

ARBORIST REPORT

Arboricultural Hazard Assessment

Commissioned By:

Raine & Horne Forestville/Frenchs Forest
11 The Centre
Forestville NSW 2087

Site Address:

114 Lady Davidson Circuit
Forestville
NSW 2087

Produced By:

Sydney Arborist
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Version 01. Revision 00.



SUMMARY

Sydney Arborist was engaged by Raine and Horne Forestville/Frenchs Forest to produce this Arboricultural Hazard Assessment (report.) Raine and Horne Forestville/Frenchs Forest will herein be referred to as the client. The subject site is located at number 114 Lady Davidson Circuit Forestville NSW. The site is located within the LGA (Local Government Area) of Warringah.

My brief from the client was to assess one (1) tree located at the rear of the site. This report will provide observations on the health and condition of the subject tree. This report will provide observations on the health and condition of the tree and make recommendations for tree retention, remediation or removal as is appropriate. If necessary; the report will also make recommendations for tree replenishment taking into account site specific considerations and the aims of Council's tree replenishment policies.

Paul Shearer is the author of this report; I have a diploma in Horticulture (Arboriculture) and am qualified to write Arborist reports within the LGA of Warringah.

One (1) tree was surveyed for the purpose of producing this report. The subject tree was identified as a Sydney Blue gum (*Eucalyptus saligna*) specimen. The tree was assessed as a late mature specimen.

The tree exhibits decay, cavities, a history of failure, a loss of bark integrity and recently had been pruned to remove deadwood. The tree exhibits a cavity in a large co-dominant stem which had penetrated the stem beyond safely accepted limits for structural integrity. Cockatoos appeared to be nesting in the cavity at the time of my on-site inspection.

I have recommended that the subject tree be removed as a matter of safety and tree replenishment be carried out as per Warringah Council's tree replenishment guidelines. I have also recommended that if possible the tree only be removed down to the cavity so the tree may continue to be used as habitat for native fauna.

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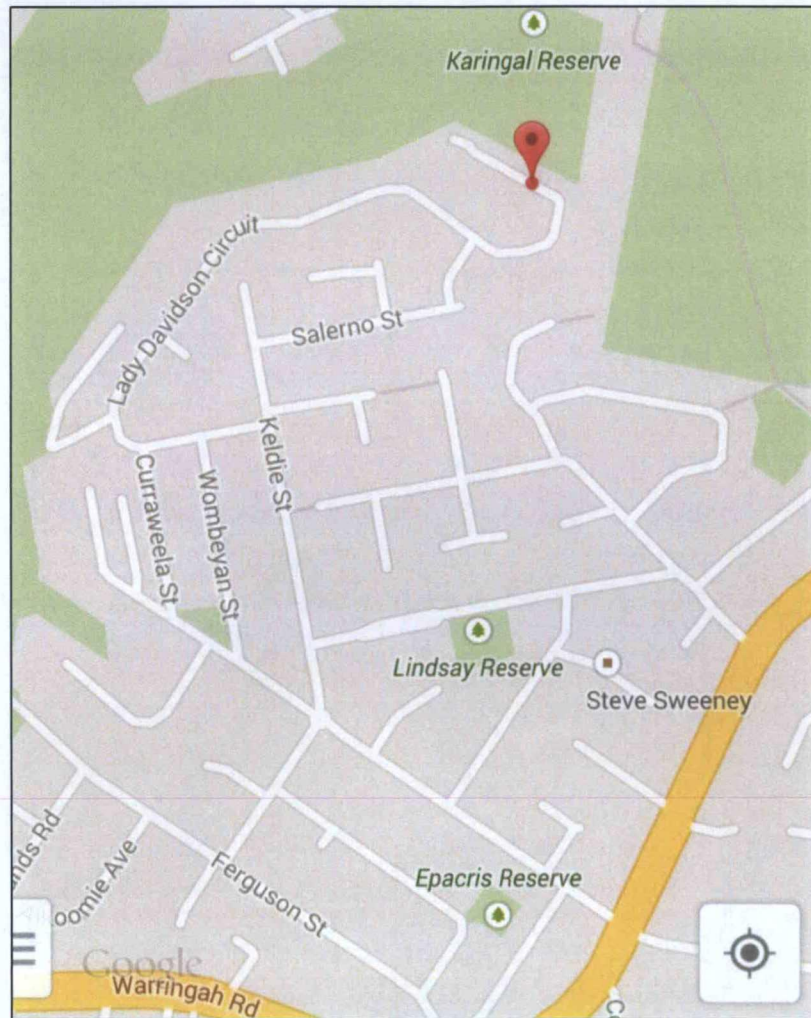
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MAP 1. Site Location Map. (Google Maps 2014)



