

Appendix 7

Arborist Report

Laurence & Co.



CONSULTANCY
ARBORICULTURE
PLANT PATHOLOGY

ARBORICULTURAL IMPACT ASSESSMENT
&
TREE PROTECTION SPECIFICATION

REF: L&Co2021021 | 10 May 2022 | v.1.2

SITE ADDRESS | 22,24,26,28,30, 32, 34 Berry Road, 21, 23, 25, 27, 29 & 31 Holdsworth Avenue and 42,
44 & 46 River Road, St Leonards

PREPARED FOR | Greaton Development

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1.0	EXECUTIVE SUMMARY 	2
2.0	INTRODUCTION 	3
3.0	RESULTS 	3
4.0	ARBORICULTURAL IMPACT ASSESSMENT 	4
5.0	REFERENCES 	9
6.0	APPENDIX 1 METHODOLOGY	10
7.0	APPENDIX 2 TREE ASSESSMENT SCHEDULE	14
8.0	APPENDIX 3 TREE LOCATION PLAN	29
9.0	APPENDIX 4 PROPOSED DEVELOPMENT PLANS	30
10.0	APPENDIX 5 ARBORICULTURAL IMPACT ASSESSMENT PLANS	38
11.0	APPENDIX 6 TREE PROTECTION PLAN	40
12.0	APPENDIX 7 TYPICAL TREE PROTECTION DETAIL	41
13.0	APPENDIX 8 TREE PROTECTION SPECIFICATION	44
14.0	APPENDIX 9 PLATES	47
15.0	APPENDIX 10 PRUNING SPECIFICATION	50
16.0	APPENDIX 11 LIMITATIONS & DISCLAIMERS	53

1.0 EXECUTIVE SUMMARY |

- 1.1 The proposal, outlined in the supplied plans, shows the demolition of the existing residences and construction of five apartment towers with a basement parking lot underneath a central 'Green Spine' section at 22, 24, 26, 28, 30, 32 & 34 Berry Road, 21, 23, 25, 27, 29 & 31 Holdsworth Avenue and 42, 44 & 46 River Road, St Leonards. The plans also show two proposed pocket parks, one on Berry Road, the other on Holdsworth Avenue.
- 1.2 A total of one-hundred and thirty-one (131) trees were assessed that were a mix of Australian native and exotic species.
- 1.3 The supplied plans show no works are proposed within the TPZs of Trees 1, 2, 3, 9-18, 25, 33, 34, 39, 56, 57, 129, 130 & 131. However, the tree protection measures outlined in this report should be implemented to avoid indirect impacts.
- 1.4 The proposed works represent a *Minor Encroachment* (as defined by AS4970) on Tree 26. However, 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 Tree 26.
- 1.5 The proposed works are within the TPZs &/or SRZs of Trees 4, 36, 37 & 38 and represent a *Major Encroachment* (as defined by AS4970). However, negative impacts can be avoided if the tree sensitive construction methods and protection measures outlined in this report are carefully implemented and be acceptable under the Australian Standard AS4970, Clause 3.3.4.
- 1.6 The crowns of Trees 4, 36 & 38 are likely to be impacted by the proposed apartment blocks. The branches should be retained where possible, but a Pruning Specification is provided if this is not achievable.
- 1.7 Trees 5-8, 19-24, 27-32, 35, 40-42, 44-55, 58-128 are either within the proposed building footprint or represented a Major TPZ encroachment and will need to be removed. This was based on a consideration of their health, structure, and the size of the encroachment. These trees were mostly assigned Insignificant, Low or Moderate Landscape Significance Values except for Tree 77, which was assigned a High Landscape Significance Value. Trees 5, 7, 19, 24, 35 & 55 were street trees and managed by Council. These trees were in fair physiological with a short to medium ULE and there is an opportunity for removal and replacement with healthy advanced size specimens of species with higher amenity and ecological value as part of this proposal.
- 1.8 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 Report and Tree Protection Specification was prepared for Greateon Development in relation to the proposed development of 22, 24, 26, 28, 30, 32, 34 Berry Road, 21, 23, 25, 27, 29 & 31 Holdsworth Avenue and 42, 44 & 46 River Road, St Leonards. This report has determined the impact of the proposed works on the trees at 22, 24, 26, 28, 30, 32, 34 Berry Road, 21, 23, 25, 27, 29 & 31 Holdsworth Avenue and 42, 44 & 46 River Road, St Leonards and neighbouring properties and where appropriate, has provided tree sensitive construction methods to minimise negative impacts to the trees.
- 2.1.2 In preparing this report, the author is aware of and has considered the objectives of the Lane Cove Council's *Lane Cove Development Control Plan Part J.2. Tree preservation and Landscape Guidelines (2010)*, *Lane Cove Local Environmental Plan 2009*, *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)*.
- 2.1.3 The tree data was divided into two (2) sections according to the outcome of the preliminary proposal and the tree locations. The two (2) sections were designated *Trees Located Within the Site* and *Trees Located Outside of the Site*.
- 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):

- Elevation South Rev. F. Dwg. No. A0202. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Elevation North Rev. F. Dwg. No. A0200. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Elevation East Rev. F. Dwg. No. A0201. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Elevation West Rev. F. Dwg. No. A0203. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Green Spine West Elevation Rev. E. Dwg. No. A0204. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Green Spine East Elevation Rev. E. Dwg. No. A0205. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Ground Floor Plan Rev. K. Dwg. No. A0100. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Demolition Plan Rev J. DWG A0033. Prepared by Koichi Takada Architects. Dated 29.04.2022.
- Arborist Survey Overlay Rev. A. Dwg. No. SK100. Prepared by Koichi Takada Architects. Dated 21.03.2020.

2.2 The Proposal

- 2.2.1 The supplied plans show the demolition of the existing residences and construction of five apartment towers with a basement parking lot underneath a central 'Green Spine' section at 22, 24, 26, 28, 30, 32 & 34 Berry Road, 21, 23, 25, 27, 29 & 31 Holdsworth Avenue and 42, 44 & 46 River Road, St Leonards. The plans also show two proposed pocket parks, one on Berry Road, the other on Holdsworth Avenue.

3.0 RESULTS |

3.1 The Site

- 3.1.1 The site is a complex shaped block consisting of suburban dwellings with a total area stated in the plans as 7643m². The site has a slight fall from north to south with a cliff and sharp fall at the end of Berry and Holdsworth Avenue towards River Road.
- 3.1.2 The site is bounded by Berry Road to the northwest, Holdsworth Avenue to the southeast, River Road to the south and residential properties to the north.

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 one-hundred and thirty-one (131) 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 in April 2022. 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 6, 8, 20, 21, 22, 23, 28, 29, 31, 40, 41, 44, 45, 46, 47, 48, 49, 50, 52, 53, 58, 59, 60, 62, 63, 64, 68, 70, 71, 72, 73, 74, 75, 76, 79, 80, 81, 83, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 101, 103, 104, 105, 106, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127 & 128 were within the site boundary and are covered by the Council's tree management controls.
- 3.2.7 Trees 10, 27, 32, 43, 54, 61, 65, 66, 69, 78, 86 & 107 are exempt from the Council's tree management controls based on dimensions and/or species.
- 3.2.8 Trees 56 & 57 were located on adjacent properties. All trees located on adjacent properties were allocated a Retention Value of *Priority for Retention*.
- 3.2.9 Trees 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 25, 26, 32, 33, 34, 35, 36, 37, 38, 39, 55, 56, 57, 129, 130 & 131 are street trees and are managed by the Council.

4.0 ARBORICULTURAL IMPACT ASSESSMENT |

4.1 Trees Located Within the Site

- 4.2 **Trees 6, 8, 20, 21, 22, 23, 27, 28, 29, 31, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 58, 59, 60, 61, 62, 63, 64, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76, 78, 79, 80, 81, 83, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127 & 128.**
- 4.2.1 Trees 6, 8, 20, 21, 22, 23, 27, 28, 29, 31, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 58, 59, 60, 61, 62, 63, 64, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76, 78, 79, 80, 81, 83, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127 & 128 were identified as *Magnolia denudata* (Yulan Magnolia), *Lagerstroemia indica* (Crepe Myrtle), *Pittosporum undulatum* (Native Daphne), *Melaleuca quinquenervia* (Broad Leaved Paperbark), *Syncarpia glomulifera* (Turpentine), *Eucalyptus pilularis* (Blackbutt), *Olea europea* subsp. *cuspidata* (African Olive), *Cupressus macrocarpa* (Monterey Cypress), *Cupressus cashmeriana* (Bhutan cypress), *Pittosporum undulatum* (Native Daphne), *Camellia sasanqua* (Camellia), *Angophora costata* (Sydney Red Gum), *Callistemon viminalis* (Weeping Bottlebrush), *Mangifera indica* (Mango), *Murraya paniculata* (Mock Orange), *Cupressocyparis leylandii* 'Leighton Green' (Leyland Cypress), *Eriobotrya japonica* (Loquat tree), *Magnolia grandiflora* 'Little Gem' (Magnolia), *Murraya paniculata* (Mock Orange), *Camellia sasanqua* (Camellia), *Elaeocarpus reticulatus* (Blueberry Ash), *Camellia sasanqua* (Camellia), *Grevillea* sp. 'Moonlight', *Leptospermum laevigatum* (Coastal Tea Tree), *Camellia sasanqua* (Camellia), *Metrosideros excelsa* (New Zealand Christmas Tree), *Dicksonia* sp. (Tree Fern), *Syagrus romanzoffianum* (Cocos Palm), *Crataegus monogina* (Hawthorn), *Olea europea* subsp. *cuspidata* (African Olive), *Pittosporum undulatum* (Native Daphne), *Citrus* sp. (Citrus Tree), *Crataegus monogina* (Hawthorn), *Cupressus sempervirens* (Italian Cypress), *Archontophoenix cunninghamiana* (Bangalow Palm), *Cupressocyparis leylandii* 'Leighton Green' (Leyland Cypress), *Camellia sasanqua* (Camellia), *Ligustrum lucidum* (Large Leaf Privet), *Archontophoenix cunninghamiana* (Bangalow Palm), *Celtis australis* (Hackberry), *Plumeria acutifolia* (Frangipani), *Corymbia maculata* (Spotted Gum), *Ligustrum lucidum* (Large Leaf Privet), *Metrosideros excelsa* (New Zealand Christmas Tree), *Camellia sasanqua* (Camellia), *Glochidion ferdinandi* (Cheese Tree), *Jacaranda mimosifolia* (Jacaranda), *Rhododendron arboreum* (Rhododendron), *Cupressus macrocarpa* (Monterey Cypress), *Ulmus parvifolia* (Chinese Weeping Elm), *Cinnamomum camphora* (Camphor Laurel), *Cupressus cashmeriana* (Bhutan cypress), *Cupressus macrocarpa* (Monterey Cypress), *Camellia sasanqua* (Camellia), *Celtis australis* (Hackberry), *Rhododendron arboreum* (Rhododendron), *Glochidion ferdinandi* (Cheese Tree), *Celtis australis* (Hackberry), *Murraya paniculata* (Mock Orange), *Camellia sasanqua* (Camellia), *Phoenix canariensis* (Canary Island Date Palm), *Schefflera actinophylla* (Queensland Umbrella Tree), *Celtis australis* (Hackberry), *Pittosporum tenuifolium* (Kohuhu), *Celtis australis* (Hackberry), *Phoenix canariensis* (Canary Island Date Palm), *Ligustrum lucidum* (Large Leaf Privet), *Camellia sasanqua* (Camellia), *Ligustrum lucidum* (Large Leaf Privet), *Pittosporum tenuifolium* (Kohuhu), *Cinnamomum camphora* (Camphor Laurel),

