CHESHIRE WOODLANDS

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REPORT

ON

A SURVEY OF TREES AT POYNTON POOL

IN RELATION TO PROPOSED

RESERVOIR SPILLWAY IMPROVEMENTS

ON BEHALF OF

POYNTON TOWN COUNCIL

Author: M J Ellison

Our Ref: CW/11044-R

Date: 4 January 2023

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APPENDICES

1. TERMS OF REFERENCE

1.1. Instruction

1.2. Cheshire Woodlands is instructed by Poynton Town Council to:

- Supply Ordnance Survey Vector Map Local base mapping data
- Survey trees in accordance with the general requirements of BS5837:2012 Trees in relation to design, demolition and construction – Recommendations. The survey shall be for the sole purpose of informing the evaluation of the Poynton Pool Spillway proposal
- Produce a Tree Survey Plan and Tree Survey Schedule.

1.3. Limitations

1.4. 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.

1.5. The sole purpose of the survey was to collect data to inform an evaluation of Cheshire East Council's 'Poynton Pool Spillway' project in relation to trees, when technical details become available. The trees were assessed in sufficient detail to inform the evaluation. Appraisal of their structural condition is of a preliminary nature and whilst the Tree Survey Schedule at Appendix 1 (the Schedule) is not a tree safety inspection record, the surveyors may record obvious defects when they are observed and considered to be potentially significant to safety. Unless otherwise agreed, data in the Schedule are time limited to one year, after which they should be reviewed.

1.6. 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. INTRODUCTION

2.1. I am Michael Ellison, principal arboricultural consultant with Cheshire Woodlands Limited and my area of expertise is arboriculture.

2.2. The development proposal comprises modifications to the northernmost 560 metres of the dam wall on the west side of Poynton Pool as outlined on the Cheshire East website under the heading '*Poynton Pool Spillway Improvements*'[1] (the Proposal). Trees and woodland affected by the proposal extend to approximately 610 metres of the Poynton Park boundary with the A523 (London Road North). 44 trees between the Pool and the Park boundary are proposed for removal and a further 37 are stated to be at risk of removal. The area of land affected by the proposal extends to some 1.48 hectares, within most of which trees will be rooting. A detailed proposal is not available for appraisal at the time of issuing this report.

2.3. The following documents have been considered in the evaluation:

- Jacobs *BS5837:2012 Tree Survey Report* ref. BRJ10627-JAC-XX-XX-RP-EN-001 dated 7 October 2022
- '*Poynton Pool Spillway Improvements*' accessed online.

2.4. Technical terms used in this report and survey are included in the *Glossary of Terms* in Appendix 5.

[1] https://www.cheshireeast.gov.uk/highways_and_roads/roadworks/major-projects/poynton-pool-spillway-improvements.aspx

3. THE SITE

3.1. Poynton Park is a well-used public park with a circular walking route that passes along the eastern bank of the Pool, and a footpath through woodland on the west side of the Pool between South Park Drive to the south and Anglesey Drive to the North over a distance of around 880 metres. At the northwestern corner is a small car park, bounded by woodland on its east side. The Park is generally level with a minor fall from east to west up to the eastern edge of the Pool. From the western edge of the Pool is the earth dam bounded on its west side by the A523, along part of which is a stone boundary retaining wall.

3.2. The British Geological Survey - *Geology of Britain Viewer*[2] identifies the superficial geology for the Park as '*Till, Devensian – Diamicton*'.

3.3. 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. It is assumed that the dam is formed from clay soils excavated to form the Pool.

4. STATUTORY PROTECTION

4.1. An online search of Cheshire East Council's interactive mapping facility[3] confirmed that trees on and immediately adjacent to the site are not protected by a tree preservation order and the Park is not in a conservation area. Trees in the Park are subject to the provisions of The Forestry Act[4] subject to specified exceptions, some of which may apply to the felling of some trees in relation to the spillway project.

