

Abel Ecology

Arboricultural Impact Assessment (SSD)

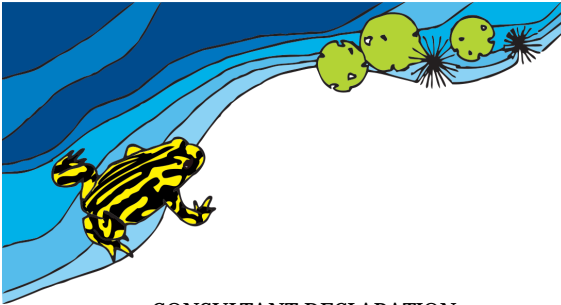
For Capital Insight

Address: 490 Chapel Road, Bankstown NSW 2200


Lot 1 DP 853675, Lot 10 DP 6880 and Raw Avenue

Proposed New Bankstown Hospital

<b>Prepared for:</b>	Elisabeth Wallace
<b>Report No:</b>	AE26-2916-ARB-ISS-3
<b>Prepared by:</b>	Abel Ecology
<b>Date:</b>	24 March 2026



CONSULTANT DECLARATION

PROJECT DETAILS	
PROJECT NAME	New Bankstown Hospital
Application number	SSD-105396208
Address of subject land	490 Chapel Road, Bankstown
Lot / DP	Lot 1 DP 853675, Lot 10 DP 6880 and Raw Avenue
APPLICANT DETAILS	
Applicant name	Health Administration Corporation
Applicant address	1 Reserve Road, St Leonards, NSW 2065
REPORT DETAILS	
Name of report this declaration relates	Arboriculture Impact Assessment
Report reference no.	AE26 2916 ARB ISS 3
Report date	24 <sup>th</sup> March 2026
Company name (inc. ABN / ACN)	Abel Ecology (ABN: 37 626 221 467)
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DECLARATION BY CONSULTANT	
Name	Andres Araya
Registration no.	
Organisation registered with	
Declaration	<p>The undersigned declares that Arboriculture Impact Assessment:</p> <ul style="list-style-type: none"> <li>has been prepared in accordance with the following policy, guidelines, or legislative requirements: <ul style="list-style-type: none"> <li>SEARs (SSD-105396208) Item 8 Trees and Landscaping</li> <li>The Australian Standard (AS 4970-2025)</li> <li>Bankstown DCP</li> <li>SEPP (Bio &amp; Conservation) Chapter 2</li> </ul> </li> <li>contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the Arboriculture Impact Assessment relates;</li> <li>does not contain information that is false or misleading;</li> <li>identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project;</li> <li>identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the Arboriculture Impact Assessment relates;</li> <li>contains a consolidated summary of the proposed or necessary mitigation measures.</li> </ul>
Signature	
Date	24 <sup>th</sup> March 2026



## Disclaimer

No tree is entirely without hazard potential. No responsibility is accepted for any damage or injury that may be caused by any trees on the site. All measures outlined should minimise damage inflicted on the trees if carefully implemented.

This report does not provide an assessment of risk of harm posed from tree hazards. Information may be provided about the structure, function, defects or tree pests and/or diseases, vitality, condition and life expectancy. However, no assessment of targets, frequency of use by potential targets or guidance of risk of harm is included in this report.

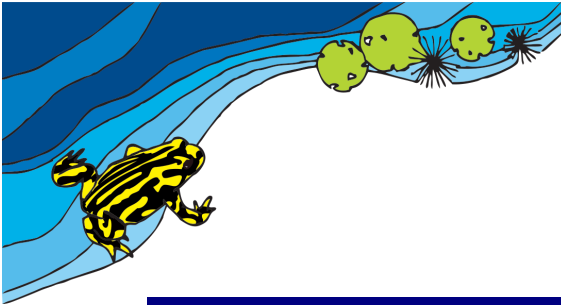
This report is an arboricultural impact assessment; it is not a risk assessment.

No internal examination of any kind has been undertaken on any tree described in this report, unless expressly stated. On occasions, a mallet may be used as an auditory guide to assist in determining the presence of internal hollows.

Generative Artificial Intelligence (Gen AI) has not been used to assist or undertake the preparation or writing of this report. The figures in this report have been created using QGIS (v3.34).

### Document History

Report	Version	Prepared by	Technical Review by	Proofread by	Submission	
					Method	Date
Report	Draft A	Andy Araya	Dr Danny Wotherspoon	Sue Simmons	Dropbox	27 January 2026
Report	Draft B	Andy Araya		Corinna Campbell	Dropbox	27 February 2026
Report	Issue 1	Andy Araya		Sue Simmons	Dropbox	20 March 2026
Report	Issue 2	Andy Araya Nicholas Tong		Corinna Campbell	Dropbox	23 March 2026
Report	Issue 3	Andy Araya Nicholas Tong		Corinna Campbell	Dropbox	24 March 2026



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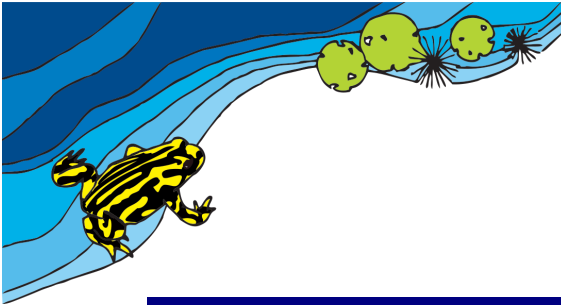
## List of Abbreviations

DSH	Diameter at Standard Height (1.4 metres)
DAB	Diameter Above Buttress
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment
LGA	Local Government Area
APZ	Asset Protection Zone
IPA	Inner Protection Area
NRZ	Notional Root Zone

Note regarding maps in this report

The diagrams/site maps used in this report have been supplied by and are used with the permission of the Client.

With regard to maps provided by the Land Information Centre, Topographic maps used with the permission of © Land and Property Information, NSW.



## Glossary

Explanation of Tree assessment terminology and rationale:

**Amenity** - Trees with recreational, functional, environmental, ecological, social, health or aesthetic value rather than for production purposes (Standards Australia 2007).

A desirable or useful feature or facility of a building or place; the pleasantness or attractiveness of a place (Google Dictionary 2017). An assessment of amenity value is to some extent subjective and qualitative, however it also includes Arboricultural assessments of structure and health of the tree.

**Arborist** - A person with training to AQF Level 3 in Arboriculture, or above, or equivalent recognized and relevant experience that enables the person to perform the tasks required by the Australian Standards for Arboricultural practice (AS4373-2007 Pruning of amenity trees and AS4970-2009 Protection of trees on development sites).

**Australian Qualification Framework (AQF)** - A national framework for all educational and training purposes in Australia.

**Codominant stems** - Stems or trunks of about the same size originating from the same position from the main stem.

**Condition** - An evaluation of the structural status of the tree including defects that may affect the useful life of an otherwise healthy specimen. Such influencing factors include cavities and decay, weak unions between scaffolds (major branches) or trunks and faults of form or habit.

**Coppiced** - Cutting a trunk close to ground level in order to stimulate the production of multiple new stems (epicormic shoots).

**DAB (Diameter Above Buttress)** –A standard Arboricultural measurement used to calculate the Structural Root Zone (SRZ).

**DSH (Diameter at Standard Height)** –A standard Arboricultural measurement used to calculate the Tree Protection Zone (TPZ), taken at 1.4 metres from the ground.

**Epicormic Growth** - The production of epicormic growth from dormant buds is a response to stress, fire and damage, including poor pruning methods. ‘Epi’s’ can occur on branches, stems and from the rhizome base of the tree. Arising from the cambium (actively growing bark region) they are often weakly attached. Epicormic shoots arising from rhizomes is an adaptive strategy in many Australian native plants including Eucalypts and plants in the Proteacea family, occurring commonly after fire, damage or drought.

**Mycorrhizae/Rhizosphere** - Mycorrhizae are fungi that grow in symbiotic association with tree roots (especially the fine root hairs) and are attributed with increasing the uptake of nutrients, particularly phosphorus, and reducing infection from soil borne pathogens. They greatly increase the surface area of a tree's root system. Mycorrhizae require aerobic soil conditions and are reduced in number by compaction, waterlogging and overuse



of soil fertilisers. Forest litter or similar mulch provides ideal conditions for the proliferation of Mycorrhizae. Rhizosphere is a term describing the peripheral area of a tree's root system where this symbiotic association most commonly occurs.

Remedial (restorative) pruning - Removing damaged, diseased or lopped branches, taking the cut back to undamaged tissue, in order to induce the production of shoots from latent or adventitious buds, from which a new crown will be established.

STAG – A dead tree, that often remains standing as a large deadwood. Additionally, STAGS often form hollows and provide habitat for local fauna.

Stem - Organ supporting the branches, leaves, flowers and fruit, and connecting the upper parts of the tree to the root system; may also be referred to as 'the trunk'.

Visual Tree Assessment (VTA) - using external characteristics as indicators of the internal conditions and structural stability of a tree. It is described by Mattheck and Breloer (1994), the first step of the method is to visually examine a tree to find external symptoms of internal defects. It is generally used in some form by Arborists in Australia for tree assessment.

A full VTA is comprised of three steps. This report does not undertake a full VTA. A level 1 and level 2 visual inspection were employed for this report. No internal examination was undertaken. On occasions, a mallet may be used as an auditory guide for the presence of internal hollows. The assessment described in this report is ground based visual assessment. No climbing of any tree was done as part of an assessment.

Vitality - Indicates the energy reserves of the tree and is determined by the observed crown colour and density, the percentage of dead/dying branches and epicormic growth, and the tree's response to wounding, disease and decay pathogens. Poor vitality compromises the tree's ability to initiate internal defence systems (including compartmentalisation of damage or decay) is reduced and it can also become predisposed to attack by insects and pathogens. Often used synonymously in Arboricultural writing with 'vigour' or 'health'.

Tree Hazard Potential - An assessment of the risks associated with retaining a tree in its existing or proposed surroundings. Factors to consider are the growth characteristics of the species, tree vitality, condition and the frequency and type of potential targets. The impact the proposed works can have on any individual tree can only be assumed from general principals about trees.

This report does not provide an assessment of risk of harm posed from tree hazards. Information may be provided about the structure, function, defects or tree pests and/or diseases, vitality, condition and life expectancy. However, no assessment of targets, frequency of use by potential targets or guidance of risk of harm is included in this report.

Tree Protection Zone (TPZ) – Based on the DSH measurement of the tree. It specifies an area around the tree to protect the upper parts as well as the underground root system from impacts of development works. Specifications for TPZ may include maintenance actions such as application of mulch and irrigation.



## Executive summary

Abel Ecology carried out a tree assessment survey at the Bankstown Hospital Site on behalf of Capital Insight, to assess the likely impacts of 160 on trees on the site, and to address issues pertaining to tree protection.

The proposal is to develop the New Bankstown Hospital on the previous Bankstown TAFE site.

Of the remaining trees, 94 are recommended for retention (including nine trees subject to further investigation, and two (2) trees to be confirmed with final hardstand area design).

A further 66 trees are recommended for removal due to the impacts caused by the proposed development. It is the policy of the client that replacement planting for removed trees is to take place at a ratio of greater than 1:1 (67 minimum).

This report identifies eight (8) trees to be removed on neighbouring lands (school, council). The appropriate approvals to be obtained prior to removal. If the trees on neighbouring properties are unable to be removed, tree protection measures and fencing must be implemented, and reconsideration of proposed works may be required.

This report does not authorise tree removal on the site or on the neighbouring properties.

This AIA addresses the development submission stage described in Table 1 of AS4970 2025. A matter for consideration at the submission stage is: "Identify trees for retention through comprehensive arboricultural impact assessment of proposed construction."

It is anticipated that a tree planting program will occur at a later stage during development. Civil engineering works tend to cause soil compaction. Soil compaction is bad for tree growth and must be remedied prior to plantings to ensure viability.

Rehabilitation of soil structure and the addition of soil organic matter will assist with maximising the potential for street trees.



The following recommendations apply:

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
Tree Protection D,C	Show tree locations and Tree Protective Fencing on all construction plans used on site.	Section 6 Appendix 1
C	<p>Engage a project arborist to ensure and certify that the Tree Protection Plan is satisfactorily implemented and to provide advice as applicable.</p> <p>The arborist will inspect the site after tree protection measures are in place and before any construction/excavation works are conducted.</p> <p>The arborist will then attend the site at least once within every three months during construction, and once upon completion of construction.</p>	Appendix 7
C	<p>Construct tree protection fences at a minimum radius distance(s) measuring the TPZ from the centre of the tree, prior to construction to prevent unnecessary root damage.</p> <p>Construct tree protection fences using chain wire mesh panels to a height of 1.8 metres high. Fences are to be held in place with secure footings.</p> <p>Install trunk protection up to 2 m on trees T2, T78, T211.</p> <p>Where oversized or tall plant/machinery is to be used, the project arborist must be engaged to determine if canopy pruning, or protection is necessary.</p>	Appendix 2 Appendix 7 Appendix 4
C	Exclude all site activity from tree protection zones during demolition, construction and demobilisation phases (Refer: Tree Protection Plan in Appendix 7).	Appendix 7
C	Do not remove tree protection fences until construction is completed, at which time the arborist will sign-off on fence removal and provide further advice as applicable.	Appendix 7
Root Management C	<p>Advice must be sought from a suitably skilled and experienced project arborist wherever roots over 40 mm diameter are encountered during excavation near trees to be retained.</p> <p>The tearing of roots of retained trees must be avoided and root pruning undertaken as directed by the nominated arborist.</p>	Appendix 7



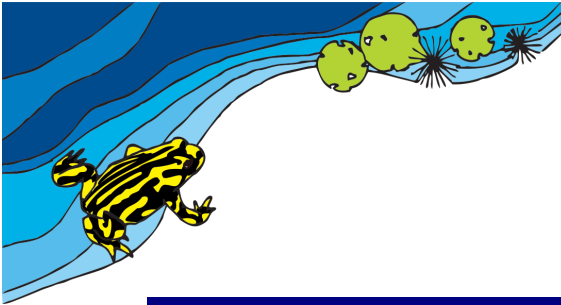
Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
C	Cleanly cut with clean, sharp tools for any roots with a thickness of 2cm or more encountered during excavation to reduce damage to roots from tearing, splitting and cracking.	Appendix 7
C	Route any potential trenching for underground services outside the TPZs of retained trees. If any underground service installation or underground boring will occur within TPZs, engage an arborist to supervise the activity.	Appendix 7
C	If trenching excavation is to occur within the TPZ of trees to be retained, engage hydraulic methods utilising a Vacuum Truck and trained operator to minimise damage to roots. These works are also to be conducted with the supervision of the Project Arborist.	Appendix 7
Crown Management C	Limb/canopy protection and management may be required if high level parts of plant machinery are to be in close proximity of retained trees. Advice must be sought from the project arborist to determine what measures are required.	Appendix 7
C	If protection measures are unsuitable, crown pruning may be required. Crown pruning must comply with the appropriate class of pruning described in AS 4373-2007 Pruning of amenity trees and be undertaken by a qualified arborist practising modern arboricultural methods.	Appendix 7
Certification by AQF5 Arborist C	<p>An AQF5 Arborist (or equivalent) must inspect the site following the installation of the TPZ fencing, trunk protection and placement of the mulch. The Project Arborist must then provide compliance documentation to be retained on the project file records.</p> <p>Tree protection compliance is to be checked before any tree related or earthworks occur on the site. Tree protection measures must be reviewed when development design changes occur and at construction hold points as outlined in AS 4970-2025 – <i>Protection of Trees on Development Sites</i>.</p> <p>Hold Points occur at the start of various construction phases which include – Site Establishment, Construction work, Implement Hard and Soft Landscape Works and Practical Completion.</p>	Appendix 7
Fauna Management C	A hollow clearance survey should be undertaken by an appropriately experienced ecologist prior to tree removal works. This is to ensure the appropriate management/relocation of existing protected fauna located at the Site, under <i>Environmental Protection and Conservation Act (1999)</i> and <i>Biodiversity and Conservation Act (2016)</i> before the commencement of any high disturbance.	Appendix 7



Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
Future-Development Landscape Plantings C	<p>As part of any landscape planting establishment program, all soil areas and plots for proposed plantings are to be decompacted and amended with organic matter.</p> <p>Decompaction and the addition of organic matter must be undertaken to 30 – 60 cm in depth. The soil decompaction area and the related soil volume must be sufficient to support the expected mature size of the proposed street trees.</p> <p>Additional guidance can be provided by a AQF level 5 (or equivalent) arborist/horticulturalist.</p>	Appendix 7
C	<p>A tree maintenance program is to be created by an AQF5 (or equivalent) Horticulturalist/Aboriculturalist and implemented for the landscape plantings to ensure establishment and increase survivability.</p>	Appendix 7
C	<p>Advanced stock (&gt;300 mm pot size) must not be planted within nominated tree protection areas to avoid disrupting the critical root zone of protected trees.</p>	Appendix 7
D,C	<p>Where possible, future development Landscape Plans should use locally native species to replace removed trees at a rate of greater than 1:1 (minimum 85 trees). Suggested species, below, are adapted to local climate conditions and are likely to have a long span of usefulness for the site while providing a net ecological benefit. Other locally native species may be used if desired, providing that they are appropriate for the long-term use of the site. Some suggested local native species are:</p> <ul style="list-style-type: none"> <li>• <i>Angophora costata</i></li> <li>• <i>Angophora floribunda</i></li> <li>• <i>Corymbia maculata</i></li> <li>• <i>Eucalyptus crebra</i></li> <li>• <i>Eucalyptus eugenioides</i></li> <li>• <i>Eucalyptus fibrosa</i></li> <li>• <i>Eucalyptus paniculata</i></li> <li>• <i>Eucalyptus punctata</i></li> <li>• <i>Eucalyptus tereticornis</i></li> <li>• <i>Syncarpia glomulifera</i></li> </ul>	Section 6 Appendix 7
C	<p>Each replacement tree is to be a vigorous specimen with a straight trunk, gradually tapering and continuous, crown excurrent, symmetrical, with roots established but not pot bound in a volume container or approved similar and be</p>	Appendix 7



Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
	maintained by an appropriately qualified and experienced landscape contractor for up to one (1) year after planting, or as appropriate.	
C	Where Tree Protection Zone fences are to be moved or relocated this must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. If the tree protection fences are relocated/moved, the newly exposed areas are to have a mulch layer installed (75-100mm) to reduce compaction to the root system of the retained specimens.	Appendix 7
C	To minimise damage to retained crowns, all Tree Protection Zones are to be adhered to. This must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. Minor pruning may be required if damage occurs	Appendix 7
C	Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby.	Appendix 1 Appendix 7
C	There is to be no storage of materials, rubbish, soil, equipment, structures or goods of any type to be kept or placed within 5 metres from the trunk or within the dripline of any tree for the duration of the development. This will ensure protection of the tree/s to be retained on or adjacent to site.	Appendix 7



# 1. Introduction

## 1.1 Scope

This Arboriculture Impact Assessment has been prepared by Abel Ecology on behalf of the Health Administrative Corporation to assess the potential environmental impacts that could arise from the construction and operation related to the New Bankstown Hospital project (the development) at 490 Chapel Road, Bankstown (the site). This report supports the assessment of the proposed Activity under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Industry specific SEARs were issued on the 5<sup>th</sup> February 2026 for the New Bankstown Hospital. Development for the purposes of a hospital with an Estimated Development Cost (EDC) of more than \$30 million is state significant development under Clause 14 of Schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP). The proposed works will have an EDC exceeding \$30 million, and therefore the development is considered State Significant Development. Additionally, under Section 2.60 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (the TI SEPP), development for the purpose of health services facility can be carried out by any person with consent on land in a prescribed zone. A prescribed zone includes the SP2 Infrastructure and MU1 Mixed Use zones within which the site is located. Therefore, development for a 'health services facility' is permitted with consent on the site.

