Arborist Impact Assessment

REPORT COMMISSIONED BY:

GARDINER&WETHERILL
ARCHITECTS
C/o Ross Gardner
Mark Steed
Hurstville Public School
80 Forest Road,
Hurstville NSW 2220
rg@gardenerwetherill.com.au

Ross Gardiner 02 9929 6777
School 02 958 3963

MCARDLE
ARBORIST
CONSULTANCY

PREPARED BY:

CONSULTING ARBORIST
Jim McArdle
Bachelor of Ed. (Science)
Diploma of Arboriculture L5
ABN 87 145 760 461

12/19 Reliance Drive Tuggerah NSW 2259
4351 3322
jim@mcardlearborist.com.au
mcardlearborist.com.au

MEMBER ISA ™

Tree Contractors Association Australia

Table of Contents

1.0 ABSTRACT

1.1The Principal of Hurstville Public Primary School has commissioned this arborist Impact Assessment Report. An AQF level 5 arborist attended site on the 17th October 2018 to assess (2) two trees impacted by the proposed extension of the library.

1.2The two trees will be removed and replenished are of moderate value with defects including poor vigour and constrained within a small feature garden.

2.0 INTRODUCTION

2.1 The Principal Mark Steed has commissioned the Arborist Impact Assessment for two trees on site at Hurstville Public School. The proposed extension of the library will impact on (2) two trees a *Bauhinia sp* and a *Jacaranda sp*. of moderate retention value.

2.2 Jim McArdle B.Ed.Sc (Syd),QTRA,TRA,AQF level 5 (Ryde) arborist and Tree Contractors association president has assessed the trees and findings include that the two trees will be impacted and remain unviable with construction works. The two trees are in a poor location and with unbalanced canopies and constricted into a small garden space would be a better option to remove and replenish.

2.3 The trees will be replenished with indigenous specimens of 50 litre potted volume planted according to the landscape plan.

2.4 Mr James McArdle AQF level 5 Consulting Arborist B.Ed/Sc.(SYD) conducted the evaluation using Visual Tree Assessment (VTA) according to Claus Mattheck and Breloer (1994) method for biological and lower level mechanical functions The systems are in accordance with industry best practice and impact assessments are based upon the Australian Standards, Protection of Trees on Development sites AS4970-2009.

2.5 REFERENCES

1. Gardiner&Wetherill Site Map. 2018.
2. Hurstville LEP 2012.

3.0 AIMS

3.1 The Arborist Assessment report is developed to assess the trees at the above address for health and status according to *AS4970 2009 Protection of trees on Development Sites.*

3.2 The aim of this report is to:

- To inspect and assess (2) two trees at Hurstville Public School, 80 Forest Road, Hurstville according to the methodologies given.
- To give recommendation with professional opinion and management of these trees

4.0 METHODOLOGY

4.1 This tree risk assessment uses a ground Visual Tree Assessment (VTA) method employed in this report. The VTA system is based on the theory of tree biology, physiology and tree architecture and structure and is a method used to identify visible signs on trees that indicate health and potential hazards. The tree risk assessment matrix is developed using AS/NZ ISO 31000:2009 Risk management and principles and translates similar information from these documents.

4.2 The collection of data is performed in the field by an AQF Level 5 arborist. The assessment summaries the species, height and diameter, the trees health and structural condition for each trees, hazards, and retention categories were assigned to each tree.

4.3 Testing on site may include, mallet sounding, non-invasive testing for hollows, probing cavities, white ant infestation. Invasive tests will determine the depth of decay around cavities. All testing is ground based. It should be noted that this tree assessment report couldn't be considered final until all aerial inspections; drill and root tests have been completed, as these may reveal further defects.

4.4 This data was recorded in a Tree Survey Table and various assessment methods were used including:
1. Tree Useful Life Expectancy (TULE 2014). Adapted from Jeremy Barrell (TULE) gives extra assessment life expectancy categories range to no potential for life expectancy. Appendix A.
2. Health & Structural Condition of Tree Assessment. This describes the vigour and vitality of the tree. Appendix B.
3.Retention value. Some trees have special restrictions including cultural, scientific, historical or threatened category and may be reviewed as part of this report or further reporting Appendix C.
4. Tree Protection Extracts are referenced As4970 2009 Tree Protection on Development Sites.

5.0 PLANNING GUIDELINES AND SPECIFIC LEGISLATION

Tree management measures are in place for the Georges River Council under the provisions of the Hurstville Local Environmental Plan 2012.

