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Arborist Report

Arboricultural Impact Assessment Statement

Prepared For:	NSW Department of Education
Site Address:	100 Ryans Rd & 19 Northview St, Gillieston Heights, NSW 2321
Ref No:	9451 V10

Prepared By: Alyx Capper
Diploma of Horticulture (Arboriculture)
VALID Tree Risk Qualified
Tree Risk Assessment Qualified (ISA, USA)

Date: 15 January 2025

Contents

Revision History

Version	Date	Notes/Changes	Section
1 – Draft	3/10/2024	Initial report	
2	9/10/2024	Prepare new report based on updated design plans	Whole report
3	14/10/2024	Include the latest Lot and DP as per Preamble V3	3.4 Site Description
4	31/10/2024	Updates as per Town Planner and SINSW comments	Various
5	12/11/2024	Reference Landscape Schematic Design	4.4 Documents Referenced
6	20/11/2024	Update tree data to reflect design and current scope of activity not including future public works (external footpath)	Multiple sections and tables updated
7	21/11/2024	Table 11.3, data about external footpath deleted	11.3 Trees with Major Encroachment
8	25/11/2024	Update table to reflect tree numbers	Summary, 12 Recommendations and Conclusion
9	13/01/2025	Updates as per request from Johnstaff email 13/01/25	Various
10	15/01/2025	Add Landscape Masterplan from the Landscape Schematic Design	6.1 Landscape Masterplan

Summary

Arbpro Pty Ltd were commissioned by NSW Department of Education (DoE), on the 19th of September 2024 to undertake an Arboricultural Impact Assessment (AIA) on trees at Gillieston Public School, 100 Ryans Rd and 19 Northview St, Gillieston Heights, NSW 2321. The proposed activity includes the redevelopment of the school.

The property lies within the City of Maitland Local Government Area (LGA).

The aim of the inspection was to:

- Assess the current health, structure, age class, tree life expectancy, and retention value of the trees.
- Determine Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) of each tree potentially affected by the proposed activity.
- Make recommendations for remedial actions required, including tree removals.
- Determine an outcome of the trees (retain or remove) based on the condition of the subject trees at time of inspection, irrespective of design plans.
- Recommend Tree Protection mitigation measures to ensure trees that are retained remain viable in the future.

Further assessments and reports may be required if design changes occur.

A total of fifty-two (52) individual trees were assessed for the arborist report. The below table summarises the number of trees recommended for retention and removal within the property boundary, their assigned retention values, and their suitability for retention.

Retention Value	To Retain	Tree Numbers	To Remove	Tree Numbers
Very High	0		0	
High	0		0	
Medium	31	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, 17, 19, 25, 27, 28, 31, 32, 33, 35, 36, 37, 43, 44, 45, 46, 47, 48, 50, 51, 52	5	34, 38, 39, 41, 42
Low	11	13, 15, 16, 18, 20, 21, 22, 23, 24, 26, 49	2	29, 30
Exempt	0		2	6, 11
Environmental Weed	0		1	40
Total	42		10	

A further eight (8) trees are to be removed, as per the landscape plan, which are outside the property boundary. Two (2) trees are on Gillieston Rd, six (6) trees are on Northview St.

1 Disclaimer

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Any information provided from others about the condition of the trees and the site can only be assumptions.

All inspections are carried out using Visual Tree Assessment (VTA) methods from ground level only and do not include the use of any diagnostic devices.

Roots and internal defects that are now compartmentalised cannot be assessed as they are not visible. Arbpro cannot determine the structural integrity of internal defects or roots due to this reason.

Extreme and adverse weather conditions are unpredictable and can cause unexpected or inexplicable tree failure.

Trees are living organisms whose health and condition can change rapidly. The recommendations in this report are valid for twelve (12) months from the date of inspection, providing the site remains the same. If the site changes in any way, the report will be invalidated.

It is the client's responsibility to make arrangements with Arbpro Pty Ltd to conduct any recommended re- inspections.

2 Activity

The Gillieston Public School have been identified by the NSW Department of Education (DoE) as requiring redevelopment. The proposed Gillieston Public School redevelopment and new public preschool is driven by service need including increase in expected student enrolments and the removing of demountable structure and replacement with permanent teaching spaces.

The Gillieston Public School redevelopment and new public preschool comprises the following activity:

- Demolition and removal of existing temporary structures.
- Site preparation activity, including demolition, earthworks, tree removal.
- Construction of new:
    - 32 permanent general learning spaces and 3 support teaching spaces.
    - Administration and staff hubs.
    - Hall, canteen and library.

- Out of school hours care.
- Public preschool (standalone building for 60 places).
- Covered Outdoor Learning Areas (COLAs).
- Outdoor play areas, including games courts and yarning circle.
- New at-grade car parking.
- Extension of the existing drop-off / pick-up area and new bus bay.
- Realignment of the existing fencing.
- Associated stormwater infrastructure upgrades.
- Associated landscaping.
- Associated pedestrian and road upgrade activity.

3 Background

3.1 Introduction

NSW Department of Education (DoE) has commissioned Arbpro Pty Ltd to prepare an Arboricultural Impact Assessment (AIA) report on trees at Gillieston Public School, 100 Ryans Rd, Gillieston Heights, NSW 2321. The proposed activity includes the redevelopment of the school, as discussed in *Section 2 Activity.*

The trees were inspected during a site visit on the 9th of November 2022, and the assessments were completed by Kayne Smith (AQF Level 5 Arborist). The assessment reflects the condition of the subject trees on site at the time of inspection. Mature trees do not change significantly in two (2) years and the method used to categorise tree values would not have likely changed the tree significance, therefore, an additional site visit was not required.

On the 1st, 2nd, and 3rd of October 2024, Alyx Capper (AQF Level 5 Arborist) and Kayne Smith (AQF Level 5 Arborist) from Arbpro Tree Specialists, examined the previously collected tree data, along with site photos and cross referenced that information to determine what consequences the proposed activity will have on the trees.

This AIA is based on updated plans, and the further examination of the necessary data was undertaken on the 7th, 8th, 9th of October 2024, with most up to date design plans reviewed on the 19th of November 2024.

3.2 Aim

The aim of the inspection was to:

- Assess the current health, structure, age class, tree life expectancy, and retention value of the trees.
- Determine Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) of each tree.
- Make recommendations for remedial actions required, including tree removals.
- Determine an outcome of the trees (retain or remove) based on the condition of the subject trees at time of inspection, irrespective of design plans.
- Recommend Tree Protection mitigation measures to ensure trees that are retained remain viable in the future.

3.3 Significance of Environmental Impacts

Based on the identification of potential impacts and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that all potential impacts can be appropriately mitigated to ensure that there is minimal impact on the locality, community and/or the environment.

The architectural design process identifies and addresses an extensive number and type of 'potential impacts' which have mitigation measures applied as part of the design process. Major 'potential impacts' and their mitigation measures that have been addressed in the design stage of the project are captured in the architectural Schematic Design Report.

3.4 Site Description

The Site is identified as 100 Ryans Road and 19 Northview Street, Gillieston Heights, legally described as Lot 51 DP1162489 and Part Lot 2 DP1308605.

The Site is located within the Maitland Local Government Area (LGA) and is zoned RU2 Rural Landscape and R1 General Residential zone under the provisions of the Maitland Local Environmental Plan 2011 (MLEP2011).

Existing attributes of the subject site are noted as follows:

- The subject site exhibits an area of approximately 23,385m² and is located in the suburb of Gillieston Heights;
- The subject site has a frontage to Ryans Road to the east, Gillieston Road to the north, and Northview Street to the south;
- In its existing state, the subject site comprises the existing Gillieston Public School. Existing school buildings are primarily located in the west portion of the subject site with a large area of open space situated in the eastern portion. There are limited permanent structures located on the subject site with thirteen (13)

existing demountable classrooms currently occupying the subject site. Permanent buildings consist of the Main Administration Building, Original Brick Cottage, Library and GLS building located in the centre of the subject site; and

- Carparking is provided from Gillieston Road for staff. Pedestrian access is available via this main entrance from Gillieston Road and via a separate pedestrian-only access gates on Northview Street and Ryans Road.

The existing site context is shown in *Figure 1* and *Figure 2* below.

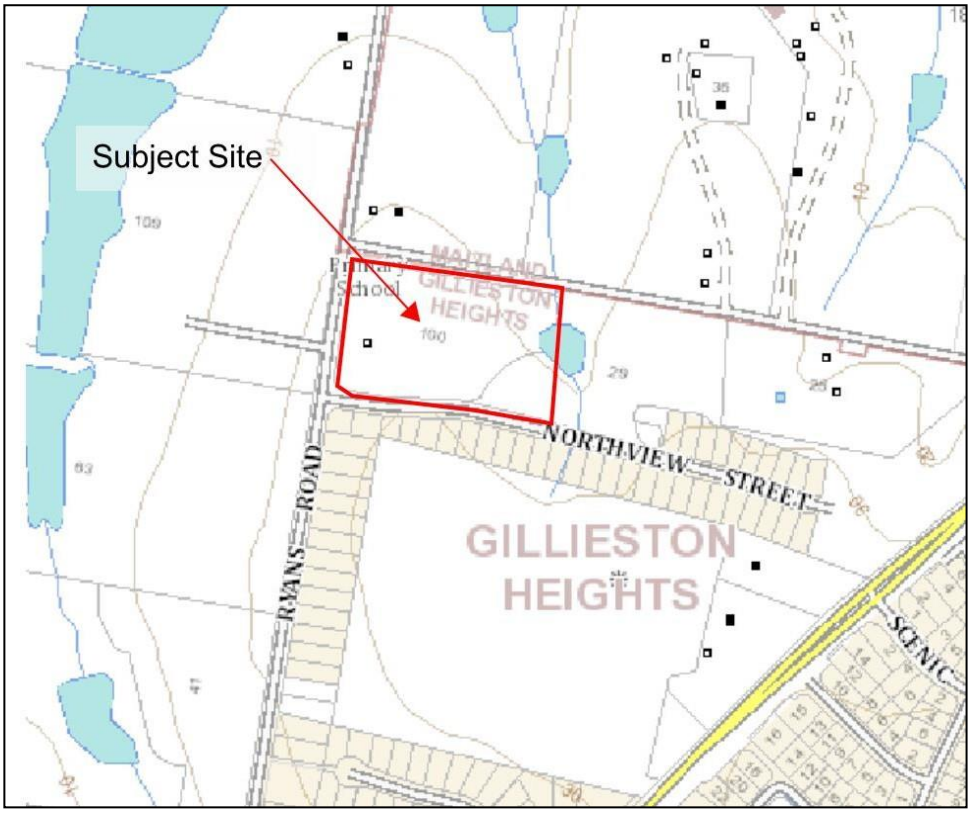

Figure 1 Cadastral Map, provided by Johnstaff. (Source: NSW Spatial Viewer, 2024).

Figure 2 Site Aerial Map, provided by Johnstaff. (Source: Near Map, 2024).

4 Methodology

4.1 Visual Tree Inspection

The inspection included a Visual Tree Assessment (VTA) of the trees from ground level only. The inspection included the notation of the dimensions of the tree and an assessment of the health, age, landscape significance, tree life expectancy, and retention value of all trees. Measurements of diameters at breast height (DBH) were taken with a diameter tape at approximately 1.4 metres from ground level and expressed in millimetres. Measurements of diameters at base (DRB) were taken with a diameter tape at immediately above the root buttress and expressed in millimetres. Tree heights and canopy spreads were estimated and expressed in metres.

