cheshire woodlands
arboricultural consultancy

ARBORICULTURAL STATEMENT

ON

5 MITFORD ROAD, MANCHESTER, M14 6NT

ON BEHALF OF

LEE ARCHITECTS LTD
LEEPARK HOUSE
449 CHESTER ROAD
MANCHESTER, M16 9HA

Author: M. J. Ellison & T. Baron

Our Ref: CW/8987-AS

Date: 24 January 2018

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1. EXECUTIVE SUMMARY

1.1 The application proposal comprises the construction of a residential building, additional car parking spaces and the removal of selected boundary walls and a hedge. The higher quality trees can be retained and protected in accordance with current best practice.

1.2 The proposed layout will have only minor impacts on trees and only the removal of stumps of felled trees and a hedge are required to enable the development. Loss of the hedge could be mitigated by the provision of new trees and landscaping. Additional trees are proposed for removal for reasons of safety and to prevent damage to infrastructure, but these trees could be retained in accordance with best practice if required.

1.3 Some minor pruning has been recommended to remove dead or dying branches, along with the removal of dense ivy on trees adjacent to a car park.

2. TERMS OF REFERENCE

2.1 Instruction

2.1.1 Cheshire Woodlands Limited is instructed by Lee Architects Ltd to:

- Survey and prepare a schedule of trees, within influencing distance of the proposal, to comply with the general requirements of BS5837:2012 Trees in relation to design, demolition and construction
- Annotate a topographical survey drawing and produce a Tree Constraints Plan
- Appraise a development proposal in relation to trees and produce an arboricultural statement
- Advise on any conflicts between the proposal and trees and how these might be resolved
- Where necessary, carry out a single revision of the documents at a, b and c above, to be issued for submission with a planning application

2.1.2 The following documents have been considered in our evaluation:

- Site layout drawing ref. L619/15 RA
- Tree survey plan drawing ref. CW/8987-P-TS
- Tree constraints plan drawing ref. CW/8987-P-TC
- Tree survey schedule ref. CW/8987-SS

2.2 Limitations

2.2.1 This report and associated documents remain the copyright of Cheshire Woodlands Limited and there should be no transfer of rights to any third party without express written consent.

2.2.2 Trees are assessed in sufficient detail to gather data for and inform the current project. Appraisal of the structural condition of trees is of a preliminary nature and sufficient to inform the project.

2.2.3 Trees are assessed from ground level without invasive investigation and are viewed from within the site or from areas with public access. Assessment may be restricted where site conditions limit access or where trees are wholly or partially off-site or obscured by vegetation. The disclosure of hidden defects cannot be expected.

2.2.4 Assessing the potential effects of trees on load-bearing soils beneath existing and proposed structures is not considered in this report. No soil samples have been taken.

3. INTRODUCTION

3.1 The shaded sections in this report highlight key issues that are specific to the project.

3.2 This assessment evaluates the effects of a development proposal on trees. The comparative values of trees are considered broadly in line with the guidance of BS5837 and their retention, protection and management are informed by this evaluation.

3.3 Michael Ellison & Thomas Baron, of Cheshire Woodlands Limited assessed the trees and evaluated the effects of the development proposal on trees.

3.4 The development proposal comprises the erection of a residential building, along with the addition of four car parking spaces. Boundary walls and selected partition walls in the car park towards the east of the site will be removed, as shown on the tree constraints plan at Appendix 2.

3.5 This report provides sufficient supporting information to demonstrate impacts on trees and enable the local planning authority [LPA] to determine the planning application insofar as it relates to trees.

4. THE SITE

4.1 Located 4.3 miles from the centre of Manchester, the site is generally level and comprises residential properties, car parking and residential garden. It is bounded by residential properties to the north, east and south and Mitford Road to the west, and is.

4.2 The British Geological Survey - *Geology of Britain Viewer* identifies the underlying soils as 'Till, Devensian - Diamicton'.

4.3 Till is a general term referring to any kind of sediment deposited directly from glacier ice; typically unstratified and unsorted and sometimes called boulder-clay. Trees growing on cohesive clay soils are often more reliant on roots growing within the upper horizons, and are potentially more sensitive to changes to the upper soils than trees on more open sandy soils.

