Burn Road
Huddersfield

Wiggett

TREE SURVEY REPORT

tba
landscape architects

Landscape Architecture
Arboriculture

Ashton Old Baths
Stamford Street West
Ashton-under-Lyne
Lancashire
OL6 7FW

Tel: 0161 8042099

Email: info@trevorbridge.co.uk
www.trevorbridge.co.uk

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1.0 Introduction

1.1 Trevor Bridge Associates Ltd (TBA) have been instructed by Wiggett to undertake a pre-development arboricultural survey of trees and significant vegetation. The pre-development tree survey should be read in conjunction with the accompanying ***Tree Survey & Root Protection Area drawings*** ref: 6724.01.

1.2 A site visit to the site was carried out in September 2021.

1.3 This pre-development tree survey should be considered the first part of a process in identifying trees that are to be retained and protected. A key part of the pre-development survey is the identifying of Root Protection Areas (RPA's). In Addition to the pre-development survey the following documents may be required to fully support a planning application:

i) An Arboricultural Impact Assessment - This will assess the impact on trees of a proposed development.

ii) An Arboricultural Method Statement - This provides specific details on how a development should proceed in such a manner that avoids damage to trees being retained. It is accompanied with a tree protection plan.

1.4 The following information was provided for reference for the purposes of undertaking this pre-development survey.

- CTE Surveying drawing: *Topographical Survey,* Drawing No.: Non cited Date: June 2021

1.5 This report has been undertaken by Phil Dye, a consulting arboriculturist since 2006. Phil has a BSc (hons) Arboriculture and the AA Technicians Certificate in Arboriculture (Cert Arb L4 (ABC)). He is a LANTRA qualified Professional Tree Inspector. He is a professional member of the Consulting Arborists Society, a professional member of the Arboricultural Association, an associate member of the Institute of Chartered Foresters and a licensed user of Quantified Tree Risk Assessment (QTRA) - license no. 2278. He is trained in valuing amenity trees using the Capital Asset Value for Amenity Trees (CAVAT) system.

2.0 Scope and Limitations of the Report

2.1 This report has been prepared to inform the design layout of potential development and be submitted with a planning application.

2.2 Due to the changing nature of trees – and possibly other site circumstances – this report and recommendations are limited to a two year period. Similarly, this report could be invalidated if any alterations are made to the site that could change the conditions as seen at time of inspection.

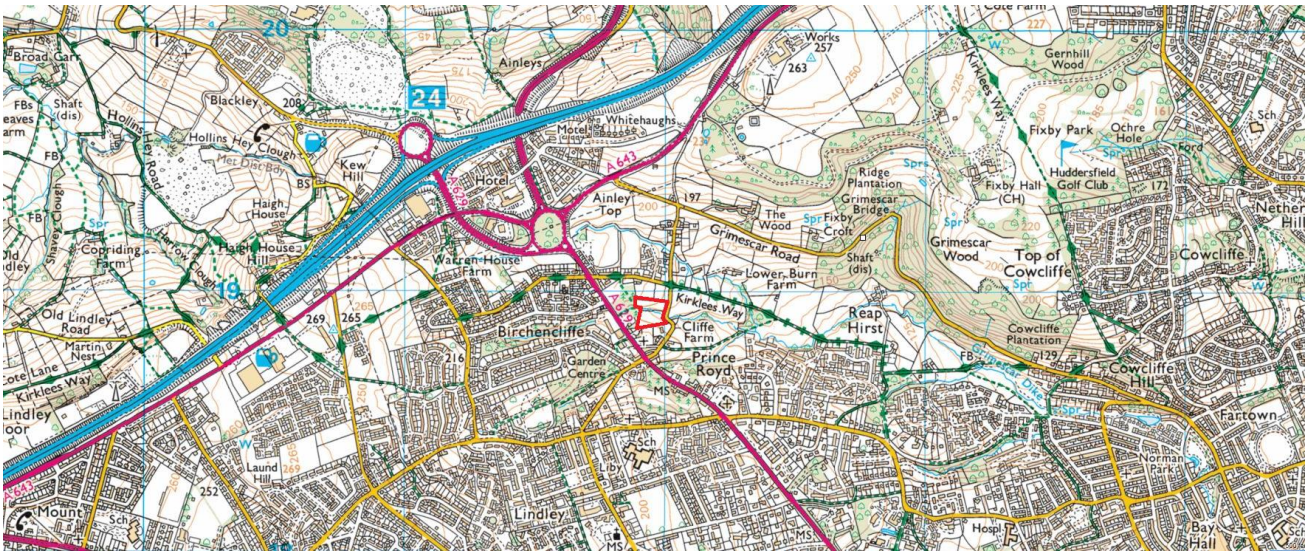
2.3 Under certain circumstances, roots can affect foundations, drains and other underground services. These issues have not been addressed by this report.