The assessment did not include any woody tissue testing or root exploration. No diagnostic equipment was used to determine the extent of defects.

Each tree was GIS mapped with attributes collected using Trimble GeoExplorer XH. Trees and surrounds were visually assessed and given a reference number of T1-T52 *(Figure 3)*. However, the physical tree tags on site are T148-T199, as can be seen in *Section 7.2 Impact Assessment & Results*.

4.2 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ)

Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) were calculated according to the Australian Standard – Protection of Trees on Development Sites 2009 (AS 4970-2009).

The TPZ is the primary means of protecting trees on development sites. The TPZ is a combination of the root area and crown area that requires protection. It is an area isolated from construction disturbance, so that the tree remains sustainable and stable. The TPZ radius is calculated with the following formula, taken from AS 4970-2009:

TPZ radius = DBH x 12

A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required).

The SRZ is a specified distance measured from the trunk that is set aside for the protection of the trees roots both structural and fibrous. The woody root growth and soil cohesion in this area are necessary to hold the tree upright (AS 4970-2009). The SRZ is calculated with the following formula, taken from AS 4970-2009:

$$\text{SRZ radius} = (\text{DAB} \times 50)^{0.42} \times 0.64$$

The SRZ for trees with trunk diameters less than 0.15 m will be 1.5m.

4.3 Tree Life Expectancy, Significance and Retention Value

Tree Life Expectancy (TLE) was estimated based on the species, age, health and site condition of the tree. Landscape significance was determined by using the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010). The tree retention value was determined by using the Retention Value - Priority Matrix of the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010). For further information, please refer to *Appendix A – Tree Retention Value*, located at the end of this report.

4.4 Documents Referenced

The discussions and recommendations of this report are based on the findings from the site inspection and the analysis of the following documents:

- Australian Standard 4373-2007, Pruning of amenity trees (AS 4373-2007).
- Australian Standard 4970-2009, Protection of trees on development sites (AS 4970-2009).
- Preliminary Tree Assessment Report; Prepared By: Arbpro Pty Ltd; File Name: Arborist Report Gillieston Public School Maitland NSW.pdf; Ref: 7310; Dated: 19/11/2022.
- Preliminary Tree Assessment Report; Prepared By: Arbpro Pty Ltd; File Name: Arborist Report Gillieston Public School Maitland NSW.pdf; Ref: 7310 V2; Dated: 12/8/2024.
- Survey Plan; File Name: 4814.ConsultantIssueWIP.240712; Prepared By: SHAC; Project: Gillieston Public School.

- Survey Plan; File Name: 2403751-DET-001-B - mark-up; Prepared By: ADW Johnson; Cad Ref: 230990-05; Project: Perradenya Estate; Date: 13/5/2024.
- Survey Plan; File Name: 4814.GilliestonPS.5.Architectural Drawings.240927; Prepared By: SHAC; Project: Gillieston Public School; Date: 17/9/2024.
- Survey Plan; File Name: 3405 Project Staging _ Layout; Prepared By: SHAC; Project: Project Staging Gillieston Public School.
- Survey Plan; File Name: GPS-ACOR-00-XX-DR-C-DSD-revA; Prepared By: ACOR Consultants; Project: Gillieston Public School. Date: 29/8/2024.
- Survey Plan; File Name: 241003 - 4814 - Sheet 9107 - Existing Trees[4]; Prepared By: SHAC; Project: Gillieston Public School; Drawing Title: Existing Trees; Date: 3/10/2024.
- Landscape Schematic Design, File Name: 14435.5-GILLIESTON P.S-Landscape Schematic Design_Rev P1; Prepared By: Terras Landscape Architects; Dated: 2/12/2024; Provided on 14/01/2025.
- Survey Plan; File Name: 4814.GilliestonPS.5.Architectural Drawings.241115.pdf; Prepared By: SHAC; Project: Gillieston Public School; Date: October 2024.

4.5 Supporting Documents

Please refer to the supplied electronic files to view the following information:

4.5.1 Google Earth KMZ file: ‘Gillieston tree map locations v2.kmz’.

This file can be loaded in to Google Earth to view the location of the tree.

5 Tree Locations

5.1 Overview of trees T1-T52

The following photo includes assessed trees within the property boundary. Trees that require removal outside the property boundary can be seen in *Figure 4* and *Figure 5* on the following pages.

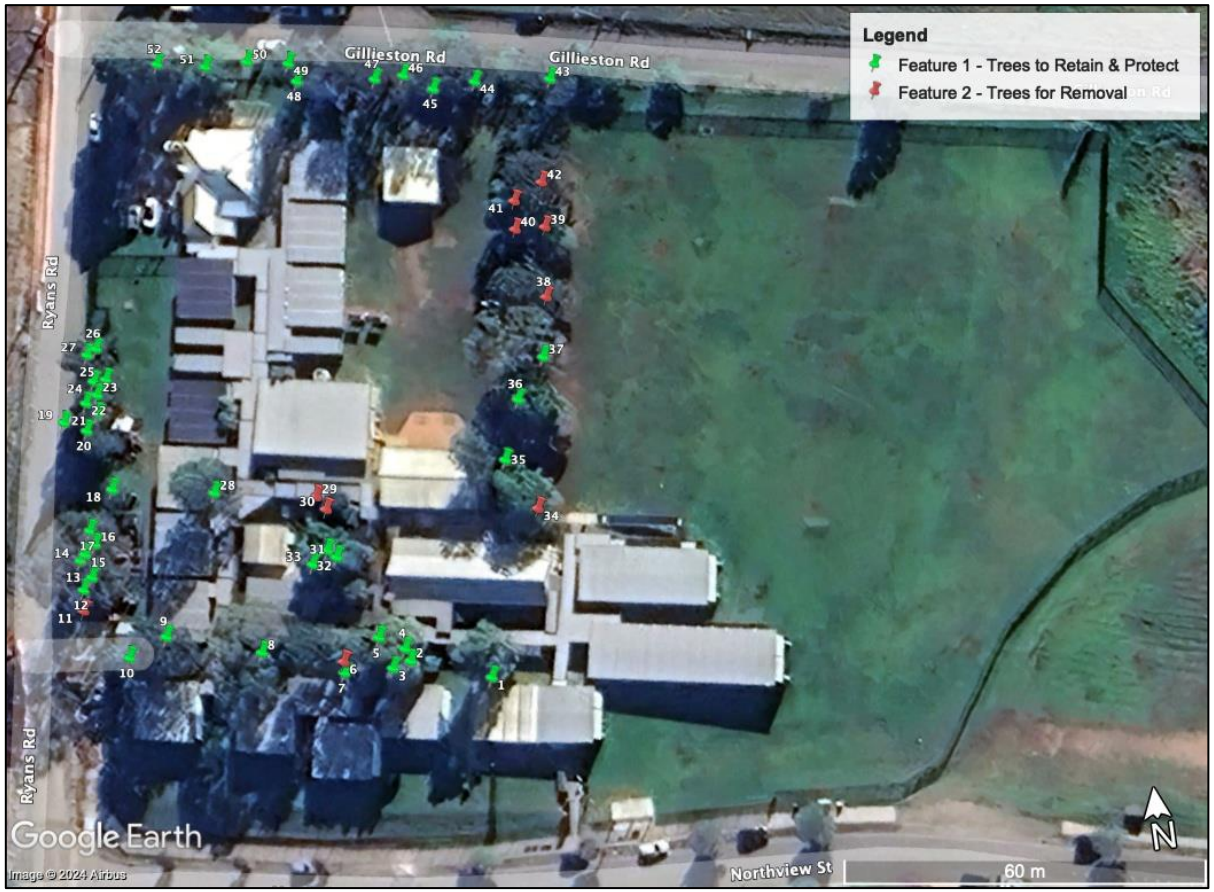

Figure 3 Overview of tree locations. Photo courtesy of Google Earth, accessed 20 November 2024.

6 Concept Plans

6.1 Landscape Masterplan

Figure 4 Landscape Masterplan as shown in the Landscape Schemtaic Design, noting the locations of the tree removals outside the property boundary on Gillieston Road and Northview Street. File Name: 14435.5-GILLIESTON P.S-Landscape Schematic Design_Rev P1; Prepared By: Terras Landscape Architects; Dated: 2/12/2024; Provided on 14/01/2025.

6.2 Concept Plan showing Location of Existing Trees

Figure 5 Supplied plan showing location of existing trees - File Name: 241003 - 4814 - Sheet 9107 - Existing Trees[4]; Prepared By: SHAC; Project: Gillieston Public School. Supplied via email on 3/10/2024.

6.3 Proposed Ground Floor Site Plan

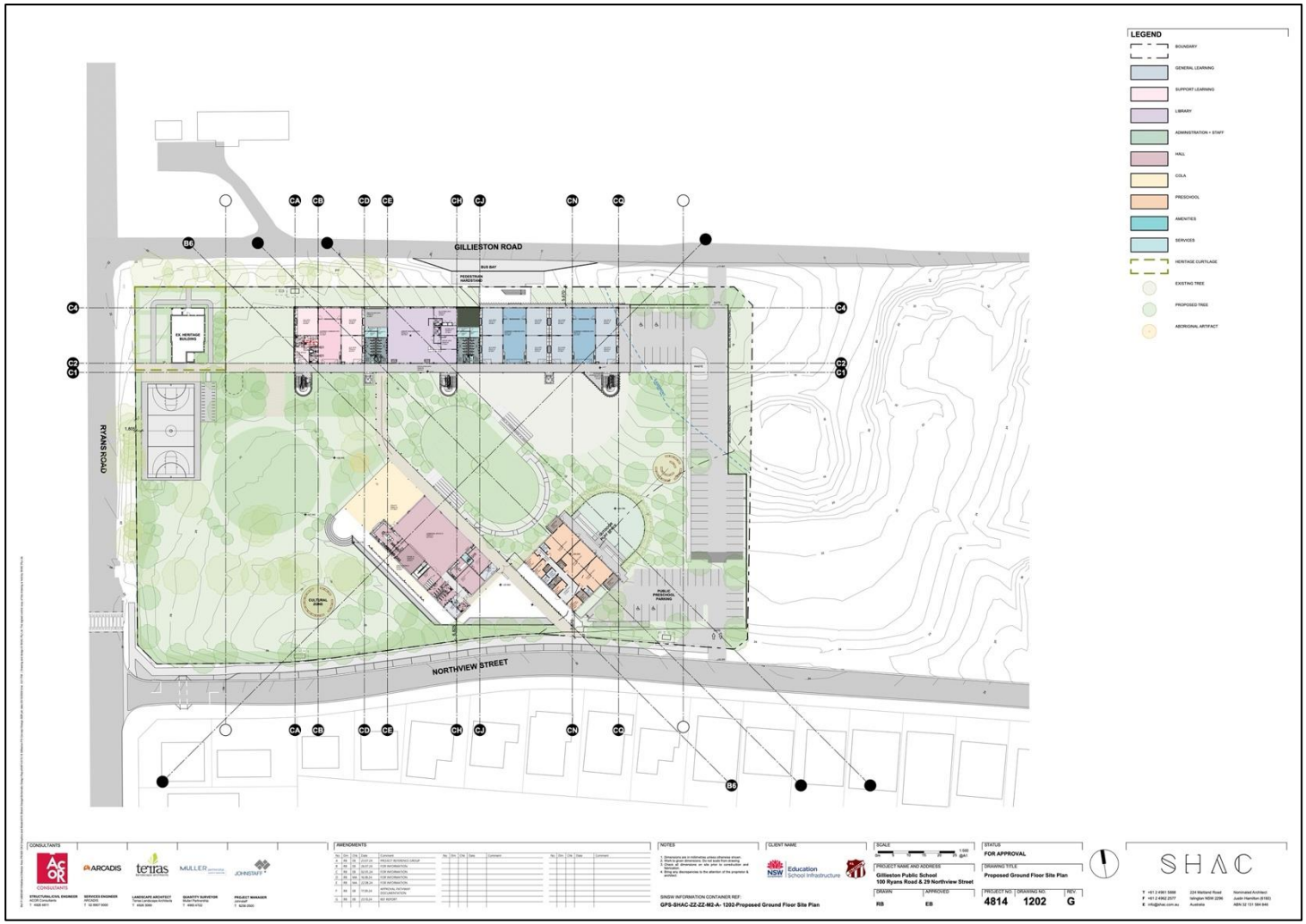

Figure 6 Proposed ground floor site plan. File name: 4814.GillestonPS.5.Architectural Drawings.241115.pdf; Page 6 of 35; Drawing No: 1202; Rev: G.

