



**NORTHERN  
TREE SERVICES**

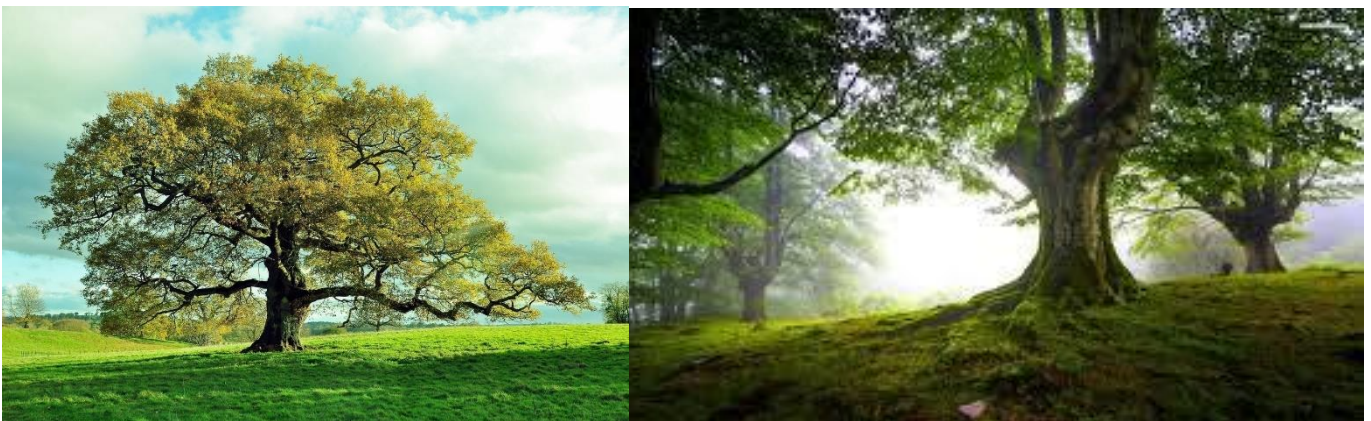
Arboricultural Contractors & Consultants

# Tree Survey Report

Easton Road/ Green Lane, Leixlip

Co. Kildare

September 2021



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## Appendices

Appendix A - Tree Constraints Plan ( PDF & DWG attached)

Appendix B - Tree Survey Schedule

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Tuesday 12<sup>th</sup> October 2021

## Instruction

*The Consultant shall, in accordance with prevailing Standards British Standards Institute. BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. London: BSI. (BS 5837:2012), prepare an Arboricultural Impact Report identifying all trees that are potentially impacted by any of the possible project options.*

## Introduction

The Proposed Development is to provide segregated cycle infrastructure and to upgrade existing cycle lanes on Easton Road/Green Lane in Leixlip falling within Kildare County, Ireland over a distance of approximately 700m. This survey has been commissioned to provide opinion upon the condition of existing trees and to ensure measures are employed to protect those trees suitable for retention.

## Limitations

- The survey was carried out from ground level and only those features significant at the time of survey are recorded
- No samples of wood, roots or soils were taken for analysis.
- There is no guarantee either expressed or implied of the internal condition of the wood or rooting system, or that problems or deficiencies may arise in the future.
- The survey is no guarantee that where trees have been identified as suitable for retention, the whole tree, or parts of it will not fail – trees are living organisms whose health and condition can change rapidly and are obviously affected hugely by unquantifiable high winds. Trees should be checked regularly and especially after storm events.
- The topographic plan provided did not include all of the trees surveyed. These trees' positions were estimated and plotted on the plan by the author, using the positions of street furniture that were plotted for reference.

## Methodology

- The significant trees inside the site ( as illustrated in Photo 1) were assessed from ground level using Visual Tree Assessment techniques, and relevant observations and measurements taken in accordance with those specified in the industry standard document BS5837:2012 “Trees in relation to design, demolition and construction – Recommendations”
- Where trees are sufficiently homogenous, they have been assessed collectively and recorded as a group ( prefix G- on the Schedule).
- An audible investigation of the tree using the Thor 710 nylon mallet is used when decay or cavities are suspected in the trees’ boles.
- Survey forms are contained electronically on Ipad Mini which is contained within an all-weather case.
- A Clinometer is used to measure tree heights.
- Where access to trees is restricted by undergrowth/ obstructions/ site boundaries etc estimations are made of required measurements for health and safety reasons.

## Survey Key

### Tree Numbers

Trees have been affixed with orange plastic tags and numbered, with the numbers pertaining to those in the Schedule. The numbers are also plotted on the plan drawing.