2.4 Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer occasional damage under only average weather conditions. A lack of recommended work does not imply that a tree will never suffer damage.

3.0 Site Location

3.1 The site comprises 2 agricultural fields to the west of Burn Road, Huddersfield.

3.2 The location of the site is marked in red within the plan extract below:



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3.3 The grid reference of the site is SE 11975 18930.

3.4 The full details of the tree cover is included within the tree survey schedule within section 11.0 of this report, and within the accompanying Tree Survey & Root Protection Area drawing.

4.0 Tree Survey Schedule - Methodology

4.1 This survey complies with British Standard 5837:2012 *Trees in relation to design, demolition and Construction - Recommendations*. All significant trees or groups within the site have been inspected, identified and detailed.

4.2 Site. The survey was carried out from ground level and without the use of special diagnostic equipment (unless otherwise stated). Lower-grade material may been treated as numbered groups, for example where in rows or dense groupings.

4.3 Schedule. The following information is given in the schedule:

- **Tree reference No**: A sequential number sequence post-fixed with a T for Trees, G for groups, H for hedges and W for Woodlands.
- **Tree Species**. Common name of Species.
- **Height** (metres). An electronic hypsometer is used to measure tree heights. Tree heights are only measured where it is possible to gain a clear unobstructed view of the tree, otherwise the height is estimated.
- **Trunk diameter** (millimetres). This is a key measurement for calculating the Root Protection Areas of trees. Measurements are taken at 1.5m, height above ground level. If trees are assessed as a group or woodland feature, the trunk diameter of the largest tree within the group or woodland is estimated and used.
- **Crown spread** (metres**):** The maximum lateral spread of the canopy as measured from the cardinal compass points (NESW). Spreads are measured either by pacing or laser where access is available, otherwise estimated.
- **Crown clearance** (metres): The height of the lowest section of canopy measured from cardinal compass points.
- **Age class.** A classification of the age of the tree. In the case of woodlands and groups this is based in the oldest tree.

Y – Young:	Recently planted trees less than ¼ life expectancy.
SM – Semi-Mature:	Established trees less than 1/3rd predicted life expectancy.
EM – Early mature:	Trees between 1/3rd and 2/3rd predicted life expectancy.
M - Mature:	Trees over 2/3rd predicted life expectancy.
V - Veteran:	A tree of significant age (with a large girth) which provides cultural, landscape or ecological value.

- **Physiological condition:** (Good, Fair, Poor, Dead). An assessment of the tree's health and vitality reflecting the tree's potential longevity as well as its capacity for withstanding environmental stresses (such as pests and diseases).
- **Structural Condition:** (Good, Fair, Poor, Dead): A consideration of the structural integrity of the physical structure of the tree.
- **Life Expectancy**: Estimated remaining contribution (years, 0-10 10-20 20-40 40+).
- **Root Protection Area**: As calculated via BS 5837: 2012 (area in square metres and as a radius in metres). This is the basis of the Root Protection Area marked as a circle on the Tree Survey (may have been modified in light of site circumstances). This is generally the minimum position for protective fencing.
- **Retention Category:**
  Trees are categorised using the criteria shown in the table below. The purpose of the categorisation is to apply a non fiscal value to tree stock to allow informed decisions on which trees should be retained or removed within the context of development.

