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ARBORICULTURAL REPORT

TREE INSPECTION & RISK ASSESSMENT

SITE ADDRESS: 88 TERRACE RD, GUILDFORD, 6055. WA

CLIENT: LYN O'BRIEN.

PREPARED BY: ALEX CORKE, INDEPENDENT CONSULTING ARBORIST, BRANCH ARBORICULTURE.

REPORT DATE: 09.03.2026.

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1.0 BRIEF:

1.1 Branch Arboriculture has been instructed by Ms Lyn O'Brien (Client) to undertake an inspection, Visual Tree Assessment (VTA) & QTRA Risk Assessment of the established trees surrounding the 88 Terrace St, Guildford, WA (subject property) and prepare a report outlining findings and provide recommendations on options for future tree management.

1.2 This assessment involved the following procedures:

- A site visit to undertake an inspection and assessment of the subject trees.
- Assessment of target/occupancy rates, to determine level of risk.
- Undertake field measurements, documenting, and photographing the subject trees.
- Present findings and maintenance recommendations as required.

2.0 GENERAL OBSERVATIONS:

2.1 Alex Corke, consulting arborist at Branch Arboriculture, undertook the onsite arboricultural inspection of the subject trees from the ground on 04/03/26, during clear and warm meteorological conditions, with a light breeze.

2.2 For clarity, the subject trees have been numbered 1 -7 (see image **2.5** below). These numbers are for purposes of this report only, and do not correspond with any previous reports/tree inventories.

2.3 The subject trees are situated to the north, and east, south of the subject property – a vacant single storey heritage dwelling.
(GPS coordinates for the location of the subject tree can be found in **4.0** survey tables below.)

2.4 As part of the quote request for this arboricultural report from the Client, details from a building survey undertaken in December 2025 were shared suggesting that Subject tree #3 (Jacaranda) is the primary causal agent of structural damage to the east façade of the subject property.

2.5 There appears to be no functioning reticulation within the grounds of the subject property, and the existing plants and subject trees were exhibiting early signs of drought at the time of inspection.

2.5 Satellite image showing location of subject trees in relation to the subject property taken from GPS Tracks:



3.0 TREE INSPECTION AND ASSESSMENT METHODOLOGY:

3.1 The health and structural characteristics of the subject trees were assessed using contemporary arboricultural principles and practices, and for the purposes of this report, a standard Visual Tree Assessment (VTA) to assess tree health/structure and to identify potential anatomical defects was undertaken.

3.2 To assess the level of risk the subject tree represents to the property and its occupants, Quantified Tree Risk Assessment (QTRA) was used.

3.3 Whilst every effort is made to ensure an accurate assessment of the subject trees' condition during the survey, no responsibility can be taken for resultant damage or injury occurred by the structural failure of a tree. The survey provides a study of what is visible, not obscured, or inaccessible on the day of survey. Please note that the findings of this report are only valid for 12 months from the date of the tree inspection. This report does not constitute to a full tree safety policy for the entire site, nor does it take into account any underground geological conditions or activity that may affected the structural condition of the trees. For full details of limitations of liability please see page 13.

3.5 NOTES ON VTA:

Contemporary arboricultural inspections typically employ a biomechanically based system of Visual Tree Assessment (VTA), the basis of which is the identification of symptoms produced by a tree in reaction to a weak point, or area of mechanical stress.

VTA is a non-invasive method of examining the health and structural condition of individual trees. It has become the standard approach for surveying trees. By visually examining a tree, an arborist can gather information on the condition of its roots, stem, main branch structure, crown, buds and leaves to make an assessment and draw conclusions about its general condition, structure, health, and vitality.

It is a systematic approach, which directs the arborist through a procedure from biological and routine observations to analysis, using their understanding of failure criteria.

In any inspection regarding tree health or safety, an arborist will look for biological signs, such as undersized leaves, discoloured foliage, dead branches, large or numerous cankers and fungal fruiting bodies. They will be able to recognize the significance of these observations by comparing them with the typical growth patterns and appearance of the tree involved.

