Vertical

Tree Management & Consultancy

Arboricultural Impact Assessment and Tree Protection Plan

Commissioned by: Adam McDougall

Site: 30 Abernethy Street Seaforth 2092

Within: Northern Beaches Council

Date of Inspection: 24 May 2022

Version: 1.0

Prepared by: Michael Garton

Vertical Tree Management & Consultancy

Level 5 Consulting Arborist (AQF level 5)
QTRA – Quantified Tree Risk Assessment
TRAQ – Tree Risk Assessment Qualification

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Table of Contents

Figures

Tables

Appendices

1 Introduction / Aims/ Objectives:

1.1 Introduction

This Arboricultural preliminary Assessment version 1.0 has been prepared by Vertical Tree Management and Consultancy, and Consulting Arborist Michael Garton for the client, Adam McDougall. The report shall assess the existing viability of trees within the site and neighbouring properties. The report will consider the retention value and risk assessment as viewed on the day of the inspection. An assessment will be undertaken in relation to the design and construction of the site dwellings and associated structures.

The trees within the site have been assessed and given a retention value rating. Trees with low retention value should be removed. Tree with a medium retention value may be removed for the benefit of the outcome and trees with high retention values should be retained where possible.

The trees considered for the purpose of this report are located within the site: 30 Abernethy Street Seaforth, Lot/Section/Plan no: A/-/DP358783 and 32 Abernethy Street Seaforth, Lot/Section/Plan no: 501/-/DP708511. Both properties are located within the Northern Beaches local government area and are subject to the relevant local government and legislative framework.

1.2 Aims

This report shall assess the site trees and advise on acceptable setback distances and impacts within the Tree Protection Zones:

- Methodology used in tree evaluation, retention value and Tree Protection zones & Structural Root Zones
- Tree data table with retention values
- A scale plan showing the location of the trees on the subject site, Appendix A.
- Allocation of a number to each tree, Appendix A.
- Provide canopy spread and diameter at breast height and at ground level of each tree, p4.
- Indicate the tree retention values, Tree Protection Zone (TPZ), Structural Root Zone (SRZ) and assessment of the developable environment.

1.3 Objectives

- Assess the condition of the trees.
- Determine the impact of development on the site trees.
- Provide recommendation for management and protection strategies for site trees.

1.4 The site

Located in the Northern Beaches local government area, the site is as R2: Low Density Residential and neighbouring properties zoned and C3 Environmental Management. The site parcel of land is approximately 1150 m^2. The site is on a steep gradient towards the waterway to the west. The vegetation within the property is scattered endemic, native and exotic vegetation within Council's nature strip, neighbouring property and within the site.

A summary of the control checks for the land can be seen below in **Error! Reference source not found.**. Information within has been gained from NSW Government e Planning Spatial viewer website 24 May 2022.

Figure 1 - Aerial image of the site 30 Abernethy Street Seaforth (sixmaps 2018)

Planning Control	Conditioned	Not Conditioned
Zoning	R2: Low Density Residential	
Heritage Listed Property		X
Heritage Conservation Area		X
Terrestrial Biodiversity (CEEC-EEC)	Biodiversity	
Bush Fire Prone Land	Vegetation Buffer	

Table 1 - Site control measures listed on the land 30 Abernethy Street Seaforth

2 Methodology:

2.1 Site Inspection

Site inspection was undertaken by the author on the 24 May 2022.

2.2 Plans Provided

Assessment of potential impacts on the trees in the immediate vicinity of the development site was based on various PDF plans produced by LUXITECTURE and supplied by the client and include the following drawings:

