Project No: DUBBO/HOS/17 Report No: DUBBO/HOS/AIA/B

ARBORICULTURAL IMPACT ASSESSMENT
TREE PROTECTION SPECIFICATION

Dubbo Base Hospital
Myall Street
Dubbo

Prepared for: NSW HEALTH INFRASTRUCTURE

8th November 2017
Revision B

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1.0 INTRODUCTION

1.1 Background

1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared for Savills Australia, on behalf of NSW Health Infrastructure, in relation to the proposed redevelopment works at Dubbo Base Hospital, 6 Myall Street, Dubbo. 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 to minimise adverse impacts.

1.1.2 In preparing this report, the author is aware of and has taken into account the objectives of Dubbo Regional Council's *Tree Preservation Register (2017)*, *Australian Standard 4970 Protection of Trees on Development Sites (2009), Australian Standard 4373 Pruning of Amenity Trees (2007)* and *Australian Standard 2303-2015 Tree Stock for Landscape Use.*

Refer to Methodology **(Appendix 1)**

1.1.3 This impact assessment is based on an assessment of the following supplied documentation/plans only:

- Site Plan Stage 4 - Ground Rev 1 – prepared by HDR dated 10/08/17
- Preferred Concept Layout, issue P2 – prepared by GTA Consultants, dated 30.10.17
- Swept Path Assessment S 03-08, issue P5 – prepared by GTA Consultants, dated 01.08.17
- Access & Circulation Vehicle Movement Diagram S 1, issue P2 – prepared by GTA Consultants, dated 11.08.17

Refer to Plans **(Appendix 2)**

1.2 The Proposal

1.2.1 The supplied plans show the proposed works include the following three (3) components:

- Demolition works and construction of the Stage 4 Building and western vehicular entry off Myall Street
- Demolition works and the construction of Stages 3 and 4 carpark
- Demolition works and the construction of entry road and roundabout

Refer to Plans **(Appendix 2)**

2.0 RESULTS

2.1 The Site

2.1.1 The site is located in the south eastern section of the Dubbo Base Hospital complex and comprises of existing hospital buildings, internal roads, carparks and landscape/garden areas. The site is level to gently sloping with a southerly aspect.

2.1.2 The hospital buildings within the site include the Main Entry and Emergency Department Building, the George Hatch Building, the Playmates Cottage Dubbo Child Care Centre and a residential dwelling (62 Cobbora Road).

2.1.3 The site is bound by other areas of the hospital site to the north and west, residential allotments to the east, and Myall Street and the roundabout at the hospital entry to the south.

[1] Mattheck & Breloer (2003)

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2.2 The Trees

2.2.1 Ninety four (94) trees were assessed using the Visual Tree Assessment[2] (VTA) criteria and notes. Site vegetation contains a mix of Australian native and exotic species. Of the trees assessed, forty nine (49) trees were determined to be of moderate Landscape Significance, with forty four (44) trees of low Landscape Significance. One tree (Tree 76) was determined to be of high Landscape Significance. No trees were determined to be of very high Landscape Significance.

2.2.2 None of the trees are listed on the *Dubbo Regional Council Significant Tree Register*. The Register notes that the Tree Preservation Order applies only to trees and groups of trees and communities registered on the Significant Tree Register or on the Interim List associated with the Register.[3]

2.2.3 None of the tree species are listed as *Priority Weeds for the Central West* by the Department of Primary Industries.[4] However, the trees listed in Table 1 are considered environmental weed species due to their propensity to self-seed.

2.2.4 Table 1: Exempt Species

Species	Tree Number
Acer negundo (Box Elder)	27, 29, 38, 41, 52 & 82
Ligustrum lucidum (Large Leaf Privet)	31
Olea europaea var. cuspidata (African Olive)	32, 64, 65 & 75
Syagrus romanzoffiana (Cocos Palm)	87

2.2.5 A search of the BioNet Atlas of NSW Wildlife Database was undertaken in October 2017. Tree 42 *Eucalyptus nicholii* (Narrow Leaf Peppermint) was identified at the site and are listed as a *Vulnerable Species* under the NSW *Biodiversity Conservation Act (2016)* and the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*.[5] Based on its size, location within landscaped areas of the hospital grounds and proximity to buildings, Tree 42 appears to be a planted specimen and is not a component of a locally indigenous vegetation community.

2.2.6 As required by Clause 2.3.2 of *Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970)*, each tree assessed has been allocated a Retention Value. The Retention Value is based on the tree's Useful Life Expectancy and Landscape Significance with consideration to its health, structural condition and site suitability. The Retention Values do not take into account 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

Refer to Tree Assessment Schedule **(Appendix 3)**

[2] Mattheck & Breloer (2003)
[3] Dubbo Regional Council (2017)
[4] Department of Primary Industries (2017)
[5] NSW Office of Environment and Heritage (2011)

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3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Stage 4 Building & Western Vehicular Entry (Myall Street)

3.1.1 Trees to be removed

The supplied plans show that nineteen (19) trees are to be removed as part proposed Stage 4 Building and western vehicular entry (Myall Street). This includes eleven (11) trees with a Retention Value of *Consider for Retention,* four (4) trees with a Retention Value of *Consider for Removal* and four (4) trees with a Retention Value of *Priority for Removal*.

3.1.2 Table 2: Trees to be removed

Consider for Retention	Consider for Removal	Priority for Removal
71, 77, 78, 79, 82, 83, 84, 85, 86, 88 & 89	72, 75, 80 & 90	70, 73, 81 & 87

3.1.3 No trees with a Retention Value of *Priority for Retention* are proposed for removal.

3.1.4 Trees to be retained

The supplied plans show that twelve (12) trees are to be retained as part proposed Stage 4 Building and western vehicular entry (Myall Street). This includes one (1) tree with a Retention Value of *Priority for Retention,* two (2) trees with a Retention Value of *Consider for Retention* and nine (9) trees with a Retention Value of *Consider for Removal.*

3.1.5 Table 3: Trees to be retained

Priority for Retention	Consider for Retention	Consider for Removal
76	69 & 92	6, 65, 66, 67, 68, 74, 91, 93 & 94

3.2 Entry Road & Roundabout

3.2.1 Trees to be removed

The supplied plans show that twenty four (24) trees are to be removed as part of the proposed entry road and roundabout. This includes twelve (12) trees with a Retention Value of *Consider for Retention,* six (6) trees with a Retention Value of *Consider for Removal* and six (6) trees with a Retention Value of *Priority for Removal*.

