Tree Survey – Lot 508 Progress Drive, Bibra Lake

Prepared for

City of Cockburn

Zana Sheary & Sarah Taylor
Arboricultural Consultants
Paperbark Technologies Pty Ltd
ISA Certified Arborist - AU0039A
Quantified Tree Risk Assessor, Licensed user 1082 & 4098
Diploma of Horticulture/Arboriculture
PO Box 1116
Scarborough WA 6922
Mobile: 0401 817 551
www.paperbarktechnologies.com.au
zana@paperbarktechnologies.com.au

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BRIEF:

This consultant has been commissioned by City of Cockburn to inspect and submit a report in respect of 50 trees located within the designated site at Lot 508 Progress Drive, Bibra Lake which is scheduled to undergo development works.

The survey is to establish the trees botanical name, common name, approximate height and canopy spread, diameter taken at breast height (DBH), diameter of root flare (DRF), health and structure of the tree, and provide a Helliwell Valuation of each tree. Tree pruning works or tree removal has not been recommended due to the proposed plans yet to be finalised.

Each tree has had the tree protection zones (TPZ) and structural root zone (SRZ) worked out and provided to assist in future management around the retained trees.

A total of fifty trees have been audited and photographed.

The inspection consisted of several parts:

- Examination, observation and documenting the health, the condition and tree inventory details.
- Each tree is tagged with the corresponding asset number within the City's GIS dataset.
- Provide a Helliwell Valuation of each tree.
- Provide TPZ and SRZ radius details.
- Provide an itemised list of trees which require tree surgery works.
- Photograph and tagging each tree.
- Adding tree numbers to an aerial map for clarification.

This consultant confirms that the site inspections were carried out on the 27th & 28th of April 2021. All trees were captured on GPS and each tree is tagged.

FORM AND APPROACH:

Below are the definitions for the captured information provided:

Botanical name Information:

Botanical names are listed detailing the generic name followed by the specific epithet. The variety is named where applicable. Only the scientific and botanical names should be accepted to identify an exact tree species.
The botanical name is predominantly used within this report and the common name provided for your reference within the summary.

Tree Age:

Tree age is based on the age of the tree that would be considered typical for the species in the general area. It is not based on the health of the tree.

Young
The tree has recently been planted or self-sown (within the last 3 – 5 years).

Semi mature
The tree has become established in the site and may be approaching its expected mature size. If correctly maintained the specimen will continue to grow to maturity.

Mature
Usually the tree will have reached the expected size for the species in the site.

Post mature
The tree has passed the mature stage of its life and is characterized by both a very slow growth rate and by intolerance to disturbances. The post-mature tree has limited energy reserves to fight invading diseases and insects, especially pruning wounds. Removal of live tissue is something to avoid.

Senescent
The tree is in its final stages of life, the tree is beginning to lose its ability to defend itself. It is at this stage that the tree becomes susceptible to pests and disease. The tree will be assessed for hazards and may require reduction pruning or removal.

Note
It is important to note that tree age is not directly related to tree health. For example: It is possible for a young tree to have very poor health and a mature tree to have good health.

Tree health:

Good
The tree is demonstrating good or exceptional growth for the species. The tree should exhibit a full canopy of foliage and have only minor pest or diseases problems. Foliage colour, size and density should be typical of a healthy specimen of that species.

Fair
The tree is in reasonable condition and growing well for the species. The tree should exhibit an adequate canopy of foliage. There may be some dead wood present in the crown, some grazing by insects or animals may be evident and/or foliage colour, size or density may be atypical for a healthy specimen of that species.

Poor
The tree is not growing to its full capacity; extension growth of the laterals may be minimal. The canopy may be thinning or sparse. Large amounts of dead wood may be evident throughout the crown. Significant pest and disease problems may be evident or symptoms of stress indicating tree decline.

Very poor
The tree appears to be in a state of decline and the canopy may be very thin and sparse. A significant volume of deadwood may be present in the canopy or pest and disease problems may be causing a severe decline in tree health.

Dead
The tree is dead.

Tree Structure:

Each tree surveyed was examined in detail to ascertain its overall structural condition and then placed into one of five categories:

Good: The tree has a well-defined and balanced crown. Branch unions appear to be strong, with no defects evident in the trunk or the branches. Major limbs are well defined. The tree would be considered a good example of the species. Probability of significant failure is highly unlikely.

Fair: The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions or branches may be exhibiting minor structural faults. If the tree is single trunked, this may be on a slight lean or be exhibiting minor defects. Probability of significant failure is low.

Poor: The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered major root damage. Probability of significant failure is moderate.

Very Poor: The tree has a poorly structured crown. The crown is unbalanced or exhibits large gaps. Major limbs are not well defined. Branch unions may be poor or faulty at the point of attachment. A section of the tree has failed or is in imminent danger of failure. Active failure may be present or failure is probable in the immediate future.

Has Failed: A significant section of the tree or the whole tree has failed.

Helliwell Visual Amenity Valuation

The Helliwell System provides an objective method of placing a $ value upon an urban tree. The **Helliwell System** is used worldwide for assessing the **Amenity Value** of a tree, is one of a number used within Australia and has gained broad acceptance within the Perth region.

This system assesses the contribution each tree makes to the urban forest by evaluating the size of tree, the health and condition, the species and suitability for the location.

This method allows us to attach a monetary value to each tree which is considered a valuable community asset to be enjoyed by all. Seven standard factors are identified for the tree.

For each of the factors the tree is given a score of up to 8 points, the scores for all the factors are then multiplied together to give an assessment of the amenity value of the tree, which is then multiplied by the conversion rate.

The value per point rate for the assessment has been assigned at **$71.13** which has been calculated using the appropriate conversion exchange rates and increased yearly with CPI. The value per point for Australia has been approved with the Author of the Helliwell System, Rodney Helliwell.

