Arboricultural Impact Assessment

New High School for Jordan Springs

Prepared by Alex Austin

For

The Department of Education (DoE)

December 2024

Final V5

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1 Summary

This Arboricultural Impact Assessment (AIA) has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for the construction and operation of a New High School for Jordan Springs (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with EP&A Regulations 2021 section 170 and 171 as well as the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure. This report and the tree data have also been prepared in accordance with Australian Standard 4970: 2009 *Protection of trees on development sites.*

The site inspection was completed on the 7th November 2024 by Jamie Oates, An AQF Level 5 Arborist. 68 trees within the proposed activity area and 56 trees surrounding the project area on the adjacent street verges were inspected and are now subject to this report. The majority of the trees are tagged and numbered 1 – 124 with small round metal tags. Alex Austin, an AQF level 8 Arborist, has prepared this document following a review of the tree data and site plans.

The project site is located on the corner of Armoury Road and Infantry Street in Jordan Springs and is legally described as part of Lots 2 and 3 in DP 1248480.

The tree assessment revealed;

- 124 Low (C) Retention Value trees (All new plantings that are easily replaceable).

Complete tree data can found be in the table located in the Appendix.

The proposed activity is for the construction and operation of a New High School for Jordan Springs. The school will provide permanent General Learning Spaces (GLS), Support Learning Spaces (SLS), staff facilities and a library across three (3), three storey buildings, a single storey hall, half playing field, three (3) outdoor sport courts, 72 operational at grade parking spaces (including two (2) accessible spaces), 100 bicycle spaces and landscaping.

If the proposed activity is to proceed, then 70 trees are proposed for removal in order to facilitate the layout. Trees for removal include; all 68 trees in the project area and Two (2) trees numbered 116 & 124 on the adjacent street verges which are outside the REF boundary and project site. Five (5) trees proposed for removal numbered 29, 30, 40, 44 & 124 are of a protected size >3.5m height and the remaining 65 are of an exempt size <3.5m height.

54 trees outside the project area can be retained and protected from works. These 54 trees outside the project are included in this report to ensure they are protected from this project's activities but are excluded from the activity REF Scope. 19 trees proposed for retention are of a protected size >3.5m height and the remaining 35 are of an exempt size <3.5m height. No impact to the viability of these trees is anticipated if the protection measures are applied as per the guidance in this report.

To ensure the 54 trees nominated for retention remain viable during and post construction, mitigation measures including the engagement of a project arborist, tree protection fencing, tree protection signage, trunk protection, sensitive construction techniques, arborist supervision of works in the Tree Protection Zones (TPZ's), a restriction of activities within Tree Protection Zones (TPZ's) and compliance reporting must be incorporated into the project.

A Tree Retention and Removal Plan is located in the Appendix.

98 new trees are proposed to be planted within the project as per the landscape plan. The replacement plantings are larger in numbers then the proposed Tree removal and provide species that will considerably increase the future canopy on the site.

This document must be used in its entirety and further questions are to be directed to:

Alex Austin

AQF Level 8 Arborist

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3 Document Details

Version Number	Date	Description
001	15/11/2024	Draft
002	29/11/2024	Draft – Document updated following town planner and TSA Riley review.
003	16/12/2024	Draft - Document updated following SI and TSA Riley review.
004	18/12/2024	Draft – Document, figures, tables and maps revised after receipt of updated demolition plan.
005	18/12/2024	Final

4 Background

The site inspection was completed on the 7th November 2024 by Jamie Oates, An AQF Level 5 Arborist. 68 trees within the proposed activity area and 56 trees surrounding the project area on the adjacent street verges were inspected and are now subject to this report. The majority of the trees are tagged and numbered 1 – 124 with small round metal tags. Alex Austin, an AQF level 8 Arborist, has prepared this document following a review of the tree data and site plans.

4.1 Legislative Context

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments – Consideration of environmental factors for health services facilities and schools, October 2024* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

Table 1

Regulation / Guideline Section	Requirement	Response	Report Section
Clause 171(2) of the EP&A Regulation 2021	(c)Any environmental impact on the ecosystems of the locality? (d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality. e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations h) long-term effects on the environment, i) degradation of the quality of the environment,	The proposed 70 Tree Removals will reduce canopy cover and aesthetic appeal of the local area. There are more replacement tree plantings (98) than proposed tree removals (70) and the replacement plantings provide species that will considerably increase the future canopy cover, aesthetic appeal and environmental quality of the site/locality for the long term.	Section 9 & 10

4.2 Reviewed Documents

The following plans/ reports identified in Table 2 have been reviewed to inform the assessment contained within this report:

Table 2

Discipline	Document name	Revision	date
Architect	Demolition Plan	Issue Po2	12/11/2024.
Architect	Scenario 1 Overall Ground floor Plan by DJRD	Issue Po5	12/11/2024.
Architect	Staging Plans by DJRD	Issue P03	05/12/2024
Landscape Architect	Landscape Master Plan by Site Image Issue A	Issue A	21/11/2024
Architect	Demolition Plan, by DJRD	Issue 03	17/12/2024

4.3 Proposed Activity Scenarios

The project scope of works includes two (2) Scenarios, to allow construction and operation of the school, with (Scenario 1 – preferred option) or without (Scenario 2 – Interim Solution) the public domain works and permanent off-site basin being constructed by others under a separate planning pathway.

4.3.1 Scenario 1 – Preferred Option - Road Network completed and permanent OSD Basin Constructed

External works undertaken by others to facilitate Scenario 1

- Construction of Park Edge Road;
- Any adjustments to Infantry Street;
- Kiss and drop zone along Park Edge Road;
- Support kiss and drop zone located along Infantry Street; and
- Construction and operation of permanent OSD Basin off site.

Note – Scenario 1 is not to proceed if external works undertaken by others is not completed.

Scenario 1

Construction and Operation of the New High School for Jordan Springs, including:

- Decommissioning of existing on-site OSD basin;
- Demolition of roads and associated services within the site boundary;
- Tree removal within the site boundary
- Earthworks;
- Three (3) multi-storey classroom buildings;
- One (1) school hall;
- Three (3) outdoor sport's courts;
- One (1) sport's field;
- 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, accessed via Park Edge Road;
- 100 bicycle parking spaces across the site; and
- Landscaping.

4.3.2 Scenario 2 - Interim Solution – Road network not completed, Permanent OSD Basin not constructed.

Scenario 2 - Stage 1

Construction and operation of a temporary on-site OSD Basin;

Construction and operation of the New High School for Jordan Springs, including;

- Demolition of roads and associated services within the site boundary;
- Tree removal within the site boundary
- Earthworks;
- Three (3) multi-storey classroom buildings;

- One (1) sport's field;
- Temporary carpark - 72 at grade car parking spaces, including two (2) accessible parking spaces and waste services, located on the northwest corner of the site, accessed off Armoury Road;
- 100 bicycle parking spaces across;
- Temporary Kiss and drop facilities on Armoury Road; and
- Associated landscaping.

Scenario 2 - Stage 2

Stage 2 is not to be undertaken until the temporary on-site OSD basin under stage 1 works is completed and operational.

Decommissioning of existing on-site OSD basin, prior to the following works being undertaken:

- 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, located on the southeast corner of the site. This car park cannot be constructed until the decommissioning of the existing OSD basin is completed and will be non-operational with no road connection until completion of Scenario 2 – Stage 3;
- One (1) school hall;
- Three (3) outdoor sport's courts; and
- Associated landscaping.

External works undertaken by others to facilitate Stage 3

- Construction of Park Edge Road;
- Any adjustments to Infantry Street;
- Kiss and drop zone along Park Edge Road;
- Support kiss and drop zone located along Infantry Street; and
- Construction and operation of OSD Basin off site.

Note – Scenario 2 - Stage 3 is not to proceed until the external works undertaken by others have been completed.

Scenario 2 - Stage 3

- Connection of the southeast carpark to Park Edge Road;
- Rectification works along Armoury Road to remove temporary kiss and drop facilities and cross over for temporary carpark;
- Demolition of temporary carpark, once permanent car park is operational; and
- Decommissioning of temporary OSD basin.

5 Methodology

5.1 Aims and Objectives

- Determine the Retention Value and required area for each tree to be protected and remain viable during and post construction.
- Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.
- Encroachments to the TPZs are to be minimized prior to construction.
- Works within the defined Tree Protection Zone shall utilize special measures to avoid or minimize adverse impacts on trees.
- Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.
- The trees to be retained must be protected from all other demolition, excavation, and construction activities.

5.2 Tree Health and Condition

The inspection of the trees was made from the ground and involved inspection of the external features only. No invasive, diagnostic or laboratory testing was carried out.

Tree height and canopy spread were estimated and trunk diameter (DBH) and Diameter at Root Crown (DRC), have been measured with a diameter tape where applicable.

Data including species, age class, health, structure, landscape significance, defect and life expectancy were recorded. Tree species were identified using available seed and fruit during the site inspection.

All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only.

5.3 Tree Protection Zone and Structural Root Zone

The Tree Protection Zone method has been derived from the Australian Standard 4970–2009: *Protection of trees on development sites*.

The Tree Protection Zone (TPZ) is defined as a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown. It is the area required to provide for the viability of a tree to be retained where it is potentially subject to damage by development.

The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) by 12.

$$TPZ\ radius = DBH \times 12$$

The trunk diameter method has been used in this report to determine the TPZ. This area provides a general guide where the roots are likely to be located.