[2] Geology of British Viewer
[3] Cheshire East Council Public Map Viewer
[4] The Forestry Act 1967 (as amended)

4.2. See Appendix 4 for further guidance on the statutory protection of trees, hedgerows, and wildlife.

5. SURVEY METHODOLOGY

5.1. The trees were surveyed on 14 December by Glyn Thomas and Tom Baron, qualified arboricultural consultants with Cheshire Woodlands Limited.

5.2. The survey is recorded in the Schedule and on the Tree Survey Plan in Appendices 1 and 2 respectively. Using the method set out in Appendix 3, the comparative values of trees are considered broadly in line with the guidance of BS5837:2012 and the retention, protection, management or removal of trees should be informed by this evaluation.

5.3. The Ordnance Survey Vector Map Local plan for the site was overlaid with the Jacobs Tree Constraints Plan and aerial imagery. This formed the base for the Tree Survey Plan. Tree stems from the Jacobs plan are represented by an open circle. Stem diameters and canopy spreads were measured using a tape and tree heights using a tape and clinometer. Where dimensions are estimated this is identified in the Schedule.

5.4. The survey first assessed the collective value of the trees, which were identified in four groups (G1 – G3 and W1). The 'visual prominence' of trees was assessed in four groups and they were broadly categorised in accordance with Table 1 of BS5837:2012. See Appendix 3 for further guidance on the method. The colour-coded categories for individually plotted trees are represented by a circle around the plotted tree stems. A small number of trees were identified as having veteran tree characteristics and these are identified by an additional orange circle around the tree stem position.

5.5. Below-ground constraints for the individually plotted trees are represented on the Tree Survey Plan as Root Protection Areas (RPA), calculated in accordance with section 4.6 and Table D.1 of BS5837:2012. There are further constraints from other trees not individually plotted on this plan.

6. THE TREES

6.1. Dating back to the mid-1700s, the woodland was planted on the entire length of the dam embankment and extends north by a further 360 metres beyond Anglesey Drive, lining the busy A523 up to the Towers Road junction.

6.2. The woodland contains a range of species, and ages from young to post-mature. It provides a mature and continuous backdrop to the Pool and historic parkland, and is part of a tree-lined corridor between Poynton to the south and Hazel Grove to the north.

6.3. The trees and woodland are part of a wildlife corridor along the A523 that provides a link in an extensive wider wooded habitat network extending from Middlewood and Lyme Park in the east, Poynton Coppice to the south, and Wigwam Wood and Bramhall Park to the west.

6.4. Whilst the survey generally did not record specific wildlife habitats, the survey area contains many trees and a length of hedging that have potential to host bird nesting, bat roosts, and habitats for small mammals, invertebrates, lichens, and fungi. See Appendix 4 for further guidance.

6.5. Having collapsed into the Pool, the Willow trees in group G3 are likely to provide nesting sites for a range of waterfowl and other birds. Whilst a small number have veteran tree characteristics, none of the trees could be definitively classified as veterans. There is high potential for the alders to be rooting in and beneath the pool, and for the willows to be rooting into the margins.

6.6. Trees in W1 and group G3 form a continuous woodland unit but have been separated in the survey due to their distinctive characteristics. The individually plotted trees are the most prominent, but many other trees form an essential component of the woodland structure and these should be plotted and recorded and considered as potential constraints on any future construction or ground remodelling.

6.7. Located next to a section of the busy A523 that is frequently subject to standing traffic, the woodland is likely to be particularly valuable for its interception of atmospheric particulates[5], having a direct impact on air quality for neighbouring residents.

6.8. The species of individually plotted trees are as listed below:

Species	**No.**	**%**
Beech	23	25
Oak	16	17
Lime	24	26
Horse chestnut	4	4
Sycamore	15	16
Norway maple	4	4
Other	5	5
Total	91	

6.9. The Jacobs *BS5837:2012 Tree Survey Report* ref. BRJ10627-JAC-XX-XX-RP-EN-001, at section 3, States:

> *"It is recommended that once a fixed scheme layout is developed the tree schedule date and tree constraints plan is used to carry out an Arboricultural Impact Assessment (AIA) of the scheme. This document will assess the impact of the proposals on the current stock and will identify which will need to be removed, which can be retained, and which trees may require special measure adopting to allow for their retention should their RPA be compromised by the development."*