SIGNIFICANCE IN THE ENVIRONMENT
Trees are subject to the following legislation which can be verified by an ecologist:

- *Biodiversity Act 2016* (NSW) (BIO Act) –Where identified, threatened tree species are considered in this report. This can be further verified by an ecologist.

- *Noxious Weeds Act 1993* (NSW) (NWA) – The NWA provides provisions for the control and management of noxious plants and pest species. The Minister is granted powers to issue an Order declaring a plant noxious.

SIGNIFICANCE IN THE LANDSCAPE
Assessment of trees significance in the landscape is generally categorised as either:

- *Significant in the landscape –Prominent from a broad landscape perspective, including streetscape. HIGH VALUE. **
- *Significant in the landscape – Prominent from a neighbourhood perspective. -Retained due to its status but may have some conditions or health issues. HIGH VALUE. **
- *Significant in the landscape – Prominent from adjacent areas surrounding the site. HIGH VALUE**
- *Good and worthy of preservation – Retained due to its status but may have minor conditions or health issues. MODERATE VALUE. **
- *Worthy of preservation- retained due to its status but may have major conditions or health issues. MODERATE VALUE. ***According to *TULE* (See appendix A)
- Low Retention-Retain if possible.
- Exempt- Very Low

6.0 SITE MAP

Fig 1. Aerial site map of Hurstville Public School, 80 Forest Road, Hurstville. Courtesy of the NSW Planning Portal.
Scale is approximately 50m:2.5cm measure.

7.0 TREE SURVEY TABLE

Tree No.	Location	Scientific& Common Name	Crown Spread (m)	Height (m)	Diam (cm)	TPZ SRZ (m)	Condition of Tree & Failure potential (Health &Structure) (Defect & Measurements)	TULE	Retention Value	Impacts
1	Adjacent library	*Jacaranda mimosifolia* Jacaranda	8	8	30/20 40	4.32 2.25	Immature, good condition but poor development. Unbalanced and leanbing south.	3d	Mod	Remove and replenish
2	Adjacent library	*Bauhinia purpurea* Butterfly Tree	5	6	20/20 300	3.39 2	Immature, with unbalanced canopy and flowering. Poorly pruned with flushcuts.	3d	Mod	Remove and replenish

*No hollows or habitat observed or contained.

8.0 MAPPING ANALYSIS

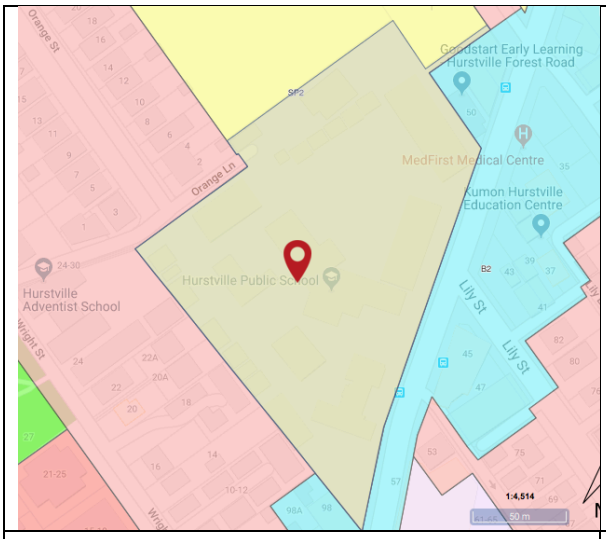


Fig 2.

Land Zoning
SP2 - Infrastructure : Educational Establishment (pub. 2012-12-07)
SP2

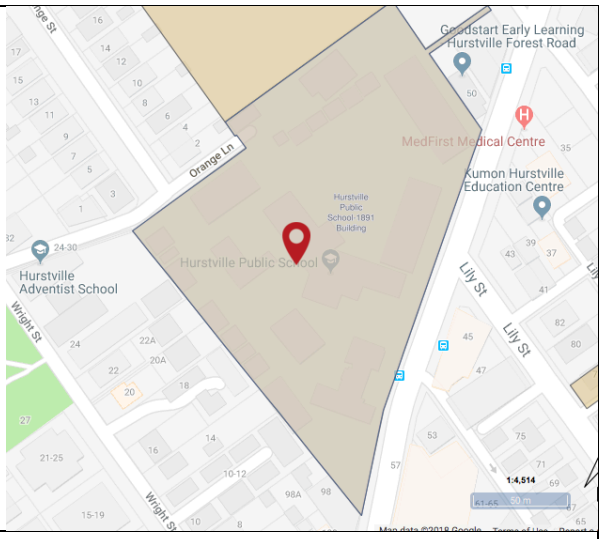


Fig 3.

