)	Crown clearance (m)	No. of stems	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition comments	Preliminary management recommendations	Remaining contribution (years)	Category
6	Betula pendula	18	3	1	59	4	6	6	4	M	Good	Good	-minor witches broom	No Recommendations	31-40	B.1
7	Taxus baccata	9	3	1	38	4	3	6	3	M	Good	Good		No Recommendations	40>	A.1
8	Taxus baccata	8	3	3	30 42 29	4	5	5	3	M	Good	Good	-included unions	No Recommendations	40>	A.1
9	Ilex aquifolium	5	1	3	16, 15 12	1	3	3	1	SM	Good	Moderate	-included unions	No Recommendations	40>	C.1
10	Sambucus nigra	3	1	1	15	2	2	1	2	SM	Good	Good	-suppressed	No Recommendations	21-30	C.1
11	leylandii	15	4	1	48	3	3	3	3	M	Good	Good		No Recommendations	40>	A.1
12	Prunus padus	3	1	1	23	2	2	1	2	M	Poor	Moderate	-severe decline -deadwood included union	No Recommendations	<10	U
13	Betula pendula	18	3	1	51	5	6	4	6	M	Good	Good	-minor deadwood -minor witches broom	No Recommendations	40>	A.1
14	Taxus baccata	4	1	10	15	2	2	2	2	M	Good	Good	-understory tree	No Recommendations	40>	C.1
15	Betula pendula	4	5	1	34	3	4	3	4	M	Good	Good	-suppressed by adjacent trees	No Recommendations	31-40	B.1
16	Salix baylonica	18	1	1	72	6	10	5	8	M	Good	Good	-large tear out wound -storm damage -crossing branches -included unions -poor form -low crown over road -pruning wounds	crown raise	21-30	C.1
17	Fagus sylvatica pendula	19	2	1	43	3	6	3	4	M	Good	Good	-minor pruning wounds	No Recommendations	40>	A.1
18	Betula pendula	5	2	1	22	1	1	3	3	M	Poor	Poor	-poor form -severe decline	<Null>	<10	U
19	Betula pendula	10	3	1	23	2	1	4	4	M	Good	Good	-suppressed	<Null>	31-40	B.1
20	Prunus padus	11	2	1	28	3	3	3	3	M	Good	Good	-included union -exposed roots	<Null>	21-30	C.1
21	Ilex aquifolium	3	1	1	16	1	1	1	1	M	Good	Good	-topped	<Null>	21-30	C.2

Tree no.	Species	Height (m)	Crown clearance (m)	No. of stems	DBH (cm)	N	E	S	W	Age Class	Physiological Condition	Structural Condition	Condition comments	Preliminary management recommendations	Remaining contribution (years)	Category
22	Betula pendula	21	4	2	58 32	5	4	2	4	M	Good	Good	-co-dominant stem -included union -about 1m from adjacent building built recently -dense ivy	severe ivy	21-30	C.1
23	Ilex aquifolium	8	1	1	21	2	1	1	1	M	Good	Good	-heavily suppressed	No Recommendations	11-20	C.1
24	leylandii	12	1	1	28	5	3	3	3	M	Good	Good		No Recommendations	31-40	B.1
25	Prunus padus	15	2	1	31	5	4	4	4	M	Good	Good	-minor stem damage	No Recommendations	31-40	B.1
26	Betula pendula	21	3	1	42	4	4	4	4	M	Good	Good		No Recommendations	40>	A.1
27	Prunus	4	1	2	18 16	6	1	2	4	M	Poor	Poor	-severe lean poor form	Fell	<10	U
28	Crataegus monogyna	6	1	1	23	2	3	1	3	M	Good	Good	suppressed	No Recommendations	31-40	B.1
29	Prunus padus	6	1	1	55	1	5	5	5	M	Moderate	Poor	-ganoderma -severe decline	<Null>	<10	U
30	Sorbus	15	5	1	46	1	5	5	6	M	Good	Good	-dead wood -suppressed -included unions	<Null>	21-30	C.1
31	Fagus sylvatica	16	4	1	42	3	3	2	8	M	Good	Good	-ivy -suppressed	<Null>	31-40	B.1
32	Acer pseudo platanus	20	3	1	58	5	8	4	3	M	Good	Good	-suppressed	<Null>	31-40	B.1
33	Prunus padus	5	2	4	28 27 25 13	6	7	3	6	M	Good	Moderate	28 27 25 13 -included unions -suppressed -poor form -rubbing branches deadwood	<Null>	21-30	C.1
34	Crataegus monogyna	6	2	1	28	4	4	1	5	M	Good	Good	-suppressed -deadwood	<Null>	31-40	B.1
35	Betula pendula	18	6	1	53	6	6	6	6	M	Good	Good	-severed ivy -minor deadwood	<Null>	40>	A.1



