

# TREE SURVEY REPORT TREE CONSTRAINTS PLANS

subjects at

Loonbrae, Blairgowrie

for

Gavia Environmental

July 2021

v 1

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## **1. INTRODUCTION**

### **1.1 Instruction**

I have been instructed by Gavia Environmental on behalf of the prospective planning applicant for a site within the curtilage of the childrens' nursery at Loonbrae, Blairgowrie to conduct an arboricultural survey and to report on several trees on (and where present, around) the site.

The principal purpose is to assess their condition and relative suitability for retention in the context of development, based mainly on quality and estimated remaining amenity contribution. I am also to indicate the constraints above and below ground that they would present (if retained) to any design and development.

This information can be used by landowners and designers to select trees for retention and/or the juxtaposition of trees and proposed development.

It does not consider the impact on any of the trees of any specific development proposal.

### **1.2 Reproduction, assignation and reliance**

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Notwithstanding, this report may be made available without the author's express consent to any future owner and developer of the site and to Perth and Kinross Council and to any statutory consultees insofar as the report may be required for Planning matters.

### **1.3 Qualifications**

The industry standard of best practice for such situations is BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* – and it requires tree surveys and assessments to be carried out by an Arboriculturist, defined as "a person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction".

The tree survey work and reporting has been carried out by Julian Morris, a professionally qualified and experienced arboriculturist holding a Bachelor of Science

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Degree, the Arboricultural Association Technicians Certificate, the LANTRA Professional Tree Inspectors Certificate, Certificate of Public Sector Administration and the RICS Diploma in Surveying and being an Associate member of the Institute of Chartered Foresters and a member of the Arboricultural Association and bound by their Codes of Professional Conduct.

## **2. GENERALITIES**

*In this report, terms used that have Initial Capitals are proper nouns, have a recognised formal meaning or are defined in the Glossary appended to the report.*

### **2.1 Purpose and scope**

A report is required in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* – recording the results of a tree survey, providing retention desirability categorisation, above-ground height and spread and giving preliminary advice on appropriate Root Protection Areas ("RPAs") for all the trees or groups of trees. It also reports on any trees that are an imminent and serious hazard to life or property.

The tree survey data, plotted on a site plan to show the tree locations and constraints, may be used as a design tool to inform decisions (in terms of constraints above and below ground, quality and longevity) as to which trees are to be retained and which are to be removed, avoided or pruned to accommodate a specific form of development.

In accordance with BS5837 the trees have been assessed independently of any specific design layout.

A separate report, taking account of a specific design layout, can if required be provided to evaluate trees to be removed and the impact of the proposed development on retained trees ('Arboricultural Impact Assessment') and the physical extent of protection to be provided ('Tree Protection Plan').

The site is identified on the drawings provided to me. I have not been provided with a topographic survey plan showing the position of any trees. The plans provided have been rotated an unknown amount from grid north and so the survey is based on OS mapping.

Where tree positions have been plotted during the tree survey, this has been done using a combination of GPS positions and positions relative to physical features shown on the base map. A degree of imprecision and inaccuracy is inevitable, and the position of trees may have to be plotted more accurately if they are found to be in close proximity to proposed development.

To accord with BS5837, only trees with a stem diameter of 75 mm or more (or in the case of woodlands or substantial tree groups, only individual trees with stem diameters greater than 150 mm) are to be recorded, including any offsite trees that overhang the site or are located beyond the site boundaries within a distance of up to 12 times their estimated stem diameter.

Where it is deemed appropriate, individual trees within homogeneous groups will not be identified; instead the group will be delineated, measured and described collectively.

This report is **not a tree hazard and risk assessment**, and any reporting on risk is restricted to instances (if any) where trees were observed that might present an imminent and serious hazard to life or property (where the risk is assessed as 'Unacceptable'). Where other trees present a lesser (but still less than 'Acceptable') risk to people or property for the existing permitted use of the site, this will be reflected in the categorisation of the tree after any recommended works have been carried out. A separate, systematic, risk assessment may be required during or after finalization of development design.

## **2.2 Generalities – limitations and statutory restrictions**

The survey was carried out in accordance with the Methodology set out in the Appendix to this report. This report is based on a visual inspection from ground level only.

The trees have been assessed only on the basis of endemic weather patterns for the location.

No intrusive or destructive tests were carried out, the survey did not include exhaustive foliar examination (except for purposes of identifying the species) and the inspection was primarily visual and was conducted from the ground and no climbing was done.

The trees have been assessed during a single visit in a single season, in the weather conditions noted in the 'Findings' section of the report, with the limitations that this brings, such as the opportunity to assess the reaction of the tree to a variety of wind strengths and directions, the presence of seasonal fungal Fruiting Bodies, visibility of branch structures or fruit/foilage vitality.

Dense basal epicormics and/or ivy on trees, and occasionally dense undergrowth can obstruct the full inspection of trees. Only enough to reach a preliminary or final conclusion about any such affected trees will have been removed.