Heritage
Item - General : Hurstville Public School-1891 Building (pub. 2012-12-07)

9.0 FINDINGS

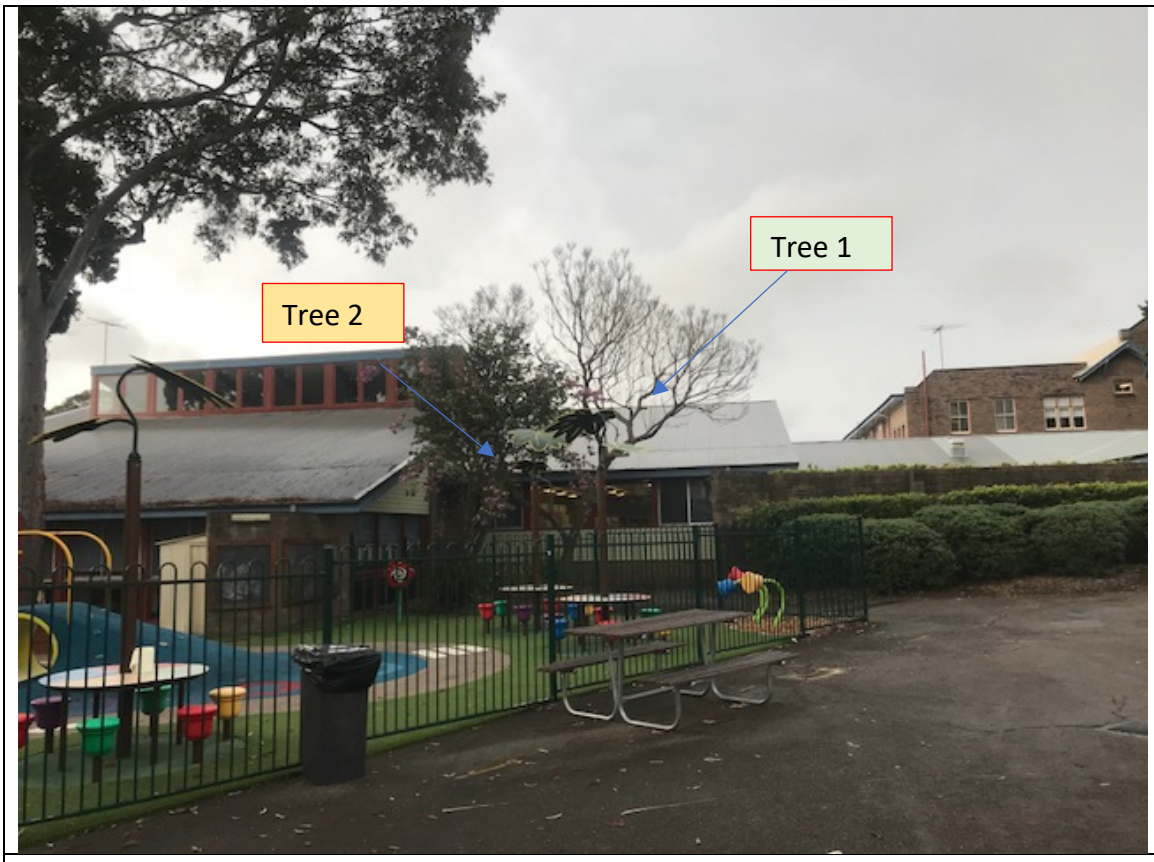


Plate 1. Tree 1&2 to be removed and replenished Tree 1 is rhs and tree 2 lhs

10.0 DISCUSSION

10.1 The (2) two trees numbered 1&2 assessed are of moderate value and will be impacted by the proposed new development.

10.2 Neither of these trees has hollows or has any observable habitat lodging within their branches on the inspection.

10.3 The tree 1 *Jacaranda sp* has poor form and has an unbalanced canopy. Tree 2 is a *Bauhinia sp* and has constricted habit due to the tree 1 and is constrained within the garden and hardsurfaced area.

10.4 The two tree will be impacted and could be replenished keeping biodiversity values. Indigenous trees like *Callistemon viminalis* (Bottlebrush) *Eucalyptus ficifolia* (Western Red Flowering Gum) are suitable size and colour attracting small birds and have great form and tolerance for a low maintenance garden amongst children. These trees grow to five metres and are low risk.