TREES UNSUITABLE FOR RETENTION:			
'U' – [Marked red on plan] **Trees of such a condition that they can not be realistically retained as living trees in the context of the current land use for longer than 10 years.**	• Trees that have serious, irremediable, structural defect, such that their early loss is expected due to collapse including those which will become unviable after the removal of other category U trees (where for what ever reason, the loss of companion shelter can not 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 health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *Note Category U trees can have existing or potential conservation value which might be desirable to preserve*		
TREES TO BE CONSIDERED FOR RETENTION:			
	1. Mainly arboricultural values	**2. Mainly landscape values**	**3. Mainly cultural values, including conservation**
'A' – [Marked green on plan] **Trees of high quality with an estimated life expectancy of at least 40 years**	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (eg the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (eg veteran trees or wood pasture)
'B' – [Marked blue on plan] **Trees of moderate quality with a remaining life expectancy of at least 20 Years**	Trees which may be in the A category but are down graded due to their impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such they are unlikely to be suitable for retention for beyond 40 years; trees lacking the special quality necessary to merit category A designation	Trees that are 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 clearly identifiable conservation or other cultural benefits
'C' – [Marked grey on plan] **Trees of low quality with an estimated life expectancy of at least 10 years, or young trees with a stem diameter below 150mm**	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 any greater collective landscape value ; and/or trees offering low or only temporary /transient landscape benefits	Trees with no material conservation or other cultural value

- **Observations**: This provides general information regarding the trees, providing details regarding defects, or points of merit.
- **Preliminary Recommendations:** Any management works that should be carried out. Recommendations for management works are only recommended sparingly, generally where there is a significant safety concern, or long term benefit for the tree. Works are considered within the context of the site at the time of survey. Works that are required in relation to new development proposals are considered separately (such as part of a method statement).

5.0 Trees and Construction – General Issues

5.1 Typically, about 80% of roots will be found in the upper half metre of soil and often extending well beyond the canopy spread. The threat to the trees by development comes from:

(a) root severance or fracture
(b) compaction of the soil, preventing gaseous exchange and moisture percolation
(c) possible change to moisture gradients due to surface water run-off or interception
(d) physical damage to low branches and trunk.
(e) Damage from chemical run-off from construction activities

The consequences for the tree of such damage are:

(i) instability, if severe enough
(ii) entry points for pathogenic fungi at wounds / fractures
(iii) loss of vitality due to reduced oxygen, mineral and moisture take-up; all leading to
(iv) root death, and
(iv) a general decline or possible death of the tree.

6.0 Tree Constraints

6.1 Constraints imposed by trees during development, both above and below ground need to be considered within the site layout design.

Protection is afforded to the tree by defining a Root Protection Area (RPA) within which no development activity should take place. The size of the RPA is defined in the British Standard and relates to trunk diameter. The RPA is normally the minimum position for placement of protective fencing.

6.2 Nominally the RPA is represented by a circle around the tree. The area of the RPA may however, subject to the consideration of the arboricultural consultant, and be altered to a polygon in order to reflect the site conditions and requirements. For example, existing hard surfaces and foundations are likely to restrict or limit root growth while good quality soil may promote and extend root growth.

6.3 Root Protection Areas primarily relate to below ground constraints (root protection). Other constrains that must be considered include:

- The current as well as ultimate height and spread of a tree.
- Large trees close to a building, particularly a dwelling, can cause apprehension to owners/occupiers that result in pressure for tree removal or inappropriate pruning. Buildings should be sited allowing for the species height, spread and overall habit.
- Species characteristics; i.e. density of foliage, fruit-fall, susceptibility to honeydew drip, or branch drop. Trees are shedding organisms. The leaves of some species may cause problems with blocking of gullies and gutters. Fruit may cause slippery patches and honeydew drop can affect surfaces (particularly cars). If conflicts may arise detailed design may address such issues, such as non-slip paths, use of car-ports, provision of leaf guards or grilles etc.
- The potential impact on direct and diffuse light of a particular location of land; shading of buildings by trees can be a problem, especially where rooms require natural light, in addition open spaces such as gardens and sitting areas should be designed to meet requirements for direct sunlight (for at least part of the day).
- Infrastructure requirements in relation to trees e.g. easements for underground or above ground apparatus and visibility splays.
- Space for the provision of new planting or landscaping.
- The proposed end use of space within Root Protection Areas.
- The requirement to protect overhanging canopies of trees that overhang or extend beyond Root Protection Areas.

7.0 Structures within the Root Protection Areas of Trees.

7.1 In the development layout design structures should be positioned outside of RPAs. In some exceptional instances there may be an overriding justification for construction within the RPA. In such cases technical solutions may be available to minimise (to an acceptable level) disturbance to the tree/s. Where such technical solutions may be relied upon full details will need to be included within a method statement. Advice must be sought from a suitably qualified arboriculturist in such matters.

7.2 In some cases it may be unavoidable to place permanent hard surfacing within an RPA (for example the placement of an access driveway or parking area). In such cases the following should apply:

- No excavation of the soil should take place, other than scraping of the turf/vegetation layer
- Any design must avoid compaction, allowing even distribution of weight.
- New hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.
- If the proposed surface is likely to require de-icing salt then run-off should be directed away from the RPA.

- Permeable hard surfacing can result in soil moisture saturation for long periods (resulting in root death). Where there is a risk of water-logging a design should incorporate land drainage.

7.3 Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Piles, pads or elevated beams can support bridges over RPAs. In all cases full specifications and methodology must be included within a supporting method statement.

8.0 Wildlife Issues and Timing of Operations

8.1 Bats. Under current legislation it is an offence to 'intentionally or recklessly disturb a bat' or 'damage, destroy or block access to the resting place of any bat'. For further details consultation must be made with the Statutory Nature Conservancy Organisation (Natural England, 0300 060 1842, www.naturalengland.org.uk). Where relevant any current ecological surveys for the site will take precedence in this matter.

8.2 Birds. It is an offence to kill, injure or take any wild bird; or take, damage or destroy the nest of any wild bird while it is in use or being built. Therefore, work likely to disturb nesting birds must be avoided from late March to August.

8.3 The pruning of some species should avoid specific times. *Prunus* species (eg flowering and fruiting Cherry, Plum, Almond etc) should only be pruned during June – August in order to minimise the risk of infection by Silver Leaf disease. *Acer* (Maples including Sycamore), *Betula* (Birches) and, *Morus* (Mulberry) should not be pruned February – June due to sap bleeding; also *Juglans* (Walnut) should not be pruned from December – June.

9.0 Tree Preservation Orders and Conservation Areas

9.1 Prior to any works a check should be carried out to establish the site is subject to a tree preservation order or within a conservation area.

9.2 Works to protected trees require consent from the local planning authority. In the case of TPO's an application must be made. In the case of conservation areas a notification must be made. TPO applications take up to eight weeks, conservation area notifications take six weeks.

9.3 Certain exemptions apply; for example the removal of deadwood. In the case of dangerous trees 5 days written notice should be given to the local authority (in the cases of immediate danger the work should proceed, but the local authority contacted as soon as possible afterwards).

9.4 Planning consent overrides protected trees, where the works or removal are necessary for development to proceed.

10.0 Felling Licences

10.1 There are restrictions on the felling of non-garden trees**.** In any quarter calendar year it is permissible to fell up to 5 cubic metres of timber (as long as the timber is not sold).