The Structural Root Zone (SRZ) is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

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

5.4 Root Loss

In line with section 3.3.2 of AS 4970:2009, a 10% incursion to a TPZ is considered a minor encroachment. Any more than 10% is considered a major incursion and special measures should be taken to minimise impact on the retained trees and the Arborist must demonstrate that the tree will remain viable post construction.

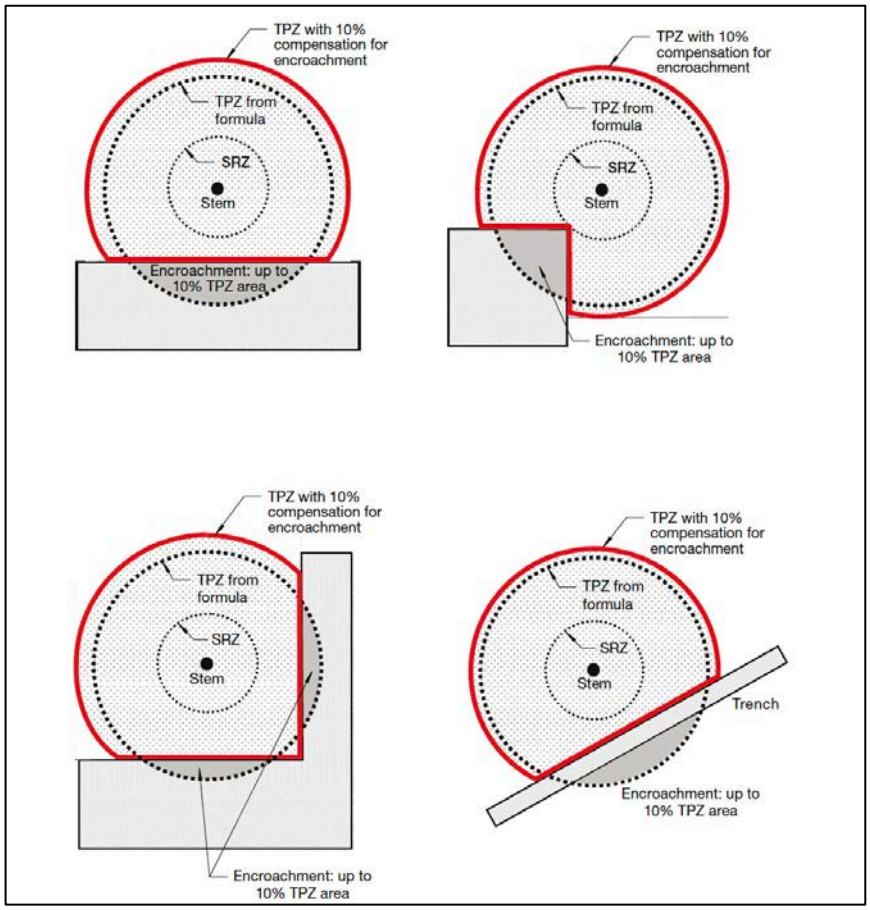


Figure 1: Example acceptable 10% minor encroachments. (Source: AS 4970:2009)

5.5 Retention Value

The retention value method used is based on the IACA Significance of a Tree, Assessment Rating System (STARS) (IACA 2010)©. See appendix for detailed description of the method. The Stars retention value method used is a simplified rating system consisting of 4 categories as a summary of the survey's cascading process. The retention value considers the trees health and structure, age class, defects, life expectancy and significance in the landscape.

- Priority for Retention (High - A - Green) -These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone. Considerable efforts should be made to retain these trees.
- Consider for Retention (Medium – B (Blue)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. Reasonable efforts should be made to retain these trees.
- Consider for Removal (Low- C –Grey) These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention. These trees may also be easily replaceable due to their small size.
- Priority for Removal (Remove – R- Red). -These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

6 Site Details

6.1 Penrith Local Government Area.

The site is located in the Penrith Local Government Area.

6.2 Zoning

The site is zoned UR - Urban pursuant to SEPP (Precincts - Western Parkland City) 2021.

6.3 Biodiversity and Conservation SEPP

The subject trees that are over 3.5m in height are protected by the State Environmental Planning Policy (Biodiversity and Conservation SEPP) 2021. Trees proposed for removal or pruning, are covered by the SEPP unless they are considered an imminent danger to life and property (by a AQF Level 5 or above Arborist) and require a permit to be issued by Council.

6.4 Suburb Map

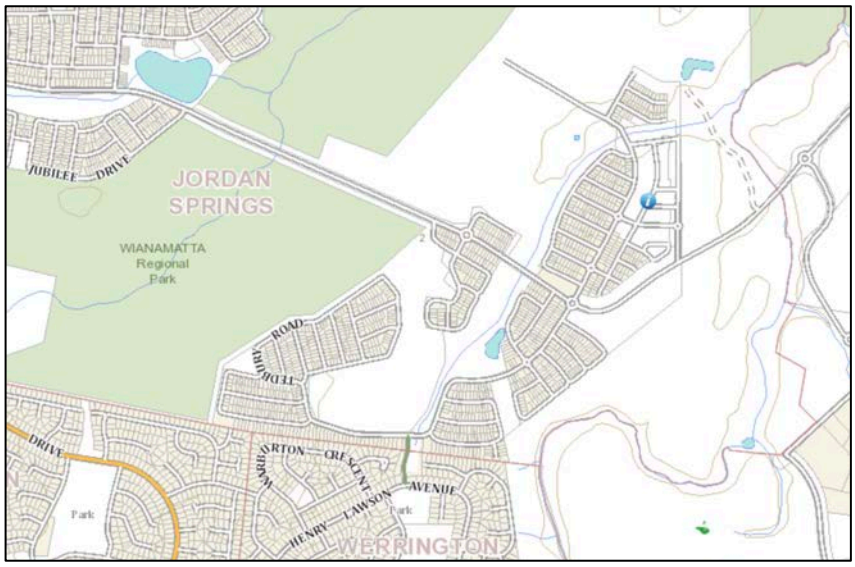


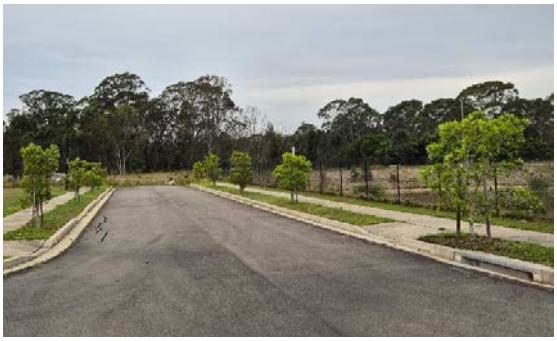
Figure 4: Map of Suburb showing site location (Source: Sixmaps 2024).

6.5 Aerial Image

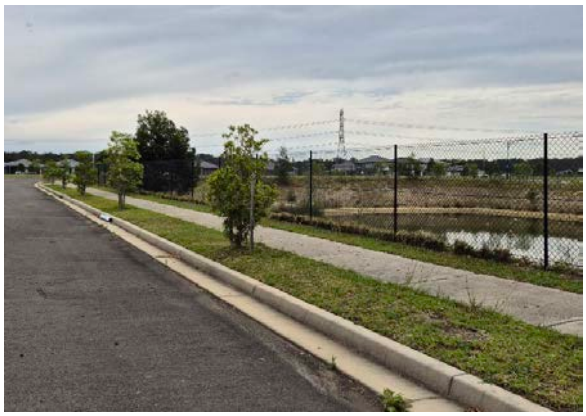
Figure 5: Provides an aerial photograph of the project site, outlines the boundaries of the project site (in red) and the boundaries of Lots 2 and 3 in DP 1248480 (in blue). (Source: Guidance for Consultant Reports New High School for Jordan Springs).

6.6 Site conditions

The project site is located on the corner of Armoury Road and Infantry Street in Jordan Springs and is legally described as part of Lots 2 and 3 in DP 1248480. The site currently has vacant lots with new street, services and street tree plantings. One (1) detention basin is located within the site.

Figures 6 & 7: The appearance of the existing site condition can be observed. (Source: Oates 7/11/2024).

Figures 8 & 9: The appearance of the existing site condition can be observed. . (Source: Oates 7/11/2024).


Figures 10 & 11: The appearance of the existing site condition can be observed. (Source: Oates 7/11/2024).

7 Tree Survey

The site inspection was completed on the 7th November 2024 by Jamie Oates, An AQF Level 5 Arborist. 68 trees within the proposed activity area and 56 trees surrounding the project area on the adjacent street verges were inspected and are now subject to this report. The majority of the trees are tagged and numbered 1 – 124 with small round metal tags. Alex Austin, an AQF level 8 Arborist, has prepared this document following a review of the tree data and site plans. This report and the tree data have been prepared in accordance with Australian Standard 4970: 2009 *Protection of trees on development sites.* The site trees subject to this report have been tagged and mapped. The complete data table is listed in the appendix.

The tree assessment revealed;

- 124 Low (C) Retention Value trees (All new plantings that are easily replaceable).

There are 24 trees of protected size (>3.5m) and 100 trees of exempt size(<3.5m height).