3.2.2 Table 4: Trees to be removed

Consider for Retention	Consider for Removal	Priority for Removal
2, 11, 12, 13, 37, 44, 45, 46, 47, 48, 49 & 61	15, 16, 34, 35, 36 & 50	5, 6, 7, 9, 10 & 17

3.2.3 No trees with a Retention Value of *Priority for Retention* are proposed for removal.

3.2.4 Trees to be retained

The supplied plans show that sixteen (16) trees are to be retained as part of the proposed entry road and roundabout. This includes twelve (12) trees with a Retention Value of *Consider for Retention* and four (4) trees with a Retention Value of *Consider for Removal.*

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3.2.5 Table 5: Trees to be retained

Consider for Retention	Consider for Removal
1, 3, 4, 8, 18, 54, 55, 56, 57, 58, 59 & 60	14, 19, 62 & 63

3.3 Stages 3 & 4 Carpark

3.3.1 Trees to be removed

The supplied plans show that nineteen (19) trees are to be removed as part of the proposed Stage 3 and 4 carpark. This includes six (6) trees with a Retention Value of *Consider for Retention,* ten (10) trees with a Retention Value of *Consider for Removal* and three (3) trees with a Retention Value of *Priority for Removal*.

3.3.2 Table 6: Trees to be removed

Consider for Retention	Consider for Removal	Priority for Removal
20, 22, 24, 40, 42 & 43	21, 23, 25, 26, 27, 28, 29, 30, 33 & 39	31, 32 & 38

3.3.3 No trees with a Retention Value of *Priority for Retention* are proposed for removal.

3.3.4 Trees to be retained

The supplied plans show that four (4) trees are to be retained as part of the proposed Stages 3 and 4 carpark. This includes three (3) trees with a Retention Value of *Consider for Retention* and one (1) tree with a Retention Value of *Consider for Removal.*

3.3.5 Table 7: Trees to be retained

Consider for Retention	Consider for Removal
51, 53 & 53	41

3.4 Works within Tree Protection Zones

3.4.1 Works are proposed within the Tree Protection Zone (TPZ) areas of fourteen (14) (Trees 3, 4, 8, 18, 54-60, 64, 69 and 76) to be retained as discussed below.

3.4.2 Minor Encroachment

The supplied plans show that works are proposed within the TPZ areas of Trees 3, 4, 8 and 64. As the encroachment into the TPZ areas is less than 10%, the extent of work represents *Minor Encroachment*s as defined by AS-4970. A *Minor Encroachment* is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. The encroachment into the TPZ should be compensated for by extending the TPZ in areas not subject to encroachment.

3.4.3 Major Encroachment

The supplied plans show that works are proposed within the TPZ areas of Trees 18, 54-60, 69 and 76. The extent of works represents *Major Encroachments* as defined by AS-4970. Clause 3.3.4 of AS-4970 notes that design factors and tree sensitive methods can be used to minimize the impact of the encroachment. The following tree sensitive methods should be used to minimise the impact of the works:

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- Demolition of existing structures and pavements should be undertaken using tree sensitive methods. Where possible, existing underground structures should be left in-situ.

- Pavements (including sub-base materials) should be installed above or at existing grade and utilize existing sub-base layers where possible. Surfaces and sub-base materials should be thinned as required above roots (with appropriate root protection installed). In addition, the basal flare/buttressing of each tree should be taken into account when designing pavements and kerbs in close proximity to trees.

3.5 Pruning Works

3.5.1 The supplied plans show that Reduction Pruning/Crown Lifting may be required for Trees 18 and 76 to provide vehicular clearance.

3.5.2 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. The Practising Arborist should have a minimum of 3 years' experience in practical Arboriculture. 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.

3.6 Underground Services

3.6.1 Underground services should be located outside of TPZ areas. Where this is not possible, they should be installed using tree sensitive excavation (hand/hydrovac/airspade etc) with the services located around/below roots (>25mmø, or as determined by the Project Arborist). Alternatively, boring methods may be used for underground service installation where the installation depth is greater than 1200mm below existing grade (measured from top of pipe). Excavations for starting and receiving pits for boring equipment should be located outside of TPZ areas or located to avoid roots (>25mmø, or as determined by the Project Arborist).

3.7 Replacement Planting

3.7.1 Replacement planting is recommended where trees are proposed for removal. Replacement trees should be grown in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

4.0 CONCLUSION

4.1 Ninety four (94) trees were assessed in preparation of this Report and consist a mix of Australian native and exotic species. None of the trees are listed on the *Dubbo Regional Council Significant Tree Register*. The Register notes that the Tree Preservation Order applies only to trees and groups of trees and communities registered on the Significant Tree Register or on the Interim List associated with the Register.[6]

4.2 The supplied plans show the proposed works include demolition works and the construction of the Stage 4 Building and western vehicular entry, entry road and roundabout, and Stages 3 and 4 carpark.

[6] Dubbo Regional Council (2017)

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4.3 The supplied plans show sixty two (62) trees are to be removed as part of the proposed works. Of these:

- Nineteen (19) trees are to be removed for the Stage 4 Building and vehicular entry
- Twenty four (24) trees are to be removed for the entry road and roundabout
- Nineteen (19) are to be removed for the Stage 3 and 4 carpark

4.5 It should be noted that Trees 21 and 24 which are both proposed for removal are commemorative/memorial specimens. Tree 21 has low Landscape Significance and Tree 24 has moderate Landscape Significance.

4.6 The supplied plans show thirty two (32) trees are to be retained as part of the proposed works. Of these, tree sensitive methods as outlined within Section 3.4.3 will be required for ten (10) trees (Trees 18, 54-60, 69 & 76) to minimise the impact of the works. The trees to be retained should be protected in accordance with the Tree Protection Specification **(Appendix 5)**.

4.7 The supplied plans show that Reduction Pruning/Crown Lifting may be required for Trees 18 and 76 to provide vehicular clearance. 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.

4.8 Replacement planting is recommended where trees are proposed for removal. Replacement trees should be grown in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

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.

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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

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Appendix 1: Methodology

1.1 **Site Inspection**: This report was determined as a result of a comprehensive site during October 2017. The comments and recommendations in this report are based on findings from this site inspection.

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.*[7] The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic 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.

