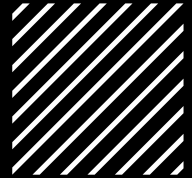




ARBORICULTURAL IMPACT ASSESSMENT

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1 PARKVIEW AVENUE, BELFIELD

ARBORICULTURAL IMPACT ASSESSMENT IN ACCORDANCE
WITH AS 4970-2009 FOR TREES ON DEVELOPMENT SITES

Phone : 0433 946 019

Email : steven@arborcheck.com.au

Web : www.arborcheck.com.au

ABN : 51 628 117 751



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1. Executive Summary

Arborcheck was engaged by Rony Obied (the client) to prepare an Arboricultural Impact Assessment and Tree Protection Plan for the trees located near the proposed development at 1 Parkview Avenue, Belfield (the subject site).

The initial Visual Tree Inspection (VTA) was conducted from ground level on Wednesday, 3rd April 2024, by Steven Sammut (AQF Diploma L5 Arborist), assessing 17 trees. Trees were geolocated using the Survey Plan or a Garmin eTrex22, numbered, and physically tagged for identification throughout the construction process (except neighbouring trees and council trees). Tree locations have been scaled onto the provided site plan using QGIS to accurately plot their Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) to assess potential development encroachment.

This report aims to document trees that can be retained or require removal to accommodate the proposed development works. Recommendations have been provided where possible to integrate suitable trees and construction, following the guidelines and practices published within AS4970-2009 Protection of trees on development sites.

The table below outlines the trees set for removal and retention:

Retention Value	Retain and Protect	Remove
High	0	0
Medium	1	9
Low	1	6
Total	2	15

A Tree Protection Plan at the end of this Arboricultural Impact Assessment details tree protection and construction methods to be followed during each stage of the construction process.



2. Disclaimer

This report has been crafted in alignment with the agreed scope of works between ArborCheck and the client. Its validity is strictly from the date specified on the cover page and in the footer of each page, superseding any prior revisions related to the subject site. However, any new information, revisions, or events occurring after the publication date render this report void.

ArborCheck holds adequate experience and expertise in arboriculture to undertake tasks as per the AS4970-2009 guidelines for protecting trees on development sites. All reasonable care has been taken to gather reliable information presented in this report. The discussions and recommendations herein are based on observations made during the inspection and under specified conditions.

While this report provides statements, opinions, or advice in good faith, ArborCheck holds no liability, whether through negligence or otherwise, for any damage, injury, or loss arising from the interpretation or action taken based on the information provided within this report.

A tree's response to its environment evolves throughout its life cycle and is affected by numerous external factors, including unpredictable events like extreme weather conditions. Although a visual tree assessment (VTA) can reveal external symptoms and defects, it cannot guarantee immunity to failure due to unforeseen circumstances. Consequently, ArborCheck cannot be held responsible for any resultant damage, injury, or loss.

This report does not definitively ascertain details about parts of a tree's root system not exposed to visual inspection. It's also impossible to assure a tree's perpetual safety under all future conditions.

The client is responsible for managing ongoing inspections of the trees mentioned in this report and should engage qualified arborists as needed.



3. Introduction

ArborCheck was tasked by Rony Obied (referred to as “the client”) to prepare an Arboricultural Impact Assessment focusing on trees surrounding the proposed development site at 1 Parkview Avenue, Belfield. A thorough site inspection, including a Visual Tree Assessment (VTA), was conducted on 25/05/2025, aimed at gathering essential tree data. All details regarding the planned development, as outlined in this report, have been extracted from the client-provided documentation listed in section 2 of this report.

The client’s objective involves submitting a development application to the Canterbury Bankstown, aiming to demolition of the existing structures and construction of a dual occupancy.

This report evaluates the potential for retaining the subject trees during and post the proposed development, aligning with various planning regulations and Australian Standards specified in Section 2. The primary goal is to apply the guidelines outlined in AS4970-2009 Protection of trees on development sites to determine the feasibility of harmonizing trees with construction. It also aims to offer suggestions regarding tree preservation and safeguarding or, if necessary, tree removal and replacement. These recommendations are based on the trees’ preservation value and the degree of proposed encroachment.

Section 8 provides a Tree Schedule, cataloging all tree data obtained during the site inspection that contributed to this report. This comprehensive table includes details such as botanical and common names, location, protection status, dimensions encompassing height, crown spread, Diameter at Breast Height (DBH), Diameter at Base (DAB), calculated Tree Protection Zone (TPZ), calculated Structural Root Zone (SRZ), age classification, tree health, structural integrity, and observed tree defects.

For reference, a glossary of terms is available in Appendix 1 of this report.

The following documents have been reviewed by ArborCheck to prepare this report:

- Architectural Plans
- Survey Plan
- Landscape Plan

This report has been prepared with consideration to the following planning instruments and policies:

- Biodiversity Conservation Act 2016 No 63
- Biodiversity Conservation Regulation 2017
- State Environmental Planning Policy (Biodiversity and Conservation) 2021
- Canterbury Bankstown Local Environmental Plan 2023
- Canterbury Bankstown Development Control Plan 2023
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- AS4970-2009 Protection of Trees on Development Sites
- AS4373-2007 Pruning of Amenity Trees



4. Scope of Works

The objective of this report is to recognise trees situated on the subject site and neighboring areas that might face direct or indirect impacts due to the proposed development activities. Recommendations within this report are formulated concerning the preservation and safeguarding or removal and substitution of evaluated trees, aligning with the legislation outlined in section 3.

trees that are more than 5m in height

4.1 Limitations

This report does not serve as a site evaluation and does not involve intrusive/internal testing of tree components, diagnostic examinations, aerial tree assessments, soil analyses, root mapping, or underground examination of tree parts.

The assessment was confined to what was accessible during the site inspection. Consequently, the evaluation of tree health and structure relied solely on ground-level observations of the external aspects of each tree. In cases where trees on adjacent properties were appraised, all measurements were approximated unless expressly specified.

Detailed plans outlining cut/fill operations or above/below ground service placements were not furnished to ArborCheck for the creation of this report.



5. Method

On [DATE], a Ground-level Visual Tree Inspection (VTA) was carried out by Steven Sammut (AQF Dip L5 Arborist). Utilising a Trimble TDC600 handheld data collector, tree data was geotagged and compiled. Each tree received an individual identification number. The collected data encompassed various details:

- Botanical and common tree names
- Tree location
- Approximate height (m)
- Approximate crown spread (m)
- Diameter at Breast Height (DBH) in millimeters
- Diameter at Base (DAB) in millimeters
- Tree age classification
- Assessment of tree health, vigor, structure, and defects
- Estimated Life Expectancy (ELE)
- Significance and Retention value of the tree

DBH measurements were taken 1.4 meters above ground level, while DAB measurements were assessed over bark at ground level using a diameter tape. Heights and crown spreads were approximations unless specifically stated otherwise.

Following the guidelines stipulated in AS4970-2009 for the Protection of trees on development sites, Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) were calculated. ArborCheck has use ARCGIS to map these zones onto the provided site plan in the specified scale. For palms, other monocots, cycads, and tree ferns, TPZ calculations extended to 1 meter outside their crown projection.