[5] https://www.fs.usda.gov/research/treesearch/14743

6.10. The proposal states:

> *"We are aware that users of the area feel that trees provide some protection from noise and pollution. There is evidence that areas of dense woodland with greenery all year round can help to reduce noise and pollution. However, the trees in Poynton Park form a narrow belt, are quite widely spaced and lose their leaves at some times of the year and therefore only offer limited protection.*
>
> *The trees must be removed as this work is mandatory and cannot be replanted in the same location due to safety risks.*
>
> *The Council are trying to reduce the of level disruption the works will cause, by maintaining some level of screening for park users through retention of the lower shrubs through these sections."*

7. CONCLUSIONS

7.1. The overall health of the woodland is good, with a small number of trees exhibiting reduced vitality and some dead trees. Whether by design or accident, the occasional removal of mature trees over the past half century has provided opportunities for natural colonisation by trees and has resulted in a species and age structure that provides for the long-term continuity of this important landscape and ecological asset.

7.2. Providing a backdrop to Poynton Park, the woodland is a component of a designed landscape that extends beyond the boundaries of the current Park. It screens the busy A523 from views within the Park and from residential properties beyond, and is a well-used recreational amenity that provides connections with woodland habitats to the north, south, east and west that cannot be replaced elsewhere. Along with other ecosystem services, these benefits are considerable, and their loss should be considered as a cost in the cost benefit analysis of any project that has potential to affect their health or long-term viability.

7.3. The *Poynton Pool Spillway Improvements* scheme appears to have been advanced without the benefit of an Arboricultural Impact Assessment as recommended in the Jacobs tree report (6.8). The likely impact of the proposals is far wider reaching than removal of the 81 trees stated. All trees along the 610 metres of the proposal are at risk from direct impacts of excavation, regrading of ground, and construction activity.

7.4. Management of the risks from falling trees and branches requires careful consideration and it is evident that the woodland has been proactively managed in this regard. Regarding the integrity of the dam, our assessment did not identify any trees that singly or in combination are likely to breach the dam in the event that they were uprooted. Tree roots, having high tensile strength and forming a dense mat in most organic and 'A horizon' soils, and would generally serve to limit surface erosion and stabilise soil.

7.5. Regarding the requirement to apply for a felling licence under the Forestry Act, the application of exceptions to the requirement to apply for a felling licence requires close consideration. Several exceptions could apply, but consideration of these is beyond the scope of this report.

8. RECOMMENDATIONS

8.1. The current and any future proposal should be the subject of a full Arboricultural Impact Assessment that considers the impact on the overall landscape asset as well as on individual trees.

8.2. The lost benefits from trees removed or adversely affected by the proposal should be fully accounted for in a cost benefit analysis for the project.

8.3. Alternative, tree friendly, solutions to improve resilience of the dam should be investigated with the direct input of an arboriculturist.

8.4. As recommended in the Jacobs tree report, the proposal or any alternative scheme should be managed and closely monitored in accordance with a detailed and satisfactory Arboricultural Method Statement in accordance with BS5837:2012.

APPENDIX 1

PRELIMINARY TREE SURVEY SCHEDULE

(TO BE FINALISED ON COMPLETION OF LAYOUT PROPOSAL)

CHESHIRE WOODLANDS

PROJECT: POYNTON POOL SPILLWAY
CLIENT: POYNTON TOWN COUNCIL
REF: CW/11044-SS1
REVISIONS:

SURVEYED BY: G. THOMAS & T. BARON
DATE: 14 DECEMBER 2022
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	Lime	M	3	3	550	N	• Standing stump with regrowth in car park		2	U		N/A
G1	1 Sycamore Hornbeam Beech	M Y-EM Y	≤15	≤12 (EST)	≤650	N	• Closely spaced group to edge of car park • Dense basal growth • Low ground clearance • Unmanaged section of highway boundary hedge beneath crown, with natural colonisation of hornbeam and beech		3	A		≤7.8
G2	Sycamore	EM	≤23	≤10 (EST)	≤600	N	• Western edge of broadleaved woodland bordering car park • Several trees colonised by ivy • Ground clearance down to 3m over car park		3G	A		≤7.2

The sole purpose of the survey was to collect data to inform the design of the current project in relation to trees. Whilst this is not a tree safety inspection record, the surveyor may record obvious defects when they are observed and considered to be significant to safety. Unless otherwise agreed, data in this schedule are time limited to one year, after which they should be reviewed.

