Assessment of Trees at Creaney Primary School

Prepared For

Programmed Facility Management

Prepared By

ARBOR logic

Contents

1. Terms Used

The following terminology has been commonly used in this report:

'Trees' meaning the trees that are the subject of this report

'School' meaning the school known as Creaney Primary School

'Fall Zone' meaning the area where a branch (or complete tree) failure is considered most likely to fall into

'Target' meaning any areas of 'static' permanent potential targets such buildings, powerlines etc. within the likely projected Fall Zone of the Tree or if 'transitional' targets such as people or vehicles may also occur within the projected Fall Zone of the Tree

'Last Inspection' meaning the last inspection of the Trees at this School undertaken by Arbor logic in November 2022

2. Purpose of the Report

1. Undertake an inspection of all of the Trees within the grounds of the School
2. Identify any Trees requiring works in view of the relevant legal and risk management responsibilities that are generally associated with tree ownership
3. Provide any recommendations for the identified Trees accordingly

3. Particulars and Limitations to the Assessment

The information and opinions provided in this report are based on the observations made during the site assessment undertaken April 11, 2024

The observations of all of the Trees were undertaken from ground level.

Viewing conditions at the time of the assessments were considered to be fine and were unimpeded.

No exploratory excavations, or tomographic scans (or the like) were undertaken as part of this particular assessment.

4. Method of the Assessment

All of the Trees at this School were assessed from ground level in in accordance with general 'visual tree assessment'[1] methods and principles. The overall health of each Tree was adjudged from an inspection of its leaf, overall percentage of leaf mass present in the canopy of the Tree, and the presence (or absence) of any pest or disease factor that could have an effect on its health. The structural integrity of each Tree was determined from a visual inspection of its main stem, primary (and secondary) branch unions to determine the presence of any areas considered to be a structural 'defect' or 'imperfection' such as unions with included bark, swelling, or noticeable splitting at them. The natural species traits of the given Tree was also considered as part of the assessment process; i.e. is it a species known to be subject to issues associated with decay, termites (and how that would affect its structural integrity), or can be subject to the 'sudden branch drop' phenomenon.

The risks associated with each Tree at the School were assessed based on the findings of the visual observations of the given Tree and using the Quantified Tree Risk Assessment[2] method and principles (ver 5.3.2).

In this instance consideration was given to what incidences could be expected to occur to the given Tree under 'normal' weather conditions over the next 2-year time period. Note: Whilst this aspect of the assessment generally includes consideration of the sort of storm and strong wind events considered to be typical to this area of Western Australia, it does exclude any unexpected severe weather events that may occur unexpectedly over that period.

For the purposes of this assessment, all buildings, areas immediately around the buildings, footpaths leading into the School, public roads and footpath around the edges of the School and the areas of playground that were considered to have high volumes of traffic during the course of a day by pupils and/or staff were again allocated a Target rating of '2'; with the Fall Zones of each Tree being assessed to potentially be occupied between 15 minutes and 2.4 hours per day on an average daily basis.

The School's oval and areas where pupils were considered likely to use during periods of recess were considered to be lower Target areas. Based on observations made during the assessment, a Target rating of '3' has been applied for these areas; with the Fall Zones of each Tree being assessed to potentially be occupied between 2 minutes and 14 minutes per day on an average daily basis over the course of a year.

Any areas that looked to be lower use were allocated a Target rating of '4' for occupancy of up to 2 minutes per day on an average daily basis over the course of a year.

[1] Field Guide for Visual Tree Assessment (VTA); The Body Language of Trees, A Handbook for Failure Analysis; C Matteck, H Breloer

[2] Refer Quantified Tree Risk Assessment (www.QTRA.co.uk)

5. Summary of Key Findings

5.1 Summary of Observations and Comments

Overall little to no change looks to have occurred to most of the Trees at this School since the Last Inspection.

All of the works recommended after the Last Inspection look to have been completed and look to have achieved the desired results.

A number of small dead and near dead trees were noted to be present. All Jarrah and Common Sheoak, and the nature of their decline suggests that it may have been due to the possible presence of *Phytophthora* although further investigation by way of tissue analysis would be to verify.

Most of the other Trees at this School looked to be remaining in good health and whilst some have smaller diameter deadwood in their canopy it doesn't look to represent a risk of harm due to its size and/or the nature of the use of the area around that particular Tree.

The canopy of a number of the Jarrah (*Eucalyptus marginata*) at this School (whilst in better condition compared to the Last Inspection) still looks to have slightly chlorotic leaf. This can be attributed to a soil pH and/or *Armillaria* or *Phytophthora* (both fungal pathogens) issue. Further investigation by way of a soil analysis would be required to verify.

Armoured Scale (*Maskellia globosa*) was also noted to still be present in a number of the Tuart (*Eucalyptus gomphocephala*) at the School, and whilst noticeable its presence part looks to be having little to no major impact to their health at this time.

A tip borer (Auger Beetle) issue was again noted to be affecting some of the New Zealand Christmas Tree at the School. Whilst the tips of those Trees are declining the majority of their canopy remains in good health at this time. Treatments are available for this pest insect if desired.

The majority of the Trees at this School also continue to have (what is considered to be) typical structural forms for specimens of their given species and no major change looks to have occurred since the Last Inspection.

Further bark damage was noted on a couple of the larger older Tuart and looks to be typical of that caused by birds. The damage looks to be remaining relatively superficial at this time, and does not appear to be impacting the health of the Trees in question. The damage caused can however have a long-term impact of the structural integrity of the damaged part; particularly when located at a branch union or on the top side of a branch so they will need to be carefully monitored over the coming years and they may need canopy works or even need to be removed as a result of the damage caused even if it is remaining in good health at that time.