Table1 Factors and scores for individual trees as assigned by the Helliwell system.

The most used scores are highlighted below.

Factor	Points									
	0	0.5	1	2	3	4	5	6	7	8
Size of tree (Canopy size)	Less than 2m2	2-5m2	5-10m2	10-20m2	20-30m2	30-50m2	50-100m2	100-150m2	150-200m2	over 200m2
Useful life expectancy	Less than 2 years		2-5 years	**5-40 years**	**40-100 years**	100+ years				
Importance of position in the landscape	No importance	Very little importance	Little importance	Some importance	**Considerable importance**	Great importance				
Presence of other trees		Woodland	Many	**Some**	Few	None				
Relation to the setting	Totally unsuitable	Moderately unsuitable	Just suitable	Fairly suitable	**Very suitable**	Particularly suitable				
Form		Ugly	**Average or indifferent**	Good						
Special factors				One	Two	Three				

Example - assessed as follows:

Factor		Score
Size of the tree	195m2	7
Useful Life Expectancy	40 - 100 years	3
Importance of position in the landscape	Considerable Importance	3
Presence of other trees	Many	1
Relation to the setting	Very suitable	3
Form	Average Form	1
Special Factors - Heritage Significance	None	1

Score = 7x3x3x1x3x1x1 =189 x $71.13 = $13,443.57

This method of assessment only takes account of the amenity value of a tree and does not attempt to assess any costs which may be incurred in growing or maintaining the tree.

The total monetary value of the 50 trees surveyed was found to be AUD $177,327.09.

TPZ – Tree Protection zone

The Australian Standard AS 4970-2009 *Protection of trees on development sites* provides guidelines regarding a suitable TPZ to ensure the protection of trees on sites where development is to occur.
The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance to ensure that the tree/s remain viable.

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

E.g. DBH is 0.5m x 12 = 6m radius (TPZ = 6m measured from the centre of the trunk at ground level.)

Where proposed encroachment is greater than 10% into the TPZ the Arborist must be able to demonstrate that the tree(s) are likely to remain viable.

Where design changes occur the project Arborist may need to re-inspect selected trees to ensure the trees are adequately protected.

A TPZ radius for each tree audited has been included within the survey.

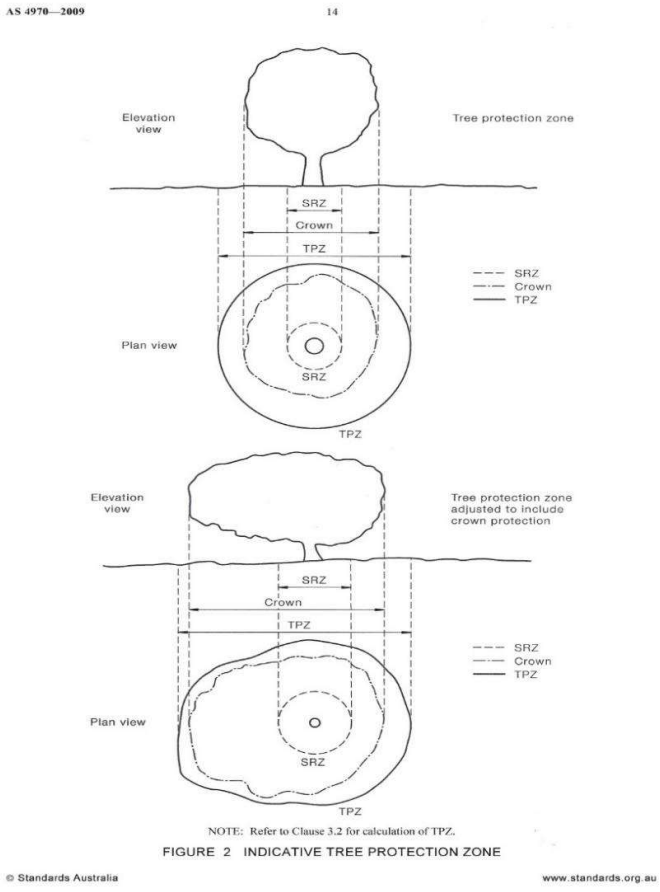


Figure 1 Indicative tree protection zone from AS 4970-2009

SRZ – Structural Root Zone

The structural root zone area of a tree is the area where generally larger diameter woody roots required to support above ground parts of the tree have developed.

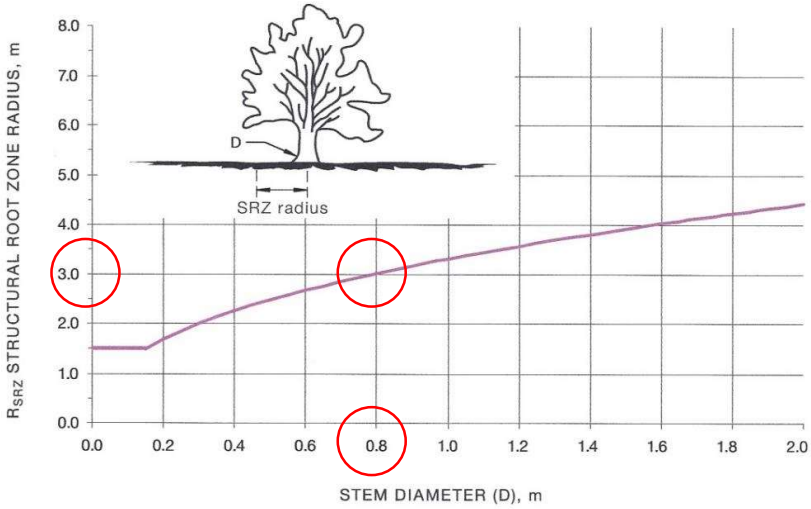
Australian Standard AS 4970-2009 *Protection of trees on development sites* provides a formula based upon basal trunk diameter to determine a structural root zone radius where major encroachment into a TPZ is proposed.