5.1 Tree Retention Value Categories

Each subject tree has been assigned a high, medium, or low retention value rating based on the Institute of Australian Consulting Arborists' (IACA) Significance of a Tree Assessment Rating System (STARS). This document acknowledges the original concept and contribution of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd and Andrew Morton in June 2001. The full method is detailed in Appendix 4.

High - Priority for Retention (High)	These trees are deemed significant for retention and must be preserved and protected. Any design modifications or relocation of buildings should accommodate the setbacks as specified by the Australian Standard AS4970 Protection of Trees on Development Sites. Tree-sensitive construction techniques, such as pier and beam, must be employed if work is to proceed within the Tree Protection Zone.
Medium - Consider for Retention (Medium)	These trees should be retained and protected. Although they are deemed less critical, their preservation should remain a priority. Removal should only be considered if it significantly impacts the proposed construction or activities, and after all other alternatives have been thoroughly evaluated and exhausted.
Low - Consider for Removal (Low)	These trees are not deemed significant for retention and do not necessitate any special measures or design modifications to ensure their preservation.
Remove with Priority	These trees are hazardous, declining, or weeds and should be removed.



5.2 Tree Structure and Vigour

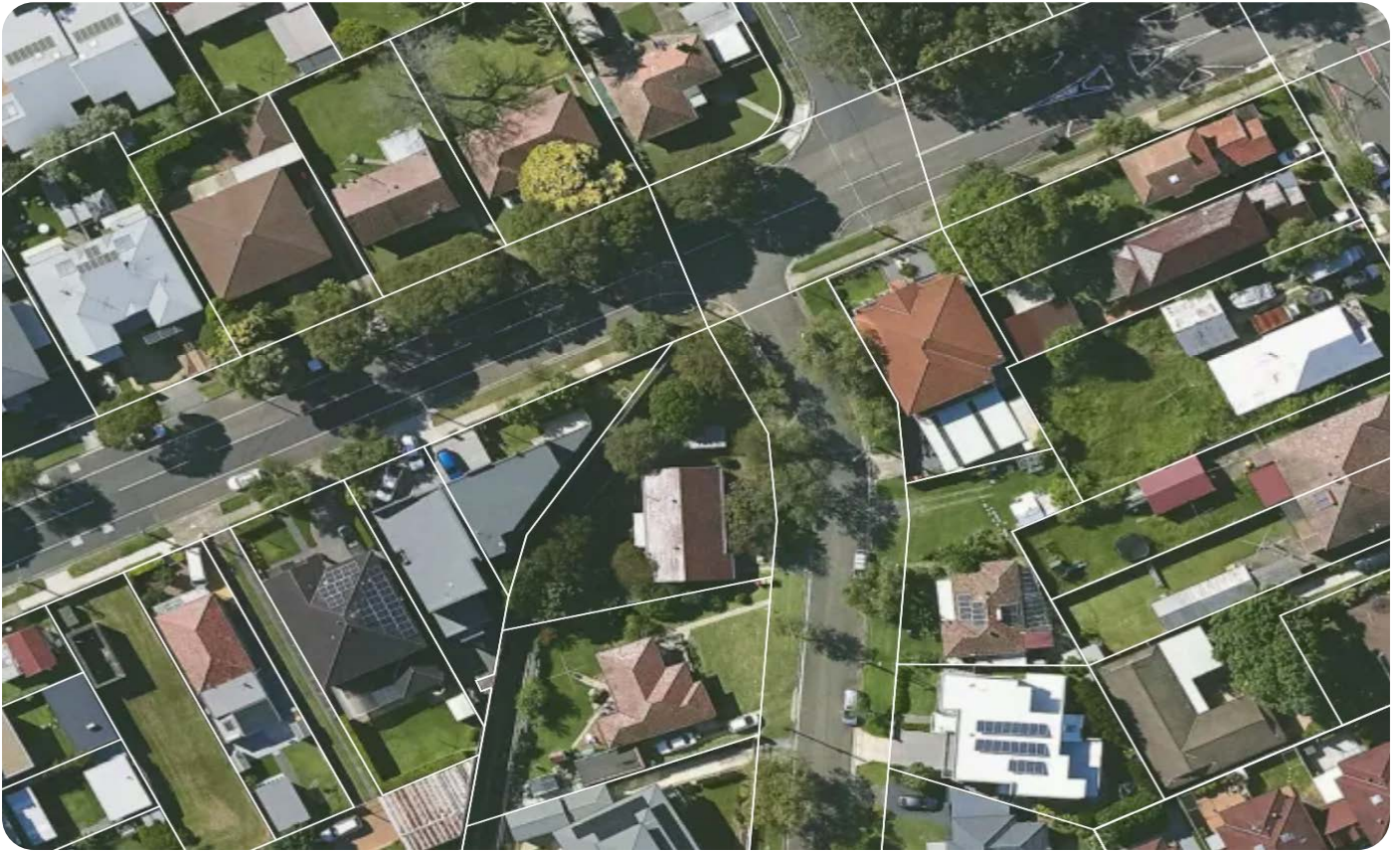
The health and structure of each subject tree have been categorised as Very Good, Good, Fair, or Poor according to the classifications provided below. Observations are documented in the VTA Table.

	Vigour	Structure
Very Good	Specimen exhibits typical characteristics of the species, with standard foliage size, colour, and density. It shows no signs of pests or disease, and there is no deadwood or epicormic shoots present.	Stable structure, no defects or damage observed.
Good	The specimen exhibits the typical characteristics of its species, including standard foliage size, colour, and density. It shows no signs of pests or disease, has minimal deadwood, and very few epicormic shoots.	The structure has good integrity with minor defects that can be fixed.
Fair	Form typical of species, in fair health and vigour, possibly with slight thinning or sparsity, moderate levels of deadwood and epicormic shoots, and low to moderate presence of pests and diseases.	Adequate structural integrity, with minor to moderate defects that can be corrected or managed.
Poor	Unusual foliage size, colour, density, significant deadwood, epicormic shoots, and moderate to severe pest infestation.	Structural integrity issues and major structural defects that cannot be remedied.



6. Description of the Subject Site and Development

The site is in the Canterbury Bankstown LGA and is zoned R2. The site is known as 1 Parkview Avenue, Belfield and its legal description is Lot 1/DP204490. The site has an area of 752.5sqm.



The development proposes demolition of the existing structures and construction of a dual occupancy.