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KEY:

- Surveyed tree - category A
- Surveyed tree - category B
- Surveyed tree - category C
- Surveyed tree - category U
- Surveyed tree - extents of root protection area (RPA)
- Surveyed group of trees - Category A
- Surveyed group of trees - Category B
- Surveyed group of trees - Category C
- Surveyed group of trees - Category U
- Existing building and/or topographical feature

BS5837:2005 Trees in relation to construction - Categories and definitions

Trees for removal

U: Identification on Plan - RED - Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound Arboricultural management.

Criteria

Trees that have a serious, immediable, structural defect, such that their early loss is expected due to collapse, including those that will become enviable after removal of other R category trees (i.e. where, for example, the loss of shelter, theloss of companion shelter cannot be mitigated by pruning)

Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline

Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease),or very low quality trees suppressing adjacent trees of better quality

NOTE: Habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost: installation of bat box in nearby tree)

Trees to be considered for retention

A: Identification on Plan - LIGHT GREEN - Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)

B: Identification on Plan - MID BLUE - Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested.

C: Identification on Plan - GREY - Those of low quality and value; currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm

Category C trees will usually not be retained where they would impose a significant constraint on development. Young trees with a stem diameter of less than 150 mm should be considered for relocation. Category A and B trees will normally be retained

Criteria – Subcategories

The following subcategories are applied. Trees may be allocated more than one subcategory, but this will not increase their overall value

1: Mainly Arboricultural values

A1: Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or formal or semi-formal Arboricultural features (e.g. the dominant and/or principal trees within an avenue)

B1: Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage)

C1: Trees not qualifying in higher categories

2: Mainly landscape values

A2: Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups)

B2: Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, 'A' category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality

C2: Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit

3: Mainly cultural values, including conservation

A3: Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)

