



ARBORICULTURAL IMPACT ASSESSMENT
&
TREE PROTECTION SPECIFICATION

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SITE ADDRESS | 94 Bettington Road, Oatlands NSW
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1.0 EXECUTIVE SUMMARY |

- 1.1 The proposal, outlined in the supplied plans, shows the of five residential multi-storey apartment towers, club buildings and car park (denoted as buildings A, B, C, D, and E) at Oatlands Golf Course, 94 Bettington Road Oatlands, NSW.
- 1.2 This report forms part of a Site Compatibility Certificate (SCC) application.
- 1.3 A total of forty-five (45) trees were assessed that were a mix of Australian native and exotic species.
- 1.4 The supplied plans show no works are proposed within the TPZs of Trees 2, 4, 5, 9, 10, 11, 12, 13, 20, 22, 24, 25, 27, 28, 36, 37, 38, 39, 40, 41, 42, 43, 44 & 45. However, the tree protection measures outlined in this report should be implemented to avoid indirect impacts.
- 1.5 The proposed works represent a *Minor Encroachment* (as defined by AS4970) on Trees 1, 3, 21 & 23. A *Minor Encroachment* is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as in the current cases. Further, the tree protection measures outlined in this report will reduce the likelihood of negative impacts on Trees 1, 3, 21 & 23.
- 1.6 The proposed works are within the TPZs of Trees 6, 14 & 19 and represents a *Major Encroachment* (as defined by AS4970). However, the proposed encroachments can be accommodated, and negative impacts can be avoided if the tree sensitive construction methods and protection measures outlined in this report are implemented and be acceptable under the Australian Standard AS4970, Clause 3.3.4.
- 1.7 The proposed works represent a *Major Encroachment* (as defined by AS4970) on Tree 15 and Tree 16. These trees will need to be removed as the encroachment is too large for their long-term viability, based on a consideration of their health, structure and the size of the encroachment. These trees were both assigned Low Landscape Significance Values.
- 1.8 Trees 7, 8, 17, 18, 26, 29, 30, 31, 32, 33, 34 & 35 are within the proposed building footprint and will need to be removed. These trees were all assigned Low to Moderate Landscape Significance Values except for Tree 26 which was assigned a High Landscape Significance Value.
- 1.9 The location of the underground services was not detailed in the supplied plans. The installation of underground services should be located outside of the TPZs detailed in this report. Where this is not possible, they should be installed around or below roots (>25mmØ) using either hydrovac or hand excavation and supervised by the Project Arborist.

2.0 INTRODUCTION |

2.1 Background

- 2.1.1 This Arboricultural Impact Assessment and Tree Protection Specification Report was prepared for Oatlands Golf Club in relation to the proposed development of 94 Bettington Road, Oatlands NSW. This report has determined the impact of the proposed works on the trees at 94 Bettington Road, Oatlands NSW and neighbouring properties and where appropriate has provided tree sensitive construction methods to minimise negative impacts to the trees.
- 2.1.2 The subject trees are part of a Site Compatibility Certificate (SCC) application.
- 2.1.3 In preparing this report, the author is aware of and has considered the objectives of the City of Parramatta's- *Parramatta Development Control Plan Part 5.4 Preservation of Trees or Vegetation (2011)*, *Parramatta Local Environmental Plan (2011)*, *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, *Australian Standard 4373 Pruning of Amenity Trees (2007)* and *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*.
- 2.1.4 Further methodology used in the preparation of this report is detailed in Appendix 1.
- 2.1.5 This Arboricultural Impact Assessment was based on an assessment of the following supplied documentation/plans only (Appendix 4):

- Yield Schedule SK16. Prepared by Mirvac Design. Dated 26th October 2021.
- Site Plan SK03. Prepared by Mirvac Design. Dated 26th October 2021.
- Indicative Plans – B2 - Residential SK05. Prepared by Mirvac Design. Dated 26th October 2021.
- Indicative Plans – B1 – Club Parking SK06. Prepared by Mirvac Design. Dated 26th October 2021.
- Indicative Plans – L01 – Club Parking SK07. Prepared by Mirvac Design. Dated 26th October 2021.
- Plan showing selected features and levels over part of Lot 100 DP 1243044 Being No. 94 Bettington Road, Oatlands. (Project No. 21-000404). Prepared by Calibre Consulting (NSW) Pty. Ltd. Dated 15th October 2021.

2.2 The Proposal

- 2.2.1 The supplied plans show the construction of five residential multi-storey apartment towers, club buildings and car park (denoted as buildings A, B, C, D, and E) at Oatlands Golf Course, 94 Bettington Road Oatlands, NSW.

3.0 RESULTS |

3.1 The Site

- 3.1.1 The site is an irregular shaped block with a total area stated in the plans as approximately 1.6ha. The site has a fall from north to south. The site consists of an existing carpark and buildings associated with the Oatlands Golf Course.
- 3.1.2 The site is bounded by the golfing greens and residential properties to the north and south, Bettington Road to the west and Oatlands House and carpark to the east.

3.2 The Trees

- 3.2.1 A Visual Tree Assessment (VTA) (Mattheck & Breloer, 2003) has been undertaken on trees growing within the site to determine their health and structural condition (Appendix 2). A full VTA of trees located outside of the site boundaries was not undertaken due to limited access. The species and trunk diameter were recorded for the purposes of determining Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) calculations only. The distance of each tree from the site boundary is an approximation due to limited access.

3.2.2 The Australian Standard 4970: *Protection of Trees on Development Sites* (2009) Clause 2.3.2, requires the allocation of a Tree Retention Value. This value is based on the Useful Life Expectancy (ULE) and Landscape Significance, which considers the tree's health, structural condition and site suitability. The Retention Value does not consider any proposed development works and is not a schedule for tree retention or removal. The trees have been allocated one of the following Retention Values:

- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

3.2.3 The Australian Standard 4970: *Protection of Trees on Development Sites* (2009) also requires the calculation of the Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) for each tree (Appendix 1).

3.2.4 A total of forty-five (45) trees and group trees were assessed which were a mix of Australian native and exotic species.

3.2.5 A search of the BioNet Atlas of NSW Wildlife Database was undertaken during October 2021. No individual threatened tree species that were listed within this database for the area were identified during the current field investigations of the site. The ecological significance and habitat value of the trees has not been assessed and is beyond the scope of this report.

3.2.6 Trees 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 14, 15, 17, 19, 21, 24, 26, 27, 28, 31, 33, 34, 35, 36, 37, 38, 39, 41, 42 & 43 were within the site boundary and are covered by the Council's tree management controls.

3.2.7 Trees 10, 11, 13, 16, 18, 20, 22, 23, 25, 29, 30, 32, 40 & 44 are exempt from the Council's tree management controls.

3.2.8 Tree 45 was located on the adjacent property and as such was allocated a Retention Value of *Priority for Retention*.

4.0 ARBORICULTURAL IMPACT ASSESSMENT |

4.1 Tree 1

4.1.1 Tree 1 was identified as *Lophostemon confertus* (Brush Box) and was allocated a Moderate Landscape Significance Value and a Retention Value of *Consider for Retention*.

4.1.2 The tree was in good physiological condition as indicated by the full crown density, normal leaf colour and low volumes of dead wood and epicormic growth.

4.1.3 The supplied plans show that the proposed landscaping is within the TPZ of Tree 1. The TPZ encroachment is approximately 6.4% and represents a *Minor Encroachment* as defined by AS-4970. A *Minor Encroachment* is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as is in the current case.

4.1.4 Given the good physiological condition of Tree 1 and the size of the encroachment, the proposed landscaping can be accommodated without affecting the long term structural and physiological viability of Tree 1 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.

4.1.5 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.

4.1.6 Any new landscaping must maintain the current levels of the area.

4.1.7 See Appendix 5 & 6 for further details.

4.2 Trees 2, 4, 5, 28, 40 & Tree Groups 43 & 44

4.2.1 Trees 2, 4, 5, 28, 40 Tree Groups 43 & 44 were identified as *Corymbia maculata* (Spotted Gum), *Lophostemon confertus* (Brush Box), *Corymbia eximia* (Yellow Blood Wood), *Magnolia grandiflora* (Bull Bay Magnolia), *Ligustrum lucidum* (Large Leaf Privet), *Photinia* sp. (Photinia) and *Robinia pseudoacacia* (Robinia) respectively and were allocated Low Landscape Significance Values (excepting Tree 4 that was allocated a Moderate Landscape Significance Value) and Retention Values of *Consider for Removal* or *Priority for Removal*.

4.2.2 The supplied plans show no works are proposed within the TPZs of Trees 2, 4, 5, 28, 40 & Tree Groups 43 & 44. However, TPZ fencing must be installed to avoid indirect impacts.

4.2.3 Refer to Appendix 5 for further details.

4.2.4 Refer to the Tree Protection Specification for specific details (Appendices 7 & 8).

4.3 Tree 3

4.3.1 Tree 3 was identified as *Corymbia maculata* (Spotted Gum) and was allocated a High Landscape Significance Value and a Retention Value of *Priority for Retention*.

4.3.2 The tree was in good physiological condition as indicated by the crown density being 75-95% of an idealised example of the species, normal leaf colour and low volumes of dead wood and epicormic growth.