7. VTA Tree Inspection Schedule

KEY																
• DBH = Diameter at breast height (1.4m) • DAB = Diameter at base • TPZ Radius = Tree Protection Zone (refer to 5.2.1) • SRZ Radius = Structural Root Zone (refer to 5.2.2) • Age: Immature = <20% of life expectancy for species Semi-mature = 20-50% of life expectancy for species Mature = 50-80% of life expectancy for species Over-mature = >80% of life expectancy for species • Estimated Life Expectancy: Long = > 40 years Medium = 15 - 40 years Short = 5 - 15 years • Retention Value (STARS): High = priority for retention Medium = may be retained and protected, considered less critical Low = not considered important for retention																

TREE ID	SPECIES	LOCATION	EXEMPT SPECIES	HEIGHT (M)	SPREAD (M)	DBH (M)	DAB (M)	TPZ RADIUS (M)	SRZ RADIUS (M)	AGE CLASS	VIGOUR	STRUCTURE	LANDSCAPE SIGNIFICANCE VALUE	ESTIMATED LIFE EXPECTANCY (STARS)	RETENTION VALUE (STARS)	NOTES
1	Likely Prunus spp. (Ornamental Plum)	Front Yard	NO	5.5	4.5	0.32	0.45	3.84	2.37	Mature	Fair	Fair	Moderate	Short to Medium (5–20 yrs)	Medium	Tree has co-dominant trunks with visible bark damage and lichen; crown is sparse with minimal leaf density indicating decline; minor deadwood and possible pest presence. Proximity to structures and access points poses moderate risk.
2	Magnolia spp.	Front Yard	NO	4.5	3.5	0.17	0.27	2.04	1.91	Semi-mature	Poor	Fair	Low	Short (<15 years)	Low	Tree exhibits poor vigour—sparse crown, chlorotic and necrotic foliage, and fungal staining on stems. Hollow wounds and branch dieback visible. Located close to building, potentially affecting foundations and services. Decline appears advanced and potentially irreversible.
3	Lagerstroemia indica (Crepe Myrtle)	Front Yard	NO	6	5	0.26	0.3	3.12	2.00	Mature	Fair	Fair	Moderate	Medium (15–40 years)	Medium	Multi-stemmed specimen with evidence of basal damage and bark sloughing. Moderate canopy thinning, patchy foliage with signs of stress. Aesthetic value present; some decline visible but not critical.
4	Callistemon spp. (Bottlebrush)	Road Reserve	NO	7.5	6	0.4	0.6	4.8	2.67	Mature	Good	Good	Moderate	Medium (15-40 years)	Medium	Healthy specimen with full canopy. Lichen and moss presence. Positioned near road, providing amenity. No evident structural defects.
5	Likely Nerium oleander (Oleander)	Front Yard	NO	3.5	3.5	0.14	0.4	2	2.25	Semi-mature	Fair	Fair	Low to Moderate	Medium (15–25 years)	Low	Shrub-like multi-stem form. Generally healthy foliage, though older flowers are spent and some necrotic tips visible. No major defects, but does not meet definition of a tree per AS4970 (>3 m with clear trunk); significance mostly ornamental.
6	Likely Lagerstroemia indica (Crepe Myrtle)	Front Yard	NO	5.5	4.5	0.21	0.23	2.52	1.79	Mature	Poor	Fair	Moderate	Short to Medium (5–20 years)	Low	Tree displays signs of advanced decline: sparse crown, necrotic and chlorotic leaves, deadwood, and dry seed pods. Bark and branch condition consistent with stressed or senescing specimen. Located near infrastructure but with limited retention value.
7	Lagerstroemia indica (Crepe Myrtle)	Front Yard	NO	6	5.5	0.29	0.4	3.48	2.25	Mature	Fair	Fair	Moderate	Medium (15–30 years)	Medium	Large multi-stem specimen in a high-visibility location. Bark exfoliating naturally, canopy partially thinning. Moderate levels of spent seed capsules and patchy leaf colour indicate mild stress. Minor canopy clearance needed around powerlines.



TREE ID	SPECIES	LOCATION	EXEMPT SPECIES	HEIGHT (M)	SPREAD (M)	DBH (M)	DAB (M)	TPZ RADIUS (M)	SRZ RADIUS (M)	AGE CLASS	VIGOUR	STRUCTURE	LANDSCAPE SIGNIFICANCE VALUE	ESTIMATED LIFE EXPECTANCY (STARS)	RETENTION VALUE (STARS)	NOTES
8	Ligustrum lucidum (Large-leaf Privet)	Back Yard	NO	6	5	0.35	0.43	4.2	2.32	Mature	Good	Fair	Low to Moderate	Medium (15–30 years)	Low	Invasive species with healthy foliage and dense crown. Located close to fence and carport, potentially problematic due to vigorous growth. Basal flare is sound but co-dominant trunk present. Structure adequate, but species typically has low arboricultural value.
9	Likely Nerium oleander (Oleander)	Back Yard	NO	4	3.5	0.26	0.6	3.12	2.67	Semi-mature	Good	Fair	Moderate	Medium (15–30 years)	Low	Dense, upright multi-stemmed specimen with good leaf colour and flowering. Some basal congestion and minor suckering observed. Well-maintained appearance; moderate contribution to privacy and aesthetics despite shrub-like structure.
10	Viburnum odoratissimum (Sweet Viburnum)	Back Yard	NO	4	3.5	0.13	0.35	1.56	2.13	Semi-mature	Fair	Fair	Moderate	Medium (15–30 years)	Medium	Multi-stemmed hedge-like specimen used for screening. Canopy thinning in upper sections, with epicormic growth and suckers at base. Leaf health generally fair; minor pest signs on lower foliage.
11	Lagerstroemia indica (Crepe Myrtle)	Back Yard	NO	5.5	4.5	0.17	0.2	2.04	1.68	Mature	Fair	Good	Moderate	Medium (15–30 years)	Medium	Healthy main structure and trunk form with minimal defects. Canopy is generally well-formed but has some retained seed capsules and moderate thinning. Epicormic growth at base may need management. Positioned near building with potential minor clearance issues.
12	Citrus sinensis (Sweet Orange)	Back Yard	NO	4	3.5	0.19	0.22	2.28	1.75	Mature	Good	Good	High (productive value)	Medium to Long (20–35 yrs)	Low	Productive fruit tree with healthy foliage and good structure. Moderate fruit load with no visible structural defects. Located near outbuilding; appropriate clearance observed.
13	Eriobotrya japonica (Loquat)	Back Yard	NO	5.5	5	0.38	0.4	4.56	2.25	Mature	Good	Fair	Moderate	Medium (15–30 years)	Medium	Healthy dense foliage with no visible leaf chlorosis. Bark and trunk show minor past pruning wounds. Central lead dominates form; slight canopy asymmetry due to adjacent competition. Potential fruit production.
14	Lagerstroemia indica (Crepe Myrtle)	Back Yard	NO	5.5	4.5	0.24	0.34	2.88	2.10	Mature	Fair	Fair	Moderate	Medium (15–25 years)	Medium	Moderate canopy density with retained seed capsules and seasonal dieback. Base is multi-stemmed with clear exfoliating bark. No major defects visible, but proximity to fence may limit development. Routine pruning advised to manage structure and aesthetics.
15	Lagerstroemia indica (Crepe Myrtle)	Back Yard	NO	5	4.5	0.21	0.17	2.52	1.57	Mature	Fair	Fair	Moderate	Medium (15–25 years)	Medium	Canopy is moderately dense, with seasonal senescence (autumnal leaf tones and fruit retention). Bark exfoliation typical of species; minor basal suckering observed. Structure is upright, although some crowding with adjacent trees noted.

