TREE CONTRACTORS ASSOCIATION OF AUSTRALIA

SAFETY | EXPERIENCE | TRUST

INTERIM

TREE MANAGEMENT GUIDELINES

FOR FACILITIES MANAGEMENT AND SCHOOLS

The Tree Management Guideline is intended to assist facility managers to make informed decisions about the management of trees on their sites.

The aim of the guidelines is to minimise the need for expensive actions or works on trees while providing a safe and desirable landscape that sustains healthy trees and educational, environmental and ecological health and economic benefit to the facility and the community who utilise it.

The Guidelines provides useful information to staff in identifying when specialised assistance is required in the management of trees in particular relation to risk.

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ASSESSING TREE MANAGEMENT

The minimum requirement for a consultant should be AQF-level 5 qualification and TCAA arborists have relevant industry experience.

If the facility manager has a reason to seek further advice or assessment of trees and intends to engage a AQF level 5 Arborist, it is important that a prehistory including previous reports be supplied or tree inventory data or other induction registers to the arborist who will make tree management decisions which can be cost effective to the facility.

A complete tree inventory can be costly but provides the most accurate data especially on a facility that has lots of trees.

A partial survey focused on high occupancy area (where assembly points and buildings) will suit limited budgets without limiting the goals.

Where necessary the tree inventory should also include trees on neighbouring properties especially where they are large or known toxicogenic or have had poor management practices applied. Walkways, access drives, central administration buildings (offices) are also key areas to survey around.

IDENTIFYING TREE MANAGEMENT NEEDS AND COSTS

By compiling and analyzing the tree inventory data for your facilities trees this should assist in identifying works that will merge into your program with a view to sequence works according to budgetary constraints. Although emergency issues may arise and override this planned program.
By reviewing the given report the facility manager/principal can identify high risk or problematic tree species and seek to sequence and structure a works program.

RECOGNISING RISK

Two essential factors to be considered to improve tree safety on sites are:

1. Utilization of a site
   if a tree fails what is the impact to persons or property.

   a. *Continual use*-Access paths, gateways, assembly areas.
   b. *Constant Use*-Occupied classrooms, buildings, residences and sit down lunch areas.
   c. *Frequent Use*-Busy street adjacent, typical schoolyard, childcare center.
   d. *Intermittent use*-Parking lot oval.
   e. *Occasional Use*. Out of bounds area, restricted and inducted areas.

   In terms of further condensing these areas, 5 & 4 are **High** use, 3&2 are **Medium** use, 1 is **Low** use.

2. Minimal School Usage Areas

Minimal school usage areas that will be occupied by students for educational/ recreational purposes (Campsites, Bush trails, Ecology areas) will require an inspection by staff / General Assistant using the *Draft: Tree Inspection and Checklist* to identify hazards prior to entry.

HAZARDS POSED BY INDIVIDUAL TREES

1. Relates to defects, toxicities and poor management practices relating to trees including pruning from unqualified operators or untrained personnel.
2. Elevated hazards; these trees have defects, which make them likely or somewhat likely to fail or expose a person or property to damage. When such a tree is identified in a **High use** area, the extent of the risk is categorised into very likely or somewhat likely to fail.
3. Lesser hazards, where trees are unlikely or highly unlikely to have potential to harm except in higher use area, where mitigation rather than removal is undertaken.

In the Tree Risk Assessment (TRA) most trees are categorised, as high, very high and extreme high.
TRA that are identified within the scope of the recent schools review arborist report will be documented. A mitigation of these risks through works management may include pruning, tree removal, fencing, and specifying type of approach including hierarchy of control).

It is the facility manager's responsibility to manage the safety of the remaining and future tree specimens within their sites. Understanding the basics of TRA and addressing the risks associated with trees will ensure the safety of the facility and prolongs the life of a tree.

RETENTION OF RECORDS

Records/ photographs of near-miss and the damaged trees include into the yearly register of inspection. This will assist new staff in managing Tree Risks.

OBSERVATION AND AWARENESS

Observation and awareness of tree issues and behaviors are necessary to provide for optimum safety. Arborists in many cases have to balance protecting trees with protecting persons and property. Simple observation of these past failures can reveal a great deal about a particular location. The strongest conclusion should be formed based on assessment of the area and attention to weather.

1. Monitor the trees condition especially over weather events
2. Do not occupy areas near or under the tree in storms or windy weather.
3. Observe trees in the early mornings as evidence of branch drop is more probable when the plant cells are Turgid.
4. Review the health of the tree with TCAA checklist
5. Discuss the notes with people who have access to your site(Toolbox Talk or staff meeting)
6. Evaluate the whole tree as part of the contextual environment it is in.
7. Monitor moisture of soil. (Watering) Using the hand–feel method to determine if moisture of the soil is optimum or saturated for soil heave in trees.

