

### **REPORT:**

# A): ARBORICULTURAL IMPACT ASSESSMENT

and

B). TREE MANAGEMENT PLAN (Trees to be retained and protected)

1-31 Walter Street & 452-462 Willoughby NSW

Prepared 29 August 2019 Our Ref: 4544

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#### 1.0 PREFACE

Redgum Horticultural has prepared this report for Architecture Urbaneia (the architect) on behalf of Walter Projects Pty Ltd (the applicant), 1/571 Military Road, Mosman NSW.

Mr. Neville Shields (*the author*) attended 1-31 Walter Street & 452-462 Willoughby Road, Willoughby NSW (*the site*), on 2 August 2018 and 26 & 28 August 2019, all the trees and their growing environment were examined. The site is subject to a Development Application and this report and any works recommended herein, that require approval from the consenting authority, forms part of that development application.

#### INTRODUCTION

The land is situated in the Willoughby Municipal Council (*the Council*) Local Government Area (*LGA*) and the trees are protected under Clause 5.9 of Development Control Plan and Willoughby Local Environment Plan 2012. The Council is the consenting authority for development works on the site. This report involves 133 trees (*the trees*), as indicated on Site Plan A - Survey of Subject Trees (Appendix C) and considers the removal of one hundred and four (104) trees within the property and on the Walter Street road reserve and the retention of twenty-nine (29) trees within the site, neighbouring property and adjacent on the road reserve. The trees will be considered as 13 stands to encompass all trees within and immediately adjacent to the site, where appropriate, as marked on Appendix C, Survey of Subject Trees. *Tree Protection Zone* (TPZ) fences or works are marked on the Appendix F, Trees to be Retained and Tree Protection Zones.

The site is comprised of one vacant parcel of land and twenty-four residential blocks where the existing structures are to be demolished and are to be replaced with a proposed residential development with one, two or three levels of basement parking. As part of the Landscape Plan where appropriate, the tree cover on the site will be enhanced by planting with advanced specimens/s of appropriate tree species for the space available above and below ground being soil volumes available and to prevent future conflict between trees and built structures.

The current proposed building design and its configuration and infrastructure were arrived at prior to the undertaking of an arboricultural assessment of the trees on the site to determine their significance by Redgum Horticultural. The plans provided do not show the location of sewer, water or electricity supply to the proposed development.

Setbacks for the new works and associated infrastructure should provide enough space to protect the existing growing environments both above and below ground for trees to be retained, and so that trees within the property and on adjoining properties will not be adversely affected. The proposed design has considered the spatial requirements for the trees to be retained based on the information available or provided at the time of compiling this report, and those areas to be protected will be discussed further. The Summary lists the general condition of trees and a summary of works in Table 1.0. In section 7.0 each individual tree is described in greater detail including protective or remedial works. Tree maintenance works including pruning, removal or transplantation are detailed in section 14.0.

#### 3.0 SUMMARY

This report considers 133 trees, 109 trees within the site, 4 trees on a neighbouring property and 20 trees on the adjacent road reserve with Trees 2, 3, 4, 5, 27, 64 to  $69^{x4}$ ,  $70^{x5}$ , 71 to 74, 78, 79, 80, 83 &  $92^{x2}$  to be retained and protected and Trees 1, 6 to 26 & 28 to  $47^{x2}$ , 48, 49,  $50^{x6}$  to  $58^{x3}$ ,  $59^{x7}$ , 60 to  $63^{x3}$ , 75 to 78, 81, 82, 84 to  $87^{x2}$ , 88 to 91 &  $93^{x2}$ , 94,  $95^{x2}$ , 96 to 102x3, 103 & 104 are recommended to be removed. For Tree 2, 3, 5, 27, 64, 65, 66, 67, 68, 69, 78, 80, 83 & 92x2; the alignment of the development is sufficiently setback to not affect these specimens. Tree 4; the alignment of the basement and children's play area are a major encroachment to this specimen. The section of the development within the TPZ of this specimen is to be constructed using tree sensitive excavation and construction techniques such as a vertical cut with shotcrete and contiguous pilings for the basement to reduce any impact on its stability. Root Mapping may be required due to the proposed positioning of Play area and possible level changes within tree protection zones of Neighbouring property retained specimens. Tree 71, 72, 73, 74 & 79, these specimens will be subject to a major encroachment by the proposed retaining wall. As the proposed excavation for the retaining wall is on down slope or across slope side of trees the potential is increased for tensile roots to the north of the site; therefore root mapping is recommended to ascertain if significant woody (above 30mm) would be impacted by the retaining wall otherwise redesign within the TPZ to reduce the encroachment to minor would be required. Tree 70, the alignment of the retaining wall is an acceptable minor encroachment estimated at 9.7% by the proposed development with the proposed excavation on down slope or across slope side to this specimen.

The boundary fences and retaining wall within the tree protection zone of the retained specimens are to be constructed using tree sensitive excavation and construction techniques such as pier and beam construction with suspended sections to reduce any impact on their stability, with piers to be dug by hand using non-motorised machinery to further assist in their protection.

If associated infrastructure (pipe works) are to be installed within the Tree Protection Zone of any retained specimen, they are to be installed by hand with non-motorised machinery. If structural roots are found within the trench, they are to be left intact and dug around retaining this specimen's structural integrity with works to be undertaken in consultation with the project arborist.

There will be no impact to Tree 2, 3, 5, 27, 64, 65, 66, 67, 68, 69, 78, 80, 83 & 92<sup>x2</sup> with a minor encroachment to Tree 70, 78 & 80 while Tree 4, 71, 72, 73, 74 & 79 will be subject to major encroachment which are to be retained and protected as per AS 4970 (2009) Section 3, 3.3.3 Major Encroachments from development works within >10% of the area of the Tree Protection Zone and as per discussion points in section 14 in part B of this report. Any excavations must be supervised and certified by the Project Arborist in accordance with AS4970 (2009).

#### Documentation Referenced for the Preparation of this Report

Planning Proposal Plan Set, Issue A: 30/07/2019 1-31 Walter Street & 452-462 Willoughby Road, Willoughby Prepared by Architecture Urbaneia

Plan Set; Landscape Master Plan, Drawing No. 2334 LP – 00, 00.1, 00.2, 01, 02, 03, 04 Revision A, Date 20.08.19, Scale 1:500 @ A1 John Lock & Associates
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#### 4.0 AIMS

#### Part A: (AIA) Arboricultural Impact Assessment

- 4.1 Detail the condition of the trees or large shrubs on the site or on adjoining sites where such trees or large shrubs may be affected by the proposed works, by assessment of individual specimens or stands.
- 4.2 Provide as an outcome of the visual tree assessment (VTA), the following: a description of the trees or large shrubs, observations made, discussion of the effects the location of the proposed building works may have on the trees or large shrubs and make recommendations required for remedial or other works to the trees or large shrubs, if and where appropriate.

#### Part B: (TPP) Tree Protection Specification & Tree Protection Plan

- 4.3 Provide a detailed specification for remedial works or protection measures for their retention in a safe and healthy condition, or a condition not less than that at the time of initial inspection for this report, or in a reduced but sustainable condition due to the impact of the development but ameliorated through tree protection measures able to be applied, and will consider the location and condition of the trees or large shrubs in relation to the proposed building works, or recommend removal and replacement where appropriate.
- 4.4 Determine from the assessment the works or measures required to ameliorate the impact upon the trees or large shrubs to be retained, by the proposed building works or future impacts the trees or large shrubs may have upon the new building works if and where appropriate, or the benefits of removal and replacement if appropriate for the medium to long term safety and amenity of the site.

#### 5.0 OBJECTIVES

#### Part A: Arboricultural Assessment Report

- 5.1 Assess the condition of the subject trees.
- 5.2 Determine impact of development on the subject trees.
- 5.3 Provide recommendations for retention or removal of the subject trees.

#### Part B: Tree Protection Plan

5.3 Provide recommendations for retention or removal of the subject trees or large shrubs.

#### 6.0 METHODOLOGY (This Methodology where utilised is applied to both Parts A and B).

- 6.1 The method of assessment of tree/s applied is adapted from the principles of visual tree assessment undertaken from the ground, which considers:
  - Tree health and subsequent stability, both long and short term
  - Sustainable Retention Index Value (SRIV) Version 4 (IACA 2010) ©
  - Hazard potential to people and property
  - Amenity values
  - Habitat values
  - Significance
- 6.2 This assessment is undertaken using standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment from the ground of each individual tree, or stand of trees, or a representative population sample. Any dimensions recorded as averages, or by approximation are noted accordingly.

- 6.3 This report adopts Australian Standard AS4970 2009 *Protection of trees on development sites* as a point of reference and guide for the recommended minimum setbacks (Table 2 Part B) from the centre of a tree's trunk to development works and the distances may be increased or decreased by the author in accordance with AS4970 Section 3.3.4 as a result of other factors providing mitigating circumstances or constraints as indicated by but not restricted to the following:
  - 1. Condition of individual trees.
  - 2. Tolerance of individual species to disturbance,
  - 3. Geology e.g. physical barriers in soil, rock floaters, bedrock to surface
  - 4. Topography e.g. slope, drainage,
  - 5. Soil e.g. depth, drainage, fertility, structure,
  - 6. Microclimate e.g. due to landform, exposure to dominant wind,
  - 7. Engineering e.g. techniques to ameliorate impact on trees such as structural soil, gap graded fill, lateral boring.
  - 8. Construction e.g. techniques to ameliorate impact on trees such as pier and beam, bridge footings, suspended slabs,
  - 9. Root mapping,
  - 10. Physical limitations existing modifications to the environment and any impact to tree/s by development e.g. property boundaries, built structures, houses, swimming pools, road reserves, utility services easements, previous impact by excavation, or construction in other directions, soil level changes by cutting or filling, existing landscaping works within proximity, modified drainage patterns,
  - 11. Extraneous factors e.g. potential future impacts from development on adjoining land when the tree is located on or near to a property boundary.
- Trees in groups may be referred to as stands and a stand may exclusively contain specimens to be either retained or removed or a combination of both. A stand may be used to discuss all the trees on a given site to expedite their assessment or refer to trees growing proximate to one another or within a defined space. Stands may be comprised by mass boundary or screen plantings, to form a group of the same or a mixture of taxa. Each stand is considered as a single unit with each component tree assessed and expressed in tabular form or indicated by a given percentage as a population sample of each stand. Where it is appropriate for a stand of trees to be retained in full or part, the location and setback of Tree Protection Zone fences or works, are prescribed to provide for the preservation of the stand or selected component trees, in a condition not less than that at the time of initial inspection for its incorporation into the landscape works for the site, or in a reduced but sustainable condition due to the impact of the development but ameliorated through tree protection measures.
- The meanings for terminology used herein are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009. An extract from the IACA Dictionary forms a glossary of terms included as Appendix E.

Table 1.0 General condition and Schedule of works of trees or large shrubs. Trees described in greater detail in section 7.0.

Tree / Stand No.	Genus and species	Common name	Condition G = Good, F = Fair P = Poor, D = Dead	Description of work to be done
1	Pittosporum undulatum	Native Daphne	G	Remove and replace with by new plantings as per Landscape Plan
2	Banksia marginata	Silver Banksia	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan - Neighbouring property specimen
3	Lophostemon confertus	Queensland Brush Box	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan - Neighbouring property specimen
4	Eucalyptus microcorys	Tallowwood	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan - Neighbouring property specimen
5	Archontophoenix cunninghamiana	Bangalow Palm	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan - Neighbouring property specimen
6	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
7	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
8	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
9	Grevillea robusta	Silky Oak	G	Remove and replace with by new plantings as per Landscape Plan
10	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
11	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
12	Grevillea robusta	Silky Oak	F	Remove and replace with by new plantings as per Landscape Plan
13	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
14	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
15	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
16	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
17	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
18	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
19	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
20	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan

Tree / Stand No.	Genus and species	Common name	Condition G = Good, F = Fair P = Poor, D = Dead	Description of work to be done
21	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
22	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
23	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
24	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
25	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
26	Casuarina glauca	Swamp She Oak	G	Remove and replace with by new plantings as per Landscape Plan
27	Corymbia maculata	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan. – Street tree specimen
28	Pittosporum undulatum	Native Daphne	F	Remove and replace with by new plantings as per Landscape Plan
29	Jacaranda mimosifolia	Jacaranda	G	Remove and replace with by new plantings as per Landscape Plan
30	Camellia japonica	Camellia	G	Remove and replace with by new plantings as per Landscape Plan
31	Tristaniopsis collina	Hill Water Gum	G	Remove and replace with by new plantings as per Landscape Plan – Street tree specimen
32	Tristaniopsis collina	Hill Water Gum	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
33	Callistemon 'Harkness'	Harkness Bottlebrush	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
34	Lagerstroemia indica	Crepe Myrtle	G	Remove and replace with by new plantings as per Landscape Plan
35	Tristaniopsis collina	Hill Water Gum	G	Remove and replace with by new plantings as per Landscape Plan – Street tree specimen
36	Tristaniopsis collina	Hill Water Gum	G	Remove and replace with by new plantings as per Landscape Plan – Street tree specimen
37	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
38	Angophora costata	Sydney Red Gum	F	Remove and replace with by new plantings as per Landscape Plan – Street tree specimen
39	Tristaniopsis laurina	Water Gum	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen

Tree / Stand No.	Genus and species	Common name	Condition G = Good, F = Fair P = Poor, D = Dead	Description of work to be done
40	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
41	Tristaniopsis laurina	Water Gum	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
42	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
43	Tristaniopsis laurina	Water Gum	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
44	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	F	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
45	Tristaniopsis laurina	Water Gum	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
46	Tristaniopsis laurina	Water Gum	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
47/2	Tristaniopsis laurina x2	Water Gum	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
48	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
49	Tristaniopsis laurina	Water Gum	G	Remove and replace with by new plantings as per Landscape Plan  – Street tree specimen
50/3	Juniperus sabina x6	Savin Juniper	G	Remove and replace with by new plantings as per Landscape Plan
51	Jacaranda mimosifolia	Jacaranda	F	Remove and replace with by new plantings as per Landscape Plan
52	Allocasuarina littoralis	Black She Oak	F	Remove and replace with by new plantings as per Landscape Plan
53	Lagerstroemia indica	Crepe Myrtle	G	Remove and replace with by new plantings as per Landscape Plan
54	Lagerstroemia indica	Crepe Myrtle	G	Remove and replace with by new plantings as per Landscape Plan
55	Pittosporum undulatum	Native Daphne	F	Remove and replace with by new plantings as per Landscape Plan
56	Glochidion ferdinandi	Cheese Tree	F	Remove and replace with by new plantings as per Landscape Plan
57	Archontophoenix cunninghamiana	Bangalow Palm	G	Remove and replace with by new plantings as per Landscape Plan

Tree / Stand No.	Genus and species	Common name	Condition G = Good, F = Fair P = Poor, D = Dead	Description of work to be done
58/4	Waterhousia floribunda x3	Weeping Lilly Pilly	F	Remove and replace with by new plantings as per Landscape Plan
59/5	Waterhousia floribunda x7	Weeping Lilly Pilly	F	Remove and replace with by new plantings as per Landscape Plan
60	Fraxinus griffithii	Evergreen Ash	F	Remove and replace with by new plantings as per Landscape Plan
61	Fraxinus griffithii	Evergreen Ash	F	Remove and replace with by new plantings as per Landscape Plan
62	Ficus benjamina	Weeping Fig	F	Remove and replace with by new plantings as per Landscape Plan
63/6	Yucca sp. x3	Yucca	G	Remove and replace with by new plantings as per Landscape Plan
64	Ficus hillii	Hills Fig	F	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
65	Ficus benjamina	Weeping Fig	F	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
66	Ficus benjamina	Weeping Fig	F	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
67	Corymbia maculata	Spotted Gum	F	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
68	Corymbia maculata	Spotted Gum	F	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
69/7	Corymbia maculata x4	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
70/8	Corymbia maculata x5	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
71	Corymbia maculata	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
72	Corymbia maculata	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
73	Corymbia maculata	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
74	Corymbia maculata	Spotted Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
75	Glochidion ferdinandi	Cheese Tree	F	Remove and replace with by new plantings as per Landscape Plan

Tree / Stand No.	Genus and species	Common name	Condition  G = Good, F = Fair  P = Poor, D = Dead	Description of work to be done
76	Corymbia maculata	Spotted Gum	G	Remove and replace with by new plantings as per Landscape Plan
77	Acacia decurrens	Early Black Wattle / Green Wattle	G	Remove and replace with by new plantings as per Landscape Plan
78	Eucalyptus microcorys	Tallowwood	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
79	Eucalyptus microcorys	Tallowwood	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
80	Eucalyptus sp.	Eucalypt	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
81	Eucalyptus sp.	Eucalypt	G	Remove and replace with by new plantings as per Landscape Plan
82	Eucalyptus sp.	Eucalypt	G	Remove and replace with by new plantings as per Landscape Plan
83	Angophora costata	Sydney Red Gum	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
84	Butia capitata	Jelly Palm	G	Remove and replace with by new plantings as per Landscape Plan
86	Pittosporum undulatum	Native Daphne	F	Remove and replace with by new plantings as per Landscape Plan
87/9	Cupressus macrocarpa 'Leightons Green' x2	Leightons Green Pine	G	Remove and replace with by new plantings as per Landscape Plan
88	Callistemon viminalis 'Captain Cook'	Captain Cook Bottlebrush	F	Remove and replace with by new plantings as per Landscape Plan
89	Araucaria heterophylla	Norfolk Island Pine	F	Remove and replace with by new plantings as per Landscape Plan
90	Grevillea robusta	Silky Oak	F	Remove and replace with by new plantings as per Landscape Plan
91	Casuarina glauca	Swamp She Oak	F	Remove and replace with by new plantings as per Landscape Plan
92/10	Acacia decurrens x2	Early Black Wattle / Green Wattle	G	Retain and protect within a Tree Protection Zone (TPZ) as per the Tree Protection Plan
93/11	Butia sp. x2	Palm	G	Remove and replace with by new plantings as per Landscape Plan
94	Archontophoenix cunninghamiana	Bangalow Palm	G	Remove and replace with by new plantings as per Landscape Plan
95/12	Yucca sp. x2	Yucca	G	Remove and replace with by new plantings as per Landscape Plan
96	Melaleuca linariifolia	Snow in Summer	G	Remove and replace with by new plantings as per Landscape Plan

Tree / Stand No.	Genus and species	Common name	Condition G = Good, F = Fair P = Poor, D = Dead	Description of work to be done
97	Eucalyptus sp.	Eucalypt	G	Remove and replace with by new plantings as per Landscape Plan
98	Acer palmatum	Japanese Maple	G	Remove and replace with by new plantings as per Landscape Plan
99	Viburnum odoratissimum	Sweet Viburnum	G	Remove and replace with by new plantings as per Landscape Plan
100	Elaeocarpus reticulatus	Blueberry Ash	G	Remove and replace with by new plantings as per Landscape Plan
101	Syzygium luehmannii	Small Leafed Lilly Pilly	G	Remove and replace with by new plantings as per Landscape Plan
102/13	Cupressus macrocarpa 'Brunniana' x3	Brunnings Cypress	G	Remove and replace with by new plantings as per Landscape Plan
103	Pittosporum undulatum & Privet	Native Daphne	F	Remove and replace with by new plantings as per Landscape Plan
104	Eucalyptus sp.	Eucalypt	G	Remove and replace with by new plantings as per Landscape Plan