- 4.3.3 The supplied plans show that the proposed landscaping is within the TPZ of Tree 3. The TPZ encroachment is approximately 1.5% and represents a *Minor Encroachment* as defined by AS-4970. A *Minor Encroachment* is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as is in the current case.
- 4.3.4 Given the good physiological condition of Tree 1 and the size of the encroachment, the proposed landscaping can be accommodated without affecting the long term structural and physiological viability of Tree 3 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.
- 4.3.5 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.
- 4.3.6 Any new landscaping must maintain the current levels of the area.
- 4.3.7 See Appendices 5 & 6 for further details.
- 4.4 **Tree 6**
- 4.4.1 Tree 6 was identified as *Corymbia maculata* (Spotted Gum) and was allocated a High Landscape Significance Value and a Retention Value of *Priority for Retention*.
- 4.4.2 The tree was in good physiological condition as indicated by the full crown density, normal leaf colour and low volumes of dead wood and epicormic growth.
- 4.4.3 The supplied plans show the proposed landscaping is within the TPZ of Tree 6. The TPZ encroachment is approximately 11.6% and represents a *Major Encroachment* as defined by AS-4970. However, Clause 3.3.4 of AS-4970 does allow for *Major Encroachments* if design factors (e.g. tree sensitive construction methods) are used to minimise negative impacts.
- 4.4.4 Given the good physiological condition of Tree 6, the proposed landscaping can be accommodated without affecting the long term structural and physiological viability of Tree 6 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.
- 4.4.5 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.
- 4.4.6 Any new landscaping must maintain the current levels of the area including sub-base materials.
- 4.4.7 See Appendix 5 & 6 for further details.
- 4.5 **Trees 7, 8, 17 & 31**
- 4.5.1 Trees 7, 8, 17 & 31 were identified as *Corymbia maculata* (Spotted Gum), *Araucaria heterophylla* (Norfolk Island Pine), *Jacaranda mimosifolia* (Jacaranda), and *Fraxinus* sp. (Claret Ash) respectively, and were allocated Moderate Landscape Significance Values and Retention Values of *Consider for Retention*.
- 4.5.2 Trees 7 & 31 were in fair physiological condition as indicated by reduced crown density, estimated to be 50-75% of an idealised example of these species. Tree 31 had localised crown death. Both Tree 7 and 8 had structures within the SRZ.
- 4.5.3 The supplied plans show that Trees 7, 8, 17 & 31 are within the footprint of the proposed development and will need to be removed.
- 4.5.4 See Appendix 5 for further details.
- 4.5.5 As most of these trees were Mature to Late-Mature trees, removal and replacement with healthy advanced size specimens would replace the loss of amenity within a medium to long timeframe.
- 4.6 **Trees 9, 10, 12, 24, 36, 37 & 39**
- 4.6.1 Trees 9, 10, 12, 24, 36, 37 & 39 were identified as a *Jacaranda mimosifolia* (Jacaranda) and were allocated Low to Moderate Landscape Significance Values and Retention Values of *Consider for Retention*, *Consider for Removal* or *Priority for Removal*.
- 4.6.2 The supplied plans show no works are proposed within the TPZ of Trees 9, 10, 12, 24, 36, 37 & 39. However, TPZ fencing must be installed to avoid indirect impacts.
- 4.6.3 Refer to Appendix 5 for further detail.
- 4.6.4 Refer to the Tree Protection Specification for specific details (Appendices 7 & 8).
- 4.7 **Trees 11, 13, 20, 22 & 25**
- 4.7.1 Trees 11, 13, 20, 22 & 25 were identified as *Gordonia axillaris* (Gordonia) and were allocated Low Landscape Significance Values and Retention Values of *Consider for Removal*.
- 4.7.2 The supplied plans show no works are proposed within the TPZ of Trees 11, 13, 20, 22 & 25. However, TPZ fencing must be installed to avoid indirect impacts.
- 4.7.3 Refer to the Tree Protection Specification for specific details (Appendices 7 & 8).
- 4.8 **Trees 14 & 19**
- 4.8.1 Trees 14 & 19 were identified as *Jacaranda mimosifolia* (Jacaranda) and were allocated Moderate Landscape Significance Values and Retention Values of *Consider for Retention*.

- 4.8.2 The supplied plans show the proposed landscaping and footpath is within the TPZs of Tree 14 & 19. The TPZ encroachment is approximately 17.2% and 12% respectively, and represents a *Major Encroachment* as defined by AS-4970. However, Clause 3.3.4 of AS-4970 does allow for *Major Encroachments* if design factors (e.g. tree sensitive construction methods) are used to minimise negative impacts.
- 4.8.3 The proposed landscaping and footpath can be accommodated without affecting the long term structural and physiological viability of Trees 14 & 19 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.
- 4.8.4 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.
- 4.8.5 The proposed footpath must be constructed at or above the existing grade, including sub-base materials. The proposed landscaping must maintain the current levels of the area.
- 4.8.6 See Appendix 5 & 6 for further details.
- 4.9 **Tree 15**
- 4.9.1 Tree 15 was identified as *Gordonia axillaris* (Gordonia) and was allocated a Low Landscape Significance Value and a Retention Value of *Consider for Removal*.
- 4.9.2 The supplied plans show that the proposed footpath is within the SRZ of Tree 15. Works within the SRZ represent a *Major Encroachment* as defined by AS-4970 as root severance within the SRZ can lead to the destabilisation of the tree.
- 4.9.3 Tree 15 will need to be removed to accommodate the proposal.
- 4.9.4 Refer to Appendix 5 for further details.
- 4.9.5 Removal and replacement with a healthy advanced size specimen would replace the loss of amenity within a short timeframe.
- 4.10 **Tree 16**
- 4.10.1 Tree 16 was identified as *Jacaranda mimosifolia* (Jacaranda) and was allocated a Low Landscape Significance Value and a Retention Value of *Consider for Removal*.
- 4.10.2 The supplied plans show the proposed road is within the TPZ of Tree 16. The TPZ encroachment is approximately 18.6% and represents a *Major Encroachment* as defined by AS-4970.
- 4.10.3 Given the size and location of the encroachment, the long term structural and physiological viability of Tree 16 is highly likely to be compromised by the proposed encroachment and the tree will need to be removed to accommodate the works.
- 4.10.4 This tree is exempt from the Council's Tree Management based on dimensions and can be removed without Council consent.
- 4.10.5 Refer to Appendix 5 for further details.
- 4.10.6 Removal and replacement with a healthy advanced size specimen would replace the loss of amenity within a short timeframe.
- 4.11 **Trees 18, Tree Group 29, Tree Group 30, 32 & Tree Group 35**
- 4.11.1 Trees 18, Tree Group 29, Tree Group 30, 32 & Tree Group 35 were identified as *Gordonia axillaris* (Gordonia), *Malus* sp. (Crab Apple), *Callistemon viminalis* (Weeping Bottlebrush) and *Pyrus calleryana* 'Chanticleer' (Callery Pear) and were allocated Low Landscape Significance Values and Retention Values of *Consider for Removal*.
- 4.11.2 The supplied plans show that Trees 18, Tree Group 29, Tree Group 30, 32 & Tree Group 35 are within the footprint of the proposed development and will need to be removed.
- 4.11.3 Trees 18, Tree Group 29, Tree Group 30 & 32 (but not Tree Group 35) are exempt from the Council's Tree Management based on dimensions and can be removed without Council consent.
- 4.11.4 Refer to Appendix 5 for further details.
- 4.11.5 Removal and replacement with healthy advanced size specimens would replace the loss of amenity within a short to medium timeframe.
- 4.12 **Tree 21**
- 4.12.1 Tree 21 was identified as *Jacaranda mimosifolia* (Jacaranda) and was allocated a Moderate Landscape Significance Value and a Retention Value of *Consider for Retention*.
- 4.12.2 The supplied plans show that the proposed landscaping is within the TPZ of Tree 21. The TPZ encroachment is approximately 7.2% and represents a *Minor Encroachment* as defined by AS-4970. A *Minor Encroachment* is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as in the current case.
- 4.12.3 Given the good structural condition of the tree and the size of the encroachment, the proposed landscaping can be accommodated without affecting the long term structural and physiological viability of Tree 21 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.

- 4.12.4 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.
- 4.12.5 Any new landscaping must maintain the current levels of the area.
- 4.12.6 See Appendix 5 & 6 for further details.
- 4.13 **Tree 23**
- 4.13.1 Tree 23 was identified as *Jacaranda mimosifolia* (Jacaranda) and was allocated a Low Landscape Significance Value and a Retention Value of *Consider for Removal*.
- 4.13.2 Tree 23 had a fair Structural Rating due to the tree being pruned/lopped for powerline clearance and the presence of minor co-dominant inclusions.
- 4.13.3 This tree is exempt from the Council's Tree Management based on dimensions and can be removed without Council consent.
- 4.13.4 The supplied plans show that the proposed landscaping is within the TPZ of Tree 23. The TPZ encroachment is approximately 3.8% and represents a *Minor Encroachment* as defined by AS-4970. A Minor Encroachment is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ.
- 4.13.5 Given the size of the encroachment, the proposed landscaping can be accommodated without affecting the long term structural and physiological viability of Tree 23 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.
- 4.13.6 TPZ fencing should be installed prior to any site works and remain in place for the duration of the demolition and construction processes.
- 4.13.7 Any new landscaping must maintain the current levels of the area.
- 4.13.8 See Appendices 5 & 6 for further details.
- 4.14 **Tree 26**
- 4.15 Tree 26 was identified as *Araucaria cunninghamii* (Hoop Pine) and was allocated a High Landscape Significance Value and a Retention Value of *Consider for Retention*.
- 4.15.1 Tree 26 was in fair physiological condition as indicated by reduced crown density and chlorotic foliage. The crown density was estimated to be 25-50% of an idealised example of this species. The localised crown death included small diameter branches (<25mm Ø) which were present in moderate volumes. There were structures in the SRZ.
- 4.16 The supplied plans show that Tree 26 is within the footprint of the proposed development and will need to be removed.
- 4.16.1 See Appendix 5 for further details.
- 4.17 **Tree 27**
- 4.17.1 Tree 27 was identified as *Fraxinus* sp. (Claret Ash) and was allocated a Moderate Landscape Significance Value and a Retention Value of *Consider for Retention*.
- 4.17.2 The supplied plans show no works are proposed within the TPZ of Tree 27. However, TPZ fencing must be installed if the area is used for demolition & construction access.
- 4.17.3 Refer to the Tree Protection Specification for specific details (Appendices 7 & 8).
- 4.18 **Trees 33 & 34**
- 4.18.1 Trees 33 & 34 were identified as *Callistemon viminalis* (Weeping Bottlebrush) and were allocated Moderate Landscape Significance Values and a Retention Value of *Consider for Retention*.
- 4.18.2 The supplied plans show that Trees 33 & 34 are within the footprint of the proposed road outside of Building C and will need to be removed.
- 4.18.3 See Appendix 5 for further details.
- 4.18.4 Removal and replacement with healthy advanced size specimens would replace the loss of amenity within a short timeframe.
- 4.19 **Trees 38 & 42**
- 4.19.1 Trees 38 & 42 were identified as *Syzygium australe* (Brush Cherry Lilly Pilly) and were allocated High Landscape Significance Values and Retention Values of *Priority for Retention*.
- 4.19.2 The supplied plans show no works are proposed within the TPZ of Trees 38 & 42. However, TPZ fencing must be installed to avoid indirect impacts.
- 4.19.3 Refer to the Tree Protection Specification for specific details (Appendices 7 & 8).
- 4.20 **Tree 41**
- 4.20.1 Tree 41 was dead at the time of assessment.
- 4.21 **Tree 45**
- 4.21.1 Tree 45 was identified as *Jacaranda mimosifolia* (Jacaranda) and was allocated an adjusted Retention Value of *Priority for Retention* given it was located outside of the site.
- 4.21.2 A first order branch from Tree 45 extends 7 m into the site.

