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Arboricultural Implications Assessment and Arboricultural Method Statement Proposed Garage on Land at Bank Farm, The Green, Bagnall ST9 9JR

1 INTRODUCTION

1.1 N& J Tree Services have been commissioned by Mr David Pearson to conduct an arboricultural survey of a mature tree that is situated on the perimeter of the above site adjacent to the land where the proposed garage is to be constructed. This report details the arboricultural impact of developing the site, subsequent mitigation recommendations and protective measures.

1.2 The survey was carried out on 7th January 2015 by means of inspection from ground level by a qualified Arboricultural Consultant. Trees were assessed in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.*

1.3 Under the British Standard the assessment of trees is made objectively. The categorisation method identifies the quality and value of the existing tree stock.

1.4 A total of one individual tree (T1) within the boundary of the development area was surveyed and mapped (refer to appendix 3 aerial photograph for tree location). All arboricultural information recorded during the survey is presented at appendix 2.

1.5 The nature of the soils on site was not assessed during the survey. The possibility of soil movement due to tree root activity cannot be discounted.

1.6 This report provides the results of the survey and includes the following:

- A schedule of all trees located within the proposed development site (Appendix 2);
- An assessment based on *BS 5837:2012*, of trees in terms of their potential value within any future development.
- On the basis of this assessment trees have been categorised into one of four categories: A, B, C or U ;
- An assessment, based on *BS 5837:2012*, of the requirement for protection of trees during the construction phase (Section 7);
- Advice on removal, retention and management of any trees (Sections 5 and 8);
- A Tree Constraints Plan detailing tree quality categories, for all trees surveyed ; which includes details trees to be retained and removed and temporary tree protection fencing alignment (Appendix 1) .
- An arboricultural method statement relating to the report (Section 9)

2. THE SITE AND SURROUNDINGS

2.1 The survey area is located in the rear garden of the property; the tree is actually situated in the rear garden of the above property on the dry stone boundary wall that runs along the west perimeter of the site adjacent to a bridle path.

2.2 Weather conditions during the survey were overcast with a light north westerly wind.

Image 1: View of tree looking south west from driveway / side of existing garage

3.0 DEVELOPMENT PROPOSALS

3.1 The proposed construction of a garage

4.0 TREE POPULATION

4.1 One tree (T1) was recorded that is growing adjacent to the development boundary area of the site. This is included within the *BS 5837:2012* quality a category is provided at Appendix 2.

4.2 The tree population recorded is entirely confined within the formal garden area of Bank Farm Bagnall due west of the proposed garage construction.

Tree Quality Categorisation

4.3 Under *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* trees and groups are objectively assigned a quality category designed to quantify their value within any future development. Table 1, below, presents a summary of the categories presented in the British Standard.

Table 1: Summary of *BS 5837:2012* tree quality categorisation criteria

Category A	Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value
Category B	Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value
Category C	Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits
Category U	Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infection pathogens

5.0 Arboricultural implications of the proposed development

5.1 Table 2 lists the number and quality of trees that will require removal in order to facilitate the development proposals and those that can be retained. This is the result of an assessment based on the proposed site plan and discussions with the client regarding their application strategy.

Table 2:

	A	B	C	U
Trees that can be retained		**T1**		
Total		**1**		
Trees that require removal to facilitate development				
Trees that require removal due to disease or recognised structural defects.				
Total		**nil**	**nil**	**nil**