10.5 IMPACTS TABLE 2

Tree No	Species	Retention Value	IMPACTS	WORKS
1.	*Jacaranda sp*	Moderate	18%	Remove and Replenish
2.	*Bauhinia sp*	Moderate	15%	Remove and Replenish

10.6The Tree Management Plan following in figure 4 presents the proposed plan and the replenished trees located towards the streetscape.

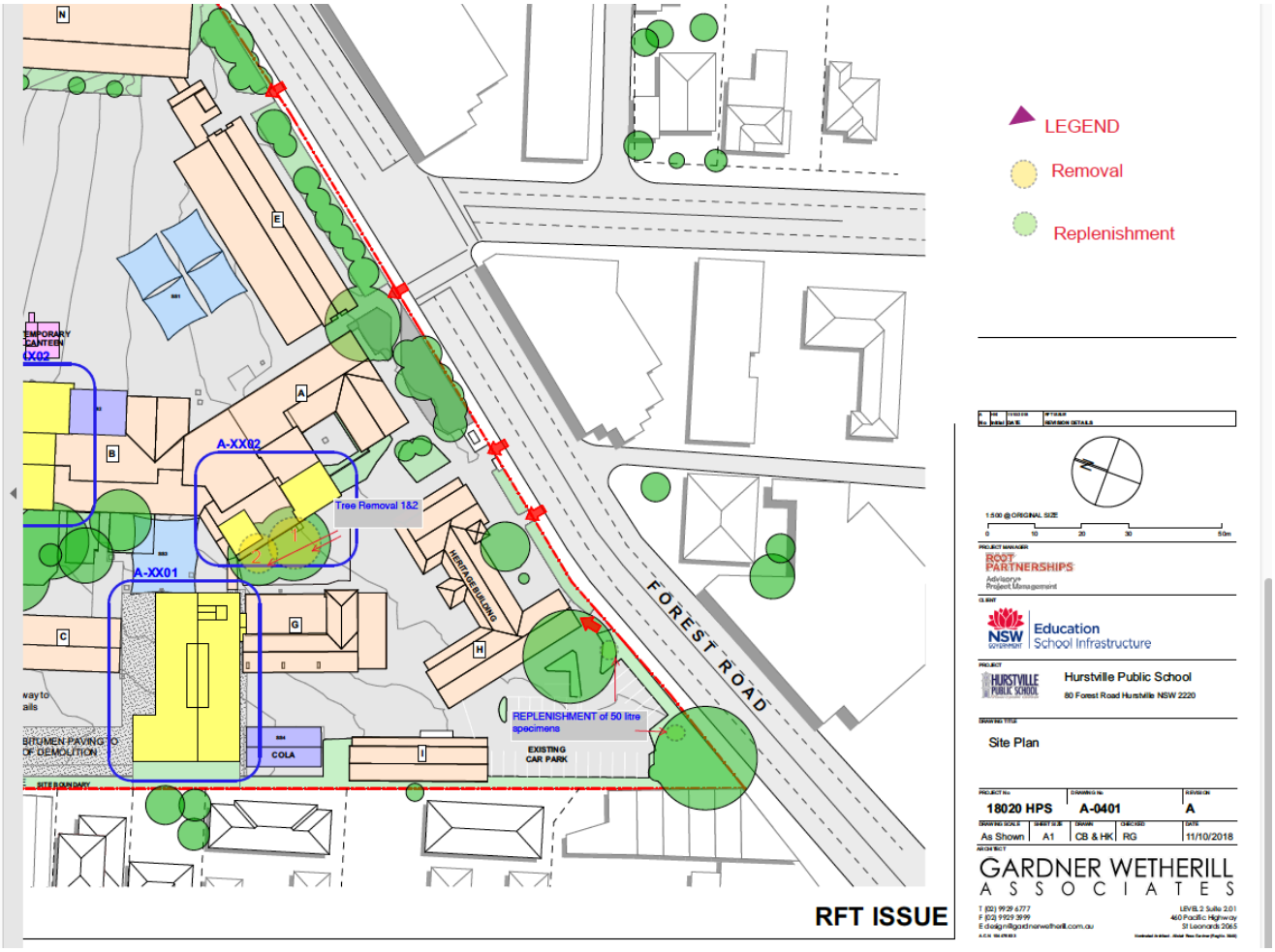


Figure 4 Tree Management Plan and Site Plan.