Facility Name:			DATE:	
Name of TCAA Trained Facilitator:			SIGNED:	
Usage area	High	Medium	Low	Storm

Using the schedule of defects/toxic trees/poor management practices to trees in section 2, identify trees that have or could cause Major Fail potential.

Fail potential	**ISSUE/DEFECT**	**No defect Present**	**Yes defect Present**	**List number of affected trees. (Attached site plan)**
1	POISONOUS SPECIES			
2	Slip, trip, stab, eye, stick injuries			
3	Near power lines 0.2 8 fire rules 10/50- Clearances met.			
4	Soil movement-root lifting			
5	Dead branches/trees			
6	Cracks-Stems-(trunks) and branches			
7	Cracks-pointy ribs			
8	Weak branch union			
9	Fungi-Root Issues			
10	Cavities/hollows			
11	Architecture -leaning tree.			
12	Weak bark branch unions			
13	Epicormic shoots			
14	Construction- impact damage			
15	Girdling roots			
16	Restricted root zones			
17	Cankers			
18	Trees in decline			
19	Storm damage			
20	Trees neighbours			

ANNUAL TREE INSPECTION AND CHECKLIST B

Tree Contractors Association of Australia

Bill Sullivan (2014) RISK MATRIX Northern Territory

Facility Name:	DATE:
Name of TCAA Trained Facilitator:	SIGNED:

AREA USAGE:

- HIGH ☐
- MEDIUM ☐
- LOW ☐
- STORM DAMMAGE ☐

SUMMARY:

- ARBORIST NEEDED ☐
- EMERGENCY TREE LOPPING REQUIRED ☐
- COMMENTS .....
- FORM COMPLETE ☐
- NAME: .....
- SIGN: .....

ISSUE/DEFECT	NOT PRESENT	PRESENT	#TREE'S AFFECTED	FAIL POTENTIAL	COMMENTS
POISONOUS SPECIES					
SLIP, TRIP, STAB, EYE DANGER					
NEAR POWER LINES / FIRE CLEARENCE MET					
SOIL MOVEMENT/ ROOT LIFTING					
DEAD BRANCHES/ TREE'S					
CRACKS IN TRUNK OR BRANCHES					
WEAK BRANCH / BARK UNIONS					
FUNGI-ROOT ISSUES					
CAVITIES / HOLLOWS					
ARCHITECTURE - LEANING TREE					
EPICORMIC SHOOTS					
CONSTRUCTION - IMPACT DAMAGE					
GIRDLING ROOTS					
RESTRICTED ROOT ZONES					
CANKERS					
TREES IN DECLINE					
TREE NEIGHBOURS					
STORM DAMAGE					

FAILURE POTENTIAL GUIDELINE:

	1. OCCASIONAL USE	2. INTERMITTENT USE	3. FREQUENT USE	4. CONSTANT USE	5. CONTINUAL USE
A. VERY LIKELY Alomost certainly likely to occur in most circumstances	MEDIUM	HIGH	HIGH	VERY HIGH	EXTREME
B. LIKELY May occur frequently	MEDIUM	MEDIUM	HIGH	VERY HIGH	VERY HIGH
C. SOMEWHAT LIKELY Possible and likely to occur at some time	LOW	MEDIUM	HIGH	HIGH	VERY HIGH
D. UNLIKELY Not likely to occur but could happen	LOW	LOW	MEDIUM	MEDIUM	HIGH
E. HIGHLY UNLIKELY May occur in rare and exceptional circumstances	LOW	LOW	LOW	MEDIUM	HIGH

