HUNTER BRUCE
TREE CONSULTING

Arboricultural Impact Assessment Report (AIA)

Date: 14/09/2022

Prepared For: Fresh Landscapes
Station Rd,
Seven Hills NSW 2147

Site Address: Oxley Street
Crows Nest NSW 2065

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1 Contents

2 Background 4
2.1 Introduction 4
2.2 The Site 4
2.3 The Proposal 4
2.4 Statutory Requirements 5
2.5 Subject Trees 6
2.6 Documents and Plans Referenced 6
3 Methodology 7
3.1 Visual Tree Assessment 7
3.2 Safe Useful Life Expectancy 7
3.3 Tree Retention Values 7
3.4 Tree Protection Zones 8
3.5 Encroachment into the Tree Protection Zone 8
3.5.1 Minor Encroachment 9
3.5.2 Major Encroachment 9
4 Results 10
4.1 Tree Retention Values 10
4.1.1 High retention Trees 10
4.1.2 Medium Retention Trees 10
4.1.3 Low Retention Trees 10
5 Proposed Design Impact on Trees – Discussion 11
5.1 Tree 1 11
5.2 Tree 2 11
6 Recommendations 12
6.1 Trees to be retained and protected 12
6.2 Trees to be removed 12
6.3 Consultation and Approvals 12
7 Tree Protection Requirements 13
7.1 Trunk, Branch and Ground Protection 13
7.2 Signage 13
7.3 Restricted Activities in TPZ 14
7.4 Activities in TPZ needing supervision 14
8 References 15
9 Glossary 16
10 Appendices 23
10.1 Appendix 1 – Tree Schedule 23

10.2 Appendix 2 – Photos of the Trees 26
10.3 Appendix 3 – Tree Locations and Retention Values 27
10.4 Appendix 4 – Tree Removal and Tree Retention Locations 28
10.5 Appendix 6 – Safe Useful Life Expectancy 29
10.6 Appendix 7 – Retention Value 30
10.7 Appendix 8 – Acceptable Encroachment 32
11 DISCLAIMER 33
11.1 LIMITS OF OBSERVATION 33

2 Background

2.1 Introduction

An Arboricultural Assessment Report was commissioned by Fresh Landscapes to identify and assess two (2) trees impacted by the Crows Nest Train Station Upgrade works. The report aims to determine each tree's useful life expectancy (ULE), determine tree retention values, and make recommendations on tree sensitive construction methods and/or design modifications to preserve trees where possible.

Only trees located on the survey were assessed and included in the report.

The conclusions and recommendations of this report are based on the Australian Standard, AS 4970-2009, Protection of Trees on Development Sites, and the findings from the site inspection.

2.2 The Site

The area assessed is located on Oxley Street as shown in figure 1.

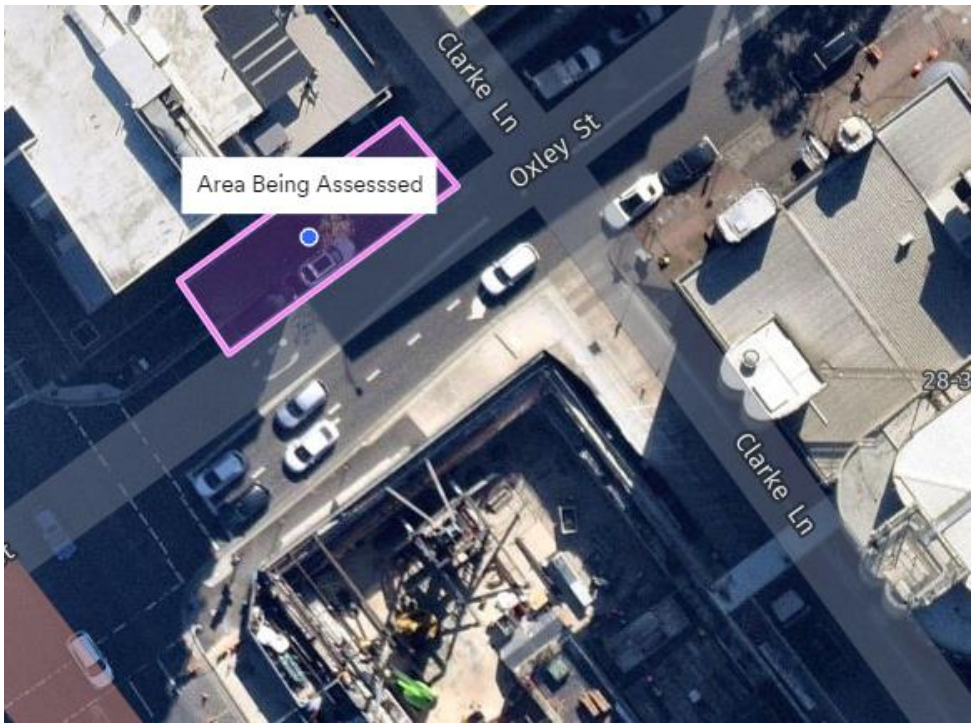


FIGURE 1 - THE SITE (NEARMAPS.COM.AU)

2.3 The Proposal

The Crows Nest integrated station Development is located on the western fringe of the Crows Nest village, between the Pacific Highway, Clarke Lane and Oxley Street, with the station platform sitting approximately 25 metres below ground[1].

[1] https://infrastructurepipeline.org/project/sydney-metro-city-and-southwest-crows-nest-station

The development comprises the following works:

- station entrances on Pacific Highway and Clarke Street
- retail spaces next to the station entry and along Pacific Highway
- pedestrian crossings on Clarke and Hume Streets
- bike parking on Hume Street, Pacific Highway, Clarke Street and Oxley Street
- Hume Street bi-directional separated cycle link from Clarke Street to Nicholson Street
- upgrades to Hume Street intersection
- improved pedestrian crossings at intersections of Oxley Street, Pacific Highway, Hume Street and Clarke Street
- public domain works, and
- kiss-and-ride and taxi bays.

2.4 Statutory Requirements

It was found that the following statutory regulations applied to the land:

- *Environmental Planning and assessment Act 1979 (NSW)*
- *Australian Standard 4970 – Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

2.5 Subject Trees

A site inspection was carried out by Russell Cleaver (AQF 5 Arborist) on the 3rd of September 2022 and two (2) trees were assessed and included in the report. Details of each tree can be found in the 'Tree Schedule' in **Appendix 1** and photos of each tree can be found in **Appendix 2**.

The tree locations are shown in figure 2.