Lagerstroemia indica (Crepe Myrtle), *Magnolia grandiflora* (Bull Bay Magnolia), *Persea americana* (Avocado), *Camellia sasanqua* (Camellia), *Cyathea australis* (Rough Tree Fern), *Magnolia denudata* (Yulan Magnolia), and *Cyathea australis* (Rough Tree Fern), respectively, and were allocated Low and Insignificant Landscape Significance Values and Retention Values of *Consider for Removal* or *Priority for Removal*.

- 4.2.2 Tree 43 had been removed and Tree 50 was dead. Trees 54 & 61 are exempt from the Council's Tree Management based on dimensions and can be removed without Council consent. Trees 27, 43, 65, 66, 69, 78, 86 & 107 are exempt from the Council's Tree Management based on species and can be removed without Council consent.
- 4.2.3 The supplied plans show that these Trees are within the footprint of the proposed apartment towers, basement parking and associated landscaping and will need to be removed.
- 4.2.4 Removal and replacement with healthy advanced size specimens would replace the loss of amenity within a short to medium timeframe.
- 4.2.5 Refer to Appendix 5 for further details.
- 4.3 **Trees 42, 51, 67, 82, 84, 85, 99, 102, 111 & 121**
- 4.3.1 Trees 42, 51, 67, 82, 84, 85, 99, 102, 111 & 121 were identified as *Syncarpia glomulifera* (Turpentine), *Jacaranda mimosifolia* (Jacaranda), *Syzygium leuhmannii* (Small Leaved Lilly Pilly), *Corymbia maculata* (Spotted Gum), *Araucaria columnaris* (Cook Island Pine), *Liquidamber styraciflua* (Liquidamber), *Glochidion ferdinandi* (Cheese Tree), *Cinnamomum camphora* (Camphor Laurel) and *Magnolia grandiflora* (Bull Bay Magnolia), respectively, and were allocated Moderate Landscape Significance Values and Retention Values of *Consider for Retention*, excepting Tree 111, which was assigned *Priority for Removal*.
- 4.3.2 The supplied plans show that Trees 42, 51, 67, 82, 84, 85, 99, 102, 111 & 121 are within the footprint of the proposed apartment towers, basement parking and associated landscaping and will need to be removed.
- 4.3.3 Removal and replacement with healthy advanced size specimens would replace the loss of amenity within a short to medium timeframe.
- 4.3.4 Refer to Appendix 5 for further details.
- 4.4 **Tree 77**
- 4.4.1 Tree 77 was identified as *Quercus robur* (English Oak) and was allocated a High Landscape Significance Value and a Retention Value of *Priority for Retention*.
- 4.4.2 The supplied plans show that Tree 77 is within the footprint of the proposed apartment towers, basement parking and associated landscaping and will need to be removed.
- 4.4.3 Removal and replacement with a healthy advanced size specimen would replace the loss of amenity within a long timeframe.
- 4.4.4 Refer to Appendix 5 for further details.
- 4.5 **Tree 30**
- 4.5.1 Tree 30 was identified as *Ulmus parvifolia* (Chinese Weeping Elm) and was allocated a Moderate Landscape Significance Value and a Retention Value of *Consider for Retention*.
- 4.5.1 The supplied plans show the proposed landscaping and footpath are within the SRZ of Tree 30. 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. The overall TPZ encroachment was estimated to be 55.5% and also represents a *Major Encroachment* as defined by AS-4970.
- 4.5.2 Given the size and location of the encroachment, the long term structural and physiological viability of Tree 30 is highly likely to be compromised by the proposed encroachment and the tree will need to be removed to accommodate the works.
- 4.5.3 Removal and replacement with a healthy advanced size specimen would replace the loss of amenity within a medium timeframe.
- 4.5.4 Refer to Appendix 5, 6 & 7 for further detail.

4.6 Trees Located Outside of the Site

4.7 Trees 1, 2, 3, 9-18, 25, 33, 34, 39, 56, 57 & 129-131.

4.7.1 Trees 1, 2, 3, 9-18, 25, 33, 34, 39, 56, 57 & 129-131 were identified as *Callistemon viminalis* (Weeping Bottlebrush), *Podocarpus elatus* (Brown Pine), *Callistemon viminalis* (Weeping Bottlebrush), *Jacaranda mimosifolia* (Jacaranda), *Callistemon viminalis* (Weeping Bottlebrush), *Corymbia citriodora* (Lemon Scented Gum), *Grevillea robusta* (Silky Oak), *Syncarpia glomulifera* (Turpentine), *Celtis australis* (Hackberry), *Eucalyptus botryoides* (Bangalay), *Tristaniaopsis laurina* (Water gum), *Callistemon viminalis* (Weeping Bottlebrush), *Glochidion ferdinandi* (Cheese Tree), *Citharexylum spinosum* (Fiddlewood Tree), *Michelia figo* (Port Wine Magnolia) and *Podocarpus elatus* (Brown Pine), respectively, and were allocated adjusted Retention Values of *Priority for Retention*, given they were located outside of the site.

4.7.2 The supplied plans show no works are proposed within the TPZs of Trees 1, 2, 3, 9-18, 25, 33, 34, 39, 56, 57 & 129-131. However, TPZ fencing, and trunk protection should be installed prior to any site works (including demolition) and remain in place for the duration of the demolition and construction of the new apartments. Materials, waste storage and temporary services should not be located within the TPZ fenced area. If works are required within the TPZ fenced area, then they should be supervised by the Project Arborist.

4.7.3 The tree protection measures must be inspected by the Project Arborist prior to the start prior of site works, including demolition.

4.7.4 Refer to Appendices 5, 6 & 7 for further details.

4.8 Tree 35

4.9 Tree 35 was identified as *Lophostemon confertus* (Brush Box) and was allocated an adjusted Retention Value of *Priority for Retention*, given it was located outside of the site.

4.10 The supplied plans show that Tree 35 is within the footprint of the proposed Holdsworth Avenue vehicle entry and will need to be removed.

4.10.1 Removal and replacement with a healthy advanced size specimen would replace the loss of amenity within a medium timeframe.

4.10.2 Refer to Appendix 5 for further details.

4.11 Tree 26

4.11.1 Tree 26 was identified as *Casuarina cunninghamiana* (River She Oak) and was allocated an adjusted Retention Value of *Priority for Retention*, given it was located outside of the site.

4.11.2 The supplied plans show the proposed landscaping is within the TPZ of Tree 26. The proposed TPZ encroachment is approximately 3.6%, which represents a *Minor Encroachment* as defined by AS4970 and is considered acceptable by the standard when it is compensated for elsewhere and contiguous within the TPZ, as in the current case. Given the size of the encroachment, the proposed development can be accommodated without affecting the long term structural and physiological viability of Tree 26 if the following tree sensitive construction methods and protection measures are carefully implemented under the supervision of the Project Arborist.

4.11.3 All landscaping treatments should be installed at or above the existing grade.

4.11.4 Refer to Appendices 5, 6 & 7 for further details.

4.12 Trees 36-38

4.12.1 Trees 36-38 were identified as *Lophostemon confertus* (Brush Box) and were allocated adjusted Retention Values of *Priority for Retention*, given they were located outside of the site.

4.12.2 The supplied plans show the proposed apartment building and associated landscaping with paving is within the TPZs of Trees 36-38. The overall TPZ encroachment was estimated to be 19.3%, 16.2% and 27.3%, respectively, which 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 and/or the presence of existing or past structures are likely to have been obstacles to root growth into the area of encroachment.

4.12.3 The property boundaries have existing stone or masonry retaining walls that are likely to have restricted root growth into the proposed encroachment area reducing negative impacts to Trees 36-38.

4.12.4 Given the good physiological condition of the trees and the presence of existing structures, the proposed development can be accommodated and is considered acceptable under Clause 3.3.4 of AS-4970. However, given the size of encroachment the proposal represents a significant risk to the tree's long term structural and physiological viability and therefore the following tree sensitive construction methods and protection measures must be carefully implemented under the supervision of the Project Arborist. Significant departures from the detailed tree sensitive construction methods and protection measures are likely to result in a shortened ULE and/or tree removal.