B3: Trees with clearly identifiable conservation or other cultural benefits

C3: Trees with very limited conservation or other cultural benefits

Metres

2 0 2 4

1:100

rev	date	description	by
A	Mar 2014	Tree Constraints Plan	CEL-TW

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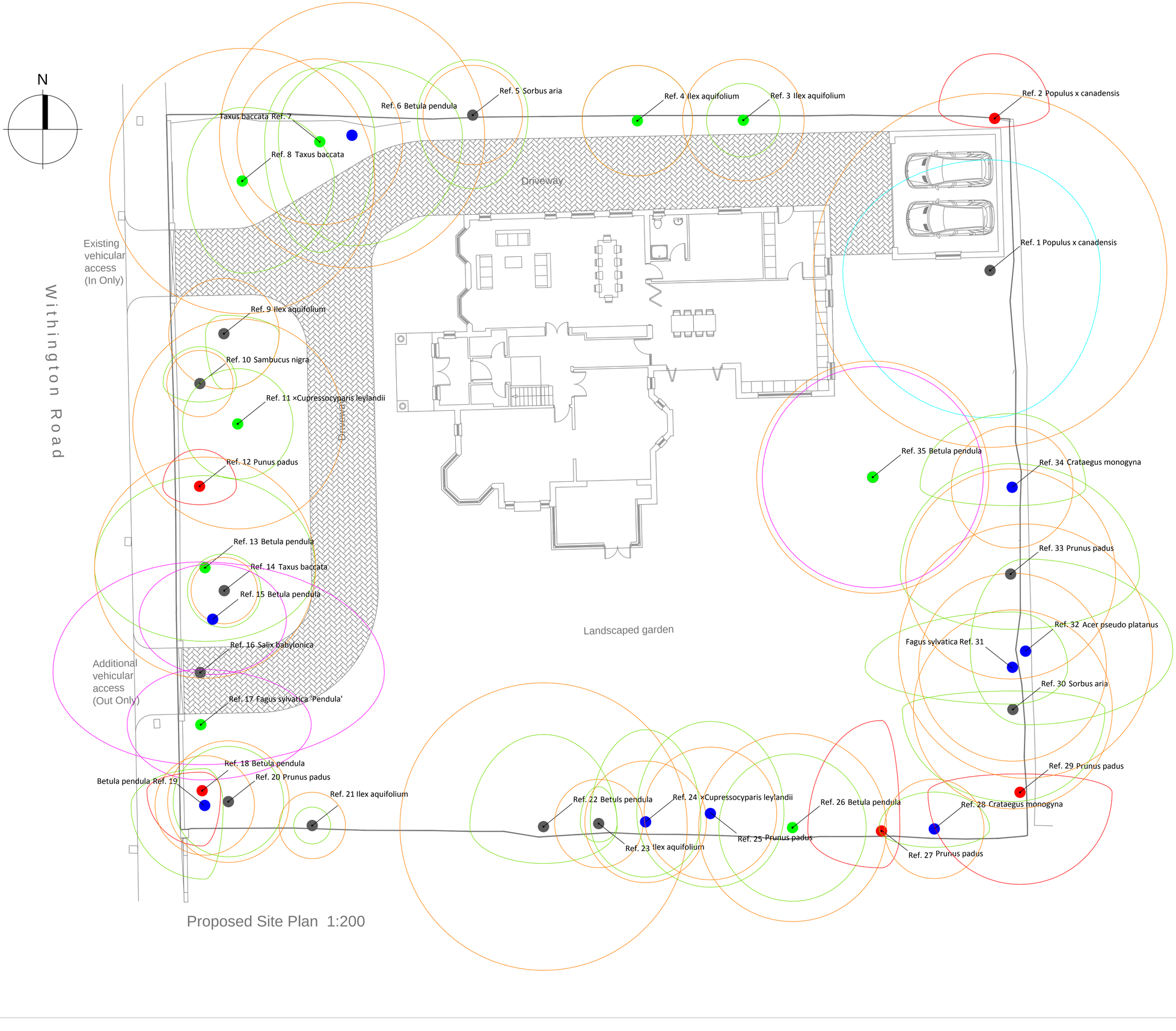
client
Property Owner

project
Withington Road

drawing title
Tree Constraints Plan

scale	drawn	date
1:100 @ A1	CEL-TW	Mar 2014

drawing number	rev
WR-TCP-001	A



Proposed Site Plan 1:200

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KEY:

- Retained Tree
- Tree to be Removed Due to the Proposal
- Tree to be Removed Due to Overall Poor Condition
- Tree to be Removed Prior to planning application due to destruction of present driveway
- Retained Group
- Group to be Remvoed Due to the Proposal
- Group to be Removed Due to Poor Overall Condition
- Building and/or Topographical Feature
- Retained tree - extents of root protection area (RPA)