7 Observations

7.1 Environmental Significance Status

The following information was identified using the NSW Planning Portal Spatial Viewer:

- The area is currently zoned as RU2 – Rural Landscape, and R1 – General Residential *(Figure 7)*:

Figure 7 The area is zoned as RU2 – Rural Landscape, and R1 – General Residential. As shown on the NSW Planning Portal, accessed 2 October 2024.

- Bushfire Prone Mapping (Figure 8, Section 7.1.1):
    - Vegetation Category 1, Vegetation Buffer.

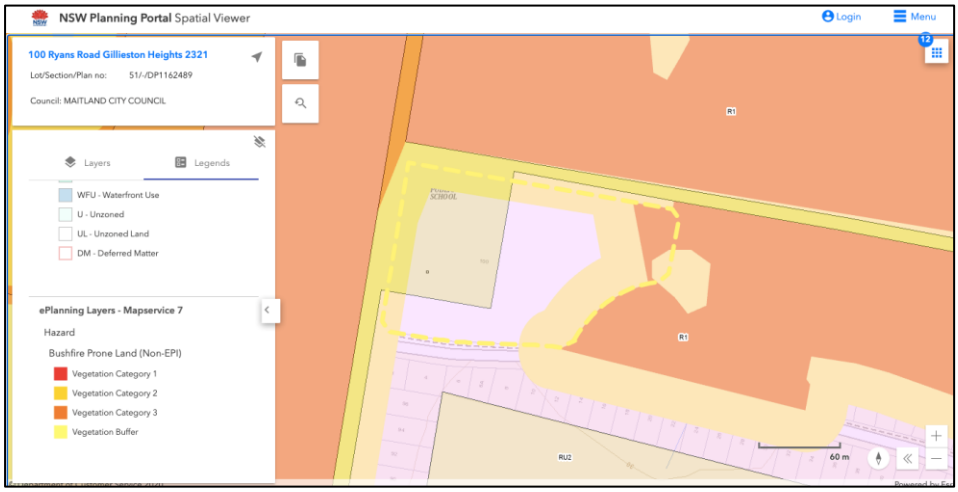

Figure 8 The shaded areas show land considered to be Vegetation Category 3 (Orange) and Vegetation Buffer (Yellow). Photo courtesy of NSW Planning Portal, accessed 2 October 2024.

7.1.1 Bushfire Prone Land

Bush Fire Prone Land mapping is intended to designate areas of the State that are considered to be higher bush fire risk for development control purposes. Vegetation Category 1 consists of: > Areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations. Vegetation Category 2 consists of: >Rainforests. >Lower risk vegetation parcels. These vegetation parcels represent a lower bush fire risk to surrounding development and consist of: - Remnant vegetation; - Land with ongoing land management practices that actively reduces bush fire risk. Vegetation Category 3 consists of: > Grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands. Buffers are created based on the bushfire vegetation, with buffering distance being 100 metres for vegetation category 1 and 30 metres for vegetation category 2 and 3. Bushfire Prone Land (BFPL) Mapping Guidelines are available from www.rfs.nsw.gov.au.

(https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0011/4412/Guideline-for-Councils-to-Bushfire-Prone-Area-Land-Mapping.pdf)

7.2 Impact Assessment & Results

The following table includes assessed trees within the property boundary.

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
1	148	Angophora floribunda (Rough-barked Apple)	520	520	6.2	2.5	Mature	Good	15-40yrs	Medium	Medium	1m from footpath, co-dom with good union	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
2	149	Eucalyptus species (Gum Tree)	480	480	5.8	2.4	Mature	Good	15-40yrs	Medium	Medium	1.5m from footpath, small Mandarin tree at base	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
3	150	Hymenosporum flavum (Native Frangipani)	150	150	1.8	1.5	Mature	Good	15-40yrs	Medium	Medium	Growing directly beside footpath, slight damage to root flare	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
4	151	Grevillia robusta (Silky Oak)	510	510	6.1	2.5	Mature	Good	15-40yrs	Medium	Medium	Root flare exposed and directly adjacent to footpath	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
5	152	Cuppressus sempervirens (Mediterranean Cypress/Pencil Pine)	340	340	4.1	2.1	Mature	Good	15-40yrs	Medium	Medium	400mm from footpath, suppressed growth on Southern side due to neighbouring trees	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Exotic	Retain
6	153	Dead tree	210	210	2.5	1.7	Over Mature	Dead	Dead	Dead	Priority for Removal	Dead tree not considered important for retention	Removal of dead tree considered the most appropriate action	Native	Remove
7	154	Grevillia robusta (Silky Oak)	440	440	5.3	2.3	Mature	Good	15-40yrs	Medium	Medium	Nesting bird in upper canopy	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
8	155	Corymbia citriodora (Lemon-Scented Gum)	460	460	5.5	2.4	Mature	Good	15-40yrs	Medium	Medium	Growing in contact with concrete slab	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
9	156	Grevillia robusta (Silky Oak)	690	690	8.3	2.8	Mature	Good	15-40yrs	Medium	Medium	Growing adjacent to concrete drive	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
10	157	Cupaniopsis anacardioides (Tuckeroo)	210	210	2.5	1.7	Semi Mature	Good	15-40yrs	Medium	Medium	500mm from concrete drive	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
11	158	Eucalyptus species (Gum Tree)	150	150	1.8	1.5	Young	Poor	1-5yrs	Low	Priority for Removal	Regrowth from stump, in spiral of decline. Not considered important for retention	Removal of tree considered the most appropriate action	Native	Remove
12	159	Corymbia citriodora (Lemon-Scented Gum)	520	520	6.2	2.5	Mature	Good	15-40yrs	Medium	Medium		Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
13	160	Casuarina cunninghamiana (River Sheoak QLD)	280	280	3.4	1.9	Mature	Good	15-40yrs	Low	Low	Suppressed by adjacent tree, and suppressing Bottlebrush	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
14	161	Callistemon species (Bottle Brush)	150	150	1.8	1.5	Semi Mature	Fair	15-40yrs	Low	Medium	Suppressed by adjacent tree	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
15	162	Casuarina cunninghamiana (River Sheoak QLD)	220	220	2.6	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
16	163	Casuarina cunninghamiana (River Sheoak QLD)	250	250	3.0	1.8	Mature	Fair	15-40yrs	Low	Low		Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
17	164	Casuarina cunninghamiana (River Sheoak QLD)	330	330	4.0	2.1	Mature	Good	15-40yrs	Medium	Medium	Remove small saplings surrounding tree	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
18	165	Mulberry Morus spp	150	150	1.8	1.5	Young	Good	15-40yrs	Low	Low	Broken branch leaning on ground	Tree contains minor attributes worthy of retention, its removal should be considered. Tree appears outside any proposed demolition. Install tree protection fencing prior to construction works commencing	Exotic	Retain
19	166	Corymbia citriodora (Lemon-Scented Gum)	550	550	6.6	2.6	Mature	Good	15-40yrs	Medium	Medium	1m from fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain
20	167	Casuarina cunninghamiana (River Sheoak QLD)	230	230	2.8	1.8	Mature	Good	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
21	168	Casuarina cunninghamiana (River Sheoak QLD)	230	230	2.8	1.8	Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
22	169	Casuarina cunninghamiana (River Sheoak QLD)	220	220	2.6	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
23	170	Casuarina cunninghamiana (River Sheoak QLD)	150	150	1.8	1.5	Semi Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
24	171	Casuarina cunninghamiana (River Sheoak QLD)	240	240	2.9	1.8	Semi Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
25	172	Casuarina cunninghamiana (River Sheoak QLD)	300	300	3.6	2.0	Mature	Good	15-40yrs	Low	Medium	2 small Bottlebrush beneath tree. Crown lift over basketball/tennis court	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
26	173	Casuarina cunninghamiana (River Sheoak QLD)	240	240	2.9	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Native	Retain
27	174	Jacaranda mimosifolia (Jacaranda)	530	530	6.4	2.5	Mature	Good	15-40yrs	Medium	Medium	1.5m from fence, hanging branch	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Exotic	Retain
28	175	Grevillia robusta (Silky Oak)	450	450	5.4	2.4	Mature	Good	15-40yrs	Medium	Medium	Slight damage to surface root	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing. Removal may need to be considered if tennis/basketball court has a major encroachment on the TPZ	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
29	176	Banksia integrifolia (Coast Banksia)	370	370	4.4	2.2	Mature	Fair	1-5yrs	Low	Low	Tree has had very poor pruning leaving it susceptible to decay	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Native	Remove
30	177	Syzygium australe (Brush Cherry)	220	220	2.6	1.8	Mature	Fair	1-5yrs	Low	Low	Has recently sustained 50% bark loss on both main trunks	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Native	Remove
31	178	Lagerstroemia indica (Crepe Myrtle)	280	280	3.4	1.9	Mature	Good	15-40yrs	Low	Medium	Suppressed by adjacent tree	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Exotic	Retain
32	179	Jacaranda mimosifolia (Jacaranda)	340	340	4.1	2.1	Mature	Good	15-40yrs	Medium	Medium	Growing adjacent to footpath	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Exotic	Retain
33	180	Callistemon viminalis (Weeping Bottlebrush)	380	380	4.6	2.2	Mature	Good	15-40yrs	Medium	Medium	Good shade tree	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Native	Retain
34	181	Jacaranda mimosifolia (Jacaranda)	680	680	8.2	2.8	Mature	Good	15-40yrs	Medium	Medium	500mm from concrete footpath	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building	Exotic	Remove
35	182	Grevillia robusta (Silky Oak)	380	380	4.6	2.2	Mature	Good	15-40yrs	Medium	Medium	Tree growing adjacent to concrete	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
36	183	Lophostemon confertus (Brushbox)	590	590	7.1	2.7	Mature	Good	15-40yrs	Medium	Medium		Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
37	184	Corymbia citriodora (Lemon-Scented Gum)	580	580	7.0	2.6	Mature	Good	15-40yrs	Medium	Medium		Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Native	Retain
38	185	Grevillia robusta (Silky Oak)	580	580	7.0	2.6	Mature	Good	15-40yrs	Medium	Medium		Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building and storm water	Native	Remove
39	186	Jacaranda mimosifolia (Jacaranda)	320	320	3.8	2.1	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building	Exotic	Remove
40	187	Ligustrum lucidum (Broad-leafed Privet)	530	530	6.4	2.5	Mature	Good	15-40yrs	Low	Environmental Weed	Multiple previous branch failures, species is considered an environmental weed in NSW. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building	Noxious Weed	Remove
41	188	Brachychiton populneus (Kurrajong Tree)	700	700	8.4	2.8	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building	Native	Remove
42	189	Grevillia robusta (Silky Oak)	700	700	8.4	2.8	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building	Native	Remove
43	190	Grevillia robusta (Silky Oak)	570	570	6.8	2.6	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
44	191	Grevillia robusta (Silky Oak)	470	470	5.6	2.4	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain
45	192	Grevillia robusta (Silky Oak)	450	450	5.4	2.4	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain
46	193	Grevillia robusta (Silky Oak)	300	300	3.6	2.0	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain
47	194	Grevillia robusta (Silky Oak)	710	710	8.5	2.9	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain
48	195	Grevillia robusta (Silky Oak)	540	540	6.5	2.6	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Native	Retain