I have only checked with the relevant Local Authority as to the existence of Conservation Area designation or Tree Preservation Orders to the extent that I have been instructed to do so. Such designations could have the statutory effect of prohibiting certain tree works or be indicative of the Local Authority's existing view of the importance of the trees to the amenity of the area.

### **2.3 Generalities - Soil and other ground conditions**

No sampling, examination or analysis of the soil was done. Unless otherwise stated, only general assumptions have been made in the course of the survey and reporting about likely ground conditions, related in part to observations of current tree vitality. BS5837 suggests that a soil assessment should be undertaken by a competent person to inform any decisions relating to the root protection area (RPA), tree protection, new planting design and foundation design to take account of retained, removed and new trees.

*Ground conditions, particularly shrinkable clays, relative to new planting design and foundation design to take account of retained, removed and new trees are beyond the scope of this report.*

### **2.4 Generalities - Tree categorisation protocols**

In assessing the merit of the trees and their retention desirability, any specific design layout must be disregarded.

The purpose of the tree categorization method, as stated in BS5837, is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

For a tree (or group of trees) to qualify under any given category, it should fall within the scope of that category, as defined in the British Standard. Trees are categorised (A, B, C or U) by estimated remaining amenity contribution combined with quality.

If a distinction is required for trees in categories A to C, one or more of the three subcategories (1, 2, 3) are added to reflect arboricultural qualities (1), landscape qualities (2) or cultural (including conservation) values (3).

On this last subcategory, it should be noted that 'conservation' is not defined in the Standard and could refer to conservation of historic environment or of nature, or of both. In this report, historic environment and other cultural conservation aspects will be covered only where Conservation Areas or Tree Preservation Orders known to have been made on historical or cultural grounds. Therefore subcategory 3 will be reserved for nature conservation values, specifically ancient or veteran trees.

### **3. INVESTIGATIVE FINDINGS**

#### **3.1 Practicalities**

The tree survey was undertaken on 21<sup>st</sup> July 2021. The conditions were still, hot, dry and sunny.

No access was taken to adjacent land.

Every tree (over 75mm diameter) on-site recorded individually has been affixed with a uniquely numbered tag (see picture below).



*Individual tree (left) and Group (right) tags if applicable*

No older tags were found on the trees.

There were no offsite trees that overhang the site or are located beyond the site boundaries within a distance of up to 12 times their estimated stem diameter.

#### **3.2 Site description (general)**

The site is within the curtilage of the childrens' nursery. Its exact extent within the larger site is not yet defined and the proposal may involve service connections or soakaways within the wider site as well as inevitable construction access. A number of trees have been recorded where it appeared that they may be considerations in a satisfactory layout that presumes against the loss of trees.

The site is bounded on the east and south west by stone walls and on the north west by a retaining wall beyond which to the north is a wooded area.

The site is generally level. It is moderately exposed to prevailing weather from the south.

No bodies of water or water courses on or near the site present a flooding risk materially affecting the trees.

### 3.3 Trees and categorisations

A total of about 15 trees on and around the site were recorded individually.

Shrub species were noted but are generally considered shrubs that do not come within the remit of the British Standard, and individuals have only been recorded if they had the stature of what one would ordinarily call a 'tree'.

The investigative findings for the survey stage (species, description, measurements, characteristics, categorisation etc.) are summarised in **the first Appendix** to this report.

The retention desirability categorisation of the trees follows the guidance in BS5837. Greatest consideration could be given to retaining Category A and B trees (i.e. generally those with an estimated Remaining Contribution of 20 or more years). A fuller explanation is given in **Appendix 5** to this report.

Typically designers make the assumption that the amenity contribution of Category C trees (typically, those having an Estimated Remaining Contribution of 10 to 20 years) and Category U trees are likely to be exceeded by the design life of any proposed development, and these may be suitable for retention only in low risk or low visibility locations, as contributions to high/moderate quality tree groups or in positions where a replacement tree would be desirable in due course.

### 3.4 Veteran or ancient trees

The survey did not identify the presence of individual veteran or ancient trees on the site.



## **4. TREE CONSTRAINTS**

*The tree constraints plan(s) referred to in the following sections are available in CAD format for use in detailed design.*

### **4.1 Above ground constraints**

The spread of the crowns of the recorded trees have generally been estimated at 4 cardinal points. Only the average spread has been given where crowns were found to be approximately circular in horizontal extent.

The extent of the crowns is plotted on the Tree Constraints plan appended to this report, colour-coded to give an immediate overview of their relative retention desirability.

The plan also indicates as 'Unclassified' any small or offsite trees that were recorded only for reference purposes or context. These do not present any material constraints above or below ground.

IF GROUPS For groups, the extent of the Group including the crown spreads of edge trees, is shown on the plan.

*Within groups the spread of individual trees may overlap, such that the removal of individual trees from the group, may not allow construction in the volume that had been occupied by those trees. Importantly, removal of trees from Groups will result in loss to the remaining trees of companion shelter and may reduce the wind-firmness of remaining trees within the Group or the whole Group and/or may result in storm breakages of limbs or forks.*

Using the plan as a guide, it may be appropriate to define areas within which development may be constrained by the presence of tree crowns or canopy. That said, the crown spreads do not necessarily represent the height at which crowns might constrain development.