5. STATUTORY TREE PROTECTION

5.1 An email enquiry to Manchester City Council confirmed that the site is not in a conservation area and that trees on the site are not currently the subjects of a tree preservation order.

6. SURVEY METHODOLOGY

6.1 The trees were surveyed on 19 January 2018 and were identified, measured and recorded in the schedule at Appendix 1. Stem diameters and canopy spreads were mostly measured using a tape; tree heights using a tape and clinometer.

6.2 The structural condition of the trees was assessed on the basis of the 'visual tree assessment method' (Mattheck and Breloer 1994).

6.3 The trees were assessed for 'visual prominence' and were also broadly categorised as set out in Table 1 of BS5837. See *Appendix 3* for further guidance.

6.4 A brief assessment for obvious signs of wildlife habitat in trees and hedges on the site was carried out during the survey. No protected or exceptional habitats were identified and details were not recorded.

6.5 The site layout proposal drawing is the base for the tree constraints plan at Appendix 2.

6.6 Below ground constraints are represented on the drawing as 'root protection areas' [RPA], calculated and where appropriate, modified in accordance with section 4.6 and table D.1 of BS5837.

7. EVALUATION OF THE TREES

7.1 BS5837 recommends that trees be evaluated and categorised as set out in Table 1, which also provides a summary of the impact of the development proposal on trees.

7.2 Table 1

	To be retained and protected	To be removed for development	To be removed for other reasons
Category A High quality with life expectancy of at least 40 years	None	None	None
Category B Moderate quality with life expectancy of at least 20 years	Trees T2 & T3 Group G1	None	None
Category C Low quality with life expectancy of at least 10 years, or small young trees	None	Trees Group G2	T4, T5 & T6
Category U Cannot be retained in context of current land-use for longer than 10 years	None	None	Tree T1
Hedges and Shrubs	None	Hedge H1	None

7.3 Trees T4, T5 & T6 are low quality (C category) lime and holly trees which are situated in the far southeast of the site. T4 is exerting pressure on and displacing the adjacent boundary wall and T4 & T5 are both heavily biased over the neighbouring gardens to the southeast. Proposed parking extends into the root protection area (RPA) of T4 and given the ground levels, this could be accommodated by off-setting the RPA to the east or by using special engineer designed surfacing as set out at clause 7.4.2 of BS5837 (2012).

7.4 There are incursions into the RPAs of the Category B trees T2, T3 and group G1 for the installation of car parking. These incursions are less than 20% of the RPA of any of the trees and given the site levels, could be constructed

using special engineer designed surfacing.

7.5 The lime stump T6 is proposed to be removed, but its retention would not constrain the development proposal.

7.6 Group G2 consists of two lime stumps which have produced dense regrowth of shoots. These will be removed to enable construction of the car parking, but would not be retained irrespective of the development.

7.7 Tree T1 is a U category hawthorn with reduced vitality and has recently suffered failure of its westernmost stem due to decay. It is proposed that this tree should be removed and replaced.

7.8 The privet boundary hedge (H1) 5 metres west of 9 Mitford Road is to be removed along with the stone boundary wall between properties 7 and 9 on Mitford Road.

7.9 Pruning is proposed to remove dead and dying branches from the ash tree T3, and to raise the crowns of trees in G1 to up to 4 metres to provide ground clearance adjacent to and above the car park.

7.10 Dense ivy currently obscures the visual assessment of trees in G1, so the severance and removal of 2 metres of ivy from the base of each tree is proposed.

8. CONCLUSIONS

8.1 The development requires the removal of two lime stumps and a hedge, although other minor removals are recommended to prevent ongoing damage to a boundary wall, this is not required to enable the development.

8.2 Trees proposed for retention could be protected for the duration of construction works in accordance with current best practice as set out in BS5837.

8.3 Overall, the proposed development will have only a minor impact on trees and this could be easily mitigated by the provision of new trees and landscaping as part of the development proposal.

9. RECOMMENDATIONS

9.1 All tree and hedge pruning and removal works should be implemented in accordance with the management recommendations in the survey schedule at Appendix 1 and in compliance with the requirements of British Standard 3998:2010 *Tree work – Recommendations* [BS3998].