Branch failures were noted to have recently occurred on a small number of the Trees at the School. In all instances the failures look to have been due to force loading (i.e. storm damage) related causes rather than from any predictable or preventable causes.

Termites were still noted to be present in the lower main stem of one Tree at the School seen in the image below and don't look to have been treated since they were first noticed during the Last Inspection. At this time the presence of the termites was not considered to be of a major concern to the structural integrity of that Tree, although treatments are suggested to occur to minimise the potential for them to start to affect it any further.

5. Summary of Key Findings

The cable installed into the large Tuart at the front of the School was inspected and looks to be remaining in good working order at this time.

The cable does look slightly tauter than before; but doesn't necessarily look to be tight or under strain.

There are no visible signs of any separation at the union of its two main stems (and they may even be separate trees anyway).

Image taken October 2022
Note the cable is slightly slack in its appearance

Image taken April 2024
Note the cable now looks slightly taught compared to the Last Inspection

Whilst not a major concern, this is one that will need to be monitored more closely than other Trees at this School for any signs of increased load on the cable, or separation at the union or the canopy of the two stems.

5. Summary of Key Findings

5.2 Risks Identified and Considered

Based on my observations during this assessment the risks associated with the vast majority of the Trees at this School were assessed to be as low as reasonably practicable at this time whilst still providing the amenity for which they had been planted for. As such no works were considered necessary on those Trees.

Whilst this is not to say that there aren't any risks associated with those Trees, or that there isn't any potential for failure to occur; particularly on the higher risk species of Tree. However, any RoH that are present are unlikely to be able to be mitigated any further through canopy pruning without resulting in the Trees being removed or the pruning resulting in the amount of amenity that they provide being severely compromised to the point where the retention of the Tree would be questioned.

The risks associated with 13 Trees at this School were assessed to be within what is generally considered to be a 'tolerable' range; but not necessarily as low as reasonably practicable at this time. Canopy works were considered likely to address the risks identified and assessed with most of those Trees, so that (once done) the risks associated with them would be lower and well within the tolerable range if not as low as reasonably practicable whilst still retaining the Tree and the benefits that they provide to the School. Three of these Trees are however recommended to be removed (all dead trees).

Although they don't necessarily represent a risk of harm the small dead and near dead Trees at the School are suggested to be removed and minor canopy works are suggested for a palm to remove the lower dead fronds that are reachable from ground level (potential fire risk).

5. Summary of Key Findings

5.3 Other Issues Noted

5.3.1 Root Disturbance to Walls

Disturbance to a number of small (single limestone block) retaining walls was again noted to be continuing to occur for the same reasons detailed in the report after the Last Inspection.

The Trees in the planter areas are all early mature Rosewood (*Tipuana tipu*) that show good health and structural form and look to be providing valuable amenity to the area in which they are situated in terms of shade and visual benefits. They all look to be 'early-mature' trees and can be expected to live for another 20-40 years or more, during which time they may double in size in terms of their height, trunk diameter and canopy extents. They are considered to be a very low risk, low maintenance species in terms of their pruning requirements so in many respects they are considered suitable for school situations, although their relatively surface orientated root system can cause issues with surrounding infrastructure if not taken into consideration at the design and construction stage of the development of the area where they are to be situated.

In this instance the planter constructed around it does NOT appear to have taken into consideration the Trees, their roots, or their potential for future growth.

At this time the damage was still considered to be more 'cosmetic' rather than a safety concern as no movement was noted in the walls during the inspection and they are only small/low header walls for low rise planter beds.

However further damage can be expected to occur in the future, and if repair was required, including a degree of arboricultural input in the process will be key to a successful outcome.

5. Summary of Key Findings

5.3.2 Root Disturbance Paved Footpath

Disturbance to a few areas of paving was noted to be starting to occur; seen in the images below.

Although no pavers were removed, the disturbance looked to be typical of that caused by roots and assumed to a root (or roots) from the nearby Tree; a good mature Tuart.

Repair to the paving is suggested to mitigate the potential trip hazard. In this instance the disturbed sections of the paving would need to be removed to enable further assessment of the size and number of any roots present, and if so what impact their removal would have on the Tree of origin.

Assuming any roots encountered are <2-3cm in diameter, then their removal would be considered unlikely to have much impact to the future health or potential life span of the Tree of origin.

Removal of any roots larger than this would not be recommended without seeking further advice.

Once pruned, the paving can then be replaced as required.

However, expect to need to repeat the process every 5 or so years due to the generation of new roots back into the area under the paving.

If a longer-term time frame than this was required then further discussion will be required to discuss landscape options as some changes to the area around the Tree will likely be required; either surface and/or sub-surface materials.

Note: The use of 'conventional' root barrier materials (i.e. a 600mm deep plastic barrier) is **NOT** considered to be a viable option if the Trees are to be retained and would difficult to install to manufacturers specifications in the given situation.

5. Future Management Recommendations

5.4 Visual Summary of Recommendations

Key

- Trees requiring canopy works
- Dead tree recommended to be removed
- Small dead trees suggested to be removed
- D Root disturbance issues
- T Tree with termites
- Specific trees to monitor more closely than others

N

5. Summary of Key Findings

No major change visible since the Last Inspection.

All of the Trees in this area currently show good health and no visible change to their structural condition.

Decay noted in one old Coastal Moort. Ok for now but one to watch.

The dead section of a Jarrah looks to be retaining sufficient structural integrity at this time as well but is also one to watch.

Area may benefit from some new trees being planted.

Nature playground area

No major change visible in most Trees since the Last Inspection.

Most look to be remaining in good health and no visible change to their structural condition.

Armoured Scale, borers and canker issues continue to affect smaller parts of some of the Tuart resulting in some smaller diameter (but noticeable) deadwood. Not necessarily a risk of harm in some but in others it is suggested to be removed.