- A001 COVER SHEET 04.02.22 1
- A002 BASIX COMMITMENTS 04.02.22 1
- A003 SHADOW DIAGRAMS JUNE 21ST 9AM 04.02.22 1
- A004 SHADOW DIAGRAM JUNE 21ST 12PM 04.02.22 1
- A005 SHADOW DIAGRAM JUNE 21ST 3PM 04.02.22 1
- A008 SITE ANALYSIS PLAN 04.02.22 1
- A009 SITE PLAN 04.02.22 1
- A101 LOWER GROUND FLOOR 04.02.22 1
- A102 GROUND FLOOR PLAN 04.02.22 1
- A103 FIRST FLOOR PLAN 04.02.22 1
- A104 ROOF PLAN 04.02.22 1
- A105 DIMENSIONED FLOOR PLANS 04.02.22 1
- A107 CONSTRUCTION MANAGEMENT PLAN 04.02.22 1
- A108 DEMOLITION PLAN 04.02.22 1
- A200 ELEVATIONS 04.02.22 1
- A201 ELEVATIONS 04.02.22 1
- A202 ELEVATIONS 04.02.22 1
- A203 EL A300 SECTIONS 04.02.22 1
- A301 SECTIONS 04.02.22 1
- A302 DRIVEWAY SECTION 04.02.22 1
- A401 AREA CALCULATIONS PLAN 04.02.22 1
- A403 SOLAR STUDY 04.02.22 1
- A404 SOLAR STUDY 04.02.22 1
- A501 MATERIAL FINISHES SCHEDULE 04.02.22 1
- A505 POOL PLAN AND SECTIONS 04.02.22 1
- A506 POOL PLAN AND SECTIONS 04.02.22 1
- A601 WINDOW SCHEDULE 04.02.22 1
- A602 WINDOW SCHEDULE 04.02.22 1
- A603 WINDOW SCHEDULE 04.02.22 1
- A604 WINDOW SCHEDULE 04.02.22 1 EVATIONS 04.02.22 1

2.3 Tree Numbering System

A tree numbering system was assigned to the trees indicated in Appendix A.

2.4 Tree Protection Zone (TPZ)

TPZ was calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula.

2.5 Structural Root Zone (SRZ)

SRZ was calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula.

2.6 Amendments

Recommendations for amendments to the proposed development were based on Australian Standards for AS 4970 - 2009 “Protection of Trees on Development Sites”.

2.7 Incursions

Allowable incursions to Tree Protection Zones were based on Australian Standards for AS 4970 2009 “Protection of Trees on Development Sites” and the author’s extensive experience with trees on development sites.

2.8 Destabilisation

Potential destabilization from root severance within the Structural root Zone (SRZ) based on data compiled from findings of Matheck (1994).

2.9 Plans and retention value

Plans showing canopy, retention value, Tree Protection Zone and Structural Root zone and tree protection device locations indicated in Appendix A.

2.10 Tree protection & specification

Tree protection & specification in accordance with AS4970-2009.

2.11 Assumptions

1. The information provided is accurate and true to the conditions of the site.
2. The information provided has been ground truth or has been otherwise stated.
3. The techniques for excavation, construction boring and dismantling are in keeping with traditional methods unless otherwise stated.

3 Tree Assessment Data

Table 2. Tree Assessment Data for trees located in 30 Abernethy Street Seaforth

Number	Species	Height	width	DBH (cm)	DGL (cm)	TPZ (m)	SRZ (m)	Age Class	Health	Condition	Amenity	Retention Value	Notes
1	Sydney Blue Gum (*Eucalyptus saligna)*	22	18	88	95	10.6	3.2	Mature	Good	Good	High	High	Tree is in good health and structure with no major defects High landscape significance and retention value
2	Broad Leaved Paperbark *(Melaleuca quinquenervia)*	8	14	37	40	4.4	2.3	Mature	Fair	Fair	Low	Low	The grouping of 3 trees are in good health with fair structure. Tress have been significantly reduced and lopped - Low landscape significance and retention value
3	Broad Leaved Paperbark *(Melaleuca quinquenervia)*	5	12	40	42	4.8	2.3	Mature	Fair	Fair	Low	Low	The grouping of 6 trees are in good health with fair structure. Trees have been significantly reduced and lopped - Low landscape significance and retention value
4	Cocos Palm *(Syagrus romanzoffiana)*	9	2	25	30	2	2	Mature	Good	Good	Low	Low	Tree in good health and structure with no obvious defects
5	Broad Leaved Paperbark *(Melaleuca quinquenervia)*	8	4	34	44	4.1	2.3	Mature	Fair	Fair	Low	Low	Tree is in good health with fair structure. Tree has been significantly reduced and lopped - Low landscape significance and retention value
6	Cocos Palm *(Syagrus romanzoffiana)*	9	2	25	30	2	2	Mature	Good	Good	Low	Low	Tree in good health and structure with no obvious defects

Number	Species	Height	width	DBH	DGL	TPZ	SRZ	Age Class	Health	Condition	Amenity	Retention Value	Notes
7	Frangipani species (*Plumeria species)*	6	9	17	23	2	2	Mature	Fair	Fair	Low	Low	Fair Health and structure with no obvious defects.