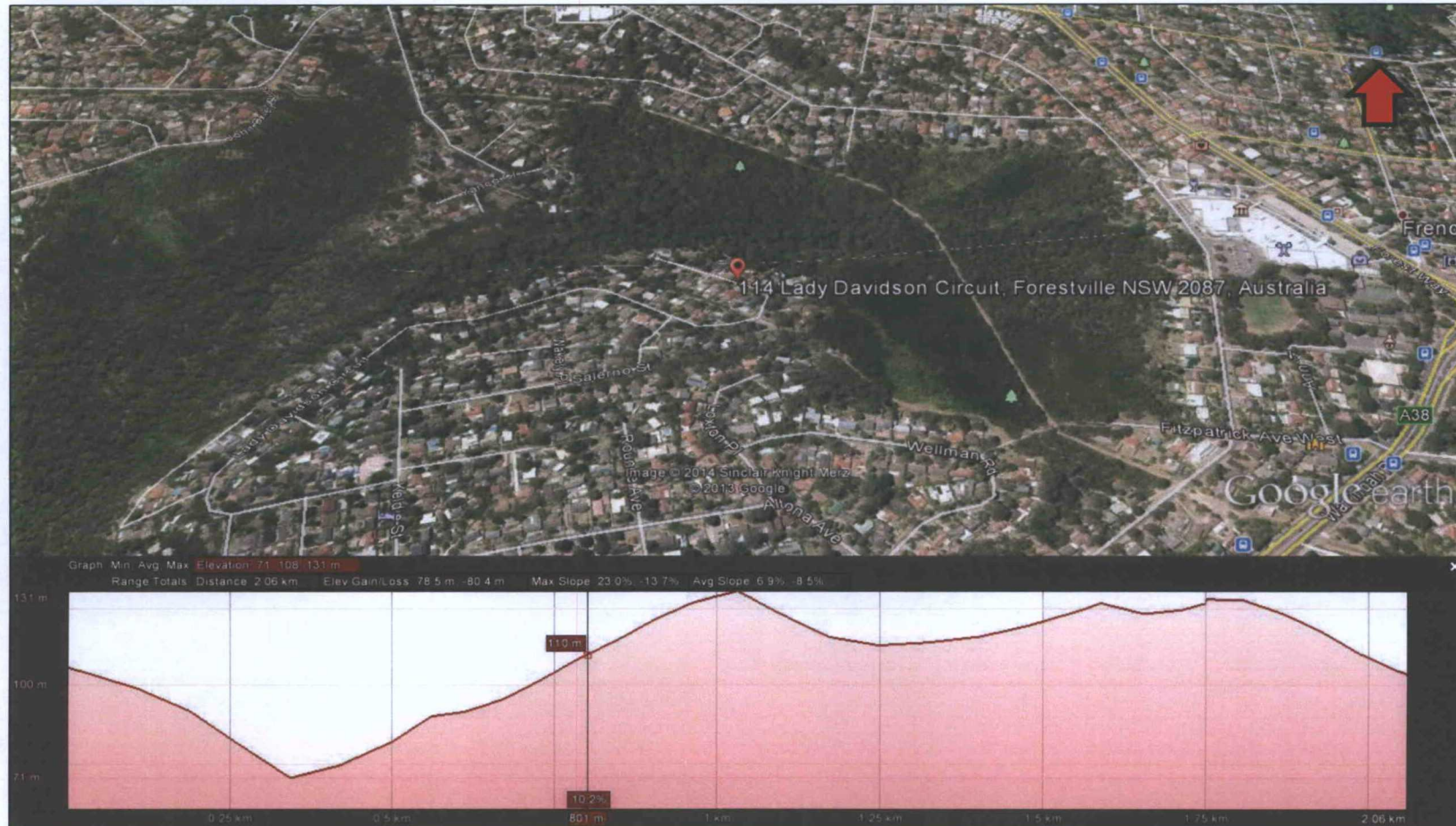
PHOTOGRAPH 1. Tree Location Schedule. North point and tree location estimated. (Google Earth 2014)

LEGEND: RETAIN TREE/S  REMOVE TREE  TRANSPLANT TREE  FURTHER TESTING 



Raine & Horne Forestville/114 Lady Davidson CCT. Forestville NSW/ 8th of Feb 2014
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PHOTOGRAPH 2 & DIAGRAM 1. Site Elevation Profile. The elevation on-site is 109 metres. North point estimated. (Google Earth 2014)



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1.0 INTRODUCTION

- 1.1** Sydney Arborist was engaged by Raine and Horne Forestville/Frenchs Forest to produce this Arboricultural Hazard Assessment (report.) Raine and Horne Forestville/Frenchs Forest will herein be referred to as the client. The subject site is located at number 114 Lady Davidson Circuit Forestville NSW. The site is located within the LGA (Local Government Area) of Warringah.
- 1.2** My brief from the client was to assess one (1) tree located at the rear of the site. This report will provide observations on the health and condition of the subject tree. This report will provide observations on the health and condition of the tree and make recommendations for tree retention, remediation or removal as is appropriate. If necessary; the report will also make recommendations for tree replenishment taking into account site specific considerations and the aims of Council's tree replenishment policies.