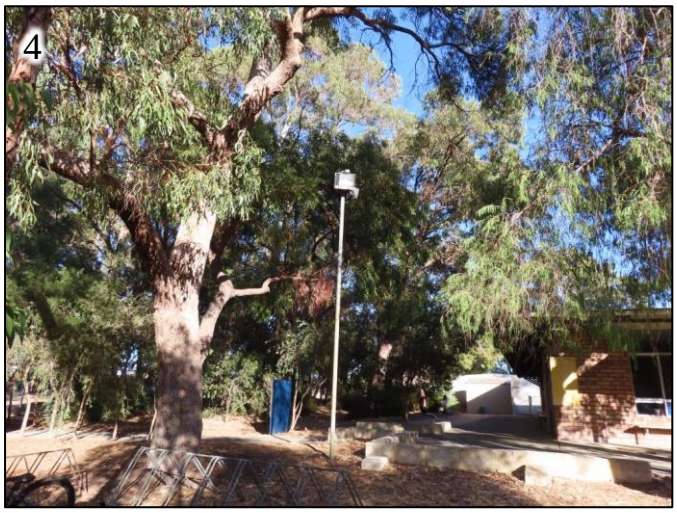
Three small dead Jarrah noted and another looks to be mostly dead; all suggested to be removed before natural decay starts to affect their structural integrity.

No major change visible since the Last Inspection.

All of the Trees in this area look to be remaining in good health and no major change visible in their structural condition.

Loading noted in parts of the canopy of both of the larger older Tuart trees and so some canopy works are recommended.

5. Summary of Key Findings



Densely treed area.

Predominantly Jarrah and Tuart and remnant trees for this area.

Most currently show good health and structural form and no major issues visible at this time from a risk management point of view.

Looks to be a relatively low use area so whilst some trees have deadwood in their canopy for the most part it looks to represent a low RoH at this time.

Canopy works are however suggested for three Trees in this area and a dead Common Sheoak is suggested to be removed before natural decay starts to affect its structural integrity.

No major change visible since the Last Inspection.

All of the Trees currently show good health and no visible change to their structural condition.

Minor amounts of smaller diameter sized deadwood is visible in some of the Trees but doesn't look to represent a risk of harm due to its size. Marginal weight loading at this time.

No major change visible since the Last Inspection.

Most of the Trees in this area currently show good health and structural form and no major issues visible at this time.

Some visible deadwood noted in the Tuart (looks to be a Canker and/or borer issue). For the most part it isn’t a major concern at this time from a risk management point of view due to its size and the nature of the use of the area.

5. Summary of Key Findings

No major change visible since the Last Inspection.

Most of the Trees in this area currently show good health and structural form and no major issues visible at this time. Some smaller deadwood noted but looks to represent a low risk due to its size and the nature of the use of the area.

Special Education Area.

Large mature Tuart. Currently shows good health and no visible change to its structural condition. Armoured Scale noted but looks to be having marginal impact to its health at this time. Couple of branches have failed since the Last Inspection. Both around the 8-10cm diameter sized parts. Both mid-canopy northern side this time. Both look to have been force loading related causes.

Canopy works were being undertaken on this Tree at the time of the inspection; refer separate report on this Tree for further details.

5. Summary of Key Findings

5.5 Table of Trees Requiring Works

The following table provides details of each of the Trees identified as requiring some degree of management at this time (along with its recommended actions) and a number of Trees identified as having an issue of note and worthy of consideration.

The other Trees at the School not detailed in the following table were assessed, but were considered to NOT require any management works at this particular time.

Explanation of Fields of Information

Tree No; Provides the allocated number of the Tree identified at the School, and corresponds to a number in the table of data collected on the given Tree.

Species; Provides both the botanical and most commonly used name of the identified tree.

Estimated Height; Provides an estimation of the height of the Tree in metres

Estimated DBH; Provides an estimation of the diameter of the main stem (trunk) of the Tree in cm; typically measures at 1.4 metres above ground level

Health Condition; Provides a view of the Tree's health/vigour condition at the time of inspection based on a number of predetermined criteria.

Health Rating	Explanation
Excellent	Shows to have typical foliage condition and amount of foliage mass for a specimen of the species. May have a minor amount of deadwood, but no signs of any major pest or disease factor that may affect its health.
Good	Shows to have typical foliage condition. Canopy foliage may be slightly chlorotic, or it may have a slightly higher percentage of deadwood than usual, or exhibit signs of being affected by environmental conditions. May have a minor pest or disease present that could start to affect its health.
Fair	Shows to have a relatively high percentage of deadwood than considered typical for a specimen of the given species and/or a low volume of live canopy leaf mass for a specimen of the given species. Apical sections of the canopy (may also be) dead. Signs of a pest or disease factor evident.
Poor	Canopy mass and foliage condition shows to be in a poor state for a specimen of the species. Has a high percentage of deadwood material in its canopy and a low volume of live canopy mass (typically <20%).
Dead	Shows to have either no live tissue within its structure, or at best have <5% live foliage mass remaining in its canopy.

5. Summary of Key Findings

Structural Form; Provides a view of the Tree's structural form at the time of inspection based on a number of predetermined criteria.

Structure Rating	Explanation
Good	Shows typical structural form for a specimen of the species. Branch unions show typical form at the point of attachment. May have a small number of minor structural defects; but are within the scope of tree surgery management to rectify. Shows to be root-stable.
Acceptable	Shows an acceptable form, but may have a number of structural defects present i.e. bi-furcation with noticeable swelling, or large stem cavities, but structure remains within the scope of management at this stage; albeit with a higher risk/management requirement.
Questionable/Undesirable	Shows an undesirable structure for a specimen of the species. Structural condition likely to cause future issues in regards to the potential for stem or complete tree failure to occur. Generally includes previously lopped trees.
Poor	Major structural defects evident. May have large stem cavities, extensive termite damage, or noticeable movement in main stem, branch unions or root plate area.

