Project No: WENTWORTH/HEALTH/22 Report No: WENTWORTH/HEALTH/AR/C

ARBORICULTURAL REPORT

Wentworth Health Services
24 Hospital Road, Wentworth
Review of Environmental Factors

Prepared for: NSW HEALTH INFRASTRUCTURE

3rd May 2023
Revision C

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1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Report was prepared for NSW Health Infrastructure in relation to the Review of Environmental Factors (REF) for the Wentworth Health Service Redevelopment. The purpose of this Report is to undertake a Visual Tree Assessment[1] (VTA), determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods and tree protection measures to minimise adverse impacts.

1.1.2 The Wentworth Health Service Redevelopment is a $30 million project located in the Far West region of NSW, close to the Victorian border. The project will include full asset replacement of the existing health service's ageing buildings and infrastructure, along with additional health services in line with contemporary models of care and the ongoing needs of the local area.

1.1.3 In preparing this Report, the authors are aware of and have considered the objectives of the following:

- *Wentworth Local Environmental Plan (2011)*
- *Wentworth Shire Development Control Plan (2011)*
- *Australian Standard 4970 Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

Refer to Methodology **(Appendix 1)**

1.1.4 This Report is based on an assessment of the following supplied documentation/plans only:

- Tree Removal Plan – prepared by NBRS, Rev 3, dated 01.05.23
- Tree Retention Plan – prepared by NBRS, Rev 2, dated 14.04.2023
- General Arrangement Plan 1A - prepared by NBRS, Rev 2, dated 14.04.2023
- General Arrangement Plan 1B - prepared by NBRS, Rev 2, dated 14.04.2023
- General Arrangement Plan 2 - prepared by NBRS, Rev 2, dated 14.04.23
- Demolition Plan Stage 1A - prepared by NBRS, Rev 2, dated 03.04.23
- Demolition Plan Stage 1B - prepared by NBRS, Rev 2, dated 03.04.23
- Site Plan - prepared by TTW, Rev 3, dated 11.04.2023
- Pavement & Jointing Plan - prepared by TTW, Rev 3, dated 11.04.23
- Cut & Fill Plan - prepared by TTW, Rev 4, dated 11.04.23

Refer to Plan **(Appendix 2)**

1.2 The Project

1.2.1 The project will utilise the existing hospital entry and maintain the existing carparks. The proposed main hospital building is to be located in southwestern corner of the site. The construction will be undertaken in two stages to maintain the operations of the existing service. The proposed main hospital building will be constructed as Stage 1A with the ambulance driveway civil works undertaken as Stage 1B.

[1] Mattheck & Breloer (2003)

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1.2.2 As the proposed main hospital building is located within the existing hospital site, the infrastructure is largely supported by the existing networks servicing the current hospital. Existing services infrastructure will be upgraded to support the new development as required. Some of the services will be relocated to clear the development area.

1.2.3 The staff accommodation area is to be retained and will be screened from the main access road. Landscaping is to be provided to the west of the building to create connection from the hospital (IPU in particular) out to the river. Other landscape opportunities are being provided to the north of the site to promote greater visual and physical connection to the land and the country.

2.0 RESULTS

2.1 The Site

2.1.1 The site is a crown land title DP 1136392 and the address is listed as 24 Hospital Road, Wentworth, NSW, 2648. The hospital site is accessed via the Hospital Road off the Silver City Highway. It is approx. 1km from the town center across the two bridges. The site is zoned RU5 Village in the *Wentworth Local Environmental Plan (2011)*.

2.2.2 The existing hospital is located adjacent to the Darling River and consists of several single level structures with brick cladding and a metal roof. The site is generally level with a slight slope to the southwest. There is a levee bank surrounding the existing establishments that was built to protect the asset from the floods.

2.2 The Trees

2.2.1 Sixty-eight (68) trees and tree groups were assessed using the VTA criteria and notes. The trees comprise a mix of locally indigenous, Australian native and exotic species. The ecological significance and heritage value of the trees has not been assessed and is beyond the scope of this Report. Separate Ecological and Heritage Reports have been prepared for the site.

2.2.2 The trees are not listed in Schedule 5 Environmental Heritage of the *Wentworth Local Environmental Plan (2011).*

2.2.3 The trees are not species are listed as *Priority Weeds for the Riverina* by the Department of Primary Industries.[2]

2.2.4 As required by Clause 2.3.2 of *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, each of the trees assessed has been allocated a Retention Value. TreeiQ allocates one of four Retention Value categories based on a combination of Landscape Significance and Useful Life Expectancy (ULE). The assessment of Landscape Significance and ULE involves a degree of subjectivity and there will be a range of tree quality and value within each of the Retention Value categories. The Retention Values do not consider any proposed development works and are 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

[2] Department of Primary Industries (2017)

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2.2.5 Four (4) trees and tree groups (Trees 36, 55 & 67 & Tree Group 49) at the site have been allocated a Retention Value of *Priority for Retention*. Of particular importance is Tree 36 and Tree Group 49 which were identified as *Eucalyptus camaldulensis* (River Red Gum) and are located adjacent to the Darling River. These trees are locally indigenous species and may be remnants or descendants of the original vegetation (i.e pre-European occupation) of the area. Trees 55 and 67 are also large specimens of high Landscape Significance with a medium ULE.

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Tree Removal

3.1.1 Tree 23

Tree 23 was identified as *Olea europaea* (European Olive) and is located in the northwestern corner of the site. The tree is in fair structural condition as it has been previously lopped with resultant wounds in various stages of decay. Tree 23 is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.1.2 The supplied plans show Tree 23 is to be removed to allow for the site remediation works. Replacement planting using a healthy, advanced-size specimen could replace the loss of amenity from tree removal within a short timeframe.

3.1.3 Tree 24

Tree 24 was identified as *Melia azedarach* (White Cedar) and is located in the northwestern corner of the site. The tree is in poor structural condition as it has been previously lopped with resultant wounds in various stages of decay. Tree 24 is of moderate Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

3.1.4 The supplied plans show Tree 24 is to be removed to allow for the site remediation works. Tree 24 is recommended for removal irrespective of future development works.

3.1.5 Tree Group 50

Tree Group 50 was identified as *Syagrus romanzoffianum* (Cocos Palm) and is a group of two (2) trees located in the southwestern corner of the site. The trees are in good health and structural condition with no significant defects identified at the time of assessment. Tree Group 50 is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.1.6 The supplied plans show Tree Group 50 is to be removed to accommodate the proposed (main hospital) building footprint. Replacement planting using healthy, advanced-size specimens could replace the loss of amenity from tree removal within a short timeframe.

3.1.7 Tree 51

Tree 51 was identified as *Eucalyptus peninsularis* (Cummins Mallee) and is located in the southwestern corner of the site. The tree is in fair structural condition due to a previous branch failure and wounds in various stages of decay. Tree 51 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.1.8 The supplied plans show Tree 51 is to be removed to accommodate the proposed (main hospital) building footprint. It should be noted that a memorial plaque is located at the tree's base, and the tree may hold sentimental value for past or present hospital patients and staff.

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3.1.9 Tree 52

Tree 52 was identified as *Eucalyptus peninsularis* (Cummins Mallee) and is located in the southwestern corner of the site. The tree is in fair structural condition due to a major co-dominant bark inclusion, a previous branch failure and wounds in various stages of decay. Tree 52 is of moderate Landscape Significance and has been allocated a Retention Value of *Consider for Retention.*

3.1.10 The supplied plans show Tree 52 is to be removed to accommodate the proposed car park footprint.

3.1.11 Trees 53 & 57

Trees 53 and 57 were identified as *Eucalyptus* spp. (Eucalypt species) and are located in the southeastern corner of the site. Tree 57 is in fair health due to a reduced crown density of 50-75% and presence of moderate volumes of deadwood within its crown. Both trees are in fair structural condition due to the presence of wounds in various stages of decay. Trees 53 and 57 are of moderate Landscape Significance and have been allocated a Retention Value of *Consider for Retention.*

3.1.12 The supplied plans show Trees 53 and 57 are to be removed to accommodate the proposed (staff accommodation) building.

3.1.13 Tree 54

Tree 54 was identified as *Eucalyptus* sp. (Eucalypt) and is located in the southeastern corner of the site. Tree 54 is in poor health with a reduced crown density of 0-25% and presence of high volumes of deadwood within its crown. The tree is in poor structural condition due to the presence of wounds in various stages of decay. Tree 54 is of low Landscape Significance and has been allocated a Retention Value of *Priority for Removal.*

3.1.14 The supplied plans show Tree 54 is to be removed to accommodate the proposed (staff accommodation) building footprint. Tree 54 is recommended for removal irrespective of future development works.

3.1.15 Tree 56

Tree 56 was identified as *Eucalyptus sideroxylon* (Mugga Ironbark) and is located in the southeastern corner of the site. Tree 56 is in fair health with a reduced crown density of 50-75%. The tree is in poor structural condition due to the presence of wounds in various stages of decay. Tree 56 is of low Landscape Significance and has been allocated a Retention Value of *Consider for Removal.*

3.1.16 The supplied plans show Tree 56 is to be removed to accommodate the proposed (staff accommodation) building footprint. Replacement planting using a healthy, advanced-size specimen could replace the loss of amenity from tree removal within a short timeframe.