- 4.12.5 The crown of Tree 36 is in conflict with the proposed extension and one 1st order and one third order branch would need to be removed as part of the proposal. It is estimated that these branches together represent approximately 10% of the total crown volume.
- 4.12.6 The crown of Tree 38 is in conflict with the proposed extension and one large diameter 2nd order branch would need to be removed as part of the proposal. It is estimated that these branches together represent approximately 12-14% of the total crown volume. The pruning is not in accordance the Australian Standard 4373 and should be avoided where possible and the branch retained.
- 4.12.7 Pruning 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. Pruning 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.
- 4.12.8 Refer to the provided pruning specification for further information (Appendix 10).
- 4.12.9 TPZ fencing and trunk protection should be installed prior to any site works (including demolition) and remain in place for the duration of the demolition and construction of the new apartments. Materials, waste storage and temporary services should not be located within the TPZ fenced area. If works are required within the TPZ fenced area, then they should be supervised by the Project Arborist.
- 4.12.10 The tree protection measures must be inspected by the Project Arborist prior to the start prior of site works, including demolition.
- 4.12.11 If a crane is required, then a spotter must be used for crane works within and adjacent to the TPZ areas. The crane must not contact the tree's trunk, branches or crown, and a minimum crown clearance of 2m should be maintained at all times.
- 4.12.12 A spotter must be used for crane works within and adjacent to the TPZ areas. The crane must not contact the tree's trunk, branches or crown, and a minimum crown clearance of 2m should be maintained at all times.
- 4.12.13 Any landscaping works should be completed after the main demolition and incorporate the existing masonry wall. All landscaping plantings must be tube stock in the TPZ of Tree 4.
- 4.12.14 Refer to Appendices 5, 6 & 7 for further details.
- 4.13 **Tree 4**
- 4.13.1 Tree 4 was a street tree identified as *Melaleuca quinquenervia* (Broad Leaved Paperbark) and was allocated a High Landscape significance value. Tree 4 was one of the highest value trees assessed. The tree was in good physiological condition.
- 4.13.2 The supplied plans show the proposed apartment buildings and landscaping is within the SRZs of Tree 4. However, details on the extent of works in the TPZ of Tree 4 were not provided. 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. The overall TPZ encroachment was estimated to be 34.8% and also 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.
- 4.13.3 The property boundary has an existing masonry retaining wall that is likely to have restricted root growth into the proposed encroachment area reducing negative impacts to Tree 4.
- 4.13.4 Given the good physiological condition of the trees and the presence of existing structures, the proposed development can be accommodated and is considered acceptable under Clause 3.3.4 of AS-4970. However, given the size of encroachment the proposal represents a significant risk to the tree's long term structural and physiological viability and therefore the following tree sensitive construction methods and protection measures must be carefully implemented under the supervision of the Project Arborist. Significant departures from the detailed tree sensitive construction methods and protection measures are likely to result in a shortened ULE and/or tree removal.
- 4.13.5 The crown of Tree 4 is in conflict with the proposed extension and two second order branches would need to be removed as part of the proposal. It is estimated that these branches together represent approximately 10% of the total crown volume.
- 4.13.6 Pruning 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. Pruning 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.
- 4.13.7 Refer to the provided pruning specification for further information (Appendix 10).

- 4.13.8 TPZ fencing and trunk protection should be installed prior to any site works (including demolition) and remain in place for the duration of the demolition and construction of the apartments. Materials, waste storage and temporary services should not be located within the TPZ fenced area. If works are required within the TPZ fenced area, then they should be supervised by the Project Arborist.
- 4.13.9 All works within the TPZ should be at or above (<100mm) the existing grade (including sub-base materials) and detailed drawings must be assessed by the Project Arborist prior to works starting.
- 4.13.10 If a crane is required, then a spotter must be used for crane works within and adjacent to the TPZ areas. The crane must not contact the tree's trunk, branches or crown, and a minimum crown clearance of 2m should be maintained at all times.
- 4.13.11 A spotter must be used for crane works within and adjacent to the TPZ areas. The crane must not contact the tree's trunk, branches or crown, and a minimum crown clearance of 2m should be maintained at all times.
- 4.13.12 Any landscaping works should be completed after the main demolition and incorporate the existing masonry wall. All landscaping plantings must be tube stock in the TPZ of Tree 4.
- 4.13.13 Refer to Appendices 5, 6 & 7 for further details.
- 4.14 **Trees 5, 7, 19, 24, 32 & 55**
- 4.14.1 Trees 5, 7, 19, 24, 32 & 55 were identified as *Podocarpus elatus* (Brown Pine), *Pittosporum undulatum* (Native Daphne), *Corymbia maculata* (Spotted Gum), *Cupressus* sp. (Cypress Pine) and *Magnolia denudata* (Yulan Magnolia), respectively, and were allocated adjusted Retention Values of *Priority for Retention*, given they were located outside of the site and street trees.
- 4.14.2 The supplied plans show the proposed apartment buildings and landscaping is within the SRZs of Trees 4, 5, 7, 19, 24, 32 & 55. 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. The overall TPZ encroachments were estimated to be 34.8%, 32.6%, 21.8%, 24.7%, 36.7%, 35.0% and 37.2%, respectively and also represents a *Major Encroachment* as defined by AS-4970.
- 4.14.3 Given the fair physiological condition and the size of the encroachment, Trees 5, 7, 19, 24, 32 & 55 will need to be removed to accommodate the proposal.
- 4.14.4 These trees were in fair physiological with a short to medium ULE and there is an opportunity for removal and replacement with healthy advanced size specimens of species with higher amenity and ecological value as part of this proposal.
- 4.14.5 Refer to Appendix 5, 6 & 7 for further detail.
- 4.15 **Pruning, Removal & Replacement Planting**
- 4.15.1 Pruning and 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. Pruning and 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.
- 4.15.2 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.
- 4.15.3 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 between 22.10.2020, 10.11.21. 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 Preliminary Arboricultural 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>Callistemon viminalis</i> (Weeping Bottlebrush)	6	4	270	3	33	2.0	Good	Poor	Mature	5-15	Low	Consider for Removal	Pruned/lopped for powerline clearance. Co-dominant inclusions, major. Wound(s), early signs of decay. Structures within SRZ.	No Encroachment
2	<i>Podocarpus elatus</i> (Brown Pine)	4	3	236	3	25	1.9	Fair	Poor	Mature	<5	Low	Priority for Removal	Crown density 25-50%. Crown consists mainly of epicormic growth. Pruned/lopped for powerline clearance. Structures within SRZ.	No Encroachment
3	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	4	4	246	3	27	1.9	Fair	Poor	Mature	5-15	Low	Consider for Removal	Crown density 50-75%. Pruned/lopped for powerline clearance. Co-dominant inclusions, major.	No Encroachment
4	<i>Melaleuca quinquenervia</i> (Broad Leaved Paperbark)	15	7	781	9	276	3.1	Good	Good	Mature	15-40	High	Priority for Retention	Crown extends into site 6m at 5m. Crown density 75-95%. Small (<25mmØ) & medium (25-75mmØ) epicormic growth in low volumes. Co-dominant inclusions, minor. Structures within SRZ.	34.8% (Within SRZ)
5	<i>Podocarpus elatus</i> (Brown Pine)	14	5	650	8	191	2.9	Good	Fair	Mature	5-15	Moderate	Consider for Retention		32.6% (Within SRZ)
6	<i>Magnolia denudata</i> (Yulan Magnolia)	7	5	375	5	64	2.3	Good		Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
7	<i>Podocarpus elatus</i> (Brown Pine)	14	5	445	5	90	2.5	Fair	Fair	Late Mature	5-15	Low	Priority for Retention	Crown 4m into site. Crown density 50-75%. Small (<25mmØ) & medium (25-75mmØ) epicormic growth in moderate volumes. Pruned/lopped for powerline clearance. Co-dominant inclusions, minor. Structures within SRZ. Phototropic lean, slight.	21.8% (Within SRZ)