Age Class; Provides an opinion on the age class of the given Tree; i.e. juvenile, semi-mature, mature.

Image; Provides an image of the tree

Comments; Provides any additional information (seen as relevant) to the individual specimen.

Comments are (generally) self-explanatory.

Risk Assessed; Provides information on what part of the Tree was assessed for risk

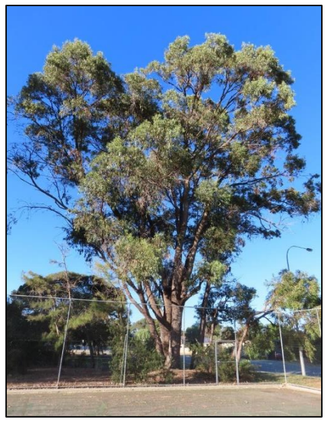
Target Area; Identifies what the Target of concern is within the Fall Zone of the Tree

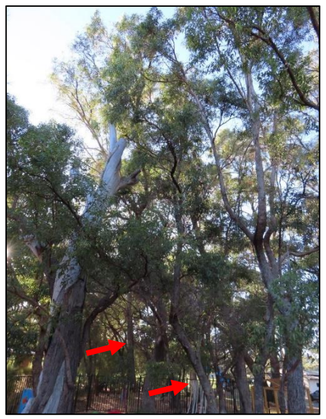
QTRA Variables; Provides the variables assessed using QTRA guidelines:

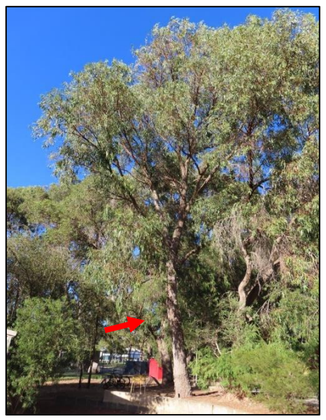
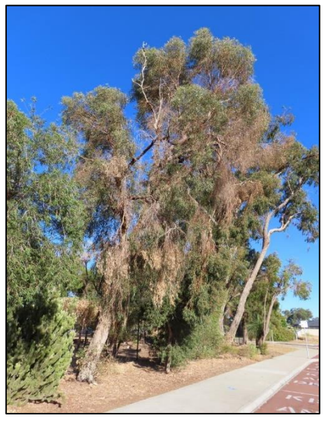
T=	Target
SoP=	Size of part
PoF=	Probability of Failure
RoH=	Risk of Harm Calculated based on the variables assessed

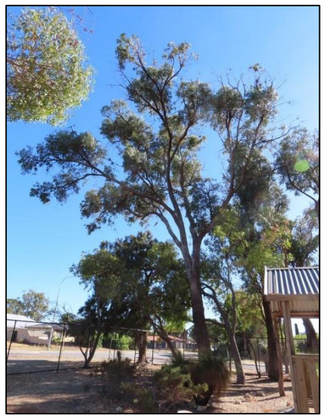
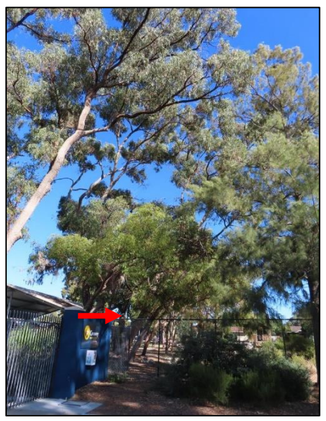
Management; Provides future management recommendations; either in view of the relevant legal and risk management responsibilities that are generally associated with tree ownership, or to reduce future management requirements and expenditure

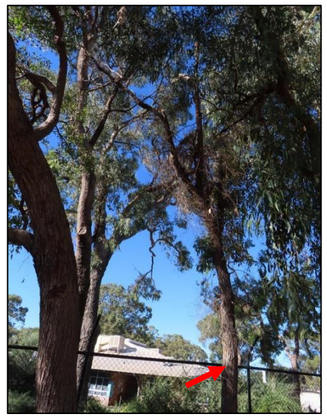
Comments in this section are (generally) self-explanatory

Tree No.	Species	Height (metres)	DBH (cm)	Health	Structure	Age Class	Image	Comments	QTRA Variables						Recommended Works
									Risk Assessed	Target	T	SoP	PoF	RoH	
1	Jarrah (Eucalyptus marginata)	12	45	Fair	Good	Mature		Canopy is slightly sparse but overall it looks to be remaining in good health and no major change looks to have occurred since the Last Inspection. Minor amount of smaller and moderate diameter sized deadwood present in its canopy	Deadwood over Target area	Low use/Target area	3	4	2	1/500,000	Low risk but suggest remove larger deadwood
2	Tuart (Eucalyptus gomphocephala)	23	180	Excellent	Acceptable	Mature		Large mature specimen. Currently shows good health and a good (typical) structural form. Armoured Scale noted but looks to be having marginal impact to its health at this time. Minor amount of smaller and moderate diameter sized deadwood present in its canopy. Weight loading noted in sections of canopy	Failure of live branches over Target area (110-250mm diameter-SoP 3)	Basketball Court	3	3	3	1/500,000	Remove the noticeable deadwood. Remove couple of branches extending over the courts and reduce end weight loading low branch west side
3	Tuart (Eucalyptus gomphocephala)	26	180	Excellent	Acceptable	Mature		Large old tree. Currently shows good health. Previously topped. Regrowth unions look ok at this time. Weight loading noted in sections of canopy	Failure of (live) branches over Target area (260-450mm diameter-SoP 2)	Footpath, Shed	2	2	4	1/50,000	Reduce weight loading NE area