7.1 Tree Location Maps

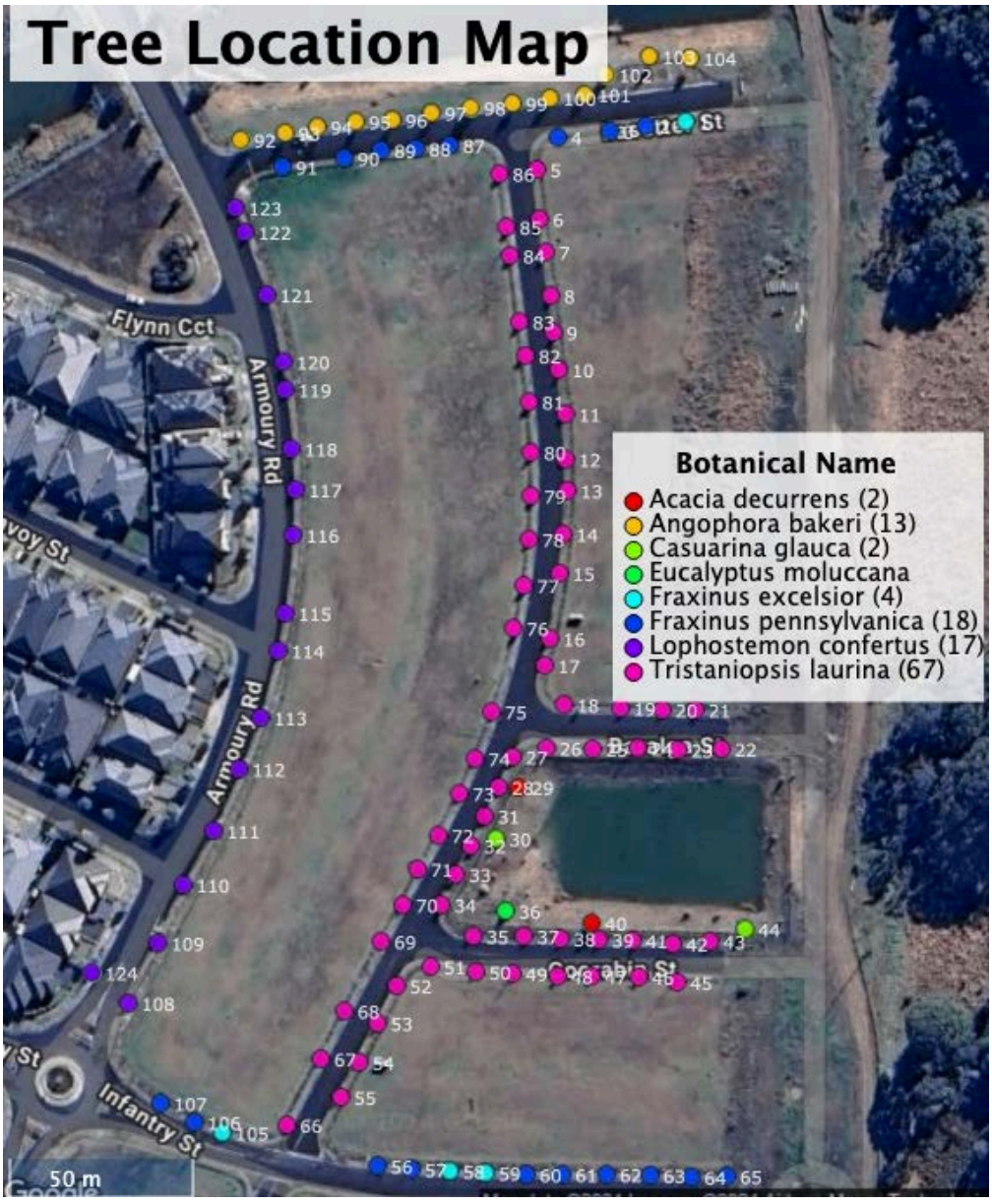


Figure 12: The Tree location map can be observed. See appendix for the larger image. See the tree data sheet for tree ownership detail. (Source: Tree Plotter 2024).

Figures 13 & 14: The Tree location maps for exempt sized trees (Left) and Protected Size trees (Right) can be observed. (Source: Tree Plotter 2024).

7.2 124 Low (C) Retention Value trees

These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention as they are newly planted. These trees are all easily replaceable due to their small size. Examples include;

7.2.1 Tree 8 *Tristaniopsis laurina* (Kanooka)

Tree 8 *Tristaniopsis laurina* (Kanooka) is a typical newly planted tree on the street verge. The tree is 2.3m height, which is an exempt size in the Penrith LGA.

Figure 15: Tree 8 can be observed in the landscape. (Source: Oates 7/11/2024).

7.2.2 Tree 57 *Fraxinus pennsylvanica* (Red Ash)

Tree 57 *Fraxinus pennsylvanica* (Red Ash) is a typical newly planted tree on the street verge. The tree is 3.1m height, which is an exempt size in the Penrith LGA.

Figure 16: Tree 57 can be observed in the landscape. (Source: Oates 7/11/2024).

7.2.3 Tree 92 *Angophora bakeri* (Narrow-leaved Apple)

Tree 92 *Angophora bakeri* (Narrow-leaved Apple) is a typical newly planted tree on the street verge. The tree is 6m height, which is an protected size in the Penrith LGA.

Figure 17: Tree 92 can be observed in the landscape. (Source: Oates 7/11/2024).

7.2.4 Tree 111 *Lophostemon confertus* (Queensland Box)

Tree 111 *Lophostemon confertus* (Queensland Box) is a typical newly planted tree on the street verge. The tree is 3m height, which is an exempt size in the Penrith LGA.

Figure 18: Tree 111 can be observed in the landscape. (Source: Oates 7/11/2024).

7.2.5 Tree 29 *Acacia decurrens* (Green Wattle)

Tree 29 *Acacia decurrens* (Green Wattle) is a typical self sown tree in the detention basin area. . The tree is 3.6m height, which is an protected size in the Penrith LGA.

Figure 19: Tree 29 can be observed in the landscape. (Source: Oates 7/11/2024).

7.2.6 Tree 124 *Lophostemon confertus* (Queensland Box)

Tree 124 *Lophostemon confertus* (Queensland Box) is a typical newly planted tree on the street verge. The tree has been in the ground longer than the project side of the road and is a larger specimen. The tree was outside the scope of the data collection area. The tree has been assessed form google street view due to time constraints associated with the project submission deadline. The tree is approximately 8m height, which is a protected size in the Penrith LGA. The tree is located outside 133 Armory Road.

Figure 20: Tree 124 can be observed in the landscape. (Source: Google Street view7/11/2024).

8 Proposed Activity

The proposed activity is for the construction and operation of a New High School for Jordan Springs that is proposed to have a capacity of 1,000 students and 80 staff to meet forecast enrolment demand associated with population growth in Jordan Springs and Ropes Crossing.

8.1 Existing Layout

The project site is located on the corner of Armoury Road and Infantry Street in Jordan Springs and is legally described as part of Lots 2 and 3 in DP 1248480. The site currently has vacant lots with new street, services one(1) detention basin and new street tree plantings. .

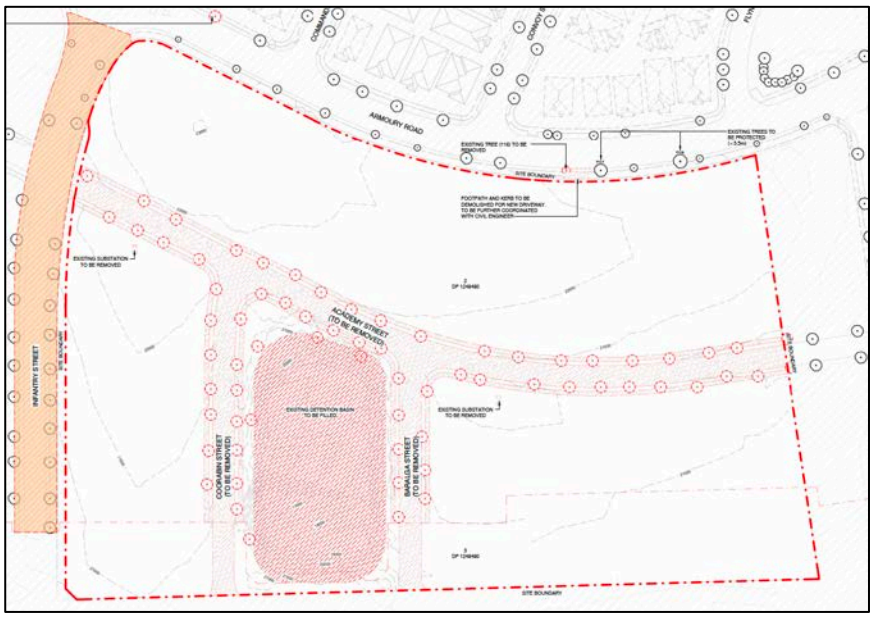


Figure 21: The existing layout.(Source: Demolition Plan by DJRD Issue Po3 dated 17/11/2024).

8.2 Proposed Layout - Scenario 1

The school will provide permanent General Learning Spaces (GLS), Support Learning Spaces (SLS), staff facilities and a library across three (3), three storey buildings, a single storey hall, a playing field, three (3) outdoor sport courts, 72 operational at grade parking spaces (including two (2) accessible spaces), 100 bicycle spaces and landscaping.

Figure 22: The proposed layout (Source: Overall Ground floor Plan by DJRD Issue Po5 dated 12/11/2024).

