CHESHIRE WOODLANDS

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Mr P Blanchard
Manchester City Council
8th Floor
Town Hall Extension
P.O. Box 532
Manchester
M60 2LA

09 April 2024

Dear Mr Blanchard,

TREE SURVEY AND ARBORICULTURAL ASSESSMENT - ST JOHN'S GARDENS, MANCHESTER

Further to my survey of 1 February, I set out below the findings of my inspections and risk assessment of your trees along with my management recommendations. When you have had the opportunity to consider my report and recommendations I can produce a scheme for the protection of trees during any rebuilding or resurfacing works.

Method

The tree were inspected and assessed from ground level using binoculars where necessary. Stem diameters and heights was/were both measured and estimated.

Trees usually contain dead branches, cavities, minor defects, and other features that are not recorded individually unless they are of sufficient significance to affect the outcome of the risk assessment, or there is some other reason to.

In consideration of the risks associated with the trees, the Quantified Tree Risk Assessment (QTRA) method has been applied. Guidance on the method, its application, and the use of results to inform management decisions is provided in the QTRA Practice Note[1].

Based on the you accepting the principles set out in the QTRA Practice Note and or any other specific instructions, I have taken account of the cost/benefit balance when providing management recommendations.

Where technical terms are used, they are included in a glossary at Appendix 3.

Limitations

Because the inspections were non-invasive and carried out from ground level, the disclosure of hidden defects cannot be expected. In this regard, unless otherwise stated, I consider that a sufficient view was taken of the trees to inform the reasonable assessment of risks from their structural failure.

Assessment of the potential influence of trees, upon buildings or other structures resulting from the effects of trees upon shrinkable loadbearing soils, was excluded from our fee proposal, and therefore from this report.

Statutory protection of trees

The site is in the Castlefield Conservation Area but trees on site are not protected by a tree preservation order. Subject to certain specified exemptions, it will be necessary to submit a six week notice of intent to the local planning authority before removing or carrying out work or damage to any trees.

Tree data

My inspection records and management recommendations are in a tabulated Tree Risk Assessment Schedule (the Schedule) in appendix 1, and trees are plotted on a Tree Risk Assessment Drawing (the Drawing) in appendix 2. The trees were assessed in groups and recorded individually only where there was a potentially significantly elevated risk, or there was some other reason to do so. Group reference numbers are prefixed G and individual trees are either prefixed T or by the reference for the group within which they stand, e.g. G1/7 would be tree number 7 and located in group G1. Both groups and individual trees are colour coded in relation to risk as described in table 1. The risk for groups is the residual risk after any higher risk trees have been considered and those trees recorded individually.

Risk decision making guidance

In 2011, the National Tree Safety Group, comprising a wide range of stakeholders, published a suite of guidance for tree owners and managers.

The guidance, which seeks to encourage tree owners to take a balanced and proportionate approach to tree safety management, is set out in three documents with the overarching guidance in *Common sense risk management of trees: Guidance on trees and public safety in the UK for, owners, managers and advisers*[2]. There are also two summary documents, one for estates and smallholdings[3], and another for householders.

Cheshire Woodlands cannot provide guarantees of safety or that trees or branches will not fail. We evaluate the structural condition of trees at what we consider to be an appropriate level of detail given their size and location in relation to people and property that could be harmed or damaged. What is an appropriate level of detail for our inspection of trees is informed by use of the QTRA method.

Risk control measures bring benefits in terms of reducing or eliminating a risk, but those benefits come at a cost that should, in broad terms, be balanced against the benefits of risk control. For guidance on considering costs and benefits, please refer to the QTRA Practice Note.

Based on the presumption that you agree to the principles set out here and in the QTRA Practice Note, I have taken account of the cost/benefit balance when providing management recommendations. You may wish to take a different approach; in which case I would review my advice.

For the avoidance of doubt, I am providing an inspection record and risk assessment of your trees, along with management advice. I am not providing guarantees of safety or dictating how you must manage your trees.