***DBH – Diameter at Breast Height; **DGL – Diameter at Ground Level ***TPZ – Tree Protection Zone; ^SRZ – Structural Root Zone, ~ Approximately. Appendix B – Explanatory notes**

DW = Dead wood (%), CS = Clear stem - no branching (m), LC = Live Crown (%)

4 Tree Protection Zone & Structural Root Zone

4.1 Tree Protection Zone (TPZ)

The TPZ is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The TPZ is calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula. Development encroachments are referred to as: 1) No impact (0%) incursion; 2) Low impact (<10%) of minor consequence; 3) Medium impact (<20%) incursion where the project arborist is to demonstrate the tree(s) remain viable by tree sensitive construction techniques; and 4) High level impact (>20%) where design changes or further information is required to manage tree vitality.

4.2 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. Variations can only be made by an AQF5 Consulting Arborist (Project Arborist).

4.3 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. this may require root investigation by non-destructive methods and consideration of relevant factors listed in AS4970 Clause 3.3.4.

4.4 Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when major encroachment into a TPZ is proposed. The SRZ calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula. Excavation within the structural root zone should be avoided. In the event this cannot be avoided the site arborist (AQF level 5) must be present. Excavation must be non-destructive such as hand excavation or Airspade® or other.

The trees identified to have a major incursion within the calculated TPZ or SRZ by excavations, disturbance or soil fill will require an assessment of the impact to the tree. The incursion must be assessed and determined in accordance with AS4970 “Protection of Trees on Development Sites”. Trees with major incursions may be adversely impacted with long term health and stability problems. Identification of work within the TPZ or SRZ will allow the site Arborist to recommend alternative solutions where possible.

4.5 Variations of the TPZ

It may be possible to encroach into or make variations to the standard TPZ. Encroachment includes excavation, compacted fill, and machine trenching. Encroachment into the tree protection zone (TPZ) is sometimes unavoidable. Any loss of TPZ compensated for elsewhere.