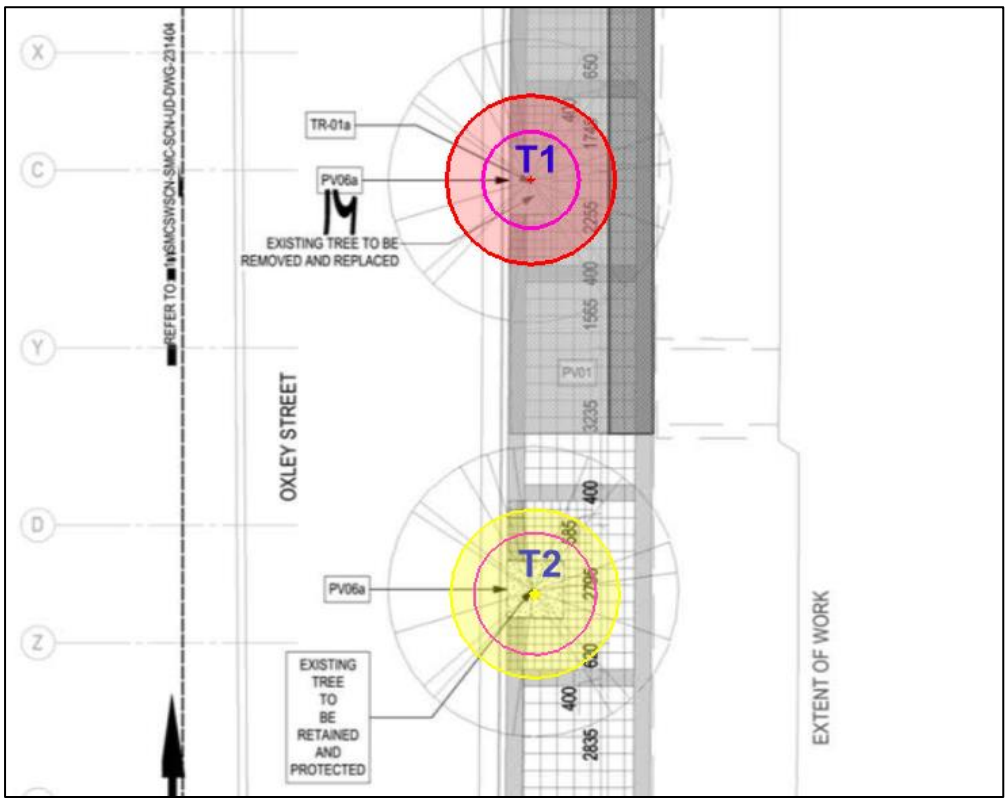


FIGURE 2 - TREE LOCATIONS

2.6 Documents and Plans Referenced

- *CROWS NEST STATION LANDSCAPE ARCHITECTURE MASTER PLANT SCHEDULE – DRG #* SMCSWSCN-SMC-SCN-UD-DWG-031404 – 01.04.20
- *Urban Arbor – Arboricultural Impact Assessment Report – Crows Nest Station - 21 April 2022 - Ref: 220421-CNS-AIA*

3 Methodology

3.1 Visual Tree Assessment

An assessment of each tree and vegetation area was undertaken by AQF level 5 arborist Russell Cleaver and was made using the Visual Tree Assessment (VTA) procedure[2]. All the trees were assessed in view from the ground. No aerial inspection or diagnostic testing has been undertaken as part of this assessment. Tree height, and canopy spread were estimated. Diameter at breast height (DBH) was measured using a diameter tape when required.

3.2 Safe Useful Life Expectancy

The remaining Safe Useful Life Expectancy of the tree is an estimate of the sustainability of the tree in the landscape, calculated based on an estimate of the average age of the species in an urban area, less its estimated current age. The life expectancy of the tree has been further modified where necessary in consideration of its current health and vigour, condition, and suitability to the site. Detailed methodology can be found in **Appendix 6.**

The following ranges have been allocated to each tree:

- Greater than 40 years (Long)
- Between 15 and 40 years (Medium)
- Between 5 and 15 years (Short)
- Less than 5 years (Transient)
- Dead or immediately hazardous (defective or unstable)

3.3 Tree Retention Values

The trees have been allocated a sustainable retention value determined by using the Institute of Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©) and can be found in **Appendix 7**.

The retention value of each tree was calculated by assessing both the estimated life expectancy and the significance of the tree. In relation to life expectancy, the health, condition, and suitability of the tree to the site was assessed. The landscape significance of each tree was determined by assessing the amenity, heritage, and ecological values of the tree.

A rating has been given to the trees as a measure of the significance of the tree in the landscape and to assist in determining priorities for retention. The recommended actions for each retention value category are listed in **Table 1** below.

[2] VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Principle explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. Arboricultural Journal, Vol 18 pp 1-23 (1994).

Retention Value	Recommendations
High	• These trees are considered important for retention and should be retained and protected. • Design modification or relocation of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970. • Tree sensitive construction measures must be implemented e. pier and beam etc if works are to proceed within the TPZ.
Medium	• The retention of these trees is desirable, but not essential.. • Their removal should only be considered if adversely affecting the proposed building/works, and all other alternatives have been considered and exhausted. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replenishment Policy to compensate for loss of amenity.
Low	• These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention. • These trees should not be considered as a constraint to the future development of the site.

TABLE 1

3.4 Tree Protection Zones

There are two types of zones (as defined by AS 4970-2009) that need to be considered when undertaking an arboricultural impact assessment:

- Tree protection zone (TPZ): The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is calculated by measuring the diameter at breast height (DBH) and multiplying it by twelve (12). The resulting value is applied as a radial measurement from the centre of the trunk to delineate the TPZ. The maximum TPZ should be no more than 15m radius and the minimum should be no less than 2m radius.

- Structural root zone (SRZ): The SRZ is the area of the root system used for stability, mechanical support, and anchorage of the tree. This is the minimum area recommended to maintain tree stability but does not reflect the area required to sustain tree health. Works within this zone are not permitted as it may compromised structural stability.

3.5 Encroachment into the Tree Protection Zone

Encroachment within the TPZ is acceptable, providing that the arborist can demonstrate that the tree will remain viable. There are three (3) levels of encroachment (as defined by AS 4970-2009):

- **No encroachment (0%): No encroachment within the TPZ.**
- **Minor encroachment (<10%): The encroachment is less than 10% of the TPZ.**
- **Major encroachment (>10%): The encroachment is greater than 10% of the TPZ.**

3.5.1 Minor Encroachment

Encroachment into the TPZ of less than 10% is considered acceptable, though this is dependent on-site conditions and tree characteristics. The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. Detailed root investigations should not be required. Examples of acceptable incursions are shown in **Appendix 8**.

3.5.2 Major Encroachment

When encroachment into the TPZ exceeds 10%; the project arborist must demonstrate why the tree will remain viable; non-destructive root investigation may be required to investigate and identify the location of roots within the proposed area of encroachment; the area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ; and the project arborist will be required to supervise any works within the TPZ area.

4 Results

4.1 Tree Retention Values

4.1.1 High retention Trees

No trees were given a 'High' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state the following where trees are determined to have a 'High' retention value:

'Design modification or relocation of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970.'

4.1.2 Medium Retention Trees

Tree numbered 2 was given a 'Medium' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state the following where trees are determined to have a 'Medium' retention value:

'These trees may be retained and protected. These trees are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.'

4.1.3 Low Retention Trees

Tree numbered 1 was given a 'Low' retention value.

The recommendations made by 'IACA Australian Consulting Arboriculturalists Significance of a Tree Assessment Rating System (STARS©)', state that following trees are determined to have a 'Low' retention value:

'These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.'

5 Proposed Design Impact on Trees – Discussion

5.1 Tree 1

There are no direct construction impacts under the current proposed design to T1.

5.2 Tree 2

There are no direct construction impacts under the current proposed design to T2.

6 Recommendations

6.1 Trees to be retained and protected

Tree 2 must be retained and protected as per the specifications detailed in **Section 7**.

6.2 Trees to be removed

There are no construction impacts on tree 1, however it is a poor specimen with a sparse canopy and low retention value. It is therefore recommended that the tree be removed and replaced with a *platanus orientalis 'Digitata'* in a minimum 600L pot size, a canopy height of 4.5m and a canopy spread of 2.5m as per the Sydney Metro Crows Nest Station Landscape Architecture Master Plant Schedule (DRG # SMCSWSCN-SMC-SCN-UD-DWG-031404 01.04.20).

The replacement tree would be larger, healthier, and provide greater amenity to the area than tree 1.

6.3 Consultation and Approvals

Condition of Approval E6 from the Critical State Significant Infrastructure project (CSSI-7400) was used to develop the report and the following conditions have been considered and adhered to:

(a) a description of the conditions of the tree(s) and its amenity and visual value;

(b) consideration of all options to avoid tree removal, including relocation of services, redesign or relocation of ancillary components (such as substations, fencing etc.) and reduction of standard offsets to underground services; and

(c) measures to avoid tree removal, minimise damage to, and ensure the health and stability of those trees to be retained and protected. This includes details of any proposed canopy or root pruning, root protection zone, excavation, site controls on waste disposal, vehicular access, materials storage and protection of public utilities."

7 Tree Protection Requirements

Tree protection is required around tree 2.

7.1 Trunk, Branch and Ground Protection

Install protection to the trunk and branches of tree 2 as shown in figure 3.

The stem and branches of trees to be retained must be protected as follows:

- Two layers of carpet underlay (or other padding approved by the Project Arborist) shall be installed around the stem and branches. Stem protection shall cover the stem from ground level; and
- Hardwood or treated pine timbers (100 mm x 50 mm) the same length as the stem or branch shall be positioned over the padding and next to each other around the stem or branch, secured together with galvanised wire or strapping. Boards shall not be nailed or screwed into the stem or branch. No part of the protection shall be secured to the tree.