This report has been prepared to assess the trees on the site and prepare a report that addresses issues pertaining to the proposal and tree management.

A survey of the proposed development site at 490 Chapel Road, Bankstown ('the site' – Figure 1) was undertaken by Abel Ecology.

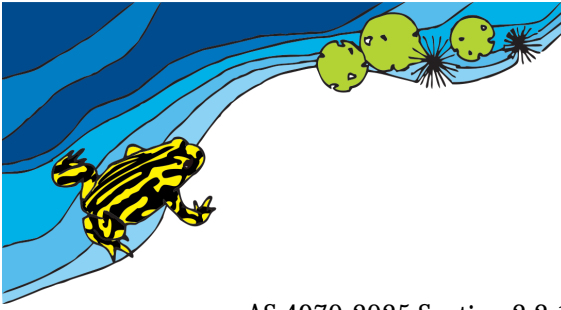
This report provides a description of individual trees in Appendix 2 and assesses the anticipated impact of the development to the trees on the site (Section 5).

Introductory information is provided in Section 1. Methods are provided in Sections 2 and 3, and in the Appendices.

This report includes both a:

1. Preliminary Arboricultural Report (pre-Determination); and
2. Arboricultural Impact Assessment (for Determination)
3. Tree Protection Plan (Appendix 7)

The Australian Standard (AS 4970-2025) *Protection of trees on development sites* describes five stages in planning (Section 2.2 of AS 4970-2025). Each stage from Section 2.2 is listed below. The relationship between sections from this report and the Australian Standard are provided below.



AS 4970-2025 Section 2.2.1 Site Survey – Where required – Section 3 and Appendix 1 of this report

AS 4970-2025 Section 2.2.2 Preliminary tree assessment and AS 4970-2025 Section 2.2.3 Preliminary arboricultural report – Section 2, Section 3 and Appendix 2 of this report

AS 4970-2025 Section 2.2.4 Development design and review – Section 4 of this report

AS 4970-2025 Section 2.2.5 Arboricultural impact assessment – Section 5 of this report.

The preparation of this report has been guided by the Australian Standard (AS 4970-2025), local council legislation and related policies as well as the scope of works discussed with the client.

## 1.2 Summary of the Activity

The proposed development includes the construction and operation of a new health services facility (hospital) including the following works:

- A 14-storey hospital building plus roof plant
- A 10-storey building for logistics and multi-storey car parking
- Site preparation including earthworks, cut and fill and tree removal
- Construction of new vehicular access points, internal roads and on-grade car parking spaces
- Inground building services works and utility adjustments, including service diversions
- Building foundation works
- Signage, including wayfinding, and
- Landscaping.

The EIS prepared by Colliers provides a full description of the proposed works.



### 1.3 Site Description

The site is located at 490 Chapel Road, Bankstown NSW 2100, within the Canterbury Bankstown LGA. The site is legally described as Lot 1 DP853675, Lot 10 DP6880 and Raw Avenue. The site has an approximate area of 38,170m<sup>2</sup> and is generally rectangular in shape.

Tree removal will also be undertaken at the adjacent LaSalle College at 347A Hume Highway, Bankstown, legally described as Lot 2 in DP109612 to the west and Lot 202 in DP1231757 to the north, while infrastructure works will be undertaken on French Avenue, Chapel Road, Meredith Street and Heath Street. Refer to Figure 1 for a site aerial.



Figure 1. Site aerial of the proposed development

Source: Nearmap, Colliers



## 1.4 SEARs Reporting

Item	SEARS Requirement	Relevant Section of Report
8 Trees and Landscaping	<ul style="list-style-type: none"><li>Assess the number, location, condition and significance of trees to be removed and retained and note any existing canopy coverage to be retained on-site.</li></ul>	Section 3
		Section 4
		Section 5

## 1.5 Information and Documentation Provided

Abel Ecology has been provided the following documents from the client:

- Proposed Site Plan New Bankstown Hospital 490 Chapel Road, Bankstown, By Architectus, NBH-ARC-1GN-SDA-AR-04-EXX01 (Revision C), Dated 23.03.2026

No further documentation was provided.



## 2. Method

The site is located within the Canterbury-Bankstown LGA which defines a protected tree as being greater than 5 m in height.

### CANTERBURY-BANKSTOWN LGA

Canterbury Bankstown Council defines a protected tree as:

- being over 5 m in height.

(<https://www.cbccity.nsw.gov.au/your-council/policies-and-codes/tree-management-order>)

Trees that were under 5m in height and/or exempt species were not assessed.

Exempt tree list: (<https://www.cbccity.nsw.gov.au/residents/trees-garden-and-home/trees/private-trees#:~:text=Exempt%20trees%20list,to%20refund%20your%20application%20fees>)

The vitality and condition of trees were assessed from ground level using a modified VTA (Visual Tree Assessment) method (Mattheck & Breleor, 1994). No internal investigations of the tree were undertaken. On occasions a nylon hammer may be used for sounding to determine if hollows are present. Tree heights were determined by visual estimation. Trees were marked using nails and numbered aluminium tags, which correspond with the tree identification numbers used in this report.

The Notional Root Zone (NRZ) and Tree Protection Zone (TPZ) of each tree was determined using the formula “TPZ = d.s.h. x 12”, and Structural Root Zone (SRZ) was calculated using the formula “SRZ radius = (Base Diameter X 50)<sup>0.42</sup> x 0.64”. Formulae used to calculate NRZs, TPZs and SRZs are provided in the Australian Standard for Protection of Trees on Development Sites AS4970-2025 (Standards Australia, 2025).

For this report, the term ‘health’ is synonymous with ‘vigour’ and ‘vitality’. The term ‘structure’ is synonymous with ‘condition’.

Tree locations are shown in Figure 4. Trees are individual data is described in Appendix 2.

### 2.1 Plotted Tree Locations

Tree locations were recorded using GPS data collected on site and then input on georeferenced maps using a Geographic Information Systems program (QGIS). Inherent margins of error (~5m) of GPS units and the density of obstructions at various locations on site may result in variations of recorded tree locations and true tree locations on site. As such it is recommended that for more accurate location data, a surveyor should plot tagged trees on site.



## 2.2 Limitations

DSH (Diameter at Standard Height 1.4 m) and DAB (Diameter Above Buttress) may be estimated for trees when access is difficult. The access difficulties may be due to proximity to structures, materials, hazardous fauna and flora, overgrown vegetation or located on neighbouring properties. When an estimate is recorded the abbreviation “est” is included in the table.

No soil, root or other below ground investigations were done as part of this assessment.

No aerial inspections were undertaken as part of this assessment.



### 3. Observations

#### 3.1 Assessed Trees

Data for 133 (160 including 'not assessed') trees assessed at the time of the survey is further outlined in Appendix 2.

Species identified within and adjacent to the site include the following (Table 1)

Table 1. Tree species identified

Common Name	Species	Count
Diamond-leaf Pittosporum	<i>Auranticarpa rhombifolia</i>	1
Coastal Banksia	<i>Banksia integrifolia</i>	1
Illawarra Flame Tree	<i>Brachychiton acerifolius</i>	1
Bottlebrush	<i>Callistemon viminalis</i>	9
River Sheoak	<i>Casuarina cunninghamiana</i>	10
Camphor Laurel	<i>Cinnamomum camphora</i>	9
Lemon-scented Gum	<i>Corymbia citriodora</i>	2
Spotted Gum	<i>Corymbia maculata</i>	10
Pencil Pine	<i>Cupressus sempervirens</i>	2
Blueberry Ash	<i>Elaeocarpus reticulatus</i>	1
Sugar Gum	<i>Eucalyptus cladocalyx</i>	1
Yellow Gum	<i>Eucalyptus leucoxylon</i>	1
Tallowwood	<i>Eucalyptus microcorys</i>	8
Grey Box	<i>Eucalyptus moluccana</i>	3
Grey Gum	<i>Eucalyptus punctata</i>	6
Swamp Mahogany	<i>Eucalyptus robusta</i>	2
White Gum	<i>Eucalyptus scoparia</i>	3
Mugga Ironbark	<i>Eucalyptus sideroxylon</i>	9
Peppermint Gum	<i>Eucalyptus sp. Peppermint</i>	1
Forest Red Gum	<i>Eucalyptus tereticornis</i>	4
Port Jackson Fig	<i>Ficus (rubiginosa)</i>	1
Jacaranda	<i>Jacaranda mimosifolia</i>	2



Common Name	Species	Count
Juniper	<i>Juniperus sp.</i>	1
Liquidamber	<i>Liquidamber styraciflua</i>	1
Brush Box	<i>Lophostomon confertus</i>	2
Snow in Summer	<i>Melaleuca linariifolia</i>	1
Prickly-leaved Paperbark	<i>Melaleuca styphelioides</i>	5
White cedar	<i>Melia azederach</i>	1
NA	NOT ASSESSED	30
Phoenix Palm	<i>Phoenix canariensis</i>	6
London Plane Tree	<i>Platanus x acerifolia</i>	4
Chinese Thuja	<i>Platyclusus orientalis</i>	4
Peppercorn Tree	<i>Schinus molle</i>	1
Cocos Palm	<i>Syagrus romanzoffiana</i>	4
Turpentine	<i>Syncarpia glomulifera</i>	2
Golden Elm	<i>Ulmus glabra lutescens</i>	3
Chinese Elm	<i>Ulmus parvifolia</i>	8
	<i>Total</i>	160

### 3.2 Health and Structure of Assessed Trees

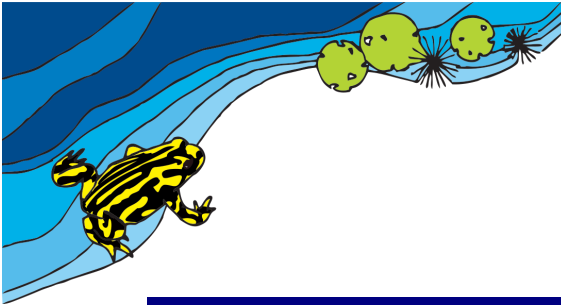
Health and Structure for assessed trees was observed to be good with no major issues observable.

### 3.3 Trees on adjacent land

Some trees are located on the fenceline (western side) between the site and the oval of the school. The applicant is to obtain the appropriate approvals prior to the removal of these trees (Table 5).

Trees located on council land (footpath) are marked for retention (Table 5). Any tree outside the property boundary will require the appropriate approvals, if required for removal. Street trees are to have trunk and branch protections (Refer: Appendix 4, Appendix 7 Tree Protection Plan) installed prior to the commencement of works.

The Project Arborist is to inspect and certify that tree protections are installed as described in the Tree Protection Plan contained in this report (Appendix 7).



## 4. Development Design and Review

Design changes have been considered to retain native trees on the site.

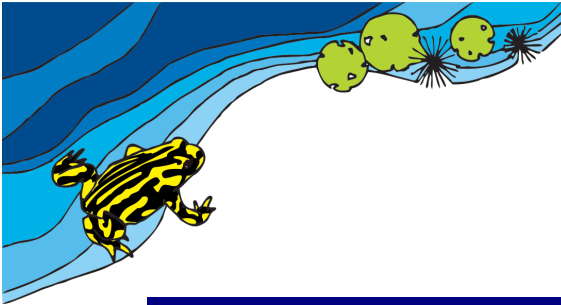
Tree 23 (*Eucalyptus tereticornis*) is a remnant species of the vegetation community present on the site prior to European colonisation. Design changes were considered to retain this large native species. Unfortunately, due to restrictions and setbacks for roadways, as well as access to underground carparks, this tree was unable to have impacts reduced and could not be retained.

Tree 32 (*Eucalyptus scoparia*) is not impacted by the proposal; however this tree has been recommended for removal to improve sightlines to the entry of the main hospital.

Tree 75 (*Eucalyptus punctata*) is a large native tree previously contained between the footpath and a carpark. The design has increased the available soil area and allow for this tree to expand structural and feeder roots. Tree health and vitality is expected to improve due to this design.

Tree 178 (*Corymbia citriodora*) is not affected by the proposal, however, as this tree grows it is expected to cause significant structural damage to the footpath and carpark. Therefore, this tree is recommended for removal.

Health Infrastructure policy requires the replacement of removed trees at a rate of greater than 1:1. Therefore, a minimum of 67 replacement trees should be installed as part of the landscape plan, to comply with this requirement.



## 5. Arboricultural impact assessment

### 5.1 Tree Retention

The proposal indicates the retention of the following ninety-four (94) (including 26 trees not assessed/exempt, nine (9) trees subject to further investigation and two (2) trees to be determined with final design of hardstand) trees:

Table 2. Trees recommended for retention

Tree Number	Species	Encroachment into NRZ (%)	Level of Impact	Action
T2	<i>Callistemon viminalis</i>	0	Nil	Retain
T13	<i>Eucalyptus tereticornis</i>	0	Nil	Retain
T25	<i>Melia azederach</i>	0	Nil	Retain
T26	<i>Eucalyptus microcorys</i>	0	Nil	Retain
T27	Same (part of T26)	0	Nil	Retain
T28	<i>Callistemon viminalis</i>	0	Nil	Retain
T30	<i>Callistemon viminalis</i>	0	Nil	Retain
T31	<i>Platanus x acerifolia</i>	0	Nil	Retain
T44	<i>Platanus x acerifolia</i>	0	Nil	Retain
T45	NOT ASSESSED	0	Nil	Retain
T61	NOT ASSESSED	0	Nil	Retain
T62	<i>Ulmus glabra lutescens</i>	0	Nil	Retain
T72	<i>Eucalyptus punctata</i>	0	Nil	Retain
T74	NOT ASSESSED	0	Nil	Retain
T75	<i>Eucalyptus punctata</i>	Increased soil volume	Nil	Retain
T78	NOT ASSESSED	0	Nil	Retain
T79	NOT ASSESSED	0	Nil	Retain - subject to final position of hardstand area
T96	<i>Auranticarpa rhombifolia</i>	0	Nil	Retain
T97	<i>Callistemon viminalis</i>	0	Nil	Retain
T98	NOT ASSESSED	0	Nil	Retain



Tree Number	Species	Encroachment into NRZ (%)	Level of Impact	Action
T100	NOT ASSESSED	0	Nil	Retain
T101	<i>Liquidamber styraciflua</i>	Encroachment in to SRZ	Severe	Retain – subject to further investigation and project arborist assessment
T102	<i>Ulmus parvifolia</i>	7	Minor	Retain
T103	<i>Platanus x acerifolia</i>	0	Nil	Retain
T104	<i>Platanus x acerifolia</i>	0	Nil	Retain
T105	NOT ASSESSED	0	Nil	Retain - subject to final position of hardstand area
T145	<i>Callistemon viminalis</i>	0	Nil	Retain
T146	<i>Callistemon viminalis</i>	Encroachment in to SRZ	Severe	Retain – subject to further investigation and project arborist assessment
T147	<i>Elaeocarpus reticulatus</i>	0	Nil	Retain
T148	<i>Ulmus parvifolia</i>	11	Moderate	Retain
T149	<i>Ulmus parvifolia</i>	Encroachment in to SRZ	Severe	Retain – subject to further investigation and project arborist assessment
T154	<i>Lophostomon confertus</i>	0	Nil	Retain
T156	NOT ASSESSED	0	Nil	Retain
T159	<i>Banksia integrifolia</i>	7	Minor	Retain
T174	NOT ASSESSED	0	Nil	Retain
T175	NOT ASSESSED	9	Minor	Retain
T184	NOT ASSESSED	19	Moderate	Retain
T185	NOT ASSESSED	0	Nil	Retain
T193	<i>Syagrus romanzoffiana</i>	0	Nil	Retain
T207	<i>Eucalyptus sideroxylon</i>	0	Nil	Retain



Tree Number	Species	Encroachment into NRZ (%)	Level of Impact	Action
T208	<i>Corymbia maculata</i>	26	Major	Retain – subject to further investigation and project arborist assessment
T209	<i>Eucalyptus robusta</i>	0	Nil	Retain
T212	NOT ASSESSED	0	Nil	Retain
T213	NOT ASSESSED	0	Nil	Retain
T214	<i>Ulmus glabra lutescens</i>	7	Minor	Retain
T218	<i>Lophostomon confertus</i>	8	Minor	Retain
T219	<i>Eucalyptus sideroxylon</i>	0	Nil	Retain
T220	<i>Corymbia maculata</i>	0	Nil	Retain
T221	<i>Eucalyptus microcorys</i>	0	Nil	Retain
T222	<i>Eucalyptus microcorys</i>	0	Nil	Retain
T223	NOT ASSESSED	0	Nil	Retain
T224	NOT ASSESSED	0	Nil	Retain
T226	<i>Ulmus parvifolia</i>	0	Nil	Retain
T227	<i>Ulmus parvifolia</i>	0	Nil	Retain
T228	<i>Ulmus parvifolia</i>	0	Nil	Retain
T256	<i>Corymbia maculata</i>	0	Nil	Retain
T257	<i>Corymbia maculata</i>	0	Nil	Retain
T258	<i>Corymbia maculata</i>	0	Nil	Retain
T259	NOT ASSESSED	0	Nil	Retain
T260	NOT ASSESSED	0	Nil	Retain
T261	<i>Ulmus glabra lutescens</i>	0	Nil	Retain
T262	<i>Ulmus parvifolia</i>	0	Nil	Retain
T263	<i>Eucalyptus sideroxylon</i>	0	Nil	Retain
T264	<i>Corymbia maculata</i>	0	Nil	Retain
T265	NOT ASSESSED	0	Nil	Retain
T266	NOT ASSESSED	0	Nil	Retain
T267	<i>Corymbia maculata</i>	0	Nil	Retain
T268	NOT ASSESSED	0	Nil	Retain



Tree Number	Species	Encroachment into NRZ (%)	Level of Impact	Action
T269	NOT ASSESSED	0	Nil	Retain
T270	NOT ASSESSED	0	Nil	Retain
T271	<i>Ulmus parvifolia</i>	0	Nil	Retain
T272	NOT ASSESSED	0	Nil	Retain
T273	<i>Eucalyptus sideroxylon</i>	0	Nil	Retain
T274	NOT ASSESSED	0	Nil	Retain
T275	<i>Phoenix canariensis</i>	Increased soil volume	Nil	Retain
T276	<i>Eucalyptus scoparia</i>	Increased soil volume	Nil	Retain – subject to further investigation and project arborist assessment
T277	<i>Jacaranda mimosifolia</i>	0	Nil	Retain – subject to further investigation and project arborist assessment
T278	<i>Eucalyptus microcorys</i>	0	Nil	Retain – subject to further investigation and project arborist assessment
T279	<i>Schinus molle</i>	0	Nil	Retain
T280	<i>Melaleuca linariifolia</i>	0	Nil	Retain
T281	<i>Jacaranda mimosifolia</i>	0	Nil	Retain
T282	<i>Casuarina cunninghamiana</i>	0	Nil	Retain
T283	<i>Casuarina cunninghamiana</i>	Increased soil volume	Nil	Retain
T284	<i>Casuarina cunninghamiana</i>	Increased soil volume	Nil	Retain
T285	<i>Eucalyptus sideroxylon</i>	0	Nil	Retain
T286	<i>Corymbia maculata</i>	9	Minor	Retain
T287	<i>Eucalyptus robusta</i>	10	Moderate	Retain
T289	<i>Eucalyptus punctata</i>	0	Nil	Retain
T290	<i>Syagrus romanzoffiana</i>	0	Nil	Retain



Tree Number	Species	Encroachment into NRZ (%)	Level of Impact	Action
T291	<i>Casuarina cunninghamiana</i>	0	Nil	Retain
T292	<i>Casuarina cunninghamiana</i>	0	Nil	Retain
T300	<i>Eucalyptus leucoxylon</i>	0	Nil	Retain
306	<i>Eucalyptus moluccana</i>	0	Nil	Retain
307	<i>Eucalyptus moluccana</i>	0	Nil	Retain
309	<i>Ficus (rubignosa)</i>	12	Moderate	Retain
			TOTAL	94

No trees are identified to be transplanted for future inclusion in landscaping.