Table 1. QTRA Advisory Risk Thresholds

Risk Thresholds	Description	Action
1/ 1000	• Unacceptable • Risks will not ordinarily be tolerated	• Control the risk
1/10 000	• Unacceptable (where imposed on others) • Risks will not ordinarily be tolerated • Tolerable (by agreement) • Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	• Control the risk • Review the risk • Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/1 000 000	• Tolerable (where imposed on others) • Risks are generally tolerable	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at a reasonable cost • Review the risk
	• Broadly Acceptable	• No action currently required • Review the risk

Findings

The risks from falling trees and branches are low, I identified only three trees where the risk was elevated to the yellow region of risk (table 1). For two of these I have provided management options to reduce the risk. These options should be implemented according to your own priorities and are prefixed with a management category to assist your decisions.

The hornbeam tree T3 appears to be in terminal decline and there are very small dead branches overhanging the footpath. I expect larger branches to die and the risk to increase to a level that is unacceptable over the next 1-3 years, and partly for this reason, I recommend its removal.

Although not a major concern, there is low overhang to some footpaths and pedestrian areas and in this regard ongoing maintenance pruning is specified in the Schedule.

As you are aware, many trees on site are interfering with infrastructure. I have identified many trees that are either causing displacement of walls or have potential to displace them. Similarly, many trees are displacing surfacing. It is inevitable that, if the trees remain, there will be a need for ongoing repairs. I have provided general recommendations for managing the trees in relation to infrastructure damage, including the removal and replacement of some trees, and the removal of iron railings.

At some locations, trees have potential to outgrow their locations irrespective of their potential to displace infrastructure. An example of this is the four plane trees in group G5, which at around 19 metres high are dominating the northern aspect of the adjacent dwellings but have potential mature heights in the region of 25-30 metres with a commensurate increase in crown spread and stem diameter. I am proposing the reduction of these trees to provide a framework that can be pollarded on a regular cycle; 2 trees in spring 2024 and 2 trees in winter 2025/6, thereafter staggered re-pollarding every 2 years. Because this form of management has potential to reduce the annual growth rate of the stem, I suggest that it would be appropriate management for some other plane, hornbeam and alder trees that are abutting walls and railings. I have recommended this for several trees.

If left unmanaged, the hornbeam trees T4-T6 will soon be in contact with the adjacent wall and it is my opinion there is no scope to contain their growth. I am recommending their removal along with tree T1. Following removal, I recommend the tree planting pit be doubled in size as has been done with some other trees in the vicinity. New hornbeams can then be planted with more space to develop and can then be managed by pruning to create a framework where the trees can be pollarded on a regular cycle.

The roots of some trees are being damaged by grass cutting equipment and I suggest that where this occurs, there are two management options. The simplest is to stop mowing the grass in the affected areas and cut it just once a year with a nylon line brush cutter, perhaps planting some bulbs in the area. The other option is to raise the ground level slightly above the affected roots and to reseed the grass.

Conclusions and recommendations

Safety concerns are few and are easily addressed as set out in the schedule. Damage to infrastructure and managing continuity of tree cover is more difficult.

The lifespans of many trees on the site will be foreshortened by their relationships with infrastructure, but these conflicts can be managed to maximise the contribution of trees to the amenity of the site while reducing the risk of damage.

Partial solutions to conflicts will include phased removal and replacement of trees with careful selection of tree species suited to a particular location, regular pollarding of some trees, modification and or removal of walls, railings, and surfacing. When you have had the opportunity to review my survey data and report with your management committee, I can produce a schedule of work and a method statement for any excavation or building work that has potential to damage trees. I could also produce a spreadsheet setting out phased management works of over a period of say 10-20 years.

My suggested management options are detailed in the Schedule, and each is prefixed with a numbered category to help you prioritise the work.

I advise that you should periodically review the tree at perhaps 2-3 yearly intervals, or more frequently if you identify concerns, and carry out your own visual checks for signs of obvious damage to trees following severe wind events. Obvious damage might include broken and hanging branches, split branches or stems, partially failed trees that are hung up in neighbouring trees, or cracking in the ground around a tree indicating that there might have been excessive movement in its roots.

BS3998 2010 Tree work - Recommendations should be used as a reference point for standards of tree work. Cheshire Woodlands can provide on-site tree pruning and maintenance guidance for grounds staff if required.