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

[7] 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 is considered to meet 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.
	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

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

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

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Appendix 2: Plans

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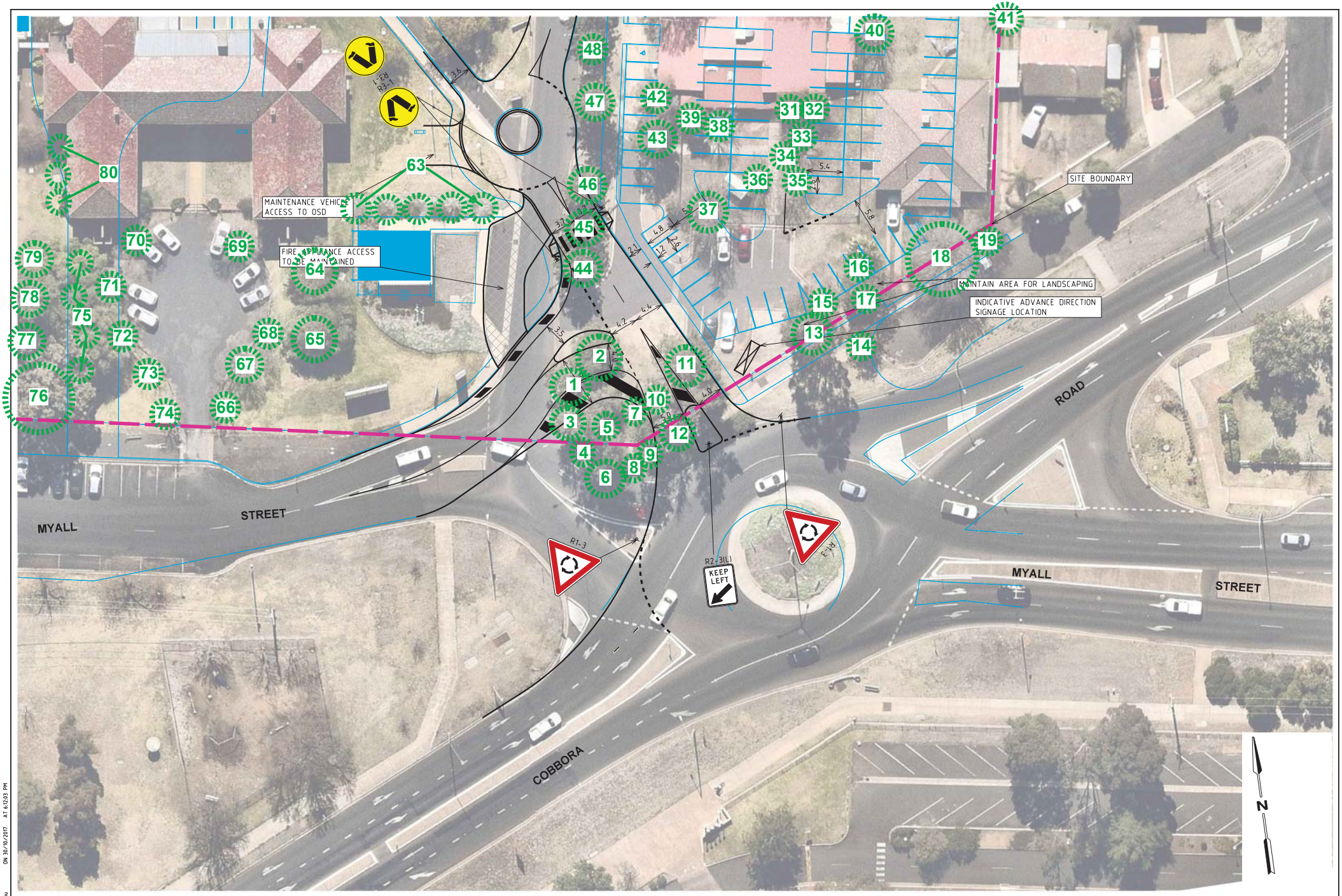

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DESIGN CHECK	H.OBERMAIER
APPROVED BY	B.MAYNARD
DATE ISSUED	30 OCTOBER 2017

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DUBBO HOSPITAL REDEVELOPMENT
PROPOSED HYBRID INTERSECTION DESIGN

PREFERRED CONCEPT LAYOUT

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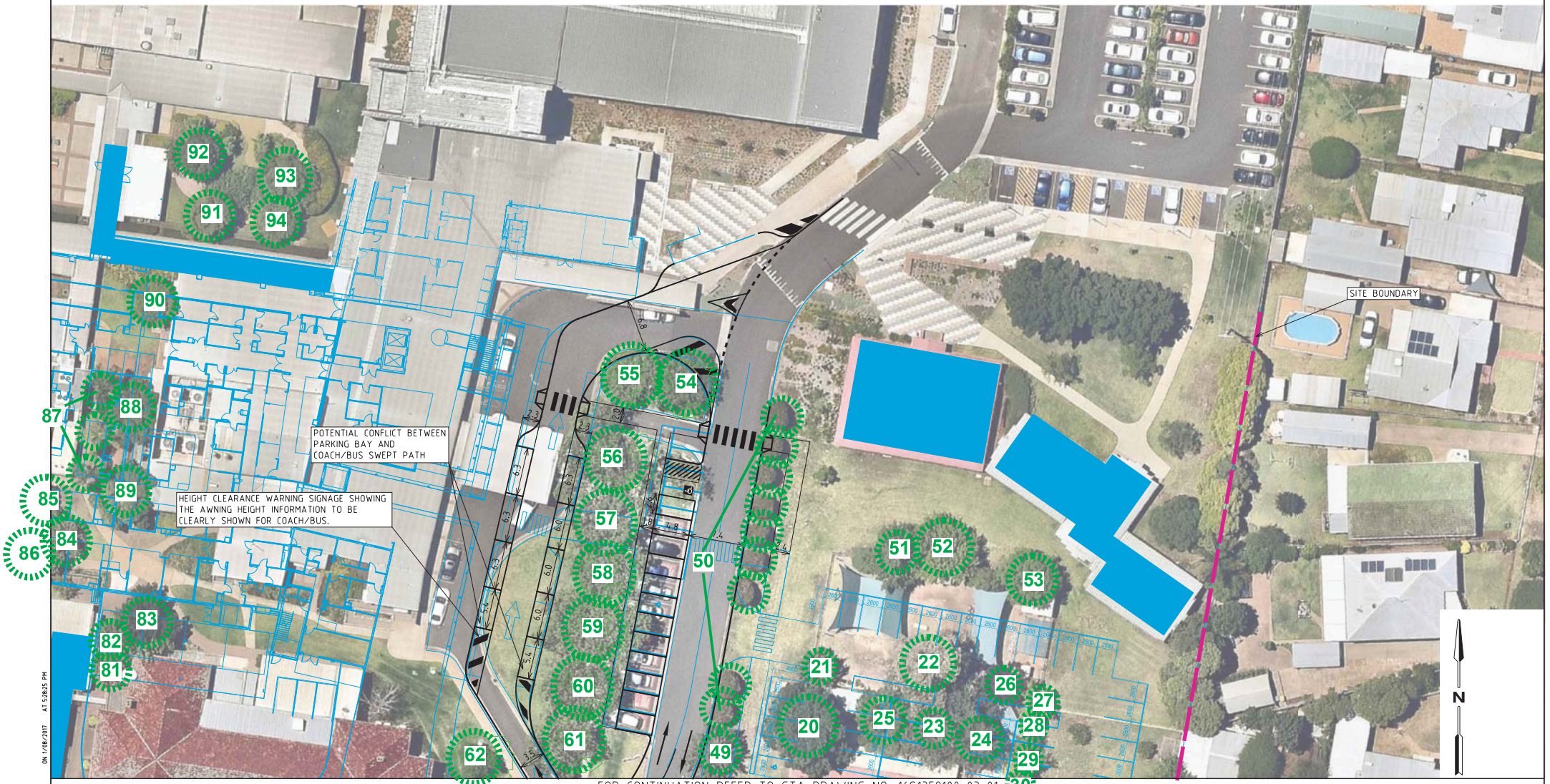