This zone considers a tree's structural stability only and not the root zone required for a tree's health and long term viability, which is usually a much larger area.

An indicative SRZ radius can be determined from the trunk diameter measured immediately above the buttress using the following formula. SRZ radius = $(D \times 50)^{0.42} \times 0.64$ or using the following guide from AS 4970-2009. E.g. Diameter at root flare is 0.8m (red circle) and using the graph below a 3m SRZ radius is required. This is measured from the centre of the trunk at ground level.

An SRZ radius for each tree audited has been included within the survey.

Trunk diameters used in TPZ and SRZ calculations were predominantly directed measured, however some were estimated due to difficulty accessing the trunk and base of the trees.



The curve can be expressed by the following formula:
$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$

NOTES:

1 R_{SRZ} is the calculated structural root zone radius (SRZ radius).
2 D is the stem diameter measured immediately above root buttress.
3 The R_{SRZ} for trees less than 0.15 m diameter is 1.5 m.
4 The R_{SRZ} formula and graph do not apply to palms, other monocots, cycads and tree ferns.
5 This does not apply to trees with an asymmetrical root plate.

Figure 2 Displays the Structural Root Zone Calculation from AS 4970-2009 *Protection of trees on development sites* and indicates how to work out the SRZ of each tree.

Tree Survey Details over leaf.

Tree Number	Botanical Name	Tree Age	Approx. Height (M)	Approx. Canopy Spread (M)	DBH (MM)	Tree Health	Tree Structure	Helliwell Evaluation	TPZ radius (m)	SRZ radius (m)
62545	*Corymbia calophylla*	MATURE	12	10	640	POOR	FAIR	$6,401.70	7.68	2.92
62546	*Eucalyptus marginata*	SENESCENT	7	5	730	DEAD	FAIR	$0.00	8.76	3.03
62547	*Eucalyptus marginata*	SENESCENT	5	1	1010	DEAD	POOR	$0.00	12.12	3.57
62548	*Eucalyptus gomphocephala*	POSTMATURE	23	11	860	FAIR	FAIR	$7,682.04	10.32	3.6
62549	*Eucalyptus marginata*	MATURE	10.3	7	530	GOOD	FAIR	$6,401.70	6.36	2.65
62550	*Allocasuarina fraseriana*	POSTMATURE	12	8	680	POOR	POOR	$6,401.70	8.16	3.09
62551	*Eucalyptus marginata*	POSTMATURE	10	6	550	POOR	POOR	$5,121.36	6.6	3.27
62552	*Eucalyptus gomphocephala*	SENESCENT	15	9	520	DEAD	POOR	$0.00	6.24	2.8
62553	*Eucalyptus marginata*	SENESCENT	7	4	1040	DEAD	POOR	$0.00	12.48	3.75
62554	*Eucalyptus marginata*	POSTMATURE	12	6	720	POOR	POOR	$5,121.36	8.64	3.08
62555	*Eucalyptus marginata*	MATURE	10.5	6	520	FAIR	FAIR	$5,121.36	6.24	2.69
62556	*Eucalyptus rudis*	POSTMATURE	15	12	880	POOR	POOR	$7,682.04	10.56	3.14

Tree Number	Botanical Name	Tree Age	Approx. Height (M)	Approx. Canopy Spread (M)	DBH (MM)	Tree Health	Tree Structure	Helliwell Evaluation	TPZ radius (m)	SRZ radius (m)
62557	*Eucalyptus gomphocephala*	MATURE	23.6	16	1230	FAIR	FAIR	$10,242.72	14.76	3.77
62558	*Eucalyptus marginata*	SEMIMATURE	7	3	300	FAIR	FAIR	$1,920.51	3.6	2.08
62559	*Eucalyptus marginata*	MATURE	10	3	450	POOR	POOR	$5,121.36	5.4	2.63
62560	*Banksia attenuata*	POSTMATURE	8	8	330	POOR	POOR	$5,121.36	3.96	2.15
62561	*Eucalyptus marginata*	MATURE	12.3	4	470	POOR	POOR	$3,841.02	5.64	2.61
62562	*Eucalyptus marginata*	SEMIMATURE	3.7	2.5	150	GOOD	FAIR	$1,920.51	2	1.57
62563	*Banksia menziesii*	MATURE	7	4.5	330	GOOD	FAIR	$3,841.02	3.96	2.13
62564	*Banksia menziesii*	SEMIMATURE	3	2	170	FAIR	FAIR	$1,280.34	2.04	1.57
62565	*Banksia menziesii*	MATURE	5.7	6	630	GOOD	FAIR	$3,841.02	7.56	2.73
62566	*Eucalyptus marginata*	SEMIMATURE	5	2.5	220	FAIR	FAIR	$1,920.51	2.64	1.85
62567	*Banksia menziesii*	SEMIMATURE	4	2	210	FAIR	POOR	$640.17	2.52	1.79
62568	*Eucalyptus marginata*	MATURE	12	9	890	DEAD	POOR	$0.00	10.68	3.2
62569	*Corymbia calophylla*	MATURE	13.5	12	880	FAIR	FAIR	$6,401.70	10.56	3.14

