

5th December 2011

Tree (Safety) Management Plan

Commissioned by:

Coogee Public School



Produced by:

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SUMMARY

Enviro Frontier Tree Management was engaged by Coogee Public School to produce this tree safety management plan.

The subject site was located at Byron Street (Cnr of Coogee Bay Road) Coogee NSW. Site usage is for a school. The site is located within the Local Government Area of Randwick. The local consent authority is Randwick City Council.

The client has requested this tree management plan as part of a pro-active approach to tree health and safety management for the subject site and an overview of budget requirements.

No written brief outlining the client's objectives was supplied for the purpose of producing this report.

The client's representative raised concerns regarding the health and condition of the tree population at the subject site, due to a recent large limb loss from a Ficus tree. The client's representative requested that tree management issues relating to public safety/ liability, reduction of maintenance costs, suitable replacement species, site amelioration and appropriate tree placement be addressed.

The purpose of this tree management plan is to address client concerns and provide a reference guide for "best arboricultural practice" at the subject site for a five year period.

A site inspection for the purpose of gathering field notes was carried out by consulting arborist Peter Dubiez (Level 5 Arborist) of Enviro Frontier Tree Management on the 5th December 2011.

Thirty nine trees were surveyed for the purpose of producing this tree management plan. A number of the subject trees exhibited high landscape significance due primarily to the subject site history.

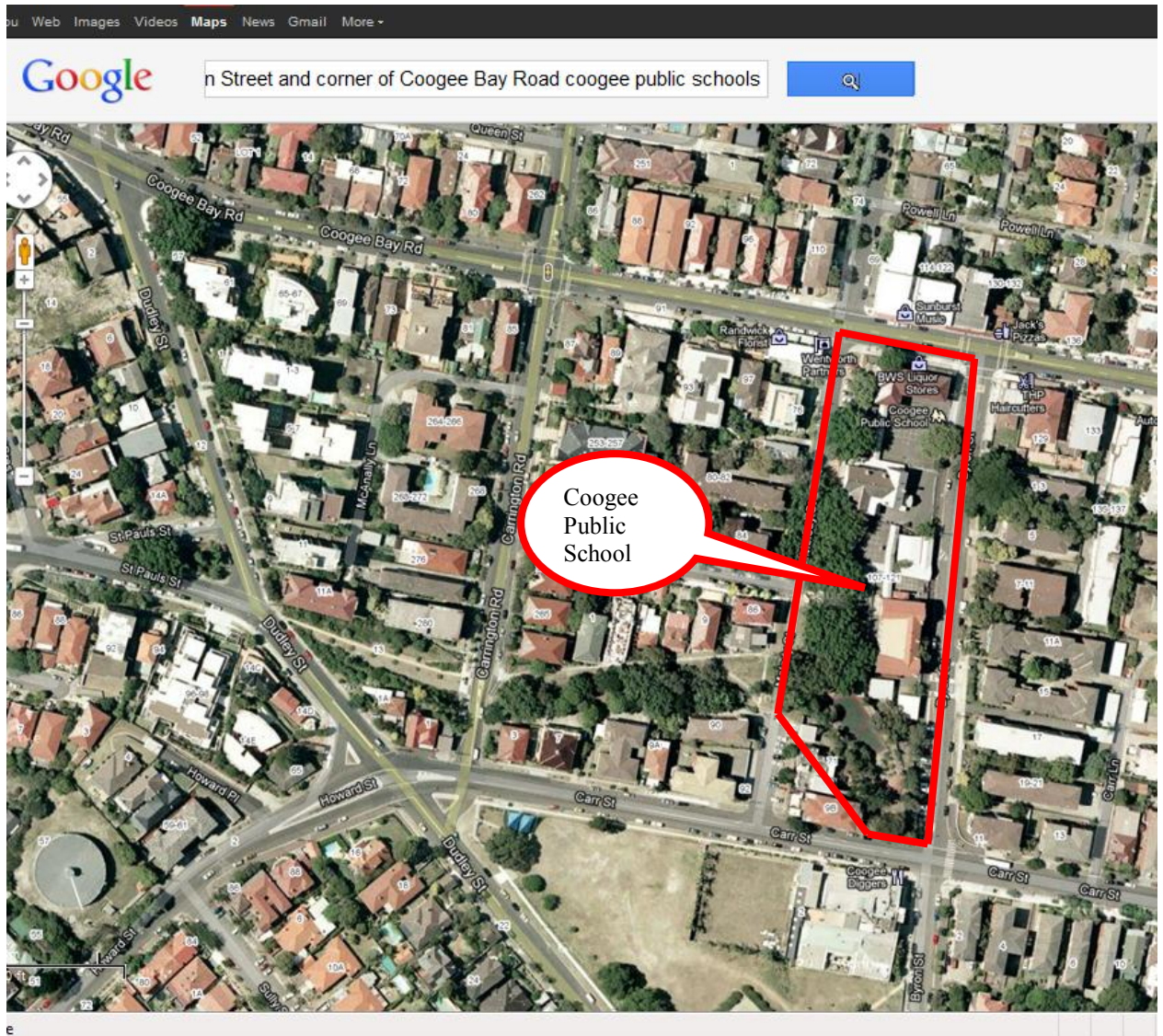
A tree management safety plan is a project where the initial capital outlay is rewarded with an open space area that is greatly enhanced in the areas of, safety, reduced maintenance costs, aesthetic appeal and ecological biodiversity.