Tree No.	Species	Height (metres)	DBH (cm)	Health	Structure	Age Class	Image	Comments	QTRA Variables						Recommended Works
									Risk Assessed	Target	T	SoP	PoF	RoH	
4	Tuart (Eucalyptus gomphocephala)	12	45	Excellent	Good	Mature		Two trees in close proximity that effectively form the one canopy. Minor amount of moderate and larger diameter sized deadwood	Deadwood over Target area	Nature play area	3	3	2	1/50,000	Remove the larger/moderate diameter sized deadwood. No canopy thinning required (Two trees in this area)
5	Tuart (Eucalyptus gomphocephala)	17	70, 45	Excellent	Good	Mature		Large mature specimen. Part of a group of trees in close proximity that effectively form the one canopy. Currently shows good health and a good (typical) structural form. Weight loading noted in sections of canopy	Failure of live branches over Target area (110-250mm diameter-SoP 3)	Footpath	2	4	2	1/50,000	Reduce load upper canopy NE and NW areas. Remove the noticeable deadwood
6	Common Sheoak (Allocasuarina fraseriana)	7	30, 10	Dead	Acceptable	Mature		Looks to have recently died	Failure of upper dead sections	Nature play area, Footpath	2	4	2	1/50,000	Remove to ground level and grind the stump

Tree No.	Species	Height (metres)	DBH (cm)	Health	Structure	Age Class	Image	Comments	QTRA Variables						Recommended Works
									Risk Assessed	Target	T	SoP	PoF	RoH	
7	Tuart (Eucalyptus gomphocephala)	17	60	Excellent	Good	Mature		Good specimen. Currently shows good health and a good (typical) structural form. Minor amount of smaller diameter sized deadwood in the canopy. Weight loading noted in sections of canopy	Failure of live branches over Target area (110-250mm diameter-SoP 3)	Footpath, Play area, Seating area	2	3	4	1/500,000	Remove the eastern branch. Remove the noticeable deadwood
8	Californian Petticoat Palm (Washingtonia filifera)	7	40	Excellent	Good	Semi-mature		Good specimen. Large skirt of dead fronds (potential fire risk)			n/a				Raise dead fronds so they aren't in reach from ground level
9	Tuart (Eucalyptus gomphocephala)	14	45	Good	Good	Mature		Ok tree. Minor amount of smaller and moderate diameter sized deadwood present in its canopy. Outside of the fence but still on School land according to cadastre information	Deadwood over Target area	Public footpath, Street parking	2	4	3	1/500,000	Low risk but suggest remove. Remove the noticeable deadwood. No canopy thinning required

Tree No.	Species	Height (metres)	DBH (cm)	Health	Structure	Age Class	Image	Comments	QTRA Variables						Recommended Works
									Risk Assessed	Target	T	SoP	PoF	RoH	
10	Jarrah (Eucalyptus marginata)	7	10	Dead	Acceptable	Mature		Three small trees that look to have recently died	Failure of upper dead sections/main stems	Nature play area	3	3	3	1/500,000	Suggest remove to ground level as it looks likely to have limited life span remaining. Grind the stump
11	Tuart (Eucalyptus gomphocephala)	24	65	Good	Good	Mature		Large mature tree. Some larger deadwood and leggy extended branch structures	Deadwood over Target area	Nature play area	3	3	3	1/500,000	Remove the larger/moderate diameter sized deadwood. Reduce end weight loads SW, west and NW branch
12	Tuart (Eucalyptus gomphocephala)	24	Multiple	Good	Good	Mature		Large mature tree. Some larger deadwood but otherwise ok	Deadwood over Target area	Nature play area	3	3	3	1/500,000	Remove the larger/moderate diameter sized deadwood

Tree No.	Species	Height (metres)	DBH (cm)	Health	Structure	Age Class	Image	Comments	QTRA Variables						Recommended Works
									Risk Assessed	Target	T	SoP	PoF	RoH	
13	Jarrah (Eucalyptus marginata)	7	20	Near/ mostly Dead	Acceptable	Mature		Mostly dead tree and its canopy conditions suggests it probably has limited life span remaining	Failure of upper dead sections	Nature play area	3	3	3	1/500,000	Suggest remove to ground level as it looks likely to have limited life span remaining. Grind the stump
other small dead trees suggested to be removed															

6. Future Management Recommendations

6.1 Tree Removals

A number of dead and near dead Trees at this School are recommended to be removed to ground level.

The stumps of any Tree removed is recommended to be stump-ground to be a minimum 300mm below ground level**, or where grinding is not considered possible without impacting other adjacent trees, cut to as low to ground level as possible so to not create a trip hazard.**

6.2 Canopy Works

Minor amounts of canopy works are recommended for **10** Trees at this School to address the issues identified with those Trees.

In the majority of incidences canopy works are relatively minor and incorporate the removal of larger diameter deadwood. In some instances specific branch removal has also been recommended to occur to mitigate the risks identified with those Trees.

Details of the extent of works for each of these identified Trees have been provided as an attachment to this report.

Other than what has been specified on the attached table of works, no other canopy works are considered necessary at this stage on these or any of the other Trees at the School at this time.

6.3 Priority of Works

All of the works identified are considered to be a 'High' priority, and are recommended to be undertaken as soon as practicably possible.

6.4 Quality Control of Works

Proper canopy management (pruning) is only one aspect of overall tree management. Unfortunately it is still often an area that is poorly understood or executed by many tree surgery contractors, and the results of poor pruning can often result in increased risks associated with the tree. This in turn often necessitates (what would have been) avoidable increased management (and therefore expense) requirements, or in some instance necessitates the premature removal of the tree.

To this extent it is vital that all tree pruning works must comply with Australian Standards 4373 (2007); *Pruning of Amenity Trees*, and the volume of canopy thinning recommended/detailed on any given tree must be strictly adhered to. All persons undertaking the pruning of a tree are recommended to have (a minimum of) AQF certificate 3 in Arboriculture (or recognised equivalent level of qualification).