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DUBBO HOSPITAL REDEVELOPMENT

CONCEPT LAYOUT

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Appendix 3: Tree Assessment Schedule

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
1	*Lophostemon confertus* (Brush Box)	300	7	3	Good	Good	Partially suppressed. Storm damage.	15-40	Moderate	Consider for Retention	3.6	2	Retain. No works within TPZ.	Entry road & roundabout
2	*Lophostemon confertus* (Brush Box)	300	7	4	Good	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	3.6	2	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
3	*Casuarina cunninghamiana* (River She-Oak)	500	18	6	Good	Good	Crown density 75-100%. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Storm damage.	15-40	Moderate	Consider for Retention	6	2.5	Retain. Minor encroachment, pavement/kerb.	Entry road & roundabout
4	*Casuarina cunninghamiana* (River She-Oak)	400	16	6	Fair	Good	Small (<25mm) diameter & medium (25-75mm) deadwood in moderate volumes. Wound/s, early stages of decay. Crown density 75-100%.	15-40	Moderate	Consider for Retention	4.8	2.3	Retain. Minor encroachment, pavement/kerb.	Entry road & roundabout
5	*Casuarina cunninghamiana* (River She-Oak)	300	5	2	Good	Poor	Wound/s, early stages of decay. Storm damage, Terminal leader missing. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes.	<5	Low	Priority for Removal	3.6	2	Remove.	Entry road & roundabout
6	*Casuarina cunninghamiana* (River She-Oak)	200	12	3	Poor	Fair	Crown density 25-50%. Small (<25mm) & medium (25-75mm) diameter deadwood in high volumes.	<5	Low	Priority for Removal	2.4	1.7	Remove.	Entry road & roundabout
7	*Casuarina cunninghamiana* (River She-Oak)	250	12	3	Poor	Fair	Crown density 25-50%. Small (<25mm) & medium (25-75mm) diameter deadwood in high volumes.	<5	Low	Priority for Removal	3	1.9	Remove.	Entry road & roundabout
8	*Casuarina cunninghamiana* (River She-Oak)	350	19	5	Good	Fair	Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Wound/s, advanced stages of decay, 1st order branch.	5-15	Moderate	Consider for Retention	4.2	2.2	Retain. Minor encroachment, pavement/kerb.	Entry road & roundabout

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
9	*Casuarina cunninghamiana* (River She-Oak)	300	19	4	Poor	Fair	Crown density 0-25%. Small (<25mm) & medium (25-75mm) & large (>75mm) diameter deadwood in moderate volumes.	<5	Moderate	Priority for Removal	3.6	2	Remove.	Entry road & roundabout
10	*Casuarina cunninghamiana* (River She-Oak)	300	19	4	Poor	Fair	Crown density 0-25%. Small (<25mm) & medium (25-75mm) & large (>75mm) diameter deadwood in moderate volumes.	<5	Moderate	Priority for Removal	3.6	2	Remove.	Entry road & roundabout
11	*Casuarina cunninghamiana* (River She-Oak)	500	17	9	Fair	Fair	Crown density 50-75%. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Wound/s, early stages of decay. Storm damage.	5-15	Moderate	Consider for Retention	6	2.5	Remove. Pavement/kerb footprint.	Entry road & roundabout
12	*Casuarina cunninghamiana* (River She-Oak)	400	20	5	Good	Fair	Crown density 75-100%. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes.	5-15	Moderate	Consider for Retention	4.8	2.3	Remove. Pavement/kerb footprint.	Entry road & roundabout
13	*Corymbia maculata* (Spotted Gum)	550	19	6	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
14	*Jacaranda mimosifolia* (Jacaranda)	150	5	3	Good	Good		15-40	Low	Consider for Removal	2	1.5	Retain. No works within TPZ.	Entry road & roundabout
15	*Sapium sebiferum* (Chinese Tallowwood)	150 150	5	4	Fair	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in moderate volumes. Small (<25mm) epicormic growth in moderate volumes.	15-40	Low	Consider for Removal	2.4	1.7	Remove. Pavement/kerb footprint.	Entry road & roundabout
16	*Livistona australis* (Cabbage Tree Palm)	400	8	2	Good	Good		15-40	Low	Consider for Removal	4.8	2.3	Remove. Pavement/kerb footprint.	Entry road & roundabout
17	*Grevillea robusta* (Silky Oak)	400 250	10	4	Poor	Fair	Crown density 0-25%. Co-dominant inclusion. Small (<25mm), medium (25-75mm) & large (>75mm) diameter deadwood in high volumes.	<5	Moderate	Priority for Removal	6	2.5	Remove.	Entry road & roundabout