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MAP 1. Site Location Map: The subject site. Not to scale. (Google Maps 2011.)



1. METHODOLOGY

1.1 Site Inspection Methodology:

A site inspection for the purpose of gathering field notes was carried out by consulting arborist Peter Dubiez of Enviro Frontier Tree Management on the 5th December 2011. Approximately 2 hours was spent onsite gathering field notes.

Field notes were recorded electronically on a PDA (Personal Digital Assistant). The summary of observations (table 1) was produced on an Excel® spread-sheet and is a duplicate of notes gathered whilst in the field.

1.2 Tree Survey Methodology:

My verbal brief from the client requested that trees be surveyed for the purpose of producing this tree (safety) management plan.

The subject trees were inspected from the ground only using VTA (Visual Tree Assessment).

The hazard rating, significance rating and retention value awarded the subject trees were calculated off site by utilising field notes.

Tree height and average crown diameter were estimated without the use of a clinometer. The DBH (Diameter at Breast Height) of the subject trees was measured with a metric measuring tape at 1.0 metres above ground level. Multi-stemmed specimens were measured at the widest stem.

I did not carry out drilling or Resistograph® assessment to assess stem/buttress structural integrity. I did not collect and send tissue samples for pathology testing. I did not conduct aerial inspections of the subject trees.

1.3 Research Methodology:

Site specific local government and other planning instruments relevant to the subject site and it' tree population were referenced online.

Every effort was made to obtain information from reliable sources.

2. ASSUMPTIONS

The comments and recommendations in this Tree Management Plan assume the following:

2.1 Any safety concerns relating to the existing health and condition of the subject trees needed to be identified.

The amenity of adjoining neighbours needed to be considered.

The retention of the subject trees and preservation of the streetscape and landscape character was desired.

Removal of trees is considered a last resort option.

Consideration for potential wildlife habitat and related ecological issues was to be considered.

Federal, state, local, cultural heritage and environmental planning instruments needed to be addressed.

Information obtained from the client's representative and sourced information was accurate.

3. OBSERVATIONS

3.1 The Site:

The site was located within the Local Government Area of Randwick. The local consent authority was Randwick City Council. Appendix 1

3.2 Site Usage:

Site usage is for school.

3.3 Relevant Planning & Environmental Instruments:

The following planning and environmental instruments were relevant to the subject site;

- Local Government Act (1993)
- EPA Act (1989)
- Randwick City Council LEP
- Randwick City Council Tree Preservation Order

4. Age of Surveyed Tree Population as a Percentage (0-100%): A total of 40 trees were surveyed (including 3 trees outside school grounds)

4.1 Tree Age:

Details the age class awarded to the relevant number and percentage of trees surveyed:

Juvenile/Young – 20 trees or 50% of the tree population surveyed

Semi-mature - 9 trees or 22% of the tree population surveyed

Mature - 11 trees or 28% of the tree population surveyed

4.2 Risk rating – Appendix 2

Details the relevant number and percentage of hazard rating for individual/grouping of tree surveyed:

- Rating 1 (Very minor hazard) – 2 or 5%
- Rating 2 (Minor hazard) – 19 or 48%
- Rating 3 (Medium hazard) – 3 or 4%
- Rating 4 (High hazard) – 13 or 33%
- Rating 5 (Very high hazard) – 2 or 5%