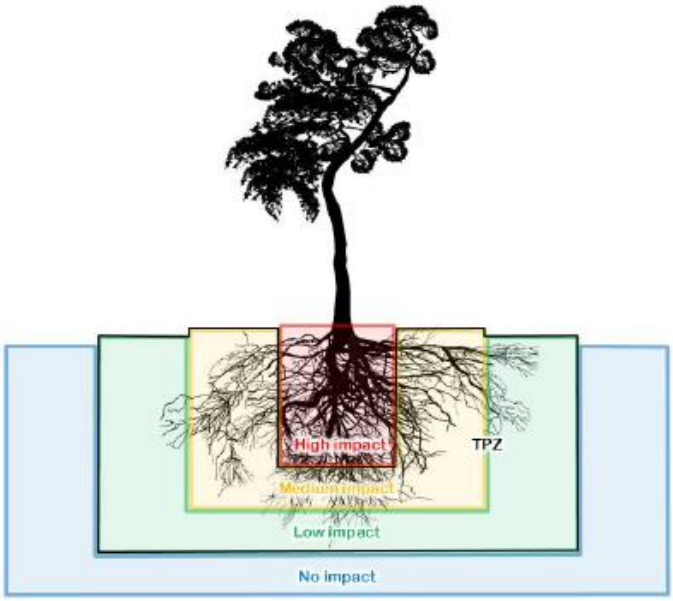

Figure 2. Low medium and high impact zones in reference to the tree

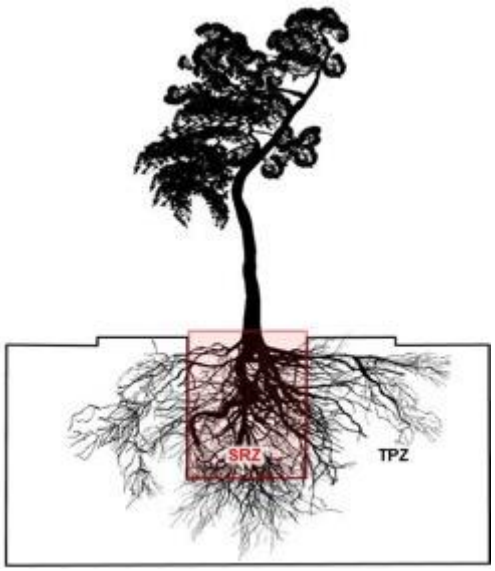

Figure 3. Structural root Zone the area required for tree stability

5 Discussion

Tree 1 - Sydney Blue Gum (*Eucalyptus saligna)*

The mature Sydney Blue Gum tree located within the rear neighbouring property is in good health and structure. The tree has a high landscape significance and retention value and will not be impacted by the proposed development. The proposed pool structure is out of the tree protection zone, the existing sandstone rock shelf and slape of the land prevent lateral roots accessing the site. The existing boundary fence will act a tree protection. No additional tree protection measures are required to be implemented.

Tree group 2 - Broad Leaved Paperbark (*Melaleuca quinquenervia)*

This grouping of 3 Broad Leaved Paperbark trees will have incursion of less than 5% within the tree protection zone. This level if incursion is considered minor and will have no lasting effects on the tree's overall health and stability. The existing boundary fence will act as tree protection. No additional tree protection measures are required to be implemented.

Tree group 3 Broad Leaved Paperbark (*Melaleuca quinquenervia)*

This grouping of 6 Broad Leaved Paperbark trees are in fair health and structure. These trees have been excessively lopped over their lifetime for views and inclinator access. These trees will have incursion of less than 10% within their tree protection zone. The existing concrete boundary wall separating the two properties and its foundations are believed to have prevented tree roots from accessing the site. With the presence of roots unlikely to be located within the area of the proposed accessway and pool, the impact on the trees will be minimal. The existing boundary fence will act as tree protection. No additional tree protection measures are required to be implemented.

Tree 4 Cocos Palm (*Syagrus romanzoffiana)*

This Cocos Palm is in good health and structure with no obvious defects. The existing concrete boundary wall and its foundations have prevented tree roots from accessing the site. With the presence of roots unlikely to be located within this area, the proposed accessway and pool will have no impact on the tree's overall health and stability. The existing boundary fence will act as tree protection. No additional tree protection measures are required to be implemented.

Tree 5 - Broad Leaved Paperbark (*Melaleuca quinquenervia)*

The Broad Leaved Paperbark has been excessively looped over their lifetime for views and access. The existing concrete boundary wall and its foundations have prevented tree roots from accessing the site. With the presence of roots unlikely to be located within the area of the proposed accessway and pool, the impact on the tree will be minimal. The existing boundary

fence will act as tree protection. No additional tree protection measures are required to be implemented.

Tree 6 Cocos Palm (*Syagrus romanzoffiana)*

This Cocos Palm is in good health and structure with no obvious defects. The existing concrete boundary wall and its foundations have prevented tree roots from accessing the site. With the presence of roots unlikely to be located within this area, the proposed accessway and construction of the dwelling will have no impact on the tree's overall health and stability. The existing boundary fence will act as tree protection. No additional tree protection measures are required to be implemented.

Tree 7 Frangipani Species *(Plumeria species)*

The mature Frangipani species is in good health and structure with no obvious defects. This tree is to be retained and protected. The use of tree protection fencing and signage is considered adequate protection.

6 Recommendations

Retention Value	Tree Number
Priority for Retention (High)	**1, 7**
Consider for Retention (Medium)	**2, 3, 4, 5,**
Consider for Removal (Low)	
Priority for Removal (Low)	

- Trees 1 and 7 are a High Priority for Retention
- Trees and tree groups 2, 3, 4, 5 will have minimal impacts of their tree protection zones throughout the proposed construction. These trees are to be retained. Existing boundary fencing will act as tree protection, no additional tree protection measures are required.
- Tree 7 requires Tree Protection Fencing and Signage (appendix D).

7 Standards

7.1 Owners/builders responsibilities

It is the responsibility of the owner/builder to make this report available to all contractors associated with the development at the site. The following Tree protection Plan, report version one should be adhered to ensure that the trees are viable into the future.