See Appendix 2, Arboricultural Data Sheets for subcategories

5.2 The one mature sycamore tree can be safely retained.

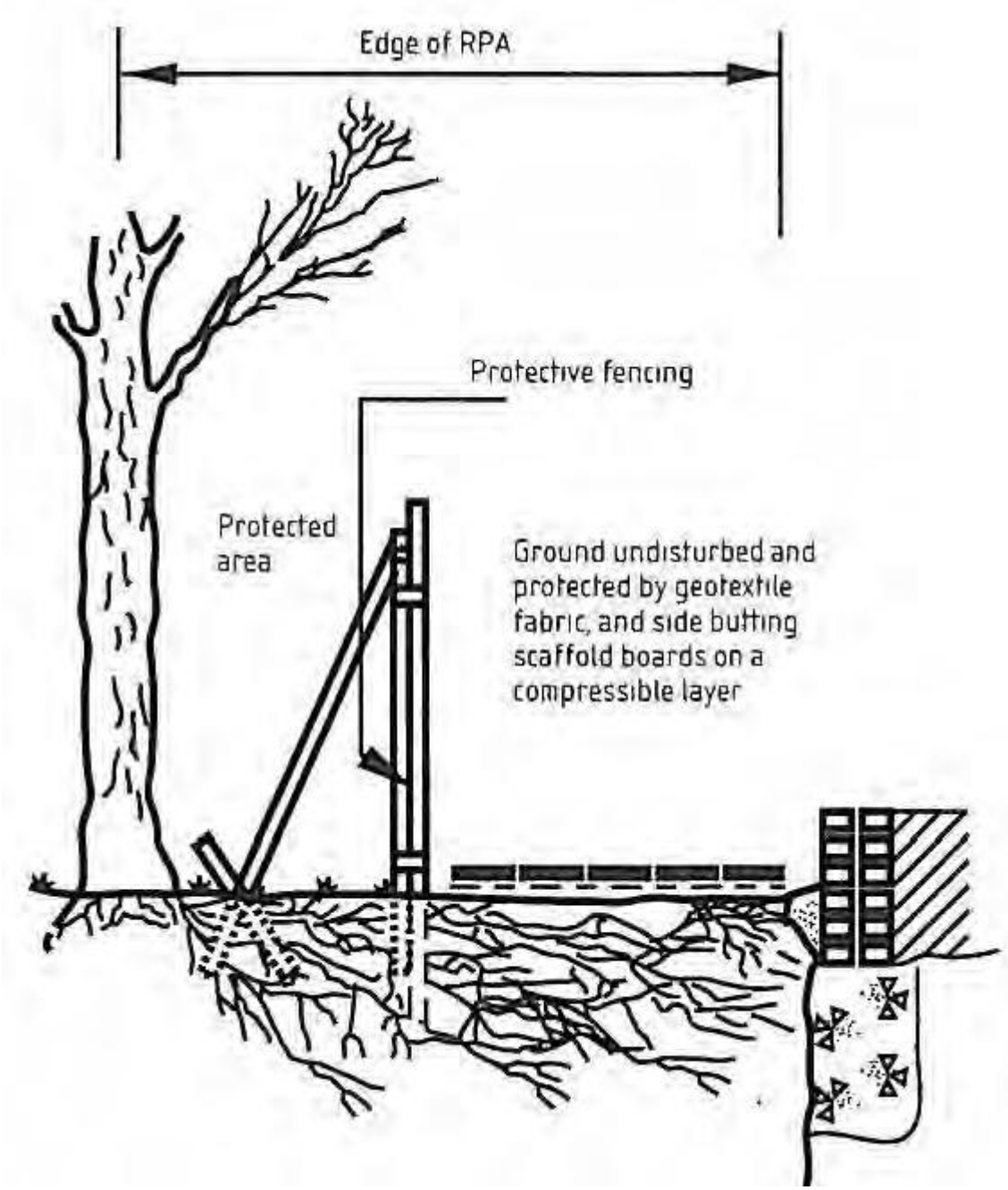
5.3 I recommend that in this instance the distance for the root protection area radius (RPA) given utilising BS 5837 criteria / calculation (appendix 2) of 8m, would be neither practical or entirely necessary as the tree is situated in an extensive area of ground where optimum root growth can be expected around the trees entire spread.