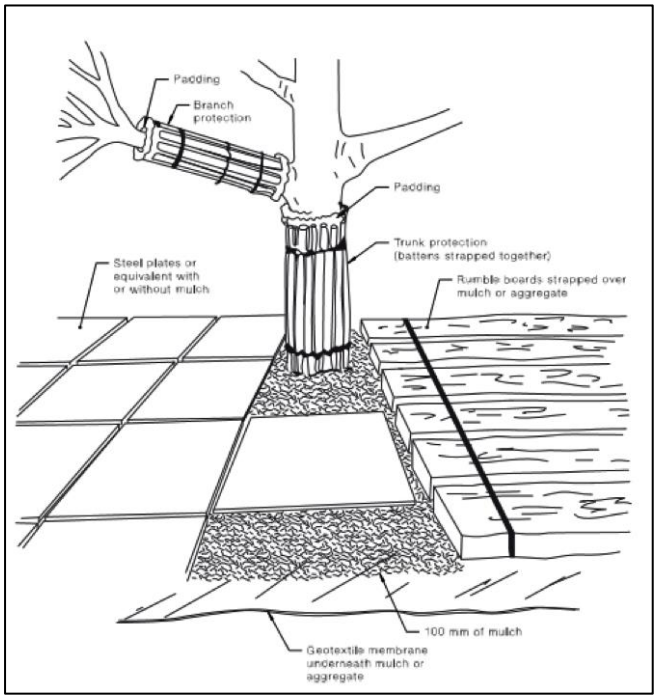


FIGURE 3

The exposed ground surface within the Tree Protection Zone shall be protected by placing geotextile fabric on the ground surface, covering this with a layer of mulch to a depth of 75 mm and then placing boarding (scaffolding board, plywood sheeting or similar material) on top. The geotextile fabric and mulch shall be kept clear of tree stems by at least 50 mm.

7.2 Signage

Below is an example of signage that can be utilized on tree protection zones.



FIGURE 4 – SIGNAGE – SOURCE AS 4970

7.3 Restricted Activities in TPZ

The following activities are restricted in the TPZ as per AS 4970-2009

- Machine excavation including trenching
- Excavation for silt fencing
- Cultivation
- Storage
- Preparation of chemicals
- Parking of vehicles and plant
- Re-fueling
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Lighting of fires
- Soil level changes
- Temporary or permanent installation of utilities and signs
- Physical damage to the tree

7.4 Activities in TPZ needing supervision

The following activities shall not be carried out within any Tree Protection Zone unless under the supervision of the Project Arborist:

- increasing or decreasing soil levels (including cut and fill)
- soil cultivation, excavation or trenching
- placing offices or sheds
- erection of scaffolding or hoardings
- any other act that may adversely affect the vitality or structural condition of the tree.

All work undertaken within or above a Tree Protection Zone shall be supervised by the Project Arborist.

Excavation within the Tree Protection Zone of any tree to be retained shall be undertaken using non-destructive methods (eg. an Airspade or by hand) to ensure no roots greater than 40 mm in

8 References

Australian Standards AS 4373 (2007) Pruning of Amenity Trees. Sydney: Standards Australia.

Dictionary for Managing Trees in Urban Environments - Institute of Australian Consulting Arboriculturists (IACA) 2009.

E. Thomas Smiley, Nelda Matheny, and Sharon Lilly (2011) Tree Risk Assessment & Principles. ISA Printed USA.

Mattheck, C & Breloer, H (1994) 'Field Guide for Visual Tree Assessment' Arboricultural Journal, Vol 18 pp 1-23.

Mattheck, C Updated Field Guide for Visual Tree Assessment, Karlsruhe Research Centre: 2007

Mattheck Dr.; Claus R & Breloer Helge. The Body Language of Trees - A Handbook for Failure Analysis 6th Edition: London. England. The Stationery Office: 1995.

Nearmaps.com

9 Glossary

Dictionary for Managing Trees in Urban Environments
Institute of Australian Consulting Arboriculturists (IACA) 2009.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. dormant, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour, High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the *typical* growth of leaves, *crown cover* and *crown density*, branches, roots and trunk and *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the *atypical* growth of leaves, reduced *crown cover* and reduced *crown density*, branches, roots and trunk, and a deterioration of their functions with reduced *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

Dormant Tree Vigour Determined by existing turgidity in lowest order branches in the outer extremity of the crown, with good bud set and formation, and where the last *extension growth* is distinct from those most recently preceding it, evident by bud scale scars. Normal vigour during dormancy is achieved when such growth is evident on a majority of branches throughout the crown.

Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as *Young*, *Mature* and *Over-mature* (British Standards 1991, p. 13, Harris *et al*, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, *in situ*.

Mature Tree aged 20-80% of life expectancy, *in situ*.

Over-mature Tree aged greater than >80% of life expectancy, *in situ,* or *senescent* with or without reduced *vigour*, and declining gradually or rapidly but irreversibly to death.

Periods of Time

Periods of Time The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as *Immediate*, *Short Term*, *Medium Term* and *Long Term*.

Immediate An *episode* or occurrence, likely to happen within a twenty-four (24) hour period.
Short Term A period of time less than <1 – 15 years.

Medium Term A period of time 15 – 40 years.

Long Term A period of time greater than >40 years.

Trunk

Trunk A single stem extending from the *root crown* to support or elevate the *crown*, terminating where it divides into separate *stems* forming *first order branches*. A trunk may be evident at or near ground or be absent in *acaulescent* trees of *deliquescent* habit, or may be continuous in trees of *excurrent* habit. The trunk of any *caulescent* tree can be divided vertically into three (3) sections and can be categorized as *Lower Trunk*, *Mid Trunk* and *Upper Trunk*. For a *leaning* tree these may be divided evenly into sections of one third along the trunk.

Acaulescent A *trunkless* tree or tree growth forming a very short *trunk*.

Caulescent Tree grows to form a *trunk*. See also *Acaulescent*.

Condition of Trees

Condition A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1^{st}) and possibly second (2^{nd}) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

Good Condition Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in

much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.

Fair Condition Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.

Poor Condition Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);
Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the *epidermis* (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site or having been taken away from a site prior to site inspection.

Leaning Trees

Leaning A tree where the *trunk* grows or moves away from upright. A lean may occur anywhere along the *trunk* influenced by a number of contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A *leaning* tree may maintain a *static lean* or display an increasingly *progressive lean* over time and may be hazardous and prone to *failure* and *collapse*. The degrees of leaning can be categorized as *Slightly Leaning*, *Moderately Leaning*, *Severely Leaning* and *Critically Leaning*.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0^{O}-15^{O} from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15^{O}-30^{O} from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30^{O}-45^{O} from upright.

Critically Leaning A leaning tree where the trunk is growing at an angle greater than $>45^{O}$ from upright.

Progressively Leaning A tree where the degree of *leaning* appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

Form of Trees

Crown Form The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as *Dominant*, *Codominant*, *Intermediate*, *Emergent*, *Forest* and *Suppressed*. The habit and shape of a *crown* may also be considered qualitatively and can be categorized as *Good Form* or *Poor Form*.

Good Form Tree of *typical* crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, or cultural practices such as lopping and competition for space and light.

Poor Form Tree of *atypical* crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be *misshapen* or disfigured by disease or vandalism.

Crown Form Codominant Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

Crown Form Dominant Crowns of trees generally not restricted for space and light receiving light from above and all sides.

Crown Form Emergent Crowns of trees restricted for space on most sides receiving most light from above until the *upper crown* grows to protrude above the canopy in a stand or forest environment. Such trees may be *crown form dominant* or transitional from *crown form intermediate* to *crown form forest* asserting both *apical dominance* and *axillary dominance* once free of constraints for space and light.

Crown Form Forest Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower crown*.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

Crown Form Suppressed Crowns of trees generally not restricted for space but restricted for light by being *overtopped* by other trees and occupying an understorey position in the canopy and growing slowly.

Symmetry

Symmetry Balance within a *crown,* or *root plate,* above or below the *axis* of the trunk of branch and foliage, and root distribution respectively and can be categorized as *Asymmetrical* and *Symmetrical*.

Asymmetrical Imbalance within a crown, where there is an uneven distribution of branches and the foliage *crown* or *root plate* around the vertical *axis* of the trunk. This may be due to *Crown Form Codominant* or *Crown From* S*uppressed* as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines.