Tree Ref	Tree Tag ID	Tree Species	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Development Notes	Species Origin	Retain / Remove
49	196	Notelaea longifolia (Mock olive)	200	200	2.4	1.7	Mature	Fair	15-40yrs	Low	Low	Regrowth from cut stump. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Exotic	Retain
50	197	Lagerstroemia indica (Crepe Myrtle)	220	220	2.6	1.8	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Exotic	Retain
51	198	Jacaranda mimosifolia (Jacaranda)	500	500	6.0	2.5	Mature	Good	15-40yrs	Medium	Medium	1.5m from existing path. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Exotic	Retain
52	199	Eucalyptus tereticornis (Forest Red Gum)	870	870	10.4	3.1	Mature	Good	15-40yrs	Medium	Medium	1m from carpark. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Tree contains attributes worthy of retention. All activity within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist. Demolition of existing concrete car park and curb shall also be overseen by project arborist, starting closest to the tree, and working backwards	Native	Retain

7.3 Glossary for Impact Assessment & Results

The impact assessment has been undertaken in accordance with the *Australian Standard 4970-2009 Protection of trees on development sites (AS4970-2009)*. The results include, but not limited to, an assessment of retention value, DBH, DAB, age class, health, significance, tree life expectancy, proposed outcome and comments. Includes, but not limited to, the following:

7.3.1 Tree Ref

Tree reference number as shown on the tree location map and survey plan.

7.3.2 Tree Tag ID

Plastic tag positioned on the tree trunk at head height.

7.3.3 DBH

Measurements of diameters at breast height (DBH) were taken with a diameter tape at approximately 1.4 metres from ground level and expressed in metres. This measurement determines the TPZ.

7.3.4 DRB

Measurements of diameter at root buttress (DRB) were taken immediately above the root buttress and expressed in metres. This measurement determines the SRZ.

7.3.5 TPZ

The TPZ is the primary means of protecting trees on development sites. For further information, please see *Section 4.2 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ).*

7.3.6 SRZ

The SRZ is a specified distance measured from the trunk that is set aside for the protection of the trees roots both structural and fibrous. For further information, please see *Section 4.2 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ).*

7.3.7 Age Class

- Young
- Semi-mature
- Mature
- Over-mature

7.3.8 Health

- Poor - Tree under stress, which may be alleviated with some remediation work.
- Fair - Showing signs of stress, decay or health issues, which may be alleviated with remediation work.
- Good - No signs of significant health issues visible.

7.3.9 TLE (Tree Life Expectancy)

Estimated tree life expectancy:

- Long - >40 years
- Medium – 15-40 years
- Short – 5-15 years
- Dead - <5 years

7.3.10 Landscape Significance
Landscape significance was determined by using the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010).

7.3.11 Retention Value
Tree retention value is gained by a matrix system that takes in to account the significance of the subject tree and the estimated tree life expectancy.

7.3.12 Notes
Brief information on the particular tree.

7.3.13 Development Notes
Information regarding the proposed activity around the tree, usually containing a course of action for the project arborist.

7.3.14 Species Origin
Species origin is one of the following:

- Endemic – naturally occurs in the localised area of assessment.
- Native – Australian native species.
- Exotic – native to areas outside of Australia.

7.3.15 Remove / Retain
A selection of either retain or remove tree based on species, age class, significance, health and structure, regardless of design plans.

8 Discussion

8.1 Current Tree Population

A total of fifty-two (52) individual trees were assessed for this arborist report. The table below summarises the surveyed tree species:

Tree Species	Species Origin	Tree Numbers	Total
Angophora floribunda (Rough-barked Apple)	Native	1	**1**
Banksia integrifolia (Coast Banksia)	Native	29	**1**
Brachychiton populneus (Kurrajong Tree)	Native	41	**1**
Callistemon species (Bottle Brush)	Native	14	**1**
Callistemon viminalis (Weeping Bottlebrush)	Native	33	**1**
Casuarina cunninghamiana (River Sheoak QLD)	Native	13, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26	**11**
Corymbia citriodora (Lemon-Scented Gum)	Native	8, 12, 19, 37	**4**
Cupaniopsis anacardioides (Tuckeroo)	Native	10	**1**
Cuppressus sempervirens (Mediterranean Cypress/Pencil Pine)	Exotic	5	**1**
Dead tree	Native	6	**1**
Eucalyptus species (Gum Tree)	Native	2, 11	**2**
Eucalyptus tereticornis (Forest Red Gum)	Native	52	**1**
Grevillia robusta (Silky Oak)	Native	4, 7, 9, 28, 35, 38, 42, 43, 44, 45, 46, 47, 48	**13**
Hymenosporum flavum (Native Frangipani)	Native	3	**1**
Jacaranda mimosifolia (Jacaranda)	Exotic	27, 32, 34, 39, 51	**5**
Lagerstroemia indica (Crepe Myrtle)	Exotic	31, 50	**2**
Ligustrum lucidum (Broad-leafed Privet)	Noxious Weed	40	**1**
Lophostemon confertus (Brushbox)	Native	36	**1**
Mulberry Morus spp	Exotic	18	**1**
Notelaea longifolia (Mock olive)	Exotic	49	**1**
Syzygium australe (Brush Cherry)	Native	30	**1**

8.2 TLE (Tree Life Expectancy)

TLE is the estimated tree life expectancy (Barrell, 2009). It is an estimation of the length of time, from the date of inspection, that the tree will live in its current growing environment, prior to any proposed activity.

- Long - >40 years
- Medium – 15-40 years
- Short – 5-15 years
- Dead - <5 years

TLE	Number of Trees	Tree Numbers
40 Plus	0	
15-40yrs	48	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
5-15yrs	0	
1-5yrs	3	11, 29, 30
Remove Hazardous	0	
Dead	1	6
Total		**52**

8.3 Landscape Significance

Landscape significance was determined by using the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010). For further information, please refer to *Appendix A – Tree Retention Value*, located at the end of this report. A summary of the results are listed below:

Landscape Significance	Number of Trees	Tree Numbers
High	0	
Medium	33	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 17, 19, 27, 28, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52
Low	18	11, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 40, 49
Dead	1	6
Environmental Weed	0	
Total		**52**

8.4 Retention Value

Retention value was determined by using the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010). For further information, please refer to *Appendix A – Tree Retention Value*, located at the end of this report. A summary of the results are listed below:

Retention Value	Number of Trees	Tree Numbers
Very High	0	
High	0	
Medium	36	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, 17, 19, 25, 27, 28, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52
Low	13	13, 15, 16, 18, 20, 21, 22, 23, 24, 26, 29, 30, 49
Priority for Removal	2	6, 11
Environmental Weed	1	40
Total		**52**

9 Impact to Trees on Development Sites

9.1 Typical Damage to Tree Roots

Root damage is the most common cause of damage to trees on construction sites. Roots are far more extensive and closer to the surface than commonly thought.

Activities that have the potential to impact retained trees on development sites include, but not limited to, the following:

- Bulk earthworks to achieve desired grade.
- Construction of excavated areas, such as batters, retaining wall, etc.
- Construction of finished surfaces, particularly hard impermeable surfaces within the TPZ of retained trees.
- Excavation and trenching for foundations, services etc. *(Figure 9)*.
- Demolition of existing buildings and surfaces.

At the early stages of design, it is important to consider the impact of the construction process on trees that are proposed to be retained, and ensure they will remain viable both during construction and in the future.

Typically, tree roots only inhabit the first 600mm of soil *(Figure 10)*, so even shallow excavation will incur significant root loss to trees. Most tree roots are found near the soil surface. Soils near the surface have high nutrient and microorganism concentrations, good aeration, and warm temperatures, so are ideally suited to root growth.

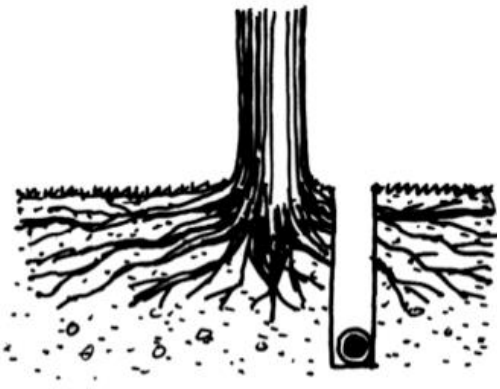

Figure 9 Drawing depicting the extent of root damage that can be caused by trenching next to trees.

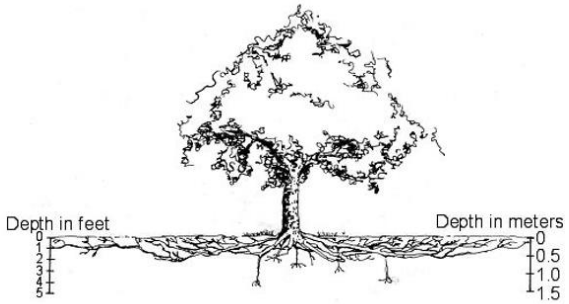

Figure 10 Drawing of a typical tree root system. Typically, tree roots extend beyond the dripline whilst the majority of the roots inhabit the top 600mm of soil.

In addition to this, tree roots are also significantly compromised by activities that reduce or prevent the flow of oxygen through the soil such as soil compaction of the existing soil or raising the soil levels to much in the incorrect manner.

- The decreased levels of oxygen in filled over root systems can also lead to decay of structural roots, which may compromise tree stability. Where the affected tree has grown roots up in the fill profile (a common response to deoxygenation of the natural profile) the tree may appear healthy with the canopy sustained by the active feeder roots, but may ultimately be a hazard in its location due to decay of critical structural roots.
- Both oxygen and water are held in pores between the soil particles. When the soil pores are large (i.e. in coarse sandy soils) the soil is generally aerated and free draining and roots are often found deeper in the profile. In heavy soils (clays / compacted soils) drainage is not as effective and oxygen is limited. Roots are often very shallow in these situations.
- Placing soil or other materials over root systems at depths greater than 100mm will impede air movement into and out of the soil and will invariably restrict air flow around roots.
- Compaction makes pore sizes smaller and not only reduces space for oxygen to move through the soil but effectively reduces the capacity for roots to grow through the soil.
- Roots respire and convert stored carbohydrate to sugars for energy. Waterlogged or compacted soils hold low levels of oxygen and prevent roots from respiring. This means a tree can’t access its stored energy when it needs to.
- Poor soil aeration can stunt tree growth and in worst case scenarios cause a tree to die a slow - or in severe cases, rapid - death. When roots aren't functioning properly, they can't meet the ongoing nutrient and water requirements of the above ground portion of the tree. Growth slows, and if the situation does not improve (e.g. through intervention including gentle removal of fill, growth of new

roots beyond the zone of fill or growth of new roots within the fill profile), shoots or branches may die back in response to the shortage of resources. Where roots are severely compromised, the tree is likely to continue into a spiral of decline, culminating in premature death.

