ArborCert

Tree Management Consultants

Arboricultural Consultants, Appraisal and Certification

Australian Arborist License AL1733

Tree Risk Assessment Qualified 187593

Arboricultural Impact Assessment Report

AS-4970 Protection of Trees on Development Sites

Report prepared for:

Nathan Hollier

Site address:

1/32 James Street,

Horseshoe Bend NSW 2320

(Lot 1 DP 741557)

Prepared by:

Steve Watson

ArborCert

Arboricultural Consultants

Diploma of Arboriculture 1332873

Ref No: 0050 / 2025 - Date: 23rd April 2025

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Disclaimer

This Arborist Report complies with AS-4970 Protection of Trees on Development Sites.

This report was prepared for the exclusive use of Nathan Hollier (the client) for 1/32 James Street, Horseshoe Bend NSW 2320 (Lot 1 DP 741557) and ArborCert.

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This report does not identify all structural defects of trees inspected and no responsibility is accepted for faults not identified or predicted.

Conditions such as extreme wind, sufficient to break normal healthy branches, storms, lightning, and other events are common in storm season in the environment at this site and it is reasonably foreseeable that damage to healthy trees may well occur purely due to these events.

It is not possible to accurately identify all structural defects at high levels in trees or internal structural faults that cannot be seen by the naked eye. Due to the nature of tree growth, the location of roots is unpredictable.

The client should rely on the contents of this report only to the extent that some structural faults have been observed, but not all. No responsibility for damage to persons or property is accepted for damage by trees referred to in this report due to unforeseen or extreme environmental events.

The accurate identification of tree species can be difficult. Things such as modern cultivars, natural cross breeding and being able to locate seasonal flowers, fruits and seed pods can affect identification. Best efforts are made at the time of inspection.

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Nathan Hollier contacted ArborCert and commissioned an Arboricultural Impact Assessment be carried out on trees at 1/32 James Street, Horseshoe Bend NSW 2320 (Lot 1 DP 741557).

The aim of this report is to assess the arboricultural impact of the development and to ensure compliance with AS-4970, 2009 Protection of Trees on Development Sites.

ArborCert performed an on-site inspection on Wednesday 23rd April 2025.

In general, locating the development in this location requires the removal of three (3) trees. Trees 1, 3 and 4 are to be removed and are not part of this tree protection plan.

Tree 1 *Jacaranda mimosifolia* or Jacaranda is assessed as having Moderate Landscape Significance and Moderate Retention Value. The tree is in fair condition on the back side of the property. It has an unbalanced crown with bark inclusion between codominant stems showing soil, rot, and weeds growing. There is moderate deadwood and bark inclusions further up in the tree.

In my professional opinion, Tree 1 will be affected by the proposed development. The tree does not have significant value or utility and should be removed and is not part of this tree protection plan moving forward.

Tree 2 *Jacaranda mimosifolia* or Jacaranda is assessed as having Moderate Landscape Significance and Moderate Retention Value. Tree in fair condition on adjacent property with minor deadwood and epicormic shoots, several branches hangover over the fence

In my professional opinion, Tree 2 should be trimmed back to the fence line, and much of the proposed development will occur within the tree protection zone of this tree, but the development may go ahead on the proviso that a number of tree protection controls are put in place, and the tree should be retained and is part of this tree protection plan moving forward.

Tree 3 *Melaleuca bracteata* or Black Tea Tree is assessed as having Low Landscape Significance and Low Retention Value. The tree is in fair condition with bark inclusion between codominant trunks, it is on a northern lean with epicormic shoots at base.

In my professional opinion, Tree 3 will be affected by the proposed development. The tree does not have significant value or utility other than shade and food for small mammals and birds and should be removed and is not part of this tree protection plan moving forward.

Tree 4 Melaleuca quinquenervia or Broad-Leaved Paperbark is assessed as having Low Landscape Significance and Low Retention Value. The tree is in fair condition with extensive bark inclusions common to species. It has moderate deadwood and evidence of borer activity.

In my professional opinion, Tree 4 will be affected by the proposed development. The tree does not have significant value or utility other than shade and food for small mammals and birds and should be removed and is not part of this tree protection plan moving forward.

To ensure that protection measures are being adhered to during the pre-construction and construction stages, there should be a predetermined number of site inspections conducted by the Project Arborist (PA).

Thought should be given to a planting and tree management program to provide for new and care for existing trees and to increase canopy cover.

Increasing canopy cover improves the amenity, increases shade and screening but the greatest benefit is in the lowering of the heat island effect, or residual ground level temperatures.

It is recommended that the tree population is inspected annually and after major storm events for hazardous trees or as otherwise outlined elsewhere in this report.

This Report covers the next one (1) year only.

2.0 Introduction

Nathan Hollier contacted ArborCert and commissioned an Arboricultural Impact Assessment be carried out on trees at 1/32 James Street, Horseshoe Bend NSW 2320 (Lot 1 DP 741557).

The aim of this report is to assess the arboricultural impact of the development and to ensure compliance with AS-4970, 2009 Protection of Trees on Development Sites.

2.1 Brief

The purpose of this report is to assess the existing trees at 1/32 James Street, Horseshoe Bend NSW 2320 (Lot 1 DP 741557) likely to be affected by the proposed development. (please refer to figure 1 for area of report).

The Client requested that:

1. An Arboricultural Impact Assessment and accompanying Tree Protection Plan, specifically addressing issues with the proposal.

2. Outline the health and condition of existing trees on site affected by the development proposal including an Arboricultural Impact Assessment.

3. Assess the landscape significance and retention value of the trees listed.

From the Arboricultural Impact Assessment, recommendations to reduce impacts will be outlined in report, with emphasis on the protection of trees to be retained.

2.2 Methodology

ArborCert has performed an on-site inspection on Wednesday 23rd April 2025.

Visual Tree Assessment methodology as described by Mattheck and Breloer (1994) was used on all trees.

An initial site survey was conducted where the tree was surveyed, identified, measured, and assessed for health, structure, and sustainability.

Height dimensions were measured using a digital clinometer and Diameter at Breast Height (DBH) dimensions were measured using a diameter tape measure.

Canopy spread was measured by pacing out distances.

Age was estimated by experience of the species. Sustainability was based on the current age, estimated life span and by estimation of the difference between the two.

Hollows and cavities were investigated via sounding hammer and probe. Further investigation via Resistograph was used when required and a report included in Appendices if so required.

Observations were made from ground level using binoculars and later using a digital camera.

Further desk top assessment was conducted to ascertain Structural Root Zone (SRZ), Tree Protection Zone (TPZ) and other criteria regarding landscape significance and retention values (Standards Australia, AS-4970, 2009).

Landscape significance and retention value of trees was assessed as per “Criteria for Assessment of Landscape Significance” by Andrew Morton (2003).

2.3 Documentation and Legislation

Supporting Documents

The client supplied the following documents.

- Proposed Plans.
- Site Survey.

Applicable Legislation

- Maitland Development Control Plan 2011 (DCP).
- Maitland Local Environment Plan 2011 (LEP).
- State Environmental Planning Policy (Biodiversity and Conservation) 2001.
- Biodiversity Conservation Act 2016.

3.0 Site

3.1 Site Location

Figure 1 Google Earth Satellite image of site with trees numbered 1 to 4 in yellow (Google Earth Maps).