### 7.0 TREE ASSESSMENT – 7.1 - Assessment of a stand of Trees

Tree / Stand No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Vigour GV = Good Vigour LV = Low Vigour	Condition G = Good F = Fair P = Poor D = Dead	1. SRIV Age, Vigour, Condition / Index Rating www.iaca.org.au / 2. Estimated Life Expectancy 1. Long 2. Medium 3. Short	Crown Form D = Dominant C = Co-dominant I = Intermediate S = Suppressed F = Forest E = Emergent	Ht. Approx. metres	Crown Spread approx. metres / Orientation R = Radial, or other	Crown Symmetry 1 = symmetrical 2 = asymmetrical / Orientation	Crown Cover % / Crown Density % / D = dormant	DBH in mm @ 1.4m, or other, as indicated  Trunk Orientation other than R = radial, e.g. N/S g = ground	Trunk Lean  1 = Upright-Slight  2 = Moderate  3 = Severe  4 = Critical.  5 = Acaulescent  / Orientation / ST = Static P = Progressive Sc = Self- correcting	Roots Evident at Root Crown 1. = None 2. = Adventitious 3. = Basal Flare 4. = Buttresses 5. = First Order Roots (FOR), No. & distribution e.g. R = radial, or one each to N, S, E and W	Pests, Diseases & Damage No or Yes If Yes see comments	Branch Bark Included No or Yes or N/A	Form G = Good Form P = Poor Form	Significance scale 1=High 2=Medium 3=Low / Retention Value 1=High 2=Medium 3=Low 4=Remove
1	Pittosporum undulatum	М	GV	G	MGVG - 10 1	D	6	7x5 E/W	2/N	80 80	450 @ 200 R	5/R ST	1	NO	NO	Р	1
2018	Native Daphne	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, or	rientation E/M	/, asymmetri	cal bias to no	th Neighbou	ıring Property S	Specimen	1-1.5m fr	om bou	ndary
2	Banksia marginata	М	GV	G	MGVG - 10 1	С	9	5x5 R	1	70 70	330 est R	1/R ST	No access	NO	NO	G	2
-	Silver Banksia	Comment:	Trunk to	o 3 metres,	crown deliqueso	ent, orientatio	n radial,	symmetrica	al Neighbou	uring Propert	ty Specimen 3	.0m from bour	ndary fence				
3	Lophostemon confertus	М	GV	G	MGVG - 10	E	10	7x3 N/S	2/S	80 80	290 R	2/W ST	1	NO	NO	Р	2
"	Queensland Brush Box	Comment:	Comment: Trunk to 2 metres with slight lean-to west, crown deliquescent, orientation E/W, asymmetrical bias to south Neighbouring Property Specim										cimen 4.0	m from b	oundary	fence	
4	Eucalyptus microcorys	М	GV	G	MGVG - 10	D	12	8x8 R	1	90 90	980 980x450N/S	5/R ST	1	NO	YES?	Р	1 1
-	Tallowwood	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, or	ientation radi	al, symmetri	cal Neighbo	uring Property	Specimen 3.0i	n from bo	undary fe	ence	
5	Archontophoenix cunninghamiana	М	GV	G	MGVG - 10	D	6	4x3 E/W	2/W	80 80	190 x2 R	5/R ST	1	NO	NO	Р	2
	Bangalow Palm	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, or	rientation E/M	/, asymmetri	cal bias to we	st Neighbou	ring Property S	pecimen			
6	Casuarina glauca	М	GV	F	MGVF - 9 1	D	12	7x7 R	1	70 70	470 R	1/R ST	1	NO	NO	G	1 1
	Swamp She Oak	Comment:	Trunk to	o 9 metres,	crown deliqueso	ent, orientatio	n radial,	symmetrica	al.							*	
7	Casuarina glauca	М	GV	G	MGVF - 9 1	D	15	5x5 R	1	80 80	860 x740 E/W	5/R ST	5 7-S	YES	NO	Р	1
1	Swamp She Oak	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, or	ientation radi	al, symmetri	cal. Old brand	h tear wound	to south.				
8	Casuarina glauca	0	GV	F	OGVF - 5	F	12	5x5 R	1	50 50	960 x 780 N/S	5/R ST	5 1-N/5-S	NO	NO	Р	2 2
•	Swamp She Oak	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, or	ientation radi	al, symmetri	cal. Becoming	senescent.					
9	Grevillea robusta	М	GV	G	MGVG - 10 1	F	12	5x3 E/W	2/N	70 70	320 R	1/R ST	5 1-W	NO	NO	G	1 2
	Silky Oak	Comment:	Trunk to	o 7 metres t	he bifurcate, cro	wn deliquesce	nt, orier	tation E/W	, asymmetrica	al bias to nor	rth.						
10	Casuarina glauca	М	GV	F	MGVF - 10	D	12	8x8 R	1	50 50	380 R	1/R ST	1	NO	NO	G	1
	Swamp She Oak	Comment:	Trunk to	o 3 metres,	crown deliqueso	ent, orientation	n radial,	symmetrica	al.								•

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11	Casuarina glauca	М	GV	F	MGVF - 9 1	F	12	7x7 R	1	50 50	470 R	1/R ST	5 5-R	NO	YES	G	1
''	Swamp She Oak	Comment:	Trunk t	o 3 metres,	crown deliqueso	ent, orientatio	n radial,	symmetric	al.			000 00					
12	Grevillea robusta	М	GV	F	MGVF - 9	E	12	6x3 N/S	2/W	50 50	260 R	1/R ST	1	NO	NO	Р	1 2
'-	Silky Oak	Comment:	Trunk t	o 5 metres t	hen bifurcate, c	rown deliqueso	ent, orie	ntation N/S	S, asymmetrio	cal bias to we	est.		1			,	
13	Casuarina glauca	М	GV	F	MGVF - 9	F	5	5x5 R	1	50 50	450 R	1/R ST	1	NO	NO	G	1
	Swamp She Oak	Comment:	Trunk t	o 3 metres,	crown deliqueso	ent, orientatio	n radial,	symmetric	al. Suckering	to east.						,	
14	Casuarina glauca	М	LV	F	MLVF - 4	D	15	7x7 R	1	50 50	420 R	5/R ST	5 2-S	NO	NO	Р	2 2
''	Swamp She Oak	Comment:	Acaule	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, o	rientation rad	ial, symmetri	ical. Becomin	g senescent si	uckering in bas	al area to	east.	,	
15	Casuarina glauca	М	GV	G	MGVG - 10 1	С	12	4x4 R	1	60 60	280 R	1/R ST	1	NO	NO	G	1 1
	Swamp She Oak	Comment:	Trunk e	erect, straigh	nt, gradually tape	ering & continu	ous, cro	wn excurre	ent.				•	•		,	
16	Casuarina glauca	М	GV	G	MGVG - 10 1	С	12	4x4 R	1	60 60	350 R	1/R ST	1	NO	NO	G	1
	Swamp She Oak	Comment:	Trunk t	o 6 metres,	crown deliqueso	ent, orientatio	n radial,	symmetric	al.								
17	Casuarina glauca	М	GV	G	MGVG - 10 1	С	12	4x4 R	1	60 60	370 R	1/R ST	1	NO	NO	G	1
	Swamp She Oak	Comment:	Trunk t	o 5 metres,	crown deliqueso	ent, orientatio	n radial,	symmetric	al. Suckering	to basal are	a to south.						
18	Casuarina glauca	М	GV	G	MGVG - 10 1	С	7	4x4 R	1	60 60	300 R	1/R ST	1	NO	NO	G	1
'	Swamp She Oak	Comment:	Trunk t	o 3 metres,	crown deliqueso	ent, orientatio	n radial,	symmetric	al.				•				
19	Casuarina glauca	0	LV	F	OLVF - 2	С	12	4x4 R	1	50 50	440 R	1/R ST	5 6-R	NO	NO	G	2 2
.	Swamp She Oak	Comment:	Trunk t	o 2 metres,	crown deliqueso	ent, orientation	n radial,	symmetric	al.								
20	Casuarina glauca	М	LV	F	MLVF - 4	F	12	4x4 R	2/E	50 50	330 R	1/R ST	1	NO	NO	G	2 2
	Swamp She Oak	Comment:	Trunk t	o 4 metres,	crown deliqueso	cent, orientation	n radial,	symmetric	al.		•						

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0.4	Casuarina glauca	М	GV	F	MGVF - 9	F	12	6x6 R	1	60 60	450 R	1/R ST	1	NO	NO	G	2 2
21	Swamp She Oak	Comment	Trunk e	rect straigh	nt, gradually tape	erina & continu	lous cro	18/18	ent.	00	I N	31					
	Casuarina glauca	M	GV	F	MGVF - 9	F	7	3x3	1	60	180	1/R	1	NO	NO	G	2
22			150		1			R		60	R	ST	'	110	110		2
	Swamp She Oak	Comment:	Trunk e	erect, straigh	nt, gradually tape	ering & continu	ous, cro	i	ent.	T			Г	1			
23	Casuarina glauca	М	GV	F	MGVF - 9 1	F	12	6x6 R	1	60 60	540 R	1/R ST	5 1-S	NO	NO	Р	2 2
20	Swamp She Oak	Comment:	Trunk to	o 1 metre, c	rown deliquesce	ent, orientation	radial, s	ymmetrica	ıl.	500000		000 0		ı		J.	900
24	Casuarina glauca	М	GV	F	MGVF - 9	F	12	6x6 R	1	60 60	390 R	1/R ST	1	NO	NO	G	2 2
	Swamp She Oak	Comment:	Comment: Trunk to 2 metres, crown deliquescent, orientation radial, symmetrical.														
25	Casuarina glauca	М	GV	F	MGVF - 9	F	12	6x6 R	1	60 60	200 R	1/R ST	1	YES	NO	G	2 2
	Swamp She Oak	Comment:	Trunk e	rect, straigh	nt, gradually tape	ering & continu	ous, cro	wn excurre	ent. Trunk wo	und to south	at 2m.					*	
26	Casuarina glauca	М	GV	G	MGVG - 10 1	F	8	6x6 R	1	70 70	230 R	1/R ST	1	NO	NO	G	1
	Swamp She Oak	Comment:	Trunk e	rect, straigh	nt, gradually tape	ering & continu	ious, cro	wn excurre	ent. 2 suckers	to south							
27	Corymbia maculata	М	GV	G	MGVG - 10 1	D	10	7x5 N/S	2/S	70 70	370 R	1/R ST	5 1-W/1-N/1-E	NO	NO	Р	1
	Spotted Gum	Comment:	Trunk to	o 4 metres t	hen acutely dive	ergent to south	self-cor	recting mic	crown, crow	n deliquesce	nt, orientation	N/S, asymme	etrical bias to so	outh.			
28	Pittosporum undulatum	М	GV	F	MGVF - 9	D	6	6x2 E/W	2W	70 70	300#@g R	5/R ST	1	YES	NO	Р	2 3
	Native Daphne	Comment:	Acaules	scent or sho	ort trunk @ or ne	ar ground, cro	wn deliq	uescent, o	rientation E/W	V, asymmetr	ical bias to we	est. Lopped to	clear backyard	and neigh	bouring	property	<i>/</i> .
29	Jacaranda mimosifolia	М	GV	G	MGVG - 10 1	D	6	6x6 R	1	70 70	600 R	5/R ST	1	YES	NO	G	2 2
20	Jacaranda	Comment:	Acaules	scent or sho	rt trunk @ or ne	ar ground, cro	wn deliq	uescent, o	rientation radi	ial, symmetri	cal. Specime	n lopped to cle	ar residence to	south.		h	·
30	Camellia japonica	М	GV	G	MGVG -10	D	5	2x2 R	1	70 70	700#@g R	5/R ST	1	NO	NO	G	2 2
	Camellia	Comment:	Acaules	scent or sho	rt trunk @ or ne	ar ground, cro	wn deliq	uescent, o	rientation radi	ial, symmetr	cal.	•					•

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31	Tristaniopsis collina	М	GV	G	MGVG -10	D	5	2x2 R		1		70 70	220 R	1/R ST	1	NO	NO	G	1
	Hill Water Gum	Comment:	Trunk e	rect, straigh	nt, gradually tape	ering & continu	ious, cro	wn excu	rent.		•					•	,		
32	Tristaniopsis collina	0	LV	F	OLVF – 2 2	D	4	4.5x1.5 E/W		2/E		50 50	300 R	5/R ST	1	YES	NO	Р	2 3
	Hill Water Gum	Comment:	Acaule	scent or sho	ort trunk @ or ne	ear ground, cro	wn deliq	uescent,	orient	ation E	Ξ/W, a	asymmetrica	al bias to east	. Senescent s	pecimen	•			
33	Callistemon 'Harkness'	0	LV	F	OLVF – 2 2	D	5	9x9 R		2/SW		40 50	500 R	1/R ST	1	NO	NO	Р	3
	Harkness Bottlebrush	Comment:	Trunk t	o 1 metre, c	rown deliquesce	ent, orientation	radial, a	asymmetr	ical bi	as to s	outh-	west. Sene	scent Specim	en – Lopped f	or line clearand	e			
34	Lagerstroemia indica	М	GV	F	MGVF - 9	D	5	3x3 R		1		N/A D	170 R	1/R ST	1	NO	NO	G	2 2
	Crepe Myrtle	Comment:	Trunk t	o 500 mm, d	crown deliquesc	ent, orientation	radial,	symmetri	cal.						11	•	•		
35	Tristaniopsis collina	М	GV	F	MGVF - 9	D	2	2x2 R		1		70 70	200 R	1/R ST	1	NO	NO	G	2 2
	Hill Water Gum	Comment:	Trunk e	rect, straigh	nt, gradually tap	ering & continu	ious, cro	wn excu	rent.							•			
36	Tristaniopsis collina	Y	GV	G	YGVG - 9	D	3	.5 N	.5 S	.5 E	.5 W	70 70	200 R	1/R ST	1	NO	NO	G	2 2
2019	Hill Water Gum	Comments	: Trunk	erect, straig	ht, gradually tap	pering & contin	uous, cr	own excu	ırrent.	- Roa	d Res	serve Speci	men			•		•	
37	Callistemon viminalis 'Hanna Ray'	М	GV	G	MGVG - 10	D	5	2 N	2 S	5 E	2 W	70 70	400 R	1/R ST	1	YES	NO	Р	2 2
	Hanna Ray Bottlebrush	Comments	: Trunk	to 500mm,	crown deliqueso	cent, orientatio	n E/W, a	asymmetr	ical bia	as to e	east. L	opped for I	ine clearance	Road Rese	rve Specimen	1		1	
38	Angophora costata	М	GV	F	MGVF - 9	D	5	2 N	2 S	2 E	2 W	60 70	400 R	1/R ST	1	YES	NO	Р	2 2
	Sydney Red Gum	Comments	: Trunk	to 1.5 metre	es, crown deliqu	escent, orienta	tion rad	ial, symm	etrica	I. Lopp	ped fo	r line cleara	ance Road I	Reserve Speci	men	1		•	
39	Tristaniopsis laurina	М	GV	F	MGVF - 9	D	5	4 N	4 S	4 E	4 W	70 70	330 R	1/R ST	1	YES	NO	Р	2 2
	Water Gum	Comments	s: Acaule	escent or sh	ort trunk @ or n	ear ground, cr	own deli	quescent	, orier	ntation	radia	l, symmetri	cal. Lopped fo	or line clearanc	e Road Res	erve Spec	imen		
40	Callistemon viminalis 'Hanna Ray'	М	GV	F	MGVF - 9	D	5	3 N	3 S	5 E	5 W	70 70	800#@g R	1/R ST	1	YES	NO	G	2 2
	Hanna Ray Bottlebrush	Comments	s: Acaule	escent or sh	ort trunk @ or n	ear ground, cr	own deli	quescen	, orier	ntation	E/W,	asymmetri	cal bias to we	st. Lopped for	line clearance.	- Road R	eserve S	Specime	n

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41	Tristaniopsis laurina	М	GV	G	MGVG - 10 1	D	5	2 N	2 S	2 E	2 W	80 80	800 R	1/R ST	1	YES	NO	G	2 2
	Water Gum	Comments:	Trunk to	500mm,	crown deliquesc	ent, orientatio	n radial,	symm	etrical	. Lopp	ed for	line clearan	ce Road Re	serve Specim	en			I .	
42	Callistemon viminalis 'Hanna Ray'	М	GV	F	MGVF - 9	D	5	2 N	4 S	5 E	1 W	70 70	320 R	1/R ST	1	YES	NO	Р	2 2
	Hanna Ray Bottlebrush	Comments:	Trunk to	500mm,	crown deliquesc	ent, orientatio	n E/W, a	asymm	etrical	bias t	o east.	Lopped for	line clearance	e. Distorted ca	nopy to south/e	east Roa	ad Resen	ve Spec	imen
43	Tristaniopsis laurina	Y	GV	F	YGVF - 8	D	5	2 N	2 S	2 E	2 W	70 70	500 R	1/R ST	1	YES	NO	G	2 2
	Water Gum	Comments:	Trunk to	1 metre,	crown deliquesc	ent, orientatio	n radial,	, symm	etrical	. Lopp	ed for	line clearan	ce Road Re	serve Specim	en	•			
44	Callistemon viminalis 'Hanna Ray'	М	GV	F	MGVF - 9 1	D	5	3 N	3 S	5 E	4 W	70 70	390 R	1/R ST	1	YES	NO	Р	2 2
	Hanna Ray Bottlebrush	Comments:	Trunk to	2 metres	, crown deliques	cent, orientati	on E/W,	asymr	netrica	al bias	to eas	st. Lopped fo	r line clearan	ce Road Res	serve Specime	า	l	I.	-
45	Tristaniopsis laurina	Y	GV	G	YGVG - 9	D	1	.5 N	.5 S	.5 E	.5 W	70 70	90 R	1/R ST	1	NO	YES	Р	3
	Water Gum	Comments:	Trunk to	120mm,	crown deliquesc	ent, orientatio	n radial,	, symm	etrical	Roa	ad Res	serve Specin	nen						
46	Tristaniopsis laurina	Y	GV	G	YGVG - 9 1	D	3	1.5 N	1.5 S	1.5 E	1.5 W	70 70	140 R	1/R ST	1	NO	NO	G	2 2
	Water Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	rown e	xcurre	nt.									
47/	Tristaniopsis laurina x2	Y	GV	G	YGVG - 9	D	1.5	.5 N	.5 S	.5 E	.5 W	70 70	30 R	1/R ST	1	NO	NO	G	2
2	Water Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	rown e	xcurre	nt <i>R</i>	oad R	eserve Spec	imen						
48	Callistemon viminalis 'Hanna Ray'	М	GV	G	MGVG - 10 1	D	5	3 N	3 S	3 E	3 W	70 70	620 #@g R	5/R ST	1	YES	NO	G	2
	Hanna Ray Bottlebrush	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesc	ent, or	ientati	on rad	ial, symmetr	ical Road F	Reserve Specii	men				
49	Tristaniopsis laurina	М	GV	G	MGVG - 10 1	D	5	7 N	3 S	3 E	3 W	70 70	390#@g R	5/R ST	1	YES	NO	G	2 2
	Water Gum	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesc	ent, or	ientati	on N/S	S, asymmetri	cal bias to no	rth. Lopped fo	r line clearance	e Road F	Reserve S	Specime	∍n
50/	Juniperus sabina x6	М	GV	G	MGVG - 10 1	С	6	.5 N	.5 S	.5 E	.5 W	80 80	190# R	1/R ST	1	NO	NO	G	2 2
3	Savin Juniper	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	rown e	xcurre	nt.	,			,			;		