There are 33 trees external to the property that are recommended for retention are listed in Table 3 below. The table indicates management and protection recommendations to limit damage to the trees.

Table 3. Trees to Retain external to the property (included in table 2)

Tree Number	Species	Position	Protections	Action
T2	<i>Callistemon viminalis</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T28	<i>Callistemon viminalis</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T30	<i>Callistemon viminalis</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T31	<i>Platanus x acerifolia</i>	Street tree	Prune to 1m from site boundary	Retain
T44	<i>Platanus x acerifolia</i>	Street tree	Prune to 1m from site boundary	Retain
T45	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T61	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T62	<i>Ulmus glabra lutescens</i>	Street tree	Prune to 1m from site boundary	Retain
T74	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T78	<i>Not assessed/Exempt</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T79	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T103	<i>Platanus x acerifolia</i>	Street tree	Prune to 1m from site boundary	Retain
T104	<i>Platanus x acerifolia</i>	Street tree	Prune to 1m from site boundary	Retain
T105	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T154	<i>Lophostomon confertus</i>	Street tree	Prune to 1m from site boundary	Retain
T156	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T174	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T175	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T185	<i>Not assessed/Exempt</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T212	<i>Not assessed/Exempt</i>	Street tree close to access point	Prune to 1m from site boundary Trunk and branch Protection	Retain
T213	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain



Tree Number	Species	Position	Protections	Action
T214	<i>Ulmus glabra lutescens</i>	Street tree	Prune to 1m from site boundary	Retain
T259	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T260	<i>Not assessed/Exempt</i>	Street tree	Prune to 1m from site boundary	Retain
T261	<i>Ulmus glabra lutescens</i>	Street tree	Prune to 1m from site boundary	Retain
T276	<i>Eucalyptus scoparia</i>	Retaining wall	North Boundary (school)	Retain – subject to further investigation and project arborist assessment
T277	<i>Jacaranda mimosifolia</i>	Retaining wall	North Boundary (school)	Retain – subject to further investigation and project arborist assessment
T278	<i>Eucalyptus microcorys</i>	Retaining wall	North Boundary (school)	Retain – subject to further investigation and project arborist assessment
T279	<i>Schinus molle</i>	North Boundary (school)	Site Boundary Fencing	Retain
T280	<i>Melaleuca linariifolia</i>	North Boundary (school)	Site Boundary Fencing	Retain
T281	<i>Jacaranda mimosifolia</i>	North Boundary (school)	Site Boundary Fencing	Retain
T306	<i>Eucalyptus moluccana</i>	West Boundary (school)	Site Boundary Fencing	Retain
T307	<i>Eucalyptus moluccana</i>	West Boundary (school)	Site Boundary Fencing	Retain
			TOTAL	33



## 5.2 Tree Removal

Impacts from the proposed development to trees within the works footprint, are recommended for removal. This report recommends the removal of the following sixty-six (66) (including four (4) trees not assessed) trees. (Table 4):

Table 4. Trees recommended for Removal

Tree Number	Species	Cause of Impact	Level of Impact	Action
T1	<i>Callistemon viminalis</i>	Driveway	SRZ	Remove
T3	<i>Eucalyptus punctata</i>	Driveway	SRZ	Remove
T4	<i>Phoenix canariensis</i>	Driveway	SRZ	Remove
T6	<i>Syagrus romanzoffiana</i>	Driveway	SRZ	Remove
T11	<i>Callistemon viminalis</i>	Driveway	SRZ	Remove
T12	<i>Eucalyptus tereticornis</i>	Driveway	SRZ	Remove
T23	<i>Eucalyptus tereticornis</i>	Driveway	SRZ	Remove
T24	<i>Eucalyptus microcorys</i>	Driveway	SRZ	Remove
T29	<i>Callistemon viminalis</i>	Driveway	SRZ	Remove
T32	<i>Eucalyptus scoparia</i>	Building	SRZ	Remove
T33	<i>Cinnamomum camphora</i>	Driveway	SRZ	Remove
T46	<i>Syncarpia glomulifera</i>	Building	SRZ	Remove
T47	<i>Syncarpia glomulifera</i>	Building	SRZ	Remove
T54	<i>Syagrus romanzoffiana</i>	Retaining wall	SRZ	Remove
T57	<i>Cinnamomum camphora</i>	Building	SRZ	Remove
T59	<i>Eucalyptus microcorys</i>	Building	SRZ	Remove
T60	<i>Eucalyptus scoparia</i>	Building	SRZ	Remove
T66	<i>Cinnamomum camphora</i>	Sewer	SRZ	Remove
T73	<i>Eucalyptus punctata</i>	Retaining wall	SRZ	Remove
T76	<i>Eucalyptus punctata</i>	Roadway	SRZ	Remove
T77	<i>Eucalyptus microcorys</i>	Driveway	SRZ	Remove
T84	<i>Chamaecyparuss/Cupressocyparuss</i>	Sewer	SRZ	Remove
T106	<i>Corymbia citriodora</i>	Roadway	SRZ	Remove
T107	<i>Cinnamomum camphora</i>	Roadway	SRZ	Remove
T108	<i>Cinnamomum camphora</i>	Roadway	SRZ	Remove



Tree Number	Species	Cause of Impact	Level of Impact	Action
T110	<i>Cinnamomum camphora</i>	Sewer	SRZ	Remove
T111	<i>Cinnamomum camphora</i>	Sewer	SRZ	Remove
T113	<i>Phoenix canariensis</i>	Building	SRZ	Remove
T117	<i>Phoenix canariensis</i>	Roadway	SRZ	Remove
T118	<i>Phoenix canariensis</i>	Roadway	SRZ	Remove
T119	<i>Cinnamomum camphora</i>	Driveway	SRZ	Remove
T123	<i>Casuarina cunninghamiana</i>	Roadway	SRZ	Remove
T124	<i>Cinnamomum camphora</i>	Driveway	SRZ	Remove
T126	<i>Phoenix canariensis</i>	Roadway	SRZ	Remove
T130	<i>Melaleuca styphelioides</i>	Sewer	SRZ	Remove
T131	<i>Melaleuca styphelioides</i>	Sewer	SRZ	Remove
T150	<i>Platyclusus orientalis</i>	Carpark	SRZ	Remove
T151	<i>Platyclusus orientalis</i>	Carpark	SRZ	Remove
T152	<i>Platyclusus orientalis</i>	Carpark	SRZ	Remove
T153	<i>Platyclusus orientalis</i>	Carpark	SRZ	Remove
T155	<i>Casuarina cunninghamiana</i>	Carpark	SRZ	Remove
T157	<i>Corymbia maculata</i>	Carpark	SRZ	Remove
T158	<i>Eucalyptus sp. Peppermint</i>	Carpark	SRZ	Remove
T163	<i>Juniperus sp.</i>	Carpark	SRZ	Remove
T176	<i>Melaleuca styphelioides</i>	Carpark	SRZ	Remove
T177	<i>Eucalyptus sideroxylon</i>	Carpark	43% TPZ	Remove
T178	<i>Corymbia citriodora</i>	Carpark	SRZ	Remove
T179	<i>Eucalyptus cladocalyx</i>	Carpark	SRZ	Remove
T194	<i>Brachychiton acerifolius</i>	Carpark	SRZ	Remove
T203	<i>Eucalyptus moluccana</i>	Carpark	SRZ	Remove
T204	<i>Eucalyptus tereticornis</i>	Carpark	SRZ	Remove
T210	NOT ASSESSED	Carpark	SRZ	Remove
T211	NOT ASSESSED	Carpark	SRZ	Remove
T216	<i>Casuarina cunninghamiana</i>	Driveway	SRZ	Remove
T217	<i>Cupressus sempervirens</i>	Roadway	SRZ	Remove
T229	<i>Eucalyptus microcorys</i>	Building	SRZ	Remove



Tree Number	Species	Cause of Impact	Level of Impact	Action
T230	NOT ASSESSED	Driveway	SRZ	Remove
T231	NOT ASSESSED	Driveway	SRZ	Remove
T235	<i>Corymbia maculata</i>	Pathway	SRZ	Remove
T251	<i>Eucalyptus sideroxylon</i>	Pathway	SRZ	Remove
T252	<i>Eucalyptus sideroxylon</i>	Roadway	SRZ	Remove
T253	<i>Eucalyptus sideroxylon</i>	Roadway	SRZ	Remove
T254	<i>Casuarina cunninghamiana</i>	Driveway	SRZ	Remove
T255	<i>Casuarina cunninghamiana</i>	Carpark	SRZ	Remove
T301	<i>Melaleuca styphelioides</i>	Carpark	SRZ	Remove
T310	<i>Melaleuca styphelloides</i>	Carpark	SRZ	Remove
			TOTAL	66

Table 5. Trees external to the property (Remove) (included in table 4)

Tree Number	Species	Cause of impact	Position	Action
T1	<i>Callistemon viminalis</i>	Driveway	Street tree	Remove
T11	<i>Callistemon viminalis</i>	Driveway	Street tree	Remove
T29	<i>Callistemon viminalis</i>	Driveway	Street tree	Remove
T106	<i>Corymbia citriodora</i>	Roadway	Street tree	Remove
T107	<i>Cinnamomum camphora</i>	Roadway	Street tree	Remove
T108	<i>Cinnamomum camphora</i>	Roadway	Street tree	Remove
T203	<i>Eucalyptus moluccana</i>	Roadway	West Boundary (school)	Remove
T310	<i>Melaleuca styphelloides</i>	Roadway	West Boundary (school)	Remove
			TOTAL	8



## 5.3 Direct impacts

### 5.3.1 Impact of proposal on retained trees

Trees T282, T283, T291, T292 are located within the property on the uppermost part of the site (north-east corner) were previously contained by an existing roadway and the current plan will increase the available soil volume for these trees to expand their root system. Tree protection fencing is required to be installed around these trees, as per the Tree Protection Plan (Appendix 7) and Figure 5

Trees T279, T280, and T281 are located outside the property boundary, within the school grounds at the northernmost part of the site. These trees are not expected to be impacted by the proposed development. The notional root zone is not affected due to the trees growing on the upper part of a ~1.8m retaining wall. These trees are recommended to be pruned to the property boundary if required. Works around these trees are supervised by the project arborist to ensure the SRZ are not impacted by demolition, storage of materials or construction.

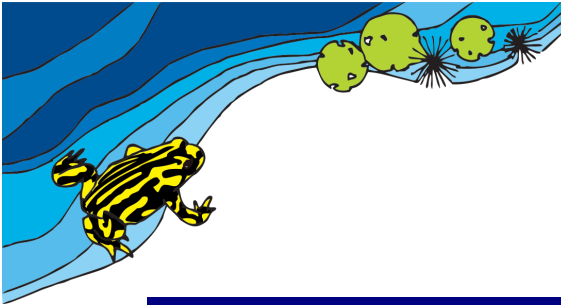
Trees T276, T277, T278, are located outside the property boundary, within the school grounds at the northernmost part of the site. These trees are not expected to be impacted by the proposed development. The notional root zone is not affected due to the trees growing on the upper part of a ~1.8m retaining wall. Further detailed design and assessment by the project arborist is required to determine if these trees can be retained.

Trees T101, T146 and T149 are located within the property along the eastern boundary. The current plans propose retaining walls within the structural root zones. Further detailed design and assessment by the project arborist is required to determine if these trees can be retained.

Tree T75 is located within the property on the eastern side of the site at Chapel Road. The plans shows that this tree will be situated within an island between the entry/exit driveways (Figure 7). The current design will increase the soil volume allowing for this tree to expand the root system. Works around these trees are supervised by the project arborist to ensure the SRZ are not impacted by demolition, storage of materials or construction. Tree protection is required to be installed around this tree as per the tree protection plan (Appendix 7 and Figure 7).

### 5.3.2 Services

All excavated trenching is to be routed outside the tree protection zones. Where this is not achievable underboring may be an acceptable method after consultation with the project arborist.



## 6. Conclusion

Trees recommended for removal are in conflict with the proposed development with major impacts to the SRZ or greater than 20% encroachment into the NRZ.

Trees with minor or moderate impacts to the NRZ have been allocated compensatory areas for root growth and are listed in Table 2 and shown in Figure 5, Figure 6 and Figure 7.

Retained trees are to have protections as described in the Tree Protection Plan (Appendix 7).

Street trees are recommended to be pruned to 1m from the property boundary to avoid damage from the installation of site hoarding. All pruning works are to be conducted under supervision and advice of the project arborist and comply with Australian Standard 4373 2007 Pruning of amenity trees.

All protections are to comply with the Australian Standard 4970 2025 protection of trees on development sites.

Any works that occur within the TPZ of retained trees are to be confirmed and documented by the Project Arborist.

The establishment of generous protection areas and maintenance of stringent site controls will be essential in preventing damage during construction. Landscaping must also accommodate existing roots and provide favourable conditions for normal root function.

Roots cannot grow without oxygen, and they cannot survive in compacted soils. Any activity that buries or cuts roots such as a soil stockpile or service trench will result in death of a corresponding portion of the canopy (*Perry, 1982*). It follows, then, that a large soil stockpile near the base of the tree will remove oxygen for a significant proportion of the root system, and thus impact the live crown.

Levinsson (*2015*) suggests effective management may be more valuable to tree survival than beginning with a vigorous specimen. In the context of trees on or adjacent to development sites, effective management is simply a matter of adequate protection, mulching, and regular irrigation, as this satisfies the most commonly limiting factors for tree growth (*Harris et al., 2004; Mauser, 2009*). Additionally, wood chip and leaf litter mulches are effective and cost-efficient methods for stimulating new root growth and improving soil quality in compacted urban soils (*Scharenbroch & Watson, 2014*).