3.2 Tree Retention

3.2.1 The supplied plans show that fifty-nine (59) trees and tree groups are to be retained as part of the proposed development. This includes four (4) trees with a Retention Value of *Priority for Retention*, twenty-nine (29) trees with a Retention Value of *Consider for Retention,* twenty (20) trees with a Retention Value of *Consider for Removal* and six (6) trees with a Retention Value of *Priority for Removal.*

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3.2.2 Table 1: Tree Retention

	Priority for Retention	Consider for Retention	Consider for Removal	Priority for Removal
No works within TPZ = 41	36	8, 9, 10, 11, 12, 27, 28, 32, 34, 37, 38, 39, 40, 41, 42, 43, 44, 45, 68	1, 2, 3, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 33, 35, 46, 47 & 48	4, 5, 6, 7 & 26
Minor Encroachment = 7	49 & 55	31 & 58	66	29
Major Encroachment = 11	67	30, 59, 60, 61, 62, 63, 64 & 65		
TOTAL = 59	**4**	**29**	**20**	**6**

3.3 Minor Encroachment

3.3.1 The supplied plans show that works are proposed within the Tree Protection Zone (TPZ) areas of Trees 29, 31, 49, 55, 58 and 66. As the encroachment into the individual TPZ is less than 10% and outside of the Structural Root Zone (SRZ), the extent of works represent *Minor Encroachments* as defined by *Australian Standard 4970-2009 Protection of Trees on Development Sites* (AS-4970). A *Minor Encroachment* is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. The encroachments into TPZ areas should be compensated for by extending the TPZ in areas not subject to encroachment.

3.4 Major Encroachment

3.4.1 The supplied plans show that works are proposed with TPZ areas of Trees 30, 59-65 and 67. The extent of works represent *Major Encroachments* as defined by AS-4970 and are discussed in more detail below.

3.4.2 Pavements

Pavements (including sub-base layers) within the TPZ areas should be installed above existing grade to minimise the potential for root damage.

3.4.3 When removing existing pavements, machinery should work backwards out of the TPZ areas to ensure machinery remains on un-demolished sections of pavement at all times. The existing sub-base layers should be left in situ and reused where possible. Where this is not possible, the existing sub-base should be removed by hand/hand tools ensuring that tree roots (>25mmø) are retained and protected.

3.4.4 Excavation works for the installation of pavements should be undertaken using tree sensitive methods (hand/hydro vacuum or similar approved) to protect tree roots. Pavement sub-base layers should either be thinned and/or finished pavement levels and kerbs modified as required to enable the retention of roots (>25mmø) as required by the Project Arborist. Sub-base materials should be lightly compacted above and around roots using a plate compactor only.

3.4.5 Remediation Works

Excavation for the remediation works within the TPZ areas should be undertaken using a compact excavator (<2t) fitted with a flat bladed bucket and guided buy a spotter to enable the retention of tree roots. Ground levels should be lowered in small increments with roots (>25mmø) retained and protected as required by the Project Arborist.

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3.5 Other Works within TPZ Areas

3.5.1 Demolition Works

Demolition works within TPZ areas should be supervised by the Project Arborist and utilise tree sensitive methods. Structures should be demolished in small sections ensuring demolition machinery/equipment does not come into contact with any part of the tree. Structures (e.g. kerbs, strip footings, retaining walls) within an SRZ can contribute to tree stability by providing ballast to the rootplate or acting as a stop to the overturning of the rootplate. If possible, existing underground structures and sub-base materials should be left in situ and reused.

3.5.2 Mulch, Turf & Vegetation Removal

The removal of small areas of mulch, turf and vegetation within TPZ areas should be undertaken using hand tools. Larger woody shrubs and small trees which cannot be removed without significant ground disturbance should either be cut to ground level and treated with herbicide to prevent regrowth (where required) or stump ground. Stump grinding should not be undertaken in the SRZ of existing trees to be retained.

3.5.3 Underground Services

Underground services should be located outside of the TPZ areas. Where this is not possible, services should be installed using tree sensitive excavation (hand/hydrovac etc) methods with the services located around/below roots (>25mmø) as required by the Project Arborist. Excavation using compact machinery (<2T) fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).

3.5.4 Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1000mm below existing grade. Excavations for starting and receiving pits for boring equipment should be located outside of the TPZ areas or located to avoid roots (>25mmø) as required by the Project Arborist. OSD tanks (where required) should be located outside of the TPZ areas.

3.5.5 Landscaping

The installation of plants/turf within the TPZ areas should be undertaken using hand tools and roots (>25mmø) should be protected. No mechanical cultivation/ripping of soils should be undertaken within the TPZ areas. Excavation and installation of imported soil mixes should be excluded from the TPZ areas other than the installation of soil conditioners to a maximum depth of 50mm above the existing soil profile.

3.6 Pruning

3.6.1 The supplied plans show that Trees 55 and 61 may need to be pruned to provide building clearance (staff accommodation) and access during construction. The Reduction Pruning works should be limited to providing a maximum of 1.5m clearance from the new buildings with no greater than 10% of the tree's total crown volume removed.

Refer to Plates 10 & 11 **(Appendix 4)**

3.6.2 It should be noted that the assessment of pruning requirements was made from ground level with no set-out of the proposed building footprints. During the construction phase of a project some additional minor pruning works may be required to provide building clearances and should be determined by the Project Arborist at the time of construction.

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3.6.3 Provision should be made within the scaffolding design so that additional pruning is not required. Where additional clearance is required, branches may be temporarily pushed or tied back. Where branches cannot be pushed or tied back without damage, scaffolding/hoarding should be modified and constructed around branches (with appropriate branch protection installed as required). Deadwood greater 30mmø should be removed from the crowns of the trees in areas with high value targets.

3.6.4 Pruning works should be carried out by a Practising Arborist. The Practising Arborist should hold a minimum qualification equivalent (using the Australian Qualifications Framework) of Level 3 or above, in Arboriculture or its recognised equivalent. Pruning work should be undertaken in accordance with *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.

3.7 New Tree Planting

3.7.1 Replacement trees should be installed within the hospital site to help off-set the loss of canopy cover from the tree removal. The Landscape Plan proposes a 1:6 replacement rate for new trees. New trees should be grown in accordance with *Australian Standard 2303 Tree Stock for Landscape Use (2015).*

3.8 Ongoing Tree Management

3.8.1 A number of the trees to be retained were identified as having structural defects. Refer to Tree Assessment Schedule **(Appendix 3).** Ongoing monitoring/inspection and maintenance (including deadwood removal) should be undertaken for trees which are situated in close proximity to 'high target' areas (i.e. areas of frequent use/vulnerable structures).

4.0 SUMMARY & CONCLUSION

4.1.1 Sixty-eight (68) trees were addressed within this Report and comprise a mix of locally indigenous, Australian native and exotic species. Four (4) trees and tree groups (Trees 36, 55 & 67 & Tree Group 49) at the site have been allocated a Retention Value of *Priority for Retention*. Of particular importance is Tree 36 and Tree Group 49 which were identified as *Eucalyptus camaldulensis* (River Red Gum) and are located adjacent to the Darling River.

4.1.2 The supplied plan shows that nine (9) trees (Trees 23, 24, 50-54, 56 & 57) will need to be removed to accommodate the proposed development works. Of these, five (5) trees (Trees 23, 24, 50, 54 & 56) have been allocated either a Retention Value of *Priority for Removal* or *Consider for Removal* and any loss of amenity from tree removal can be replaced within a short time period.

4.1.3 The supplied plans show that fifty-nine (59) trees (Trees 1-22 & 25-49, 55 & 58-68) are to be retained as part of the proposed development works. Tree sensitive methods will be required for Trees 30, 59-65 and 67 to minimise adverse impacts. The trees should be protected in accordance with Section 3.0 Arboricultural Impact Assessment, Tree Protection Specification **(Appendix 5)** and Typical Tree Protection Details **(Appendix 6)**.

4.1.4 Replacement trees should be installed within the hospital site to help off-set the loss of canopy cover from the tree removal. New trees should be grown in accordance with *Australian Standard 2303 Tree Stock for Landscape Use (2015)*.

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5.0 LIMITATIONS & DISCLAIMER

TreeiQ takes care to obtain information from reliable sources. However, TreeiQ can neither guarantee nor be responsible for the accuracy of information provided by others. Plans, diagrams, graphs and photographs in this 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.

This Report has been prepared for exclusive use by the client. This Report shall not be used by others or for any other reason outside its intended target or without the prior written consent of TreeiQ. Unauthorised alteration or separate use of any section of the Report invalidates the Report.

Many factors may contribute to tree failure and cannot always be predicted. TreeiQ 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. There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the trees or site may not arise in the future. Information contained in this report covers only the trees assessed and reflects the condition of the trees at the time of inspection. Additional information regarding the methodology used in the preparation of this Report is attached as Appendix 1. A comprehensive tree risk assessment and management plan for the trees is beyond the scope of this Report.

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.

6.0 BIBLIOGRAPHY & REFERENCES

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Standards Australia (2015), *Tree Stock for Landscape Use AS-2303*

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7.0 APPENDICES

Appendix 1: Methodology

1.1 **Site Inspection**: This report was determined as a result of a comprehensive site inspection during June 2022.

1.2 **Visual Tree Assessment (VTA)**: The subject tree(s) was assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis*.[3] The inspection was limited to a visual examination of the subject tree(s) from ground level only. The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic or tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

1.3 **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

1.4 **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans. Trees not shown on the supplied plans have been plotted in their **approximate location only.**

1.5 **Trees & Development**: Tree Protection Zones, Tree Protection Measures and Sensitive Construction Methods for the subject tree were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

The *Tree Protection Zone* (TPZ) is described in AS-4970 as a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The *Structural Root Zone* (SRZ) is described in AS-4970 as the area around the base of a tree required for the tree's stability in the ground. Severance of structural roots within the SRZ is not recommended as it may lead to the destabilisation and/or demise of the tree.