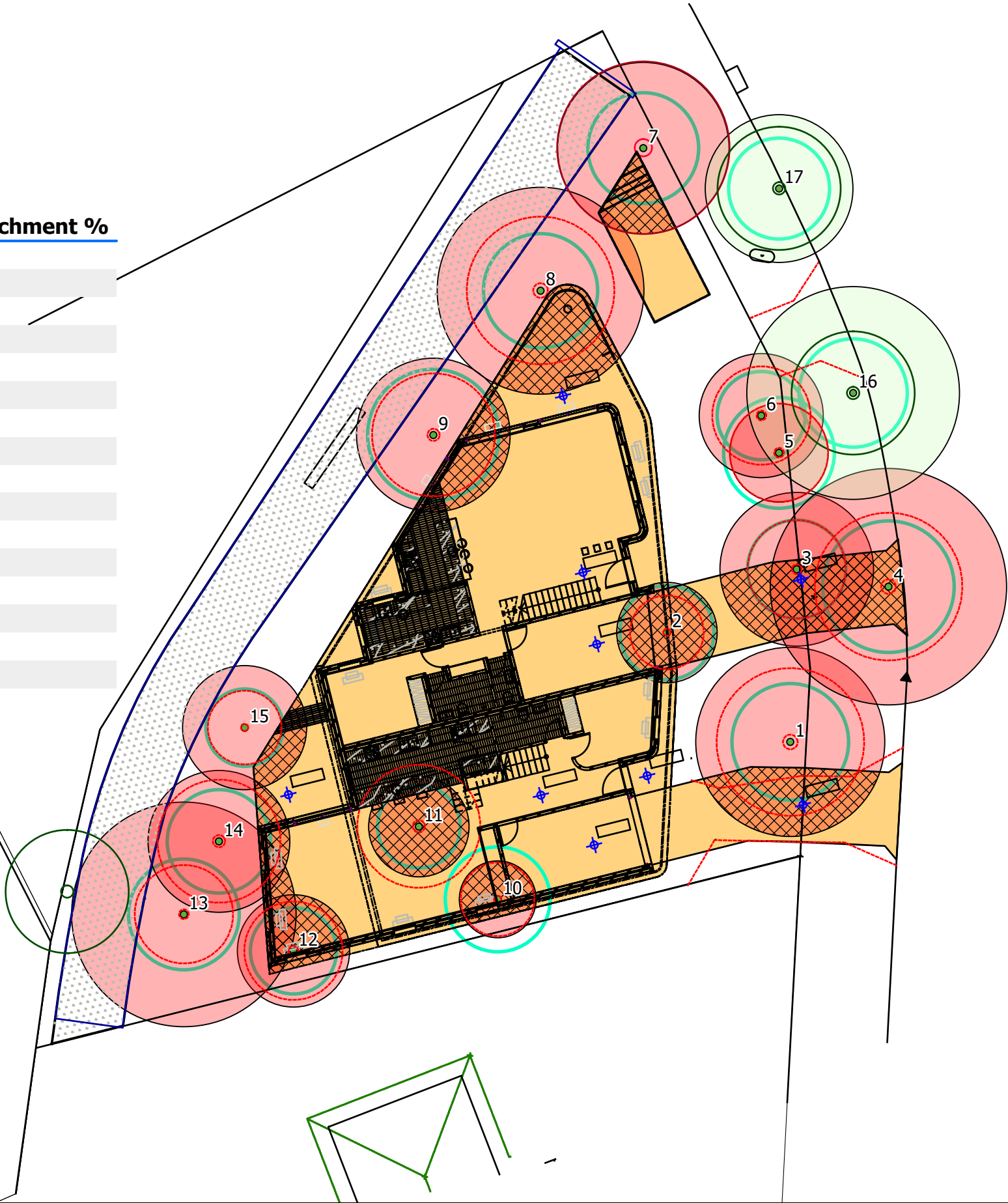
TREE ID	SPECIES	LOCATION	EXEMPT SPECIES	HEIGHT (M)	SPREAD (M)	DBH (M)	DAB (M)	TPZ RADIUS (M)	SRZ RADIUS (M)	AGE CLASS	VIGOUR	STRUCTURE	LANDSCAPE SIGNIFICANCE VALUE	ESTIMATED LIFE EXPECTANCY (STARS)	RETENTION VALUE (STARS)	NOTES
16	Callistemon spp. (Bottlebrush)	Road Reserve	NO	7	5.5	0.36	0.38	4.32	2.20	Mature	Fair	Fair	Moderate	Medium (15–30 years)	Medium	Sparse flowering observed; crown is uneven and thinning. Trunk shows signs of previous branch removal and moss coverage. Tree is structurally sound but declining in vigour. Located in streetscape with moderate visual contribution. Ongoing maintenance and monitoring required.
17	Callistemon spp. (Bottlebrush)	Road Reserve	NO	6	4.5	0.25	0.32	3	2.05	Mature	Fair	Poor	Low to Moderate	Short to Medium (5–20 yrs)	Low	Asymmetrical canopy due to prior pruning; limb wounds remain exposed. Moderate crown thinning and limited flowering. Mossy bark with minor decay visible at pruning cuts. Positioned near kerb; landscape contribution minimal.

8. Tree Protection Plan

Tree Number	SRZ	TPZ	Recommendation	TPZ Enorachment %	SRZ Enorachment %
1	2.37	3.84	Remove	31.37	22.49
2	1.91	2.04	Remove	93.97	95.54
3	2	3.12	Remove	53.57	61.48
4	2.67	4.8	Remove	22.39	42.58
5	2.25	2	Remove	14.69	14.01
6	1.79	2.52	Remove	28.58	29.25
7	2.25	3.48	Remove	31.29	28.26
8	2.32	4.2	Remove	77.31	70.32
9	2.67	3.12	Remove	100	100
10	2.13	1.56	Remove	50.94	61.01
11	1.68	2.04	Remove	8.35	6.14
12	1.75	2.28	Remove	16	7.88
13	2.25	4.56	Remove	20.48	
14	2.1	2.88	Remove		
15	1.57	2.52	Remove		
16	2.2	4.32	Retain		
17	2.05	3	Retain		

Legend

- Tree Number
- Enorachments
- SRZ
- Development Area
- Lot
- TPZ
- Recommendation
 - Remove
 - Retain



ArborCheck

Tree Protection Plan

Client: OBIED	Date: 31/5/25
Drawn: SS	Project No: TPZ104
Revision: 1	Scale: 1:200

SHEET
A01



9. Impact Assessment Table

TREE ID	BUILDING/CIVIL ENCROACHMENT DESCRIPTION	TPZ IMPACT (%)	SRZ IMPACT (%)	COMMENTS	RECOMMENDATION FOR REMOVAL/RETENTION
1	Driveway	31.37	22.49	Refer to the notes in Section 7 of the report regarding the condition of each tree. All of the nominated trees are proposed for removal to facilitate development.	Removal
2	Building Footprint/Driveway	93.97	95.54		Removal
3	Driveway	53.57	61.48		Removal
4	Driveway	22.39	42.58		Removal
5	<Null>	14.69	14.01		Removal
6	<Null>	28.58	29.25		Removal
7	Swimming Pool	31.29	28.26		Removal
8	Building Footprint	77.31	70.32		Removal
9	Building Footprint	100	100		Removal
10	Building Footprint	50.94	61.01		Removal
11	Building Footprint	8.35	6.14		Removal
12	Building Footprint	16	7.88		Removal
13	Building Footprint	20.48	<Null>		Removal
14	Building Footprint	<Null>	<Null>		Removal
15	Building Footprint	<Null>	<Null>		Removal
16	<Null>	<Null>	<Null>	Retain Tree on Council Road Reserve - No Impact or supervision required during construction.	Retention
17	<Null>	<Null>	<Null>	Retain Tree on Council Road Reserve - No Impact or supervision required during construction.	Retention



10. Discussion

This Arboricultural Impact Assessment examines the proposed encroachment to the root and crown zones and assesses the potential impact of the proposed activities on the subject trees. According to AS4970-2009 Protection of Trees on Development Sites, encroachment includes excavation, compacted fill, and machine trenching. The following activities are considered within this assessment:

- Existing Levels
- Proposed Levels
- Tree Protection Zones (TPZ)
- Structural Root Zones (SRZ)
- Crown Zones
- Footprint of the proposed development
- Temporary structures (scaffolding, hoardings etc.);
- Encroachment (crown, machine trenching, compacted fill, and excavation)
- Species tolerance to disturbance; and
- Assessment of the likely impact of the works on existing trees.

