Arboricultural Assessment
CSIRO_1 Henry St, Belmont

Prepared for Jonathon Yap
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treelogic
Tree management for the urban forest

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Contents.

Ref: _CSIRO_1 Henry St, Belmont

File No.	Version	Author	Issue date	Issued by.
14_5849	1 Draft	Bruce Callander	01/06/15	BC
14_5849	2 Design Review	Bruce Callander	23/03/16	BC

1 Introduction

Jonathon Yap, on behalf of Belmont Projects Pty Ltd, engaged Tree Logic to prepare a tree assessment report for the subject site being the previous CSIRO research facility at 1 Henry St, Belmont to inform designers of tree related constraints to any proposed redevelopment of the subject site. The survey was required to determine the type, condition and retention value of trees within the site.

Key Objectives:

- Inspect and assess vegetation within the subject site, CSIRO facilities at 1 Henry St, Belmont.
- Provide an arboricultural report that identifies the subject trees to species level and provides information on each tree including origin, dimensions, condition, and suitability for retention. (Tree details –Appendix 1).
- Provide where necessary, recommendations regarding the future management of trees suitable to retain and details of tree protection distances (AS4970-2009) to assist with the planning of any proposed site development.
- Locate and number the trees on the site survey plan attached as Appendix 2.

Executive Summary

1.1 Three hundred and ninety one (391) tree features were inspected including three hundred and eighty three (383) individual trees and shrubs, seven (7) street trees and one (1) neighbour's tree.

1.2 Trees that were less than 5 metres tall or had a trunk diameter less than 15cm measured at 1.4 metres were collected as shrubs.

1.3 All assessed trees were attributed an arboricultural rating that reflects the retention value of each tree/shrub.

1.2.1 Three (3) trees were attributed an arboricultural rating of High

1.2.2 One hundred and fifteen (115) trees were attributed an arboricultural rating of Moderate with one being attributed a rating of Moderate/High based on being a large specimen of English Yew (*Taxus baccata*) which is a relatively rare slow growing tree of modest size. High and Moderate rated trees represent the best opportunity to retain established trees of fair or better quality.

1.2.3 Two hundred and forty two (242) trees/shrubs were attributed an arboricultural rating of Low being of either small size and age or due to below typical health and / or structure. Low rated trees are not considered worthy of being a constraint on any proposed development.

1.2.4 Thirty one (31) trees/shrubs were attributed an arboricultural rating of None. Such trees/shrubs are not suitable to retain on arboricultural grounds, having significant health and / or structural deficiencies or defects or for safety or environmental reasons.

Refer to Table 3 in Section 3 for tree numbers, Appendix 1 for tree assessment details and Appendix 3 for tree descriptors.

1.3 Only Twelve (12) trees are proposed to be retained under the current design proposal of which 6 are of Moderate arboricultural value and 6 are of Low value.
To successfully retain suitable trees within the site tree protection zones (TPZ's) must be established before any demolition or construction works commence on site and must be maintained for the duration of all works. Access to TPZs must be approved by the site arborist and appropriate barrier fencing, ground and trunk buffering must be installed beforehand.

1.4 Existing soil grades must remain unaltered within any tree protection zone. Trenching for installation of footings, road base or utilities and underground services must not occur within the recommended TPZ of any retained trees unless based on results of Non-destructive root investigation (NDRI) and approved by the consulting arborist and the relevant authority.

1.5 Appropriate TPZ dimensions are provided in the tree assessment data in Appendix 1 and TPZ management guidelines are included in Appendix 4.

2 Method:

2.1 Site inspection method.

A site inspection was undertaken on Wednesday, May 27th, 2015 during calm, mostly dry conditions. The trees were inspected from the ground and observations were made of the growing environment and surrounding area. The trees were not climbed and no samples of the trees or site soil were taken.

Tree assessment details are listed in the Tree Assessment Table in Appendix 1 and relate to the trees and tree groups shown and numbered in Appendix 2 on a copy of a site plan supplied by the owner.

Observations were made of the trees to determine age and condition, with measurements taken to establish tree height (measured with a height meter), crown width (paced) and trunk diameter (measured at 1.3m above grade unless otherwise stated). Definitions of arboricultural descriptors can be seen in Appendix 3.

Photographs of some trees and site conditions were taken for further reference and inclusion in the report.

2.2 Arboricultural assessment method;

The health and structural characteristics of each tree were assessed and each tree was attributed an 'Arboricultural Rating'. The arboricultural rating correlates the combination of tree condition factors (health, structure & form) with tree amenity value. Amenity relates to the trees biological, functional and aesthetic characteristics within a built environment. The arboricultural rating in combination with other factors can assist the project team and planners in nominating trees suitable for retention. The four arboricultural ratings used by Tree Logic include:

- **High:** Trees of high quality in good to fair condition. Retention of such trees is highly desirable.
- **Moderate**: Trees with a Moderate arboricultural rating were generally suitable for retention and design should attempt to incorporate these trees and provide adequate clearances during development stages where reasonable design intent is not unduly hampered.
- **Low**: Trees with a Low arboricultural rating generally had low retention values. They were either fair specimens of relatively small size or displayed general health or structural deficiencies and were not worthy of being a constraint on reasonable design intent. Retention of Low rated trees may be considered in some instances if not requiring a disproportionate expenditure of resources to successfully incorporate into the design or manage ongoing condition.
- **None**: Trees attributed an arboricultural rating of None had health or structural characteristics that were beyond arboricultural maintenance or were environmental weed species or self-sewn trees spreading through the site to the exclusion of other plants.

  Full tree descriptors are attached as Appendix 3.

2.3 Establishing Tree Protection Zones (TPZ);

2.3.1 To successfully retain suitable trees within or around a development site, consideration must be given to protecting the trunk, crown and roots of each specimen. Tree protection zones (TPZ's) are used to provide adequate space for the preservation of sufficient roots to maintain tree health (particularly important for mature trees) whilst providing a buffer zone between construction activity and the tree trunk and crown.

2.3.2 The method for determining tree protection zones adopted in this report is the 'Australian Standard for Protection of trees on development sites' (AS4970-2009). The TPZ area is based on the trunk diameter measurement measured in metres at 1.4m and

multiplied by 12 and is a guide for planning purposes. The trunk of the tree is used as the centre point for the measurement. Additional guidelines are outlined in Appendix 4 for establishment and maintenance of the tree protection zone.

2.3.3 TPZ measurements are included in the tree assessment data in Appendix 1.

2.4 Documents reviewed include;

- Tree point locations supplied by TGM Group surveyors used as a basis for the tree location plan attached as Appendix 2. Location: CSIRO_1 Henry St, Belmont. TL Ref No: 14_5849. Date: 28/05/15.
- Flora and Fauna Assessment- CSIRO_1 Henry St, Belmont. Biosis Research April 2011
- Heritage Assessment Report- CSIRO_1 Henry St, Belmont. Urbis Nov 2010
- Planning property reports and City of Greater Geelong planning overlays.
  - The site is Commonwealth land not subject to the Planning Scheme.
  - No specific tree controls apply to the site under City of Greater Geelong planning scheme or relevant overlays.

3 Observations

Site description.

3.1 The subject site, CSIRO_1 Henry St, Belmont, comprised a trapezoid allotment of approximately 6.2 Ha on the south west corner of Henry St, Belmont and Princes Highway in Belmont,

3.1.1 The site was generally flat from south to north with a gradual fall from the western boundary to the eastern boundary of 10 metres with a minor slope of approximately 1:60.

3.1.2 The site is accessible from Henry Street via several paved roadways and crossovers.

3.1.3 There were no creeks or natural drainage lines within the tree study area.

3.1.4 The site was highly disturbed having been previously used as a scientific research facility with associated buildings, paved access roads and car parks and informal gardens and lawns. Prior to this the site was used for agricultural purposes.

3.1.5 The majority of trees were confined to the perimeter or in linear planted windrows in the western half of the site. A number of individual amenity and ornamental trees exist in the open lawns at the eastern end of the site or around buildings and courtyards within the building network.

3.1.6 Based on the species diversity, similar age classes and spatial layout of the vegetation it can be concluded that all trees were introduced specimens of native or exotic origins. Based on aerial imagery from 1958 to 1967 provided in the Heritage Assessment Report (Urbis 2010) the site was devoid of trees and the majority of trees were planted in the 1960s and 1970s. There was no naturally occurring native vegetation, no accumulated natural ground debris, mulch or deadwood and no natural recruitment of native vegetation.

3.1.7 Only trees that were generally greater than 5m in height or had trunk diameter greater than 15 cm measured at 1.4 metres were identified on the survey plan that forms the basis of the tree assessment. Some smaller trees or shrubs were observed but were not inspected in detail as they do do not meet the scope of works for a ‘Tree’ assessment. Such diminutive features are identified by the word ‘Shrub’ in the tree data in Appendix 1.

3.1.8 An aerial view of the subject site is shown in Plate 1.

Plate 1. Aerial view of the subject site (http://maps.au.nearmap.com_16/03/2015)

Plate 2 Aerial view from 1961 (from Heritage Assessment Report-Urbis 2010)

Tree population.

3.2 Three hundred and ninety one (391) tree features were assessed within the subject site including 348 individual trees and 35 'shrubs' within the site, 7 trees located in the Henry Street road reserve and 1 neigbour's tree.

3.3 The diversity of species comprised approximately 60 different species. The top 12 most prevalent species are indicated in Table 1.

Table 1. 12 most prevalent tree species	No of specimens	% of tree population
Melaleuca styphelioides (Prickly-leaved Paperbark)	44	11.25%
Corymbia citriodora (Lemon-scented Gum)	32	8.18%
Corymbia maculata (Spotted Gum)	24	6.14%
Eucalyptus cladocalyx (Sugar Gum)	23	5.88%
Corymbia ficifolia (Red-flowering Gum)	19	4.86%
Eucalyptus gomphocephala (Tuart)	18	4.60%
Eucalyptus leucoxylon (Yellow Gum)	18	4.60%
Melaleuca armillaris (Bracelet Honey-myrtle)	16	4.09%
Angophora costata (Smooth-barked Apple)	14	3.58%
Eucalyptus camaldulensis (River Red Gum)	9	2.30%
Eucalyptus sideroxylon (Red Ironbark)	9	2.30%
Melaleuca lanceolata (Moonah)	8	2.05%

3.4 The origin of all trees was assessed to determine if any trees were indigenous to the local area or native to Victoria or if the trees were of horticultural significance.
It has been established that all trees were introduced planted specimens despite some trees.

Table 2. Tree species Origin	Total	
Victorian native	129	32.99%
Australian native	219	56.01%
Exotic conifer	24	6.14%
Exotic deciduous	9	2.30%
Exotic evergreen	8	2.05%
Exotic Palm	2	0.51%
Total	**391**	100.00%

3.5 Tree health:
The health rating was assessed based on foliage colour, size and density as well as shoot initiation and elongation.

3.5.1 In general terms 288 trees (84% of the tree population) displayed health conditions considered typical or better for the species considering the age range and the local and prevailing growing conditions.

3.5.2 Eighty trees (20.5%) displayed minor health deficiencies.

3.5.3 Fifteen trees (4%) displayed Poor Health and eight trees (2%) were dead.

3.5.4 Many of the Tuart trees displayed limitations to health associated with infestations of Psyllid which was evident in the discolouration and desiccation of the lower foliage.

3.5.5 Many of the Prickly-leaved Paperbark had reduced foliage density associated with limited light as many of the trees were close grown in linear groups and being suppressed by adjacent trees.

3.6 Tree structure:
The structure of the trees was assessed for structural defects and deficiencies, likelihood of failures and potential risk to targets existing or proposed.

3.6.1 One hundred and thirty three (34%) of trees displayed Fair structure considered typical and acceptable for the species.

3.6.2 One hundred and eighty six trees (48%) displayed Fair-poor structural condition with minor deficiencies that may be manageable with arboricultural input were they to be retained.

3.6.3 Fifty eight trees (15%) had poor structure that was associated with increased risk of partial tree failure.

3.6.4 Fourteen trees (3%) had Very poor structure and were unsuitable to retain.

3.7 Trees may be considered significant to the landscape because of their size, dominance within the site, presence within outlooks and general amenity in terms of shade, screen, foliage and flowers and historic, cultural or horticultural characteristics. The key to successful tree retention is to identify the trees that represent the best opportunity for retention and implement tree protection and design amendments before any site works commence.

Each of the assessed trees was attributed an ‘Arboricultural Rating’. The arboricultural rating correlates the combination of tree condition factors (health, structure & form) with tree amenity value. Amenity relates to the trees biological, functional and aesthetic characteristics within an urban landscape context and its ability to continue provide these qualities into the medium to long term future. The arboricultural rating in combination with other factors can assist the project team and planners in nominating trees suitable for retention. It should be noted that the arboricultural rating is different to the conservation/ecological values placed on trees by other professions. Definitions of arboricultural ratings can be seen in Appendix 3.

Table 3 indicates the arboricultural ratings attributed to the trees inspected.

Table 3: Arboricultural Rating

Arb Rating	Total	Trees number
High	3	28, 196, 346
Moderate	115	49, 51, 55, 57, 59, 64, 69, 70, 72, 77, 78, 97, 100, 104, 106, 115, 123, 144, 148, 149, 155, 160, 162, 178, 179, 181, 183, 186, 192, 200, 203, 207, 208, 209, 211, 214, 216, 217, 218, 219, 221, 222, 223, 225, 226, 227, 228, 234, 236, 238, 247, 248, 250, 251, 256, 258, 259, 260, 261, 262, 263, 264, 265, 267, 269, 271, 272, 274, 275, 276, 297, 299, 316, 319, 320, 335, 341, 342, 344, 348, 349, 350, 352, 354, 358, 360, 361, 365, 368, 370, 371, 373, 375, 378, 383, 388
Low	242	1, 2, 3, 4, 5, 11, 13, 20, 22, 25, 26, 27, 31, 32, 33, 34, 35, 36, 37, 39, 42, 46, 48, 50, 52, 53, 54, 56, 58, 60, 61, 62, 63, 65, 66, 67, 68, 71, 75, 76, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 98, 99, 101, 102, 103, 105, 108, 109, 116, 117, 118, 119, 120, 121, 122, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 143, 145, 146, 147, 150, 151, 152, 153, 154, 156, 157, 158, 159, 161, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 180, 182, 184, 185, 187, 188, 189, 190, 191, 193, 194, 195, 197, 198, 199, 201, 202, 204, 205, 206, 213, 215, 224, 229, 230, 231, 232, 233, 239, 241, 242, 243, 244, 245, 246, 249, 252, 253, 254, 255, 257, 266, 268, 270, 273, 277, 278, 279, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 298, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 317, 318, 321, 322, 323, 324, 325, 326, 328, 329, 330, 331, 332, 333, 334, 336, 337, 338, 339, 340, 343, 345, 347, 351, 353, 355, 356, 357, 362, 363, 364, 367, 369, 372, 374, 376, 379, 381, 382, 384, 389, 390
None	31	7, 8, 9, 44, 45, 73, 74, 79, 107, 110, 111, 112, 113, 114, 142, 210, 212, 220, 235, 237, 240, 280, 327, 359, 366, 377, 380, 385, 386, 387, 391
Total	391	

3.7.1 High and Moderate rated trees were assessed as suitable to retain and as having the potential to be medium to long term features of the surrounding landscape if retained.