6.5 Estimated Budget Requirements

The canopy works and tree removals recommended in this report are estimated to cost in the order of ≤$10,000 - $15,000 to complete.

6. Future Management Recommendations

6.6 Termite Treatment

Treatment of the termites identified at the School is recommended to be undertaken.

Method of treatment is strongly recommended to be 'non-invasive' to the Tree i.e. a baiting, dusting or spraying method of treatment. The drilling of holes into the Tree as part of any treatment applied must NOT be permitted to occur.

6.7 Tree Health Improvement Measures (Jarrah)

Tree health improvement measures are recommended to be considered for any Jarrah at the School showing signs of chlorotic (yellowing) foliage. Otherwise those Trees at the School may have limited life span remaining.

Soil amendments and improvement measures to help increase soil biology and stimulate development of new root mass by way of:

- Apply soil wetter over their general root zone area,
- Apply Iron Manganese Sulphate around the root zone of the Trees and water in well,
- Apply mix of liquid seaweed, liquid fish and bio-prime trace (all to manufacturers specifications) around the root zone of the Trees.

This works could quite probably be taken in-house by grounds staff with some level of expertise and training in general horticulture/plant health care.

Any other measures implemented should be based on further analysis of soil and tissue samples to verify if there are any underlying soil chemistry issues that require addressing.

6.8 Management of Root Disturbance Issues

6.8.1 Planter Bed Walls

At this time repair of the disturbed sections of garden bed wall doesn't look to be required from a risk management perspective.

The planters constructed do NOT appear to have taken into consideration the fact that trees that were going to be planted or the sort of pressure roots from trees can exert as they grow and increase in physical size.

As such removing the existing trees and replacing them with new ones will probably result in the same issues occurring again in the future; unless a very small species of tree was used in which case they wouldn't provide the same level of amenity that the current Trees provide.

The use of a conventional root barrier in this situation would also prove of little to no value in preventing the sort of damage seen from occurring given the nature of the material of the barrier.

If repair was required, including a degree of arboricultural input in the process will be key to a successful outcome. Looking at the landscape there may be a number of options to address the issues without removing the Trees and achieving the desired results although further discussion will be required to table any potential options.

6. Future Management Recommendations

6.8.2 Paving Disturbance

In this instance the disturbed sections of the paving would need to be removed to enable further assessment of the size and number of any roots present, and if so what impact their removal would have on the Tree of origin.

Assuming any roots encountered are <2-3cm in diameter, then their removal would be considered unlikely to have much impact to the future health or potential life span of the Tree of origin.

Removal of any roots larger than this would not be recommended without seeking further advice.

Once pruned, the paving can then be replaced as required. However, expect to need to repeat the process every 5 or so years due to the generation of new roots back into the area under the paving.

If a longer-term time frame than this was required then further discussion will be required to discuss landscape options as some changes to the area around the Tree will likely be required; either surface and/or sub-surface materials.

Note: The use of 'conventional' root barrier materials (i.e. a 600mm deep plastic barrier) is **NOT** considered to be a viable option if the Trees are to be retained and would difficult to install to manufacturers specifications in the given situation.

6.9 Longer term Management of the Trees at this School

6.9.1 General Considerations

Once the works recommended in this report have been completed, then future management requirements for most of the Trees at this School are still considered likely to remain relatively low as the majority of the Trees identified at the School were considered to be comparatively low 'risk' (in terms of their propensity for branch failures) and low maintenance species in terms of their canopy pruning requirements at this time.

Whilst this is not to suggest that branch failures will not occur on any of the Trees, or that they will not require aspects of management in the future, management requirements for the Trees look likely to remain comparatively low.

Longer-term, most issues at this School are considered likely to arise from the larger older Tuart trees due to their physical size, age and typical traits of older specimens of their given species. This particularly applies to the large old Tuart at the front of the School (with the cables in the upper canopy) and the ones near to an inside the Special Education area. However, any risks associated with them look to be remaining within the realms and scope of management at this time. Continued periodic inspections of these Trees and pruning to maintain load off their structure will be required as part of their future management. These particular trees are recommended for an annual inspection to monitor their progress.

Issues of disturbance and displacement of the planter bed walls can be expected to continue to occur as the trees in those areas continue to mature and increase in physical size. If (when) repair becomes required, including a degree of arboricultural input in the process will be key to a successful outcome.

Although it remains a well treed school site, some new trees are recommended to be planted in strategic areas to maintain a diverse age range within its tree population; attachment 3 of this report provides a list of species considered suitable for use within this School.

Otherwise issues and pruning requirements for the Trees at this School are considered likely to remain comparatively low for the size of tree population present.

6. Future Management Recommendations

6.9.2 Future Inspections

The large mature Tuart tree at the front of the School with the cables and the large mature Tuart trees within and near the Special Education area are all recommended to be inspected on an annual basis to provide comment on their progress and identify if any further management works are required at that time. The next inspection for those particular Trees is recommended to be scheduled for around April 2025.

All of the other Trees at this School are recommended to be re-inspected by a suitably qualified independent arboricultural consultant on a biennial basis to identify if any further management works are required at that time. The next inspection is recommended to be scheduled for early 2026.

In the event of any branch failures greater than 100mm (10cm) in diameter occurring on any of the Tree's at this School subsequent to the recommended works being undertaken, and before the next inspection is due to be undertaken, then the future management of the Tree in question is recommended to be re-assessed at that time.

Times, date, weather condition at the time of failure, the size of part (diameter) that fails, and from which Tree at the School are all important details that can help with more informed management decisions for trees to be made.