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 (%)
8	<i>Lagerstroemia indica</i> (Crepe Myrtle)	8	4	400	5	72	2.3	Fair	Fair	Mature	5-15	Low	Consider for Removal	Crossing branches. Localised crown death. Crown density 50-75%. Small (<25mmØ) epicormic growth in moderate volumes. Wound(s), advanced stages of decay.	Within Development Footprint
9	<i>Jacaranda mimosifolia</i> (Jacaranda)	12	7	600	7	163	2.8	Dormant. No rating.	Good	Mature	15-40	High	Priority for Retention		No Encroachment
10	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	3	2	112	2	13	1.5						Priority for Retention		No Encroachment
11	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	6	4	175	2	14	1.7						Priority for Retention		No Encroachment
12	<i>Corymbia citriodora</i> (Lemon Scented Gum)	18	6	400	5	72	2.3	Good	Good	Mature	15-40	High	Priority for Retention		No Encroachment
13	<i>Grevillea robusta</i> (Silky Oak)	20	4	500	6	113	2.6						Priority for Retention		No Encroachment
14	<i>Syncarpia glomulifera</i> (Turpentine)	12	4	200	2	18	1.8						Priority for Retention		No Encroachment
15	<i>Syncarpia glomulifera</i> (Turpentine)	12	4	225	3	23	1.8						Priority for Retention		No Encroachment
16	<i>Syncarpia glomulifera</i> (Turpentine)	12	4	275	3	34	2.0						Priority for Retention		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 (%)
17	<i>Syncarpia glomulifera</i> (Turpentine)	12	4	300	4	41	2.1						Priority for Retention		No Encroachment
18	<i>Celtis australis</i> (Hackberry)	7	4	225	3	23	1.8						Priority for Retention		No Encroachment
19	<i>Pittosporum undulatum</i> (Native Daphne)	4	1	75	2	13	1.5						Priority for Retention		24.7% (Within SRZ)
20	<i>Pittosporum undulatum</i> (Native Daphne)	5	2	71	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Partially suppressed. Structures within SRZ.	Within Development Footprint
21	<i>Melaleuca quinquenervia</i> (Broad Leaved Paperbark)	11	2	300	4	41	2.1	Fair	Good	Late Mature	5-15	Low	Consider for Removal	Crown density 25-50%. Heavily suppressed. Structures within SRZ.	Within Development Footprint
22	<i>Syncarpia glomulifera</i> (Turpentine)	8	3	150	2	13	1.6	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Partially suppressed. Restricted soil volume.	Within Development Footprint
23	<i>Eucalyptus pilularis</i> (Blackbutt)	9	5	250	3	28	1.9	Poor	No access to base. No rating.	Senescent	<5	Low	Priority for Removal	Localised crown death. Crown density 0-25%. Partially suppressed. Wound(s), no visible sign of decay.	Within Development Footprint
24	<i>Corymbia maculata</i> (Spotted Gum)	9	2	175	2	14	1.7	Poor	Good	Semi-mature	<5	Low	Priority for Retention		36.7% (Within SRZ)
25	<i>Eucalyptus botryoides</i> (Bangalay)	7	5	200	2	18	1.8						Priority for Retention		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 (%)
26	<i>Casuarina cunninghamiana</i> (River She Oak)	12	6	375	5	64	2.3						Priority for Retention		3.6%
27	<i>Olea europea subsp. cuspidata</i> (African Olive)	8	6	214	3	21	1.8	Good	Poor	Mature	5-15	Insignificant	Priority for Removal	Wound(s), early signs of decay. Phototrophic lean, severe.	Within Development Footprint
28	<i>Cupressus macrocarpa</i> (Monterey Cypress)	14	4	375	5	64	2.3	Good	Fair	Mature	5-15	Low	Consider for Removal	DBH range 200 -375mm. Group of 8 trees. Vines. Crown density 75-95%. Partially suppressed. Phototrophic lean, slight.	Within Development Footprint
29	<i>Cupressus cashmeriana</i> (Bhutan cypress)	9	4	250	3	28	1.9	Fair	Good	Mature	5-15	Low	Consider for Removal	Crown density 50-75%. Structures within SRZ.	Within Development Footprint
30	<i>Ulmus parvifolia</i> (Chinese Weeping Elm)	18	9	600	7	163	2.8	Good	Good	Mature	15-40	Moderate	Consider for Retention	Small (<25mmØ), medium (25-75mmØ) & large (>75mmØ) deadwood in low volumes. Wound(s), no visible sign of decay. Limited crown clearance. Structures within SRZ.	55.5% (Within SRZ)
31	<i>Cupressus cashmeriana</i> (Bhutan cypress)	15	5	394	5	70	2.3	Fair	Poor	Mature	<5	Low	Priority for Removal	Localised crown death. Crown density 50-75%. Small (<25mmØ) & medium (25-75mmØ) deadwood in moderate volumes. Co-dominant inclusions, major. Limited crown clearance. Structures within SRZ.	Within Development Footprint
32	<i>Cupressus sp.</i> (Cypress Pine)	3	1	50	2	13	1.5						Priority for Retention		35.0% (Within SRZ)
33	<i>Tristaniaopsis laurina</i> (Water gum)	5	3	71	2	13	1.5						Priority for Retention		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 (%)
34	<i>Tristaniaopsis laurina</i> (Water gum)	6	4	177	2	14	1.7						Priority for Retention		No Encroachment
35	<i>Lophostemon confertus</i> (Brush Box)	9	6	400	5	72	2.3						Priority for Retention	Pruned/lopped for powerline clearance.	Within Development Footprint
36	<i>Lophostemon confertus</i> (Brush Box)	12	8	700	8	222	3.0						Priority for Retention	Crown into 3m into site.	19.3%
37	<i>Lophostemon confertus</i> (Brush Box)	8	6	600	7	163	2.8						Priority for Retention	Crown into 2m into site.	16.2%
38	<i>Lophostemon confertus</i> (Brush Box)	12	6	900	11	366	3.3						Priority for Retention	Crown 4m into site at 4m above grade.	27.3%
39	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	4	2	71	2	13	1.5						Priority for Retention		No Encroachment
40	<i>Pittosporum undulatum</i> (Native Daphne)	7	3	175	2	14	1.7	Fair	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Localised crown death. Crown density 50-75%. Small (<25mmØ) deadwood in moderate volumes. Structures within SRZ.	Within Development Footprint
41	<i>Camellia sasanqua</i> (Camellia)	4	2	100	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
42	<i>Syncarpia glomulifera</i> (Turpentine)	12	9	900	11	366	3.3	Fair	Good	Mature	15-40	Moderate	Consider for Retention	Crown density 75-95%. Small (<25mmØ) & medium (25-75mmØ) epicormic growth in moderate volumes. 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 (%)
43	<i>Removed</i>			N/A	N/A	N/A	N/A						N/A		Within Development Footprint
44	<i>Angophora costata</i> (Sydney Red Gum)	5	1	50	2	13	1.5	Poor	Fair	Senescent	<5	Low	<i>Priority for Removal</i>	Localised crown death. Crown density 0-25%.	Within Development Footprint
45	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	4	2	112	2	13	1.5	Fair	Fair	Mature	<5	Low	<i>Priority for Removal</i>	Small (<25mmØ) & large (>75mmØ) epicormic growth in high volumes. Limited crown clearance. Structures within SRZ.	Within Development Footprint
46	<i>Mangifera indica</i> (Mango)	4	3	375	5	64	2.3	Poor	Fair	Mature	<5	Low	<i>Priority for Removal</i>	Localised crown death. Crown density 25-50%. Co-dominant inclusions, major. Structures within SRZ.	Within Development Footprint
47	<i>Murraya paniculata</i> (Mock Orange)	5	2	300	4	41	2.1	Fair	Fair	Mature	<5	Low	<i>Priority for Removal</i>	Crown consists mainly of epicormic growth. Pruned/lopped for powerline clearance. Limited crown clearance. Structures within SRZ.	Within Development Footprint
48	<i>Cupressocyparis leylandii</i> 'Leighton Green' (Leyland Cypress)	4	3	200	2	18	1.8	Fair	Fair	Mature	<5	Low	<i>Priority for Removal</i>	Group of 2 trees. Crown density 50-75%. Small (<25mmØ) & medium (25-75mmØ) deadwood in high volumes. Limited crown clearance. Structures within SRZ.	Within Development Footprint
49	<i>Eriobotrya japonica</i> (Loquat tree)	8	4	200	2	18	1.8	Good	Good	Mature	5-15	Low	<i>Consider for Removal</i>	Wound(s), early signs of decay.	Within Development Footprint
50	<i>Dead</i>			0	0	0	1.5								Within Development Footprint
51	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	7	400	5	72	2.3	Dormant. No rating.	No access to base. No rating.	Mature	5-15	Moderate	<i>Consider for Retention</i>	Wound(s), early signs of decay. Trunk cavity(s), major. 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 (%)
52	<i>Magnolia grandiflora</i> 'Little Gem' (Magnolia)	5	3	50	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
53	<i>Murraya paniculata</i> (Mock Orange)	5	2	300	4	41	2.1	Fair	Fair	Mature	<5	Low	Priority for Removal		Within Development Footprint
54	<i>Camellia sasanqua</i> (Camellia)	3	2	87	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
55	<i>Magnolia denudata</i> (Yulan Magnolia)	4	3	71	2	13	1.5						Priority for Retention		37.2% (Within SRZ)
56	<i>Glochidion ferdinandi</i> (Cheese Tree)	8	4	375	5	64	2.3						Priority for Retention		No Encroachment
57	<i>Citharexylum spinosum</i> (Fiddlewood Tree)	9	5	300	4	41	2.1						Priority for Retention		No Encroachment
58	<i>Elaeocarpus reticulatus</i> (Blueberry Ash)	9	3	200	2	18	1.8	Fair	Good	Mature	5-15	Low	Consider for Removal	Crown density 50-75%.	Within Development Footprint
59	<i>Camellia sasanqua</i> (Camellia)	5	4	350	4	55	2.2	Fair	No access to base. No rating.	Mature	<5	Low	Priority for Removal	Crown density 50-75%. Small (<25mmØ) deadwood in moderate volumes.	Within Development Footprint
60	<i>Grevillea</i> sp. 'Moonlight'	4	3	75	2	13	1.5	Fair	No access to base. No rating.	Mature	<5	Low	Priority for Removal	Crown density 50-75%. Small (<25mmØ) & medium (25-75mmØ) deadwood in high volumes.	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 (%)
61	<i>Leptospermum laevigatum</i> (Coastal Tea Tree)	3	2	50	2	13	1.5	Fair	No access to base. No rating.	Young	<5	Low	Priority for Removal	Structures within SRZ.	Within Development Footprint
62	<i>Camellia sasanqua</i> (Camellia)	5	3	71	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
63	<i>Metrosideros excelsa</i> (New Zealand Christmas Tree)	4	2	100	2	13	1.5	Good	No access to base. No rating.	Young	<5	Low	Priority for Removal	Structures within SRZ.	Within Development Footprint
64	<i>Dicksonia</i> sp. (Tree Fern)	6	2	75	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
65	<i>Syagrus romanzoffianum</i> (Cocos Palm)	11	4	200	2	18	1.8	Good	Good	Mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
66	<i>Syagrus romanzoffianum</i> (Cocos Palm)	11	4	200	2	18	1.8	Good	Good	Mature	5-15	Low	Consider for Removal		Within Development Footprint
67	<i>Syzygium leuhmannii</i> (Small Leaved Lilly Pilly)	10	4	225	3	23	1.8	Good	Fair	Mature	5-15	Moderate	Consider for Retention	Mechanical damage to exposed surface roots. Co-dominant inclusions, minor. Wound(s), no visible sign of decay. Trunk cavity(s), minor.	Within Development Footprint
68	<i>Crataegus monogina</i> (Hawthorn)	5	4	250	3	28	1.9	Fair	Poor	Senescent	<5	Low	Priority for Removal	Crossing branches. Crown density 25-50%. Localised crown death. Structures within SRZ.	Within Development Footprint
69	<i>Olea europea</i> subsp. <i>cuspidata</i> (African Olive)	11	5	400	5	72	2.3	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Small (<25mmø) & large (>75mmø) epicormic growth in moderate volumes. 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 (%)
70	<i>Pittosporum undulatum</i> (Native Daphne)	7	4	200	2	18	1.8	Good	Fair	Mature	<5	Low	Priority for Removal	Lopped with resultant epicormics. Wound(s), early signs of decay. Structures within SRZ.	Within Development Footprint
71	<i>Citrus sp.</i> (Citrus Tree)	4	2	200	2	18	1.8	Fair	No access to base. No rating.	Mature	<5	Low	Priority for Removal	Crown density 75-95%.	Within Development Footprint
72	<i>Crataegus monogina</i> (Hawthorn)	5	4	200	2	18	1.8	Fair	Fair	Mature	<5	Low	Priority for Removal	Group of 2 trees.	Within Development Footprint
73	<i>Cupressus sempervirens</i> (Italian Cypress)	5	1	75	2	13	1.5	Good	No access to base. No rating.	Semi-mature	<5	Low	Priority for Removal	Group of 4 trees.	Within Development Footprint
74	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	8	3	75	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Group of 2 trees.	Within Development Footprint
75	<i>Cupressocypariss leylandii</i> 'Leighton Green' (Leyland Cypress)	8	4	100	2	13	1.5	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Group of 3 trees. Structures within SRZ.	Within Development Footprint
76	<i>Camellia sasanqua</i> (Camellia)	4	2	50	2	13	1.5	Good	Good	Young	<5	Low	Priority for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
77	<i>Quercus robur</i> (English Oak)	22	9	800	10	290	3.1	Fair	Good	Late Mature	15-40	High	Priority for Retention	Crown density 75-95%. Small (<25mmØ) & medium (25-75mmØ) deadwood in moderate volumes. Small (<25mmØ) & medium (25-75mmØ) epicormic growth in moderate volumes.	Within Development Footprint
78	<i>Ligustrum lucidum</i> (Large Leaf Privet)	5	3	100	2	13	1.5	Fair	Fair	Young	<5	Insignificant	Priority for Removal		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 (%)
79	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	4	2	100	2	13	1.5	Good	Good	Semi-mature	5-15	Low	<i>Consider for Removal</i>	Group of 2 trees.	Within Development Footprint
80	<i>Celtis australis</i> (Hackberry)	4	3	50	2	13	1.5	Good	Good	Young	<5	Insignificant	<i>Priority for Removal</i>		Within Development Footprint
81	<i>Plumeria acutifolia</i> (Frangipani)	4	3	125	2	13	1.5	Good	Good	Mature	5-15	Low	<i>Consider for Removal</i>	Structures within SRZ.	Within Development Footprint
82	<i>Corymbia maculata</i> (Spotted Gum)	16	7	400	5	72	2.3	Good	Good	Mature	5-15	Moderate	<i>Consider for Retention</i>	Crown density 75-95%. Medium (25-75mmØ) deadwood in moderate volumes. Structures within SRZ. Phototrophic lean, moderate.	Within Development Footprint
83	<i>Corymbia maculata</i> (Spotted Gum)	10	5	175	2	14	1.7	Fair	Good	Semi-mature	5-15	Low	<i>Consider for Removal</i>	Trunk conflict. Crown density 50-75%. Partially suppressed. Structures within SRZ.	Within Development Footprint
84	<i>Araucaria columnaris</i> (Cook Island Pine)	15	4	400	5	72	2.3	Good	Good	Mature	5-15	Moderate	<i>Consider for Retention</i>	Small (<25mmØ) deadwood in low volumes. Structures within SRZ.	Within Development Footprint
85	<i>Araucaria columnaris</i> (Cook Island Pine)	15	4	400	5	72	2.3	Good	Good	Mature	5-15	Moderate	<i>Consider for Retention</i>		Within Development Footprint
86	<i>Ligustrum lucidum</i> (Large Leaf Privet)	4	3	150	2	13	1.6	Good	No access to base. No rating.	Semi-mature	5-15	Insignificant	<i>Priority for Removal</i>		Within Development Footprint
87	<i>Metrosideros excelsa</i> (New Zealand Christmas Tree)	5	3	350	4	55	2.2	Poor	No access to base. No rating.	Senescent	<5	Low	<i>Priority for Removal</i>	Crown density 25-50%. Small (<25mmØ) epicormic growth in high volumes.	Within Development Footprint

