Arboricultural Impact Assessment



Prepared For Mr. Trent Girdler 1 Whale Beach Road AVALON BEACH NSW 2107

SITE ADDRESS 1 WHALE BEACH ROAD AVALON BEACH NSW 2107

Prepared by Chantalle Brackenridge Hughes Consulting Arboriculturist & Horticulturist Diploma of Arboriculture AQF Level 5



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1 Introduction

1.1 Brief

- 1.1.1 This Arboricultural Impact Assessment (AIA) was prepared by Chantalle Hughes of Treeism Arboricultural Services. This report was commissioned by Mr Trent Girdler, owner of the subject site. The Site is identified as Lot 122 of DP 17189 and known as 1 Whale Beach Road, Whale Beach, New South Wales.
- 1.1.2 The purpose of this report is to identify the species of each assessed tree, assess their vigour, condition, landscape prominence and ascribe a Retention Value to each tree.
- 1.1.3 The Structural Root Zone (SRZ) and the Tree Protection Zone (TPZ) of each tree is established using the formula provided within the Australian Standard 4970-2009 Protection of trees on development sites (AS4970).
- 1.1.4 This report identifies the potential impacts the proposal will have on the retention or long-term viability of each tree and aims to provide guidelines for tree protection and maintenance during development.
- 1.1.5 Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.
- 1.1.6 This report is not intended to be a comprehensive tree risk assessment; however, the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.
- 1.1.7 This AIA is not intended as an assessment of any impacts on the trees by any proposed future development of the site.

1.2 Methodology

- 1.2.1 In preparation for this report, ground level, visual tree assessments¹ or limited VTA (e.g. where access was limited), of fourteen (14) trees was completed by the author of this report on 18th November 2020. Inspection details of these trees are provided in Appendix 5 Schedule of Assessed Trees.
- 1.2.2 The tree heights were visually estimated or measured using a Nikon ForestryPro, unless otherwise noted in Appendix 5, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape. Tree canopy spreads were stepped out with field observations written down, and photographs of the site and trees were taken using an iPhone SE.
- 1.2.3 Information contained in this report only reflects the condition of the trees at the time of inspection. Trees are dynamic, living things which can be subject to change without notice in certain circumstances.

¹ Visual Tree Assessment (VTA) is a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.



- 1.2.4 No aerial inspections, root mapping or woody tissue testing were undertaken as part of this tree assessment.
- 1.2.5 Plans and documents referenced for the preparation of this report include:
 - AS4970-2009 Protection of trees on development sites, Standards Australia;
 - Pittwater 21 Development Control Plan (DCP) 2014, Part B Section 22.
 - Survey Plan, Reference no. 3369, authored by DP Surveying, dated 17 September 2020.
 - Working Drawings, Project no. A-127, authored by A H Design, dated October 2020.
 - Preliminary Landscape Plan, Drawing no. L/01, authored by Discount Landscape Plans, dated 2 December 2020.

1.3 Tree Preservation and Management Guidelines

• This AIA takes account the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 'Vegetation SEPP' and the Pittwater 21 Development Control Plan (DCP) 2014, Part B Section 22.

2 Observations and Discussion

2.1 Threatened Species

2.1.1 No assessed tree was found to be subject to conservation status under NSW State Government legislation (i.e. NSW Biodiversity Conservation Act 2016) or Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.2 Assessed Trees

- 2.2.1 Fourteen (14) trees (prescribed and non-prescribed) were assessed or identified and are included in this report. Details of these are included in the Schedule of Assessed Trees—Appendix 5.
- 2.2.2 <u>Tree numbers</u>—of the fourteen (14) assessed trees, the following is noted:
 - Two (2) trees are located on Council manage land adjacent to the subject site—Tree 1 & 2.
 - Nine (9) trees are prescribed and are located on the subject site—Tree 3, 5, 6, 7 & 9-13.
 - Three (3) trees are non-prescribed and located on the subject site—Tree 4, 8 & 14.
- 2.2.3 **Species origin** Of the ten (10) prescribed trees, the following is noted:
 - Nine (9) prescribed trees are locally native species—Tree 1-3, 6, 7 & 9-13.
 - One (1) prescribed tree is an unknown native species—Tree 5.