In some cases it may be possible to encroach into or make variations to the theoretical TPZ. A *Minor Encroachment* is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. In this situation the Project Arborist must demonstrate that the tree would remain viable. This may require root investigation by non-destructive methods or the use of sensitive construction methods.

1.6 **Tree Health**: The health of the subject tree(s) was determined by assessing:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

1.7 **Tree Structural Condition**: The structural condition of the subject tree(s) was assessed by:

I. Assessment of branching structure
(i.e co-dominant/bark inclusions, crossing branches, branch taper, terminal loading, previous branch failures)
II. Visible evidence of structural defects or instability
(i.e root plate movement, wounds, decay, cavities, fungal brackets, adaptive growth)
III. Evidence of previous pruning or physical damage
(root severance/damage, lopping, flush-cutting, lions tailing, mechanical damage)

1.8 **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

[3] Mattheck & Breloer (2003)

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1.9 **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

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 or meets the criteria for significance assessment of trees and/or landscapes by a suitably qualified professional. The criteria are based on general principles outlines in the Burra Charter and on criteria from the Register of the National Estate.
High	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of cultural or historical importance or is widely known.
	The subject tree is a prominent specimen which forms part of the curtilage of a heritage item with a known or documented association with that item.
	The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species for the site defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999).
	The subject tree is known to contain nesting hollows to a species scheduled as a Threatened or Vulnerable Species for the site as defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999).
	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.
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 is a good representative of the species in terms of aesthetic value.
Low	The subject tree is a known environmental weed 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.

1.10 **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

<table>
<tr><th>ULE</th><th></th><th colspan="3">Landscape Significance</th></tr>
<tr><td></td><td>Very High</td><td>High</td><td>Moderate</td><td>Low</td></tr>
<tr><td>40 years +</td><td rowspan="3">Priority for Retention</td><td colspan="2">Priority for Retention</td><td rowspan="3">Consider for Removal</td></tr>
<tr><td>15-40 years</td><td>Priority for Retention</td><td>Consider for Retention</td></tr>
<tr><td>5-15 years</td><td colspan="2">Consider for Retention</td></tr>
<tr><td>Less than 5 years</td><td>Consider for Removal</td><td colspan="3">Priority for Removal</td></tr>
</table>

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.

p. 0404 424 264 | f. 02 9012 0924
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GRID NORTH

LOT 1
DP1136392

WENTWORTH STREET

HOSPITAL ROAD

SKI RESERVE ROAD

DARLING RIVER

HEAVY VEGETATION

GROUP 49

ASBESTOS AREA

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33 T34 T35 T36 T37 T38 T39 T40 T41 T42 T43 T44 T45 T46 T47 T48 T50 T51 T52 T53 T54 T55 T56 T57 T58 T59 T60 T61 T62 T63 T64 T65 T66 T67 T68

DEAD

This plan is prepared for Health Infrastructure from a field survey of the existing physical features of the site for the purpose of designing new constructions on the land and should not be used for any other purpose.

The title boundaries and easements shown hereon are diagrammatic only, boundaries have not been fully investigated and were not marked at the time of survey. The western most boundary is determined by top of river bank.

Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed location of all services.
This note is an integral part of this plan.

IMPORTANT NOTE REGARDING IN-GROUND SERVICES
Contained within this plan are assumed lines of in-ground services. Spot locations of services as requested by the client at ground level have been determined using Ground Penetrating Radar Techniques (GPR) by EIICON Services Pty Ltd (m: 0419 568331). The assumed lines join the survey positions of the spot locations. Walpole Surveying does not guarantee the location of any in-ground service in this plan. Further in-ground services may exist. The in-ground service location must be proven to the satisfaction of the land owner and responsible authority before any excavation work commences.

DATUM FOR COORDINATES:
GROUND - APPLY CSF 0.999683 ABOUT 0,0 FOR GRID

UNDERGROUND SERVICES AS DETERMINED BY EIICON: 0419 568331
QUALITY LEVEL B (AS 5488.1:2019)

SERVICES NOTES:-

1. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS "SAS 48" ARE QUALITY LEVEL A AS DEFINED BY AS 5488.1:2019. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
2. UNDERGROUND SERVICES HAVE BEEN LOCATED FOR POSITION AND DEPTH AND HAVE BEEN DETERMINED FROM USING EIICON 25/05/2022. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

DENOTES PAINT MARK MEASURED AND DEPTH

Much of the sewer and storm water proved difficult to trace and locate with GPR due to material of construction being PVC and clay. (As advised by EIICON and maintenance)

DIAL BEFORE YOU DIG www.1100.com.au

LEGEND
- ELECTRICITY POLE
- LIGHT POLE
- ELECTRICITY BOARD/SWITCH
- ELECTRICITY STAY
- GAS VALVE
- FIRE HYDRANT
- TAP
- STOP VALVE
- AIR VALVE
- WATER MARKER POST
- DRAINAGE PITS
- BORE
- SEWER PITS
- COMMUNICATION PITS
- COMMUNICATION MARKER POST
- ACCESS SHAFT
- SIGN
- BIN
- FLAG POLE
- ELECTRICITY OVERHEAD
- ELECTRICITY UNDERGROUND
- ELECTRICITY ALONG BUILDING
- GAS UNDERGROUND
- GAS ALONG BUILDING
- WATER PIPE UNDERGROUND
- COMMUNICATION LINE UNDERGROUND
- DRAINAGE PIPE UNDERGROUND
- SEWER PIPE UNDERGROUND

WALPOLE SURVEYING
Licensed NSW & Victorian Cadastral and Engineering Surveyors
465 Smollett Street
PO Box 3186, Albury, NSW 2640
p. 02 6021 2233 | f. 02 6021 1411
info@walpolesurveying.au.au

SURVEYORS REF: 22072
VERSION 1
06/06/2022

SCALE
5 0 5 10 15 20 25
LENGTHS ARE IN METRES

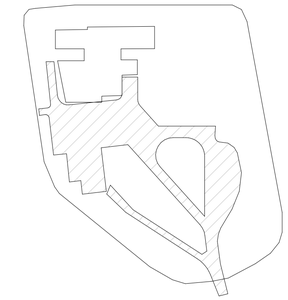
ORIGINAL
SCALE 1:500 | SHEET SIZE A1

NOTES
DATE OF SURVEY: May 2022
DATUM FOR LEVELS: AHD Vide SSM49545
CONTOUR INTERVAL: 0.2m
TREES SHOWN ARE APPROXIMATELY TO SCALE

PLAN OF FEATURES AND LEVELS
WENTWORTH HEALTH SERVICE
24 Hospital Road, Wentworth
For Health Infrastructure

NBRS

KEY PLAN



REF

PROJECT MANAGER
MOSTYN COPPER

ELECTRICAL ENGINEER
STEENSEN VARMING

CIVIL ENGINEER
TTW

HYDRAULIC ENGINEER
WSP

TRAFFIC CONSULTANT
SCT CONSULTING

COST MANAGER
GENUS ADVISORY

Issue

No.	Date	Description	Chkd
1	11/04/2023	REF ISSUE	JK
2	14/04/2023	REF ISSUE	JK

Changes to this Revision

NBRS
+61 2 9922 2344 nbrs.com.au
Nominated Architect:
Andrew Duffin NSW 5602
NBRS & Partners Pty Ltd VIC 51197 ABN 16 002 247 565

Project
WENTWORTH MSP

at
24 Hospital Rd
Wentworth NSW 2648
for
Health Infrastructure

Drawing Title
GENERAL ARRANGEMENT PLAN - MILESTONE 1A

Date 17/04/2023 10:42:16 AM
Scale 1 : 500 @ A1

Drawing Reference 21325-NBRS-LS-DD-REF-1201
Revision 2

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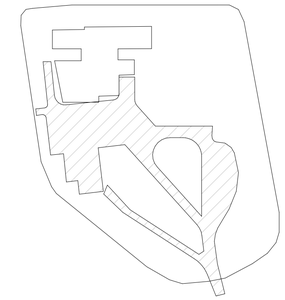
NBRS

KEY PLAN



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WENTWORTH MSP

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Drawing Title
GENERAL ARRANGEMENT PLAN - MILESTONE 1B