They will also look at the tree for signs of structural weakness or for a change in growth patterns that may indicate defects. If mechanical weakness is suspected, there may be a need for more investigation using specialist decay detection and measuring equipment.

A list of diagnostic criteria used for the VTA inspections can be found in appendix (ii)

3.6 NOTES ON QTRA:

Tree safety management is a matter of balancing the risk of harm from tree failure while maintaining the benefits conferred by trees. Although it may seem counter-intuitive, the condition of trees should not necessarily be the first consideration. Instead, tree managers should first take account of the usage of the land on and around which the trees stand, and this in turn will inform the process of assessing the trees.

The QTRA method applies established and accepted risk management principles to tree safety management. By quantifying the risk of harm as a probability, QTRA enables the tree manager to manage the risk from tree failure to widely accepted risk thresholds.

Using this approach, first the targets (people and property) onto which trees could fail are assessed and quantified, thus enabling tree managers to determine whether they need to assess trees and to what degree of rigour an assessment or inspection of the trees is required. Where necessary, a tree or branch is then considered in terms of both its size (potential impact) and probability of failure. Values derived from the assessment of these three components (target, size and probability of failure) are combined to calculate a risk of harm as a probability, which can then be compared to advisory levels of risk acceptability.

This method moves the management of tree safety away from labelling trees as either 'safe' or 'unsafe' thereby requiring definitive statements of tree safety from either tree surveyors or tree managers. Instead, QTRA quantifies the risk of harm from tree failure in a way that enables tree managers to balance safety with tree value and operate to pre-determined risk thresholds.

By taking a QTRA approach to tree risk, managers commonly find they spend less resources on assessing and managing tree risk, whilst maximising the benefits their tree populations provide. Furthermore, in the event of a 'tolerable' or 'acceptable' tree risk being realised, they are in a robust position to demonstrate that they have acted both reasonably and proportionately.

Note: The QTRA method does not provide predictions of what will or will not happen but provides an estimate of the risk of harm from any particular tree failure hazard over a twelve-month period.

For further details of VTA and QTRA ranges used see explanatory notes in appendices.

4.0 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	1
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'45.0"S 115°58'32.6"E
Date of Tree Inspection/assessment:	04/03/26
Botanic name: (Common name)	<i>Eucalyptus caesia</i> (Silver Princess)
Origin of species:	Native (WA Endemic)
Stem diameter (DBH):	0.21m
Height (approx.):	9 m
Crown spread approx:	10 m
Age:	Early mature
Health:	Good: Exhibiting good foliage density & appearance, with no evidence of detrimental levels of pathogenic activity observed.
Structure:	Satisfactory: Single stem to approx. 3 metres, subsequent stem/limb unions appear sound, with some limb over extension developing. Recent 80mm limb failure. Satisfactory basal flare with no established lignotuber.
Crown form:	Broad
Useful life expectancy -/ </> 25 years:	> 15 years
Additional observations:	Good specimen, suited to its location.
Maintenance recommendations:	Minor maintenance pruning recommended.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 4, PoF 6 = RoH: <1/1M Broadly acceptable WT- T 3, S 0, PoF 6 = RoH: <1/1M Broadly acceptable
Image of subject tree:	

4.1 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	2
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.7"S 115°58'32.4"E
Date of Tree Inspection/assessment:	04/03/26
Botanic name: (Common name)	<i>Jacaranda mimosifolia</i> (Jacaranda)
Origin of species:	Native (Eastern states)
Stem diameter (DBH):	0.26 m
Height (approx.):	9 m
Crown spread approx. (N/E/S/W):	4m/5m/3m/4m
Age:	Early mature
Health:	Good: Exhibiting good foliage density & appearance, with no evidence of detrimental levels of pathogenic activity observed. Minor deadwood and epicormic shoot development throughout canopy – typical of species.
Structure:	Good: Single stem to 2m, moderate basal flare, stem/limb unions appear sound throughout canopy. Moderate lean to east from phototropic growth development .
Crown form:	Broad
Useful life expectancy -/ </> 25 years:	> 15 years
Additional observations:	Subject tree situated 1.14m from subject property., with surface root directly adjacent to crack in wall.
Maintenance recommendations:	Consider removal prior to structural remediation works.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 0, PoF 6= RoH: <1/1M Broadly acceptable WT- T5, S 2, PoF 6 = RoH: 1/<1M Broadly acceptable
Image of subject tree:	