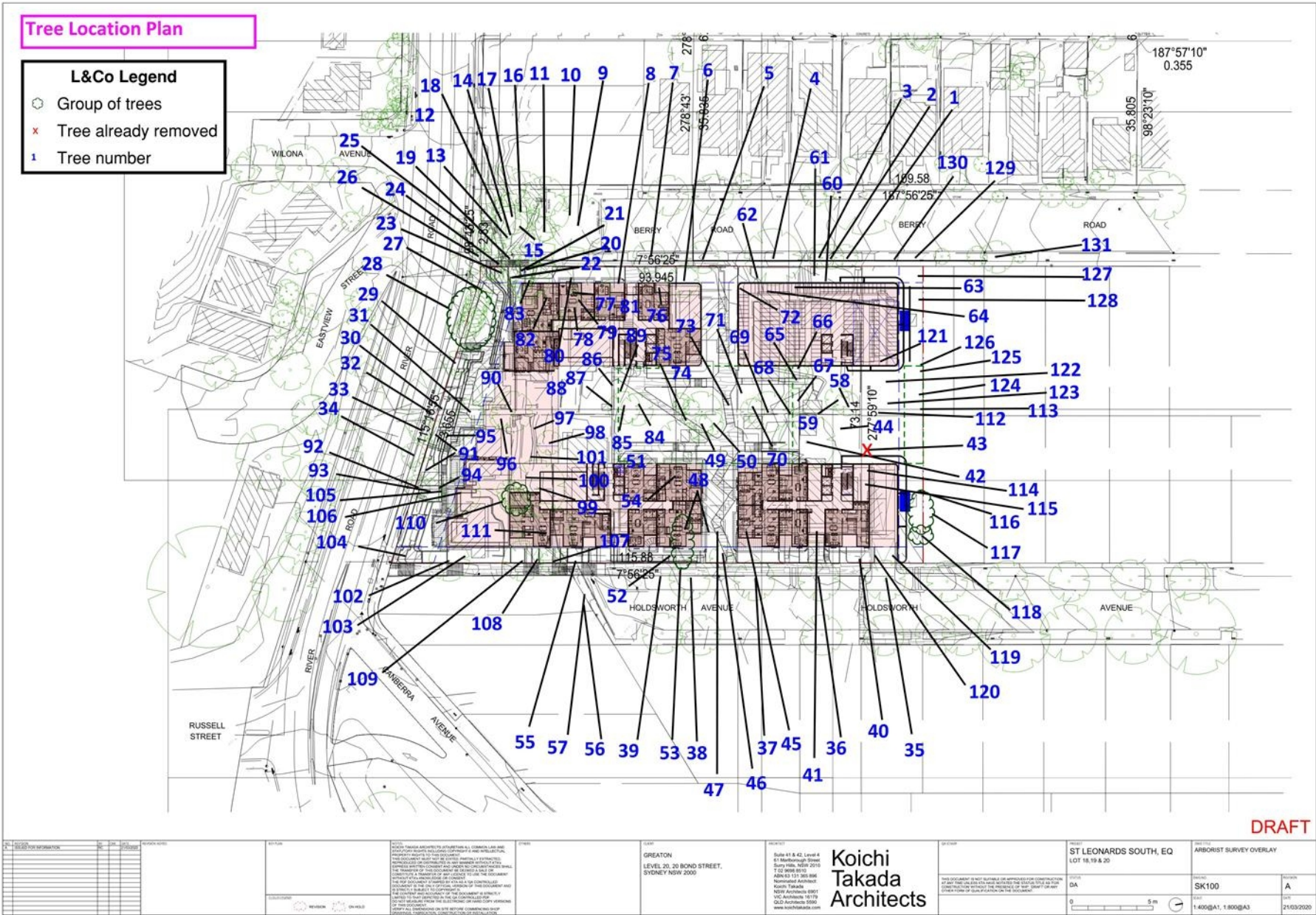
Tree No.	Species	Height (m)	Radial Crown Spread (m)	DBH comb. (mm)	Radial TPZ (m)	TPZ Area (m²)	Radial SRZ (m)	Health Rating	Structural Rating	Age Class	ULE (years)	L/Sign	Retention Value	Comments	TPZ Encroachment (%)
88	<i>Camellia sasanqua</i> (Camellia)	4	3	225	3	23	1.8	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
89	<i>Glochidion ferdinandi</i> (Cheese Tree)	4	3	50	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal		Within Development Footprint
90	<i>Jacaranda mimosifolia</i> (Jacaranda)	11	4	400	5	72	2.3	Dormant. No rating.	Good	Mature	5-15	Low	Consider for Removal	Structures within SRZ. Restricted soil volume.	Within Development Footprint
91	<i>Rhododendron arboreum</i> (Rhododendron)	5	2	71	2	13	1.5	Good	Fair	Mature	5-15	Low	Consider for Removal	Group of 2 trees. Crossing branches. Structures within SRZ.	Within Development Footprint
92	<i>Cupressus macrocarpa</i> (Monterey Cypress)	12	4	225	3	23	1.8	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Previously crown lifted. Structures within SRZ.	Within Development Footprint
93	<i>Ulmus parvifolia</i> (Chinese Weeping Elm)	8	3	71	2	13	1.5	Good	Fair	Semi-mature	5-15	Low	Consider for Removal	Crown density 75-95%. Co-dominant inclusions, minor. Structures within SRZ.	Within Development Footprint
94	<i>Cinnamomum camphora</i> (Camphor Laurel)	4	2	50	2	13	1.5	Good	Good	Young	<5	Low	Priority for Removal	Structures within SRZ.	Within Development Footprint
95	<i>Cupressus cashmeriana</i> (Bhutan cypress)	6	2	75	2	13	1.5	Fair	Good	Semi-mature	<5	Low	Priority for Removal	Crown density 50-75%. Limited crown clearance. Structures within SRZ.	Within Development Footprint
96	<i>Cupressus macrocarpa</i> (Monterey Cypress)	7	4	325	4	48	2.1	Fair	Fair	Mature	<5	Low	Priority for Removal	Crossing branches. Crown density 50-75%. Structures within SRZ. Adaptive growth.	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 (%)
97	<i>Camellia sasanqua</i> (Camellia)	4	3	175	2	14	1.7	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
98	<i>Celtis australis</i> (Hackberry)	12	5	375	5	64	2.3	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Co-dominant inclusions, minor. Limited crown clearance. Structures within SRZ.	Within Development Footprint
99	<i>Liquidamber styraciflua</i> (Liquidamber)	16	8	600	7	163	2.8	Good	No access to base. No rating.	Mature	15-40	Moderate	Consider for Retention	Crown density 75-95%. Small (<25mmØ) & medium (25-75mmØ) deadwood in low volumes. Trunk cavity(s), minor. Structures within SRZ.	Within Development Footprint
100	<i>Rhododendron arboreum</i> (Rhododendron)	5	2	50	2	13	1.5	Good	Fair	Mature	5-15	Low	Consider for Removal		Within Development Footprint
101	<i>Glochidion ferdinandi</i> (Cheese Tree)	4	3	50	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
102	<i>Glochidion ferdinandi</i> (Cheese Tree)	12	6	500	6	113	2.6	Good	No access to base. No rating.	Mature	5-15	Moderate	Consider for Retention	Crown density 75-95%. Small (<25mmØ) deadwood in moderate volumes. Wound(s), early signs of decay. Trunk cavity(s), minor. Structures within SRZ.	Within Development Footprint
103	<i>Celtis australis</i> (Hackberry)	6	4	71	2	13	1.5	Good	Good	Semi-mature	5-15	Insignificant	Priority for Removal	Phototrophic lean, moderate.	Within Development Footprint
104	<i>Murraya paniculata</i> (Mock Orange)	5	3	71	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	Group of 10 trees, hedged.	Within Development Footprint
105	<i>Camellia sasanqua</i> (Camellia)	5	3	71	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	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 (%)
106	<i>Phoenix canariensis</i> (Canary Island Date Palm)	11	3	425	5	82	2.4	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Crown over building.	Within Development Footprint
107	<i>Schefflera actinophylla</i> (Queensland Umbrella Tree)	10	4	200	2	18	1.8	Fair	No access to base. No rating.	Semi-mature	<5	Low	Priority for Removal	Crown density 50-75%. Structures within SRZ.	Within Development Footprint
108	<i>Celtis australis</i> (Hackberry)	4	3	150	2	13	1.6	Good	No access to base. No rating.	Mature	<5	Low	Priority for Removal	Group of 3 trees.	Within Development Footprint
109	<i>Pittosporum tenuifolium</i> (Kohuhu)	11	4	275	3	34	2.0	Fair	No access to base. No rating.	Late Mature	<5	Low	Priority for Removal	Crossing branches. Crown density 25-50%. Small (<25mmØ) epicormic growth in moderate volumes. Wound(s), advanced stages of decay.	Within Development Footprint
110	<i>Celtis australis</i> (Hackberry)	12	4	225	3	23	1.8	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Group of 3 trees.	Within Development Footprint
111	<i>Cinnamomum camphora</i> (Camphor Laurel)	14	6	400	5	72	2.3	Good	Poor	Mature	<5	Moderate	Priority for Removal	Strangler figs pumila. On rock ledge. Limited crown clearance. Storm damage.	Within Development Footprint
112	<i>Phoenix canariensis</i> (Canary Island Date Palm)	11	4	400	5	72	2.3	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Structures within SRZ. Phototropic lean, slight. Grade alteration, cut.	Within Development Footprint
113	<i>Ligustrum lucidum</i> (Large Leaf Privet)	11	4	300	4	41	2.1	Good	Poor	Mature	5-15	Low	Consider for Removal	Crossing branches. Growing from rock wall. Co-dominant inclusions, major. Trunk cavity(s), minor.	Within Development Footprint
114	<i>Ligustrum lucidum</i> (Large Leaf Privet)	4	3	100	2	13	1.5	Good	No access to base. No rating.	Young	<5	Low	Priority for Removal	Crown conflict with adjacent structures. 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 (%)
115	<i>Camellia sasanqua</i> (Camellia)	4	2	75	2	13	1.5	Good	No access to base. No rating.	Mature	<5	Low	Priority for Removal	Group of 2 trees. Crown conflict with adjacent structures. Structures within SRZ.	Within Development Footprint
116	<i>Ligustrum lucidum</i> (Large Leaf Privet)	4	3	100	2	13	1.5	Good	No access to base. No rating.	Young	<5	Low	Priority for Removal		Within Development Footprint
117	<i>Pittosporum tenuifolium</i> (Kohuhu)	5	3	50	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Group of 6 trees. Crown conflict with adjacent structures. Structures within SRZ.	Within Development Footprint
118	<i>Cinnamomum camphora</i> (Camphor Laurel)	6	3	50	2	13	1.5	Good	Good	Young	5-15	Low	Consider for Removal	Group of 3 trees. Crown conflict with adjacent structures. Structures within SRZ.	Within Development Footprint
119	<i>Lagerstroemia indica</i> (Crepe Myrtle)	7	4	300	4	41	2.1	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Co-dominant inclusions, minor. Structures within SRZ.	Within Development Footprint
120	<i>Lagerstroemia indica</i> (Crepe Myrtle)	7	4	300	4	41	2.1	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Co-dominant inclusions, minor. Structures within SRZ.	Within Development Footprint
121	<i>Magnolia grandiflora</i> (Bull Bay Magnolia)	11	3	125	2	13	1.5	Good	Good	Semi-mature	5-15	Moderate	Consider for Retention	Lost central leader. Wound(s), no visible sign of decay. Limited crown clearance. Structures within SRZ.	Within Development Footprint
122	<i>Magnolia grandiflora</i> (Bull Bay Magnolia)	7	4	90	2	13	1.5	Good	Good	Semi-mature	5-15	Low	Consider for Removal	Structures within SRZ.	Within Development Footprint
123	<i>Persea americana</i> (Avocado)	7	4	125	2	13	1.5	Good	Good	Mature	5-15	Low	Consider for Removal	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 (%)
124	<i>Camellia sasanqua</i> (Camellia)	6	4	106	2	13	1.5	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
125	<i>Camellia sasanqua</i> (Camellia)	6	4	225	3	23	1.8	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Limited crown clearance. Structures within SRZ.	Within Development Footprint
126	<i>Cyathea australis</i> (Rough Tree Fern)	7	1	50	2	13	1.5	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal		Within Development Footprint
127	<i>Magnolia denudata</i> (Yulan Magnolia)	6	3	71	2	13	1.5	Dormant. No rating.	No access to base. No rating.	Mature	5-15	Low	Consider for Removal		Within Development Footprint
128	<i>Cyathea australis</i> (Rough Tree Fern)	7	2	50	2	13	1.5	Good	No access to base. No rating.	Mature	5-15	Low	Consider for Removal	Limited crown clearance.	Within Development Footprint
129	<i>Michelia figo</i> (Port Wine Magnolia)	3	2	100	2	13	1.5						Priority for Retention	Street tree.	No Encroachment
130	<i>Michelia figo</i> (Port Wine Magnolia)	3	2	100	2	13	1.5						Priority for Retention	Street tree.	No Encroachment
131	<i>Podocarpus elatus</i> (Brown Pine)	4	3	215	3	21	1.8						Priority for Retention	Street tree.	No Encroachment



