



TREE MANAGEMENT CONSULTING ARBORICULTURISTS

ARBORICULTURAL IMPACT ASSESSMENT

for

TCON Constructions Pty Ltd
C/- Aleksandar Projects
PO Box 257
BONDI NSW 2026

SITE ADDRESS

400-404 CABRAMATTA ROAD WEST,
2-18 ORANGE GROVE ROAD and 6 LINKS AVENUE,
CABRAMATTA

MARCH 2024

Prepared by
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**INSTITUTE OF AUSTRALIAN
CONSULTING ARBORICULTURISTS**



EXECUTIVE SUMMARY

This Arboricultural Impact Assessment is based on an earlier Preliminary Arboricultural Assessment Planning prepared in 2015 for the Planning Proposal and an Arboricultural Impact Assessment prepared in 2020 for a residential development of the site. An inventory of the existing tree assets on the site identified a total of seventy-five (75) trees, which were assessed and accorded retention values based on their current health and condition (i.e. their *Useful Life Expectancy*) and their significance in the landscape (Appendix F).

The primary aim of this Arboricultural Impact Assessment is to present an analysis of the likely effects on tree retention based on the current development plans.

In 2024 a site visit to audit the tree population resulted in an updated and amended audit of the Site's tree assets (Appendix F).

Since 2015, five (5) trees have been approved for removal by Fairfield City Council, five (5) trees are not protected species under the Fairfield City Wide Development Control Plan 2013, and fourteen (14) trees were not present and presumably died and removed.

Twenty-eight (27) trees were identified as being of high retention value.
Thirteen (13) trees are attributed with a medium retention value.
Eleven (11) trees were identified as being of low retention value.

Of the above:

- Fourteen are to be retained – 10 x high retention value and 4 x medium retention value.
- Thirty-seven are proposed to be removed – 17 x high retention value, 9 x medium retention value, and 11 x low retention value.

The updated Tree Schedule at Appendix F reflects those changes to the tree retention and removal numbers.

Our analysis of the cumulative impacts of excavation, level changes, stormwater piping and swales, and construction, revealed fourteen (14) trees, five of which are shown as 'Trees to be Retained' in the Site Specific development controls within Chapter 10 *Miscellaneous Development* of the Fairfield City Wide Development Control Plan 2013, would be retained.

Site and tree specific recommendations are provided in this report to ensure trees are appropriately managed through the development and construction phases.

It is expected that tree replacement within the common open space areas and broader site landscape will eventually provide an amenable, safer, long-term, and complimentary tree planting commensurate with, and sympathetic to, the current indigenous species assemblage on the site.

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1 INTRODUCTION

- 1.1 This Preliminary Arboricultural Assessment (AIA) was commissioned by Orhan Kaba of Designiche, on behalf of the owners of the subject site. “The site” is identified as Lots 6 and 7 in D.P. 709126, Lot 3 in D.P. 30217, Lots 1 and 2 in D.P. 503339 and Lot 1 in D.P. 29449, collectively known as 400–404 Cabramatta Road West, Cabramatta, New South Wales.
- 1.2 This report is to accompany a development proposal to Fairfield City Council for a multi-dwelling/residential flat building development of the site.
- 1.3 The purpose of this AIA is to assess the *vigour* and *condition* of the surveyed trees, in, or in close proximity to the projected building envelope, and identify the probable removal and retention of trees associated with the projected building envelope.
- 1.4 This AIA gives recommendations for tree retention or removal and provides guidelines for planning and designing built elements in proximity to existing trees to be retained.
- 1.5 Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.
- 1.6 This AIA is not intended as an assessment of any impacts on trees by any proposed future development of the site, other than the current proposal.
- 1.7 This report is not intended to be a comprehensive tree *hazard* or *risk* assessment, nor is it intended as a development or construction impact assessment or tree protection specification; however, the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.

2 METHODOLOGY

- 2.1 In preparation for this AIA, ground level, *visual tree assessments*¹ of seventy-five (75) trees were undertaken by Catriona Mackenzie (AQF5 arboriculturist) and Mark Jamieson (AQF4 horticulturist) on 11th August 2015, and Chantalle Hughes on 07 February 2024. Inspection details of these trees are provided in Appendix F – *Schedule of Assessed Trees*.
- 2.2 Tree heights were measured where possible with a Nikon Forestry Pro laser rangefinder, and canopy spreads were visually estimated or measured with a Leica Distometer laser measurer. Unless otherwise noted in Appendix F, all trunk diameters were measured at 1.4 metres above ground level (DBH) using a Yamiyo diameter tape.
- 2.3 Field observations were written down at the time of site visit and tree inspections, and photographs of the site and trees taken using a Canon EOS1000D digital SLR and/or iPhone 5 cameras.
- 2.4 No *aerial inspections*, *root mapping* or woody tissue testing were undertaken as part of this tree assessment. Information contained in this tree report covers only the trees that were examined and reflects the condition of those trees at the time of inspection.
- 2.5 Plans and documents referenced for the preparation of this report include:
- Detail Survey, Ref. No. 2437CD, dated 24/03/2015, prepared by Chami & Associates.
 - Stage 1 Plans 01 – 34, Revision C, prepared by Designiche P/L, dated 15 March 2024.
 - Stage 2 Plans DA01-DA12 Revision D prepared by Aleksandar Design Group, dated 1 February 2024.
 - Stage A Hydraulic Details H01 – H05 Revision 5 prepared by ANACivil Pty Ltd dated March 2024.
 - Landscape Plans L/01 – 12 Revision C by A Total Concept, dated 19 March 2024.
 - Fairfield Local Environment Plan 2013 (LEP) Schedules and Maps.
 - Fairfield City Wide Development Control Plan (DCP), Chapter 3 *Environmental Management and Constraints*.
 - Draft Site-Specific development controls for inclusion within Chapter 10 Miscellaneous Development of the DCP (**SSDCP**).
 - Preliminary Arboricultural Assessment prepared by Urban Forestry Australia dated August 2015.
 - Arboricultural Impact Assessment prepared by Urban Forestry Australia dated December 2022.
 - AS4970-2009 *Protection of trees on development sites*, Standards Australia (**AS4970**).
- 2.6 The subject trees are shown on a marked-up copy of the site survey. This plan is attached as Appendix G—Tree Location Plan.

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

3 OBSERVATIONS AND DISCUSSION

3.1 Assessed Trees— Presence and Species Recorded

3.1.1 Seventy-five (75) trees were assessed in 2015 and included in this report. Details of these are included in the Schedule of Assessed Trees – Appendix F.

3.1.2 Following the site visit on February 2024 and re-assessment of trees present on the site, fourteen (14) trees were not present, or dead:

- Two (2) *Melaleuca quinquenervia* Broad-leaved paperbark – Trees 10 and 12.
- Two (2) *Allocasuarina littoralis* (Black She-oak) – Tree 27 and 59.
- One (1) *Eucalyptus elata* (River peppermint) – Tree 5.
- One (1) *Corymbia gummifera* (Red bloodwood) – Tree 14.
- One (1) *Brachychiton acerifolius* (Illawarra Flame tree) – Tree 22.
- One (1) *Quercus robur* (English oak) – Tree 43.
- One (1) *Grevillea robusta* (Silky Oak) – Tree 44.
- One (1) *Acacia decurrens* (Black wattle) – Tree 47.
- One (1) *Jacaranda mimosifolia* (Jacaranda) – Tree 50.
- One (1) *Grevillea robusta* (Silky oak) – Tree 54
- One (1) *Lophostemon confertus* (Brush box) – Tree 55
- One (1) *Populus deltoides* (Cottonwood) – Tree 56.

3.1.3 Five (5) trees found on the site are exempt (non-prescribed) species or considered to be undesirable due to their weed status or detrimental species traits (in this site context), such as proliferate propagules and/or irritants or ability to out compete nearby vegetation:

- Two (2) *Ligustrum lucidum* (Large-leaved Privet) – Trees 15 and 17.
- One (1) *Lagunaria patersonia* (Norfolk Island Hibiscus) – Tree 8.
- One (1) *Ficus decora* (Rubber Plant) – Tree 18.
- One (1) *Cinnamomum camphora* (Camphor Laurel) – Tree 20.

3.1.4 Five (5) trees were approved for removal under a tree permit approved 28 June 2019, CRM No. 375634.

- Three (3) *Eucalyptus tereticornis* (Forest Red gum) – Trees 23, 24, 25.
- One (1) *Eucalyptus amplifolia* (Cabbage gum) – Tree 39.
- One (1) *Quercus robur* (English oak) – Tree 43.

3.1.5 The main indigenous canopy tree species found on the site are consistent with Cumberland Plain Woodlands (CPW). Of the fifty-one (51) re-assessed living/present trees, the following twenty-eight (28) are considered to be associated with CPW vegetation communities):

- Thirteen (13) *Eucalyptus tereticornis* (Forest Red Gum),
- Nine (9) *Corymbia maculata* (Spotted Gum),
- Three (3) *Eucalyptus sideroxylon* (Mugga Ironbark),
- One (1) *Eucalyptus moluccana* (Grey Box)
- One (1) *Melaleuca linariifolia* (Snow-in–summer),
- One (1) *Angophora costata* (Smooth-barked Apple),

3.1.6 The remaining twenty-three (23) assessed trees are considered to be exotic or introduced native Australian species:

- Nine (9) *Brachychiton acerifolius* (Illawarra Flame tree),
- Three (3) *Melaleuca quinquenervia* (Broad-leaved paperbark)
- Three (3) *Corymbia citriodora* (Lemon-scented gum)
- Two (2) *Eucalyptus microcorys* (Tallowwood),
- One (1) *Grevillea robusta* (Silky oak),
- One (1) *Jacaranda mimosifolia* (Jacaranda),
- One (1) *Castanospermum australe* (Blackbean),
- One (1) *Hymenosporum flavum* (Native frangipani),
- One (1) *Lagerstroemia indica* (Crape myrtle),
- One (1) *Nyssa sylvatica* (Tupelo)

3.2 Assessed Trees—Retention Values

3.2.1 Based on the Useful Life Expectancy and Landscape significance of the trees, the following Retention Values are accorded to the site trees.

Table 1: Tree Retention Values

Retention Value	Tree No. and Species	Total
High	1, 2, 3, 4, 6, 7, 9, 21, 26, 33, 35, 36, 40, 46, 49, 51, 52, 61, 62, 63, 64, 65, 66, 67, 69, 71, 75	27
Med	13, 19, 28, 29, 30, 31, 38, 41, 45, 48, 53, 58, 70	13
Low	11, 16, 32, 34, 37, 57, 60, 68, 72, 73, 74	11

- 3.2.2 The site is not zoned E2 Environmental Conservation or E3 Environmental Management.
- 3.2.3 No trees are identified as, or contributing to, listed Heritage Items, or occurring within Riparian Zones or Biodiversity Areas (LEP Maps–017 area).
- 3.2.4 No species of assessed tree is listed as threatened under the Biodiversity Conservation Act 2016 (BC Act) or Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act).