- 4.21.3 The supplied plans show no works are proposed within the TPZ of Tree 45. However, TPZ fencing must be installed to avoid indirect impacts.
- 4.21.4 The TPZ fencing proposed in Appendix 6 must incorporate the first order branch of Tree 45. Refer to the Impact Assessment and Tree Protection Specification for specific details (Appendices 5, 6, 7 & 8).
- 4.22 **Pruning, Removal & Replacement Planting**
- 4.22.1 Removal works should be carried out by a practising arborist. The practising arborist should hold a minimum qualification equivalent (using Australian Qualifications Framework) of Level 3 or above in arboriculture or its recognised equivalent. The practising arborist should have a minimum of 3 years of practical experience. Removal works should be undertaken in accordance with the Australian Standard 4373: *Pruning of Amenity Trees* (2007), *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work* (2016) and other applicable legislation and codes.
- 4.22.2 Replacement tree planting should be provided when trees are removed. Replacement trees should be supplied as advanced size stock to help offset the loss of amenity resultant from the tree removals.
- 4.22.3 Replacement planting should be supplied in accordance with Australian Standard 2303: *Tree Stock for Landscape Use* (2015).



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5.0 REFERENCES |

Mattheck & Breloer (2003), *The Body Language of Trees – A Handbook for Failure Analysis*.

NSW Office of Environment and Heritage's Atlas of NSW Wildlife (2011), *BioNet Atlas of NSW Wildlife*.

Standards Australia (2009) Protection of Trees on Development Sites AS4970.

Standards Australia (2007) Pruning of Amenity Trees AS4373.

Standards Australia (2015) Tree Stock for Landscape Use AS2303.

6.0 APPENDIX 1 | METHODOLOGY

- 6.1 This report was based on data from a site inspection conducted on the 1.10.21. The recommendations in this report are based on and limited to observations from these site inspections.
- 6.2 The subject tree(s) was assessed using the Visual Tree Assessment methodology described in *The Body Language of Trees – A Handbook for Failure Analysis* (Mattheck et al., 2003). Subject trees were assessed from the ground only to provide an Arboricultural Impact Assessment and Tree Protection Specification report. No internal diagnostic testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.
- 6.3 The dimensions of the subject tree(s) are an approximation only.
- 6.4 The location of the subject tree(s) was determined from the location plan provided. Trees not shown on this plan have been plotted in their approximate location only.
- 6.5 Tree Protection Zones & Structural Root Zones for the subject tree(s) was based on methods outlined in Australian Standard 4970: *Protection of Trees on Development Sites* (2009).
- 6.6 The health of the subject tree(s) was determined by assessing:
- Foliage size and colour
 - Pest and disease infestation
 - Extension growth
 - Crown density
 - Deadwood size and volume
 - Presence of epicormic growth
- 6.7 The structural condition of the subject tree(s) was assessed by:
- Visible evidence of structural defects or instability
 - Evidence of previous pruning or physical damage
- 6.8 The Useful Life Expectancy (ULE) is used to estimate a tree's longevity in its growing environment. The ULE is based on a tree's species, health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (modified from Barrell, 2001):
- 40 years +
 - 15-40 years
 - 5-15 years
 - Less than 5 years
- 6.9 The Landscape Significance is based on a qualitative assessment of a tree's cultural, environmental and aesthetic value. This provides a relative measure of a tree's Landscape Significance and can be used to determine its Retention Value. Trees are rated under the following categories:
- Very High
 - High
 - Moderate
 - Low
 - Insignificant

LANDSCAPE SIGNIFICANCE	DESCRIPTION
VERY HIGH	The subject tree is listed as a Heritage Item under the Local Environmental Plan with a local or state level of significance.
	The subject tree is listed on Council's Significant Tree Register.
	The subject tree is a remnant tree.
HIGH	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species or forms part of an Endangered Ecological Community associated with the subject site, as defined under the provisions of the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999.
	The subject tree is known to provide habitat to a threatened species.
	The subject tree is an excellent representative of the species in terms of aesthetic value.
	The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality.
	The subject tree forms part of the curtilage of a heritage item with a known or documented association with that item.
MODERATE	The subject tree makes a positive contribution to the visual character or amenity of the area.
	The subject tree provides a specific function such as screening or minimising the scale of a building.
	The subject tree has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
LOW	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Management Controls.
	The subject tree makes little or no contribution to the amenity of the locality.
	The subject tree is a poor representative of the species in terms of aesthetic value.
INSIGNIFICANT	The subject tree is declared a Noxious Weed under the Noxious Weeds Act.

The above table was provided by Anna Hopwood of TreeIQ™ and was modified from the Earthscape Criteria for Assessment of Landscape Significance.

- 6.10 The Retention Value is based on a tree's ULE and Landscape Significance. The subject tree(s) has been allocated one of the following Retention Values:

- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

ULE	LANDSCAPE SIGNIFICANCE				
	VERY HIGH	HIGH	MODERATE	LOW	INSIGNIFICANT
40 years +	Priority for Retention	Priority for Retention		Consider for Removal	Priority for Removal
15-40 years		Priority for Retention	Consider for Retention		
5-15 years		Consider for Retention			
Less than 5 years	Consider for Removal	Priority for Removal			

The above table was provided by Anna Hopwood of TreeIQ™

- 6.11 The Tree Protection Zone (TPZ) is the area above and below ground required to preserve the vigour and long-term viability of the tree. The TPZ is based on scientific research and is generally considered by the arboricultural industry as the area required to provide adequate tree protection during construction. The TPZ is the primary means of protecting trees on development sites (Australian Standard 4970: *Protection of Trees on Development Sites*, 2009).
- 6.12 Works within the TPZ should be avoided. However, *Minor Encroachments*, defined in AS4970 as less than 10% of the TPZ area, are considered acceptable when it is compensated for elsewhere and contiguous within the TPZ. A *Major Encroachment*, defined in AS4970 as greater than 10% of the TPZ area or within the Structural Root Zone (SRZ), may require root investigations by non-destructive methods and tree sensitive construction methods.
- 6.13 The TPZ is the area within a circle that is centred on the trunk. The radius of the TPZ is calculated by the following formula:

$$TPZ = DBH \times 12$$

where

DBH= Diameter at Breast Height (1.4m)

- 6.14 The SRZ is the minimum area around the base of the tree required for the tree's stability. The SRZ only relates to tree stability and not the vigour and long-term viability of the tree.
- 6.15 The SRZ is the area within a circle that is centred on the trunk. The radius of the SRZ is calculated by the following formula:

$$SRZ = (D \times 50)^{0.42} \times 0.64$$

where

D = Trunk diameter (m) above the root buttress

- 6.16 Encroachment into SRZ (i.e. severance of structural roots >25mmØ) may lead to the destabilisation of the tree and the long-term viability must be demonstrated in such cases. This may require root investigations by non-destructive methods.
- 6.17 For further details on the TPZ and SRZ please refer to Australian Standard 4970: *Protection of Trees on Development Sites* (2009).

7.0 APPENDIX 2 | TREE ASSESSMENT SCHEDULE

Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
1	<i>Lophostemon confertus</i> (Brush Box)	12	5	600	7	163	2.8	Good	Good	Mature	15-40	Moderate	Consider for Retention	Possible soil compaction. Small (<25mmØ) & medium (25-75mmØ) deadwood in low volumes. Small (<25mmØ) epicormic growth in moderate volumes. Mechanical damage to exposed surface roots.	6.4%
2	<i>Corymbia maculata</i> (Spotted Gum)	11	5	300	4	41	2.1	Fair	Good	Semi-mature	5-15	Low	Consider for Removal	Crown density 50-75%. Partially suppressed. Previously crown lifted. Wound(s), early signs of decay.	No Encroachment
3	<i>Corymbia maculata</i> (Spotted Gum)	17	9	600	7	163	2.8	Good	Good	Mature	40+	High	Priority for Retention	Crown density 75-95%. Small (<25mmØ) & medium (25-75mmØ) deadwood in low volumes. Structures within SRZ.	1.5%
4	<i>Lophostemon confertus</i> (Brush Box)	10	5	600	7	163	2.8	Poor	Poor	Senescent	<5	Moderate	Priority for Removal	Localised crown death. Lost central leader. Crown density 0-25%. Small (<25mmØ), medium (25-75mmØ) & large (>75mmØ) deadwood in high volumes. Crown consists mainly of epicormic growth. Trunk cavity(s), major.	No Encroachment
5	<i>Corymbia eximia</i> (Yellow Blood Wood)	9	4	200	2	18	1.8	Fair	Fair	Semi-mature	5-15	Low	Consider for Removal		No Encroachment
6	<i>Corymbia maculata</i> (Spotted Gum)	17	9	700	8	222	3.0	Good	Good	Mature	40+	High	Priority for Retention	Crown 12m towards club house at 10m Hanger(s).	11.6%
7	<i>Corymbia maculata</i> (Spotted Gum)	8	7	391	5	69	2.3	Fair	Fair	Mature	5-15	Moderate	Consider for Retention	Road in SRZ. Crown density 50-75%. Medium (25-75mmØ) deadwood in moderate volumes. Co-dominant inclusions, minor. Structures within SRZ.	Within Development Footprint
8	<i>Araucaria heterophylla</i> (Norfolk Island Pine)	14	4	600	7	163	2.8	Good	Good	Mature	15-40	Moderate	Consider for Retention	Limited crown clearance. Structures within SRZ. Phototrophic lean, slight.	Within Development Footprint

Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
9	<i>Jacaranda mimosifolia</i> (Jacaranda)	9	5	412	5	77	2.4	Dormant. No rating.	Good	Mature	5-15	Moderate	Consider for Retention	Wound(s), early signs of decay. Trunk conflict with adjacent structures. Structures within SRZ.	No Encroachment
10	<i>Jacaranda mimosifolia</i> (Jacaranda)	4	4	300	4	41	2.1	Dormant. No rating.	Fair	Mature	5-15	Low	Consider for Removal	Pruned/lopped for powerline clearance. Co-dominant inclusions, minor.	No Encroachment
11	<i>Gordonia axillaris</i> (Gordonia)	4	4	209	3	20	1.8	Good	Fair	Mature	5-15	Low	Consider for Removal	Crossing branches. Crown density 75-95%. Large (>75mmØ) deadwood in moderate volumes. Small (<25mmØ) epicormic growth in high volumes. Wound(s), advanced stages of decay. Limited crown clearance. Structures within SRZ.	No Encroachment
12	<i>Jacaranda mimosifolia</i> (Jacaranda)	5	4	100	2	13	1.5	Dormant. No rating.	Good	Semi-mature	5-15	Low	Consider for Removal		No Encroachment
13	<i>Gordonia axillaris</i> (Gordonia)	3	4	300	4	41	2.1	Good	Fair	Mature	5-15	Low	Consider for Removal		No Encroachment
14	<i>Jacaranda mimosifolia</i> (Jacaranda)	14	5	424	5	81	2.4	Dormant. No rating.	Good	Mature	5-15	Moderate	Consider for Retention	Crown into site 5m Wound(s), early signs of decay.	17.2%
15	<i>Gordonia axillaris</i> (Gordonia)	S11	4	180	2	15	1.7	Good	Fair	Mature	5-15	Low	Consider for Removal		13.5% (Within SRZ)
16	<i>Jacaranda mimosifolia</i> (Jacaranda)	3	2	71	2	13	1.5	Dormant. No rating.	Fair	Young	5-15	Low	Consider for Removal	Insect gall.	18.6%
17	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	5	346	4	54	2.2	Dormant. No rating.	Fair	Mature	5-15	Moderate	Consider for Retention	Co-dominant inclusions, major.	Within Development Footprint

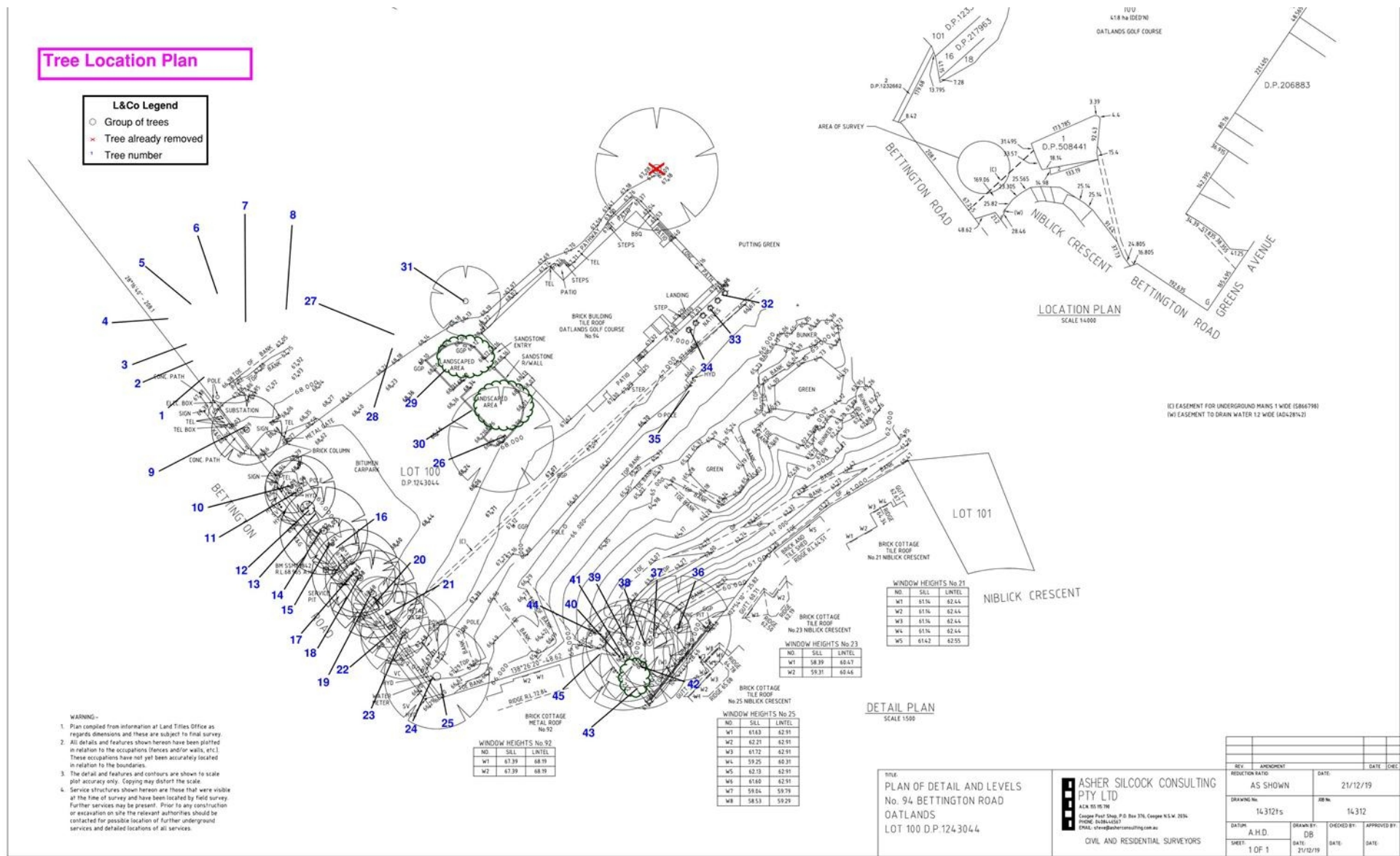
Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
18	<i>Gordonia axillaris</i> (Gordonia)	4	4	173	2	14	1.6	Good	Poor	Mature	5-15	Low	Consider for Removal	Partially suppressed. Co-dominant inclusions, major. Wound(s), advanced stages of decay.	Within Development Footprint
19	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	5	337	4	51	2.2	Dormant. No rating.	Fair	Mature	5-15	Moderate	Consider for Retention	Co-dominant inclusions, major. Adaptive growth.	12.0%
20	<i>Gordonia axillaris</i> (Gordonia)	3	2	300	4	41	2.1	Good	Poor	Mature	5-15	Low	Consider for Removal		No Encroachment
21	<i>Jacaranda mimosifolia</i> (Jacaranda)	10	5	407	5	75	2.4	Dormant. No rating.	Good	Mature	5-15	Moderate	Consider for Retention	Crown into site 4m. Wound(s), early signs of decay.	7.2%
22	<i>Gordonia axillaris</i> (Gordonia)	4	3	300	4	41	2.1	Good	Good	Mature	5-15	Low	Consider for Removal		No Encroachment
23	<i>Jacaranda mimosifolia</i> (Jacaranda)	4	4	354	4	57	2.2	Dormant. No rating.	Fair	Mature	5-15	Low	Consider for Removal	Small (<25mmø) & medium (25-75mmø) epicormic growth in high volumes. Pruned/lopped for powerline clearance. Co-dominant inclusions, minor.	3.8%
24	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	4	300	4	41	2.1	Dormant. No rating.	Fair	Mature	5-15	Moderate	Consider for Retention	Large (>75mmø) growth. Mechanical damage to exposed surface roots. Trunk conflict with adjacent structures. Structures within SRZ.	No Encroachment
25	<i>Gordonia axillaris</i> (Gordonia)	4	4	300	4	41	2.1	Good	Fair	Mature	5-15	Low	Consider for Removal	Crown density 50-75%. Small (<25mmø) & large (>75mmø) deadwood in high volumes.	No Encroachment
26	<i>Araucaria cunninghamii</i> (Hoop Pine)	25	8	750	9	254	3.1	Fair	Fair	Mature	5-15	High	Consider for Retention	Resin. Possible root severance in the SRZ. Crown density 25-50%. Small (<25mmø) epicormic growth in moderate volumes. Structures within SRZ. Adaptive growth. Chlorotic foliage.	Within Development Footprint

Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
27	<i>Fraxinus</i> sp. (Claret Ash)	11	5	500	6	113	2.6	Fair	Good	Mature	5-15	Moderate	Consider for Retention	Localised crown death. Crown density 50-75%. Small (<25mmØ) deadwood in low volumes. Wound(s), early signs of decay. Structures within SRZ.	No Encroachment
28	<i>Magnolia grandiflora</i> (Bull Bay Magnolia)	6	3	175	2	14	1.7	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Structures within SRZ.	No Encroachment
29	<i>Malus</i> sp. (Crab Apple)	4	3	50	2	13	1.5	Dormant. No rating.	Good	Semi-mature	5-15	Low	Consider for Removal	Group of 4 trees. Structures within SRZ.	Within Development Footprint
30	<i>Malus</i> sp. (Crab Apple)	4	3	50	2	13	1.5	Dormant. No rating.	Good	Semi-mature	5-15	Low	Consider for Removal	Group of 5 trees.	Within Development Footprint
31	<i>Fraxinus</i> sp. (Claret Ash)	9	5	469	6	100	2.5	Fair	Fair	Late Mature	5-15	Moderate	Consider for Retention	Localised crown death. Seam of depressed cambium. Crown density 50-75%. Small (<25mmØ) & medium (25-75mmØ) deadwood in moderate volumes. Flush cuts. Wound(s), early signs of decay.	Within Development Footprint
32	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	4	4	141	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
33	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	10	4	300	4	41	2.1	Good	Good	Mature	5-15	Moderate	Consider for Retention	Small (<25mmØ) deadwood in moderate volumes. Structures within SRZ.	Within Development Footprint
34	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	10	4	491	6	109	2.6		No access to base. No rating.	Mature	5-15	Moderate	Consider for Retention		Within Development Footprint
35	<i>Pyrus calleryana</i> 'Chanticleer' (Callery Pear)	5	3	75	2	13	1.5	Dormant. No rating.	Good	Semi-mature	5-15	Low	Consider for Removal	Group of 2 trees. Structures within SRZ.	Within Development Footprint

Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
36	<i>Jacaranda mimosifolia</i> (Jacaranda)	12	7	412	5	77	2.4	Dormant. No rating.	Fair	Late Mature	5-15	Moderate	Consider for Retention	Small (<25mmØ) & medium (25-75mmØ) epicormic growth in high volumes. Co-dominant inclusions, major. Bark inclusion(s), minor. Wound(s), early signs of decay.	No Encroachment
37	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	5	300	4	41	2.1	Dormant. No rating.	Fair	Mature	5-15	Moderate	Consider for Retention	Large (>75mmØ) deadwood in low volumes. Partially suppressed. Trunk cavity(s), minor.	No Encroachment
38	<i>Syzygium australe</i> (Brush Cherry Lilly Pilly)	12	5	424	5	81	2.4	Good	Good	Mature	40+	High	Priority for Retention	Partially suppressed. Mechanical damage to exposed surface roots.	No Encroachment
39	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	5	407	5	75	2.4	Dormant. No rating.	Poor	Senescent	<5	Low	Priority for Removal	Localised crown death. Large (>75mmØ) deadwood in high volumes. Wound(s), advanced stages of decay. Trunk cavity(s), major.	No Encroachment
40	<i>Ligustrum lucidum</i> (Large Leaf Privet)	12	5	750	9	254	3.1	Fair	Poor	Mature	<5	Low	Priority for Removal	Small (<25mmØ) & large (>75mmØ) epicormic growth in] high volumes. Co-dominant inclusions, major. Bark inclusion(s), major. Trunk cavity(s), major.	No Encroachment
41	Dead			0	0	0	1.5								No Encroachment
42	<i>Syzygium australe</i> (Brush Cherry Lilly Pilly)	14		400	5	72	2.3	Good	Good	Mature	40+	High	Priority for Retention	Partially suppressed. Mechanical damage to exposed surface roots.	No Encroachment
43	<i>Photinia sp.</i> (Photinia)	7	3	100	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Partially suppressed. Structures within SRZ.	No Encroachment
44	<i>Robinia pseudoacacia</i> (Robinia)	4	2	50	2	13	1.5	Good	Fair	Semi-mature	5-15	Low	Consider for Removal	Group of 2 trees. Partially suppressed. Trunk cavity(s), major.	No Encroachment

Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
45	<i>Jacaranda mimosifolia</i> (Jacaranda)	12	7	375	5	64	2.3							First order branch extends 7m into the site.	No Encroachment

8.0 APPENDIX 3 | TREE LOCATION PLAN



SUMMARY

GFA
25,814 m²

APTS
193

BLD	USE	AREAS				MEASURED	CAR PARKING NON RESI REQ.	RESI REQ
		BEA	GBA	GFA	NSA			
	CARPARK	18,889	18,889	0	0	420	0	0
		18,889	18,889	0	0	420	0	0
e	CLUB	3,304	3,139	2,825	2,825	0	290	0
		3,304	3,139	2,825	2,825	0	290	0
	RESI LOBBY	138	138	132	0	0	0	0
e	RESI LOBBY	69	69	66	0	0	0	0
		208	208	197	0	0	0	0
	RESIDENTIAL	0	0	0	0	0	0	0
a	RESIDENTIAL	3,824	3,442	3,167	2,794	0	0	27
b	RESIDENTIAL	6,670	6,003	5,523	4,873	0	0	47
c	RESIDENTIAL	5,815	5,233	4,815	4,248	0	0	41
d	RESIDENTIAL	4,984	4,486	4,127	3,641	0	0	35
e	RESIDENTIAL	6,233	5,610	5,161	4,554	0	0	44
		27,526	24,774	22,792	20,110	0	0	193
		49,926	47,008	25,814	22,935	420	290	193

PARKING RATES

RESIDENTIAL

PARKING RATES

CLUB

EFFICIENCIES

CARPARK

CLUB

RESI LOBBY

RESIDENTIAL

1 BED	2 BED	3 BED	VISITOR	*Visitor car parking provided on street
1	1	1	0	

Per 100m² (NLA)

10.25

BEA to GBA

100%

95%

100%

90%

GBA to GFA

0%

90%

95%

92%

GFA to NSA

0.0%

100.0%

0.0%

88.2%

PARKING

45

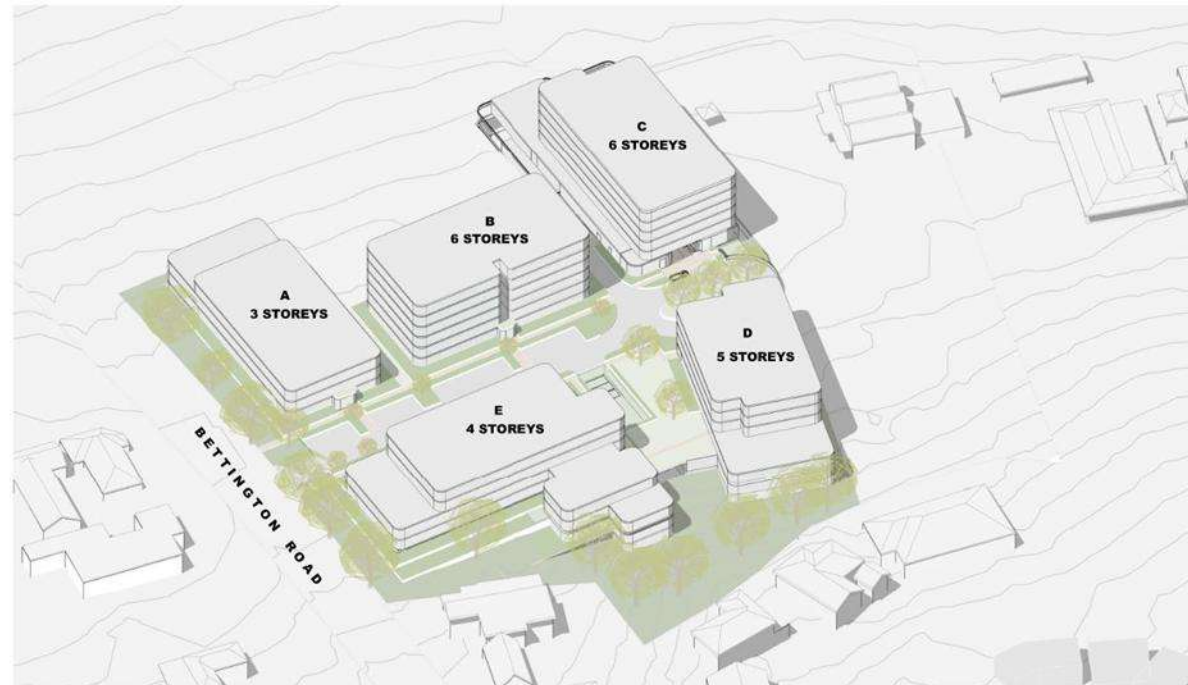
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Count	Mix	NSA
1B+	1	1%
2B1Ba	60	31%
2B2Ba	102	53%
3B	30	16%
193		20,110

Area	Count	Total Area
1B+	76	1
2B1Ba	84	2
2B1Ba	90	40
2B1Ba	91	18
2B2Ba	98	75
2B2Ba	108	1
2B2Ba	112	3
2B2Ba	115	5
2B2Ba	118	17
2B2Ba	127	1
3B	127	1
3B	131	2
3B	133	3
3B	135	11
3B	141	8
3B	142	2
3B	145	1
3B	158	2
193		20,110



YIELD SCHEDULE

SK16

Rev X

26/10/21

**MIRVAC
DESIGN**

OATLANDS GOLF CLUB
Proposal for Seniors Living



**MIRVAC
DESIGN**

OATLANDS GOLF CLUB
Proposal for Seniors Living

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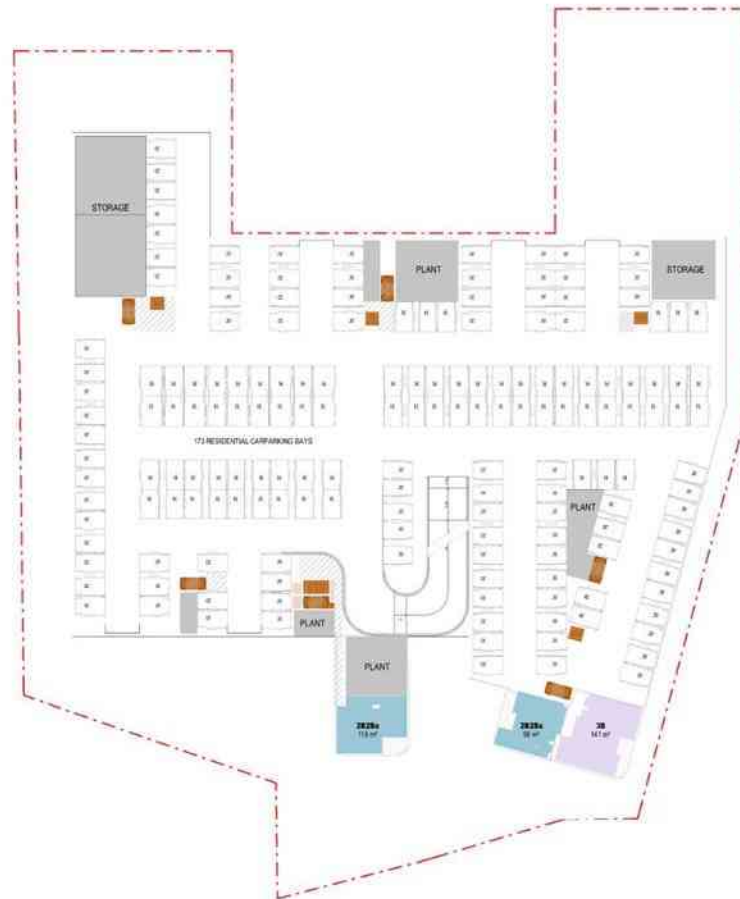


SITE PLAN
DRAWING NAME ?