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51	Jacaranda mimosifolia	М	GV	F	MGVF - 9	D	6	6 N	2 S	3 E	6 W	60 70	450#@g R	5/R ST	1	YES	NO	Р	3
	Jacaranda	Comments:	Acaules	cent or sh	ort trunk @ or n	ear ground, cr	own del	iquesce	ent, or	ientati	on E/M	, asymmetr	ical bias to w	est. Specimen	lopped to sout	h possibly	for roofli	ne clear	ance.
52	Allocasuarina littoralis	М	GV	F	MGVF - 9 1	S	5	3 N	1 S	2 E	2 W	70 70	300 R	1/R ST	1	YES	NO	Р	2 3
	Black She Oak	Comments:	Trunk w	ith modera	ate lean-to north	•													
53	Lagerstroemia indica	М	GV	G	MGVG - 10 1	D	6	3 N	3 S	4 E	2 W	N/A D	620#@g R	5/R ST	1	NO	NO	G	2 2
	Crepe Myrtle Comments: Acaulescent or short trunk @ c				ort trunk @ or n	ear ground, cr	own del	iquesce	ent, or	ientati	on E/M	, asymmetr	ical bias to ea	ist.					
54	Lagerstroemia indica	М	GV	G	MGVG - 10 1	D	6	3 N	3 S	1 E	2 W	N/A D	300#@g R	5/R ST	1	NO	NO	Р	2
	Crepe Myrtle	Comments:	Acaules	cent or sh	ort trunk @ or n	ear ground, cr	own del	iquesce	ent, or	ientati	on N/S	, asymmetri	cal bias to no	rth.			•		
55	Elaeocarpus reticulatus	М	GV	G	MGVG - 10 1	С	7	2 N	2 S	2 E	2 W	80 80	290 R	1/R ST	1	NO	NO	G	2 2
	Blueberry Ash	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.									
56	Glochidion ferdinandi	М	GV	F	MGVF - 9 2	D	6	3 N	3 S	3 E	3 W	60 70	400 R	1/R ST	1	NO	NO	G	2 2
	Cheese Tree	Comments:	Trunk to	1 metre,	crown deliquesc	ent, orientatio	n radial,	symm	etrical							•			
57	Archontophoenix cunninghamiana	М	GV	G	MGVG - 10 1	D	6	2 N	2 S	2 E	2 W	70 70	240 R	1/R ST	1	NO	NO	Y	2 2
	Bangalow Palm	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.		•							
58/	Waterhousia floribunda x3	М	GV	F	MGVF - 9	С	6	1 N	1 S	3 E	1 W	70 70	300# R	1/R ST	1	YES	NO	G	2 2
4	Weeping Lilly Pilly	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, o	rientatio	on E/V	N, asyı	nmetri	ical bias to e	ast, crown ex	current. Grow	n raised to clea	ar fence lir	ne.		
59/	Waterhousia floribunda x7	М	GV	F	MGVF - 9	С	6	1 N	1 S	1 E	2 W	50 70	240# R	1/R ST	1	YES	NO	Р	3
5	Weeping Lilly Pilly	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, o	rientati	on E/V	N, asyı	nmetri	ical bias to v	vest, crown ex	current. Poor	pruning techni	que, butch	ering spe	ecimens	
60	Fraxinus griffithii	М	GV	F	MGVF - 9	D	6	4 N	4 S	4 E	4 W	70 70	500#@g R	5/R ST	1	NO	NO	Р	2
	Evergreen Ash	Comments:	Acaules	cent or sh	ort trunk @ or n	ear ground, cr	own del	iquesce	ent, or	entati	on radi	ial, symmetr	ical.		1				Total Control of the

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Vigour GV = Good Vigour LV = Low Vigour	Condition G = Good F = Fair P = Poor D = Dead	1. SRIV Age, Vigour, Condition / Index Rating Www.iaca.org.au / 2. Estimated Life Expectancy 1. Long 2. Medium 3. Short	Crown Form D = Dominant C = Co-dominant I = Intermediate S = Suppressed F = Forest E = Emergent	Ht. Approx. metres		Spi app me Orien N= ( S= § E= W=	own read orox. etres / ntation north South East West		Crown Cover % / Crown Density % / D = dormant	DBH in mm @ 1.4m, or other, as indicated / Trunk Orientation other than R = radial, e.g. N/S g = ground	Trunk Lean  1 = Upright-Slight  2 = Moderate  3 = Severe  4 = Critical.  5 = Acaulescent / Orientation / ST = Static P = Progressive Sc = Self-correcting	Roots Evident at Root Crown 1. = None 2. = Adventitious 3. = Basal Flare 4. = Buttresses 5. = First Order Roots (FOR), No. & distribution e.g. R = radial, or one each to N, S, E and W	Pests, Diseases & Damage No or Yes If Yes see comments	Branch Bark Included No or Yes or N/A	Form G = Good Form P = Poor Form	Significance scale 1=High 2=Medium 3=Low / Retention Value 1=High 2=Medium 3=Low 4=Remove
61	Fraxinus griffithii	M	GV	F	MGVF - 9 1	D	6	1.5 N	1.5 S	1.5 E	1.5 W	70 70	450 #@g R	5/R ST	1	NO	NO	G	2 2
01	Evergreen Ash	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	00.00	1051	00-00	0000	1.00 %	100000	01					
62	Ficus benjamina	М	GV	F	MGVF - 9 1	D	6	1 N	1 S	1 E	1 W	80 80	300 R	1/R ST	1	NO	NO	G	2 2
	Weeping Fig	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	own ex	curre	nt.									
63/	Yucca sp. x3	М	GV	G	MGVG - 10 1	С	4	1 N	1 S	1 E	1 W	70 70	620 #@g R	1/R ST	1	NO	NO	Y	3
6	Yucca	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.				!		•			
64	Ficus hillii	М	GV	F	MGVF - 9 2	С	10	3 N	3 S	3 E	3 W	60 60	300 #@g R	1/R ST	1	NO	NO	G	1 1
0.	Hills Fig	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	own ex	curre	nt.						1			1
65	Ficus benjamina	М	GV	F	MGVF - 9 2	С	10	3 N	3 S	3 E	3 W	60 60	340 #@g R	1/R ST	1	NO	NO	G	1
	Weeping Fig	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	own ex	curre	nt.				•		•			
66	Ficus benjamina	М	GV	F	MGVF - 9 2	С	10	3 N	3 S	3 E	3 W	60 60	300 #@g R	1/R ST	1	NO	NO	G	1
	Weeping Fig	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, ci	own ex	curre	nt.				•		•			
67	Corymbia maculata	М	GV	F	MGVF - 9 2	С	10	3 N	3 S	3 E	3 W	60 60	240 R	1/R ST	1	NO	NO	G	1
	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, ci	own ex	curre	nt.									
68	Corymbia maculata x2	М	GV	F	MGVF - 9 2	С	10	3 N	3 S	3 E	3 W	60 60	400 R	1/R ST	1	NO	NO	G	1
	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	own ex	curre	nt.									
69/	Corymbia maculata x4	М	GV	G	MGVG - 10 1	С	10	3 N	3 S	3 E	3 W	70 70	240# R	1/R ST	1	NO	NO	G	1
7	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.				1		1			
70/	Corymbia maculata x5	М	GV	G	MGVG - 10	С	10	3 N	3 S	3 E	3 W	70 70	500 #@g R	1/R ST	1	NO	NO	G	1
8	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	own ex	curre	nt.	1000.00	TO CONTROL OF THE PARTY OF THE		Account to					

Commistration   March   Gradual   March   Gradual   Gr	Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Vigour GV = Good Vigour LV = Low Vigour	Condition G = Good F = Fair P = Poor D = Dead	1. SRIV Age, Vigour, Condition / Index Rating www.iaca.org.au / 2. Estimated Life Expectancy 1. Long 2. Medium 3. Short	Crown Form D = Dominant C = Co-dominant I = Intermediate S = Suppressed F = Forest E = Emergent	Ht. Approx. metres		Spi app me Orien N= S S= S E=	read rox. tres / tation north South East West		Crown Cover % / Crown Density % / D = dormant	DBH in mm @ 1.4m, or other, as indicated / Trunk Orientation other than R = radial, e.g. N/S g = ground	Trunk Lean  1 = Upright-Slight  2 = Moderate  3 = Severe  4 = Critical.  5 = Acaulescent / Orientation / ST = Static P = Progressive SC = Self-correcting	Roots Evident at Root Crown 1. = None 2. = Adventitious 3. = Basal Flare 4. = Buttresses 5. = First Order Roots (FOR), No. & distribution e.g. R = radial, or one each to N, S, E and W	Pests, Diseases & Damage No or Yes If Yes see comments	Branch Bark Included No or Yes or N/A	Form G = Good Form P = Poor Form	Significance scale 1=High 2=Medium 3=Low / Retention Value 1=High 2=Medium 3=Low 4=Remove
Spotted Gum	71	Corymbia maculata	М	GV	G	MGVG - 10	С	12								1	NO	NO	G	
Corymbia maculata	' '	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tag	ering & contin	iuous, c		100	0.0									,
Spotted Gum					T	MGVG - 10			5	5	5					1	NO	NO	G	
Corymbia maculata	/2	Spotted Gum	Comments:	Trunka	rect strain		ering & contin	LIQUE C				VV	70	ĸ	51					1
Corymbia maculata		00 1 00 00 00 00 00 00 00 00 00 00 00 00								_		5	70	200	1/R					1
Spotted Gum	73	Corymbia maculata	М	GV	G		С	12								1	NO	NO	G	
Corymbia maculata   M   GV   G   Tunk erect, straight, gradually tapering & continuous, crown excurrent.   Spotted Gum   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.		Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.	•					•			
Spotted Gum	7/	Corymbia maculata	М	GV	G	MGVG - 10	С	12					1000000			1	NO	NO	G	
Facility   Facility	'4	Spotted Gum	Comments:	Trunk e	rect. straic	ht. gradually tag	erina & contin	luous. c							٥.					· ·
Cheese Tree   Comments: Trunk to 2 metres, crown deliquescent, orientation N/S, asymmetrical bias to north. Senescent specimen.    The comment of the comm		10 1 2 10 0 10 10 10 10 10 10 10 10 10 10 10 1				MGVF - 9	1		6	3	3					1	YES	NO	G	
Corymbia maculata	75	Chassa Tras	Commente	Tarrateta	2	_		an N/C					8.8		ST			00 000000		3
Corymbia maculata   M   GV   G   1   D   16   N   S   E   W   70   R   ST   1   NO   NO   G   2			Comments:	Trunk to	o ∠ metres. T		cent, orientati T	on N/S,	_						1/D					2
Spotted Gum   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.	76	Corymbia maculata	М	GV	G	112000000000000000000000000000000000000	D	16								1	NO	NO	G	
Acacia decurrens  M GV G MGVG-10 D 10 5 5 5 5 5 70 400# 1/R 1 NO NO G 2  Early Black Wattle / Green Wattle  Green Wattle  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Slight lean-to west correcting.  Tallowwood  Comments: Slight lean-to west correcting.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Slight lean-to west correcting.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.  Tallowwood  Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.	'	Spotted Gum	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.		50.0000000	1000000	0.00-0.000					100
Farly Black Wattle   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Slight lean-to west correcting.   Signature   Comments: Slight lean-to west correcting.   Signature   Comments: Slight lean-to west correcting.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Signature   Comments: Signature		Acacia docurrons			1						5		70	400#	1/R	1	NO	NO	G	2
Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.   Figure   Comments: Trunk erect, straight, gradually tapering & continuous, crow	77		IVI	Gv	6	1	U	10	N	S	Е	W	70	R	ST	1	INO	NO	G	2
Fucallyptus microcorys	' '		Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	nuous, c	rown e	xcurre	nt.									
78         1         N S E W 70 R ST         ST         1           Tallowwood         Comments: Slight lean-to west correcting.           Eucalyptus microcorys         M         GV         G         MGVG - 10         D         15         7         8         ST         1         NO         NO         G         2         1           Tallowwood         Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.           80         Eucalyptus sp.         M         GV         G         MGVG-10         <		Fucalvotus microcorvs	М	GV	G		C	10								1	NO	NO	G	
Tallowwood Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.    Eucalyptus sp.   M   GV   G   MGVG - 10   D   15   7   7   7   7   7   7   7   7   7	78			10-202		'			N	S	E	W	70	R	ST		110			1
Tollow wood         Comments: Trunk erect, straight, gradually tapering & continuous, crown excurrent.           Bo         Eucalyptus sp.         M         GV         G         MGVG - 10         C         10         3         3         3         70         600#         1/R         1         NO         NO         G         2           1         N         S         E         W         70         R         ST         1         NO         NO         G         2						1			7	7	7	7	70	300#	1/R					2
80 Eucalyptus sp. M GV G MGVG - 10 C 10 3 3 3 70 600# 1/R 1 NO NO G 2 1	79	Eucalyptus microcorys	М	GV	G	11,000,000,000,000	D	15		1225	- 0					1	NO	NO	G	
80 Eucalyptus sp. M GV G 1 C 10 N S E W 70 R ST 1 NO NO G 1		Tallowwood	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	nuous, c	rown e	xcurre	nt.									
	80	Eucalyptus sp.	М	GV	G	MGVG - 10 1	С	10								1	NO	NO	G	
		Eucalypt	Comments:	Slight le	an-to east	correcting.	1	0 10	1 62		_		. 0				1			· · ·

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Vigour GV = Good Vigour LV = Low Vigour	Condition G = Good F = Fair P = Poor D = Dead	1. SRIV Age, Vigour, Condition / Index Rating www.iaca.org.au / 2. Estimated Life Expectancy 1. Long 2. Medium 3. Short	Crown Form D = Dominant C = Co-dominant I = Intermediate S = Suppressed F = Forest E = Emergent	Ht. Approx. metres		,	ead rox. tres / tation north couth East		Crown Cover % / Crown Density % / D = dormant	DBH in mm @ 1.4m, or other, as indicated / Trunk Orientation other than R = radial, e.g. N/S g = ground	Trunk Lean  1 = Upright-Slight  2 = Moderate  3 = Severe  4 = Critical.  5 = Acaulescent / Orientation / ST = Static P = Progressive Sc = Self-correcting	Roots Evident at Root Crown 1. = None 2. = Adventitious 3. = Basal Flare 4. = Buttresses 5. = First Order Roots (FOR), No. & distribution e.g. R = radial, or one each to N, S, E and W	Pests, Diseases & Damage No or Yes If Yes see comments	Branch Bark Included No or Yes or N/A	Form G = Good Form P = Poor Form	Significance scale 1=High 2=Medium 3=Low / Retention Value 1=High 2=Medium 3=Low 4=Remove
81	Eucalyptus sp.	М	GV	G	MGVG - 10 1	С	6	3 N	3 S	3 E	3 W	70 70	300 R	1/R ST	1	NO	NO	G	2 2
	Eucalypt	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own exc	curre	nt.				27. 7		-			
82	Eucalyptus sp.	М	GV	G	MGVG - 10	С	6	3 N	3 S	3 E	3 W	70 70	300 R	1/R ST	1	NO	NO	G	2 2
02	Eucalypt	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own exc	curre	nt.							<u> </u>		
83	Angophora costata	М	GV	G	MGVG - 10 1	D	10	6 N	6 S	6 E	6 W	70 70	390 R	1/R ST	1	NO	NO	G	2
	Sydney Red Gum	Comments:	Trunk to	3 metres	crown deliques	cent, orientati	on radia		etrica	al.									
84	Butia capitate	М	GV	G	MGVG - 10 1	D	8	4 N	4 S	4 E	4 W	70 70	400 R	1/R ST	1	NO	NO	G	2 2
	Jelly Palm	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own exc	curre	nt.									
85	Archontophoenix cunninghamiana	М	GV	G	MGVG - 10	D	9	2 N	2 S	2 E	2 W	70 70	300 R	1/R ST	1	NO	NO	G	2 2
	Bangalow Palm	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.									
86	Pittosporum undulatum	М	GV	F	MGVF - 9	D	6	3 N	3 S	2 E	2 W	70 70	650 #@g R	5/R ST	1	NO	NO	Р	2 3
	Native Daphne	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesce	nt, or	ientati	on N/S	, asymmetri	cal bias to so	uth. Senescen	nt specimen. Ro	t evident	in basal a	re of tru	ınk.
87/	Cupressus macrocarpa 'Leightons Green' x2	М	GV	G	MGVG - 10 1	С	6	1.5 N	1.5 S	1.5 E	1.5 W	80 80	300# R	1/R ST	1	NO	NO	G	2 2
9	Leightons Green Pine	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	rown exc	curre	nt.									
88	Callistemon viminalis 'Captain Cook'	М	GV	F	MGVF - 9 2	D	5	3 N	2 S	2 E	2 W	70 70	400 #@g R	5/R ST	1	NO	NO	G	2 2
	Captain Cook Bottlebrush	Comments:	Acaules	cent or sh	ort trunk @ or no	ear ground, cr	own del	iquescei	nt, or	ientati	on N/S	, asymmetri	cal bias to no	rth.	I	1	ı	1	<b>'</b>
89	Araucaria heterophylla	М	GV	F	MGVF - 9	С	8	2 N	2 S	2 E	2 W	70 70	400 R	1/R ST	1	NO	NO	F	2 2
	Norfolk Island Pine	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	rown exc	curre	nt.				•	•	•	•		
90	Grevillea robusta	М	GV	F	MGVF - 9 1	С	8	2 N	2 S	2 E	2 W	70 70	300 R	1/R ST	1	NO	NO	F	2 2
	Silky Oak	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	uous, c	own ex	curre	nt.						•	,		