2.2.4 The ten (10) prescribed trees and their respective Retention Value (RV) are identified in Table 1, below. Note: Refer to Appendix 3 for the methodology used to assess the Retention Value of a tree.

Tree No.	Genus & species Common Name	RV	Tree No.	Genus & species Common Name	RV
1	Angophora costata Sydney Red Gum	н	10	Melaleuca linariifolia Snow in Summer	L
2	Angophora costata Sydney Red Gum	н	11	Melaleuca quinquenervia Broad leaved Paperbark	м
3	Callistemon/Melaleuca viminalis Weeping Bottlebrush	Μ	12	Casuarina cunninghamiana River She-oak	м
5	<i>Eucalyptus</i> sp. Gum	L	13	Eucalyptus punctata Grey Gum	L
6	Syzygium smithii Common Lilly Pilly	М			
7	Syzygium smithii Common Lilly Pilly	М			
9	Eucalyptus botryoides Bangalay	L			

Table 1 —Tree Identification and Retention Value, where L = Low, M = Medi	lium. H = High. R = proposed remova	ı.
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3 Impact of the Proposed Development

- 3.1 Potential Required Removal of Prescribed Trees
 - 3.1.1 Three (3) trees would be required to be removed to accommodate the proposed works:
 - <u>Tree 7 Syzygium smithii (Common Lilly Pilly)</u> located just over 1m from the internal refiguration for the main subject site dwelling, the excavation for footings will fall well within the Structural Root Zone (SRZ) of this specimen. This tree would require removal to accommodate the proposal.
 - <u>Tree 9 Eucalyptus botryoides (Bangalay)</u> the canopy of this specimen is orientated to the west low over the proposed dining area and would require significant pruning, the proposed decking will fall within the calculated SRZ of this specimen. Removal of this low Retention Value (RV) tree would facilitate ease for design and adequate usable lawn area for the rear yard.
 - <u>Tree 13 Eucalyptus punctata (Grey Gum)</u> this tree is almost dead and should be removed irrespective of the subject site proposal.

3.2 Proposed Prescribed Tree Retention

- 3.2.1 The following prescribed eight (8) trees are proposed to be retained:
 - <u>Tree 1 Angophora costata (Sydney Red Gum)</u> located adjacent to the subject site.
 - <u>Tree 2 Angophora costata (Sydney Red Gum)</u> located adjacent to the subject site.
 - <u>Tree 3 Callistemon/Melaleuca viminalis (Weeping Bottlebrush)</u> located on the subject site.
 - <u>Tree 5 Eucalyptus sp</u>. (Gum) located on the subject site.
 - <u>Tree 6 Syzygium smithii (Common Lilly Pilly)</u> located on the subject site.
 - <u>Tree 10 Melaleuca linariifolia (Snow in Summer)</u> located on the subject site.
 - <u>Tree 11 Melaleuca quinquinervia (Broad leaved Paperbark)</u> located on the subject site.
 - <u>Tree 12 Casuarina cunninghamiana (River She-oak)</u> located on the subject site.
- 3.2.2 Under the Australian Standard 4970-2009 *Protection of trees on development sites* (AS4970), encroachments less than 10% of the *Tree Protection Zone* (TPZ) are considered to be minor. No specifications are provided in AS4970 for potential impacts of 10% or greater. This 10% is interpreted as the threshold figure, and the trigger where arboricultural investigations into TPZ encroachments beyond this figure need to be considered under the consideration set out in Section 3.3.4 of AS4970.
- 3.2.3 Disturbance within the *Structural Root Zone* (SRZ), and extent of encroachments into the TPZ's of prescribed trees to be retained are summarised in Table 2, below/next page.

Tree No.	Tree Common name	Tree located on site	SRZ affected	TPZ area (m2)	TPZ encroachment (approx. m2)	TPZ encroachment (approx. %)
1	Sydney Red Gum	×	×	72	0	0
2	Sydney Red Gum	×	×	64	0	0
3	Weeping Bottlebrush	\checkmark	×	55	0	0
5	Gum	~	×	92	4.3	4.6
6	Common Lilly Pilly	✓	×	28	*0.9	*3.2
10	Snow in Summer	✓	×	18	0	0
11	Broad leaved Paperbark	✓	×	137	*12.4	*9.1
12	River She-oak	✓	×	113	*19.5	*17.3

Table 2 – Indicates whether encroachment occurs into the SRZ and/or TPZ of trees proposed for retention. Site-specific constraints will heavily influence the presence of roots in a particular location.