If the proposed encroachment is less than 10% of the Tree Protection Zone (TPZ) area and located outside the Structural Root Zone (SRZ), the tree may remain viable, provided that this encroachment can be compensated for elsewhere and remains contiguous with the TPZ.

If the proposed encroachment is greater than 10% of the TPZ and/or inside the SRZ, the project arborist must show that the tree(s) would remain viable by considering;

- Location and distribution of roots to be determined through non-destructive investigation methods (pneumatic, hydraulic, hand digging)
- The potential loss of root mass resulting from the encroachment (the number and size of roots)
- Tree species and tolerance to root disturbance.
- Age, vigour, and size of tree.
- Lean and stability of the tree.
- Soil characteristics and volume, topography, and drainage.
- The presence of existing or past structures or obstacles affecting root growth.
- Design factors.

11. Conclusion

An Arboricultural Impact Assessment was commissioned for 17 trees located at and adjacent to the proposed development work at 1 Parkview Avenue, Belfield. The information in this report aims to assist Canterbury Bankstown in determining arboricultural-related conditions for the Development Application.

The proposed trees for removal and retention have been outlined in the table below:

Rention Value	Retain and Protect	Remove
High	0	0
Medium	1	9
Low	1	6
Total	2	15

Appendix A at the end of this Arboricultural Impact Assessment outlines tree protection and sensitive construction methods for the subject development during the construction process.



12. Appendix A - Tree Protection During Construction

12.1 Construction Time for Tree Protection

The following sequence outlines the required timeline for project arborist certification throughout the development process. Each hold point must be reviewed and certified by the project arborist. All certifications are to be documented in written format upon the completion of each phase of development. The final certification should detail any remediation instructions executed during the development. The principal contractor is responsible for implementing all tree protection requirements.

Timeline	Stage	Completion Date and Signature
The Project Arborist will meet with the principal contractor to discuss tree protection methods and resolve any feasibility issues. The Project Arborist will also mark all trees approved for removal under DA consent.	Prior to development work commencing	DATE PROJECT ARBORIST SIGNATURE
The Project Arborist must assess and certify that tree protection measures have been installed in compliance with AS 4970-2009 before any site work commences.	Prior to development work commencing	DATE PROJECT ARBORIST SIGNATURE
According to AS 4970-2009, the Project Arborist should conduct regular site inspections to ensure compliance with the recommendations. Monthly site inspections are recommended.	On-going through the development	DATE PROJECT ARBORIST SIGNATURE
The removal of any existing structures within the Tree Protection Zone (TPZ) of trees designated for retention, including buildings and hard surfaces, must be conducted under the supervision of the Project Arborist.	Demolition	DATE PROJECT ARBORIST SIGNATURE



Timeline	Stage	Completion Date and Signature
The Project Arborist is responsible for supervising all manual excavations and root pruning within the Tree Protection Zone (TPZ) of any tree designated for retention. The Project Arborist must approve all root pruning activities involving roots greater than 30mm in diameter within the TPZ. All such root pruning must be executed by an AQF Level 5 Arborist.	Construction	DATE PROJECT ARBORIST SIGNATURE
The Project Arborist must certify that all underground services, including storm water within the Tree Protection Zone (TPZ) of any tree that is to be retained, have been installed in accordance with AS 4970-2009.	Construction	DATE PROJECT ARBORIST SIGNATURE
The Project Arborist must approve the relocation of tree protection for landscaping. All landscaping work within the Tree Protection Zone (TPZ) of trees that are to be retained should be carried out in consultation with the Project Arborist to reduce impact on the trees.	Construction / Landscape	DATE PROJECT ARBORIST SIGNATURE
After all demolition, construction and landscaping works are complete the Project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of the development	DATE PROJECT ARBORIST SIGNATURE



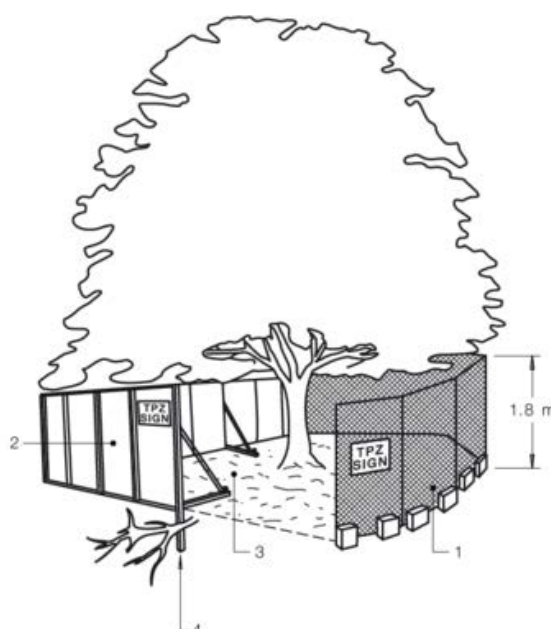
12.2 Guidelines for Tree Protection

The following tree protection guidelines should be followed during the construction period if there are no specific recommendations for individual trees.

12.2.1 Tree Protection Zone Establishment

Prior to the introduction of any machinery or materials onto the site, and before initiating any works such as bulk earthworks, fencing should be installed. Once in place, any alterations or removal of protective fencing must receive approval from the project arborist. Access to the TPZ must be restricted by securing it appropriately. The establishment and management of the Tree Protection Zone should adhere to the following guidelines:

- (1) Specify the trees within and around the subject allotment that are slated for preservation and protection during the development process. This could involve trees on neighboring properties as well as street trees.
- (2) The Tree Protection Zone radius should align with the calculation specified in the Individual Tree Data and Imagery.
- (3) Please locate and mark the alignment of protective fencing. This alignment may differ from the actual TPZ radius, taking into account areas where acceptable encroachment is permitted (determined in consultation with the project arborist) and site access needs. Protective fencing is necessary only within the subject allotment, assuming appropriate boundary fencing is already installed.
- (4) Set up protective fencing as depicted in the accompanying image. Adhere to the relevant fencing requirements outlined in AS 4687 for temporary fencing and hoardings. Additionally, affix shade cloth or a similar material to mitigate the transfer of dust, particulate matter, and liquids into the protected area.