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
18	*Ulmus parvifolia* (Chinese Elm)	550	20	8	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
19	*Ulmus parvifolia* (Chinese Elm)	150x3	6	4	Good	Fair	Partially suppressed. Codominant inclusion.	15-40	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.	Entry road & roundabout
20	*Fraxinus excelsior* (European Ash)	450	16	9	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	5.4	2.4	Remove. Pavement/kerb footprint.	Carpark
21	*Pyrus* sp. (Flowering Pear)	150	6	3	Good	Good	Commemorative planting.	15-40	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
22	*Eucalyptus crebra* (Narrow Leaf Ironbark)	550	19	6	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Phototropic lean, moderate. Branch inclusion/s, minor.	15-40	Moderate	Consider for Retention	6.6	2.6	Remove. Pavement/kerb footprint.	Carpark
23	*Fraxinus* sp. (Ash)	150	7	0	Good	Good	Heavily suppressed. Small (<25mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
24	*Ulmus parvifolia* (Chinese Elm)	400	16	8	Good	Good	Memorial tree.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove. Pavement/kerb footprint.	Carpark
25	*Sapium sebiferum* (Chinese Tallowwood)	200x2	8	5	Fair	Good		5-15	Low	Consider for Removal	3.6	2	Remove. Pavement/kerb footprint.	Carpark
26	*Prunus cerasifera* 'nigra' (Flowering Cherry)	100x4	4	3	Good	Good		15-40	Low	Consider for Removal	2.4	1.7	Remove. Pavement/kerb footprint.	Carpark

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27	*Acer negundo* (Box Elder)	150	5	3	Good	Good	Lower trunk occluding fence.	5-15	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
28	*Melaleuca bracteata* (Black Teatree)	150	5	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
29	*Acer negundo* (Box Elder)	150	6	3	Good	Good	Partially suppressed.	15-40	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
30	*Melaleuca bracteata* (Black Teatree)	150	6	3	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
31	*Ligustrum lucidum* (Small Leaf Privet)	200	6	3	Good	Good		<5	Low	Priority for Removal	2.4	1.7	Remove.	Carpark
32	*Olea europaea* var. *cuspidata* (African Olive)	150	5	3	Good	Good		<5	Low	Priority for Removal	2	1.5	Remove.	Carpark
33	*Malus* sp. (Crab Apple)	100x4	3	3	Good	Good	Partially suppressed. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	2.4	1.7	Remove. Pavement/kerb footprint.	Carpark
34	*Pistachia chinensis* (Chinese Pistachio)	200	7	5	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	Remove. Pavement/kerb footprint.	Entry road & roundabout
35	*Pistachia chinensis* (Chinese Pistachio)	200 75	7	4	Good	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in moderate volumes.	15-40	Low	Consider for Removal	2.4	1.7	Remove. Pavement/kerb footprint.	Entry road & roundabout

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
36	*Pistachia chinensis* (Chinese Pistachio)	200 200	7	4	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	3.6	2	Remove. Pavement/kerb footprint.	Entry road & roundabout
37	*Fraxinus* sp. (Ash)	500	18	6	Fair	Good		5-15	Moderate	Consider for Retention	6	2.5	Remove. Pavement/kerb footprint.	Entry road & roundabout
38	*Acer negundo* (Box Elder)	250	7	4	Poor	Fair	Medium (25-75mm) & large (>75mm) diameter deadwood in high volumes.	<5	Low	Priority for Removal	3	1.9	Remove.	Carpark
39	*Callistemon viminalis* (Weeping Bottle Brush)	100	6	2	Good	Good		5-15	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Carpark
40	*Liquidambar styraciflua* (Liquidambar)	350	15	5	Good	Good		15-40	Moderate	Consider for Retention	4.2	2.2	Remove. Pavement/kerb footprint.	Carpark
41	*Acer negundo* (Box Elder)	250	8	4	Poor	n/a	Neighbour's tree. No access to base.	5-15	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.	Carpark
42	*Eucalyptus nicholii* (Narrow Leaf Peppermint)	550 400	14	6	Fair	Fair	Crown density 75-100%. Fungal bracket/s lower trunk. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Moderate	Consider for Retention	8.4	2.9	Remove. Pavement/kerb footprint.	Carpark
43	*Hymenosporum flavum* (Native Frangipani)	250	13	4	Fair	Good	Crown density 50-75%. Partially suppressed. Mechanical damage to exposed roots.	5-15	Moderate	Consider for Retention	3	1.9	Remove. Pavement/kerb footprint.	Carpark
44	*Grevillea robusta* (Silky Oak)	300	7	4	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Pavement/kerb footprint.	Entry road & roundabout

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45	*Grevillea robusta* (Silky Oak)	300	8	5	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Pavement/kerb footprint.	Entry road & roundabout
46	*Grevillea robusta* (Silky Oak)	300	9	6	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Pavement/kerb footprint.	Entry road & roundabout
47	*Grevillea robusta* (Silky Oak)	400	11	4	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	4.8	2.3	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
48	*Grevillea robusta* (Silky Oak)	300	8	3	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
49	*Grevillea robusta* (Silky Oak)	300	9	3	Good	Good	Crown density 75-100%.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
50	*Callistemon viminalis* (Weeping Bottle Brush)	200 av	5	3	Good	Good	Group of 9. Branch inclusion/s, minor.	5-15	Low	Consider for Removal	2.4	1.7	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
51	*Liquidambar styraciflua* (Liquidambar)	300	10	4	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	3.6	2	Retain. No works within TPZ.	Carpark
52	*Acer negundo* (Box Elder)	300 150 150	7	4	Good	Good	Storm damage. Small (<25mm) epicormic growth in low volumes. Small (<25mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	4.2	2.2	Retain. No works within TPZ.	Carpark
53	*Jacaranda mimosifolia* (Jacaranda)	200x3 100	7	4	Good	Good	Wound/s, no visible signs of decay. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	4.2	2.2	Retain. No works within TPZ.	Carpark