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Drawing Reference
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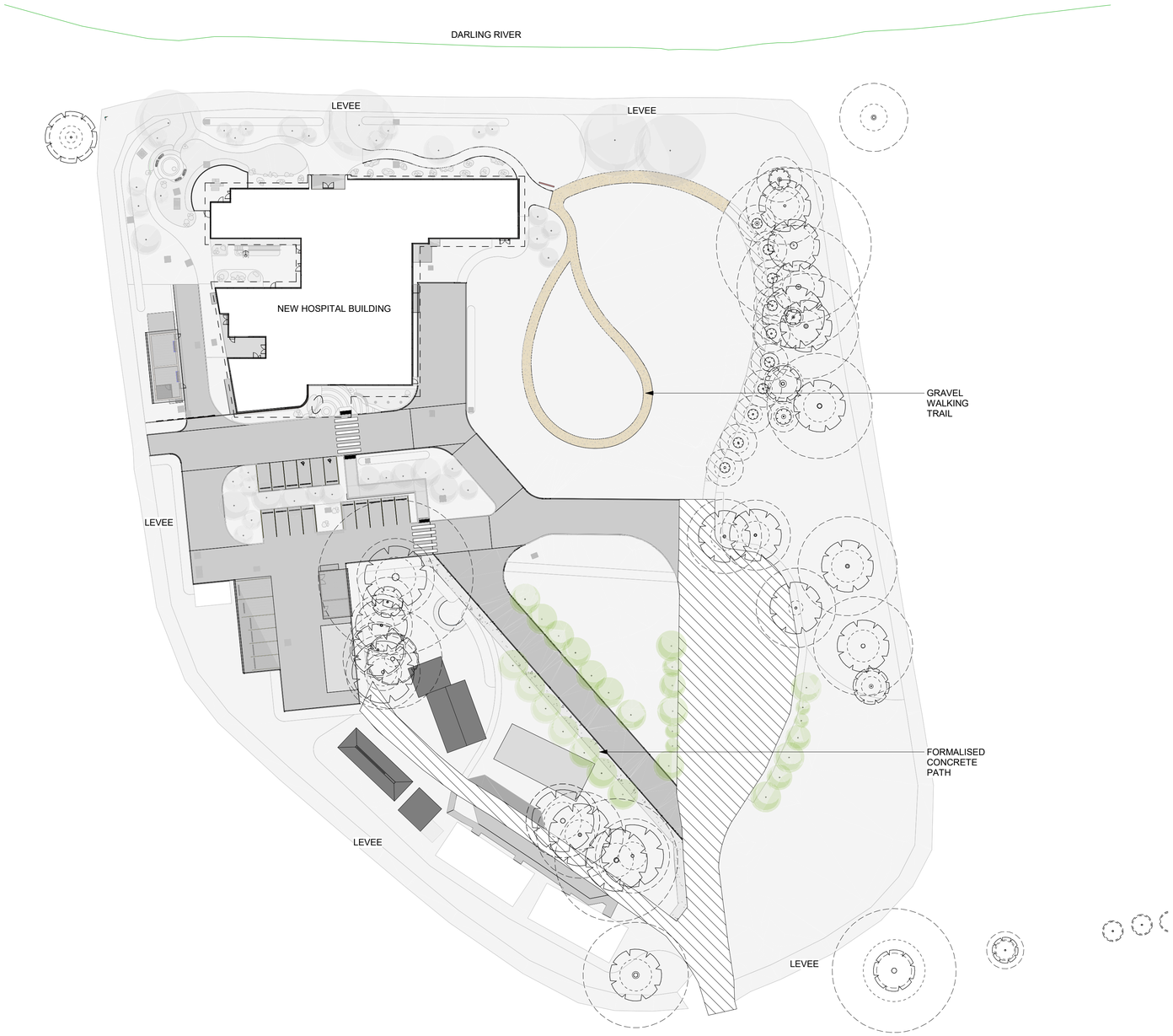

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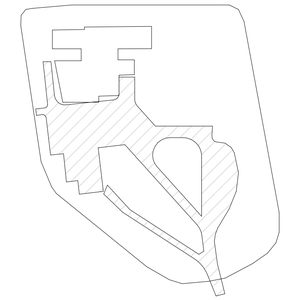
KEY PLAN



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for
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Drawing Title
GENERAL ARRANGEMENT PLAN - STAGE 2

Date 17/04/2023 10:43:24 AM
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Drawing Reference
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Revision
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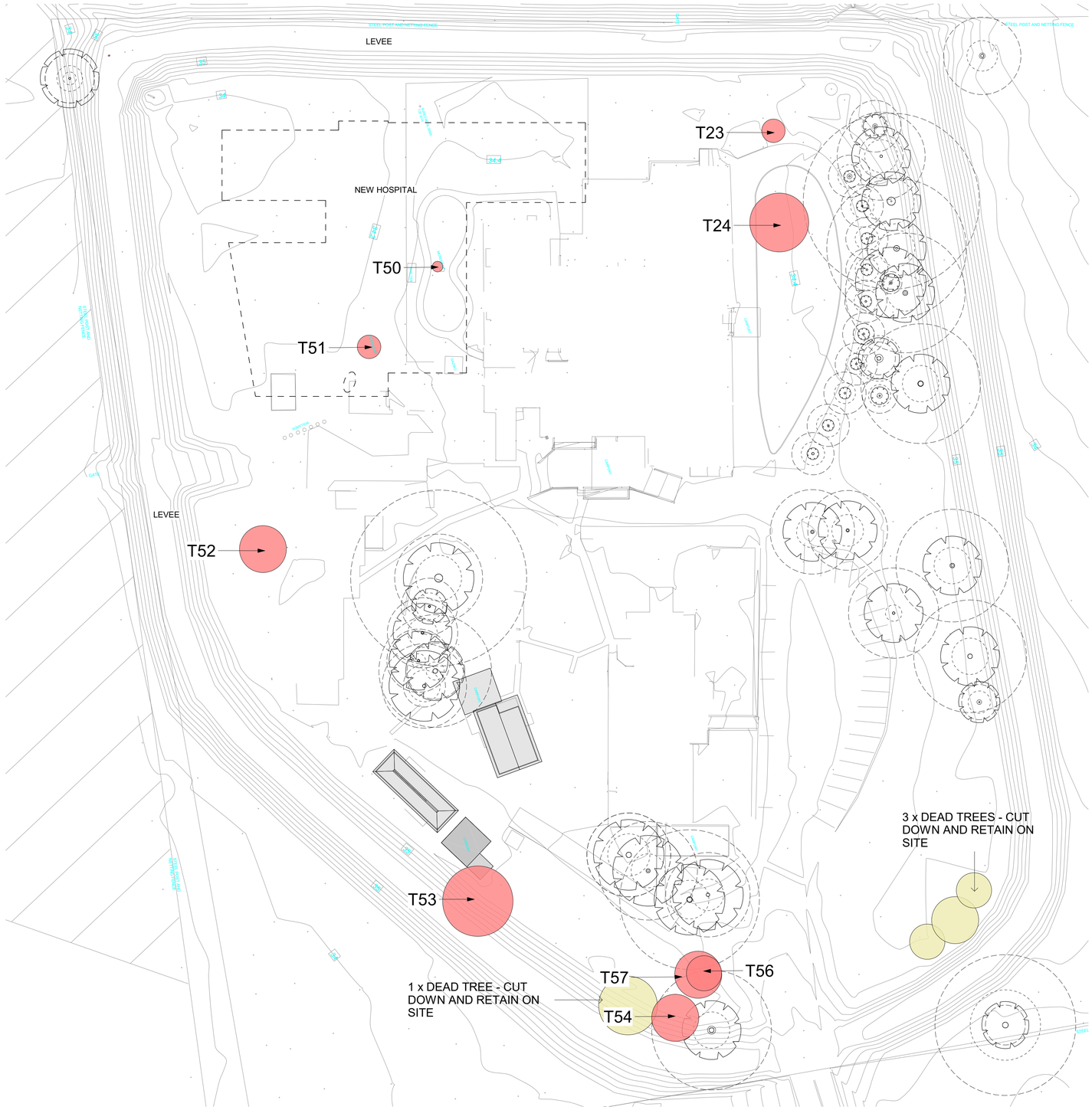

ARBORIST REPORT EXCERPT
REFER TO ARBORIST REPORT FOR FULL DETAILS

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
23	*Olea europaea*	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for	3.6	2
24	*Melia azedarach* (White Cedar)	650	8	10	Fair	Poor	Late Mature	<5	Moderate	Priority for Removal	7.8	2.8
50	*Syagrus romanzoffianum* (Cocos Palm)	300	7	3	Good	Good	Mature	5-15	Low	Consider for Removal	4	n/a
51	*Eucalyptus peninsularis* (Cummins Mallee)	400	9	4	Good	Fair	Mature	15-40	Moderate	Consider for Retention	4.8	2.3
52	*Eucalyptus peninsularis* (Cummins Mallee)	500	8	6	Good	Fair	Mature	15-40	Moderate	Consider for Retention	6	2.5
53	*Eucalyptus sp.* (Eucalypt)	300 400	8	2	Good	Fair	Mature	15-40	Moderate	Consider for Retention	6	25
54	*Eucalyptus sp.* (Eucalypt)	200 200	7	4	Poor	Poor	Mature	<5	Low	Priority for Removal	3.5	2
55	*Eucalyptus sp.* (Eucalypt)	850	15	10	Good	Good	Mature	15-40	High	Priority for Retention	10.2	3.1
56	*Eucalyptus sideroxlon* (Mugga Ironbark)	200	8	3	Fair	Poor	Mature	5-15	Low	Consider for Removal	2.4	1.7
57	*Eucalyptus sp.* (Eucalypt)	600	15	8	Fair	Fair	Mature	5-15	Moderate	Consider for Retention	7.2	2.7
50	*Syagrus romanzoffianum* (Cocos Palm)	300	7	3	Good	Good	Mature	5-15	Low	Consider for Removal	4	n/a
51	*Eucalyptus peninsularis* (Cummins Mallee)	400	9	4	Good	Fair	Mature	15-40	Moderate	Consider for Retention	4.8	2.3
52	*Eucalyptus peninsularis* (Cummins Mallee)	500	8	6	Good	Fair	Mature	15-40	Moderate	Consider for Retention	6	2.5
53	*Eucalyptus sp.* (Eucalypt)	300 400	8	2	Good	Fair	Mature	15-40	Moderate	Consider for Retention	6	25
54	*Eucalyptus sp.* (Eucalypt)	200 200	7	4	Poor	Poor	Mature	<5	Low	Priority for Removal	3.5	2
55	*Eucalyptus sp.* (Eucalypt)	850	15	10	Good	Good	Mature	15-40	High	Priority for Retention	10.2	3.1
56	*Eucalyptus sideroxlon* (Mugga Ironbark)	200	8	3	Fair	Poor	Mature	5-15	Low	Consider for Removal	2.4	1.7
57	*Eucalyptus sp.* (Eucalypt)	600	15	8	Fair	Fair	Mature	5-15	Moderate	Consider for Retention	7.2	2.7