## 6.1 Mitigation Measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
Tree Protection D,C	Show tree locations and Tree Protective Fencing on all construction plans used on site.	Section 6 Appendix 1
C	<p>Engage a project arborist to ensure and certify that the Tree Protection Plan is satisfactorily implemented and to provide advice as applicable.</p> <p>The arborist will inspect the site after tree protection measures are in place and before any construction/excavation works are conducted.</p> <p>The arborist will then attend the site at least once within every three months during construction, and once upon completion of construction.</p>	Appendix 7
C	<p>Construct tree protection fences at a minimum radius distance(s) measuring the TPZ from the centre of the tree, prior to construction to prevent unnecessary root damage.</p> <p>Construct tree protection fences using chain wire mesh panels to a height of 1.8 metres high. Fences are to be held in place with secure footings.</p> <p>Install trunk protection up to 2 m on trees T2, T78, T211.</p> <p>Where oversized or tall plant/machinery is to be used, the project arborist must be engaged to determine if canopy pruning, or protection is necessary.</p>	Appendix 2 Appendix 7 Appendix 4
C	Exclude all site activity from tree protection zones during demolition, construction and demobilisation phases (Refer: Tree Protection Plan in Appendix 7).	Appendix 7
C	Do not remove tree protection fences until construction is completed, at which time the arborist will sign-off on fence removal and provide further advice as applicable.	Appendix 7
Root Management C	<p>Advice must be sought from a suitably skilled and experienced project arborist wherever roots over 40 mm diameter are encountered during excavation near trees to be retained.</p> <p>The tearing of roots of retained trees must be avoided and root pruning undertaken as directed by the nominated arborist.</p>	Appendix 7
C	Cleanly cut with clean, sharp tools for any roots with a thickness of 2cm or more encountered during excavation to reduce damage to roots from tearing, splitting and cracking.	Appendix 7



Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
C	Route any potential trenching for underground services outside the TPZs of retained trees. If any underground service installation or underground boring will occur within TPZs, engage an arborist to supervise the activity.	Appendix 7
C	If trenching excavation is to occur within the TPZ of trees to be retained, engage hydraulic methods utilising a Vacuum Truck and trained operator to minimise damage to roots. These works are also to be conducted with the supervision of the Project Arborist.	Appendix 7
Crown Management C	Limb/canopy protection and management may be required if high level parts of plant machinery are to be in close proximity of retained trees. Advice must be sought from the project arborist to determine what measures are required.	Appendix 7
C	If protection measures are unsuitable, crown pruning may be required. Crown pruning must comply with the appropriate class of pruning described in AS 4373-2007 Pruning of amenity trees and be undertaken by a qualified arborist practising modern arboricultural methods.	Appendix 7
Certification by AQF5 Arborist C	<p>An AQF5 Arborist (or equivalent) must inspect the site following the installation of the TPZ fencing, trunk protection and placement of the mulch. The Project Arborist must then provide compliance documentation to be retained on the project file records.</p> <p>Tree protection compliance is to be checked before any tree related or earthworks occur on the site. Tree protection measures must be reviewed when development design changes occur and at construction hold points as outlined in AS 4970-2025 – <i>Protection of Trees on Development Sites</i>.</p> <p>Hold Points occur at the start of various construction phases which include – Site Establishment, Construction work, Implement Hard and Soft Landscape Works and Practical Completion.</p>	Appendix 7
Fauna Management C	A hollow clearance survey should be undertaken by an appropriately experienced ecologist prior to tree removal works. This is to ensure the appropriate management/relocation of existing protected fauna located at the Site, under <i>Environmental Protection and Conservation Act (1999)</i> and <i>Biodiversity and Conservation Act (2016)</i> before the commencement of any high disturbance.	Appendix 7
Future-Development	As part of any landscape planting establishment program, all soil areas and plots for proposed plantings are to be decompacted and amended with organic matter.	Appendix 7



Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
Landscape Plantings C	Decompaction and the addition of organic matter must be undertaken to 30 – 60 cm in depth. The soil decompaction area and the related soil volume must be sufficient to support the expected mature size of the proposed street trees. Additional guidance can be provided by a AQF level 5 (or equivalent) arborist/horticulturalist.	
C	A tree maintenance program is to be created by an AQF5 (or equivalent) Horticulturalist/Aboriculturalist and implemented for the landscape plantings to ensure establishment and increase survivability.	Appendix 7
C	Advanced stock (>300 mm pot size) must not be planted within nominated tree protection areas to avoid disrupting the critical root zone of protected trees.	Appendix 7
D,C	Where possible, future development Landscape Plans should use locally native species to replace removed trees at a rate of greater than 1:1 (minimum 85 trees). Suggested species, below, are adapted to local climate conditions and are likely to have a long span of usefulness for the site while providing a net ecological benefit. Other locally native species may be used if desired, providing that they are appropriate for the long-term use of the site. Some suggested local native species are: <ul style="list-style-type: none"> <li>• <i>Angophora costata</i></li> <li>• <i>Angophora floribunda</i></li> <li>• <i>Corymbia maculata</i></li> <li>• <i>Eucalyptus crebra</i></li> <li>• <i>Eucalyptus eugenioides</i></li> <li>• <i>Eucalyptus fibrosa</i></li> <li>• <i>Eucalyptus paniculata</i></li> <li>• <i>Eucalyptus punctata</i></li> <li>• <i>Eucalyptus tereticornis</i></li> <li>• <i>Syncarpia glomulifera</i></li> </ul>	Section 6 Appendix 7
C	Each replacement tree is to be a vigorous specimen with a straight trunk, gradually tapering and continuous, crown excurrent, symmetrical, with roots established but not pot bound in a volume container or approved similar and be maintained by an appropriately qualified and experienced landscape contractor for up to one (1) year after planting, or as appropriate.	Appendix 7



Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
C	Where Tree Protection Zone fences are to be moved or relocated this must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. If the tree protection fences are relocated/moved, the newly exposed areas are to have a mulch layer installed (75-100mm) to reduce compaction to the root system of the retained specimens.	Appendix 7
C	To minimise damage to retained crowns, all Tree Protection Zones are to be adhered to. This must be undertaken in consultation with the Consultant Arboriculturist for the project to ensure that tree protection is maintained. Minor pruning may be required if damage occurs	Appendix 7
C	Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby.	Appendix 1 Appendix 7
C	There is to be no storage of materials, rubbish, soil, equipment, structures or goods of any type to be kept or placed within 5 metres from the trunk or within the dripline of any tree for the duration of the development. This will ensure protection of the tree/s to be retained on or adjacent to site.	Appendix 7



## 7. References

- Barrell, J. (1995) 'Pre-development Tree Assessment' from *Trees and Building Sites, Proceedings of an International Conference held In the interest of developing a scientific basis for managing trees in proximity to buildings*, the International Society of Arboriculture, Illinois, USA, pp 132-142.
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- Standards Australia (2025) *Protection of trees on development sites* (AS 4970-2025)



## Appendix 1. Figures



Figure 2. Locality map for 490 Chapel Road, Bankstown, NSW

Land and property Information NSW. Spatial Information eXchange (SIX) website 2017.

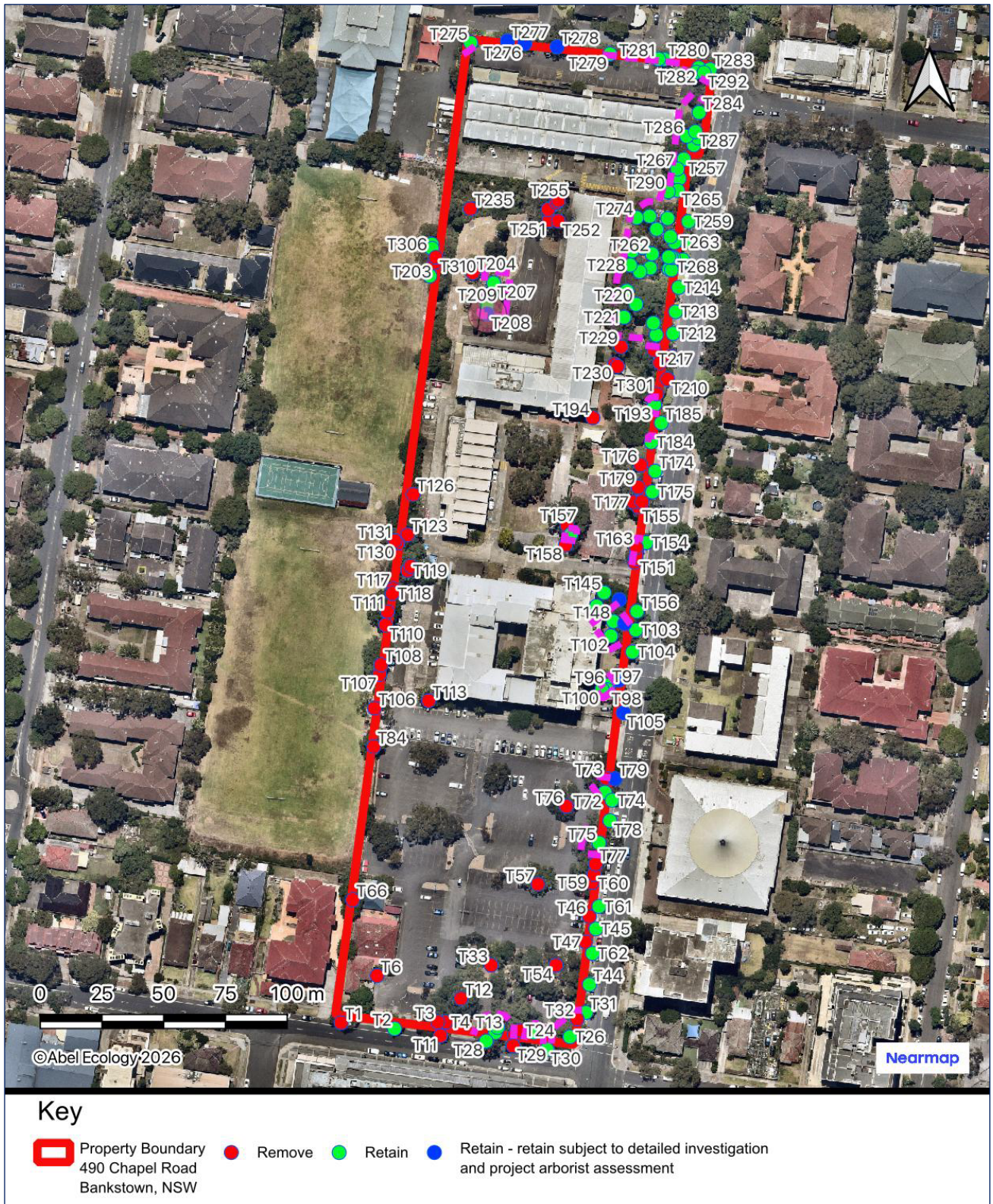
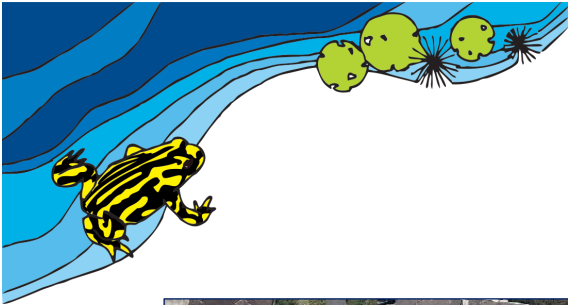


Figure 3. Aerial photograph of site (with numbered trees)

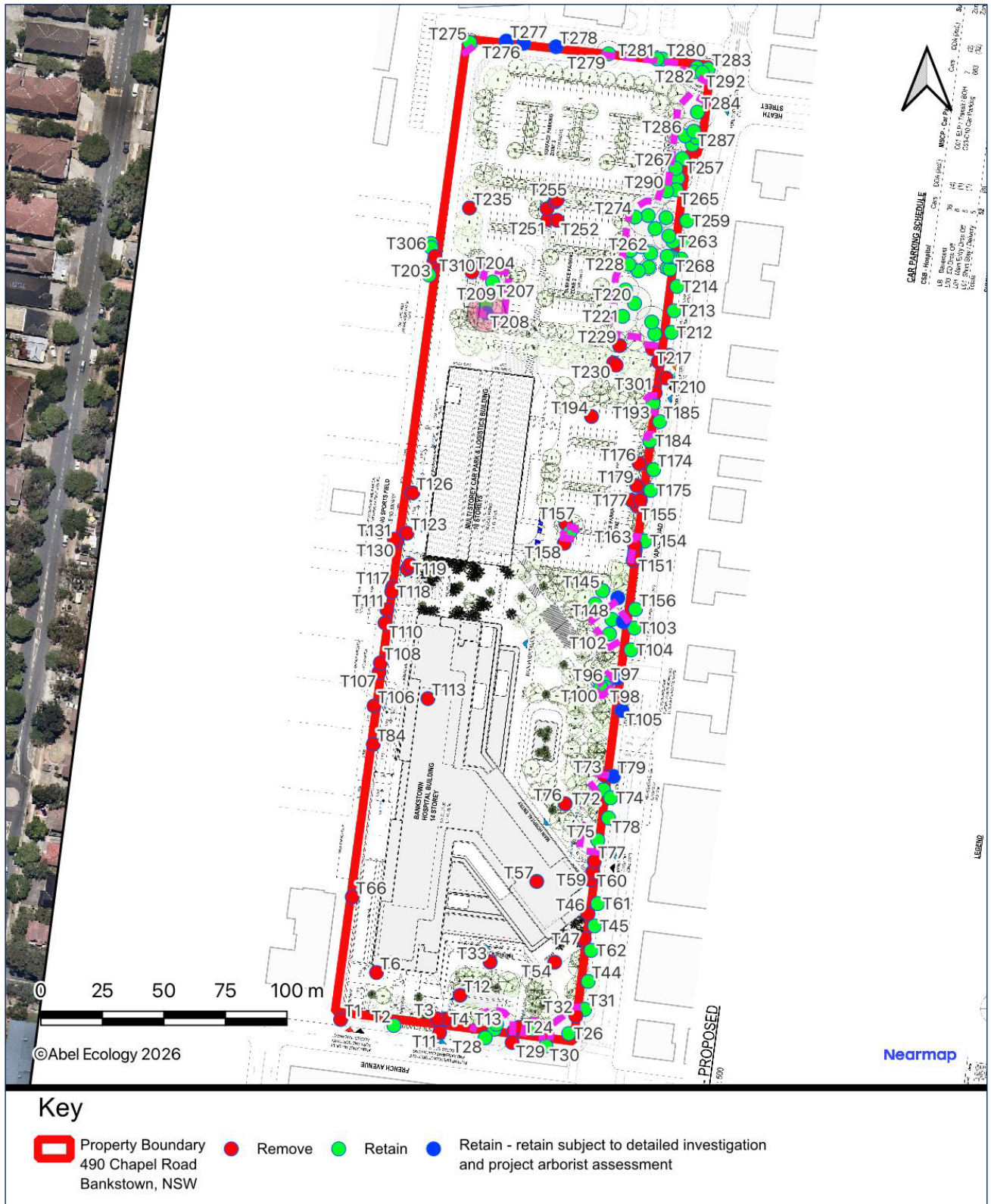
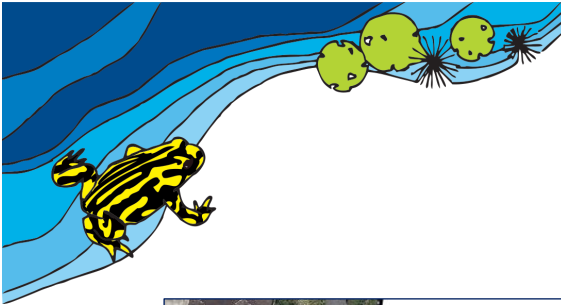


Figure 4. Proposal Diagram

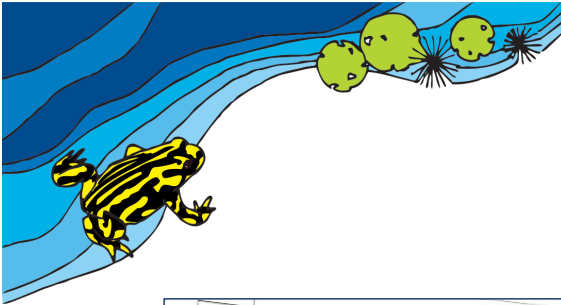


Figure 5. Tree Protection Fencing (expanded)

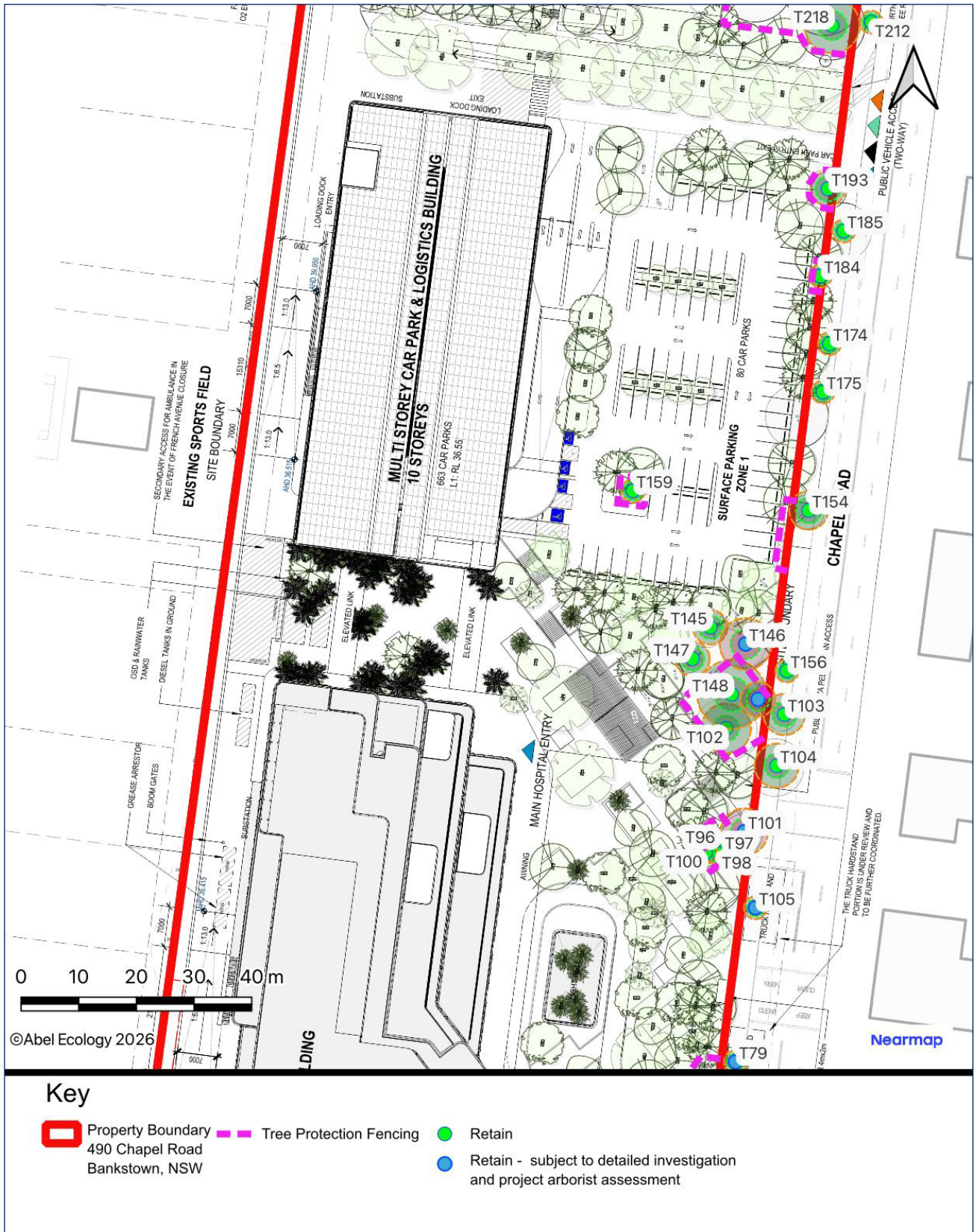
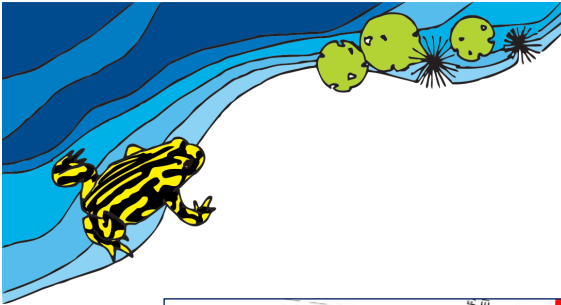


Figure 6. Tree Protection Fencing (expanded)