### Age Class – recorded as;

JUV= Juvenile(in first 1/3 of life expectancy).

SM= semi-mature(in middle 1/3 of life expectancy).

M = Mature ( in final 1/3 of life expectancy).

OM = Over Mature (becoming decrepit)

Dead

### Dia-

Diameter in metres measured at 1.5 metres above ground level

### RPA Radius –

Root Protection Area Radius is the minimum area around trees to be protected from disturbance during construction, calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

### Existing Height above Ground Level of (in metres)-

First significant branch, and, Canopy

### Observations –

The results of the Visual Tree Assessment, combining experience and knowledge of tree biology and structure to draw conclusions about the tree’s condition. Only significant details are recorded on the schedule.

**Preliminary Recommendations –**

Proposed remedial tree works irrespective of site plans to ensure safety of users and neighbours

**ERC – Estimated Remaining Contibution**

– in years e.g <10, 10+,20+, 30+, 40+

## Category

The tree retention category system according to BS5837:2012 which grades a tree's suitability for retention

**U** – Trees in such a condition that they cannot be realistically be retained in the context of the current land use for longer than 10 years

**A** - Trees of a high quality with an estimated remaining life expectancy of at least 40yrs

**B** – Trees of moderate quality with an estimated remaining life expectancy of at least 20 yrs

**C** - Trees of low quality with an estimated life expectancy of at least 10 yrs, or young trees with a stem diameter below 150mm

**Subcategory –**

1. - Trees with mainly Arboricultural qualities. 2 – Trees with mainly Landscape qualities. 3. Trees with mainly cultural values , including conservation

## Site Overview

The site is approximately 700m in length on Green Lane, running between Station Road at the Eastern end, and Accomodation Road at the Western end.

The site is fairly level with residential housing and small greens to the north of Green Lane, and GAA pitches and schools dominating the southern side of the road.



*Photo 1 – Satellite view of the site*

## Tree Overview

The trees can largely be found on municipal greens or within the schools' grounds. They are comprised mainly of Lime, Acer and Sorbus and are estimated to be less than 40 years old, with the exception of the Horse Chestnuts to the west of the entrance of Oaklawn and the over-mature Cherrys to the west of the Castleton entrance, among others.



*Photo 2 – View to the West of trees 1&2 – some of the larger trees surveyed*

The trees are generally in good health and have been maintained in the past by crown lifting from the highway, footpaths and greens. Two of the trees (nos 69 & 72) have fungal fructifications indicating advanced decay and should be removed.



*Photo 3 – Tree 69, a cherry with a fructification of the decay fungus Ganoderma adspersum on the bottom right of the bole*





*Photo 4 – Tree 72 – Cherry Plum with fructification of the decay fungus Phellinus.*



*Photo 5 – View West of the mature Horse Chestnuts at Oaklawn*



*Photo 6 – View East of the Maples behind the school wall*



*Photo 7 - View East of the Rowan trees between Green Lane and Castletown*



*Photo 8 - View East to the junction of Green Lane and Station Road ( the largest tree is a quite rare Fraxinus augustifolia)*



*Photo 9 – View West of the mature trees at Cedar Park*

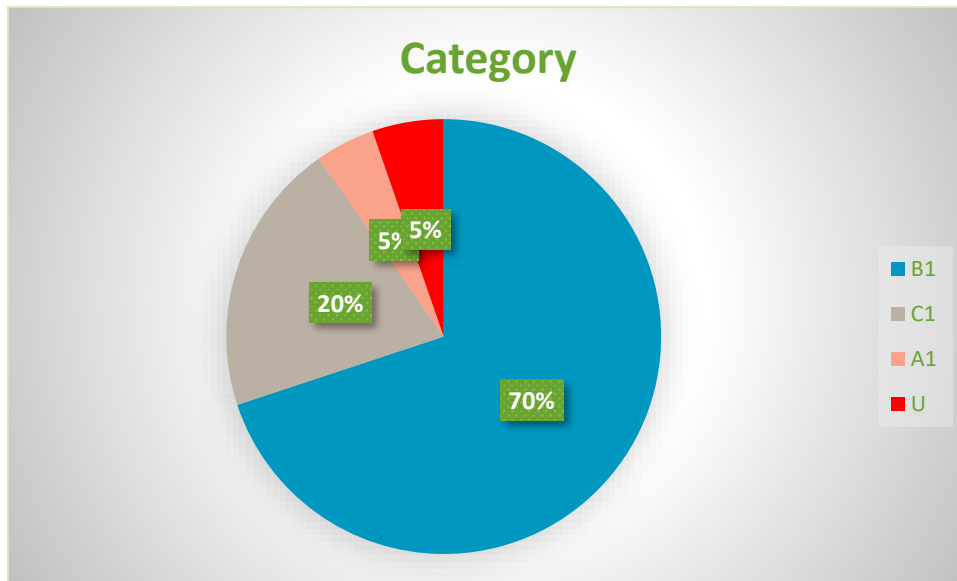


*Photo 10 – View of the Western end of the Survey at Accommodation Road*

## Survey Overview

A total of 113 no. individual trees were tagged and assessed as part of the Survey fieldwork.