LEGEND:

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



12.2.2 Protection When Works Within the Tree Protection Zone is Required

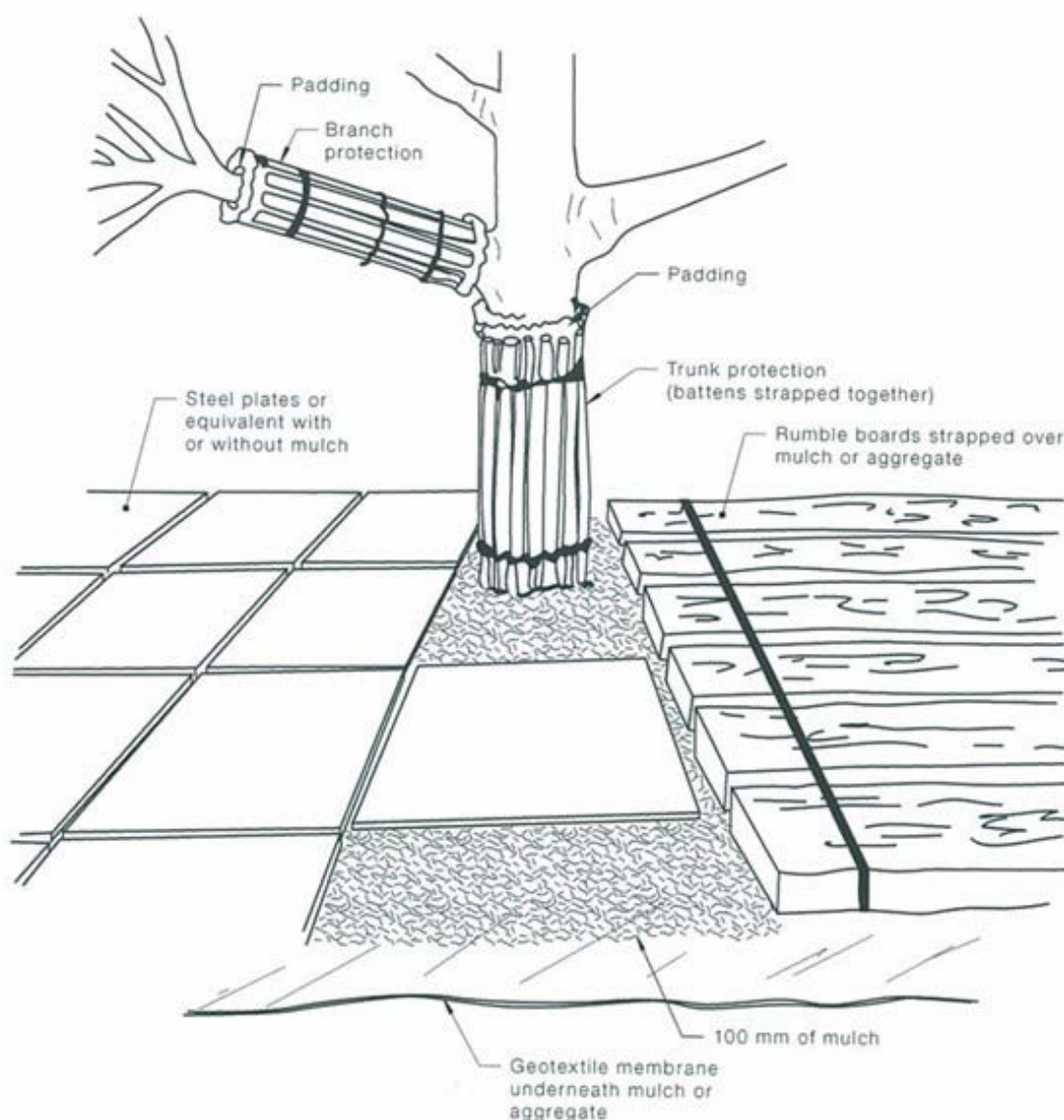
If the full TPZ radius fencing is reduced for vehicle or machinery access, heavy-duty ground and trunk protection must be implemented to allow safe passage of equipment like excavators, cranes, and hydro-excavation trucks.

The heavy-duty ground protection includes:

- (1) A layer of geotextile fabric on top of the natural ground.
- (2) Cover the geotextile with a 100mm thick layer of organic mulch.
- (3) Install ground protection on top of the organic mulch (Bog mat or timber battens)

Trunk protection will include protection to the trunk and branches of trees as shown below. A minimum height of 2m is recommended.

- (1) Install breathable padding or hessian around the trunk of the tree.
- (2) Install closely spaced timber battens around the trunk, with the top edge protecting the trunk/bark by the padding/hessian. Secure with strapping





12.2.3 Underground Services

Whenever possible, route underground services away from the TPZ. If necessary within the TPZ, use non-intrusive methods like horizontal directional drilling (HDD), non-destructive excavation (NDE) such as hydro-vacuum or Air Spade, or manual trenches. Ensure drilling is at least 600 mm deep. Note that trenching for services counts as "excavation." The project arborist should evaluate the impact of drilling and bore pits on trees.

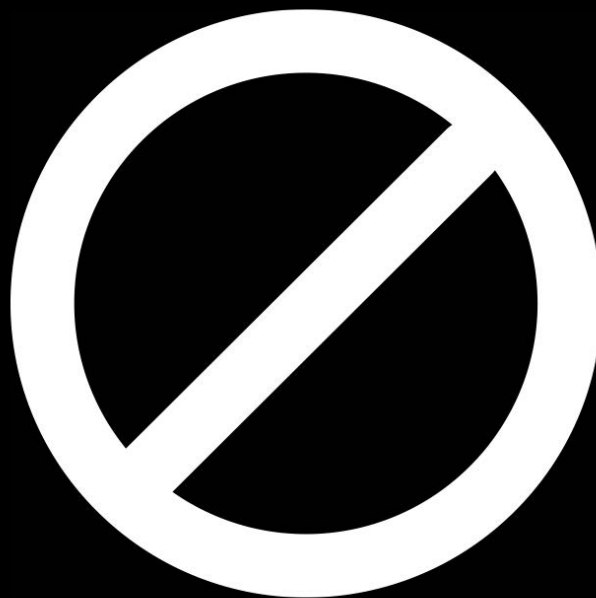


12.2.4 Example of a Tree Protection Sign



ArborCheck

TREE PROTECTION ZONE



NO ACCESS

CONTACT: ARBORCHECK

EMAIL: STEVEN@ARBORCHECK.COM.AU

PHONE: 0433 946 019

WEB: WWW.ARBORCHECK.COM.AU



13. Appendix B - Background Information

13.1 Limitations

This report does not serve as a site evaluation and does not involve intrusive/internal testing of tree components, diagnostic examinations, aerial tree assessments, soil analyses, root mapping, or underground examination of tree parts.

The assessment was confined to what was accessible during the site inspection. Consequently, the evaluation of tree health and structure relied solely on ground-level observations of the external aspects of each tree. In cases where trees on adjacent properties were appraised, all measurements were approximated unless expressly specified.

Detailed plans outlining cut/fill operations or above/below ground service placements were not furnished to ArborCheck for the creation of this report.