In this particular instance I recommend that secure bolted sections of temporary Herris type fencing situated at the crown 'drip line' (approximately 6m from trunk of tree) will form a suitable protective barrier, which will provide suitable level of protection during the development works, with minimal risk to the future health of tree T1.

5.4 I suggest that consideration might be given to cantilevered foundations and scaffolding to prevent incursion into the root protection area at the south west corner of the proposed garage. Alternatively, any excavations for foundations along this boundary should be undertaken by hand dig only and erection of scaffold legs within the RPA (if required) will need to be sited on boards to prevent compaction and / or potential surface root damage (Section5.7).

5.5 If any roots are encountered near to the CEZ and are found < 25mm in diameter, these should be pruned back with a clean cut (secateurs or bow saw) to the crown drip line. Should any roots be exposed >25mm then advice will need to be sort from and arborist or the local authority tree officer as to whether these can be pruned back without affecting the health and / or structural integrity of the tree.

5.6 Where planning permission is granted, the retention schedule (where applicable) would normally form a part of that permission. Any change to this schedule would therefore be likely to require an application to vary the consent.



Works near foundations

5.7 Foundation & Wall Construction

5.8 The construction of the new building requires the construction of a low retaining wall within the root protection zone of tree within T1.

5.9 The proposed wall and associated foundations therefore require careful consideration including how the existing tree is to be protected during construction and how the wall is to be constructed whilst causing minimal damage to the tree.

5.9.1 During the excavation of foundations and construction of the proposed garage, the ground within the root protection zone of T1is to be protected from compaction with a geotextile membrane and scaffolding boards or similar approved in accordance with Figure 3 BS 5937:2005.

5.9.2 Prior to laying of the concrete foundation the full length of the wall foundation trench within the Root Protection Zone is to be excavated by hand in accordance with clause 11.3.5 of BS 5837:2005;

5.9.3 The insitu concrete foundation is to be designed by the project engineers to the minimum required depth based on the geotechnical survey report. In accordance with 11.5.2 of BS 5837:2005 and subject to agreement onsite, roots with a diameter greater than 25mm are to be protected as detailed within the report.

5.9.4 In accordance with clause 9.4.2 BS 5837:2005 care should be taken when planning site operations to ensure that wide or tall loads or plant with booms or jibs and counterweights can operate without coming into contact with the retained trees. This is of particular relevance to the pouring of the insitu concrete foundations and the delivery and placement of the heavy masonry blocks.

5.9.5 Reference is also made to materials which could contaminate the soils e.g. concrete mixings, concrete washings and mortar which should not be discharged within 10m of the tree stem. Accordingly mortar should not be mixed within the Root Protection Area or on an area sloping towards the tree.

5.9.6 On completion of the works all surplus materials are to be collected and disposed of offsite, the temporary ground protection removed and the affected area made good.

6. STATUTORY PROTECTION AND GUIDANCE

National Planning Policy Framework (NPPF)

6.1 The NPPF assumes protection of all ancient woodland and veteran trees unless it can be clearly demonstrated that the need of, or benefits of, development outweigh the loss. In this respect ancient woodland is defined as an area which has been wooded continuously since at least 1600 AD and a veteran as a tree of exceptional value for wildlife, in the landscape, or culturally because of its great age, size or condition.

6.2 On this site there are no ancient woodland or veteran trees.

Tree Preservation Orders & Designations

6.3 Local authorities reserve the right to create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in force, lopping, topping, felling, uprooting or wilful damage caused to a tree is prohibited and such actions may be prosecuted and incur an unlimited fine. Works to TPO protected trees must only be undertaken with the written consent of the local authority.

I have not checked to see if the trees are protected by a Tree Preservation Order.

Protected Species – Bats

6.4 Mature trees often contain cavities, crevices and hollows which are a potential habitat for roosting bats. Bats are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010, and as such causing damage to a bat roost constitutes an offence.

6.5 A preliminary ground level appraisal of the wildlife habitat value of the tree was undertaken as part of the arboricultural survey. No features were noted that suggested the tree was suitable to support roosting bats.