Of these 5 no. trees were classed as Category A ( high value), 79 no. trees were classed as Category B ( moderate value), 23 no. were classed as Category C ( low value) and 6 no. were classed as Category U ( unsuitable for retention).



<b>B1</b>	<b>79</b>
<b>C1</b>	<b>23</b>
<b>A1</b>	<b>5</b>
<b>U</b>	<b>6</b>

*Percentage breakdown of the different categories of trees*



## Conclusions

Overall, the trees that were found within the red line boundary are in a fair condition and have an important role to play for any development, both in terms of amenity for existing residents and for the school children who make use of the proposed cycle lanes.

The trees' retention and future health can be easily accommodated during the planning and construction phase by the adoption of linear root protection zones.

It can be reasonably anticipated that the distribution of the trees' roots have been influenced by the existing built structures – the roots are far more likely to explore the soils found under the greens, rather than the hard compacted gravels etc under the footpaths and highway.

If the route of the proposed cycle lane adopts the route of the existing footpaths, the impact of the construction should be minimal.

## Recommendations

Preliminary remedial recommendations for individual trees can be found in the Survey Schedule in the appendices.

## Arboricultural Method Statement

**The Arboricultural Method Statement (AMS)** lays down the methodology for any demolition and/or construction works that may have an effect upon trees on and adjacent to this site. It is essential within the scope of any contracts related to this development, that this AMS is observed and adhered to. It is recommended that this document forms part of the work schedule and that specifications are issued to the building contractor(s) and these must be used to form part of their contract.

### **SEQUENCE OF WORKS (AS PER RECOMMENDATIONS OF BS5837: 2012)**

From commencement of the above development, the following methodology shall be implemented in the manner and sequence described:

1. Pre-contract site meeting
2. Arboricultural pruning and/or removal works: with written Council permission for protected trees
3. Erect *temporary* staked or (where there maybe a risk of root damage) stabilised Tree Protection Barriers (TPB) to establish a fenced-off Construction Exclusion Zone (CEZ): **before** any demolition and/or construction works begin on-site
4. Install *temporary* ground protection (TGP): **before** any demolition and/or construction works begin on-site
5. Route underground services: not within the RPAs of any retained trees
6. Demolition followed by main construction phase
7. Installation of Cellular Confinement Systems (if deemed necessary by the Arboriculturalist)
8. Remove TGP and TPBs
9. Landscape works.

### **1.0 PRE-CONTRACT SITE MEETING**

To outline on-site working methods in relation to trees prior to any demolition/construction activity, a site meeting of the following shall take place:

- Client
- Architect/Planning Consultant/Structural Engineer
- Main Contractor and his site agent
- Arboriculturist

## 2.0 ARBORICULTURAL PRUNING AND/OR FELLING WORKS

1. Before the erection of the temporary protective barrier, all tree removal shall be implemented in accordance with the Tree Survey Schedules.
2. All possible efforts must be made to prevent damage to retained trees including potential root incursion or compaction caused by vehicle access. Temporary ground protection should be used to achieve the latter.
3. All arboricultural works should conform to the recommendations of BS 3998; 2010 '*Tree Work - Recommendations*'
4. All operatives shall be equipped with and use personal protective equipment (PPE) in accordance with Health & Safety Executive current directives and industry codes of practice.
5. Wound sealants shall not be used on any tree.
6. Performance of all arboricultural operations and use of equipment shall be in accordance with current Health & Safety Executive current directives and industry codes of practice.

### 3.0 ERECT TEMPORARY PROTECTIVE BARRIERS (TPB)

1. Following completion of the tree felling and prior to demolition and construction, the main contractor shall erect the temporary protective barriers as detailed in the 'Tree Protection Specification'.
2. Prior to commencement of any site demolition, construction, preparation, excavation or material deliveries, the Arboriculturist shall inspect the installation of the temporary barriers. Any damage occurring to protective barriers during the demolition or construction phase shall be made good by the main contractor.
3. Excavation shall not occur at a distance of less than 300mm from the temporary protective barriers.