9.2 TPZ Encroachment

It states in AS4970-2009, that any encroachment in to the TPZ of trees that are to be retained, the project arborist shall recommend modifications to the design to ensure that trees worthy of preservation remain viable.

Encroachment includes but is not limited to; excavation, compacted fill, soil disturbance, machine trenching, ground penetration.

- None – The tree is located outside the proposed building footprint and is not likely to be affected by construction activities.
- Minor encroachment – if the encroachment is less than 10% of the total TPZ area, and outside the SRZ, a detailed root investigation should not be required. The area lost to this encroachment should be compensated for elsewhere, and be connecting with the TPZ.
- Major encroachment – if the proposed encroachment is greater than 10% of the total area of the TPZ or within the SRZ, the project arborist must demonstrate that the tree(s) will remain viable. This may require a detailed root investigation by non-destructive methods. The area lost to this encroachment should be compensated for elsewhere, and be connecting with the TPZ.

The location and distribution of roots may be determined by using non-destructive methods such as air spade or hand tools (manual excavation). Root investigation is used to determine the extent and location of roots within the area. The retention of the tree is not guaranteed by undertaking a root investigation.

9.3 Tree Sensitive Construction Measures

Tree sensitive construction measures such as pier and beam *(Figure 11, Figure 12, Figure 13)* are an alternative construction method that reduces pruning damage to roots and allows structures to be built closer to the root collar than other tree preservation techniques. The pier holes should be flexible in location so as to best avoid tree roots.

An AQF Level 5 arborist shall be onsite during any construction works taking place within the TPZ of trees to be retained, with prior consultation, in order to provide advice on a suitable method of construction. Any roots discovered are to be treated with care and the project arborist should be notified.

Tree sensitive construction measures should be considered to ensure that retained trees remain viable. Please see *Appendix B – Tree Sensitive Construction Measures* for further information.

9.3.1 Photos of raised paths within a trees TPZ

Figure 11 Example of a raised path with pier and beam design within the TPZ of a Norfolk Island Pine in Coffs Harbour.

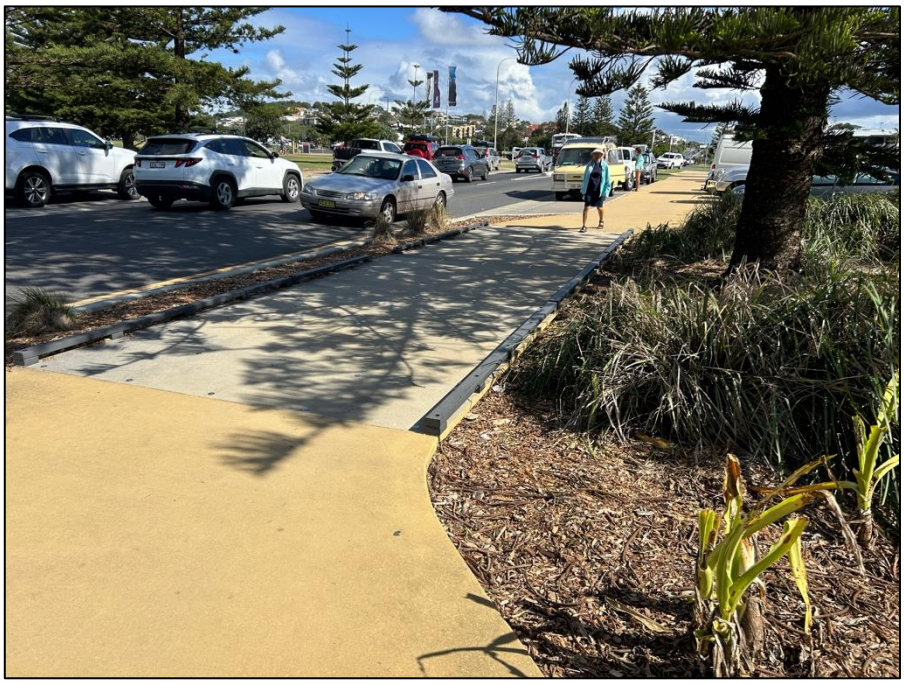

Figure 12 Example of a raised path with pier and beam design within the TPZ of a Norfolk Island Pine at Coffs Harbour Jetty.

Figure 13 Example of a raised path with pier and beam design within the TPZ and SRZ of retained trees adjacent to Bellingen Golf Course.

10 Tree Protection Plan (TPP)

10.1 Specific Protection Measures

- No excavation should occur within the SRZ of retained trees. If it is deemed absolutely necessary to encroach the SRZ, it should be done with guidance and supervision from the project arborist.
- Excavation is prohibited within the TPZ of retained trees unless undertaken at the direct consent of the project arborist.
- Any roots discovered are to be treated with care and minor roots (<40mm∅) pruned with sharp, sterile handsaw or secateurs. All significant roots (>40mm∅) are to be recorded and photographed, and the project arborist should be notified of the findings. Construction in the area should cease until the project arborist has assessed the tree roots and determined a plan of action.
- Installation of temporary metal fencing may be required within the TPZ of retained trees to facilitate construction. This shall only be done with the consent of the project arborist.
- Ground, trunk and branch protection may also be required to facilitate construction, if deemed necessary from the project arborist.

10.2 Generic Protection Measures

10.2.1 Tree Protection Fencing

Temporary metal fencing (*Figure 14)* should be erected around the TPZ of retained trees. This shall be installed after any recommended tree works have been undertaken and before the commencement of any construction works. Fencing can encompass grouped trees/trees in close proximity to each other.

The fence should be 1.8m high and made of chain wire mesh. *Australian Standard 4687-2007 Temporary fencing and hoardings,* specifies applicable fencing requirements. *See Figure 14,* for an example of tree protection fencing.

Once installed, the protection fencing must not be removed or altered without approval by the project arborist. The TPZ should be secured to restrict access and should remain intact until completion of the activity.

Where circumstances/site plans don't allow for temporary metal fencing to be installed at the TPZ, orange hi-visibility flagging *(Figure 15)* may be used at the project arborists discretion. An AQF Level 5 arborist shall be onsite during any construction works taking place within the TPZ of trees to be retained.

Where it is not practical to install tree protection fencing, then other methods of tree protection must be implemented. This may include Ground protection, Trunk protection or Branch protection *(Figure 16)*.

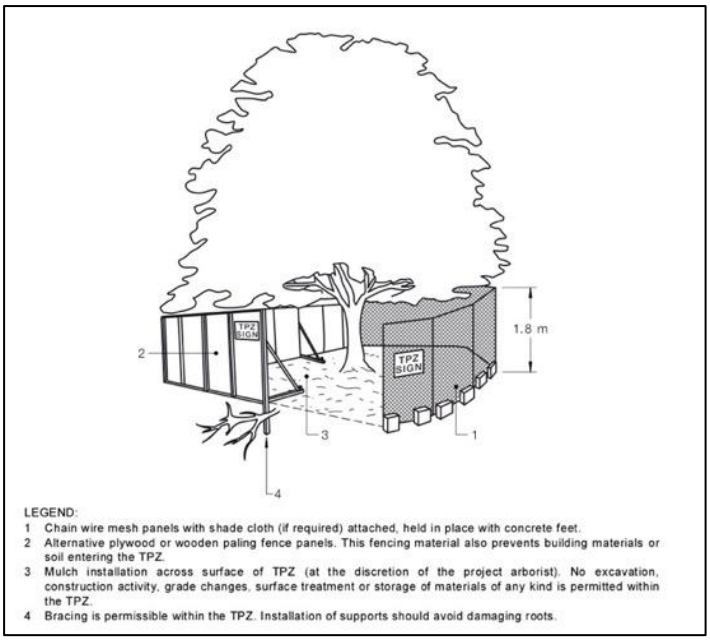

Figure 14 Example of tree protection fencing, taken from AS 4970-2009 Protection of tree on development sites.

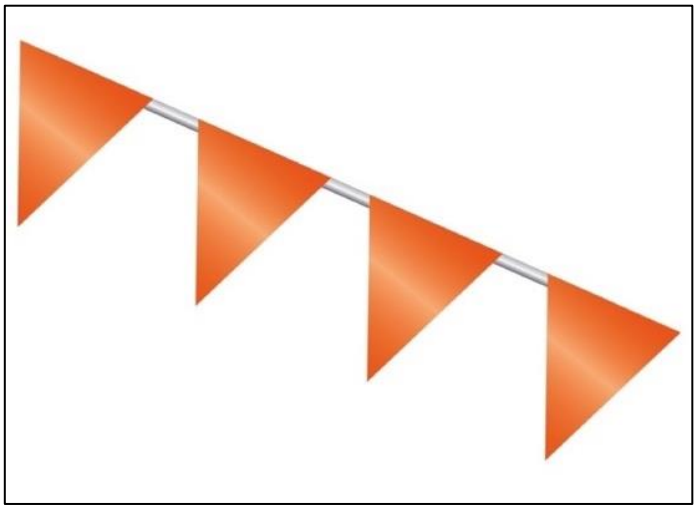

Figure 15 Example of hi-visibilty orange flagging (bunting).

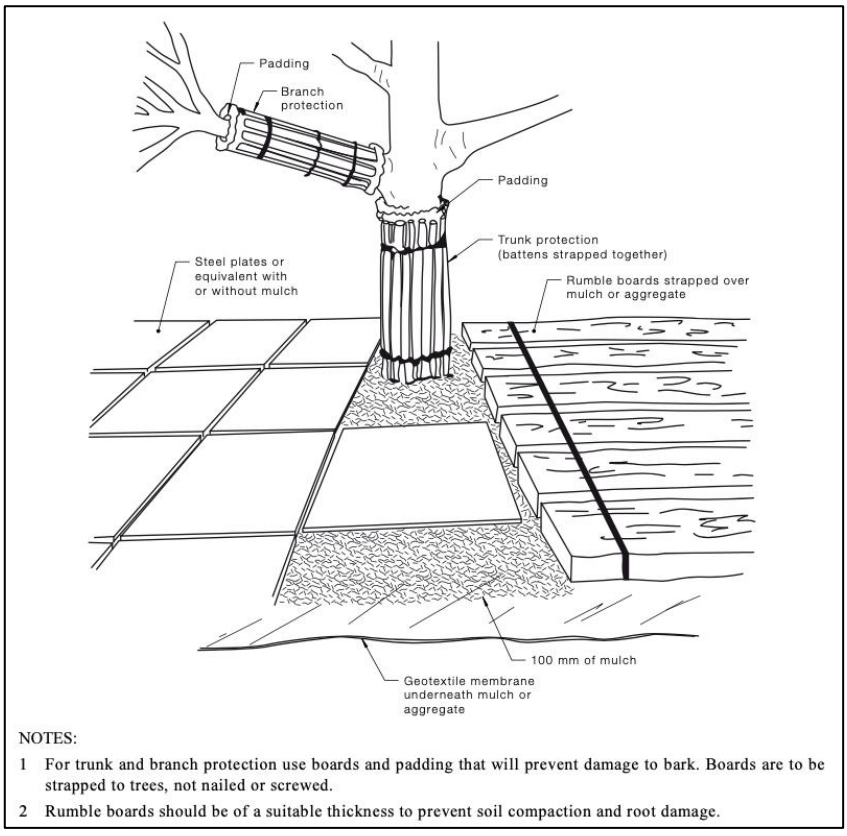

Figure 16 Example of ground, trunk and branch protection, taken from AS 4970-2009 Protection of tree on development sites.