11.0 OPTIONS
1.Design alter and change plans.
2.Remove and replenish.

11.1 CONCLUSION
The second option allows for moderate value trees to be removed and replenished and will allow for biodiversity values.

12.0 RECOMMENDATION

1. Remove the *Jacaranda sp* and the *Bauhinia sp* and replenish with 50 litre Indigenous trees like *Callistemon viminalis* (Bottlebrush) *Eucalyptus ficifolia* (Western Red Flowering Gum. Plant according to the TMP.
2. A licensed arborist must remove these trees.

GLOSSARY

Crown: The width of the foliage in the upper canopy of the assessed tree to the four cardinal points.
Crown lifting means the removal of the lower branches of the tree
Crown thinning means the portion of the tree consisting of branches and leaves and any part of the stem from which branches arise.
Drip line: Where the canopy releases water shed from the foliage during precipitation.
DBH/Diameter: Diameter of trunk at 1.4meters in height of assessed tree.
Dead wooding means the removal dead branches from a tree.
Dieback: Tree deterioration where the branches and leaves die.
Flush cut: A cut that damages or removes the branch collar or removes the branch and stem tissue and is inconsistent with the branch attachment as indicated by the bark branch ridge.
Genus/ Species: The Genus and species of each tree has been identified using its scientific name. Where the species name is not known the letters, species is used. The common name for trees may vary considerably in each area of geographical differences and so will not be used in the field survey.
Height: Height has been estimated to + / - 2 meters.
ISA: International Society of Arboriculture.
Maturity: Tree maturity has been assessed as over mature (last one third of life expectancy), mature (one third to two thirds life expectancy) and semi mature (less than one third life expectancy).
Remedial (restorative) pruning: includes: Removing damaged, deadwood; trimming diseased or infested branches. Trimming branches back to undamaged tissue in order to induce the production of shoots from latent or adventitious buds, from which a new crown will be established.
SRZ- Structural Root Zone: An area within the trees root zone in which roots stabilize the tree. Roots cut in this zone can cause instability and lead to anchorage loss.
Structural Integrity: Describes the internal supporting timber. (Substantial to frail)
TULE- Tree Useful Life Expectancy: An estimation of the trees useful life expectancy using appropriate industry methods with an inspection regime.
TPZ- Tree Protective Zone: This zone should be considered as optimal for tree growth and sustainability however the size of the zone is subjective and should be reassessed when individual design and construction methods are being discussed.
Tree Age: Trees have either been assessed as mature, immature or semi-mature.
Tree Numbering: All trees listed in the tree survey have been numbered and plotted
Vigor: This is an indication of the tree health. Trees have either been assessed as Good Vigor, Normal Vigor or Low Vigor.

APPENDIX A TULE – TREE USEFUL LIFE EXPECTANCY

Table 1 Revised 14.4.14 *ADAPTED FROM JEREMY BARREL (SULE) FOR TCAA CLIMBING CONSULTANT ARBORISTS*

	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

APPENDIX B HEALTH & STRUCTURAL CONDITION OF TREE- Visual

McArdle Arboricultural Consultancy Pty Ltd

Health & Structural Condition of Tree	
1. *J- Juvenile; IM- Immature; SM-Semi- Mature; M-Mature*	
2. Excellent Condition	
3. Good Condition but Poor Development / Habit	
4. Dieback is more than 20%.	4b Epicormics
5. Sparse Foliage Crown	5b Unbalanced Canopy
6. Physical Damage	
7. Cavity	
8. Lean	
9. Heavily Pruned	
10. Inclusions	
11. Damage to roots	
12. Insect Damage	12b Borers
13. Termite Damage	
14. Fungal Attack	
15. Parasitic Vine Present	
16. Damage by Climbing Plant	
17. Habitat Tree	
18. Endangered Species	
19. Endangered community	

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

APPENDIX C RETENTION VALUES

TABLE 3 – DETERMINING LANDSCAPE SIGNIFICANCE RATING

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that Item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m²; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m²; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this DCP.	The subject tree has a medium live crown size exceeding 40m²; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m² and can be replaced within the short term (5-10 years) with new tree planting
6. VERY LOW	The subject tree is causing significant damage to a heritage item.	The subject tree is listed as an Environment Weed Species in the Leichhardt Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.