8.3 Scenario 2 - Interim Solution – Road network not completed, Permanent OSD Basin not constructed.

Scenario 2 is an Interim Solution where the public domain works and permanent off-site basin are being constructed by others under a separate planning pathway. Further detail on activities within each stage are detailed in section 4.3.

- .Scenario 2 - Stage 1

Construction and operation of a temporary on-site OSD Basin;
Construction and operation of the New High School for Jordan Springs, including;

- Scenario 2 - Stage 2

Decommissioning of existing on-site OSD basin, prior to the following works being undertaken:

- External works undertaken by others to facilitate Stage 3

Note – Scenario 2 - Stage 3 is not to proceed until the external works undertaken by others have been completed.

- Scenario 2 - Stage 3

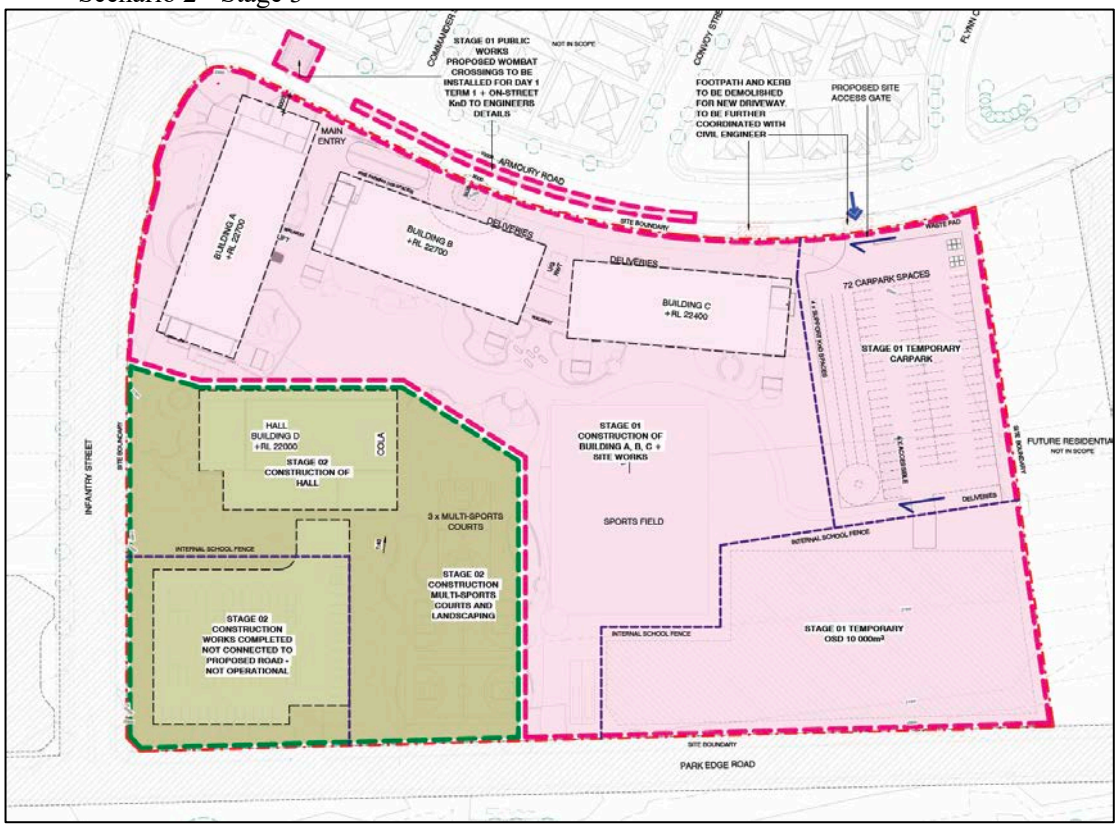


Figure 23: The proposed site plan for scenario 2 (Source: Staging Plans by DJR, Issue P03 dated 05/12/2024).

9 Impact from Proposed Activity

If the current proposed construction layouts for Scenario 1 or Scenario 2 are to proceed, then 70 trees are proposed for removal in order to facilitate the layout. Trees for removal include; all 68 trees in the project area and Two (2) trees numbered 116 & 124 on the adjacent street verges which are outside the REF boundary and project site. Five (5) trees proposed for removal numbered 29, 30, 40, 44 & 124 are of a protected size >3.5m height and the remaining 65 are of an exempt size <3.5m height.

54 trees surrounding the project area can be retained and protected from works. 19 trees proposed for retention are of a protected size >3.5m height and the remaining 35 are of an exempt size <3.5m height. No impact to the viability of the trees for retention is anticipated if the protection measures are applied as per the guidance in this report.

Complete TPZ impact data is seen in the Data Spreadsheet and Plan.

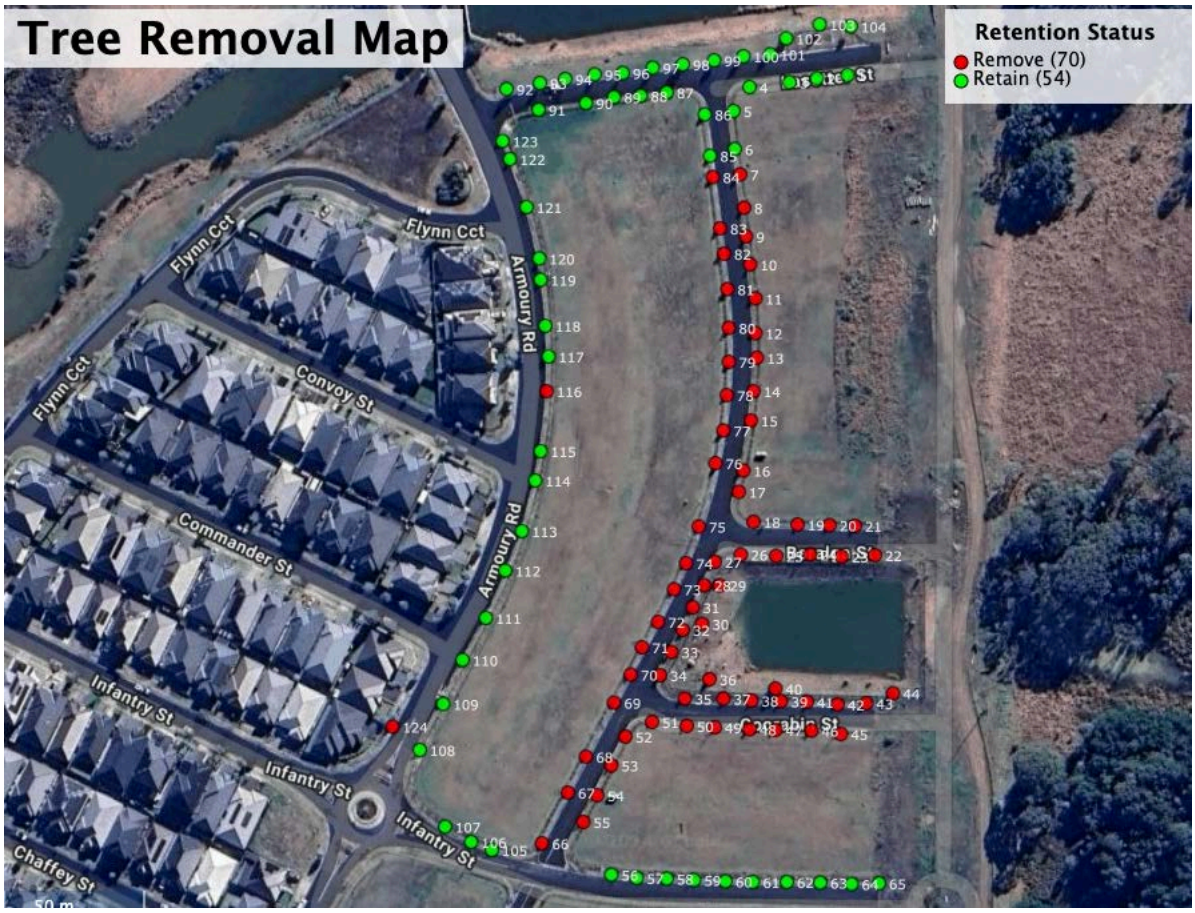


Figure 24: The Tree Removal Map can be observed. See appendix for the larger image. See the tree data sheet for tree ownership detail. (Source: Tree Plotter 2024).

9.1 70 Tree Removals

If the current proposed construction layout is to proceed, then 70 trees are proposed for removal in order to facilitate the layout. Trees for removal include; all 68 trees in the project area and Two (2) trees numbered 116 & 124 on the adjacent street verges.

Five (5) trees proposed for removal numbered 29, 30, 40, 44 & 124 are of a protected size >3.5m height and the remaining 65 are of an exempt size <3.5m height.