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Issue

No.	Date	Description	Chkd
1	11/04/2023	REF ISSUE	JK
2	14/04/2023	REF ISSUE	JK
3	01/05/2023	REF ISSUE	JK

Changes to this Revision

NBRS
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Nominated Architect:
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NBRS & Partners Pty Ltd VIC 51197 ABN 16 002 247 565

Project
WENTWORTH MSP

at
24 Hospital Rd
Wentworth NSW 2648
for
Health Infrastructure

Drawing Title
TREE REMOVAL PLAN

Date 19/04/2023 9:52:21 AM
Scale 1 : 400 @ A1

Drawing Reference
21325-NBRS-LS-DD-REF-1801

Revision
3

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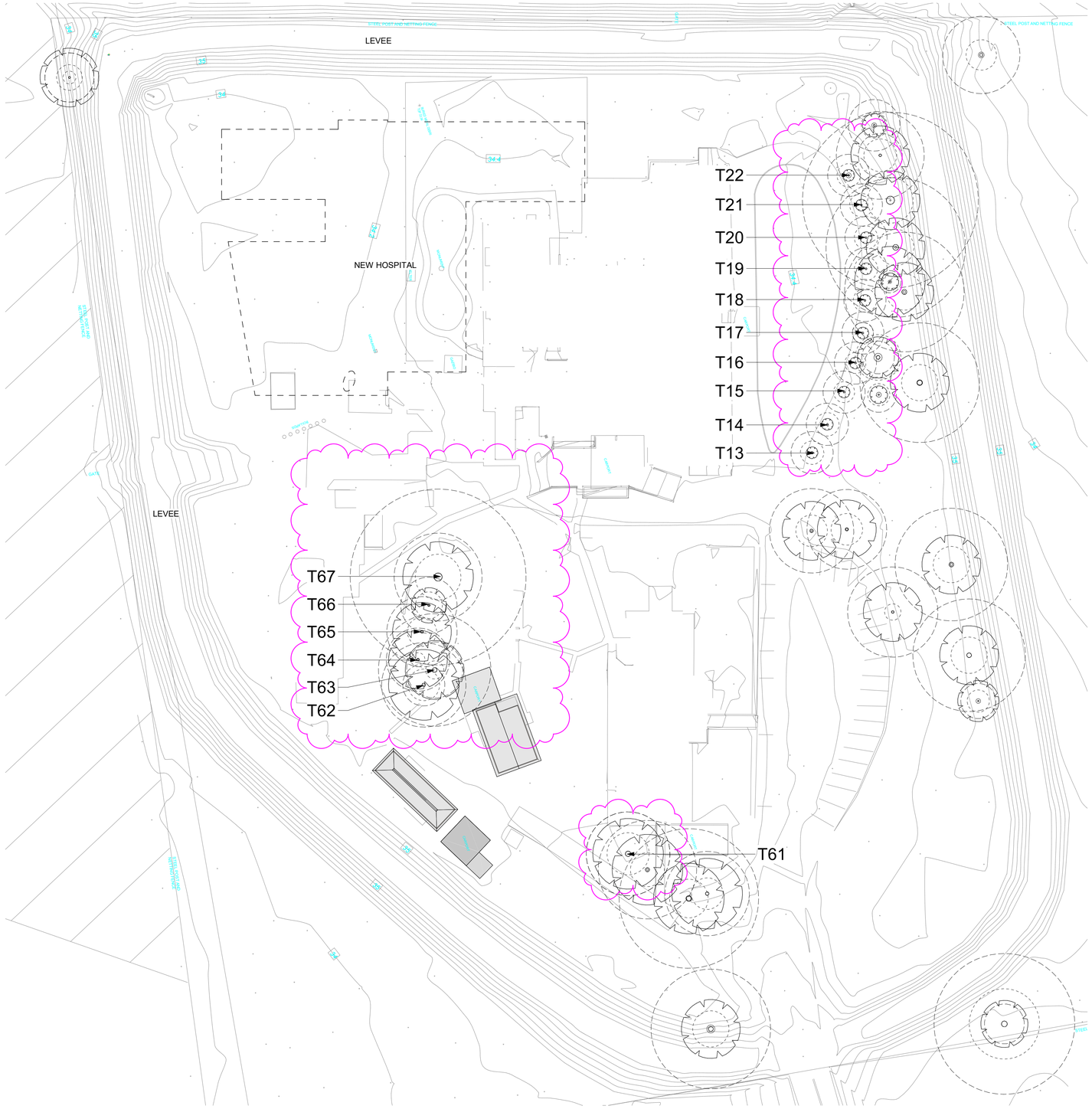


TREE RETENTION NOTES

TREE 61
ADJACENT BUILDING IS A PREFABRICATED DEMOUNTABLE. BUILDING CAN BE ROTATED ON SITE TO ACCOMMODATE FOR TREE CANOPY. BUILDING ACTS AS A CAP FOR ANY SOIL CONTAMINATION FOUND IN THE AREA. MARKER LAYER & 100-150MM GRAVEL UNDER BUILDING FOOTPRINT TO CAP ANY SOIL CONTAMINANTS IN THIS AREA. REMOVAL OF EXISTING SOIL SHOULD BE THE LAST RESORT.

TREE 62-67
THIS AREA IS BEING FILLED BY +300MM. ROADWAY TO BE EXCAVATED UNDER ARBORIST SUPERVISION. REFER TO CIVIL FOR EXTENT OF CUT/FILL. POTENTIAL TO PRUNE BRANCHES TO ACCOMMODATE BUILDING (UNDER SUPERVISION OF ARBORIST). REMOVAL OF TREE 67 IS A LAST RESORT.

TREE 13-22
NORTHERN PORTION OF RING ROAD RETAINED TO PROTECT TREE ROOTS.

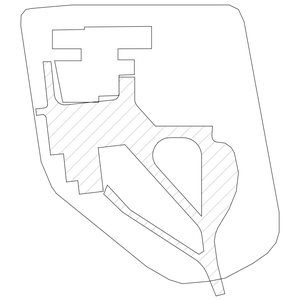
ARBORIST REPORT EXCERPT

REFER TO ARBORIST REPORT FOR FULL DETAILS

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)
13	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
14	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
15	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
16	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
17	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
18	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
19	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
20	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
21	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
22	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Mature	15-40	Low	Consider for Removal	3.6	2
62	*Pinus pinea* (Stone Pine)	600	18	12	Good	Good	Mature	15-40	Moderate	Consider for Retention	7.2	2.7
63	*Lagunaria patersonia* (Norfolk Island Hibiscus)	800	12	5	Good	Fair	Mature	15-40	Moderate	Consider for Retention	9.6	3.1
64	*Pinus pinea* (Stone Pine)	450	15	10	Fair	Fair	Mature	5-15	Moderate	Consider for Retention	5.4	2.4
65	*Pinus pinea* (Stone Pine)	500	15	10	Fair	Fair	Mature	5-15	Moderate	Consider for Retention	6	2.5
66	*Pinus pinea* (Stone Pine)	400	12	6	Fair	Fair	Mature	15-40	Low	Consider for Removal	4.8	2.3
67	*Pinus pinea* (Stone Pine)	800 800 800	17	12	Good	Good	Mature	15-40	High	Priority for Retention	15	3.9

NBRS

KEY PLAN



REF

PROJECT MANAGER
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GENUS ADVISORY

Issue

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1	11/04/2023	REF ISSUE	JK
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Changes to this Revision

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Project
WENTWORTH MSP

at
24 Hospital Rd
Wentworth NSW 2648
for
Health Infrastructure

Drawing Title
TREE RETENTION PLAN

Date 17/04/2023 10:45:14 AM
Scale 1 : 400 @ A1

Drawing Reference
21325-NBRS-LS-DD-REF-1802

Revision
2

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Appendix 3: Tree Assessment Schedule