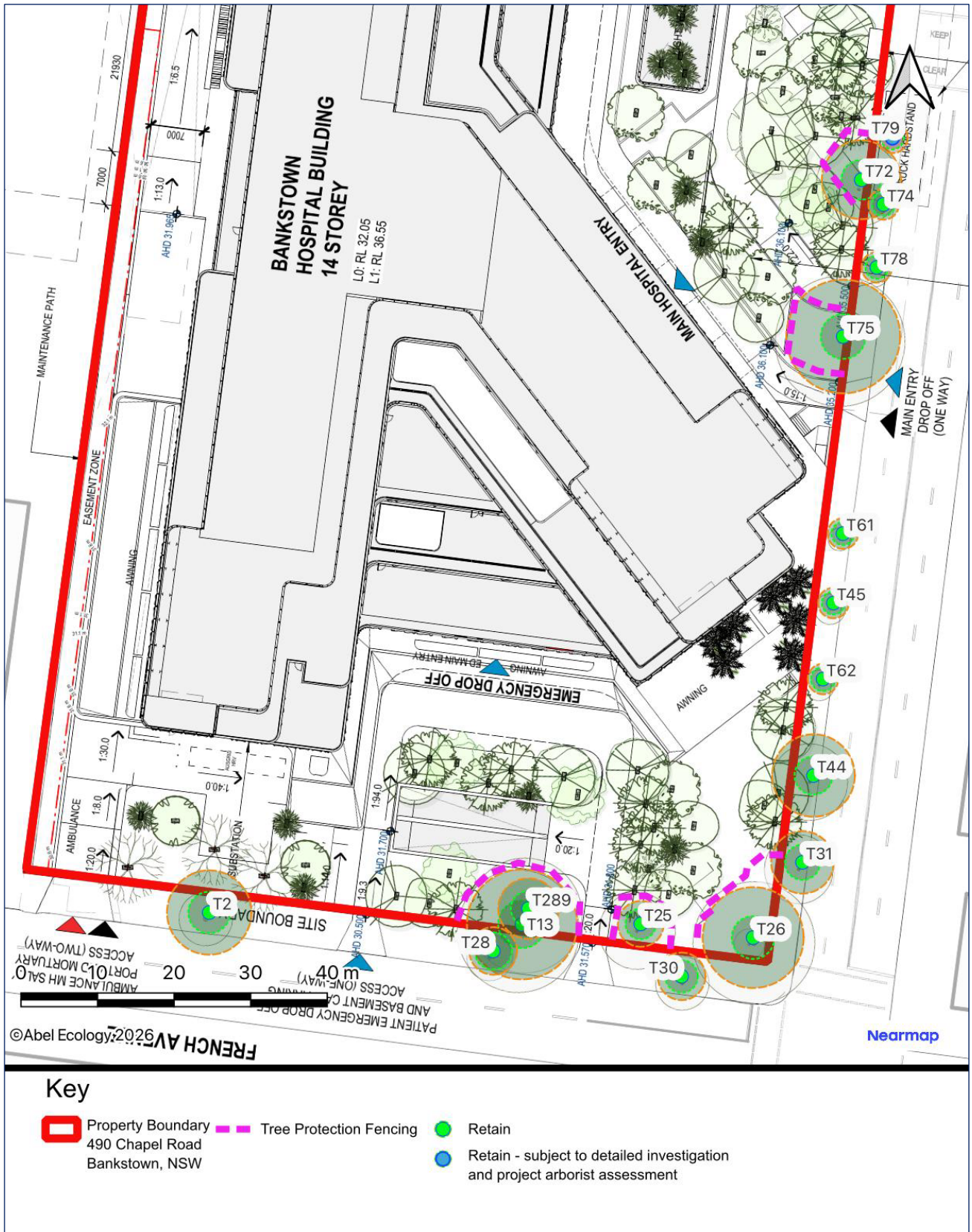
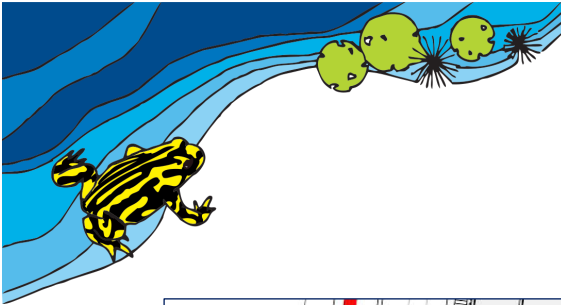


Figure 7. Tree Protection Fencing (expanded)

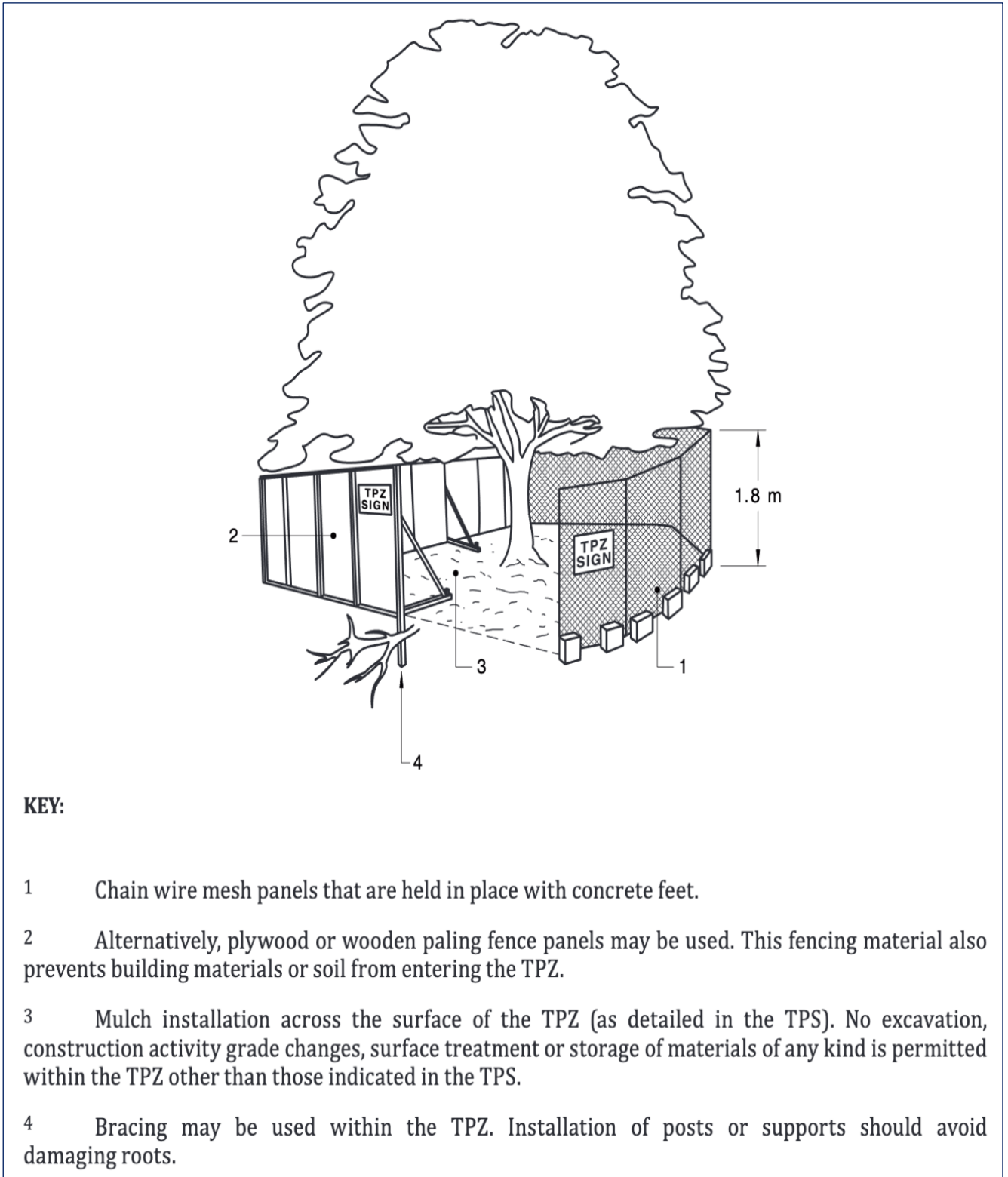
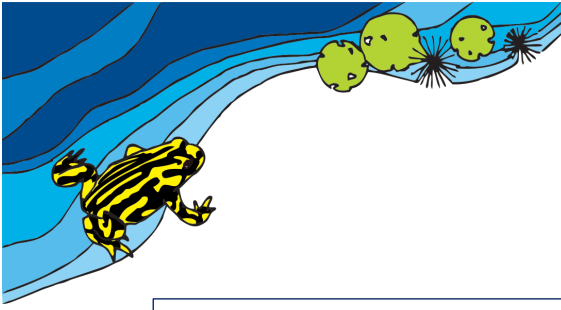
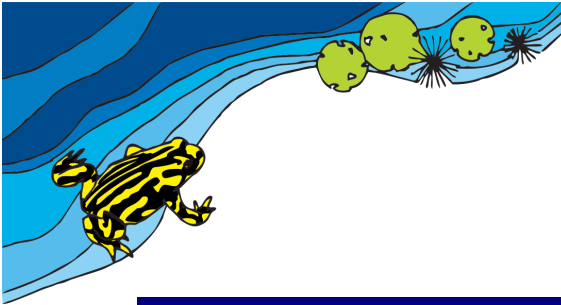


Figure 8. Example of Tree Protection Fencing (Adapted from AS 4970 2025)



## Appendix 2. Tree data table

The following tree schedule (Table 6) describes the numbered trees shown in (Figure 4).

### KEY

DAB: Diameter Above Buttress

DSH: Diameter at Standard Height (1.4m)

NRZ: Notional Root Zone

SRZ: Structural Root Zone

TPZ: Tree Protection Zone

Table 6. Tree Data and Comments

Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T1	<i>Callistemon viminalis</i>	80	80	11	9.6	3.01	9.6
T2	<i>Callistemon viminalis</i>	63	46	9	5.52	2.73	5.52
T3	<i>Eucalyptus punctata</i>	70	59	19	7.08	2.85	7.08
T4	<i>Phoenix canariensis</i>	135	90	8	10.8	3.75	10.8
T6	<i>Syagrus romanzoffiana</i>	25	21	6	2.52	1.85	2.52
T11	<i>Callistemon viminalis</i>	65	31	9	3.72	2.76	3.72
T12	<i>Eucalyptus tereticornis</i>	98	62	20	7.44	3.28	7.44
T13	<i>Eucalyptus tereticornis</i>	86	60	22	7.2	3.11	7.2
T23	<i>Eucalyptus tereticornis</i>	108	90	25	10.8	3.42	10.8
T24	<i>Eucalyptus microcorys</i>	18	15	11	2	1.61	2
T25	<i>Melia azederach</i>	30	25	7	3	2	3
T26	<i>Eucalyptus microcorys</i>	67	55	16	6.6	2.8	6.6
T28	<i>Callistemon viminalis</i>	48	26	8	3.12	2.43	3.12
T29	<i>Callistemon viminalis</i>	46	26	10	3.12	2.39	3.12
T30	<i>Callistemon viminalis</i>	35	26	8	3.12	2.13	3.12
T31	<i>Platanus x acerifolia</i>	42	26	10	4.09	2.3	4.09
T32	<i>Eucalyptus scoparia</i>	29	25	10	3	1.97	3



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T33	<i>Cinnamomum camphora</i>	64	50	13	6	2.74	6
T44	<i>Platanus x acerifolia</i>	51	45	10	5.4	2.49	5.4
T45	NOT ASSESSED				2	1.5	2
T46	<i>Syncarpia glomulifera</i>	35	22	7	2.64	2.13	2.64
T47	<i>Syncarpia glomulifera</i>	43	24	8	2.88	2.32	2.88
T54	<i>Syagrus romanzoffiana</i>	23	13	5	2	1.79	2
T57	<i>Cinnamomum camphora</i>	80	60	11	7.2	3.01	7.2
T59	<i>Eucalyptus microcorys</i>	75	56	14	6.72	2.93	6.72
T60	<i>Eucalyptus scoparia</i>	18	14	5	2	1.61	2
T61	NOT ASSESSED				2	1.5	2
T62	<i>Ulmus glabra lutescens</i>	17	13	4	2	1.57	2
T66	<i>Cinnamomum camphora</i>	55	50	11	6	2.57	6
T72	<i>Eucalyptus punctata</i>	57	43	17	5.16	2.61	5.16
T73	<i>Eucalyptus punctata</i>	81	50	16	6	3.03	6
T74	NOT ASSESSED				2	1.5	2
T75	<i>Eucalyptus punctata</i>	75	62	18	7.44	2.93	7.44
T76	<i>Eucalyptus punctata</i>	38	30	13	3.6	2.2	3.6
T77	<i>Eucalyptus microcorys</i>	54	33	10	3.96	2.55	3.96
T78	NOT ASSESSED				2	1.5	2
T79	NOT ASSESSED				2	1.5	2
T84	<i>Chamaecyparous or Cupressocyparous ?.</i>	65	60	11	7.2	2.76	7.2
T96	<i>Auranticarpa rhombifolia</i>	36	10	8	2.47	2.15	2.47
T97	<i>Callistemon viminalis</i>	19	15	8	2	1.65	2
T98	NOT ASSESSED				2	1.5	2
T100	NOT ASSESSED				2	1.5	2
T101	<i>Liquidamber styraciflua</i>	45	34	12	4.08	2.37	4.08



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T102	<i>Ulmus parvifolia</i>	40	36	15	4.32	2.25	4.32
T103	<i>Platanus x acerifolia</i>	34	30	6	3.6	2.1	3.6
T104	<i>Platanus x acerifolia</i>	36	32	13	3.84	2.15	3.84
T105	NOT ASSESSED				2	1.5	2
T106	<i>Corymbia citriodora</i>	100	80	20	9.6	3.31	9.6
T107	<i>Cinnamomum camphora</i>	65	50	14	6	2.76	6
T108	<i>Cinnamomum camphora</i>	120	40	14	9.26	3.57	9.26
T110	<i>Cinnamomum camphora</i>	60	15	17	4.69	2.67	4.69
T111	<i>Cinnamomum camphora</i>	70	20	15	6.12	2.85	6.12
T113	<i>Phoenix canariensis</i>	80	60	14	3.23	2	3.23
T117	<i>Phoenix canariensis</i>	40	30	3	3.6	2.25	3.6
T118	<i>Phoenix canariensis</i>	40	30	3	3.6	2.25	3.6
T119	<i>Cinnamomum camphora</i>	110	40	14	7.37	3.44	7.37
T123	<i>Casuarina cunninghamiana</i>	65	55	17	6.6	2.76	6.6
T126	<i>Phoenix canariensis</i>	90	60	7	7.2	3.17	7.2
T130	<i>Melaleuca styphelioides</i>	130	60	13	9.54	3.69	9.54
T131	<i>Melaleuca styphelioides</i>	100	40	10	6.79	3.31	6.79
T146	<i>Callistemon viminalis</i>	57	53	12	4.5	2.61	4.5
T148	<i>Ulmus parvifolia</i>	80	30	16	6	3.01	6
T149	<i>Ulmus parvifolia</i>	30	25	10	3	2	3
T150	<i>Platycladus orientalis</i>	62	14	7	3.07	2.71	3.07
T151	<i>Platycladus orientalis</i>	32	16	8	2.55	2.05	2.55
T152	<i>Platycladus orientalis</i>	32	16	9	2.72	2.05	2.72
T153	<i>Platycladus orientalis</i>	48	14	9	2.84	2.43	2.84
T154	<i>Lophostomon confertus</i>	39	28	7	3.36	2.23	3.36



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T155	<i>Casuarina cunninghamiana</i>	55	45	18	5.4	2.57	5.4
T156	NOT ASSESSED				2	1.5	2
T157	<i>Corymbia maculata</i>	72	60	23	7.2	2.88	7.2
T158	<i>Eucalyptus sp. Peppermint</i>	66	55	21	6.6	2.78	6.6
T159	<i>Banksia integrifolia</i>	18	17	6	2.04	1.61	2.04
T163	<i>Juniperus sp.</i>	25	12	7	2.04	1.85	2.04
T174	NOT ASSESSED				2	1.5	2
T175	NOT ASSESSED				2	1.5	2
T176	<i>Melaleuca styphelioides</i>	40	35	12	4.2	2.25	4.2
T177	<i>Eucalyptus sideroxylon</i>	35	30	16	3.6	2.13	3.6
T178	<i>Corymbia citriodora</i>	41	35	17	4.2	2.28	4.2
T179	<i>Eucalyptus cladocalyx</i>	36	30	9	3.6	2.15	3.6
T184	NOT ASSESSED				2	1.5	2
T185	NOT ASSESSED				2	1.5	2
T193	<i>Syagrus romanzoffiana</i>	38	25	11	3	2.2	3
T194	<i>Brachychiton acerifolius</i>	43	12	6	2.28	2.32	2.28
T203	<i>Eucalyptus moluccana</i>	90	80	20	9.6	3.17	9.6
T204	<i>Eucalyptus tereticornis</i>	34	28	15	3.36	2.1	3.36
T207	<i>Eucalyptus sideroxylon</i>	50	45	17	5.4	2.47	5.4
T208	<i>Corymbia maculata</i>	78	65	19	7.8	2.98	7.8
T209	<i>Eucalyptus robusta</i>	42	35	18	4.2	2.3	4.2
T210	NOT ASSESSED				2	1.5	2
T211	NOT ASSESSED				2	1.5	2
T212	NOT ASSESSED				2	1.5	2
T213	NOT ASSESSED				2	1.5	2
T214	<i>Ulmus glabra lutescens</i>	19	13	6	2	1.65	2



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T216	<i>Casuarina cunninghamiana</i>	62	60	18	7.2	2.71	7.2
T217	<i>Cupressus sempervirens</i>	28	25	11	3	1.94	3
T218	<i>Lophostomon confertus</i>	52	40	10	4.8	2.51	4.8
T219	<i>Eucalyptus sideroxylon</i>	50	40	13	4.8	2.47	4.8
T220	<i>Corymbia maculata</i>	65	55	19	6.6	2.76	6.6
T221	<i>Eucalyptus microcorys</i>	66	55	18	6.6	2.78	6.6
T222	<i>Eucalyptus microcorys</i>	67	55	18	6.6	2.8	6.6
T223	NOT ASSESSED				2	1.5	2
T224	NOT ASSESSED				2	1.5	2
T226	<i>Ulmus parvifolia</i>	32	30	9	3.6	2.05	3.6
T227	<i>Ulmus parvifolia</i>	27	20	7	2.4	1.91	2.4
T228	<i>Ulmus parvifolia</i>	24	22	7	2.64	1.82	2.64
T229	<i>Eucalyptus microcorys</i>	62	50	14	6	2.71	6
T230	NOT ASSESSED				2	1.5	2
T231	NOT ASSESSED				2	1.5	2
T235	<i>Corymbia maculata</i>	24	19	13	2.28	1.82	2.28
T251	<i>Eucalyptus sideroxylon</i>	50	40	17	4.8	2.47	4.8
T252	<i>Eucalyptus sideroxylon</i>	96	80	23	9.6	3.25	9.6
T253	<i>Eucalyptus sideroxylon</i>	75	58	17	6.96	2.93	6.96
T254	<i>Casuarina cunninghamiana</i>	43	36	17	4.32	2.32	4.32
T255	<i>Casuarina cunninghamiana</i>	30	25	12	3	2	3
T256	<i>Corymbia maculata</i>	54	45	18	5.4	2.55	5.4
T257	<i>Corymbia maculata</i>	72	60	22	7.2	2.88	7.2
T258	<i>Corymbia maculata</i>	53	40	22	4.8	2.53	4.8
T259	NOT ASSESSED				2	1.5	2