3.3 Assessed Trees—Consideration of Conservation Issues

- 3.3.1 It is acknowledged that the site contains tree species associated with Cumberland Plain Woodland, a critically endangered ecological community under the TSC and EPBC Acts. Under Section 3.2 of Chapter 3 of the DCP, it is generally only those sites zoned E2, E3 or affected by Riparian Lands and Waterways or Biodiversity, that might require preparation of a 7 Part Test². It would appear therefore, this site would be exempt from the 7-part test requirement. Despite the DCP allowing for arboriculturists to prepare a 7-part test, it is my opinion this is not appropriate unless the assessing arboriculturist has environmental qualifications.
- 3.3.2 It is my advice that if it is deemed necessary, any potential impacts on threatened species, endangered ecological communities or populations on this site, must be assessed by an appropriately qualified consulting ecologist.

3.4 Assessed Trees—Consideration of Site-Specific Tree Retention Controls of the DCP (SSDCP)

- 3.4.1 The Objectives and Controls for this site are set out at 1.6.3 of the SSDCP. The relevant Controls are duplicated, below.

² A '7 Part Test' is a statutory mechanism which allows Council to assess whether a proposed development or activity is likely to have a 'significant effect' on threatened species, populations or ecological communities, or their habitats. It describes and assesses the ecological impact of the proposal on a threatened species or its habitat.

3.4.2 Control 1.6.3 (i)

“The existing trees identified green on figure 2 of the SSDCP must be retained unless agreed by Council.”

It is noted Figure 2 (**Appendix H**) includes five (5) groups of four (4) small trees each, along the Cumberland Highway/Orange Grove Road frontage. It is noted the site survey includes only one of these groups, which is identified as Tree 68 in this report.

The remaining vegetation along the frontage consists of heavily overgrown vegetation and weeds. Given this, the total tree count shown on the Figure 2 of the SSDCP (Appendix H) and excerpt below is consistent with the survey information and the tree data collection. Twenty-one (21) – Trees 7, 8, 10, 15, 17, 27, 28, 36, 37, 40, 41, 51, 53, 62, 64, 69, 71, 72, 73, 74 and 75 are identified on the SSDCP plan.

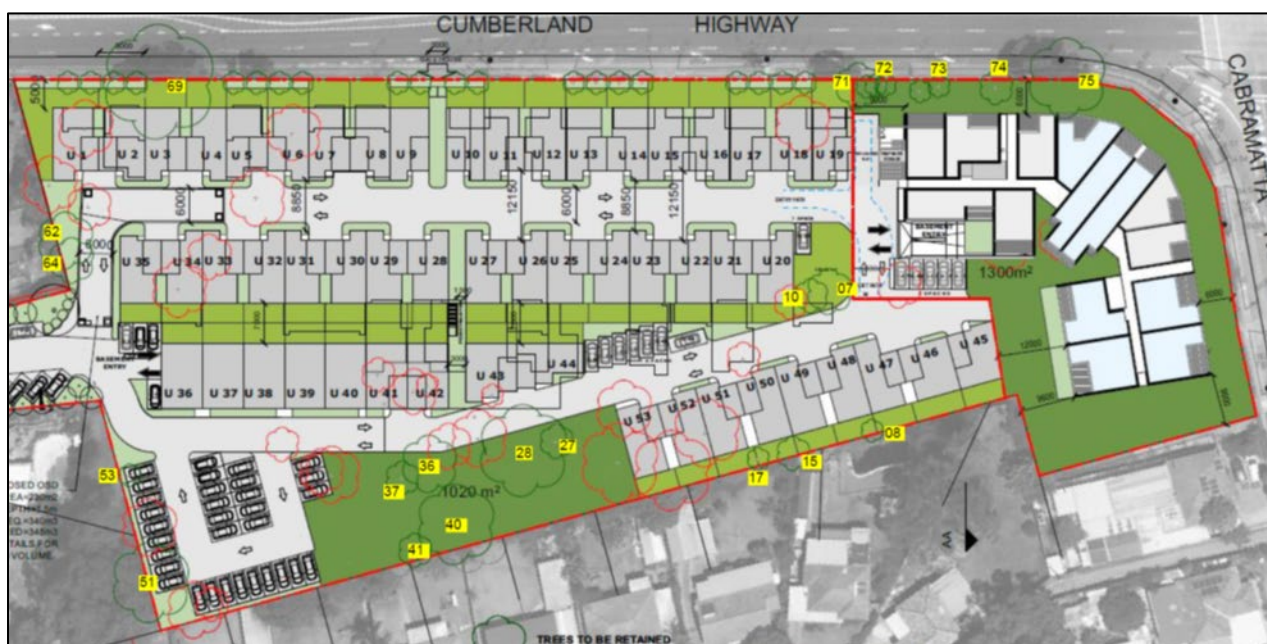


Figure 1

Excerpt of Fig. 2 of the SSDCP (Appendix G) with tree No's added to correlate with the Schedule of Assessed Trees (Appendix E).

3.4.3 Control 1.6.3 (ii)

“Any development application to remove trees must provide an arborist report prepared by a suitably qualified professional.”

This Control is met. I am a qualified Australian Qualification Framework Level 5 arboriculturist and International Society of Arboriculture qualified Tree Risk Assessor. This AIA is prepared in accordance with the principles and guidelines contained within AS4970 and chapter 3.2 *Preservation of Trees and Vegetation* of the DCP.

3.4.4 Controls 1.6.3 (iii)(iv)(v)

Except where 3.2 of the DCP applies, the remaining controls relate to ecological, biodiversity and environmental considerations under Chapter 3 of the DCP, for which I am not qualified to address and provide advice.

3.5 Proposed Tree Removal

3.5.1 Of the fifty-one (51) remaining prescribed trees, it is proposed to remove thirty-seven (37) trees. The Schedule of Assessed Trees at Appendix F should be referred to in regard to the trees proposed to be removed.

3.6 Proposed Tree Retention

3.6.1 In the Preliminary Arboricultural Assessment (PAA) for the Planning Proposal, thirty-two (32) trees were identified as potentially retainable under the June 2015 concept plans (MP01-04) by Aleksandar Group. These were trees (SSDCP trees in bold) 16, 19, 22, 23, 24, 25, 26, 38, 39, **40**, **41**, 42, 43, 48, 49, 50, 51, 52, 53, 54, **61**, **62**, 64, 65, 68, 69, 70, **71**, **72**, **73**, **74** and 75. Review of the current proposal (Revision C by Designiche) and evaluation of the likely impacts on those trees proposed to be retained within the common space and site perimeter locations is explained in detail in section 3.8.

3.6.2 It is proposed to retain fourteen (14) identified trees (SSDCP trees in bold):

- Tree 26 (Blackbean) of High Retention Value (RV).
- Tree 38 (Forest Red gum) of Medium RV.
- Tree **40** (Forest Red gum) of High RV.
- Tree **41** (Illawarra Flame tree) of Medium RV.
- Tree 45 (Forest Red gum) of Medium RV.
- Tree 46 (Forest Red gum) of High RV.
- Tree 49 (Forest Red gum) of High RV.
- Tree 51 (Grey box) of High RV.
- Tree 52 (Lemon-scented gum) of High RV.
- Tree 53 (Illawarra Flame tree) of Medium RV.
- Tree **61** (Mugga ironbark) of High RV.
- Tree **62** (Lemon-scented gum) of High RV.
- Tree 64 (Mugga ironbark) of High RV.
- Tree **71** (Spotted gum) of High RV.

3.7 Assessing and Rating Potential Impacts on Trees Proposed for Retention

3.7.1 Under the Australian Standard 4970-2009 Protection of trees on development sites (AS4970), encroachments less than 10% of the Tree Protection Zone (TPZ) are considered to be minor. This 10% is interpreted as a threshold figure and the trigger where arboricultural investigations into TPZ encroachments greater than this figure need to be considered. Guidelines for assessing the impacts of 10% or greater encroachments are provided at 3.3.4 of AS4970.

3.7.2 The potential extent of root zone impacts to protected trees to be retained can be generally rated using the *Impact Level Rating* (“ILR”) in Table 1.

Table 2: Guideline to the rating of impacts on trees to be retained.

IMPACT LEVEL RATING	
O	0 – 0.9% of root zone impacted – no impact of significance
L	1 to 10% of root zone impacted – low (minor) level of impact
L - M	>10 to 15% of root zone impacted – low (minor) to moderate level of impact
M	>15 to 20% of root zone impacted – moderate level of impact
M – H	>20 to 25% of root zone impacted – moderate to high level of impact
H	>25 to 35% of root zone impacted – high level of impact
S	>35% of root zone impacted – significant level of impact

Notes.

1. The above is based on discussions with executive members of the Institute of Australian Consulting Arboriculturists.

2. Any encroachment into the SRZ of a tree is technically a major encroachment. *Root mapping* or design modifications in this zone may be warranted.

3.8 Trees Proposed for Retention

3.8.1 **Tree 26**—*Castanospermum australe* (Blackbean) of High RV.

Structural Root Zone impacts (SRZ = 2.8m radius):

- No encroachment.
- Existing ground levels to be retained.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 6.6m radius/137m²):

- Existing ground levels to be retained.
- Minor encroachment for SW piping (less than 8m² or <5%).

3.8.1 **Tree 38**—*Eucalyptus tereticornis* (Forest Red gum) of Medium RV

Structural Root Zone impacts (SRZ = 3.1m radius):

- No encroachment.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 9.0m radius/255m²):

- Stormwater piping re-routed to avoid SRZ.
- The proposed piping through three sides of the TPZ is estimated to be approximately 123m² or 48.2% (including over excavation or batter to 750mm width).
- Whilst these encroachments are 'temporary' in nature (as roots can generate and occupy those disturbed areas) the tree is only of fair vigour and may not tolerate such a significant extent of disturbance.
- It will be a recommendation of this report that pipe and swale works are carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained. The impact is likely to be negligible on tree health and new roots can readily generate and grow into the swale area post works.

3.8.2 **Tree 40**—*Eucalyptus tereticornis* (Forest Red gum) of High RV.

Structural Root Zone impacts (SRZ = 3.1m radius):

- The proposed boundary swale 75mm deep at centre and 1000mm wide will be close to the SRZ. The impact is likely to be negligible on tree health and new roots can readily generate and grow into the swale area post works.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 9.0m radius/255m²):

- Stormwater piping re-routed to avoid SRZ and part of TPZ.
- The encroachment from the proposed piping and retaining wall through the TPZ is estimated to be approximately 25% (including over excavation or batter to 750mm width). Whilst I believe a maximum of 20% is tolerable for most situations, I am confident the tree will be viably retained as the majority of encroachment is temporary in nature. That is, tree roots can generate and occupy the soil over the pipeline following completion of the works. The type of root loss incurred is no different than that resulting from a root mapping exercise across a tree's TPZ.
- The proposed boundary swale 75mm deep at centre and 1000mm wide will traverse the TPZ. The impact is likely to be negligible on tree health.
- It will be a recommendation of this report that pipe and swale works are carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained. The impact is likely to be negligible on tree health and new roots can readily generate and grow into the swale area post works.

3.8.3 **Tree 41**— *Brachychiton acerifolius* (Illawarra Flame tree) of Medium RV.