X-TRA OBSERVATION

Tree Contractors Association of Australia *Jim McArdle (2015)*

Facility Name:	Date:
TCAA Trained Facilitator:	Signed

WHOLE TREE from a distance a. Environment- lightning, flood, Power line, Impact, slope, aspect, height of surrounding vegetation, wind force exposure, salt exposure.	
b. Does the tree appear to be whole?	
c. Is their dehydration in any part of the tree?	
d. Is the tree creaking or making an unusual sound?	
e. Does the tree appear healthy? Is the tree in a system- functioning?	
f. How does this tree compare to other tree of the same that species?	
WHOLE TREE Closer a. Do you notice the type of debris dropping, fruit capsules, bark, twigs small branches and large branches?	
b. Branches & stem- are the exudations copious?	
c. Are their nesting's (of bird s-fauna) in the tree?	
d. Are their any smells –odors different?	
e. Are their mushrooms, near the trees base?	
f. Are their excavations or works near the trees base?	
PART OF THE TREE - closer a. Canopy-Are their obvious defects. (Splits cracks, branches hanging)?	
b. b. Obvious colour differences in the leaves (or small branches)?	
c. Are the upper limbs and unions free of blemishes…in the area you are choosing to walk near?	
d. Trunks-Are the trunk stems free from blemishes?	
e. Roots system- Are their heave marks in the soil(cracks and crevices) which are made recently?	
f. Are their roots exposed or compressed rising from the soil?	
PART OF THE TREE- from a distance a. Is the tree in sound condition?	
b. Are the canopy, trunk and roots functioning to support and protect the vessels of the tree?	
c. Does any action need to be taken by your assessment thus far?	

TREE RISK ASSESSMENT MATRIX

Tree Contractors Association of Australia Categories and Sub-Categories *Redrafted 14.4.14*

Adapted Bill Sullivan (2014) RISK MATRIX Northern Territory

Failure Potential		1. Occasional use	2. Intermittent use	3. Frequent use	4. Constant use	5. Continual use
	A. Very Likely Almost certainly likely to occur in most circumstances	Medium	High	High	Very High	Extreme
	B. Likely May occur frequently	Medium	Medium	High	Very High	Very High
	C. Somewhat likely Possible and likely to occur at some time	Low	Medium	High	High	Very High
	D. Unlikely Not likely to occur but could happen	Low	Low	Medium	Medium	High
	E. Highly Unlikely May occur in rare and exceptional circumstances	Low	Low	Low	Medium	High

The risk rating score is determined after assessing the Failure Potential and Target Rating of an identified hazard tree. The determination of these calculations will indicate a priority and course of action when implementing the risk reduction measures.

Legend Failure Potential	Failure Potential x Target Rating = Risk Assessment
A. Very Likely	Partial or whole tree failure is imminent e.g. cavity in excess of 50% of the trunk. Major bark inclusions, dead limbs, leaning tree with lifting root plate, roots/trunk decayed or damaged, Toxins, HOSTING BEES (other).
B. Likely	Defects that could cause structural failure of the tree within the next 6 months.
C. Somewhat likely	Defects present that could cause portions of the tree tom fail.
D. Unlikely	Defects are minor and not likely to cause significant harm.
E. Highly unlikely	Tree is healthy with no obvious defects. Poses no immediate threat.
TARGET RATING	*Adapted from B. Sullivan for TCAA CLIMBING CONSULTANT ARBORISTS*
1. Occasional use	Out of bounds area, Restricted and inducted areas.
2. Intermittent use	Parking lot, Ovals
3. Frequent use	Busy street adjacent, schoolyard, childcare center.
4. Constant use	Occupied classrooms and buildings, residences, offices, canteen and sit down lunch areas.
5. Continual use	Access paths and gateways, where students congregate in numbers, assembly areas.

HEALTH & STRUCTURAL CONDITION OF TREE- VISUAL

Health & Structural Condition of Tree	
J- Juvenile; im- Immature; SM-Semi- Mature; M-Mature	
Excellent Condition	
Good Condition but Poor Development	3b Moderate
Dieback is more than 20%.	4b Epicormics
Sparse Foliage Crown	5b Unbalanced Canopy
Physical Damage	
Insect Damage	7bBorers
Fungal Attack	
Cavity	
Termite Damage	
Lean	
Heavily Pruned	12b Dying
Damage to roots	13b Encroachment
Parasitic Vine Present	
Damage by Climbing Plant	
Inclusions	
Habitat Tree	
Endangered Species	

Developed by Claus Mattheck in: *The Body Language of Trees (*1994), which have adapted versions from Hornsby Shire Council.