2.0 METHODOLOGY

- 2.1 A site inspection for the purpose of gathering field notes was conducted on Thursday the 30th of January 2014. Approximately 0.5 hours was spent on-site for the purpose of gathering field notes.
- 2.2 The site elevation profile (photograph 2 and diagram 2) has been provided as mean wind speed and gale frequency increases with elevation. Site exposure to strong winds due to aspect, topography and elevation are all factors which contribute to tree failure. (*Harris Clarke & Matheny 2004*)
- 2.3 Field notes were recorded on an Excel spread-sheet with a smart phone and transferred directly to this report. The summary of observations (table 2) is an accurate account of notes gathered whilst in the field.
- 2.4 The hazard rating, significance rating and retention value awarded the subject tree was calculated off-site by utilising field notes and photographic evidence. The hazard rating has been adopted from (*Harris Clarke & Matheny 2004.*) As there is currently no industry standard for assessing tree significance and retention values; the methodologies used to assess tree significance and retention values have been produced by Paul Shearer Consulting® 2013. (Attachment 3)
- 2.5 The subject tree was assessed using VTA (Visual Tree Assessment) at ground level. VTA methodology was applied as per the model produced by Mattheck and Breloer (1994). (Attachment 2)
- 2.6 The height of the tree and canopy spread of the tree were estimated.
- 2.7 The Diameter at Breast Height (DBH) of the tree was measured at 1400mm above ground level.



- 2.8** A digital camera was used at ground level for the purpose of collecting photographic evidence. Photographs displayed in this report may have been digitally enhanced (enlarged) to better illustrate observations. No other alteration of photographic content has been made.
- 2.9** This report is not a comprehensive tree hazard or risk assessment. I did not; conduct tree structural assessments, I did not conduct an aerial inspection; I did not send tree tissue or soil for pathology analysis.



3.0 ASSUMPTIONS

The comments and recommendations made in this report assume the following:

- 3.1** Any health or condition issues relating to the subject tree needed to be identified.
- 3.2** The amenity of adjoining neighbours needed to be considered.
- 3.3** The retention of the subject tree and preservation of the streetscape and landscape character was desired.
- 3.4** Removal of trees is considered a last resort option.
- 3.5** Consideration for potential wildlife habitat and related ecological issues was to be considered.
- 3.6** Issues of significance associated with the subject site such as, heritage items and relevant environmental protection mechanisms were to be considered.



4.0 OBSERVATIONS

The Site

- 4.1 The subject site is located at number 114 Lady Davidson Circuit Forestville NSW. The site is located within the LGA (Local Government Area) of Warringah. The site is located to the immediate south of Karingal Reserve. The site is not located within a designated heritage conservation area and there are no heritage or archaeological items on or associated within the site. (*NSW Dept. of Environment & Heritage 2014*)
- 4.2 The site contains a two storey masonry dwelling. The dwelling is located within the fall zone of the tree. A swimming pool had been built within the south western SRZ/TPZ of the subject tree some time ago. The elevation on-site is 109 metres and the site is located high in the catena. (Photograph 2 & Diagram 2) (*Google Earth 2014*) The topography on-site is uneven but generally slopes moderately from south to north. The aspect on-site is north to north westerly.

The Tree

- 4.3 One (1) tree was surveyed for the purpose of producing this report. The subject tree was identified as a Sydney Blue gum (*Eucalyptus saligna*) specimen. The subject species is protected under Warringah LEP 2011. The tree was assessed as a late mature specimen. The tree is considered significant within the context of the site. (Photograph 3) The tree exhibits decay, cavities, a history of pruning, a history of failure, a loss of bark integrity and recently had been pruned to remove deadwood. The tree exhibits a cavity in a large co-dominant stem which had penetrated the stem wall on two (2) sides. Cockatoos appeared to be nesting in the cavity at the time of my on-site inspection. (Photographs 4, 5 & 6) (Further tree detail table 1 following page.)

TABLE 1. Summary of Observations:

(Please refer to appendix 2 for an explanation of terms used in this table. Please refer to attachment 3 for hazard rating, significance rating and retention value definitions & calculations.)