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 (1 = low up to 4 = 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 Only common names are used in this schedule. 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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PRELIMINARY TREE SURVEY SCHEDULE

(TO BE FINALISED ON COMPLETION OF LAYOUT PROPOSAL)

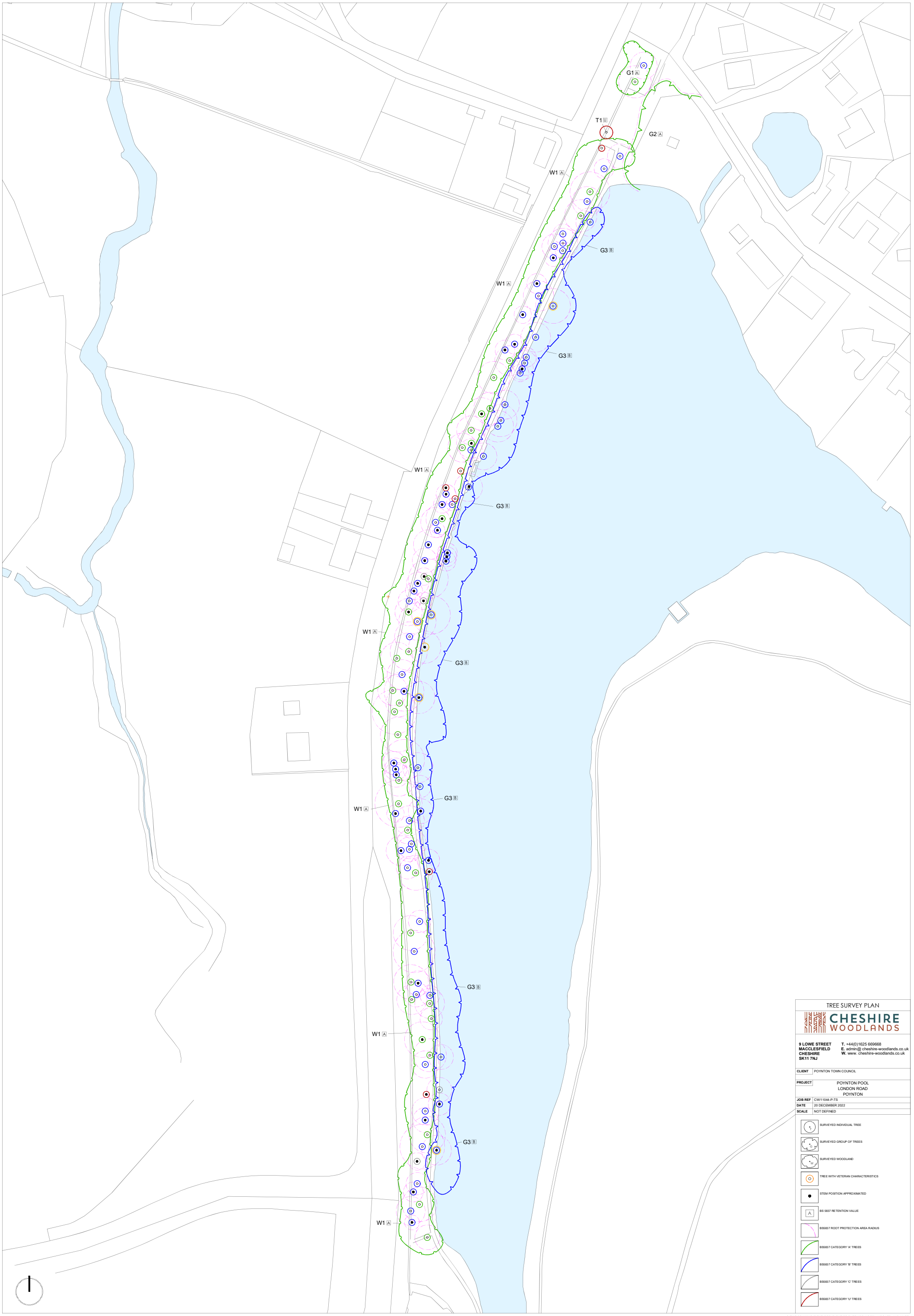
CHESHIRE WOODLANDS

PROJECT: POYNTON POOL SPILLWAY
CLIENT: POYNTON TOWN COUNCIL
REF: CW/11044-SS1

SURVEYED BY: G. THOMAS & T. BARON
DATE: 14 DECEMBER 2022
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)
G3	Alder Willow Ash Sycamore	SM-M SM-PM SM-M SM	≤15 (EST)	≤12 (EST)	≤780 (MS) (EST)	N-D	• Discontinuous linear group along edge of pond • A mix of individual trees and closely spaced groups • Mainly multi-stemmed alder and willow • Most of the alder trees have been coppiced in the past • The willows have collapsed and are rooting into the pond • Several willow trees with veteran characteristics • Occasional dead trees • General ground clearance of 4 – 5m over footpath		3G	B		≤9.3 (EST)
W1	Norway maple Sycamore Holly Beech Yew English oak Turkey oak Holm oak Lime Elm Ash Elder Cherry Silver birch Laburnum Horse chestnut	M EM SM-EM Y-M SM-EM SM-M SM-M EM SM-M SM Y-SM SM Y-EM SM SM SM-M	≤25	≤20 (EST)	≤950	N-D	• Linear mixed species plantation belt • High canopy layer of mainly beech, sycamore and oak, with an understorey of holly and young-semi-mature natural colonisation of mainly beech, oak and holly • Partially maintained boundary hedge along western edge • Signs of past tree safety management • Occasional dead trees • Signs of decline in a small number of mature beeches • An oak tree with veteran characteristics • Several trees contain features that provide potential bird nest/bat roost sites • Opportunities for silvicultural management, enrichment planting and restoration of the boundary hedge		4	A		≤11.4

APPENDIX 2



TREE SURVEY PLAN

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CLIENT	POYNTON TOWN COUNCIL
PROJECT	POYNTON POOL LONDON ROAD POYNTON
JOB REF	CW/11044-P-TS
DATE	20 DECEMBER 2022
SCALE	NOT DEFINED

- SURVEYED INDIVIDUAL TREE
- SURVEYED GROUP OF TREES
- SURVEYED WOODLAND
- TREE WITH VETERAN CHARACTERISTICS
- STEM POSITION APPROXIMATED
- BS 5837 RETENTION VALUE
- BS5837 ROOT PROTECTION AREA RADIUS
- BS5837 CATEGORY 'A' TREES
- BS5837 CATEGORY 'B' TREES
- BS5837 CATEGORY 'C' TREES
- BS5837 CATEGORY 'U' TREES

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APPENDIX 3

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Guidance Note - Visual Prominence and Tree Categorisation

Visual Prominence

A broad indication of visual contribution to the landscape. The evaluation considers:

- location
- public views
- landscape function
- tree size
- growth potential
- useful life expectancy

Visual prominence values are classified as follows:

(1) Low - visual contribution restricted to the site

(2) Moderate - visual contribution to the site and immediate surroundings

(3) High - visual contribution to the site, immediate surroundings and neighbourhood, estate or locale

(4) Very high - visual contribution to a conurbation, or trees of exceptional landscape value

Groups of trees are assessed as a single unit.