9.2 Physical tree protection is not required, but consideration should be taken to avoid any piling of debris around the bases of the immediate trees during constructing works.

10. REFERENCES.

Anon. *Geology of Britain Viewer.* British Geological Survey, Nottingham. http://www.bgs.ac.uk/ (accessed 24 January 2018)

BS5837:2012. Trees in relation to design, demolition and construction - Recommendations. British Standards Institute, London.

BS3998:2010. *Tree work - Recommendations.* British Standards Institute, London.

Mattheck. M, and Breloer. H,. 1994. *The Body Language of Trees A handbook for failure analysis*. Research for Amenity Trees No. 4.

APPENDIX 1

TREE SURVEY SCHEDULE

cheshire woodlands arboricultural consultancy

PROJECT: 5 MITFORD ROAD, MANCHESTER, M14 6NT
CLIENT: LEE ARCHITECTS LTD
REF: CW/8987-SS
REVISIONS:

SURVEYED BY: M. ELLISON & T. BARON
DATE: 18 JAN 2018
PAGE: 1

No.	Species	Age Range	Height (m)	Crown Spread (m)	Stem Dia. (mm)	Vitality	Comments	Management	Visual	Retention Value Existing	Retention Value Proposed	BS5837 RPA Radius (m)
T1	Hawthorn	M	12	8	450	R	• Stem and crown of the tree heavily colonised by ivy • Recent failure of the westernmost stem, which is decayed with a brown rot of the internal heartwood • Although the remaining section of the crown could not be visually assessed, it is apparent that there will be brown rot to the heartwood of this also • Removal is not required to enable the development proposal	• Fell to ground level and establish replacement tree	1	U	U	5.4
T2	Turkey oak	EM	20	15	600	N	• Partially supressed by adjacent trees • The tree has a clear stem of approximately 9m and the ground clearance over the proposed car parking is in excess of 9m • There is extensive fire damage to the west side of the stem from ground level up to the height of approximately 7-8m where the bark of the tree has died back up to 30% of the stem circumference	• Retain and protect during development	3	B	B	7.2

Data in this schedule are time limited and subject to limitations described elsewhere.

HEADINGS & ABBREVIATIONS

Age Range	Y = young SM = semi-mature EM = early-mature M = mature PM = post-mature V = veteran
Stem Dia	Stem diameter (measured in accordance with Figure C.1 of BS5837: 2012) (MS = multi-stemmed EST = estimated)
Crown Spread	Maximum crown spread (EST = estimated)
Vitality	A measure of physiological condition. N = normal range for the species and age R = reduced, P = poor, MD = moribund, D = dead
Visual (Visual Prominence)	Broad indication of prominence in the landscape (0 = none 1 = very low up to 5 = very high) (G = contributes to a wider group)
Retention Category Existing	Broadly in accordance with Table 1 of BS5837: 2012 (considers the merits of the tree or group in the context of the existing land-use)
Retention Category Proposed	Broadly in accordance with Table 1 of BS5837: 2012 (considers the merits of the tree or group in the context of a development proposal)
BS5837 RPA Radius	Calculated in accordance with Table D.1 of BS5837: 2012
Common Plant names	For scientific names refer to Mitchell, A. 2001. *Collins Field Guide – Trees of Britain & Northern Europe*. Harper Collins, London. pp. 420.