Structural Root Zone impacts (SRZ = 2.7m radius):

- The proposed boundary swale 75mm deep at centre and 1000mm wide will traverse the SRZ and TPZ. It will be a recommendation of this report that this work is carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained. The tree's roots will dictate the finished profile of the swale.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 6.4m radius/129m²):

- Existing ground levels to be retained.
- Stormwater piping re-routed and pit relocated to minimise encroachment to less than 10m². Tree roots can generate back into the disturbed area.
- Minor encroachment from retaining wall includes stormwater calculations.
- The proposed boundary swale 75mm deep at centre and 1000mm wide will traverse the TPZ. The impact is likely to be negligible on tree health and new roots can readily generate and grow into the swale area post works.
- Whilst there is an overall notionally significant encroachment of approximately 65m² or 50% (as approximately 34% of the notional TPZ extends into the adjoining land), the works are minor and temporary in nature, and I expect the tree to tolerate them and remain viable.

3.8.4 **Tree 45**—*Eucalyptus tereticornis* (Forest Red gum) of Medium RV.

Structural Root Zone impacts (SRZ = 2.9m radius):

- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 7.6m radius/180m²):

- Permanent encroachment of 29.3m² (16.3%) for the proposed internal road.
- Stormwater piping re-routed to avoid SRZ and part of TPZ; a temporary encroachment of 28.4m² (15.8%).
- This tree has reduced vigour and a short ULE, as such, it may not tolerate the extent of disturbance despite the potential for root generation in the area over the pipework.
- The tree also has signs of a pathogenic fungal disease. While the disease may not affect tree condition for many years, the combination of reduced vigour, presence of fungi, and retention in the COS area will likely reduce its retention potential. This tree will require monitoring during construction as it may require removal if it declines and becomes a safety issue.

3.8.5 **Tree 46**—*Eucalyptus tereticornis* (Forest Red gum) of High RV.

Structural Root Zone impacts (SRZ = 2.9m radius):

- No encroachment.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 7.6m radius/180m²):

- Existing ground levels to be retained.
- Permanent encroachment of 8.25m² (4.6%) for the proposed internal road (and negligible area from retaining wall to the south).
- Stormwater piping re-routed to avoid SRZ and part of TPZ; a temporary encroachment of 17.25m² (9.6%).
- The impact is likely to be negligible on tree health and new roots can readily generate and grow into the swale area post works.

3.8.6 **Tree 49**—*Eucalyptus tereticornis* (Forest Red gum) of High RV.

Structural Root Zone impacts (SRZ = 2.9m radius):

- No encroachment but the retaining wall is close.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 7.0m radius/152m²):

- Permanent encroachment of 29m² (19%) for the proposed retaining wall. This is within the approximately 20% supportable extent for a healthy mature tree.
- It will be a recommendation of this report that retaining wall works are carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained.

3.8.7 **Tree 51**—*Eucalyptus moluccana* (Grey box) of High RV.

Structural Root Zone impacts (SRZ = 3.1m radius):

- No encroachment.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 9.0m radius/255m²):

- Permanent encroachment of 29m² (11.4%) for the proposed retaining wall. This is within the approximately 20% supportable extent for a healthy mature tree.
- It will be a recommendation of this report that retaining wall works are carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained.

3.8.8 **Tree 52**—*Corymbia citriodora* (Lemon-scented gum) of High RV.

Structural Root Zone impacts (SRZ = 2.9m radius):

- No encroachment but the retaining wall is close.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 7.2m radius/163m²):

- Permanent encroachment of 35.4m² (21.7%) for the proposed retaining wall. This is slightly greater than the approximately 20% supportable extent for a healthy mature tree. However, this difference is negligible, and it is anticipated this tree will remain vigorous and viable post works.
- It will be a recommendation of this report that retaining wall works are carefully undertaken by hand by or under the supervision of an AQF 5 arborist, and any woody roots greater than 30mm Ø are retained.

3.8.9 **Tree 53**—*Brachychiton acerifolius* (Illawarra Flame tree) of Medium RV.

Structural Root Zone impacts (SRZ = 2.5m radius):

- No encroachment.
- Proposed planting – would need to limit plant container size of proposed 5 litre sized plants to tubestock to reduce disturbance to woody roots, or only plant 5 litre outside the SRZ.
- It will be a recommendation of this report that soil cultivation per landscape specification L/12 C must be avoided in the SRZ and TPZ of retained trees.

Tree Protection Zone impacts (TPZ = 5.1m radius/84m²):

- Permanent encroachment of approximately 11.2m² (13.3%) for the proposed retaining wall and swale (noting roots can occupy swale area post works).
- Wall and swale works will need to be carefully undertaken by hand by the supervising AQF 5 arborist, and any woody roots greater than 30mm Ø are retained.

3.8.10 **Tree 61**—*Eucalyptus sideroxylon* (Mugga ironbark) of High RV.

Structural Root Zone impacts (SRZ = 2.3m radius):

- The proposed road has been slightly realigned to be just outside of the notional SRZ radius. No major roots are expected to be encountered due to the site topography and lack of obvious surface roots, but the proposed road is close enough to warrant an AQF 5 arborist is present to undertake initial search for woody roots and supervise the adjacent works.
- The proposed OSD stormwater piping and pits have all been redesigned/relocated to remain outside of the tree's SRZ and TPZ. New pit location can be updated on an amended landscape plan.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.

Tree Protection Zone impacts (TPZ = 4.8m radius/55.5m²):

- The proposed road will result in an impacted area of about 10.38m², equivalent to a moderate 18.7% encroachment.

3.8.11 **Tree 62**—*Corymbia citriodora* (Lemon-scented gum) of High RV.

Structural Root Zone impacts (SRZ = 2.6m radius):

- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.

Tree Protection Zone impacts (TPZ = 6.1m radius/106m²):

- The proposed road has been slightly realigned to reduce the TPZ encroachment. It will result in an impacted area of about 15.2m², equivalent to a moderate 14.34% encroachment.

3.8.12 **Tree 64**—*Eucalyptus sideroxylon* (Mugga ironbark) of High RV.

Structural Root Zone impacts (SRZ = 2.9m radius):

- Trenching for SW piping has been moved just outside the SRZ. An AQF 5 arborist will need to be present to undertake initial search for woody roots and supervise the adjacent works.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.

Tree Protection Zone impacts (TPZ = 7.6m radius/180m²):

- The proposed road has been slightly realigned to reduce the TPZ encroachment.
- There is a SW pit proposed also within the TPZ. The overall encroachment is approximately 67.2m² (37.3%), of which approximately 35.8m² will be permanent (e.g. road and dwelling) and equivalent to a moderate 19.9% encroachment. This is slightly under the maximum 20% I would normally support for a mature tree of good health and vigour. The remaining 17.4% is a temporary encroachment, allowing roots to occupy the disturbed area post SW works.

3.8.13 **Tree 71**—*Corymbia maculata* (Spotted gum) of High RV.

Structural Root Zone impacts (SRZ = 2.7m radius):

- The landscape plan refers to “*proposed front fencing to architect’s detail*”. Locations of new fence footings will need arboricultural supervision to ensure no damage to existing structure roots occurs.
- The existing brick wall well within the SRZ is likely to be contributing to some stability. Removal of the existing wall and footings could cause significant root disturbance.
- A structural engineer and arborist should agree on the best outcome and construction methodology that will not adversely affect the tree. This will need to be done immediately following investigation and partial wall removal if required.
- Proposed planting – limit plant container size of proposed 5 litre or greater sized plants to tubestock to reduce disturbance to roots, or only plant 5 litre plants or greater outside the SRZ.

Tree Protection Zone impacts (TPZ = 6m radius/113m²):

- Existing ground levels are to be retained.
- Encroachment of the notional TPZ area is approximately 13.8m² resulting from the proposed path, building and road footprints and is equivalent to 12.2% and within supportable limits. However, an arborist must be engaged to assist with the existing wall removal and fence design and construction to ensure any potentially adverse effects on tree viability are avoided.

4 CONCLUSIONS

- A total of seventy-five (75) trees are included in this Arboricultural Impact Assessment. Of these:
 - Five (5) have been identified as exempt from protection under the DCP and would be removed.
 - Five (5) have been previously approved for removal under separate application to Council.
 - Fourteen (14) are not present or are dead.
 - Fourteen (14) trees are proposed to be retained.
 - Thirty-seven (37) trees are proposed to be removed.
- No assessed tree on the site was identified as an endangered species.
- No assessed tree on the site or on adjoining properties was identified as, or associated with, a heritage item.
- The proposal includes the retention of 6 trees within the common open space area (2 of which are included in Figure 2 of the SSDCP), and 8 trees on the site perimeters, 3 of which are SSDCP trees.
- Approximately half of the trees to be retained have minor to moderate TPZ encroachments, three have moderate to high encroachments and four have high to potentially significant encroachments. Some of these high levels of encroachment include works where tree roots can re-occupy disturbed areas. All works within the TPZ of trees will require an experienced and competent arborist on site to supervise and monitor the works to ensure tree retention is viable and assured.
- Provided the recommendations of this report are adopted, adverse impacts on tree vigour and structural condition of trees to be retained will be managed as practically as possible, and any tree decline, or additional tree removal, will be less likely as a result.

5 RECOMMENDATIONS

5.1 Project Arboriculturist

- 5.1.1 A Project Arboriculturist (PA) should be engaged prior to work commencing on the site, including demolition of structures, site clearing, and the like.
- 5.1.2 The PA must hold an Australian Qualification Framework Level 5 (AQF5) in Arboriculture (Note an AQF8 arborist is not acceptable unless they also have the requisite AQF5 qualification).
- 5.1.3 The following Project Arborist Checklist may assist in identifying the hold points where the PA is required on site.

Table 5: Urban Forestry Australia Project Arborist Checklist
(Modified from Ryder and Associates)

Project Arborist Checklist			
Project:			
Project Arborist:			
Commencement date:			
Item	Completed		Date
Site Preparation	Yes	NO	
Initial Induction Meeting			
Small infrastructure within Tree Protection Zone removed by hand removed under supervision of project arborist			
Large infrastructure within Tree Protection Zone removed under supervision of project arborist			
Pruning for clearance completed by qualified arborist to AS4373-2007			
Tree Protection Fencing (and/or other Tree Protection Devices), mulch, and signage installed to specification			
Building materials storage area identified and marked on plans			
Site excavation within TPZs completed under supervision of project arborist			
Construction			
Initial Induction Meeting			
Irrigation installed as per specification			
Project arborist to supervise fencing, (and/or other Tree Protection Devices), any specialised foundation excavation and Tree Protection Fencing realignment			
Inspections completed every 4-6 weeks			
Meeting 1			
Meeting 2			
Meeting 3			
Meeting 4			

Item	Completed		Date
	Yes	NO	
Landscape Construction			
Initial Induction Meeting			
Tree Protection fencing to be removed			
Final Certification			
Final inspection			
Final certification report			
All Works completed			
Signed			

5.2 Tree Removal and Pruning

- 5.2.1 Removal of site trees is subject to authority review of this report and approval is to be obtained (e.g. by Development Consent) before any trees are removed.
- 5.2.2 Before removal, the project arborist should confirm that all trees approved to be removed are clearly marked (e.g. tape/paint) and correspond with those shown on the approved schedule or approved tree protection plan. Other tree work may be specified in the tree protection plan.
- 5.2.3 Tree removal should be carried out prior to works commencing. Contractors should be instructed to avoid damage to trees within protection areas when removing or pruning trees. This may include restrictions of vehicle movements.
- 5.2.4 Tree removals are to be undertaken in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998) and Safe Work Australia's Guide to managing risks of tree trimming and removal work (2016).