RETAIN								REMOVE			FURTHER TESTING REQUIRED				
TREE No.	SPECIES	AGE	HEIGHT (m)	CANOPY (m)	DBH (mm)	DAB (mm)	TPZ (m)	SRZ (m)	HEALTH	CONDITION	HAZARD RATING (1-12)	SIGNIFICANCE RATING (1-12)	RETENTION VALUE (1-12)	ULE RATING	COMMENTS
1	Blue gum (<i>Eucalyptus saligna</i>)	LM	25*	20*	800	n/a	9.6	n/a	F	P	11	10	4	4C	History of failure, cavities, decay, cockatoos nesting in hollow, co-dominant stem removed long ago.

* Indicates measurement estimated.

5.0 DISCUSSION:

Mature Vs. Declining Trees

- 5.1 I have assessed the subject tree as a late mature specimen. "Mature trees are those being close to maximum height and exhibiting reduced extension growth elongation, (either as decreased elongation or a reduced number of flushes per year. At maturity the degree of apical control frequently lessens and a rounded crown results. Mature trees generally possess sound structure, even though inherent structural problems and numerous internal compartments may be present. They appear healthy and vigorous and may persist in this condition for long periods of time, indeed for much of their life span.
- 5.2 In contrast, declining or senescent trees appear less vigorous, because of adverse environmental stress, structural failures or simple old age. Their growth rates may be slow or non-existent. Indeed, they may experience reductions in size and mass due to the loss of large branches. The development of irregular crowns does not necessarily lead to structural instability, and trees in this condition may live for some time. However, the potential life span of trees in a state of decline seems more limited, and the likelihood of death is much greater. Even with outside intervention, a state of decline may be irreversible." (1)

Table 2. Characteristics of Mature & Declining Trees. (After; Harris, Clarke and Matheny 2004) Declining characteristics exhibited by the tree have been highlighted.

Character	Mature Tree	Declining Tree
Shoot elongation-extent	normal for species	greatly reduced single flush only
Pattern	normal for species	
Crown form	normal – some loss of apical control	stag-headed, dieback
Foliage development	normal	reduced size and density
Foliage retention (evergreens)	normal	poor
Presence of epicormic shoots	generally absent	present
Compartmentalization response	normal for species	inhibited/reduced
Wound-wood formation	normal for species	inhibited/reduced
Integrity of bark	strong	weak
Susceptibility to parasites	normal for species	increased
Reproductive behaviour	normal, may be cyclic	may produce stress crops
Stress response	normal	reduced
Autumn colouration	normal	premature

Shell Thickness Requirements for an Open Shell

5.3 As previously mentioned, the tree exhibits a cavity which has penetrated two (2) sections of the stem wall. A hollow section of a tree is called a shell, and whilst there are varying formulas to assess the structural integrity of a shell, most agree that a loss of >70% of sound wood is justification for tree removal based on a tree's potential to fail. (Harris, Clarke & Matheny, Lonsdale, Mattheck, Pokorney & others.)

5.4 It is important to note that these formulae apply to trees with a closed shell. Trees with an open shell are more prone to failure and require even more sound wood. Whilst I did not conduct an aerial inspection of the tree to take measurements of the stem and extent of the cavity it is reasonable to assume that the stem has been compromised in excess of 70% due to two (2) breaches of the stem wall. (Photographs 4 & 5)



Tree Hazard Assessment

- 5.5 A tree is considered hazardous if it is structurally unsound and there is a target that would be injured or damaged if the tree failed. An unsound tree in an area with no target is not considered a hazard; neither is a sound tree in an area with a target. The fall zone of a tree is calculated as $1.5 \times$ the height of a tree measured as a radial offset. I have determined that the dwelling on-site is located within the fall zone of the tree.



6.0 CONCLUSIONS:

- 6.1 The subject site is located at number 114 Lady Davidson Circuit Forestville NSW.
- 6.2 The site is located within the LGA (Local Government Area) of Warringah.
- 6.3 The subject tree was identified as a Sydney Blue gum (*Eucalyptus saligna*) specimen.
- 6.4 The tree is a late mature specimen.
- 6.5 The tree exhibits a cavity in a large co-dominant stem which had penetrated the stem beyond safely accepted limits for structural integrity.
- 6.6 Targets for the tree are rated as high.
- 6.7 The subject tree represents a hazard due to the potential for failure and the presence of targets rated as high.