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
1	*Casuarina pauper* (Black Oak)	1000	8	8	Fair	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) epicormic growth moderate volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	12	3.4	Retain. No works within TPZ.
2	*Casuarina pauper* (Black Oak)	300	7	5	Poor	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) high volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
3	*Casuarina pauper* (Black Oak)	300	4	3	Poor	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) high volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
4	*Casuarina pauper* (Black Oak)	300	4	3	Poor	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) epicormic growth in high volumes. Wound(s), various stages of decay.	Late Mature	<5	Low	Priority for Removal	3.6	2	Retain. No works within TPZ.
5	*Casuarina pauper* (Black Oak)	300	4	3	Poor	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) epicormic growth in high volumes. Wound(s), various stages of decay.	Late Mature	<5	Low	Priority for Removal	3.6	2	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
6	*Casuarina pauper* (Black Oak)	300	4	3	Poor	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Small (<25mm) & medium (25-75 mm) epicormic growth in high volumes. Wound(s), various stages of decay.	Late Mature	<5	Low	Priority for Removal	3.6	2	Retain. No works within TPZ.
7	*Eucalyptus* sp. (Eucalypt)	250	6	7	Poor	Good	Crown density 0-25%. Small (<25mm) diameter deadwood in high volumes. Medium (25-75 mm) diameter epicormic growth in high volumes. Wound(s), various stages of decay. Heavily suppressed. Phototropic lean, slight.	Mature	<5	Low	Priority for Removal	3	1.9	Retain. No works within TPZ.
8	*Eucalyptus cladocalyx* (Sugar Gum)	800	10	10	Poor	Fair	Crown density 50-75%. Medium (25-75mm) & large (75mm) diameter deadwood in high volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	5-15	Moder ate	Consider for Retention	9.6	3.1	Retain. No works within TPZ.
9	*Eucalyptus peninsularis* (Cummins Mallee)	800	10	10	Fair	Fair	Crown density 50-75%. Small, (<25mm), medium (25-75mm) & large (75mm) diameter deadwood in high volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	9.6	3.1	Retain. No works within TPZ.
10	*Eucalyptus largiflorens* (Black Box)	450 450	8	10	Fair	Poor	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay. Failed inclusion.	Mature	5-15	Moder ate	Consider for Retention	7.7	2.8	Retain. No works within TPZ.
11	*Eucalyptus largiflorens* (Black Box)	400 400	8	10	Fair	Poor	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay. Large basal trunk wound.	Mature	5-15	Moder ate	Consider for Retention	6.8	2.7	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
12	*Eucalyptus largiflorens* (Black Box)	600	8	10	Fair	Fair	50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Moderate	Consider for Retention	7.2	2.7	Retain. No works within TPZ.
13	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
14	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
15	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
16	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay. Partially suppressed.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
17	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay. Partially suppressed.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
18	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
19	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
20	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
21	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
22	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.
23	*Olea europaea* (European Olive)	300av	4	2	Good	Fair	Lopped. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	3.6	2	Remove. Remediation works.
24	*Melia azedarach* (White Cedar)	650	8	10	Fair	Poor	Crown density 50-75%. Not in full leaf at time of assessment. Lopped. Wound(s), various stages of decay. Medium (25-75mm) and large (75mm+) diameter epicormic growth in moderate volumes.	Late Mature	<5	Moder ate	Priority for Removal	7.8	2.8	Remove. Remediation works.
25	*Brachychiton populneus* (Kurrajong)	250	7	3	Good	Good	Heavily suppressed.	Early mature	15-40	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.
26	*Eucalyptus* cladocalyx (Sugar Gum)	850	15	10	Poor	Fair	Crown density 0-25%. Terminal dieback. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Wound(s), various stages of decay.	Mature	<5	Moder ate	Priority for Removal	10.2	3.1	Retain. No works within TPZ.
27	*Melia azedarach* (White Cedar)	650	8	7	Fair	Fair	Crown density 75-95%. Not in full leaf at time of assessment. Lopped. Wound(s), various stages of decay. Medium (25-75mm) and large (75mm+) diameter epicormic growth in moderate volumes.	Late Mature	5-15	Moder ate	Consider for Retention	7.8	2.8	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
28	*Eucalyptus peninsularis* (Cummins Mallee)	850	15	10	Good	Fair	Crown density 75-95%. Medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Previous branch failures. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	10.2	3.1	Retain. No works within TPZ.
29	*Eucalyptus sp.* (Eucalypt)	850 500	15	10	Poor	Poor	Crown density 0-25%. All dead except 1 branch.	Late Mature	<5	Moder ate	Priority for Removal	11.9	3.3	Retain. Minor encroachment, remediation work.
30	*Eucalyptus cladocalyx* (Sugar Gum)	1400	14	10	Good	Fair	Medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	15	3.9	Retain. Major encroachment, remediation work.
31	*Eucalyptus peninsularis* (Cummins Mallee)	450 450	14	10	Good	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Medium (25-75 mm) diameter epicormic growth in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	7.5	2.8	Retain. Minor encroachment, remediation work.
32	*Lagunaria patersonia* (Norfolk Island Hibiscus)	200 200 200 100	12	4	Good	Fair	Medium (25-75 mm) diameter epicormic growth in moderate volumes.	Mature	15-40	Moder ate	Consider for Retention	4.4	2.2	Retain. No works within TPZ.
33	*Brachychiton populneus* (Kurrajong)	250	6	3	Good	Good	Heavily suppressed.	Early mature	15-40	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.
34	*Eucalyptus largiflorens* (Black Box)	550	17	12	Good	Fair	No access to base. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes.	Mature	15-40	Moder ate	Consider for Retention	6.6	2.6	Retain. No works within TPZ.
35	*Eucalyptus largiflorens* (Black Box)	150	6	3	Poor	Fair	Crown density 50-75%. Heavily suppressed.	Mature	5-15	Low	Consider for Removal	2	1.5	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
36	*Eucalyptus camaldulensis* (River Red Gum)	1600	16	15	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Very high	Priority for Retention	15	4.1	Retain. No works within TPZ.
37	*Eucalyptus largiflorens* (Black Box)	800	17	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	9.6	3.1	Retain. No works within TPZ.
38	*Eucalyptus largiflorens* (Black Box)	600	13	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	7.2	2.7	Retain. No works within TPZ.
39	*Eucalyptus largiflorens* (Black Box)	500	13	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	6	2.5	Retain. No works within TPZ.
40	*Eucalyptus largiflorens* (Black Box)	400	13	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	4.8	2.3	Retain. No works within TPZ.
41	*Eucalyptus largiflorens* (Black Box)	800	12	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	9.6	3.1	Retain. No works within TPZ.
42	*Eucalyptus largiflorens* (Black Box)	700	12	10	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	8.4	2.9	Retain. No works within TPZ.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
43	*Eucalyptus largiflorens* (Black Box)	500	12	8	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	6	2.5	Retain. No works within TPZ.
44	*Eucalyptus largiflorens* (Black Box)	350	12	8	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	4.2	2.2	Retain. No works within TPZ.
45	*Eucalyptus largiflorens* (Black Box)	500 500	15	8	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Previous branch failures. Wound(s), various stages of decay.	Late Mature	15-40	Moder ate	Consider for Retention	8.5	2.9	Retain. No works within TPZ.
46	*Acacia stenophylla* (Shoestring Wattle)	200 100	6	2	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	2.8	1.8	Retain. No works within TPZ.
47	*Acacia stenophylla* (Shoestring Wattle)	100	6	2	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	2	1.5	Retain. No works within TPZ.
48	*Acacia stenophylla* (Shoestring Wattle)	200 200	6	2	Fair	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Late Mature	5-15	Low	Consider for Removal	3.5	2	Retain. No works within TPZ.
49	*Eucalyptus camaldulensis* (River Red Gum)	500-1000+	17 av	15av	Fair	Fair	Group of 10+ River Red Gum on river frontage. Possible remnants in group. No access. Not tagged.	Late Mature	40+	Very high	Priority for Retention	15	4.5	Retain. Minor encroachment, landscape & bioswale.
50	*Syagrus romanzoffianum* (Cocos Palm)	300	7	3	Good	Good	Group of 2. No access. Not tagged.	Mature	5-15	Low	Consider for Removal	4	n/a	Remove. Building footprint.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
51	*Eucalyptus peninsularis* (Cummins Mallee)	400	9	4	Good	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in low volumes. Previous branch failure(s). Wound(s), various stages of decay. Memorial tree.	Mature	15-40	Moder ate	Consider for Retention	4.8	2.3	Remove. Building footprint.
52	*Eucalyptus peninsularis* (Cummins Mallee)	500	8	6	Good	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in low volumes. Co-dominant inclusion(s), major. Previous branch failure(s). Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	6	2.5	Remove. Carpark footprint.
53	*Eucalyptus leucoxylon* subsp. *leucoxylon* (Yellow Gum)	300 400	8	2	Good	Fair	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in low volumes. Wound(s), various stages of decay. Adaptive growth.	Mature	15-40	Moder ate	Consider for Retention	6	2.5	Remove. Building footprint.
54	*Eucalyptus sp.* (Eucalypt)	200 200	7	4	Poor	Poor	Crown density 0-25%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in high volumes. Wound(s), various stages of decay.	Mature	<5	Low	Priority for Removal	3.5	2	Remove. Building footprint.
55	*Eucalyptus leucoxylon* subsp. *leucoxylon* (Yellow Gum)	850	15	10	Good	Good	Crown density 75-95%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in low volumes. Wound(s), various stages of decay. Storm damage.	Mature	15-40	High	Priority for Retention	10.2	3.1	Retain. Minor encroachment, building footprint & pavement.
56	*Eucalyptus sideroxlon* (Mugga Ironbark)	200	8	3	Fair	Poor	Crown density 50-75%. Partially suppressed. Wound(s), various stages of decay.	Mature	5-15	Low	Consider for Removal	2.4	1.7	Remove. Building footprint.
57	*Eucalyptus sp.* (Eucalypt)	600	15	8	Fair	Fair	Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	5-15	Moder ate	Consider for Retention	7.2	2.7	Remove. Building footprint.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
58	*Pinus pinea* (Stone Pine)	600	15	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Heavily suppressed. Phototropic lean, moderate. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	7.2	2.7	Retain. Minor encroachment, pavement & remediation works.
59	*Pinus pinea* (Stone Pine)	600 600 500	15	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	11.9	3.3	Retain. Major encroachment, pavement & remediation works. Minor encroachment, building footprint.
60	*Pinus pinea* (Stone Pine)	700	15	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	8.4	2.9	Retain. Major encroachment, pavement & remediation works.
61	*Pinus pinea* (Stone Pine)	200 800 300 300	15	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	14.3	3.6	Retain. Major encroachment, pavement & remediation works. Minor encroachment, building footprint.
62	*Pinus pinea* (Stone Pine)	600	18	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Moder ate	Consider for Retention	7.2	2.7	Retain. Major encroachment, pavement & remediation works. Minor encroachment, fire tanks.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
63	*Lagunaria patersonia* (Norfolk Island Hibiscus)	800	12	5	Good	Fair	Medium (25-75 mm) diameter epicormic growth in moderate volumes. No access to base. No tag.	Mature	15-40	Moderate	Consider for Retention	9.6	3.1	Retain. Major encroachment, pavement. Minor encroachment, fire tanks & remediation works.
64	*Pinus pinea* (Stone Pine)	450	15	10	Fair	Fair	Partially suppressed. Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	5-15	Moderate	Consider for Retention	5.4	2.4	Retain. Major encroachment, pavement. Minor encroachment, fire tanks & remediation works.
65	*Pinus pinea* (Stone Pine)	500	15	10	Fair	Fair	Partially suppressed. Crown density 50-75%. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	5-15	Moderate	Consider for Retention	6	2.5	Retain. Major encroachment, pavement.
66	*Pinus pinea* (Stone Pine)	400	12	6	Fair	Fair	Heavily suppressed. Etiolated form. Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	Low	Consider for Removal	4.8	2.3	Retain. Minor encroachment, pavement.
67	*Pinus pinea* (Stone Pine)	800 800 800	17	12	Good	Good	Small (<25mm), medium (25-75 mm) & large (75mm+) diameter deadwood in moderate volumes. Wound(s), various stages of decay.	Mature	15-40	High	Priority for Retention	15	3.9	Retain. Major encroachment, pavement & remediation works. Minor encroachment, stormwater pipe, fire tanks & pump room.