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DATE: 18 JAN 2018
PAGE: 2

No.	Species	Age Range	Height (m)	Crown Spread (m)	Stem Dia. (mm)	Vitality	Comments	Management	Visual	Retention Value Existing	Retention Value Proposed	BS5837 RPA Radius (m)
T3	Ash	EM	21	SEE PLAN	500	N	• The crown of the tree is partially suppressed by the neighbouring oaks in the north and has formally been suppressed by an adjacent tree to the south, which has now been removed • Ground clearance over the site in excess of 9m • There are a small number of dead branches overhanging the proposed car park • A small amount of ivy to the base of the stem • Several past branch failures which appear to be associated with the removal of an adjacent tree • Fire damage to the stem and a first order branch on the north west side up to a height of approximately 7m	• Prune to remove dead branches overhanging the proposed car park • Retain and protect during development	3	B	B	6.0
T4	Lime	EM	9	9	500	N	• The base of the tree is exerting pressure on and displacing the adjacent boundary wall • The tree has been topped in recent years at a height of approximately 3.5-5m and there is strong regrowth, some of which has recently been pruned • There are epicormic shoots to the stem • If this tree is to be retained, there will be continued damage to the boundary wall • Old bark wounds to the stem of the tree and some hollowing to the lower stem between ground level and 1.5m • The tree has a ground clearance over the proposed car park of approximately 1m which could be raised to 3m by the removal of minor lateral branches • Removal is not required to enable the development proposal	• Remove and grub/grind out stump to prevent ongoing damage to boundary wall	1	C	U	6.0
T5	Holly	EM	9	6	180	N	• Ground clearance down to ground level which could be pruned up to 2-3m by removal and shortening of minor lateral branches • Removal is not required to enable the development proposal	• Remove and grub/grind out stump to prevent ongoing damage to boundary wall	2	C	U	2.1
T6	Lime	-	-	2	600	-	• Stump with regrowth up to 3m high	• Remove shoots and grub/grind out stump	1	C	U	7.2

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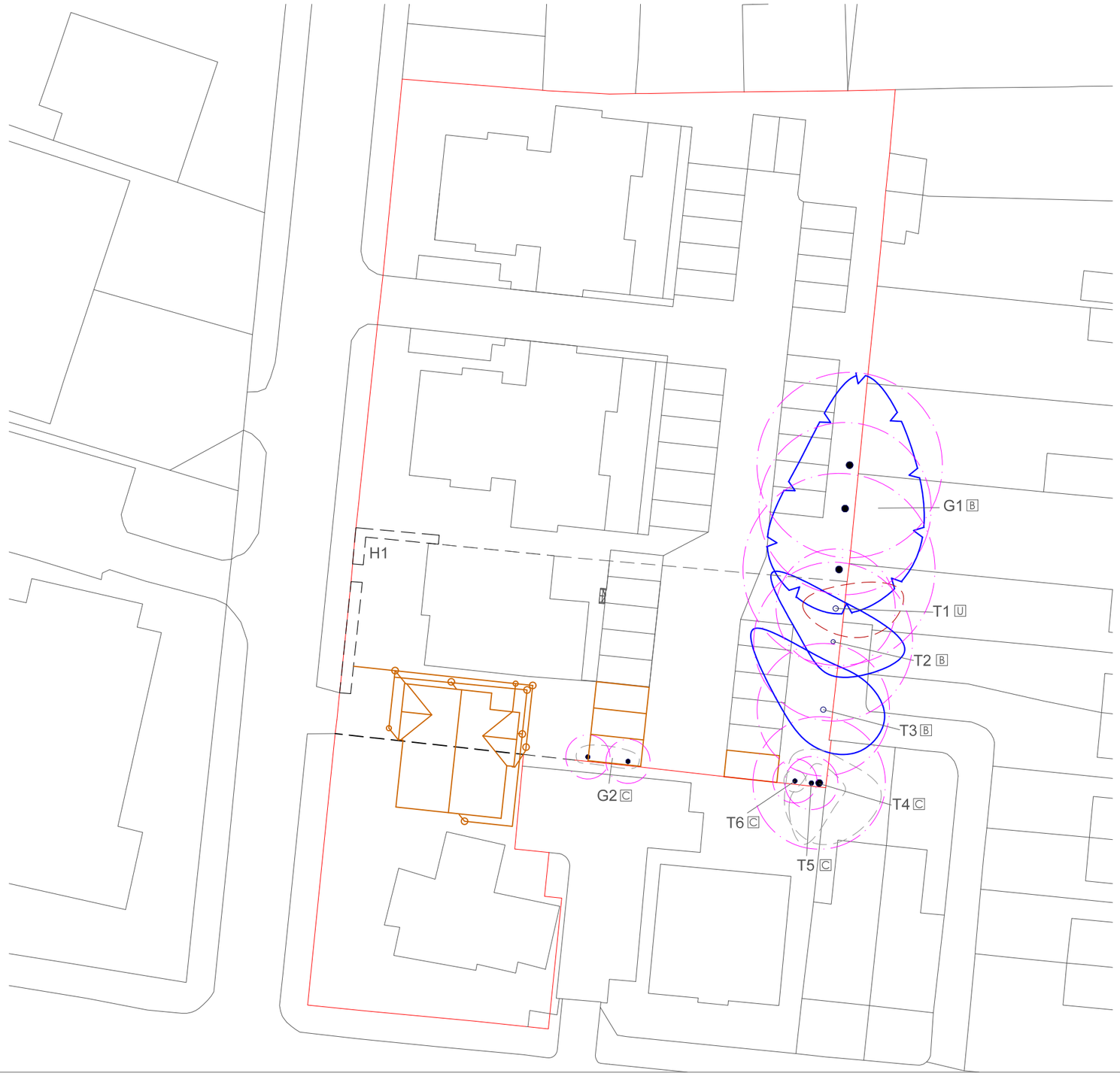
DATE: 18 JAN 2018
PAGE: 3