7.0 RECOMMENDATIONS:

Tree Removal

- 7.1 The subject tree represents a hazard and should be removed as a matter of safety. (Wires or similar should be contacted to check for cockatoo chicks in the cavity and relocate them if necessary prior to tree works commencing.)
- 7.2 Ideally the tree should be removed to approximately 1 metre above the cavity and retained for the purpose of habitat. If this approach is adopted, remaining limbs from the tree should also be removed. Alternatively; if the tree is removed to ground level, a nesting box should be installed elsewhere on-site to compensate for the loss of habitat.
- 7.3 This report must be submitted with the DA for review by Warringah Council's Tree Management. ***(The tree must not be removed until removal is approved by Council.)***

Stump Removal

- 7.4 If the tree is removed to round level; grind the stump and root-ball of the tree to a maximum depth. The grinding contractor should contact; Dial Before You Dig or discuss with client before commencing grinding works to verify the location of underground services on site. The industry standard allows for stump grindings to remain onsite unless specified otherwise.
- 7.5 The selected tree removal/grinding contractor should be a member of, or be eligible for membership with, The Tree Contractors Association or Arboriculture Australia. (Recommended tree works should be carried out by a minimum Cert 3 qualified Arborist to AS 4373 2007, The Work Health and Safety Act and the Workcover Code of Practice; Amenity Tree Industry 1998.)



Tree Replenishment

7.6 Tree replenishment must be undertaken for trees removed as per Warringah Council's Tree Replenishment Guidelines. Species selected for tree replenishment should be endemic to the site. The following is a list of canopy species endemic to the Warringah LGA that would be considered suitable for the site:

- Angophora bakeri (*Narrow-leaved Apple*)
- Sydney Red gum (*Angophora costata*)
- Red Bloodwood (*Corymbia gummifera*)
- Spotted gum (*Corymbia maculata*)
- Blackbutt (*Eucalyptus pilularis*)
- Grey Ironbark (*Eucalyptus paniculata*)

7.7 It is my view that selected plants should be tube-stock as tube-stock has proven to outperform its more advanced counterparts in the long term. Council may request larger plant stock. If tube-stock is used plants will need to be protected with protective fencing or tree guards until they reach semi-maturity.

7.8 Where possible plants should be provenance stock (grown from locally sourced seed stock) and be grown to Natspec® standards. Planting locations should provide adequate space for potential physical dimensions of trees both above and below ground at maturity.

7.9 Planting should be kept to a minimum within the TPZ of retained trees. All care should be taken when planting within the TPZ of retained trees so that damage to retained trees roots does not occur.

7.10 Planting should be carried out by a suitably qualified landscape contractor/designer. The landscape firm engaged should provide within their fees proposal to revisit the site twelve (12) months after establishment (3-5 years for tube-stock) so that they may replace dead trees, carry out corrective pruning and tree remediation as required.



Yours sincerely,

A handwritten signature in black ink, appearing to be "P. Shearer", written in a cursive style.

**Paul Shearer Dip. Hort. (Arb.) Cert. III Hort. (Arb.) Cert (Arb.)
Professional Affiliation – Arboriculture Australia (Membership
No. 2452)**



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- (1) Clark and Matheny (1994), Abstract taken from –
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APPENDICES



APPENDIX 1

ULE (Useful Life Expectancy) - Categories (after Barrell 1996, Updated 07/04/01.) The five categories and their sub-groups are as follows:

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance;

- A. Structurally sound trees located in positions that can accommodate future growth.
- B. Trees which could be made suitable for long term retention by remedial care
- C. Trees of special significance which would warrant extraordinary efforts to secure their long term retention.

2. Medium ULE- tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance;

- A. Trees which may only live from 15 to 40 years.
- B. Trees which may live for more than 40 years but would be removed for safety or nuisance reasons.
- C. Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.
- D. Trees which could be made suitable for retention in the medium term by remedial care.

3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. Trees which may only live from 5 to 15 years.
- B. Trees which may live for more than 15 years but would be removed for safety or nuisance reasons.
- C. Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.
- D. Trees which require substantial remediation and are only suitable for retention in the short term.

4. Removal - trees which should be removed within the next 5 years;

- A. Dead, dying, suppressed or declining trees.
- B. Dangerous trees through 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 which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.
- F. Trees which are damaging or may cause damage to existing structures within the next 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 moved or replaced;

- A. Small trees less than 5m in height.
- B. Young trees less than 15 years old but over 3m in height.
- C. Formal hedges and trees intended for regular pruning to artificially control growth.



APPENDIX 2

GENERIC GLOSSARY

Age Classes; (S) Semi-mature refers to a tree between immaturity and full size.

(M) Mature refers to a full sized tree with some capacity for further growth.

(LM) Late Mature refers to a tree that is entering decline.

(O) Over-mature refers to a tree already in decline.

Health; Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback. Classes are Good (G), Fair (F), Declining (D), and Poor (P).

Condition; Refers to the tree's form and growth habit, as modified by its environment (Aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health, it is possible for a tree to be healthy but in poor condition. Classes are Good (G), Fair (F), Declining (D), and Poor (P).

Diameter at Breast Height (DBH); Tree stem diameter measured at 1.4 metres above ground level.

Guy Rope Root; Refers to a large structural root on the windward side of the tree formed due to constant strong winds from a certain direction.