Tree No.	Species	DBH comb. (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Condition Rating	Comments	Age Class	ULE (years)	L/Sign	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
68	*Eucalyptus camaldulensis* (River Red Gum)	200 200 200	15	10	Fair	Fair	Incorrectly tagged T57. No access to base. Crown density 0-25%. Small (<25mm) diameter deadwood in high volumes.	Mature	5-15	Moderate	Consider for Retention	4.2	2.2	Retain. No works within TPZ.

Appendix 4: Plates

Plate 1: Showing Trees 1-5

Plate 2: Showing Trees 9-12

Plate 3: Showing Trees 18-20 & 27

Plate 4: Showing Trees 24, 31 & 32

Plate 5: Showing Trees 37, & 41-43

Plate 6: Showing Tree Group 49

Plate 7: Showing Trees 51 & 67

Plate 8: Showing plaque at base of Tree 51

Plate 9: Showing Trees 54-57

Plate 10: Showing area of potential pruning of Tree 55

Plate 11: Showing area of potential pruning of Tree 61

Plate 11: Showing Trees 58-61

Plate 12: Showing Trees 62-67

Appendix 5: Tree Protection Specification

1.0 Appointment of Project Arborist

A Project Arborist shall be engaged prior the commencement of work on-site and monitor compliance with the protection measures. The Project Arborist shall inspect the tree protection measures and Compliance Certification shall be prepared by the Project Arborist for review by the Principal Certifying Authority prior to the release of the Compliance Certificate.

The Project Arborist shall have a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 5 or above in Arboriculture.

1.1 Compliance

Contractors and site workers shall receive a copy of these specifications a minimum of 3 working days prior to commencing work on-site. Contractors and site workers undertaking works within the Tree Protection Zone shall sign the site log confirming they have read and understand these specifications, prior to undertaking works on-site.

The Project Arborist shall undertake regular site inspections and certify that the works are being undertaken in accordance with this specification.

Compliance Documentation shall be prepared by the Project Arborist following each site inspection. The Compliance Documentation shall include documentary evidence of compliance with the tree protection measures and methods as outlined within this Specification. Upon the completion of the works, a final assessment of the trees shall be undertaken by the Project Arborist and future recommended management strategies implemented as required.

1.2 Tree & Vegetation Removal

Tree removal works shall be undertaken in accordance with the *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)* and other applicable codes and legislation.

Tree removal shall not damage the trees to be retained. Other vegetation to be removed within a TPZ shall be carefully lifted by hand/hand tools to avoid damaging roots (>25mmø) within the surrounding soil profile.

1.3 Tree Protection Zone

The trees to be retained shall be protected prior and during construction from activities that may result in an adverse effect on their health or structural condition. The area within the Tree Protection Zone (TPZ) shall exclude the following activities, unless otherwise stated: -

- Modification of existing soil levels, excavations and trenching
- Mechanical removal of vegetation
- Movement of natural rock
- Storage of materials, plant or equipment or erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials, refueling or disposal of waste materials and chemicals
- Lighting fires
- Movement of pedestrian or vehicular traffic
- Temporary or permanent location of services, or the works required for their installation
- Any other activities that may cause damage to the tree

NOTE: If access, encroachment or incursion into the TPZ is deemed essential, prior authorisation is required by the Project Arborist.

1.4 Tree Protection Fencing

TPZ fencing shall be installed at the perimeter of the TPZ. Refer Tree Assessment Schedule **(Appendix 3).** The exact location of the fencing shall be confirmed through consultation between the Head 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.

As a minimum, the Tree Protection Fence shall consist of 1.8m high wire mesh panels supported by concrete feet. Panels shall be fastened together and supported to prevent sideways movement. The tree shall not be damaged during the installation of the Tree Protection Fencing. Refer to Typical Tree Protection Details (3) **(Appendix 6)**.

1.5 Signage

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with *Australian Standard - 1319 (1994) Safety signs for the occupational environment*. The signage shall be installed prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period.

1.6 Site Management

Materials, waste storage, and temporary services shall not be located within the TPZ.

1.7 Works within the Tree Protection Zones

In some cases works within the TPZ may be authorized by the determining authority. **These works shall be supervised by the Project Arborist**. When undertaking works within the TPZ, care should be taken to avoid damage to the tree's root system, trunks and lower branches.

1.8 Ground Protection

Ground protection shall be installed to any unfenced areas of the TPZ as required by the Project Arborist. Vehicular and machinery access shall be restricted to areas of existing pavement or from areas of temporary ground protection such as ground mats or steel road plates. Refer to Typical Tree Protection Details (3) **(Appendix 4).**

1.9 Trunk Protection

Trunk protection shall be installed as required by the Project Arborist by wrapping padding (either carpet underlay or 10mm thick jute geotextile mat) around the trunk and first order branches to a minimum height of 2m. Timber battens (90 x 45mm) spaced at 150mm centres shall be strapped together and placed over the padding. Timber battens must not be fixed to the trees. Refer to Typical Tree Protection Details (3) **(Appendix 4)**. Branch protection shall be installed as deemed necessary by the Project Arborist.

1.10 Structure & Pavement Demolition

Demolition of existing structures/pavement within the TPZ shall be supervised by the Project Arborist. Machinery is to be excluded from the TPZ unless operating from the existing slabs, pavements or areas of ground protection (refer to Section 1.5). Machinery shall work in conjunction with a spotter to guide the machinery operator and ensure that the ground surface/tree roots beneath the structure/pavement are not disturbed/damaged by demolition works. Machinery should not contact any part of a tree. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to roots. The Project Arborist shall assess any inground structures within the SRZ prior to their removal and determine if these structures may be contributing to the stability of the tree. Where required, inground structures should be retained in situ.

Small structures to be demolished within a TPZ shall be carefully broken up in small sections using a hand-operated pneumatic/electric breaker and waste material removed by hand/hand tools. Large structures to be demolished within the TPZ shall be undertaken within the footprint of the existing structure ('top down, pull back') and away from the trees.

When removing slab/pavement sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on un-demolished sections of slab at all times. Existing sub-base materials within a TPZ shall remain in-situ and (and reused) where possible. If the existing sub-base is to be removed, these works shall be undertaken by hand/hand tools ensuring that tree roots are retained and protected.

If roots (>25mmø) are encountered during the demolition works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times. Where the Project Arborist determines that the tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

1.11 Pavement/Kerb Installation

Installation of the pavements and sub-base within the TPZ shall be supervised by the Project Arborist. The new surfaces and sub-base materials shall be placed at (for areas of existing pavement only) or above grade to minimise excavations and retain roots (unless prior root mapping results show above sensitive construction to be unnecessary).

If roots (>25mmø) are encountered during the installation of the new sub-base and surfaces, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Adjustment of final levels and design shall remain flexible to enable the retention of structural roots (>25mmø) where deemed necessary by the Project Arborist. Compaction of the sub-base shall be consolidated with a pedestrian-operated plate compactor only. If possible, the pavement material shall be permeable.

Where required, new kerbs within the TPZ should be modified to bridge tree roots (>25mmø) unless root pruning is approved and undertaken by the Project Arborist.

1.12 Footings Installation

Footing installation within TPZ areas shall be supervised by the Project Arborist. Other than for the isolated piers, all other parts of the structure shall be installed above grade.

Drilling/piling machinery shall be excluded from the TPZ unless operating from an area where ground protection has been installed (refer to Section 1.8) or from the existing slabs or pavements. Drilling/piling machinery shall be of a suitable size to not damage the trees' roots, trunk, branches and crown. No clearance pruning is permitted to allow for machinery access. Machinery shall work in conjunction with an observer to ensure that adequate clearance from trees is maintained at all times.

1.13 Underground Services

Underground service installation within the TPZ shall be supervised by the Project Arborist.

The installation of underground services shall be located outside of the TPZ. Where this is not possible, they shall be installed using tree sensitive excavation methods (hand/hydrovac/airspade) with the services installed around/below roots (>25mmø, or as determined by the Project Arborist). Excavation using compact machinery fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).

Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1200mm below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ areas or located to avoid roots (>25mmø) as deemed necessary by the Project Arborist. OSD tanks (where required) should be located outside of the TPZ areas.