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91	Casuarina glauca	М	GV	F	MGVF - 9	D	10	2 N	2 S	2 E	2 W	50 50	300 R	1/R ST	1	NO	NO	F	2 2
91	Swamp She Oak	Comments:	Trunk to	5 metres.	crown deliques	cent, orientation	on radia	8.5		0.0		- 00	13	01					
92/	Acacia decurrens x2	М	GV	G	MGVG - 10 1	С	10	3 N	3 S	3 E	3 W	70 70	300 R	1/R ST	1	NO	NO	G	2 2
10	Green Wattle	Comments:																	
93/	Butia sp. x2	М	GV	G	MGVG - 10 1	С	6	2 N	2 S	2 E	2 W	70 70	290# R	1/R ST	1	NO	NO	G	2 2
11	Palm	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.		1		!		•			
94	Archontophoenix cunninghamiana	М	GV	G	MGVG - 10 1	С	6	2 N	2 S	2 E	2 W	70 70	300 R	1/R ST	1	NO	NO	G	2 2
	Bangalow Palm	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.									-
95/	Yucca x2	М	GV	G	MGVG - 10	С	6	1 N	1 S	1 E	1 W	70 70	300# R	1/R ST	1	NO	NO	F	2 3
12	Yucca	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.		32.70		200 90					
96	Melaleuca linariifolia	М	GV	G	MGVG - 10 1	D	5	2 N	2 S	2 E	2 W	70 70	No access	5/R ST	1	NO	NO	Р	2 3
	Snow in Summer	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesc	ent, or	ientati	on radi	ial, symmetr	ical.			ı			-
97	Eucalyptus sp.	М	GV	G	MGVG - 10 1	D	10	3 N	3 S	3 E	3 W	70 70	No access R	1/R ST	1	NO	NO	G	2 2
	Eucalypt	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.									
98	Acer palmatum	М	GV	G	MGVG - 10 1	D	5	2 N	2 S	2 E	2 W	N/A D	290 R	1/R ST	1	NO	NO	G	2 2
	Japanese Maple	Comments:	Trunk to	300mm, d	crown deliquesc	ent, orientatio	n radial,	symm	etrical										
99	Viburnum odoratissimum	М	GV	G	MGVG - 10 1	D	4	2 N	2 S	2 E	2 W	80 80	No access	5/R ST	1	NO	NO	G	2 2
	Sweet Viburnum	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesc	ent, or	ientati	on radi	ial, symmetr	ical.	ı		1			-
100	Elaeocarpus reticulatus	М	GV	G	MGVG - 10	С	6	2 N	2 S	2 E	2 W	80 80	240 R	1/R ST	1	NO	NO	G	2 2
	Blueberry Ash	Comments:	Trunk e	rect, straig	ht, gradually tap	ering & contin	iuous, c	rown e	xcurre	nt.		and the second s	1						

Tree No.	Genus & Species Common Name	Age Y = Young M = Mature O = Overmature	Vigour GV = Good Vigour LV = Low Vigour	Condition G = Good F = Fair P = Poor D = Dead	1. SRIV Age, Vigour, Condition / Index Rating Www.iaca.org.au / 2. Estimated Life Expectancy 1. Long 2. Medium 3. Short	Crown Form D = Dominant C = Co-dominant I = Intermediate S = Suppressed F = Forest E = Emergent	Ht. Approx. metres		Spi app me	tres / tation north South East		Crown Cover % / Crown Density % / D = dormant	DBH in mm @ 1.4m, or other, as indicated / Trunk Orientation other than R = radial, e.g. N/S g = ground	Trunk Lean  1 = Upright-Slight  2 = Moderate  3 = Severe  4 = Critical.  5 = Acaulescent / Orientation / ST = Static P = Progressive SC = Self-correcting	Roots Evident at Root Crown 1. = None 2. = Adventitious 3. = Basal Flare 4. = Buttresses 5. = First Order Roots (FOR), No. & distribution e.g. R = radial, or one each to N, S, E and W	Pests, Diseases & Damage No or Yes If Yes see comments	Branch Bark Included No or Yes or N/A	Form G = Good Form P = Poor Form	Significance scale 1=High 2=Medium 3=Low / Retention Value 1=High 2=Medium 3=Low 4=Remove
101	Syzygium luehmannii M	GV	G	MGVG - 10 1	D	6	2 N	2 S	2 E	2 W	80 80	470 R	1/R ST	1	NO	NO	G	2 2	
101	Small Leafed Lilly Pilly	Comments:	Trunk to	1 metre,	crown deliquesc	ent, orientatio	n radial	symm	etrical			(10) 30	ANCES!	200. 9				I	1900
102/	Cupressus macrocarpa 'Brunniana' x3	М	GV	G	MGVG - 10 1	С	4	1 N	1 S	1 E	1 W	80 80	200 R	5/R ST	1	YES	NO	G	2 2
13	Brunnings Cypress	Comments:	L Acaules	cent or sh	ort trunk @ or ne	⊥ ear ground, cr	l own del			ientati									
103	Pittosporum undulatum & Long leaf Privet	М	GV	F	MGVF - 9 2	C	7	3 N	3 S	3 E	3 W	70	800 R	5/R ST	1	NO	NO	Р	3
	Native Daphne	Comments:	Acaules	cent or sh	ort trunk @ or ne	ear ground, cr	own del	iquesc	ent, or	ientati	on radi	ial, symmetr	ical. Privet gr	owing through	crown.	•	•		•
104	Eucalyptus sp.	М	GV	G	MGVG - 10 1	D	6	2 N	2 S	2 E	2 W	70 70	290 R	1/R ST	1	NO	NO	G	2 2
	Eucalypt	Comments:	Trunk er	ect, straig	ht, gradually tap	ering & contin	uous, c	rown e	xcurre	nt.									

#### Observations

7.2 The site has a stand of mature, overmature or senescent, remnant and planted endemic and non-locally indigenous or exotic evergreen and deciduous taxa within the current proposal. The proposed design includes the retention and protection of twenty-nine (29) specimens within the neighbouring properties and on the Willoughby Road reserve as they are considered significant for their contribution as landscape elements to the property and the retention of these trees allows them as components of the current curtilage to be transferred to the new proposal, maintaining elements of a continuous landscape, providing a more harmonious integration and transition of the use of the land.

#### **Tree Significance**

7.3 Significant Trees as established by the Rating System for Tree Significance – IACA Stars (2010), Appendix A.

#### Significance Scale

- 1 High
- 2 Medium
- 3 Low

Significance Scale	Redgum Tree No.
1	4, 6, 7, 9, 10, 11, 12, 13, 15, 16, 17, 18, 26, 27, 31, 64, 65, 66, 67, 68, 69*4, 70*5, 71, 72, 73, 74
2	1, 2, 3, 5, 8, 14, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42×2, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58×3, 60, 61, 62, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87×2, 88, 89, 90, 91, 92×2, 93×2, 94, 95×2, 96, 97, 98, 99, 100, 101, 102×3, 104
3	59 <sup>x7</sup> , 63 <sup>x3</sup> , 103

#### **Tree Retention Value**

7.4 See Appendix A for Retention Value Matrix.

#### **Retention Value**

High – Priority for Retention

Medium – Consider for Retention

Low – Consider for Removal

Remove - Priority for Removal

Itomovo i monty is	T TOTAL
Retention Value	Redgum Tree No.
High Priority for.	1, 2*, 3*, 4*, 5*, 6, 7, 10, 11, 13, 15, 16, 17, 18, 26, 27, 31, 64, 65, 66, 67, 68, 69×4, 70×5, 71, 72, 73, 74, 78, 79, 80, 83
Medium Consider for Retention	8, 9, 12, 14, 19, 20, 21, 22, 23, 24, 25, 29, 30, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47×2, 48, 49, 50, 53, 55, 56, 57, 58×3, 61, 62, 76, 77, 81, 82, 84, 85, 87×2, 88, 89, 90, 91, 92×2, 93×2, 97, 98, 99, 100, 101, 102×3, 104
Low Consider for Removal	28, 32, 33, 45, 51, 52, 54, 59 <sup>x7</sup> , 60, 63 <sup>x3</sup> , 75, 86, 94, 95 <sup>x2</sup> , 96, 103
Remove Priority for. Removal	

<sup>\*</sup>Trees located within the neighbouring property and should be retained and protected. Consent required from owner if removal required.

- 7.5 AS4970 (2009) section 3, 3.3.3 requires the Project Arborist to demonstrate that where a retained tree is subject to a major encroachment (>10% of area of TPZ) it can be protected to remain viable
- 7.6 <u>Tree 2, 3 & 5</u> Banksia marginata Silver Banksia, Lophostemon confertus— Queensland Brush Box & Archontophoenix cunninghamiana Bangalow Palm, these neighbouring property specimens were found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a *Tree Protection Zone (TPZ)* setback of, 4.0m for Tree (T)2, 3.5m for T3 & 3.0m for T5 from centre of trunk (COT), the setback for the proposed development adjacent to these specimens is estimated at >4.0m from COT, which is not an encroachment by the proposed development. *These specimens are sufficiently setback from the development to not be affected.*
- 7.7 <u>Tree 4</u> *Eucalyptus microcorys* Tallowwood, this neighbouring property specimen was were found in good health & vigour at time of assessment.

- <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 11.8m for T4 from COT, the setback for the proposed development adjacent to the specimen is estimated at 7.5m to the basement and & 6.0m to the children's play area from COT, which is an encroachment by the proposed development. The alignment of the basement and children's play area are a major encroachment to this specimen. The section of the development within the TPZ of this specimen is to be constructed using tree sensitive excavation and construction techniques such as a vertical cut with shotcrete and contiguous pilings for the basement to reduce any impact on its stability. Root Mapping may be required due to the proposed positioning of Play area and possible level changes within tree protection zones of Neighbouring property retained specimens.
- 7.8 <u>Tree 27</u> Corymbia maculata Spotted Gum, this specimen was found in good health & vigour with poor form at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 4.4m from COT, the setback for the proposed development adjacent to this specimen is estimated at >5.5m from COT, which is not an encroachment by the proposed development. This specimen is sufficiently setback from the development to not be affected with trunk bundling required per discussion point 14.18 of Part B of this report.
- 7.9 <u>Tree 64, 65, 66, 67 & 68</u> *Corymbia maculata -* Spotted Gum, these specimens were found in fair health & good vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 4.8m from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is not an encroachment by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 7.10 <u>Tree 69<sup>x4</sup>, 80 & 92<sup>x2</sup></u> Corymbia maculata Spotted Gum, Eucalyptus sp. Eucalypt & Acacia decurrens Green Wattle, these specimens were found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 3.6m for Tree (T)69<sup>x4</sup> & T92<sup>x2</sup> & 7.2m for T80 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m & 7.2m respectively from COT, which is not an encroachment by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 7.11 <u>Tree 70x5</u> Corymbia maculata Spotted Gum, these specimens were found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.2m from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is an acceptable minor encroachment estimated at 9.7% by the proposed development excavation on down slope or across slope side of tree.
- 7.12 <u>Tree 71, 72, 73 & 74</u> Corymbia maculata Spotted Gum, these specimens were found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.8 for T71 & 8.4m for T72, T73 & T74 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is a major encroachment estimated at 12.2% for T71 & 14.5% to T72, T73 & T74 by the proposed development.
- 7.13 <u>Tree 78 & 83</u> Eucalyptus microcorys Tallowwood & Angophora costata Sydney Red Gum, both specimens were found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.2 for T78 & 4.7m for T83 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 7.0m & 4.5m respectively from COT, which is an encroachment estimated at 2% & 5% by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 7.14 <u>Tree 79</u> Eucalyptus microcorys Tallowwood, this specimen was found in good health & vigour at time of assessment.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 14.4m from COT, the setback for the proposed retaining wall adjacent to this specimen is estimated at 7.0m from COT, which is a major encroachment estimated at 18.8% by the proposed development.

#### Demolition and Tree Removal/s

- 7.15 Trees 1, 6 to 26 & 28 to 47<sup>x2</sup>, 48, 49, 50<sup>x6</sup> to 58<sup>x3</sup>, 59<sup>x7</sup>, 60 to 63<sup>x3</sup>, 75 to 78, 81, 82, 84 to 87<sup>x2</sup>, 88 to 91 & 93<sup>x2</sup>, 94, 95<sup>x2</sup>, 96 to 102<sup>x3</sup>, 103 & 104 are to be removed as they are located within the site in a position where they cannot be retained due to the proposed building footprints and associated infrastructure such as excavation of the basement where encroachment will have an adverse impact on its roots and crown for viability and stability.
  - Tree 6 to 8, 10 & 11, 13 to 26: Casuarina glauca Swamp She Oak; located within the vacant block and
    positioned within the proposed driveway and building envelope. If this current proposed design is
    approved, then these specimens cannot be retained and are recommended to be replaced as part of
    the proposed landscape works.
  - Tree 9 & 12: *Grevillea robusta* Silky Oak; located within the vacant block and positioned within the proposed building envelope. If this current proposed design is approved, then these specimens cannot be retained and are recommended to be replaced as part of the proposed landscape works.
  - Tree 28, 29, 30, 34, 50x6, 51 to 58x3, 59x7, 60 to 63x3, 75 to 78, 81, 82, 84 to 87x2, 88 to 91 & 93x2, 94, 95x2, 96 to 102x3, 103 & 104: *Pittosporum undulatum* Native Daphne, *Jacaranda mimosifolia* Jacaranda, *Camellia japonica* Camellia & *Lagerstroemia indica* Crepe Myrtle; located within the property and positioned within the proposed building envelope. If this current proposed design is approved, then these specimens cannot be retained and are recommended to be replaced as part of the proposed landscape works.
  - Tree 31, 32, 33 & 35 to 49: Tristaniopsis collina Hill Water Gum & Callistemon 'Harkness' Harkness
    Bottlebrush, Callistemon viminalis 'Hanna Ray' Hanna Ray Bottlebrush & Angophora costata Sydney
    Red Gum; located within the Walter Street road reserve and positioned within the proposed road
    widening and change to existing ground levels. If this current proposed design is approved, then these
    specimens cannot be retained and are recommended to be replaced as part of the proposed landscape
    works.
- 7.16 Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby. Where structural roots are to be removed, this should be undertaken manually using non-motorised hand tools after the stump has been ground out when such roots are often easier to locate from the site of the stump from which they have been severed.

#### Specific - Tree works - Post Construction

7.17 Trees to be removed are to be replaced with advanced specimens being mindful of the space limitations of the new use of the site. The advanced trees should be situated in areas along the boundaries of the site. The planting in these locations will provide the maximum benefit to the surrounding properties by screening views to and from the site and the plantings included in the proposed landscape plan. The replacement trees will be situated in positions where they may grow to maturity unhindered and will not conflict with built structures or utility services and in greater numbers than the trees removed should provide a net increase in the local amenity.

#### 8.0 CONCLUSION

One hundred and four (104) trees are nominated for removal and replacement with species in accordance with the associated Landscape documentation for the development. The twenty-nine (29) trees to be preserved will be retained and protected through the implementation of adequate measures for their integration into the development by the application of appropriate technology as detailed in this report. Where appropriate, the Landscape Plan will include planting with new trees including street tree/s.

The recommendations made in this report are subject to approval by the consent authority.

#### 9.0 RECOMMENDATIONS

- 9.1 Trees 2, 3, 4, 5, 27, 64 to 69<sup>x4</sup>, 70<sup>x5</sup>, 71 to 74, 78, 79, 80, 83 & 92<sup>x2</sup> are to be retained in situ within the site and are to be protected as detailed in 7.5 7.14 and Section 14 of part B of this report. Tree protection fences, or works, to be situated in accordance with Site Plan B Trees to be Retained and Tree Protection Zones (Appendix F). See Tree Protection Plan for additional protection measures for the management of retained specimens.
- 9.2 Trees 1, 6 to 26 & 28 to  $47^{x2}$ , 48, 49,  $50^{x6}$  to  $58^{x3}$ ,  $59^{x7}$ , 60 to  $63^{x3}$ , 75 to 78, 81, 82, 84 to  $87^{x2}$ , 88 to 91 &  $93^{x2}$ , 94,  $95^{x2}$ , 96 to  $102^{x3}$ , 103 & 104 are to be removed which is to be undertaken in accordance with 7.15 7.16 and Section 13 of Part B of this report.
- 9.3 Each of the replacement are to be a vigorous specimen with a straight trunk, gradually tapering and continuous, crown excurrent, symmetrical, with roots established but not pot bound in a volume container or approved similar and be maintained by an appropriately qualified and experienced landscape contractor for up to one (1) year after planting, or as appropriate.

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#### DISCLAIMER

The author and Redgum Horticultural take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modification/s to its growing environment either above or below ground contrary to our advice.

#### REFERENCES

- 1. Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.
- 2. IACA 2005, Sustainable Retention Index Value, Institute of Australian Consulting Arboriculturists, Australia, <a href="www.iaca.org.au">www.iaca.org.au</a>
- 3. Standards Australia 2007, Australian Standard 4373 Pruning of amenity trees, Standards Australia, Sydney, Australia.
- 4. Standards Australia 2009, Australian Standard 4970 Protection of trees on development sites, Standards Australia, Sydney, Australia
- Safe Work Australia, Guide to Managing Risk from Tree Trimming and Removal Works.

### Appendix A

## IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

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 in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

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 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.

#### **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.

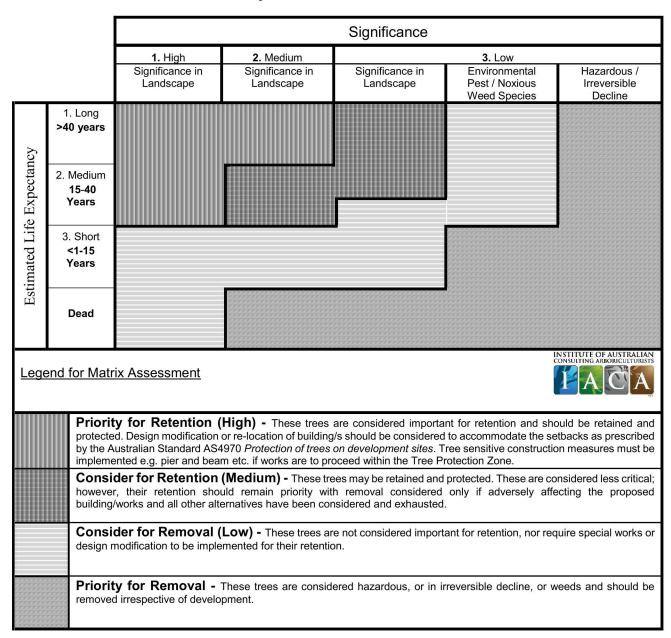
#### Hazardous/Irreversible Decline

- 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 for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Table 1.0 Tree Retention Value - Priority Matrix.



#### REFERENCES

Australia ICOMOS Inc. 1999, The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance, International Council of Monuments and Sites, www.icomos.org/australia

Draper BD and Richards PA 2009, Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, Footprint Green Tree Significance & Retention Value Matrix, Avalon, NSW Australia, www.footprintgreen.com.au

### Appendix B

### Matrix - Sustainable Retention Index Value (S.R.I.V.) ©

Version 4, 2010

Developed by IACA – Institute of Australian Consulting Arboriculturists <u>www.iaca.org.au</u>

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.

An index value is given to each category where ten (10) is the highest value.

Class		Vig	our Class and C	ondition Class		INSTITUTE OF AUSTRALIAN CONSULTING ABORICULTURISTS
Age	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if enough space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if enough space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist.  Retention potential - Medium Term.  Potential for longer with remediation or favourable environmental conditions.	Able to be retained if enough space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may a -short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if enough space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if enough space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if enough space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
Young 3	YGVG - 9 Index Value 9 Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	YGVF - 8 Index Value 8 Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	YGVP - 5 Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low- medium potential for future growth and adaptability. Retain, move or replace.	YLVG - 4 Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	YLVF - 3 Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	YLVP - 1 Index Value 1 Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.
(M)	MGVG - 10	MGVF - 9	MGVP - 6	MLVG - 5	MLVF - 4	MLVP - 2
Mature	Index Value 10 Retention potential -Medium - Long Term.	Index Value 9 Retention potential - Medium Term. Potential for longer with improved growing conditions.	Index Value 6 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 5 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 4 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 2 Retention potential - Likely to be removed immediately or retained for Short Term.
(O)	OGVG - 6	OGVF - 5	OGVP - 4	OLVG - 3	OLVF - 2	OLVP - 0
Over-	Index Value 6 Retention potential - Medium - Long Term.	Index Value 5 Retention potential - Medium Term.	Index Value 4 Retention potential - Short Term.	Index Value 3 Retention potential - Short Term. Potential for longer with improved growing conditions.	Index Value 2 Retention potential - Short Term.	Index Value 0 Retention potential - Likely to be removed immediately or retained for Short Term.