To aid with this I have provided an average or representative crown or canopy height.

Development below this height may be possible, or selective branch removal may be possible whilst retaining the rest of the tree.

### **4.2 Below ground constraints (present)**

The root protection area ("RPA") indicates the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

The extents of root protection areas for each tree are plotted on the Tree Constraints Plan appended to this report.

Where there was no need to modify the Root Protection Areas of individual trees, the default circular RPAs suggested by BS5837 have been plotted.

If and where pre-existing site conditions or other factors indicate that a normal depth of rooting exists but is distributed asymmetrically influenced by past or existing site conditions (e.g. the presence of impermeable surfaces, underground vertical structures, permanent waterlogging or known underground apparatus), a polygon of equivalent area has been produced, based on an arboricultural assessment of likely root distribution.

It was particularly noted and assumed that the boundary wall and retaining wall have truncated or been a constraint to radial rooting.

The RPA represents a volume of soil, and where rooting is deeper than normal the overall superficial area of the RPA may be reduced to reflect downward rooting in adequately drained soil. This is to be expected, for example, where roots develop downwards at retaining walls.

The plotted Root Protection Area is occasionally less than that stipulated in BS5837, and this has been used where the evidence suggests that the vitality of the tree is significantly compromised by a lack of adequate existing rooting volume.

In due course this or circular RPAs may need to be modified further due to -

- a) unseen underground apparatus, structures etc.;
- b) topography and drainage;
- c) the soil type and structure;
- d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management

N.B. 'Root Protection Area' is a concept defined in BS5837 for optimal 2 dimensional representation of suitable and sufficient rooting volume; dependent on factors such as tree species, life-stage and condition there may be alternative 2 dimensional shapes and/or areas that would contain equally suitable and sufficient rooting volume that would maintain the tree's viability.

#### **4.3 Below ground (future - advisory)**

The following are some other aspects that are beyond the reporting requirements of BS5837 at this stage but may be relevant design constraints.

a. BS5837 offers advice about the minimum distance that should be left between trees and various structures, services and surfaces to avoid future direct damage to those. This would require, among other things, an estimate of eventual stem diameter at maturity. As a precaution, it is recommended that no buildings, services or hard surfaces are proposed within 3 metres radius of the centre of any retained or proposed tree without further arboricultural advice as to growth potential, longevity and mitigation design measures that could be put in place to avoid or reduce such damage potential.

Notwithstanding, where existing underground structures have effectively prevented the radial spread of existing roots, proposed underground structures in the same or similar (but no closer) position are likely to be acceptable if they are of equivalent effectiveness in preventing root development at all soil depths.

b. BS 8002:2015 *Code of Practice for Earth Retaining Structures* makes recommendations about the proximity of trees to retaining structures relative to species and mature height of trees.

c. The NHBC has published guidance (Chapter 4.2) on meeting the technical requirements when building near trees, shrubs and hedgerows, particularly on shrinkable soils. This guidance may be relevant even if a development will not involve the NHBC or housing.

#### **4.4 Tree shade and shadow**

BS5837 provides a method of predicting the effect of tree shade and shadow on development sites, but this is not mandatory. Trees close to development can reduce the amount of sunlight and skylight to open spaces and windows, in some cases causing light levels to fall below the recommended levels. However, I consider that the recommendations in BS5837 for portraying the shade from individual trees is not a reliable or useful design tool. I have therefore not reported this aspect of the constraints that trees would present to development design.

Trees are seasonal in effect and species can be a significant factor. It can be said generally, though, that shading is worst on the north side of trees and/or where many crowns coalesce to form a dense barrier to light.

Daylighting assessments of individual retained trees or groups of trees can be carried out on request, using the detailed methods published by the Building Research Establishment. This may require further survey effort, since the shading and shadowing zone of influence of trees can be much greater than the distances covered by assessments of physical constraints (4.1 and 4.2 above).

#### **4.5 Statutory constraints**

I have not checked with the relevant Local Authority as to the existence of Conservation Area designation or Tree Preservation Orders which has or could have the statutory effect of prohibiting certain tree works or tree damage, or be indicative of the Local Authority's existing view of the importance of the trees to the amenity of the area.

Separate consent or notification would normally be required for tree works or wilful tree damage in a Tree Preservation Order or Conservation Area. It should be noted, though, that the cutting down, topping, lopping or uprooting of a tree when (and only to the extent that) that work is immediately required for the purposes of carrying out development authorised by detailed planning permission does not require separate consent. It is therefore advisable that all tree works that are proposed for the development (and any proposed replanting, whether compensatory or not) of a site are explicitly stated in any application.

A 'felling permission' is usually required from Scottish Forestry for larger volumes of timber. A number of exemptions exist, including for trees with a diameter not exceeding 10 centimetres, trees in orchards, gardens, churchyards or public open spaces, felling where the aggregate cubic contents 5 m<sup>3</sup> in any quarter (except in small native woodlands of Caledonian Pinewoods), the prevention of immediate danger to persons or to property, trees badly affected by Dutch Elm Disease and dead trees.