1.14 Excavations, Root Protection & Root Pruning

Excavations and root pruning within the TPZ shall be supervised by the Project Arborist. Excavations within the TPZ shall be avoided wherever possible.

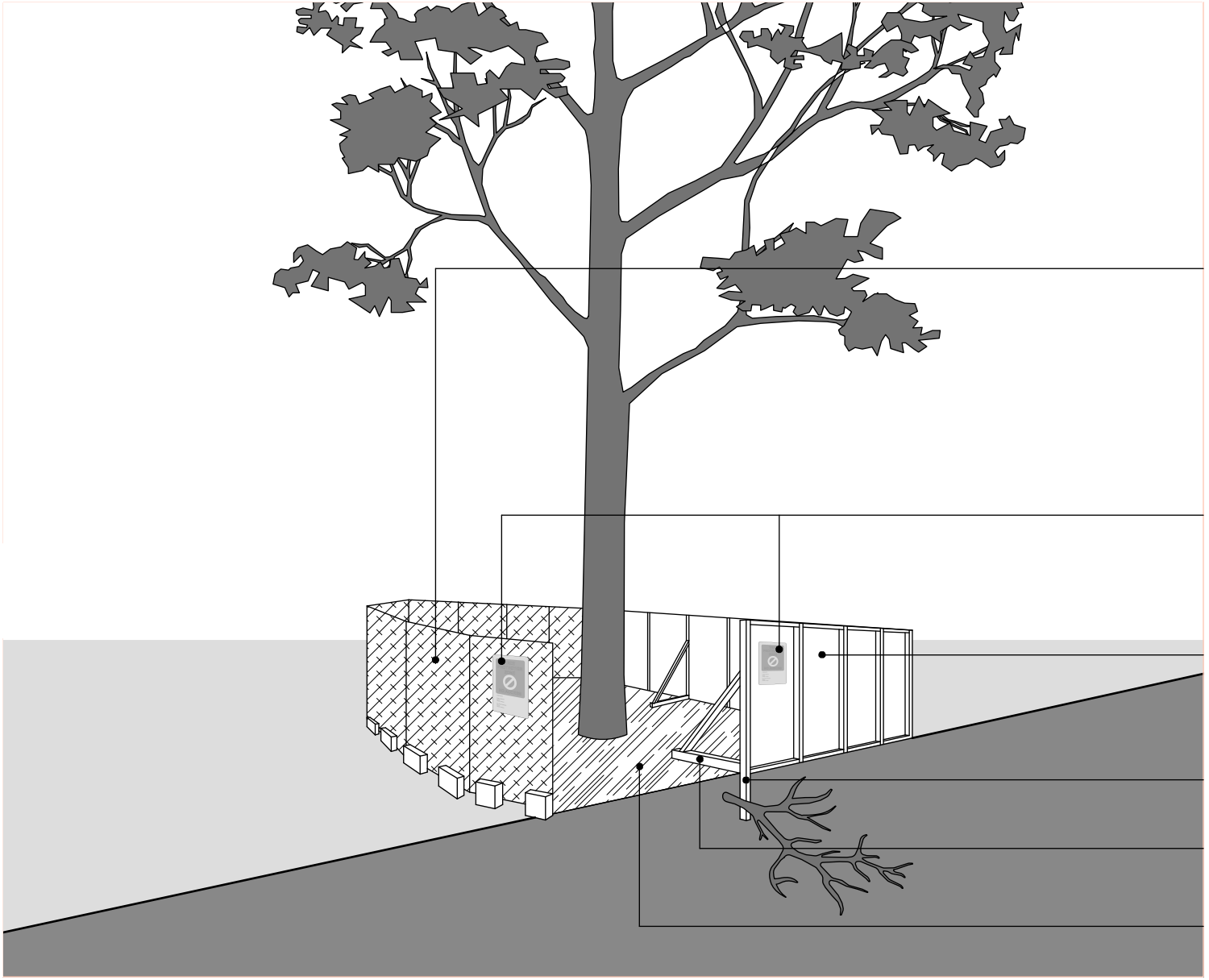
Excavations within the TPZ shall be undertaken using tree sensitive methods (hand/hydro vacuum or similar approved device) to protect tree roots. If there is any delay between excavation works and backfilling, exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times.

No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the Project Arborist. Hand excavation and root pruning shall be undertaken along the excavation line prior to the commencement of mechanical excavation to prevent tearing and shattering damage to the roots from excavation equipment.

Roots (>25mmø) shall be pruned by the Project Arborist only. Roots (<25mmø) may be pruned by the Principal Contractor. Root pruning shall be undertaken with clean, sharp secateurs or a pruning saw to ensure a smooth wound face, free from tears.

Damaged roots shall be pruned behind the damaged tissues with the final cut made to an undamaged part of the root.

Appendix 6: Typical Tree Protection Details



Note:
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

Option 1 - Fencing
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

Option 2 - Fencing
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

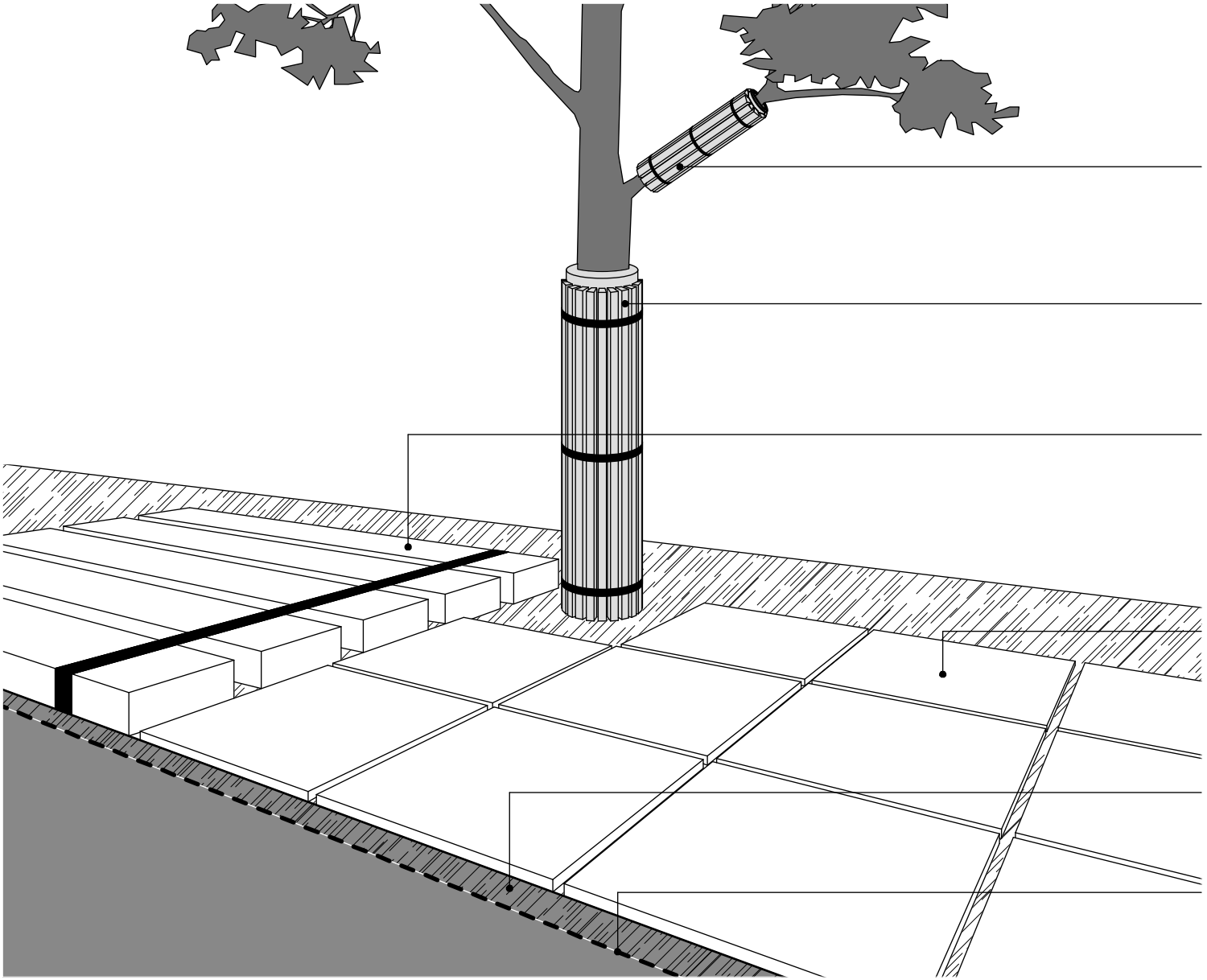
Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

03 Tree Protection Fencing

Not to Scale



Branch Protection - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

Trunk Protection - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

Ground Protection - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

04 Examples of Branch, Trunk and Ground Protection

Not to Scale

Branches may require pruning to erect scaffolding. Pruning may be subject to local regulations. Flexible branches should be tied back in preference to pruning.

Minimum 1.8m high hoarding. Temporary fencing may be incorporated into scaffolding as either containment screening or as hoarding.

Note:
If excavation is required for installation of support post for fencing, the Project Arborist should assess any pruning of roots greater than 20mm diameter.

Scaffold planks

Boards or plywood to be installed over mulch or aggregate layer for any areas requiring access within the TPZ.

Soleplate over geotextile. No excavation for soleplate within TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer within TPZ.

Geotextile fabric

05 Indicative Scaffolding within a Tree Protection Zone (TPZ) Not to Scale