Tree Number	Botanical Name	Tree Age	Approx. Height (M)	Approx. Canopy Spread (M)	DBH (MM)	Tree Health	Tree Structure	Helliwell Evaluation	TPZ radius (m)	SRZ radius (m)
62570	*Banksia menziesii*	SEMIMATURE	6	3	250	FAIR	FAIR	$1,280.34	3	2.02
62571	*Banksia menziesii*	MATURE	5	3	260	FAIR	POOR	$1,280.34	3.12	2.15
62572	*Eucalyptus marginata*	SEMIMATURE	7.6	6	480	FAIR	FAIR	$7,682.04	5.76	2.65
62573	*Eucalyptus marginata*	SEMIMATURE	7	5	380	FAIR	FAIR	$5,761.53	4.56	2.32
62574	*Eucalyptus marginata*	SEMIMATURE	5.5	4	290	FAIR	FAIR	$3,841.02	3.48	2.08
62575	*Eucalyptus rudis*	MATURE	12	7	450	FAIR	FAIR	$6,401.70	5.4	2.41
62576	*Eucalyptus rudis*	SEMIMATURE	6	3	310	FAIR	POOR	$2,560.68	3.72	2.08
62577	*Eucalyptus marginata*	SEMIMATURE	9	7	300	FAIR	FAIR	$7,682.04	3.6	2.13
62578	*Eucalyptus marginata*	MATURE	11	4	550	POOR	POOR	$2,560.68	6.6	2.73
62579	*Banksia attenuata*	SEMIMATURE	5	5	430	DEAD	POOR	$0.00	5.16	2.41
62580	*Banksia attenuata*	SEMIMATURE	4	2	170	FAIR	FAIR	$1,280.34	2.04	1.75
62581	*Banksia attenuata*	MATURE	5	6	390	DEAD	POOR	$0.00	4.68	2.39
62582	*Allocasuarina fraseriana*	SEMIMATURE	7	2	170	FAIR	FAIR	$2,560.68	2.04	1.72
62583	*Eucalyptus rudis*	MATURE	12	5	310	GOOD	FAIR	$5,761.53	3.72	2.23
62584	*Banksia attenuata*	SEMIMATURE	4.5	4	230	GOOD	FAIR	$2,560.68	2.76	1.94

Tree Number	Botanical Name	Tree Age	Approx. Height (M)	Approx. Canopy Spread (M)	DBH (MM)	Tree Health	Tree Structure	Helliwell Evaluation	TPZ radius (m)	SRZ radius (m)
62585	*Banksia menziesii*	SEMIMATURE	6	4	250	GOOD	FAIR	$2,560.68	3	1.91
62586	*Eucalyptus marginata*	SEMIMATURE	9	5	320	FAIR	FAIR	$5,761.53	3.84	2.39
62587	*Banksia sessilis*	MATURE	6	4	310	POOR	POOR	$3,841.02	3.72	2.18
62588	*Allocasuarina fraseriana*	SEMIMATURE	7	4	240	FAIR	FAIR	$3,841.02	2.52	1.94
62589	*Banksia species*	SENESCENT	5	5	450	DEAD	POOR	$0.00	5.4	2.45
62590	*Banksia attenuata*	MATURE	5	5	310	GOOD	FAIR	$3,841.02	3.72	2.23
62591	*Banksia menziesii*	MATURE	5	5	210	DEAD	POOR	$0.00	2.52	2.41
62592	*Banksia attenuata*	MATURE	4	5	270	GOOD	FAIR	$2,560.68	3.24	2.02
62593	*Eucalyptus marginata*	SEMIMATURE	6.5	5	240	FAIR	FAIR	$3,841.02	2.88	2.13
62594	*Eucalyptus marginata*	SEMIMATURE	7.4	5	230	FAIR	FAIR	$3,841.02	2.76	2.15
TOTAL								**$177,327.09**		

Summary

This consultant confirms that 50 trees located within the designated site of Progress Drive, Bibra Lake were found to be in predominantly fair health and fair structural condition.

Tree species

Eight different tree species were identified:

Botanical name	Common name
Allocasuarina fraseriana	Common Sheoak
Banksia attenuata	Candle Banksia
Banksia menziesii	Firewood Banksia
Banksia sessilis	Parrot Bush
Corymbia calophylla	Marri
Eucalyptus gomphocephala	Tuart
Eucalyptus marginata	Jarrah
Eucalyptus rudis	Flooded Gum

- All trees audited were considered suitable for retention at this time however once the proposed plans are finalised tree removal may be required pending upon the scope of works.
- Future remedial pruning works may be required when the proposed plans for the site are finalised as detailed planned usage patterns of the site are determined with the introduction of targets.
- The Helliwell Valuation was carried out based on the tree's current health and condition and the valuation of the 50 trees came in at **$177,327.09.**
- The majority of trees valued were considered to have a useful life expectancy (ULE) of 5 – 40 years due to poor or declining health and/or structural problems, with a number of semi mature specimen of *Eucalyptus marginata* (Jarrah) displaying fair to good health and were considered likely to persist with a useful life expectancy (ULE) of 40 – 100 years.
- 9 out of the 50 trees audited were found to be dead, with a number found to be suitable as habitat specimens. Dead trees do not receive a monetary value although they are considered valuable as habitat specimen.
- The TPZ and SRZ radius details for each tree provided in the report are based upon AS 4970-2009 *Protection of trees on development sites* and provide a guide to assist with the care and protection of trees to be retained, however further site inspection of select trees may be required where works are proposed in close proximity to trees to be retained.

General Tree Protection Guidelines

- The fenced tree protection zone (TPZ) is the principal means of protecting trees on development sites. All trees identified for retention shall be clearly marked and a TPZ established and fenced prior to the commencement of the development.
- This consultant advises that a structural root zone (SRZ) area of a tree is required for tree stability. The Australian Standards AS 4970-2009 *Protection of trees on development*

sites has been used to determine the structural root zone of each tree to be retained and required works within that zone are to be undertaken with prior written approval and under Arborist supervision.