No.	Species	Age Range	Height (m)	Crown Spread (m)	Stem Dia. (mm)	Vitality	Comments	Management	Visual	Retention Value Existing	Retention Value Proposed	BS5837 RPA Radius (m)
G1	Lime	M	25	12	≤700	N	• The trees have been heavily crown lifted in the past with no large branches below the height of approximately 13-14m • The general ground clearance is less than 2m over the car park and could be raised to 4-5m by removal of minor lateral branches. • The stems are shrouded with ivy which extends up to the crowns of the trees and restricted the visual assessment • The stems of the trees are located within 0.7m of a brick wall	• Sever and remove a 2m section of ivy from the base of each tree to facilitate future assessments • Prune to obtain a ground clearance of 3-4m over the car park • Retain and protect during development	3	B	B	≤8.4
G2	Lime	-	-	<2	≤500	-	• Stumps with regrowth up to 3m high • Group of two lime stumps with epicormic shoots around base	• Remove shoots and grind or grub out stumps	1	C	U	-
H1	Privet	-	≤2	≤0.9	-	N	• Boundary hedge along the boundary of properties 7 & 9	• To be removed along with boundary wall	2	-	-	-

APPENDIX 2

TREE CONSTRAINTS PLAN



SCALE: 1:200
UNITS: METRES
0 5 10

TREE CONSTRAINTS PLAN

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PROJECT	5 MITFORD ROAD MANCHESTER M14 6NT
JOB REF	CW/8987-P-TC
DATE	18 JANUARY 2018
SCALE	1:200 @ A1 LANDSCAPE

- INDIVIDUAL TREE TO BE RETAINED
- GROUP OF TREES TO BE RETAINED
- TREE, GROUP, AREA, SHRUBS OR HEDGE TO BE REMOVED
- STEM POSITION APPROXIMATED
- BS 5837 RETENTION VALUE
- BS5837 ROOT PROTECTION AREA RADIUS
- BS5837 CATEGORY 'B' TREES
- BS5837 CATEGORY 'C' TREES
- BS5837 CATEGORY 'U' TREES
- RED LINE BOUNDARY
- PROPOSED LAYOUT
- EXISTING WALLS TO BE DEMOLISHED

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APPENDIX 3

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Guidance Note - Assessment of Visual Prominence and Assessment of Retention Values

Visual Prominence Values

Determined by assessment of current and potential visual prominence and taking account of location, tree size, growth potential and useful life expectancy. Visual prominence values are classified as follows:

(0) none, (1) very low up to (5) very high

Retention Values

Trees or groups of trees are evaluated twice in order to facilitate consideration of their relative merits. Firstly, the trees are assessed and categorised in the context of the pre-development situation to provide a broad valuation of all of their attributes and the contribution to their environs. Secondly, the trees are similarly assessed and categorised in the context of a development proposal. The evaluations consider current or projected:

- life expectancy (broad categorisation)
- visual prominence (current and potential)
- landscape function
- numbers of other trees and their maturity (continuity for landscape, amenity, habitat)
- wildlife habitats (incl. continuity)
- safety
- conflicts with the built environment or other land-use
- cultural, historical or other special value

Groups of trees are assessed and categorised as a single unit.