Other than for safety related works, it will be necessary to give the local planning authority six weeks' notice of intention to implement works in a conservation area. Statutory protection of trees and wildlife should be considered in the planning and execution of tree pruning and removal. See our Guidance Note on Statutory Controls[4].

Yours sincerely,



M J Ellison

Cheshire Woodlands Limited

Appendices

1. Tree Risk Assessment Schedule
2. Tree Risk Assessment Drawing
3. Glossary of Terms

Endnotes

1. Quantified Tree Risk Assessment Practice Note
2. Common sense risk management of trees: Guidance on trees and public safety in the UK for, owners, managers and advisers
3. Common sense risk management of trees: Landowner summary of guidance on trees and public safety in the UK for estates and smallholdings
4. Guidance Note: Statutory Controls

APPENDIX 1

TREE RISK ASSESSMENT SCHEDULE

(When printing always use colour)

CLIENT:	Manchester City Council
PROJECT:	St John's Gardens Manchester
BRIEF:	Tree Risk Assessment
SURVEYOR:	M J Ellison
DATE:	Thursday, 1 February, 2024
REFERENCE:	CW/11348-RAS-24 Rev 1

HEADINGS & ABBREVIATIONS

GROUP/TREE REF:	TREE OR GROUP REFERENCE
TAG NO:	TAG NUMBER WHERE A TAG HAS BEEN AFFIXED TO TREE
AGE:	Y = YOUNG, SM = SEMI MATURE, EM = EARLY MATURE, M = MATURE, PM = POST MATURE, V = VETERAN
HEIGHT (M):	HEIGHT OF TREE OR MAXIMUM HEIGHT FOR THE GROUP, APPROXIMATELY 1 IN 10 TREES ARE MEASURED AND THE REMAINDER ESTIMATED AGAINST THE MEASURED TREES
DBH:	STEM DIAMETER FOR THE TREE OR MAXIMUM DIAMETER FOR THE GROUP - MEASURED OR ESTIMATED AT A HEIGHT OF APPROXIMATELY 1.5 METRES
VITALITY:	A MEASURE OF PHYSIOLOGICAL CONDITION. N = WITHIN NORMAL RANGE FOR SPECIES AND AGE, R = REDUCED FROM THE NORMAL RANGE FOR SPECIES AND AGE, P = POOR, MD = MORIBUND, D = DEAD
TARGET TYPE:	V = VEHICLE ON HIGHWAY; H = HUMAN; P = PROPERTY
Mx TARGETS:	WHERE TARGET HAS A VALUE GREATER THAN CONSTANT OCCUPATION BY ONE PERSON, OR A LIKELY REPAIR/REPLACEMENT VALUE GREATER THAN £2M
TARGET:	LIKELIHOOD OF A TARGET BEING OCCUPIED OR THE REPAIR OR REPLACEMENT VALUE OF PROPERTY EXPRESSED AS A FRACTION OF £2M - EXPRESSED AS A RANGE OF VALUE (SEE QTRA PRACTICE NOTE)
SIZE:	VALUE FOR THE RISK ASSESSED TREE OR BRANCH - EXPRESSED AS A RANGE OF SIZE (SEE QTRA PRACTICE NOTE)
POF:	PROBABILITY OF FAILURE WITHIN 12 MONTHS OF THE ASSESSMENT - EXPRESSED AS A RANGE OF PROBABILITY (SEE QTRA PRACTICE NOTE)
MASS %:	WHERE THE MASS OF A BRANCH IS REDUCED BY DEGRADATION, A FRACTION MAY BE INTRODUCED TO REFLECT THE PROPORTION OF THE REDUCTION
ROH:	RISK OF HARM (ANNUAL)

MANAGEMENT CATEGORIES

1) SAFETY - HIGH
2) SAFETY - MEDIUM
3) SAFETY - LOW
4) SAFETY - LONG TERM
5) DAMAGE TO STRUCTURES - HIGH
6) DAMAGE TO STRUCTURES - MEDIUM
7) DAMAGE TO STRUCTURES - LOW
8) GENERAL MANAGEMENT - HIGH
9) GENERAL MANAGEMENT - MEDIUM
10) GENERAL MANAGEMENT - LOW
11) ONGOING MANAGEMENT
12) IMMEDIATELY PRIOR TO NEXT ASSESSMENT
13) NO PRIORITY

Trees may be subject to legal controls, which should be investigated prior to any felling, pruning, or wilful damage. Unless otherwise agreed, data in this schedule are time limited to one year, after which they should be reviewed.