3.2 Site Plan

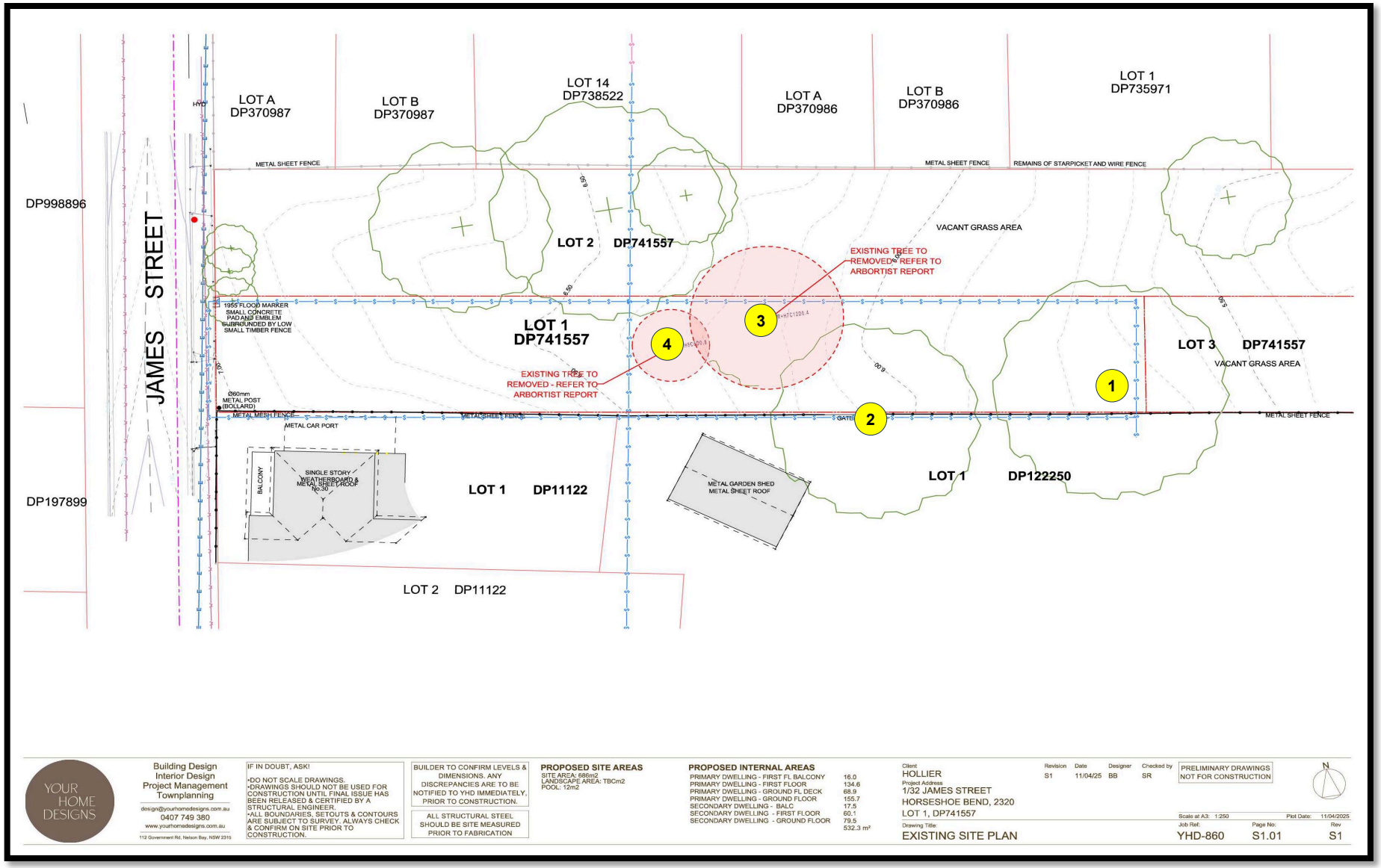

Figure 2 Your Home Designs Site Plan.

3.3 Proposed Site Plan

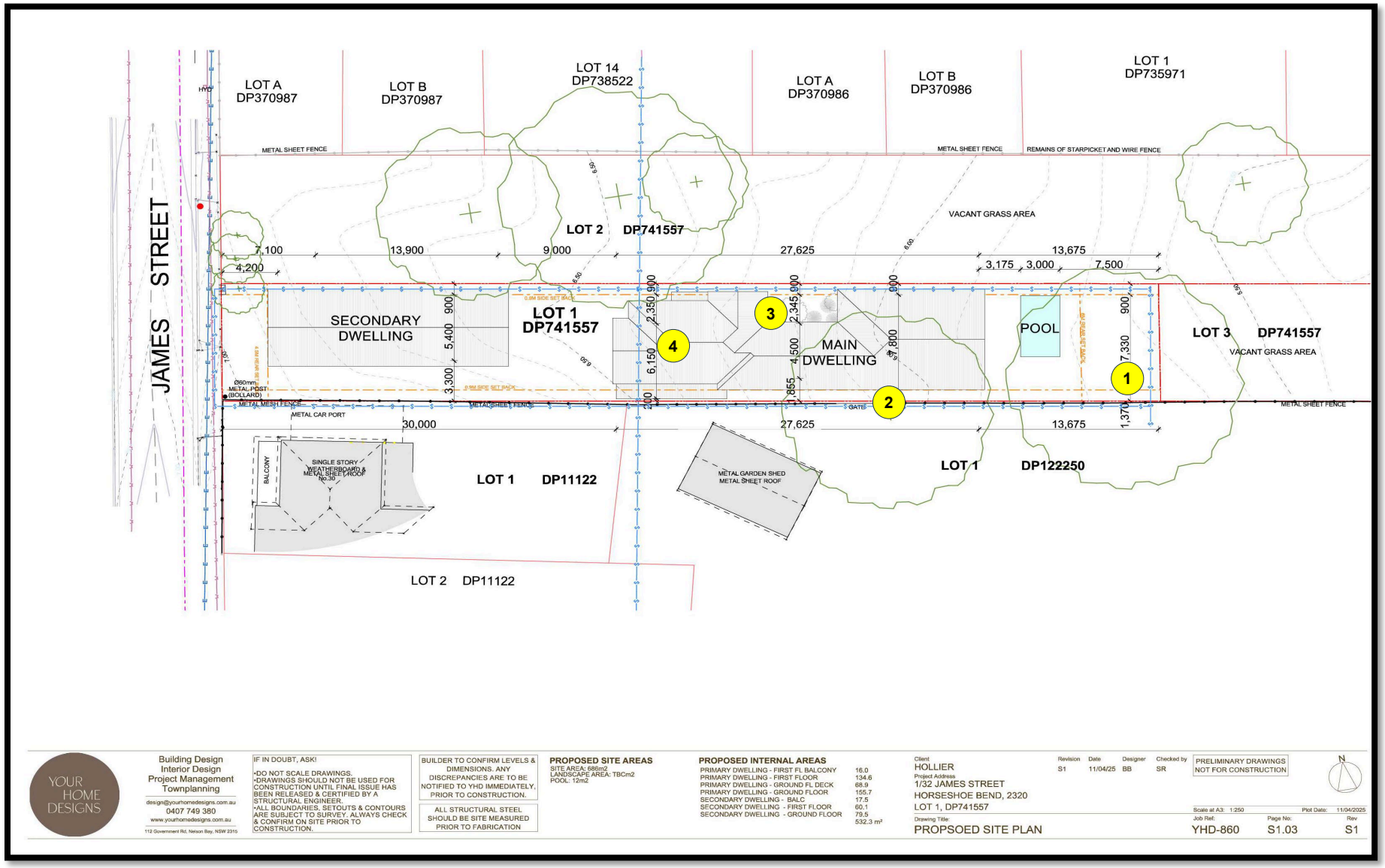

Figure 3 Your Home Designs Proposed Site Plan.

3.4 Site Description

The site is located at 1/32 James Street, Horseshoe Bend, NSW 2320 (Lot 1 DP 741557), in the Maitland City Council Local Government Area (LGA). It is approximately 166 km N of Sydney, 35 km NW of Newcastle, 27 km and 49 km ESE of Singleton.

Horseshoe Bend has a population of 427 (2021 Census).

Horseshoe Bend is a residential suburb located within the City of Maitland situated in the Hunter Region of New South Wales, Australia. The area received its name due to the distinctive curved path of the Hunter River that winds through the locality, a feature first noted by European colonists. Local inhabitants commonly shorten the name to "The Bend".

Horseshoe Bend exists as part of a Heritage Conservation Area under the Maitland Local Environment Plan (2011), and the tree works proposed within this report will require consent from the Council in order to go ahead.

Furthermore, under part B:5, section 2 of the Maitland City Development Control Plan (2011), an application must be lodged through the NSW planning portal, accompanied by a Statement of Heritage Impact prepared by a suitably qualified heritage consultant.

Due to the topography and street scape the site trees are exposed to winds from the east and south.

The tree population consists of mature native and exotic varieties.

Tree canopy coverage is currently around 25% in this area, which is adequate.

Thought should be given to a planting and tree management program to provide for new and care for existing trees and to increase canopy cover.

Increasing canopy cover improves the amenity of the site, increases shade and screening but the greatest benefit is in the lowering of the heat island effect, or residual ground level temperatures.

This will lead to naturally improving the comfort levels of residents, the population of the surrounding area and increased property values.

ArborCert Pty Ltd acknowledge the Maitland LGA sits on lands of the Aboriginal people known today as the Wonnarua People and acknowledges them as the traditional Custodians of the land, respecting Aboriginal Elders past, present and future (Maitland City Council).

4.0 Tree Inspection Details

4.1 Tree Survey Schedule

No	Botanic Name Common Name	Sustainability	AGE	Height (m)	DBH (mm)	Spread				Structure	Health	Comments
						North	East	South	West			
1.	*Jacaranda mimosifolia* or Jacaranda	>15<40 years	M	14	830	6	6	2	5	Fair	Good	Tree in fair condition on the back side of the property, unbalanced crown with bark inclusion between codominant stems showing soil, rot, and weeds growing, moderate deadwood and bark inclusions further up in the tree.
2.	*Jacaranda mimosifolia* or Jacaranda	>15<40 years	M	14	500	5	4	4	4	Fair	Good	Tree in fair condition in adjacent property with minor deadwood and epicormic shoots, several branches hangover over fence.
3.	*Melaleuca bracteata* or Black Tea Tree	>15<40 years	M	7	450	6	3	1	4	Fair	Fair	Fair condition with bark inclusion between codominant trunks, northern lean, and epicormic shoots at base.
4.	*Melaleuca quinquenervia* or Broad-Leaved Paperbark	>5<15 years	M	7	590	4	3	4	3	Fair	Fair	Tree in fair condition with extensive bark inclusions common to species, moderate deadwood and evidence of borer activity.