3.7.2 Low rated trees were generally either of unremarkable quality, displayed below typical health or structure or of relatively small dimensions and were not considered to be worthy of being a constraint on any proposed development.

3.7.3 Trees attributed an arboricultural value of None were not suitable to retain on arboricultural grounds, having significant health and / or structural defects.

(Refer to Appendix 2 for tree location and numbering and appendix 3 for tree descriptors).

4 General comments.

4.1 The pre-development arboricultural inspection report provides planners and designers with information on the measures required to protect trees suitable to be retained.

4.2 At the time of preparing the report no plans were available to be reviewed but it is understood the site is to become a residential subdivision.

4.3 In the absence of site design plans, it is not appropriate to speculate on which trees are most appropriate for retention, beyond the general guide provided by the arboricultural ratings attributed to each tree feature. Retention suitability will be dependent on the proposed landscape setting in which trees are intended to be retained. The following recommendations are provided for consideration in the design process.

4.3.1 On the basis of tree quality and potential amenity, preference should be given to retaining trees of High and Moderate arboricultural value in built areas, or areas of increased target potential.

4.3.2 Trees of Low arboricultural value should not compromise reasonable design intent.

4.3.3 Small trees of Low arboricultural value that are otherwise in reasonable condition may offer a potential established tree resource, even if only as an interim measure.

4.3.4 Low rated trees with health or structural deficiencies and trees attributed a rating of None should generally be considered for removal based on sound arboricultural opinion.

4.4 The three individual High rated trees includes

- Tree 28, a maturing Yellow Gum of large size displaying good condition and in a prominent position in the lawn to the east of the buildings.
- Tree 196, a maturing Yellow Gum of large size displaying good condition and in a prominent position on the henry Street frontage.
- Tree 346, a maturing River Red Gum of moderate size displaying good condition and located on the southern boundary at the western 1/3 of the site.

Each of these trees should be provided sufficient tree space to fully protect the recommended tree protection zone and allow the trees to continue to contribute as features of the surrounding landscape.

4.5 Many of the Moderate rated trees could be successfully retained around the perimeters of the site.

4.5.1 Moderate rated trees comprising the linear group of Lemon-scented Gums, Trees 247 to 276 provides an established avenue of relatively long-lived trees that could be retained in conjunction with a formal boulevard entrance to the site.

4.5.2 Tree 100 was attributed a Moderate arboricultural rating on the basis that it is a good and large example of a relatively slow growing and uncommon species that could be suitable to retain within the new landscape. Having said that the foliage seeds and wood contain toxins and the tree is unsuitable to retain in a context where young children may be tempted to eat the bright red fruit.

4.6 The predominant Prickly-leaved Paperbark trees were generally growing in linear grouped situations as wind breaks. Despite being possibly up to 45 to 50 years old the individual trees were still comparatively small and unremarkable and displayed reduced foliage density associated with competition for available light and resources in the close grown groups.

4.7 Principles of risk management should be adopted when considering the location of any proposed construction for dwellings or infrastructure, access roads, car-park or private open space around the Eucalypt trees.

4.7.1 The Tuart trees are potentially large sized Eucalypts that can develop a large spreading crown and heavy limbs. They have the potential to respond well to appropriate pruning to manage weight distribution on limbs and branches.

4.7.2 As such, the species are best suited to retention in larger open space settings.

4.8 In general overview, the tree population is characterised by trees that were planted generally within the 1960s to 1970s and many of the trees are reaching or have reached maturity and their useful life expectancy on site is short. This fact has slightly skewed the results of the arboricultural ratings towards more Low rated trees than might be expected within the typical distribution curve for a tree population (refer to Tree descriptors in Appendix 3). Whether the site were subject to redevelopment or not it could be expected that many of the trees on site would require renewal in the not too distant future.

4.9 All trees that are to be retained will require tree protection zones to be established prior to commencing any works onsite including demolition, bulk earthworks, construction, landscaping activity, delivery and storage of materials or placement of site sheds.

4.10 No form of excavation for footings or trenching for installation of underground services is permitted within the nominated TPZ areas for any retained trees because of the risk of severing roots vital to the stability and continued health of the trees.

4.10.1 Reduction of up to 10% of the TPZ area is acceptable on one or two sides if a commensurate area is added on to the TPZ and protected from any further encroachment.

4.10.2 Any proposed encroachment of a TPZ in excess of 10% must be approved by the consulting arborist, relevant authority and based on the results of non-destructive root investigation using either Air-spade ® or hydro-excavation.

4.11 Any recommended pruning must be undertaken by a qualified arborist and comply with Australian Standard AS 4373-2007 - Pruning of Amenity trees. All TPZ and reduced TPZ radius distances are provided in Appendix 1.

5 Tree protection

The most important consideration for the successful retention of trees is to allow appropriate above and below ground space for the trees to continue to grow. This requires the allocation of tree protection zones for retained trees.

The Australian Standard AS 4970-2009 Protection of trees on development sites has been used as a guide in the allocation of TPZs for the assessed trees. The TPZ for individual trees is calculated based on trunk diameter (DBH measured in metres), measured at 1.4 metres up from ground level. The radius of the TPZ is calculated by multiplying the trees' DBH by 12. The method provides a TPZ that addresses both the stability and growing requirements of a tree. TPZ distances are measured as a radius from the centre of the trunk at (or near) ground level. The maximum TPZ should be no more than 15m radius and the minimum TPZ should be no less than 2m radius.

Encroachment into the TPZ is permissible under certain circumstances though this is dependent on both site conditions and tree characteristics. Minor encroachment, up to 10% of the TPZ, is generally permissible provided encroachment is compensated for by recruitment of an equal area contiguous with the TPZ and the crown of the tree will not require excessive pruning that would cause the tree to become unbalanced or disfigured.

The 10% encroachment on one side equates to approximately a ⅓ reduction of the radial distance.

Examples of minor encroachment are provided in Diagram 1A &1B.

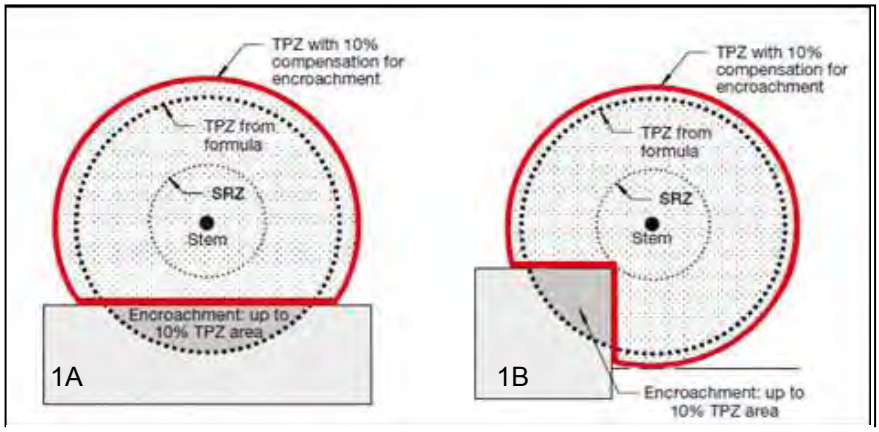

Diagram 1A & 1B: Examples of minor encroachment into a TPZ.
Extract from: AS4970-2009, Appendix D,p30 of 32

Encroachment greater than 10% is considered major encroachment under AS4970-2009 and is only permissible if it can be demonstrated that after such encroachment the tree would remain viable. Non-destructive root investigation (NDRI) may be required to identify the location of roots.

Where root pruning is required, it must be undertaken by a suitably qualified and experienced arborist and comply with Australian Standard AS 4373-2007 - Pruning of Amenity trees and be based on the results of NDRI. However, it must be understood that the results of root pruning can have unpredictable consequences that could cause the tree to decline or become unstable if excessive root material is severed.

The Structural Root Zone (SRZ) is the area in which the larger woody roots required for tree stability are found close to the trunk and which then generally taper rapidly. This is the minimum area recommended to maintain tree stability but does not reflect the area required to sustain tree health. The area between the reduced TPZ and the SRZ may only be encroached if root sensitive construction methods are adopted, based on results of Non-destructive root investigation and if approved by the consulting arborist. No works are permitted within the SRZ radius.

All TPZ measurements are provided in the tree assessment data in Appendix 1.

General TPZ management guidelines are listed in Appendix 4- Protection of retained trees.

6 Photographic catalogue:

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1 Shows the relative size, location and condition of High rated Yellow Gum, Tree 28, in the lawn to the east of the site.

2 Shows the relative size, location and condition of High rated Yellow Gum, Tree 196 on the Henry Street frontage.

3 Shows the relative size, location and condition of River Red Gum trees 301 and 316 located on the southern boundary in the west of the site.

4 Shows the relative size and condition of the linear group of Lemon-scented Gums that flank the access road extending from the western entrance to the site.

5 Shows example of Psyllid affected foliage in the Tuarts and trees that have declined or died as a result of defoliation in conjunction with competition for light and resources.

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6 Shows example of the linear group of Prickly-leaved Paperbark trees, 304 to 310.

7 Shows the relative size, location and condition of Sydney Blue Gum, Tree 300 in the western section of the site adjacent the Prickly-leaved Paperbarks 310 to 314.

8 Shows the reduced foliage density associated with River Red Gum, Tree 299, in the western half of the site.

7 Design review

7.1 A concept plan of the proposed subdivision was reviewed to identify trees that are proposed to be retained and removed. It is understood that due to the requirements for installation site drainage there is no opportunity to retain trees along the southern boundary.

7.2 The only trees that are proposed to be retained comprise 12 trees to be kept in public open space towards the north east corner of the site. They are Trees 24, 27, 31, 34, 36, 37, 38, 40, 42, 47, 49 and 51.

7.2.1 Of these 6 trees were attributed an arboricultural rating of Moderate and 6 trees were attributed a Low arboricultural rating.

7.3 Tree 42 is a Low rated *Prunus* (Plum) tree located between 2 buildings that will be demolished. It is unlikely the tree can be or is worthy of being sustained in conjunction with the works.

7.4 Tree 51, a Moderate rated Yellow Gum, is indicated to be retained but appears to exist within the alignment of a main site access road.

7.4.1 Greater space will be required to ensure the 6.2 metre radius tree protection zone is adequately protected.

7.5 High rated Yellow Gum, Tree 28, is located to the south of Tree 27 and efforts should be made to incorporate this tree into the public open space if possible as well.

7.5.1 This may require adjusting the alignment of the walk through between the proposed town houses or the extent of townhouses in the vicinity of the recommended TPZ for this tree.

7.6 Trees bestow many beneficial community outcomes, especially established canopy trees, including pollution reduction, climate buffering, ecological and environmental protection, health and healing, educational benefits, as well as increasing property value.
It is recommended that consideration should be given to either preserving more trees of Moderate or High arboricultural value or ensuring there is more open space to plant canopy trees than is currently allowed for in the concept plan.

8 Conclusion and Recommendations:

8.1 The subject site, CSIRO research facility at 1 Henry St, Belmont comprised a rectangular / trapezoid shaped allotment on the south west corner of Henry Street and the Princes Highway.

8.2 Three hundred and ninety one (391) tree / shrubs were assessed including 348 trees and 35 shrubs located within the site, 7 street trees and 1 neighbour's tree. The trees were predominantly located around the perimeter of the site, in linear windrows transecting the western half of the site with a lesser number as garden specimens in the lawns and surrounding the buildings.

8.3 The trees were planted generally within the 1960s to 1970s and many of the trees have reached maturity and have a short useful life expectancy on site. Whether the site were subject to redevelopment or not it could be expected that many of the trees on site would require renewal within coming years.

8.4 All trees were attributed an arboricultural rating that reflects the retention value of each tree.

8.4.1 Three(3) trees were attributed an arboricultural rating of High

8.4.2 One hundred and fifteen (115) trees were attributed an arboricultural rating of Moderate.

8.4.3 Two hundred and forty two (242) trees/shrubs were attributed a Low arboricultural rating due to displaying below optimum health and structure or being of diminutive size.

8.4.4 Thirty one (31) trees was attributed an arboricultural rating of None.

Refer to Section 3 and Appendix 1 for tree numbers.

8.5 High and Moderate rated trees represent the best opportunity to retain established trees of fair or better quality and would be suitable to consider for retention within the proposed redevelopment of the site.

8.6 Trees rated Low were considered to be of reduced arboricultural and landscape value that were not worthy of being a constraint on reasonable design intent.

8.6.1 Small trees of Low arboricultural value that are otherwise in reasonable condition may offer a potential established tree resource, even if only as an interim measure.

8.6.2 Retention of any Low rated trees will still require appropriate tree protection measures to be implemented.

8.7 Trees attributed an arboricultural rating of None are recommended for removal.

8.8 Given the nature of the demolition works including double storey building, basements, paths, roads and loading areas it will be difficult and impractical to retain many of the trees that are located in the garden beds abutting the buildings or within the open courtyards.

8.9 Any design proposal must accommodate the nominated TPZ area and allow for future crown spread of any trees that are to be retained.

8.10 Under the current design proposal only 12 trees are indicated to be retained of which six (6) were attributed a Moderate arboricultural rating and 6 were rated Low.

8.10.1 Design amendment may be required to adequately protect Moderate rated Tree 51.

8.10.2 The design should be reviewed to try and incorporate High rated Yellow Gum, Tree 28.

8.10.3 Consideration should be given to retaining more trees of Moderate and High arboricultural value or allocating more space for replacing these trees with appropriate canopy trees for the future.

8.11 To successfully retain suitable trees within the site and in neighbouring properties, tree protection zones (TPZ's) must be established and fenced prior to commencing any works on site. Tree protection measures must be adopted including the following:

- Tree protection fencing must be erected around trees to be retained to the satisfaction of the council or as described in Appendix 4 prior to commencing any works on site including demolition, bulk earth works, construction and landscaping and maintained for the duration of the redevelopment works.
- All TPZ dimensions are provided in the tree assessment data in Appendix 1 and relate to the trees identified in Appendix 2. TPZ management guidelines are included in Appendix 4.
- All conditions of the Tree protection guidelines attached as Appendix 4 should be adopted and applied for the duration of site works.
- Existing soil grades should remain unaltered within any tree protection zone adopted on site. Trenching for installation of services must not occur within the recommended reduced TPZ of any retained trees. Encroachment of the recommended TPZ area must not occur unless based on results of Non-destructive root investigation (NDRI) and approved by the consulting arborist and the relevant authority.
- Any further encroachment of the recommended reduced TPZ must be based on consultation with the site arborist, the results of non-destructive root investigation and utilise root sympathetic construction methods.

- Where pruning is recommended or required, it must be undertaken by a suitably qualified and experienced arborist and comply with Australian Standard AS 4373-2007 - Pruning of Amenity trees.

I am available to answer any questions arising from this report.

No part of this report is to be reproduced unless in full.

Signed Bruce Callander

Consulting Arborist- Treelogic P/L

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Appendix 1: Tree details: CSIRO_1 Henry St, Belmont.

Refer to following 16 pages.

DBH = Diameter at Breast Height (measured in centimetres at 1.3m above ground unless otherwise stated).

TPZ = Tree Protection Zone (metre radius).
Reduced TPZ = TPZ reduced by 10% area on one side only.
SRZ = Structural Root Zone

Radius distances measured in metres from the centre of the trunk.