4.3 Works outline

Details the required works as per assessment by the relevant number and percentage of trees:

- Canopy lift (pathway for pedestrians) – 18 trees or 45% of the surveyed tree population
- Clear from building & other tree works – 4 trees or 10% of the surveyed tree population
- Canopy thin, deadwood, reduce limb weight & clear from buildings – 9 trees or 23% of the surveyed tree population
- Neighbour or Council tree issue that is impacting your grounds – 3 tree or 8% of the surveyed tree population
- Removal – 4 trees or 10% of the surveyed tree population
- No work or monitor – 2 trees or 5% of the surveyed tree population

4.4 Budget Outline

Details the budgeted cost associated for works by relevant number and percentage of trees surveyed:

Works Christmas Break 2011 – 2012

- Canopy lift (pathway for pedestrians) – 0
- Clear from building & other tree works – 4 trees \$689.70 + Gst
- Canopy thin, deadwood, reduce limb weight & clear from buildings – 9 trees \$3,169.05 + Gst
- Removal – 3 trees \$3,732.30 + Gst

Total budgeted works \$7,591.05 + Gst

Works term 2 for 2012

- Canopy lift (pathway for pedestrians) – 18 trees \$767.59 + Gst
- Clear from building & other tree works – 4 trees \$344.85 + Gst
- Canopy thin, deadwood, reduce limb weight & clear from buildings – 9 trees \$768.98 + Gst
- Removal – 1 tree \$848.25 + Gst

Total budgeted works \$2,729.66 + Gst

Works term 3 for 2012

- Canopy lift (pathway for pedestrians) – 18 trees \$508.95 + Gst
- Clear from building & other tree works – 0
- Canopy thin, deadwood, reduce limb weight & clear from buildings – 9 trees \$517.28 + Gst

Total budgeted works \$1,026.23 + Gst

Total budgeted cost to meet summary of observations for forward twelve months of 2012 is \$11,346.94 + Gst

Annual Budget each year from 2013 is \$1,820.11 + Gst. This is primarily for maintenance works involved with pruning, uplifting and dead wooding. Any removals may be an additional cost to budgeted allowance

5. DISCUSSION

5.1 The Management of Mature Trees:

At a school there is a variety of hazards to assess when it comes to trees, from the limb structure, location, ground disturbance for trip hazards or building/pipes damage and even the shade value for sun protection. Trees at schools also have to be viewed for what a student may want to do in/with the tree such as climbing or being able to grab a lower limb to swing on it. Consideration has to be provided in terms of the mature tree stock and what is being currently planted to for future generations.

A hazard assessment of the subject trees was conducted as part of this tree management plan. (Not all trees on-site were assessed.) Sometimes tree hazards are obvious and at other times the hazard is not made apparent until the tree has failed. It is therefore impossible to accurately assess the failure potential of each and every tree.

The key management aspect on this site is that of the 40 trees reported 28% were mature. Of the mature trees the majority required some form of risk management works from removal, lifting, dead wooding or limb weight reduction.

The majority of the mature trees on site are Ficus Hillii. The Ficus are located on the main courtyard that house the play equipment for the children –

These species of Figs Ficus microcarpa var hillii occur naturally in the coastal rainforests of Queensland and are described as a low branching tree of 15 - 20m with a short main trunk or branching into several large trunks forming a broad open canopy. Often is the case that the tree in an urban setting develops large scaffold branches from low down the trunk, supporting a dense canopy above and to the outer reaches of the canopy drip line. Most of the trees in this stand have developed scaffold or secondary branches with some inclusion “narrow angle of attachment with embedded bark”.

The Ficus in this stand are competing for light and soil nutrients. In the stand there are a total of 5 trees (numbered on site map 9 to 13), generally in this space provided for a tree of this vigour 3 is more than adequate, even 2 will suffice, considering the competing Council trees. The Ficus grows to 20 meters in height and can develop the same canopy spread in width. The risk with a Ficus in a high person/children area is the large scaffold branches. In the Ficus stand the lower branches are competing for light and have

extended horizontally exerting extensive weight on the main junctions. Our suggestion is to reduce the weight of these limbs along with removal two Ficus trees, one decline and the smaller Ficus. This will provide the other Ficus room to continue to develop. Ficus can live up to 200 years when properly managed and maintained.