5.3 Tree Protection - General

- 5.3.1 The Tree Protection is to be in accordance with the following:
- Tree Protection Devices (TPD) may include mulching, tree guards and other devices other than fencing.
 - The TPD must be in place prior to any site works commencing, including clearing, demolition or grading.
 - The most appropriate fencing for tree protection is 1.8 – 2.1m high chain-link or welded mesh with, for example, 50mm diameter metal pole supports into ground or blow moulded plastic concrete filled feet.

- Locate large primary roots that could potentially be damaged during fencing installation and within the proposed location of posts or feet. Do not drive any posts or pickets into tree roots or place feet on top of roots.
- It is recommended that the arboriculturist provide written certification that the TPD is/are installed and will satisfy tree protection requirements.
- Nothing should occur inside the tree protection fenced areas, so therefore all access to personnel and machinery, storage of fuel, chemicals, cement or site sheds is prohibited.
- Signage should explain exclusion from the area defined by TPD and carry a contact name for access or advice (see Appendix E – Tree Protection Devices).
- The TPD cannot be removed, altered, or relocated without the project arborists' prior assessment and approval.

5.4 Tree Protection - Specific

5.4.1 All retained trees are to appropriately protected with 'fit-for-purpose' devices which may include fencing, mulching, non-compaction matting, platforms, trunk and/or branch guards as specifically advised by the project arborist (PA) and must be in place prior to any works commencing, including tree removal and site grading works.

5.4.2 These following specific recommendations apply to any tree to be retained – where applicable, these could be included in conditions of consent. They include:

- No turf laying in the TPZ of Trees 38 and 40 is to include levelling and cultivation of the soil.
- No fill greater than 100mm is supported – see 5.5.3.
- No lawn edging within the TPZ of Trees 38 and 40 is to be secured by use of strip footings for brick edging.
- No steel edging is to be used within the SRZ of any retained tree without root investigation to determine whether structural roots will be damaged or cut.
- No proposed 100 litre trees are to be planted within 8m of an existing tree to be retained.

5.4.3 Trees 26

- Adjacent works within the TPZ are to be supervised by the project arboriculturist (PA).
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.4 Trees 38, 40 and 41

- All SW piping and proposed swale works in the TPZ are to be carefully undertaken by hand by, or under the supervision of, the PA, and any woody roots greater than 30mm Ø are to be retained. Certification by the arborist is required for future compliance requirements.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.5 Trees 45 and 46

- All SW piping and proposed road works in the TPZ are to be carefully undertaken by hand by, or under the supervision of, the PA, and any woody roots greater than 30mm Ø are to be retained. Certification by the arborist is required for future compliance requirements.
- The condition of Tree 45 is to be monitored. A Tree Risk Assessment is recommended every 12 months post completion of works.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.6 Trees 49, 51, 52 and 53

- All retaining wall works in the TPZ are to be carefully undertaken by hand by, or under the supervision of, the PA (AQF 5 arborist), and any woody roots greater than 30mm Ø are to be retained. Certification by the arborist is required for future compliance requirements.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.7 Trees 61 and 62

- Road works within the TPZ are to be supervised by the PA (AQF 5 arborist), and any woody roots greater than 30mm Ø are to be retained. Certification by the arborist is required for future compliance requirements.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.8 Tree 64

- Road and dwelling works within the TPZ are to be supervised by the PA and any woody roots greater than 30mm Ø are to be retained subject to the PA's advice. Certification by the arborist is required for future compliance requirements.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.4.9 Tree 71

- The PA (AQF5arborist) is to assist with the wall or fence design and construction to ensure any potentially adverse effects on tree viability are avoided. This may require initial root mapping to investigate the most appropriate construction method to avoid disturbance, damage, or cutting of roots crucial to tree stability. Certification by the arborist is required for future compliance requirements.
- See 5.5.5 for further advice.
- Plant container size is to be limited to tubestock in the SRZ to reduce disturbance to woody roots or proposed 5 litre or greater plants are to be located outside the SRZ.
- Soil cultivation per landscape specification L/12 C is to be avoided in the SRZ and TPZ.

5.5 General Arboricultural Advice

5.5.1 Tree and Root Pruning

- Any pruning required is to be assessed and approved by the PA, prior to undertaking any of this type of work.
- Pruning shall not be undertaken by unqualified site personnel at any time.
- Pruning of branches must be undertaken by a minimum AQF Level 3 arborist in accordance with the Australian Standard AS4373-2007 *Pruning of amenity trees*,
- Unless otherwise approved by the Conditions of Development Consent, or by separate application and approval by the consent authority, pruning is to be limited to cutting of limbs less than 80mm diameters, and no more than 10% total live material removed.

5.5.2 Stockpiling and location of site sheds

- The project arboriculturist must be consulted prior to placing any items within a tree's TPZ.
- Where stockpiling must be located within the TPZ offset of trees to be retained, the existing/undisturbed natural ground must be covered with thick, coarse mulch to a minimum 75-100mm thickness.
- Large, or bulky materials (non-contaminating) can be stacked on wooden pallets or boards placed over the mulch.
- Tarpaulins (or similar) placed on boards or pallets on top of mulch shall be used to prevent loose or potentially contaminating materials from moving into the soil profile within the TPZ of trees or within 10m upslope of trees.
- Where site sheds must be located within the TPZ offset of a tree/s, the shed must be fully elevated on all sides with a minimum 300mm between existing ground and the floor/floor bearers. Isolated pad footings must be carefully dug by hand and not damage or sever any roots greater than 20mm diameters.
- Any conflict between footing locations and larger roots (i.e. 20mm Ø plus) must be brought to the attention of the project arboriculturist who is to provide practical alternatives that do not include unnecessary tree root removal.

5.5.3 Fill Material

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

5.5.4 Pavements

- Pavements should be avoided within the TPZ of trees to be retained where possible.
- Proposed paved areas within the TPZ of trees to be retained is to be placed above grade to minimise excavations within the root zone, avoiding root severance and damage.

5.5.5 Fencing and walls within the SRZ and TPZ of retained trees.

- Where fencing and/or masonry walls are to be constructed along site boundaries, they must provide for the presence of any living woody tree roots greater than 50mm diameter.
- Hand digging must occur within the SRZ of trees to be retained.
- For masonry walls/fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (e.g. steel or timber pickets, lattice etc) fixed to pillars.

5.5.6 Landscaping within tree root zones.

- The level of introduced planting media into any proposed landscaped areas within the TPZ is not to be greater than 75mm depth, and be of a coarse, sandy material to avoid development of soil layers that may impede water infiltration.
- Appropriate container size of proposed plants within the SRZ of trees should be determined prior to purchase of plants. Otherwise, any proposed landscaping within the SRZ must consist of tubestock only. This is required to ensure that damage to tree roots is avoided.
- Mattocks and similar digging instruments must not be used within the TPZ of the trees. Planting holes should be dug carefully by hand with a garden trowel, or similar small tool.
- Where possible, do not plant canopy trees beneath, or within 6 - 8m of overhead lines.

5.5.6 Other

- No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within 8m upslope of any palms or trees to be retained.
- Regular monitoring of the trees during development works for unforeseen changes or decline will help maintain the trees in a healthy state.

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March 2024


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APPENDIX A

TERMS AND DEFINITIONS



TERMS AND DEFINITIONS

The following relates to terms or abbreviations that may have been used in this report and provides the reader with a detailed explanation of those terms.

Aerial inspection Where the subject tree is climbed by a professional tree worker or arborist specifically to inspect and assess the upper stem and crown of the tree for signs or symptoms of defects, disease, etc.

Aerial roots Above ground, adventitious roots generally formed on stems and/or branches. Depending on plant species these roots perform a specific function, e.g. support, access to oxygen, vegetative propagation, as a parasite, etc.

Age classes

Y	<i>Young</i> refers to a well-established but juvenile tree
SM	<i>Semi-mature</i> refers to a tree at growth stages between immaturity and full size
EM	<i>Early-mature</i> refers to a tree that is more or less full sized and vigourously growing.
M	<i>Mature</i> refers to a full sized tree with some capacity for further growth
LM	<i>Late Mature</i> refers to a full sized tree with little capacity for growth, not yet about to enter decline
OM	<i>Over-mature</i> refers to a tree about to enter decline or already declining.

Bracket fungus The rigid fruiting body of some fungus species, especially those associated with live trees or the *decay* of wood. The structure is often bracket shaped, usually protruding from the roots, trunk or branches of the host tree when the fungus matures. The fruiting body may be ephemeral or persist for many years, and may be solitary or gregarious.

Branch failure The structural collapse of a branch that is physically weakened by wounding or from the actions of pests diseases, or overcome by loading forces in excess of its load-bearing capacity.

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

Compression fork A fork formed where two stems or branches with an acute branch crotch grow pressing against each other with included bark. Eventually the bark becomes enclosed bark where the stems flatten at their interface under increasing compression from each successive growth increment, forming a weak graft as a welded fork, which remains susceptible to tensile stress.

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

Crown All the parts of a tree arising above the trunk where it terminates by its division forming branches, e.g. the branches, leaves, flowers and fruit: or the total amount of foliage supported by branches.

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

Diameter at Breast Height (DBH) refers to the tree trunk diameter at breast height, i.e. at 1.4m above ground level.

Dieback Death of growth tips/shoots and partial limbs, generally from tip to base. Dieback is often an indicator of stress and tree health.

Epicormic Shoots which arise from adventitious or latent buds. These shoots often have a weak point of attachment. They are often a response to stress in the tree. Epicormic growth/shoots are generally a survival mechanism, often indicating the presence of a current, or past stress event such as fire, excessive pruning, drought, etc.

Inclusion - the pattern of development at branch or stem junctions where bark is turned inward rather than pushed out. This fault is located at the point where the stems/branches meet. This is normally a genetic fault and potentially a weak point of attachment as the bark obstructs healthy tissue from joining together to strengthen the joint.

Lopping Cutting between branch unions (not to branch collars), or at internodes on a tree, with the final cut leaving a stub. Lopping may result in dieback of the stub and can create infection courts for disease or pest attack.

Necrosis Dead areas of tissue that may be localised, or spread over large areas of leaves, branches, bark or roots.

Risk is the combination of the likelihood of an event and the severity of the potential consequences.

Root Mapping The exploratory process of recording the location of roots usually in reference to a datum point where depth, root diameter, root orientation and distance from trunk to existing or proposed structures are measured. It may be slightly invasive (disturbs or displaces soil to locate but not damage roots, e.g. hand excavation, or use of air or water knife), or non-invasive (does not disturb soil, e.g. ground penetrating radar).

Scaffold branch/root A primary structural branch of the crown or primary structural root of the tree.

Structural Root Zone (SRZ) Refers to the radial distance in metres, measured from the centre of the tree stem, which defines the critical area required to maintain stability of the tree. Only thorough investigation into the location of structural roots within this area can identify whether any minor incursions into this protection zone are feasible. Note: The SRZ is calculated on the diameter measured immediately above the root/stem buttress (DAB). Where this measurement is not taken in the field, it is calculated by adding 12.5% to the stem diameter at breast height (DBH). (Based on averages calculated from DBH and DAB measurements taken from 20 mature Brush Box and Camphor Laurel). Note: The SRZ may not be symmetrical in shape/area where there is existing obstruction or confinement to lateral root growth, e.g. structures such as walls, rocky outcrops, etc).