*Indicates further explanation below will greatly differ (in this case, reduce) the calculated encroachment shown within Table 2.



<u>Tree 1 & 2</u> – Sydney Red Gum – located adjacent to subject site.

Structural Root Zone impacts:

• The existing driveway is remaining unchanged, no impacts to the SRZ are foreseen.

Tree Protection Zone impacts:

• The existing driveway is remaining unchanged, no impacts within the TPZ have been calculated.

Pruning impacts:

- No pruning is required for these two street trees.
- 3.2.4 <u>Tree 3</u> Weeping Bottlebrush located on subject site.

Structural Root Zone impacts:

- All proposed works are located outside the SRZ.
 <u>Tree Protection Zone impacts</u>:
- The proposed Detention tank sits outside the calculated TPZ of this specimen. <u>Pruning impacts</u>:
- No pruning is foreseen as required for the proposed works.
- 3.2.5 <u>Tree 5</u> Gum located on adjacent site.

Structural Root Zone impacts:

• All proposed works are located outside the SRZ.

Tree Protection Zone impacts:

- An estimated encroachment of 4.3m² or 4.6% has been calculated in relation to the proposed detention tank, front porch, and side access paving. This is considered *minor* encroachment under AS4970.
- It is unlikely the proposed works would further impact the already poor health of this specimen.

Pruning impacts:

- The canopy is held high over the subject site and pruning would not be required to accommodate the proposed works.
- 3.2.6 <u>Tree 6</u> Common Lilly Pilly located on subject site.

Structural Root Zone impacts:

• All proposed works are located outside the SRZ.

Tree Protection Zone impacts:

• A total encroachment of 0.9m² or 3.2% has been calculated within the TPZ placing it in the *minor* category under AS4970. Additionally, the proposed decking will be over existing concrete, so it is very unlikely to impact tree roots.

Arboricultural Impact Assessment 1 Whale Beach Road, Whale Beach. December 2020



Pruning impacts:

- Some pruning may be required to ensure branches are not torn during demolition of the existing carport.
- 3.2.7 <u>Tree 10</u> Snow in Summer located on subject site.

Structural Root Zone impacts:

• All proposed works are located outside the SRZ.

Tree Protection Zone impacts:

• All proposed works are outside the TPZ of this tree.

Pruning impacts:

- No pruning is foreseen as required for the proposed works.
- 3.2.8 <u>Tree 11</u> Broad leaved Paperbark located on subject site.

Structural Root Zone impacts:

• All proposed works are located outside the SRZ.

Tree Protection Zone impacts:

- A total encroachment of 12.4m² or 9.1% (see Figure 1 below) has been calculated within the TPZ placing it in the *minor* category under AS4970. The encroachment is solely from the proposed decking for the rear extension.
- This lightweight deck structure is unlikely to affect the long term survival of this specimen.

Pruning impacts:

- It is unlikely any canopy pruning would be required. Should any be required then this will be less than 10% of the total live canopy of the tree and easily comply with AS4373 Pruning of Amenity Trees.
- 3.2.9 <u>Tree 12</u> River She-oak located on subject site.

Structural Root Zone impacts:

• The proposed retaining wall surrounding the sits just outside the SRZ of this specimen (see Figure 1 below).

Tree Protection Zone impacts:

- A total encroachment of 19.5m² or 17.3% has been calculated within the TPZ for the proposed pool and decking for the rear extension. This is considered a *major* encroachment under AS4970, however, is not a true indication of encroachment for this tree.
- The decking will be a lightweight structure and unlikely to require solid strip footings to accommodate it.
- The retaining wall and pool encroachment has been estimated as 12.5m² or 9.1%, the encroachment solely from the pool and wall is considered in the *minor* category of encroachment under AS4970.



• Additionally this species is very tolerant to root disturbance and negative impact on long term health or condition is considered unlikely.

Pruning impacts:

• This tree has been subjected to significant crown lifting previously and no pruning is deemed required to accommodate works.