For tree location and numbering refer Appendix 2. See Appendix 3 for Tree descriptors.

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
1	Pittosporum undulatum	Sweet Pittosporum	Victorian native	Semi-mature	16	22	4	5	Symmetric	Fair	Fair	Low				2.0	1.8	1.8	tree on site
2	Eucalyptus robusta	Swamp Mahogany	Australian native	Semi-mature	18,17,15	66	8	7	Symmetric	Fair	Fair to poor	Low	Stump sprout			3.5	2.8	2.4	tree on site
3	Eucalyptus gomphocephala	Tuart	Australian native	Semi-mature	21,15	39	7	7	Symmetric	Fair to poor	Poor	Low	Borer affected stump resprout			3.1	2.2	2.2	tree on site
4	Melaleuca linariifolia	Snow in Summer	Australian native	Early-maturity	29,21	44	4	8	Symmetric	Poor	Poor	Low	Lopped			4.3	2.3	3.0	tree on site
5	Melaleuca nesophylla	Showy Honey-myrtle	Australian native	Early-maturity	20	23	5	5	Leaning stem	Fair	Fair to poor	Low	Lift low canopy	Multiple tasks - see comments	Moderate	2.4	1.8	1.8	tree on site
6	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	24,24,12	54	6	9	Symmetric	Fair	Fair to poor	Moderate				4.3	2.6	3.0	tree on site
7	Eucalyptus globulus	Tasmanian Blue Gum	Victorian native	Maturing	52	64	15	8	Symmetric	Poor	Poor	None				6.2	2.7	4.4	tree on site
8	Casuarina glauca	Swamp She-oak	Australian native	Semi-mature	19	26	9	5	Symmetric	Dead	Poor	None				2.3	1.9	1.9	tree on site
9	Casuarina glauca	Swamp She-oak	Australian native	Semi-mature	28	33	9	5	Symmetric	Poor	Fair to poor	None				3.4	2.1	2.4	tree on site
10	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Early-maturity	32	40	11	6	Symmetric	Good	Fair	Moderate				3.8	2.3	2.7	tree on site
11	Casuarina glauca	Swamp She-oak	Australian native	Over-mature	51,41	79	16	13	Symmetric	Fair to poor	Fair	Low	Reduced foliage density, Short Useful life.			7.9	3.0	5.5	tree on site
12	Casuarina glauca	Swamp She-oak	Australian native	Semi-mature	20	25	11	5	Symmetric	Fair to poor	Fair	Moderate				2.4	1.8	1.8	tree on site
13	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	20	27	13	8	Minor asymmetry	Poor	Fair to poor	Low	Crown dieback, Partly suppressed-Crown bias East.			2.4	1.9	1.9	tree on site
14	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	40,32	52	17	14	Symmetric	Fair	Fair to poor	Moderate	Past branch failure, Crown bias West with kink in trunk.			6.1	2.5	4.3	tree on site
15	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Early-maturity	35	43	14	14	Asymmetric crown	Fair	Fair to poor	Moderate	Over-extended limb(s).	Weight reduction	Low	4.2	2.3	2.9	tree on site
16	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	36	41	10	12	Symmetric	Fair	Fair	Moderate				4.3	2.3	3.0	tree on site
17	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	39,38	58	15	15	Asymmetric crown	Fair	Fair	Moderate	Partly suppressed-Crown bias East			6.5	2.6	4.6	tree on site
18	Casuarina glauca	Swamp She-oak	Australian native	Maturing	73	86	17	12	Symmetric	Fair	Fair	Moderate				8.8	3.1	6.1	tree on site
19	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	25	29	9	6	Symmetric	Fair to poor	Fair	Moderate				3.0	2.0	2.1	tree on site
20	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	16,14	33	7	7	Symmetric	Fair to poor	Fair to poor	Low				2.6	2.1	2.1	tree on site
21	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	17	20	7	6	Minor asymmetry	Fair	Fair	Moderate				2.0	1.7	1.7	tree on site
22	Eucalyptus sp.	Gum Tree	Australian native	Semi-mature	12	24	5	5	Minor asymmetry	Fair	Fair to poor	Low				2.0	1.8	1.8	tree on site
23	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	16	19	7	5	Asymmetric crown	Fair	Fair to poor	Moderate				2.0	1.6	1.6	tree on site
24	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	33	34	9	10	Asymmetric crown	Fair	Fair to poor	Moderate	Street tree, Over-extended limb(s)	Weight reduction	Moderate	4.0	2.1	2.8	Street tree
25	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	20,20	36	4	4	Symmetric	Fair	Fair	Low				3.4	2.2	2.4	tree on site
26	Eucalyptus saligna	Sydney Blue Gum	Australian native	Maturing	50	59	24	12	Asymmetric crown	Fair to poor	Fair to poor	Low	Trunk wounds, past limb failure			6.0	2.7	4.2	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
27	Eucalyptus viminalis	Manna Gum	Victorian native	Maturing	58	61	12	12	Symmetric	Fair	Poor	Low	Lopped at 5m			7.0	2.7	4.9	tree on site
28	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Maturing	81	92	19	20	Symmetric	Good	Fair	High				9.7	3.2	6.8	tree on site
29	Melaleuca linariifolia	Snow in Summer	Australian native	Early-maturity	41,36,30,21	75	8	10	Symmetric	Fair	Fair to poor	Moderate				7.9	2.9	5.5	tree on site
30	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Australian native	Maturing	76	80	14	9	Symmetric	Fair	Fair to poor	Moderate	Past limb failure			9.1	3.0	6.4	tree on site
31	Eucalyptus viminalis	Manna Gum	Victorian native	Maturing	54	61	16	8	Asymmetric crown	Fair to poor	Poor	Low	Multiple wounds, borer damage			6.5	2.7	4.5	tree on site
32	Shrub - Prunus sp.	Cherry Plum	Exotic deciduous	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
33	Melia azedarach	White Cedar	Australian native	Semi-mature	15,12	24	5	6	Symmetric	Fair	Poor	Low				2.3	1.8	1.8	tree on site
34	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	29	37	11	9	Asymmetric crown	Fair to poor	Fair	Low	Street tree, Remove Mistletoe infestation	Multiple tasks - see comments	High	3.5	2.2	2.4	Street tree
35	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	12,10,10,9	25	5	4	Symmetric	Fair	Poor	Low				2.5	1.8	1.8	tree on site
36	Salix babylonica	Weeping Willow	Exotic deciduous	Maturing	64	70	14	16	Symmetric	Fair to poor	Fair to poor	Low				7.7	2.8	5.4	tree on site
37	Lophostemon confertus	Brush Box	Australian native	Semi-mature	12	17	4	4	Symmetric	Fair	Fair	Low				2.0	1.6	1.6	tree on site
38	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	45	50	19	10	Asymmetric crown	Fair	Fair to poor	Moderate				5.4	2.5	3.8	tree on site
39	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	45,40,40,30	94	12	11	Symmetric	Fair	Poor	Low				9.4	3.2	6.6	tree on site
40	Corymbia citriodora	Lemon-scented Gum	Australian native	Maturing	77	82	22	16	Symmetric	Fair	Fair to poor	Moderate	Congested unions			9.2	3.0	6.5	tree on site
41	Lophostemon confertus	Brush Box	Australian native	Semi-mature	17	20	8	4	Symmetric	Fair	Fair to poor	Moderate	Codominant			2.0	1.7	1.7	tree on site
42	Prunus sp.	Cherry Plum	Exotic deciduous	Semi-mature	15,12,12	23	6	8	Minor asymmetry	Poor	Fair to poor	Low				2.7	1.8	1.9	tree on site
43	Lophostemon confertus	Brush Box	Australian native	Semi-mature	23	25	9	5	Symmetric	Fair	Fair to poor	Moderate	codominant			2.8	1.8	1.9	tree on site
44	Prunus sp.	Cherry Plum	Exotic deciduous	Semi-mature	15	19	4	6	Symmetric	Poor	Poor	None				2.0	1.6	1.6	tree on site
45	Prunus sp.	Cherry Plum	Exotic deciduous	Semi-mature	21	29	4	5	Symmetric	Dead	Poor	None				2.5	2.0	2.0	tree on site
46	Shrub - Cotoneaster sp.	Grey-leafed Cotoneaster	Exotic evergreen	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
47	Angophora floribunda	Rough-barked Apple	Australian native	Maturing	76	88	16	11	Symmetric	Good	Fair to poor	Moderate	Congested unions			9.1	3.1	6.4	tree on site
48	Shrub - Cotoneaster sp.	Grey-leafed Cotoneaster	Exotic evergreen	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
49	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Early-maturity	27	26	14	5	Symmetric	Fair to poor	Fair	Moderate	Street tree Reduced foliage density			3.2	1.9	2.3	Street tree
50	Shrub - Cotoneaster sp.	Grey-leafed Cotoneaster	Exotic evergreen	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
51	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Maturing	52	65	15	21	Symmetric	Fair	Fair to poor	Moderate	Over-extended limb(s). Street tree	Weight reduction	Moderate	6.2	2.8	4.4	Street tree
52	Acacia pravissima	Ovens Wattle	Victorian native	Early-maturity	16	26	6	6	Symmetric	Fair	Fair to poor	Low				2.0	1.9	1.9	tree on site
53	Acacia floribunda	Gossamer Wattle	Victorian native	Early-maturity	12	15	5	4	Minor asymmetry	Fair	Fair to poor	Low				2.0	1.5	1.5	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
54	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	30	32	6	5	Symmetric	Fair	Fair	Low				3.6	2.1	2.5	tree on site
55	Corymbia maculata	Spotted Gum	Victorian native	Maturing	53	64	12	8	Minor asymmetry	Fair	Fair to poor	Moderate				6.4	2.7	4.5	tree on site
56	Melia azedarach	White Cedar	Australian native	Semi-mature	22	30	4	5	Symmetric	Fair	Fair to poor	Low				2.6	2.0	2.0	tree on site
57	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	43	51	15	18	Symmetric	Fair	Fair	Moderate	Deadwood, Crown bias Nth. Growing outside entrance gate			5.2	2.5	3.6	Street tree?
58	Melia azedarach	White Cedar	Australian native	Semi-mature	19	25	4	4	Symmetric	Fair	Fair	Low				2.3	1.8	1.8	tree on site
59	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	26	29	9	5	Minor asymmetry	Fair	Fair to poor	Moderate				3.1	2.0	2.2	tree on site
60	Melia azedarach	White Cedar	Australian native	Semi-mature	24	29	5	5	Symmetric	Fair	Fair to poor	Low				2.9	2.0	2.0	tree on site
61	Melia azedarach	White Cedar	Australian native	Semi-mature	20	27	4	5	Symmetric	Fair	Fair to poor	Low				2.4	1.9	1.9	tree on site
62	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	10,9,9,7	21	5	4	Minor asymmetry	Fair	Fair to poor	Low				2.1	1.7	1.7	tree on site
63	Shrub - Leptospermum sp.	Tea-tree	Victorian native	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub
64	Corymbia ficifolia	Red-flowering Gum	Australian native	Early-maturity	43	52	10	7	Symmetric	Fair	Fair	Moderate				5.2	2.5	3.6	tree on site
65	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	10,8,7,7	20	5	3	Minor asymmetry	Fair	Fair to poor	Low				2.0	1.7	1.7	tree on site
66	Corymbia maculata	Spotted Gum	Australian native	Semi-mature	24	27	10	8	Minor asymmetry	Poor	Fair to poor	Low				2.9	1.9	2.0	tree on site
67	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	10,6	22	4	5	Asymmetric crown	Fair to poor	Fair to poor	Low				2.0	1.8	1.8	tree on site
68	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	14	16	5	3	Symmetric	Fair to poor	Fair to poor	Low				2.0	1.5	1.5	tree on site
69	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	39	42	9	7	Minor asymmetry	Fair	Fair to poor	Moderate				4.7	2.3	3.3	tree on site
70	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	36	44	10	6	Symmetric	Fair	Fair	Moderate				4.3	2.3	3.0	tree on site
71	Corymbia ficifolia	Red-flowering Gum	Australian native	Early-maturity	41	47	9	7	Symmetric	Fair	Poor	Low				4.9	2.4	3.4	tree on site
72	Corymbia maculata	Spotted Gum	Australian native	Maturing	55	67	16	14	Symmetric	Fair	Fair	Moderate				6.6	2.8	4.6	tree on site
73	Pittosporum undulatum	Sweet Pittosporum	Victorian native	Semi-mature	15	20	5	5	Symmetric	Fair	Fair to poor	None				2.0	1.7	1.7	tree on site
74	Pittosporum undulatum	Sweet Pittosporum	Victorian native	Semi-mature	12	13	5	4	Symmetric	Fair	Fair	None				2.0	1.4	1.4	tree on site
75	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	26	37	6	5	Symmetric	Fair	Fair to poor	Low				3.1	2.2	2.2	tree on site
76	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	16	21	5	4	Asymmetric crown	Fair	Fair to poor	Low				2.0	1.7	1.7	tree on site
77	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	29	35	7	4	Minor asymmetry	Fair	Fair	Moderate				3.5	2.1	2.4	tree on site
78	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	28	31	7	5	Symmetric	Fair	Fair	Moderate				3.4	2.0	2.4	tree on site
79	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	7,7,8,9,8	35	7	4	Symmetric	Fair	Very poor	None	Stump sprout		Low	2.1	2.1	2.1	tree on site
80	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	10,5,7,8,8	30	7	5	Symmetric	Fair	Poor	Low	stump sprout			2.1	2.0	2.0	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
81	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	18	23	8	2	Symmetric	Fair	Fair to poor	Low				2.2	1.8	1.8	tree on site
82	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	28	34	10	3	Symmetric	Fair	Fair to poor	Low				3.4	2.1	2.4	tree on site
83	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	19,15	30	10	4	Symmetric	Fair	Fair to poor	Low				2.9	2.0	2.0	tree on site
84	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	14,13	23	10	3	Symmetric	Fair	Fair to poor	Low				2.3	1.8	1.8	tree on site
85	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	21,19	30	10	5	Minor asymmetry	Fair	Fair to poor	Low				3.4	2.0	2.4	tree on site
86	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	16	20	7	3	Symmetric	Fair	Fair to poor	Low	suppressed			2.0	1.7	1.7	tree on site
87	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	20,13	26	10	5	Symmetric	Fair	Fair to poor	Low				2.9	1.9	2.0	tree on site
88	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	15,10	20	9	3	Symmetric	Fair	Fair to poor	Low				2.2	1.7	1.7	tree on site
89	Melaleuca lanceolata	Moonah	Victorian native	Semi-mature	23,23	35	10	6	Minor asymmetry	Fair	Fair to poor	Low	Included bark fork.			3.9	2.1	2.7	tree on site
90	Acacia floribunda	Gossamer Wattle	Victorian native	Semi-mature	20	31	6	7	Symmetric	Fair	Poor	Low	Trunk decay			2.4	2.0	2.0	tree on site
91	Acacia floribunda	Gossamer Wattle	Victorian native	Semi-mature	14	20	4	4	Leaning stem	Fair	Poor	Low				2.0	1.7	1.7	tree on site
92	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	25	32	7	5	Symmetric	Fair	Fair to poor	Low				3.0	2.1	2.1	tree on site
93	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	38	43	10	10	Symmetric	Fair to poor	Poor	Low				4.6	2.3	3.2	tree on site
94	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	53	66	14	10	Leaning stem	Fair	Poor	Low				6.4	2.8	4.5	tree on site
95	Melia azedarach	White Cedar	Australian native	Early-maturity	46	51	6	7	Symmetric	Fair	Poor	Low				5.5	2.5	3.9	tree on site
96	Melia azedarach	White Cedar	Australian native	Semi-mature	29	35	6	8	Symmetric	Fair	Fair to poor	Low				3.5	2.1	2.4	tree on site
97	Melia azedarach	White Cedar	Australian native	Semi-mature	35	41	7	8	Symmetric	Fair	Fair	Moderate				4.2	2.3	2.9	tree on site
98	Eucalyptus viminalis	Manna Gum	Victorian native	Maturing	47	59	18	10	Symmetric	Fair	Fair to poor	Low				5.6	2.7	3.9	tree on site
99	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Semi-mature	15,15,10	25	11	5	Symmetric	Fair	Poor	Low	Multi stemmed			2.8	1.8	2.0	tree on site
100	Taxus baccata	English Yew	Exotic conifer	Early-maturity	23	30	6	4	Symmetric	Good	Fair	Moderate	Relatively large rare specimen suitable to retain.			2.8	2.0	2.0	tree on site
101	Eucalyptus spathulata	Swamp Mallet	Australian native	Semi-mature	25	34	12	8	Symmetric	Fair	Fair to poor	Low				3.0	2.1	2.1	tree on site
102	Juniperus sp.	Juniper	Exotic conifer	Semi-mature	10,10,7,8	20	3	5	Symmetric	Fair	Fair to poor	Low				2.1	1.7	1.7	tree on site
103	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	13	15	3	3	Symmetric	Fair	Fair	Low				2.0	1.5	1.5	tree on site
104	Cupressus sempervirens 'Swanes Golden'	Swane's Golden Pencil Pine	Exotic conifer	Early-maturity	30	39	13	4	Symmetric	Fair	Fair	Moderate				3.6	2.2	2.5	tree on site
105	Eucalyptus spathulata	Swamp Mallet	Australian native	Early-maturity	26	40	14	13	Minor asymmetry	Fair	Fair to poor	Low				3.1	2.3	2.3	tree on site
106	Syagarus romanzoffiana	Queen Palm	Exotic Palm	Semi-mature	29	38	10	4	Symmetric	Fair	Fair	Moderate				3.5	2.2	2.4	tree on site
107	Pittosporum undulatum	Sweet Pittosporum	Victorian native	Semi-mature	15	20	4	4	Symmetric	Fair	Fair to poor	None				2.0	1.7	1.7	tree on site
108	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	41	55	16	10	Symmetric	Fair	Fair to poor	Low				4.9	2.6	3.4	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
109	Fraxinus sp.	Ash	Exotic deciduous	Semi-mature	12,15,15, 10	28	5	4	Minor asymmetry	Fair to poor	Fair to poor	Low	Insufficent ID characters			3.2	1.9	2.2	tree on site
110	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	60	75	13	9	Symmetric	Fair	Very poor	None	lopped			7.2	2.9	5.0	tree on site
111	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	63	72	11	6	Symmetric	Fair	Very poor	None	Previously lopped			7.6	2.9	5.3	tree on site
112	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	55	67	11	5	Symmetric	Fair	Very poor	None				6.6	2.8	4.6	tree on site
113	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	25,26,30	65	11	5	Symmetric	Fair	Very poor	None	Previously lopped			5.6	2.8	3.9	tree on site
114	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Early-maturity	25,30	40	10	5	Symmetric	Fair	Very poor	None	lopped			4.7	2.3	3.3	tree on site
115	Eucalyptus saligna	Sydney Blue Gum	Australian native	Maturing	64	75	20	14	Symmetric	Fair	Fair	Moderate		Weight reduction	Moderate	7.7	2.9	5.4	tree on site
116	Hesperocyparis glabra	Smooth Arizona Cypress	Exotic conifer	Early-maturity	30,20,26	54	12	6	Symmetric	Fair	Fair to poor	Low				5.3	2.6	3.7	tree on site
117	Pittosporum phillyreoides	Weeping Pittosporum	Victorian native	Semi-mature	20,15	30	11	6	Symmetric	Fair	Poor	Low				3.0	2.0	2.1	tree on site
118	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	12	15	2	3	Symmetric	Fair	Fair to poor	Low				2.0	1.5	1.5	tree on site
119	Corymbia ficifolia	Red-flowering Gum	Australian native	Early-maturity	27	36	6	4	Symmetric	Fair	Fair to poor	Low				3.2	2.2	2.3	tree on site
120	Allocasuarina verticillata	Drooping She-oak	Victorian native	Maturing	64	67	16	11	Symmetric	Fair	Fair to poor	Low				7.7	2.8	5.4	tree on site
121	Acacia longifolia var. longifolia	Sallow Wattle	Victorian native	Semi-mature	15	18	3	4	Asymmetric crown	Fair	Fair to poor	Low				2.0	1.6	1.6	tree on site
122	Melaleuca linariifolia	Snow in Summer	Australian native	Early-maturity	30,21	47	8	5	Symmetric	Fair	Fair to poor	Low				4.4	2.4	3.1	tree on site
123	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	39	48	15	8	Symmetric	Fair	Fair	Moderate				4.7	2.4	3.3	tree on site
124	Pittosporum phillyreoides	Weeping Pittosporum	Victorian native	Semi-mature	20,10	28	6	6	Symmetric	Fair	Fair	Low				2.7	1.9	1.9	tree on site
125	Allocasuarina verticillata	Drooping She-oak	Victorian native	Early-maturity	39	48	11	91	Symmetric	Fair	Fair to poor	Low				4.7	2.4	3.3	tree on site
126	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	52	55	10	6	Symmetric	Fair	Poor	Low				6.2	2.6	4.4	tree on site
127	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	32,20	48	9	5	Minor asymmetry	Fair to poor	Poor	Low				4.5	2.4	3.2	tree on site
128	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	50	52	9	7	Symmetric	Fair to poor	Poor	Low				6.0	2.5	4.2	tree on site
129	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Early-maturity	16,11	25	6	5	Asymmetric crown	Fair	Fair to poor	Low				2.3	1.8	1.8	tree on site
130	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Semi-mature	19,14	26	8	6	Minor asymmetry	Fair to poor	Fair to poor	Low				2.8	1.9	2.0	tree on site
131	Shrub - Melaleuca nesophila	Showy Honey-myrtle	Australian native	Juvenile						Poor	Poor	Low (size)				2	1.3	1.4	Shrub
132	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Australian native	Maturing	79	94	17	14	Symmetric	Fair to poor	Fair to poor	Low	Dieback			9.5	3.2	6.6	tree on site
133	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	22	26	9	5	Symmetric	Fair to poor	Fair to poor	Low				2.6	1.9	1.9	tree on site
134	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Semi-mature	15,10,9	27	6	5	Minor asymmetry	Fair to poor	Poor	Low				2.4	1.9	1.9	tree on site
135	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Semi-mature	21,20,20, 16	46	8	7	Symmetric	Fair	Poor	Low				4.6	2.4	3.3	tree on site
136	Allocasuarina verticillata	Drooping She-oak	Victorian native	Semi-mature	32	36	11	7	Asymmetric crown	Fair	Poor	Low				3.8	2.2	2.7	tree on site