Sucker Epicormic shoots growing from latent buds in older wood. Such shoots are vigorous and usually upright, arising from below the graft union on the understock, or at or below ground from the trunk or roots.

Suppressed In crown class, trees which have been overtopped and whose crown development is restricted from above.

Sweep A curve in the trunk, generally near the ground. This usually occurs when a tree is partially wind thrown when young, but then stabilises itself and straightens due to reaction wood. Stem sweep can also be a naturally developed feature of some tree species. e.g. *Araucaria columnaris* (Cook Pine), that has no relationship to a defect or partial windthrow.

Tree Protection Zone (TPZ). Refers to the radial distance in metres, measured from the centre of the tree stem which defines the *tree protection zone* for a tree to be retained. This is generally the minimum distance from the center of the tree trunk where protective fencing or barriers are to be installed to create an exclusion zone. The **TPZ** surrounding a tree aids the tree's ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death and the possibly damage to structural stability of the tree from root damage.

To limit damage to the tree, protection within a specified distance of the tree's trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the TPZ. Note: In many circumstances the tree root zone does not occupy a symmetrically radial area from the trunk, but may be an irregular area due to the presence of obstructions to root spread or inhospitable growing conditions.

USEFUL LIFE EXPECTANCY (ULE) In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. ULE i.e. a system designed to classify trees into a number of categories so that information regarding tree retention can be concisely communicated in a non-technical manner. ULE categories are easily verifiable by experienced personnel without great disparity. A tree's ULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give the life expectancy); then by economics (i.e. cost of maintenance - retaining trees at an excessive management cost is not normally acceptable); and finally, effects on better trees, and sustained amenity (i.e. establishing a range of age classes in a local population). ULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with a short ULE may at present be making a contribution to the landscape, but their value to the local amenity will decrease rapidly towards the end of this period, prior to them being removed for safety or aesthetic reasons. For details of ULE categories see Appendix B, modified from Barrell 2001.

Vigour (syn. health) refers to the tree's health as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

APPENDIX B

ULE CATEGORIES



Useful Life Expectancy (ULE) CATEGORIES (after Barrell 1996, updated 01/04/01)

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

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. structurally sound trees located in positions that can accommodate future growth
- B. trees which could be made suitable for long term retention by remedial care
- C. trees of special significance which would warrant extraordinary efforts to secure their long term retention

2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. trees which may only live from 15 to 40 years
- B. trees which may live for more than 40 years but would be removed for safety or nuisance reasons
- C. trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
- D. trees which could be made suitable for retention in the medium term by remedial care

3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. trees which may only live from 5 to 15 years
- B. trees which may live for more than 15 years but would be removed for safety or nuisance reasons
- C. trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
- D. trees which require substantial remediation and are only suitable for retention in the short term

4. Removal - trees which should be removed within the next 5 years

- A. dead, dying, suppressed or declining trees
- B. dangerous trees through instability or recent loss of adjacent trees
- C. dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- D. damaged trees that are clearly not safe to retain.
- E. trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.
- F. trees which are damaging or may cause damage to existing structures within the next 5 years.
- G. trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- H. trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5. Small, young or regularly pruned - Trees that can be reliably moved or replaced.

- A. small trees less than 5m in height.
- B. young trees less than 15 years old but over 5m in height.
- C. formal hedges and trees intended for regular pruning to artificially control growth.

APPENDIX C

SIGNIFICANCE OF A TREE ASSESSMENT RATING



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

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

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria



1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

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

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.


Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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

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

Table 1 - Tree Retention Value - Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment 						
		Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.				
		Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
		Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
		Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

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

REFERENCES

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

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

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

APPENDIX D

SITE PHOTOGRAPHS





Plate 1
Looking east to Trees 40 (left) and 41. The palm would need to be carefully removed to avoid potential impacts on each tree.
C. Mackenzie



Plate 2
Looking south to Trees 61 (left) and 62.
Client photo supplied 05.06.2023



Plate 3
Looking east from Orange Grove Road to Trees 71 (right) and 72 (group of 3 at left).
Google Street View image capture March 2023



Plate 4
Looking west from within the site at high Retention Value (RV) perimeter tree 69 (Tallowwood).
C. Mackenzie



Plate 5
Looking southeast from within the site towards Tree 28 (arrowed). Note topography and depression between grassy foreground and rear of image.
C. Mackenzie



Plate 6
Looking south from Cumberland Road reserve near intersection with Cabramatta Rd. West, at high RV perimeter Tree 75 (Tallowwood).
C. Mackenzie



Plate 7
Looking south along Cumberland Road at high RV perimeter tree 71 (Spotted Gum) and 3 x smaller trees comprising Tree 72.
C. Mackenzie



Plate 8
Looking south/southeast from within the site at high RV perimeter trees-left to right, 49 (Forest Red Gum), 51 (Grey Box) and 52 (Lemon-scented Gum).
C. Mackenzie



Plate 9
Looking southeast from within the site at medium RV perimeter trees 42 and 43 (English Oaks).
C. Mackenzie

APPENDIX E

TREE PROTECTION DEVICES



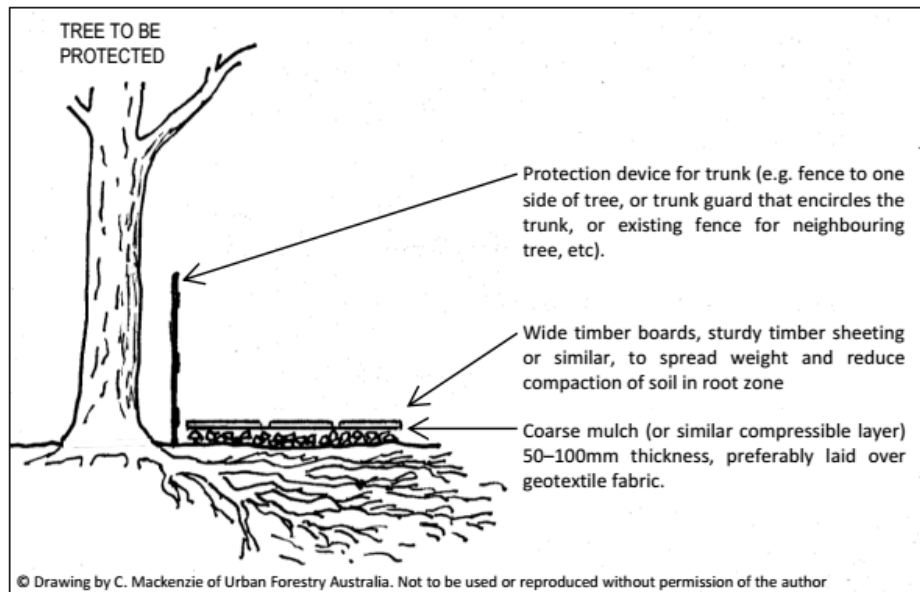


Figure 1
A method of reducing risk of root damage and soil compaction within the tree's Structural Root Zone.

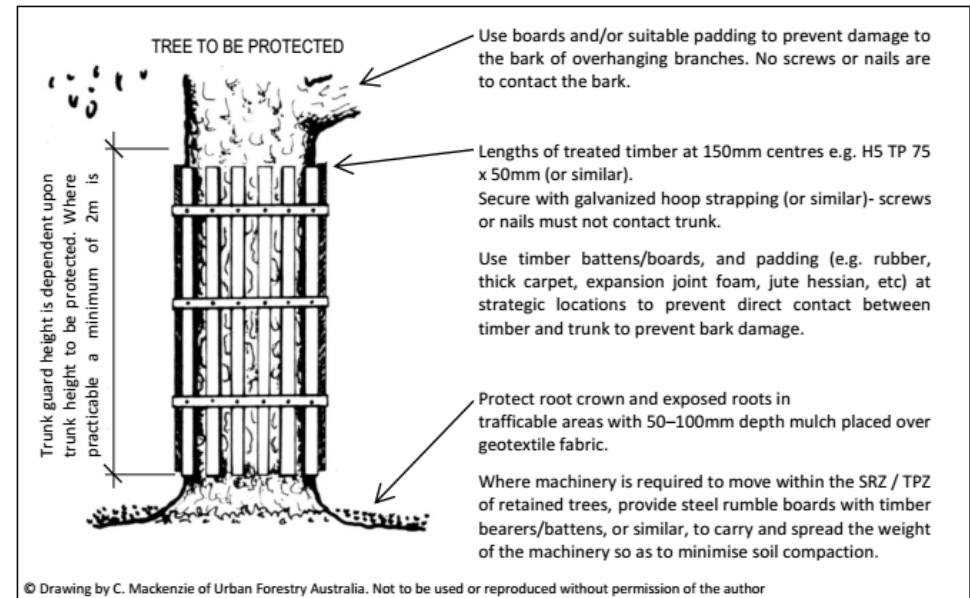


Figure 2
Example of tree trunk and tree branch protection.

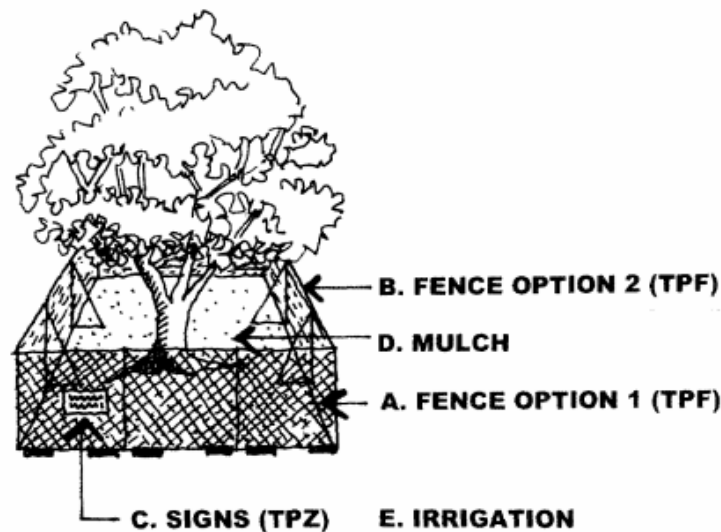


Figure 3

TREE PROTECTIVE FENCING (TPF)

A. Fence Option 1 (TPF)

1.8 metre high chain wire mesh panels with shade cloth attached if required, to be held in place with concrete blocks.

B. Fence Option 2 (TPF)

1.8 metre high plywood or wooden panel/paling fence (prevents soil or building contaminants from coming under fence when panels are laid flush to ground).