7.2 Tree related works

All tree related work relevant to this report is to be conducted in accordance with:

- The NSW Workcover Code of Practice: Amenity Tree Industry 1998.
- The AS4970-2007 “Protection of Trees on Development Sites”.
- All tree related work must be undertaken by an arborist with an Australian Qualification Framework Level 3 in Arboriculture or above.
- All tree related work carried out in the vicinity of overhead power lines must be undertaken by a qualified arborist with a current Power lines Awareness Certificate.

7.3 The Site Arborist (Vertical Tree Management & Consultancy)

The site arborist will record tree health prior to commencement of construction and provide a Tree Protection Plan setting out tree protection measures, methods, and supervision requirements.

7.4 Certification of works

The site arborist will provide certification at three stages of the project, prior, during and at the final stages for the compliance of tree protection measures. Changes to the tree protection will also be recorded as required.

7.5 The Site Arborist

The arborist will oversee work and provide advice for tree work within the tree protection zone and Structural Root Zone. A report will be required for pruning tree roots greater than 40mm in diameter.

7.6 Consent for works

All tree related work must have written consent from the relevant control authority (local Council).

8 Tree Protection Information & Specifications

To achieve the best possible outcome in protecting the relevant trees during the development, compliance with the tree protection measures is crucial in ensuring the long-term success of the site trees.

- The fundamental element for tree protection for this site is tree protection fencing to protect and delineate an area where no development activities occur.
- The trees requiring protection include

Number	Species	Action
7	Frangipani Species ***(Plumeria species)***	Retain and protect

- The Tree protection measures are to be implemented prior to commencement of construction and remain until post construction phases to ensure adequate protection for the retained trees on site, refer to Appendix D.
- The tree protection must be checked and certified by the site arborist, Vertical Tree Management & Consultancy during and after construction.
- No materials are to be stored within 3m of the neighbouring property trees.
- The effectiveness of the tree protection measures recommended depends on the degree of cooperation between the developer, construction contractor, and the site arborist.

Tree Protection Zone (TPZ) – The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. The TPZ is calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula.

Structural Root Zone (SRZ) – The SRZ only needs to be calculated when major encroachment into a TPZ is proposed. The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ is calculated using the Australian standard AS4970 - “Protection of Trees on Development Sites” formula.

Tree Protection Measures and Recommendations within this report are in accordance with Australian Standard AS4970-2009 “Protection of Trees on Development Sites”.

Tree protection measures are to be implemented prior to commencement of demolition, during construction and post construction phases to ensure adequate protection for the retained trees on site.

8.1 Specification

8.1.1 Tree Protection Zones (TPZ)

TPZ are to be erected prior to any work or machinery entering the site. The TPZ will remain in place until all site works are complete (refer to Appendix A).

8.1.2 Tree Protection Fencing

Shall protect the tree from mechanical damage. Ensure no materials are stored at the base of the trees. It is the site foreman's and owner's responsibility to ensure this area is maintained throughout the development. The Tree Protection Fencing must be checked and Certified by the Site Arborist - Derek Arnaiz, Vertical Tree Management & Consultancy.

8.1.3 No other activity

Is to take place within the TPZ. This includes and is not restricted to the following: silt fence excavation, soil level changes, storage of material or waste, run off from wash down, slurry etc., refuelling, parking, and various other activities (refer to AS4970-2009 4.2 pg. 15).

8.1.4 Maintenance of the tree protection zones

During construction shall be completed by the site arborist. The site arborist shall make regular checks and maintain the tree protection structures during construction.

8.1.5 Adequate signs

Regarding the delegated areas of "TPZ" shall be clearly visible from within the development site. The area indicates the zone required for protecting trees and all of their parts. The sign shall be made from durable all-weather material and be securely fixed to the outer visible side of the tree protection fencing. The signage shall be visible from all areas of the work site and may include multiple signs.

8.1.6 Alterations

Alteration to the TPZs requires the site arborist approval.

8.1.7 Root pruning

Trees requiring root pruniung prior to excavation shall be done under the supervision of the site arborist. Roots equal to 10mm or greater shall require pruning by the site arborist. The root pruning cuts made shall be made at a 90 degree angel and use a clean sharp pruning implement.