10.2 Certain exemptions apply, this includes the felling of trees to directly implement a planning consent. For full details Forestry England provide a leaflet entitled Tree Felling Getting Permission which can be found at https://www.forestryengland.uk/

Tree Group Hedge	Common Name	Age Class	Height (m)	No. of Stems	Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	> 5 stems	Root Protection Area (Radius, m)	N	E	S	W	N(H)	E(H)	S(H)	W(H)	Physiological Condition	Structural Condition	Life Expectancy	Future Growth Potential	Retention Category	Comments & Observations	Preliminary Work recommendations
1T	Ash	Semi-Mature	4	6						80	2.4	1	2	1	2	2	2	2	2	Poor	Fair	<10	Low	U	Early ash dieback present.	Remove
2T	Sycamore	Mature	12	14						720	15	6	6	7	6	1	1	1	1	Fair	Good	30	Low	B2	Multi stemmed from base. Large central trunk.	
3G	Apple x 1, plum x 2, sycamore x 1	Semi-Mature	3	4	80	90	70	80								0	0	0	0	Fair	Fair	10	Moderate	C2	Not plotted on topo. Location estimated.	
4T	Ash	Mature	6	4	90	120	190	190			3.6	3	2	2	2	1	1	1	1	Poor	Fair	<10	Low	U	Pollarded at 1m. Ash dieback present.	Remove
5T	Goat willow	Mature	9	1	670						8.1	6	7	5	5	0	0	0	0	Good	Fair	20	Low	B2		
6T	Sycamore	Early-Mature	7	8						200	6.8	3	4	4	4	1	1	2	1	Fair	Fair/Poor	<10	Moderate	U	Dead central stems	
7G	3 x sycamore, 1 x elder	Semi-Mature	7	2	160	160														Fair	Fair	10	High	C2	Not plotted on topo. Locations estimated.	
8G	2 x sycamore	Semi-Mature	5	5	80	110	100	60	70											Fair	Fair	10	High	C2	Not plotted on topo. Locations estimated.	
9T	Silver birch	Young	6	1	80						0.9	1	1	1	1	1	1	1	1	Fair	Fair	10	High	C2	Not plotted on topo. Locations estimated.	
10T	Sycamore	Mature	9	8						200	6.8	5	5	2	4	0	0	3	0	Fair	Fair	10	Low	C2	Tree directly to the south has been removed leaving an asymmetrical canopy.	

Tree Group Hedge	Common Name	Age Class	Height (m)	No. of Stems	Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	> 5 stems	Root Protection Area (Radius, m)	N	E	S	W	N(H)	E(H)	S(H)	W(H)	Physiological Condition	Structural Condition	Life Expectancy	Future Growth Potential	Retention Category	Comments & Observations	Preliminary Work recommendations
11T	Sycamore	Semi-Mature	7	1	170						2.1	2	1	1	1	2	1	1	1	Fair	Fair	10	High	**C2**		
12T	Sycamore	Semi-Mature	7	1	220						2.7	2	2	2	2	2	1	1	2	Fair	Fair	10	High	**C2**		
13G	Sycamore	Mature	16	1	600															Good	Good	40	Low	**A2**	Mainly off site group offering good amenity.	
14T	Ash	Mature	15	1	780						9.3	5	7	4	2	5	5	6	6	Poor	Fair	<10	Very Low	**U**	Early ash dieback present.	
15G	Ash, sycamore,	Semi-Mature	9	1	180															Fair	Fair	10	High	**C3**	Early ash dieback present. Linear group growing from a bank	Remove ash with ash dieback
16G	4 x sycamore	Mature	13	1	600															Good	Good	30	Low	**B2**		
17G	1 x sycamore, 1 x ash	Early-Mature	9	2	330	320														Fair	Fair	10	Moderate	**C2**	Ash dieback present	Remove ash
18G	Sycamore, elder, oak	Early-Mature	8	3	200	150	190													Fair	Fair	10	Moderate	**C3**	Linear group growing down the bank	
19T	Hawthorn	Mature	6	3	390	490	270				8.1	4	4	3	4	0	1	2	1	Fair	Good	20	Very Low	**B2**		
20T	Sycamore	Early-Mature	10	1	490						6	2	4	4	3	2	2	1	3	Good	Fair	20	Low	**B2**		