9.0 APPENDIX 4 | PROPOSED DEVELOPMENT PLANS

MATERIAL LEGEND	
CODE	DESCRIPTION
BAL-01	Horizontal Steel plate balustrade on dark painted concrete upstand
BAL-02	Vertical steel post balustrade
BAL-03	Glass Balustrade
CN-01	Concrete Look Render
GL-01	Clear Glass
GL-02	Colourback Glass
GL-03	Operable Glass Louvers
GL-04	Colourback Glass
GL-05	High Performance Clear Glass
GL-06	Clear Glass Common Areas
MF-01	Metal Finish Banded Light Powdercoat Finish
MF-02	Metal Finish Roof Light Powder Coat Finish
PT-02	Dark Painted Concrete
SC-01	Light Timber Look Aluminium Batten Screen
SC-02	Dark Finish Powdercoat Aluminium Batten Screen
SC-03	Dark Finish Powdercoat Aluminium Plant Screen
ST-01	Sandstone Cladding

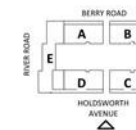
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MATERIAL LEGEND	
CODE	DESCRIPTION
BAL-01	Horizontal Steel plate balustrade on dark painted concrete upstand
BAL-02	Vertical steel post balustrade
BAL-03	Glass Balustrade
CN-01	Concrete Look Render
GL-01	Clear Glass
GL-02	Colourback Glass
GL-03	Operable Glass Louvers
GL-04	Colourback Glass
GL-05	High Performance Clear Glass
GL-06	Clear Glass Common Area
MF-01	Metal Finish Barding Light Powdercoat Finish
MF-02	Metal Finish Roof Light Powder Coat Finish
PT-02	Dark Painted Concrete
SC-01	Light Timber Look Aluminium Batten Screen
SC-02	Dark Finish Powdercoat Aluminium Batten Screen
SC-03	Dark Finish Powdercoat Aluminium Plant Screen
ST-01	Sandstone Cladding