4.2 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	3
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.5"S 115°58'32.0"E
Date of Tree Inspection/assessment:	04/03/26
Botanic name: (Common name)	<i>Eucalyptus leucoxylon</i> (SA Yellow Gum)
Origin of species:	Native (SA)
Stem diameter (DBH):	0.43 m
Height (approx.):	13m
Crown spread approx. (N/E/S/W):	12m
Age:	Mature
Health:	Good: No evidence of detrimental levels of pathogenic activity, good foliage density/appearance. Minor deadwood present in canopy.
Structure:	Good : Good basal flare, stem bifurcates at 3.5m - union appears sound - subsequent stem/limb unions appear sound throughout canopy. Lateral limbs becoming overextended.
Crown form:	Broad
Useful life expectancy -/ </> 25 years:	> 15 years
Additional observations:	
Maintenance recommendations:	Consider lateral limb reduction/maintenance pruning.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 3, S 0, PoF 6 = RoH: <1/1M Broadly acceptable WT- T 2, S 0, PoF 6 = RoH: <1/1M Broadly acceptable
Image of subject tree:	

4.3 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	4
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.1"S 115°58'31.7"E
Date of Tree Inspection/assessment:	04/03/26
<i>Botanic name:</i> (Common name)	<i>Olea europaea</i> (Olive)
Origin of species:	Exotic (Europe)
Stem diameter (DBH):	0.31m
Height (approx.):	9 m
Crown spread approx:	6.5m
Age:	Mature
Health:	Good: No evidence of detrimental levels of pests or diseases, good foliage density, appearance satisfactory - partly desiccated.
Structure:	Good, stem bifurcates at 1.2m subsequent stem/limb unions good throughout canopy.
Crown form:	Broad
Useful life expectancy -/ </> 25 years:	> 15 years
Additional observations:	
Maintenance recommendations:	No maintenance works required, Consider reticulation review.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 4, PoF 6 = RoH: <1/1M Broadly acceptable WT- T 4, S 3, PoF 7 = RoH: <1/1M Broadly acceptable
Image of subject tree:	

4.4 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	5
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.3"S 115°58'31.5"E
Date of Tree Inspection/assessment:	04/03/26
<i>Botanic name:</i> (Common name)	Angophora melanoxylon (Coolabah Apple),
Origin of species:	Native (Eastern States)
Stem diameter (DBH):	0.41 m
Height (approx.):	13 m
Crown spread approx.	9 m
Age:	Mature
Health:	Satisfactory: Keno exudation from lesions on lower stem, satisfactory foliage density & appearance. Moderate level of deadwood present in canopy.
Structure:	Satisfactory: Single stem with good basal flare, compressed structural limb union at canopy base, subsequent unions appear sound.
Crown form:	Asymmetric
Useful life expectancy -/ </> 25 years:	> 15 years
Additional observations:	Uncommon Eucalypt species for Perth metro area.
Maintenance recommendations:	Maintenance prune, consider removal of lower structural limb.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 3, PoF 5 = RoH: <1/1M Broadly acceptable WT- T 4, S 2, PoF 7 = RoH: <1/1M Broadly acceptable
Image of subject tree:	