4.2 Landscape Significance, Retention Value, Structural Root Zone, Tree Protection Zone Assessment.

Tree No	Botanic Name Common Name	Sustainability	Canopy Area	Landscape significance	Retention Value	DBH (mm)	SRZ (m)	TPZ (m)
1.	*Jacaranda mimosifolia* or Jacaranda	>15<40 years	71	Moderate	Moderate	830	3.06	10.0
2.	*Jacaranda mimosifolia* or Jacaranda	>15<40 years	57	Moderate	Moderate	500	2.47	6.0
3.	*Melaleuca bracteata* or Black Tea Tree	>15<40 years	38	Low	Low	450	2.37	5.4
4.	*Melaleuca quinquenervia* or Broad-Leaved Paperbark	>5<15 years	38	Low	Low	590	2.65	7.1

5.0 Recommendations

In general, locating the development in this location requires the removal of three (3) trees. Trees 1, 3 and 4 are to be removed and are not part of this tree protection plan.

Tree 1 *Jacaranda mimosifolia* or Jacaranda is assessed as having Moderate Landscape Significance and Moderate Retention Value. The tree is in fair condition on the back side of the property. It has an unbalanced crown with bark inclusion between codominant stems showing soil, rot, and weeds growing. There is moderate deadwood and bark inclusions further up in the tree.

In my professional opinion, Tree 1 will be affected by the proposed development. The tree does not have significant value or utility and should be removed and is not part of this tree protection plan moving forward.

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In my professional opinion, Tree 2 should be trimmed back to the fence line, and much of the proposed development will occur within the tree protection zone of this tree, but the development may go ahead on the proviso that a number of tree protection controls are put in place, and the tree should be retained and is part of this tree protection plan moving forward.

Tree 3 *Melaleuca bracteata* or Black Tea Tree is assessed as having Low Landscape Significance and Low Retention Value. The tree is in fair condition with bark inclusion between codominant trunks, it is on a northern lean with epicormic shoots at base.

In my professional opinion, Tree 3 will be affected by the proposed development. The tree does not have significant value or utility other than shade and food for small mammals and birds and should be removed and is not part of this tree protection plan moving forward.

Tree 4 Melaleuca quinquenervia or Broad-Leaved Paperbark is assessed as having Low Landscape Significance and Low Retention Value. The tree is in fair condition with extensive bark inclusions common to species. It has moderate deadwood and evidence of borer activity.

In my professional opinion, Tree 4 will be affected by the proposed development. The tree does not have significant value or utility other than shade and food for small mammals and birds and should be removed and is not part of this tree protection plan moving forward.

5.1 Trees to Be Removed.

Trees 1, 3, and 4 are to be removed and are not part of this tree protection plan.

5.2 Trees to Be Retained.

All other trees are to be retained and therefore become the subject of this tree protection plan.

5.3 Project Arborist.

To ensure that protection measures are being adhered to during the pre-construction and construction stages, there should be a predetermined number of site inspections conducted by the Project Arborist (PA).

The PA will monitor the impacts of demolition, bulk earth works, installation of temporary infrastructure including bunding, sediment control works, and drainage works.

The construction management plan (site establishment plan) should be checked for compliance with the tree protection plan.

If there is non-compliance with tree protection measures or if trees have been damaged, a time frame for compliance and remedial works should be specified by the PA.

At completion of site establishment, the project arborist should certify that tree protection measures comply with the tree protection plan.

The project arborist will monitor the impacts of general construction, landscaping, and other works on retained trees. Monitoring should be done at regular intervals throughout construction for compliance with Tree Protection Plan.5.4 Compliance Certification.

The PA shall monitor the job site for compliance with Tree Management Plan (TPM), at regular intervals during works. There are three specific hold points where no further works are to be conducted until such time as the PA has issued compliance certification.

First Compliance Certification inspection point is to be immediately after removal of trees not to be retained, the construction of Tree Protection Zones (TPZ), and the erection of site security fencing. No other works are to be started at this point.

Second Compliance Certification Point is upon completion of building works but before landscape works begin. The PA is to supervise and approve any works in the TPZ and must approve and supervise any staged removal of tree protection measures to allow for the practical installation of landscaping.

Third and Final Compliance Certification point is upon practical completion. The project arborist should specify any remedial works above and below ground.

Monitoring is to be recorded for inclusion in certification at practical completion.

The project arborist should assess the condition of trees and their growing environment and make recommendations for any necessary remedial actions.

Following the final inspection and the completion of any remedial works, the project arborist should certify (as appropriate) that the completed works have been conducted in compliance with the approved plans and specifications for tree protection (Standards Australia, AS-4970 2007 Protection of Trees on Development sites).

5.4 Trees to Be Retained.

The trees to be retained are to be protected as specified in this report.

Tree Protection Zone is to be established immediately, and tree protection systems are to be installed as per section 6 of this report.

The PA to regularly monitor the works and any impact they may have on tree. TPZ are to be inspected regularly to ensure they have not been tampered with and site staff are complying with tree protection measures as specified in the Tree Protection Plan (TPP).

5.5 Tree Pruning/Removal Methodology

Trees for removal should be marked onsite as per the approved TPP.

Before removal, the project arborist should confirm that all marked trees correspond with those shown on the schedule or plan. Other tree work may be specified in the tree protection plan.

Tree removal should be conducted prior to erection of protection fencing. Contractors should be instructed to avoid damage to trees within protection areas when removing or pruning trees. This may include restrictions of vehicle movements.

Any approved pruning required to allow for works should be done at this stage. All pruning works should be conducted as per AS-4373 2007, Pruning of Amenity Trees.

Stumps to be removed from within a TPZ must be removed in a manner that avoids damaging or disturbing roots of trees to be retained.

All climbing of trees to be retained should be done without the use of climbing spikes to avoid further damage to live trees.

Aerial removal works should be carried out by a Certificate AQF Level 3 climbing arborist with at least 3 years climbing and rigging experience. It is recommended that unless otherwise advised all removals to be replaced with an advanced tree of the same or similar species located close to original at a ratio of two to one. Koala feed trees need to be replaced at a ratio of three to one.

That all nesting hollows or possible habitat cavities located during removals be placed in an adjoining tree as close as possible to original location.

Pruning and trimming works should be carried out as per the Australian Tree Work Code of Practice and the Australian Standard AS4373-2007, Pruning Amenity Trees (Standards Australia 2007) by a suitably qualified AQF level 3 Certificate 3 Climbing Arborist

The contracting company should be experienced in this type of large tree climbing and pruning.

They should carry 20 million dollars' worth of Public Liability Insurance and appropriate Workers Compensation Insurance.

It is recommended that the pruned branches be mulched on site and the wood chips be retained for use to mulch trees to be retained. Alternatively, sections greater than 200 mm to 300 mm in diameter can be recycled for firewood.

The stumps should be ground to a depth of 300 mm below ground level.

Contractors should satisfy themselves of the location of all services before commencement of works.

The client should satisfy themselves that all relative Legislation and guidelines have been followed and all approvals and consents governing works have been gained.

ArborCert accepts no liability for misinterpretation of this report by contactors other than ArborCert staff and is not responsible for works carried out by others.

The project arborist should supervise tree removal, transplanting and pruning and approve certification upon successful completion.

Contractors should satisfy themselves of the location of all services before commencement of works.

6.0 Tree Protection Plan

6.1 General.

Tree protection measures include a range of activities and structures.

The TPZ is a restricted area usually delineated by protective fencing (or use of an existing structure such as an existing fence or wall). It is installed prior to site establishment and retained intact until completion of the works.

Some works and activities within the TPZ may be authorized by the determining authority. These must be supervised by the project arborist. Any additional encroachment that becomes necessary as the site works progress must be reviewed by the project arborist and be acceptable to the determining authority before being conducted.

Approved tree removal and pruning should be conducted before the installation of tree protection measures.

6.2 Activities Restricted Within the TPZ.

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

A. machine excavation including trenching.

B. excavation for silt fencing.

C. cultivation.

D. storage.

E. preparation of chemicals, including preparation of cement products.

F. parking of vehicles and plant.

G. refueling.

H. dumping of waste.

I. wash down and cleaning of equipment,

J. placement of fill.

K. lighting of fires.

L. soil level changes.

M. temporary or permanent installation of utilities and signs, and

N. physical damage to the tree.

6.3 Protective Fencing.

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 should be secured to restrict access.

The TPZ on this development are to be constructed of correctly erected and anchored standard temporary security fencing panel and concrete bases.

It is of paramount importance that these fences be erected correctly, and materials not stacked against them to allow koala and other fauna movement through the site and access to the trees by going under the fence panel.

AS 4687 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.

6.4 Signs.

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with AS 1319.

6.5 Root Protection during Works within the TPZ.

Some approved works within the TPZ, such as regarding installation of piers or landscaping may have the potential to damage roots.

If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimized.

Manual excavation should be conducted under the supervision of the project arborist to identify roots critical to tree stability. Relocation or redesign of the works may be required.

Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out.

Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems. Seek advice from the project arborist.

6.6 Installing Underground Services within TPZ.

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches.

For manual excavation of trenches, the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.

6.7 Scaffolding.

Where scaffolding is required, it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS 4373.

6.8 Maintaining the TPZ.

Mulching

The area within the TPZ should be mulched. The mulch must be maintained to a depth of 50-100 mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g., garden beds or turf) mulch may not be required.

Watering

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 should be installed and maintained by a competent individual.

Weed Removal

All weeds should be removed by hand without soil disturbance or should be controlled with appropriate use of herbicide.