13.2 Method

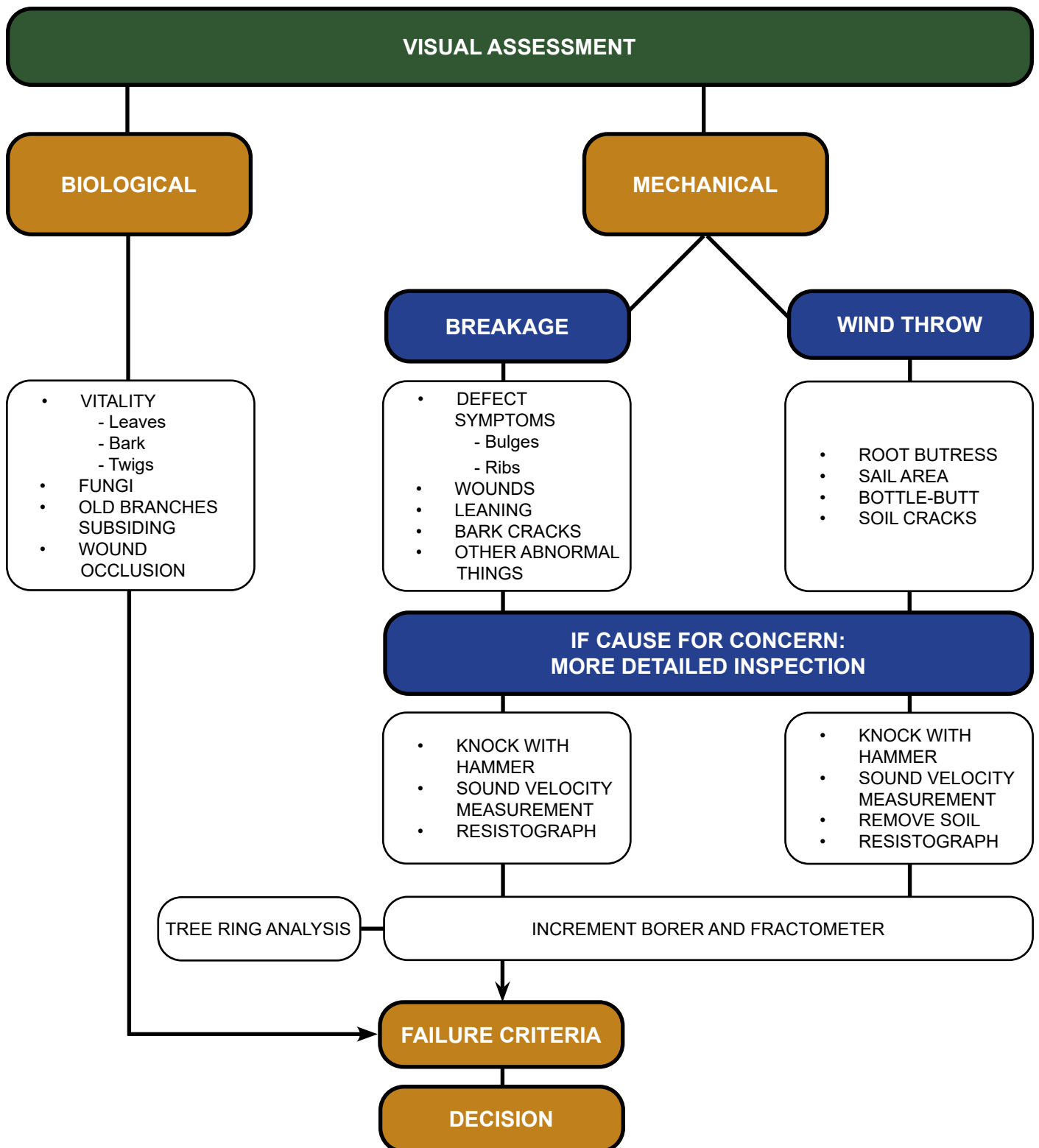
13.2.1 Visual Tree Assessment Methodology

The book 'The Language of Trees: A Guide to Analyzing Failures' authored by Claus Mattheck and Heinz Breloer in 1994 offers a comprehensive exploration of tree failure analysis. This publication delves into the Visual Tree Assessment (VTA) method, extensively detailing its principles. VTA relies on observing both the biological and mechanical attributes of trees to identify and evaluate structural defects and weaknesses. The method is systematically presented, providing a detailed framework for recognising and interpreting signs of tree defects. It incorporates various diagnostic tools and methodologies, including sonic and resistance measurements aimed at detecting decay.

The VTA Process

Chapter 8.4 of "The Body Language of Trees" (Mattheck, C., & Breloer, H. 1994) outlines the VTA process on page 118.

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
VISUAL ASSESSMENT	SYMPTOM EVALUATION	ADVANCED TESTING	EVALUATION OF SYMPTOMS	REMEDIAL ACTION
A visual assessment of the tree/s biological state of health and mechanical characteristics	Sounding and/or using non- destructive investigation methods to evaluate the defect further	If required; incremental borer machine or fractometer	Apply the VTA failure criteria	Provide mitigation or removal and replacement options
Biological and Mechanical Characteristic				
VTA Biological Characteristics Health & Vigour		VTA Mechanical Characteristics Structural / Condition		
• Suppressed species • Phototropic • Foliage size and colour • Sparse crown – photosynthetic area • Live crown ratio (%) • Defoliation • Dieback • Epicormic growth • Deadwood • Crown thinning • Bark delaminating/degraded/wounded • Saprophytes – cambial zone / periderm • Stem splits (increment growth) • Branches crossing/rubbing • Fauna browsing/damage • Kino or resin exudation • Pest (insect) and disease (pathogen) • Basal suckers • Soil compaction		• Deadwood (%) • Fungal fruiting bodies • Stem cracks/fractures • Stem taper • Subsiding branches • Excessive end weight • Branch attachments • Weak unions • Hangers • Inclusions – branch/stem • Codominant – crown/base • Previous failures • Pruning history – resulting health wounds/lesions/cankers cavities/decay/hollows • Stem bulges/swelling/ribs • Mechanical damage – stems / roots • Excessive lean / instability • Root inclusions • Root zone - soil upheaval		





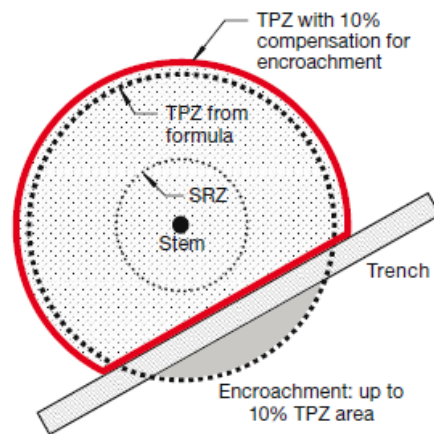
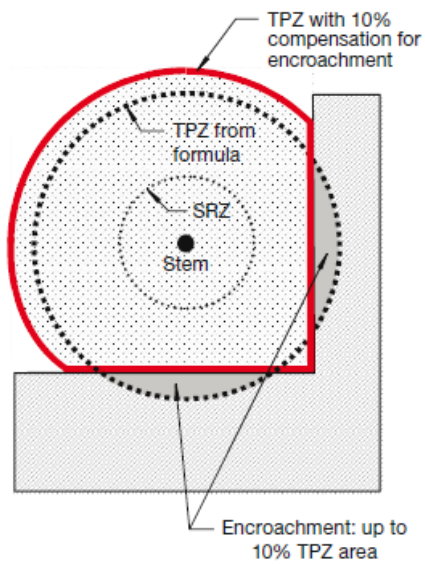
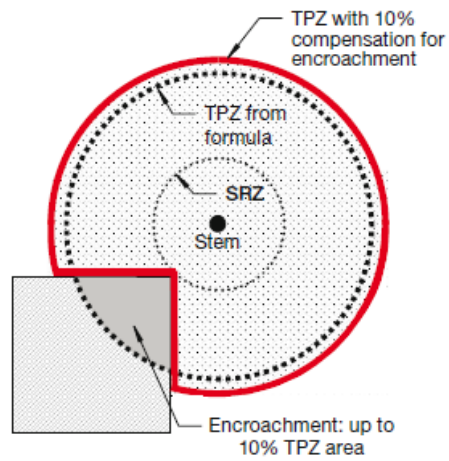
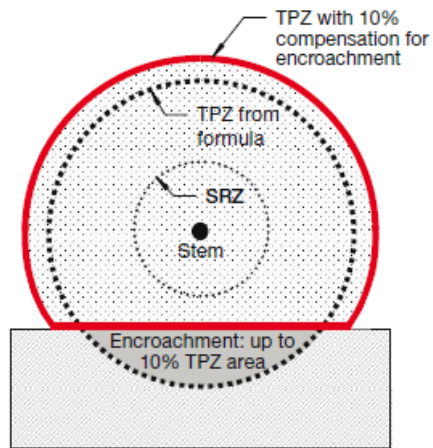
13.2.2 Calculations as per AS 4970-2009 Protection of Trees on Development Sites