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54	*Jacaranda mimosifolia* (Jacaranda)	300	8	4	Good	Good	Small (<25mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	3.6	2	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
55	*Jacaranda mimosifolia* (Jacaranda)	250 250	8	5	Good	Good		15-40	Moderate	Consider for Retention	4.2	2.2	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
56	*Jacaranda mimosifolia* (Jacaranda)	400 350 300	14	8	Good	Good	Small (<25mm) diameter deadwood in low volumes. Storm damage. Medium (25-75mm) epicormic growth in low volumes. Wound/s, advanced stages of decay. Large (>75mm) diameter deadwood in moderate volumes.	15-40	Moderate	Consider for Retention	7.2	2.7	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
57	*Jacaranda mimosifolia* (Jacaranda)	500	14	7	Good	Good	Small (<25mm), medium (25-75mm) & large (>75mm) diameter deadwood in low volumes. Small (<25mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	6	2.5	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
58	*Jacaranda mimosifolia* (Jacaranda)	400	10	4	Good	Good	Small (<25mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	4.8	2.3	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
59	*Jacaranda mimosifolia* (Jacaranda)	400 300	10	7	Good	Good	Small (<25mm) diameter deadwood in low volumes. Small (<25mm) & medium (25-75mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	6	2.5	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout

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60	*Jacaranda mimosifolia* (Jacaranda)	400 300 200	10	6	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Storm damage. Wound/s, early stages of decay. Small (<25mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Entry road & roundabout
61	*Jacaranda mimosifolia* (Jacaranda)	500	10	6	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Small (<25mm) epicormic growth. Medium (25-75mm) epicormic growth in low volumes. Wound/s, early stages of decay. Climber in crown. Storm damage.	15-40	Moderate	Consider for Retention	6	2.5	Remove. Major encroachment, pavement/kerb.	Entry road & roundabout
62	*Jacaranda mimosifolia* (Jacaranda)	150 100	6	3	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	Retain. No works within TPZ.	Entry road & roundabout
63	*Pyrus* sp. (Flowering Pear)	100	5	1	Good	Good	Group of 5. Branch inclusion/s, minor.	15-40	Low	Consider for Removal	2	1.5	Retain. No works within TPZ.	Entry road & roundabout
64	*Olea europaea* var. *cuspidata* (African Olive)	300 200 150x4	7	5	Fair	Good	Wound/s, early stages of decay. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Crown density 75-100%.	5-15	Low	Consider for Removal	6	2.5	Retain. Minor encroachment, demolition.	Building & western vehicular entry
65	*Olea europaea* var. *cuspidata* (African Olive)	300 250x2 150	7	5	Good	Good	Wound/s, early stages of decay. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.	Building & western vehicular entry
66	*Sapium sebiferum* (Chinese Tallowwood)	150 100	6	3	Fair	Good	Wound/s, no visible signs of decay. Crown density 50-75%. Small (<25mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	2.4	1.7	Retain. No works within TPZ.	Building & western vehicular entry
67	*Sapium sebiferum* (Chinese Tallowwood)	200 150x2 100	6	5	Fair	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	3.6	2	Retain. No works within TPZ.	Building & western vehicular entry

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68	*Sapium sebiferum* (Chinese Tallowwood)	250	6	5	Good	Good	Crown density 75-100%. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.	Building & western vehicular entry
69	*Sapium sebiferum* (Chinese Tallowwood)	300	7	5	Good	Good	Crown density 75-100%. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Wound/s, no visible signs of decay.	15-40	Moderate	Consider for Retention	3.6	2	Retain. Major encroachment, demolition. Use tree sensitive methods.	Building & western vehicular entry
70	*Sapium sebiferum* (Chinese Tallowwood)	250	6	4	Poor	Fair	Crown density 25-50%. Small (<25mm) & medium (25-75mm) diameter deadwood in high volumes.	<5	Low	Priority for Removal	3	1.9	Remove.	Building & western vehicular entry
71	*Sapium sebiferum* (Chinese Tallowwood)	300	9	5	Fair	Good	Crown density 50-75%. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Major encroachment, pavement/kerb.	Building & western vehicular entry
72	*Sapium sebiferum* (Chinese Tallowwood)	200	6	4	Fair	Good	Partially suppressed. Medium (25-75mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	2.4	1.7	Remove. Major encroachment, pavement/kerb.	Building & western vehicular entry
73	*Sapium sebiferum* (Chinese Tallowwood)	200 150	4	3	Poor	Fair	Crown density 25-50%. Small (<25mm) & medium (25-75mm) diameter deadwood in moderate volumes. Small (<25mm) epicormic growth in high volumes.	<5	Low	Priority for Removal	3	1.9	Remove.	Building & western vehicular entry
74	*Sapium sebiferum* (Chinese Tallowwood)	200	5	3	Fair	Good	Crown density 50-75%. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Low	Consider for Removal	2.4	1.7	Retain. No works within TPZ.	Building & western vehicular entry
75	*Olea europaea* var. *cuspidata* (African Olive)	150x6 max	7	6	Good	Good	Group of 4. Partially suppressed. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	4.2	2.2	Remove. Pavement/kerb footprint.	Building & western vehicular entry

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
76	*Eucalyptus* sp. (Eucalypt)	750	16	9	Good	Good	Small (<25mm) & medium (25-75mm) & large (>75mm) diameter deadwood in low volumes. Wound/s, early stages of decay. No fruit available to identify to species level.	15-40	High	Priority for Retention	9	3	Retain. Major encroachment, pavement/kerb. Use tree sensitive methods.	Building & western vehicular entry
77	*Grevillea robusta* (Silky Oak)	600	18	5	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Storm damage.	5-15	Moderate	Consider for Retention	7.2	2.7	Remove. Major encroachment, pavement/kerb.	Building & western vehicular entry
78	*Grevillea robusta* (Silky Oak)	550	19	4	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	5-15	Moderate	Consider for Retention	6.6	2.6	Remove. Major encroachment, pavement/kerb.	Building & western vehicular entry
79	*Grevillea robusta* (Silky Oak)	300	9	4	Fair	Fair	Heavily suppressed. Storm damage. Wound/s, advanced stages of decay. Crown density 50-75%. Small (<25mm) diameter deadwood in moderate volumes.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Major encroachment, pavement/kerb.	Building & western vehicular entry
80	*Cupressus sempervirens* 'Swanes Gold' (Pencil Pine)	150	5	1	Good	Good		5-15	Low	Consider for Removal	2	1.5	Remove. Pavement/kerb footprint.	Building & western vehicular entry
81	*Leptospermum petersonii* (Lemon Scented Teatree)	75x6	5	4	Fair	Good	Crown density 50-75%. Partially suppressed. Small (<25mm) diameter deadwood in moderate volumes.	<5	Low	Priority for Removal	2.4	1.7	Remove.	Building & western vehicular entry
82	*Acer negundo* (Box Elder)	250 200	7	5	Good	Good	Partially suppressed.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Building footprint.	Building & western vehicular entry
83	*Fraxinus* sp. (Ash)	250 250	10	4	Fair	Good	Crown density 75-100%. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	4.2	2.2	Remove. Building footprint.	Building & western vehicular entry