#### **4.6 Woodland removal constraints**

Woodland removal can trigger Government policies protecting against the loss of woodlands generally. Protection can be more stringent where remnants of ancient woodland character are present. There is no legal definition of 'woodland'. Areas over 0.1 Hectare with 20% or more canopy cover could in certain circumstances be deemed as woodland.

However, there are no areas comprising woodland on the site.

## 5. RISK REDUCTION RECOMMENDATIONS

As required by BS5837, this report must address only serious risk.

One tree was assessed as presenting an imminent and serious hazard to life or property for the existing permitted use of the site. This is indicated in the **first Appendix** with a risk of 'Unacceptable', together with recommended works to reduce the level of risk to 'Acceptable' or lower.

## 6. SUMMARY AND CONCLUSIONS

All the trees on and around the site have been identified, measured and recorded and then categorised for relative retention desirability, all in accordance with BS5837.

There were no trees on adjacent land that had to be recorded.

The position of the trees, and the extents of their crowns (colour coded for relative retention desirability) are represented on the Tree Constraints Plan.

The trees and groups of trees have had their Root Protection Areas calculated with reference to species, growing environment and other factors and a representative proportion of these have been plotted, modified from simple circles where known or expected ground conditions require it. These are represented on the Tree Constraints Plan.

A CAD version of the plan is being made available for viewing in greater detail and for use by designers if required.

The survey did not note the presence of any ancient or veteran trees on the site.

The advisory method in the British Standard for indicating the shading from the trees has been omitted, as it does not provide a useable quantification of daylighting.

The report also refers to other Standards and advisory factors by which trees might present constraints to development.

No checks have been made on statutory restrictions on tree works. Separate consent would normally be required for tree works in a Tree Preservation Order area or Conservation Area or the felling of larger volumes of timber, unless exempted, and in particular by the grant of detailed planning permission.

One or more trees were found that might present an imminent and serious hazard to life or property. Appropriate recommendations have been made.

**The tree survey has done independently of any development proposal.**

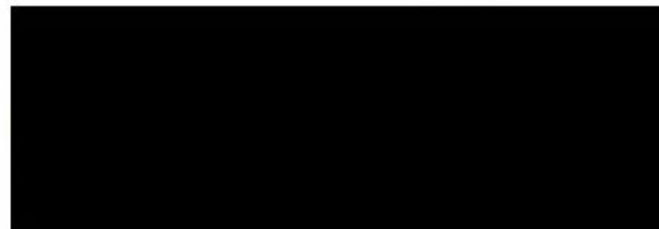
*BS 5837 recommends that “The constraints imposed by trees, both above and below ground (see Note to 5.2.1) should inform the site layout design, although it is recognized that the competing needs of development mean that trees are only one factor requiring consideration.” The tree data can be used to inform site layout,*

*including during construction. Having regard to the Estimated remaining Contribution and quality of each tree or group (represented by the retention desirability category) and the design life of the development proposal, factors such as shading of buildings and open spaces, privacy and screening, amenity value of trees, future pressure for removal, seasonal nuisance, servitudes and wayleaves and statutory undertaker powers and requirements, regulatory protection, soil shrinkability (subsidence or heave), known or potential tree risk and conservation benefits need to be weighed up alongside other design considerations to achieve a satisfactory juxtaposition of trees and site usage.*

This report provides only a baseline for detailed design or tree retention proposals, for which further advice on selection for retention and arboricultural impact assessment and/or arboricultural method statements may be recommended as development proposals evolve.

Julian A. Morris

Signed

A large black rectangular redaction box covering the signature of Julian A. Morris.