SK03

Rev X

26/10/21



**MIRVAC
DESIGN**

OATLANDS GOLF CLUB
Proposal for Seniors Living

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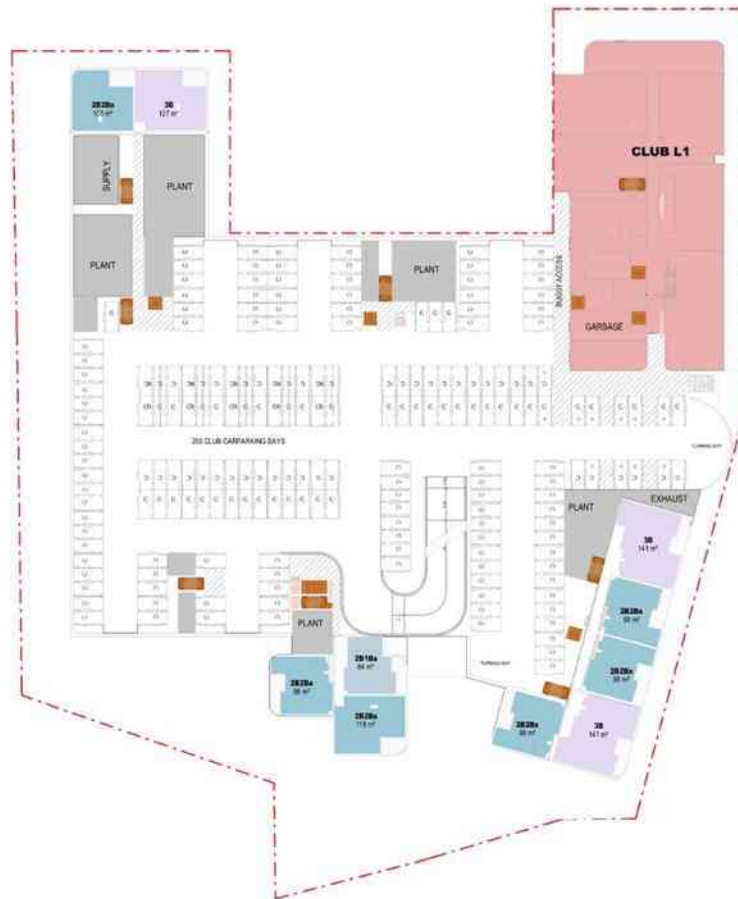


INDICATIVE PLANS - B2 -
RESIDENTIAL

SK05

Rev X

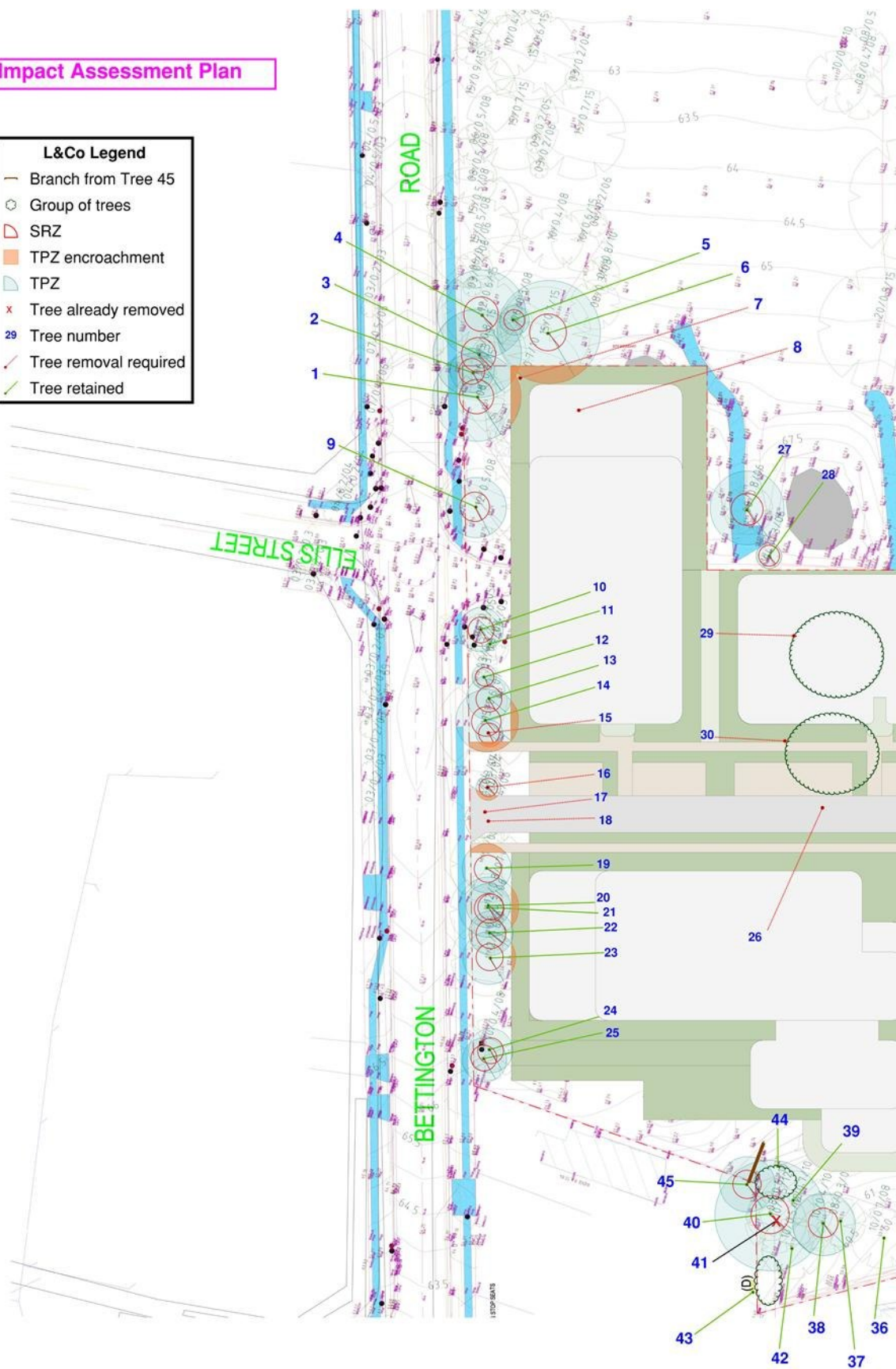
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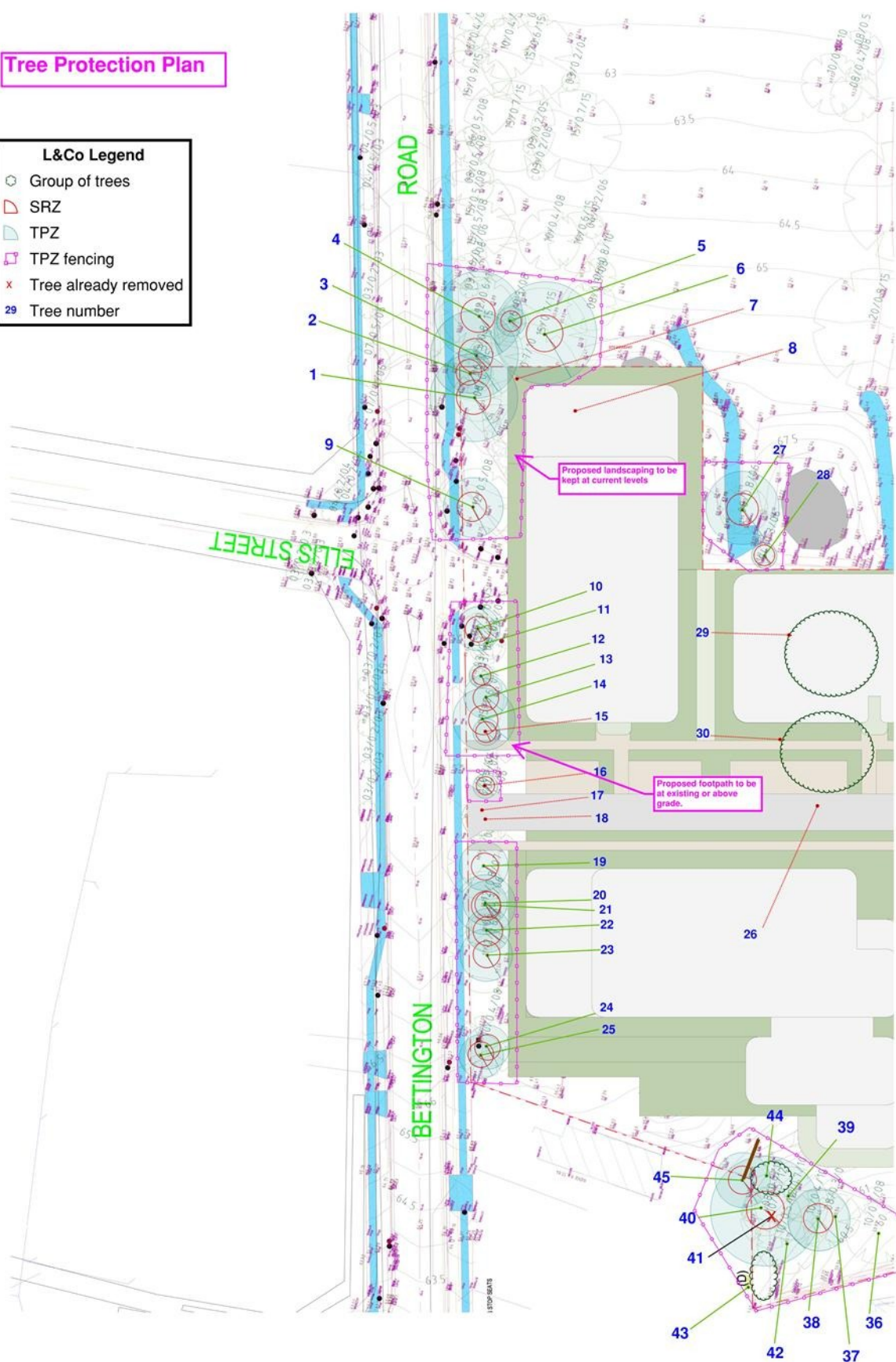
Impact Assessment Plan