4.5 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	6
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.2"S 115°58'31.5"E
Date of Tree Inspection/assessment:	04/03/26
Botanic name: (Common name)	<i>Corymbia ficifolia</i> (Red Flowering Gum)
Origin of species:	Native (WA endemic)
Stem diameter (DBH):	0.26m
Height (approx.):	9m
Crown spread approx. (N/E/S/W):	6m
Age:	Mature
Health:	Poor: No evidence of photosynthesising foliage, or live/functioning cambial tissue.
Structure:	Satisfactory – Good lignotuber development – typical of species, stem and structural limbs appear sound, with no evidence of decay. Asymmetrical canopy and stem lean due to suppression from adjacent tree.
Crown form:	Broad
Useful life expectancy -/ </> 25 years:	< 15 years
Additional observations:	
Maintenance recommendations:	Consider whole tree removal or canopy removal and retain as monolith for habitat.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 3, PoF 5 = RoH: <1/1M Broadly acceptable WT- T 4, S 2, PoF 6 = RoH: <1/M Broadly acceptable
Image of subject tree:	

4.6 TREE INSPECTION AND VTA FIELD NOTES/OBSERVATIONS:

Tree number:	7
Tree location (Address/GPS):	88 Terrace Rd, Guildford, 6055. WA 31°53'44.2"S 115°58'31.4"E
Date of Tree Inspection/assessment:	04/03/26
Botanic name: (Common name)	<i>Melaleuca lanceolata</i> (Moonah / Rottnest Tea Trea)
Origin of species:	Native (WA endemic)
Stem diameter (DBH):	0.24m
Height (approx.):	6m
Crown spread approx:	5
Age:	Mature
Health:	Satisfactory: No evidence of detrimental levels of pests or diseases, poor foliage density/appearance with extensive canopy dieback.
Structure:	Poor: Tree failed at base, with significant stress fracture in lower stem, held in situ by adjacent low wall and trees.
Crown form:	Suppressed
Useful life expectancy -/ </> 25 years:	< 15 years
Additional observations:	
Maintenance recommendations:	Remove.
QTRA Risk rating - part tree (PT)/ whole tree (WT) failure within following 12-month period:	PT - T 4, S 3, PoF 5 = RoH: <1/1M Broadly acceptable WT- T 4, S 3, PoF 6 = RoH: <1/1M Broadly acceptable
Image of subject tree:	

5.0 SUMMARY OF FINDINGS:

5.1 The results of the inspection and VTA observations indicate that the subject trees exhibit varied health and structural status at the time of the inspection, and recommended remedial works are outlined in **6.0** below to ensure continued low risk amenity benefit from the subject trees to both the subject property and its inhabitants and the local community/streetscape.

5.2 The results of the QTRA risk assessment indicate that the Risk of Harm from whole or part tree failure of the subject trees is <1/1m ('Broadly acceptable') i.e. as low as reasonably practicable, over the following 12 months.

5.3 Subject tree # 1 (Silver Princess) confers moderate visual amenity to the subject property and local streetscape and exhibits good health, structure and useful life expectancy with recent failure of a moderately sized limb, and requires minor maintenance pruning.

5.4 Subject tree # 2 (Jacaranda) appears to be in good health with good structure and confers some visual amenity to the subject property and local streetscape, however, upon inspection this tree appears to be adversely affecting the footings of the east façade of the subject property due to structural root expansion.

5.5 Subject tree # 3 (SA Yellow Gum) appear to be in good health with good structure, with a ULE of > 15 years, however the overextension of lateral limbs may increase the risk of part tree failure over time if not maintained. 2.

5.6 Subject tree # 4 (Olive) exhibits good health and structure, with a ULE of > 15 years with signs of drought stress.

5.7 Subject tree # 5 (Coolabah Apple) - an unusual species for the Perth metro area - appears to be in satisfactory health with satisfactory structure, with a ULE of > 15 years, with a compressed mid canopy structural limb union, and requires minor maintenance pruning.