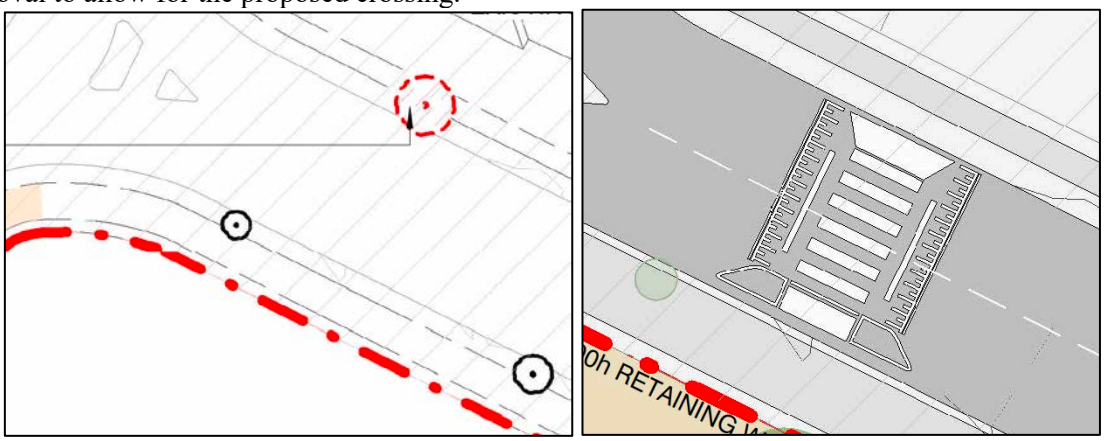
Trees for removal include;

9.1.1 68 Tree within the project area

All 68 trees within the project area require removal to facilitate the layout.

9.1.2 Tree 124 *Lophostemon confertus* (Queensland Box) – Council Tree

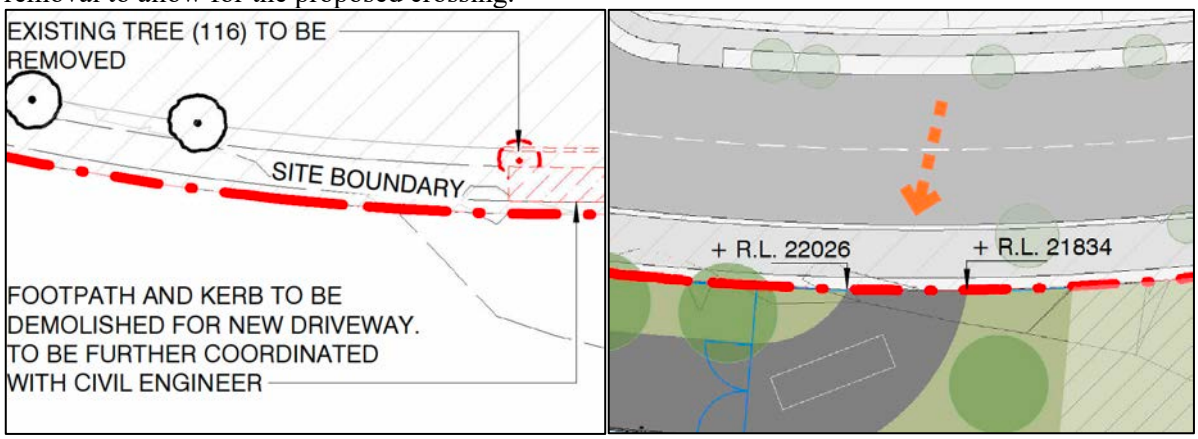
Tree 124 *Lophostemon confertus* (Queensland Box) is on the adjacent street verge and requires removal to allow for the proposed crossing.



Figures 25 & 26: The proposed demolition Plan showing the impact to tree 124 (Left) - Source Demolition Plan by DJRD Issue 3 dated 17/11/2024.and the proposed crossing (Right) - Source: Overall Groundfloor Plan by DJRD Issue Po5 dated 12/11/2024.

9.1.3 Tree 116 *Lophostemon confertus* (Queensland Box) - Council Tree

Tree 116 *Lophostemon confertus* (Queensland Box) is on the adjacent street verge and requires removal to allow for the proposed crossing.



Figures 27 & 28: The proposed demolition Plan showing the impact to tree 116 (Left) - Source Demolition Plan by DJRD Issue 3 dated 17/11/20244 .and the proposed entry drive (Right) - Source: Overall Groundfloor Plan by DJRD Issue Po5 dated 12/11/2024.

9.2 54 Trees for Retention

54 trees surrounding the project area can be retained and protected from works. 19 trees proposed for retention are of a protected size >3.5m height and the remaining 35 are of an exempt size <3.5m height. No impact to the viability of the trees for retention is anticipated if the protection measures are applied as per the guidance in this report.

Project arborist supervision and sensitive excavation techniques must be included for any excavation works for stormwater or other services located in the TPZ of trees nominated for retention. Trenching should be routed out of the TPZ in the pre excavation stage.

Trees that end up conflicting with such services must be replaced with the same species.

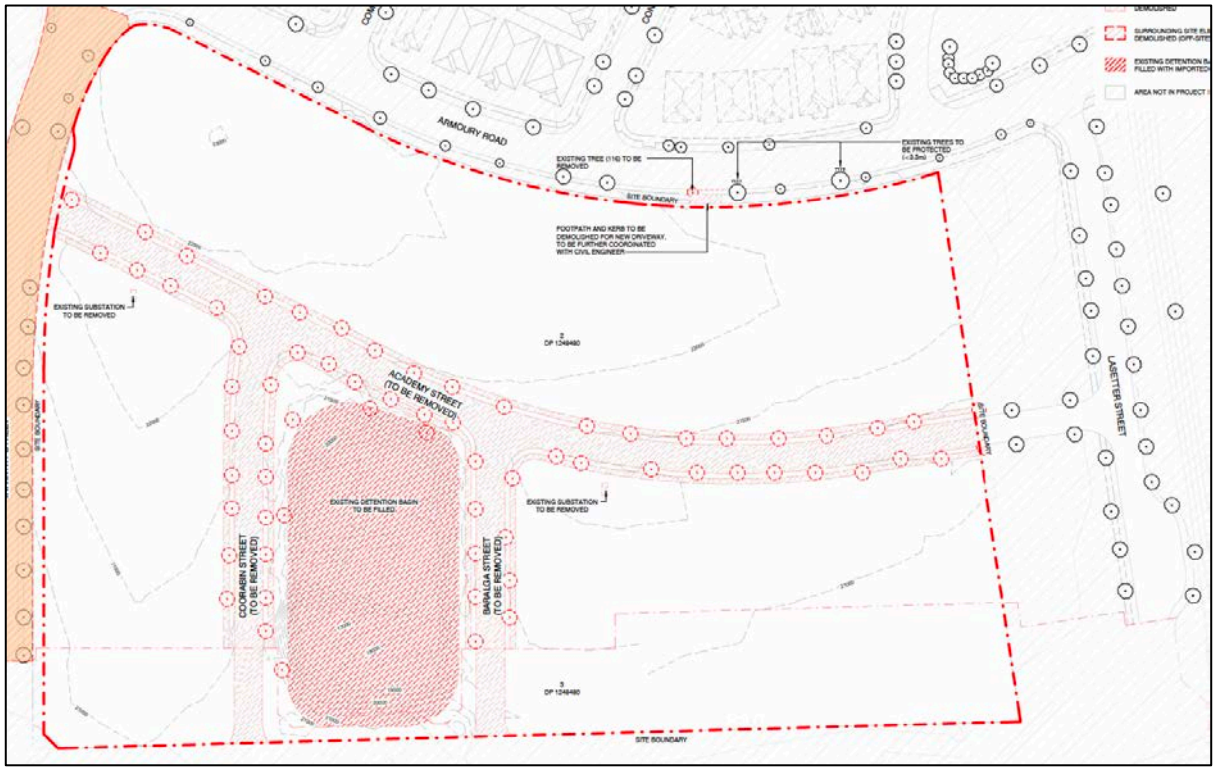


Figure 29: The existing layout showing tress surrounding the activity site to be retained. (Source: Demolition Plan by DJRD Issue Po3 dated 17/11/2024).

10 98 New Tree Plantings

98 new tree plantings are proposed within the project. The 98 Trees include numerous Cumberland Plain Woodland Species and trees as well as large canopy trees. There are more replacement tree plantings (98) than proposed tree removals (72) and the replacement plantings provide species that will considerably increase the future canopy cover and aesthetic appeal of the site/locality.

Cumberland Plain	Cumberland Red Gum Riverflat Forest	CwC		Botanic Name	Common Name	Mature Size (H x W)	Pot Size	Density	Quantity
			TREES						
		Tools	Ad	*Acacia decurrens*	Black Wattle	10 x 4	200L	As Shown	3
		Tools	Afa	*Acacia falcata*	Sickle Wattle	3 x 2	200L	As Shown	1
		Tools	Ai	*Acacia implexa*	Lightwood	8 x 7	200L	As Shown	9
			Afl	*Angophora floribunda*	Rough Bark Apple	30 x 10	200L	As Shown	5
		Tools	As	*Angophora subvelutina*	Broad-leaved Apple	7 x 6	200L	As Shown	3
			At	*Allocasuarina torulosa*	Forest She Oak	8 x 5	200L	As Shown	6
			Bi	*Banksia integrifolia*	Coast Banksia	15 x 6	200L	As Shown	3
			Bs	*Bursaria spinosa*	Native Blackthorn	10 x 4	200L	As Shown	1
		Tools	Cm	*Corymbia maculata*	Spotted Gum	20 x 12	200L	As Shown	23
			Ea	*Eucalyptus amplifolia*	Cabbage Gum	20 x 6	200L	As Shown	3
			Ecr	*Eucalyptus crebra*	Grey Ironbark	35 x 10	200L	As Shown	4
		Food	Ecu	*Exocarpos cupressiformis*	Native Cherry	8 x 5	200L	As Shown	2
			Ee	*Eucalyptus eugenioides*	Narrow-leaved Stringybark	25 x 8	200L	As Shown	4
			Et	*Eucalyptus tereticornis*	Forest Red gum	20 x 5	200L	As Shown	16
			Emo	*Eucalyptus moluccana*	Grey Box	25 x 8	200L	As Shown	9
		Tools	Ma	*Melaleuca alternifolia*	Tea Tree	7 x 4	200L	As Shown	2
		Tools	Mq	*Melaleuca quinquenervia*	Broad-leaved Paperbark	15 x 10	200L	As Shown	1
		Food	Ss	*Syzygium smithii*	Lilly Pilly	10 x 6	200L	As Shown	1
			Tl	*Tristaniopsis laurina*	Water Gum	13 x 6	200L	As Shown	2
								Total	98

Figure 30: The proposed tree species schedule (Source: Landscape Master Plan by Site Image Issue A dated 21/11/2024).