## Appendix C

Survey of Subject Tree/s
Trees the subject of this report are marked on the plans in the following appendices and are numbered as listed below.

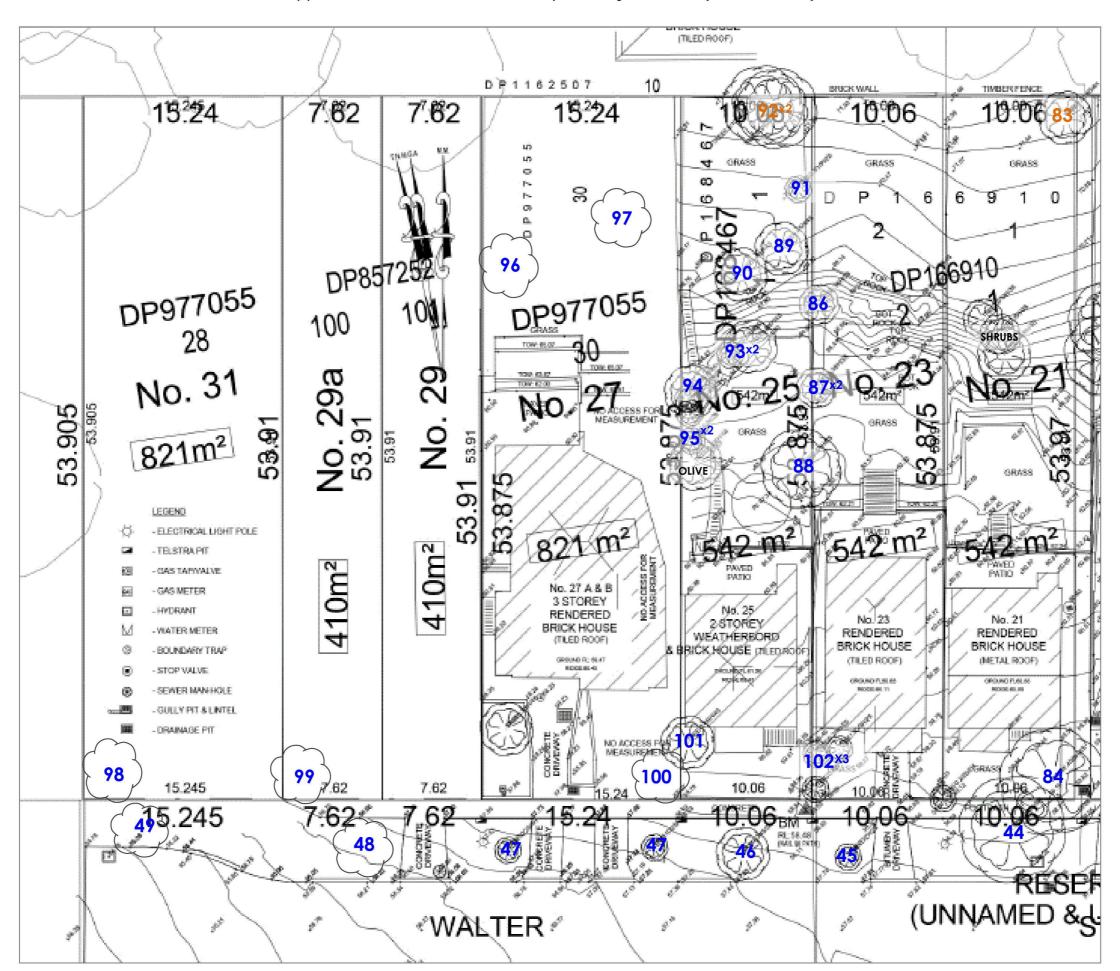
Redgum Tree / Stand No.	Genus and species	Common name	Recommendation
1	Pittosporum undulatum	Native Daphne	Remove and replace
2	Banksia marginata	Silver Banksia	Retain and protect – Neighbouring tree
3	Lophostemon confertus	Queensland Brush Box	Retain and protect – Neighbouring tree
4	Eucalyptus microcorys	Tallowwood	Retain and protect – Neighbouring tree
5	Archontophoenix cunninghamiana	Bangalow Palm	Retain and protect – Neighbouring tree
6	Casuarina glauca	Swamp She Oak	Remove and replace
7	Casuarina glauca	Swamp She Oak	Remove and replace
8	Casuarina glauca	Swamp She Oak	Remove and replace
9	Grevillea robusta	Silky Oak	Remove and replace
10	Casuarina glauca	Swamp She Oak	Remove and replace
11	Casuarina glauca	Swamp She Oak	Remove and replace
12	Grevillea robusta	Silky Oak	Remove and replace
13	Casuarina glauca	Swamp She Oak	Remove and replace
14	Casuarina glauca	Swamp She Oak	Remove and replace
15	Casuarina glauca	Swamp She Oak	Remove and replace
16	Casuarina glauca	Swamp She Oak	Remove and replace
17	Casuarina glauca	Swamp She Oak	Remove and replace
18	Casuarina glauca	Swamp She Oak	Remove and replace
19	Casuarina glauca	Swamp She Oak	Remove and replace
20	Casuarina glauca	Swamp She Oak	Remove and replace
21	Casuarina glauca	Swamp She Oak	Remove and replace
22	Casuarina glauca	Swamp She Oak	Remove and replace
23	Casuarina glauca	Swamp She Oak	Remove and replace
24	Casuarina glauca	Swamp She Oak	Remove and replace
25	Casuarina glauca	Swamp She Oak	Remove and replace
26	Casuarina glauca	Swamp She Oak	Remove and replace
27	Corymbia maculata	Spotted Gum	Retain and protect – Street tree
28	Pittosporum undulatum	Native Daphne	Remove and replace
29	Jacaranda mimosifolia	Jacaranda	Remove and replace
30	Camellia japonica	Camellia	Remove and replace
31	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree
32	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree
33	Callistemon 'Harkness'	Harkness Bottlebrush	Remove and replace – Street tree
34	Lagerstroemia indica	Crepe Myrtle	Remove and replace
35	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree
36	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree
37	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree
38	Angophora costata	Sydney Red Gum	Remove and replace – Street tree
39	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree
40	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree
41	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree
42	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree
43	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree
44	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree
45	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree

Redgum Tree / Stand No.	Genus and species	Common name	Recommendation
46	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree
47/2	Tristaniopsis laurina x2	Water Gum	Remove and replace – Street tree
48	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree
49	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree
50/3	Juniperus sabina x6	Savin Juniper	Remove and replace
51	Jacaranda mimosifolia	Jacaranda	Remove and replace
52	Allocasuarina littoralis	Black She Oak	Remove and replace
53	Lagerstroemia indica	Crepe Myrtle	Remove and replace
54	Lagerstroemia indica	Crepe Myrtle	Remove and replace
55	Pittosporum undulatum	Native Daphne	Remove and replace
56	Glochidion ferdinandi	Cheese Tree	Remove and replace
57	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace
58/4	Waterhousia floribunda x3	Weeping Lilly Pilly	Remove and replace
59/5	Waterhousia floribunda x7	Weeping Lilly Pilly	Remove and replace
60	Fraxinus griffithii	Evergreen Ash	Remove and replace
61	Fraxinus griffithii	Evergreen Ash	Remove and replace
62	Ficus benjamina	Weeping Fig	Remove and replace
63/6	Yucca sp. x3	Yucca	Remove and replace
64	Ficus hillii	Hills Fig	Retain and protect
65	Ficus benjamina	Weeping Fig	Retain and protect
66	Ficus benjamina	Weeping Fig	Retain and protect
67	Corymbia maculata	Spotted Gum	Retain and protect
68	Corymbia maculata	Spotted Gum	Retain and protect
69/7	Corymbia maculata x4	Spotted Gum	Retain and protect
70/8	Corymbia maculata x5	Spotted Gum	Retain and protect
71	Corymbia maculata	Spotted Gum	Retain and protect
72	Corymbia maculata	Spotted Gum	Retain and protect
73	Corymbia maculata	Spotted Gum	Retain and protect
74	Corymbia maculata	Spotted Gum	Retain and protect
75	Glochidion ferdinandi	Cheese Tree	Remove and replace
76	Corymbia maculata	Spotted Gum	Remove and replace
77	Acacia decurrens	Green Wattle	Remove and replace
78	Eucalyptus microcorys	Tallowwood	Retain and protect
79	Eucalyptus microcorys	Tallowwood	Retain and protect
80	Eucalyptus sp.	Eucalypt	Retain and protect
81	Eucalyptus sp.	Eucalypt	Remove and replace
82	Eucalyptus sp.	Eucalypt	Remove and replace
83	Angophora costata	Sydney Red Gum	Retain and protect
84	Butia capitata	Jelly Palm	Remove and replace
85	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace
86	Pittosporum undulatum	Native Daphne	Remove and replace
87/9	Cupressus macrocarpa 'Leightons Green' x2	Leightons Green Pine	Remove and replace
88	Callistemon viminalis 'Captain Cook'	Captain Cook Bottlebrush	Remove and replace
89	Araucaria heterophylla	Norfolk Island Pine	Remove and replace
90	Grevillea robusta	Silky Oak	Remove and replace

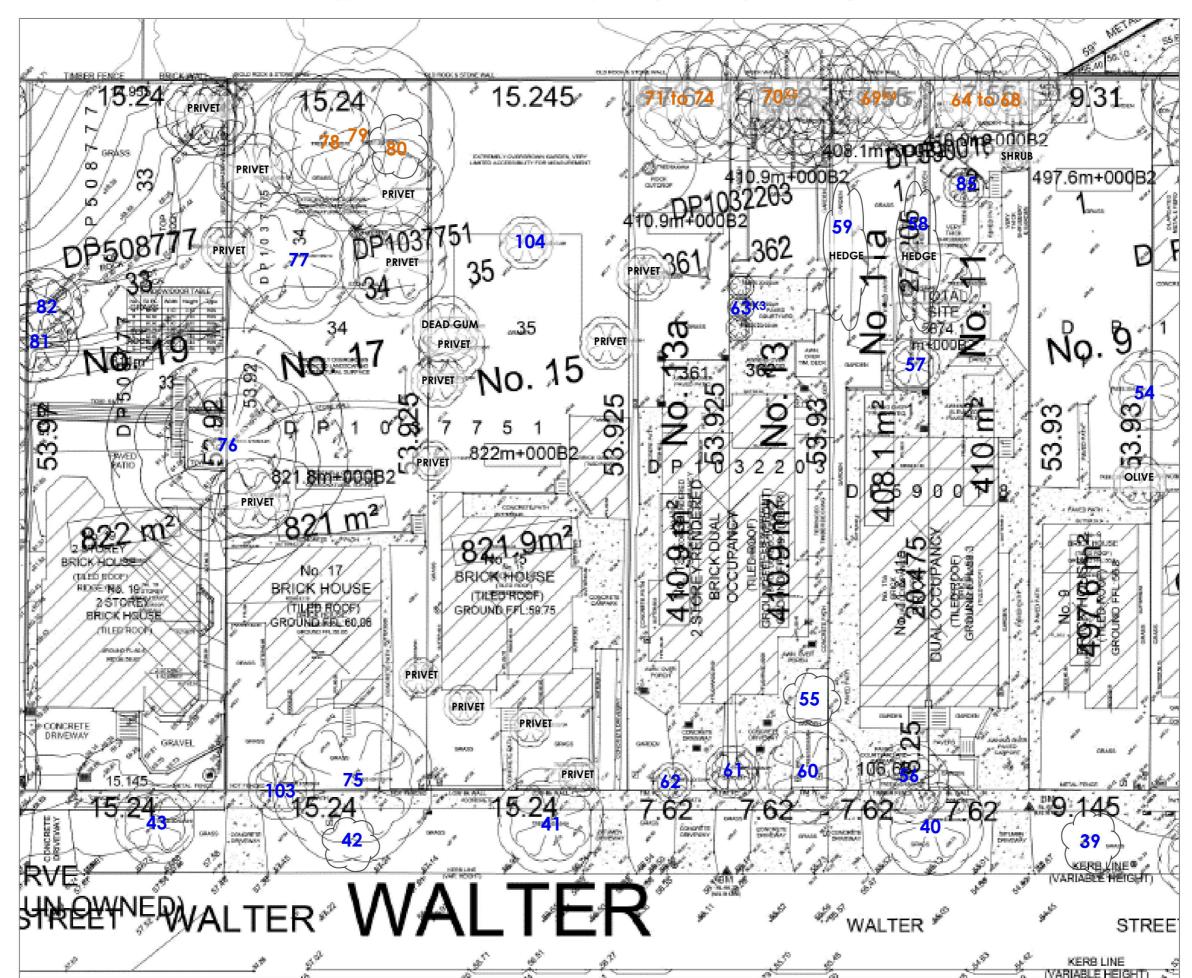
Redgum Tree / Stand No.	Genus and species	Common name	Recommendation
91	Casuarina glauca	Swamp She Oak	Remove and replace
92/10	Acacia decurrens x2	Green Wattle	Retain and protect
93/11	Butia sp. x2	Palm	Remove and replace
94	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace
95/12	Yucca sp. x2	Yucca	Remove and replace
96	Melaleuca linarifolia	Snow in Summer	Remove and replace
97	Eucalyptus sp.	Eucalypt	Remove and replace
98	Acer palmatum	Japanese Maple	Remove and replace
99	Viburnum odoratissimum	Sweet Viburnum	Remove and replace
100	Elaeocarpus reticulatus	Blueberry Ash	Remove and replace
101	Syzygium luehmannii	Small Leafed Lilly Pilly	Remove and replace
102/13	Cupressus macrocarpa 'Brunniana'x3	Brunnings Cypress	Remove and replace
103	Pittosporum undulatum & Privet	Native Daphne	Remove and replace
104	Eucalyptus sp.	Eucalypt	Remove and replace

Appendix C - Site Plan A - Survey of Subject Trees (Sheet 1 of 4)
This report has relied upon the following plan/s and documents which have been reproduced from electronic transmission and no longer to original scale.

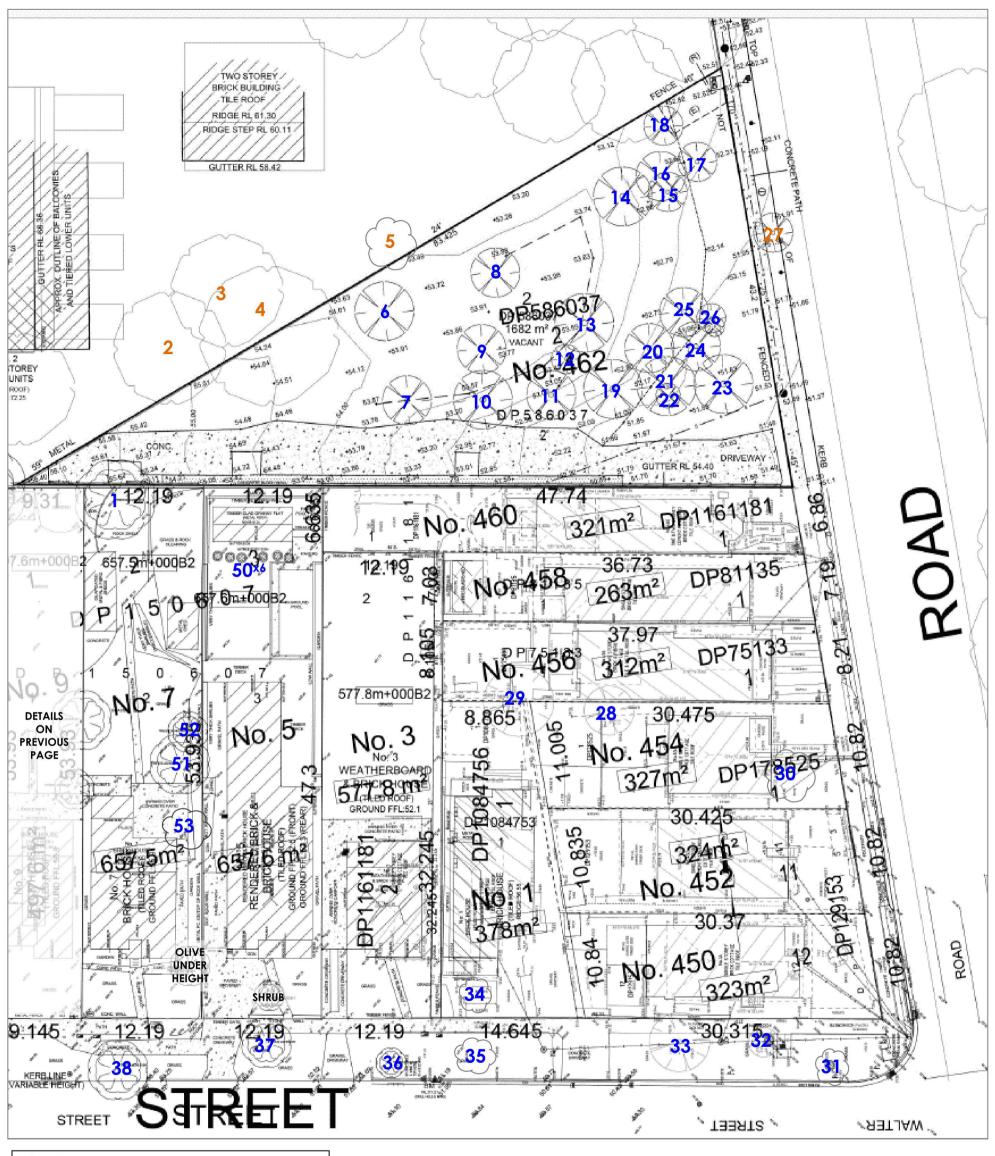












#### **Legend**

- Trees numbered in **orange** are recommended for **retention**.
- Trees numbered in **blue** are recommended for removal.



Site Survey over Lot 2 in DP 586037, Lot 1 in DP 1161181, Lot 1 in DP 81135, Lot 1 in DP 75133, Lot 1 in DP 178525, Lot 11 & 12 in DP 129153 & Lot 1 in DP 1084756, Lot 2 in DP 1161181, Lot 1, 2 & 3 in DP 150607, Lot 1 & 2 in DP 1530018, Lot 361 & 362 in DP 1032203, Lot 34 & 35 in DP 1037751, Lot 33 in DP 508777, Lots 1 & 2 in DP 166910, Lot 1 in DP 168467, Lot 30 in DP 977055, Lots 100 & 100 in DP 857252 & Lot 28 in DP 977055 Walter Street Master Plan, Planning Proposal Issue Date 25/07/19, Scale 1:500 @ A1, Issue A, Plan No. A.002



# Part B: TREE PROTECTION PLAN

(Trees to be retained and protected)

for

1-31 Walter Street & 452-462 Willoughby NSW

Prepared 29 August 2019 Our Ref: 4544

#### 10.0 PREFACE

Retention of Significant Tree/s within the continual landscape of a development is recommended to minimise the impact of the built landscape within the overall local amenity. This section of the report highlights the required specifications within the Tree Protection Plan (Tree Management Plan) and is to be read in conjunction with Part A: Arboricultural Impact Assessment of this report.