5.8 Subject tree # 6 (Red Flowering Gum) appears to be dead with no live functioning tissue.

5.9 Subject tree # 7 (Moonah) appears to have failed at the rootplate.

6.0 ADDITIONAL SITE/TREE IMAGES:

6.1: Image showing failed limb from subject tree # 1



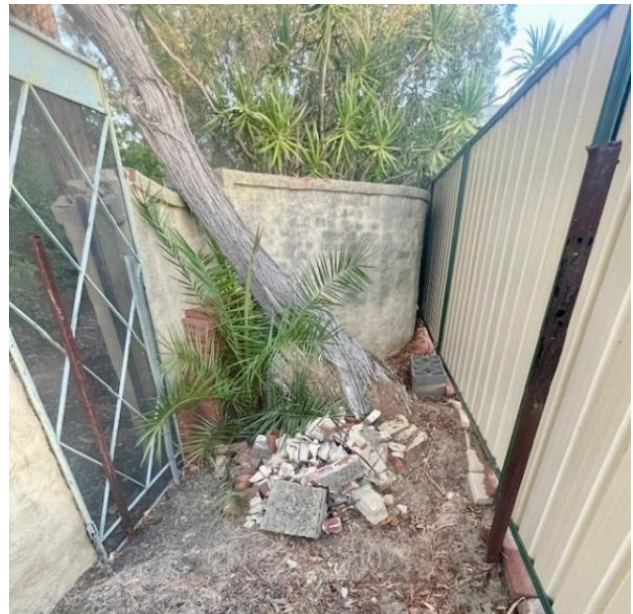
6.2: Image showing proximity of subject tree # 2 to; location of structural damage to subject property:



6.3 Image showing compressed union at canopy base of subject tree # 6:



6.4 Image showing basal failure of subject tree # extent of tree # 7:



7.0 RECOMMENDATIONS:

7.1 Subject tree # 1: Maintenance pruning overextended lateral limbs.

7.2 Subject trees # 2: Remove and grind stump prior remediation of structural issues within the subject property.

7.3 Subject tree # 3 requires minor canopy maintenance works: reducing overextended limbs to improve balance and reduce torsional stress on stem/limb unions.

7.4 Subject tree # 4: No works required - mulch to the extent of canopy dripline and check reticulation.

7.5 Subject tree # 5: Prune structural limb at poorly formed union at canopy base, mulch to the extent of canopy dripline.

7.6 Subject tree # 6: Remove tree, or remove canopy and retain stem as monolith habitat.

7.7 Subject tree # 8: Remove tree.

8.0 Discussion:

8.1 Normal amounts of leaf litter and other falling debris – gum nuts, bark, flowers, twigs and small branches etc, and other tree related minor inconveniences which may cause gutter/drain blockages, trip slip hazards, etc. are, within the remit of this report, considered a low risk - when compared with the amenity benefits conferred by the subject trees to the community.

8.2 Risk of Harm ratings can be a difficult concept to communicate to concerned stakeholders who may find themselves in close proximity to large trees, which can occasionally lose branches during strong low-pressure weather systems, and periods of hot weather, but seldom lose major limbs on a regular basis, and as such one must understand that most healthy and structurally sound trees will have developed biological ‘coping mechanisms’ to manage stresses incurred by adverse weather conditions.

8.3 Arboricultural reports enable the managers of trees to fulfill their duty of care in relation to pre-determined risk levels. These reports identify specific conditions and characteristics of each individual tree and its site conditions and consider the risks imposed on the community balanced against amenity value. Recommendations thereof are cognisant of the specifics of the hazards, associated risk, amenity and budgetary values.

8.4 Note that sporadic high energy ‘microburst’ weather systems are often very localised and are too unpredictable to be considered in the scope of a standard tree inspection, and due to the relative infrequency of such storm events, have no bearing on QTRA Risk of Harm calculations/outcomes.

8.5 As a general rule, where a tree is found to be of a ‘tolerable’ or ‘broadly acceptable’ risk, the benefits of retaining the tree far outweigh the risk imposed on the community by their continued presence.

8.6 For further information or discussion, or for any queries pertaining to this survey or findings within, Please contact Alex Corke using the details provided below:

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9.0 Disclaimer/ Limitation of Liability:

9.1 Consulting Arborists are tree specialists who use their qualifications, education, knowledge, training, diagnostic tools and experience to examine trees, recommend measures to enhance the aesthetic, structure and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of this assessment and report.