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Pre-Development Retention Value

Each surveyed tree or group of trees is valued and placed into one of the following categories (A, B, C or U). The valuation considers the benefits and disbenefits of retaining the tree or group of trees in the pre-development context; any specific issues are noted in the tree survey schedule.

(A) Trees the retention of which in the pre-development context is most desirable and that have an estimated remaining life expectancy of at least 40 years (high value category)

Wholly appropriate to the pre-development situation and without significant conflict

(B) Trees the retention of which in the pre-development context is desirable and that have an estimated remaining life expectancy of at least 20 years (moderate value category)

Appropriate to the pre-development situation but not of highest value

(C) Trees that could be retained in the pre-development context and have an estimated remaining life expectancy of at least 10 years (low value category)

Ill-suited to the pre-development situation but could be retained with moderate conflicts

Trees of no particular merit in the pre-development context

(U) Trees unsuitable for retention in the pre-development context

Cannot reasonably be retained within the pre-development situation for longer than 10 years

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Post-Development Retention Value

With reference to a development proposal, each of the trees or groups of trees is placed in one of the following categories (A, B, C or U). The valuation considers the benefits and disbenefits of retaining the tree or group of trees in the context of the development proposal; any specific issues are noted in the tree survey schedule.

(A) Trees the retention of which is most desirable (high value category)

Retention wholly appropriate to the proposed situation and without significant conflict

(B) Trees the retention of which is desirable (moderate category)

Retention appropriate to the proposed situation but not of highest value and/or having only minor conflicts

(C) Trees which could be retained (low value category)

Retention ill-suited to the proposed situation but could be retained with moderate conflicts

Trees of no particular merit in the proposed situation

(U) Trees for removal

Cannot reasonably be retained within the proposed situation

APPENDIX 4

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GUIDANCE NOTE- STATUTORY CONTROLS

TREES AND HEDGES:

Subject to certain specified exemptions, the Town and Country Planning Act 1990, requires that an application must be made to the local planning authority (LPA), to carry out works upon or remove trees that are subject to a tree preservation order (TPO).

Six weeks' notice must be given to the LPA of intention to carry out works upon or remove trees within a conservation area and not protected by a TPO.

Local planning authority consent may be required to carry out works upon or remove trees, shrubs and hedges that are the subjects of planning conditions.

LPA consent may be required for the removal of hedgerows under the Hedgerow Regulations 1997.

Your Council's planning department will advise whether or not any of the above controls apply to your trees, shrubs and hedges.

Subject to certain exemptions, the Forestry Act (1967 specified) requires that a licence must be obtained for the felling of growing trees

Your nearest Forestry Commission office will advise whether you require a felling licence.

WILDLIFE

The Wildlife and Countryside Act 1981 (together with the amendments of 1985 & 1991, the subsequent variations to the schedule orders, and strengthening amendments made within the Countryside and Rights of Way Act 2000) forms the basis for legislation protecting Britain's flora and fauna.

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Nesting birds and all species of bat are afforded statutory protection. It is an offence to:

- disturb a nesting bird
- disturb a roosting bat or damage, destroy or block access to a bat roost
- intentionally kill, injure or take a bat
- sell, hire, barter or exchange a bat, dead or alive
- be in possession or control of a bat or anything derived from a bat

Your local Wildlife Trust or your Council's Ecologist will provide guidance on statutory controls relating to wildlife.

APPENDIX 5

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

Access facilitation pruning. One off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site

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

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

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

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

Arboricultural Method Statement. Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained

Arboriculturist. Person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction

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

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

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

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

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

Bolling. A term sometimes used to describe pollard heads

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

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

Branch:

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

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

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

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

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

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

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

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

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

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

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

Competent person. A person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

Compression fork. An acute angled fork that is mechanically optimised for the growth pressure that two or more adjacent stems exert on each other

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

Construction. Site based operations with the potential to affect existing trees

Construction exclusion zone. Area based on the Root Protection Area from which access is prohibited for the duration of the project

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

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

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

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

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

Deadwood. Dead branch wood

Decurrent. In trees, a system of branching in which the crown is borne on a number of major widely-spreading limbs of similar size (cf. excurrent). In fungi with toadstools as fruit bodies, the description of gills which run some distance down the stem, rather than terminating abruptly