Metres
2 0 2 4
1:100

rev	date	description	by
A	Mar 2014	Tree Retention Plan	CEL-TW

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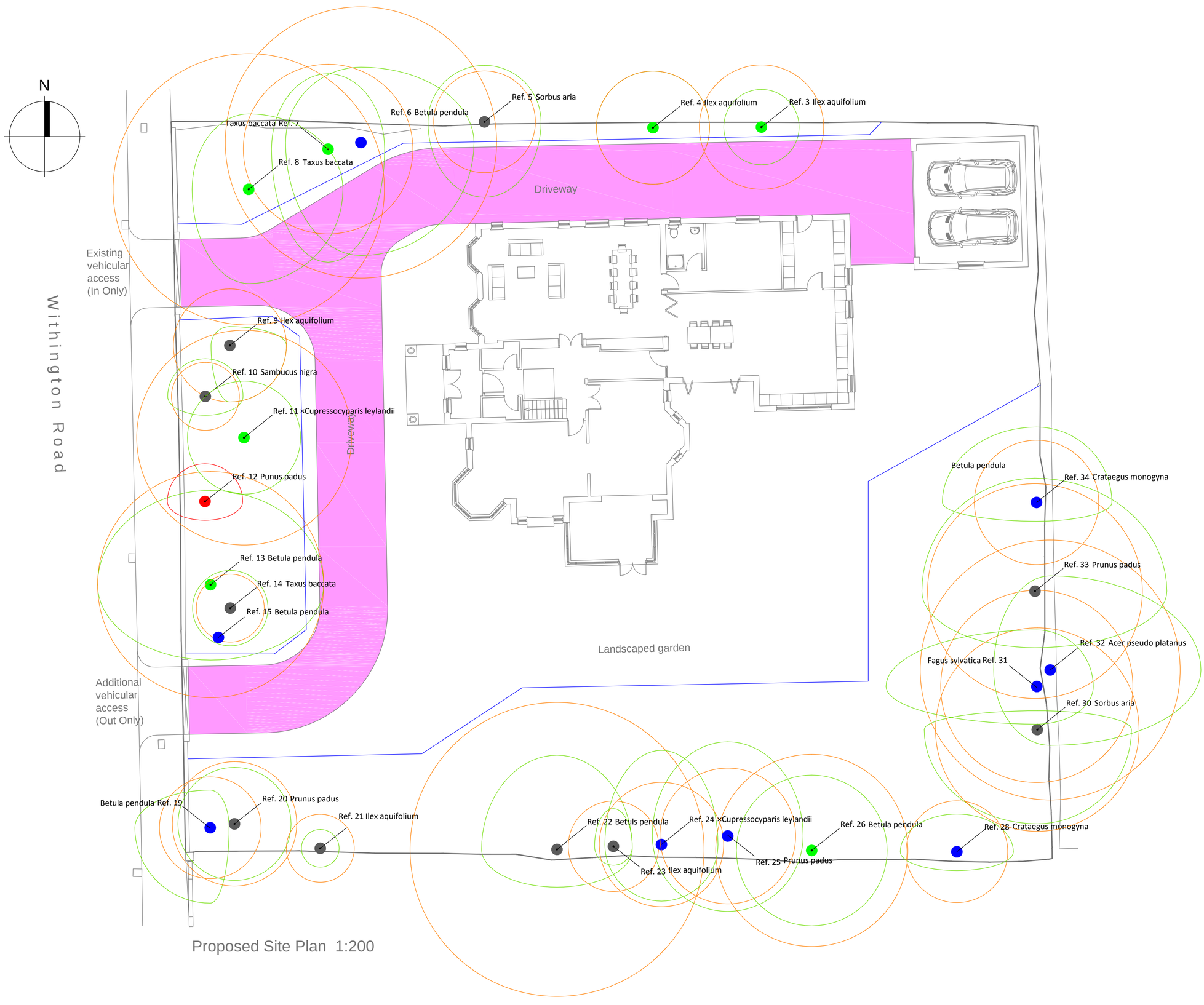
project
Withington Road

drawing title
Tree Retention Plan

scale	drawn	date
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drawing number
WR-TRP-001

rev
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Proposed Site Plan 1:200

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KEY:

- Proposed Tree Protection Fencing
- Proposed Stem Protection Fencing
- Proposed new driveway needing supervision
- Retained Tree Canopy
- Retained Tree Root Protection Area