TULE –TREE USEFUL LIFE EXPECTANCY

Tree Contractors Association of Australia

	1 Long TULE	2 Medium TULE	3 Short TULE	4 Remove	5.No Potential for Retention REMOVE IMMEDIATELY	6 Small, Young or Regularly clipped
	Trees that appeared to be retainable at the time of assessment for more than 40 years with low level of risk	**Trees that appeared to be retainable at the time of assessment for 15 to 40 years with and with low to medium level risk**	**Trees that appeared to be retainable at the time of assessment for 5 to 15 years with medium to high level of risk**	**Trees that should be removed within the next 5 years High to Very high level of risk**	**Trees that must be removed immediately. Very high to Extreme level of risk**	**Trees that can be easily transplanted or replaced.**
A	Structurally sound trees located in positions that can accommodate future growth	Trees that may only live for between 15 and 40 more years	Trees that may only live for between 5 and 15 more years	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Dead, dying or declining trees diseased or inhospitable conditions.	Small trees less than 5 meters in height
B	Trees that could be made suitable for retention in the long term by Intervention Works.	Trees that may live for more than 40 years, but would need to be removed for safety or Nuisance reasons	Trees that may live for more than 15 years, but would need to be removed for safety or nuisance reasons	Dangerous trees through instability or recent loss of adjacent trees	Dangerous trees through instability or recent loss of adjacent trees	Young trees less than 15 years old but over 5 meters in height
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention	Trees that may live for more than 40 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees that may live for more than 15 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	Trees that have been regularly pruned to artificially control growth
D		Trees that could be made suitable for retention in the medium term by Intervention Works.	Trees that require substantial Intervention Works, and are only suitable for retention in the short term	Damaged trees that are clearly not safe to retain	Damaged trees that are clearly not safe to retain and must be removed immediately	
E				Trees that may live for more than 5 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	High Toxicity Allegan trees, asthmatic and poisonous trees and must be removed immediately.	
F				Trees that may cause damage to existing structures within 5 years	OTHER with legitimate explanation to be removed immediately	
G				Trees that will become dangerous after removal of other trees for reasons given in 1A-1F		
INSPECTION FREQUENCY	Inspection frequency 1-5 Years by competent inspector unless event monitored.	Inspection frequency 1-5 Years by competent inspector unless event monitored.	Inspection frequency 1-3 years by competent inspector unless event monitored.	Inspection frequency to 1 year by competent inspector unless event monitored.	1-7 days by competent inspector and event monitored	Inspection frequency Biannually by competent inspector

DEFECTS AND ISSUES

Inspect areas with trees that are used for education.
Pests can be effectively identified in certain areas with public notices or induction.

SPIDERS

Certain trees are habitat to venomous animals, like spiders, including a tree funnel web (Atrax robustus). Dead tree roots are a suitable habitat for funnel web spiders and rank grass and dead timber for suit the Red-back spider. Pg194F.D.Hockings(2014)

POISONOUS PLANTS

Some trees may have poisonous berries or fruits. Check with poisons information centre Identify the following plants, which are highly toxic and remove. Rhus tree. Toxic sap Naked lady. Toxic sap Grevillea sp Allergenic response.

Toxicodendron succedaneum - Rhus Tree

Despite the beautiful autumn foliage colours, the Rhus Tree should not be planted.

SLIP, TRIP STAB, EYE STICK INJURY

Maintain tree with moving refuse and debris or pruning.
Slipping on wet leaves, slippery resins
Stabbed by sharp stubs, broken branches.
Eye stick walking into a branch

LIVE POWER CONDUCTION

Electrician cut power remove tree or prune to clearance. Trees that require clearances to be kept around power supplies or are within contact with a live powersource.7-°©-

(1metre for 240 volt, 3metres for 1,000volt, 132Kvolt 6metres, 330Kvolt 8 meters clearance for non electrical workers),

FIRE REDUCTION

Check the Rural Fire Service regarding the 10/50 vegetation rules for the site. Plant fire retardant trees. Remove fire risk trees.

CONTRACTING TREE WORKS

An AQF3 Arborists must review specifications and undertake works using the hierarchy of controls in accordance with the NSW Work Cover Code of Practice to achieve risk reduction.

In maintaining the quality of the contractor selected to maintain the work in accordance with AS/4790-2009-Protection of Trees in Development Sites, AS/4743-2007 Pruning of Amenity Trees and Work safe Australia Code of Practice. The facilities manager/principal should engage a contractor who is a registered current member of Tree Contractors Association Australia (TCAA) or must complete the works.

Variations should be discussed with the AQF5 Arboricultural Consultants.

AQF5 Arboricultural Consultants from TCAA should carry out a review or a walkthrough inspection, ensuring works are to a suitable and reasonable standard.

In certain circumstances and in regional areas tree works may be carried out by the same person, ensuring that independent quotes or advice, is sort out to avoid a conflict of interest.

TYPICAL RECOMMENDATIONS

Some typical intervention recommendations are;

1. *Prune immediately according to AS 4373-2007 fractured limb at 10metres height,3metres long on the North side of T-3(Tree numbered three).* /Trees to be pruned must be pruned according to AS 4373-2007. (T80) /Pruning around the power lines should have a clearance of one-meter minimum*/Remove minor deadwood ,of less than 50mm cuts in diameter.* The time frame is specified in the conclusion

2. Council permits must be issued for tree pruning within this site greater than 10%. We recommend that application to council's tree management team be submitted as per the tree preservation order. Tree applications for removal and pruning can be found on councils website.