C. Signs (TPZ)

Tree Protection Zone Signs

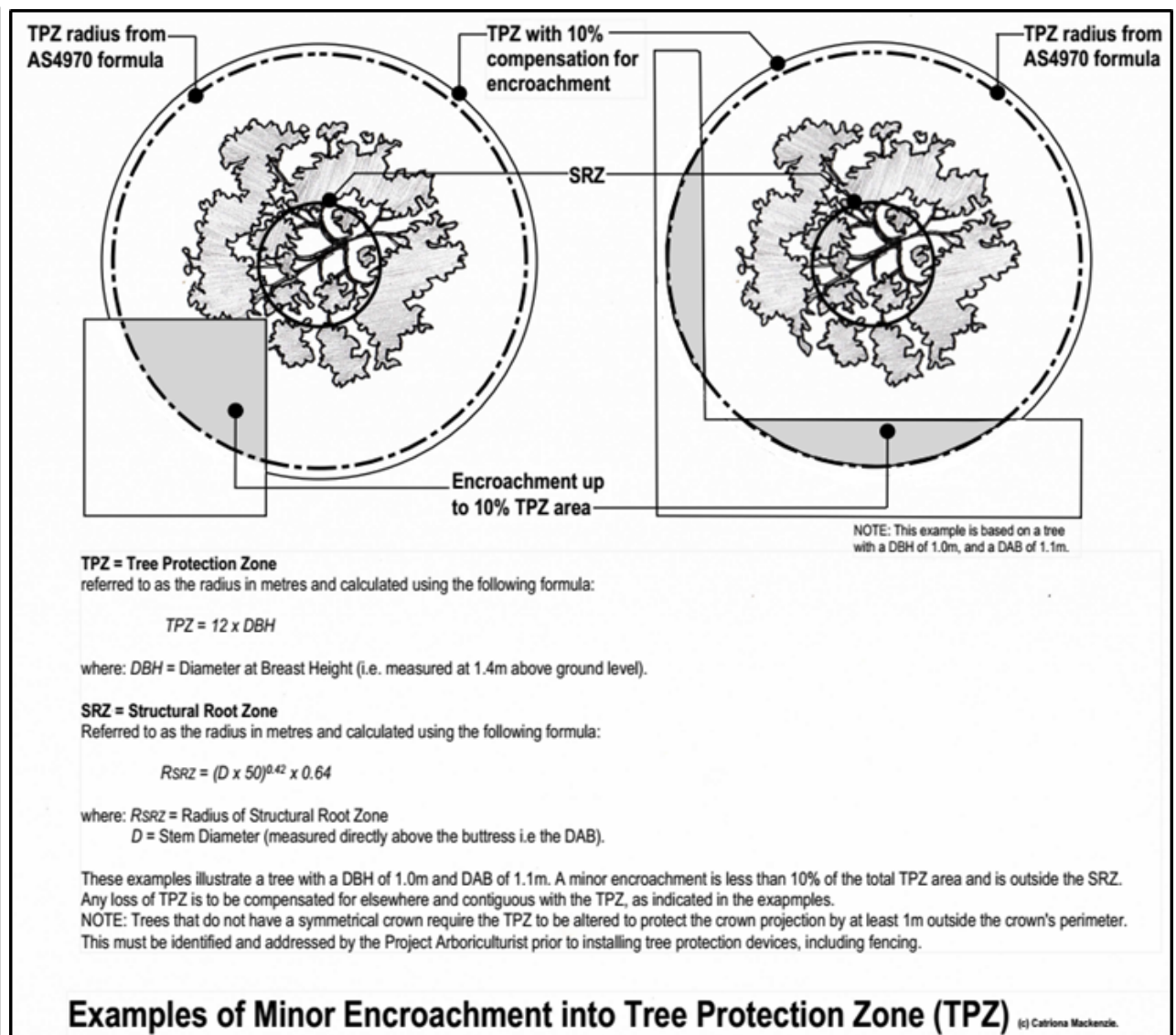
D. Mulch

50mm to 100mm thick layer of organic mulch, or aggregate, installed across surface area of TPZ.

E. Irrigation

Irrigation to arborist's advice.

© Drawing by Selena Hannan. Used with permission.



Include the Project Arboriculturist's details in the 'Contact' panel.

TREE GUARD EXAMPLES



Agricultural pipe with sock to provide cushioning before placing timber battens.

Photo Brad Davies



Finished trunk guard with hessian or carpet over buttress/base of tree. Poly plastic strapping.

Photo Brad Davies



Timber tree guard with thick carpet beneath to cushion trunk from direct contact with battens or external impacts. Galvanised hoop strapping.

Photo C Mackenzie.

APPENDIX F

SCHEDULE OF ASSESSED TREES



SCHEDULE OF ASSESSED TREES

400–404 Cabramatta Road West, Cabramatta. 02 February 2024.

Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
1	<i>Corymbia maculata</i> Spotted Gum	20	9	525	EM	G	F	Dense crown . Low volume of medium Ø deadwood . Minor pruning in the past. Sections of desiccation of stem .	2A	H	H	2.7	6.4	129
2	<i>Corymbia maculata</i> Spotted Gum	13	7	325	EM	G	F–G	Mechanical damage to lower stem N side. Mistletoe in crown . Low volume of medium Ø deadwood. Epicormic growth noted .	1A	M	H	2.2	3.9	48
3	<i>Corymbia maculata</i> Spotted Gum	22	11	600	EM	F–G	F–G	Some minor dieback upper crown interior.	2A	H	H	2.9	7.2	163
4	<i>Corymbia maculata</i> Spotted Gum	17.5	9	500	EM	G	G	Some bark cracking/discolouration. Deadwood to 90mm Ø.	1A	H	H	2.7	6	113
5	<i>Eucalyptus elata</i> River Peppermint	8	7	400 GL	SM	G	P	Basal suckers . Open, suppressed crown – sprawling habit.	4	L	L	2.3	4.8	72
6	<i>Corymbia maculata</i> Spotted Gum	20	12	625	EM	G	G	Mistletoes in crown. Very minor tip dieback.	1A	H	H	2.9	7.6	180
7	<i>Corymbia maculata</i> Spotted Gum	21	12	550 625	EM	G	G	Some bark necrosis to lower NNE scaffold noted. Low volume of small to medium Ø deadwood. Lowest limb 6.5-7m AGL to north .	1A	H	H	2.9	7.5	137
8	<i>Lagunaria patersonia</i> Norfolk Island Hibiscus	9.5	5	300	SM	F–G	F–G	Badly ' lopped '. Overall tip dieback, although not severe. Undesirable species due to 'fibreglass-like' irritant filaments produced in seed capsule.	2B	L	L	2.2	3.6	41
9	<i>Eucalyptus tereticornis</i> Forest Red Gum	21	13	725	M	F–G	F	Scattered dieback. Mistletoes. Included primary stems.	2D	H	H	3.1	8.8	241
10	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	11	4	475 AB	SM	V–P	P	Almost dead . Significant crown decline. Deadwood >200mm Ø .	4	L	L	2.5	5.4	92
11	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	14	5	600 AB	SM	P	F	Significant dieback. Suppressed on 2 sides.	3D	M	L	2.9	7.2	163
12	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	11	6	450 AB	SM	P	F	Suppressed to E . Notable, significant decline.	3D	M	L	2.4	5.1	84
13	<i>Eucalyptus tereticornis</i> Forest Red Gum	23	12	625	M	F	F	Small to medium Ø branch failures. Upper crown dieback and deadwood >100mm Ø. High percentage of epicormic growth/vigorous .	2D	H	M	2.9	7.6	180

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Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
14	<i>Corymbia gummifera</i> Red Bloodwood	22	44	250+ 650	M	F-G	F	Crown decline in upper parts. Declining sub-stem. Deadwood >100mm Ø.	2D	H	M	2.9	7.8	194
15	<i>Ligustrum lucidum</i> Large-leaved Privet							Weed species exempt from protection under the DCP.		L				
16	<i>Grevillea robusta</i> Silky Oak	20	8	600 AB	M	F-P	F	Kinked stem. Thin, sparse crown.	3B	M	L	2.9	7.2	163
17	<i>Ligustrum lucidum</i> Large-leaved Privet							Weed species exempt from protection under the DCP.		L	L			
18	<i>Ficus decora</i> Rubber Tree	17	15	*1400	M	G	F	Introduced <i>Ficus</i> species of undesirable species traits. Vigorous growth. Notable aerial roots .	3B	M	L	4	15	707
19	<i>Jacaranda mimosifolia</i> Jacaranda	14	16	350 + 500	M	G	F-G	Heavily suppressed to N. High crown. Minor tip dieback.	2D	M	M	2.9	7.2	163
20	<i>Cinnamomum camphora</i> Camphor Laurel	44	44	*600 AB	EM	F-G	F?	Introduced exotic species exempt from protection under the DCP. Suckering back in copse.	3B?	M	L	2.7	7.2	463
21	<i>Eucalyptus tereticornis</i> Forest Red Gum	23	17	675	M	F	F-G	Typical growth habit and branch architecture. Co-dominant stems @ 3.5m. Thinning crown with tip and small branch dieback. Medium volume of deadwood to 100mm Ø.	2D	H	H	3.1	8.1	206
22	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	40	5	175 + 250	SM	G	F-P	Distinct, tightly included compression fork @ 1m.	3B	M	L	2.2	3.7	43
23	<i>Eucalyptus tereticornis</i> Forest Red Gum							Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).						
24	<i>Eucalyptus tereticornis</i> Forest Red Gum							Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).						
25	<i>Eucalyptus tereticornis</i> Forest Red Gum							Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).						
26	<i>Castanospermum australe</i> Blackbean	10	10	300	SM	G	G	Some small, rubbing, crossing branches. Very minor deadwood. Young suckers/seedlings @ base. Needs pruning work if retained in high-use area.	1A	M	H	2.8	6.6	137
27	<i>Allocasuarina littoralis</i> Black She-oak	44	6	375	SM	F	F	Thin crown, w/notable dieback of tips and very small branches. Small Ø deadwood.	2D	M	M	2.4	4.5	64

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Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
28	<i>Eucalyptus tereticornis</i> Forest Red Gum	32	28	1800	M	F–G	F	Some very large Ø deadwood and old branch failures . Pruned in the past to W w/resulting dieback. Will require a Tree Risk Assessment if retained within high-use area.	2D	H	M	4.5	15	707
29	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	10	5	300	SM	F–G	F	Suppressed to SE. Heavy bias to W/NW. Co-dominant stems @ 3m.	3D	M	M	2.8	6.6	137
30	<i>Eucalyptus tereticornis</i> Forest Red Gum	15	12	575	EM	G	F–G	Slightly overtopped by T28. Low volume deadwood.	2A	M	M	2.9	7	152
31	<i>Hymenosporum flavum</i> Native Frangipani	13	5	275	SM	G	G	Minor, small branch dieback.	2A	M	M	2.1	3.3	35
32	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	11	7	525 AB	M	F–G	P	A little pale. Some dieback to SE, but not serious. Co-dominant, included stems near base. SE stem also co-dominant and included. Significant die-back noted.	4	M	L	2.6	6	113
33	<i>Eucalyptus tereticornis</i> Forest Red Gum	22	13	675	M	G	F?	Lower stem wound – decaying N side. Decay diagnostic testing recommended if tree retained.	2?	H	H?	3.1	8.1	206
34	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	16	6	2 x 375	M	G	F–G	Lost leading stem in the past. Very minor volume deadwood. Co-dominant, included stems @ 1.1m. DEAD	2A	H	L	2.6	6.4	129
35	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	9	7	350	EM	G	G	No special problems observed at time of inspection.	1A	M	H	2.3	4.2	55
36	<i>Eucalyptus tereticornis</i> Forest Red Gum	25	12	575	EM	G	G	Tall, narrow, typical habit and form. Very minor dieback and deadwood.	1A	H	H	2.9	7	152
37	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	12	7	375	EM	P	F	Very distinct tip dieback overall, especially N side. Branch failures noted. ALMOST DEAD	3D	M	L	2.4	4.5	64
38	<i>Eucalyptus tereticornis</i> Forest Red Gum	26	14	750	M	F	F	Thinning. E stem very poor. Medium volume of moderate Ø deadwood.	2D	H	M	3.1	9.0	255
39	<i>Eucalyptus amplifolia</i> Cabbage Gum							Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).						
40	<i>Eucalyptus tereticornis</i> Forest Red Gum	22	15	700 750	EM	G	G	Emergent/dominant tree. Large, low, dead branch to SE, but remainder of tree pretty good.	2A	H	H	3.1	9.0	255
41	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	17	8	525 550	M	G	F	Distinct stem kink @8m. 'Gap' in crown E side. Immature Phoenix can. at base.	2D	H	M	2.7	6.6	129
42	<i>Quercus robur</i> English Oak							Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).						