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T260	NOT ASSESSED				2	1.5	2
T261	<i>Ulmus glabra lutescens</i>	15	14	6	2	1.5	2
T262	<i>Ulmus parvifolia</i>	29	26	7	3.12	1.97	3.12
T263	<i>Eucalyptus sideroxylon</i>	54	40	21	4.8	2.55	4.8
T264	<i>Corymbia maculata</i>	55	45	19	5.4	2.57	5.4
T265	NOT ASSESSED				2	1.5	2
T266	NOT ASSESSED				2	1.5	2
T267	<i>Corymbia maculata</i>	56	48	22	5.76	2.59	5.76
T268	NOT ASSESSED				2	1.5	2
T269	NOT ASSESSED				2	1.5	2
T270	NOT ASSESSED				2	1.5	2
T271	<i>Ulmus parvifolia</i>	29	24	6	2.88	1.97	2.88
T272	NOT ASSESSED				2	1.5	2
T273	<i>Eucalyptus sideroxylon</i>	54	45	17	5.4	2.55	5.4
T274	NOT ASSESSED				2	1.5	2
T275	<i>Phoenix canariensis</i>	84	70	7	2	2	2
T276	<i>Eucalyptus scoparia</i>	40	45	11	2	1.5	2
T277	<i>Jacaranda mimosifolia</i>	40	45	8	2	1.5	2
T278	<i>Eucalyptus microcorys</i>	40	45	15	2	1.5	2
T279	<i>Schinus molle</i>	40	45	10	2	1.5	2
T280	<i>Melaleuca linariifolia</i>	40	45	9	2	1.5	2
T281	<i>Jacaranda mimosifolia</i>	40	45	11	2	1.5	2
T282	<i>Casuarina cunninghamiana</i>	66	54	18	6.48	2.78	6.48
T283	<i>Casuarina cunninghamiana</i>	50	40	19	4.8	2.47	4.8
T284	<i>Casuarina cunninghamiana</i>	72	60	16	7.2	2.88	7.2



Tree No.	Species	DAB (cm)	DSH (cm)	Height (m)	NRZ (m)	SRZ (m)	TPZ (m)
T285	<i>Eucalyptus sideroxylon</i>	41	33	13	3.96	2.28	3.96
T286	<i>Corymbia maculata</i>	72	60	22	7.2	2.88	7.2
T287	<i>Eucalyptus robusta</i>	17	17	9	2.04	1.57	2.04
T289	<i>Eucalyptus punctata</i>	43	33	10	3.96	2.32	3.96
T290	<i>Syagrus romanzoffiana</i>	27	18	7	2.16	1.91	2.16
T291	<i>Casuarina cunninghamiana</i>	48	40	15	4.8	2.43	4.8
T292	<i>Casuarina cunninghamiana</i>	30	25	15	3	2	3
T300	<i>Eucalyptus leucoxyton</i>	24	20	17	2.4	1.82	2.4
T301	<i>Melaleuca styphelioides</i>	72	30	7	5.09	2.88	5.09
T306	<i>Eucalyptus moluccana</i>	42	36	15	4.32	2.3	4.32
T307	<i>Eucalyptus moluccana</i>	41	34	15	4.08	2.28	4.08
T309	<i>Ficus (rubignosa)</i>	90	40	4	6	3.17	6
T310	<i>Melaleuca styphelloides</i>	44	18	6	2	1.5	2



## Appendix 3. Tree protection guidelines

### A Pre-construction/Demolition phase

The following methods are to be implemented to minimise potential damage to retained trees, e.g. from soil compaction and site activity. Trees are to be protected at all stages of the development, and growing conditions are to be improved within the Tree Protection Zone (TPZ). These guidelines are consistent with AS4970-2009 Protection of trees on development sites.

- A 1. All site workers are to be aware of relevant tree protection requirements. Nominated trees will be removed or transplanted as per the tree protection plan. An arborist is to supervise tree removal, pruning and transplanting and certify the completed works.
- A 2. All trees not nominated for retention are to be removed prior to any construction activity. Approved tree pruning and removal operations near retained trees are to be carried out in a way that avoids soil compaction and damage to canopy, trunk or roots. Works are to be supervised by an arborist or the person responsible for site management.
- A 3. Stumps are to be ground, not dozed or dug out, if in the vicinity of retained trees. Machinery (other than stump machines) is to be kept beyond the nominated protection zones of retained trees during all operations.
- A 4. Tree protection fencing is to be in place before the introduction of machinery or other materials to the site and before commencement of works. Fencing is to be located to at least the canopy dripline, be of sturdy construction and retained in-situ during works unless altered by the project arborist. All site activities are excluded from this zone. Refer to Appendix 2 for specific minimum setback distances. AS4687 specifies applicable fencing requirements.
- A 5. The TPZ is to be mulched using material compatible with 'AS4454-2003 Composts, soil conditioners and mulches', e.g. decomposed leaf litter, and maintained at 50-100 mm depth. Some areas, e.g. turf, may not require mulch. Temporary irrigation may be required. Weeds are to be removed and controlled.
- A 6. Pruning is to be undertaken by suitably qualified, skilled and insured people to comply with AS4373-2007, Australian Standard: Pruning of Amenity Trees. Initial pruning provides adequate clearances and general crown maintenance. Flexible branches are to be tied back, not pruned.

### B Construction phase (Maintain tree protection fencing)

- B 1. Where access is required within a TPZ, temporary ground protection measures will be required (e.g. metal plates, rumble boards or exterior-grade ply over aggregate) capable of supporting the required load without deflection. Trunk protection may be required, e.g. battens wrapped around the trunk to a height of 2 m.
- B 2. Material stockpiles or dumps, parking, excavation, site sheds, preparation of chemicals, fires, wash down areas or similar are to be located clear of TPZs. Areas designated for such requirements are not to divert drainage water into tree protection areas.



- B 3. Machine trenching is to be excluded from the TPZ of retained trees. Any required root excavation inside a TPZ is to be done by hand and intact roots >40 mm in diameter are to be retained. Services are to be installed 100 mm clear of such roots. Damaged roots must be cut cleanly with sharp implements (backhoe blades and similar are excluded), with no root dressings or paints. Trenches are to be backfilled promptly to minimise soil desiccation. Underbore if no suitable alternative location is possible. All works within the TPZ are to be supervised by an arborist.



## Appendix 4. Tree protection zone and structural root zone

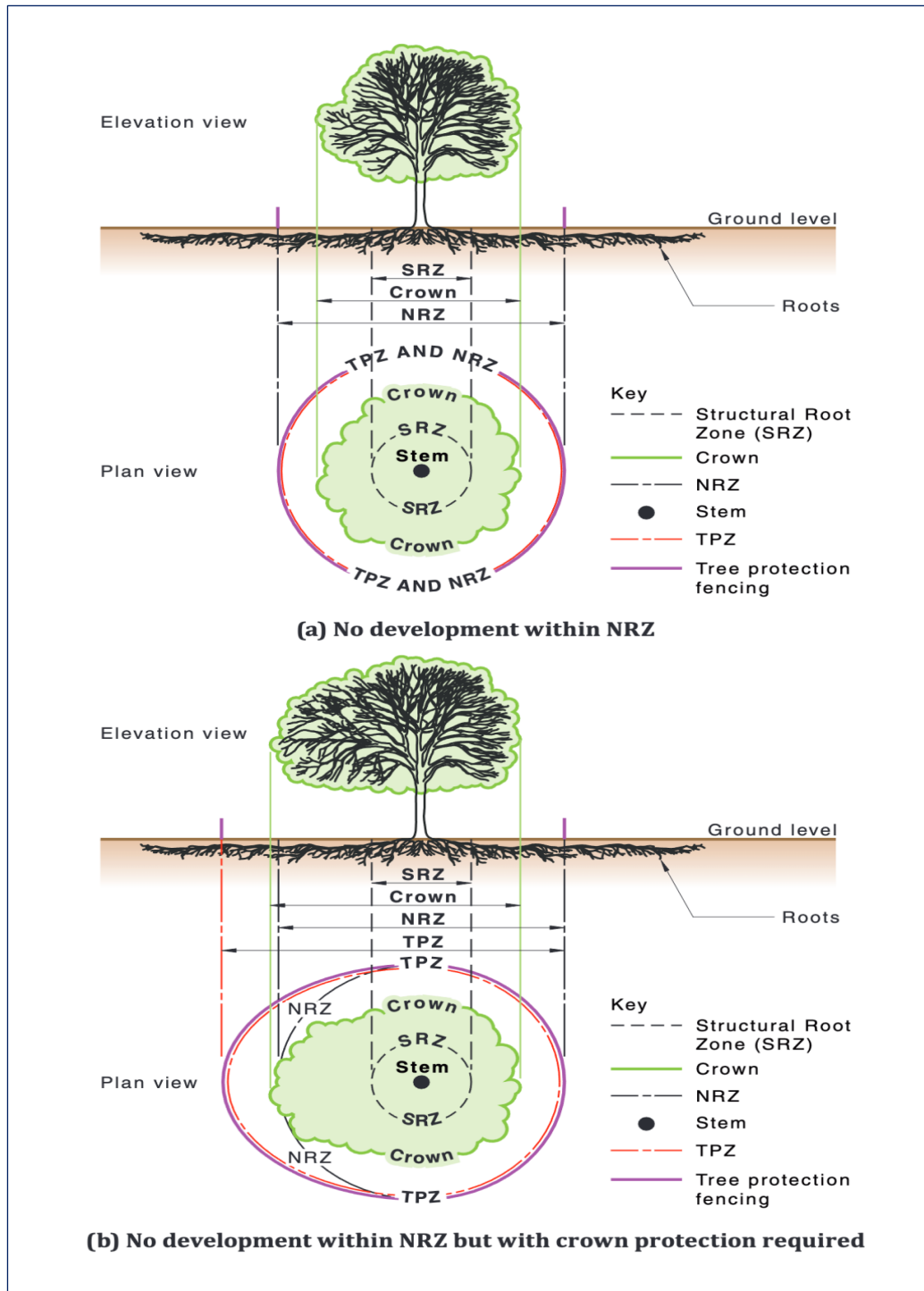


Figure 9. Extract from AS 4970 2025 (TPZ No Development).

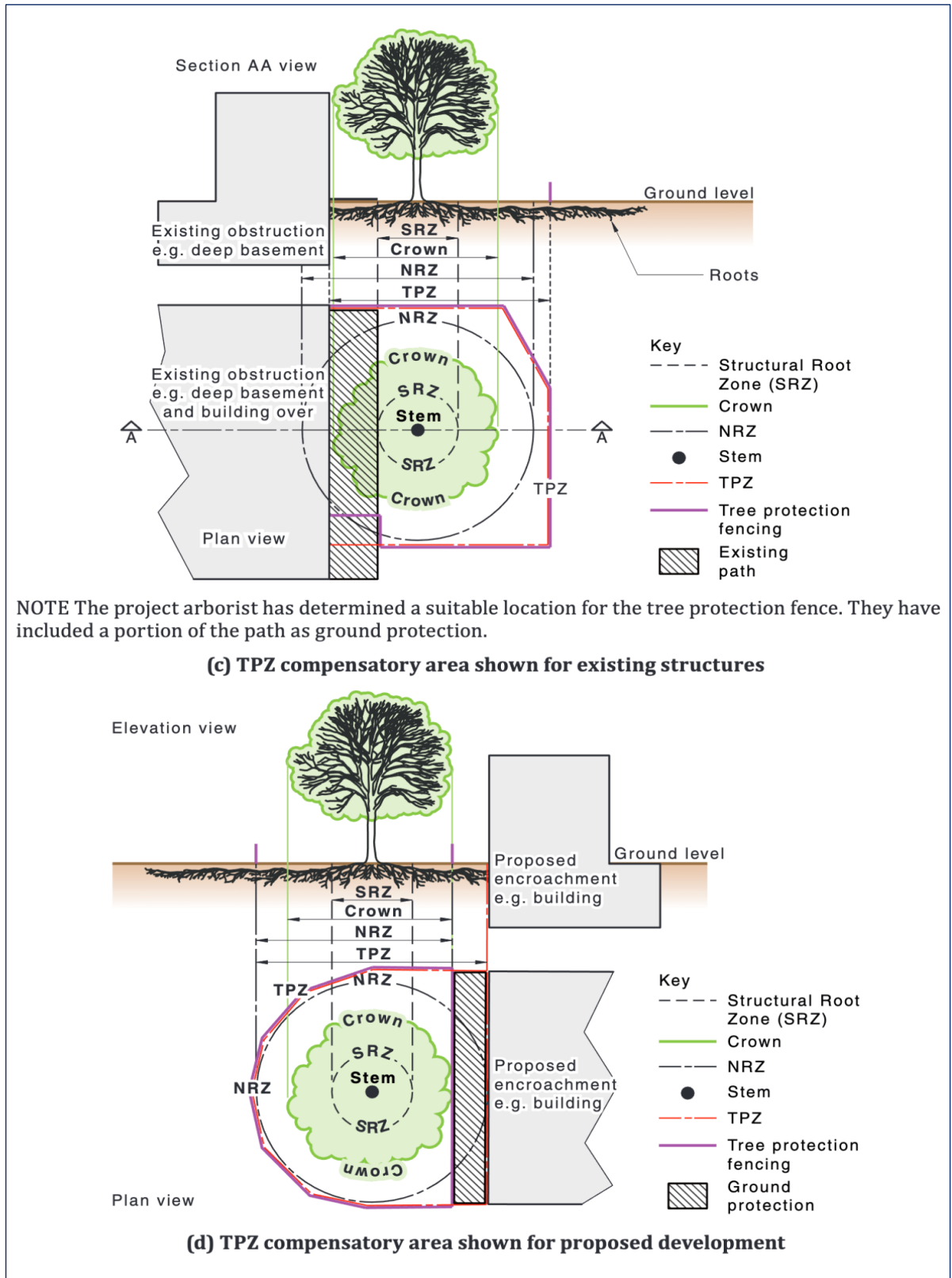
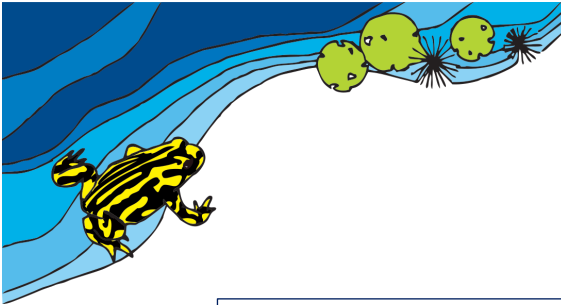
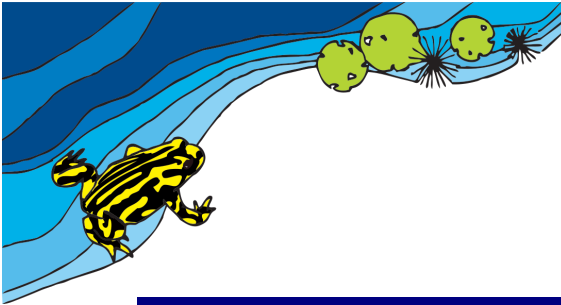


Figure 10. Extract from AS 4970 2025 (TPZ -Development)



## Appendix 5. Encroachment into tree protection zones

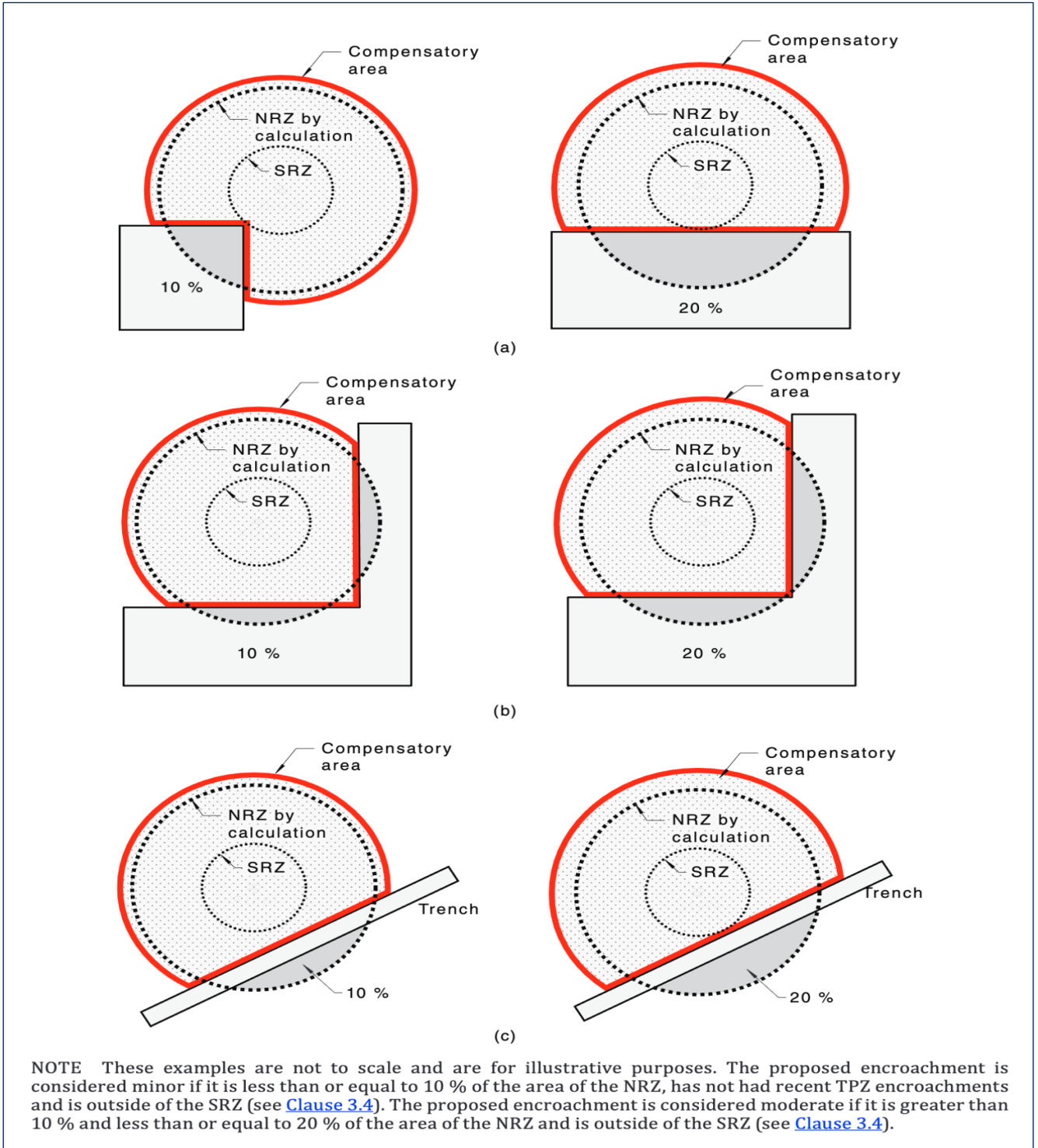


Figure 11. Extract from AS 4970 2025 (Encroachment)