### 4.0 INSTALL TEMPORARY (ANTI SOIL-COMPACTION) GROUND PROTECTION (TGP)

1. For wheeled or track construction traffic within retention tree Root Protection Areas (RPA's), ideally the TGP shall be specified by an engineer to accommodate the likely vehicular loading.
2. We recommend the use of Durabase (<http://terrafirma.gb.com/>), Ground Guards ([www.greentek.org.uk](http://www.greentek.org.uk)) or Eve-Trackway (<http://www.evetrakway.co.uk/>) due to their recognised anti-soil compaction properties (i.e. to protect underlying tree roots). **NB.** It is vital that the TGP is in place before any demolition/construction works begin on site.
3. To prevent leakage into the soil area under the TGP, fuels, oils, chemicals and cement must be carried in a portable bunded bowser and petrol must be stored in a ventilated tool box. There must be no mixing/preparation of noxious substances (e.g. cement) on the ground protection surface.
4. The areas designated for ground protection shall be clearly marked on the Architects plan drawing and/or Tree Protection Plan (TPP).

### 5.0 DEMOLITION OF EXISTING STRUCTURES

1. Where trees stand adjacent to structures to be removed, the demolition should be undertaken inwards within the footprint of the existing building (often referred to as "top down, pull back"). Where there is a significant build-up of dust on the foliage, it might be necessary to hose down the tree(s).

### 6.0 MAIN CONSTRUCTION PHASE

1. There shall be no storage of construction material, site parking, site accommodation or equipment in any area designated as the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Barrier.
2. No fires shall be lit within 15m of any tree.
3. The site agent shall supervise deliveries by self-loading crane, with vehicles positioned in such a manner that retained trees are not at risk of damage.

## 7.0 NO-DIG HARD SURFACING - THREE-DIMENSIONAL CELLULAR CONFINEMENT SYSTEMS (CCS)

1. Designed to be installed without the need for soil excavation, therefore eliminating the need for tree root severance and to sustain the vascular function of the woody roots that may extend outwards from beyond the CCS system.
2. Comprised of an expandable cellular mattress that is then in-filled with a clean stone sub-base above a geotextile membrane. The honeycomb-like structure is made of robust high density polythene that is stretched out and filled with clean angular material. The strength of the structure comes from the binding together of the infill, but with a CCS system this is achieved without compaction or a reduction in (rainwater and oxygen) permeability.
3. Perforated cell walls allow the infill to bind with the contents of adjacent cells, but with sufficient space for movement of water and air to nearby underlying tree roots. As the infill contains no fines and the geotextile layers prevent clogging from particles washing into the system, the structure remains permeable and protects tree roots.
4. The *required* permeable surface finish over the CCS ensures aqueous and gaseous exchanges can still occur in the underlying soil.
5. Edging options: Where edging is required for light structures (e.g. footpaths) above-ground pegs and treated timber edging may be acceptable. Where more substantial hard surface areas are required (e.g. access road and driveways) the use of pinned sleepers, gabions or non-invasive haunch kerbing can provide appropriate solutions.
6. Installing a CCS will assist in achieving part of SUDs (Sustainable Urban Drainage) solutions for on-site hard surfacing.
7. Resin Bonded Surface Care and Maintenance: In general, resin bonded surfaces should be regularly swept clean using a hard bristle yard brush, removing leaves and detritus material - this will prevent moss growth and help to maintain the surface's permeability. Periodic Cleaning General: Cleaning of the surface can be carried out by cold pressure washing up to a maximum 150 bar rating to remove dirt and grime. The water should be applied using a fan type lance which should be kept 200mm above the installed resin bonded surface. Care should be taken to prevent damage to the surface with excessive water pressure. Light coloured resin bonded surface blends may show tyre marks and removal by pressure washing as detailed above may be required.



*Photo 11 -Resin Bonded Gravel used across a root-plate of the TROBI Champion Ginkgo at Kew Gardens (London)*

## **8.0 REMOVAL OF TEMPORARY GROUND PROTECTION AND BARRIERS**

Temporary ground protection and protective barriers shall be removed only upon completion of the no-dig hard surface installation works and following written approval of the Council.

## **9.0 LANDSCAPE WORKS**

1. Landscaping works will be implemented in accordance with a scheme approved by the Council.
2. There shall be no rotovation of ground within any area designated as a Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Barrier unless agreed with the Council.
3. Sandy topsoil may be spread within the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) to a depth of no more than 150mm to facilitate the establishment of new vegetation. No other addition of soil or other material shall be carried out within any area designated as a Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) without consultation with the Council.
4. No hard landscaping works or excavation for cables or any other service should be installed within the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) without the written consent of the Council.