URBAN FORESTRY AUSTRALIA — CONSULTING ARBORICULTURISTS — *MANAGING OUR URBAN FOREST*

Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
43	<i>Quercus robur</i> English Oak	14	15	700	EM	G	F-G	Crown asymmetry. 'Lopped' badly. Vines in branches.	2D	M	M	3.1	8.4	222
44	<i>Grevillea robusta</i> Silky Oak	22	6	775	LM	P	F-G	Straight stem, with no anomalies. Substantial dieback and overall crown decline.	4	M	L	3.1	9.3	272
45	<i>Eucalyptus tereticornis</i> Forest Red Gum	22	18	625	M	G	F-P	Large, old branch failure to SSE. Stem wound and <i>Phellinus</i> bracket fungus. Tip/small branch dieback. TRA MONITORING	3D	H	M	2.9	7.6	180
46	<i>Eucalyptus tereticornis</i> Forest Red Gum	16	7	450	EM	G	F-G	Slight suppression to S. No major dieback or deadwood.	2A	M	H	2.5	5.4	92
47	<i>Acacia decurrens</i> Black Wattle	8	8	2x 150	M	G	F-G	'Gumming' at co-dominant stems and branch/stem junctions.	3C	L	L	1.8	2.7	23
48	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	11	7	475	EM	F	G	Upper crown a little pale and leaves distorted – otherwise ok. Healthy now	2D	M	M	2.6	5.7	102
49	<i>Eucalyptus tereticornis</i> Forest Red Gum	19	16	575	EM	G	G	Low volume, moderate Ø deadwood. Minor tip dieback.	1A	H	H	2.9	7	152
50	<i>Jacaranda mimosifolia</i> Jacaranda	10	14	*300+ 500	M	G	F?	In adjoining property. Limited inspection. Substantial stem pruned to E. Extends over site 4 – 5m @ 6 – 8m AGL.	2D?	M?	M?	2.7	7	152
51	<i>Eucalyptus moluccana</i> Grey Box	19	20	*750	M	G	G?	Straddling boundary. Limited inspection. Base obscured. Low volume deadwood mainly confined to lower crown (i.e. from 'shading out'). Flowering prolifically, trees cleared around it.	1A	H	H	3.1	9	255
52	<i>Corymbia citriodora</i> Lemon-scented Gum	24	11	600	EM	G	G	High crown. Surface roots noted 3m NE. No special problems observed at time of inspection.	1A	H	H	2.9	7.2	163
53	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	12	7	425	EM	F-G	G	Minor stem kink. Minor dieback to S.	2A	M	M	2.5	5.1	84
54	<i>Grevillea robusta</i> Silky Oak	22	15	625	M	F	G	Slight suppression to N. Scattered tip dieback.	2D	H	H	2.9	7.6	180
55	<i>Lophostemon confertus</i> Brush Box	9	3	275	SM	G	F-P	Heavily suppressed by T55. Ivy up stem and scaffolds.	3C	L	L	2.1	3.3	35
56	<i>Populus deltoides</i> Cottonwood	21	15	675	M	G	G?	Slight stem lean to S. Mistletoe high in crown. Small branch failures noted.	2A	H	M	3.1	8.1	206
57	<i>Lagerstroemia indica</i> Crape Myrtle	4-5	4-5	*250 GL	SM	G	F?	Poorly pruned in the past. Basal suckering.	3B?	L	L	1.9	2.7	23

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Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
58	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	12	9	500	M	F-G	G	Some dieback at top of crown.	2A	M	M	2.7	6	113
59	<i>Allocasuarina littoralis</i> Black She-oak	15	5	350	EM	F	F	Tip and small branch dieback.	2D	M	M	2.3	4.2	55
60	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	14	10	375 + 525	EM	F-P	F-P	Very thin, struggling. Typical stem/branch inclusions. Whole crown tip and branch dieback. ALMOST DEAD	3C	M	L	2.8	7.8	191
61	<i>Eucalyptus sideroxylon</i> Mugga Ironbark	13	12	350 400	SM	G	G	Slightly overtopped. No special problems observed at time of inspection.	1A	M	H	2.3	4.8	55.5
62	<i>Corymbia citriodora</i> Lemon-scented Gum	21	13	475 510	EM	G	F-G	Mistletoe @ old branch failure W/SW. No major dieback or deadwood.	2A	H	H	2.6	6.1	106
63	<i>Eucalyptus sideroxylon</i> Mugga Ironbark	18	11	475	EM	G	F-G	Suppressed to S. Low volume deadwood to 40mm Ø.	2A	H	H	2.6	5.8	106
64	<i>Eucalyptus sideroxylon</i> Mugga Ironbark	19	13	625	M	G	F?	Low dead branch to N. Stem bulges @ 4m. Deadwood to 100mm Ø.	2D?	H	H?	2.9	7.6	180
65	<i>Corymbia citriodora</i> Lemon-scented Gum	21	12	525	EM	G	F-G	Mistletoe in crown. No special problems observed at time of inspection. Lost approx. 160mm Ø limb to SE and old failure at leader.	1A	H	H	2.7	6.4	129
66	<i>Corymbia maculata</i> Spotted Gum	22	14	650	EM	G	G	No special problems observed at time of inspection.	1A	H	H	2.9	7.8	191
67	<i>Corymbia maculata</i> Spotted Gum	20	10	450	EM	G	G	No special problems observed at time of inspection.	1A	H	H	2.5	5.4	92
68	<i>Nyssa sylvatica</i> Tupelo	6-7	4	200-250	SM	G	F-G	Group of 4 x small, young trees. Some rubbing/crossing branches and co-dominant leaders. Wall about 1m W.	2A	L	L	2.1	3.0	28
69	<i>Eucalyptus microcorys</i> Tallowwood	19	24	1050	M	G	G?	Bias to E due to line clearance pruning. No significant deadwood. No notable dieback. Should be subject to aerial inspection if retained.	2D	H	H?	3.6	12.6	499
70	<i>Eucalyptus tereticornis</i> Forest Red Gum	16	11	*750 AB	EM	G	F?	Lopped for power lines. Stem obscured by vines.	2D	H	M?	3	8.4	222
71	<i>Corymbia maculata</i> Spotted Gum	17	10	500	EM	G	G	Crown is clear/above power lines. Retaining wall about 1m+ W. No other special problems observed at time of inspection.	2A	H	H	2.7	6	113
72	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	6-8	2-3	*225-400	SM	G	F-P	Row of 3 x trees lopped to 2 – 4m and mainly consists of regrowth.	2D	L	L	2.5	4.8	72

Tree No.	Genus and species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Observations/Comments	ULE	TSR	RV	SRZ† (m)	TPZ† (m)	TPZ (area)
73	<i>Melaleuca linariifolia</i> Snow-in-summer	4-6	4-5	*350-400	SM	G	F-P	Heavily lopped.	2D	L	L	2.5	4.8	72
74	<i>Angophora costata</i> Smooth-barked Apple	8.5	7	350	SM	G	F-P	Lopped – proliferation of epicormic regrowth @ pruning locations.	3D	M	L	2.3	4.2	55
75	<i>Eucalyptus microcorys</i> Tallowwood	25	21	1450 DAB	M	G	F?	Heavily lopped to W. Sweep and crown bias to E. Low volume deadwood up to 100mm Ø. Aerial inspection if retained. Lifting footpath significantly, bitumen to fix not effective.	2D?	H	H?	3.9	15	707

TREE REMOVED OR RETAINED

	Trees to be retained.		Non-prescribed species or has undesirable species traits and proposed to be removed.		Prescribed trees to be removed.		Removal approved under separate application (Approved 28 June 2019, CRM No. 375634).
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TREE RETENTION VALUE

	HIGH (Priority for Retention)		MEDIUM (Consider for Retention)		LOW (Consider for Removal)		REMOVED/DEAD/GONE
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† Notional radial offset of a symmetrical, unrestricted root system – subject to change depending on site conditions affecting tree root growth.
* Visually estimated.

GL at ground level.

AGL above ground level.