Metres
2 0 2 4
1:100

rev	date	description	by
A	Mar 2013	Tree Protection Plan	CEL-TW

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Property Owner

project
Withington Road

drawing title
Tree Protection Plan

scale	drawn	date
1:100 @ A1	CEL-TW	Mar 2013

drawing number
WR-TPP-001

rev
A

Abscission. The shedding of a leaf or other short-lived part of a woody plant, involving the formation of a corky layer across its base; in some tree species twigs can be shed in this way

Abiotic. Pertaining to non-living agents; e.g. environmental factors

Absorptive roots. Non-woody, short-lived roots, generally having a diameter of less than one millimetre, the primary function of which is uptake of water and nutrients

Adaptive growth. In tree biomechanics, the process whereby the rate of wood formation in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium This helps to maintain a uniform distribution of mechanical stress

Adaptive roots. The adaptive growth of existing roots; or the production of new roots in response to damage, decay or altered mechanical loading

Adventitious shoots. Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage. The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Architecture. In a tree, a term describing the pattern of branching of the crown or root system

Axil. The place where a bud is borne between a leaf and its parent shoot

Bacteria. Microscopic single-celled organisms, many species of which break down dead organic matter, and some of which cause diseases in other organisms

Bark. A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Basidiomycotina (Basidiomycetes). One of the major taxonomic groups of fungi; their spores are borne on microscopic peg-like structures (basidia), which in many types are in turn borne on or within conspicuous fruit bodies, such as brackets or toadstools. Most of the principal decay fungi in standing trees are basidiomycetes

Bolling. A term sometimes used to describe pollard heads

Bottle-butt. A broadening of the stem base and buttresses of a tree, in excess of normal and sometimes denoting a growth response to weakening in that region, especially due to decay involving selective delignification

Bracing. The use of rods or cables to restrain the movement between parts of a tree

Branch:

- **Primary.** A first order branch arising from a stem
- **Lateral.** A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral.** A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch bark ridge. The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem

Branch collar. A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot. A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling. An irreversible deformation of a structure subjected to a bending load

Buttress zone. The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium. Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker. A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Canopy species. Tree species that mature to form a closed woodland canopy

Cleaning out. The removal of dead, crossing, weak, and damaged branches, where this will not damage or spoil the overall appearance of the tree

Compartmentalization. The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compression strength. The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees with special drilling devices

Compressive loading. Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition. An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Construction exclusion zone. Area based on the Root Protection Area (in square metres) to be protected during development, by the use of barriers and/or ground protection

Crown/Canopy. The main foliage bearing section of the tree

Crown lifting. The removal of limbs and small branches to a specified height above ground level

Crown thinning. The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping. A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

Crown reduction/thinning. Reduction of the canopy volume by thinning to remove dominant branches whilst preserving, as far as possible the natural tree shape

Deadwood. Dead branch wood

Decurrent. In trees, a system of branching in which there is a well-defined central main stem, bearing branches which are limited in their length, diameter and secondary branching (cf. excurrent) In fungi with toadstools as fruit bodies, the description of gills which run some distance down the stem, rather than terminating abruptly

Defect. In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment

Delamination. The separation of wood layers along their length, visible as longitudinal splitting

Dieback. The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease. A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Distal. In the direction away from the main body of a tree or subject organism (cf. proximal)

Dominance. In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud. An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction. In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DBH (Diameter at Breast Height). Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified

Deadwood. Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Endophytes. Micro-organisms which live inside plant tissues without causing overt disease, but in some cases capable of causing disease if the

tissues become physiologically stressed, for example by lack of moisture

Epicormic shoot. A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot

Excrescence. Any abnormal outgrowth on the surface of tree or other organism

Excurrent. In trees, a system of branching in which the crown is borne on a number of major widely-spreading and secondarily branched limbs (cf. excurrent)

Felling licence. In the UK, a permit to fell trees in excess of a stipulated number of stems or volume of timber

Flush-cut. A pruning cut which removes part of the branch bark ridge and or branch-collar

Girdling root. A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Guying a form of artificial support with cables for trees with a temporarily inadequate anchorage