GRP REF	TREE REF	TAG NO	SPECIES	AGE	HT	DBH	VITALITY	REVIEW COMMENTS	MANAGEMENT & CATEGORY	RISK ASSESSMENT OF	TARGET TYPE	Mx TARGETS	TARGET	SIZE	POF	MASS %	ROH
G1				SM/EM	15	600	N	2024 February: - Linear group of trees in an amenity landscape planting - Several trees close to brick wall have potential to displace the structure - Ivy shrouding tree stems and wall	6: Remove ivy from stems and wall 6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G1/14		Alder	EM	15	300	N	2024 February: - High potential to displace boundary wall and surfacing if allowed to grow unchecked	6: Prune to contain overall crown dimensions on a regular 3-5 yearly cycle 9: Sever and remove ivy to a height of 2m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G1/15		Gean cherry	EM	14	600	N	2024 February: - Stem in contact with wall. High potential to displace boundary wall in short term - Vertical cracking in brickwork immediately adjacent to the stem - Stem colonised by ivy	9: Sever and remove ivy to a height of 2m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G1/16		Poplar	SM	15	300	N	2024 February: - High potential to displace boundary wall although currently a reasonable clearance	8: Establish replacement tree of silver birch (Betula pendula) with a view to the future removal of the poplar 9: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G2			Mixed species [Holly, Whitebeam, False acacia, Apple]	Y/EM	12	500	N	2024 February: - Past partial windthrow of whitebeam at the west end of the group		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G3			Mixed species [Hornbeam, Small leaved lime]	EM	17	500	N	2024 February: - Linear group of 4 trees - Past pruning to clear building and there are clearances of approx. 2m - Mower damage to surface roots	9: Spread and level sandy topsoil over exposed roots and reseed lawn	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G4			Mixed species [Sycamore, Hornbeam]	EM	19	700	N	2024 February: - Epicormic shoots to stem/s	9: Remove epicormic growth to a height of 3m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G5			London plane	EM	19	700	N	2024 February: - Maturing London plane trees causing extensive displacement of brick boundary wall, asphalt surfacing and iron railings. The trees will cause further displacement of the wall and if the trees are retained, future management may require removal of sections of the wall - Evidence of past crown reduction and to contain the overall dimensions of the trees and there is some merit in repeating the crown reduction - Evidence of regular pruning to maintain clearances from the building with current clearances being in the region of 3-4m	5: Top 2 alternate trees at a height of approximately 12 metres in spring 2024 and the remaining 2 trees in winter 2025/6. Repollard on a 4 yearly cycle (alternate trees every 2 years) 5: Remove iron railings that are in contact with trees and repair walls as required. Retain railings for future use elsewhere on site	risk less than 1 in 1M - calculation unnecessary	-						<1/1M