TCAA TRAINING

FOR FACILITY MANAGEMENT AND SCHOOLS

The TCAA train facility managers in Tree Risk Assessment.

COURSE OUTLINE

Observation and awareness
Hazards
Issues and Defect
Notes for pedestrians walking through drop zones.
Tree identification and common faults
Photo and Record keeping
Key indicators of vigour
Tree Monitoring and maintenance
(Inspection Regimes)

For more information

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GLOSSARY

Hazard is referring to a defect/poison/ that has potential to harm a person or property.

VTA[1] identifies issues and defects that could cause harm. The AQF5 level Arborist using the VTA-Visual Tree Analysis methodology records the presence of or likelihood of failure based on symptoms or "body language of the tree" based on biological and physical functions.

Risk is when it is possible that the hazard will actually cause harm. The level of risk will depend on factors including **occupation** of an area- how often and whom uses the area. How serious could injuries or damage cause that are a result from either impacts or poisons or poor management practices. A TRA Tree Risk Assessment incorporates **VTA** -Visual tree assessment ; observations and data relevant, including identification and categorizing targets(people and structures), evaluating failure potential impact or injury and determination of risk.
TRA-Tree risk assessment determines the level of RISK. This relies heavily on the experience of the assessor.

TULE- Tree Useful Life Expectancy based on a categorization of age of a tree and its health status, is coupled with when to inspect a tree and at what suitable management option is available.eg. Retain, Do work on the tree, Fence off, Prune or remove.
This methodology is adapted from Jeremy Barrel in 2014 by use for TCAA AQF-5 (Climbing Consulting) Arborists. It is a reasonable and acceptable tool used in TCAA-Tree contractors of Australia and has peer review by several leading TCAA QF-5 Arborists.

Tree Risk Management and Planning Trees can and will shed branches which may injure people and property, it is important to periodically assess trees for defects, toxicity, past management practices and determine the risk they pose and document this assessment. This will enable correct planning and programming as to the priorities and the constraints of budgets.

Target This is defined by what or who is affected by a failure.

Hierarchy of control assists in specifying which approach to use in managing a tree.
Firstly an approach to works in selecting appropriate safe work practices-e.g. Use an EWP-Elevated work platform , Crane, climber, grounds man, observer and climber.

[1] Analysis developed by Mattheck & Broeloer that uses the growth response and form of trees to detect defects.(1999) The Body Language of Trees

REFERENCES

Safe Work Australia-Tree Amenity Code of Practice. (NSW Work cover)
Draft code of practice Safe Access in tree trimming and arboriculture work 2011.
Australian Pruning standard AS4373-2007
AS/NZ ISO 31000:2009 Risk Management &Principles
ANSI A300 (Part 9) 2011Tree Risk Assessment.
Tree Structure Assessment TCIA American National Standard
AS/NZ ISO 31000:2009 Risk Management &Principles
ANSI A300 (Part 9) 2011Tree Risk Assessment. Tree Structure Assessment TCIA American National Standard
Australian Journal of Outdoor Education, 11(2), 50-59, 2007Andrew Brookes La Trobe University-Bendigo
Australian Standards AS 4970-2009. *Protection of Trees on Development Sites* Sydney: Standards Australia.
Barrel, J (2012). Balancing tree benefits against tree security: The duty holder's dilemma, Arboricultural journal. The International Journal of Urban Forestry, 34:1,29-44.
Jeremy Barrel, (2014) SULE to TULE a new adaption for TCAA arborists.
Conference Jim McArdle SYDNEY.
Claus Mattheck in: *The Body Language of Trees (*1994), Germany.
Mattheck, C Updated Field Guide for Visual Tree Assessment, Karlsruhe Research Centre: 2007
Mattheck & Broeloer that uses the growth response and form of trees to detect defects.(1999) The Body Language of Trees
Northern Sydney Institute (2014-2015) Arboriculture Notes RYDE TAFE.
National Tree Safety Group(2011)Common Risk Management of Trees UK.Severn Print of Gloucester United Kingdom.
F.David.Hockings(2014) Pest Diseases and Beneficials Friends and Foes of the Australian Garden. CSIRO. Collingwood Australia.

WEBSITE
http://www.dpi.nsw.gov.au
http://www.environment.gov.au
http://www.forestry.gov.uk/pdf/fcpg13.pdf/$file/fcpg13.pdf

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