This is the end of the assessment.

7.0 Contact Details and Qualifications

This report has been prepared by Steve Watson on behalf of ArborCert and Nathan Hollier for 1/32 James Street, Horseshoe Bend, NSW 2320 (Lot 1 DP 741557).

7.1 Contact Details	7.2 Qualifications
ArborCert	1. Cert 3 Horticulture (2000)
Tree Management Consultants	2. Cert 3 Arboriculture (2002)
PO Box 135, Rutherford NSW 2320	3. Cert 5 Diploma Arboriculture (2014)
Phone: 02 4933 2555	Tree Risk Assessment Qualification (TRAQ (2015)
Or: 02 4930 9080	Registered Consulting Arborist
	Arboriculture Australia
Email: admin@arborcert.com.au	Member Arboriculture Australia
Website: www.hunterrivertrees.com.au	Member International Society Arboriculture

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8.0 References

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9.0 Appendix

9.1 Images.

Figure 4 following shows Tree 1 Jacaranda mimosifolia or Jacaranda.

Figure 4 above shows tree in fair condition with unbalanced crown and bark inclusions.

Figure 5 following shows Tree 2 Jacaranda mimosifolia or Jacaranda.

Figure 5 above shows tree on neighbouring propety with branches overhanging the fence.

Figure 6 following shows Tree 3 Melaleuca bracteata or Black Tea Tree.

Figure 6 above shows tree in fair condition with codominant trunks.

Figure 7 following shows Tree 4 Triadica sebifera or Chinese Tallow.

Figure 7 above shows tree in fair condition with evidence of borer.

9.2 Additional Information on Tree Protection and Structural Root Zones

Tree Protection Zones (TPZ) serve as the primary method for safeguarding trees at construction sites. The TPZ combines protected root and crown areas. It creates an isolated space free from construction interference, ensuring tree survival. The TPZ includes the Structural Root Zone (SRZ) as illustrated in Figure A.

The method used to determine the TPZ and SRZ for these trees have been based on Australian Standard 4970 – 2009 Protection of Trees on Development Sites 3.3.5.

TPZ - Tree Protection Zones

According to Australian Standard 4970-2009 for the Protection of Trees on Development Sites:

- The Tree Protection Zone (TPZ) radius is calculated using the tree's Diameter at Breast Height (DBH).
- DBH is measured at 1.4 metres above ground level.
- To determine the TPZ radius, multiply the DBH by 12.

This standard ensures proper safeguarding of trees in areas undergoing development. Minor encroachments for these trees may be permissible under specific conditions:

- The encroachment is limited to less than 10% of the total area.
- It occurs outside the Structural Root Zone.
- The lost area can be compensated for in a contiguous space adjacent to the Tree Protection Zone (TPZ), as illustrated in Figure B.

Note: A TPZ should not be less than 2 metres nor greater than 15 metres.

SRZ – Structural Root Zones

When significant intrusion into the Tree Protection Zone (TPZ) is anticipated, it becomes necessary to calculate the Structural Root Zone (SRZ). The SRZ specifically addresses the tree's structural integrity. Within this area, the growth of woody roots and the cohesion of soil play a crucial role in maintaining the tree's vertical stability.

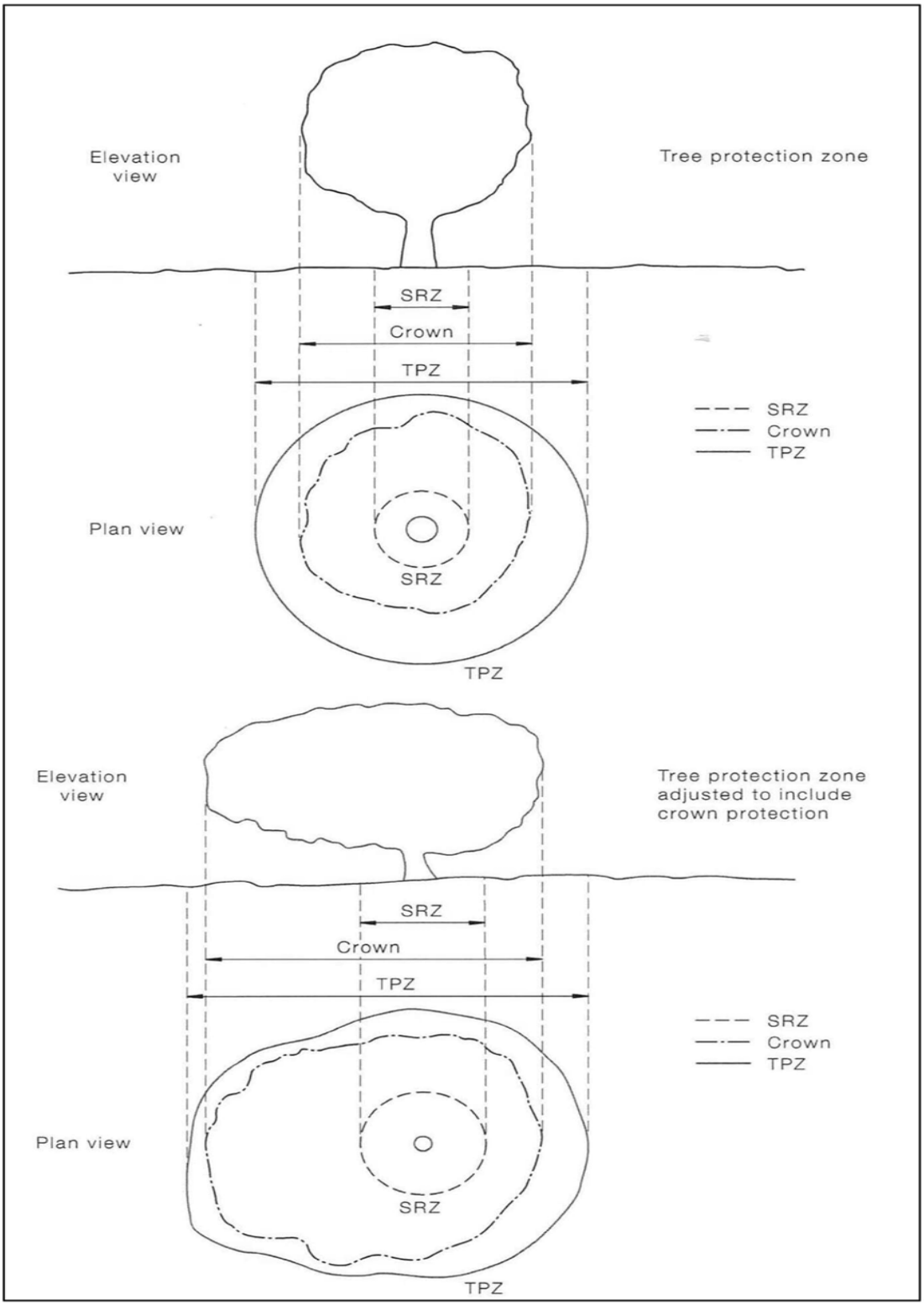
Where severing of significant roots in the SRZ (50 mm >) is anticipated, then investigation and decision needs to made by an appropriately qualified arborist regarding the trees structural integrity and retention value.

The method used to determine the SRZ for these trees have been based on Australian Standard 4970 – 2009 Protection of Trees on Development Sites 3.3.5.

Note: An SRZ should not be less than 1.5 metres.

All works in the TPZ and SRZ should be supervised by an Arborist.

9.3 Figure A


Elevation view
Tree protection zone
SRZ
Crown
TPZ
SRZ
Crown
TPZ
Plan view
SRZ
TPZ
Elevation view
Tree protection zone adjusted to include crown protection
SRZ
Crown
TPZ
SRZ
Crown
TPZ
Plan view
SRZ
TPZ

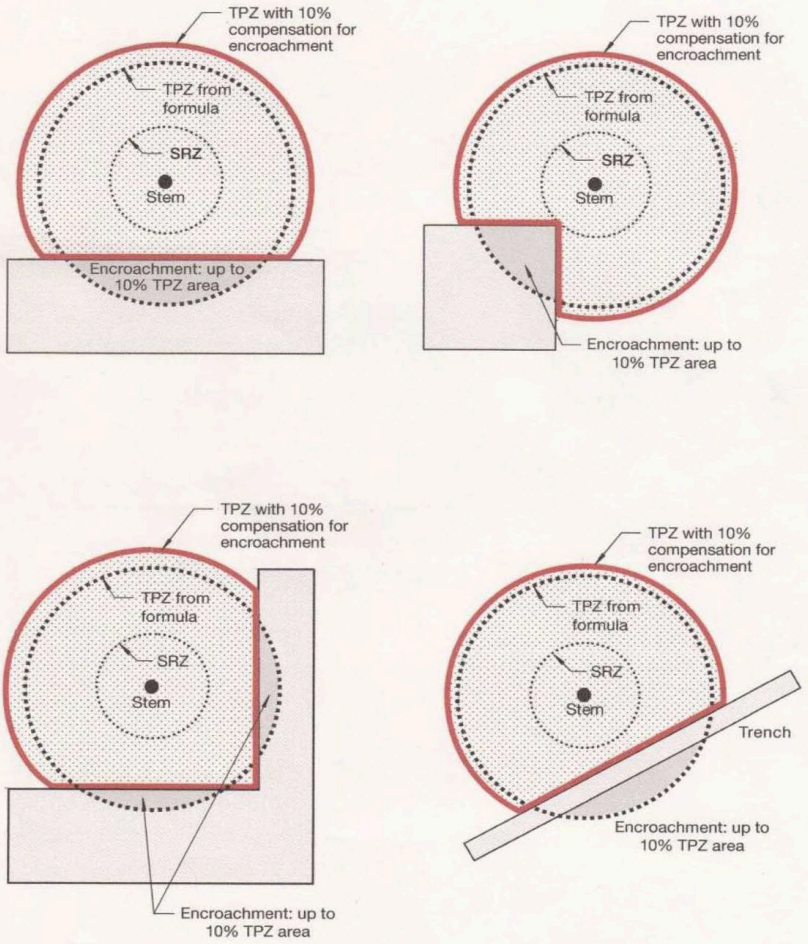
9.4 Figure B

APPENDIX D

ENCROACHMENT INTO TREE PROTECTION ZONE

(Informative)