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G6			Mixed species [Silver birch, Whitebeam, Crab apple, Cotoneaster]	EM	9	400	N	2024 February: - Cotoneaster, crab apple and birch trees close to the wall and require monitoring over the long term - Tree/s displacing surface/s	6: Monitor trees adjacent to wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G6/30		Cotoneaster	EM	6	200	N	2024 February: - Growing against boundary wall with one of the twin stems growing onto the brickwork. There are two solutions to this. The first being to remove the stem that is in contact with the wall and the second is to modify the wall to make space for ongoing growth of the tree	6: Option a: Remove the stem that is in contact with the wall Option b: Modify the wall to make space for ongoing growth of the tree	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G7			Mixed species [Hornbeam, Whitebeam, Norway maple]	EM	19	650	N	2024 February: - Minor dead branches presenting low risks - Acute included bark union/s to stem/s with signs of adaptive growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G8			Mixed species [Alder, Silver birch, Sawara cypress, Rowan, Crab apple, Evergreen oak, Acer sp. - Maple sp., Cotoneaster, Magnolia, Pear, Sumac]	SM/EM	14	600	N	2024 February: - Majority of the ornamental trees are being managed by residents - Many trees in brick planters with displacement of brickwork - Low overhang of footpaths	11: Maintain vertical clearances over footpaths of 2.5-3m where possible	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G8/39		Crab apple	EM	7	250	N	2024 February: - Potential for displacement of planter wall. Minor cracking	6: Monitor walls	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G8/40		Lawson's cypress	SM	14	300	N	2024 February: - Cracking in wall of planter	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G8/41		Evergreen oak	EM	8	600	N	2024 February: - Displacement of adjacent planter wall		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G8/42		Atlas cedar	SM	12	550	N	2024 February: - Potential for substantial growth and displacement of the planter wall	5: Option a: Fell and grind stump to a depth of 0.2m and plant a replacement tree of Yew Taxus baccata 'Fastigiata') 1.2m high Option b: Monitor wall and paving and repair as required	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G8/43		Sawara cypress	Y	4	100	N	2024 February: - Located approx. 0.5m from wall of brick planter where there is a significant level of displacement. Not clear whether this is due to the roots or settlement of foundations	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
G9			Mixed species [Silver birch, Deodar cedar, Sweet chestnut, Crab apple, False acacia, Acer sp. - Maple sp., Cherry, Sumac, Ginkgo]	SM/EM	11	350	N	2024 February: - Many trees located in brick planters, with some walls and paving showing signs of displacement	6: Monitor damage to planters	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G9/51		Deodar cedar	Y	8	200	N	2024 February: - Displacement of brick planter, which could be attributable to roots from this tree - An adjacent tree has been felled and may have been contributing to the damage - The tree is ill suited to the location and has potential for substantial future growth. Removal seems to be the only reasonable management option	5: Fell to ground level 9: Establish a replacement tree of crab apple (Malus 'Profusion''	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G9/52		Cypress	SM	10	250	N	2024 February: - Displacement of adjacent planter which is likely to be attributable to roots from this tree	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	G9/53		False acacia	Y	11	200	N	2024 February: - Wholly unsuited to the location with potential for substantial future growth - Located approx. 0.4m from planter retaining wall	5: Fell and poison or grind out stump	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T1		Whitebeam	EM	12	450	N	2024 February: - Signs of past root plate heave	2: Monitor for ongoing root plate movement	tree failure onto footpath	H	1	3	2	4	100%	1/1M
	T2		Whitebeam	EM	11	500	N	2024 February: - No obvious significant defects identified		risk less than 1 in 1M - calculation unnecessary	-						<1/1M