9.2 Branch Arboriculture Tree Consultancy cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways that the arboriculture industry does not fully understand. Conditions are often hidden within trees and below ground. Unless otherwise stated, observations have been visually assessed from ground level. Branch Arboriculture Tree Consultancy cannot guarantee that a tree will be healthy or a low risk of harm under all circumstances, or for a specified period of time. Likewise, remedial treatments cannot be guaranteed.

9.3 Treatment, pruning and removal of trees may involve considerations beyond the scope of Branch Arboriculture Tree Consultancy's service, such as property boundaries and ownership, disputes between neighbours, sight lines, landlord-tenant matters and other related incidents. Branch Arboriculture Tree Consultancy cannot take such issues into account unless complete and accurate information is given prior or at the time of the site inspection. Likewise, Branch Arboriculture Tree Consultancy cannot accept responsibility for the authorisation or non-authorisation of any recommended treatment or remedial measures undertaken.

9.4 In the event that Branch Arboriculture recommends re- inspection of trees at stated intervals. It is the client's responsibility to make arrangements with Branch Arboriculture Tree Consultancy to conduct the re-inspection.

9.5 Trees can be managed, but they cannot be controlled. To live or work near a tree involves a degree of risk. All written reports must be read in their entirety; at no time shall part of the written assessment be referred to unless taken in full context with the whole written report. If this written report is to be used in a court of law, or any other legal situation, Branch Arboriculture Tree Consultancy must be advised in writing prior to the written assessment being presented in any form to any other party.

Appendix (i): Subject tree Age/Health/Structure Category Definitions:**Tree Age:**

- **Young:** Sapling/advanced tree nursery stock/natural seedling putting on significant new growth each growing season, < 10 years.
- **Semi mature:** < 10 years – well established increasing in height and spread, but not at full potential.
- **Mature:** Established, reduced extension growth of shoot tips, reached or close to full potential (determined by site conditions.)
- **Over mature:** No longer adding significant extension growth, potentially receding, but still adding annual girth growth (senescing)

Tree Health:

- **Good:** The tree is demonstrating good extension growth for the species. The tree should exhibit a full canopy of foliage (or healthy buds in winter state) and may be affected by typical/minor pest or diseases. Foliage colour, size and density should be typical of a healthy specimen of that species.
 - **Fair:** The tree is in reasonable condition and growing well for the species. The tree should exhibit an adequate canopy of foliage. There may be extensive dead wood present in the crown, foliage may be distorted, discoloured or animals may be evident and/or foliage colour, size or density may be abnormal for a healthy specimen of that species.
 - **Poor:** The tree is not growing to its full capacity; extension growth of the laterals may be minimal. The canopy may be thinning or sparse. Large amounts of dead wood may be evident throughout the crown. Significant pest and disease problems may be evident or symptoms of stress indicating tree decline.
- Dead:** The tree is no longer photosynthesising and cellular material has ceased to function – Note at this stage trees still provide vital habitat as part of an ecosystem.

Tree Structure:

- **Good:** The tree has a well-defined and balanced crown. Branch unions appear to be strong, with no defects evident in the trunk or the branches. Major limbs are well defined. The tree would be considered a good example of the species. Probability of significant failure is highly unlikely.
- **Fair:** The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions or branches may be exhibiting minor structural faults. If the tree is single trunked, it may be on a slight lean or be exhibiting minor defects. Probability of significant failure is low.
- **Poor:** The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered major root damage. Probability of significant failure is moderate.

Appendix (ii): List of inspection criteria used for the purposes of the VTA inspection/assessment of health and structural characteristics of the subject trees. (note: inspections are not limited to the following criteria):

- Root heave and/or disturbance.
- Exposed roots – lowering of soil level – scorch/desiccation/trip hazard.
- Altered/abnormal soil levels and infill at base of stems – collar rot/root asphyxiation.
- Girdling roots – roots encircling the stem.
- Bark necrosis, canker.
- Cavities/decay pockets in stem and branch structure.
- Fungal brackets/fruitlet bodies /mycelium.
- Termite activity/Parasitic plants.
- Proximity of underground/overground services/utilities.
- Proximity of aboveground structures, eg. buildings, retaining walls, etc.
- Bark tears, lesions, splits and cracks.
- Abnormal/swollen & cracked areas in bark tissue.