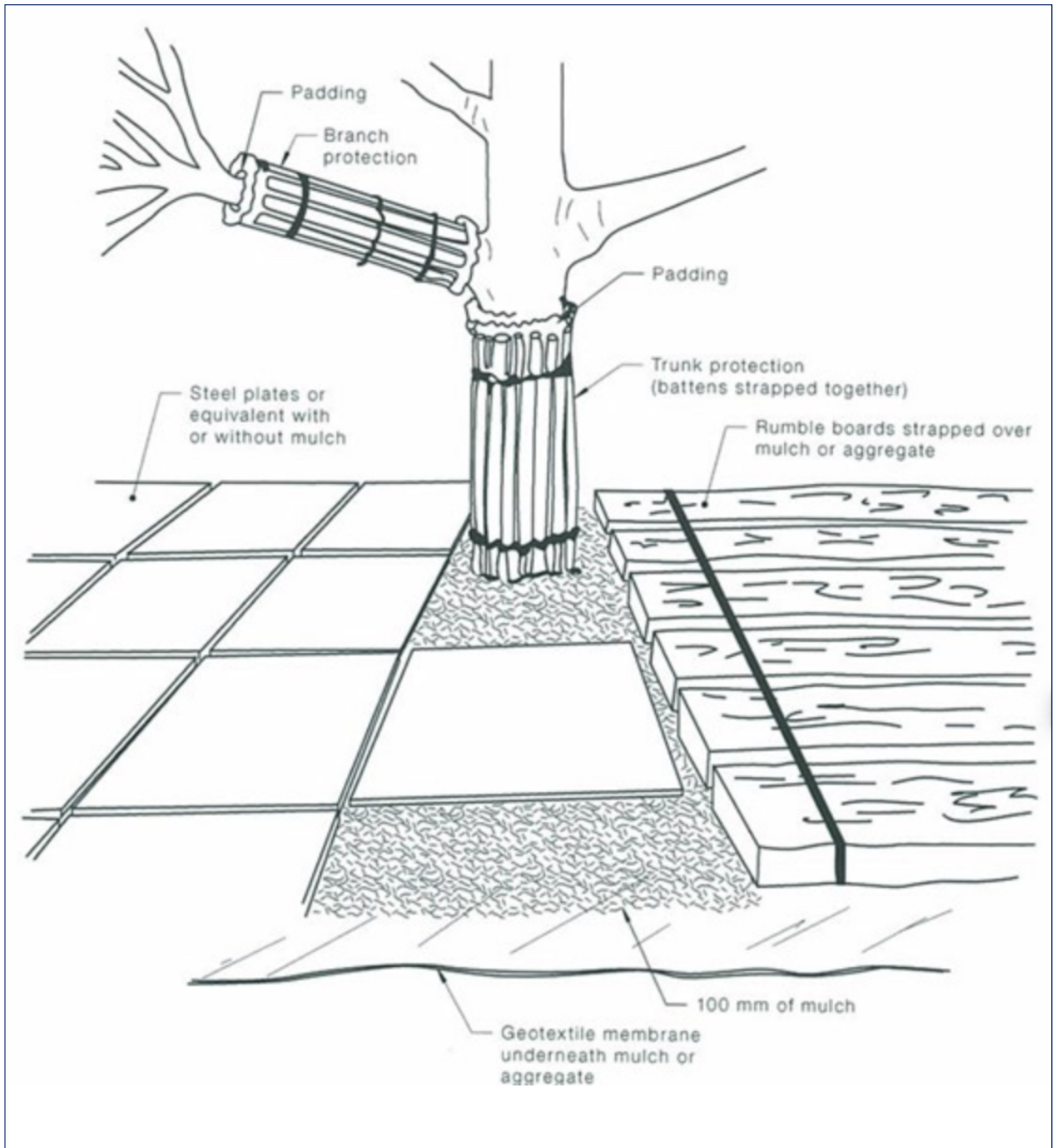
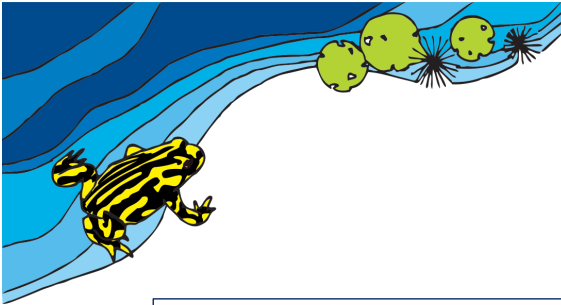
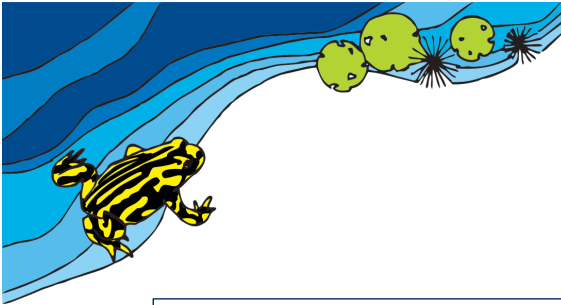
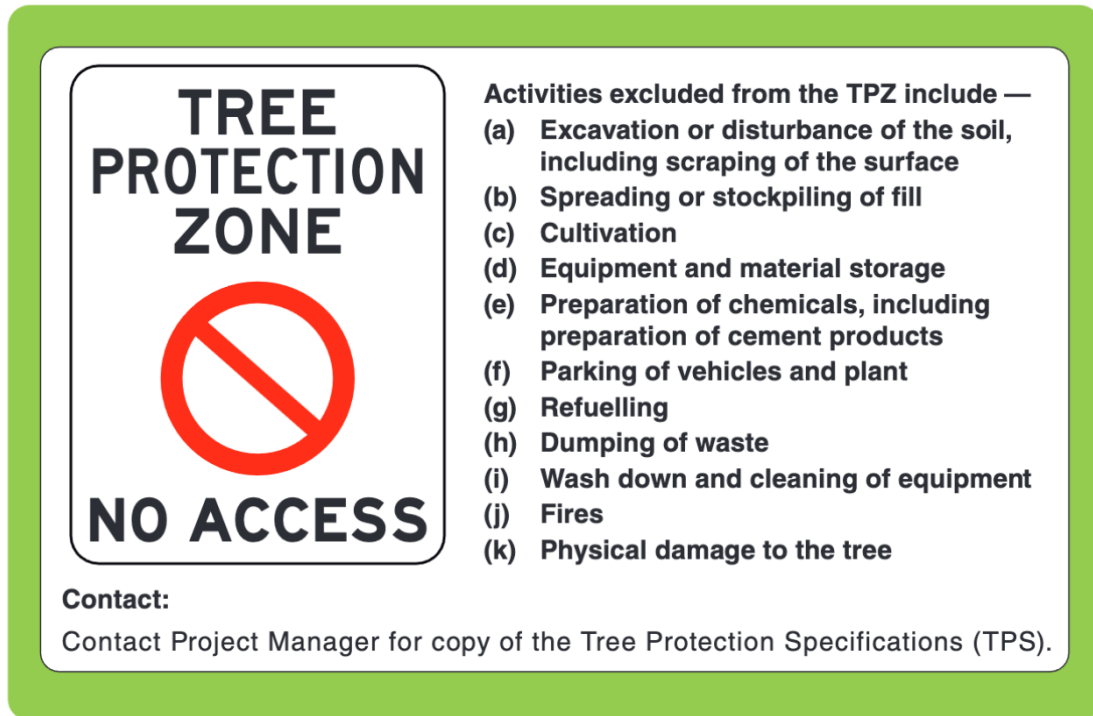


Figure 12. Extract from AS 4970 2025 (Trunk and Branch Protection)

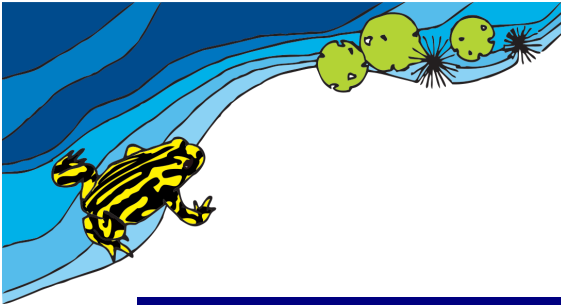


A TPZ sign provides clear and readily accessible information to indicate that a TPZ has been established. [Figure C.1](#) provides an example of a suitable sign. The sign should be minimum A3 size.



**Figure C.1 — Tree Protection Zone sign**

Figure 13. Extract from AS 4970 2025 (TPZ Signage)



## Appendix 6. IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA)©

### IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA 2010)©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria and Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

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 of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

#### 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 e.g. hedge.

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



**Table 1.0 Tree Retention Value - Priority Matrix.**

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
<p><u>Legend for Matrix Assessment</u></p> 						
	<p><b>Priority for Retention (High)</b> - 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 <i>Protection of trees on development sites</i>. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.</p>					
	<p><b>Consider for Retention (Medium)</b> - 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.</p>					
	<p><b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.</p>					
	<p><b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.</p>					

**USE OF THIS DOCUMENT AND REFERENCING**

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

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

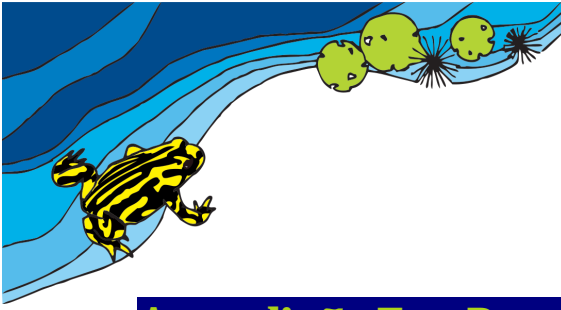
**REFERENCES**

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, [www.icomos.org/australia](http://www.icomos.org/australia)

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Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, [www.footprintgreen.com.au](http://www.footprintgreen.com.au)

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



## Appendix 7. Tree Protection Plan

Establishing and maintaining a TPZ is the most important part of protecting trees during the onsite stages of work (e.g. site establishment, demolition, construction). Tree Protection measures include a range of activities, structures and devices used to identify and isolate the Tree Protection Zone (TPZ). This plan will use fencing to isolate trees from the development works, from commencement to completion. If access to the TPZ is required, the project arborist is to give the authority for works to take place within the TPZ of retained trees. This Tree Protection Plan (TPP) is to be read in conjunction with the Arborist Impact Assessment of this report.

There are 48 trees recommended for removal. It is the policy of the client to replace trees to be removed at a ratio of greater than 1:1. Therefore, the number of replacement trees are to be greater than 49. The replacement trees are to be identified in future landscape designs.

There are ninety-three (93) trees recommended for retention. These trees are not expected to incur major impacts to their NRZ. Trees with minor or moderated impacts have been allocated increased TPZ area to compensate for the loss of soil area required for root adaptation to the impacts.

Tree Protection Zones and fencing have been allocated to the retained trees within the site and are shown in Figure 5, Figure 6 and Figure 7.

The recommendations made in this report are subject to approval by the consent authority.

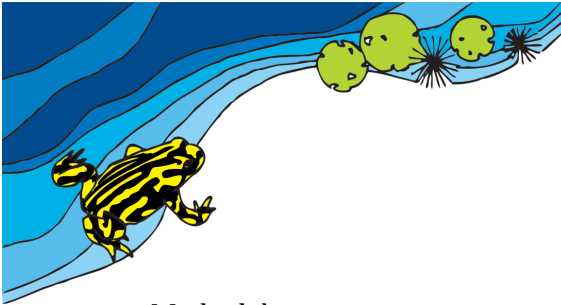
### Introduction.

This section provides information for the retained trees of the development. This Tree Protection Plan is to assist in the protection of trees within and around the area of works.

Trees to be retained are listed in Table 2 and illustrated in Figure 4. The minimum setbacks for the installation the tree protection fencing, for each tree, are outlined in this TPP.

Section 4 of the Australian Standard (AS 4970 2025) Protection of trees on development sites, outlines the measures (Section 4.2) to be employed to restrict damage or harm to the retained trees on development sites. All works are to comply with this Standard. Any pruning works required are to be conducted by a suitably qualified arborist (minimum AQF3) with a minimum of 5 years of continual experience and comply with the Australian Standard AS 4373 2007 (2020).

Tree protection fencing is to be installed as per Figure 5, Figure 6 and Figure 7 of the Australian Standard (AS 4970 2025) Protection of trees on development sites (Section 4.3). Fencing is to be a minimum of 1.8m tall and erected in a form that will not fall or collapse in poor weather conditions, to comply with the fencing standards as shown in Figure 8. Signage is required to be installed as indicated in AS 4970 2025 (Figure 13).



## Methodology

This assessment is undertaken using standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment from the ground of each individual tree or stand of trees.

Due to slight variations in imagery and plans, the accuracy of tree positions, location of tree protection fencing and measurements, must be confirmed on site by the Project Arborist.

## Tree Protection

Tree 31, 44, 45, 61, 62, 74, 78, 79, 103, 104, 105, 154, 156, 174, 175, 213, 214, 259, 260, 261 are street trees located on the footpath of council land (Chapel Road). These trees are to be pruned to 1m from the property boundary to limit impacts from installing hoarding at the boundary of the site. Pruning is to be consistent with Australian Standards (AS 4373 2007) Pruning of amenity trees.

Tree 2, 28, 30, 78, 185, 212 are street trees located on the footpath of council land (Chapel Road). The proximity of these trees to access points (Site Entry/Exit) increases the possibility of damage from entering or exiting vehicles of the site. These trees are to be pruned to 1m from the property boundary to limit damage from installing hoarding around the site. Pruning is to be consistent with Australian Standards (AS 4373 2007) Pruning of amenity trees. To limit the damage to these trees from vehicle entering or exiting the site, these trees are to have branch and trunk protection installed consistent with Australian Standards (AS 4970 2025) Protection of trees on development sites (Section 4.5.2).

Tree 275, 276, 277, 278, 279, 280, 281 are located on the northern boundary within the school property. These trees are behind a 1.8m existing retaining wall. It is expected that these trees will be isolated behind the site hoarding and will not sustain impacts to their SRZ or NRZ. Minor pruning may be required for overhanging branches of these trees to reduce damage from demolition and construction works or machinery. If works are to occur on or around these trees, advice and supervision of the project arborist must be sought.

Tree 306, 307, 309 are located on the western boundary within the school property. It is expected that site fencing/hoarding will isolate these trees from impacts or damage from the proposal. If works are to occur on or around these trees, advice and supervision of the project arborist must be sought.

Tree 13 *Eucalyptus tereticornis*, 289 *Eucalyptus punctata*, these trees are in good condition.

- ***Trees viability to development:*** this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the



length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.

- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 7.2m (T13) and 4.0m (T289) radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 7.8m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 7 and comply with AS 4970 2025 (Section 4).

Tree 25 *Melia azedarach*, this tree is in good condition.

- Trees viability to development: this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 2.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3.3m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 7 and comply with AS 4970 2025 (Section 4).

Tree 26 *Eucalyptus microcorys*, this tree is in good condition.

- Trees viability to development: this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ setback of 6.6m radius from centre of trunk (COT). The setback for the proposed retaining wall adjacent to this specimen is estimated at 3.0m from COT, which is an estimated 15.8% encroachment into the NRZ by the proposed development. It is expected for this loss of root area by the retaining wall, is to be compensated, by incorporating this TPZ into the protection zone of neighbouring trees (Figure 7). This tree may require crown reduction to limit impacts from installing hoarding at the site boundary. All pruning is to comply with pruning standards AS 4373 2007.

The alignment of the will be a minor encroachment to this specimen. The section of the excavation for the retaining wall within the TPZ of this tree is to have a vertical cut and constructed in compliance with AS 4970 2025



Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.

Tree 27 *Eucalyptus microcorys*, this tree is in good condition.

- **Trees viability to development:** these specimens are not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ of 3.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3.4m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 7 and comply with AS 4970 2025 (Section 4).

Tree 75 *Eucalyptus punctata*, this tree is in good condition.

- **Trees viability to development:** this specimen is not expected to be impacted by the proposed development due to the increased soil area allocated in the design. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ of 7.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 6.9m (west) from COT. The specimen has increased area from the proposal and is not expected to be affected. Tree protection fencing is to be installed as indicated in Figure 7 and comply with AS 4970 2025 (Section 4). A layer of mulch 50-75mm thick should be applied to the area within the TPZ fencing and watered thoroughly to stimulate and promote root growth. No works are to take place within the TPZ area of this tree.

Tree 72, *Eucalyptus punctata*, this tree is in good condition.

- **Trees viability to development:** this specimen is not expected to be impacted by the proposed development due to the increased soil area allocated in the design. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The



specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.

- ***Development Impacts:*** AS 4970 2025 (Section 4) requires a TPZ of 5.16m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3m (south) from COT. The specimen has increased area from the proposal and is not expected to be affected. Tree protection fencing is to be installed as indicated in Figure 7 and comply with AS 4970 2025 (Section 4). A layer of mulch 50-75mm thick should be applied to the area within the TPZ fencing and watered thoroughly to stimulate and promote root growth. No works are to take place within the TPZ area of this tree.

Tree 96 *Auranticarpa rhombifolia*, 97 *Callistemon viminalis*, 98 Exempt, 100 Exempt, these trees are in good condition.

- ***Trees viability to development:*** this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- ***Development Impacts:*** AS 4970 2025 (Section 4) requires a TPZ of 2.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3.3m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 6 and comply with AS 4970 2025 (Section 4).