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	T3		Hornbeam	SM	9	250	P	2024 February: - Extensive crown decline - High potential to displace wall if condition of the tree improves - Minor dead branches over footpath - Expected to deteriorate, with an ongoing increase in the risk from branch failure	5: Fell and grind stump and replace with small to medium size tree species such as cockspur thorn (Crataegus crus galli) After doubling size of planting pit (2024/5)	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T4		Hornbeam	SM	11	250	R	2024 February: - Stem within 20mm of boundary wall - High potential to displace boundary wall - No obvious signs of movement in wall	5: Fell and grind stump and replace with After doubling size of planting pit (2024/5), plant replacement hornbeam, to be maintained by pollarding at a height of 7-10 metres 6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T5		Hornbeam	SM	11	250	R	2024 February: - High potential to displace boundary wall	6: Monitor wall 8: Fell and grind stump and replace with small to medium size tree species such as hawthorn (Crataegus monogyna) After doubling the size of the planting pit (2024/5)	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T6		Hornbeam	SM	11	300	R	2024 February: - High potential to displace boundary wall	6: Fell and grind stump After doubling size of planting pit (2024/5), plant replacement hornbeam, to be maintained by pollarding at a height of 7-10 metres 6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T7		London plane	EM	16	700	N	2024 February: - Displacing wall with vertical cracking in the wall to both sides - A section of boundary wall has been removed and replaced with iron railings - The planting area for the tree has been extended into the driveway	5: Option A: remove tree, grind stump out. Plant replacement of any low growing species or a hornbeam to be maintained by regular pollarding Option B: Monitor movement of wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T8		Ash	Y	7	150	N	2024 February: - Pruned to contain growth of crown - High potential to displace boundary wall - Displacement of asphalt surfacing	5: Maintain by pollarding on a 3-4 yearly cycle to develop pollard heads	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T9		London plane	EM	16		N	2024 February: - A section of boundary wall has been removed and replaced with iron railings - High potential to displace boundary wall	6: Monitor wall and surfacing	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T10		Rowan	Y	6	75	N	2024 February: - Located within 250mm of wall and has long-term potential to displace the wall	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T11		False acacia	EM	15	550	R	2024 February: - Potential to displace boundary wall in medium term - The planting area for the tree has been extended into the driveway	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T12		False acacia	EM	17	550	N	2024 February: - Potential to displace boundary wall in short-term	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T13		Hornbeam	SM	15	400	N	2024 February: - The planting area for the tree has been extended into the driveway - High potential to displace boundary wall	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T17		Gean cherry	M	18	700	N	2024 February: - Past first-order branch failure (storm damage) - Lifting of public footpath, which appears to be part asphalt and part asphalt over concrete - No evidence of displacement of adjacent wall - Potential to displace adjacent wall	6: Monitor wall 6: Plan for removal in 5-10 years	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T18		Cypress	SM	6	75	N	2024 February: - Misplaced planting of an ornamental conifer that has outgrown its location although no signs of damage to infrastructure		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T19		Grey Alder		19	450	N	2024 February: - Epicormic shoots to the stem/s	9: Remove epicormic growth to a height of 3m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T20		Silver birch	EM	18	550	N	2024 February: - Reasonable clearance from wall and limited potential to cause damage	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M

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	T21		Silver birch	EM	18	450	N	2024 February: - Reasonable clearance from wall and limited potential to cause future problems of displacement	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T22		Silver birch	EM	16	300	N	2024 February: - Reasonable clearance from wall and limited potential to cause future problems of displacement - Stem colonised by ivy	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T23		Silver birch	EM	16	400	N	2024 February: - Reasonable clearance from wall with moderately low risk of displacement - Stem colonised by ivy	9: Sever and remove ivy to a height of 2m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T24		Norway maple	EM	16	600	N	2024 February: - Potential for substantial future growth and potential for displacement of adjacent boundary wall in the long term - Stem colonised by ivy	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T25		Holly	Y	6	75	N	2024 February: - A young tree located abutting the boundary wall and having high potential to cause displacement	5: Fell and poison stump	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T26		Cherry	Y	3	50	N			risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T27		Japanese cherry	EM	3		D	2024 February: - Stump	8: Option a: Fell and grind out stump and establish replacement of a smaller maturing species such as hawthorn (Crataegus monogyna) Option b: Consider doubling the size of planter by opening up into the area of asphalt and establishing medium canopy species such as birch (Betula pendula) or alder (Alnus glutinosa)	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T28		Japanese cherry	EM	7	250	D	2024 February: - Dead	2: Option a: Fell and grind out stump and establish replacement of a smaller maturing species such as cherry (Prunus serrula) Option b: Consider doubling the size of planter by opening up into the area of asphalt and establishing medium canopy species such as birch (Betula pendula) or alder (Alnus glutinosa)	first-order branch failure onto footpath	H	1	2	3	3	100%	1/50K
	T29		Whitebeam	EM	9	400	N	2024 February: - Past windthrow with a lean of approx. 25 degrees towards the road which has recently increased with a lean of approx. 25 degrees towards the road which has recently increased. Likely progressive failure	2: Reduce height by (approximately) 2m and reduce radial spread on N side by 2m, and on E, & W sides by 1m	tree failure onto footpath	H	1	3	2	3	100%	1/100K
	T31		Sumac		5	200	N	2024 February: - Abrading wall but no signs of displacement	6: Option A: monitor wall Option B: Prune to remove branches that are abrading the wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T32		Silver birch	EM		450	N	2024 February: - Located approx. 200mm from a 1.5m high brick wall and causing displacement of the structure with a vertical crack in the wall immediately adjacent to the tree. This displacement is likely to continue and get worse over time and there would be some merit in removing this tree and establishing a replacement at a greater distance from the wall	5: Fell and poison stump/s - and establish a replacement tree of silver birch (Betula pendula)	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T33		Crab apple	Y	3	75	N	2024 February: - Previously topped to contain growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T34		Crab apple	Y	3	75	N	2024 February: - Previously topped to contain growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T35		Crab apple	Y	3	75	N	2024 February: - Previously topped to contain growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T36		Crab apple	Y	3	75	N	2024 February: - Previously topped to contain growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T37		Crab apple	Y	3	75	N	2024 February: - Previously topped to contain growth		risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T38		Crab apple	SM	5	150	N	2024 February: - Low overhang to footpath	9: Prune to maintain 2.5m clearance over path	risk less than 1 in 1M - calculation unnecessary	-						<1/1M