Dated

July 2021

**Julian A Morris Professional Tree Services**

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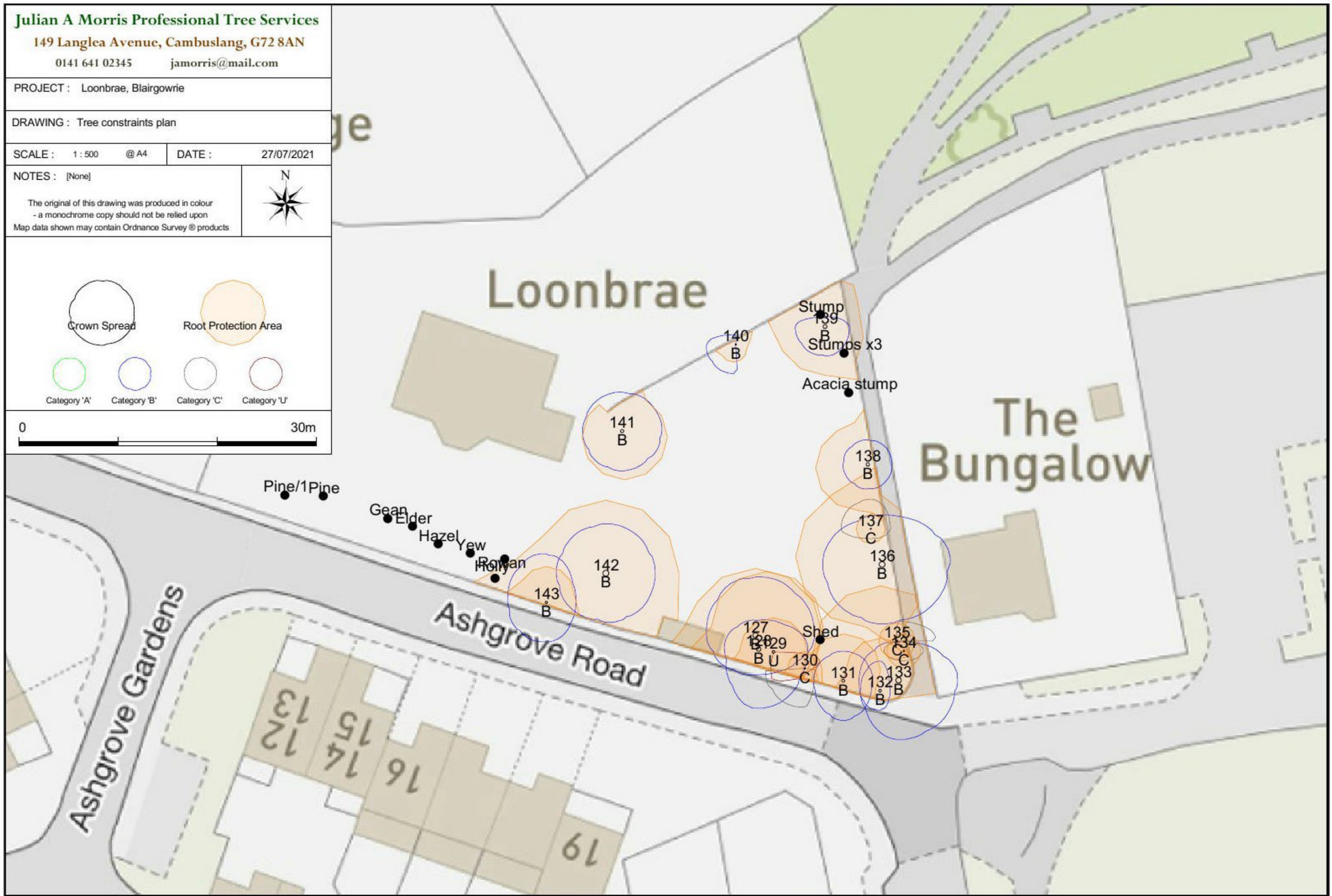
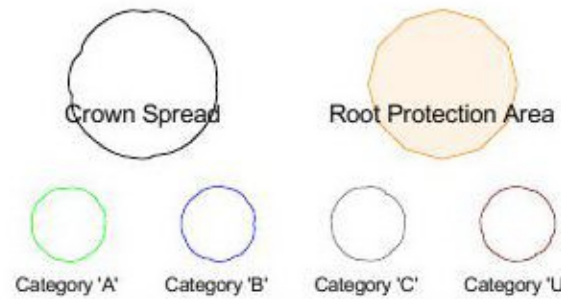
PROJECT : Loonbrae, Blairgowrie

DRAWING : Tree constraints plan

SCALE : 1 : 500 @ A4 DATE : 27/07/2021

NOTES : [None]

The original of this drawing was produced in colour  
- a monochrome copy should not be relied upon  
Map data shown may contain Ordnance Survey © products