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137	Melaleuca linariifolia	Snow in Summer	Australian native	Maturing	68,56	84	10	8	Symmetric	Fair	Fair to poor	Low				10.6	3.1	7.4	tree on site
138	Melaleuca linariifolia	Snow in Summer	Australian native	Semi-mature	31	40	8	4	Asymmetric crown	Fair	Fair to poor	Low				3.7	2.3	2.6	tree on site
139	Melaleuca linariifolia	Snow in Summer	Australian native	Maturing	60	71	13	7	Symmetric	Fair	Fair to poor	Low				7.2	2.9	5.0	tree on site
140	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	13	21	6	6	Asymmetric crown	Fair to poor	Fair to poor	Low				2.0	1.7	1.7	tree on site
141	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	19	22	6	4	Symmetric	Fair to poor	Fair to poor	Low				2.3	1.8	1.8	tree on site
142	Eucalyptus sp.	Gum Tree	Australian native	Maturing	50	57	17	13	Symmetric	Poor	Fair to poor	None	Upper crown dead			6.0	2.6	4.2	tree on site
143	Melaleuca lanceolata	Moonah	Victorian native	Maturing	28,20,21	56	11	10	Symmetric	Fair	Poor	Low				4.8	2.6	3.4	tree on site
144	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	32	37	7	7	Symmetric	Fair	Fair to poor	Moderate				3.8	2.2	2.7	tree on site
145	Eucalyptus sp.	Gum Tree	Australian native	Semi-mature	10	22	4	4	Asymmetric crown	Fair	Fair to poor	Low				2.0	1.8	1.8	tree on site
146	Ficus elastica	Rubber Tree	Exotic evergreen	Early-maturity	13,15,17, 10	26	10	6	Symmetric	Fair	Fair to poor	Low				3.4	1.9	2.4	tree on site
147	Casuarina cunninghamiana	River She-oak	Australian native	Semi-mature	25	36	7	6	Symmetric	Fair to poor	Fair to poor	Low				3.0	2.2	2.2	tree on site
148	Eucalyptus viminalis	Manna Gum	Victorian native	Maturing	84	107	18	16	Asymmetric crown	Fair	Fair to poor	Moderate		Weight reduction	Low	10.1	3.4	7.1	tree on site
149	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	29,43	55	14	9	Symmetric	Fair	Fair	Moderate				6.2	2.6	4.4	tree on site
150	Agonis flexuosa	Willow Myrtle	Australian native	Semi-mature	25	36	5	5	Symmetric	Fair	Fair to poor	Low				3.0	2.2	2.2	tree on site
151	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	30,28	56	14	8	Symmetric	Fair	Poor	Low				4.9	2.6	3.4	tree on site
152	Shrub - Pittosporum undulatum	Sweet Pittosporum	Victorian native	Juvenile						Poor	Poor	Low (size)				2	1.3	1.4	Shrub
153	Shrub - Callistemon sp.	Bottlebrush	Australian native	Juvenile						Poor	Poor	Low (size)				2	1.3	1.4	Shrub
154	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	15,13	20	8	6	Symmetric	Fair	Fair to poor	Low				2.4	1.7	1.7	tree on site
155	Cedrus deodara	Deodar	Exotic conifer	Semi-mature	21	26	7	6	Symmetric	Fair	Fair	Moderate				2.5	1.9	1.9	tree on site
156	Shrub - Callistemon sp.	Bottlebrush	Australian native	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub
157	Ulmus glabra 'Lutescens'	Golden Wych Elm	Exotic deciduous	Semi-mature	18	23	5	4	Symmetric	Fair	Fair	Low				2.2	1.8	1.8	tree on site
158	Ulmus glabra 'Lutescens'	Golden Wych Elm	Exotic deciduous	Semi-mature	20	24	5	5	Symmetric	Fair	Fair	Low				2.4	1.8	1.8	tree on site
159	Melaleuca quinquenervia	Broad-leaved Paperbark	Australian native	Early-maturity	20,18,21	40	9	7	Minor asymmetry	Fair	Fair to poor	Low				4.1	2.3	2.9	tree on site
160	Angophora costata	Smooth-barked Apple	Australian native	Maturing	52	58	17	12	Symmetric	Fair	Fair	Moderate				6.2	2.6	4.4	tree on site
161	Hakea salicifolia	Willow-leaved Hakea	Australian native	Semi-mature	18	26	11	5	Symmetric	Fair	Fair to poor	Low				2.2	1.9	1.9	tree on site
162	Eucalyptus saligna	Sydney Blue Gum	Australian native	Semi-mature	17	22	8	5	Symmetric	Fair	Fair	Moderate				2.0	1.8	1.8	tree on site
163	Shrub - Cupressus sp.	Cypress	Exotic conifer	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
164	Shrub - Cupressus sp.	Cypress	Exotic conifer	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub

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165	Melaleuca lanceolata	Moonah	Victorian native	Early-maturity	26	33	12	6	Symmetric	Fair	Fair to poor	Low				3.1	2.1	2.2	tree on site
166	Shrub - Acacia sp.	Wattle Tree	Victorian native	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub
167	Callistemon viminalis	Weeping Bottlebrush	Australian native	Semi-mature	19,12	25	9	7	Symmetric	Fair	Fair to poor	Low				2.7	1.8	1.9	tree on site
168	Shrub - Cupressus sp.	Cypress	Exotic conifer	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
169	Eucalyptus botryoides	Southern Mahogany	Victorian native	Semi-mature	38,37	56	7	6	Symmetric	Fair to poor	Poor	Low				6.4	2.6	4.5	tree on site
170	Agonis flexuosa	Willow Myrtle	Australian native	Semi-mature	17,10	22	6	7	Symmetric	Fair	Poor	Low				2.4	1.8	1.8	tree on site
171	Cupressus sempervirens	Italian Cypress	Exotic conifer	Semi-mature	16	21	12	2	Symmetric	Fair	Fair	Low	Size			2.0	1.7	1.7	tree on site
172	Melaleuca linariifolia	Snow in Summer	Australian native	Semi-mature	15,19	25	6	4	Symmetric	Fair	Fair to poor	Low				2.9	1.8	2.0	tree on site
173	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	17	23	6	5	Symmetric	Fair	Fair	Low				2.0	1.8	1.8	tree on site
174	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	24,20	36	6	6	Symmetric	Fair	Fair to poor	Low				3.7	2.2	2.6	tree on site
175	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	22,20,16	50	10	7	Symmetric	Fair	Poor	Low				4.1	2.5	2.8	tree on site
176	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	15,15,19	42	6	8	Symmetric	Fair	Poor	Low				3.4	2.3	2.4	tree on site
177	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	38,31	46	14	7	Symmetric	Fair	Fair to poor	Low	Previously lopped			5.9	2.4	4.1	tree on site
178	Eucalyptus cladocalyx	Sugar Gum	Australian native	Maturing	54	76	19	9	Symmetric	Fair	Fair to poor	Moderate				6.5	2.9	4.5	tree on site
179	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	17,32,17	45	10	7	Symmetric	Fair	Fair	Moderate				4.8	2.4	3.4	tree on site
180	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	33	36	11	6	Symmetric	Fair	Poor	Low	Previously lopped			4.0	2.2	2.8	tree on site
181	Eucalyptus cladocalyx	Sugar Gum	Australian native	Maturing	79	89	21	13	Symmetric	Fair	Fair to poor	Moderate				9.5	3.2	6.6	tree on site
182	Angophora costata	Smooth-barked Apple	Australian native	Semi-mature	30	39	13	7	Symmetric	Fair	Fair to poor	Low				3.6	2.2	2.5	tree on site
183	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	39,25	52	10	8	Symmetric	Fair	Fair to poor	Moderate				5.6	2.5	3.9	tree on site
184	Angophora costata	Smooth-barked Apple	Australian native	Maturing	59	66	19	12	Symmetric	Fair	Poor	Low				7.1	2.8	5.0	tree on site
185	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	54	62	16	10	Minor asymmetry	Fair to poor	Fair to poor	Low				6.5	2.7	4.5	tree on site
186	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Maturing	61	68	18	9	Symmetric	Fair	Fair	Moderate				7.3	2.8	5.1	tree on site
187	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	35,20,10	53	10	7	Symmetric	Fair to poor	Poor	Low				5.0	2.5	3.5	tree on site
188	Pittosporum tenuifolium	Kohuhu	Exotic evergreen	Semi-mature	10	18	6	4	Symmetric	Fair	Poor	Low				2.0	1.6	1.6	tree on site
189	Cordyline australis	Cabbage Tree	Exotic Palm	Semi-mature	15,12	25	6	4	Symmetric	Fair	Fair	Low				2.3	1.8	1.8	tree on site