Figure 1 – Tree 10-12 – Proposed encroachment, orange dotted circle SRZ, blue dashed TPZ. Pink shading represents encroachment. (excerpt of Preliminary Landscape Plan by Discount Landscape Plans). Not to scale. Marked up by C. Hughes.



4 Conclusions

- 4.1.1 A total of fourteen (14) trees are included in this Arboricultural Impact Assessment.
- 4.1.2 One (1) tree ascribed a *medium* Retention Value tree (Tree 7) and (2) two trees ascribed a *low* Retention Value tree (Tree 9 & 13) will require removal to accommodate the proposal.
- 4.1.3 Tree 13 requires removal irrespective of the development.
- 4.1.4 Provided the recommendations of this report are adopted, adverse impacts on the vitality and condition of the trees to be retained are unlikely.

5 Recommendations

5.1 Tree Removal

- 5.1.1 Three (3) trees (Tree 7, 9 & 13) will require removal to accommodate the proposal.
- 5.1.2 Tree removal is at the discretion of Council approving such, no work should be carried out prior to approval.
- 5.1.3 Tree removal works are to be carried out by an AQF Level 3 Arborist.
- 5.1.4 Tree removals are to be undertaken in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998) and Safe Work Guide to Managing Risks of Tree Trimming and Removal Work 2016.
- 5.1.5 Tree removals shall be in accordance with the Work Health and Safety Act 2011 and the Work Health and Safety (WHS) Regulations 2011.

5.2 Project Arboriculturist

- 5.2.1 A Project Arboriculturist (PA) shall be engaged prior to further works commencing on the site.
- 5.2.2 The PA must have a minimum Australian Qualification Framework Level 5 (AQF5) or above in Arboriculture.
- 5.2.3 Duties of the PA shall include, but not be limited to:
 - Liaising with the Project Manager/Head Contractor/Site Manager to confirm the tree protection fencing locations, construction access, and other specific tree protection requirements prior to site works commencing.
 - Inspection of Tree Protection Devices and supervision of works as recommended in this report or as specified in any Conditions of Consent associated with an approved development application.
 - Provision of Compliance Certification if, and when required.

5.3 Minimising Impacts on Trees to be Retained

- 5.3.1 <u>Tree 1 & 2</u> Sydney Red Gum located adjacent to subject site.
 - Protect Tree 1 & 2 by placing temporary fencing and signage a minimum 4.5m from the tree stems ensuring pathway, driveway and road access.



- Any ground level changes within the calculated TPZ the subject trees are to be supervised by the Project Arborist/Council.
- No canopy pruning is considered to be required.
- Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.2 <u>Tree 3</u> Weeping Bottlebrush– located on adjacent site.
 - Protect Tree 3 by placing temporary fencing and signage a minimum 4m from the tree stem.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
 - Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.3 <u>Tree 5</u> Gum– located on subject site.
 - Protect Tree 5 by placing temporary fencing and signage a minimum 5m from the tree stem outside active work zones.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
 - Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.4 <u>Tree 6</u> Common Lilly Pilly– located on subject site.
 - Protect Tree 6 by placing temporary fencing and signage a minimum 3m from the tree stem outside active work zones.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
 - Any required canopy pruning shall be carried out by an AQF Level 3 Arborist and to a maximum 10% of the total live canopy.
 - Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.5 <u>Tree 10</u> Snow in Summer– located on subject site.
 - Protect Tree 10 by placing temporary fencing and signage a minimum 2.5m from the tree stem outside active work zones.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
 - Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.6 <u>Tree 11</u> Broad leaved Paperbark– located on subject site.
 - Protect Tree 11 by placing temporary fencing and signage a minimum 6.5m from the tree stem outside active work zones.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.



- Any required canopy pruning shall be carried out by an AQF Level 3 Arborist and to a maximum 10% of the total live canopy.
- Refer to Section 6 & 7 of this report for further tree protection measures.
- 5.3.7 <u>Tree 12</u> River She-oak– located on subject site.
 - Protect Tree 12 by placing temporary fencing and signage a minimum 6m from the tree stem outside active work zones.
 - Any ground level changes within the calculated TPZ the subject tree are to be supervised by the Project Arborist/Council.
 - Any required canopy pruning shall be carried out by an AQF Level 3 Arborist and to a maximum 10% of the total live canopy.