Habit. The overall growth characteristics, shape of the tree and branch structure

Hazard beam. An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Heartwood/false-heartwood/ripewood. Sapwood that has become dysfunctional as part of the natural aging processes

Heave. A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

High canopy tree species. Tree species having potential to contribute to the closed canopy of a mature woodland or forest

Incipient failure. In wood tissues, a mechanical failure which results only in deformation or cracking, and not in the fall or detachment of the affected part

Included bark (ingrown bark). Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact

Increment borer. A hollow auger, which can be used for the extraction of wood cores for counting or measuring wood increments or for inspecting the condition of the wood

Infection. The establishment of a parasitic micro-organism in the tissues of a tree or other organism

Internode. The part of a stem between two nodes; not to be confused with a length of stem which bear nodes but no branches

Lever arm. A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin. The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed Lignification

Lions tailing. A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading

Loading. A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Longitudinal. Along the length (of a stem, root or branch)

Lopping. A term often used to describe the removal of large branches from a tree, but also used to describe other forms of cutting

Mature Heights (approximate)**:**

- **Low maturing** – less than 8 metres high
- **Moderately high maturing** – 8 – 12 metres high
- **High maturing** – greater than 12 metres high

Micro drill. An electronic rotating steel probe, which when inserted into woody tissue provides a measure of tissue density

Minor deadwood. Deadwood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree

Mulch. Material laid down over the rooting area of a tree or other plant to help conserve moisture; a mulch may consist of organic matter or a sheet of plastic or other artificial material

Mycelium. The body of a fungus, consisting of branched filaments (hyphae)

Occluding tissues. A general term for the roll of wood, cambium and bark that forms around a wound on a woody plant (cf. wound wood)

Occlusion. The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen. A micro-organism which causes disease in another organism

Photosynthesis. The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products.

Phytotoxic. Toxic to plants

Pollarding. The removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.

Primary branch. A major branch, generally having a basal diameter greater than 0.25 x stem diameter

Primary root zone. The soil volume most likely to contain roots that are critical to the health and stability of the tree and normally defined by reference to Table 1 of BS5837 (1991) Guide for Trees in Relation to Construction.

Priority. Works may be prioritised, 1. = high, 5. = low

Probability. A statistical measure of the likelihood that a particular event might occur.

Proximal. In the direction towards from the main body of a tree or other living organism (cf. distal)

Pruning. The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial. In the plane or direction of the radius of a circular object such as a tree stem

Rams-horn. In connection with wounds on trees, a roll of occluding tissues which has a spiral structure as seen in cross-section

Rays. Strips of radially elongated parenchyma cells within wood and bark. The functions of rays include food storage, radial translocation and contributing to the strength of wood

Red-rot. A form of decay in which reddish pigments are present but which is biochemically a white-rot; not to be confused with brown-rots which sometimes also have a reddish-brown colour

Reactive Growth/Reaction Wood. Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Removal of dead wood. Unless otherwise specified, this refers to the removal of all accessible dead, dying and diseased branchwood and broken snags

Removal of major dead wood. The removal of, dead, dying and diseased branchwood above a specified size

Respacing. Selective removal of trees from a group or woodland to provide space and resources for the development of retained trees.

Residual wall. The wall of non-decayed wood remaining following decay of internal stem, branch or root tissues

Root-collar. The transitional area between the stem/s and roots

Root-collar examination. Excavation of surfacing and soils around the root-collar to assess the structural integrity of roots and/or stem

Root protection area. An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival. Calculated with reference to Table 2 of BS5837 (2005) and shown in plan form in square metres

Root zone. Area of soils containing absorptive roots of the tree/s described

microscopic and dispersed in air or water. The **Primary** root zone is that which we consider of primary importance to the physiological well-being of the tree

Sapwood. Living xylem tissues

Secondary branch. A branch, generally having a basal diameter of less than 0.25 x stem diameter

Selective delignification. A kind of wood decay (white-rot) in which lignin is degraded faster than cellulose