10.2.2 Signs

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site, *see Figure 17*. The lettering on the sign should comply with *AS 1319-1994 Safety signs for the occupational environment*.

Figure 17 Example of an appropriate TPZ sign.

10.2.3 Activities Restricted Within the TPZ

Activities generally excluded from the TPZ include but are not limited to the following:

- Machine excavation including trenching.
- Excavation for silt fencing.
- Cultivation.
- Storage.
- Preparation of chemicals, including preparation of cement products.
- Parking of vehicles and plant.
- Refuelling.
- Dumping of waste.
- Wash down and cleaning of equipment.
- Placement of fill.
- Soil level changes.
- Temporary or permanent installation of utilities and signs.
- Physical damage to the tree.

11 Proposed Activity Impact

Tree Protection Zones (TPZ's) and Structural Root Zones (SRZ's) are defined as per Section 3 of Australian Standard AS4970-2009 Protection of Trees on Development Sites. It should be noted that TPZ's and SRZ's are notional areas only and do not reflect actual root locations. At this time, no exploratory root investigation has been undertaken, it may be recommended based on the findings within this report.

Every tree on site is believed to have some level of TPZ encroachment throughout the duration of the project.

11.1 Trees not affected by proposed activity

Tree ID	Tree Species	TPZ Radius (M)	Retention Value (STARS)	Observations and Defects	Notes	Development Notes	Generic Tree Protection Measures
-	-	-	-	-	-	-	-

11.2 Trees with Minor Encroachment

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove
6	Dead tree	2.5	1.7	Priority for Removal	Dead tree not considered important for retention	Demolition	Removal of dead tree considered the most appropriate action	Remove
11	Eucalyptus species (Gum Tree)	1.8	1.5	Priority for Removal	Regrowth from stump, in spiral of decline. Not considered important for retention	Demolition, Boundary fence	Removal of tree considered the most appropriate action	Remove

11.3 Trees with Major Encroachment

The trees in the following table are likely to have a TPZ encroachment of >10%.

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
1	Angophora floribunda (Rough-barked Apple)	6.2	2.5	Medium	1m from footpath, co-dom with good union	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
2	Eucalyptus species (Gum Tree)	5.8	2.4	Medium	1.5m from footpath, small Mandarin tree at base	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
3	Hymenosporum flavum (Native Frangipani)	1.8	1.5	Medium	Growing directly beside footpath, slight damage to root flare	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
4	Grevillia robusta (Silky Oak)	6.1	2.5	Medium	Root flare exposed and directly adjacent to footpath	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
5	Cuppressus sempervirens (Mediterranean Cypress/Pencil Pine)	4.1	2.1	Medium	400mm from footpath, suppressed growth on Southern side due to neighbouring trees	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
7	Grevillia robusta (Silky Oak)	5.3	2.3	Medium	Nesting bird in upper canopy	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
8	Corymbia citriodora (Lemon-Scented Gum)	5.5	2.4	Medium	Growing in contact with concrete slab	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
9	Grevillia robusta (Silky Oak)	8.3	2.8	Medium	Growing adjacent to concrete drive	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
10	Cupaniopsis anacardioides (Tuckeroo)	2.5	1.7	Medium	500mm from concrete drive	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
12	Corymbia citriodora (Lemon-Scented Gum)	6.2	2.5	Medium		Demolition, Boundary fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
13	Casuarina cunninghamiana (River Sheoak QLD)	3.4	1.9	Low	Suppressed by adjacent tree, and suppressing Bottlebrush	Demolition, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
14	Callistemon species (Bottle Brush)	1.8	1.5	Medium	Suppressed by adjacent tree	Demolition, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
15	Casuarina cunninghamiana (River Sheoak QLD)	2.6	1.8	Low	Suppressed by adjacent tree	Demolition, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
16	Casuarina cunninghamiana (River Sheoak QLD)	3.0	1.8	Low		Demolition, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
17	Casuarina cunninghamiana (River Sheoak QLD)	4.0	2.1	Medium	Remove small saplings surrounding tree	Demolition, Boundary fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
18	Mulberry Morus spp	1.8	1.5	Low	Broken branch leaning on ground	Demolition	Tree contains minor attributes worthy of retention, its removal should be considered. Tree appears outside any proposed demolition. Install tree protection fencing prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
19	Corymbia citriodora (Lemon-Scented Gum)	6.6	2.6	Medium	1m from fence	Demolition, Building, Boundary fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
20	Casuarina cunninghamiana (River Sheoak QLD)	2.8	1.8	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
21	Casuarina cunninghamiana (River Sheoak QLD)	2.8	1.8	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
22	Casuarina cunninghamiana (River Sheoak QLD)	2.6	1.8	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
23	Casuarina cunninghamiana (River Sheoak QLD)	1.8	1.5	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
24	Casuarina cunninghamiana (River Sheoak QLD)	2.9	1.8	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
25	Casuarina cunninghamiana (River Sheoak QLD)	3.6	2.0	Medium	2 small Bottlebrush beneath tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
26	Casuarina cunninghamiana (River Sheoak QLD)	2.9	1.8	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Demolition, Building, Boundary fence	Tree contains minor attributes worthy of retention, its removal should be considered. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
27	Jacaranda mimosifolia (Jacaranda)	6.4	2.5	Medium	1.5m from fence, hanging branch	Demolition, Building, Boundary fence	Tree contains attributes worthy of retention. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
28	Grevillia robusta (Silky Oak)	5.4	2.4	Medium	Slight damage to surface root	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing. Removal may need to be considered if tennis/basketball court has a major encroachment on the TPZ	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
29	Banksia integrifolia (Coast Banksia)	4.4	2.2	Low	Tree has had very poor pruning leaving it susceptible to decay	Demolition	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Remove		
30	Syzygium australe (Brush Cherry)	2.6	1.8	Low	Has recently sustained 50% bark loss on both main trunks	Demolition	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Remove		

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
31	Lagerstroemia indica (Crepe Myrtle)	3.4	1.9	Medium	Suppressed by adjacent tree	Demolition	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
32	Jacaranda mimosifolia (Jacaranda)	4.1	2.1	Medium	Growing adjacent to footpath	Demolition	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
33	Callistemon viminalis (Weeping Bottlebrush)	4.6	2.2	Medium	Good shade tree	Demolition, Building	Consider removal based on low retention value and previous poor pruning. If retained, install tree protection fencing prior to demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
35	Grevillia robusta (Silky Oak)	4.6	2.2	Medium	Tree growing adjacent to concrete	Demolition	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
36	Lophostemon confertus (Brushbox)	7.1	2.7	Medium		Demolition, Proposed footpath	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
37	Corymbia citriodora (Lemon-Scented Gum)	7.0	2.6	Medium		Demolition, Storm water, Proposed footpath	Tree contains attributes worthy of retention. All demolition work within TPZ to be overseen by project arborist. Install tree protection fencing prior to demolition and prior to construction works commencing	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
43	Grevillia robusta (Silky Oak)	6.8	2.6	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence, Proposed footpath	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
44	Grevillia robusta (Silky Oak)	5.6	2.4	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
45	Grevillia robusta (Silky Oak)	5.4	2.4	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
46	Grevillia robusta (Silky Oak)	3.6	2.0	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
47	Grevillia robusta (Silky Oak)	8.5	2.9	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
48	Grevillia robusta (Silky Oak)	6.5	2.6	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
49	Notelaea longifolia (Mock olive)	2.4	1.7	Low	Regrowth from cut stump. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
50	Lagerstroemia indica (Crepe Myrtle)	2.6	1.8	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ
51	Jacaranda mimosifolia (Jacaranda)	6.0	2.5	Medium	1.5m from existing path. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

Tree ID	Tree Species	TPZ Radius (M)	SRZ Radius (M)	Retention Value (STARS)	Notes	Encroachment Type	Development Notes	Retain/ Remove	Generic Tree Protection Measures	Specific Tree Protection Measures
52	Eucalyptus tereticornis (Forest Red Gum)	10.4	3.1	Medium	1m from carpark. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Demolition, Boundary fence, Sed fence	Tree contains attributes worthy of retention. All works within TPZ shall be overseen by project arborist. New boundary fence may be in line with tree. Exact location of fence shall be flexible in design and installed around tree, under supervision and guidance from the project arborist. Demolition of existing fence shall be overseen by project arborist. Demolition of existing concrete car park and curb shall also be overseen by project arborist, starting closest to the tree, and working backwards	Retain	TPZ Fencing	Tree sensitive construction measures , Project arborist overseeing works within TPZ

11.4 Trees within Construction Footprint

Tree ID	Tree Species	Health	T.L.E	Retention Value (STARS)	Notes	Encroachment Type	Development Notes
34	Jacaranda mimosifolia (Jacaranda)	Good	15-40yrs	Medium	500mm from concrete footpath	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
38	Grevillia robusta (Silky Oak)	Good	15-40yrs	Medium		Demolition, Building, Storm water	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building and storm water
39	Jacaranda mimosifolia (Jacaranda)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
40	Ligustrum lucidum (Broad-leafed Privet)	Good	15-40yrs	Environmental Weed	Multiple previous branch failures, species is considered an environmental weed in NSW. Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
41	Brachychiton populneus (Kurrajong Tree)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
42	Grevillia robusta (Silky Oak)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building

11.5 Trees recommended for Removal

Tree ID	Tree Species	Health	TLE	Retention Value (STARS)	Notes	Encroachment Type	Development Notes
6	Dead tree	Dead	Dead	Priority for Removal	Dead tree not considered important for retention	Demolition	Removal of dead tree considered the most appropriate action
11	Eucalyptus species (Gum Tree)	Poor	1-5yrs	Priority for Removal	Regrowth from stump, in spiral of decline. Not considered important for retention	Demolition, Boundary fence	Removal of tree considered the most appropriate action

Tree ID	Tree Species	Health	TLE	Retention Value (STARS)	Notes	Encroachment Type	Development Notes
29	Banksia integrifolia (Coast Banksia)	Fair	1-5yrs	Low	Tree has had very poor pruning leaving it susceptible to decay	Demolition	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist
30	Syzygium australe (Brush Cherry)	Fair	1-5yrs	Low	Has recently sustained 50% bark loss on both main trunks	Demolition	Removal considered the most appropriate action based on low retention value and previous poor pruning. If retained, install tree protection fencing after demolition and prior to construction works commencing. All demolition work within TPZ to be overseen by project arborist
34	Jacaranda mimosifolia (Jacaranda)	Good	15-40yrs	Medium	500mm from concrete footpath	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
38	Grevillia robusta (Silky Oak)	Good	15-40yrs	Medium		Demolition, Building, Storm water	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building and storm water
39	Jacaranda mimosifolia (Jacaranda)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
40	Ligustrum lucidum (Broad-leafed Privet)	Good	15-40yrs	Environmental Weed	Multiple previous branch failures, species is considered an environmental weed in NSW. Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
41	Brachychiton populneus (Kurrajong Tree)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building
42	Grevillia robusta (Silky Oak)	Good	15-40yrs	Medium	Appears to be inside building footprint on current design plan	Demolition, Building	Tree contains attributes worthy of retention. However, the tree cannot be retained under the current design plan due to proposed building

12 Recommendations and Conclusion

Engage a suitably qualified arborist (minimum AQF Level 3 Arborist) to remove trees listed for removal prior to demolition; and to crown lift trees near buildings and pathways to a height of four (4) metres from ground level (where possible) to ensure machinery does not damage trees/branches during both demolition and construction.