6. Future Management Recommendations

6.9.3 Visual Summary of Recommendations

Key

- Trees requiring canopy works
- Dead tree recommended to be removed
- Small dead trees suggested to be removed
- D Root disturbance issues
- T Tree with termites
- Specific trees to monitor more closely than others

Given their form and history an annual inspection of these Trees is recommended to occur

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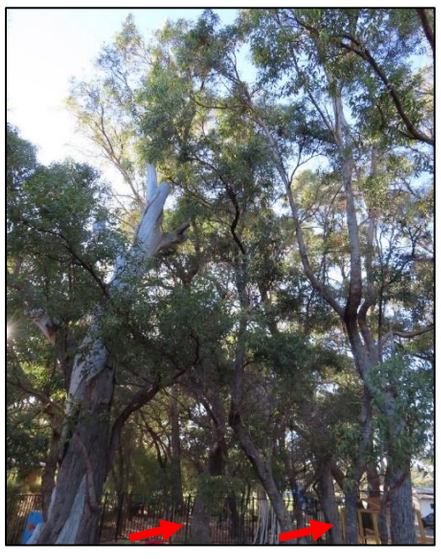
Attachments to the Report

Attachment 1; Tree Location Guide
Attachment 2; Table of Recommended Works
Attachment 3; Species of Tree Considered Suitable for this School
Attachment 4; Company Information and Disclaimer

Attachment 1; Tree Location Guide with works

Attachment 2; Table of Recommended Works

- The stumps of any Tree removed is recommended to be stump-ground to be a minimum 300mm below ground level**, or where grinding is not considered possible without impacting other adjacent trees, cut to as low to ground level as possible to not create a trip hazard.**
- All tree pruning works must comply with Australian Standards 4373 (2007); *Pruning of Amenity Trees*
- All persons undertaking the pruning of a tree are recommended to have (a minimum of) AQF certificate 3 in Arboriculture (or recognised equivalent level of qualification)
- Other than what has been detailed in the attached table, no other canopy works are to be undertaken on any of the identified Trees.
- No canopy reduction, or topping of Trees is to occur.

Tree No.	Species	Height (metres)	DBH (cm)	Image	Recommended Works
1	Jarrah (Eucalyptus marginata)	12	45		Remove the larger/noticeable deadwood. No canopy thinning required
2	Tuart (Eucalyptus gomphocephala)	23	180		Remove the noticeable deadwood. Remove couple of branches extending over the courts and reduce end weight loading low branch west side
3	Tuart (Eucalyptus gomphocephala)	26	180		Reduce end weight loading (and length where possible) NE and NW area of the canopy. Remove any larger deadwood from the canopy.
4	Tuart (Eucalyptus gomphocephala)	12	45		Remove the larger/moderate diameter sized deadwood. No canopy thinning required (Two trees in this area)
5	Tuart (Eucalyptus gomphocephala)	17	70, 45		Reduce load upper canopy areas north side. Remove the noticeable deadwood

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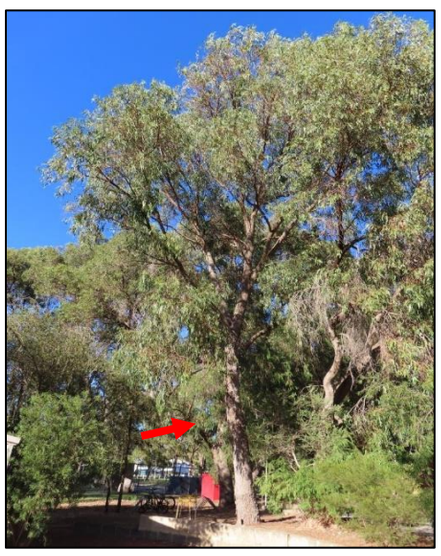
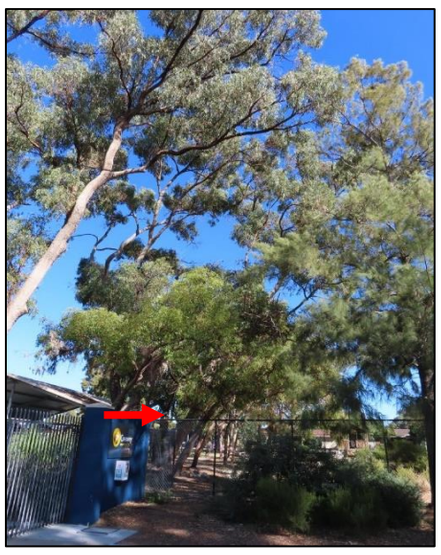
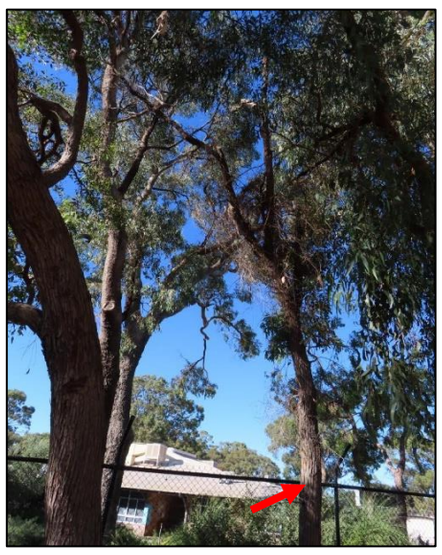
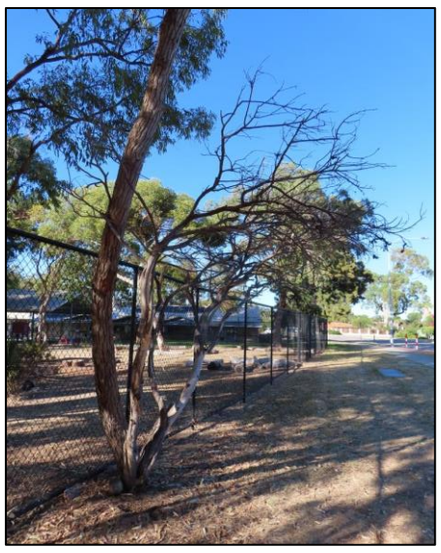
Tree No.	Species	Height (metres)	DBH (cm)	Image	Recommended Works
6	Common Sheoak (Allocasuarina fraseriana)	7	30, 10		Near dead tree. Remove to ground level and grind the stump
7	Tuart (Eucalyptus gomphocephala)	17	60		Remove the eastern branch. Remove the noticeable deadwood. No other canopy thinning required
8	Californian Petticoat Palm (Washingtonia filifera)	7	40		Raise dead fronds so they aren't in reach from ground level
9	Tuart (Eucalyptus gomphocephala)	14	45		Remove. Remove the noticeable deadwood. No canopy thinning required
10	Jarrah (Eucalyptus marginata)	7	10		Remove to ground level and grind the stumps; three small dead trees