Structural Root Zone (SRZ); As detailed in AS4970-2009 Protection of Trees on Development Sites, refers to the area of root zone measured as a radial offset from the centre of the tree stem required for tree stability. SRZ calculation; $(D \times 50)^{0.42} \times 0.64$. D = trunk diameter in metres measured above the root buttress. It is important to note that the SRZ is calculated as a radial average and biological root growth is affected by many factors. It may therefore be necessary, in certain cases, to undertake root mapping via physical or non-invasive means to determine the exact location of structural tree roots. **AS4970-2009 only requires SRZ calculations when a major encroachment into the TPZ (>10%) or inside the SRZ is proposed.**

Tree Protection Zone (TPZ); As detailed in AS4970-2009 Protection of Trees on Development Sites, the TPZ includes the SRZ and is the combination of root and canopy area required to maintain tree stability and health/viability. TPZ calculation; twelve (12) times the trunk DBH measured as a radial offset from the centre of the tree stem. The TPZ indicates the location where protective fencing should be installed to create an exclusion zone around a protected tree.

Visual Tree Assessment (VTA); Refers to visual inspection of tree only.

Aerial Inspection; Refers to climbing a tree to obtain more accurate information.

Crown; Refers to the position of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

Stem; Refers to an organ which supports branches, leaves, flowers and fruits.

Endemic; Refers to locally indigenous species.



Indigenous; Refers to Australian native plants which are not endemic.

Epicormic Shoots; Trees have epicormic buds which in times of stress may grow to increase the foliage on a tree. An increase in the photosynthetic production of sugar (energy) may assist in overcoming a trees' stressed condition. The presence of epicormic shoots on a tree is therefore a sign of stress in tree health.

Fall Zone; Refers to a radial offset of 1.5 the height of a tree.

Lopped; Refers to a tree which has been pruned contrary to AS4373 (2007.) This type of pruning may be harmful to the health or condition of a tree.

USEFUL LIFE EXPECTANCY (ULE); In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. ULE i.e. a system designed to classify trees into a number of categories so that information regarding tree retention can be concisely communicated in a non-technical manner. ULE categories are easily verifiable by experienced personnel without great disparity. A tree's ULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give safe life expectancy), then by economics (i.e. cost of maintenance: retaining trees at an excessive management cost is not normally acceptable), effect on better trees, and sustained amenity (i.e. establishing a range of age classes in a local population). ULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with a short ULE may be at present by making a contribution to the landscape but their value to the local amenity will decrease rapidly towards the end of this period, prior to their being removed for safety or aesthetic reasons. For details of ULE categories see Appendix A, adapted from Barrell 1996. (Updated April 2001)

AS4373; Refers to Australian Standard for Pruning of Amenity Trees. This certification commenced in 1996 (updated 2007) and is a standard for correct arboricultural techniques. The standard takes into account tree biology and tree worker safety issues.



ATTACHMENTS

ATTACHMENT 1

PHOTOGRAPHS

PHOTOGRAPH 3. (South aspect.) This photograph taken from Lady Davidson Circuit illustrates the landscape significance of the tree (T1.)



PHOTOGRAPH 4. (East aspect) This photograph shows a cockatoo sitting in the cavity (red arrow.)



PHOTOGRAPH 5. (North West aspect) This photograph illustrates that the cavity has penetrated the stem wall twice (red arrow.)