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MATERIAL LEGEND	
CODE	DESCRIPTION
BAL-01	Horizontal Steel plate balustrade on dark painted concrete upstand
BAL-02	Vertical steel post balustrade
BAL-03	Glass Balustrade
CN-01	Concrete Look Render
GL-01	Clear Glass
GL-02	Colourback Glass
GL-03	Operable Glass Louvers
GL-04	Colourback Glass
GL-05	High Performance Clear Glass
GL-06	Clear Glass Common Areas
MF-01	Metal Finish Banding Light Powdercoat Finish
MF-02	Metal Finish Roof Light Powder Coat Finish
PT-02	Dark Painted Concrete
SC-01	Light Timber Look Aluminium Batten Screen
SC-02	Dark Finish Powdercoat Aluminium Batten Screen
SC-03	Dark Finish Powdercoat Aluminium Plant Screen
ST-01	Sandstone Cladding

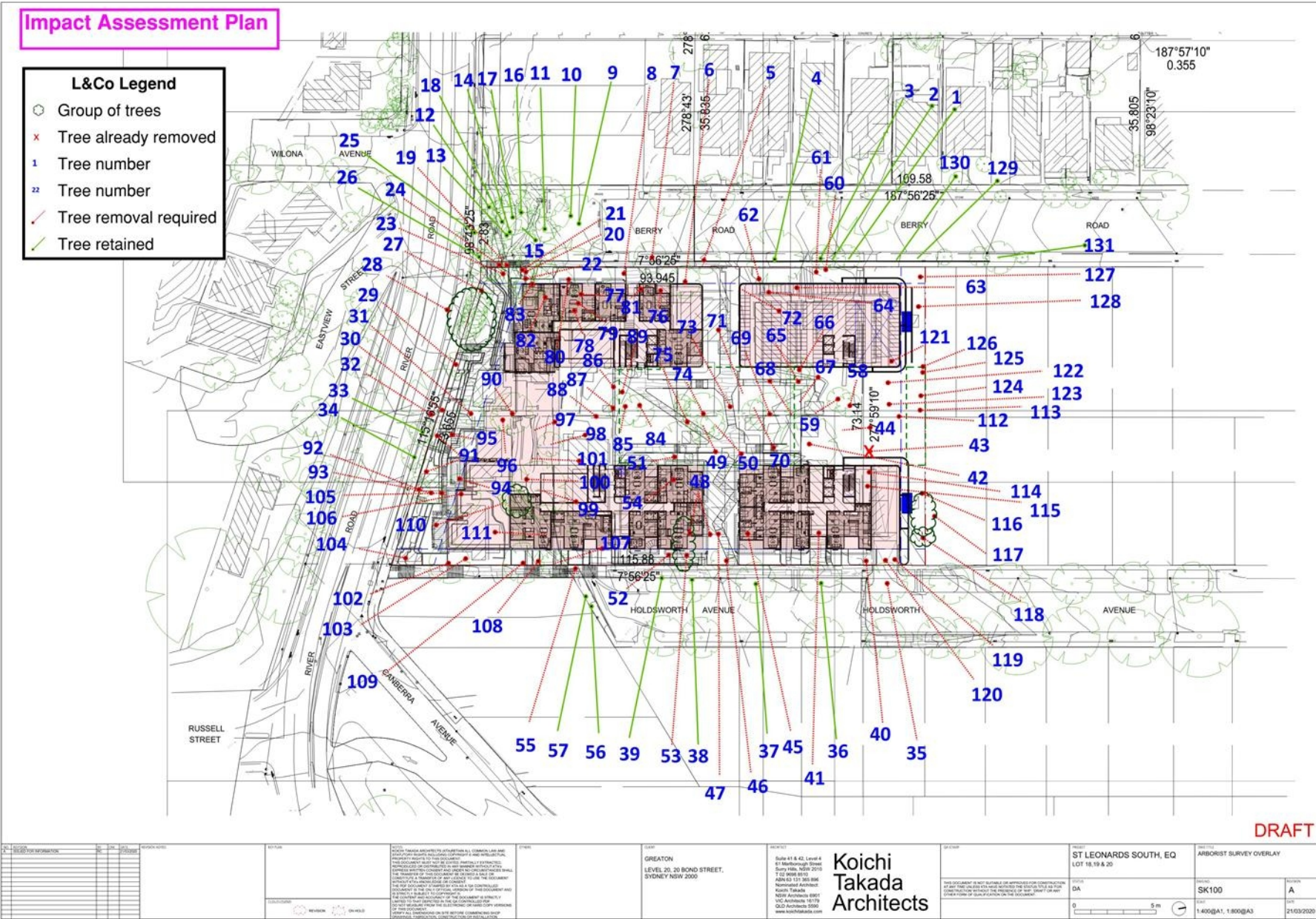
[illegible]



[illegible]

MATERIAL LEGEND	
CODE	DESCRIPTION
BAL-01	Horizontal Steel plate balustrade on dark painted concrete upstand
BAL-02	Vertical steel post balustrade
BAL-03	Glass Balustrade
CN-01	Concrete Look Render
GL-01	Clear Glass
GL-02	Colourback Glass
GL-03	Operable Glass Louvers
GL-04	Colourback Glass
GL-05	High Performance Clear Glass
GL-06	Clear Glass Common Areas
MF-01	Metal Finish Banding Light Powdercoat Finish
MF-02	Metal Finish Roof Light Powder Coat Finish
PT-02	Dark Painted Concrete
SC-01	Light Timber Look Aluminium Batten Screen
SC-02	Dark Finish Powdercoat Aluminium Batten Screen
SC-03	Dark Finish Powdercoat Aluminium Plant Screen
ST-01	Sandstone Cladding

[illegible]



L&Co Legend

- Group of trees
- SRZ
- TPZ
- TPZ encroachment
- Tree number
- Tree removal required
- Tree retained