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
84	*Jacaranda mimosifolia* (Jacaranda)	500	8	6	Fair	Fair	Large (>75mm) diameter deadwood in moderate volumes. Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes. Partially suppressed. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	6	2.5	Remove. Building footprint.	Building & western vehicular entry
85	*Liquidambar styraciflua* (Liquidambar)	550	17	5	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6	Remove. Building footprint.	Building & western vehicular entry
86	*Ulmus parvifolia* (Chinese Elm)	400 350	15	9	Good	Good	Small (<25mm) & medium (25-75mm) diameter deadwood in low volumes.	15-40	Moderate	Consider for Retention	6.6	2.6	Remove. Building footprint.	Building & western vehicular entry
87	*Syagrus romanzoffiana* (Cocos Palm)	300	8	2	Good	Good	Group of 3.	<5	Low	Priority for Removal	3.6	2	Remove. Building footprint.	Building & western vehicular entry
88	*Sapium sebiferum* (Chinese Tallowwood)	300	12	5	Fair	Good	Crown density 75-100%. Small (<25mm) diameter deadwood in moderate volumes. Small (<25mm) epicormic growth in low volumes.	15-40	Moderate	Consider for Retention	3.6	2	Remove. Building footprint.	Building & western vehicular entry
89	*Sapium sebiferum* (Chinese Tallowwood)	350	8	5	Fair	Good	Crown density 75-100%. Small (<25mm) epicormic growth in low volumes. Small (<25mm) diameter deadwood in moderate volumes. Mechanical damage to exposed roots.	15-40	Moderate	Consider for Retention	4.2	2.2	Remove. Building footprint.	Building & western vehicular entry
90	*Sapium sebiferum* (Chinese Tallowwood)	200 150	7	4	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	Remove. Building footprint.	Building & western vehicular entry
91	*Sapium sebiferum* (Chinese Tallowwood)	250	7	4	Fair	n/a	No access to base. Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes.	5-15	Low	Consider for Removal	3	1.9	Retain. No works within TPZ.	Building & western vehicular entry

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication	Area
92	*Pyrus* sp. (Flowering Pear)	300	9	3	Good	n/a	No access to base.	15-40	Moderate	Consider for Retention	3.6	2	Retain. No works within TPZ.	Building & western vehicular entry
93	*Sapium sebiferum* (Chinese Tallowwood)	200	6	4	Good	n/a	No access to base. Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	Retain. No works within TPZ.	Building & western vehicular entry
94	*Sapium sebiferum* (Chinese Tallowwood)	150x2	6	3	Fair	n/a	No access to base. Crown density 75-100%. Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	Retain. No works within TPZ.	Building & western vehicular entry

Appendix 4: Plates

Plate 1: Showing Trees 3-17

Plate 2: Showing Trees 31-34

Plate 3: Showing Trees 44-46

Plate 4: Showing Trees 58-61

Plate 5: Showing Trees 63 (group of five)

Plate 6: Showing Trees 65-69

Plate 7: Showing Trees 75-79

Plate 8: Showing Trees 80 (group of three)

Plate 9: Showing Trees 84-86

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 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 Site Arborist.

1.2 Tree Protection Fencing

TPZ fencing shall be located at the perimeter of the TPZ. Refer to Tree Assessment Schedule (**Appendix 3).** Where TPZ areas overlap, TPZ fencing may be combined to form a single larger TPZ area. 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)**.

1.3 Site Management

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

1.4 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.

If roots (>25mmø) are encountered during the demolition, excavation and construction works, 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 roots (>25mmø) where deemed necessary by the Project Arborist.

1.5 Ground Protection

Where deemed necessary by the Project Arborist, machinery movements 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 6).**

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1.6 Trunk Protection

Trunk protection shall be installed onto Trees 1 and 3. Trunk protection shall be installed 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 6)**.

Branch protection shall be installed as deemed necessary by the Project Arborist.

1.7 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 1.6). Machinery should not contact the tree's roots, trunk, branches and crown.

The existing pavement shall be carefully lifted by hand to minimise damage to the existing sub-base and to prevent damage to tree roots. Wherever possible, the existing sub-base material shall remain in-situ. Where deemed necessary by the Project Arborist, the structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

When removing slab sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on un-demolished sections of slab at all times. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to the tree's roots.

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.

1.8 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 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.

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.

1.9 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 either hydrovac or hand excavation methods with the services installed around/below roots (>25mmø, or as determined by the Project Arborist).

Alternatively, boring methods may be used for underground service installation where the installation depth is greater than 800mm below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ or located to avoid roots (>25mmø, or as determined by the Project Arborist).

1.10 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 undertaken by hand or using hydro vacuum excavation methods (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.

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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.

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Appendix 6: Typical Tree Protection Details