Tree Group Hedge	Common Name	Age Class	Height (m)	No. of Stems	Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	> 5 stems	Root Protection Area (Radius, m)	N	E	S	W	N(H)	E(H)	S(H)	W(H)	Physiological Condition	Structural Condition	Life Expectancy	Future Growth Potential	Retention Category	Comments & Observations	Preliminary Work recommendations
21T	Sycamore	Semi-Mature	6	13						70	3	2	2	2	2	0	0	0	0	Fair	Fair	10	Moderate	C2	Multi stemmed from base.	
22G	Sycamore	Semi-Mature	4	12						50										Fair	Fair	10	High	C2		
23T	Sessile oak	Semi-Mature	2	1	90						1.2	1	1	2	1	0	0	0	0	Fair	Fair	10	Moderate	C2	Small stunted specimen. Powdery mildew present.	
24T	Sessile oak	Semi-Mature	7	1	200						2.4	2	3	2	3	0	0	0	0	Fair	Fair	10	Moderate	C2	Oak apple galls throughout.	
25G	Sycamore, ash, elder, hawthorn	Semi-Mature	5	12						50	2.1									Fair	Fair	10	High	C2	Group of trees surrounding a derelict wooden structure	
26G	2 x hawthorn	Early-Mature	5	4	200	150	100	100												Good	Good	20	Moderate	B3		
27G	Ash	Semi-Mature	8	2	190	110														Poor	Fair/Poor	<10	Low	U	Ash dieback present	Remove group
28T	Hawthorn	Early-Mature	3	6						90	2.7	2	2	2	2	0	0	0	0	Fair	Fair	10	Moderate	C2		
29H	Mixed species	Early-Mature	5	1	70															Fair	Fair	10	High	C3	Lonicera with bay, hawthorn, budleija and elder	
30T	Silver birch	Mature	10	2	350	280					5.4	3	4	3	3	2	5	2	4	Fair	Good	20	Moderate	B2	Off site tree. Diameters estimated.	

Tree Group Hedge	Common Name	Age Class	Height (m)	No. of Stems	Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	> 5 stems	Root Protection Area (Radius, m)	N	E	S	W	N(H)	E(H)	S(H)	W(H)	Physiological Condition	Structural Condition	Life Expectancy	Future Growth Potential	Retention Category	Comments & Observations	Preliminary Work recommendations
31G	Laburnum, larch and Holly	Mature	12	1	300															Good	Good	20	Moderate	B2	Off site tree not plotted on topo. Diameters and location estimated.	
32G	Sycamore, beech	Mature	16	1	700											0				Good	Fair	20	Low	B2	Off site trees partially plotted on topo. Diameters and location estimated. Offers good amenity. Canopies overhanging site by up to 6m. Bark Included union in beech	
33G	5 x sycamore	Mature	14	1	600															Good	Fair	20	Low	B2	Off site tree not plotted on topo. Diameters and location estimated.	
34T	Sycamore	Mature	14	2	550	600					9.9	5	6	4	4	1	5	5	5	Good	Fair	20	Low	B2		
35T	Sycamore	Semi-Mature	6	12						70	2.9	2	2	2	2	1	1	1	1	Fair	Fair	10	High	C2		
36G	Ash and sycamore	Mature	16	1	600															Good	Good	40	Low	A2	Off site trees not plotted on topo. Diameters and location estimated. Good screening along the western boundary.	

Appendix A - Glossary of Arboricultural Terms

Adventitious shoots
Shoots that develop from tissue other than a growing shoot apex or bud. Such shoots will often develop in circumstances where a tree has been pruned or is under physiological stress.

Bifurcation
The point at where a single tree trunk forks into two stems.

Bottle-butt/Bottling
Usually occurring in the base of a tree trunk where decay results in a tree developing additional **secondary growth** to structurally compensate. See also **Reaction wood**.

Brown-rot
A type of wood decay where cellulose is primary degraded resulting in a brittle decay where affected wood can retain hardness but lose toughness and flexibility. Affected wood can fracture acutely.