All pruning work should comply with AS 4373-2007 Pruning of amenity trees and Safe Work Australia Guide to managing risks of tree trimming and removal work (2016) and be undertaken by an Arborist with a minimum AQF Level 3 in Arboriculture.

Engage a project arborist (minimum AQF Level 5 Arborist) to oversee the demolition of existing buildings and construction of new buildings within the TPZ of retained trees. The project arborist should recommend any tree sensitive construction measures to ensure trees listed for retention have the best likelihood of remaining viable both during and after construction.

The project arborist should recommend Tree Protection measures based on the design layout to protect trees listed for retention.

Permission shall be granted from the relevant consent authority prior to removing any of the trees listed in this report.

A total of fifty-two (52) individual trees (T1-T52) were assessed for the AIA.

The below table summarises the number of trees recommended for retention and removal within the property boundary, their assigned retention values, and their suitability for retention.

Retention Value	To Retain	Tree Numbers	To Remove	Tree Numbers
Very High	0		0	
High	0		0	
Medium	31	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, 17, 19, 25, 27, 28, 31, 32, 33, 35, 36, 37, 43, 44, 45, 46, 47, 48, 50, 51, 52	5	34, 38, 39, 41, 42
Low	11	13, 15, 16, 18, 20, 21, 22, 23, 24, 26, 49	2	29, 30
Exempt	0		2	6, 11
Environmental Weed	0		1	40
Total	42		10	

A further eight (8) trees are to be removed, as per the landscape plan, which are outside the property boundary. Two (2) trees are on Gillieston Rd, six (6) trees are on Northview St.

12.1 Construction Phases

12.1.1 Demolition and Pre-construction Stage

- Trees identified for pruning and removal should be undertaken prior to erection of protection fencing.
- Tree protection zones should be implemented on completion of tree works.
- Install tree protection fencing and signs.

12.1.2 Construction Stage

- Regular inspections should be undertaken to ensure compliance with the TPP is maintained.
- The project arborist should supervise any activity within an established TPZ.
- The condition of trees should be assessed on completion of the activity and tree protection fencing can be removed.

12.1.3 Post-construction Stage

- The project arborist should assess the condition of the trees and make recommendations for any remedial actions.
- Following completion of any remedial works, the project arborist should certify compliance with the TPP. Certification should include a statement on the overall condition of trees after construction.

13 Mitigation Measures

Project Stage ***Design (D)*** ***Construction (C)*** ***Operation (O)***	**Mitigation Measures**	**Relevant Section of Report**
D	Engage project arborist during the design stages of the project to make recommendations on tree sensitive construction measures if required.	*Section 9.3 Tree Sensitive Construction Measures*
C	Trees identified for pruning and removal should be undertaken prior to erection of protection fencing, and before demolition and construction works begin.	*Section 12 Recommendations and Conclusion*
C	Tree protection zones should be implemented on completion of tree works.	*Section 10 Tree Protection Plan (TPP)*
C	Install tree protection fencing and signs.	*Section 10 Tree Protection Plan (TPP)*

Project Stage ***Design (D)*** ***Construction (C)*** ***Operation (O)***	**Mitigation Measures**	**Relevant Section of Report**
C	• Regular inspections should be undertaken to ensure compliance with the TPP is maintained. • The project arborist should supervise any works within an established TPZ. • The condition of trees should be assessed on completion of the activity and tree protection fencing can be removed.	*Section 12.1.2 Construction Stage*
O	• The project arborist should assess the condition of the trees and make recommendations for any remedial actions. • Following completion of any remedial works, the project arborist should certify compliance with the TPP. Certification should include a statement on the overall condition of trees after construction.	*Section 12.1.3 Post-construction Stage*

Out of the ten (10) trees recommended for removal within the property boundary that were assessed for this report:

- Zero (0) trees have a high retention value.
- Five (5) trees (T34, T38, T39, T41, T42) have a medium retention value.
- Two (2) trees (T29, T30) have a low retention value.
- Two (2) trees (T6, T11) are considered to be a Priority for Removal, irrespective of design plans.
- One (1) tree (T40) was considered to be an Environmental Weed.
- Based on this information and the detailed arboricultural assessment of each individual tree, the removal of the ten (10) trees is considered to have a minimal impact on the environment.

A further eight (8) trees are to be removed, as per the landscape plan, which are outside the property boundary. Two (2) trees are on Gillieston Rd, six (6) trees are on Northview St.

It is the conclusion of the assessing arborist that all trees that are to be retained and protected, can be achieved without detriment to their health and longevity, providing a suitably qualified arborist (minimum AQF Level 5 Arborist) is engaged, and the tree protection measures are followed.

Should you require any further information on this arborist report, please do not hesitate to contact our office on 0400 822 848.

Date: 13 January 2025

Alyx Capper
Consulting Arborist
AQF Level V Arboriculture
VALID Tree Risk Qualified
Tree Risk Assessment Qualified (International Society of Arboriculture, USA)

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Appendix A – Tree Retention Value

Tree Life Expectancy (TLE) – Assessment Criteria (Adapted from Jeremy Barrell, 2001)			
Long >40 years	**Medium 15-40 years**	**Short 5-15 years**	**Dead <5 years**
Trees that appear to be retainable at the time of the assessment for more than 40 years with an acceptable level of risk. Structurally sound trees located in positions that can accommodate future growth. Trees that could be made suitable for retention in the long term by remedial tree care. Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that appear to be retainable at the time of the assessment for 15-40 years with an acceptable level of risk. Trees that may only live between 15 and 40 years. Trees that could live for more than 40 years but may be removed for safety or nuisance reasons. Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that could be made suitable for retention in the medium term by tree care.	Trees that appear to be retainable at the time of the assessment for 5-15 years with an acceptable level of risk. Trees that may only live between 5 and 15 years. Trees that could live for more than 15 years but may be removed for safety or nuisance reasons. Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that could be made suitable for retention in the medium term by tree care.	Trees that should be removed within the next 5 years. Dead, dying, suppressed or declining trees because of disease or inhospitable conditions. Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form. Damaged trees that are clearly not safe to retain. Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that are damaging or may cause damage to existing structures within 5 years. Trees that will become dangerous after removal of other trees.

Barrell, Jeremy. 2009. *SULE: Its use and status into the new millennium.* [Online]. [13 December 2016]. Available from: http://www.barrelltreecare.co.uk/pdfs/BT08-Sydney.pdf

Tree Significance – Assessment Criteria		
High	**Medium**	**Low**
The tree is in good condition and vigour. The tree has a form typical of the species. The tree is a remnant or is planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age. The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register. The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due its size and scale and makes a positive contribution to the local amenity. The tree supports local and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values. The trees growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* – tree is appropriate to the site conditions.	The tree is in fair-good condition and good or low vigour. The tree has a form typical or atypical of the species. The tree is planted locally indigenous or a common species with its taxa commonly planted in the local area. The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street. The tree provides a fair contribution to the visual character and amenity of the local area. The trees growth is moderately restricted by above and below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.	The tree is in fair-poor condition and good or low vigour. The tree has a form atypical of the species. The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings. The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area. The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen. The trees growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* – tree is inappropriate for the site conditions. The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms. The tree has a wound or defect that has potential to become structurally unsound. The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties. The tree is a declared noxious weed by legislation. The tree is structurally unsound and /or unstable and is considered potentially dangerous. The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

Tree Life Expectancy	Tree Significance					
		High	Medium	Low		
	Long >40 years					
	Medium 15-40 years					
	Short <1-15 years					
	Remove / Dead					

Legend for Matrix Assessment	
	Priority for Retention (Very High) – These are trees that the assessor deems that the council will not approve for removal based on their significance. These trees tend to belong to Critically Endangered Economic Communities/Threatened Ecological Communities, are located within Heritage Conservation Areas, are important, endemic species that provide significant habitat.
	Priority for Retention (High) – These trees are considered important for retention and should be retained and protected. Design modification and re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard 4970 *Protection of tree on development sites*. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) – These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) – These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal – These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

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

Appendix B – Tree Sensitive Construction Measures

Pier and Beam

Pier and beam are an alternative construction method that reduces pruning damage to roots and allows structures to be built closer to the root collar than other tree preservation techniques.

Pier and beam is a useful foundation structure to use if your site has large existing trees. If new structural work is being done within the drip line of the tree, a great beam can span the roots and avoid cutting roots of mature trees, it is a load-bearing beam foundation that is above grade and is supported by piers. They are able span tree roots while supporting a structure above.

There are many benefits to suspending the footpath above grade. Not only do the roots not become severed during construction but the soil is far less likely to become compacted so root growth and nutrition uptake will not be affected.

“Sidewalk suspension can allow a great deal of soil volume for trees and addresses the issue of compaction. There is no contact between the bottom of the sidewalk slab and the soil; the slabs rest on supports and pilings. This allows the planting pit to be filled with well-aerated, quality soil. Suspending the sidewalk avoids issues with soil compaction so that roots can spread without interrupting the hardscape.” (Gilman & Partin, 2007)

“The high levels of soil and base course compaction required to support the pavement loadings can become problematic for a tree that is planted close to pavement… [in that it] often hinders or excludes root growth by limiting their access to the water and mineral resources contained in the soil.” (Beecham, 2012).

Instead of cutting a trench through the drip line of a mature tree (which causes considerable damage to the tree) a grade beam is a foundation built at or above the existing grade. The mass of the foundation is supported by strategically placed reinforced concrete piers. The piers transfer the load to the soil and prevent toppling. Walls and other landscape structures can be built on top of a grade beam foundation. (John, 2014)

Root Mapping

Tree root mapping enables buildings to be constructed across tree root zones (TPZ – Tree Protection Zones and sometimes even SRZ – Structural Root Zones) using piering techniques.

Alternatively, tree root maps may identify that a building can be constructed closer to the tree than calculated according to AS-4970-2009 regulations (Protection of Trees on Development Sites) without pruning too many roots.

Excavation techniques such as air spades or hand excavation are used to carefully remove the soil in certain areas of the root zone while leaving the structural roots undamaged. By mapping the roots, it allows the developer a clearer idea of how close they can build to the tree therefore maximising the available space.

Ground Penetrating Radar

Ground-penetrating radar (GPR) is a geophysical method that uses radar pulses to image the subsurface. This non-destructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum, and detects the reflected signals from subsurface structures. GPR can have applications in a variety of media, including rock, soil, ice, fresh water, pavements and structures. In the right conditions, practitioners can use GPR to detect subsurface objects, changes in material properties, and voids and cracks. (Wikipedia.com, accessed 28 October 2019).