NOTE- Ficus root system can cause significant damage and issues with structures and plumbing. It is noted that the school already has plumbing issues that can be attributed to Ficus root system. Also noted is the Ficus has caused lifting and uneven ground of the sponge matting that has been placed under the play equipment.

In the same stand location as the Ficus trees are also Plane trees. The Plane tree is a grand tree that grows in similar dimensions to the Ficus tree. The primary difference is that the Plane tree are deciduous (lose leaves in winter). The Plane trees are semi-mature, in development they will continue to compete with each other and the Council trees. With correct arboriculture management these trees can be sustained in their existing area to provide adequate canopy screen. Note the Plane Tree (No. 5) nearest the building will need to be monitored due to possible future retaining wall structure issues.

The other mature species on site are primarily Camphor Laurels. These trees root system for evasiveness and hardiness are similar to the Ficus. The Camphor Laurels are in decline, yet at this stage primarily require dead wood and limb management/pruning. Monitoring of trees inclusion of branch timber for any signs of separation to be undertaken each year.

Other mature specie outlined for removal is the Cocos Palm, due to proximity to building and being on the Council order noxious weed list.

NOTE – In the neighbouring property (No. 19), dead Radiata Pine, this tree needs to be removed by the neighbour as dead limbs overhang the children's play area. Council Ficus tree (No. 3 & 6) require pruning back from the school. All trees mentioned above can be highlighted to the Randwick Council TPO when they visit site to review the other works itemised in this report. Council approval will be required to conduct a majority of the works outlined in this report.

5.3 Compaction

Trees oxygen and nutrients primarily come from the root system. In any school the continual movement of children over the ground will compact the soil. The main functions of roots include the uptake of water and nutrients, anchorage, storage of sugar reserves and the production of some plant hormones required by the shoots. In order for roots to function, they must be supplied with oxygen from the soil. The root system of trees consists of several 'types' of roots found in different parts of the soil and is generally much more extensive than commonly thought. The importance of roots is easily overlooked because they are not visible, that is 'out of sight, out of mind'. Damage to the root system is a common cause of tree decline and death and is the most common form of damage associated with school sites. Root growth is opportunistic and takes place wherever the soil environment is favourable. The most limiting factor for root growth is air.

Compaction is defined as the loss of large pore spaces (macropores) within the soil with a net loss of total pore space. Macropores are essential for the exchange of gases between the soil air and the atmosphere (aeration) and the removal of excess water from the soil (drainage).

In summary, the effects of root loss or damage by any means could include—

- (A) loss of stability if structural woody roots or even lower order woody roots are cut;
- (B) reduction in water and nutrient uptake;
- (C) an eventual loss of leaves, reduced photosynthesis and thus sugar production;
- (D) decay as a result of wounding; and
- (E) predisposition to soil borne pathogens.

It is commonly observed that trees may take many years to decline and eventually die from root damage.

It is recommended that areas of high compaction where there are trees, whether mature or juvenile be de-compacted twice per year. This can be done manually by use of pitchfork to break up the soil, or by mechanical means with an aerator. Another form of compaction assistance is mulch at the base of trees and their root zones. The mulch has to be offset by possible run off issues associated with this school site.

- 5.4** The site has a good array of juvenile stock, 50% of trees surveyed for the report. An ongoing tree planting program to continue with primarily Australian natives that will assist the environment as well as provide a canopy screen cover for sunlight filtering and protection. Planting of trees to consider location to building and structures with a 10 year and more overview.

5.5 What are the risks?

“Although trees provide many benefits to people and environments, they also pose risks. Property can be damaged and people injured or killed when trees fail. Trees, however, cannot be neatly separated into hazardous and non-hazardous groups. Nearly every tree has some potential to fail, particularly when exposed to a catastrophic storm. Complete tree safety could not be attained without removing most trees. (Arboricultural managers must not only be able to evaluate tree hazard potential, but also to convey the relative risk of failure to the tree owners. Together the arborist and owner can evaluate the situation and determine which treatment options combine suitable reduction in tree hazard with an acceptable level of risk.)

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.