- L&Co Legend**
- Branch from Tree 45
 - Group of trees
 - SRZ
 - TPZ encroachment
 - TPZ
 - Tree already removed
 - Tree number
 - Tree removal required
 - Tree retained



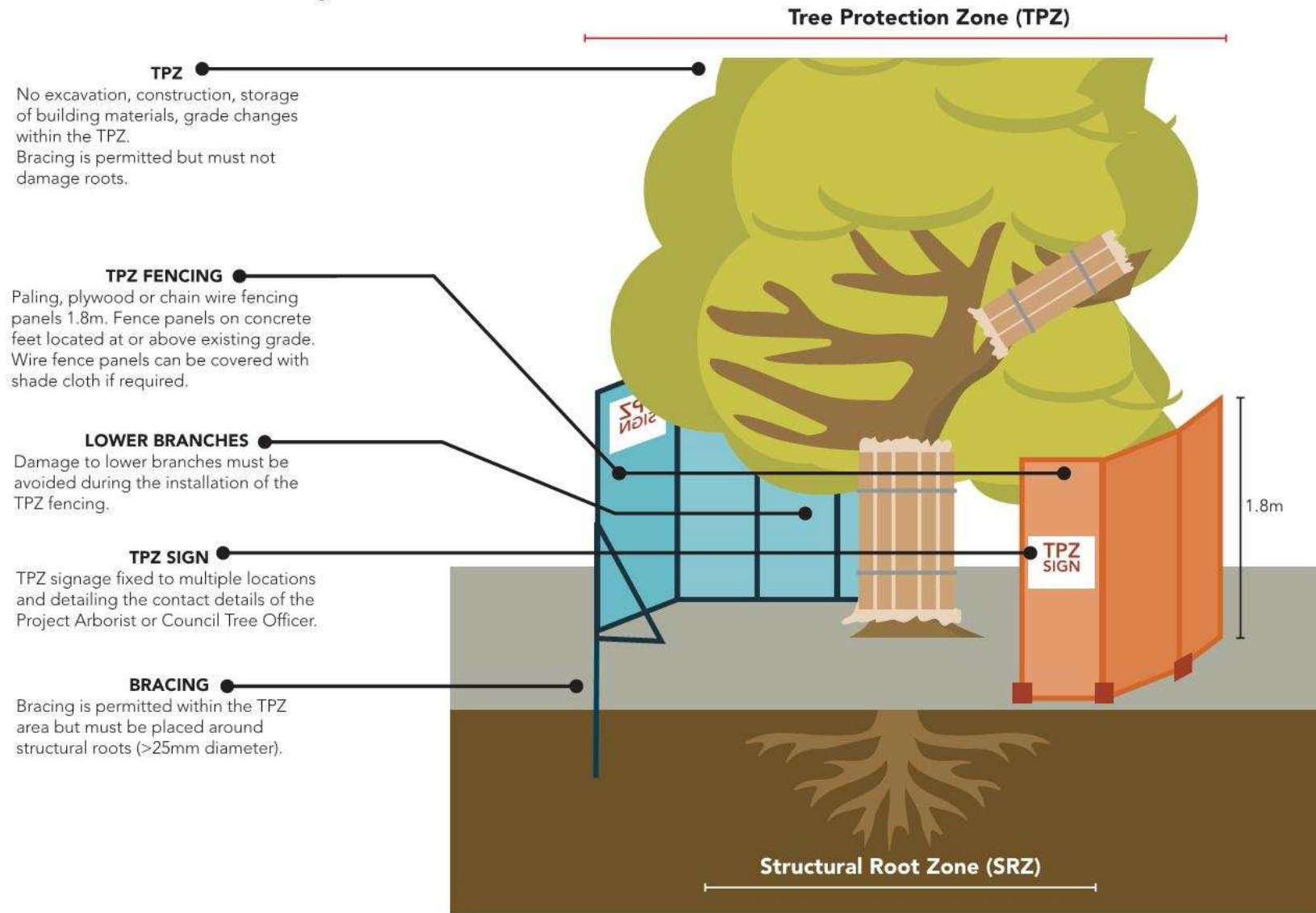
Tree Protection Plan

L&Co Legend	
	Group of trees
	SRZ
	TPZ
	TPZ fencing
	Tree already removed
	Tree number



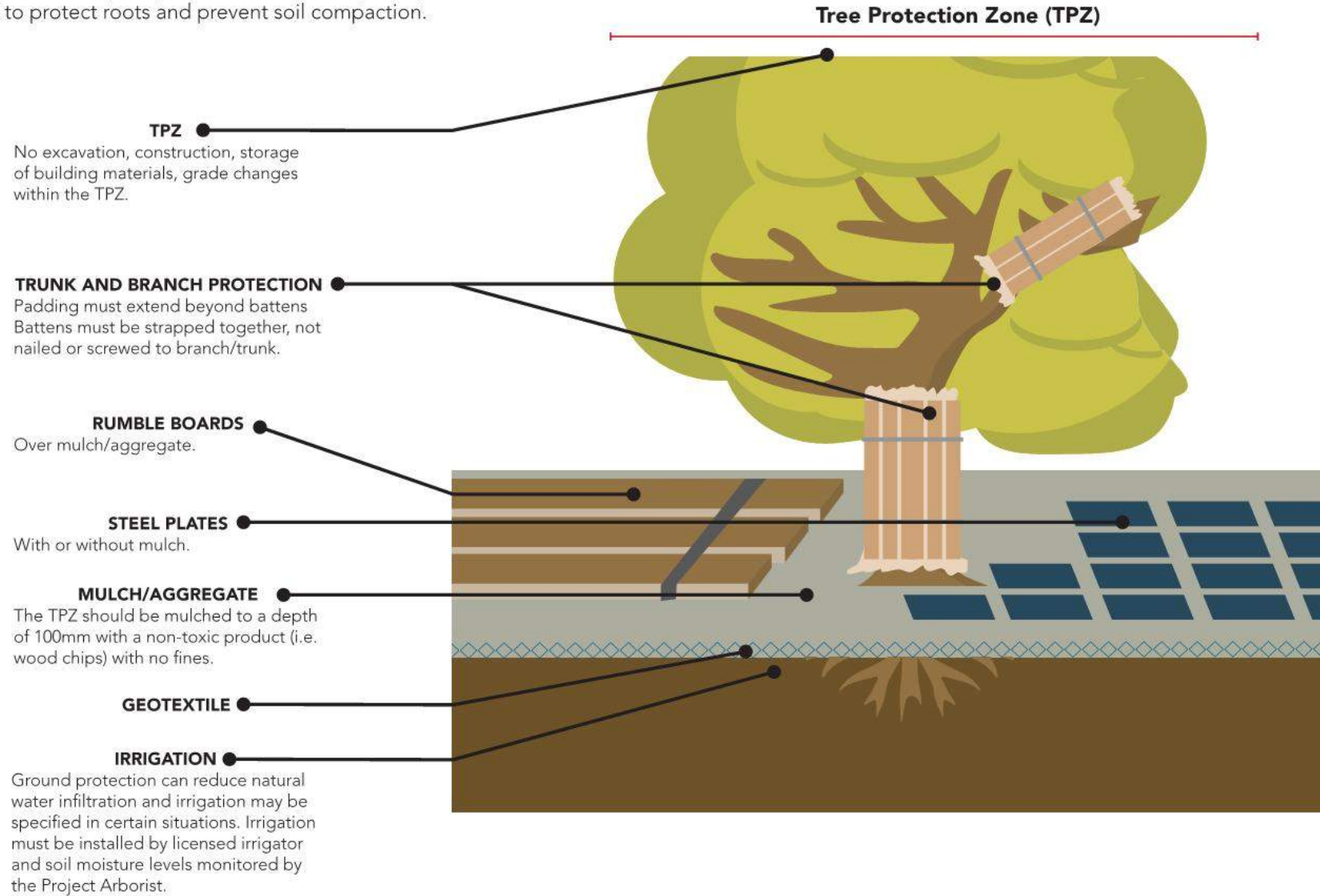
12.0 APPENDIX 7 | TYPICAL TREE PROTECTION DETAIL

Tree Protection Detail - TPZ Fencing



Tree Protection Detail - Ground Protection

Required if temporary access for machinery is required within the TPZ to protect roots and prevent soil compaction.



13.0 APPENDIX 8 | TREE PROTECTION SPECIFICATION

13.1 Appointment of Project Arborist

- 13.1.1 Prior to commencement of works a Project Arborist should be engaged to monitor compliance with the protection measures. The Project Arborist will inspect tree protection measures and prepare a compliance certification for the principal certifying authority prior to the release of compliance certification. Contractors and site workers are to receive these specifications at least 3 days prior to commencing works. Contractors and site workers working within the TPZ should sign the site log confirming they have read and understood these specifications prior to commencing works.

13.2 Compliance

- 13.2.1 The Project Arborist will conduct regular site visits to certify the works are compliant with this specification. A compliance document will be prepared by the Project Arborist following each site inspection. The compliance document will include evidence of compliance with the tree protection measures detailed in this specification.

13.3 Tree & Vegetation Removal

- 13.3.1 Tree and vegetation removal will be undertaken prior to installation of tree protection measures. Tree removal works should be undertaken in accordance with the *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work* (2016).
- 13.3.2 Tree and vegetation removal must not damage trees to be retained.