#### 11.0 INTRODUCTION

- 11.1 This section of the report provides the specification/s for all tree/s to be retained (on subject site) as detailed in Part A Arboricultural Impact Assessment.
- The trees to be retained are indicated on the Site Plan Survey of Subject Trees to be retained & Tree Protection Zones. The minimum setback for protective fencing from development works per tree to be retained is summarised in Table 1.0. Tree Protection Specifications including Site maintenance, Site Arboricultural service, Periodic inspections, Mulching, Irrigation, Weed control / suppression, Provision of services.
- Tree maintenance works including pruning, removal or transplantation are detailed in section 2.0. Works for Tree Protection on Construction Sites are detailed in section 3.0 and Tree Protection Zones a Standard Procedure as detailed in section 13.0 to be applied, or further detailed, or additional or alternative works added where appropriate.

#### 12.0 METHODOLOGY

This Methodology where utilised is applied to both Part A – Arboricultural Impact Assessment and B – Tree Protection Plan.

- 12.1 The method of assessment of tree/s applied is adapted from the principles of visual tree assessment undertaken from the ground, which considers:
  - Tree health and subsequent stability, both long and short term
  - Sustainable Retention Index Value (SRIV) Version 4 (IACA 2010) ©
  - Hazard potential to people and property
  - Amenity values
  - Habitat values
  - Significance
- This assessment is undertaken using standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment from the ground of each individual tree, or stand of trees, or a representative population sample. Any dimensions recorded as averages, or by approximation are noted accordingly.

#### 13.0 PRUNING STANDARDS

- Any pruning recommended in this report is to be to the Australian Standard® AS4373 *Pruning of amenity trees* and conducted in accordance with the NSW Work Cover Authority Code of Practice, Tree Work, 2007.
- All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO).
- 13.3 Tree maintenance work is specialised and in order to be undertaken safely to ensure the works carried out are not detrimental to the survival of a tree being retained, and to assist in the safe removal of any tree, should be undertaken by a qualified arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.

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#### 14.0 SUMMARY: Tree Management Plan

This Tree Protection Plan recommends; Trees 2, 3, 4, 5, 27, 64 to 69<sup>x4</sup>, 70<sup>x5</sup>, 71 to 74, 78, 79, 80, 83 & 92<sup>x2</sup> are located within the site, neighbouring properties and on the Willoughby Road, road reserve and are to be retained and protected for the duration of development consent. For Tree 2, 3, 5, 27, 64, 65, 66, 67, 68, 69, 78, 80, 83 & 92<sup>x2</sup>; the alignment of the development is sufficiently setback to not affect these specimens. Tree 4; the alignment of the basement and children's play area are a major encroachment to this specimen. The section of the development within the TPZ of this specimen is to be constructed using tree sensitive excavation and construction techniques such as a vertical cut with shotcrete and contiguous pilings for the basement to reduce any impact on its stability. Root Mapping may be required due to the proposed positioning of Play area and possible level changes within tree protection zones of Neighbouring property retained specimens. Tree 71, 72, 73, 74 & 79, these specimens will be subject to a major encroachment by the proposed retaining wall. As the proposed excavation for the retaining wall is on down slope or across slope side of trees the potential is increased for tensile roots to the north of the site; therefore root mapping is recommended to ascertain if significant woody (above 30mm) would be impacted by the retaining wall otherwise redesign within the TPZ to reduce the encroachment to minor would be required. Tree 70, the alignment of the retaining wall is an acceptable minor encroachment estimated at 9.7% by the proposed development with the proposed excavation on down slope or across slope side to this specimen.

#### Discussion

- 14.1 AS4970 (2009) section 3, 3.3.3 requires the Project Arborist to demonstrate that where a retained tree is subject to a major encroachment (>10% of area of TPZ) it can be protected to remain viable
- 14.2 <u>Tree 2, 3 & 5</u> Banksia marginata Silver Banksia, *Lophostemon confertus* Queensland Brush Box & *Archontophoenix cunninghamiana* Bangalow Palm, these neighbouring property specimens were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>: these specimens are not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. These specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a *Tree Protection Zone (TPZ)* setback of, 4.0m for Tree (T)2, 3.5m for T3 & 3.0m for T5 from centre of trunk (COT), the setback for the proposed development adjacent to these specimens is estimated at >4.0m from COT, which is not an encroachment by the proposed development. *These specimens are sufficiently setback from the development to not be affected.*
- 14.3 <u>Tree 4</u> Eucalyptus microcorys Tallowwood, this neighbouring property specimen was were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>; this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimen should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 11.8m for T4 from COT, the setback for the proposed development adjacent to the specimen is estimated at 7.5m to the basement and & 6.0m to the children's play area from COT, which is an encroachment by the proposed development. The alignment of the basement and children's play area are a major encroachment to this specimen. The section of the development within the TPZ of this specimen is to be constructed using tree sensitive excavation and construction techniques such as a vertical cut with shotcrete and contiguous pilings for the basement to reduce any impact on its stability. Root Mapping may be required due to the proposed positioning of Play area and possible level changes within tree protection zones of Neighbouring property retained specimens.
  - 14.4 <u>Tree 27</u> Corymbia maculata Spotted Gum, this specimen was found in good health & vigour with poor form at time of assessment.
    - <u>Trees viability to development</u>; this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. This specimen should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.

- <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 4.4m from COT, the setback for the proposed development adjacent to this specimen is estimated at >5.5m from COT, which is not an encroachment by the proposed development. This specimen is sufficiently setback from the development to not be affected with trunk bundling required per discussion point 14.18.
- 14.5 <u>Tree 64, 65, 66, 67 & 68</u> Corymbia maculata Spotted Gum, these specimens were found in fair health & good vigour at time of assessment.
  - <u>Trees viability to development</u>; these specimens are not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 4.8m from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is not an encroachment by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 14.6 <u>Tree 69x4, 80 & 92x2</u> Corymbia maculata Spotted Gum, Eucalyptus sp. Eucalypt & Acacia decurrens Green Wattle, these specimens were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>: these specimens are not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 3.6m for Tree (T)69<sup>x4</sup> & T92<sup>x2</sup> & 7.2m for T80 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m & 7.2m respectively from COT, which is not an encroachment by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 14.7 <u>Tree 70x5</u> Corymbia maculata Spotted Gum, these specimens were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>; these specimens are impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.2m from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is an acceptable minor encroachment estimated at 9.7% by the proposed development excavation on down slope or across slope side of tree.
- 14.8 <u>Tree 71, 72, 73 & 74</u> Corymbia maculata Spotted Gum, these specimens were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>; these specimens are impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.8 for T71 & 8.4m for T72, T73 & T74 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 5.0m from COT, which is a major encroachment estimated at 12.2% for T71 & 14.5% to T72, T73 & T74 by the proposed development.

As the proposed excavation for the retaining wall is on down slope or across slope side of trees the potential is increased for tensile roots to the north of the site; therefore root mapping is recommended to ascertain if significant woody (above 30mm) would be impacted by the retaining wall otherwise redesign within the TPZ to reduce the encroachment to minor would be required.

- 14.9 <u>Tree 78 & 83</u> *Eucalyptus microcorys* Tallowwood & *Angophora costata* Sydney Red Gum, both specimens were found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>: these specimens are not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimens should remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 7.2 for T78 & 4.7m for T83 from COT, the setback for the proposed retaining wall adjacent to these specimens is estimated at 7.0m & 4.5m respectively from COT, which is an encroachment estimated at 2% & 5% by the proposed development. The specimens are sufficiently setback from the development to not be affected.
- 14.10 <u>Tree 79</u> Eucalyptus microcorys Tallowwood, this specimen was found in good health & vigour at time of assessment.
  - <u>Trees viability to development</u>; this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per D/A conditions prior to commencement of works and to be monitored throughout the project at approx. 3 mthly intervals depending on the length of the development. The specimen **may** remain viable beyond completion of development provided recommended installation & protection measures are adhered to.
  - <u>Development Impacts</u>: AS4970 (2009) section 3 requires a TPZ setback of 14.4m from COT, the setback for the proposed retaining wall adjacent to this specimen is estimated at 7.0m from COT, which is a major encroachment estimated at 18.8% by the proposed development.

As the proposed excavation for the retaining wall is on down slope or across slope side of trees the potential is increased for tensile roots to the north of the site; therefore root mapping is recommended to ascertain if significant woody (above 30mm) would be impacted by the retaining wall otherwise redesign within the TPZ to reduce the encroachment to minor would be required.

The boundary fences and retaining wall within the tree protection zone of the retained specimens are to be constructed using tree sensitive excavation and construction techniques such as pier and beam construction with suspended sections to reduce any impact on their stability, with piers to be dug by hand using non-motorised machinery to further assist in their protection.

If associated infrastructure (pipe works) are to be installed within the Tree Protection Zone of any retained specimen, they are to be installed by hand with non-motorised machinery. If structural roots are found within the trench, they are to be left intact and dug around retaining this specimen's structural integrity with works to be undertaken in consultation with the project arborist.

There will be no impact to Tree 2, 3, 5, 27, 64, 65, 66, 67, 68, 69, 78, 80, 83 & 92<sup>x2</sup> with a minor encroachment to Tree 70, 78 & 80 while Tree 4, 71, 72, 73, 74 & 79 will be subject to major encroachment which are to be retained and protected as per AS 4970 (2009) Section 3, 3.3.3 Major Encroachments from development works within >10% of the area of the Tree Protection Zone and as per discussion points in section 14 in part B of this report. Any excavations must be supervised and certified by the Project Arborist in accordance with AS4970 (2009).

#### General – Tree Protection works – Prior to Demolition

- 14.11 <u>Milestones</u> Prior to demolition works, a site arborist shall be appointed to supervise all tree protection procedures detailed in this specification. The Site Arborist shall have a minimum level 5 AQF qualification in Arboriculture. Milestones are to be adhered to throughout the duration of this development and all relevant documentation is to be submitted to the local authority.
- 14.12 The Tree Protection Zone for each tree/s is to be incorporated into the construction works for the site and the protection fencing or works to be situated as indicated on the Appendix F Tree Protection Plan. The setbacks from building works on the side closest to each tree are to be carried out as indicated in Table 2.0, and Tree Protection Zones be constructed as described here and detailed in Appendix D. The trees will be sustained within the constraints of the modifications to the site by the proposed development works.
- 14.13 Trees 2, 3, 4, 5, 27, 64 to 69<sup>x4</sup>, 70<sup>x5</sup>, 71 to 74, 78, 79, 80, 83 & 92<sup>x2</sup> are to be retained and protected and incorporated into the landscape works for the site, and Tree Protection Zone fencing to be marked accordingly on the Landscape Plan, where appropriate and installed prior to any demolition or construction.

- 14.14 <u>Ground protection</u> If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards. These measures may be applied to root zones beyond the TPZ.
- 14.15 Where applicable, any excavation for the establishment of a batter slope or benching for reasons of safety and to comply with Work Cover Authority safety regulations should be restricted as far as is safely possible near to trees to be retained to prevent root damage. If the excavations cannot be undertaken near to vertical the stability of these trees and their long-term viability may be compromised and their retention in a safe and healthy condition jeopardized and they may need to be revised and possibly removed.

#### Specific - Tree Protection Works - Prior to Demolition and Tree Removal

- 14.16 All other trees/shrubs; prior to demolition and tree removal works these tree/s are to be placed within a Tree Protection Zone with protective fencing and maintained and retained until the completion of all building works. Protective fencing is to be installed as shown in Appendix F Tree Protection Plan.
  - The Protective fencing where required may delineate the Tree Protection Zone (TPZ) and should be situated as determined by the project arborist in accordance with AS4970 Protection of trees on development sites, Section 4, 4.3. "Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ must be secured to restrict access. AS4687 Temporary fencing and hoardings specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing" or similar.
  - Tree Protection signage is to be attached to each TPZ and displayed from within the development site in accordance with AS4970 2009 Protection of trees on development sites
  - The area of the Tree Protection Zone to be mulched to a depth of 100 mm with organic material being 75% leaf litter and 25% wood, and this being composted material preferably from the same genus and species of tree as that to where the mulch is to be applied, i.e. species-specific mulch. The depth of mulch and type as indicated, to be maintained for the duration of the project. Where deep excavation will expose the soil profile to drying out the root plate is to be protected by pegging jute matting across the ground surface 2 m back from the edge of the profile and 2 m down the face of the profile and is to be in one continuous sheet or layers up to 5 mm thick and overlapped 300 mm and pegged. Pegs are to be a minimum length of 200 mm and spaced at 500 mm increments in a grid pattern. Once installed mulch is to be placed on top of the jute matting previously described.
- 14.17 There is to be no storage of materials, rubbish, soil, equipment, structures or goods of any type to be kept or placed within 5 metres from the trunk or within the dripline of any tree for the duration of the development. This will ensure protection of the tree/s to be retained on or adjacent to site.
- 14.18 Where a tree is to be retained and a *Tree Protection Zone* cannot be adequately established due to restricted access e.g. tree located along side an access way, the trunk and branches in the lower crown will be protected by wrapping 2 layers of hessian or carpet underfelt around the trunk and branches for a minimum of 2 m or as lower branches permit, then wire or rope secures 75x50x2000 mm hardwood battens together around the trunk (do not nail or screw to the trunk or branches). The number of battens to be used is as required to encircle the trunk and the planks are to extend to the base of the tree (AS4970 2009 *Protection of trees on development sites*, Example of Trunk & branch protection



14.19 <u>Milestone</u> - Project/Site arborist is to inspect/assess all retained specimens prior to demolition to inspect tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection

#### Demolition and Tree Removal/s

- 14.20 Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby. Where structural roots are to be removed this should be undertaken manually using non-motorised hand tools after the stump has been ground out when such roots are often easier to locate from the site of the stump from which they have been severed.
- 14.21 The demolition of walls, driveways retaining walls, paths and pools etc. within 6 m of a tree to be retained should be undertaken manually using hand tools. Where a driveway is to be demolished being of concrete strip or slab type construction, it should be undertaken by working from the end of the concrete closest to the building back towards the street by utilising the concrete as a stable platform to prevent soil compaction. Where a concrete slab driveway passes less than 1 m from the base of a tree and the area beneath the driveway is to be undisturbed and incorporated into the landscape works for the site, the volume of space previously occupied by the driveway must be replaced with local top soil from the site or otherwise a loamy sand, to replace the mass of the concrete on the root plate which may be critical to the ballast and centre of mass for the stability of the tree. If the tree becomes unstable immediately contact the Project / Site Arboriculturist.
- 14.22 Ground protection in accordance with AS4970 section 4, 4.5.3 may require steel plates to protect the ground surface from compaction to protect roots between the stages of demolition and construction.

#### Specific - Tree Protection works - Post Demolition and Prior to Construction

- 14.23 <u>Milestone</u> Project/Site arborist is to inspect/assess all retained specimens prior to construction in relation to tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection.
- Location of underground utilities within a Tree Protection Zone of a retained specimen.

  Any utility services to be situated underground within the TPZ are to be undertaken utilising excavation techniques that prevent or minimise damage to structural roots (roots greater than >20 mm diameter). To prevent soil compaction and root damage these works should be conducted with non-motorised hand tools, air knife or directional drilling.
- 14.25 <u>Re-grading of site near retained trees</u>; Grading &/or re-grading of sites/slopes within Tree Protection Zones or near retained specimens is to be undertaken <u>only</u> if at all, after consultation with the Project Arborist. This is to protect all structural roots systems from damage or compaction from machinery.
- 14.26 <u>Placement of relocatable buildings</u>; consideration should be given to tree sensitivity such as the buildings being placed on pier and beam or skids construction as they are to be positioned now on the eastern side of their driplines within the Tree Protection Zone (TPZ). The area of the Tree Protection Zone under the buildings is to be mulched to a depth of 200 mm (*if installed on skids*) with organic material to further reduce compaction. The mulch is to be composted material, i.e. species-specific mulch. Alternatively, if installed on a pier & beam construction, piers are to be undertaken manually by using non-motorised hand tools to determine the location of first order and lower order structural roots with a diameter of 20 mm (*structural woody roots*) or greater, without damaging them.

#### Specific - Tree Protection works - During Construction

- 14.27 <u>Milestone</u> Project/Site arborist is to inspect/assess all retained specimens during construction in relation to tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection.
- 14.28 Where any structural roots (roots with a diameter of greater than >20 mm) encountered by excavation are to be pruned and it is to be undertaken with clean sharp pruning tools, with a final cut to undamaged wood to prevent infestation by pathogens and assist continued root growth and undertaken in consultation with the Consulting Arboriculturist. Tree Protection Zone fences are to be maintained during these works. Ground protection in accordance with AS4970 section 4, 4.5.3 may require steel plates to protect the ground surface from compaction to protect roots between the stages of demolition and construction of the new pavement.
- All Tree Protection Zones of retained trees are to be monitored for the duration of the construction phase of the development. The three main areas requiring monitoring are; <u>mulching</u> mulch must be maintained to a depth of 50–100 mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required, <u>watering</u> soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system could be installed and maintained by a competent individual and <u>weeding</u> weeds should be removed by hand without disturbing soil or should be controlled with weedicide.

Trees to be removed are to be replaced with advanced specimens being mindful of the space limitations of the new use of the site. The advanced trees should be situated in areas along the boundaries of the site. The planting in these locations will provide the maximum benefit to the surrounding properties by screening views to and from the site and the plantings included in the proposed landscape plan. The replacement trees will be situated in positions where they may grow to maturity unhindered and will not conflict with built structures or utility services and in greater numbers than the trees removed should provide a net increase in the local amenity.

#### Specific - Tree Protection works - Post Construction

14.31 <u>Milestone</u> - At completion of construction work the Site/Project Arborist should carry out an assessment of all trees retained &/or affected by works. This assessment is to document any required on-going remedial care needed to ensure viable retention of trees affected. Documentation is to be submitted to the consenting authority.

#### 15.0 CONCLUSION

One hundred and four (104) trees are nominated for removal and replacement with species in accordance with the associated Landscape documentation for the development. The twenty-nine (29) trees to be preserved will be retained and protected through the implementation of adequate measures for their integration into the development by the application of appropriate technology as detailed in this report. Where appropriate, the Landscape Plan will include planting with new trees including street tree/s.

It is often a consequence of redevelopment, and subject to the nature of the proposed land use that some or all the trees present on the site prior to that redevelopment may be required to be removed and replaced with new tree plantings in different locations. This may be dependent upon the type of development and its design constraints and the requirements of the local planning instruments and any Landscape Design Codes if existing. Where tree removal is required for this development, it is considered that those trees identified within this report are not sustainable within the context of the proposed development. Where tree retention has been considered, those trees are expected to survive the redevelopment process and remain stable and viable. The retention and protection of existing trees on site is a significant aspect of the development process, allowing those trees as components of the current curtilage to be transferred to the new development for incorporation into the landscaping works for the site. The retention of some or all the existing trees contributes to: the preservation of local amenity, screening of views to and from the site, and a balance to the scale and bulk of buildings, while maintaining elements of a continuous landscape, providing a more harmonious integration and transition of the use of the land.