# Glossary of Arboricultural terms

**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'

**Aerial Inspection.** A procedure for further inspection carried out by a climbing Arborist

**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

**Attenuated (slender).** Low height/diameter ratio. Fracture-safety may be compromised

**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

**Bollig.** 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, cables or synthetic fibres 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. Can be used to describe a suppressed branch growing from a stem
  - **Sub-lateral.** A third order branch, subordinate to a lateral branch, or stem and usually bearing only either small shoots or 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
- Compartmentalisation.** 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
- 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 wellbalanced

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 the crown is borne on a number of major widely-spreading and secondarily branched limbs (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 microorganisms

**Distal.** In the direction away from the main body of a tree or other living 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 1.5m 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 there is a well defined central main stem, bearing branches which are limited in their length, diameter and secondary branching (cf. Excurrent)

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

**Formative Prune.** Removal of weak, crossing, rubbing, dead, diseased branches to create a structured framework for inhibited growth development

**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 rewetting

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

**Major deadwood.** Deadwood of a diameter likely to cause significant harm or damage upon impact with a target beneath the tree

**Mature Heights (approximate):**

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

**Mass Damping.** The independent movements of leaves, branches and trunk which absorb and dissipate energy delivered in a strong gust of wind, greatly reducing stress on the overall tree canopy

**Microdrill.** 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; 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. woundwood)

**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

**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 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 branch wood and broken snags

**Removal of large diameter dead wood.** The removal of dead, dying and diseased branch wood above a specified size

**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

**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.** The main supporting structure, from ground level up to the first major division into branches. A stem can divide into two or more substantial elements that might be described as co-dominant stems

**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

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

**Understorey 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 and interesting specimen, which has usually lived longer than the typical upper age range for the species concerned

**Vigour.** The expression of carbohydrate expenditure to growth (in trees)

**Vitality.** A measure of physiological condition expressed through the health and growth of foliage, shoots and adaptive woody tissues

**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

**Windthrow.** 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

Incorporating extracts from Lonsdale, D. 1999 *'Principles of Tree Hazard Assessment and Management*

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# Appendix B



**NORTHERN**  
TREE SERVICES

## Tree Survey Schedule

<b>Client</b>	WSP
<b>Site</b>	Easton Rd/Green Lane, Leixlip

<b>Surveyor</b>	D. Gault
<b>Date</b>	22/9/21

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht Abv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
1	Lime	Mature	14	57	6.84	5	5	4	4	2	6	Multistemmed from 2m	None	30+	B1
2	Lime	Mature	12	45	5.4	5	3	5	4	4	7	No gross defects	None	30+	B1
3	Lime	Mature	9	42	5.04	4	3	3	3	3	3	Historic wound at base E.	None	30+	B1
4	Lime	Mature	9	43	5.16	4	3	3	3	3	3	Swelling at 1m	None	30+	B1
5	Lime	Mature	11	55	6.6	5	5	5	5	3	3	No gross defects	None	30+	B1
6	Lime	Mature	11	43	5.16	4	5	4	3	3	3	No gross defects	None	30+	B1
7	Lime	Mature	12	54	6.48	7	3	5	4	3	4	No gross defects	None	30+	B1

### Key to Survey

**Tree No.** - Reference number of tree surveyed - corresponds to number on tag and/or plan

**Age Class** - JUV= Juvenile (in first 1/3 of life expectancy). SM= semi-mature (in middle 1/3 of life expectancy). M = Mature (in final 1/3 of life expectancy). OM= Over Mature (becoming decrepit)

**Dia**- Diameter in cm measured at 1.5 meters above ground level

**RPA Radius** – Root Protection Area Radius is the minimum area around trees to be protected from disturbance during construction

**Crown Spread** – Taken as a minimum at the four cardinal points to derive an accurate representation of the crown

**Existing Height above ground level** (in meters)– of first significant branch and direction of growth. And **Can.** – of the canopy

**ERC – Estimated Remaining Contribution** – in years e.g., <10, 10+,20+, 30+, 40+

**Category** –

**U** – Trees in such a condition that they cannot realistically be retained in the context of the current land use for longer than 10 years

**A** - Trees of a high quality with an estimated remaining life expectancy of at least 40yrs

**B** – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years

**C** - Trees of low quality with an estimated life expectancy of at least 10 years, or young trees with a stem diameter below 15cm

**Subcategory** – **1.** - Trees with mainly Arboricultural qualities. **2** – Trees with mainly Landscape qualities. **3.** Trees with mainly cultural values, including conservation.