Refer to Section 6 & 7 of this report for further tree protection measures.



6 General Tree Protection Measures

6.1 Stockpiling

6.1.1 Any ground identified for proposed stockpiling that is within the TPZ of trees to be retained shall be covered with thick, coarse mulch, placement of wooden pallets over the mulch, covering of the pallets with a tarpaulin (or similar), and the placement of materials on top of this device to prevent loose or potentially contaminating materials from moving into the soil profile.

6.2 Fill Material

- 6.2.1 Placement of fill material within the TPZ of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be a coarse, gap graded material such as 20 50mm crushed basalt or equivalent to provide some aeration to the root zone. Note that roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose.
- 6.2.2 The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil.
- 6.2.3 A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material should be placed in direct contact with the trunk.

6.3 Hygiene Practices

6.3.1 No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within 8m upslope of any palms/trees to be retained.

7 Post Construction Tree Care Measures

7.1 Mulching

7.1.1 The removal of mulch after construction to remove any contaminants and its replacement with a good quality mulch and addition of 10% organic matter will improve beneficial soil micro-organisms, retain moisture and improve aeration and water infiltration.

7.2 Irrigation

7.2.1 An arboriculturist should determine whether irrigation should be carried out during extended periods of drought.

7.3 Pest Management

7.3.1 Monitoring is required, as trees under stress are more prone to insect attack.



8 References

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9 Acknowledgements

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Report prepared by Chantalle Hughes – December, 2020

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10 Appendices

Appendix 1 – Terms and Definitions

Age classes

- Y Young refers to an established but juvenile tree.
- **SM** Semi-mature refers to a tree at growth stages between immaturity and full size.
- **EM** Early-mature refers to a tree close to full sized still actively growing.
- M Mature refers to a full sized tree with some capacity for further growth.

LM Late-Mature refers to a full sized tree with little capacity for growth that is not yet about to enter decline.

OM Over-Mature refers to a full sized tree with little capacity for growth that is entering or has entered decline.

Co-dominant: refers to stems or branches equal in size and relative importance.

Condition/Structure: refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition/structure.

Deadwood: refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.

Diameter at Breast Height (DBH): Refers to the tree trunk diameter at breast height (1.4 metres above ground level).

Epicormic growth: adventitious branches that are considered to be a weak attachment in the short term due to minimal wood formation. There are generally formed following storm-related branch breakage or poor pruning practices. Should sufficient holding wood form in the long-term this growth is less of an issue.

Hazard: refers to anything with the potential to harm health, life or property.

Health: Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Secondary Stem: refers to stems or branches with one of unequal size and relative importance.

SRZ: refers to the Structural Root Zone of the tree, this is the area required for tree stability.

TPZ: refers to the Tree Protection Zone of the tree, this is the primary method of protecting trees, it is a combination of the root area and the canopy and the SRZ is located within it.

Visual Tree Assessment (VTA): a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

Appendix 2 – ULE Guide



ULE categories (after Barrell 1996, Updated 01/04/01)

The five categories and their sub-groups are as follows:

- 1. Long ULE tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Structurally sound trees located in positions that can accommodate future growth
 - b) Trees which could be made suitable for long term retention by remedial care
 - c) Trees of special significance which would warrant extraordinary efforts to secure their long term retention
- 2. Medium ULE tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Trees which may only live from 15 to 40 years
 - b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons
 - c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - d) Trees which could be made suitable for retention in the medium term by remedial care
- 3. Short ULE tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Trees which may only live from 5 to 15 years
 - b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons
 - c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - d) Trees which require substantial remediation and are only suitable for retention in the short term.
- 4. Removal trees which should be removed within the next 5 years:
 - a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions
 - b) dangerous trees through instability or recent loss of adjacent trees
 - c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form
 - d) Damaged trees that are clearly not safe to retain
 - e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - f) Trees which are damaging or may cause damage to existing structures within the next 5 years
 - g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
 - h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review
- 5. Small, young or regularly pruned Trees that can be reliably moved or replaced:
 - a) small trees less than 5m in height
 - b) young trees less than 15 years old but over 5m in height
 - c) formal hedges and trees intended for regular pruning to artificially control growth



Appendix 3 – STARS – Significance of a Tree Assessment Rating System (IACA 2010)©

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape.