DETERMINING THE RETENTION VALUE OF TREES ON DEVELOPMENT SITES 4
EARTHSCAPE HORTICULTURAL SERVICES
December 2011

RETENTION VALUE	RECOMMENDED ACTION
"High"	• These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following section to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however they trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	• These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
"Very Low"	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

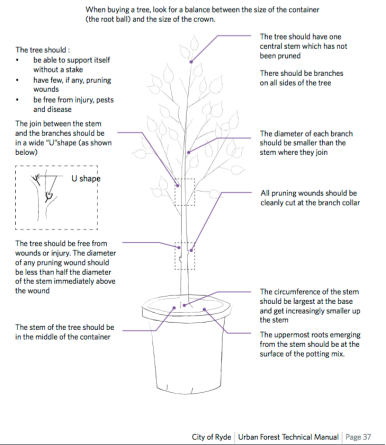
APPENDIX D PLANTING SCHEDULE SPECIFICATION

Before planting, careful consideration should be given to the location of trees and shrubs to minimize future problems. Review As2030 2015 for selection criteria of Planting Stock for Landscape Use. A basic guide for planting follows:

1. Don't plant too close to buildings or in-ground pools or plant large trees too close together: Determine the height and canopy of trees when fully grown. Allow room for root growth (at least twice the height of the tree). Large trees should be planted at least three meters from buildings.
2. Check when planting under wires or over drainage lines: Determine the mature size of the tree and the size and nature of its root system.
3. Consider your neighbours when choosing plants: Consider the effect on neighboring properties (i.e. shading, loss of views, impact on foundations, fences and services).
4. Use trees to provide your home with summer shade and/or winter sun: Plant deciduous trees (suitable to the climate and soils of this Shire). Consider the summer and winter shadows of evergreen trees.
5. Don't grow climbers on trees: Climbers can strangle trees, leading to the tree's eventual death.
6. Retain and protect as many trees as possible when building or extending your home. (This will be a Council requirement).
7. Use locally native and non-invasive species in your garden: Increase the success rate of your garden. Attract native fauna to your garden. Reduce the amount of watering required.
8. Don't excavate or alter the ground level around trees: Can cause root damage or starving of the roots. Can cause limb drop, instability or tree death. Substantially altering soil level within three meters of the trunk is in breach of the Tree Preservation Order.
9. When buying plants, check their characteristics: Check on mature size, shade characteristics, potential for roots to cause damage, flowers, fruits and pollen, to determine their suitability.

Mature trees do need maintenance: Remove or trim misshapen branches. Check for fungal rots or other diseases. If in doubt, contact Council for a tree inspection or contact an experienced Arborist. Indiscriminate lopping can be dangerous to your safety and the health of the tree.

Figure 6.1 Choosing a good quality tree
what to look for above ground



City of Ryde | Urban Forest Technical Manual | Page 37

DISCLAIMER

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

Any legal description provided to McArdle Arboricultural Consultancy Pty Ltd is assumed to be correct. Any titles and ownerships to any property are assumed to be good and sound. McArdle Arboricultural Consultancy Pty Ltd takes care to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

McArdle Arboricultural Consultancy's reports and recommendations shall not be viewed by others or for any other reason outside its intended target, either partially or whole, without the prior written consent of the consultant. Unauthorised alteration or separate use of any section of the report invalidates the whole report. McArdle Arboricultural Consultancy Pty Ltd cannot be held responsible for any consequences as a result of work carried out outside specifications, not in compliance with Australian Standards or by inappropriately qualified staff.

Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale. All recommendations contained within this report represent the current industry best practice methods of inspection.
McArdle Arboricultural Consultancy Pty Ltd shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.

LIMITS OF OBSERVATION
McArdle Arboricultural Consultancy Pty Ltd makes every effort to accurately identify current tree health and safety issues. Results may or may not correlate to actual tree structural integrity. There are many factors that may contribute to limb or total tree failure. Not all these symptoms are visible. There can be hidden defects that may result in a failure even though it would seem that other, more obvious defects would be the likely cause of failure.

All standing trees have an element of unpredictable risk. McArdle Arboricultural Consultancy Pty Ltd endeavours to identify the risk that the tree represents; however, a level of risk associated with every tree will remain. McArdle Arboricultural Consultancy Pty Ltd does not provide any warranty or guarantee that problems, deficiencies or failures with regard to the plant/s, property or building/s will not arise in the future.

Ongoing monitoring may foresee deterioration of a tree and allow remedial action to be taken to prevent injury or damage. The timing for re-inspection on individual trees is subjective and will vary however an annual inspection is advisable for trees in subsequent years.

***FURTHER RESEARCH** The report does not cover threatened, heritage or existing trees in relation to remnant forest. Further reporting may be considered as part of the relevant ASSESSMENT.*