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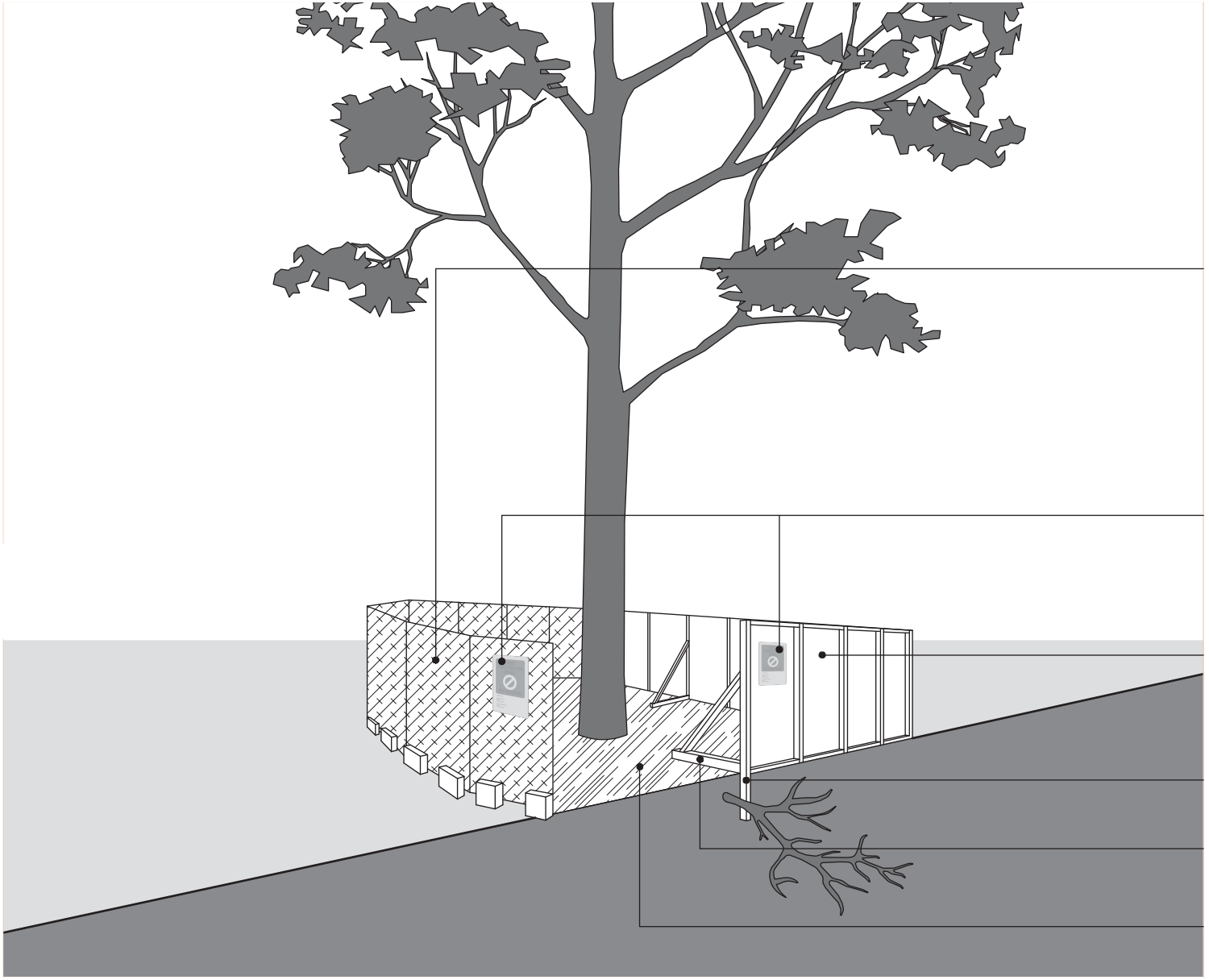


Note:
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

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.

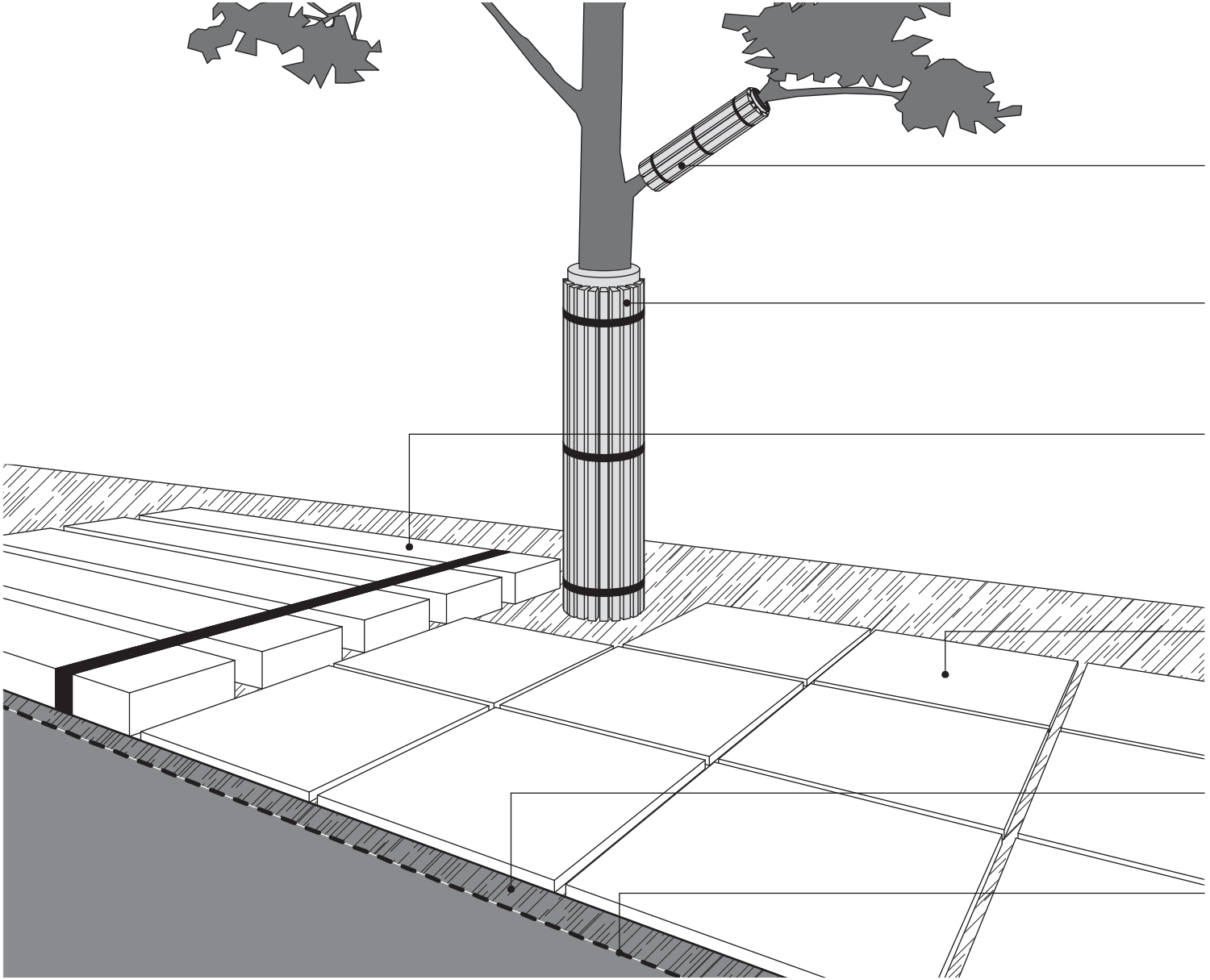
Installation of supports should avoid damaging roots.

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