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* tree is appropriate to the site conditions.

2. Medium Significance in landscape.

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area;
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street;
- The tree provides a fair contribution to the visual character and amenity of the local area;
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape.

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings;
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area;
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen;
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* tree is inappropriate to the site conditions;
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms;
- The tree has a wound or defect that has potential to become structurally unsound.



Appendix 3 – STARS – Significance of a Tree Assessment Rating System (IACA 2010)©

Environmental Pest / Noxious Weed Species:

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties;
- The tree is a declared noxious weed by legislation. Hazardous/Irreversible Decline:
- The tree is structurally unsound and/or unstable and is considered potentially dangerous;
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are designed for individual trees only but can be applied to a monocultural stand in its entirety e.g. hedge.

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd and Andrew Morton in June 2001.



Table 1 - Tree Retention Value - Priority Matrix.

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

Appendix 4 – Tree Protection Devices



Figures 1 & 2 – Tree Protection Fencing and appropriate signage.



Figure 3 - Stem, Branch & Ground protection measures

Key

- Padding (such as geotextile membrane, natural hessian, rubber, or carpet to protect bark).
- 2. Battens/boards for branch/stem protection, strapped together NOT nailed into bark/tree. Minimum 2m in height on stem where feasible.
- 3. Ground protection base 75-100mm of fit for purpose mulch.
- If machinery is required to move within the TPZ then steel rumble boards (4a) or wide, timber sheeting/boards thrashed together (4b) is to be placed over mulch layer (preferably with geotextile base layer), this to spread the weight and minimise soil compaction



Figure 3 – Stem and ground protection measures.

Appendix 5 – Schedule of Assessed Trees – Site inspection 18/11/2020, 1 Whale Beach Road, WHALE BEACH.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	v	с	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
1	Angophora costata Sydney Red Gum	15	16	400	Μ	G	F	Locally native species. Located on Council managed land adjacent to site. Die-back in the upper canopy. Crossing, rubbing branches mid canopy.	2A	Н	Н	2.4	4.8	72
2	Angophora costata Sydney Red Gum	13	16	375	Μ	G	G-F	Locally native species. Located on Council managed land adjacent to site. Minor die-back in the upper canopy, canopy orientated to the north. Codominant @ 5m AGL.	2A	Н	Н	2.3	4.5	64
3	Callistemon/Melaleuca viminalis Weeping Bottlebrush	7	10	AB 350	М	G	G	Introduced native species. Sprawling specimen. Multiple stems from ground level. Small stubs noted.	2A	М	М	2.1	4.2	55
4	Archontophoenix cunninghamiana Bangalow Palm	-	-	-	-	-	-	Introduced native species. Exempt species under P21 DCP 2014.	2A	L	L	-	-	-
5	<i>Eucalyptus</i> sp. Gum	14	10	450	Μ	Ρ	Ρ	Native species. Poor, twisted form. 95% epicormic growth. Significant borer damage at base of stem. Tree in spiral of decline.	4A	L	L	2.5	5.4	92
6	Syzygium smithii Common Lilly Pilly	6.5	10	225/ 150 (275)	EM	G	G	Locally native species. Secondary stem @ 0.1m AGL. Small decay pocket with cavity in stem union.	2A	М	М	2.1	3.0	28
7	Syzygium smithii Common Lilly Pilly	8	12	375	Μ	G	G	Locally native species. Lost limb to south, Located 2.3m from wall of dwelling, 0.2m from deck. Canopy orientated over dwelling.	2A	Μ	Μ	2.4	4.5	64