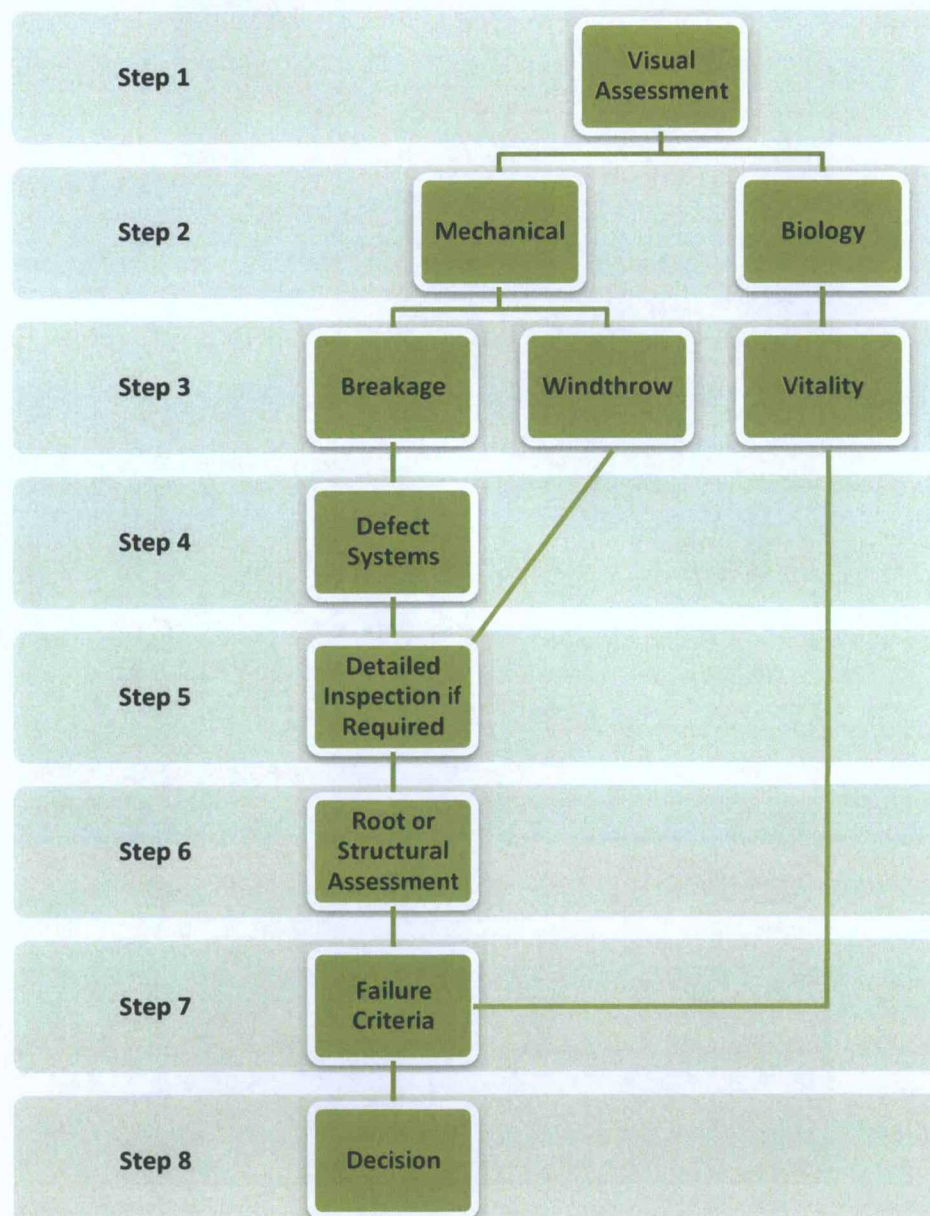


PHOTOGRAPH 6. (North aspect) A co-dominant stem had been pruned from the tree long ago. The tree exhibited poor wound wood callusing at this pruning site (red arrow.) The tree exhibited a loss of bark integrity (green arrow.)



ATTACHMENT 2

DIAGRAM 2. (VTA) Methodology Model; Based on Tree Biology, Function & Mechanics. (After; Mattheck & Breloer 1994.)



ATTACHMENT 3

TABLE 3. HAZARD RATING, SIGNIFICANCE RATING & RETENTION VALUE DEFINITIONS

Hazard Rating: Refers to three separate categories; Failure Potential, Size of Defective Part and Target Rating. A tree is given a score of 1 to 4 in each individual category. A score of 12 would rate as an extreme Hazard Rating; a score of 3 would rate as a very low Hazard Rating. *(After; Harris Clarke & Matheny 2004.)*

(Failure Potential) – Identifies the most likely failure and rates the likelihood that the structural defect will result in failure.

1. Low - defects are minor (e.g. Dieback of twigs, small wounds with good wound wood development)
2. Medium – defects are present and obvious (e.g. Cavity encompassing 10-25% of stem circumference).
3. High – numerous and or significant defects present (e.g. Cavity encompassing 30-50% of stem circumference or major bark inclusions).
4. Severe – defects are very severe (e.g. heart rots fruiting bodies, cavity encompassing more than 50% stem circumference).

(Size of Defective Part) – Rates the size of the part most likely to fail. The larger the part that may fail, the greater the potential for damage.

1. Most likely failure less than 150mm in diameter.
2. Most likely failure 150mm – 450mm in diameter.
3. Most likely failure 450mm – 750mm in diameter.
4. More than 750mm in diameter.

(Target Rating) – Rates the use and occupancy of the area that would be struck by the defective part.

1. Occasional use (e.g. jogging/cycle track).
2. Intermittent use (e.g. picnic area/day use parking).
3. Frequent use, secondary structure (e.g. seasonal camping area/storage facilities).
4. Constant use, structures (e.g. year-round use for a number of hours each day/residences).

Hazard Rating = Failure Potential + Size of Part + Target Rating. (Add each of these categories for a rating out of 12).

Significance Rating: Refers to four separate categories; Species, Landscape Significance, Ecological Significance and Cultural Significance. A tree is given a score of 1 to 3 in each individual category. A score of 12 would rate a tree as being of high significance and a score of 3 would rate a tree as being of low significance.