If all the recommendations and procedures detailed herein are adhered to, some or all the trees the subject of this report will continue or will be replaced with more appropriate plantings in suitable locations or enhanced by additional new plantings and will grow to develop as important landscape components providing elements of long term amenity for the property and its owners or occupants, and the local community.

The recommendations made in this report are subject to approval by the consent authority.

As a renewable and dynamic natural resource, the urban tree and the growing environment essential for its survival must be understood and carefully managed to balance its needs with those of people. It is crucial that as required: this resource be planned for, planted, nurtured, protected, maintained and replaced, to ensure appropriateness and suitability of new plantings and trees retained, for safety and viability, so that it remains vital, and is sustainable in continuity.

#### 16.0 RECOMMENDATIONS - Retention.

- 16.1 Trees 2, 3, 4, 5, 27, 64 to 69<sup>x4</sup>, 70<sup>x5</sup>, 71 to 74, 78, 79, 80, 83 & 92<sup>x2</sup> are to be retained in situ within the site and are to be protected as detailed in 14.2 14.31 of Part B of this report. Tree protection fences or works, to be in accordance with Site Plan B Trees to be Retained and Tree Protection Zones (Appendix F).
- 16.2 Where Tree Protection Zone fences are to be moved or relocated this must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. If the fences are relocated areas are to be mulched in accordance with 14.16 of this report to reduce compaction to the root system of the retained specimens.
- 16.3 To minimise damage to retained crowns, all Tree Protection Zones are to be adhered to. This must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. Minor pruning may be required if damage occurs, work to undertaken in accordance with section 4 of this report.
- 16.4 <u>Milestones</u> Project/Site arborist is to inspect/assess all retained specimens prior to Demolition and Tree Removal, Post Demolition, Prior to Construction during Construction and on completion in relation to trees protected and the protection measures have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection.
- 16.5 Any work to be undertaken within Tree Protection Zones is to be undertaken in accordance with 16.2 of this report.
- 16.6 Tree removal near retained specimens is to be undertaken in accordance with 14.20 of this report.
- 16.7 There is to be no storage of materials, rubbish, soil, equipment, structures or goods of any type to be kept or placed within 5 metres from the trunk or within the dripline of any tree for the duration of the development. This will ensure protection of the tree/s to be retained on or adjacent to site.
- 16.8 Each of the replacement are to be a vigorous specimen with a straight trunk, gradually tapering and continuous, crown excurrent, symmetrical, with roots established but not pot bound in a volume container or approved similar and be maintained by an appropriately qualified and experienced landscape contractor for up to one (1) year after planting or as appropriate.

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#### DISCLAIMER

The author and Redgum Horticultural take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modification/s to its growing environment either above or below ground contrary to our advice.

## Appendix D

# Extract from Australian Standard AS4970 2009 Protection of trees on development sites

Section 3, Determining the tree protection zones of the selected trees

#### 3.1 Tree protection zone (TPZ)

"The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ incorporates the structural root zone (SRZ) (refer to Clause 3.3.5)."

#### 3.2 Determining the TPZ

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

 $TPZ = DBH \times 12$ 

where

DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

#### 3.3.5 Structural root zone (SRZ)

"The SRZ is the area required for street stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots."

#### **Determining the SRZ**

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

SRZ radius = (D x 50)0.42 x 0.64

where

D = trunk diameter, in metres, measured above the root buttress.

Note: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m.

## Appendix E

### Glossary

From

Dictionary for Managing Trees in Urban Environments by Draper BD and Richards PA 2009, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

#### Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as *Young*, *Mature* and *Over-mature* (British Standards 1991, p. 13, Harris *et al*, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, in situ.

Mature Tree aged 20-80% of life expectancy, in situ.

**Over-mature** Tree aged greater than >80% of life expectancy, in situ, or senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.

#### **Condition of Trees**

**Condition** A tree's *crown form* and growth habit, as modified by its *environment* (aspect, suppression by other trees, soils), the *stability* and *viability* of the *root plate*, trunk and structural branches (first (1<sup>st</sup>) and possibly second (2<sup>nd</sup>) order branches), including structural defects such as wounds, cavities or hollows, *crooked* trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with *vigour* and it is possible for a tree to be of *normal vigour* but in *poor condition*. Condition can be categorized as *Good Condition*, *Fair Condition*, *Poor Condition* and *Dead*.

**Good Condition** Tree is of good habit, with *crown form* not severely restricted for space and light, physically free from the adverse effects of *predation* by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from or contributed to by vigour.

**Fair Condition** Tree is of good habit or *misshapen*, a form not severely restricted for space and light, has some physical indication of *decline* due to the early effects of *predation* by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the *environment* essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from or contributed to by vigour.

**Poor Condition** Tree is of good habit or *misshapen*, a form that may be severely restricted for space and light, exhibits symptoms of advanced and *irreversible decline* such as fungal, or bacterial infestation, major die-back in the branch and *foliage crown*, *structural deterioration* from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from borer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local *environment* that would normally be sufficient to provide for its basic survival if in *good* to *fair* condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and *predation* by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from or contributed to by vigour.

Senescent / Moribund Advanced state of decline, dying or nearly dead.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes

Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);

Osmosis (the ability of the root system to take up water);

Turgidity (the ability of the plant to sustain moisture pressure in its cells);

Epicormic shoots or *epicormic strands* in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a *lignotuber*);

Symptoms

Permanent leaf loss;

Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);

Abscission of the epidermis (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site or having been taken away from a site prior to site inspection.

#### **Branch**

Branch An elongated woody structure arising initially from the trunk to support leaves, flowers, fruit and the development of other branches. A branch may itself fork and continue to divide many times as successive orders of branches with the length and taper decreasing incrementally to the outer extremity of the crown. These may develop initially as a gradually tapering continuation of the trunk with minimal division as in a young tree or a tree of excurrent habit, or in a sapling, or may arise where the trunk terminates at or some distance from the root crown, dividing into first order branches to form and support the foliage crown. In an acaulescent tree, branches arise at or near the root crown. Similarly, branches may arise from a sprout mass from damaged roots, branches or trunk.

Orders of branches the marked divisions between successively smaller branches (James 2003, p. 168) commencing at the initial division where the trunk terminates on a *deliquescent* tree or from *lateral* branches on an *excurrent* tree. Successive branching is generally characterised by a gradual reduction in branch diameters at each division, and each gradation from the trunk can be categorised numerically, e.g. first order, second order, third order etc. (See Figure 21.)

#### Crown

**Canopy** 1. Of multiple trees, the convergence, or merging in full or part, of the crowns of two or more trees due to their

proximity, or where competition for light and space available in a forest environment is limited as each tree develops forming a continuous layer of foliage. 2. Used as a plural for crown. 3. Sometimes synonymously used for crown (USA).

habit

Orders of branches on an

acaulescent tree of deliquescent

Orders of branches on a tree of

deliquescent habit

**Crown** Of an individual tree all the parts arising above the trunk where it terminates by its division forming branches, e.g. the branches, leaves, flowers and fruit; or the total amount of foliage supported by the branches. The crown of any tree can be divided vertically into three sections and can be categorised as *lower crown*, *mid crown* and *upper crown* (Figure 8). For a *leaning* tree these can be divided evenly into crown sections of one-third from the *base* to apex. The volume of a crown can be categorised as the *inner crown*, *outer crown* and *outer extremity of crown*.

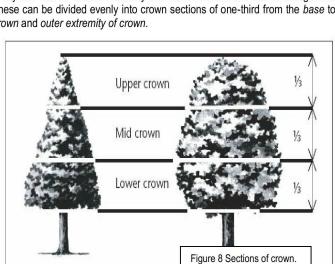
**Lower crown** the *proximal* or lowest section of a crown when divided vertically into one-third  $(\frac{1}{3})$  increments. See also *Crown*, *Mid crown* and *Upper crown*.

**Mid crown** the middle section of a crown when divided vertically into one-third (1/3) increments. See also *Crown*, *Lower crown* and *Upper crown*.

**Upper crown** the *distal* or highest section of a crown when divided vertically into one-third (1/3) increments. See also *Crown*, *Mid crown* and *Lower crown*.

**Crown Projection (CP)** Area within the *dripline* or beneath the lateral extent of the *crown* (Geiger 2004, p. 2). See also *Crown spread* and *Dripline*.

**Dripline** A line formed around the edge of a tree by the lateral extent of the *crown*. Such a line may be evident on the ground with some trees when exposed soil is displaced by rain shed from the crown. See also *Crown Projection*.



Trunk

Trunk

Orders of branches on a tree

Figure 21 Orders of branches

deliquescent in the upper crowr

of excurrent habit

#### **Crown Form of Trees**

**Crown Form** The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as *Dominant*, *Codominant*, *Intermediate*, *Emergent*, *Forest* and *Suppressed*. The habit and shape of a *crown* may also be considered qualitatively and can be categorized as *Good Form* or *Poor Form*.

**Good Form** Tree of *typical* crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, or cultural practices such as lopping and competition for space and light.

**Poor Form** Tree of *atypical* crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as *soil water* availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be *misshapen* or disfigured by disease or vandalism.

Crown Form Codominant Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

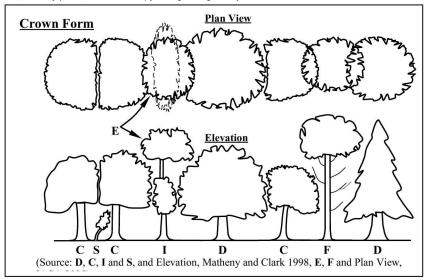
Crown Form Dominant Crowns of trees generally not restricted for space and light receiving light from above and all sides.

**Crown Form Emergent** Crowns of trees restricted for space on most sides receiving most light from above until the *upper crown* grows to protrude above the canopy in a stand or forest environment. Such trees may be *crown form dominant* or transitional from *crown form intermediate* to *crown form forest* asserting both *apical dominance* and *axillary dominance* once free of constraints for space and light.

**Crown Form Forest** Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each *inferior* and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the *lower crown*.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

**Crown Form Suppressed** Crowns of trees generally not restricted for space but restricted for light by being *overtopped* by other trees and occupying an understorey position in the canopy and growing slowly.



#### **Deadwood**

**Deadwood** Dead branches within a tree's crown and considered quantitatively as separate to *crown cover* and can be categorised as *Small Deadwood* and *Large Deadwood* according to diameter, length and subsequent *risk* potential. The number of dead branches on a tree can be categorized as *Low Volume Deadwood*, *Medium Volume Deadwood* and *High-Volume Deadwood*. See also *Dieback*.

**Deadwooding** Removing of dead branches by *pruning*. Such pruning may assist in the prevention of the spread of *decay* from *dieback* or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low risk potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high-risk potential.

High Volume Deadwood High Volume Deadwood Where >10 dead branches occur that may require removal.

Medium Volume Deadwood Where 5-10 dead branches occur that may require removal.

Low Volume Deadwood Where <5 dead branches occur that may require removal.

#### **Dieback**

**Dieback** The death of some areas of the *crown*. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, *abrupt changes* in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced *resistance*, *stress* or *decline* which may be temporary. Dieback can be categorized as *Low Volume Dieback*, *Medium Volume Dieback* and *High-Volume Dieback*.

High Volume Dieback Where >50% of the crown cover has died.

Medium Volume Dieback Where 10-50% of the crown cover has died.

Low Volume Dieback Where <10% of the crown cover has died. See also Dieback, High Volume Dieback and Medium Volume Dieback.

#### **Epicormic shoots**

**Epicormic Shoots** Juvenile shoots produced at branches or trunk from *epicormic strands* in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of *stress* or *decline*. Epicormic shoots can be categorized as *Low Volume Epicormic Shoots*, *Medium Volume Epicormic Shoots* and *High Volume Epicormic Shoots*.

High Volume Epicormic Shoots Where >50% of the *crown cover* is comprised of live *epicormic shoots*. **Medium Volume Epicormic Shoots** Where 10-50% of the *crown cover* is comprised of live *epicormic shoots*. **Low Volume Epicormic Shoots** Where <10% of the *crown cover* is comprised of live *epicormic shoots*.

#### **General Terms**

Cavity A usually shallow void often localized initiated by a wound and subsequent decay within the trunk, branches or roots, or beneath bark, and may be enclosed or have one or more opening.

Decay Process of degradation of wood by microorganisms (Australian Standard 2007, p. 6) and fungus.

**Hazard** The threat of danger to people or property from a tree or tree part resulting from changes in the physical condition, growing environment, or existing physical attributes of the tree, e.g. included bark, soil erosion, or thorns or poisonous parts, respectively.

**Included bark** 1. The bark on the inner side of the *branch union* or is within a concave *crotch* that is unable to be lost from the tree and accumulates or is trapped by *acutely divergent* branches forming a *compression fork*. 2. Growth of bark at the interface of two or more branches on the inner side of a branch union or in the crotch where each branch forms a branch collar and the collars roll past one another without forming a graft where no one collar can subsume the other. Risk of failure is worsened in some taxa where branching is *acutely divergent* or *acutely convergent* and ascending or erect.

**Hollow** A large void initiated by a *wound* forming a *cavity* in the trunk, branches or roots and usually increased over time by *decay* or other contributing factors, e.g. fire, or fauna such as birds or insects e.g. ants or termites. A hollow can be categorized as an *Ascending Hollow* or a *Descending Hollow*.

Risk The random or potentially foreseeable possibility of an episode causing harm or damage.

Significant Important, weighty or more than ordinary.

**Significant Tree** A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or *in situ*, or contribution as a component of the overall landscape for *amenity* or aesthetic qualities, or *curtilage* to structures, or importance due to uniqueness of taxa for species, subspecies, variety, *crown form*, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as *remnant vegetation*, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

**Sustainable Retention Index Value (SRIV)** A visual tree assessment method to determine a qualitative and numerical rating for the viability of urban trees for development sites and management purposes, based on general tree and landscape assessment criteria using classes of age, condition and vigour. SRIV is for the professional manager of urban trees to consider the tree in situ with an assumed knowledge of the taxon and its growing environment. It is based on the physical attributes of the tree and its response to its environment considering its position in a matrix for age class, vigour class, condition class and its sustainable retention about the safety of people or damage to property. This also factors the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. SRIV is supplementary to the decision made by a tree management professional as to whether a tree is retained or removed (IACA - Institute of Australian Consulting Arboriculturists 2005)

**Visual Tree Assessment (VTA)** A visual inspection of a tree from the ground based on the principle that, when a tree exhibits apparently superfluous material in its shape, this represents repair structures to rectify *defects* or to reinforce weak areas in accordance with the *Axiom of Uniform Stress* (Mattheck & Breloer 1994, pp. 12-13, 145). Such assessments should only be undertaken by suitably competent practitioners.

#### **Leaning Trees**

**Leaning** A tree where the *trunk* grows or moves away from upright. A lean may occur anywhere along the *trunk* influenced by several contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A *leaning* tree may maintain a *static lean* or display an increasingly *progressive lean* over time and may be hazardous and prone to *failure* and *collapse*. The degrees of leaning can be categorized as *Slightly Leaning*, *Moderately Leaning*, *Severely Leaning* and *Critically Leaning*.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0°-15° from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15°-30° from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30°-45° from upright.

Critically Leaning A leaning tree where the trunk is growing at an angle greater than >45° from upright.

Progressively Leaning A tree where the degree of leaning appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

#### **Periods of Time**

**Periods of Time** The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as *Immediate*, *Short Term*, *Medium Term* and *Long Term*.

Immediate An episode or occurrence, likely to happen within a twenty-four (24) hour period, e.g. tree failure or collapse in full or part posing an imminent danger.

Short Term A period less than <1 – 15 years.

Medium Term A period 15 – 40 years.

Long Term A period greater than >40 years.

#### Roots

First Order Roots (FOR) Initial woody roots arising from the root crown at the base of the trunk, or as an adventitious root mass for structural support and stability. Woody roots may be buttressed and divided as a marked gradation, gradually tapering and continuous or tapering rapidly at a short distance from the root crown. Depending on soil type these roots may descend initially and not be evident at the root crown or become buried by changes in soil levels. Trees may develop 4-11 (Perry 1982, pp. 197-221), or more first order roots which may radiate from the trunk with a relatively even distribution, or be prominent on a particular aspect, dependent upon physical characteristics e.g. leaning trunk, asymmetrical crown; and constraints within the growing

environment from topography e.g. slope, soil depth, rocky outcrops, exposure to

predominant wind, soil moisture, depth of water table etc.

Orders of Roots The marked divisions between woody roots, commencing at the initial division from the base of the trunk, at the root crown where successive branching is generally characterised by a gradual reduction in root diameters and each gradation from the trunk and can be categorized numerically, e.g. first order roots, second order roots, third order roots etc. Roots may not always be evident at the root crown and this may be dependent on species, age class and the growing environment. Palms at maturity may form an adventitious root mass.

Root Plate The entire root system of a tree generally occupying the top 300-600mm of soil including roots at or above ground and may extend laterally for distances exceedingly twice the height of the tree (Perry 1982, pp. 197-221). Development and extent are dependent on water availability, soil type, soil depth and the physical characteristics of the surrounding landscape.

Root Crown Roots arising at the base of a trunk.

Zone of Rapid Taper The area in the root plate where the diameter of structural roots reduces substantially over a short distance from the trunk. Considered to be the minimum radial distance to provide structural support and root plate stability. See also Structural Root Zone (SRZ).

Structural Roots Roots supporting the infrastructure of the root plate providing strength and stability to the tree. Such roots may taper rapidly at short distances from the root crown or become large and woody as with gymnosperms and dicotyledonous angiosperms and are usually 1st and 2nd order roots or form an adventitious root mass in monocotyledonous angiosperms (palms). Such roots may be crossed and grafted and are usually contained within the area of crown projection or extend just beyond the dripline.

### Orders of roots (indicative) First order root Second order root Third order root Fourth order root Fifth order root Roots and root plate sections (indicative) Zone of rapid taper Root crown Fine roots Root tip Root hairs Outer roots Interbuttress zone Tap root Buttress root Sinker roots Heart root Dripline Figure 22 Orders of Roots.

#### **Symmetry**

Symmetry Balance within a crown, or root plate, above or below the axis of the trunk of branch and foliage, and root distribution respectively and can be categorized as Asymmetrical and Symmetrical.

Asymmetrical Imbalance within a crown, where there is an uneven distribution of branches and the foliage crown or root plate around the vertical axis of the trunk. This may be due to Crown Form Codominant or Crown Form Suppressed as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines. An example of an expression of this may be, crown asymmetrical, bias

Symmetrical Balance within a crown, where there is an even distribution of branches and the foliage crown around the vertical axis of the trunk. This usually applies to trees of Crown Form Dominant or Crown Form Forest. An example of an expression of this may be crown symmetrical.

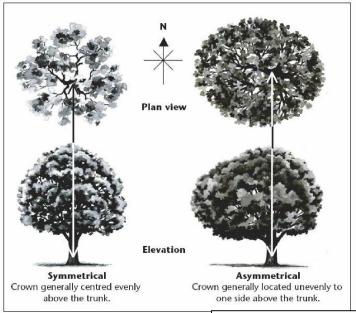


Figure 27 Symmetry within crown

#### **Trunk**

**Trunk** A single stem extending from the *root crown* to support or elevate the *crown*, terminating where it divides into separate *stems* forming *first order branches*. A trunk may be evident at or near ground or be absent in *acaulescent* trees of *deliquescent* habit or may be continuous in trees of *excurrent* habit.