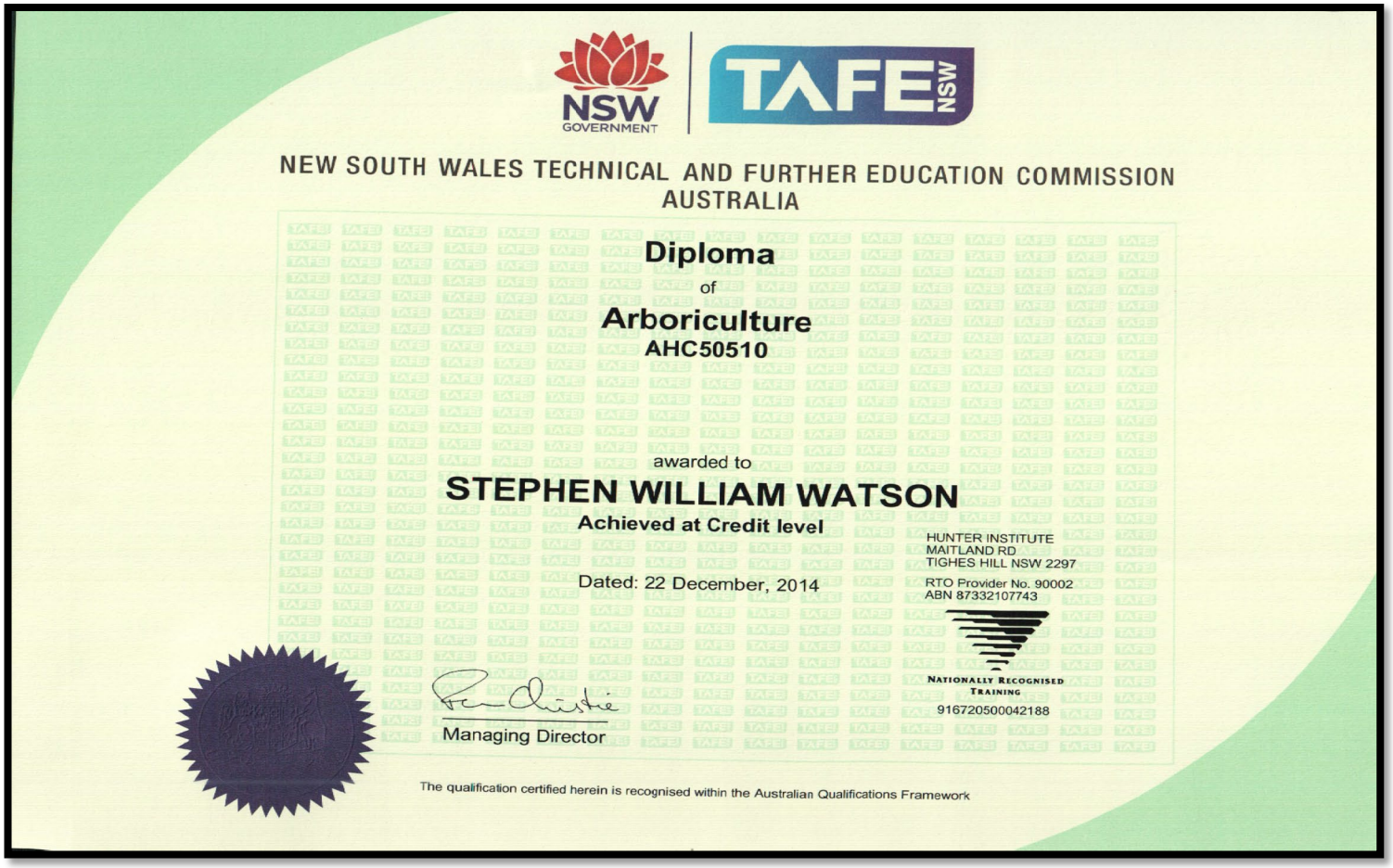
Encroachment into the tree protection zone (TPZ) is sometimes unavoidable. Figure D1 provides examples of TPZ encroachment by area, to assist in reducing the impact of such incursions.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

FIGURE D1 EXAMPLES OF MINOR ENCROACHMENT INTO TPZ

9.5 Diploma of Arboriculture



NSW GOVERNMENT

TAFE NSW

NEW SOUTH WALES TECHNICAL AND FURTHER EDUCATION COMMISSION
AUSTRALIA

Diploma

of

Arboriculture

AHC50510

awarded to

STEPHEN WILLIAM WATSON

Achieved at Credit level

Dated: 22 December, 2014

HUNTER INSTITUTE
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TIGHES HILL NSW 2297

RTO Provider No. 90002
ABN 87332107743

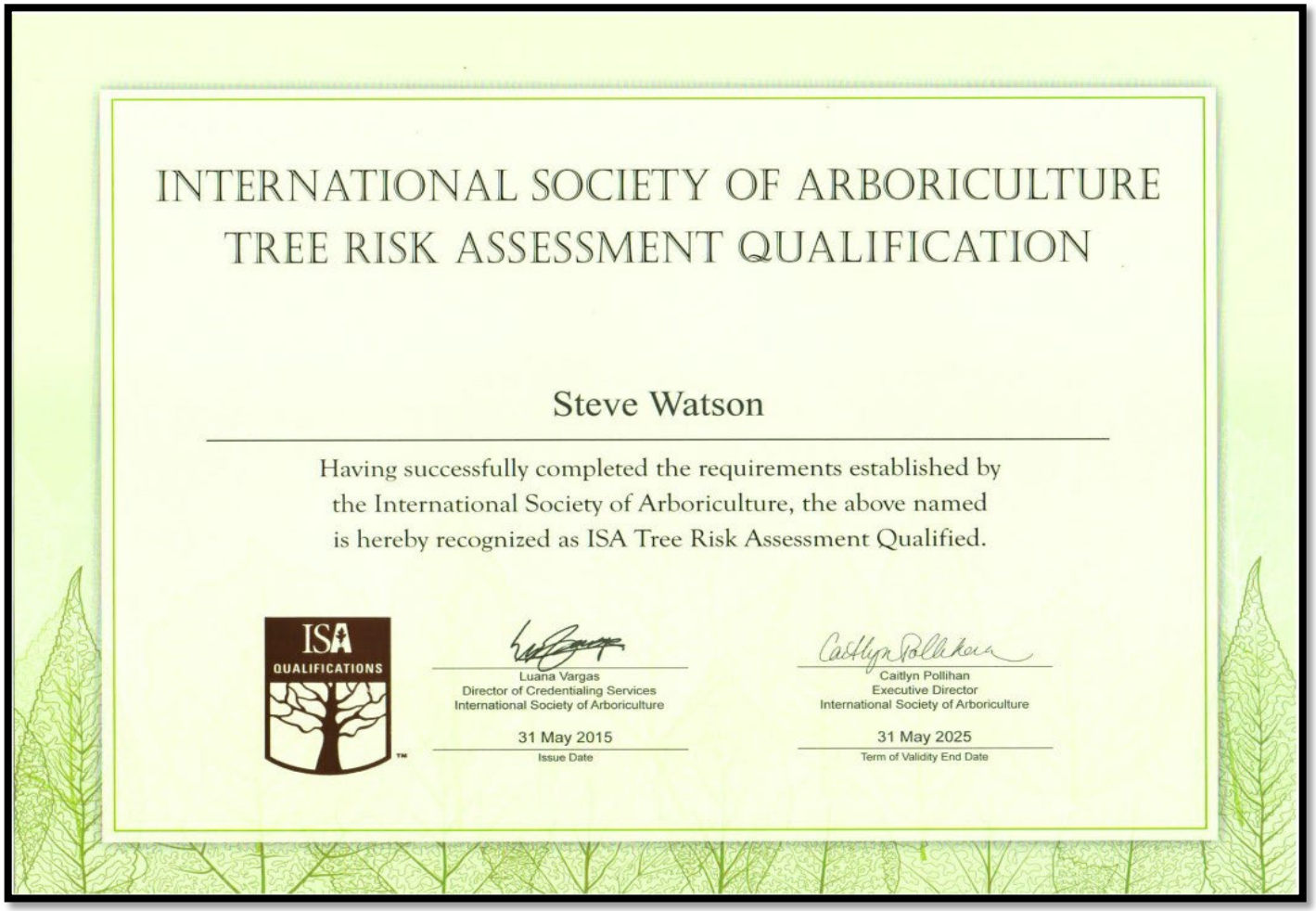
NATIONALLY RECOGNISED TRAINING

916720500042188

Managing Director

The qualification certified herein is recognised within the Australian Qualifications Framework

9.6 Tree Risk Assessment Qualification



INTERNATIONAL SOCIETY OF ARBORICULTURE
TREE RISK ASSESSMENT QUALIFICATION

Steve Watson

Having successfully completed the requirements established by the International Society of Arboriculture, the above named is hereby recognized as ISA Tree Risk Assessment Qualified.