(Tree Species) - Identifies the species of tree, its protected status and its suitability for the site.

1. Low - Refers to a weed species, (e.g., trees listed on the NSW Noxious Plants List and species that are exempt under a Tree Preservation Order.)
2. Moderate - Refers to non-endemic indigenous species and exotic species protected under a Tree Preservation Order.
3. High - Refers to trees protected under a Tree Preservation Order which are endemic to the local government area.

(Landscape Significance) - Assesses a tree within the landscape and rates its contribution to the streetscape or landscape character in terms of visual amenity.

1. Low - Refers to trees that have little influence on the streetscape or landscape character in terms of visual amenity.
2. Moderate to High - Refers to trees that have a moderate to high influence on the streetscape or landscape character in terms of visual amenity
3. High - Refers to trees that have a high influence on the streetscape or landscape character in terms of visual amenity. (For example, a highly prominent tree that 'creates a sense of place'.)

(Ecological Significance) - Assesses a tree and rates its potential contribution in ecological terms.

1. Low - Refers to trees of little ecological value, or trees with a low possibility of contributing to the locale in an ecological sense.
2. Moderate - Endemic species or introduced species which may provide ecological benefits.
3. High - Refers to threatened species or trees that constitute a wildlife corridor, riparian zone or make other contributions to the locale in an ecological sense. (For example, a tree with hollows that may serve as habitat.)

(Cultural Significance) - Details the cultural or heritage significance of a tree.

1. Low - Refers to trees that have no cultural significance.
2. Moderate - Refers to trees declared as culturally significant at local government level, or trees which contribute to a heritage item at local government level. (May also include culturally significant plantings as assessed by the author which have not been declared.)
3. High - Refers to trees declared as culturally significant at state or national level or trees with archaeological significance.

Significance Rating = Tree Species + Landscape Significance + Ecological Significance + Cultural Significance. (Add each of these four categories together for a score out of 12.)

Retention Value: Refers to three separate categories; Health, Condition and Situation. A tree is given a score of 1 to 4 in each individual category. A score of 12 would rate a tree as having a high retention value and a score of 3 would rate a tree as having a low retention value.

(Health) - Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback. (Matheny & Clarke 1994)

1. Poor.
2. Declining.
3. Fair.
4. Good.

(Condition) - Refers to the tree's form and growth habit, as modified by its environment (Aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health as it is possible for a tree to be healthy but in poor condition. (After; Matheny & Clarke 1994)

1. Poor.
2. Declining.
3. Fair.
4. Good.

(Situation) - Refers to the physical location of a tree on a site and its potential for future growth taking into account any physical restrictions, (e.g. position of house.)

1. Refers to a tree that is causing damage to property.
2. Refers to a tree that has outgrown its situation and may cause damage to the built environment within the next 5 years.
3. Refers to a tree located in a situation that can accommodate further growth with regular maintenance.
4. Refers to a tree located in a situation that can accommodate its potential mature physical dimensions.

Retention Value = Tree Health + Tree Condition + Tree Situation. (Add each of these three categories together for a score out of 12.)

TABLE 4. Hazard Assessment, Significance Rating & Retention Value Calculations. Please refer to appendix 2 and table 3 for an explanation of values used in this table.

INFORMATION CATEGORY	
HAZARD RATING (1-12)	T1
Failure Potential 1, 2, 3, 4.	4
Size of Defective Part 1, 2, 3, 4.	3
Target Rating 1, 2, 3, 4.	4
TOTAL	11
SIGNIFICANCE RATING (1-12)	
Tree Species (Origin) 1, 2, 3.	3
Landscape Significance 1, 2, 3.	3
Ecological Significance 1, 2, 3.	3
Cultural Significance 1, 2, 3.	1
TOTAL	10
RETENTION VALUE (1-12)	
Health 1, 2, 3, 4.	2
Condition 1, 2, 3, 4.	1
Situation 1, 2, 3, 4.	1
TOTAL	4

ATTACHMENT 4

DISCLAIMER

Limits of Scope Statement:

"I am not a solicitor," There is no substitute for current professional litigation consulting agricultural matters and legal advice. This publication is not intended as, and does not represent legal advice and should not be relied upon to take the place of such advice. Although every effort has been made to assure the accuracy of the information included in this publication as of the date on which it was issued, laws, court and arbitration decisions and governmental regulations in Australia and New South Wales are subject to frequent change. To be included in all the standards and duties of evaluation, investigations, interpretations, methodology and contradictions in determining the failure for claims and litigation.

Assumptions:

Care has been taken to obtain information from reliable sources. All data has been verified insofar as possible, however, Sydney Arborist or the author can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless Stated Otherwise:

Information contained in this report covers only the tree/trees that were examined and reflects the condition of trees at the time of inspection.