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190	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Semi-mature	16	18	9	3	Symmetric	Fair	Fair to poor	Low				2.0	1.6	1.6	tree on site
191	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	18	22	9	4	Symmetric	Fair	Fair	Low				2.2	1.8	1.8	tree on site
192	Eucalyptus cornuta	Yate	Australian native	Early-maturity	41	50	15	10	Symmetric	Fair	Fair to poor	Moderate				4.9	2.5	3.4	tree on site
193	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	15,14,12	31	5	6	Asymmetric crown	Fair	Poor	Low				2.9	2.0	2.0	tree on site
194	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	23	27	11	5	Minor asymmetry	Fair	Fair to poor	Low	Hard against building			2.8	1.9	1.9	tree on site
195	Hesperocyparis macrocarpa syn.Cupressus macrocarpa	Smooth Arizona Cypress	Exotic conifer	Semi-mature	25	32	11	5	Minor asymmetry	Fair	Fair to poor	Low	Hard against building			3.0	2.1	2.1	tree on site
196	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Maturing	102	110	22	15	Symmetric	Fair	Fair	High				12.2	3.4	8.6	tree on site
197	Eucalyptus cornuta	Yate	Australian native	Maturing	85	96	13	12	Minor asymmetry	Fair to poor	Poor	Low	Multiple past limb failures			10.2	3.3	7.1	tree on site
198	Shrub - Hakea sp.	Hakea	Australian native	Juvenile						Poor	Poor	Low (size)				2	1.3	1.4	Shrub
199	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	26,20,19	47	7	5	Symmetric	Fair to poor	Poor	Low				4.5	2.4	3.2	tree on site
200	Angophora costata	Smooth-barked Apple	Australian native	Maturing	56	62	19	14	Symmetric	Fair	Fair	Moderate				6.7	2.7	4.7	tree on site
201	Cupressus torulosa	Bhutan Cypress	Exotic conifer	Semi-mature	12,6	17	7	2	Symmetric	Fair to poor	Fair to poor	Low	Suppressed			2.0	1.6	1.6	tree on site
202	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Early-maturity	23,15	31	7	9	Symmetric	Fair to poor	Fair to poor	Low	Partly suppressed-Crown bias Sth.			3.3	2.0	2.3	tree on site
203	Eucalyptus cornuta	Yate	Australian native	Maturing	50	7	15	10	Minor asymmetry	Fair	Fair to poor	Moderate	Past powerline clearance			6.0	1.1	4.2	tree on site
204	Melaleuca nesophylla	Showy Honey-myrtle	Australian native	Early-maturity	16	20	5	5	Minor asymmetry	Fair	Fair	Low (size)				2.0	1.7	1.7	tree on site
205	Eucalyptus obliqua	Messmate Stringybark	Victorian native	Early-maturity	32,26	57	16	10	Minor asymmetry	Fair	Fair to poor	Low	Past stem failure. Crown bias Nth.			4.9	2.6	3.5	tree on site
206	Eucalyptus viridus	Green Mallee	Victorian native	Maturing	20,30	51	13	16	Minor asymmetry	Fair	Fair to poor	Low	Included bark fork.			4.3	2.5	3.0	tree on site
207	Angophora costata	Smooth-barked Apple	Australian native	Semi-mature	35	37	15	12	Symmetric	Fair	Fair to poor	Moderate	Trunk pruning wounds			4.2	2.2	2.9	tree on site
208	Cupressus sempervirens	Italian Cypress	Exotic conifer	Early-maturity	25	26	8	3	Symmetric	Fair	Fair	Moderate				3.0	1.9	2.1	tree on site
209	Fraxinus 'Raywood'	Claret Ash	Exotic deciduous	Semi-mature	24	27	6	8	Symmetric	Fair	Fair	Moderate				2.9	1.9	2.0	tree on site
210	Tamarix aphylla	Athel Tree	Exotic evergreen	Over-mature	43,43,37	70	4	7	Symmetric	Poor	Poor	None	Lopped			8.5	2.8	6.0	tree on site
211	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	42	45	17	11	Symmetric	Fair	Fair	Moderate	Trunk pruning wounds			5.0	2.4	3.5	tree on site
212	Eucalyptus viridus	Green Mallee	Victorian native	Early-maturity	14,13,12, 11,10	50	11	11	Symmetric	Fair	Poor	None	Stump resprout.			3.2	2.5	2.5	tree on site
213	Angophora costata	Smooth-barked Apple	Australian native	Early-maturity	37,33	63	15	10	Symmetric	Fair	Fair to poor	Low	Previously lopped			5.9	2.7	4.2	tree on site
214	Cupressus sempervirens	Italian Cypress	Exotic conifer	Early-maturity	22,10,10	36	8	3	Symmetric	Fair	Fair	Moderate				3.1	2.2	2.2	tree on site

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215	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	72	79	14	11	Symmetric	Fair	Fair to poor	Low	Partly lopped			8.6	3.0	6.0	tree on site
216	Cupressus torulosa	Bhutan Cypress	Exotic conifer	Early-maturity	21	26	9	4	Symmetric	Fair	Fair	Moderate				2.5	1.9	1.9	tree on site
217	Angophora costata	Smooth-barked Apple	Australian native	Maturing	52	63	15	11	Symmetric	Fair	Fair to poor	Moderate	Previously partly lopped			6.2	2.7	4.4	tree on site
218	Angophora costata	Smooth-barked Apple	Australian native	Maturing	55	63	17	13	Symmetric	Fair	Fair	Moderate				6.6	2.7	4.6	tree on site
219	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Early-maturity	20,18,18	41	7	6	Symmetric	Fair	Fair	Moderate	Acute forks			3.9	2.3	2.7	tree on site
220	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Maturing	52	56	16	11	Symmetric	Dead	Poor	None				6.2	2.6	4.4	tree on site
221	Casuarina glauca	Swamp She-oak	Australian native	Early-maturity	37	48	12	9	Symmetric	Fair	Fair	Moderate				4.4	2.4	3.1	tree on site
222	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Semi-mature	21	35	9	6	Symmetric	Fair	Fair	Moderate				2.5	2.1	2.1	Street tree
223	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Early-maturity	35	36	7	8	Symmetric	Fair	Fair	Moderate	Canker wounds			4.2	2.2	2.9	tree on site
224	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	77	81	16	12	Symmetric	Fair	Fair to poor	Low	Previously partly lopped, Ivy infestation.			9.2	3.0	6.5	tree on site
225	Casuarina glauca	Swamp She-oak	Australian native	Semi-mature	21	26	7	6	Symmetric	Fair	Fair	Moderate	Suckering habit.			2.5	1.9	1.9	tree on site
226	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	40	51	10	13	Symmetric	Fair	Fair	Moderate				4.8	2.5	3.4	tree on site
227	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	46	58	14	9	Symmetric	Fair to poor	Fair	Moderate	Psyllid			5.5	2.6	3.9	tree on site
228	Agonis flexuosa	Willow Myrtle	Australian native	Maturing	43,26	63	8	10	Symmetric	Fair	Fair	Moderate	Neighbour's tree			6.0	2.7	4.2	Neighbour's tree
229	Eucalyptus gomphocephala	Tuart	Australian native	Semi-mature	27	36	9	8	Symmetric	Fair to poor	Fair to poor	Low	Psyllid, Suppressed.			3.2	2.2	2.3	tree on site
230	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	48	60	15	14	Symmetric	Fair to poor	Fair	Low	Psyllid, Acute fork.			5.8	2.7	4.0	tree on site
231	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	49	55	14	11	Symmetric	Fair to poor	Fair to poor	Low	Psyllid, Included bark fork			5.9	2.6	4.1	tree on site
232	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	65,42	94	15	16	Asymmetric crown	Fair	Fair to poor	Low	Psyllid, Acute fork with basal wounds			9.3	3.2	6.5	tree on site
233	Eucalyptus gomphocephala	Tuart	Australian native	Early-maturity	32	42	9	9	Symmetric	Fair to poor	Fair to poor	Low	Partly suppressed-Crown bias Nth. Psyllid			3.8	2.3	2.7	tree on site
234	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	49	58	12	11	Symmetric	Fair	Fair	Moderate	Psyllid			5.9	2.6	4.1	tree on site
235	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	45	53	11	9	Symmetric	Dead	Poor	None				5.4	2.5	3.8	tree on site
236	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	37,22	61	11	7	Symmetric	Fair	Fair	Moderate	Partly suppressed-Crown bias East			5.2	2.7	3.6	tree on site
237	Eucalyptus gomphocephala	Tuart	Australian native	Semi-mature	27	32	9	6	Symmetric	Poor	Poor	None	Main leader dead.			3.2	2.1	2.3	tree on site
238	Eucalyptus gomphocephala	Tuart	Australian native	Maturing	46	59	13	10	Symmetric	Fair	Fair	Moderate	psyllid			5.5	2.7	3.9	tree on site
239	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	20,16	40	9	7	Leaning stem	Fair to poor	Poor	Low	Partly suppressed-Crown bias East.			3.1	2.3	2.3	tree on site
240	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Over-mature	29,20	65	8	8	Collapsing	Fair	Very poor	None				4.2	2.8	3.0	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
241	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	29,17	50	10	6	Asymmetric crown	Fair	Fair to poor	Low	Partly suppressed-Crown bias Sth. Previously partly lopped			4.0	2.5	2.8	tree on site
242	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	22,17	46	9	8	Asymmetric crown	Fair	Fair to poor	Low	Partly suppressed-Crown bias Nth.			3.3	2.4	2.3	tree on site
243	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	29,28,13	51	9	7	Symmetric	Fair	Fair to poor	Low	Previously partly lopped			5.1	2.5	3.6	tree on site
244	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	23,19,18, 14	63	10	8	Collapsing	Fair to poor	Poor	Low				4.5	2.7	3.2	tree on site
245	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	24,23	63	9	9	Asymmetric crown	Fair	Fair to poor	Low	Previously partly lopped			4.0	2.7	2.8	tree on site
246	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Maturing	27	35	8	8	Asymmetric crown	Fair	Fair to poor	Low	Previously partly lopped. Partly suppressed-Crown bias West.			3.2	2.1	2.3	tree on site
247	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	40	43	14	12	Symmetric	Good	Fair	Moderate	Acute fork			4.8	2.3	3.4	tree on site
248	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	28	35	15	13	Symmetric	Fair	Fair	Moderate				3.4	2.1	2.4	tree on site
249	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	18	30	10	5	Symmetric	Fair to poor	Fair	Low (size)	Suppressed			2.2	2.0	2.0	tree on site
250	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	25,22	38	15	14	Symmetric	Fair	Fair	Moderate				4.0	2.2	2.8	tree on site
251	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	35	43	15	10	Symmetric	Fair	Fair	Moderate				4.2	2.3	2.9	tree on site
252	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	22	30	14	6	Symmetric	Fair to poor	Fair	Low	Suppressed. Reduced foliage density.			2.6	2.0	2.0	tree on site
253	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Over-mature	35,30,20	91	9	9	Symmetric	Fair	Fair to poor	Low	Subsiding limbs. Previously partly lopped			6.0	3.2	4.2	tree on site
254	Shrub - Callistemon viminalis	Weeping Bottlebrush	Australian native	Juvenile						Fair	Fair to poor	Low (size)				2	1.3	1.4	Shrub
255	Shrub - Callistemon viminalis	Weeping Bottlebrush	Australian native	Juvenile						Fair	Fair to poor	Low (size)				2	1.3	1.4	Shrub
256	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	31,27	53	15	13	Symmetric	Fair	Fair to poor	Moderate	Included bark fork.	Reduce Lesser co-dominant stem	Moderate	4.9	2.5	3.5	tree on site
257	Shrub - Hedera helix	Ivy	Exotic evergreen	Juvenile						Fair	Fair	Low (size)	Sprawling mass of Ivy			2	1.3	1.4	Shrub
258	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	24	37	12	13	Symmetric	Fair	Fair	Moderate	Low branching.			2.9	2.2	2.2	tree on site
259	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	25,19	36	14	10	Symmetric	Fair	Fair to poor	Moderate	Included bark fork.	Reduce Lesser co-dominant stem	Low	3.8	2.2	2.6	tree on site
260	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	44	44	15	11	Symmetric	Fair	Fair	Moderate	acute fork			5.3	2.3	3.7	tree on site
261	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	33	43	14	10	Symmetric	Fair	Fair	Moderate				4.0	2.3	2.8	tree on site
262	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	38	45	15	16	Symmetric	Fair	Fair	Moderate	Over-extended limb(s) developing	Weight reduction	Low	4.6	2.4	3.2	tree on site
263	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	26,23	41	15	11	Symmetric	Fair	Fair	Moderate				4.2	2.3	2.9	tree on site

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264	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	22,14	34	12	9	Symmetric	Fair	Fair	Moderate				3.1	2.1	2.2	tree on site
265	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	33	40	14	12	Symmetric	Fair	Fair	Moderate				4.0	2.3	2.8	tree on site
266	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	18,16	32	11	8	Symmetric	Fair to poor	Fair to poor	Low	Sparse foliage.			2.9	2.1	2.1	tree on site
267	Corymbia citriodora	Lemon-scented Gum	Australian native	Maturing	49	52	16	13	Symmetric	Fair	Fair to poor	Moderate	Acute forks			5.9	2.5	4.1	tree on site
268	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
269	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	34	45	14	12	Symmetric	Fair	Fair	Moderate				4.1	2.4	2.9	tree on site
270	Schinus areira	Peppercorn Tree	Exotic evergreen	Early-maturity	29,23	75	7	11	Symmetric	Fair	Fair to poor	Low	Partly suppressed weed species			4.4	2.9	3.1	tree on site
271	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	25	31	13	5	Symmetric	Fair	Fair to poor	Moderate	Acute fork			3.0	2.0	2.1	tree on site
272	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	16,15	25	7	8	Symmetric	Fair	Fair to poor	Moderate	Split branch	Branch removal	Moderate	2.6	1.8	1.8	tree on site
273	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
274	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	16,16	34	9	9	Symmetric	Fair	Fair to poor	Moderate	Included bark fork.	Reduce Lesser co-dominant stem	Low	2.7	2.1	2.1	tree on site
275	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	28	34	11	9	Symmetric	Fair	Fair	Moderate				3.4	2.1	2.4	tree on site
276	Corymbia citriodora	Lemon-scented Gum	Australian native	Early-maturity	37,41	63	13	13	Symmetric	Fair	Fair to poor	Moderate	Acute forks, Ivy on trunk.			6.6	2.7	4.6	tree on site
277	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
278	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
279	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
280	Acacia sp.	Wattle Tree	Victorian native	Over-mature	21	29	5	6	Collapsed	Dead	Very poor	None				2.5	2.0	2.0	tree on site
281	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
282	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
283	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	41	49	19	9	Symmetric	Fair	Fair to poor	Low				4.9	2.5	3.4	tree on site
284	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
285	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Early-maturity	19,19,14	32	10	12	Collapsing	Fair	Poor	Low				3.6	2.1	2.5	tree on site
286	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
287	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	46	59	Fair-poor	11	Symmetric	Fair	Fair to poor	Low	Acute unions			5.5	2.7	3.9	tree on site
288	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
289	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
290	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub

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291	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	30	38	15	14	Symmetric	Fair	Fair	Low	Inappropriate			3.6	2.2	2.5	tree on site
292	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
293	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
294	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair	Fair	Low (size)				2	1.3	1.4	Shrub
295	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub
296	Shrub - Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Juvenile						Fair to poor	Fair to poor	Low (size)				2	1.3	1.4	Shrub
297	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Maturing	58	90	14	15	Symmetric	Fair	Fair	Moderate				7.0	3.2	4.9	Street tree
298	Eucalyptus viminalis	Manna Gum	Victorian native	Semi-mature	29	33	11	7	Symmetric	Fair to poor	Fair	Low	Reduced foliage density, size & colour.			3.5	2.1	2.4	tree on site
299	Eucalyptus camaldulensis	River Red Gum	Victorian native	Maturing	64	74	16	16	Symmetric	Fair to poor	Fair	Moderate	Trunk wound. Reduced foliage density. Deadwood.	Crown Maintenance	Low	7.7	2.9	5.4	tree on site
300	Eucalyptus saligna	Sydney Blue Gum	Australian native	Early-maturity	36	49	13	11	Symmetric	Fair to poor	Fair to poor	Low	Past stem failure. Reduced foliage density			4.3	2.5	3.0	tree on site
301	Eucalyptus camaldulensis	River Red Gum	Victorian native	Early-maturity	31,31	53	15	12	Symmetric	Fair	Fair to poor	Low				5.3	2.5	3.7	tree on site
302	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Over-mature	44,36	56	9	9	Symmetric	Fair to poor	Fair to poor	Low				6.8	2.6	4.8	tree on site
303	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	20,16,16, 24,15	50	8	8	Symmetric	Fair to poor	Fair to poor	Low	Typical multi stemmed form			5.0	2.5	3.5	tree on site
304	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	24,24,23, 23	52	8	9	Symmetric	Fair to poor	Fair to poor	Low				5.6	2.5	3.9	tree on site
305	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	23,22,15, 15	49	8	9	Symmetric	Fair to poor	Fair to poor	Low				4.6	2.5	3.2	tree on site
306	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	23,15,15, 14,14	50	7	8	Symmetric	Fair to poor	Fair to poor	Low				4.4	2.5	3.1	tree on site
307	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	13,12,10	24	5	4	Symmetric	Fair to poor	Fair to poor	Low (size)				2.4	1.8	1.8	tree on site
308	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	23	28	6	4	Symmetric	Fair to poor	Fair to poor	Low	Dieback, mistletoe			2.8	1.9	1.9	tree on site
309	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Over-mature	27,23,23, 17,17	73	8	11	Symmetric	Fair to poor	Fair to poor	Low				5.8	2.9	4.1	tree on site
310	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Semi-mature	25,17	34	8	7	Symmetric	Fair to poor	Fair to poor	Low				3.6	2.1	2.5	tree on site
311	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	23,23,19	54	8	9	Symmetric	Fair to poor	Fair to poor	Low				4.5	2.6	3.2	tree on site
312	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	23,19,19	45	8	8	Symmetric	Fair	Fair to poor	Low				4.2	2.4	3.0	tree on site
313	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	9,7,6	17	3	2	Symmetric	Poor	Fair to poor	Low				2.0	1.6	1.6	tree on site
314	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	16,15,12, 10	43	6	5	Symmetric	Fair to poor	Fair to poor	Low	Suppresed			3.2	2.3	2.3	tree on site
315	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	20,15,13	40	8	7	Symmetric	Fair to poor	Fair to poor	Low				3.4	2.3	2.4	tree on site
316	Eucalyptus camaldulensis	River Red Gum	Victorian native	Maturing	58	71	14	11	Symmetric	Fair	Fair	Moderate				7.0	2.9	4.9	tree on site

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317	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	27,15	47	8	8	Symmetric	Fair to poor	Fair to poor	Low				3.7	2.4	2.6	tree on site
318	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	18,17,16, 16,12	58	9	8	Symmetric	Fair to poor	Fair to poor	Low				4.3	2.6	3.0	tree on site
319	Eucalyptus viminalis	Manna Gum	Victorian native	Maturing	58	78	15	15	Symmetric	Fair	Fair to poor	Moderate	Over-extended limb(s). Deadwood.	Crown Maintenance		7.0	3.0	4.9	tree on site
320	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	40	53	16	9	Symmetric	Fair	Fair	Moderate				4.8	2.5	3.4	tree on site
321	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	20,17,15	43	7	7	Symmetric	Fair to poor	Fair to poor	Low				3.6	2.3	2.5	tree on site
322	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	24,16,18, 12	34	6	8	Asymmetric crown	Fair to poor	Fair to poor	Low	Partly suppressed-Crown bias East			4.3	2.1	3.0	tree on site
323	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	17,17,15, 12,11	44	6	6	Symmetric	Fair to poor	Fair to poor	Low	Partly suppressed-Crown bias Sth.			3.9	2.3	2.7	tree on site
324	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	18,15,15, 11	38	5	7	Symmetric	Fair to poor	Fair to poor	Low				3.6	2.2	2.5	tree on site
325	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	22,18,16, 17,15	44	7	7	Symmetric	Fair to poor	Fair to poor	Low				4.8	2.3	3.3	tree on site
326	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	14	20	8	3	Symmetric	Fair	Fair	Low	Size			2.0	1.7	1.7	tree on site
327	Eucalyptus sp.	Gum Tree	Australian native	Maturing	47	55	10	11	Symmetric	Dead	Very poor	None	Past branch failure			5.6	2.6	3.9	tree on site
328	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	21	24	5	5	Symmetric	Fair to poor	Fair to poor	Low	Reduced foliage density,			2.5	1.8	1.8	tree on site
329	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	19,16,15, 15	42	7	8	Symmetric	Fair to poor	Fair to poor	Low				3.9	2.3	2.7	tree on site
330	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Over-mature	36,38,30, 25	104	8	13	Symmetric	Fair to poor	Fair to poor	Low	Past branch failure.			7.8	3.4	5.5	tree on site
331	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	13,13,12, 11	39	6	6	Symmetric	Fair to poor	Fair to poor	Low				2.9	2.2	2.2	tree on site
332	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	20,14,10, 10	38	7	6	Symmetric	Fair to poor	Fair to poor	Low				3.4	2.2	2.4	tree on site
333	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	22,21,19, 23,20	74	9	10	Symmetric	Fair to poor	Fair to poor	Low				5.6	2.9	4.0	tree on site
334	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	14,14,13, 14,	39	8	8	Symmetric	Fair to poor	Fair to poor	Low				3.3	2.2	2.3	tree on site
335	Eucalyptus camaldulensis	River Red Gum	Victorian native	Early-maturity	40	55	16	7	Symmetric	Fair	Fair	Moderate				4.8	2.6	3.4	tree on site
336	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	37,30,18	69	10	9	Symmetric	Fair to poor	Fair to poor	Low				6.1	2.8	4.3	tree on site
337	Melaleuca styphelioides	Prickly-leaved Paperbark	Australian native	Maturing	31,22,21, 20	64	9	10	Symmetric	Fair to poor	Fair to poor	Low				5.7	2.7	4.0	tree on site
338	Corymbia ficifolia	Red-flowering Gum	Australian native	Semi-mature	16	20	5	5	Asymmetric crown	Fair to poor	Fair	Low	Partly suppressed-Crown bias West			2.0	1.7	1.7	tree on site
339	Agonis flexuosa	Willow Myrtle	Australian native	Early-maturity	20	26	5	4	Asymmetric crown	Fair to poor	Fair to poor	Low (size)	Partly suppressed-Crown bias West			2.4	1.9	1.9	tree on site
340	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	21	30	9	5	Symmetric	Fair	Fair to poor	Low				2.5	2.0	2.0	tree on site
341	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	25	37	14	6	Symmetric	Fair	Fair	Moderate				3.0	2.2	2.2	tree on site
342	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	20	31	13	6	Symmetric	Fair	Fair	Moderate				2.4	2.0	2.0	tree on site
343	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Early-maturity	24,20,28	47	10	9	Symmetric	Fair	Fair to poor	Low				5.0	2.4	3.5	tree on site

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344	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	28	44	15	7	Symmetric	Fair	Fair	Moderate		Reduce Lesser co-dominant stem	Low	3.4	2.3	2.4	tree on site
345	Melaleuca armillaris	Bracelet Honey-myrtle	Victorian native	Early-maturity	10,8,9	26	4	4	Symmetric	Fair	Fair to poor	Low				2.0	1.9	1.9	tree on site
346	Eucalyptus camaldulensis	River Red Gum	Victorian native	Maturing	60	78	16	12	Symmetric	Fair	Fair	High				7.2	3.0	5.0	tree on site
347	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	15	26	9	4	Symmetric	Fair	Fair to poor	Low	Size			2.0	1.9	1.9	tree on site
348	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	21	26	12	7	Symmetric	Fair	Fair	Moderate				2.5	1.9	1.9	tree on site
349	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	21	27	13	6	Symmetric	Fair	Fair	Moderate				2.5	1.9	1.9	tree on site
350	Corymbia citriodora	Lemon-scented Gum	Australian native	Semi-mature	23	28	12	6	Symmetric	Fair	Fair	Moderate				2.8	1.9	1.9	tree on site
351	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	14	22	6	4	Symmetric	Fair	Fair to poor	Low				2.0	1.8	1.8	tree on site
352	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	38	47	17	10	Symmetric	Fair	Fair	Moderate				4.6	2.4	3.2	tree on site
353	Eucalyptus camaldulensis	River Red Gum	Victorian native	Semi-mature	13	23	8	4	Minor asymmetry	Fair	Fair to poor	Low	Size			2.0	1.8	1.8	tree on site
354	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	20	28	12	5	Symmetric	Fair	Fair	Moderate	Remove ivy from base			2.4	1.9	1.9	tree on site
355	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	13	19	5	3	Symmetric	Fair	Poor	Low	Basal decay			2.0	1.6	1.6	tree on site
356	Eucalyptus camaldulensis	River Red Gum	Victorian native	Semi-mature	30	38	11	7	Symmetric	Fair	Fair to poor	Low				3.6	2.2	2.5	tree on site
357	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	12	16	6	3	Symmetric	Fair	Fair	Low	Size			2.0	1.5	1.5	tree on site
358	Eucalyptus camaldulensis	River Red Gum	Victorian native	Semi-mature	26	34	11	6	Symmetric	Fair	Fair	Moderate				3.1	2.1	2.2	tree on site
359	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	10,12	50	10	5	Symmetric	Fair	Very poor	None	Stump sprout			2.0	2.0	2.0	tree on site
360	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	43	57	15	10	Asymmetric crown	Fair	Fair	Moderate				5.2	2.6	3.6	tree on site
361	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	31	40	11	6	Minor asymmetry	Fair	Fair	Moderate				3.7	2.3	2.6	tree on site
362	Shrub - Eucalypt sp.	Gum tree	Victorian native	Juvenile						Fair	Fair	Low (size)	9 cm Dbh			2	1.3	1.4	Shrub
363	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Maturing	66	79	20	10	Symmetric	Fair to poor	Fair to poor	Low	Reduced foliage density,			7.9	3.0	5.5	tree on site
364	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	14	20	8	4	Asymmetric crown	Fair	Fair to poor	Low				2.0	1.7	1.7	tree on site
365	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Maturing	53	65	18	10	Symmetric	Fair	Fair	Moderate				6.4	2.8	4.5	tree on site
366	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	10,15,15	61	10	6	Symmetric	Fair	Very poor	None	Stump sprout			2.8	2.7	2.7	tree on site
367	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	34	35	11	6	Minor asymmetry	Fair	Fair to poor	Low				4.1	2.1	2.9	tree on site
368	Eucalyptus camaldulensis	River Red Gum	Victorian native	Semi-mature	20	24	14	5	Symmetric	Fair	Fair	Moderate				2.4	1.8	1.8	tree on site
369	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	23	34	7	6	Leaning stem	Fair	Poor	Low				2.8	2.1	2.1	tree on site
370	Eucalyptus cladocalyx	Sugar Gum	Australian native	Maturing	49	61	21	12	Symmetric	Fair	Fair	Moderate				5.9	2.7	4.1	tree on site

Tree No	Botanic name	Common Name	Origin	Age	DBH	Basal	Height	Width	Form	Health	Structure	Arb rating	Comments	Works	Priority	TPZ (m radius)	SRZ (m radius)	Reduced TPZ (m radius)	Location
371	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	26	38	13	7	Symmetric	Fair	Fair	Moderate				3.1	2.2	2.2	tree on site
372	Eucalyptus cornuta	Yate	Australian native	Maturing	84	102	19	15	Symmetric	Fair	Poor	Low				10.1	3.3	7.1	tree on site
373	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	36	41	16	8	Symmetric	Fair	Fair to poor	Moderate	Co-dominant stem			4.3	2.3	3.0	tree on site
374	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Early-maturity	43	54	16	7	Symmetric	Fair	Fair to poor	Low				5.2	2.6	3.6	tree on site
375	Eucalyptus sideroxylon	Red Ironbark	Victorian native	Early-maturity	32	40	11	6	Symmetric	Fair	Fair	Moderate				3.8	2.3	2.7	tree on site
376	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	21,21	37	15	7	Symmetric	Fair	Fair to poor	Low	Co-dominant stem with included bark			3.6	2.2	2.5	tree on site
377	Eucalyptus sp.	Gum Tree	Australian native	Early-maturity	21,27	42	14	7	Minor asymmetry	Dead	Poor	None		Tree Removal	High	4.1	2.3	2.9	tree on site
378	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	35	44	15	8	Symmetric	Fair	Fair	Moderate				4.2	2.3	2.9	tree on site
379	Eucalyptus cornuta	Yate	Australian native	Maturing	76,54	124	19	15	Symmetric	Fair	Poor	Low				11.2	3.6	7.8	tree on site
380	Eucalyptus sp.	Gum Tree	Australian native	Early-maturity	30,33	50	13	7	Symmetric	Dead	Poor	None		Tree Removal	High	5.4	2.5	3.7	tree on site
381	Eucalyptus leucoxylon	Yellow Gum	Victorian native	Early-maturity	31	42	12	6	Symmetric	Fair	Fair to poor	Low				3.7	2.3	2.6	tree on site
382	Corymbia maculata	Spotted Gum	Victorian native	Early-maturity	32,26,25	62	18	9	Symmetric	Fair	Fair to poor	Low				5.8	2.7	4.1	tree on site
383	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	25	30	10	6	Symmetric	Fair	Fair	Moderate				3.0	2.0	2.1	tree on site
384	Corymbia maculata	Spotted Gum	Victorian native	Semi-mature	27	31	12	7	Symmetric	Fair	Fair to poor	Low				3.2	2.0	2.3	tree on site
385	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	15,15,20	55	9	7	Symmetric	Fair	Very poor	None	Stump sprout			3.5	2.6	2.4	tree on site
386	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	10,15,12, 13	35	10	5	Symmetric	Fair	Poor	None	Stump sprout			3.0	2.1	2.1	tree on site
387	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	17,15,10, 15	58	7	7	Symmetric	Fair	Very poor	None	Stump sprout			3.5	2.6	2.4	tree on site
388	Eucalyptus cladocalyx	Sugar Gum	Australian native	Maturing	45,30	66	12	10	Symmetric	Fair	Fair to poor	Moderate	Dead tree 2m north	Weight reduction	Moderate	6.5	2.8	4.5	tree on site
389	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	18	25	8	4	Symmetric	Fair	Fair	Low	Size			2.2	1.8	1.8	tree on site
390	Eucalyptus cladocalyx	Sugar Gum	Australian native	Semi-mature	14	25	6	2	Symmetric	Fair	Fair	Low	Size			2.0	1.8	1.8	tree on site
391	Eucalyptus cladocalyx	Sugar Gum	Australian native	Early-maturity	16,17,10, 14	57	8	6	Symmetric	Fair	Very poor	None	Stump sprout			3.5	2.6	2.4	tree on site

Appendix 2: Tree numbers & locations: CSIRO_1 Henry St, Belmont.