Figure 31: The landscape masterplan depicting the locations of the new tree plantings. (Source: Landscape Master Plan by Site Image Issue A dated 21/11/2024).

11 Mitigation Measures

54 Trees adjacent to the site boundary will be retained if the tree protection measures in the report are adhered to. The trees for retention are shown on the tree retention and removal plan, the demolition plans and listed in the data sheet. In order to minimise the impact to the tree nominated for retention, the following mitigation measures must be incorporated into the works.

11.1 Summary Table for Mitigation measures

Table 3

Mitigation Number/ Name	When is Mitigation Measure to be complied with	Mitigation Measure	Reason for Mitigation Measure
Plan Detail	**Throughout whole project**	**The trees for retention are shown on the tree retention and removal plan, the demolition plans and listed in the data sheet**	**To protect trees for retention from unnecessary damage.**
11.2 Project Arborist	**Throughout whole project**	**An official "Project Arborist" should be commissioned to oversee the tree protection, any works within the TPZ's and complete compliance certification**	**To protect trees for retention from unnecessary damage.**
11.4 Tree Protection Fencing	**Prior to commencement of Works**	**Protect all trees for retention with Tree Protection fencing compliant with AS 4970:2009**	**To protect trees for retention from unnecessary damage.**
11.5 Tree Protection Signage	**Prior to commencement of Works**	**Protect all trees for retention with Tree Protection signage compliant with AS 4970:2009**	**To protect trees for retention from unnecessary damage.**
11.6 Sensitive work methods in TPZ's.	**Throughout Project**	**Project Arborist to supervise any excavation works within TPZ's of trees to be retained for stormwater, electrical etc,**	**To protect trees for retention from unnecessary damage.**
11.7 – Restricted Activites in the TPZ.	**Throughout Project**	**Construction Manager to ensure activities listed in 11.7 do not occur in the TPZ of trees to be retained.**	**To protect trees for retention from unnecessary damage.**
11.8 Compliance Reporting	**Monthly Throughout Project and if excavation works occur in the TPZ of Trees for retention.**	**Project Arborist to complete monthly site visits and record evidence to ensure compliance with mitigation measures**	**To protect trees for retention from unnecessary damage.**
10	**At the end of the Civil works**	**98 Trees to be planted in the site.**	**To replace the removed trees and increase tree population for the future.**
11.8 # 2 Completion Inspection and Report	**Upon completion of works**	**Project Arborist to inspect and report on the condition of trees for retention.**	**To ensure trees for retention were protected and will remain viable post construction.**

11.2 Project Arborist

An official "Project Arborist" should be commissioned to oversee the tree protection, any works within the TPZ's and complete compliance certification. The Project Arborist should have minimum five (5) years industry experience in the field of arboriculture.

11.3 Tree Works

11.3.1 70 Tree Removals

70 site trees are proposed for removal and should be removed at the beginning of the project. The trees nominated for retention must not be damaged during the tree removal works. The trees for removal are shown on the tree retention and removal plan, the demolition plans and listed in the data sheet.

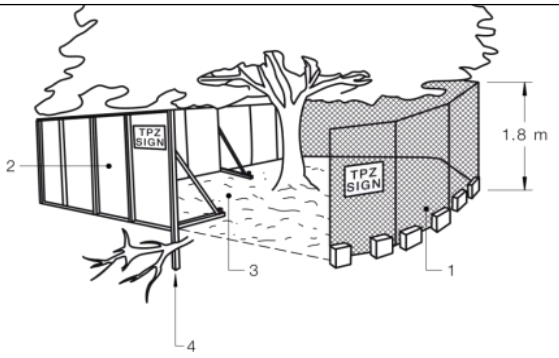
11.3.2 Standard of Works

To ensure a high standard of works is achieved, all proposed arboricultural works must be completed by a suitably qualified and experienced Arborist(s) of a minimum AQF Level 3 in accordance with the principles of the Australian Standard *4373-2007 Pruning of Amenity Trees.*

11.4 Tree Protection Fencing

The trees for retention must be protected by Tree Protection fencing. Protective fencing is to be installed as close as practicable from the trunk to the TPZ distances listed in the Tree Data table. Existing site features such as boundary fences will influence the extent of the TPZ fencing. The project arborist is to determine the suitability and extent of the tree protection fencing to be used.

Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after the works are complete. The temporary dismantling of tree protection fencing must only be done with the authorisation of the project arborist and/or the responsible authority.



LEGEND:
1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

Figure 32: TPZ fencing specification. (Source: AS 4970:2009).

11.5 Tree Protection Signage

The tree protection signage below should be installed along the Tree Protection Fences.

Figure 33: TPZ signage specification. (Source: Austin 2024).

11.6 Works within TPZ's

All works within the TPZs must be completed by techniques that do not damage tree roots. Any excavation works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

- Excavation/demolition by hand
- Excavation/demolition by machine with Arborist supervision
- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an air spade with vacuum truck

Machine excavation is prohibited within the remaining TPZ areas of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

11.7 Activities Restricted within the TPZ

- Machine excavation without Arborist supervision
- Demolition by machine without Arborist supervision
- Excavation for silt fencing
- Storage
- Preparation of chemicals, including preparation of cement products
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill other than what is proposed
- Soil level changes
- Temporary or permanent installation of services, utilities, or signs
- Physical damage to the tree
- Parking or driving of vehicles/machinery.

11.8 Compliance Inspections & Reports

Inspections should be conducted by the Project Arborist at key points during the construction to ensure that protection measures are being adhered to during construction stages and any decline in tree health or additional remediation measures can be identified.

Tree inspections and compliance reporting by the project arborist is required at the following points;:

1. Following the tree removal works and the installation of the tree protection measures including, tree protection fencing and signage.
2. Every month during the works to ensure compliance
3. If excavation works are to occur in the TPZ of any tree for retention.
4. At the practical completion of the project

Following each inspection, the project arborist shall prepare a brief compliance report detailing the condition of the trees. These reports should contain photographic evidence where required to demonstrate that the protection measures are in place as specified.

Any Non-Compliance Statements shall be submitted to the Project Manager (as well as the clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

12 Evaluation of Environmental Impacts

This Arboricultural Impact Assessment has provided a detailed analysis of the trees that could be affected by the proposed activity on the subject site. The requirements for Tree Preservation Zones are in line with AS 4970:2009 *Protection of tree on development sites.* This report examines and takes into account the relevant environmental factors in the Guidelines and Environmental Planning and Assessment Regulations 2021 under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

The viability of the trees nominated for retention is not anticipated to be impacted if the protection measures are applied as per the guidance in this report. There are more replacement tree plantings (98) than proposed tree removals (70) and the replacement plantings provide species that will considerably increase the future canopy cover and aesthetic appeal of the site/locality.

13 References

Australian Standard 4970: 2009 *Protection of trees on development sites.*

British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*

14 Industry Qualifications

- AQF Level 5 & 8 Consulting Arborist.
- ISA Certified Arborist # AU-0348A
- Tree Risk Assessment Qualification (TRAQ) (Exp Oct 2028)
- Advanced Quantified Tree Risk Assessment Registered User # 3692
- Masters of Environmental Law

15 Appendices

15.1 Significance of a Tree Assessment Rating System (IACA 2010)©

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape.

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a 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 to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's 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.

2. Medium Significance in landscape.

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a 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 tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape.

- The tree is in fair-poor condition and good or low vigour;
- The tree has 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 tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to 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.