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

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

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

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

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

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

Incorporating extracts from Lonsdale, D. 1999. Principles of Tree Hazard Assessment. Her Majesty's Stationary Office, London

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

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

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

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

Endophytes. Micro-organisms which live inside plant tissues without causing overt disease, but in some cases capable of causing disease if the tissues become physiologically stressed, for example by lack of moisture

Engineer-designed hard surfacing. Hard surfacing constructed within the 'Root protection area' of a tree, which will be designed by a structural or geotechnical; engineer in collaboration with an arboriculturist as set out in clause 7.4 of British Standard BS5837:2012. The purpose being to minimise the effects of the construction on the health of the tree.

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. decurrent)

Fastigiate. Having upright, often clustered branches

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

Field layer. Herbs, ferns, grasses and sedges

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

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

Ground layer. Mosses, ivy, lichens and fungi

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

Haloing. Removing or pruning trees from around the crown of another (usually mature or post-mature) tree to prevent it becoming supressed

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. The dead central wood that has become dysfunctional as part of the aging processes

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

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

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

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

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

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

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

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

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

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

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

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

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

Mature Heights (approximate):

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

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; a mulch may consist of organic matter or a sheet of plastic or other artificial material

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

Occluding tissues. A general term for the roll of wood, cambium and bark that forms around a wound on a woody plant (cf. 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, usually to a point just outside that of the previous cutting. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species

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

Primary root zone. The soil volume most likely to contain roots that are critical to the health and stability of the tree and normally defined by reference BS5837 (2012) Trees in Relation to design, demolition and construction

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

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

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

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

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

Incorporating extracts from Lonsdale, D. 1999. Principles of Tree Hazard Assessment. Her Majesty's Stationary Office, London

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

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

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

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

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

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

Rib. A ridge of wood that has usually developed because of locally increased mechanical loading. Often associated with internal cracking in the wood of the stem, branch or root.

Ring-barking (girdling). The removal of a ring of bark and phloem around the circumference of a stem or branch, normally resulting in an inability to transport photosynthetic assimilates below the area of damage. Almost inevitably results in the eventual death of the affected stem or branch above the damage

Ripewood. See heartwood

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

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

Root protection area (RPA). Layout design tool indicating a national 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

Root zone. Area of soils containing absorptive roots of the tree/s described. The Primary root zone is that which we consider of primary importance to the physiological well-being of the tree

Sapwood. Living xylem tissues

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

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

Service. Any above- or below-ground structure or apparatus required for utility provision e.g. drainage, gas supplies, ground source heat pumps, CCTV and satellite communications

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

Silviculture. The practice of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values

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 microscopic and dispersed in air or water

Shrub species. Woody perennial species forming the lowest level of woody plants in a woodland and not normally considered to be trees

Sporophore. The spore bearing structure of fungi

Sprouts. Adventitious shoot growth erupting from beneath the bark

Stem/s. Principle above-ground structural component(s) of a tree that supports its branches

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

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

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

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

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

Structure. Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork

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

Tree Protection Plan. Scale drawing, informed by descriptive text where necessary, based upon the finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures

Tree Risk Assessment. An assessment and description of the risks and where appropriate the values associated with a tree or trees. The primary risk being considered is that from falling trees. Other risks, such as damage to infrastructure, interruption of service and building subsidence may also be considered

- Walkover – A general view of the tree population considered in the context of the adjacent land-use to identify trees that present significantly elevated risks
- Drive-by - A general view of the tree population from a moving vehicle and considered in the context of the adjacent land-use to identify trees that present significantly elevated risks
- Individual – the assessment of risks from a single tree considered in the context of the adjacent land-use to identify trees that present significantly elevated risks

Understorey. This layer consists of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grow under lower light conditions

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

Incorporating extracts from Lonsdale, D. 1999. Principles of Tree Hazard Assessment. Her Majesty's Stationary Office, London

Veteran tree. Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem

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

Vitality. A measure of physiological condition. N = within normal range for species and age, R = reduced from the normal range for the species and age, P = poor, MD = moribund, D = dead

Volunteer trees. Trees arising from natural colonisation rather than having been planted

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