13.4 Tree Protection Zone

- 13.4.1 Trees that are to be retained must be protected prior to and during construction from works that could negatively impact their health and structural integrity. The following works should not occur within the TPZ unless authorised by the Project Arborist:

- Modification of existing soil levels, excavations and trenching
- Mechanical removal of vegetation
- Movement of naturally occurring rock
- Storage of materials, plant/equipment and building of sheds
- No signage or hoarding shall be fixed to the trees
- Preparation of building materials, refuelling or disposal of waste materials and chemicals
- No lighting of fires
- No pedestrian or vehicular traffic
- Temporary or permanent location of services, or works required for their installation
- Any other activities that may damage the tree

13.6 Tree Protection Fencing

- 13.6.1 The TPZ fencing must be positioned at the perimeter of the TPZ and may be combined to form a single area where the TPZs of multiple trees overlap. The approximate location of the TPZ fencing is outlined in the Arboricultural Impact Assessment with the exact location determined by consultation between the Principal Contractor/Project Manager and the Project Arborist prior to the commencement of works. Fencing may be setback to allow for demolition/construction access and for the installation of pavements only where appropriate ground protection is installed and approved by the Project Arborist. The TPZ fencing must be at least 1.8m above grade and made of wire mesh panels that are supported by concrete feet and fastened together to prevent sideways movement. Tree damage, including any low branches, must be avoided during the installation of the tree protection fencing. The TPZ fencing must include signage to identify the TPZ fencing and include the Project Arborist contact details.

13.7 Site Management

- 13.7.1 Materials, waste storage and temporary services should not be located within the TPZ.

13.8 Works within the Tree Protection Zones

- 13.8.1 In certain situations, works within the TPZ may be authorised by the determining authority. These works must be supervised by the Project Arborist. When working within the TPZ, special care should be taken to avoid damage to the tree's root system, trunks and lower branches.
- 13.8.2 If roots (>25mmØ) are encountered during excavation, demolition and construction works, these roots must be retained undamaged and advice sought from the Project Arborist. The design and final levels must remain flexible to enable the retention of roots >25mmØ where deemed necessary by the Project Arborist.

13.9 Ground Protection

- 13.9.1 The movement of machinery should be restricted to existing paved areas or in areas with temporary ground protection (i.e. steel road plates, ground mats) when deemed necessary by the Project Arborist.
- 13.9.2 Ground protection should be installed as per AS4970 and Appendix 7- *Typical Tree Protection Detail*.
- 13.9.3 If irrigation is considered necessary, it should be installed first and by a licensed irrigator under the supervision of the Project Arborist with no trenching.
- 13.9.4 The irrigation should be covered with a layer of geotextile and mulched to a depth of 100mm with a non-toxic product (i.e. woodchips) with no fines.
- 13.9.5 Once the irrigation, geotextile and mulch are in place then the ground protection boards (steel plates or rumble boards) can be installed.
- 13.9.6 Boards should remain in place for the entire build.

13.10 Trunk & Branch Protection

- 13.10.1 If trunk protection is required it should be installed by wrapping the trunk and first order branching with padding (i.e. carpet underlay or 10mm thick geotextile) to a minimum height of 2m. Timber battens (90 x 45mm), spaced at 150mm centres should be strapped together and placed over the padding (Refer to AS4970 for further details).
- 13.10.2 Branch protection should be installed when considered necessary by the Project Arborist.
- 13.10.3 Branches should be wrapped with padding (i.e. Ableflex) to provide protection. Where possible, branches should be tied back and construction works to take place around branches (with appropriate branch protection installed as required). If pruning is unavoidable it should be in accordance with AS4373 and supervised by the Project Arborist.

13.11 Structure & Pavement Demolition

- 13.11.1 The Project Arborist should supervise the demolition of existing structures/pavement within the TPZ. Machinery is to be excluded from the TPZ unless operating from existing slabs, pavements or areas of ground protection. Machinery should not contact the tree's roots, trunks, branches and crown.
- 13.11.2 Existing pavement should be hand lifted to minimise disturbance to the existing sub-base and to prevent damage to tree roots. Wherever possible, the existing sub-base material should remain in situ.
- 13.11.3 When removing slab sections within the TPZ, machinery must work from the tree outwards to ensure the machinery always remains on the un-demolished section of slab. Wherever possible, footings or elements below grade should be retained to minimise disturbance to the tree's roots.
- 13.11.4 Structures must be shattered with hand-operated pneumatic/electric breaker before removal when considered necessary by the Project Arborist.
- 13.11.5 If roots (>25mmØ) are encountered during excavation, demolition and construction works these roots must be retained undamaged and advice sought from the Project Arborist. Exposed roots must be protected from direct sunlight, drying out and extremes of temperature by using 10mm thick jute geotextile fabric. This fabric should be kept moist at all times.
- 13.11.6 Where the Project Arborist determines that the tree is using underground elements (i.e. footings, pipes, rocks etc.) for support, these elements should be left *in situ*.

13.12 **Pavement/Kerb Installation**

- 13.12.1 Installation of pavements and sub-base within the TPZ must be supervised by the Project Arborist. New surfaces and sub-base materials should be placed above grade to minimise excavations and retain roots (unless prior root mapping has determined that there are no roots within the area of construction).
- 13.12.2 If roots (>25mmØ) are encountered during the installation of the new sub-base and surfaces these roots must be retained undamaged and advice sought from the Project Arborist. The design and final levels must remain flexible to enable the retention of roots >25mmØ where deemed necessary by the Project Arborist.
- 13.12.3 Compaction of the ground prior to the installation of fill is not permitted.
- 13.12.4 New sub-base material should be a 20mm no-fines road base (i.e. Benedict Sand & Gravel- Product Code 20NF/RB or similar). Recycled concrete aggregates should not be used to avoid raising soil pH levels.
- 13.12.5 If required, bedding sand should be washed river sand (no crushed paving blends). The bedding sand should be consolidated with a pedestrian operated plate compactor only. If possible, pavement material should be permeable.
- 13.12.6 Kerbs within the TPZ should be modified to bridge roots (>25mmØ) unless root pruning is approved and undertaken by the Project Arborist.

13.13 **Underground Services**

- 13.13.1 The installation of underground services should be located outside of the TPZ. Where this is not possible they should be installed around or below roots (>25mmØ) using either hydrovac or hand excavation and supervised by the Project Arborist.
- 13.13.2 Boring methods may be used for the installation of services 800mm below grade. Excavations for starting and receiving pits for the boring equipment should be located outside of the TPZ or located to avoid roots (>25mmØ, or determined by the Project Arborist).

13.14 **Excavations, Root Protection & Root Pruning**

- 13.14.1 Excavations and root pruning within the TPZ must be supervised by the Project Arborist and should be avoided where possible.
- 13.14.2 No over-excavation, battering, or benching should be undertaken beyond the footprint of any structure unless approved by the Project Arborist. Hand excavation and root pruning along the excavation line should be completed prior to the commencement of mechanical excavation to prevent tearing and shattering damage to the roots.
- 13.14.3 Roots >25mmØ should be pruned by the Project Arborist only. Roots <25mmØ may be pruned by the Principal Contractor. Root pruning should be undertaken with clean, sharp secateurs or a pruning saw to ensure a smooth wound face, free from tears.
- 13.14.4 Damaged roots should be pruned behind the damaged tissues with the final cut made to the undamaged part of the root.

14.0 APPENDIX 9 | PLATES



a) Showing site from Bettington Road. b) Showing Tree 8. c) Showing Tree 7. d) Showing the tree group along Bettington Road. e-f) Showing Tree 26. f) Showing recent works within the SRZ of Tree 26.



g) Showing Tree 27. h) Showing Tree group 29. i) Showing Trees 27, 28 & 8. j) Showing Trees 32-34. k) Showing Trees 36-45. l) Showing Tree 45 and the branch extending 7m into the site.

15.0 APPENDIX 10 | LIMITATIONS & DISCLAIMERS

- 15.1 Subject trees were assessed from the ground only and for providing an Arboricultural Impact Assessment and Tree Protection Specification.
- 15.2 All recommendations in this Arboricultural Impact Assessment and Tree Protection Specification report are based on the observations made on the day of inspection (1.10.21). There is no warranty, expressed or implied, that problems or deficiencies relating to the subject trees, or the subject site may not arise in the future.
- 15.3 Laurence & Co Consultancy takes care to obtain information from reliable sources. However, Laurence & Co Consultancy can neither guarantee nor be responsible for the accuracy of information provided by others. Plans, diagrams, graphs and photographs in this Arboricultural Impact Assessment and Tree Protection Specification report are visual aids only and are not necessarily to scale. This report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction/ecological/heritage etc. issues.
- 15.4 This report has been prepared for exclusive use by the client. This report should not be viewed by others or for any other reason outside its intended target or without the prior written consent of Laurence & Co Consultancy. Unauthorised alteration or separate use of any section of the report invalidates the report.
- 15.5 Many factors may contribute to tree failure and cannot always be predicted. Laurence & Co Consultancy takes care to accurately assess tree health and structural condition. However, a tree's internal structural condition may not always correlate to visible external indicators.
- 15.6 **Limitation of Liability.** Laurence & Co Consultancy shall be liable only for direct damages that result from negligence or wilful misconduct in the performance of its services. Under no circumstances shall Laurence & Co Consultancy be liable for indirect, consequential, special, or punitive damages, or for damages caused by the client's failure to perform its obligations under law or contract. Laurence & Co Consultancy shall not be liable for and Client shall indemnify Laurence & Co Consultancy from and against all claims, demands, liabilities and costs (including attorneys' and expert fees) arising out of or in any way related to our performance or non-performance of services, including all on-site activities except to the extent caused by Laurence & Co Consultancy's negligence or wilful misconduct. In no event shall Laurence & Co Consultancy's liability exceed the amount paid to Laurence & Co Consultancy by the Client for our professional services (net of reimbursable expenses) and Client specifically releases Laurence & Co Consultancy for any damages, claims, liabilities and costs in excess of that amount.
- 15.7 Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this report are subject to approval from the relevant Consent Authority.