Some of the defects that may result in tree failure are weak branch attachments, decay of trunk and branches, excessive weight coupled with poor taper, and root loss or root decay. Strong winds can place excessive loads on trees and can cause breakage even in the absence of defects. Structures, vehicles, and people are possible targets. The potential for property damage depends on the likelihood of a tree or a part of a tree striking the property. Injury to people depends on the likelihood of a tree striking a specific area when people are present.”

6. RECOMMENDATIONS:

6.1 Immediate:

- Carry out pruning and dead wooding as specified in the summary of observations schedule
- Submit a Tree Application for the removal of tree assets as outlined in the report. A Tree order provides works can be carried out within 12 months of consent. Enviro Frontier Pty Ltd will provide this as part of the arboriculture service.
- Take down and remove trees as per the approval.
- Have all stumps on site where tree/palm removal has taken place ground to a minimum depth of 300mm. (Leaving stumps in the ground is not only unsightly; it also creates a trip hazard and promotes the breeding of destructive fungal pathogens. A schematic of underground services should be supplied to the contractor prior to the commencement of grinding works. The industry standard allows for stump grindings to remain on-site unless

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specified otherwise.)

- Consider a systematic removal program over the ten years to reduce the number of Ficus on the site.
- Where practical, leaf mulch or wood chip should be applied within the PRZ of all trees on site. The inclusion of leaf mulch will avoid damage to tree stem/roots, improve soil quality by the promotion of beneficial fungi sub-surface, and reduce compaction thereby improving soil quality and tree vigour. The application of mulch will also reduce maintenance costs via the reduction in mowing and water use. In short, it will reduce maintenance costs and reduce the incidence of disease and associated tree removals. (Mulch utilised should only be produced from native trees, be aged, free from seed/pests and be spread at a depth of 75mm. Mulch should be kept away from the stem of young plants.)
- All dead wood with a stem diameter in excess of 20mm should be removed from retained trees that are over public access frequently used areas.
- All tree work should be carried out by a qualified arborist to AS4373.
- The selected tree contractor should be a member of, or be eligible for membership with, the Tree Contractors Association or The National Arborist Association of Australia.

6.2 Reporting of Works

To have an appropriate Risk Management System for your tree inventory requires the ongoing and follow up documentation.

- Works undertaken, by what staff and qualifications
- Supporting Work Method Statements and appropriate Public and Workers Compensation Insurance
- Forward plan of works to be undertaken
- Documentation of works
- Review of tree stock each term

TREE MANAGEMENT PLAN	
REGULATORY	<p>Consult local ordinances and regulations including AS4373 (2007) regarding any limitations on tree maintenance and succession planting.</p> <p>Educate residents & contractors about the biology of trees, their life span, health and condition.</p> <p>Tree management plans are adopted as policy by local consent authorities under their LEP. This tree management plan provides a systematic best practice approach for the subject site and should be adopted as policy for the management of tree assets.</p>
BIOLOGICAL	Develop a thorough understanding of the life cycle of the tree assets and the components of their individual mortality spiral.
CULTURAL	<p>Prune to remove dead, dying diseased and other structurally unsound branches.</p> <p>Monitor for insects and diseases (including soil borne fungal pathogens.)</p> <p>Monitor for structural faults and defects.</p> <p>Reduce the impacts of soil compaction, reduced drainage and evapotranspiration with the application of leaf mulch.</p> <p>Provide species appropriate irrigation and irrigate in times of drought or stress. (Do not over-irrigate.)</p> <p>Remove trees as required. (The tree removal strategy, number of trees removed and succession planting should be dictated by tree health, condition and specific site situations.) Carry out community consultation as required.</p>
CHEMICAL	Selectively treat pests and diseases as required. (Determined via the monitoring process.)