Buckling
The physical deformation of bark and wood when subjected to significant compression loading. For example buckling may occur at base of a leaning trunk that has not developed sufficient growth to withstand **compression loading**, or whose structural integrity is reduced via internal decay.

Cable Brace
The use of cables to form a linkage between two or more stems/branches in order to reduce the possibility of stem/branch failure.

Canker
A wound or lesion that has formed on the bark of a tree. This may be caused by a fungal or bacterial pathogen.

Co-dominance
See also **dominance** and **suppressed form**. Co-dominance occurs where two or more trees grow in close proximity to each other forming a group, but no one tree has attained structural dominance over the neighbouring trees. In some cases one or more trees may visually appear as having one large canopy. This is most often the case with groups of trees of the same species and similar age.

Compression Loading
Mechanical loading creating a compressive force.

Construction Exclusion Zone
An area or areas, usually within a root protection area, which is to remain undisturbed during development processes. Such areas are generally fenced off with tree protective fencing during development.

Coronet cuts
Pruning technique often associated with **monoliths**, but may be applied to branches in any tree. Coronet cuts are multiple jagged cuts made at a pruning point to the remaining branch stub to emulate, as far as is possible, a natural branch fracture in order to promote a habitat conditions beneficial to wildlife.

Crown lifting
The pruning of lower limbs within a tree canopy, usually specified by indicating a required height in metres above ground level.

Crown reduction
The reduction of the outer section of a tree's canopy either partially or all over. Specified by an amount in metres, but may also be specified as a % of the total canopy spread. The natural form of the canopy should be retained, as far is possible.

Crown thinning
The removal of selected branches within the internal structure of a tree canopy, usually to lessen canopy density. This is achieved by removal of secondary or tertiary branches.

Deadwood
Dead branches within the tree. Most deadwood results from the natural dying off of branches within a tree canopy. It is natural for deadwood to form in mature trees. Where deadwood forms on the outer section of tree canopies, referred to as **die-back**, it is generally an indication that the tree is under physiological stress. Deadwood plays an important role for habitat and biodiversity and should not be removed unnecessarily. Within TBA reports deadwood is referred to in three different sizes based on estimated girth:

Minor deadwood:	Girth up to 20mm.
Moderate deadwood:	Girth from 20 to 40mm
Major deadwood:	Girth 40mm and larger

Die-back
The dead of branches in the outer canopy, beginning with shoot-tips. Die-back is usually an indication of severe physiological stress within a tree, often associated with root dysfunction. Die-back can manifest in the long term with significant dying off of larger branches. Other symptoms are usually present, such as small leaf development, late bud-burst, early dropping of leafs, thin leaf cover and the presence of **epicormic growth** in the main canopy. For some species such as Common Oak, die-back is a natural part of the tree's life-cycle; as the tree ages and its vitality reduces, the tree will naturally retrench canopy cover to reduce resource/energy expenditure.

Dominant/dominance
A tree may be referred to as being visually dominant within a landscape. Dominance may also refer to a trees structural dominance over neighbouring trees. As plants, trees require sunlight to photosynthesise. The more a tree can develop canopy cover with access to sunlight the more chance that tree will remain healthy. Groups of trees will effectively complete for sunlight, adapting growth to achieve this. Dominant trees are those which achieve dominance over neighbouring trees. See also **co-dominance** and **suppressed form**.

Dysfunction
The disturbance to physiological aspects of a tree. This may be caused by a pathogen or by physical damage.

Epicormic growth
A shoot that forms from an adventitious bud (see **adventitious shoots**). Sometimes triggered by physiological stress or pruning. Some species produce epicormic growth when healthy, such as common Lime.

Flush-cut
A poor pruning technique in which a branch is removed by cutting into the tissue of the 'parent' branch or trunk, thus unnecessarily harming tissue on parts of the tree being retained. Flush-cut branch wounds are more likely to decay and form cavities.

Hazard Beam
An upwardly curved lateral branch/limb that has strong compressive and tensile mechanical forces acting within it, which can result in a longitudinal splitting referred to as hazard beam failure. These most often result in **incipient failure.**

Incipient failure
The fracture or breakage of a part of a tree that remains partially attached within the tree.