**APPENDIX 1 - TREE DATA**

**LOCATION:** Loonbrae, Blairgowrie

**DATE:** July 2021

Tag	Species	Binomial	Stems (if >1)	Meas ured DBH (mm)	Ht. (m)	Spread (m)				Crown ht.(m)	ht 1st	dir 1st	Observations	Cond- ition	Life- stage	ERC (yrs)	Grading	risk	action
						N or ave.	E	S	W										
143	Hazel	<i>Corylus avellana</i>	6<10	230	5	5	3	4	4	1.5 to 2.5			Multistemmed.soul compaction and damage to surface roots.	Fair to good	Mature	10 to 20 yrs	B		
142	Western Red Cedar	<i>Thuja plicata</i>	2	820	17	5				2.5 to 3.5			Triple stemmed by 3m. Soil compaction W. Minor root damage. 2large pruning wounds around 3m.	Fair	Early-mature	20 to 40 yrs	B		
141	Bhutan Pine	<i>Pinus wallichiana</i>		350	9	4				1.5 to 2.5			Excurent. Dead minor roots S.	Fair to good	Semi-mature	>40 yrs	B		
140	Plum	<i>Prunus domestica</i>		110	6	1	0	3	3	0 to 1				Fair to good	Semi-mature	20 to 40 yrs	B		
139	Scots Pine	<i>Pinus sylvestris</i>		400	14	1	2.5	3	3	1.5 to 2.5		SW	Lower deadwood. Excurent	Fair	Early-mature	20 to 40 yrs	B		
138	Lawson Cypress	<i>Chamaecyparis lawsoniana</i>		350	11	2.5				0 to 1			Minor soil compaction. Very close to wall	Fair to good	Semi-mature	20 to 40 yrs	B		
137	Lawson Cypress	<i>Chamaecyparis lawsoniana</i>		120	6	3	2	1	3	0 to 1			Ellwoodii. Lower deadwood	Fair	Semi-mature	10 to 20 yrs	C		
136	Beech	<i>Fagus sylvatica</i>	3	580	18	5	7	6	6	2.5 to 3.5			Triple stemmed from base. Large stump or stub at base. Some soil compaction.	Fair	Early-mature	20 to 40 yrs	B		
135	Pear	<i>Pyrus communis</i>		150	5	2	4	0	0	2.5 to 3.5			Crown bias NE	Fair	Semi-mature	20 to 40 yrs	C		
134	Lawson Cypress	<i>Chamaecyparis lawsoniana</i>		140	6	1	2	1	2	1.5 to 2.5			Suppressed	Fair	Semi-mature	10 to 20 yrs	C		
133	Copper Beech	<i>Fagus sylvatica</i> 'Purpurea'	2	560	18	4	6	6	4	1.5 to 2.5			Several buttress abrasions. Twin stemmed from fair inclusion fork at 1m.	Fair to good	Early-mature	>40 yrs	B		

**APPENDIX 1 - TREE DATA**

**LOCATION:** Loonbrae, Blairgowrie

**DATE:** July 2021

Tag	Species	Binomial	Stems (if >1)	Measured DBH (mm)	Ht. (m)	Spread (m)				Crown ht.(m)	ht 1st	dir 1st	Observations	Condition	Life-stage	ERC (yrs)	Grading	risk	action
						N or ave.	E	S	W										
132	Lawson Cypress	<i>Chamaecyparis lawsoniana</i>		290	16	3	1	2	2	1.5 to 2.5			Lower small deadwood	Fair to good	Semi-mature	20 to 40 yrs	B		
131	Yew	<i>Taxus baccata</i>	2	300	11	3	3	4	3	1.5 to 2.5				Fair to good	Early-mature	>40 yrs	B		
130	Silver Birch	<i>Betula pendula</i>		140	4.5	0	1	4	4	1.5 to 2.5			Strong bias S	Fair to good	Young	20 to 40 yrs	C		
129	Scots Pine	<i>Pinus sylvestris</i>		280	6	0	5	3	0	2.5 to 3.5			Very decayed stem. Heavily imbalanced SE.	Poor	Semi-mature	<10 yrs	U	Unacceptable	Remove to max 2m
128	Scots Pine	<i>Pinus sylvestris</i>		460	15	3	5	6	3.5	1.5 to 2.5			Minor deadwood	Fair to good	Early-mature	20 to 40 yrs	B		
127	Scots Pine	<i>Pinus sylvestris</i>		550	17	6	6	4	5	2.5 to 3.5			Minor deadwood	Fair to good	Mature	20 to 40 yrs	B		

## APPENDIX 2 - GLOSSARY OF TERMS

**Adaptive growth:** An increase in wood production in localised areas in response to a decrease in wood strength or external loading to maintain an even distribution of forces across the structure.

**Adventitious/epicormic growth:** New growth arising from dormant or adventitious buds directly from main branches/stems or trunks.

**Binomial:** Unless otherwise stated the Linnaean binomial name of the species is stated for the avoidance of any ambiguity arising from varying usage of common names.

**Bracing:** The installation of cables, ropes, rods and/or belts to reduce the probability of failure of parts of the tree structure due to weakened elements under excessive movement.

**Callus:** Undifferentiated tissue initiated as a result of wounding and which become specialised tissues ('Woundwood') of the repair over time.

**Cavity:** A void within the solid structure of the tree, normally associated with decay or deterioration of the woody tissues.

**Co-dominant stems:** Two or more, generally upright, stems of roughly equal size and vigour competing with each other for dominance.

**Compression fork:** an inherently weak fork in which continued radial growth of two competing substems results in pressure which tends to push the fork apart.

**Conservation Area:** A designation made under the Planning Acts in the interest of preserving or enhancing the special architectural or historic character or appearance of an area.

**Crown:** The foliage bearing section of the tree formed by its branches and not including any clear stem/trunk.

**Crown Lifting:** The removal of the lowest branches and/or preparing of lower branches for future removal.

**Crown Reduction:** The reduction in height and/or spread of the crown of a tree.

**Crown Spreads:** The extent of the live crown, measured from the centre of the base of the canopy, in each of the four cardinal points (in the order north, east, south, west)

**Crown Thinning:** The removal of a portion of smaller/tertiary branches, usually at the outer crown, to produce a uniform density of foliage around an evenly spaced branch structure.