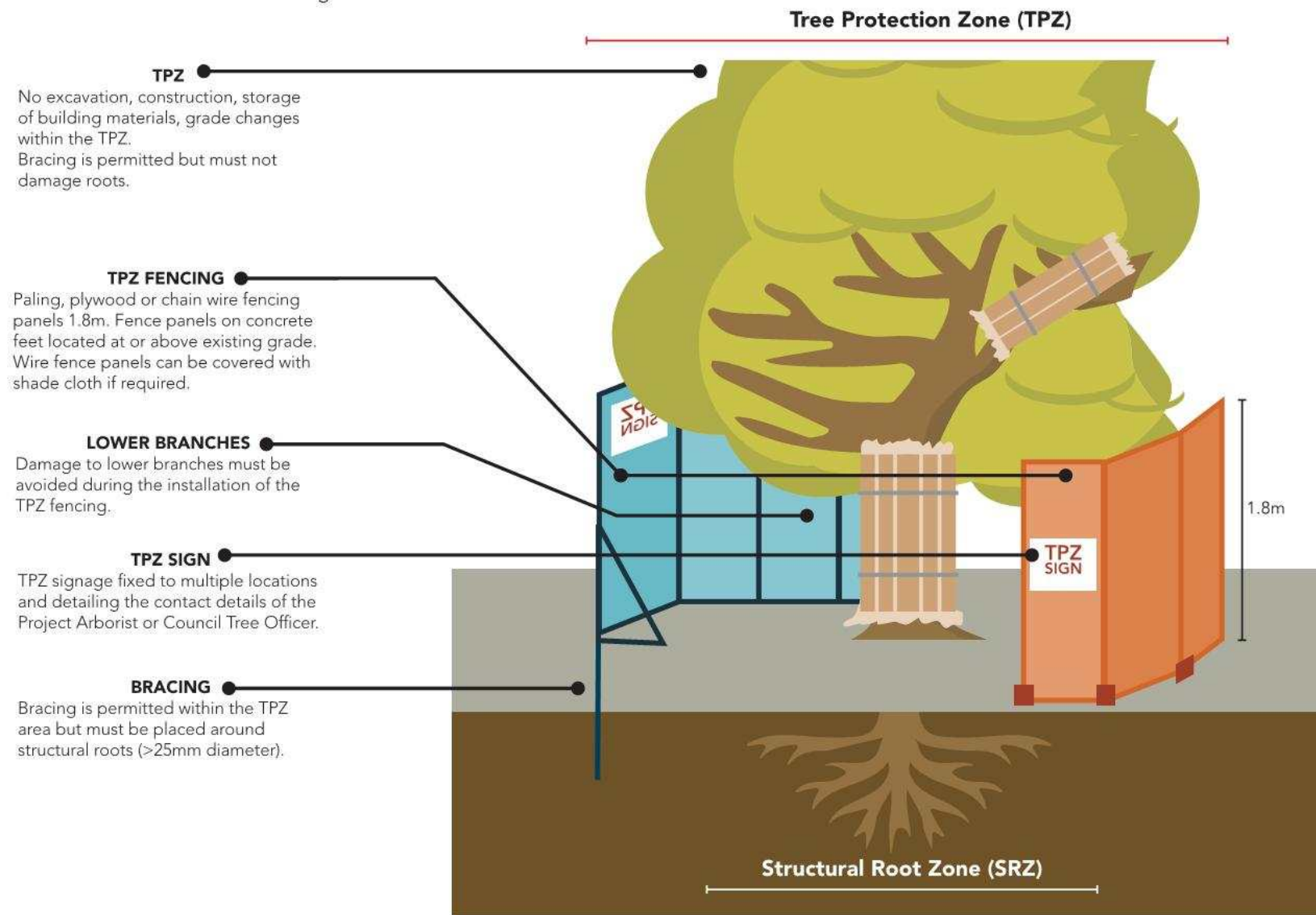


11.0 APPENDIX 6 | TREE PROTECTION PLAN



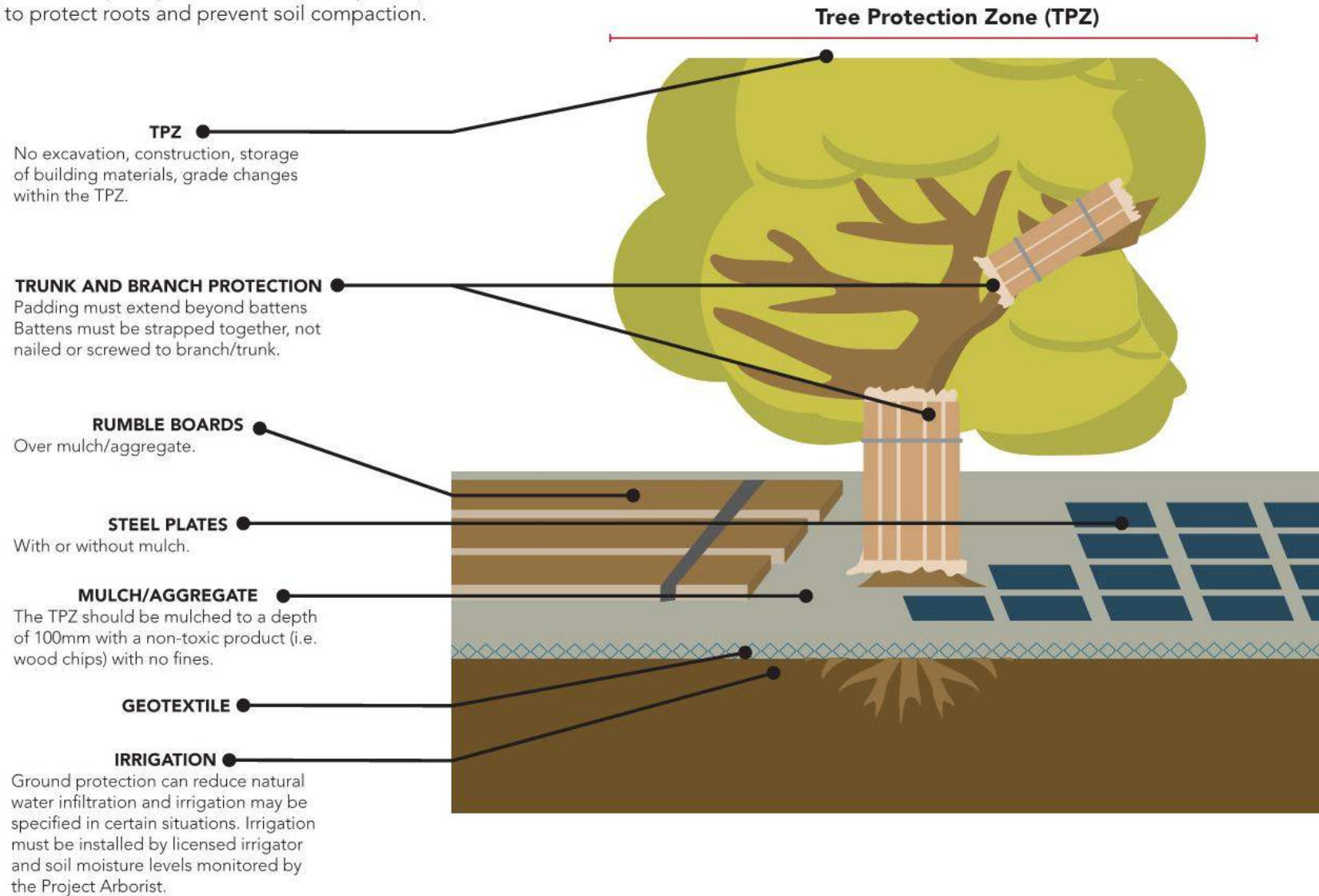
12.0 APPENDIX 7 | TYPICAL TREE PROTECTION DETAIL

Tree Protection Detail - TPZ Fencing

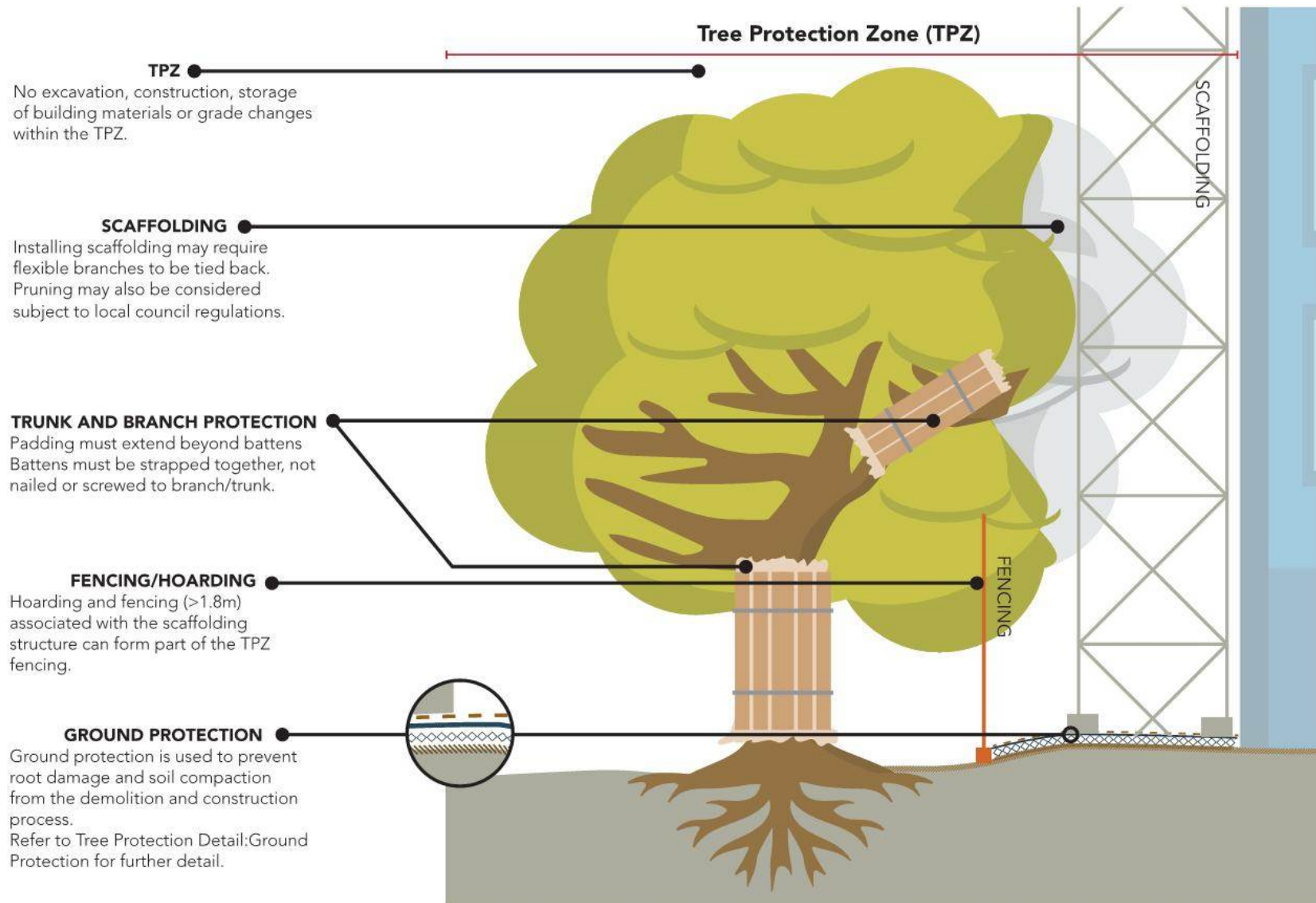


Tree Protection Detail - Ground Protection

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



Tree Protection Detail - Scaffolding within TPZ



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 in 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).
- 13.13.3 Excavations, Root Protection & Root Pruning
- 13.13.4 Excavations and root pruning within the TPZ must be supervised by the Project Arborist and should be avoided where possible.
- 13.13.5 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.
- 13.13.6 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.
- 13.13.7 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 Trees 4 & 5 from Berry Road. b) Showing Trees 9 & 77 from the Berry Road Proposed Park Area. c) Trees in the Reserve between River Road and Berry Road. d) Showing Trees 29 & 30. e) Showing Trees 32 & 33. g) Showing Tree 111.



g) Showing example of lopped trees on Holdsworth Avenue. h) Showing Tree 42 in the Green Spine Deep Soil Section. i) Showing examples of trees with Low Landscape Significance Values. j) Showing Tree 45. k) Showing Tree 49. l) Showing Tree 51.



m) Showing wound on Tree 51. n) Showing Trees 56 & 57. o) Showing Trees 66 & 67. p) Showing Trees 74 & 75. q) Showing Tree 4. r) Showing Trees 112, 113 & 123.

15.0 APPENDIX 10 | PRUNING SPECIFICATION



Tree No. 4	BRANCH Ø	BRANCH ORDER	AS4373 CODE	ORIENTATION	HEIGHT ABOVE GRADE (m)	Crown Encroachment (%)
Branch 1 (B1)	100	Second	Selective Thinning (S)	East	6m	5%
Branch 2 (B2)	100	Second	Selective Thinning (S)	East	8m	5%



Tree No. 36	BRANCH Ø	BRANCH ORDER	AS4373 CODE	ORIENTATION	HEIGHT ABOVE GRADE (m)	Crown Encroachment (%)
Branch 1 (B1)	75	First	Reduction Pruning (R)	West	4m	8%
Branch 2 (B2)	50	Third	Reduction Pruning (R)	West	4m	2%



Tree No. 38	BRANCH Ø	BRANCH ORDER	AS4373 CODE	ORIENTATION	HEIGHT ABOVE GRADE (m)	Crown Encroachment (%)
Branch 1 (B1)	225	Second	Selective Thinning (S)	West	3	12%

16.0 APPENDIX 11 | LIMITATIONS & DISCLAIMERS

- 16.1 Subject trees were assessed from the ground only and for providing an Arboricultural Report and Tree Protection Specification.
- 16.2 All recommendations in this Arboricultural Report are based on the observations made on the days of inspection (22.10.2020, 10.11.21). 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.
- 16.3 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 Preliminary Arboricultural 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.
- 16.4 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.
- 16.5 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.
- 16.6 **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.
- 16.7 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.