- No building materials are to be stored or disposed of within the tree protection zone, with provisions implemented so that building chemicals do not come into contact with tree roots.
- Excavated soil shall not be stored or built up around the trunk of trees to be retained. **Soil levels shall not be changed around the base of trees, either raised or lowered.**
- Small tracked machinery equipped with a flat bladed bucket is to be used to undertake earthworks in proximity of trees to be retained to ensure root damage is minimised and roots cleanly cut rather than pulled and split.
- If a bob cat is to be used it is to be driven in a forward and backwards motion within the trees TPZ and no turning or squirreling is to be carried out within the recommended tree protection zone radius. This is to ensure that the soil is not dug into when turning which will rip and tear surface roots.
- If soil levels are to be lowered within the tree protection zone a spotter will be required to watch all works and it is preferable to use a mini excavator (Not a bobcat) when carrying out this work. The mini excavator is to lightly scrape the top layer off not gouge deep sections of soil. **Roots greater than 30mm in diameter are not to be cut without Arborist authorisation.**
- Any remedial pruning works which requires the removal of lower limbs to facilitate access by large machinery or to alleviate the level of risk to the contract staff shall be carried out by a competent Arborist to the relevant Australian Standards AS 4373-2007 *Pruning of amenity trees.*
- Where the extent of construction works has resulted in a nominated tree becoming structurally unstable or within a location to render the tree a high level of risk to property and persons, the contractor shall inform the works supervisor for further instructions.
- Any damage to a protected tree during the preliminary stages of site clearance or during the construction works shall be reported immediately to the site supervisor with remedial works carried out by a qualified Arborist to the relevant Australian Standard.
- Supplementary watering to retained trees may be required over summer months where works are in close proximity of the trees. Watering the trees is required to minimise stress on the trees while works are occurring. It is recommended to water deeply a minimum of once per week applying up to 300 litres for each tree. It is recommended that the water truck have a wetting agent added to assist soil wetting.
- Established trees of good vigour and structure are an asset. Trees are living organisms that require certain environmental conditions in order to maintain their value and multiple minor impacts during development have a cumulative impact upon the tree health. Damage to trees to be retained must therefore be avoided or minimized throughout the construction process and procedures to ensure the protection of trees are to be in place at all stages of the project.

Zana Sheary and Sarah Taylor - Arboricultural Consultants

Paperbark Technologies Pty Ltd
PO Box 1116
Scarborough WA 6922
Mob: 0401 817 551
zana@paperbarktechnologies.com.au
www.paperbarktechnologies.com.au
ISA Certified Arborist AU-0341A
Quantified Tree Risk Assessor Lic-3442/4098
Diploma of Horticulture/Arboriculture

Limitation of liability
Trees can be managed, but they cannot be controlled. To live or work near a tree involves a degree of risk.
This report only covers identifiable defects present at the time of inspection. Paperbark Technologies accepts no responsibility and cannot be held liable for any structural defect or unforeseen event/situation or adverse weather conditions that may occur after the time of inspection.
Paperbark Technologies cannot guarantee that the tree/s contained within this report will be structurally sound under all circumstances, and is not able to detect every condition that may possibly lead to the structural failure of a tree. Paperbark Technologies cannot guarantee that the recommendations made will categorically result in the tree being made safe.
Unless specifically mentioned this report will only be concerned with above ground inspections, as such all observations have been visually assessed from ground level. Trees are living organisms and as such cannot be classified as safe under any circumstances. Trees fail in ways that the arboriculture industry does not fully understand.
The recommendations are made on the basis of what can be reasonably identified at the time of inspection therefore Paperbark Technologies accepts no liability for any recommendations made.
All care has been taken to obtain information from reliable sources, however Paperbark Technologies can neither guarantee nor be responsible for the accuracy of information provided by others.
In the event that re-inspection of the tree/s is recommended it is the client's responsibility to make arrangements with Paperbark Technologies.

References

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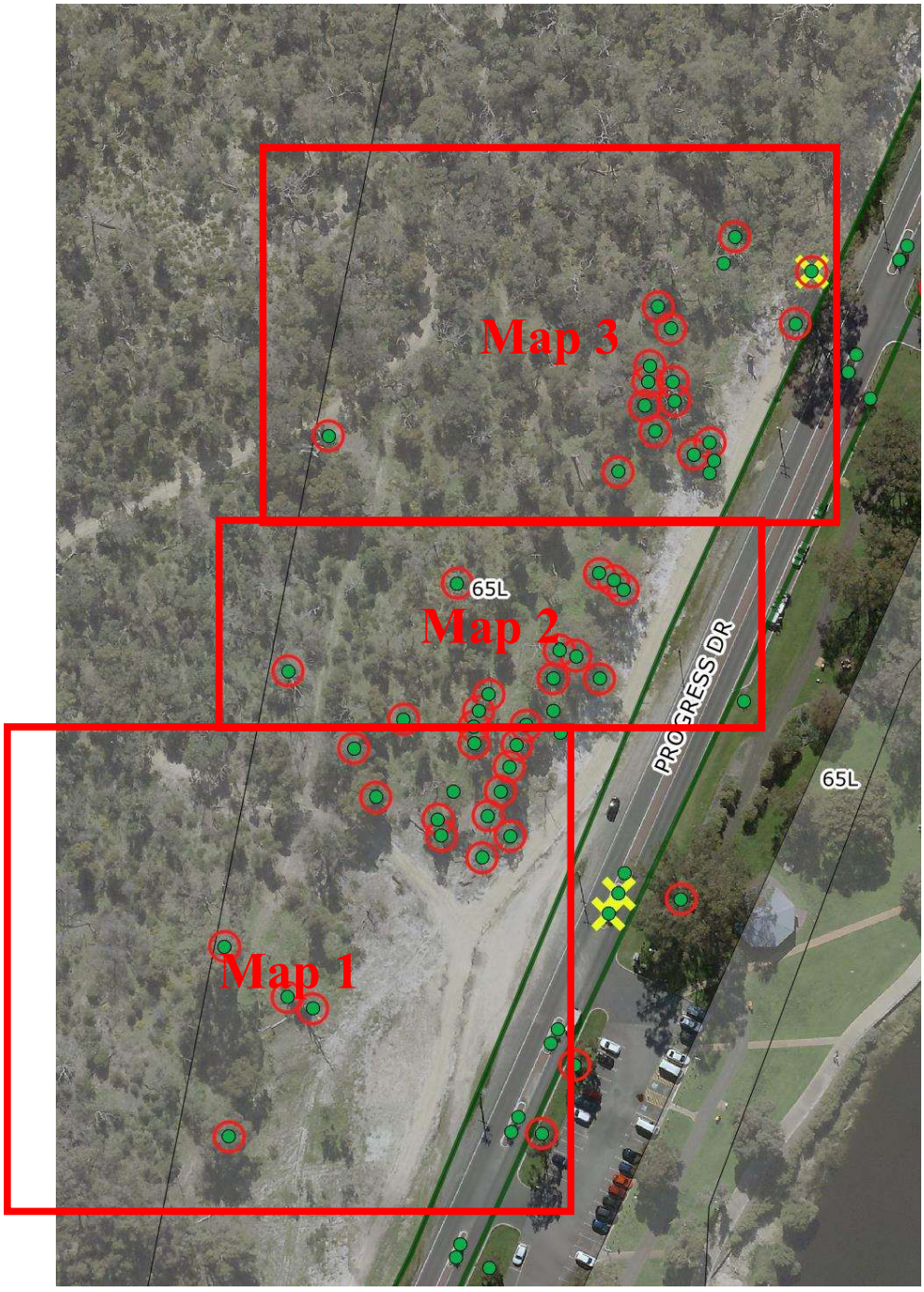
Australian Standard 4373-2007 *Pruning of amenity trees.*