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Tree Categorisation

Broadly in accordance with section 4.5 and Table 1 of British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

Trees or groups of trees are evaluated twice. Firstly, they are assessed and categorised in the pre-development context to provide a broad valuation of all of their attributes and their contribution to the amenity of the area. Secondly, they are similarly assessed and categorised in the context of a development proposal. The evaluations consider:

- useful life expectancy
- visual prominence (see above)
- landscape function
- numbers of other trees and their maturity (continuity for landscape, amenity, habitat)
- wildlife habitats (including continuity)
- safety
- conflicts with the built environment or other land-use
- cultural, historical or other value

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

Pre-Development assessment

The tree or group of trees is assessed 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) High quality - Trees the retention of which is most desirable and that have an estimated useful life expectancy of at least 40 years

Wholly appropriate and without significant conflict

(B) Moderate quality - Trees the retention of which is desirable and that have an estimated useful life expectancy of at least 20 years

Appropriate but not of highest value

(C) Low quality - Trees that could be retained and have an estimated useful life expectancy of at least 10 years

Ill-suited but could be retained with moderate conflicts

Trees of no particular merit

(U) Trees unsuitable for retention

Could not reasonably be retained for longer than 10 years

Post-Development assessment

The tree or group of trees is assessed and 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 a development proposal

Any specific issues are noted in the tree survey schedule.

(A) High quality - Trees the retention of which is most desirable and that have an estimated useful life expectancy of at least 40 years

Wholly appropriate and without significant conflict

(B) Moderate quality - Trees the retention of which is desirable and that have an estimated useful life expectancy of at least 20 years

Appropriate but not of highest value and/or having only minor conflicts

(C) Low quality - Trees which could be retained and have an estimated useful life expectancy of at least 10 years

Ill-suited but could be retained with moderate conflicts

Trees of no particular merit

(U) Trees for removal

Would need to be removed to accommodate the development proposal, or could not reasonably be retained for longer than 10 years

APPENDIX 4

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Guidance note - Statutory Controls

Trees and Hedges

Subject to specified exceptions, an application must be made to the local planning authority [LPA] to carry out work on or remove trees that are protected by a tree preservation order [TPO][1]

Six weeks' notice must be given to the LPA of intention to carry out work on or remove trees within a conservation area and not protected by a TPO[1]

LPA consent may be required to carry out work on or remove trees, shrubs and hedges that are affected by planning conditions

LPA consent may be required for the removal of hedgerows[2]

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

Subject to specified exemptions, a licence may be required for the felling of growing trees[3]

Your nearest Forestry Commission or Natural Resources Wales office will advise whether you require a felling licence

[1] https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas
[2] https://www.gov.uk/guidance/countryside-hedgerows-regulation-and-management
[3] https://www.gov.uk/guidance/tree-felling-licence-when-you-need-to-apply

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Wildlife

Nesting birds and all species of bat are afforded statutory protection.[4] 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.

[4] https://www.gov.uk/topic/planning-development/protected-sites-species

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 'epicomic'

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

Ancient tree. A tree that has passed beyond maturity and is old, or aged, in comparison with other trees of the same species. An ancient tree is one that has all or most of the following characteristics: a) biological, aesthetic or cultural interest, because of its great age; b) a growth stage that is described as ancient or post-mature; c) a chronological age that is old relative to others of the same species

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

Axial. Aligned along the axis of the stem, branch or root

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

Bark expansion crack. The pattern of axial strips of bark on smooth-barked trees that have grown faster than the adjacent bark. A growth response to stretching of the bark by expansion of the underlying xylem

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

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

Cellulose. A carbohydrate consisting of glucose molecules joined end-to-end, so as to form long filaments; a principal constituent of plant cell walls

Chlorosis. The loss of green pigment from plant tissues, caused by mineral deficiency. Chlorotic (adj.)

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 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

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

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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

Decay. (of organic tissue) decomposition by fungi or bacteria

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

Desire-line footpath. A footpath that has been created by regular use rather than by design and construction

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

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

Early-wood. The wood laid down around the time of the main flush of shoot growth in the early part of the growing season

Endophytes. Micro-organisms that 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

Fibre-buckling. The kinking if wood fibres and failure of other xylem elements when exposed to compressive loading

Field layer. Herbs, ferns, grasses and sedges

First-order branch. A high order branch, usually arising from a stem

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. The dead central wood that has become dysfunctional as part of the aging processes and being distinct from the sapwood

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

Laser Rangefinder. A device that uses a laser beam to measure distance, angle, and height.