Symmetrical Balance within a crown, where there is an even distribution of branches and the *foliage crown* around the vertical *axis* of the trunk. This usually applies to trees of *Crown Form Dominant* or *Crown Form Forest*. An example of an expression of this may be crown symmetrical.

Crown Spread Orientation Direction of the *axis* of *crown spread* which can be categorized as *Orientation Radial* and *Orientation Non-radial*.

Crown Spread Orientation Non-radial Where the crown extent is longer than it is wide, e.g. east/west or E/W. Further examples, north/south or N/S, and may be *Crown Form Codominant*, e.g. **A** or **B**, *Crown Form Intermediate* e.g. **A**, or *Crown Form Suppressed* e.g. **B***, and* crown symmetry is *symmetrical* e.g. **A**, or *asymmetrical* e.g. **B**.

Crown Spread Orientation Radial Where the *crown spread* is generally an even distance in all directions from the trunk and often where a tree has *Crown Form Dominant* and is *symmetrical.*

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or *in situ*, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

Diameter at Breast Height (DBH) - Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the

point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Crown Projection (CP) Area within the *dripline* or beneath the lateral extent of the *crown* (Geiger 2004, p. 2). See also *Crown spread* and *Dripline*.

Dripline A line formed around the edge of a tree by the lateral extent of the *crown*. Such a line may be evident on the ground with some trees when exposed soil is displaced by rain shed from the crown. See also *Crown Projection*.

Deadwood

Deadwood Dead branches within a tree's crown and considered quantitatively as separate to *crown cover* and can be categorised as *Small Deadwood* and *Large Deadwood* according to diameter, length and subsequent *risk* potential. The amount of dead branches on a tree can be categorized as *Low Volume Deadwood*, *Medium Volume Deadwood* and *High Volume Deadwood*. See also *Dieback.*

Deadwooding Removing of dead branches by *pruning*. Such pruning may assist in the prevention of the spread of *decay* from *dieback* or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low *risk* potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high *risk* potential.

Low Volume Deadwood Where <5 dead branches occur that may require *removal*.

Medium Volume Deadwood Where 5-10 dead branches occur that may require *removal*.

High Volume Deadwood High Volume Deadwood Where >10 dead branches occur that may require *removal*.

Dieback

Dieback The death of some areas of the *crown*. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, *abrupt changes* in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced *resistance, stress* or *decline* which may be temporary. Dieback can be categorized as *Low Volume Dieback*, *Medium Volume Dieback* and *High Volume Dieback*.

Low Volume Dieback Where <10% of the *crown cover* has died.

Medium Volume Dieback Where 10-50% of the *crown cover* has died.

High Volume Dieback Where >50% of the *crown cover* has died.

Epicormic shoots

Epicormic Shoots Juvenile shoots produced at branches or trunk from *epicormic strands* in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of *stress* or *decline*. Epicormic shoots can be categorized as *Low Volume Epicormic Shoots*, *Medium Volume Epicormic Shoots* and *High Volume Epicormic Shoots*.

Low Volume Epicormic Shoots Where <10% of the c*rown cover* is comprised of live *epicormic shoots*.

Medium Volume Epicormic Shoots Where 10-50% of the *crown cover* is comprised of live *epicormic shoots*.

High Volume Epicormic Shoots Where >50% of the *crown cover* is comprised of live *epicormic shoot*

Roots

First Order Roots (FOR) Initial woody roots arising from the *root crown* at the base of the *trunk*, or as an *adventitious root mass* for structural support and *stability*. Woody roots may be buttressed and divided as a marked gradation, gradually tapering and continuous or tapering rapidly at a short distance from the root crown. Depending on soil type these roots may descend initially and not be evident at the root crown, or become buried by changes in soil levels. Trees may develop 4-11 (Perry 1982, pp. 197-221), or more first order roots which may radiate from the trunk with a relatively even distribution, or be prominent on a particular aspect, dependent upon physical characteristics e.g. leaning trunk, *asymmetrical* crown; and constraints within the growing *environment* from topography e.g. slope, soil depth, rocky outcrops, exposure to predominant wind, soil moisture, depth of *water table* etc.

Orders of Roots The marked divisions between woody roots, commencing at the initial division from the base of the trunk, at the *root crown* where successive branching is generally characterised by a gradual reduction in root diameters and each gradation from the trunk and can be categorized numerically, e.g. *first order roots*, second order roots, third order roots etc. Roots may not always be evident at the *root crown* and this may be dependent on species, age class and the growing environment. Palms at maturity may form an adventitious root mass.

Root Plate The entire root system of a tree generally occupying the top 300-600mm of soil including roots at or above ground and may extend laterally for distances exceeding twice the height of the tree (Perry 1982, pp. 197-221). Development and extent is dependent on water availability, soil type, *soil depth* and the physical characteristics of the surrounding landscape.

Root Crown Roots arising at the base of a trunk.

Zone of Rapid Taper The area in the *root plate* where the diameter of *structural roots* reduces substantially over a short distance from the *trunk.* Considered to be the minimum radial distance to provide structural support and *root plate* stability. See also *Structural Root Zone (SRZ)*.

Structural Roots Roots supporting the infrastructure of the *root plate* providing strength and *stability* to the tree. Such roots may taper rapidly at short distances from the *root crown* or become large and woody as with gymnosperms and dicotyledonous angiosperms and are usually 1st and 2nd order roots, or form an *adventitious root mass* in monocotyledonous angiosperms (palms). Such roots may be

10 Appendices

10.1 Appendix 1 – Tree Schedule

Tree #	Botanical Name	Age class	Height (m)	Spread (m)	DCH (mm)	DRB (mm)	TPZ (m)	SRZ (m)	Condition	Structure	Description, condition and comments.	SULE	Landscape Significance	Retention Value
1	*Platanus Acerifolia*	J	3	1.5	50	80	2	1.5	F	F	Juvenile tree is in fair condition with a sparse canopy for the size/age.	L	L	L
2	*Platanus Acerifolia*	J	5	3	120	140	2	1.5	G	G	Juvenile tree in good condition and has good structural form.	M	M	M

Tree Schedule Table Notes

Genus, Species and Common Name

The botanical and common name of each tree is identified and recorded. Occasionally the exact species name is unknown; sp. is recorded to indicate this.

Height, Spread, Trunk Dia, DBH and DRB

- The tree's height and spread is recorded in metres.
- The tree DBH is recorded in millimetres. DBH is an abbreviation of Diameter (of the trunk) measured at Breast Height (or 1.2m from the base of the trunk). If more than one trunk is present the DCH is calculated in accordance with AS4970-2009 Protection of Trees on Development Sites.

- If the tree has multiple trunks multiple trunks each trunk DCH (Trunk Dia) will be recorded individually.

- The tree DRB is recorded in millimetres. DRB is an abbreviation of Diameter (of the trunk) measured above the Root Buttress. It is required to calculate the

SRZ in accordance with AS4970-2009 Protection of Trees on Development Sites when there is major encroachment within the TPZ, ie. greater than 10% is encroached upon or if there is an encroachment within the SRZ.

Age

The age class of each tree is estimated as either:

J – Juvenile, a young sapling, easily replaced from nursery stock.
SM - Semi Mature, a tree that has not grown to mature size.
M - Mature, a tree that has reached mature size and will slowly increase in size over time.
OM - Over Mature, a tree that has been mature for a long period and is beginning to display signs of decline, e.g. large dead branches.
S - Senescent, an over mature tree that is now in decline.

SRZ (Structural Root Zone)

The SRZ is a radial area extending outwards from the centre of the trunk. This area contains the majority of the structural woody roots. This area is responsible primarily for stability. Root damage or root loss within this zone greatly increases the opportunity for decay fungi to ingress into the heartwood, causing internal decay in addition to destabilising the tree's structural integrity. The SRZ is calculated as follows (This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites):

SRZ (Radius) = (DAB x 50)^0.42 x 0.64

TPZ (Tree Protection Zone)

The TPZ is a circular area with a radius measured by multiplying the DCH by twelve (12), or a circular area the size of the tree's drip line whichever is greater. This area contains the majority of the essential structural and feeder roots responsible for stability, gaseous exchange and water and nutrient uptake. Excavation, back filling, compaction or other disturbance should not occur in this area.