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht. Adv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
8	Sorbus	Mature	7	15	1.8	2	2	2	2	2	3	Suppressed by neighbours	None	10+	C1
9	Lime	Mature	15	62	7.44	7	7	7	4	4	3	No gross defects	None	30+	B1
10	Lime	Mature	13	52	6.24	5	3	6	3	3	4	No gross defects	None	30+	B1
11	Lime	Mature	13	52	6.24	6	3	5	3	3	4	No gross defects	None	30+	B1
12	Lime	Mature	11	63	7.56	7	3	5	3	3	3	No gross defects	None	30+	B1
13	Lime	Mature	13	71	8.52	8	7	6	5	3	5	No gross defects	None	30+	B1
14	Lime	Mature	14	45	5.4	4	2	5	4	4	3	No gross defects	None	30+	B1
15	Horse Chestnut	Mature	9	58	6.96	6	6	6	6	2	3	No gross defects	None	30+	B1
16	Horse Chestnut	Mature	11	72	8.64	4	5	6	4	2	3	No gross defects	None	30+	B1
17	Horse Chestnut	Mature	12	79	9.48	5	4	7	5	2	2	No gross defects	None	20+	B1
18	Sorbus	Mature	9	38	4.56	3	3	3	3	2	3	No gross defects	None	20+	B1
19	Cherry	Mature	8	58	6.96	4	3	3	4	3	3	No gross defects	None	20+	B1
20	Lime	Semi-mature	6	17	2.04	1	2	2	3	2	2	No gross defects	None	40+	B1
21	Lime	Semi-mature	8	22	2.64	4	3	2	3	3	3	No gross defects	None	40+	B1
22	Lime	Semi-mature	7	22	2.64	3	3	3	3	2	2	Historic wound to 1m W - mostly occluded	None	40+	B1
23	Lime	Semi-mature	8	21	2.52	3	2	3	3	1.5	2	No gross defects	None	40+	B1
24	Lime	Semi-mature	8	23	2.76	4	2	3	3	2	2	No gross defects	None	40+	B1

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht Abv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
25	Sorbus	Juv	5	13	1.56	1	1	1	1	2	2	Suffering from drought	None	20+	C1
26	Lime	Semi-mature	10	31	3.72	4	4	4	1	2	2	No gross defects	None	40+	B1
27	Lime	Semi-mature	10	26	3.12	4	1	1	4	2.5	2	No gross defects	None	40+	B1
28	Lime	Semi-mature	8	25	3	1	3	3	4	2	2	No gross defects	None	40+	B1
29	Oak	Mature	13	53	6.36	7	7	7	7	3	3	No gross defects	None	40+	A1
30	Sorbus	Semi-mature	7	23	2.76	2	2	1	2	1.5	3	No gross defects	None	20+	C1
31	Cherry	Semi-mature	8	41	4.92	2	4	5	4	3	3	No gross defects	None	30+	B1
32	Lime	Semi-mature	8	27	3.24	2	3	3	2	1	3	No gross defects	None	40+	B1
33	Cherry	Semi-mature	7	23	2.76	0	0	2	2	2	2	Decay at leader. Weighted to S&W	None	10+	C1
34	Lime	Semi-mature	10	32	3.84	4	5	1	3	1	2	No gross defects	None	40+	B1
35	Lime	Semi-mature	10	32	3.84	2	1	3	3	1	2	No gross defects	None	40+	B1
36	Oak	Mature	9	35	4.2	6	5	5	4	2	2	No gross defects	None	40+	A1
37	Hornbeam	Semi-mature	6	29	3.48	2	3	3	2	0.5	2	No gross defects	None	40+	B1
38	Lime	Semi-mature	8	34	4.08	5	5	1	3	1	2	No gross defects	None	40+	B1
39	Cherry	Juv	7	18	2.16	1	1	2	2	1.5	2	Suppressed- poor specimen	None	20+	C1
40	Cherry	Juv	5	19	2.28	1	0	1	1	0.5	2	Suppressed- poor specimen	None	20+	C1
41	Sorbus	Semi-mature	6	27	3.24	1	2	2	2	1	2	Slight loss of vitality	None	20+	C1