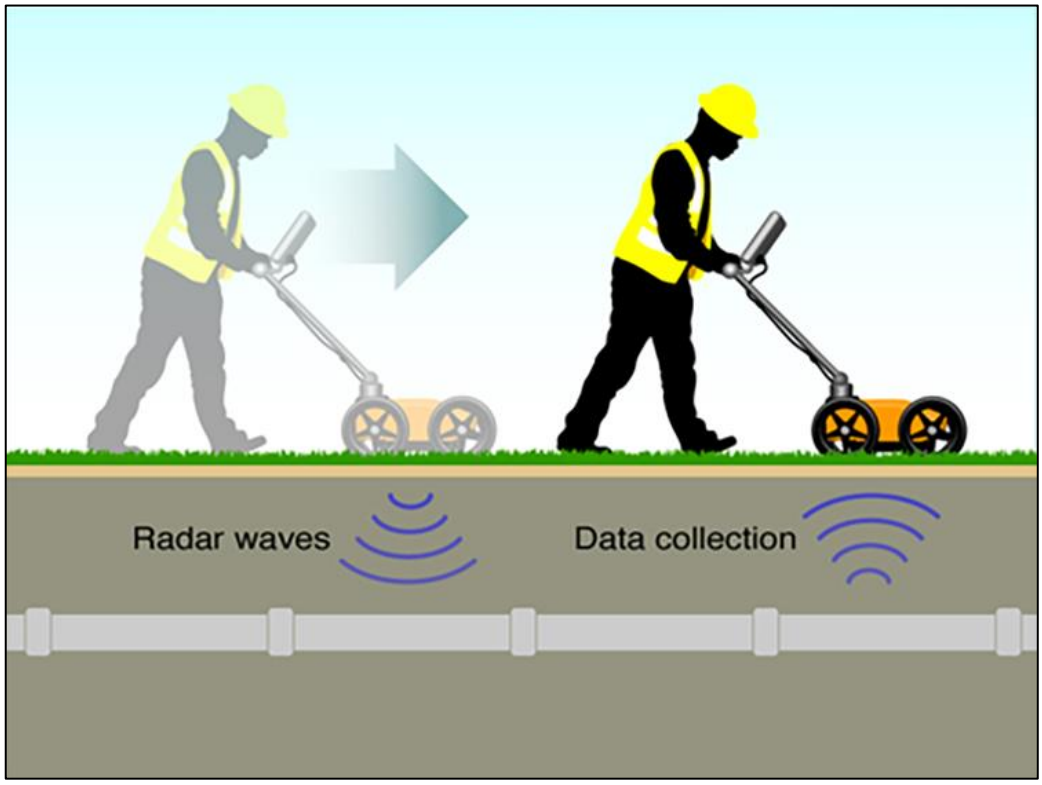

Photo courtesy of provac.net.au. Accessed 12 March 2020.

Appendix C – Tree Schedule

Tree Ref	Tree Species	Height (M)	Spread (M)	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Species Origin
1	Angophora floribunda (Rough-barked Apple)	16	7	520	520	6.2	2.5	Mature	Good	15-40yrs	Medium	Medium	1m from footpath, co-dom with good union	Native
2	Eucalyptus species (Gum Tree)	15	7	480	480	5.8	2.4	Mature	Good	15-40yrs	Medium	Medium	1.5m from footpath, small Mandarin tree at base	Native
3	Hymenosporum flavum (Native Frangipani)	8	4	150	150	1.8	1.5	Mature	Good	15-40yrs	Medium	Medium	Growing directly beside footpath, slight damage to root flare	Native
4	Grevillia robusta (Silky Oak)	16	7	510	510	6.1	2.5	Mature	Good	15-40yrs	Medium	Medium	Root flare exposed and directly adjacent to footpath	Native
5	Cuppressus sempervirens (Mediterranean Cypress/Pencil Pine)	10	3	340	340	4.1	2.1	Mature	Good	15-40yrs	Medium	Medium	400mm from footpath, suppressed growth on Southern side due to neighbouring trees	Exotic
6	Dead tree	6	3	210	210	2.5	1.7	Over Mature	Dead	Dead	Dead	Priority for Removal	Dead tree not considered important for retention	Native
7	Grevillia robusta (Silky Oak)	16	6	440	440	5.3	2.3	Mature	Good	15-40yrs	Medium	Medium	Nesting bird in upper canopy	Native
8	Corymbia citriodora (Lemon-Scented Gum)	14	10	460	460	5.5	2.4	Mature	Good	15-40yrs	Medium	Medium	Growing in contact with concrete slab	Native
9	Grevillia robusta (Silky Oak)	16	10	690	690	8.3	2.8	Mature	Good	15-40yrs	Medium	Medium	Growing adjacent to concrete drive	Native
10	Cupaniopsis anacardioides (Tuckeroo)	6	4	210	210	2.5	1.7	Semi Mature	Good	15-40yrs	Medium	Medium	500mm from concrete drive	Native
11	Eucalyptus species (Gum Tree)	6	3	150	150	1.8	1.5	Young	Poor	1-5yrs	Low	Priority for Removal	Regrowth from stump, in spiral of decline. Not considered important for retention	Native
12	Corymbia citriodora (Lemon-Scented Gum)	16	10	520	520	6.2	2.5	Mature	Good	15-40yrs	Medium	Medium		Native
13	Casuarina cunninghamiana (River Sheoak QLD)	7	5	280	280	3.4	1.9	Mature	Good	15-40yrs	Low	Low	Suppressed by adjacent tree, and suppressing Bottlebrush	Native
14	Callistemon species (Bottle Brush)	5	5	150	150	1.8	1.5	Semi Mature	Fair	15-40yrs	Low	Medium	Suppressed by adjacent tree	Native

Tree Ref	Tree Species	Height (M)	Spread (M)	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Species Origin
15	Casuarina cunninghamiana (River Sheoak QLD)	7	4	220	220	2.6	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree	Native
16	Casuarina cunninghamiana (River Sheoak QLD)	7	5	250	250	3.0	1.8	Mature	Fair	15-40yrs	Low	Low		Native
17	Casuarina cunninghamiana (River Sheoak QLD)	13	6	330	330	4.0	2.1	Mature	Good	15-40yrs	Medium	Medium	Remove small saplings surrounding tree	Native
18	Mulberry Morus spp	5	5	150	150	1.8	1.5	Young	Good	15-40yrs	Low	Low	Broken branch leaning on ground	Exotic
19	Corymbia citriodora (Lemon-Scented Gum)	16	10	550	550	6.6	2.6	Mature	Good	15-40yrs	Medium	Medium	1m from fence	Native
20	Casuarina cunninghamiana (River Sheoak QLD)	10	5	230	230	2.8	1.8	Mature	Good	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Native
21	Casuarina cunninghamiana (River Sheoak QLD)	10	4	230	230	2.8	1.8	Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Native
22	Casuarina cunninghamiana (River Sheoak QLD)	10	5	220	220	2.6	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Native
23	Casuarina cunninghamiana (River Sheoak QLD)	8	4	150	150	1.8	1.5	Semi Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Native
24	Casuarina cunninghamiana (River Sheoak QLD)	10	5	240	240	2.9	1.8	Semi Mature	Fair	15-40yrs	Low	Low	Remove small saplings surrounding tree. Crown lift over basketball/tennis court	Native
25	Casuarina cunninghamiana (River Sheoak QLD)	15	6	300	300	3.6	2.0	Mature	Good	15-40yrs	Low	Medium	2 small Bottlebrush beneath tree. Crown lift over basketball/tennis court	Native
26	Casuarina cunninghamiana (River Sheoak QLD)	10	6	240	240	2.9	1.8	Mature	Fair	15-40yrs	Low	Low	Suppressed by adjacent tree. Crown lift over basketball/tennis court	Native
27	Jacaranda mimosifolia (Jacaranda)	12	12	530	530	6.4	2.5	Mature	Good	15-40yrs	Medium	Medium	1.5m from fence, hanging branch	Exotic

Tree Ref	Tree Species	Height (M)	Spread (M)	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Species Origin
28	Grevillia robusta (Silky Oak)	16	10	450	450	5.4	2.4	Mature	Good	15-40yrs	Medium	Medium	Slight damage to surface root	Native
29	Banksia integrifolia (Coast Banksia)	8	4	370	370	4.4	2.2	Mature	Fair	1-5yrs	Low	Low	Tree has had very poor pruning leaving it susceptible to decay	Native
30	Syzygium australe (Brush Cherry)	7	3	220	220	2.6	1.8	Mature	Fair	1-5yrs	Low	Low	Has recently sustained 50% bark loss on both main trunks	Native
31	Lagerstroemia indica (Crepe Myrtle)	6	6	280	280	3.4	1.9	Mature	Good	15-40yrs	Low	Medium	Suppressed by adjacent tree	Exotic
32	Jacaranda mimosifolia (Jacaranda)	10	10	340	340	4.1	2.1	Mature	Good	15-40yrs	Medium	Medium	Growing adjacent to footpath	Exotic
33	Callistemon viminalis (Weeping Bottlebrush)	6	8	380	380	4.6	2.2	Mature	Good	15-40yrs	Medium	Medium	Good shade tree	Native
34	Jacaranda mimosifolia (Jacaranda)	12	10	680	680	8.2	2.8	Mature	Good	15-40yrs	Medium	Medium	500mm from concrete footpath	Exotic
35	Grevillia robusta (Silky Oak)	14	8	380	380	4.6	2.2	Mature	Good	15-40yrs	Medium	Medium	Tree growing adjacent to concrete	Native
36	Lophostemon confertus (Brushbox)	14	10	590	590	7.1	2.7	Mature	Good	15-40yrs	Medium	Medium		Native
37	Corymbia citriodora (Lemon-Scented Gum)	16	12	580	580	7.0	2.6	Mature	Good	15-40yrs	Medium	Medium		Native
38	Grevillia robusta (Silky Oak)	14	10	580	580	7.0	2.6	Mature	Good	15-40yrs	Medium	Medium		Native
39	Jacaranda mimosifolia (Jacaranda)	8	6	320	320	3.8	2.1	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Exotic
40	Ligustrum lucidum (Broad-leafed Privet)	12	8	530	530	6.4	2.5	Mature	Good	15-40yrs	Low	Environmental Weed	Multiple previous branch failures, species is considered an environmental weed in NSW. Appears to be inside building footprint on current design plan	Noxious Weed
41	Brachychiton populneus (Kurrajong Tree)	14	10	700	700	8.4	2.8	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Native
42	Grevillia robusta (Silky Oak)	16	10	700	700	8.4	2.8	Mature	Good	15-40yrs	Medium	Medium	Appears to be inside building footprint on current design plan	Native

Tree Ref	Tree Species	Height (M)	Spread (M)	DBH (cm)	DRB (M)	TPZ Radius (M)	SRZ Radius (M)	Age Class	Health	TLE	Landscape Significance (STARS)	Retention Value (STARS)	Notes	Species Origin
43	Grevillia robusta (Silky Oak)	16	10	570	570	6.8	2.6	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
44	Grevillia robusta (Silky Oak)	14	10	470	470	5.6	2.4	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
45	Grevillia robusta (Silky Oak)	14	10	450	450	5.4	2.4	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
46	Grevillia robusta (Silky Oak)	14	10	300	300	3.6	2.0	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
47	Grevillia robusta (Silky Oak)	16	10	710	710	8.5	2.9	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
48	Grevillia robusta (Silky Oak)	16	10	540	540	6.5	2.6	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native
49	Notelaea longifolia (Mock olive)	5	5	200	200	2.4	1.7	Mature	Fair	15-40yrs	Low	Low	Regrowth from cut stump. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Exotic
50	Lagerstroemia indica (Crepe Myrtle)	6	5	220	220	2.6	1.8	Mature	Good	15-40yrs	Medium	Medium	Tree located at northern side of property. Appears to be inside building footprint on current design plan	Exotic
51	Jacaranda mimosifolia (Jacaranda)	10	10	500	500	6.0	2.5	Mature	Good	15-40yrs	Medium	Medium	1.5m from existing path. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Exotic
52	Eucalyptus tereticornis (Forest Red Gum)	16	12	870	870	10.4	3.1	Mature	Good	15-40yrs	Medium	Medium	1m from carpark. Tree located at northern side of property. Appears to be inside building footprint on current design plan	Native