6.6 Should the presence of a bat roost be suspected whilst undertaking works on any trees and groups on site, operations must be halted until a licensed bat handler or ecologist can provide advice.

Protected Species – Birds

6.7 Trees are a potential habitat for nesting birds, which (as well as their nests and eggs) are protected under the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly, damage or destroy an active bird's nest or any part thereof.

6.8 Due to the suitability of the trees within the vicinity of the survey boundary for nesting birds, all tree work should ideally be undertaken outside the bird nesting season (British bird nesting season: March to August inclusive). If this is not possible then a detailed inspection of each tree should be undertaken by a qualified ecologist immediately prior to the arboricultural works. Should an active nest be found (being built, containing eggs or chicks) work must be halted until the nest becomes inactive.

7.0 TREE PROTECTION REQUIREMENTS

Root Protection Areas

7.1 As per *BS 5837:2012*, the **Root Protection Area (RPA)** is calculated using each tree's diameter at 1.5 metres and represents the minimum area around each tree that must be left undisturbed to ensure their survival.

7.2 Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present. The majority of tree roots are found in the top 600 mm of soil and most of the fine roots that absorb water and nutrients are found in the top 100 mm.

7.3 The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in their extent and the **RPA** may not be a circular area centred on the tree stem.

7.4 On this site the majority of trees are growing in relatively homogeneous ground conditions.

Protective Fencing and Exclusion Zones

7.5 Temporary protective barrier fencing will be required to demarcate a **Construction Exclusion Zone (CEZ)** around retained trees. This must be put in place prior to the commencement of any development works, including bringing machinery or materials onto site, the erection of site huts and commencement of earthworks.

7.6 The **CEZ** acts to protect both tree roots and branches and has been extended to incorporate canopy spread where appropriate.

7.7 Protective fencing alignment is shown within the report and at Appendix 1.

7.8 The fencing must be fixed into the ground to withstand accidental impact from machinery and to ensure that a sufficient protective area is maintained. Details of recommended protective fencing are discussed above.

7.9 A weatherproof notice stating 'Construction Exclusion Zone – Keep Out' must be fixed to each fencing panel.

7.10 Any alteration to the fencing alignment to allow for approved activities will be made in agreement with the council's Arboricultural Officer.

7.11 The protective fencing must not be removed until the physical construction phase has been completed and all vehicles have been removed from site, to the satisfaction of the council's Arboricultural Officer.

Ground Contamination

7.12 Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any trees on or within proximity to the site due to the risk of soil contamination caused by accidental spillage.

7.13 Particular care must be taken when working on or close to sloping ground to avoid unintentional run off into the rooting area of retained trees or nearby water bodies.

Underground Utility Issues

7.14 No utility drawings were provided and no assessment has been made of the juxtaposition of tree roots and the likely location of new services. It has been presumed for the purposes of this report that all utilities will be installed outside of the **Construction Exclusion Zone**.

7.15 Where the installation of services within the **Construction Exclusion Zone** of retained trees is unavoidable, appropriate work methods will be required to ensure the safe long term survival of those trees. This process will require additional consultation with a qualified Arboricultural Consultant and is likely to be more expensive than conventional trench installation.

Ground Level Changes

7.16 A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment.

7.17 Existing ground levels within the **Construction Exclusion Zone** should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

8.0 MANAGEMENT RECOMMENDATIONS

Tree Work (where required)

8.1 All tree surgery including felling work should be carried out by a qualified contractor in accordance with *BS 3998:2010 Tree work – Recommendations*. ***No tree work required***

Mitigation for the removal of trees (where applicable)

NA

Post Construction Tree Care

NA

Foundation Depth Calculations (where applicable)

8.2 This report has been written in accordance with, and to satisfy the requirement of *BS 5837:2012*.

8.3 The nature of the soils on site was not assessed during the survey. The possibility of soil movement due to tree root activity cannot be discounted.