Following the guidelines outlined in AS 4970-2009 for safeguarding trees on development sites, the Tree Protection Zone (TPZ) radius for individual trees is determined by multiplying their Diameter at Breast Height (DBH) by 12, as specified in Section 3.2 of AS4970-2009. The TPZ radius is measured from the center of the tree's stem at ground level. For trees with multiple stems, the formula used is $RTPZ = \sqrt{[(DBH1)^2 + (DBH2)^2 + (DBH3)^2]}$.

The TPZ should ideally range from a minimum of 2 meters to a maximum of 15 meters, except when specific crown protection is necessary, as outlined in Clause 3.3, which details variations to the TPZ. However, for palms, other monocots, cycads, and tree ferns, the TPZ should not be less than 1 meter beyond the crown projection.

Additionally, as per AS 4970-2009, the Stem Retention Zone (SRZ) radius is calculated by measuring the stem's diameter near ground level, just above the basal flare (D). The SRZ is determined by the formula $SRZ = (D \times 50)^{0.42} \times 0.64$, measured radially from the center of the stem.

Sometimes, encroachment into the Tree Protection Zone (TPZ) becomes unavoidable. To mitigate the impact of such incursions, the image below provides examples illustrating TPZ encroachment by area as a reference.





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

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.



Appendix A

The following example shows the IACA **Significance of a Tree, Assessment Rating System (STARS)** used in an Arboricultural report.

Tree Significance

Determined by using the Tree Significance - Assessment Criteria of the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010), Appendix B.

Trees 14, 16, 17/3, 19 and 20/4 are of high significance with the remaining majority of medium significance and a few of low significance. Tree 14 is significant as a prominent specimen and a food source for indigenous avian fauna. Tree 16 as a non-locally indigenous planting is of good form and prominent *in situ*; Tree 17/3 as a stand of 6 street trees along the Davey Street frontage screening views to and from the site and contiguous with trees in Victoria Park extending the aesthetic influence of the urban canopy to the site. Similarly for Trees 20/4 as street trees in Long Road and Tree 19 as an extant exotic planting as a senescent component of the original landscaping. The trees of low significance are recent plantings as fruit trees – Avocados, and 1 Cootamundra Wattle as a non-locally indigenous tree in irreversible decline and potentially structurally unsound.

Significance Scale

- 1 – High
2 – Medium
3 – Low

Significance Scale	1	2	3
Tree No. / Stand No.	14, 16, 17/3, 19, 20/4	1/1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12/2, 15, 18, 21/5	3, 13, 22

Tree Retention Value

Determined by using the Retention Value - Priority Matrix of the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010), Appendix B.

Retention Value

- High** – Priority for Retention
Medium – Consider for Retention
Low – Consider for Removal
Remove - Priority for Removal

Retention Value	High Priority for Retention	Medium Consider for Retention	Low Consider for Removal	Remove Priority for Removal
Tree No. / Stand No.	1/1, 5, 17/3*, 19	2, 4, 6, 7, 8, 9, 10, 11, 14, 15, 16, 18, 20/4*, 21/5	3, 12/2, 13,	22

* Trees located within the neighbouring property and should be retained and protected.



13.3 Definition of Terms

Age Class	• I = Immature (under 20% of life expectancy for species) • SM =Semi-mature (20-50% of life expectancy for species) • M =Mature (50-80% of life expectancy for species) • M = Overmature (over 80% of life expectancy for species)
Bark	All tissues outside the vascular cambium.
Botanical Name	A botanical name is the scientific name given to a particular plant species. It must conform to the system of botanical nomenclature as prescribed by the International Code of Nomenclature for algae, fungi, and plants (ICN).
Co-dominate stems/ union	Stems or trunks of about the same size originating from the same position from the main stem.
Common Name	The local name given to a particular plant species, as opposed to the scientific Latin or Greek name, is used universally. (taxonomy) The colloquial name of a taxon or species that is in any language.
Crown	A tree's crown, also known as the canopy, refers to the uppermost part of the tree, comprising its branches, leaves, and twigs. The portion of the tree extends outward and upward from the trunk and represents the tree's overall shape and appearance.
Crown Lifting	The removal of the lower branches.
DBH	Diameter at breast height - The nominal trunk diameter at 1.4 m above ground level is determined from the trunk's circumference divided by pi.
DAB	Diameter at base - determined from the trunk's circumference divided by pi.
Decay	The process of degradation of woody tissues by micro-organisms.
Dripline	A tree's dripline refers to the outermost edge of its canopy or crown. It is the imaginary line on the ground directly below the outermost reach of the tree's branches. When it rains, waterfalls on the branches and leaves drip off and fall to the ground, typically along this drip line.
Deadwooding	Removal of dead branches from the crown of a tree
Declining tree	A declining tree is a tree experiencing a gradual and sustained deterioration in health and Vigor. It shows signs of stress and exhibits various symptoms of decline over time. Declining trees may eventually reach a point where they cannot recover, leading to their eventual death if not addressed appropriately.
ELE	Estimated Life Expectancy (ELE) • Long = > 40 years (Long) • Medium = 15 - 40 years (Medium) • Short = 5 - 15 years (Short) • Remove = < 5 years (Remove)
Epicormic shoots	Shoots produced from epicormic buds at the cambium of trunks or branches.
Final cut	This is the final cut in the process of the reduction or removal of branches and stems. This final cut aims to reduce the risk of microorganism infection according to branch attachment and compartmentalisation principles to encourage even wound closure.
Flush cut	A flush cut to a tree refers to cutting a branch or limb completely flush with the main trunk or a larger branch. This means the cut is made very close to the point where the branch attaches to the tree, leaving no branch collar or branch bark ridge remaining.
Hanging branches	Unattached, cut or broken branches that are caught in the crown.
Height (m)	An estimate of a tree's overall height
Minor encroachment	If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.
Major encroachment	If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods.
Pathogen	A disease-causing organism.
Project arborist	The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.