6.3 TABLE 5. TREE MANAGEMENT PLAN (Part B - Five year timeline.)

Christmas 2012	Carry out recommendations as per report. Tree removals to be tailored to suit specific tree/site situations. Succession, additional planting & application of Seasol® to be carried out during Autumn. Pruning works to be carried out to AS4373 2007 & as per species and timing requirements.
2012-2013	Monitor all trees and carry out tree/remediation works as outlined. Succession planting & application of Seasol® to be carried out during Autumn. Carry out formative pruning of young plants and replace dead or underperforming succession plantings as required. All pruning works to be carried out to AS4373 & as per species and timing requirements.
2013-2014	Monitor all trees carry out tree/remediation works as required & top up mulch as required. Succession planting & application of Seasol® to be carried out during Autumn. Carry out formative pruning of young plants and replace dead or underperforming succession plantings as required. Pruning works to be carried out to AS4373 2007 & as per species and timing requirements.
2014-2015	Monitor all trees carry out tree/remediation works as required & top up mulch as required. Succession planting & application of Seasol® to be carried out during Autumn. Pruning works to be carried out to AS4373 2007 & as per species and timing requirements.
2015-2016	Monitor all trees carry out tree/remediation works as required & top up mulch as required. Succession planting & application of Seasol® to be carried out during Autumn. Carry out formative pruning of young plants and replace dead or underperforming succession plantings as required. Pruning works to be carried out to AS4373 2007 & as per species and timing requirements.

Yours sincerely,

**PETER DUBIEZ Dip. Hort. (Arb.) Enviro Frontier Tree Management
(Member - National Arborists Association of Australia.)**

Appendix 1: SITE MAP OF TREE LOCATIONS



TABLE 1. Summary of Observations, Comments & Recommendations:

no.	Species	Age	Height (mtrs)	Trunk	DBH	Form	Crown spread (mtrs)	live crown ratio	Vigour	Epicormic growth	Limb die back	Works to be done	Risk Rating
1	Lilli Pilli	mature	15	1	730mm	asymmetrical - north	12	95%	normal	minor	0	Prune from building, monitor limbs over bus depot	2
2	Camphor Laurel	mature	15	1	900mm	asymmetrical - west	12	80%	normal	fair	0	Prune from building, deadwood and lift from car park on road	4
3	Ficus (Council tree) - <i>Should be council responsibility</i>	mature	17	1	200mm	symmetrical	17	90%	normal	minor	0	Lift limbs over school building by reduction and removing pendulum limbs	3
4	Camphor Laurel	semi-mature	12	3	930mm	asymmetrical - west	12	70%	fair	fair	10%	Deadwood, reduce limbs, lift limbs, monitor inclusions	4
5	Plane Tree	semi-mature	8	1	680mm	asymmetrical - west	8	90%	fair	fair	5%	Deadwood, remove low limb over entrance path, clear building	4
6	Ficus (Council tree) - <i>Should be council responsibility</i>	semi mature	9	1	250mm	symmetrical	14	80%	normal	normal	0	No work required over school area - monitor to future prune from building	1
7	Plane Tree	semi mature	7	1	420mm	symmetrical	5	90%	normal	minor	5%	Deadwood and internal thin to improve wind sail area	4

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8	Ficus	mature	11	multi	1110mm	asymmetrical due to competing Ficus trees	15	90%	normal	minor	5%	Deadwood, crossed/competing limbs, lift lower limbs prevent children grabbing, reduce long lower horizontals	4
9	Ficus	mature	10	multi	1200mm	asymmetrical due to competing Ficus trees	15	20%	poor	major	70%	Deadwood and shorten up weak limbs	5
10	Ficus	mature	11	multi	1000mm	asymmetrical due to competing Ficus trees	15	95%	normal	minor	5%	Deadwood, low limb reduction, lift lower limbs	4
11	Ficus	mature	12	multi	950mm	asymmetrical due to competing Ficus trees	18	95%	normal	minor	5%	Deadwood, low limb over fence on walk way, lift over play area, reduce long limb weight	4
12	Ficus	semi-mature	12	1	570mm	asymmetrical due to competing Ficus trees	8	95%	fair	minor	5%	Removal and stump grind to create more space for other trees.	3
13	Ficus	mature	14	multi	1150mm	asymmetrical due to competing Ficus trees	15	95%	fair	minor	5%	Deadwood, reduce long weighty limbs, remove competing limbs, mulch garden bed or similar, decompact base soil	4
14	Eucalypt	mature	10	multi	200mm	asymmetrical	5	80%	fair	moderate	15%	Deadwood, remove small leader stem to ground level, decompact soil;	3
15	Banksia	juvenile	8	1	200mm	symmetrical	2	80%	normal	normal	0	no works - monitor	1