Tree No	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	v	С	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
8	Howea forsteriana Kentia Palm	-	-	-		-	-	Introduced native species. Exempt species under P21 DCP 2014.	2A	L	L	-	-	-
9	Eucalyptus botryoides Bangalay	8	10	250	EM	F-P	F-P	Locally native species. Strong lean to west. Insect damage noted. Lost low codominant limb to west in recent storm. High percentage of deadwood.	3A	L	L	2.1	3.0	28
10	Melaleuca linariifolia Snow in Summer	4.5	8	200	Μ	G	F	Locally native species. Lost codominant limb to east. Sprawling canopy orientated over neighbouring property.	3A	L	L	2.0	2.4	18
11	Melaleuca quinquenervia Broad leaved Paperbark	15	10	550	Μ	G	G	Locally native species. One low dog- legged limb to west. Twiggy deadwood noted. Codominant @ 3m AGL, union sound.	2A	М	Μ	2.9	6.6	137
12	Casuarina cunninghamiana River She-oak	15	10	500	М	G	G-F	Locally native species. Heavily crown raised. Codominant @ 5m AGL.	2A	М	М	2.8	6.0	113
13	Eucalyptus punctata Grey Gum	9	6	250	EM	Р	Р	Locally native species. 5% live canopy. Fauna scratches up stem,.	4A	L	L	2.0	3.0	28
14	Archontophoenix cunninghamiana Bangalow Palm	-	-	-	-	-	-	Introduced native species. Exempt species under P21 DCP 2014.	2A	L	L	-	-	-

KEY



Trees to be retained.

Dead/non-prescribed tree or palm on site that may be removed or retained without Development Consent or Tree Management Permit.

Trees proposed to be removed.



Low Retention Value-These trees are not considered important for retention.

Т

Medium Retention Value-These trees may be retained & protected.

н

High Retention Value -These trees are considered important for retention and should be retained and protected.

* DBH is visually estimated (usually adjoining trees or those that are hard to access). AB – above buttress roots. AGL - above ground level.

** Indicates the determined DBH and TPZ for a multi-stemmed tree based on the formula shown in Appendix A of AS4970-2009.

Μ

SRZ & TPZ in groups of trees taken from the largest stem diameter of the group.

- **H** refers to the approximate height of a tree in metres, from base of stem to top of tree crown.
- **Sp** refers to the approximate and average spread in metres of branches/canopy (the 'crown') of a tree.

DBH refers to the approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted) and expressed in millimetres. Figures in brackets indicate the minimum TPZ allowable as per Section 3.2 Determining the TPZ with AS4970-2009.

- Age refer to Appendix 1 -Terms and Definitions for more detail.
- V refers to the tree's vigour (health) Refer to Appendix 1 -Terms and Definitions for more detail.
- **C** refers to the tree's structural condition. Refer to Appendix 1 -Terms and Definitions for more detail.
- ULE refers to the estimated Useful Life Expectancy of a tree. Refer to Appendix 2 for details.
- **TSR** The *Tree Significance Rating* considers the importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of view of public benefit. Refer to Appendix 3 – Significance of a Tree Assessment Rating for more detail.
- **RV** Refers to the retention value of a tree, based on the tree's ULE *and* Tree Significance. Refer to Appendix 3 Significance of a Tree Assessment Rating for more detail.
- **SRZ** Structural Root Zone (SRZ) refers to the critical area required to maintain stability of the tree. Refer to Appendix 1 -Terms and Definitions for more detail. This is not calculated/does not apply for palms, cycads, tree ferns or monocot species.
- **TPZ** Tree Protection Zone (TPZ) refers to the *tree protection zones* for trees to be retained. Refer to Appendix 1 -Terms and Definitions for more detail. For palms, cycads, tree ferns or monocot species it is calculated to be no less than 1m outside the crown projection.



Appendix 6 – Photographs



<u>Plate 1</u> – Tree 1 & 2 – Street trees will remain unaffected from the proposed works.



<u>Plate 2</u> – Tree 5 – Upper canopy of tree has significant die-back.





<u>Plate 3</u> – Tree 6 – Care when removing the carport will be required given the low canopy.



<u>Plate 4</u> – Tree 9 – Proposed for removal, recently lost low limb during a storm (noted with arrow).





<u>Plate 5</u> – Tree 12 – Proposed for removal, tree almost dead.



<u>Plate 6</u> – Tree 9 (foreground) & Tree 7 – Arrow notes Tree 7 that requires removal to accommodate works. Tree 9 in foreground requires removal also and is in poor condition.



Appendix 7 – Tree Location Plan.



NOT TO SCALE. Marked up by C. Hughes 8 December 2020. Survey Plan excerpt authored by DP Surveying, dated 17 September 2020.