9.0 Method Statement

9.1 The purpose of this report is to aid the preservation of trees shown to be retained at and adjacent to the site. Trees can easily be retained and effectively protected during the proposed garage construction by clearly setting out the tree protection methods, construction techniques and working practices. This document provides this information; principles that are approved and enforced by the local planning authority.

9.2 The following points are explained and qualified in more detail in this report and this summary is intended for quick reference only. Any actions consequent to this summary should be discussed with the local authority tree officer before being undertaken in order to prevent potential breach of tree protection legislation, whether by planning condition, area planning designation or specific tree preservation order (which may apply to individual trees, groups, hedges of any size).

9.3 This document will give site specific instructions on the methods required to protect the existing tree stock agreed to be retained. These methods are set out in a logical sequence of operations and include:

i) Pre-construction meeting: (If required) to run through the arboricultural method statement (AMS) and ensure all relevant parties are familiar with its contents and show the trees concerned and where protection will be required.
ii) Tree protection fencing and exclusion signage: To BS5837:2012 or other agreed approach.
iii) General tree care measures and awareness
iv) Site monitoring

9.4 The BS recommendations are made for appropriate barriers to exclude construction from RPA's: The RPA for each tree or hedge is provided in the tree survey schedule. The protective barriers are sacrosanct and no construction activities shall take place within this zone. This fencing should be erected in position prior to any demolition or construction and be maintained in position for the duration of the development process.

9.5 The Tree Protection Plan (TPP) will indicate retained trees, trees to be removed, the precise location of protective barriers and ground protection (where applicable). This document and the associated TPP will be endorsed by planning conditions, agreement or obligation as appropriate.

10.0 Methodology

10.1 References may include: British Standard 5837:2012 'Trees in Relation to Construction - Recommendations'; British Standard 3998:2010 'Tree Work' and National Joint Utilities Group 'Guidelines for the planning, installation and maintenance of utility services in proximity to trees' 1995.

10.2 Sequenced Methods of Construction and Tree Protection

10.2.1 *Phase 1*
P1.0 Pre Contract Meeting

P1.1 If required an onsite meeting will be held with all relevant parties including the developer, appointed arboricultural supervisor (consultant) and Local Planning Authority (LPA) representative. The purpose of this meeting is to record site features including tree condition, agree tree works (detailed below), location of permanent and temporary access, location of site storage and the location of tree protection barriers.

10.2.3 *Phase* 2
P2.0 Tree Protection Barriers

P2.1 In order to exclude the CEZ from significant demolition and construction activity, protection barriers will be erected.

P2.2 Protection barriers will comprise of bolted sections of Heras fencing panels, which will be securely fixed with wire or scaffold clamps onto wooden stakes driven into the ground, Supporting struts will be fixed to the inside of the barrier to ensure maximum rigidity.

P2.3 Once the barriers have been properly erected in position, they are to be considered as sacrosanct and are not to be removed or altered in any way without prior approval from the LPA.

P2.4 Clear notices are to be fixed to the outside of the fencing with words such as 'PROTECTED AREA – NO ACCESS AND NO STORAGE OR WORKING WITHIN THIS AREA'.

P2.5 All operatives and other relevant personnel are to be informed of the role of the exclusion barriers and their importance. A copy of the Tree Protection Plan will be displayed on site at all times during construction.

P2.6 The location of the protection barriers is indicated on the TPP. The position of the barriers is to be marked out with biodegradable marker paint on site and agreed with appropriate representatives from the LPA and Contractor. The barriers will be erected prior to any works on site in the vicinity of retained trees, including demolition or the delivery of machinery, materials, plant or equipment to the site or any adjacent land. The barriers will remain in situ until final completion or a time agreed by the LPA and Contractor.

10.2.4 ***Phase 3***

P3.0 Dismantling Protection Barriers and Landscaping Works

P3.1 A minimum of seven days' notice will be given to the LPA prior to the dismantling of the protection barriers.