**Condition:**

Good	Generally free from defects and in good health
Fair	Reasonably healthy but defects are present that may adversely affect Estimated Remaining Contribution but that may be addressed in the short term by minor intervention
Poor	In decline and/or defective requiring major intervention
Dead	No signs of life or so little that death is inevitable

**Construction Exclusion Zone (CEZ):** area based on the Root Protection Area (and low crowns) from which access is prohibited for the duration of a project

**Decurrent:** Widely spreading on several limbs

**DBH/Diameter:** Stem diameter, more fully known as Diameter at Breast Height (1.5m).

**Dieback:** No signs of life on branch tips due to age or external influences.

**Epicormic Growth:** See Adventitious Growth

**Excurrent:** Having a main stem and radiating limbs of limited length

**Estimated Remaining Contribution:** The number of years that the tree in substantially its current form (or better) is expected to continue to make an arboricultural or landscape contribution.

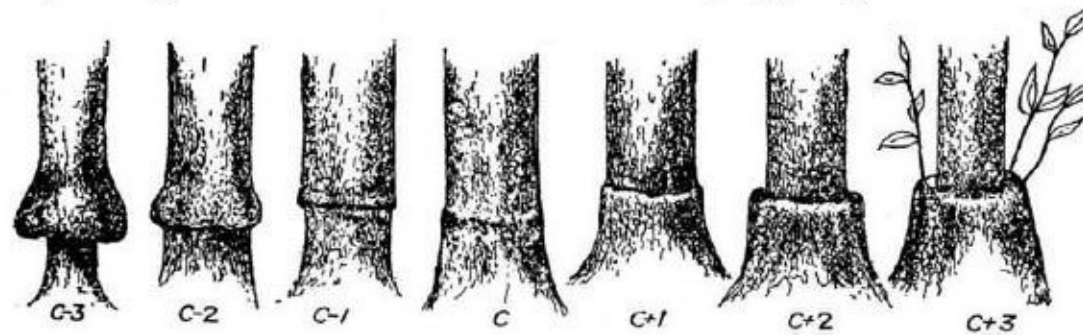
40+ years	corresponding with BS 5837	40+ years
20 to 40 years	corresponding with BS 5837	20+ years
10 to 20 years	corresponding with BS 5837	10+ years
0 to 10 years	corresponding with BS 5837	less than 10 years

**Fruiting bodies:** The fruiting body is the spore bearing, reproductive structure of that fungus.

**Graft:** The growing together, naturally or deliberately, of two plant parts (including from different

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species or varieties) with joined vascular cambia. Varying degrees of compatibility (see below)



**Hazard beam:** Upwardly curving part of a tree prone to longitudinal splitting

**Inclusion fork:** A compression fork further weakened by the inclusion of bark from both competing substems at their interface.

**Life Stage:**

Newly planted	Not fully established and capable of being transplanted or easily replaced
Young	Establishing, usually with good vigour
Early mature	Established, usually vigorous and increasing in height
Mature	Fully established around half their species' life expectancy, generally good vigour and achieving full height potential but crown still spreading
Late mature	Moderate vigour, no additional height expected and growth rate slowing
Over-mature	Fully mature, in last quarter of life expectancy, vigour decreasing
Veteran	See Veteran definition
Ancient	Beyond maturity, old in comparison with other trees of the same species; showing Veteran (see below) values and characteristics because of age rather than past events

**Occlusion:** growth of callus and wound wood, sealing wounds.

**Planning Acts:** Primary Planning legislation in Scotland relevant to trees and their protection, principally the Town & Country Planning (Scotland) Act 1997, the Planning etc. (Scotland) Act 2006 and The Town and Country Planning (Tree Preservation Order and Trees in Conservation Areas) (Scotland) Regulations 2010.

**Pollard:** The removal of the top of a young tree at a prescribed height to encourage multi-stem branching from that point, repeated on a cyclical basis always retaining the initial pollard point.

**Quality/Value Category:** As defined and used by BS5837 -

- A Trees of high quality and value
- B Trees of moderate quality and value
- C Trees of low quality and value

Subcategories of these record the main value of the tree

- 1 Mainly Arboricultural values
- 2 Mainly landscape values
- 3 Mainly cultural values, including conservation

**Retrenchment pruning:** A form of reduction intended to encourage development of lower shoots and emulate the natural process of tree aging.

**Risk Category:** In accordance with the Health & Safety Executive's general parameters.

- Lower than 1:1,000,000 'Acceptable'                      Between 1:1,000,000 and 1:1,000 'Tolerable'
- Higher than 1:1,000 'Unacceptable'                      So low that it cannot be quantified, 'Negligible'.

**Root Protection Area (RPA)** layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

**Tree Preservation Order:** An Order made under the Planning Acts in the interests of the amenity of an area.

**Veteran:** A survivor that has developed some of the habitat features such as wounds or decay found on an ancient tree, not necessarily as a consequence of time, but of past events or its environment. It may look old relative to other trees of the same species.

**Vigour:** The health and resilience of a tree reflected in shoot extension, leaf size and density.

**Woundwood:** lignified and differentiated tissue produced as a response to wounding.

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### **APPENDIX 3 - SURVEY METHODOLOGY & LIMITATIONS**

This methodology complements the methodology requirements of BS5837, which are not restated here.