8.1.8 Trenching and boring underground services

Trenching and boring within the TPZ shall be done under the supervision of the site arborist. Where possible all services should be routed outside the minimum set back distance. Where this is not possible the underground service should be installed by directional drilling at a depth of no less than 600mm or use manual excavation techniques. When the Structural Root Zone is affected the project arborist must demonstrate that the tree(s) would remain viable.

8.1.9 Tree pruning

Tree pruning, crown lifting, crown reduction, branch removal shall be carried out by an arborist with minimal qualification of certificate 3 (Australian Qualification Framework AQF Level 2) in arboriculture.

8.1.10 Hold points

Requiring certification by the site arborist include:

- Installation of tree protection and signage.
- Excavation within TPZ/SRZ.
- Various unforeseen changes in the field.
- Mid construction
- Completion of construction works.

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Date	Version	Prepared By	Approved by
25 May 2022	1	Michael Garton	Derek Arnaiz

Disclaimer statement. The response of a living tree to its immediate environment is dynamic throughout its entire life cycle due to external influences giving each tree a unique natural variability. A visual tree assessment addresses the external symptoms presented by a tree. This cannot exclude a tree from the potential for failure due to unforeseen circumstances. This report cannot provide a conclusive recommendation regarding any part of a tree root system that is not exposed for visual inspection. Additionally, it cannot not be assumed, that a tree will be safe in all conditions in the future. Appropriate management, assessment, and maintenance aim to mitigate risks to an acceptable level. This report is the opinion, advise or recommendation based on the information supplied by the client or observation of the author.

REFERENCES

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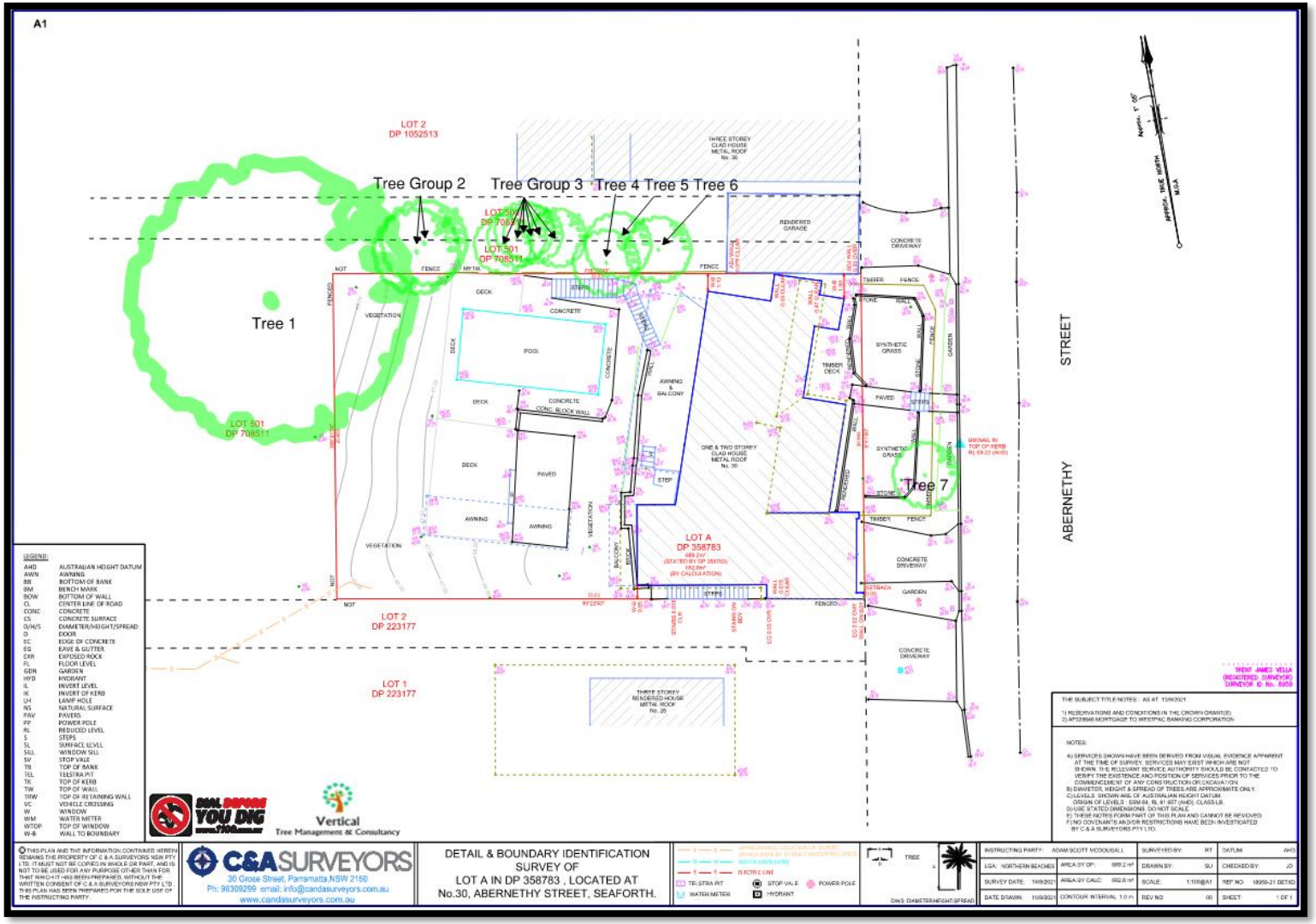
Draper BD & Richards PA 2009, *Dictionary for Managing Trees in Urban Environments, Institute of Australian Consulting Arborists*, CSIRO publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *footprint Green Tree Significance and Retention Value Matrix, Avalon, NSW, Australia*, www.footprintgreen.com.au