The TPZ is used to identify the minimum area required for the safe retention of a given tree. This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites. An incursion to 10% within the TPZ is potentially acceptable if no other option is available. A major encroachment (in excess of 10%) is required to be clearly justified by the project Arborist and compensated for elsewhere.

10.2 Appendix 2 – Photos of the Trees

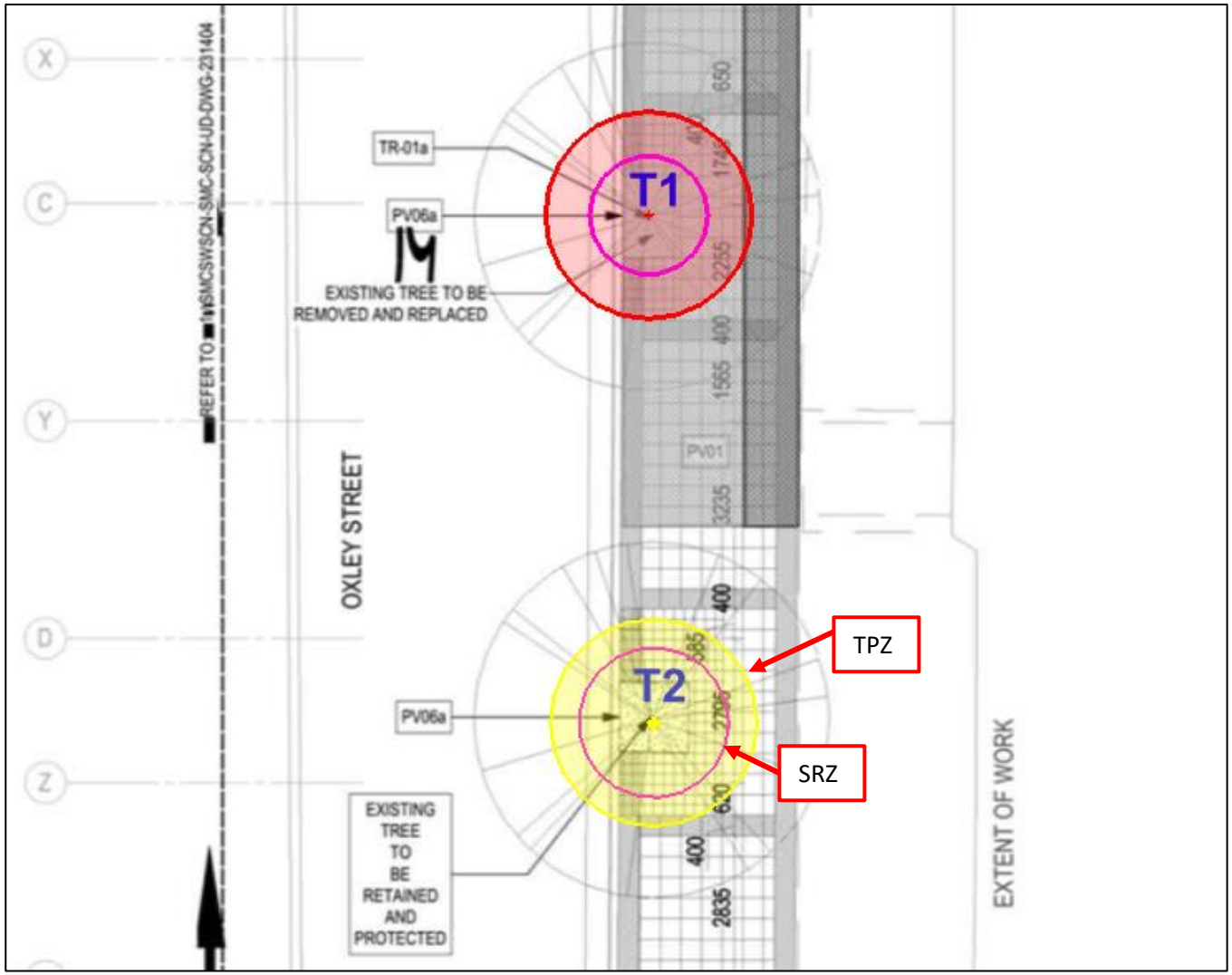


FIGURE 5 - TREE 1



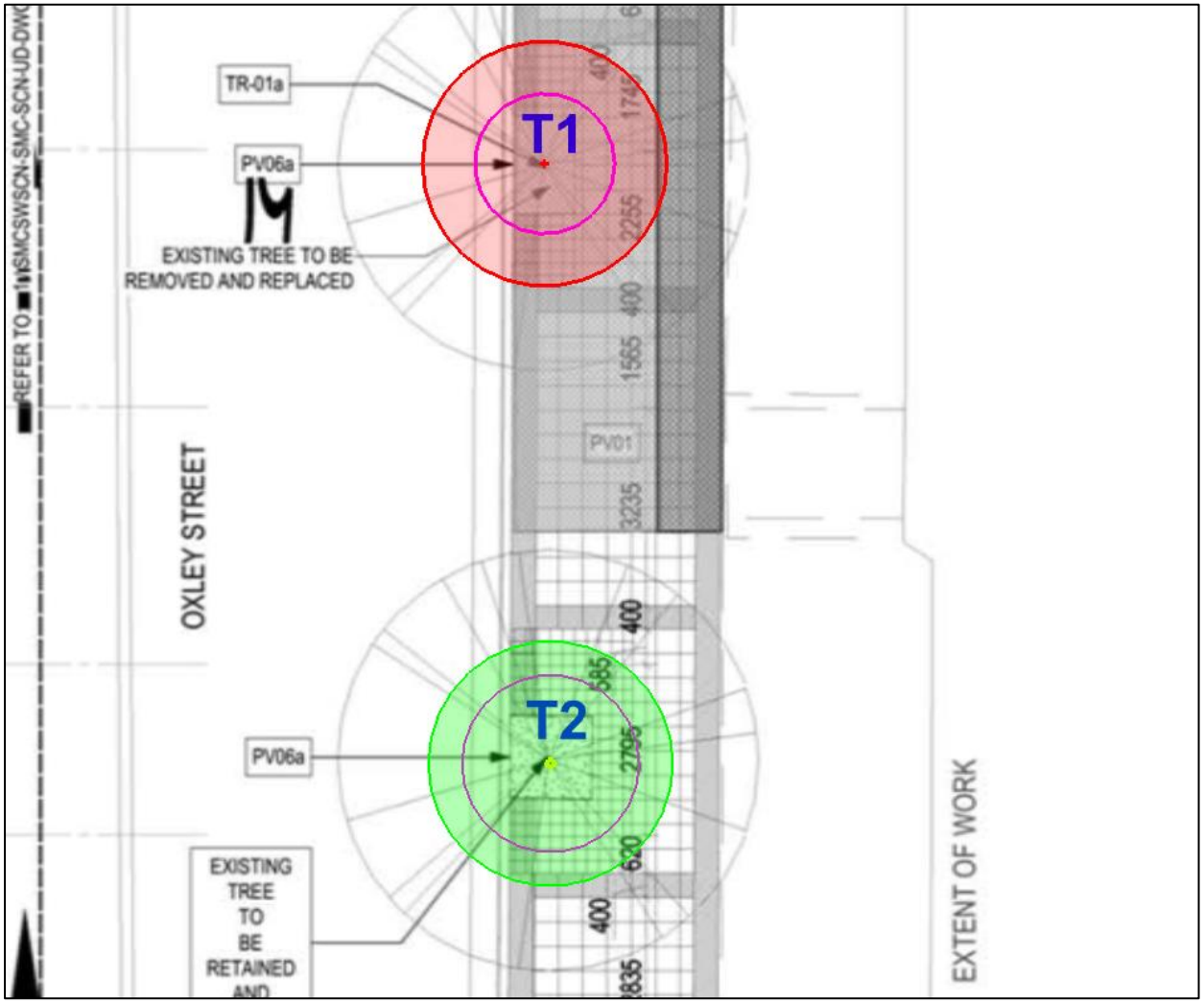
FIGURE 6 - TREE 2

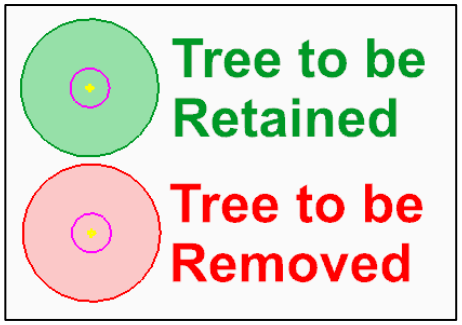
10.3 Appendix 3 – Tree Locations and Retention Values