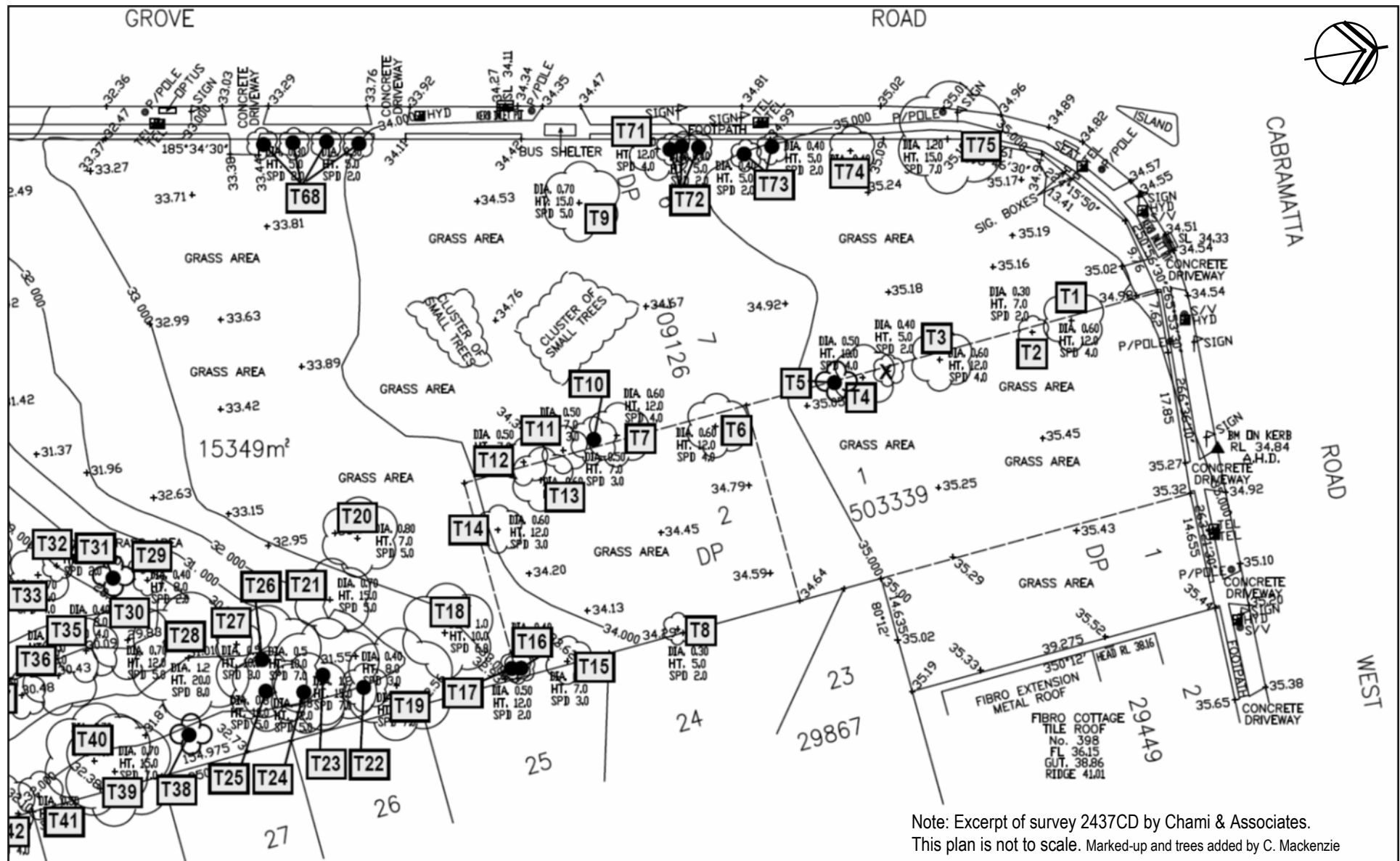
LEGEND

H	refers to the approximate height of a tree in metres, from base of stem to top of tree crown.
Sp	refers to the approximate and average spread in metres of branches/canopy (the 'crown') of a tree.
DBH	refers to the approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted), and expressed in millimetres.
Age	refer to Appendix A -Terms and Definitions for more detail.
V	refers to the tree's vigour (health). F – Low vigour, G – normal vigour, P = poor vigour. Refer to Appendix A -Terms and Definitions for more detail.
C	refers to the tree's structural condition. F = fair condition, G = good condition, P = poor condition. Refer to Appendix A -Terms and Definitions for more detail.
ULE	refers to the estimated <i>Useful Life Expectancy</i> of a tree. Refer to Appendices A and B for details. Where further investigation or testing of trees is required, a ULE can't be accorded until investigations have taken place.
TSR	The <i>Tree Significance Rating</i> considers the importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of public benefit. Refer to Appendix C –for more detail.
RV	Refers to the retention value of a tree, based on the tree's ULE and Tree Significance. Refer to Appendix C –for more detail. Note: a RV cannot be accorded to a tree where the ULE is not provided.
SRZ†	Structural Root Zone (SRZ) refers to the critical <u>radial offset in metres</u> from the centre of the tree's stem required to maintain stability of the tree. The SRZ is calculated on the diameter measured immediately above the root buttress or flare (DAB). Where this measurement is not taken in the field, it is calculated by adding 12.5% to the stem diameter at breast height (DBH). Refer to Appendix A -Terms and Definitions for more detail.
TPZ†	Tree Protection Zone (TPZ) refers to the <i>tree protection zones</i> for trees to be retained. The measurement given is a <u>radial offset in metres</u> from the centre of the tree's stem. Refer to Appendix A -Terms and Definitions for more detail.

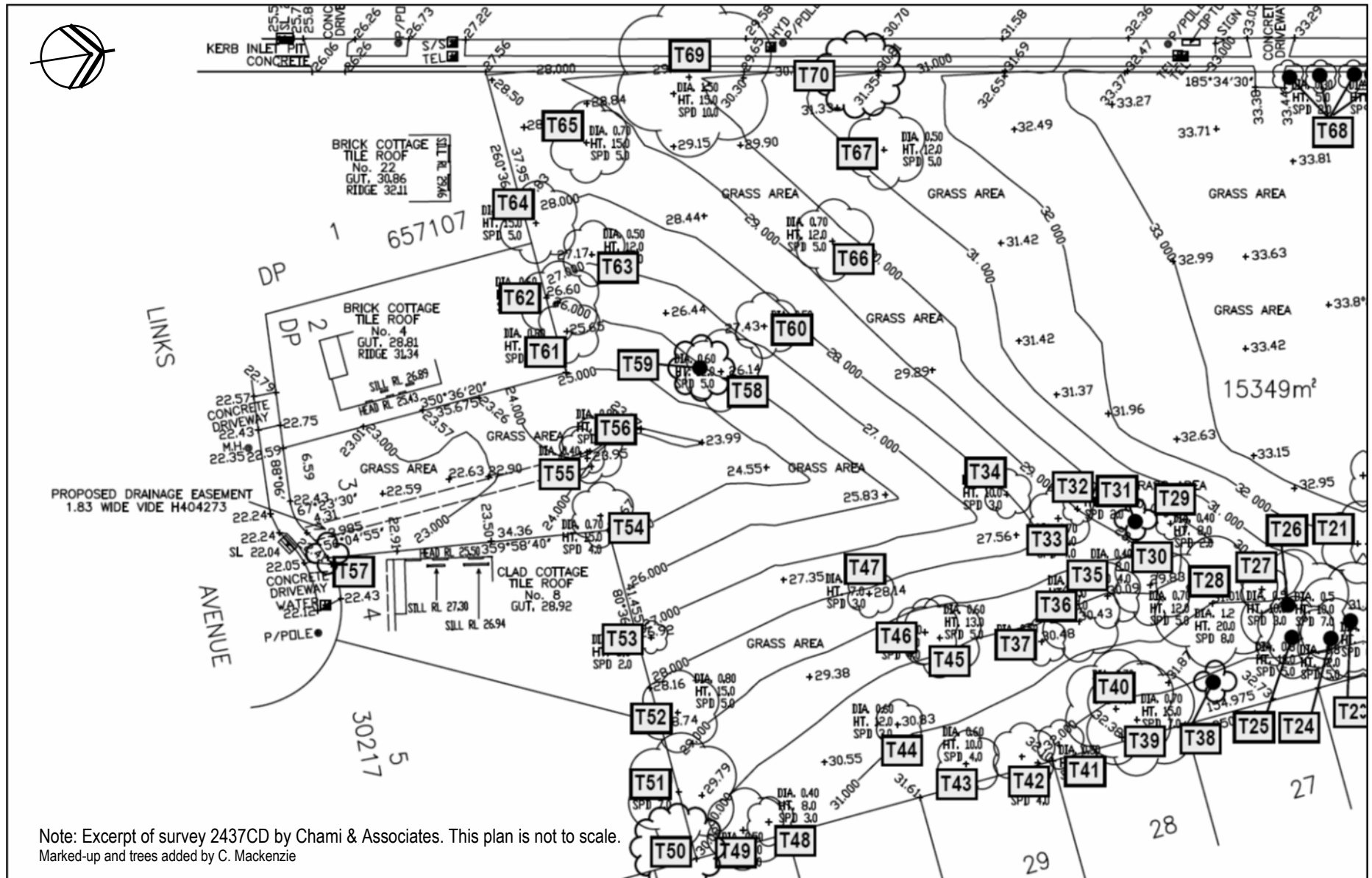
APPENDIX G

TREE LOCATION PLAN





Note: Excerpt of survey 2437CD by Chami & Associates.
This plan is not to scale. Marked-up and trees added by C. Mackenzie



APPENDIX H

FIGURE 2 FROM SSDCP



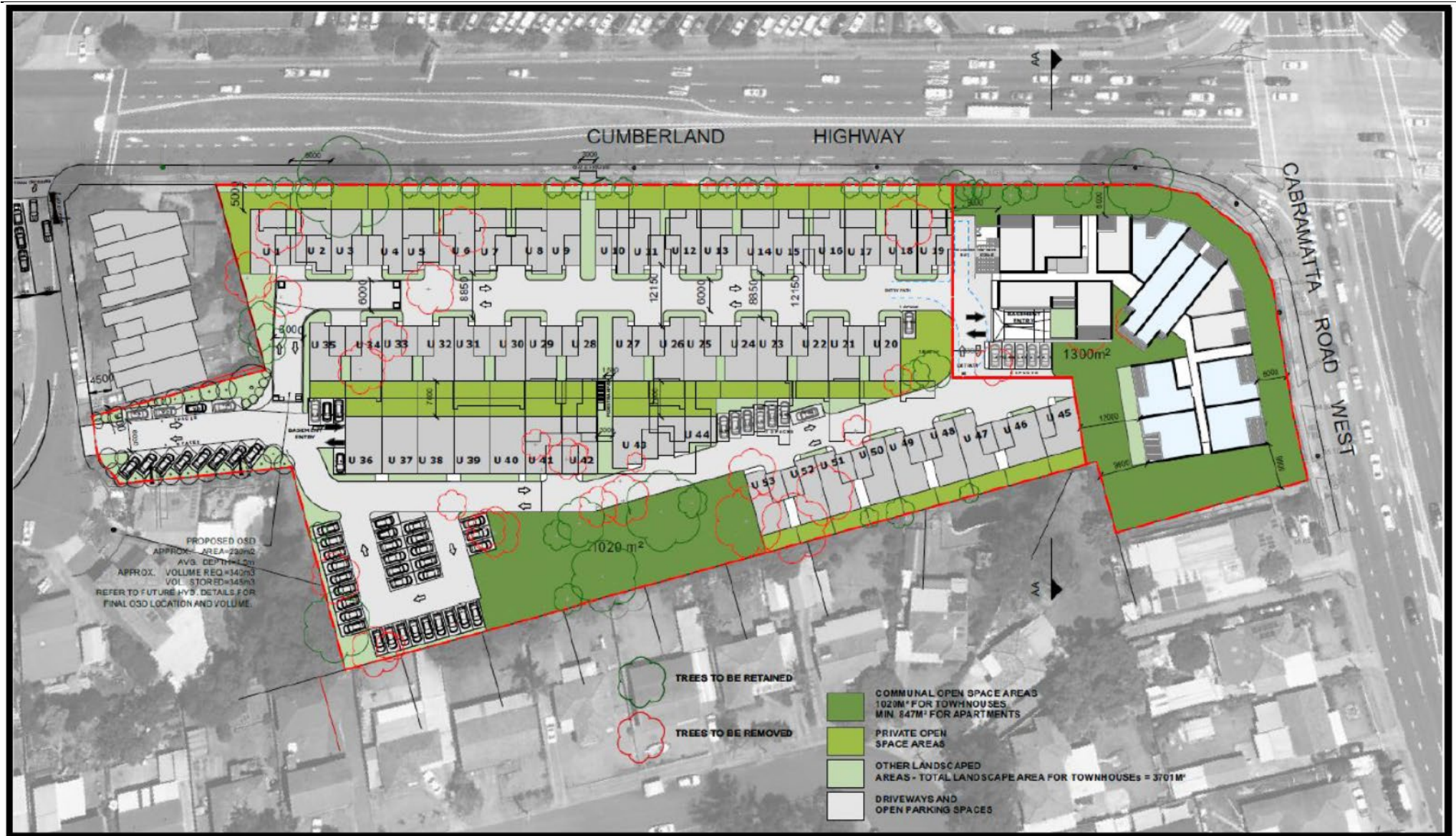


Figure 2 Site layout and building setbacks and Common Open Space