Tree No.	Species	Height (metres)	DBH (cm)	Image	Recommended Works
11	Tuart (Eucalyptus gomphocephala)	24	65	  	Remove the larger/moderate diameter sized deadwood. Reduce end weight loads SW, west and NW branch
12	Tuart (Eucalyptus gomphocephala)	24	Multiple		Remove the larger/moderate diameter sized deadwood. No canopy thinning required
13	Jarrah (Eucalyptus marginata)	7	20		Remove to ground level and grind the stump; near dead tree
other small dead trees to be removed				 	

Attachment 3; Species of Tree Considered Suitable for this School

WA Natives	**Size (at maturity)**
WA Peppermint (*Agonis flexuosa*)	Medium-large
Wilga/Australian Willow (*Geijera parviflora*)	Small-Medium
Red Flowering Gum (*Corymbia ficifolia*)	Small
Coastal Moort (*Eucalyptus utilis*)	Small-Medium
Coolibah (*Eucalyptus microtheca*)	Small
Coral Gum (*Eucalyptus torquata*)	Small
Jarrah (*Eucalyptus marginata*)	Medium-large
Snow-in-Summer (*Melaleuca linariifolia*)	Small
Yate (*Eucalyptus cornuta*)	Medium-large
Flooded Gum (*Eucalyptus rudis*)	Large
Australian Natives	
South Australian Yellow Gum (*Eucalyptus leucoxylon ssp 'Megalocarpa',* or '*Eukie Dwarf*')	Small-Medium
Dwarf Sugar Gum (*Eucalyptus cladocalyx 'Nana'*)	Small-Medium
Red Box (*Eucalyptus polyanthemos*)	Medium
Broadleaved Paperbark (*Melaleuca quinquenervia*)	Medium
Weeping Broadleaved Paperbark (*Melaleuca leucadendra*)	Medium
Red Flowering Broadleaved Paperbark (*Melaleuca viridiflora*)	Small-Medium
Kurrajong (*Brachychiton populneus*)	Small
Lacebark (*Brachychiton diversicolor*)	Small-Medium
Rough Barked Apple Gum (*Angophora floribunda*)	Medium
Bottlebrush (*Callistemon species*); any variety	Small
Spotted Gum (*Corymbia maculata*)	Large
Exotics - Evergreen	
Canary Islands Madrone (*Arbutus canariensis*)	Small
Cook Island Pine (*Araucaria columnaris*)	Small-Medium
Aleppo Pine (*Pinus halepensis*)	Medium-large
Long-leaved Fig (*Ficus longifolia*)	Small-Medium
Exotics - Deciduous	
Round-lobed Sweet Gum (*Liquidambar styracciflua 'Rotundiloba'*)	Small-Medium
Pride of Bolivia (*Tipuana tipu*)	Medium-large
Jacaranda (*Jacaranda mimosifolia*)	Medium
Ornamental Pears (*Pyrus species*)	Small
English Oak (*Quercus robur*)	Medium-large

General Guide to Size Range

Small Tree	<8-10m
Small – Medium Tree	10-15m
Medium -Large	15-20m
Large	>20-25m

- Species selection for each location should be undertaken in consultation with an arboricultural consultant to ensure correct species is chosen any for given area of the School.
- Other species not on the list above should only be planted after consultation with an arboricultural consultant to ensure that potential management issues with the tree planted will not arise.
- Only quality specimens from reputable tree growing nurseries should be used at the School.
- All tree stock purchased used is strongly recommended to comply with AS 2303 (2015); Tree stock for landscape use
- Planting is recommended to occur late autumn/early winter.
- Soil improvement measures are recommended to be implemented at the time of planting to aid in establishment.

Disclaimer

This Report has been provided in good faith and based upon the material information provided by the Client to Arbor logic, and/or based on the visual inspection of the tree(s) at the time this advice was prepared.

The contents of this Report should be read in full, and at no time shall any part of the Report be referred to unless taken in full context with the remainder of the document.

The contents of this Report may not be reissued to another party or published in part or full without Arbor logic's written permission.

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- Material information not being provided by the Client to Arbor logic at the time this advice was prepared.
- The provision of misleading or incorrect information by the Client or any other party to Arbor logic upon which this advice was prepared.
- This advice being used by the Client or any other party in circumstances or situations other than the specific subject of this advice.
- Failure by the Client to follow this advice.
- The action(s) or inaction(s) of the Client or any other party that gives rise to the loss of, or damage to, the tree(s) that are the subject of this advice.

It is also important to take into consideration that all trees are living organisms and as such there are many variables that can affect their health and structural properties that remain beyond the scope of reasonable management practices or the advice provided in this Report based on the visual inspection of the tree(s).

As such a degree of risk will still remain with any given tree(s) despite the adoption of any best management practices or recommendations made in this Report.