Shedding. In woody plants, the normal abscission, rotting off or sloughing of leaves, floral parts, twigs, fine roots and bark scales

Silvicultural thinning. Removal of selected trees to favour the development of retained specimens to achieve a management objective

Simultaneous white-rot. A kind of wood decay in which lignin and cellulose are degraded at about the same rate

Snag. In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing-point or dormant bud; a snag usually tends to die back to the nearest growing point

Soft-rot. A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Spores. Propagules of fungi and many other life-forms; most spores are
Shrub species. Woody perennial species forming the lowest level of woody plants in a woodland and not normally considered to be trees

Sporophore. The spore bearing structure of fungi

Sprouts. Adventitious shoot growth erupting from beneath the bark

Stem/s. The main supporting structure/s, from ground level up to the first major division into branches

Stress. In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

Stress. In mechanics, the application of a force to an object

Stringy white-rot. The kind of wood decay produced by selective delignification

Storm. A layer of tissue which supports the fruit bodies of some types of fungi, mainly ascomycetes

Structural roots. Roots, generally having a diameter greater than ten millimetres, and contributing significantly to the structural support and stability of the tree

Subsidence. In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots

Subsidence. In relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight

Taper. In stems and branches, the degree of change in girth along a given length

Target canker. A kind of perennial canker, containing concentric rings of dead occluding tissues

Targets. In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping. In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Torsional stress. Mechanical stress applied by a twisting force

Translocation. In plant physiology, the movement of water and dissolved materials through the body of the plant

Transpiration. The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

Understory. A layer of vegetation beneath the main canopy of woodland or forest or plants forming this

Understory tree species. Tree species not having potential to attain a size at which they can contribute to the closed high canopy of a woodland

Vascular wilt. A type of plant disease in which water-conducting cells become dysfunctional

Vessels. Water-conducting cells in plants, usually wide and long for hydraulic efficiency; generally not present in coniferous trees

Veteran tree. A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned

White-rot. A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

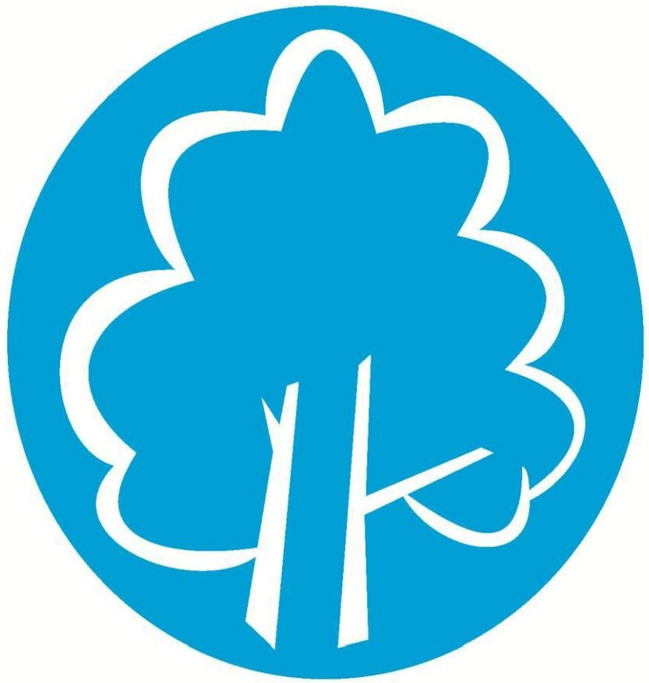
Wind exposure. The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure. The force exerted by a wind on a particular object

Wind throw. The blowing over of a tree at its roots

Wound dressing. A general term for sealants and other materials used to cover wounds in the hope of protecting them against desiccation and infection; only of proven value against fresh wound parasites

Woundwood. Wood with atypical anatomical features, formed in the vicinity of a wound'



PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.



TREE PROTECTION AREA

KEEP OUT!

(TOWN & COUNTRY PLANNING ACT 1990)

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.

CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION

ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Tree Protection Warning Sign

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