- Physical abnormalities, eg lightning strikes, bridge grafts, etc.
- Unnatural change in bark colour, texture and form.
- Compression folds in bark.
- Excessive gum, sap, kino exudation and/or weeping.
- Borer, leaf miner and other insect activity.
- Included bark at major stem and branch unions.
- Evidence of tree surgery and infrastructure, eg cabling, bracing, propping, and other abiotic tree attachments.
- Branch attachments.
- Evidence of lopping and/or pollarding and poor pruning cuts.
- Branch sockets – areas where branches have been torn from union.
- Branches of uneven taper.
- Crossing, broken and hung-up branches – branch stubs.
- Die-back symptoms – stag heading and reduction in foliage density.
- Major dead wood – > 40mm Ø.
- Minor dead wood – < 10mm Ø.
- Foliage – changes in colour, size, shape and thickness variation.
- Epicormic growth.
- Growth habit of tree – leaning/crooked/ asymmetrical growth.

Appendix (iii) QTRA Risk Thresholds and Target Ranges Used in the Preceding Report:

The QTRA Risk of Harm calculation version 5.3/17 was used for this risk assessment.

Using a comprehensive range of values, QTRA enables the tree assessor to identify and analyse the risk from tree failure in three key stages. These values are combined to calculate an annualised Risk of Harm from a tree (Risk of Harm is shown in Field notes expressed as RoH):

1. To consider land-use in terms of vulnerability to impact and likelihood of occupation and establish a QTRA 'Target Range Value'. Target ranges for the subject trees at this site are based on occupancy rates of either people using the high ropes course, walking near or under the tree via footpaths, vehicles/pedestrians utilising the carpark/driveways/access roads. It may also be determined by situations where the subject tree is in close proximity to a static target e.g. building or item of built infrastructure. Each location is assessed to obtain a target rating and then the tree hazard is assessed in relation to that target. (Target ranges are shown in Field notes expressed as 'T' – see target ranges used in this survey in appendix (iii))

2. Considering the consequences of an impact requires taking account of the size of the tree or branch, whereby the size of part most likely to fail is considered in a range from 1 (large branch/stem/whole tree greater than 450mm Ø) through to 4 (Branches 100mm Ø or less), which may fall or fail within a 12-month period. (Size range is not used when property is the target, as the consequence is estimated in the cost of repair or replacement)

3. Probability of failure is assessed using VTA (see 4.1 above) which enables the assessor to quantify the likelihood that a whole or tree part would be likely to fail during the following 12 months. Probability of failure ranges from '1' (PoF 1/1 - > 1/10 - imminent failure/extremely likely) through to '7' (PoF 1/m - 1/10m - unlikely/highly unlikely) (Probability of Failure in Field notes are expressed as 'PoF')

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

QTRA Target Ranges				
Target Range	Property (repair or replacement cost)	Human (not in vehicles)	Vehicle Traffic (number per day)	Ranges of Value (probability of occupation or fraction of £2 000 000)
1	£2 000 000 – >£200 000	Occupation: Constant – 2.5 hours/day Pedestrians & cyclists: 720/hour – 73/hour	26 000 – 2 700 @ 110kph (68mph) 28 000 – 2 900 @ 100kph (62mph) 31 000 – 3 200 @ 90kph (56mph) 32 000 – 3 300 @ 80kph (50mph) 36 000 – 3 700 @ 70kph (43mph) 42 000 – 4 300 @ 60kph (37mph) 47 000 – 4 800 @ 50kph (32mph)	1/1 – >1/10
2	£200 000 – >£20 000	Occupation: 2.4 hours/day – 15 min/day Pedestrians & cyclists: 72/hour – 8/hour	2 600 – 270 @ 110kph (68mph) 2 800 – 290 @ 100kph (62mph) 3 100 – 320 @ 90kph (56mph) 3 200 – 330 @ 80kph (50mph) 3 600 – 370 @ 70kph (43mph) 4 200 – 430 @ 60kph (37mph) 4 700 – 480 @ 50kph (32mph)	1/10 – >1/100
3	£20 000 – >£2 000	Occupation: 14 min/day – 2 min/day Pedestrians & cyclists: 7/hour – 2/hour	260 – 27 @ 110kph (68mph) 280 – 29 @ 100kph (62mph) 310 – 32 @ 90kph (56mph) 320 – 33 @ 80kph (50mph) 360 – 37 @ 70kph (43mph) 420 – 43 @ 60kph (37mph) 470 – 48 @ 50kph (32mph)	1/100 – >1/1 000