Each tree is inspected initially from a distance to ensure closer inspection is safe.

The position of trees or the outline of groups is captured on site using a Geographic Information System ('GPS') and the trees' attributes are recorded as a map layer. These are brought into the report as an Excel spreadsheet for processing and use. The data includes a 16 digit Ordnance Survey grid reference, which may be used to plot trees or group polylines on a georeferenced plan. The strength and position of satellite signals used by GPS is variable in quantity, strength and quality, and reflections from buildings, fences or vehicles can result in aberrations. Generally 1.5 metre GPS accuracy is achieved, suitable only for indicative relative position of trees. If these are within 12 x their stem diameter of any linear features, their distance and orientation relative to those features is measured and recorded.

The height is estimated by the use of a clinometer and trigonometry. Distances are measured using calibrated paces or a laser measuring device, adjusted where necessary for the terrain.

Diameters of stem are measured using a diameter tape which measures circumference ('girth') and gives the equivalent average diameter. Where trees are multistemmed from below 1.5m, either the diameter at a lower representative point, or the equivalent stem diameter of the combined cross sectional area of all the stems is given. For offsite trees, stem diameters are estimated using a laser measurement device and tacheometry; distances are estimated.

The tree species is identified from knowledge supported by Johnson and Moore (see Fuller Citation at Appendix 4) using bark, buds, twigs, fruit, flowers, form and habit.

Binoculars are used where appropriate to examine visible features and structures above a few metres in height. A hand lens is used to examine small features and to help narrow down the list of possible species of any pathogen growths on the tree.

Whilst it is not possible without laboratory examination and testing to confirm definitive identifications of pests, diseases and fungal infections, all reasonable attempts are made to eliminate possibilities and in most cases a species or genus or a common name can be stated with a reasonable degree of confidence that the implications arising from the identification will be appropriate to the other outcomes of the report such as risk assessment, recommendations and Estimated Remaining Contribution.

Soundings will be taken either with a rubber mallet or a nylon-tipped hammer to try and ascertain the existence and likely extent of cavities or other invisible decay. Cavities will be inspected visually with a torch only insofar as this is reasonably possible from the ground, removing only enough of loose material as is necessary to reach conclusions about the extent and nature of decay or defects.

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Except to the extent stated in the report, the assessment is based on a visual inspection from ground level only, from publicly accessible and privately available vantage points.

Soil present around the base of trees is not removed and root collars are not examined except where, and to the extent, they are already exposed. No sampling, examination or analysis of the soil was done. No intrusive or destructive tests is carried out. The survey does not include exhaustive foliar examination (except for purposes of identifying the species).

Trees are generally assessed during a single visit, with the limitations that this brings, such as the opportunity to assess (i) the reaction of trees to a variety of wind strengths and directions, (ii) the presence of seasonal fungal Fruiting Bodies, (iii) foliage density (iv) structural elements concealed by foliage. Only a broad indication of the intensity of usage of the site and the immediately surrounding land and pedestrian/vehicle routes is gained from a single visit.

Obstacles liked dense basal epicormics and/or ivy on trees, and occasionally dense undergrowth can obstruct the full inspection of trees, including their rooting area. Only enough to reach a preliminary or final conclusion about any such affected trees will be removed.

#### **APPENDIX 4 - Fuller citation of texts, if referred to**

Strouts and Winter (1994) *Diagnosis of ill-health in trees*

Mattheck and Breloer (1994) – *The body language of trees*

Roberts, Jackson and Smith (2006) – *Tree Roots in the Built Environment*

British Standards Institute (2011) – *BS3998: Recommendations for tree work*

British Standards Institute (2012) – *BS5837: Trees in relation to design, demolition and construction - Recommendations.*

Johnson and Moore (2004) – *Collins Tree Guide*

White, John and Forestry Commission (1998) - *Estimating the Age of Large and Veteran Trees in Britain' - Forestry Commission Information Note*

Schwartz, Engels and Mattheck (2000) - *Fungal Strategies of Wood Decay in Trees*

Mynors (2002) – *The Law of Trees, Forests and Hedgerows*

Health & Safety Executive (2001) - *Reducing Risk, Protecting People*

British Standards Institute (2008) – *BS8206-2: Lighting for buildings. Code of practice for daylighting*

Littlefair, Paul, BRE (2011) – *Site Layout Planning for Daylight and Sunlight*

British Standards Institute (2015) *BS8596 Surveying for bats in trees and woodland – guide*

British Standards Institute (2015) *Microguide to surveying for bats in trees and woodland*

Statutory Nature Conservation Organisations/ Bat Conservation Trust (2015) – *Method Statement for the Appropriate Use of Endoscopes by Arborists*

Arboricultural Association (2017) *Guidance Note 11 Aerial Inspections: A guide to good practice*

Arboricultural Association (2020) *Guidance Note 12 The use of cellular confinement systems near trees: A guide to good practice*

## APPENDIX 5

Table 1 Cascade chart for tree quality assessment

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