Refer following 6 pages.

treelogic

Map Source: Near Maps
Author: Tree Logic
Date: 31/5/2015

Appendix 2 - Tree Numbers and Location
CSIRO. 1 Henry Street, Belmont

Co-ordinate System: GDA 1994
MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994

Key map

treelogic

Map Source: Near Maps
Author: Tree Logic
Date: 31/5/2015

N

Appendix 2 - Tree Numbers and Location
CSIRO. 1 Henry Street, Belmont

Co-ordinate System: GDA 1994
MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994

Map 1

treelogic

Map Source: Near Maps
Author: Tree Logic
Date: 31/5/2015

N

Appendix 2 - Tree Numbers and Location
CSIRO. 1 Henry Street, Belmont

Co-ordinate System: GDA 1994
MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994

Map 2

treelogic

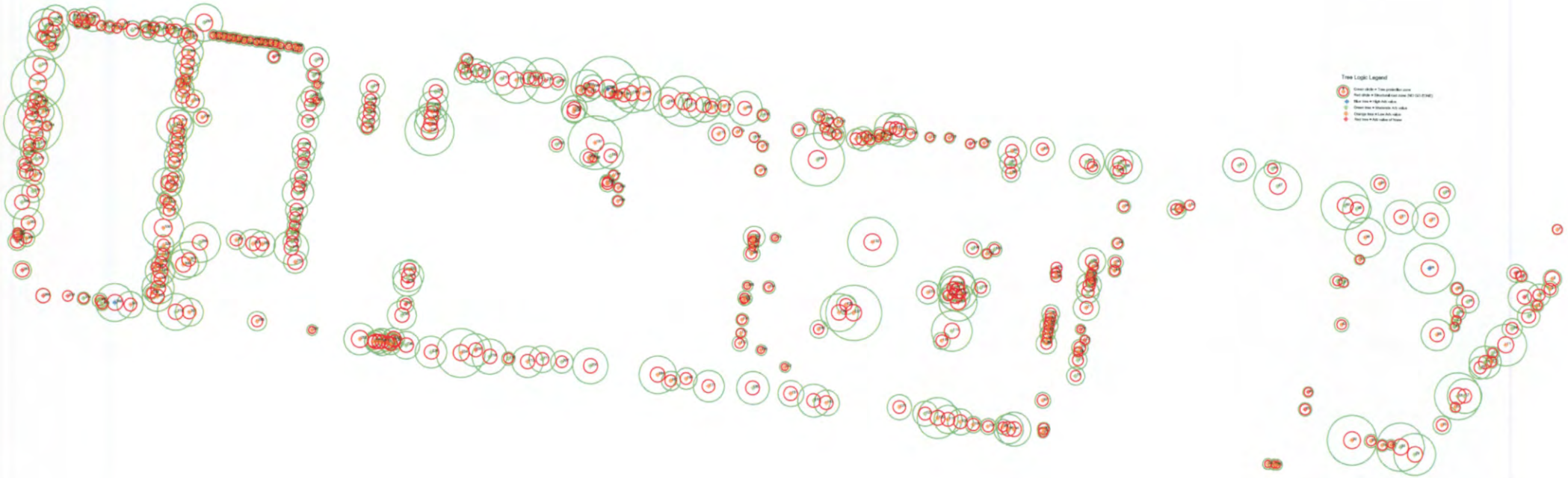
Map Source: Near Maps
Author: Tree Logic
Date: 31/5/2015

Appendix 2 - Tree Numbers and Location
CSIRO. 1 Henry Street, Belmont

Co-ordinate System: GDA 1994
MGA Zone 55
Projection: Transverse Mercator
Datum: GDA 1994

Map 3

Copy of CAD plan by arboricultural ratings



Legend

Site Area:	62,262 sqm
Park Area:	5,000 sqm
Existing building	
Council width road	
Private road	
Existing Trees	

Area Schedule

Larger Lots	
12.5m x 30/32m (375/400sqm):	21
10.5m x 30m min (315sqm):	40
Total:	61
Semi-detached Townhouses	
8m x 21m (189sqm):	27
9m x 21m (168sqm):	38
Larger Corner Lots:	6
Total:	71
Apartments/ Townhouses	
2 Bedroom:	
Total (townhouses):	90
Total (apartments):	TBC
Overall Total: (Townhouses)	**222**

Appendix 3: Arboricultural Descriptors

Note that not all of the described tree descriptors may be used in a tree assessment and report. The assessment is undertaken with regard to contemporary arboricultural practices and consists of a visual inspection of external and above-ground tree parts.

1. Tree Condition

The assessment of tree condition evaluates factors of health and structure. The descriptors of health and structure attributed to a tree evaluate the individual specimen to what could be considered typical for that species growing in its location under current climatic conditions. For example, some species can display inherently poor branching architecture, such as multiple acute branch attachments with included bark. Whilst these structural defects may technically be considered arboriculturally poor, they are typical for the species and may not constitute an increased risk of failure. These trees may be assigned a structural rating of fair-poor (rather than poor) at the discretion of the assessor.

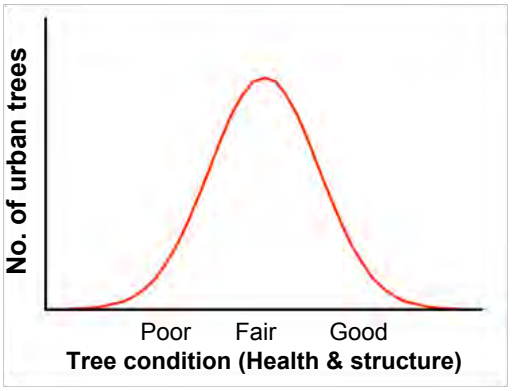


Diagram 1: Indicative normal distribution curve for tree condition

Diagram 1, provides an indicative distribution curve for tree condition to illustrate that within a normal tree population the majority of specimens are centrally located within the condition range (normal distribution curve). Furthermore, that those individual trees with an assessed condition approaching the outer ends of the spectrum occur less often.

2. Tree Name

Provides botanical name, (genus, species, variety and cultivar) according to accepted international code of taxonomic classification, and common name.

3. Tree Type

Describes the general geographic origin of the species and its type e.g. deciduous or evergreen.

Category	Description
Indigenous	Occurs naturally in the area or region of the subject site
Victorian native	Occurs naturally within some part of the State of Victoria (not exclusively) but is not indigenous (component of EVC benchmark).
Australian native	Occurs naturally within Australia but is not a Victorian native or indigenous
Exotic deciduous	Occurs outside of Australia and typically sheds its leaves during winter
Exotic evergreen	Occurs outside of Australia and typically holds its leaves all year round
Exotic conifer	Occurs outside of Australia and is classified as a gymnosperm
Native conifer	Occurs naturally within Australia and is classified as a gymnosperm
Native Palm	Occurs naturally within Australia. Woody monocotyledon
Exotic Palm	Occurs outside of Australia. Woody monocotyledon

4. Height and Width

Indicates height and width of the individual tree; dimensions are expressed in metres. Crown heights are measured with a height meter where possible. Due to the topography of some sites and/or the density of vegetation it may not be possible to do this for every tree. Tree heights may be estimated in line with previous height meter readings in conjunction with assessor's experience. Crown widths are generally paced (estimated) at the widest axis or can be measured on two axes and averaged. In some instances the crown width can be measured on the four cardinal direction points (North, South, East and West).

Crown height, crown spread are generally recorded to the nearest metre (crown spread would be rounded up) for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m. Estimated dimensions (e.g. for off-site or otherwise inaccessible trees where accurate data cannot be recovered) shall be clearly identified in the assessment data.

5. Trunk diameters

The position where trunk diameters are captured may vary dependent on the requirements of the specific assessment and an individual trees specific characteristics. DBH is the typical trunk diameter captured as it relates to the allocation of tree protection distances. The basal trunk diameter assists in the allocation of a structural root zone. Some municipalities require trunk diameters be captured at different heights, with 1.0 m above grade being a common requirement. The specific planning schemes will be checked to ascertain requirements.

Stem diameters shall be recorded in centimetres, rounded to the nearest 1 cm (0.01 m).

Diameter at Breast Height (DBH)

Indicates the trunk diameter (expressed in centimetres) of an individual tree measured at 1.4m above the existing ground level or where otherwise indicated, multiple leaders are measured individually. Plants with multiple leader habit may be measured at the base. The range of methods to suit particular trunk shapes, configurations and site conditions can be seen in Appendix A of Australian Standard *AS 4970-2009 Protection of trees on development site*s. Measurements undertaken with forestersø tape or builders tape.

Basal trunk diameter

The basal dimension is the trunk diameter measured at the base of the trunk or main stem(s) immediately above the root buttress. Used to ascertain the Structural Root Zone (SRZ) as outlined in AS4970.

6. Health

Assesses various attributes to describe the overall health and vigour of the tree.

Category	Vigour, Extension growth	Decline symptoms, Deadwood, Dieback	Foliage density, colour, size, intactness	Pests and or disease
Good	Above typical. Excellent. Full canopy density	Negligible	Better than typical	Negligible
Fair	Typical. 90-100% canopy density	Minor or expected. Little or no dead wood	Typical	Minor, within damage thresholds
Fair to Poor	Below typical - low vigour	More than typical. Small sub-branch dieback	Exhibiting deficiencies	Exceeds damage thresholds
Poor	Minimal - declining	Excessive, large and/or prominent amount & size of dead wood	Exhibiting severe deficiencies	Extreme and contributing to decline
Dead	N/A	N/A	N/A	N/A

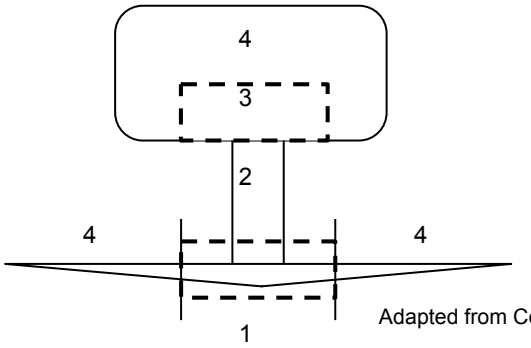
7. Structure

Assesses principal components of tree structure (Diagram 2).

Descriptor	Zone 1 - Root plate & lower stem	Zone 2 - Trunk	Zone 3 - Primary branch support	Zone 4 - Outer crown and roots
Good	No obvious damage, disease or decay; obvious basal flare / stable in ground	No obvious damage, disease or decay; well tapered	Well formed, attached, spaced and tapered. No history of failure.	No obvious damage, disease, decay or structural defect. No history of failure.
Fair	Minor damage or decay. Basal flare present.	Minor damage or decay	Typical main branch architecture, well attached, spaced and tapered. No history of branch failure.	Minor damage, disease or decay; minor branch end-weight or over-extension. No history of branch failure.
Fair to Poor	Moderate damage or decay; minimal basal flare	Moderate damage or decay; approaching recognised thresholds	Weak, decayed or with acute branch attachments; previous branch failure evidence	Moderate damage, disease or decay; moderate branch end-weight or over-extension. Minor branch failure evident.
Poor	Major damage, disease or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate	Major damage, disease or decay; exceeds recognised thresholds; fungal fruiting bodies present. Acute lean. Stump re-sprout	Decayed, cavities or has acute branch attachments with included bark; excessive compression flaring; failure likely. Evidence of major branch failure.	Major damage, disease or decay; fungal fruiting bodies present; major branch end-weight or over-extension. Branch failure evident.
Very Poor	Excessive damage, disease or decay; unstable / loose in ground; altered exposure; failure probable	Excessive damage, disease or decay; cavities. Excessive lean. Stump re-sprout	Decayed, cavities or branch attachments with active split; failure imminent. History of major branch failure.	Excessive damage, disease or decay; excessive branch end-weight or over-extension. History of branch failure.

Diagram 2: Tree structure zones

1. Root plate & lower stem
2. Trunk
3. Primary branch support
4. Outer crown & roots



Adapted from Coder (1996)

Structure ratings will also take into account general branching architecture, stem taper, live crown ratio, crown symmetry (bias or lean) and crown position such as tree being suppressed amongst more dominant trees.

The lowest or worst descriptor assigned to the tree in any column could generally be the overall rating assigned to the tree. The assessment for structure is limited to observations of external and above ground tree parts. It does not include any exploratory assessment of underground or internal tree parts unless this is requested as part of the investigation. Trees are assessed and then given a rating for a point in time. Generally, trees with a poor or very poor structure are beyond the benefit of practical arboricultural treatments.

The management of trees in the urban environment requires appropriate arboricultural input and consideration of risk. Risk potential will take into account the combination of likelihood of failure and impact, including the perceived importance of the target(s).

8. Age class

Relates to the physiological stage of the tree's life cycle.

Category	Description
Young	Sapling tree and/or recently planted. Approximately 5 or less years in location.
Semi-mature	Tree increasing in size and yet to achieve expected size in situation. Primary developmental stage.
Early mature	Tree established. Usually vigorous. 50% of attainable age/size.
Maturing	Specimen approaching expected size in situation, with reduced incremental growth
Over-mature	Mature full-size with a retrenching crown. Tree is senescent and in decline. Significant decay generally present

9. Arboricultural Rating

Relates to the combination of tree condition factors, including health and structure (arboricultural merit), and also conveys an amenity value. Amenity relates to the trees biological, functional and aesthetic characteristics (Hitchmough 1994) within an urban landscape context. The presence of any serious disease or tree-related hazards that would impact risk potential are taken into account.