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Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht. Abv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
42	Apple	Juv	4	13	1.56	1	2	1	2	1	1.5	No gross defects	None	40+	A1
43	Apple	Juv	4	14	1.68	1	1	1	2	1	1.5	No gross defects	None	40+	A1
44	Sorbus	Juv	4	14	1.68	2	2	2	2	1.5	1.5	Suffering from drought	None	20+	B1
45	Sorbus	Juv	5	18	2.16	2	2	1	2	1.5	1.5	Suffering from drought	None	20+	B1
46	Acer	Mature	14	52	6.24	5	7	5	6	2	4	Group of approximately 6no. stems from ground, sharing crown	None	40+	C1
47	Lime	Semi-mature	5	18	2.16	2	2	2	2	2	2	No gross defects	None	40+	B1
48	Pine (Scots)	Juv	4	10	1.2	1	1	1	0	1	1	No gross defects	None	40+	B1
49	Lime	Mature	10	34	4.08	4	4	4	4	3	2	No gross defects	None	40+	B1
50	Sorbus	Mature	7	32	3.84	3	3	3	2	2	2	No gross defects	None	20+	B1
51	Sorbus	Mature	7	29	3.48	4	4	3	2	3	3	No gross defects	None	20+	B1
52	Sorbus	Mature	4	13	1.56	2	1	2	1	2	2	Poor specimen	None	10+	C1
53	Sorbus	Over-mature	6	24	2.88	1	3	3	2	3	3	Poor specimen. Suffering from drought	None	<10	C1
54	Sorbus	Semi-mature	5	13	1.56	2	2	1	1	2	2	No gross defects	None	20+	B1
55	Sorbus	Semi-mature	5	14	1.68	2	2	2	2	2	2	No gross defects	None	20+	B1
56	Sorbus	Semi-mature	5	13	1.56	2	3	2	1	2	2	No gross defects	None	20+	B1
57	Sorbus	Over-mature	7	26	3.12	3	3	3	2	2	2	No gross defects	None	20+	B1
58	Sorbus	Semi-mature	6	15	1.8	2	3	2	2	2	3	Suffering from drought	None	20+	B1

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht Adv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
59	Lime	Mature	12	40	4.8	5	4	4	3	3	2	No gross defects	None	40+	B1
60	Acer	Mature	11	40	4.8	2	4	4	3	3	3	No gross defects	None	40+	B1
61	Acer	Mature	11	39	4.68	4	3	3	2	3	3	No gross defects	None	40+	B1
62	Sorbus	Semi-mature	6	14	1.68	2	2	1	2	2	2	Dead leader	Remove	<10	U
63	Sorbus	Juv	3	3	0.36	0	0	0	0	2	2	Recently planted. Almost dead	Remove	<10	U
64	Sorbus	Mature	5	14	1.68	2	2	2	2	2	2	Suffering from drought. Probable decay at base from strimmer damage	None	<10	C1
65	Sorbus	Mature	6	16	1.92	3	3	3	3	3	3	Probable decay at base from strimmer damage	None	10+	C1
66	Sorbus	Mature	5	11	1.32	1	1	1	1	3	3	Decay from strimmer damage at base	None	<10	C1
67	Cherry	Over-mature	10	53	6.36	8	6	7	3	2	2	Sprawling crown with decay in limbs	None	10+	C1
68	Cherry	Over-mature	10	58	6.96	6	4	4	5	4	2	Large historic wound at 1m N	None	10+	C1
69	Cherry	Over-mature	10	68	8.16	6	6	3	4	2	2	Ganoderma at 1m E.	Remove	<10	U
70	Sorbus	Mature	8	28	3.36	6	5	3	3	3	2	No gross defects	None	20+	B1
71	Cherry	Over-mature	6	21	2.52	2	3	3	3	3	3	Crooked bole	None	10+	C1
72	Cherry Plum	Over-mature	6	29	3.48	2	3	4	4	3	3	Decay fungus Phellinus pomaceus from 2-3m N & W	Remove	<10	U
73	Acer	Mature	9	43	5.16	4	4	4	4	3	3	OH neighbours roof	None	30+	B1
74	Sorbus	Mature	9	40	4.8	4	4	4	3	3	2	No gross defects	None	20+	B1
75	Sorbus	Mature	8	32	3.84	3	3	4	3	3	3	Decay at base from strimmer damage	None	<10	C1