ISA QUALIFICATIONS

Luana Vargas
Director of Credentialing Services
International Society of Arboriculture

31 May 2015
Issue Date

Caitlyn Pollihan
Executive Director
International Society of Arboriculture

31 May 2025
Term of Validity End Date

9.7 Arboriculture Australia Registered Consulting Arborist

10.0 Glossary of Arboricultural Terms

Absorbing roots	fine, fibrous roots that take up water and mineral; most absorbing roots are within the top 30 cm of soil
Acceptable risk	the degree or amount of risk that the owner, manager, or controlling authority is willing to accept
Acceptable risk threshold	the highest level of risk that does not exceed the owner/manger's tolerance
Advanced assessment	an assessment performed to provide detailed information about specific tree parts, defects, targets, or site conditions. Specialised equipment, data collection and analysis, and/or expertise are usually required
Aerial inspection	inspection of the upper tree parts not readily accessed from the ground; typically done by climbing or from an aerial lift
Aerial (airborne) patrol	inspection undertaken from a plane or helicopter; often used by electric utilities to monitor tree growth near electric transmission lines
Aeration	provision of air to the soil to alleviate soil compaction and improve its structure
Analysis	detailed examination of the elements or structure of something
Annual rings	rings of xylem that are visible in a cross section of the stem, branches, and roots of some trees. In temperate zones, the rings typically represent one year of growth
Arboriculture Australia	peak professional industry association in Australia
Barrier zone	a chemical and anatomical barrier formed by the cambium present at the time of wounding in response to wounding. Inhibits the spread of decay into xylem tissue formed after the time of wounding, wall 4 in the CODIT model (contrast with *reaction zone*)
Basal Swelling	increased wood growth in the area near or where the trunk and roots come together
Basic assessment	detailed visual inspection of a tree and surrounding site that may include the use of simple tools. It requires that a tree risk assessor walk completely around the tree trunk looking at the site, aboveground roots, trunk, and branches

Bulge	swellings on branches, trunks, or root flares: often caused by new tissue formed as a response to movement and that reinforces the wood structure at the weak area
Buttress root	roots at the trunk base that help support the tree and equalise mechanical stress
Butt rot	decay of the lower trunk, trunk flare, or the buttress roots
Canker	localised diseased area on stems, roots, and branches. Often shrunken and discoloured converging crowns of two or more trees
Cavity	open or closed hollow within a tree stem, branch, or root, usually associated with decay
Cleaning / clean out	in pruning – the selective removal of dead dying, diseased, damaged, broken, and defective branches
Client	person or organisation contracting services
Codominant (trees in a stand)	more than one tree sharing dominance in a stand of trees
Codominant stem	forked branches nearly the same size in diameter, arising from a common junction and lacking a normal branch union
Column of decay	wood decay inside a tree that extends longitudinally up and down a stem or through a branch
Compaction (soil)	compression of the soil, often as a result for vehicle or heavy equipment, that breaks down soil aggregates and reduces soil volume and total pore space, especially the macropores
Compression	in mechanics, the action of forces to squeeze, crush or push together any material or substance (contrast with *tension)*
Compression crack	fracture caused by compressive stress
Compression wood	reaction wood in gymnosperms, and some angiosperms, that develops on the underside of branches or leaning trunks and is important in load bearing (contrast with *tension wood)*
Conclusions	the summary and results of a risk assessment
Condition	overall state of the tree; refers to health, vigour and structure rated as excellent, good, fair, poor, or dead
Conk	fruiting body or non-fruiting body (sterile conk) of a fungus. Often associated with decay (*see bracket)*
Consequences	outcome of an event

Consequences of failure	personal injury, property damage, or disruption of activities due to the failure of a tree or tree part
Constant occupancy	a target is present at nearly all times, 24hours a day, 7 days a week
Corrected lean	tree lean characterised by leaning lower trunk and top that is more upright because of self-correction, sweep
Crack	separation in wood fibres narrow breaks or fissures in stems or branches. If severe, may result in tree or branch failure.
Crown	the part of the tree comprising the total amount of foliage, selective removal of lower branches from crown to raise crown
DBH	Diameter at Breast height; diameter of the trunk measured at 1.4 metres above ground level
Decay	process of degradation by micro-organisms
Decay-detection device	an instrument or tool developed to detect decay in tree parts
Decline	gradually diminishing health or condition of a tree
Decomposition	the breakdown or separation of a substance into simpler substances
Decurrent	the form of a tree with no central leader but with structural scaffold branches forming the basis of a spreading crown, compare with excurrent
Defect	an imperfection, weakness, or lack of something necessary. In trees, defects are injuries, growth patterns, decay or other conditions that reduce the tree's structural strength.
Definite indicator	an indicator that decay is present
Degree of harm	the amount or extent of injury, damage, or disruption
Diameter	the length of a straight line through the centre of a circle
Diameter tape	a measuring tape scaled such that when it encircles a tree trunk, the diameter can be read directly
Discoloration	wood response of a tree to micro-organisms, including bacteria and non-decay causing fungi, resulting in dead, darkened wood with little strength
Dominant (tress in a stand)	the tree or trees in a stand that are typically larger in height (taller), diameter, and crown spread than all the adjacent trees

Drive-by (assessment)	limited visual inspection from only one side of the tree, performed from a slow-moving vehicle: also, may be called a windshield assessment
Duty of care	legal obligation that requires an individual to apply reasonable actions when performing tasks that may potentially harm others
Edge tree	a tree on the edge of a stand, growing under conditions of light and exposure different from those prevailing within the stand
Event	occurrence of a set of circumstances, in tree risk assessment, a tree or tree part impacting a target
Excurrent	the form of a tree with a central leader and symmetric, vertical crown, compare to decurrent
Extreme (risk rating)	defined by its placement in the risk matrix (see Matrix 2 on page 2 of the Tree Risk Assessment form); failure is *imminent* with a *high* likelihood of impacting the target, and the consequences of the failure are *severe*
Failure (of tree or tree part)	breakage of stem, branch, or roots, or loss of mechanical support in the root system
Fastigiate	having clusters of vertical branches, appearing as a single columnar form
Fibre	elongated, tapering, thick-walled cell that provides strength to wood
Fissure	a long, narrow opening or split
Flexure wood	response growth triggered by the continued flexing of a tree stem or branch
Force	any action or influence causing an object to accelerate/decelerate, calculated as mass multiplied by acceleration. Is a vector quantity
Forest stand	a group of trees in a wooded setting
Freezer/thaw crack	frost crack: vertical split in the wood of a tree, often near the base of the bole, caused by internal stresses and low temperatures
Frequent occupancy	the target zone is occupied for a large portion of a day or week
Front crack	vertical split in the wood of a tree, often near the base of the bole, caused by internal stresses and low temperatures
Form	the shape and symmetry of a tree

Fungal fruiting structure — the reproductive structures of a fungus (conks, brackets, mushrooms)

Fungus (pl. fungi) — group of organisms from the kingdom Fungi, including yeasts, moulds, mushrooms, and smuts. Typically, multicellular, saprophytic, or parasitic and lacking vascular tissue and chlorophyll, reproduces vegetatively and by various types of spores borne in fruiting bodies

Girdling root — root that encircles all or part of the tree trunk of the tree's other roots, constricting the vascular tissue and inhibiting secondary growth and the movement of water and photosynthates

Grade changes — a topographic alteration to the surface of the ground

Gravity — the force that attracts a body toward the centre of the earth

Ground-penetration radar — a non-destructive device that uses radar pulses to image the subsurface

Guy

1. a steel or synthetic-fibre cable between a tree or branch and an external anchor (another tree, the ground, or other fixed object) to provide supplemental support.