Lateral branch: A side branch

Late-wood. The wood laid down after the time of the first main flush of shoot growth. Usually denser than the early-wood

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

Lesion. Death or abnormal change in tissues, usually associated with disease or trauma

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

Loam. A soil with roughly equal proportions of sand, silt, and clay

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

Marginal browning of leaves. Death of a tissues to the margin or edge of the leaf

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

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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)

Obvious defects. Defects that are so apparent that most people, whether specialist or not, would recognise them on taking a general, but not necessarily close view of the tree. Whether an 'obvious defect' is significant depends on both a structural assessment, which may be purely visual, and on the land-use context

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

Phloem. Vascular tissue that distributes the products of photosynthesis (sugars) around the plant

Photosynthesis. The process whereby plants use light energy to split hydrogen from water molecules and combine it with carbon dioxide to form carbohydrates that are be basic building block for plant growth. Photosynthetic capacity is the plants ability to produce carbohydrates

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

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

Removal of major deadwood. 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

Rhizomorph. A root-like aggregation of fungal hyphae

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. The older central wood of those tree species in which sapwood gradually ages without being converted to heartwood

Root-buttresses. A buttress-like formation at the transition between roots and stems

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

Saprophytic fungi. Fungi that live on dead or decomposing matter (in the tree) as opposed to functional, living tissues

Sap-run. Liquid running down a stem, branch, or root buttress and providing a food source or other habitat resource. Originating from phloem or xylem death or infections, or water that has accumulated in or run through decaying material.

Sapwood. Living xylem tissues

Safety factor. The ratio of the maximum stress that a structural part of a tree can withstand to the maximum stress experienced under normal conditions

Screef. To clear surface vegetation (commonly up to a depth of around 20mm)

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

Senescence. The condition or process of deterioration with age.

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

Shoot. The elongating region of a stem or branch

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

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

Single-up. Removal of stems from a multi-stemmed tree with the aim of developing a tree with a single stem.

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

Soil auger. A hand-held steel auger 60mm diameter auger used for extracting soil samples.

Soil horizons. A layer parallel to the soil surface, whose physical characteristics differ from the layers above and beneath:

- **O)** Organic matter - Litter layer of plant residues
- **A)** Surface soil - Layer of mineral soil with accumulation of organic matter
- **B)** Subsoil - This layer accumulates mineral and organic compounds.
- **C)** Parent rock - Layer of large unbroken rocks
- **R)** Bedrock - Partially weathered bedrock at the base of the soil profile

Soil sample. A sample of soil extracted for the purpose of either field or laboratory testing to determine mineral, chemical or structural composition, and or moisture content and shrinkability.

Sounding hammer. A small plastic or nylon hammer used for assessing the audible signs of decay, cracks and other features in trees

Spores. Propagules of fungi and many other life-forms; most spores are microscopic and dispersed in air or water

Sporophore. The spore bearing structure of fungi

Sprouts. Adventitious shoot growth erupting from beneath the bark

Squirrel damage. Stripping of the bark from stems or branches by squirrels. This can result in the death of branches or even entire trees

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

Stem taper. The downward tapering of a tree stem out into the flare of the root buttresses

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

Strain. In mechanics, the distortion of an object caused by a stress

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

Terminal xylem. The last layers of xylem cells produced at the end of the growing season

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 cambium. Sometimes described simply as 'cambium'. Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Vascular dysfunction. Dysfunction of water conducting cells

Vascular wilt. A type of plant disease in which water-conducting cells become dysfunctional

Vessels. Water-conducting cells in plants, usually wide and long for hydraulic efficiency; generally not present in coniferous trees

Veteran tree. A tree that has the physical characteristics of an ancient tree but is not ancient in years, compared with others of the same species

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

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

Weeping lesion. Exudations from a lesion in plant tissue

Wet flush. Where water from underground flows out onto the surface to create an area of saturated ground, rather than a well-defined channel

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

Xylem. Secondary xylem; the main structurally supporting and water-conducting element of trees (refined definition specific to this case)

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