Tree no.	Species	Age Class	Ht. (m)	Dia. (cm)	RPA Radius (m)	Crown Spread (m)				Existing Ht. Abv. G. Level		Observations	Preliminary Recommendations	ERC	Category
						N	E	S	W	1 <sup>st</sup> Sig.	Can				
76	Birch (Himalayan)	Mature	12	39	4.68	6	6	6	5	3	2	No gross defects	None	30+	B1
77	Sorbus	Mature	6	13	1.56	1	1	1	1	2	2	Dead	Remove	<10	U
78	Sorbus	Mature	5	17	2.04	2	3	3	2	3	2	No gross defects	None	20+	B1
79	Acer	Mature	8	33	3.96	4	3	3	2	2	2	No gross defects	None	40+	B1
80	Acer	Juv	7	14	1.68	1	2	2	3	3	3	Poor specimen	None	30+	C1
81	Acer	Mature	11	28	3.36	4	3	3	2	3	3	No gross defects	None	40+	B1
82	Acer	Mature	10	29	3.48	4	3	4	3	3	3	No gross defects	None	40+	B1
83	Acer	Mature	10	30	3.6	5	3	5	3	4	2	No gross defects	None	40+	B1
84	Acer	Mature	10	27	3.24	5	3	5	2	2	3	No gross defects	None	40+	B1
85	Acer	Mature	9	31	3.72	5	4	5	3	3	3	No gross defects	None	40+	B1
86	Acer	Mature	10	30	3.6	5	6	5	4	3	3	No gross defects	None	40+	B1
87	Acer	Mature	10	28	3.36	4	4	5	3	3	3	No gross defects	None	40+	B1
88	Acer	Mature	9	28	3.36	4	3	5	2	3	3	No gross defects	None	40+	B1
89	Acer	Mature	12	32	3.84	5	2	3	2	4	4	Occluded seam of decay to 1.5m S	None	40+	C1
90	Acer	Mature	14	48	5.76	6	3	7	4	2	3	No gross defects	None	40+	B1
91	Acer	Mature	16	63	7.56	8	7	7	3	3	2	No gross defects	None	40+	B1
92	Acer	Mature	10	42	5.04	4	5	4	4	1.5	2	No gross defects	None	40+	B1
93	Sweet Chestnut	Semi-mature	9	36	4.32	4	5	4	4	1.5	1	No gross defects	None	40+	A1
94	Acer	Mature	10	34	4.08	5	4	3	3	2	2	No gross defects	None	40+	B1
95	Sweet Chestnut	Semi-mature	6	34	4.08	3	3	2	3	2	1.5	Seam of decay to 1.5m S	None	40+	B1
96	Horse Chestnut	Mature	7	37	4.44	4	4	3	2	1.5	1.5	Probable decay at base from strimmer damage. Low vitality	None	20+	C1

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						N	E	S	W	1 <sup>st</sup> Sig.	Can				
97	Cherry	Mature	6	20	2.4	4	4	2	3	1	1.5	Massed ivy	Sever ivy	20+	B1
98	Apple	Mature	6	18	2.16	2	2	2	2	1.5	2	Low vitality	None	10+	C1
99	Elm	Over-mature	7	11	1.32	1	1	1	1	1	1	Dead	Remove	<10	U
100	Sweet Chestnut	Semi-mature	8	27	3.24	4	4	5	5	3	2	No gross defects	None	40+	B1
101	Acer	Mature	10	42	5.04	5	4	5	4	2	3	No gross defects	None	40+	B1
102	Lime	Mature	12	39	4.68	5	5	4	3	2	3	No gross defects	None	40+	B1
103	Sweet Chestnut	Semi-mature	7	23	2.76	4	4	4	4	3	1	No gross defects	None	40+	B1
104	Hornbeam	Mature	8	33	3.96	4	3	2	2	2	2	No gross defects	None	40+	B1
105	Ash	Mature	17	46	5.52	6	7	6	5	3	2	No gross defects	None	30+	B1
106	Birch (Silver)	Mature	9	19	2.28	4	4	3	2	2	2	No gross defects	None	30+	B1
107	Sorbus	Mature	7	14	1.68	2	2	2	1	2	2	No gross defects	None	20+	B1
108	Alder	Juv	4	9	1.08	2	2	0	0	1.5	2	Suppressed	None	10+	C1
109	Alder	Mature	11	31	3.72	1	4	4	1	3	2	No gross defects	None	40+	B1
110	Alder	Mature	8	29	3.48	3	4	1	1	2	3	Forked from 0.5 m - bark inclusion	None	30+	C1
111	Birch (Silver)	Mature	15	31	3.72	5	4	4	4	0.5	2	Large limbs at 0.5m	None	30+	B1
112	Strawberry Tree	Mature	4	15	1.8	2	1	2	1	0.5	2	No gross defects	None	30+	B1
113	Acer	Semi-mature	7	20	2.4	4	4	4	2	1	2	No gross defects	None	40+	B1