2. steel cable between a utility pole and an external anchor (another pole, the ground, or other fixed objects, which may sometimes be a tree) to keep the pole upright. Guys act in tension (contrast with *prop)*

Gymnosperm — plants with exposed seeds, usually within cones (contrast with *angiosperm*)

Harm — personal injury or death, property damage, or disruption of activities

Hazard — situation or condition that is likely to lead to a loss, personal injury, property damage, or disruption of activities; a likely source of harm, in relation to trees, a hazard is the tree part(s) identified as a likely source of harm

Hazard Tree Health
(Synonym**, hazardous tree)** — a tree identified as a likely source of harm

Health — freedom from pests, diseases, ailments, stress – measured as excellent, good, fair, poor, or dead

Heart rot — any of several types of fungal decay of trees heartwood, often beginning with infected wounds in the living portions of wood tissue

Heartwood	inner xylem, consisting of dead cells, does not transport water and minerals
High (likelihood of impact)	The failed tree or branch will most likely impact the target. This is the case when a fixed target is fully exposed to the assessed tree or near a high-use road or walkway with an adjacent street tree
Hydrology	study of the properties, distribution, and effects of water on the Earth's surface, underground, and in the atmosphere
Imminent (likelihood of failure)	failure has started or is most likely to occur soon, even if there is no significant wind or increased load
Impact (verb)	striking a target or causing a disruption that affects activities
Improbable (Likelihood of failure)	the tree or branch is not likely to fail during normal weather conditions and may not fail in many severe weather conditions within the specified time frame
Included bark	bark that becomes embedded in a crotch (union) between branch and trunk or between Codominant stems. Causes a weak structure
Inspection	an organised and systematic examination
Inspection frequency	the number of inspections per given unit of time (e.g., once every three years)
Inspection interval	time between inspections
Interior tree	a tree within a stand of trees, protected from wind exposure
International Society of Arboriculture (ISA)	peak professional industry association
Land disturbances	disruptions to a terrestrial site, community, or ecosystem that alters the physical environment
Land-use history	actions, events, or changes that have taken place on a site
Latewood	portion of an annual ring (growth ring) that forms during summer characterised by small diameter cells with thick walls summer wood (contrast with *early wood)*
Lean	angle of a trunk
Leader	dominant upright stem, particularly on excurrent trees
Legal precedents	a principle or rule established by a prior court or other decision-making body

Level(s) of assessment	categorisation of a breadth and depth of analysis used in an assessment
Lever arm	the distance between the applied force (or centre of force) and the point where the object will bend or rotate
Liability	something for which one is responsible. Legal responsibility
Lightning protection system	hardware installed in a tree to conduct the charge of a lightning strike to ground
Lignin	organic substance that impregnates certain cell walls to thicken and strengthen the cell to reduce susceptibility to decay and pest damage
Likelihood	the chance of an event occurring. In the context of tree failures, the term may be used to specify: 1. the chance of a tree failure occurring: 2. the chance of impacting a specified target: and 3. the combination of the likelihood of a tree failing and the likelihood of impacting a specified target
Likelihood of failure	the chance of a tree failure occurring within the specified time frame
Likelihood of failure and impact	the chance of a tree failure occurring and impacting a target within the specified time frame
Likelihood of impact	the chance of a tree failure impacting a target during the specified time frame
Likely (likelihood of failure and impact)	defined by its placement in the likelihood matrix (see Matrix 1 on page 2 of the Tree Risk Assessment form); imminent likelihood of failure and medium likelihood of impact, or probable likelihood of failure and high likelihood of impact
Limitations	restraints or factors that restrict the precision, applicability, or extent of something
Limited visual assessment	a visual assessment from a specified perspective such as foot, vehicle, or aerial (airborne) patrol of an individual tree or a population of trees near specified targets to identify specified conditions or obvious defects
Live crown ration (LCR)	the ratio of crown length to total tree height
Live crow ratio	ratio of the height of the crown containing live foliage to the height of the tree

Load	1. a general term used to indicate the magnitude of a force, bending moment, torque, pressure, or such, applied to a substance or material. 2. Cargo: weight to be borne or conveyed
Load testing	in advanced tree risk assessment, pulling tests to measure or observe the amount of inclination and/or deformation to assess stability
Lopping	cutting of branches or stems between branch unions (this practice is generally unacceptable)
Low (likelihood of impact)	it is not likely that the failed tree or branch will impact the target
Low (risk rating)	defined by its placement in the risk matrix (see Matrix 2 on page 2 of the Tree Risk Assessment form): consequences are *negligible,* and likelihood is *unlikely*, or consequences are *minor,* and likelihood is *somewhat* likely
Mallet	a broad-headed hammer made of wood, plastic, or resin used for "sounding" a tree
Mass damping	a process by which the amplitude of oscillations is reduced: In trees, motion created by the forces of wind or rigging operations may be reduced through branch movement
Matrix	a rectangle array of rows and columns used to facilitate problem solving or decision making
Mechanical stress	a measure of the internal forces acting within a deformable body; force per unit area
Mechanics	study of forces and their effects on bodies at rest or in motion
Medium (likelihood of impact)	the failed tree or branch may or may not impact the target, with nearly equal likelihood
Meristematic tissue	undifferentiated tissue in which active cell division takes place found in the root tips, buds, cambium, cork cambium and latent buds
Minor (consequences)	low-to-moderate property damage, small disruption to traffic or communication utility, or very minor injury
Mitigation	in tree risk management, the process for reducing risk
Mitigation options	alternatives for reducing risk
Mitigation priority	established hierarchy for mitigation of risks based on risk ratings, budge, resources, and policies

Mobile target	a target that is in motion or intermittently moving
Moderate (risk rating)	defined by its placement risk matrix (see Matrix 2 on page 2 of the Tree Risk Assessment form); consequences are *minor,* and likelihood is *very likely* or *likely,* or likelihood is *somewhat likely,* and consequences are *significant* or severe
Moment	a turning, bending, or twisting force exerted by a lever, defined as the force (acting perpendicular to the lever) multiplied by the length of the lever
Moveable target	target that can be relocated
Multiple risks	the concept that any tree, part, or failure mode could represent more than one type of risk
Negligence	failure to exercise due care
Negligible (consequences)	low-value property damage or disruption that can be replaced or repaired and does not involve personal injury
Neutral plane	an imaginary plane where there is neither tension nor compression
Occasional occupancy	occupied by people or targets infrequently or irregularly
Occupancy rate	the amount of time targets are within a target zone
Oozing	seeping or exudation from a tree cavity or other opening
Open grown	a tree that has grown with exposure to wind and other element from all directions
Overextended branch	branch that extends outside the normal crown area
Parenchyma	thin-walled living cells essential in photosynthesis, radial transport, energy storage, and production of protective compounds
Pathogen	causal agent of disease, usually refers to micro-organisms
Patterns of failure	common modes of tree failure within a tree species or failure of multiple trees in a contiguous area that share similar site histories or environmental conditions
Phloem	plant vascular tissue that transports photosynthates and growth regulators situated on the inside of the bark, just outside the cambium. Is bidirectional (transports up and down) (contrast with *xylem)*

Possible (likelihood of failure)	failure could occur, but it is unlikely during normal weather conditions within the specified time frame
Potential indicator	an indicator that decay might be present
Precipitation	any form of water that falls to the Earth's surface, such as rain, snow, or sleet
Prioritizing targets	a process for classifying and ranking targets according to importance or value
Probability	the measure of the chance of occurrence expressed as a number between 0 and 1, where 0 is impossibility and 1 is absolute certainty. Often expressed as a percentage
Probable (likelihood of failure)	failure may be expected under normal weather conditions within the specified time frame
Probe	a stiff, small-diameter, rod, stick, or wire that is inserted into a cavity or crack to estimate its size or depth
Prop	rigid brace, acting in compression, to support a tree, tree branch, or utility pole. Prop pole (contrast with *guy*)
Protection factors	structures, trees, branches, or other factor that would prevent or reduce harm to targets in the event of a tree failure
Pruning	removing branches (or occasionally roots) from a tree or other plant, using approved practices, to achieve a specified objective
Pruning cycle	in utility and municipal arboriculture, the time scheduled between pruning events that is established as a guideline for providing reasonable clearance between trees and conductors
Qualitative tree risk assessment	a process using ratings of consequences and likelihood to determine risk significance level (e.g., *extreme, high, medium, or low)* and to evaluate the level of risk against qualitative criteria.
Radius	distance from the centre to the perimeter of a circle, one half of diameter
Ram's horn	inward curling formation of wound wood resembling the horns of a ram
Rare occupancy	not commonly used by people
Rays	parenchyma tissues that extend radially across the xylem and phloem of a tree and function in transport, storage, structural strength, and defence

Reaction wood	wood formed in leaning or crooked stems, or on upper or lower sides of branches, as a means of counteracting the effects of gravity, (*see compression wood and tension wood*)
Reaction zone	natural boundary formed chemically within a tree to separate damaged wood from existing healthy wood. Important in the process of compartmentalization (contrast with barrier zone)
Recommendations	one or many alternatives that are promoted to achieve a desired outcome, based on professional judgement
Reporting (risk assessment reporting)	Presenting the client with a summary statement describing in detail the results of and assessment
Residual risk	risk remaining after mitigation
Resistance-recording drill	a device consisting of a specialised micro-drill bit that drills into trees and graphs resistance to penetration; used to detect internal differences in the wood, such as decay
Response growth	new wood produced in response to loads to compensate for higher strain in outermost fibres; includes reaction wood (compression and tension) and wound wood
Retain and monitor	the recommendation to keep a tree and conduct follow-up assessment after a stated inspection interval
Retrenchment	natural process during which an overly mature tree reduces its crown and increases its girth to consolidate resources and increase longevity; the deliberate process of reducing tree height to mimic natural processes
Rhizomorph	a root-like aggregation of fungal hyphae
Rib	longitudinal bulge of response wood growth
Risk	the combination of the likelihood of an event and the severity of the potential consequences. In the context of trees, risk is the likelihood of a conflict or tree failure occurring and affecting a target, and the severity of the associated consequences-personal injury, property damage, or disruption of activities
Risk aggregation	the consideration of risk in combination
Risk analysis	the systematic use of information to identify sources and to estimate the risk
Risk assessment	the process of risk identification, analysis, and evaluation
Risk categorization	the process of assigning risk and risk factors to categories based on severity or hierarchy