TREE RISK ASSESSMENT SCHEDULE

(When printing always use colour)

GRP REF	TREE REF	TAG NO	SPECIES	AGE	HT	DBH	VITALITY	REVIEW COMMENTS	MANAGEMENT & CATEGORY	RISK ASSESSMENT OF	TARGET TYPE	Mx TARGETS	TARGET	SIZE	POF	MASS %	ROH
	T44		London plane	EM	19	800	N	2024 February: - Causing displacement of asphalt surfacing around base - The tree is regularly pruned to maintain clearances on the adjacent dwellings	6: Monitor surfacing 6: Repair surfacing as required Prune as required to maintain clearances from dwellings	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T45		London plane	EM	19	750	N	2024 February: - Restricted space between brick walls and located within 20mm of one of the walls - Displacement of walls evident in vertical cracking - The tree has been managed to maintain clearances from buildings by regular pruning	5: Option A: Retain tree and continue existing management and remove adjacent sections of wall Option B: Fell to ground level and ground out stump. Repair wall and establish replacement tree	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T46		Sycamore	EM	18	700	N	2024 February: - Located within 250mm of 1.5m brick wall and the wall to the north of the stem is out of vertical alignment and is breaking away from an adjacent wall	5: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T47		London plane	EM	18	800	N	2024 February: - Located close to 1.5m high walls. No obvious signs of displacement - Some displacement of adjacent asphalt surface - Stem colonised by ivy	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T48		Silver birch	EM	12	250	N	2024 February: - Located close to 1.5m high wall and has potential to cause displacement of the structure - Stem colonised by ivy	6: Monitor wall	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T49		Silver birch	EM	12	350	N	2024 February: - Located close to 1.5m high wall and has potential to cause displacement of the structure - Epicormic shoots to the stem/s	6: Monitor wall 9: Remove epicormic growth to a height of 3m	risk less than 1 in 1M - calculation unnecessary	-						<1/1M
	T50		Silver birch	EM	10	200	N	2024 February: - Located close to 1.5m high wall and has potential; to cause displacement of the structure - Sycamore, holly and cypress trees growing adjacent to stem	6: Monitor wall 9: Remove sycamore and holly	risk less than 1 in 1M - calculation unnecessary	-						<1/1M

APPENDIX 2

TREE RISK ASSESSMENT DRAWING



TREE RISK ASSESSMENT DRAWING

CHESHIRE WOODLANDS

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Client:	**Manchester City Council**
Project:	**St John's Gardens Manchester**
Reference:	**CW/11348-P-RA-24**
Date:	**Thursday, 1 February, 2024**
Scale:	**Not to scale**

Legend:

TREES:	GROUPS:
Risk not assessed	Risk not assessed
Unacceptable High	Unacceptable High
Unacceptable	Unacceptable
Tolerable	Tolerable
Broadly Acceptable	Broadly Acceptable
Proposed new tree	
Stump of felled tree	
Tree felled and stump removed	

APPENDIX 3

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

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

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

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 notional 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

Secondary thickening. Production of a layer of new xylem (wood) over a pre-existing shoot, branch, stem or root.

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)

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