Environmental Pest / Noxious Weed Species:

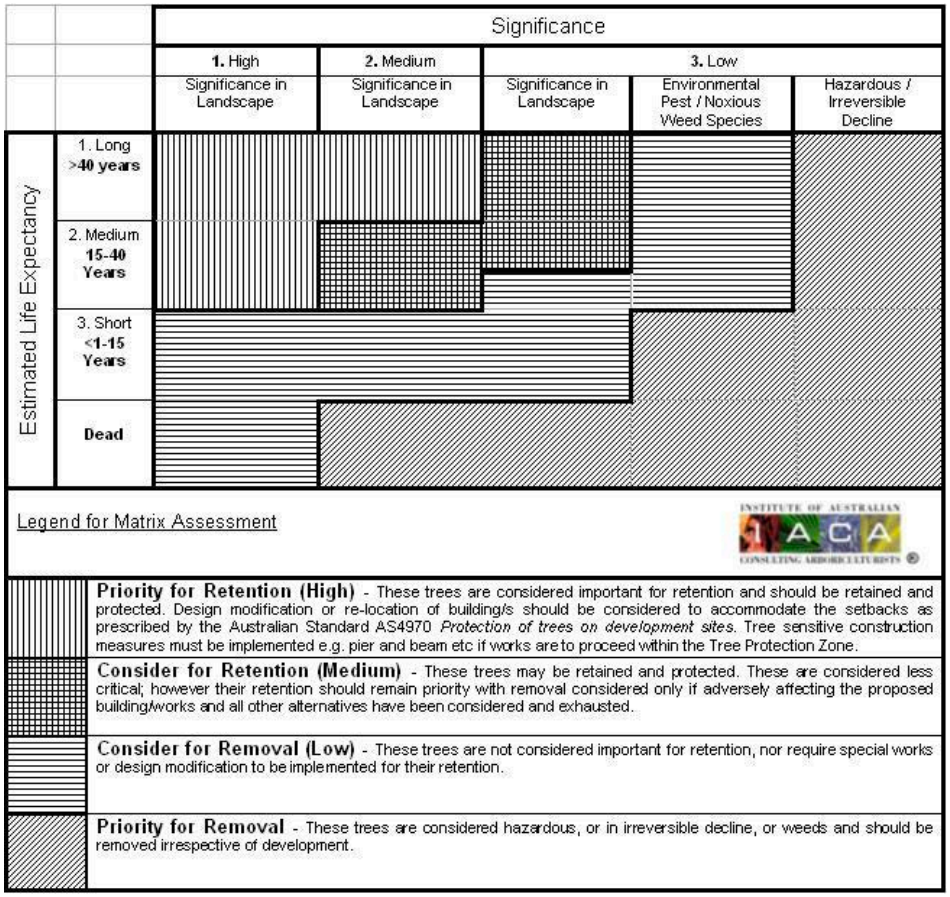
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties;
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline:

- 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.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group. Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety

Table - Tree Retention Value - Priority Matrix



15.2 Complete Tree and Project Impact Data Spreadsheet

15.3 Tree Location Map

15.4 Tree Retention and Removal Map

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
1	Adjacent Street Verge	European Ash	*Fraxinus excelsior*	1	Juvenile	5	12	2	12.56	1.36	3.7m	2	Good	Average		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
2	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	5	10	2	12.56	1.26	3.5m	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
3	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	7	2	12.56	1.08	2.7m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
4	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	5	8	2	12.56	1.15	3.2m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
5	Adjacent Street Verge	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	None anticipated	Retain and Protect
6	Adjacent Street Verge	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	2.6m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	None anticipated	Retain and Protect
7	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	9	2	12.56	1.2	3m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
8	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.3m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
9	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.6m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
10	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
11	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
12	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	11	2	12.56	1.31	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
13	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Previous branch failure(s), Canopy Dieback,		Low	C	Within development footprint	Remove
14	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	11	2	12.56	1.31	2.7m.	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
15	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	2.7m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
16	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.7m.	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
17	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.3m	1	Average	Good	Exempt size	Short (5-15 years)	Mechanical damage		Low	C	Within development footprint	Remove
18	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
19	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
20	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	7	2	12.56	1.08	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
21	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	8	2	12.56	1.15	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
22	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	8	2	12.56	1.15	2.4m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
23	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	9	2	12.56	1.2	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
24	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
25	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.1m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
26	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
27	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	12	2	12.56	1.36	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
28	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	13	2	12.56	1.4	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
29	Project Area	Green Wattle	*Acacia decurrens*	1	Juvenile	4	8	2	12.56	1.15	3.6m	2	Good	Good		Short (5-15 years)	Infrastructure contact	Located whin fenced of dam area. Not tagged.	Low	C	Within development footprint	Remove
30	Project Area	Swamp she-oak	*Casuarina glauca*	1	Juvenile	6	10	2	12.56	1.26	5	2	Good	Good		Long (>40 years)		Located whin fenced of dam area. Not tagged.	Low	C	Within development footprint	Remove
31	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	11	2	12.56	1.31	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
32	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	9	2	12.56	1.2	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
33	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	11	2	12.56	1.31	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
34	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	10	2	12.56	1.26	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove

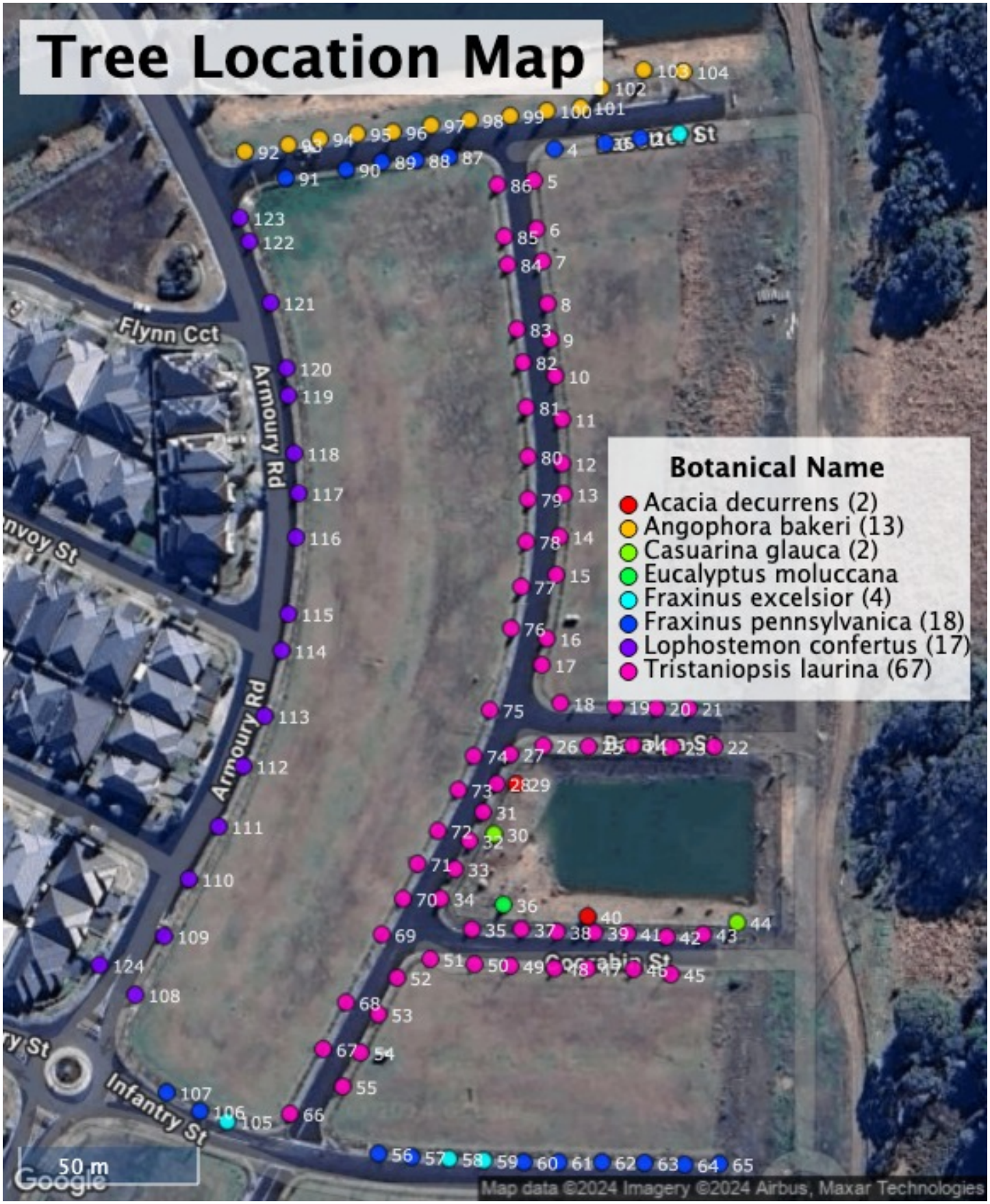
Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
35	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	8	2	12.56	1.15	2.6m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
36	Project Area	Grey Box	*Eucalyptus moluccana*	1	Juvenile	6	12	2	12.56	1.36	3m	2	Good	Good	Exempt size	Long (>40 years)		Located within fenced off dam area. Not tagged.	Low	C	Within development footprint	Remove
37	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback, Canopy thinning,		Low	C	Within development footprint	Remove
38	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	7	2	12.56	1.08	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
39	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.4m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
40	Project Area	Green Wattle	*Acacia decurrens*	1	Mature	20	25	2.4	18.09	1.85	5	4	Good	Good		Short (5-15 years)	Co-dominant stems, Infrastructure contact	Located within fenced off dam area. Not tagged.	Low	C	Within development footprint	Remove
41	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	8	2	12.56	1.15	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
42	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	8	2	12.56	1.15	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
43	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
44	Project Area	Swamp she-oak	*Casuarina glauca*	1	Juvenile	10	15	2	12.56	1.49	6	3	Good	Good		Long (>40 years)		Located whin fenced of dam area. Not tagged.	Low	C	Within development footprint	Remove
45	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
46	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.8m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
47	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.4m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
48	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	9	2	12.56	1.2	2.9m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
49	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	7	2	12.56	1.08	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
50	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
51	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
52	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.4m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
53	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	6	2	12.56	1.02	2.8m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
54	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	5	2	12.56	0.94	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
55	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	3	9	2	12.56	1.2	2.7m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
56	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	7	2	12.56	1.08	3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
57	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	7	2	12.56	1.08	3.1m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
58	Adjacent Street Verge	European Ash	*Fraxinus excelsior*	1	Juvenile	4	8	2	12.56	1.15	3.1m	2	Good	Good	Exempt size	Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
59	Adjacent Street Verge	European Ash	*Fraxinus excelsior*	1	Juvenile	5	13	2	12.56	1.4	3.7m	3	Good	Good		Medium (15-40 years)	Co-dominant stems, Crossing/rubbing branches		Low	C	None anticipated	Retain and Protect
60	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	8	2	12.56	1.15	2.9m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
61	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	5	2	12.56	0.94	2.9m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
62	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	5	2	12.56	0.94	3m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
63	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	7	2	12.56	1.08	3.6m	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
64	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	7	2	12.56	1.08	2.9m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
65	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	6	2	12.56	1.02	3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
66	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	2.6m	2	Average	Average	Exempt size	Short (5-15 years)	Abnormal lean, Canopy Dieback,		Low	C	Within development footprint	Remove
67	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	3.4m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
68	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	8	2	12.56	1.15	2.5m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
69	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	10	2	12.56	1.26	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove

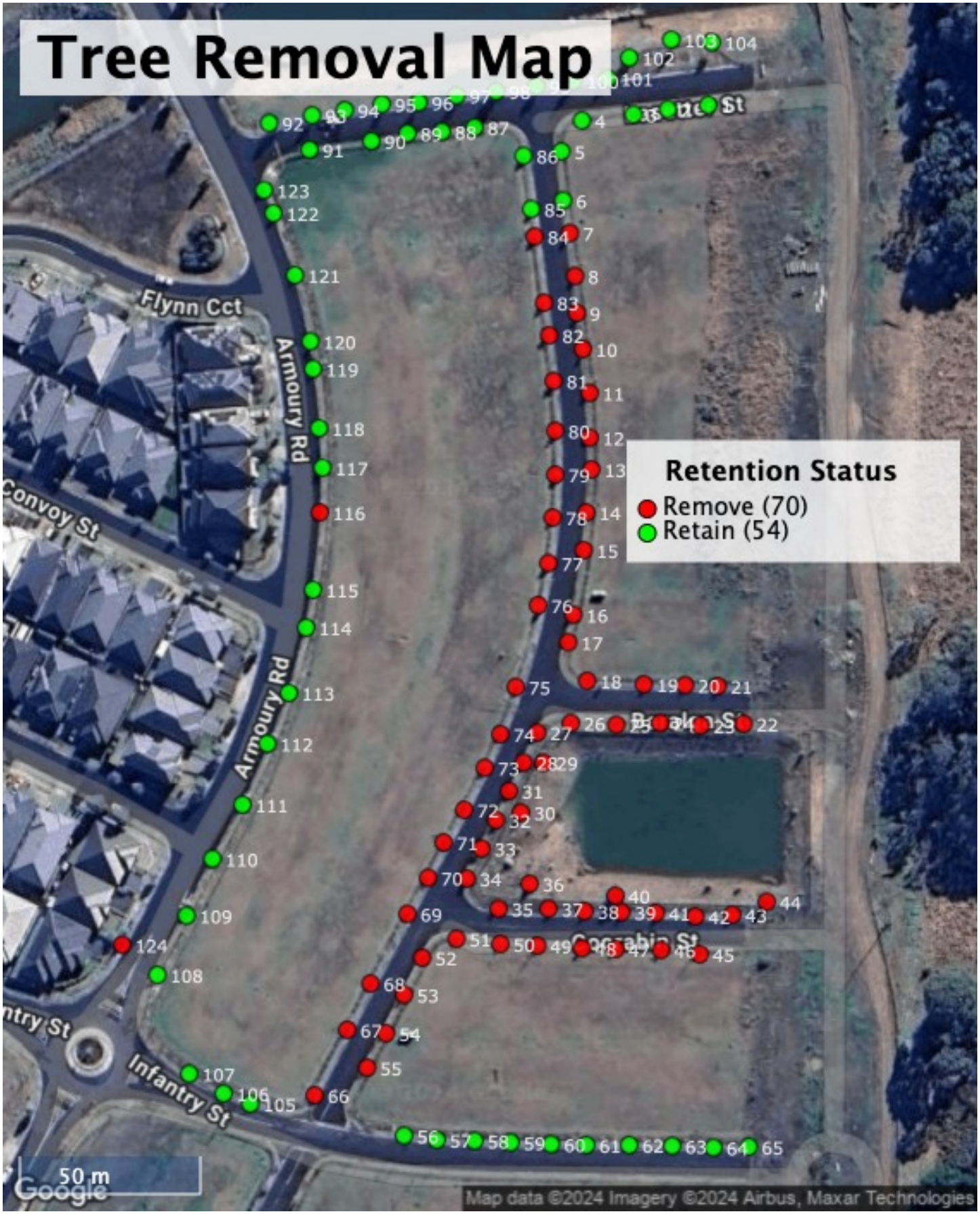
Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
70	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	10	2	12.56	1.26	2.6m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
71	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
72	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
73	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.5m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
74	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.6m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
75	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	9	2	12.56	1.2	2.6m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
76	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.7m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
77	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.9m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
78	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	11	2	12.56	1.31	2.9m	1	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
79	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.7m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
80	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	10	2	12.56	1.26	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
81	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.9m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
82	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
83	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	5	10	2	12.56	1.26	2.9m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
84	Project Area	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	12	2	12.56	1.36	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	Within development footprint	Remove
85	Adjacent Street Verge	Kanooka	*Tristaniopsis laurina*	1	Juvenile	4	8	2	12.56	1.15	2.8m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	None anticipated	Retain and Protect
86	Adjacent Street Verge	Kanooka	*Tristaniopsis laurina*	1	Juvenile	6	11	2	12.56	1.31	3m	2	Average	Good	Exempt size	Short (5-15 years)	Canopy Dieback,		Low	C	None anticipated	Retain and Protect
87	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	10	2	12.56	1.26	3m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
88	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	9	2	12.56	1.2	3.2m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
89	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	7	2	12.56	1.08	3.1m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
90	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	3	7	2	12.56	1.08	3.1m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
91	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	4	9	2	12.56	1.2	3.3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
92	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	20	25	2.4	18.09	1.85	6	3	Good	Good		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
93	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	15	20	2	12.56	1.68	5	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
94	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	10	15	2	12.56	1.49	5	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
95	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	10	15	2	12.56	1.49	5	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
96	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	10	15	2	12.56	1.49	5	2	Good	Good		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
97	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	16	21	2	12.56	1.72	6	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
98	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	20	26	2.4	18.09	1.88	7	3	Good	Good		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
99	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	15	20	2	12.56	1.68	6	2	Good	Good		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
100	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	17	23	2.04	13.07	1.79	7	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
101	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	10	15	2	12.56	1.49	5	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
102	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	20	25	2.4	18.09	1.85	7	3	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
103	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	13	21	2	12.56	1.72	6	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
104	Adjacent Street Verge	Narrow-leaved Apple	*Angophora bakeri*	1	Juvenile	11	23	2	12.56	1.79	6	2	Good	Good		Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
105	Adjacent Street Verge	European Ash	*Fraxinus excelsior*	1	Juvenile	5	13	2	12.56	1.4	2.9m	3	Good	Good	Exempt size	Medium (15-40 years)	Co-dominant stems		Low	C	None anticipated	Retain and Protect
106	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	5	8	2	12.56	1.15	3.2m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees In Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy Diameter [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Arborist Notes	Landscape Significance	Retention Value	TPZ Encroachment Type	Retention Status
107	Adjacent Street Verge	Red Ash	*Fraxinus pennsylvanica*	1	Juvenile	5	8	2	12.56	1.15	2.9m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
108	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	5	8	2	12.56	1.15	2.4m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
109	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	7	12	2	12.56	1.36	3.2m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
110	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	5	8	2	12.56	1.15	2.5m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
111	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	9	2	12.56	1.2	3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
112	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	8	2	12.56	1.15	2.6m	2	Good	Good	Exempt size	Medium (15-40 years)	Mechanical damage		Low	C	None anticipated	Retain and Protect
113	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	6	9	2	12.56	1.2	3.1m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
114	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	3	5	2	12.56	0.94	2.4m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
115	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	7	2	12.56	1.08	2.9m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
116	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	8	2	12.56	1.15	3.1m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	Conflicts with access ramp location	Remove
117	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	6	12	2	12.56	1.36	3.9m	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
118	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	8	2	12.56	1.15	2.4m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
119	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	5	9	2	12.56	1.2	3.5m	2	Good	Good		Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
120	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	8	2	12.56	1.15	3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
121	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	9	2	12.56	1.2	3.3m	2	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
122	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	7	2	12.56	1.08	2.7m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
123	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	4	8	2	12.56	1.15	2.8m	1	Good	Good	Exempt size	Medium (15-40 years)			Low	C	None anticipated	Retain and Protect
124	Adjacent Street Verge	Queensland Box	*Lophostemon confertus*	1	Juvenile	20	25	2.4	18.09	1.85	7	3	Good	Good		Medium (15-40 years)	Located outside 133 Armoury Road. Outside scope of data collection. Viewed from google strreet view.		Low	C	Conflicts with pedestrain crossing location	Remove



See the Tree data sheet for tree ownership detail.



Trees for removal include; all 68 trees in the project area and Two (2) trees numbered 116 & 124 on the adjacent street verges which are outside the REF boundary and project site.

54 trees surrounding the project area will be retained and protected from works. These trees are outside the REF boundary and project site

See the Tree data sheet for tree ownership detail.