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16	Brush Box	semi mature	8	multi		symmetrical	5	80%	fair	normal	15%	Deadwood, monitor basal cavity	4
17	Group of 7 trees - melaleuca, tea tree, banksia	juvenile	4 to 6				2 to 3	80%+	normal	normal	5%	Lift lower limbs, deadwood, monitor	2
18	Group of 9 trees - eucalypts, banksia, tea trees	juvenile	4 to 6				2 to 3	80%+	normal	normal	5%	Lift lower limbs, deadwood, monitor	2
19	Radiata Pine - Neighbours tree	mature	10	1			6	dead	dead	dead	dead	Over play area - have neighbour remove	5
20	Silky Oak	juvenile	6	1	300mm	symmetrical	3	80%	fair	0	15%	Remove - tree will become to large for area	4
21	Cedar Wattle	juvenile	4	1	200mm		2	95%	normal	normal		Monitor, lift limbs, remove weak branches	2
22	Banksia	semi mature	4	1				95%	normal	normal	0	Monitor, lift limbs, remove weak branches	2
23	Eucalypt and Norfolk	semi mature & juvenile	7	multi and single		symmetrical	5	95%	normal	normal	5%	Deadwood eucalypt & prune from building, monitor Norfolk and decompact soil on a yearly basis	4
24	Cocos Palm	mature	9	1	330mm	symmetrical	4					Remove to close to building and on noxious plant list	4
25	Banksia	semi-mature	8	1	300mm	asymmetrical - west due to building						Lift over walk way	3

Appendix 2: TREE HAZARD CLASSIFICATION

The Hazard categories listed below (provided by Australian Tree Consultants) are applicable under normal weather conditions – squalls and storms have the capacity to destroy many trees regardless of their age and condition.

Hazard Category	Hazard Ratings	Description	Time Frame
1	Very minor hazard	The tree appears healthy but is of a type or condition to potentially develop minor branch drop of live or dead wood	Remedial tree works required at a time frame to be scheduled by client – some trees will/may require annual maintenance
2	Minor hazard	The tree appears healthy, minor defects that can be rectified by minor tree surgery	Remedial tree works required at a time frame to be scheduled by client – some tree will/may require annual maintenance
3	Medium hazard	Mature to aged tree in declining condition, and/or structure, and/or disease apparent, showing potential for branch drop	Remedial tree works required at a time frame to be scheduled by client – some tree will/may require annual maintenance
4	High Hazard	The tree shows signs of over weighted limbs, major deadwood/limb loss, root damage, other significant defects present	Remedial tree work required as soon as possible
5	Very high hazard	Defects are very severe, dangerous trees because of structural defetcts including cavities, decay, included bark, wounds or poor form	Remedial tree work required as soon as possible

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AUTHORS EXPERIENCE & QUALIFICATIONS:

Industry Experience:

- Manager – Enviro Frontier (all aspects of tree management) 2010-present
- Business Manager NSW – Citywide – Open Space Division 2009 - 2010.
- Manager Active Tree Services Residential/Commercial Division- 1990 - 2005.

Qualifications & Training:

- Tree Care & Maintenance Certificate - Ryde School of Horticulture - 1994
- Phil Hadlington Tree Course - 1989
- Working Committee for the first Amenity Tree Industry standards with WorkCover
- Working Committee for the first AS4373
- Founding Member for Tree Contractors Association

Professional Association:

- Member - National Arborist Association of Australia
- Member – Tree Contractors Association

APPENDIX 2

SULE (Safe Useful Life Expectancy)

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

1. Long SULE - 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 SULE- 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 SULE - 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 3

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 at 1.3 metres above ground.

Critical Root Zone (CRZ); Refers to a radial offset of five (5) times the trunk DBH measured for the centre of the trunk, rounded to the nearest 0.5 metres.

Primary Root Zone (PRZ); Refers to a radial offset of ten (10) times the trunk DBH measured from the centre of the trunk, rounded to the nearest 0.5 metres.

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

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

Remnant Stand or Tree; Refers to a stand of trees or tree which is a remaining specimen/s from an area of previous woodland or forest community.

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.

Epicormic Growth; Refers to shoots produced by dormant buds within the bark or stem of a tree as a result of stress, incorrect pruning or increased light.

Resistograph® Drill; Refers to a specialised arboricultural tool used for drilling a tree to ascertain structural integrity.

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

Co-Dominant Stems; Refers to stems on trunks of about the same size originating from the same position from the main stem.

Catena; Refers to the physical location of a site on a slope.