Australian Standard 4970-2009 *Protection of trees on development sites.*

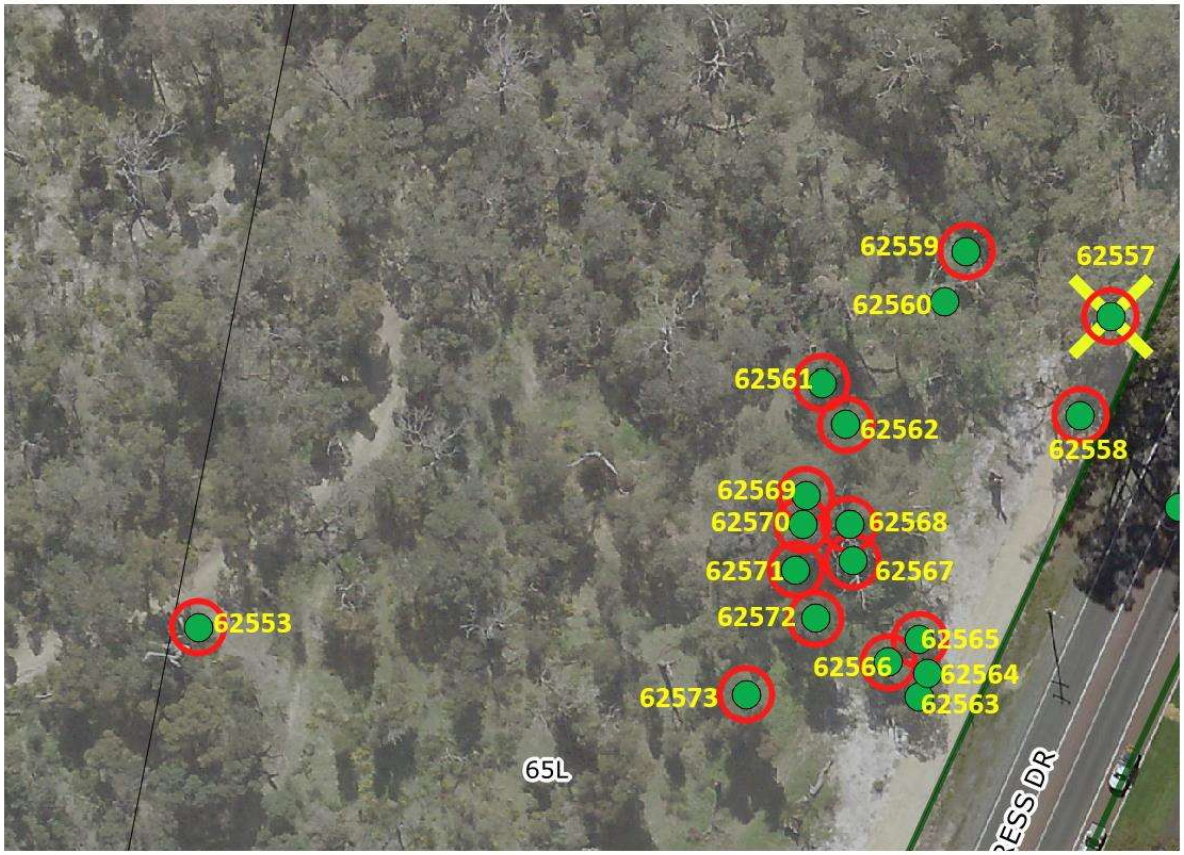
Overall Map



Map 1

Map 2

Map 3



Tree number and referenced photo numbers.