Included bark
Usually occurs within the fork of a tree where two opposed stems grow adjacent each other forming a split to form. This will often result in mechanically weakened forks or **bifurcations**.

Laterals
Limbs that forms the sides of a tree canopy.

Layering
The ability of some species to propagate themselves by developing adaptive root growth on stems that become embedded in soil, such as Willow. This can result in a single 'parent tree' falling into decline, but creating outer new growth from fallen stems, branches.

Lions tailing
A branch with little or no side branches along its length other than the branch end. This is usually the result of poor pruning technique when **crown thinning**. Such branches are more likely to oscillate and fracture in wind, or simply become structurally overloaded.

Loading
Mechanical force applied to a tree or parts of a tree, either through the structure of the tree itself, or external forces such as wind.

Longitudinal
Along the length of a stem, branch etc.

Mulch
A material placed around the base of a tree in order to improve growth potential or heath by suppressing competition of other plants, conserving moisture, reducing fluctuations in soil temperature, and depending on the material used, improving the upper soil nutrients. Mulch can range from mats for newly planted trees, to woodchip or other organic material placed around mature trees.

Monolith
An alternative to tree felling, where the trunk of a tree is retained at a height usually no greater than several metres above ground level. The purpose is to retain deadwood habitat for wildlife. The canopy is fully removed though some primary branches may be retained as stubs. The pruning points around the tree are **coronet cut** to emulate natural branch fractures in order to promote more natural decay patterns and increase potential for habitat and biodiversity.

Occlusion
Also referred to as wound-wood. New wood formation that forms from the exposed cambium around wounds, particularly pruning wounds. Full occlusion occurs when the wound wood covers the wound.

Pioneer species
Species of trees that are adept at colonising land which becomes derelict or unmanaged. Such species are commonly Silver Birch, Willow (particularly Goat Willow), Ash, Alder and Common Oak.

Pollarding
The removal of a tree canopy back to a section of the trunk of primary branches (usually no more than several metres above ground level) and allowing the tree to re-generate. It is a severe form of pruning that is most appropriate in only a few species. Such pruning will normally require re-pollarding to be undertaken on a cyclic basis. Generally between three to five years. Pollarding as a management option is best undertaken when a tree is at a young age, but is most often used on mature trees as an intervention measure.

Reaction Wood
Woody material formed in parts of a tree in order to increase structural support. Such growth is an adaptive response to changes in mechanical loading which may result from changes in exposure, mechanical defects and wood decay. Trees are mechanically 'self optimising'; structurally responding and adapting to the environmental conditions they are in, be that decay, wind exposure, light suppression etc.

Retrenchment pruning
A form of **crown reduction** in over-mature or veteran trees to anticipate or keep pace with decline within the canopy. This may be a phased form of crown reduction which is intended to emulate the progressive shrinkage of canopy into the lower crown.

Root-collar
The point at the base of the trunk between the above ground and underground portion of the tree.

Secondary growth
The growth of wood stems to increase in girth.

Suppressed Form
See also **dominance** and **co-dominance**. A tree develops a suppressed form when neighbouring trees (or structures) block light. A tree depends on sunlight in order to function. Where light may be restricted by larger, more dominant neighbouring trees, a suppressed tree may have little option than to grow towards available light sources in order to survive. This can result in trees forming lateral and leaning growth forms.

Structural root plate
The portion of the roots that are closest to the root-collar. These roots are most important in providing structural support for the tree.

Taper
The rate in which the girth of a branch or stem reduces along its length.

Targets
The potential objects or persons that may be impacted should a tree or parts of a tree fail. A tree within an urban environment would tend to have a much higher target potential than a tree in a field. In the case of development the target potential of a tree may be significantly increased.

Topping
The removal of the upper portions of a tree, usually in a crude manner that results in disfigurement of a tree and potential long term structural and physiological damage. Not to be misinterpreted as Crown reduction.