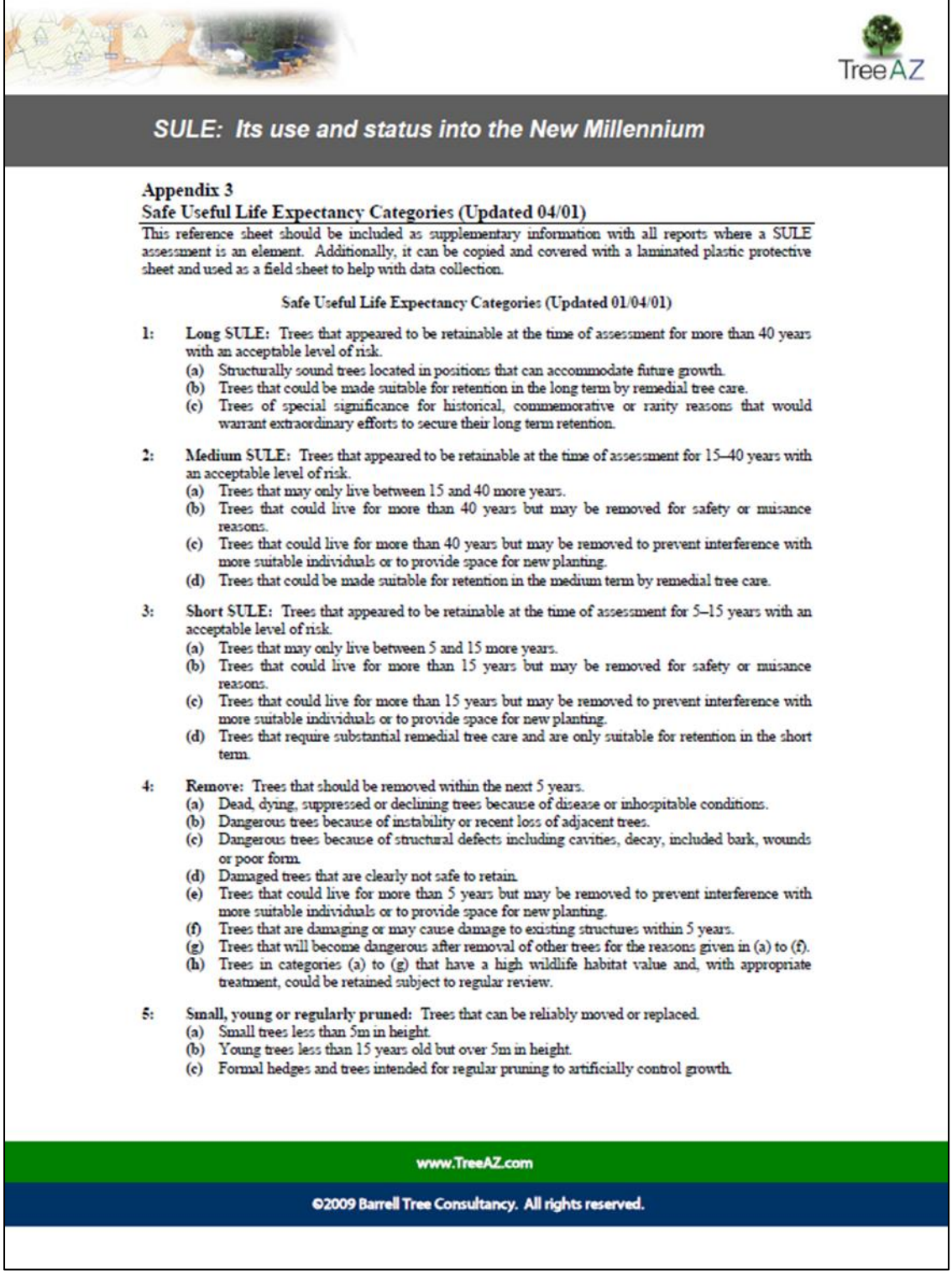


10.4 Appendix 4 – Tree Removal and Tree Retention Locations





10.5 Appendix 6 – Safe Useful Life Expectancy



TreeAZ

SULE: Its use and status into the New Millennium

Appendix 3
Safe Useful Life Expectancy Categories (Updated 04/01)

This reference sheet should be included as supplementary information with all reports where a SULE assessment is an element. Additionally, it can be copied and covered with a laminated plastic protective sheet and used as a field sheet to help with data collection.

Safe Useful Life Expectancy Categories (Updated 01/04/01)

1: **Long SULE:** Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial tree care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

2: **Medium SULE:** Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.
- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: **Short SULE:** Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.
- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: **Remove:** Trees that should be removed within the next 5 years.
- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (d) Damaged trees that are clearly not safe to retain.
- (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (f) Trees that are damaging or may cause damage to existing structures within 5 years.
- (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: **Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

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10.6 Appendix 7 – Retention Value

IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA 2010)©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

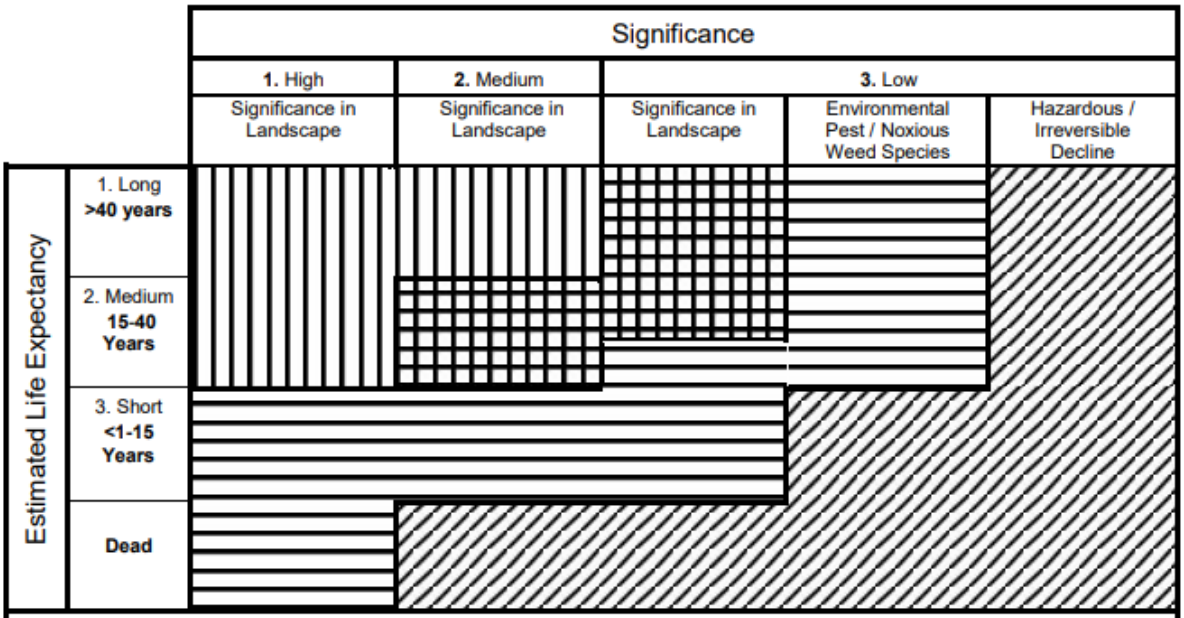
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

Table 1.0 Tree Retention Value - Priority Matrix.



Legend for Matrix Assessment

INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS

Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.

Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES

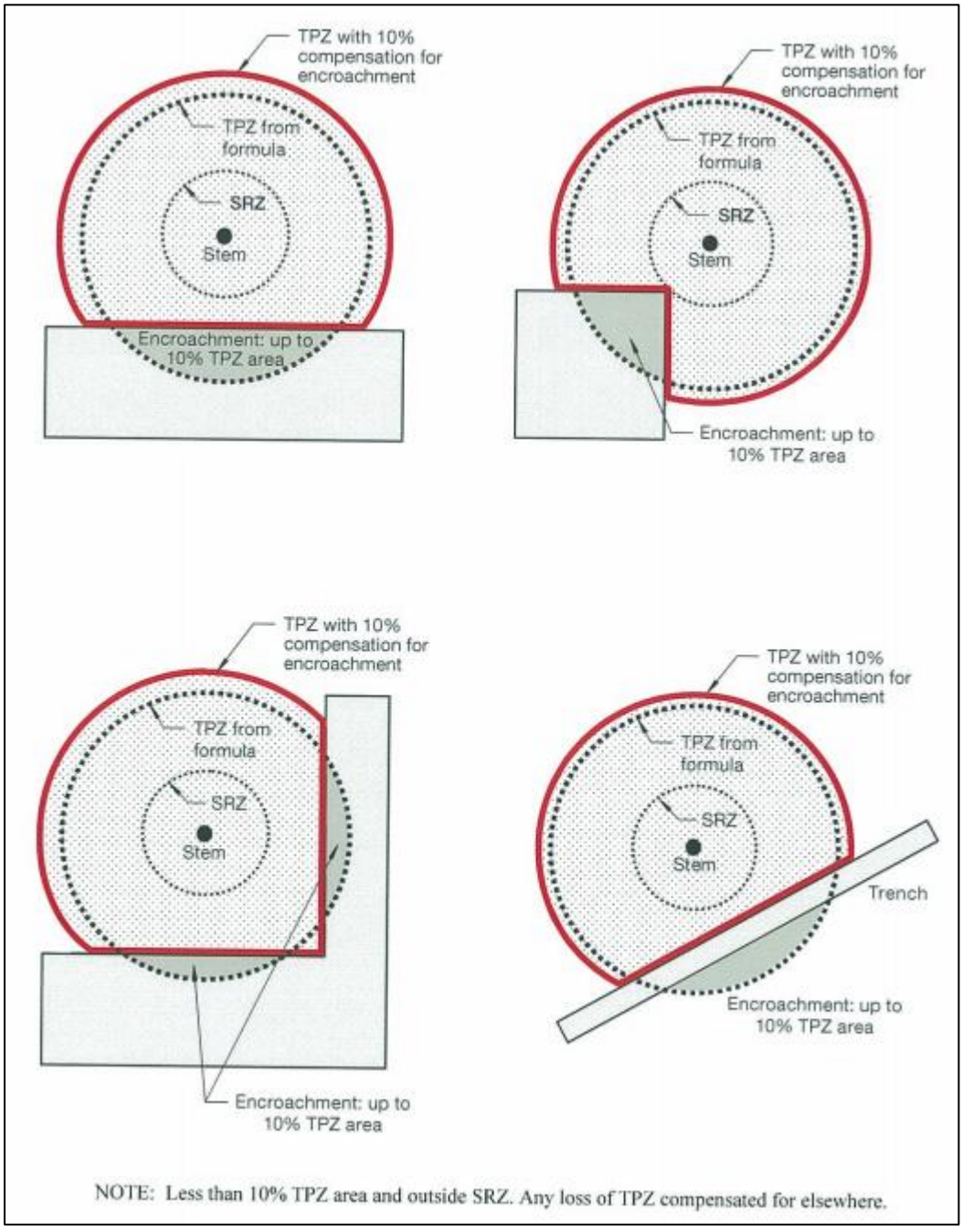
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Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

10.7 Appendix 8 – Acceptable Encroachment



Source - Council of Standards Australia (August 2009) AS 4970 – 2009 – Protection of Trees on Development Sites Standards Australia.

STANDARD NOTES:
• REFER TO SHEET SMCSWSCN-SMC-SCN-UD-DWG-011202 FOR STANDARD NOTES

Tree and Specimen Planting Schedule

Code	Botanical Name	Common Name	Height (m)	Spread (m)	Pot Size (L)	Count
TREE						
PA	*Platanus orientalis 'Digitata'*	Oriental Plane	4.5	2.5	600	11
PA1	*Platanus orientalis 'Digitata'*	Oriental Plane	3.5	2.0	200	14
EE	*Elaeocarpus emundi*	Smooth Leafed Quandong	3.5	1	600	19
TL	*Tristaniopsis laurina*	Water Gum	4	2	600	14

01

NOTES:
1. SPECIES TO BE CONFIRMED WITH COUNCIL
2. PLANT HEIGHT AND SPREAD AT PLANTING NOT MATURITY

Master Planting Schedule

Code	Species	Common Name	Area	Planting Height	Planting Spread	Pot Size (mm)	Density /m2	Quantity
Grasses								
DiLR	*Dianella revoluta 'Litte Rev'*	Native Flax	20.794 m²	0.30 m	0.20 m	140	6	125
Dita	*Dianella tasmanica 'Tasred'*	Flax Lilly	6.315 m²	0.30 m	0.20 m	140	7	44
Groundcovers								
Mypa	*Myoporum parvifolium*	Boobalia	8.975 m²	0.10 m	0.30 m	140	7	63
			36.084 m²					232

APPROVED BY TfNSW: CCR 131203 DATED 01.04.20

FOR CONSTRUCTION

REV.	BY	DATE	DESCRIPTION	APPD.
01	GF	20/08/20	TREE HEIGHT, SPREAD AND POT SIZE UPDATED	KS
00	SL	06/04/20	APPROVED FOR CONSTRUCTION	KS

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing. | ALT. DRG No.

CLIENT

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DRG CHECK WW
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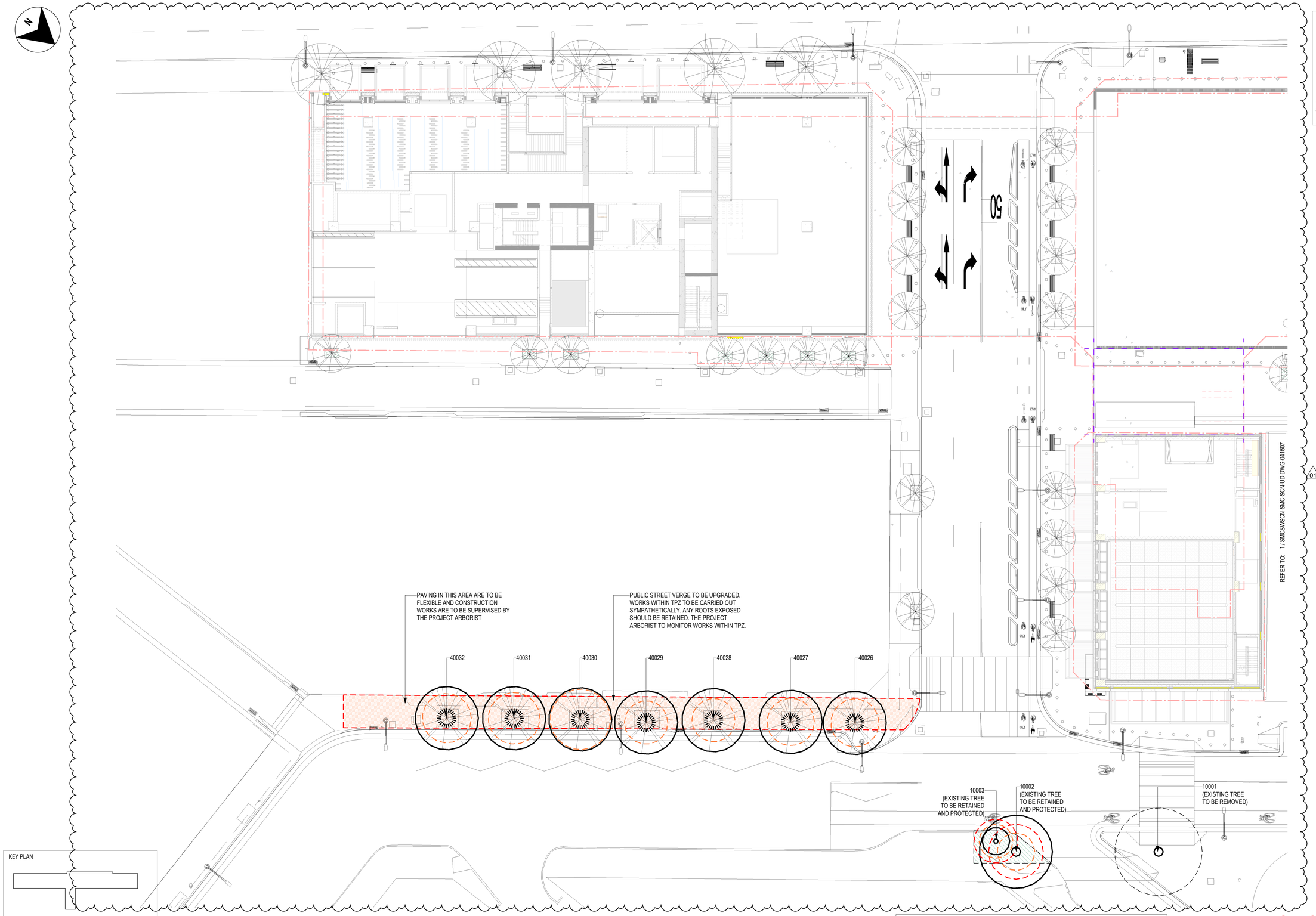
SYDNEY METRO