Appendix (iv) Glossary of common arboricultural terms which may be found in the preceding report:

Abiotic: Pertaining to non-living agents, e.g. mechanical/environmental factors.

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.

Agl: Above ground level - used to describe the vertical location of tree parts/defects.

Branch Collar: The swollen ring of growth formed around the base of a branch by the successive layers of each growth increment of the branch and the supporting branch or trunk to which it is connected.

Compartmentalisation: The confinement of disease, decay or other dysfunction within an anatomically isolated area of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region.

Compressed fork/union: An acute angled fork that is mechanically compromised by the growth pressure that two or more adjacent stems exert on each other.

Basal flare: the natural taper from stem base to buttress roots.

Buttress roots: woody adaptive growth providing mechanical support (tension), from stem base to root crown.

Callus Tissue/Wood: Undifferentiated and unlignified wood that forms initially after wounding around the margins of a wound separating damaged existing wood from the later forming lignified wood or wound wood.

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

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

Co-dominant: Crowns of more than one tree combine to form single canopy.

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.

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.

Dbh: Diameter at breast height – an industry standard method of measuring a trees' girth. The measurement is taken as close as possible to 1.6m agl.

Deadwood: Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat species and seldom represents a threat to the health of the tree.

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

Epicormic shoot. A shoot having developed from a dormant or adventitious bud and not having developed from a first-year shoot.

First order branch: A branch arising from the main stem forming the main structure of the crown.

Growth Cracks: Longitudinal split that may develop as a rupture in the bark from normal growth.

Hanger: Unattached/ broken limb held within crown.

Heartwood: The central section of a branch or trunk, usually darker coloured than sapwood, comprised of lignin blocked secondary xylem sapwood cells that are no longer conductive but provide a structural and protective function.

Included bark: A branch/stem union in which the bark in two or more adjacent stems has become trapped, whereby the tissues at this point are not biomechanically connected. Structural failure may occur if the union is weak and or excessive stresses are imposed.

Lateral: A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches · (Sub-lateral/ third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs).

Leader: A structural stem exhibiting apical dominance.

Lopped/Lopping: Branches that have been cut between the 'internodes' - points where new branches arise along a branch length. Such cuts may produce multiple shoots from the cut surface which may be weakly attached.

Natural Target Pruning: This is where the final cut is made outside of the branch collar and bark branch ridge – see AS 4373 – Pruning of Amenity Trees – 2007.

Occlusion: Woody callus growth produced when a wound occurs, eg. a pruned branch, or damage to bark tissue. Vigorous callus tissue growth which will eventually cover the wound completely is a good indicator of a healthy tree.

Root Crown/Collar: The area at the base of the stem where the main roots arise from the trunk.

Sapwood: The living cells in the outer, usually light coloured, water and nutrient conducting wood, forming a region of secondary xylem.

Structural Branches: Main or first order branches elongated to form a permanent framework of branches supporting the crown.

SRZ : Structural Root Zone a theoretical area in which the main structural roots necessary for stability/structural integrity of the tree are likely to be found, whose measurements are calculated using formulae recommended in AS 4970 – 2009 which and are based on diameter measurements of the Subject trees' lower stem.

TPZ: Tree Protection Zone a theoretical area for protection of trees on development sites, whose measurements are calculated using formulae recommended in AS 4970 – 2009 which and are based on diameter measurements of the Subject trees' lower stem.

Appendix (v) References / Bibliography:

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End of Report