Tree No.	Photo 1	Photo 2
62545	2021-04-27-11-42-23-589.JPG	2021-04-27-11-42-23-718.JPG
62546	2021-04-27-11-47-32-977.JPG	2021-04-27-11-47-33-118.JPG
62547	2021-04-27-11-52-26-809.JPG	2021-04-27-11-52-27-001.JPG
62548	2021-04-27-11-57-31-134.JPG	2021-04-27-11-57-31-284.JPG
62549	2021-04-27-12-05-40-231.JPG	2021-04-27-12-05-40-419.JPG
62550	2021-04-27-12-09-21-539.JPG	2021-04-27-12-09-21-668.JPG
62551	2021-04-27-12-16-01-585.JPG	2021-04-27-12-16-01-766.JPG
62552	2021-04-27-12-23-16-275.JPG	2021-04-27-12-23-16-438.JPG
62553	2021-04-27-12-32-16-292.JPG	2021-04-27-12-32-16-423.JPG
62554	2021-04-27-12-48-34-036.JPG	2021-04-27-12-48-34-257.JPG
62555	2021-04-27-12-53-58-040.JPG	2021-04-27-12-53-58-201.JPG
62556	2021-04-27-12-59-33-884.JPG	2021-04-27-12-59-34-061.JPG
62557	2021-04-27-13-11-00-013.JPG	2021-04-27-13-11-00-172.JPG
62558	2021-04-27-13-20-47-089.JPG	2021-04-27-13-20-47-288.JPG
62559	2021-04-27-13-30-49-231.JPG	2021-04-27-13-30-49-354.JPG
62560	2021-04-27-13-36-57-561.JPG	2021-04-27-13-36-57-695.JPG
62561	2021-04-27-13-48-03-779.JPG	2021-04-27-13-48-03-898.JPG
62562	2021-04-27-13-51-08-715.JPG	2021-04-27-13-51-08-995.JPG
62563	2021-04-27-13-56-32-743.JPG	2021-04-27-13-56-32-895.JPG
62564	2021-04-28-06-46-47-771.JPG	2021-04-28-06-46-48-032.JPG
62565	2021-04-28-06-50-49-086.JPG	2021-04-28-06-50-49-201.JPG
62566	2021-04-28-07-00-05-926.JPG	2021-04-28-07-00-06-154.JPG
62567	2021-04-28-07-02-59-170.JPG	2021-04-28-07-02-59-348.JPG
62568	2021-04-28-07-07-00-504.JPG	2021-04-28-07-07-00-663.JPG
62569	2021-04-28-07-15-50-886.JPG	2021-04-28-07-15-51-063.JPG
62570	2021-04-28-07-21-54-351.JPG	2021-04-28-07-21-54-525.JPG
62571	2021-04-28-07-25-56-646.JPG	2021-04-28-07-25-56-807.JPG
62572	2021-04-28-07-29-31-321.JPG	2021-04-28-07-29-31-495.JPG
62573	2021-04-28-07-37-29-953.JPG	2021-04-28-07-37-30-185.JPG
62574	2021-04-28-07-41-30-603.JPG	2021-04-28-07-41-30-790.JPG
62575	2021-04-28-07-45-11-376.JPG	2021-04-28-07-45-11-634.JPG
62576	2021-04-28-07-49-09-249.JPG	2021-04-28-07-49-09-416.JPG
62577	2021-04-28-08-02-10-272.JPG	2021-04-28-08-02-10-563.JPG
62578	2021-04-28-08-05-39-736.JPG	2021-04-28-08-05-39-899.JPG
62579	2021-04-28-08-10-15-558.JPG	2021-04-28-08-10-15-749.JPG
62580	2021-04-28-08-15-39-419.JPG	2021-04-28-08-15-39-566.JPG
62581	2021-04-28-08-31-31-457.JPG	2021-04-28-08-31-31-575.JPG
62582	2021-04-28-08-34-12-497.JPG	2021-04-28-08-34-12-650.JPG
62583	2021-04-28-08-37-05-587.JPG	2021-04-28-08-37-05-748.JPG
62584	2021-04-28-08-40-49-095.JPG	2021-04-28-08-40-49-265.JPG
62585	2021-04-28-08-43-06-927.JPG	2021-04-28-08-43-07-089.JPG
62586	2021-04-28-08-46-40-997.JPG	2021-04-28-08-46-41-154.JPG
62587	2021-04-28-08-57-11-080.JPG	2021-04-28-08-57-11-252.JPG

Tree No.	Photo 1	Photo 2
62588	2021-04-28-09-01-39-687.JPG	2021-04-28-09-01-39-923.JPG
62589	2021-04-28-09-04-35-691.JPG	2021-04-28-09-04-35-810.JPG
62590	2021-04-28-09-08-57-588.JPG	2021-04-28-09-08-57-779.JPG
62591	2021-04-28-09-17-21-578.JPG	2021-04-28-09-17-21-735.JPG
62592	2021-04-28-09-19-41-760.JPG	2021-04-28-09-19-41-985.JPG
62593	2021-04-28-09-23-38-282.JPG	2021-04-28-09-23-38-518.JPG
62594	2021-04-28-09-26-13-119.JPG	2021-04-28-09-26-13-275.JPG