The trunk of any *caulescent* tree can be divided vertically into three (3) sections and can be categorized as *Lower Trunk*, *Mid Trunk* and *Upper Trunk*. For a *leaning* tree these may be divided evenly into sections of one third along the trunk.

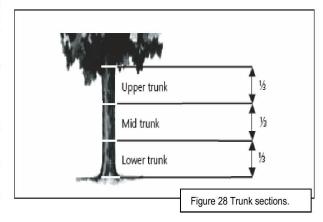
Acaulescent A trunkless tree or tree growth forming a very short trunk. See also Caulescent. (See Fig. 21)

Caulescent Tree grows to form a trunk. See also Acaulescent. (See Fig. 21)

**Lower trunk** Lowest, or *proximal* section of a trunk when divided into one-third  $(\mathcal{Y}_3)$  increments along its *axis*. See also *Trunk*, *Mid trunk* and *Upper trunk*.

**Mid trunk** A middle section of a trunk when divided into one-third (1/2) increments along its axis. See also *Trunk*, *Lower trunk* and *Upper trunk*.

**Upper trunk** Highest, or *distal* section of a trunk when divided into one-third  $(\mathcal{Y}_3)$  increments along its *axis*. See also *Trunk*, *Lower trunk* and *Mid trunk*.



**Diameter at Breast Height (DBH)** Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of *reaction wood* or *adaptive wood*, therefore an average diameter is determined with a *diameter tape* or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a *leaning* trunk is *crooked* a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the *trunk* from the point immediately below the base of the flange of the *branch collar* extending the furthest down the trunk, and the distance of this point above ground recorded as *trunk* length. Where a tree is located on sloping ground the DBH should be measured at halfway along the side of the tree to average out the angle of slope. Where a tree is *acaulescent* or *trunkless* branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

#### **Vigour**

**Vigour** Ability of a tree to sustain its life processes. This is independent of the *condition* of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. *dormant*, deciduous or semi-deciduous trees. Vigour can be categorized as *Normal Vigour*, *High Vigour*, *Low Vigour* and *Dormant Tree Vigour*.

**Normal Vigour** Ability of a tree to maintain and sustain its life processes. This may be evident by the *typical* growth of leaves, *crown cover* and *crown density*, branches, roots and trunk and *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

**High Vigour** *Accelerated growth* of a tree due to incidental or deliberate artificial changes to its growing *environment* that are seemingly beneficial, but may result in *premature aging* or failure if the favourable conditions cease, or promote *prolonged senescence* if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous *pollarding* practices over the life of the tree.

**Low Vigour** Reduced ability of a tree to sustain its life processes. This may be evident by the *atypical* growth of leaves, reduced *crown cover* and reduced *crown density*, branches, roots and trunk, and a deterioration of their functions with reduced *resistance* to *predation*. This is independent of the *condition* of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

## Appendix F

Survey of Subject Tree/s

Trees the subject of this report are marked on the plans in the following appendices and are numbered as listed below.

Redgum Tree / Stand No.	Genus and species	Common name	Recommendation	
1	Pittosporum undulatum	Native Daphne	Remove and replace	
2	Banksia marginata	Silver Banksia	Retain and protect – Neighbouring tree	
3	Lophostemon confertus	Queensland Brush Box	Retain and protect – Neighbouring tree	
4	Eucalyptus microcorys	Tallowwood	Retain and protect – Neighbouring tree	
5	Archontophoenix cunninghamiana	Bangalow Palm	Retain and protect – Neighbouring tree	
6	Casuarina glauca	Swamp She Oak	Remove and replace	
7	Casuarina glauca	Swamp She Oak	Remove and replace	
8	Casuarina glauca	Swamp She Oak	Remove and replace	
9	Grevillea robusta	Silky Oak	Remove and replace	
10	Casuarina glauca	Swamp She Oak	Remove and replace	
11	Casuarina glauca	Swamp She Oak	Remove and replace	
12	Grevillea robusta	Silky Oak	Remove and replace	
13	Casuarina glauca	Swamp She Oak	Remove and replace	
14	Casuarina glauca	Swamp She Oak	Remove and replace	
15	Casuarina glauca	Swamp She Oak	Remove and replace	
16	Casuarina glauca	Swamp She Oak	Remove and replace	
17	Casuarina glauca	Swamp She Oak	Remove and replace	
18	Casuarina glauca	Swamp She Oak	Remove and replace	
19	Casuarina glauca	Swamp She Oak	Remove and replace	
20	Casuarina glauca	Swamp She Oak	Remove and replace	
21	Casuarina glauca	Swamp She Oak	Remove and replace	
22	Casuarina glauca	Swamp She Oak	Remove and replace	
23	Casuarina glauca	Swamp She Oak	Remove and replace	
24	Casuarina glauca	Swamp She Oak	Remove and replace	
25	Casuarina glauca	Swamp She Oak	Remove and replace	
26	Casuarina glauca	Swamp She Oak	Remove and replace	
27	Corymbia maculata	Spotted Gum	Retain and protect – Street tree	
28	Pittosporum undulatum	Native Daphne	Remove and replace	
29	Jacaranda mimosifolia	Jacaranda	Remove and replace	
30	Camellia japonica	Camellia	Remove and replace	
31	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree	
32	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree	
33	Callistemon 'Harkness'	Harkness Bottlebrush	Remove and replace – Street tree	
34	Lagerstroemia indica	Crepe Myrtle	Remove and replace	
35	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree	
36	Tristaniopsis collina	Hill Water Gum	Remove and replace – Street tree	
37	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree	
38	Angophora costata	Sydney Red Gum	Remove and replace – Street tree	
39	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	
40	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree	
41	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	
42	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree	
43	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	
44	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree	
45	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	

Redgum Tree / Stand No.	Genus and species	Common name	Recommendation	
46	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	
47/2	Tristaniopsis laurina x2	Water Gum	Remove and replace – Street tree	
48	Callistemon viminalis 'Hanna Ray'	Hanna Ray Bottlebrush	Remove and replace – Street tree	
49	Tristaniopsis laurina	Water Gum	Remove and replace – Street tree	
50	Juniperus sabina	Savin Juniper	Remove and replace	
51	Jacaranda mimosifolia	Jacaranda	Remove and replace	
52	Allocasuarina littoralis	Black She Oak	Remove and replace	
53	Lagerstroemia indica	Crepe Myrtle	Remove and replace	
54	Lagerstroemia indica	Crepe Myrtle	Remove and replace	
55	Pittosporum undulatum	Native Daphne	Remove and replace	
56	Glochidion ferdinandi	Cheese Tree	Remove and replace	
57	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace	
58/3	Waterhousia floribunda x3	Weeping Lilly Pilly	Remove and replace	
59/4	Waterhousia floribunda x7	Weeping Lilly Pilly	Remove and replace	
60	Fraxinus griffithii	Evergreen Ash	Remove and replace	
61	Fraxinus griffithii	Evergreen Ash	Remove and replace	
62	Ficus benjamina	Weeping Fig	Remove and replace	
63/5	Yucca sp. x3	Yucca	Remove and replace	
64	Ficus hillii	Hills Fig	Retain and protect	
65	Ficus benjamina	Weeping Fig	Retain and protect	
66	Ficus benjamina	Weeping Fig	Retain and protect	
67	Corymbia maculata	Spotted Gum	Retain and protect	
68	Corymbia maculata	Spotted Gum	Retain and protect	
69/6	Corymbia maculata x4	Spotted Gum	Retain and protect	
70/7	Corymbia maculata x5	Spotted Gum	Retain and protect	
71	Corymbia maculata	Spotted Gum	Retain and protect	
72	Corymbia maculata	Spotted Gum	Retain and protect	
73	Corymbia maculata	Spotted Gum	Retain and protect	
74	Corymbia maculata	Spotted Gum	Retain and protect	
75	Glochidion ferdinandi	Cheese Tree	Remove and replace	
76	Corymbia maculata	Spotted Gum	Remove and replace	
77	Acacia decurrens	Green Wattle	Remove and replace	
78	Eucalyptus microcorys	Tallowwood	Retain and protect	
79	Eucalyptus microcorys	Tallowwood	Retain and protect	
80	Eucalyptus sp.	Eucalypt	Retain and protect	
81	Eucalyptus sp.	Eucalypt	Remove and replace	
82	Eucalyptus sp.	Eucalypt	Remove and replace	
83	Angophora costata	Sydney Red Gum	Retain and protect	
84	Butia capitata	Jelly Palm	Remove and replace	
85	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace	
86	Pittosporum undulatum	Native Daphne	Remove and replace	
87/8	Cupressus macrocarpa 'Leightons Green' x2	Leightons Green Pine	Remove and replace	
88	Callistemon viminalis 'Captain Cook'	Captain Cook Bottlebrush	Remove and replace	
89	Araucaria heterophylla	Norfolk Island Pine	Remove and replace	
90	Grevillea robusta	Silky Oak	Remove and replace	

Redgum Tree / Stand No.	Genus and species	Common name	Recommendation	
91	Casuarina glauca	Swamp She Oak	Remove and replace	
92/9	Acacia decurrens x2	Green Wattle	Retain and protect	
93/10	Butia sp. x2	Palm	Remove and replace	
94	Archontophoenix cunninghamiana	Bangalow Palm	Remove and replace	
95/11	Yucca sp. x2	Yucca	Remove and replace	
96	Melaleuca linarifolia	Snow in Summer	Remove and replace	
97	Eucalyptus sp.	Eucalypt	Remove and replace	
98	Acer palmatum	Japanese Maple	Remove and replace	
99	Viburnum odoratissimum	Sweet Viburnum	Remove and replace	
100	Elaeocarpus reticulatus	Blueberry Ash	Remove and replace	
101	Syzygium luehmannii	Small Leafed Lilly Pilly	Remove and replace	
102/12	Cupressus macrocarpa 'Brunniana'x3	Brunnings Cypress	Remove and replace	
103	Pittosporum undulatum & Privet	Native Daphne	Remove and replace	
104	Eucalyptus sp.	Eucalypt	Remove and replace	

Table 2.0 This table only applies to trees being retained. Tree Protection Zone fencing locations as measured from the centre of each tree and the recommended distances for the side closest to the building construction works e.g. excavation (see explanatory notes below). Tree Protection Zone fences and setbacks where applicable

	a in Appendix F.			
1. Redgum Tree No. / Redgum Stand No.	2. Structural Root Zone SRZ (DARB) From centre of trunk (COT) Diameter Above Root Buttress AS4970 2009 Section 3, 3.3.5 (see Appendix D) where applicable (Minimum 1.5 metres)	3. Trunk Diameter at Breast Height  DBH  1.4m above ground, AS4970 2009, or mm or m above ground where indicated. # = average. g = ground	4. Tree Protection Zone (TPZ) = 12 x DBH  From centre of trunk (COT) in metres AS4970 2009Section 3 (see Appendix D) (Minimum 2.0 metres)	5. Proposed distance of tree protection fence/works on the side closest to building construction², in metres by Redgum Horticultural.
2	2.1	330 est	4.0	4.01,2
3	1.9	290	3.5	>8.01,2
4	2.9 (720)	980	11.8	>7.5 (basement) 6.0 (Children's play area) 1,2
5	1.6	190	3.0 x 2.5 E/W <sup>24</sup>	3.01,2
27	2.2	370	4.4	4.4 1,2
64	2.3	400#	4.8	4.8
65	2.3	400#	4.8	4.8
66	2.3	400#	4.8	4.8
67	2.3	400#	4.8	4.8
68	2.3	400#	4.8	4.8
69//6	2.0	300#	3.6	3.6
70/7	2.7	600#	7.2	5.0 (9.7% retaining wall)
71	2.8	650	7.8	5.0 (12.2% retaining wall)
72	2.8	700	8.4	5.0 (14.5% retaining wall)
73	2.8	700	8.4	5.0 (14.5% retaining wall)
74	2.8	700	8.4	5.0 (14.5% retaining wall)
78	2.7	600	7.2	7.0
79	3.6	1200	14.4	7.0 (18.8% retaining wall)
80	2.7	600	7.2	7.0
83	2.2	390	4.7	4.5
92/9	2.0	300#	3.6	3.6

#### Descriptors for modified setbacks as per above table.

- 1 Special condition apply to protect the roots of trees generally.
- 2 Additional protective fencing information is detailed in attached plans.
- 3 Acceptable due to the good relative tolerance of the species to development impacts.
- 4 Range of setbacks for the trees at each end of a linear stand are to be calculated if required.
- 5 Acceptable as fence located at a substantial distance beyond dripline or may also include the location of a smaller tree in proximity to a larger tree to be retained and the smaller tree being protected well within the protective fencing for that larger tree.
- 6 Acceptable due to additional special protection works, see Section 5.0 for this tree.
- 7 Acceptable as pre-existing site conditions were conducive to having restricted the development of root growth in this direction.
- 8 Street trees with protective fencing of minimal width to allow for pedestrian access along road reserve.
- 9 Acceptable as tree transplanted reducing the area of the root zone.
- 10 Acceptable as not effected by development works.
- 11 Young trees not expected to have established a substantially expansive root system and able to re-establish or modify growth to be sustainable due to age and good vigour.
- 12 Set back prescribed by the consent authority.

#### Explanatory notes for Table 2.0.

This table is based upon Australian Standard AS4970 2009 Protection of trees on development sites, Section 3 Determining the protection zone of the selected trees (see Appendix D), where the approved building works should be no closer, including excavation, than the dimensions stated above.

#### "3.3 Variations to the TPZ

3.3.2 Minor Encroachment - If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

- 13 Acceptable as tree growing on a lean and encroachment on compression wood side where root growth is of reduced structural importance.
- 14 Acceptable as root mapping has indicated extent of structural woody roots with a diameter of 20 mm or more.
- 15 Acceptable as a specimen of palm taxa tolerant of encroachment.
- 16 Acceptable as excavation on down slope or across slope side of tree.
- 17 Acceptable as encroachment into growing area below ground minor, with one corner of building or excavation works extending to within the radius of the dripline.
- 18 Acceptable as encroachment by pier, including screw piles, with minimal disturbance.
- 19 Acceptable as encroachment above grade without excavation or sub-base compaction.
- 20 Acceptable as located within 0.5 m from edge of dripline.
- 21 Acceptable as encroachment with gap graded fill that can accommodate gaseous exchange between roots/soil and the atmosphere and ongoing root growth.
- 22 Minimum setback 2 m, AS4970 (2009) section 3, 3.2.
- 23 Maximum setback 15 m, AS4970 (2009) section 3, 3.2.
- 24 Tree is a palm, other monocot, cycad or tree fern TPZ is to be 1 m outside crown projection AS4970 (2009) section 3, 3.2.
- 25 Minimum Structural Root Zone (SRZ) for trees less than 0.15 m diameter is 1.5 m, AS4970 (2009) section 3, 3.5.

#### 3.3.3 Major Encroachment

If the proposed encroachment is greater than 10% of the area of the TPZ or inside the SRZ the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ."

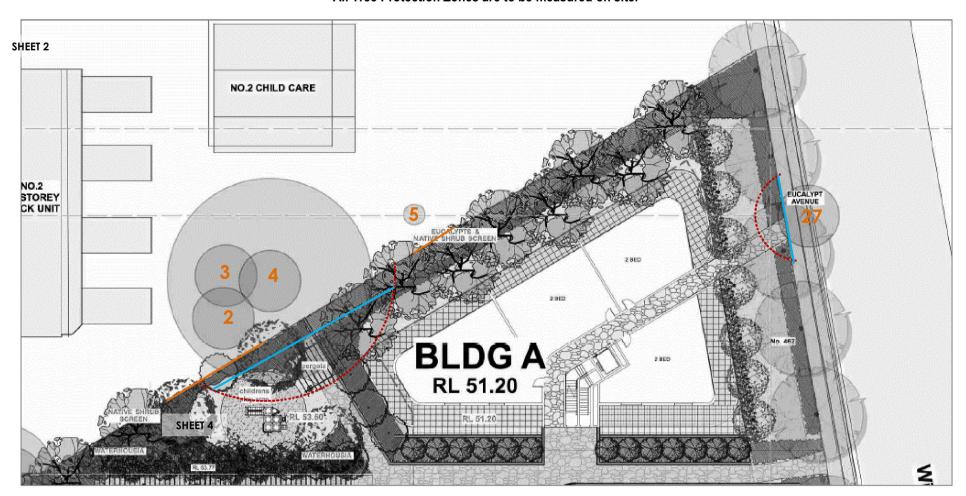


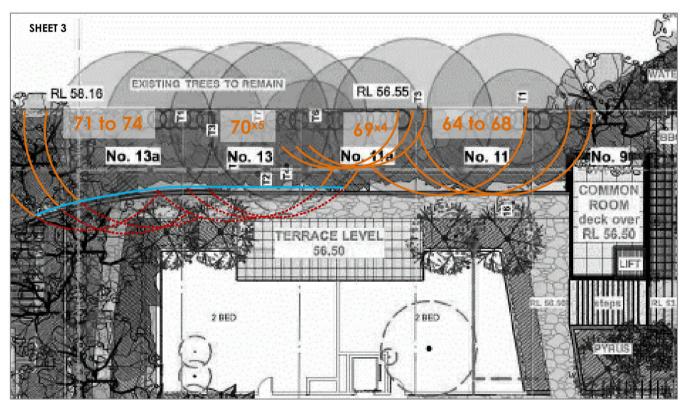
## Appendix F

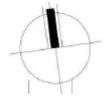
### Site Plan - Survey of Subject Trees to be Retained & Tree Protection Zones (Sheet 2 to 4 of 4)

This report has relied upon the following plan/s and documents which has been reproduced from electronic transmission and no longer to original scale.

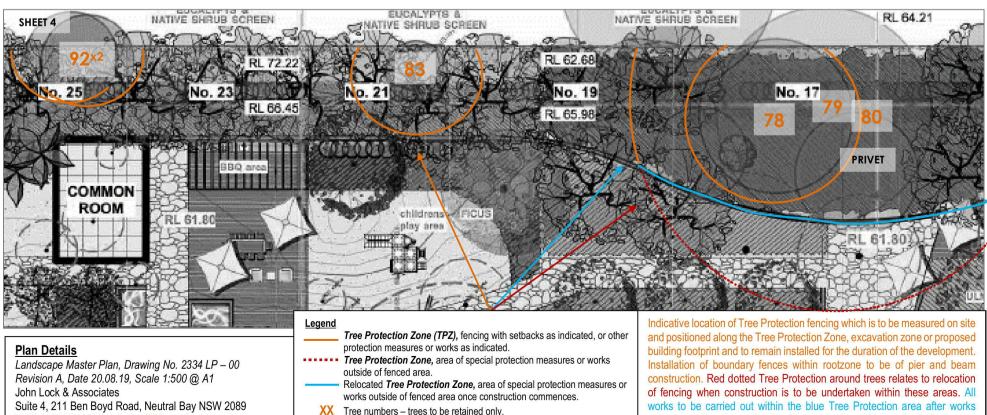
All Tree Protection Zones are to be measured on site.







commences is to be undertaken in consultation with site arboriculturist.



Subject trees represented by the approximate location of the trunk.

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