Risk evaluation	the process of comparing the assessed risk against given risk criteria to determine the significance of the risk
Risk management	the application of policies, procedures, and practices used to identify, evaluate, mitigate, monitor, and communicate tree risk
Risk matrix (risk rating matrix)	a tool for ranking and displaying risks by assigning ratings for consequences and likelihood
Risk perception	the subjective perceived level of risk from a situation or object, often differing from the actual level of risk
Risk rating	the level of risk combining, the likelihood of a tree failing and impacting a specified target, and severity of the associated consequences
Risk tolerance	degree of risk that is acceptable to the owner, manager, or controlling authority
Root collar excavation (RCX)	process of removing soil to expose and assess the root collar (root crown) of a tree
Root crown	area where the main root joins the plant stem, usually at or near ground level
Root rot	decay located in the roots; root decay is usually developed from the bottom up, and crown symptoms may or may not be visible
Saprophyte	organism that lives on and may act to decay dead organic matter
Sapwood	outer wood (xylem) that is active in longitudinal transport of water and minerals
Sapwood rot	decay located in the sapwood. Bark and/or cambium may be damaged or dead. Signs of this classification of rot are usually numerous, but small, fruiting bodies along the bark's surface are common
Scaffold branches	permanent or structural branches; arising from the trunk
Scope of work	the defined project objectives and requirements
Scam	lines formed where two edges of bark meet at a crack or wound
Secondary xylem	xylem produced to the interior of the vascular cambium during secondary growth
Severe (consequences)	serious personal injury or death, damage to high-value property, or disruption of important activities

Shear	1. (n) in mechanics, the movement or failure of materials, especially laminar material such as wood, by sliding side by side 2. (n) a tool used to cut small-diameter plant material, including secateurs and snips, as well as long-bladed hand tools and power tools used to cut hedges 3. (v) to cut; often used to describe cutting foliage or stems to a single plane, as in a hedge
Shear plane crack	a crack at the natural plane between tension and compression stresses
Shell wall	the remaining solid wood around a cavity or internal wood decay
Significant (consequences)	property damage of moderate-to-high value, considerable disruption, or personal injury
Soft rot	decay of plant tissues characterised by the breakdown of tissues within the cell wall (contrast with *brown rot and white rot)*
Soil compaction	compression of the soil, often because of vehicle or heavy-equipment traffic, that breaks down soil aggregates and reduces soil volume and total pore space, especially macropores space
Soil depth	the vertical extent of soil present below ground
Somewhat likely (likelihood of failure and impact)	defined by its placement in the likelihood matrix (see Matrix 1 on page 2 of the Tree Assessment form) *imminent* likelihood of failure and *low* likelihood of impact, or *probable* likelihood of failure and *medium* likelihood of impact, or *possible* likelihood of failure and *high* likelihood of impact
Sonic assessment	a process of measuring wood density, or other mechanical properties, using an instrument that transmits, receives, and records the velocity of sound or electric waves through wood
Sounding	process of striking a tree with a mallet or other appropriate tool and listening for tones that indicate dead bark, a thin layer of wood outside a cavity, or cracks in wood
Standard of care	degree of care that a reasonable person should exercise in performing duty of care; a measurement used to assess whether an individual acted in a reasonable manner
Static pull test	in advanced tree risk assessment, a load test that measures outermost fibre strain in the stem or branches, and/or inclination at the root flare, in response to a controlled pull

Static target	target that cannot be easily relocated
Strain	the deformation resulting from a stress, measured as a change in specimen length per unit of total length
Stratifying targets	a process for classifying and ranking targets according to importance or value
Strength loss	degradation of the ability to withstand mechanical stress
Stress	1. in Plant Health Care, a factor that negatively affects the health of a plant; a factor that stimulates a response 2. In mechanics, a force per unit area
Structural defect	feature, condition, or deformity of a tree that indicates a weak structure or instability that could contribute to tree failure the area around the tree, usually within 3 to 4 metres from the trunk, in which the structural roots are situated, and which must be protected during construction
Structural support system	a device or mechanism providing supplemental support to individual branches and/or entire trees
Structure	construction and arrangement of parts (roots, trunk, branches) – rated as excellent, good, fair, or poor
Subdominant (trees in a stand)	understory trees in a stand or forest with growth somewhat restricted by larger nearby trees
Suberin	a waxy substance present in some cell walls
Sudden branch drops	sudden, unanticipated failure of a tree branch with little or no discernible defect; often associated with long, horizontal branches and warm temperatures
Suppressed (trees in a stand)	understory trees in a stand or forest with growth severely restricted by competing nearby trees
Sweep	corrected tree lean characterised by a leaning lower trunk and a top that has grown back toward vertical
Taper	change in diameter over the length of trunks, branches, and roots
Target	people, property, or activities that could be injured, damage, or disrupted by a tree
Target-based actions	risk mitigation actions aimed at reducing the likelihood of impact in the event of tree failure
Target management	acting to control the exposure of targets to risk

Target value	the monetary worth of something; the importance or preciousness of something
Target zone	the area where a tree or branch is likely to land if it were to fail
Tension	in mechanics, the action of forces to stretch or pull apart any material or substance (contrast with *compression)*
Tension wood	a form of reaction wood in broadleaved trees (hardwoods) that forms on the upper side of branches or the trunks of leaning trees (contrast with *compression wood)*
Time frame	period for which an assessment is defined, period for recommended mitigation
Tomography	use of multiple sensors placed around a trunk or limb to record sound or magnetic waves travelling through the wood, with measurements resulting in a picture of internal density characteristics. Typically used in arboriculture to measure the extent of decay in trees
Topography	the land and water features of an area, including changes in elevation
Topping	cutting the main trunk to reduce the height of a tree (this is an unacceptable practice)
Torsion	the action of twisting or being twisted
Tracheid	elongate, tapering xylem cell adapted for the support and transport of water and elements
Tree architecture	the structural form and shape of a tree
Tree-based actions	risk mitigation actions aimed at reducing the likelihood of tree failure
Tree conflict	an interference between the needs of a tree and society or infrastructure
Tree growth regulator	chemical that can be applied to trees that slows terminal growth by reducing cell elongation
Tree population	a defined set, group, or collection of trees an area around a tree that is protected by a physical barrier from negative impacts, usually from construction activities
Tree risk assessment	a systematic process used to identify, analyse, and evaluate tree risk

Tree risk assessment qualification	latest techniques for Visual Tree Risk Assessment as per International Society of Arboriculture training
Tree risk evaluation	the process of comparing, the assess risk against given risk criteria to determine the significance of the risk
Tree risk management	the application of policies, procedures, and practised used to identify, evaluate, mitigate, monitor, and communicate tree risk
Unacceptable risk	a degree of risk that exceeds the tolerance of the owner, manager, or controlling authority
Unlikely (likelihood of failure and impact)	defined by its placement in the likelihood matrix (see Matrix 1 on page 2 of the Tree Risk Assessment form); *possible* or *probable* likelihood of failure and *low* likelihood of impact, or *possible* likelihood failure and *medium* likelihood of impact or *improbable* likelihood of failure with any likelihood of impact rating, or any likelihood of failure rating with very *low* likelihood of impact
Verbal report	oral report: results of the risk assessment delivered to the client orally
Very likely (likelihood of failure and impact)	defined by its placement in the likelihood matrix (see Matrix 1 on page 2 of the Tree Risk Assessment form), imminent likelihood of failure and high likelihood of impact
Very low (likelihood of impact)	the chance of the failed tree or branch impacting the specified target is remote. This is the case in a rarely used site fully exposed to the assessed tree or an occasionally used site that is partially protected by trees or structures
Vessel	end-to-end, tube-like, water-conducting cells in the xylem of angiosperms
Veteran tree	a tree which, because of its great age, size, or condition, is of exceptional cultural, landscape, or nature conservation value
Visual assessment	method of assessing the structural integrity of trees using external symptoms of mechanical stress (such as bulges reactive growth, etc) and defects (cracks, cavities, etc)
Vigour	capacity to grow, and to resist disease, ailments, pests, stress – categorised as normal, high low and dormant
Walk-by (assessment)	a limited visual inspection, usually from one side of the tree, performed as the tree risk assessor walks by the tree(s)
White rot	fungal decay of wood in which both cellulose and lignin are broken down (contrast with *brown rot and soft rot*)

Wildlife habitat	an environment suitable for sustaining one or more species of animals
Wind exposure	exposure to the forces of wind
Wind load	the force on a tree or structure resulting from the impact of wind
Wind velocity	the speed of wind
Wood decay	the process of wood degradation by micro-organisms
Work order	a written document detailing the work to be completed and authorising performance of contracted work
Wound wood	lignified, differentiated tissues produced on woody plants as a response to wounding
Written quote	a document with text, images, and/or references, delivered in print, or, electronic form, containing the results of the risk assessment
Xylem	main water-and mineral-conducting tissue in trees and other plants provided structural support (contrast with phloem).