Tree 102 *Ulmus parvifolia*, 148 *Ulmus parvifolia*, these trees are in good condition.

- ***Trees viability to development:*** this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- ***Development Impacts:*** AS 4970 2025 (Section 4) requires a TPZ of 6.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 8.5m (west) from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 6 and comply with AS 4970 2025 (Section 4).



Tree 151 *Platycladus orientalis*, 152 *Platycladus orientalis*, 153 *Platycladus orientalis*, 163 *Juniperus* sp, these trees are in good condition.

- Trees viability to development: these specimens are not impacted by the proposed development due to maintaining existing soil levels. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 3.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 2m (east) from COT, which does not impact the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 6 and comply with AS 4970 2025 (Section 4).

Tree 159 *Banksia integrifolia*, this tree is in good condition.

- Trees viability to development: this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 2.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3.3m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 6 and comply with AS 4970 2025 (Section 4).

Tree 193 *Syagrus romanzoffiana* (exempt sp.), this tree is in good condition.

- Trees viability to development: this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 3.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 3.3m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback



from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 6 and comply with AS 4970 2025 (Section 4).

Tree 207 *Eucalyptus sideroxylon*, 209 *Eucalyptus robusta*, these trees are in good condition.

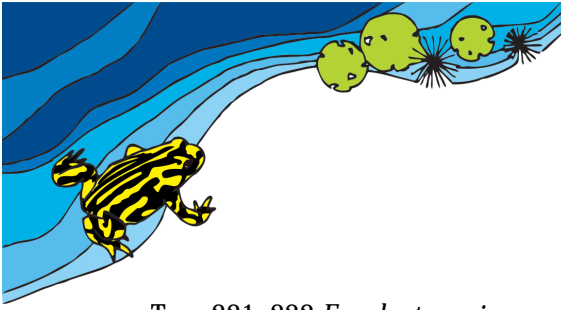
- **Trees viability to development:** these specimens are impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ of 5.4m (T207), 4.2 (T209) radius from centre of trunk (COT). The setback for the proposed building developments adjacent to these specimens is estimated at 4.4m (T207) and 3.6m (T209) from COT, which is an estimated 4.9% (T207), and 3.3% (T209) encroachment into the NRZ by the proposed development. TPZ is to be increased to 8.2m (W) and (E) from T208, as indicated in Figure 5, to compensate loss of soil area, due to the incursion from the development.

The alignment of the development will be a minor encroachment to these specimens. The section of the building developments within the NRZ of this tree is to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.

Tree 218 *Lophostemon confertus*, this tree is in good condition.

- **Trees viability to development:** this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ setback of 3.0m radius from centre of trunk (COT). The setback for the proposed development of the pathway adjacent to this specimen is estimated at 2.1m from COT, which is an estimated 11.1% encroachment into the TPZ by the proposed development. The TPZ for this tree is to be increased to 3.5m (W) form COT, to compensate for the loss of soil area from the development. It is expected for this loss of root area by the pathway, is to be compensated, by also incorporating this TPZ into the protection zone of neighbouring trees (Figure 5).

The alignment of the development will be a moderate encroachment to this specimen. The section of the pathway development within the NRZ of this tree is to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.



Tree 221, 222 *Eucalyptus microcorys*, this tree is in good condition.

- Trees viability to development: these specimens are impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimens should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ of 6.6m at a radius from centre of trunk (COT) of both trees. The setback for the proposed carpark development adjacent to these specimens are estimated at 5.1m from COT, which is an estimated 7.6% encroachment into their NRZs by the proposed development. It is expected that the loss of root area by the carpark development, is to be compensated, by incorporating the TPZs of these trees into the protection zone of neighbouring trees (Figure 5).

The alignment of the development will be a minor encroachment to these specimens. The section of the carpark development within the NRZs of these trees are to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.

Tree 284 *Casuarina cunninghamiana*, this tree is in good condition.

- Trees viability to development: this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- Development Impacts: AS 4970 2025 (Section 4) requires a TPZ setback of 7.2 radius from centre of trunk (COT). The setback for the proposed roadway development adjacent to these specimens is estimated at 5.5m from COT, which is an estimated 12.4% encroachment into the NRZ by the proposed development. It is expected for this loss of root area by the roadway development, is to be compensated, by incorporating this TPZ into the protection zone of neighbouring trees (Figure 5).

The alignment of the development will be a moderate encroachment to this specimen. The section of the roadway development within the NRZ of this tree is to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.

Tree 276, *Jacaranda mimosifolia* 277 *Jacaranda mimosifolia*, 278 *Jacaranda mimosifolia*, 279 *Schinus molle*, 280 *Melaleuca linariifolia*, 281 *Jacaranda mimosifolia*, these trees are in good condition. These trees are located



outside the property boundary, on the upper side of a ~1.8m retaining wall. These trees overhang into the site and may require pruning to limit damage from development activities.

- **Trees viability to development:** this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ setback of 2.0 radius from centre of trunk (COT). The setback for the proposed roadway development adjacent to these specimens is estimated at 1.6m from COT, which is estimated to be up to 8.2% encroachment into the NRZ by the proposed development. However, due to the trees being raised above the property boundary, impacts to these trees are not expected (Figure 5).

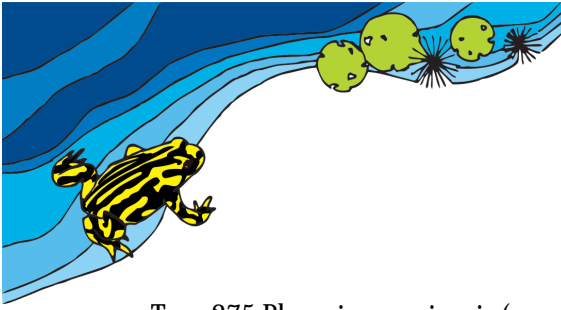
The alignment of the development is not considered an encroachment to these specimens to these specimens. The section of the roadway development within the NRZ of this tree is to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist.

Tree 282, 283, 291, 292 *Casuarina cunninghamiana*, these trees are in good condition.

- **Trees viability to development:** this specimen is impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ setback of 6.5m (T282), 4.8m (T291), 3.0m (T292) radius from centre of trunk (COT). The setback for the proposed roadway development adjacent to these specimens is estimated at 3.6m (T282), 1.2m (T291), 2.8m (T292) from COT, which is an estimated 17.6% (T282), 33.9% (T291), 2.9% (T292) encroachment into the NRZ by the proposed development.

However, although the calculations of encroachments are minor (T292), moderate (T282) and major (T291), the actual area for root growth will be increased due to the removal of previously covered carpark. It is expected that these trees will continue to grow without issue.

The alignment of the development is not considered an encroachment into the NRZ of these specimens. The section of the roadway development within the NRZ of this tree is to be constructed in compliance with AS 4970 2025 Protection of trees on development sites to engineers' specifications with work to be undertaken in consultation with the project arborist. Tree protection fencing is to be installed as indicated in Figure 5 and comply with AS 4970 2025 (Section 4).



Tree 275 Phoenix canariensis (exempt sp.), this tree is in good condition.

- **Trees viability to development:** this specimen is not impacted by the proposed development. The project arborist is to certify the installation of protection measures as per DA conditions, prior to commencement of works and be monitored throughout the project at approximately 3 monthly intervals depending on the length of the development. The specimen should remain viable beyond completion of the development provided recommended installation and protection measures are adhered to.
- **Development Impacts:** AS 4970 2025 (Section 4) requires a TPZ setback of 2.0m radius from centre of trunk (COT). The setback for the proposed development adjacent to this specimen is estimated at 4.0m from COT, which is not an encroachment into the NRZ by the proposed development. The specimen is sufficiently setback from the development to not be affected. Tree protection fencing is to be installed as indicated in Figure 5 and comply with AS 4970 2025 (Section 4).

Tree 271, 218, 219, 220, 223, 224, 226, 227, 228, 256, 257, 258, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 284, 285, 286, 287, 290, 300, are located at a sufficient distance from the proposed development to not be impacted. These trees are to have tree protection fencing installed as per the Tree Protection Fencing Diagram illustrated in Figure 5. Tree protection fencing is to comply with AS 4970 2025 (Section 4).

#### General - Tree Protection Works (Prior to demolition)

Hold Point – Prior to demolition works, a Project arborist shall be appointed to supervise all tree protection procedures detailed in this specification. The Project Arborist shall have a minimum level 5 AQF qualification in Arboriculture. Hold Points are to be adhered to throughout the duration of this development and all relevant documentation is to be submitted to the local authority.

The Tree Protection Zone for each tree/s is to be incorporated into the construction works for the site and the protection fencing or works to be situated as indicated in Figure 5, Figure 6 and Figure 7.

#### Specific – Tree Protection Works (Prior to demolition and Tree removal)

Prior to demolition and tree removal works these tree/s are to be placed within a Tree Protection Zone with protective fencing and maintained and retained until the completion of all building works.

The Protective fencing where required may delineate the Tree Protection Zone (TPZ) and should be situated as determined by the project arborist in accordance with AS 4970 2025 Protection of trees on development sites, Section 4, 4.4. “Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ must be secured to restrict access. AS 4687 2022 Temporary Fencing and Hoardings specifies applicable fencing requirements. Shade cloth or similar



should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing” or similar.

Tree Protection signage is to be attached to each TPZ and displayed from within the development site in accordance with AS4970 2025 Protection of trees on development sites.

There is to be no storage of materials, rubbish, soil, equipment, structures or goods of any type to be kept or placed within 5 metres from the trunk or within the dripline of any tree for the duration of the development. This will ensure protection of the tree/s to be retained on or adjacent to site.

Hold Point - Project arborist is to inspect/assess all retained specimens prior to demolition to inspect tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection

Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby. Where structural roots are to be removed this should be undertaken manually by the use of non-motorised hand tools after the stump has been ground out when such roots are often easier to locate from the site of the stump from which they have been severed.

#### Specific – Tree protection Works (Post demolition and prior to construction)

Hold Point - Project arborist is to inspect/assess all retained specimens prior to construction in relation to tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection.

Any utility services to be situated underground within the TPZ are to be undertaken utilising excavation techniques that prevent or minimise damage to structural roots (roots greater than >20 mm diameter). To prevent soil compaction and root damage these works should be conducted with non-motorised hand tools, air knife or directional drilling.

#### Specific – Tree Protection Works (During construction)

Hold Point - Project arborist is to inspect/assess all retained specimens during construction in relation to tree protection measures to monitor that they have been carried out as per the approved D/A conditions for the site. Documentation is to be submitted to the consenting authority after each inspection.

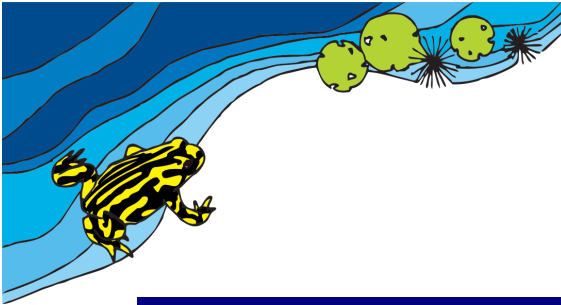
Where any structural roots (roots with a diameter of greater than >20 mm) encountered by excavation are to be pruned and it is to be undertaken with clean sharp pruning tools, with a final cut to undamaged wood to prevent infestation by pathogens and assist continued root growth and undertaken in consultation with the Consulting Arboriculturist. Tree Protection Zone fences are to be maintained during these works.



All Tree Protection Zones of retained trees are to be monitored for the duration of the construction phase of the development. Soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system could be installed and maintained by a competent individual and weeding - weeds should be removed by hand without disturbing soil or should be controlled with weedicide.

#### Specific – Tree Protection Works (Post Construction)

Hold Point - At completion of construction work the Project Arborist should carry out an assessment of all trees retained & or affected by works. This assessment is to document any required on-going remedial care needed to ensure viable retention of trees affected. Documentation is to be submitted to the consenting authority.



## Appendix 8. Company Profile

Abel Ecology has been in the flora and fauna consulting business since 1991, starting in the Sydney Region, and progressively more statewide in New South Wales since 1998, and now also in Victoria. During this time extensive expertise has been gained with regard to Master Planning, Environmental Impact assessments including flora and fauna, bushfire reports, Vegetation Management Plans, Management of threatened species, Review of Environmental Factors, Species Impact Statements and as Expert Witness in the Land and Environment Court. We have done consultancy work for industrial and commercial developments, golf courses, civil engineering projects, tourist developments as well as residential and rural projects. This process has also generated many connections with relevant government departments and city councils in NSW. Our team consists of eight scientists and four administrative staff, plus casual assistants as required.

### Licences

NPWS s132C Scientific licence number is SL100780

NPWS GIS data licence number is CON95034

NSW Dept of Primary Industries Secretary's Animal Care and Ethics Committee Approval: 18/575

NSW Dept of Primary Industries Animal Research Authority. Accreditation No: 84207

### The Consultancy team

#### Dr Danny Wotherspoon

BSc, DipEd, MA, PhD, Grad Dip Bushfire Protection,

MECA NSW, MEPLA, MNELA, MESA, MEIANZ, White card.

Danny has practised as an ecological and bushfire consultant since 1991.

He is a consulting ecologist to private developers, State Government agencies and various City Councils on a regular basis, for development applications, government projects, and as expert witness in the NSW Land and Environment Court.

Danny's PhD researched fragmented vegetation and fauna habitat use. He has special expertise in fauna habitat use. Danny has presented invited papers at international conferences since 2001 in Australia, China, South Africa, Sri Lanka and Israel on his PhD and other research, including golf course habitat management. Danny's scientific papers have been published in both international and Australian academic journals.



## Mark Mackinnon

B Env. Sci. (Hons); Grad. Dip. in Bushfire Protection.

Accredited Practitioner Level 3 - Bushfire Planning & Design (BPAD); Accreditation number 36395.

MEIANZ, White Card.

Mark is a passionate and enthusiastic scientist who thrives in the field of natural resource management. He has experience in threatened species, fire ecology, bushfire management, pest plant and animals, and landscape restoration. In particular he specialises in ornithology and bushfire management. Mark has several specialized field-based skills including simple and complex tree climbing, working at heights, general firefighter departmental fire accreditation, venomous snake and reptile handling, immunization to handle bat species, and an A - class bird banding licence with mist-net endorsement. Mark is also skilled in GIS mapping, first-aid and four -wheel-driving.

## Mark Sherring

BM, MAABR, Cert. Hort., Cert. Bush Regen, Cert. Rural Ops, White Card.

Member of the Australian Association of Bush Regenerators.

Mark has extensive knowledge and experience of plant species in New South Wales. He has built up his expert knowledge on NSW native plant species over the many years that he has practiced as a Botanist. He is regularly asked to contribute to the extensive (ongoing) flora surveys of the Sydney Basin and Blue Mountains carried out by the Royal Botanic Gardens, Sydney. Mark has extensive field survey experience, having worked for over ten years in various plant-related roles. His role in Abel Ecology is to provide expert advice on flora and on the full range of flora management issues encountered, and in the design and management of environmental monitoring projects.

## Nicholas Tong

BSc (Biology), MPhil (Ecology), Cert. III CLM

BAM Accredited Assessor (BAAS22012),

MECA NSW, Snr First Aid, White card.

Nicholas is an experienced ecologist with expertise in fauna, plant species identification, vegetation assessment and ecological restoration. In the last six years, he has been a consulting ecologist to private developers and large corporations, for a variety of projecting including State Significant Developments. Nicholas has extensive field work experience in Sydney, the Blue Mountains and Central West NSW. His Master's project investigated the impacts of exotic predators on herpetofauna in the arid zone. His role at Abel Ecology is to provide expert advice on fauna and the application of the Biodiversity Offset Scheme.



## Andy Araya

Botanist / Ecologist

B Env. Sci. M Teach (Env., Marine, Agr., Bio., Chem.), Dip. Marine Operations

First Aid Cert. White Card. ACDC Chemical Licence, RPA Operator, NSW Boating Licence, Marine Radio Licence, Security Licence, Chainsaw Licence.

Andy has over 15 years' experience as a bush regeneration supervisor working across a number of environments throughout NSW and QLD from EEC of the Cumberland Plain, riparian and wetland areas, sand dunes and rainforests, to the higher elevations of the Blue Mountains National Park. Managing teams of up to 10 staff in remote areas as well as urban environments has allowed Andy to hone his skills of communication and native species identification. Andy's additional experience as a builder in the building and construction industry gives him a solid understanding of the considerations and legal requirements clients face in mitigating environmental and personal harm.

## Emily Barbaro

Ecologist

BA, MPublishing, Grad. Cert. EnvSc, MESSM

Emily has completed a Graduate Certificate in Environmental Science and a Master of Environmental Science and Management. During her degree, Emily also completed the Volunteer Botanical Training Program at the Australian National Herbarium, Centre for Australian National Biodiversity Research and CSIRO. The Program included both botanical and general herbarium tasks, such as archiving plant specimens, plant identification, and assistance with taxonomic research projects. Emily has previously worked as a Bush Regenerator and has been volunteering with Bushcare for Blue Mountains City Council for the last three years. She is passionate about continuing to learn more about her local Blue Mountains flora and fauna.

## Rohan Chretien

Junior Ecologist

B Env. Bio

Rohan has completed a Bachelor of Environmental Biology (Environmental Sciences) at the University of Technology Sydney. During his degree, he completed a student research internship and volunteer research work under the UTS School of Life Sciences' Terrestrial Ecology Lab, developing his field surveying and reporting skills. This research looked at plant-pollinator interactions, native vegetation and invertebrate observation, as well as floral production of invasive species in disturbed environments. Rohan is passionate about furthering his understanding of ecological niches, systems and impacts as well as gaining an advanced knowledge of conservation practices.



Emma Colless

Junior Ecologist

BSc (Enviro.)

Emma holds a Bachelor of Science in Environmental Science from the University of Technology Sydney, where she developed skills in plant identification, field surveys and environmental management strategies. As a graduate ecologist, Emma is committed to expanding her hands-on experience in plant identification and field survey techniques. She has a genuine passion for native flora and urban environmental management, is enthusiastic about applying her scientific knowledge in practical settings and delivering innovative and sustainable project outcomes.

Dr Stephanie Clark

Specialist Consultant

B Sc (Hons), PhD.

Stephanie has over 30 years' experience in the collection, identification and taxonomy of marine, estuarine, freshwater and terrestrial molluscs. She has conducted numerous targeted surveys for endangered and threatened species (particularly land and freshwater molluscs) in both Australia and the United States. She is particularly interested in the systematics, taxonomy, morphology (external and internal), population and conservation genetics and conservation of molluscs particularly terrestrial (especially the Helicoidea) and freshwater (especially the Hydrobiidae and related families) groups.