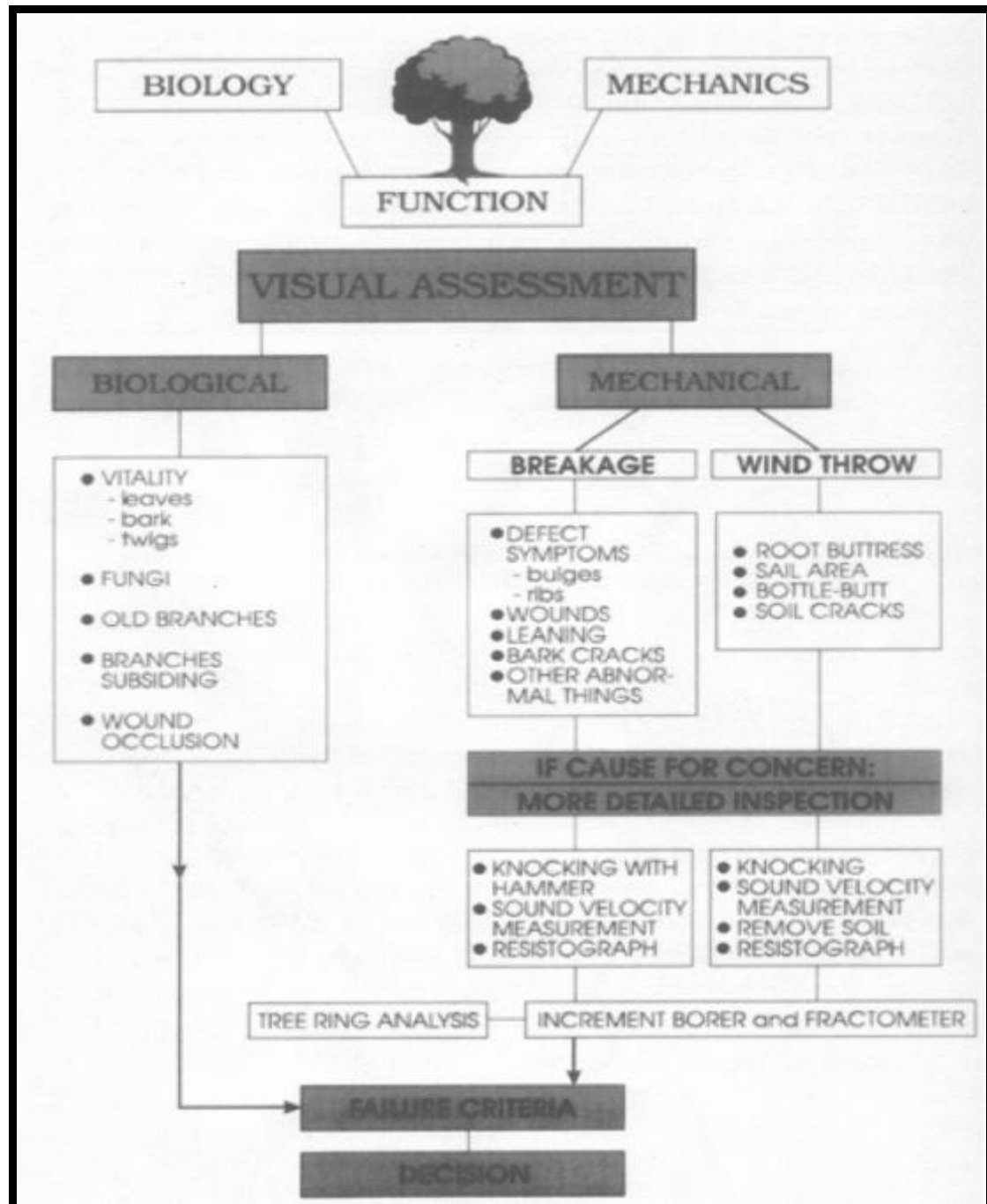
Endemic; Refers to locally indigenous species.

Significant Tree; Refers to mature trees assessed as having either high landscape significance or playing a significant role in the structure or 'playability' of the course.

Senescing Trees; Refers to trees that are in full decline.

Mycelium; Refers to fungal presence as exhibited by a floury white vein.

(VTA) Methodology Model; (Mattheck and Breloer 1994.)



DISCLAIMER

Limits of Scope Statement:

“I am not a solicitor,” There is no substitute for current professional litigation consulting agri-horticultural 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, Enviro Frontier Tree Management, 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.