Photos of trees in order

2021-04-27-11-42-23-589.JPG

2021-04-27-11-42-23-718.JPG

2021-04-27-11-47-32-977.JPG

2021-04-27-11-47-33-118.JPG

2021-04-27-11-52-26-809.JPG

2021-04-27-11-52-27-001.JPG

2021-04-27-11-57-31-134.JPG

2021-04-27-11-57-31-284.JPG

2021-04-27-12-05-40-231.JPG

2021-04-27-12-05-40-419.JPG

2021-04-27-12-09-21-539.JPG

2021-04-27-12-09-21-668.JPG

2021-04-27-12-16-01-585.JPG

2021-04-27-12-16-01-766.JPG

2021-04-27-12-23-16-275.JPG

2021-04-27-12-23-16-438.JPG

2021-04-27-12-32-16-292.JPG

2021-04-27-12-32-16-423.JPG

2021-04-27-12-48-34-036.JPG

2021-04-27-12-48-34-257.JPG

2021-04-27-12-53-58-040.JPG

2021-04-27-12-53-58-201.JPG

2021-04-27-12-59-33-884.JPG

2021-04-27-12-59-34-061.JPG

2021-04-27-13-11-00-013.JPG

2021-04-27-13-11-00-172.JPG

2021-04-27-13-20-47-089.JPG

2021-04-27-13-20-47-288.JPG

2021-04-27-13-30-49-231.JPG

2021-04-27-13-30-49-354.JPG

2021-04-27-13-36-57-561.JPG

2021-04-27-13-36-57-695.JPG

2021-04-27-13-48-03-779.JPG

2021-04-27-13-48-03-898.JPG

2021-04-27-13-51-08-715.JPG

2021-04-27-13-51-08-995.JPG

2021-04-27-13-56-32-743.JPG

2021-04-27-13-56-32-895.JPG

2021-04-28-06-46-47-771.JPG

2021-04-28-06-46-48-032.JPG

2021-04-28-06-50-49-086.JPG

2021-04-28-06-50-49-201.JPG

2021-04-28-07-00-05-926.JPG

2021-04-28-07-00-06-154.JPG

2021-04-28-07-02-59-170.JPG

2021-04-28-07-02-59-348.JPG

2021-04-28-07-07-00-504.JPG

2021-04-28-07-07-00-663.JPG

2021-04-28-07-15-50-886.JPG

2021-04-28-07-15-51-063.JPG

2021-04-28-07-21-54-351.JPG

2021-04-28-07-21-54-525.JPG

2021-04-28-07-25-56-646.JPG

2021-04-28-07-25-56-807.JPG

2021-04-28-07-29-31-321.JPG

2021-04-28-07-29-31-495.JPG

2021-04-28-07-37-29-953.JPG

2021-04-28-07-37-30-185.JPG

2021-04-28-07-41-30-603.JPG

2021-04-28-07-41-30-790.JPG

2021-04-28-07-45-11-376.JPG

2021-04-28-07-45-11-634.JPG

2021-04-28-07-49-09-249.JPG

2021-04-28-07-49-09-416.JPG

2021-04-28-08-02-10-272.JPG

2021-04-28-08-02-10-563.JPG

2021-04-28-08-05-39-736.JPG

2021-04-28-08-05-39-899.JPG

2021-04-28-08-10-15-558.JPG

2021-04-28-08-10-15-749.JPG

2021-04-28-08-15-39-419.JPG

2021-04-28-08-15-39-566.JPG

2021-04-28-08-31-31-457.JPG

2021-04-28-08-31-31-575.JPG

2021-04-28-08-34-12-497.JPG

2021-04-28-08-34-12-650.JPG

2021-04-28-08-37-05-587.JPG

2021-04-28-08-37-05-748.JPG

2021-04-28-08-40-49-095.JPG

2021-04-28-08-40-49-265.JPG

2021-04-28-08-43-06-927.JPG

2021-04-28-08-43-07-089.JPG

2021-04-28-08-46-40-997.JPG

2021-04-28-08-46-41-154.JPG

2021-04-28-08-57-11-080.JPG

2021-04-28-08-57-11-252.JPG

2021-04-28-09-01-39-687.JPG

2021-04-28-09-01-39-923.JPG

2021-04-28-09-04-35-691.JPG

2021-04-28-09-04-35-810.JPG

2021-04-28-09-08-57-588.JPG

2021-04-28-09-08-57-779.JPG

2021-04-28-09-17-21-578.JPG

2021-04-28-09-17-21-735.JPG

2021-04-28-09-19-41-760.JPG

2021-04-28-09-19-41-985.JPG

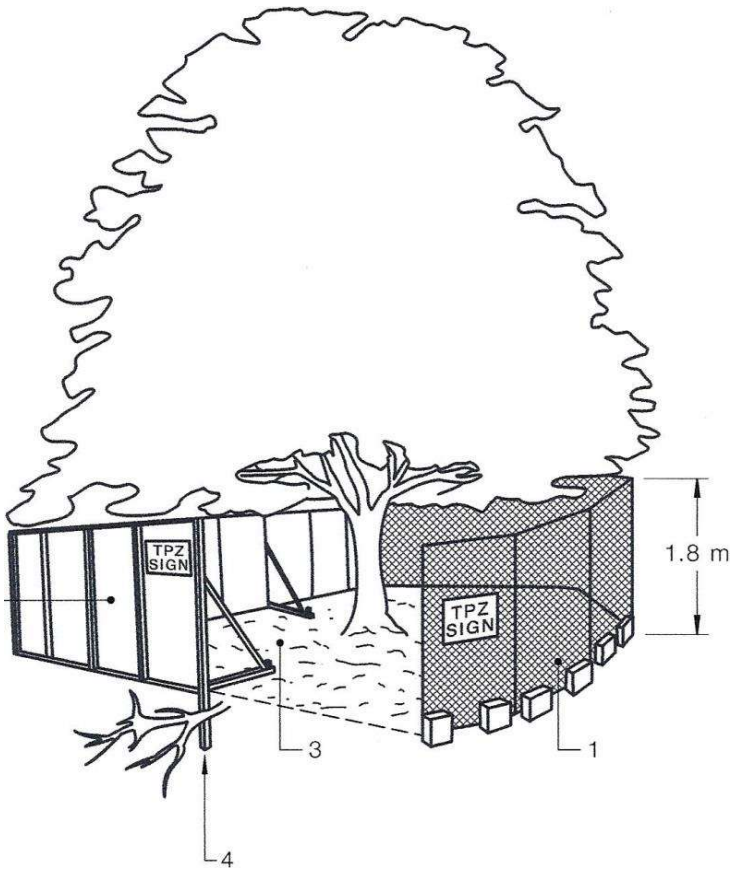
2021-04-28-09-23-38-282.JPG

2021-04-28-09-23-38-518.JPG

2021-04-28-09-26-13-119.JPG

2021-04-28-09-26-13-275.JPG

Example of Tree Protection Fencing from AS 4970-2009



LEGEND:
1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.