P3.2 All landscaping once the barriers have been removed will avoid soil re-grading and disturbance within the CEZ and no soil levels be altered after the protection barriers have been removed.

11.0 SUMMARY / CONCLUSION

11.1 The following points are explained and qualified in more detail in this report and this summary is intended for quick reference only. Any actions consequent to this summary should be discussed with the local authority tree officer before being undertaken in order to prevent potential breach of tree protection legislation, whether by planning condition, area planning designation or specific tree preservation order (which may apply to individual trees, groups or hedges of any size).

11.2 **Notable Tree Constraints**: The main trees, tree groups or hedges of arboricultural significance (A or B grade in terms of tree health and general visual amenity contribution) are:

1 Category B tree

11.3 **Mitigation Measures:** The following mitigation measures will be included in this report:-

a) Tree Protection Fencing: to be erected where indicated on the TPP and to conform with the specifications set out in the arboricultural method statement (AMS).

b) Provided that appropriate protection of retained trees is suitably implemented along with specialist construction methods as advised above and in the AMS, the layout will not have any material affect or impact on the sustainable public amenity values or to the site's contribution to the landscape.

SURVEY METHOD

The survey of trees was conducted from ground level only. The nature of the soils on site was not assessed. Trees are dynamic living organisms with a constantly changing structure; even trees in good condition can suffer from damage or stress. The information recorded is presented as being correct at the time of survey.

The following features of each tree, group of trees or wood may have been recorded in the Arboricultural Survey Data Sheets at Appendix 1.

Species The common name is given. The Latin name may also be given if further clarification is required.

Height Top height of tree recorded in metres.

Stem Diameter For single-stemmed trees the measurement is taken at 1.5 metres above ground level and recorded in millimetres.
For multi-stemmed trees an average all stems measured at 1.5m above ground level is used.
For tree groups a range from minimum to maximum diameters is provided based on measurements taken using one of the aforementioned methods.

No. of Stems A count of stems arising below a height of 1.5 metres.

Crown Spread The N, S, E and W branch spreads are recorded in metres to provide a representative crown shape.

Height of Lowest Branch Crown clearance above ground level recorded in metres.

Direction of Lowest Branch The direction of growth of the first significant branch from the point of attachment.

Maturity **Young** Trees than can reasonably be relocated or replaced like for like, without undue cost;
Middle Age Trees in the established growth stage of their life with the potential to continue increasing in size;
Mature Trees that have reached their ultimate size, given their location and surroundings;

Condition **Good, Fair, Poor.** An overall assessment of a tree's physiological and structural state in which factors that may increase its susceptibility to the effects of development are taken into account.

Veteran. Trees that are in such a condition as to significantly increase their biological, cultural or aesthetic value. This is characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Comments A brief evaluation and description of the tree with comments on form, vitality, health and any significant defects or symptoms of ill-health.

BS 5837 Tree Quality Assessment

The tree quality assessment is based on Table 1 of BS 5837:2012 (See below). Four categories (A, B, C and U) are used to denote tree quality (A= High, B = Moderate, C = Low, U= Unsuitable for retention). Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category (the subcategories may be used in combination but do not accumulate collective weight).

Root Protection Area (RPA)

The RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m^2) and as the radius of a circle (m) typically plotted from the centre of the stem.

The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.3 and Table D.1) and is based on a trees stem diameter. In some cases the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion.

Recommendations

Recommendations for arboricultural works, etc. are based on the **current** land use, and take into account the tree or group attributes without bias to the proposed development.

SURVEY METHOD

Estimated Remaining Contribution

An estimation of the life expectancy as healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey.

Long > 40 years
Medium 20 – 40 years
Short less than 20 years

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • 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 *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

British Standards Institute 2012, p.9

NOTES:
All young trees are assessed as quality category ‘C’ but this does not preclude their retention within a development.

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