CROWS NEST STATION
LANDSCAPE ARCHITECTURE
MASTER PLANT SCHEDULE

STATUS: FOR CONSTRUCTION | SHEET 1 OF 1 | Ⓒ

DRG No. SMCSWSCN-SMC-SCN-UD-DWG-031404 | REV. 01

100mm AT FULL SIZE Plot Date & Time 19/08/2020 4:29:07 PM



NOTES:
1. REFER TO THE ACCOMPANYING TREE MANAGEMENT REPORT SMCSWSCN-SMC-SCN-UD-REP-03 AND SCHEDULE FOR FULL DESCRIPTION OF THE TREES, THE RECOMMDED PROTECTION MEASURES MANAGEMENT STRATEGY TO MINIMISE THE CONTRSUCTION IMPACT OF THE TREES
2. SEEK ADVICE FROM THE NOMINATED PROJECT ARBORIST AND/OR COUNCILS ARBORIST FOR ALL WORKS THAT MAY IMPACT ON THE TREES ILLUSTRATED ON THIS PLAN.
3. CANOPIES SHOWN ARE INDICATIVE
4. REFER TO SHEET SMCSWSCN-SMC-SCN-UD-DWG-011202 FOR STANDARD NOTES

LEGEND

- EXISTING TREE TO BE REMOVED AND REPLACED
- EXISTING TREE TO BE RETAINED AND PROTECTED
- TRUNK PROTECTION BATTENS
- TREE PROTECTION ZONE (TPZ) NOMINAL AREA ADAPTED TO REFLECT EXISTING STRUCTURE. SURFACE IMPACT TO BE MANAGED CAREFULLY DURING CONSTRUCTION.
- NOMINAL ROOT ZONE (SRZ)
- TEMPORARY TREE PROTECTION FENCING

APPROVED BY TfNSW: CCR 131203 DATED 01.04.20

FOR CONSTRUCTION

REV.	BY	DATE	DESCRIPTION	APPD.
01	SL	14/09/20	GENERAL UPDATES REFER SHEET	KS
00	SL	06/04/20	APPROVED FOR CONSTRUCTION	KS

1:200 @ A1 0 2 4 6 8 10 m

CLIENT

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DESIGNED GM
DRG CHECK WW
DESIGN CHECK SB
APPROVED KS

SYDNEY METRO

CROWS NEST STATION
LANDSCAPE ARCHITECTURE
TREE PROTECTION PLAN

STATUS: FOR CONSTRUCTION | SHEET 1 OF 2 | ©

DRG No. SMCSWSCN-SMC-SCN-UD-DWG-041506 | REV. 01

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing. | ALT. DRG No.

100mm AT FULL SIZE Plot Date & Time 14/09/2020 10:00:07 AM

NOTES:
1. REFER TO THE ACCOMPANYING TREE MANAGEMENT REPORT SMCSWSCN-SMC-SCN-UD-REP-03 AND SCHEDULE FOR FULL DESCRIPTION OF THE TREES, THE RECOMMDED PROTECTION MEASURES MANAGEMENT STRATEGY TO MINIMISE THE CONTRSUCTION IMPACT OF THE TREES
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LEGEND

- EXISTING TREE TO BE REMOVED AND REPLACED
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- TRUNK PROTECTION BATTENS
- TREE PROTECTION ZONE (TPZ) NOMINAL AREA ADAPTED TO REFLECT EXISTING STRUCTURE. SURFACE IMPACT TO BE MANAGED CAREFULLY DURING CONSTRUCTION.
- NOMINAL ROOT ZONE (SRZ)

40013 (DEAD)

PAVING IN THIS AREA ARE TO BE FLEXIBLE AND CONSTRUCTION WORKS ARE TO BE SUPERVISED BY THE PROJECT ARBORIST

40014

01

REFER TO: 1 / SMCSWSCN-SMC-SCN-UD-DWG-041506

PAVING IN THIS AREA ARE TO BE FLEXIBLE AND CONSTRUCTION WORKS ARE TO BE SUPERVISED BY THE PROJECT ARBORIST

40021 40020 40019 40018 40017 40016 40015

KERB EXTENSION WORKS WITHIN TPZ 40019 & 40020 TO BE SUPERVISED BY PROJECT ARBORIST TO ENSURE MINIMISED IMPACT

EXCAVATION AND KERB REALIGNMENT WORKS WITHIN TPZ40020 TO BE SUPERVISED BY PROJECT ARBORIST TO ENSURE MINIMISED IMPACT

KEY PLAN

APPROVED BY TINSW: CCR 131203 DATED 01.04.20

FOR CONSTRUCTION

REV.	BY	DATE	DESCRIPTION	APPD.
01	SL	14/09/20	GENERAL UPDATES REFER SHEET	KS
00	SL	06/04/20	APPROVED FOR CONSTRUCTION	KS

1:200 @ A1 0 2 4 6 8 10 m

A1 Original | Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D. | This sheet may be prepared using colour and may be incomplete if copied

NOTE: Do not scale from this drawing. | ALT. DRG No.

CLIENT

NSW GOVERNMENT | sydney METRO

The information shown on this drawing is for the purposes of the Sydney Metro Project only. No warranty is given or implied as to its suitability for any other purpose. The Service Providers accept no liability arising from the use of this drawing and the information shown thereon for any purpose other than the Sydney Metro Project.

SERVICE PROVIDERS

CNDC Crows Nest Design Consortium

DRAWN SL
DESIGNED GM
DRG CHECK WW
DESIGN CHECK SB
APPROVED KS

SYDNEY METRO

CROWS NEST STATION
LANDSCAPE ARCHITECTURE
TREE PROTECTION PLAN

STATUS: FOR CONSTRUCTION | SHEET OF | ©

DRG No. SMCSWSCN-SMC-SCN-UD-DWG-041507 | REV. 01

100mm AT FULL SIZE Plot Date & Time 14/09/2020 10:00:37 AM

11 DISCLAIMER

Hunter Bruce Consulting Pty Ltd does not assume responsibility for liability associated with the tree on or adjacent to this project site, their future demise and/or any damage, which may result therefrom.

Hunter Bruce Consulting Pty Ltd takes care to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

Hunter Bruce Consulting Pty Ltd cannot be held responsible for any consequences as a result of work carried out outside specifications, not in compliance with Australian Standards or by inappropriately qualified staff. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale.

11.1 LIMITS OF OBSERVATION

Hunter Bruce Consulting makes every effort to accurately identify current tree health and safety issues. Results may or may not correlate to actual tree structural integrity. There are many factors that may contribute to limb or total tree failure. Not all these symptoms are visible. There can be hidden defects that may result in a failure even though it would seem that other, more obvious defects would be the likely cause of failure. All standing trees have an element of unpredictable risk.

This report and all recommendations within this report are valid for a period of 12 months.