Category	Description
High	Tree of high quality in good to fair condition. Generally a prominent arboricultural/landscape feature. These trees have the potential to be a medium- to long-term component of the landscape if managed appropriately. Retention of these trees is highly desirable.
Moderate	Tree of moderate quality, in fair or better condition. Tree may have a condition, and or structural problem that will respond to arboricultural treatment. These trees have the potential to be a medium- to long-term component of the landscape if managed appropriately. Retention of these trees is generally desirable.
Low	Unremarkable tree of low quality or little amenity value. Tree in either poor health or with poor structure or a combination. Tree is not significant because of either its size or age. Young trees with a stem diameter below 15 cm. These trees are easily replaceable. Tree (species) is functionally inappropriate to specific location and would be expected to be problematic if retained. Retention of such trees may be considered if not requiring a disproportionate expenditure of resources for a tree in its condition and location.
None	Trees of low quality with an estimated remaining life expectancy of less than10 years, or young trees with a stem diameter below 15 cm. Tree has either a severe structural defect or health problem or combination that cannot be sustained with practical arboricultural techniques and the loss of tree would be expected in the short term. Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. Tree infected with pathogens of significance to either the health or safety of the tree or other adjacent trees. Tree whose retention would not be viable after the removal of adjacent trees (includes trees that have developed in close spaced groups and would not be expected to acclimatise to severe alterations to surrounding environment – removal of adjacent shelter trees). Tree has a detrimental effect on the environment, for example, the tree is a recognised environmental woody weed with potential to spread into waterways or natural areas.

Trees have many values, not all of which are considered when an arboricultural assessment is undertaken. However, individual trees or tree group features may be considered important community resources because of unique or noteworthy characteristics or values other than their age, dimensions, health or structural condition. Recognition of one or more of the following criterion is designed to highlight other considerations that may influence the future management of such trees.

Significance	Description
Horticultural Value/ Rarity	Outstanding horticultural or genetic value; could be an important source of propagating stock, including specimens that are particularly resistant to disease or exposure. Any tree of a species or variety that is rare.
Historic, Aboriginal Cultural or Heritage Value	Tree could have value as a remnant of a particular important historical period or a remnant of a site or activity no longer in action. Tree has a recognised association with historic aboriginal activities, including scar trees. Tree commemorates a particular occasion, including plantings by notable people, or having associations with an important event in local history.
Ecological Value	Tree could have value as habitat for indigenous wildlife, including providing breeding, foraging or roosting habitat, or is a component of a wildlife reserve. Remnant Indigenous vegetation that contribute to biological diversity

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Appendix 4: Tree protection zones.

Introduction

In order to sustain trees on a development site consideration must be given to the establishment of tree protection zones.

The physical dimensions of tree protection zones can sometimes be difficult to define. The projection of a tree's crown can provide a guide but is by no means the definitive measure. The unpredictable nature of roots and their growth, differences between species and their tolerances, and observable and hidden changes to the trees growing environment, as a result of development, are variables that must be considered.

Most vigorous, broad canopied trees survive well if the area within the drip-line of the canopy is protected. Fine root density is usually greater beneath the canopy than beyond (Gilman, 1997). If few to no roots over 3cm in diameter are encountered and severed during excavation the tree will probably tolerate the impact and root loss. A healthy tree can sustain a loss of between 30% and 50% of absorbing roots (Harris, Clark, Matheny, 1999), however encroachment into the structural root system of a tree may be problematic.

The structural root system of a tree is responsible for ensuring the stability of the entire tree structure in the ground. A tree could not sustain loss of structural root system and be expected to survive let alone stand up to average annual wind loads upon the crown.

Allocation of tree protection zone (TPZ)

The method of allocating a TPZ to a particular tree will be influenced by site factors, the tree species, its age and developed form.

Once it has been established, through an arboricultural assessment, which trees and tree groups are to be retained, the next step will require careful management through the development process to minimise any impacts on the designated trees. The successful retention of trees on any particular site will require the commitment and understanding of all parties involved in the development process. The most important activity, after determining the trees that will be retained is the implementation of a TPZ.

The intention of tree protection zones is to:

- mitigate tree hazards;
- provide adequate root space to sustain the health and aesthetics of the tree into the future;
- minimise changes to the trees growing environment, which is particularly important for mature specimens;
- minimise physical damage to the root system, canopy and trunk; and
- define the physical alignment of the tree protection fencing

Tree protection

The most important consideration for the successful retention of trees is to allow appropriate above and below ground space for the trees to continue to grow. This requires the allocation of tree protection zones for retained trees.

The Australian Standard AS 4970-2009 Protection of trees on development sites has been used as a guide in the allocation of TPZs for the assessed trees. The TPZ for individual trees is calculated based on trunk (stem) diameter (DBH), measured at 1.4 metres up from ground level. The radius of the TPZ is calculated by multiplying the trees DBH by 12. The method provides a TPZ that addresses both the stability and growing requirements of a tree. TPZ distances are measured as a radius from the centre of the trunk at (or near) ground level. The minimum TPZ should be no less than 2m and the maximum no more than 15m radius. The TPZ of palms should be not less than 1.0m outside the crown projection.

Encroachment into the TPZ is permissible under certain circumstances though is dependent on both site conditions and tree characteristics. Minor encroachment, up to 10% of the TPZ, is generally permissible provided encroachment is compensated for by recruitment of an equal area contiguous with the TPZ. Examples are provided in Diagram 1. Encroachment greater than 10% is considered major encroachment under AS4970-2009 and is only permissible if it can be demonstrated that after such encroachment the tree would remain viable.

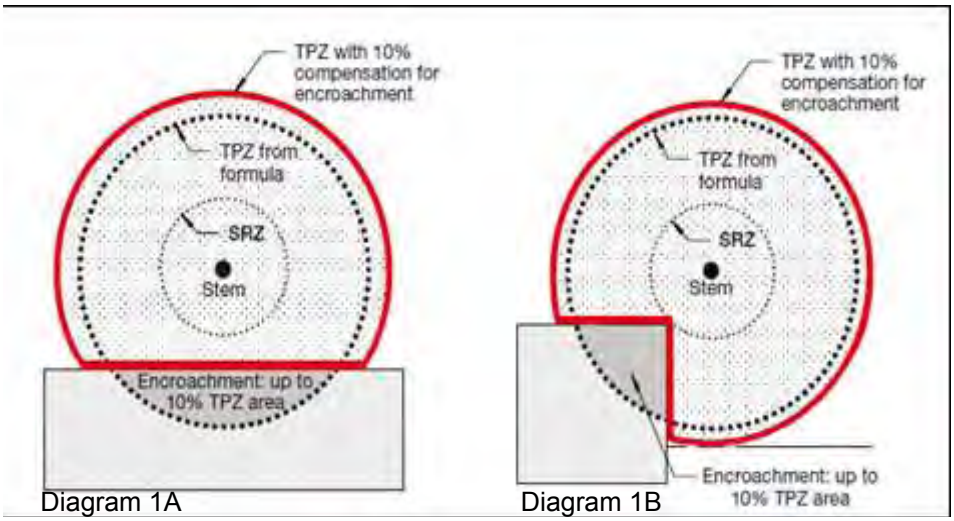


Diagram 1: Examples of minor encroachment into a TPZ.

(Extract from: AS4970-2009, Appendix D, p30 of 32)

The 10% encroachment on one side equates to approximately ⅓ radial distance. Tree root growth is opportunistic and occurs where the essentials to life (primarily air and water) are present. Heterogeneous soil conditions, existing barriers, hard surfaces and buildings may have inhibited the development of a symmetrically radiating root system.

Existing infrastructure around some trees may be within the TPZ or root plate radius. The roots of some trees may have grown in response to the site conditions and therefore if existing hard surfaces and building alignments are utilised in new designs the impacts on the trees should be minimal. The most reliable way to estimate root disturbance is to find out where the roots are in relation to the demolition, excavation or construction works that will take place (Matheny & Clark, 1998). Exploratory excavation prior to commencement of construction can help establish the extent of the root system and where it may be appropriate to excavate or build.

The TPZ should also give consideration to the canopy and overall form of the tree. If the canopy requires severe pruning in order to accommodate a building and in the process the form of the tree is diminished it may be worthwhile considering altering the design or removing the tree.

General tree protection guidelines

The most important factors are:

- Prior to construction works the trees nominated for tree works should be pruned to remove larger dead wood. Pruning works may also identify other tree hazards that require remedial works.
- Installation of tree protection fencing. Once the tree protection zones have been determined the next step is to mulch the zone with woodchip and erect tree protection fencing. This must be completed prior to any materials being brought on-site, erection of temporary site facilities or demolition/earth works. The protection fencing must be sturdy and withstand winds and construction impacts. The protection fence should only be moved with approval of the site supervisor. Other root zone protection methods can be incorporated if the TPZ area needs to be traversed.
- Appropriate signage is to be fixed to the fencing to alert people as to importance of the tree protection zone.
- The importance of tree preservation must be communicated to all relevant parties involved with the site.
- Inspection of trees during excavation works.

Exploratory excavation

The most reliable way to estimate root disturbance is to find out where the roots are in relation to the demolition, excavation or construction works that will take place (Matheny & Clark, 1998).

Exploratory excavation prior to commencement of construction can help establish the extent of the root system and where it may be appropriate to excavate or build. This also allows management decisions to be made and allows time for redesign works if required.

Any exploratory excavation within the allocated TPZ is to be undertaken with due care of the roots. Minor exploration is possible with hand tools. More extensive exploration may require the use of high pressure water or air excavation techniques. Either hydraulic or pneumatic excavation techniques will safely expose tree roots; both have specific benefits dependent on the situation and soil type. An arborist is to be consulted on which system is best suited for the site conditions.

Substantial roots are to be exposed and left intact.

Once roots are exposed decisions can be made regarding the management of the tree. Decisions will be dependent on the tree species, its condition, its age, its relative tolerance to root loss, and the amount of root system exposed and requiring pruning.

Other alternative measures to encroaching the TPZ may include boring or tunnelling.

How to determine the diameter of a substantial root

The size of a substantial root will vary according to the distance of the exposed root to the trunk of the tree. The further away from the trunk of a tree that a root is, the less significant the root is likely to be to the tree's health and stability.

The determination of what is a substantial root is often difficult because the form, depth and spread of roots will vary between species and sites. However, because smaller roots are connected to larger roots in a framework, there can be no doubt that if larger roots are

severed, the smaller roots attached to them will die. Therefore, the larger the root, the more significant it may be.

Gilman (1997) suggests that trees may contain 4-11 major lateral roots and that the five largest lateral roots account (act as a conduit) for 75% of the total root system. These large lateral roots quickly taper within a distance to the tree, this distance is identified as the Structural Root Zone (SRZ). Within the SRZ distance, all roots and the soil surrounding the roots are deemed significant.

No root or soil disturbance is permitted within the SRZ.
In the area outside the SRZ the tree may tolerate the loss of one or a number of roots. The table below indicates the size of tree roots, outside the SRZ that would be deemed substantial for various tree heights. The assessment of combined root loss within the TPZ would need to be undertaken by an arborist on an individual basis because the location of the tree, its condition and environment would need to be assessed.

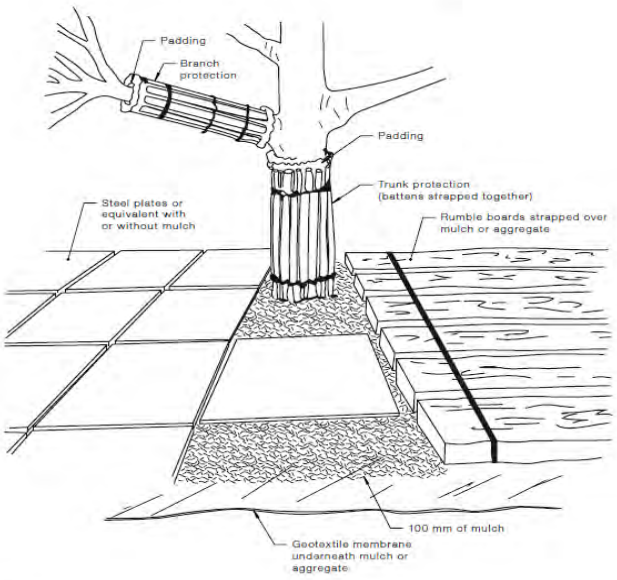
Table 1: Estimated significant root sizes outside SRZ

Height of tree	Diameter of root
Less than 5m	≥ 30mm
Between 5m - 15m	≥ 50mm
More than 15m	≥ 70mm

Ground buffering

Where works are required to be undertaken within the Tree root zone without penetration of the surface, ground buffering and trunk and limb protection must be provided to minimise the potential for soil to become compacted and avoid potential for impact wounds to occur to surface roots, trunk or limbs. Refer below.

Diagram 2: Examples of ground buffering and trunk and limb protection.



NOTES:
1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION

(Extract from: AS4970-2009, Appendix D, pg17)

Construction Guidelines

The following are guidelines that must be implemented to minimise the impact of the proposed construction works on the retained trees.

- The Tree Protection Zone (TPZ) is fenced and clearly marked at all times. The actual fence specifications should be a minimum of 1.2 - 1.5 metres of chain mesh or like fence with 1.8 meter posts (e.g. treated pine or star pickets) or like support every 3-4 metres and a top line of high visibility plastic hazard tape. The posts should be strong enough to sustain knocks from on site excavation equipment. This fence will deter the placement of building materials, entry of heavy equipment and vehicles and also the entry of workers and/or the public into the TPZ. Note: There are many different variations on the construction type and material used for TPZ fences, suffice to say that the fence should satisfy the responsible authority.

- Contractors and site workers should receive written and verbal instruction as to the importance of tree protection and preservation within the site. Successful tree preservation occurs when there is a commitment from all relevant parties involved in designing, constructing and managing a development project. Members of the project team need to interact with each other to minimise the impacts to the trees, either through design decisions or construction practices. The importance of tree preservation must be communicated to all relevant parties involved with the site.

- The consultant arborist is on-site to supervise excavation works around the existing trees where the TPZ will be encroached.

- A layer of organic mulch (woodchips) to a depth of no more than 100mm should be placed over the root systems within the TPZ of trees, which are to be retained so as to assist with moisture retention and to reduce the impact of compaction.

- No persons, vehicles or machinery to enter the TPZ without the consent of the consulting arborist or site manager.

- Where machinery is required to operate inside the TPZ it must be a small skid drive machine (i.e Dingo or similar) operating only forwards and backwards in a radial direction facing the tree trunk and not altering direction whilst inside the TPZ to avoid damaging, compacting or scuffing the roots.

- Any underground service installations within the allocated TPZ should be bored and utility authorities should common trench where possible.

- No fuel, oil dumps or chemicals shall be allowed in or stored on the TPZ and the servicing and re-fuelling of equipment and vehicles should be carried out away from the root zones.

- No storage of material, equipment or temporary building should take place over the root zone of any tree.

- Nothing whatsoever should be attached to any tree including temporary services wires, nails, screws or any other fixing device.

- Supplementary watering should be provided to all trees through any dry periods during and after the construction process. Proper watering is the most important maintenance task in terms of successfully retaining the designated trees. The areas under the canopy drip lines should be mulched with woodchip to a depth of no more than 100mm. The mulch will help maintain soil moisture levels. Testing with a soil probe in a number

of locations around the tree will help ascertain soil moisture levels and requirements to irrigate. Water needs to be applied slowly to avoid runoff. A daily watering with 5 litres of water for every 30 mm of trunk calliper may provide the most even soil moisture level for roots (Watson & Himelick, 1997), however light frequent irrigations should be avoided. Irrigation should wet the entire root zone and be allowed to dry out prior to another application. Watering should continue from October until April.

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