IACA2010, *IACA Significance of a Tree Assessment Rating System (STARS*), Institute of Australian Consulting Arborists. www.iaca.org.au

Appendix A – Tree Survey



Appendix B - TREE ASSESSMENT TABLE EXPLANATORY NOTES Thyer Tree Valuation Method (1996)

AGE CLASS (Modified from *British Standard BS5837*-1991).
Immature (I): Young trees, less than 20% of life expectancy.
Semi-mature (S): Middle aged trees, 20-40% of life expectancy.
Mature (M): Trees between 40-80% of life expectancy.
Over-mature (O): Senescent trees, or those declining irreversibly. Less than 20% of life expectancy.

HEALTH - This evaluates a trees vitality and vigour as indicated by its crown density, leaf size, foliage colour and its ability to withstand wounding, pests, diseases, or changes to the growing environment.
Good: (G) Tree is generally healthy and showing signs of normal vigour and is expected to continue to remain so, provided conditions around the tree required for its survival do not change.
Average: (A) Tree is typical of the species, considering its age, without noticeable decline.
Fair: (F) Tree shows signs of normal vigour but shows some indications of decline due topsets and diseases or changes to its growing environment.
Poor: (P) Tree exhibits symptoms of advanced and irreversible decline due to fungal decay, severe dieback of branch and crown canopy, predation of pests, storm or lightning damage, root damage or instability of the tree and alterations to its growing environment.

STRUCTURAL CONDITION - This refers to the trees form, and growth habit modified by its environment, the state of the trunk and the main structural branches. It includes the presence of defects such as decay, weak branch junctions and other visible abnormalities. Although some trees without defects fail in storms, the presence of any defect will increase the chances of failure.
Good: (G) Trees with a single dominant trunk along which evenly spaced branches are spread. Branches have properly formed collars which provide strong attachment to the trunk and are about 25% of the trunk diameter. Minor structural defects may be present with low failure potential.
Average: (A) Trees which have structural defects and low failure potential.
Fair: (F) Trees with structural defects and medium failure potential, which require monitoring on an annual basis.
Poor: (P) Trees with defects which have failed, or have a high risk of failing soon, and corrective action must be taken as soon as possible.

Appendix C - IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the footprint green tree significance and 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 the 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 ACA dictionary for managing trees in urban environments 2009.

This rating system will assist in the planning process for proposed works, above and below ground where trees are to be retained on or adjacent a development site. This 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.

Tree Significance - Assessment Criteria

1. **High Significance in landscape**
   - The tree is in good condition and good vigor,
   - 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 vigor,
   - 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 vigor,
- 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 taxonomy *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.**

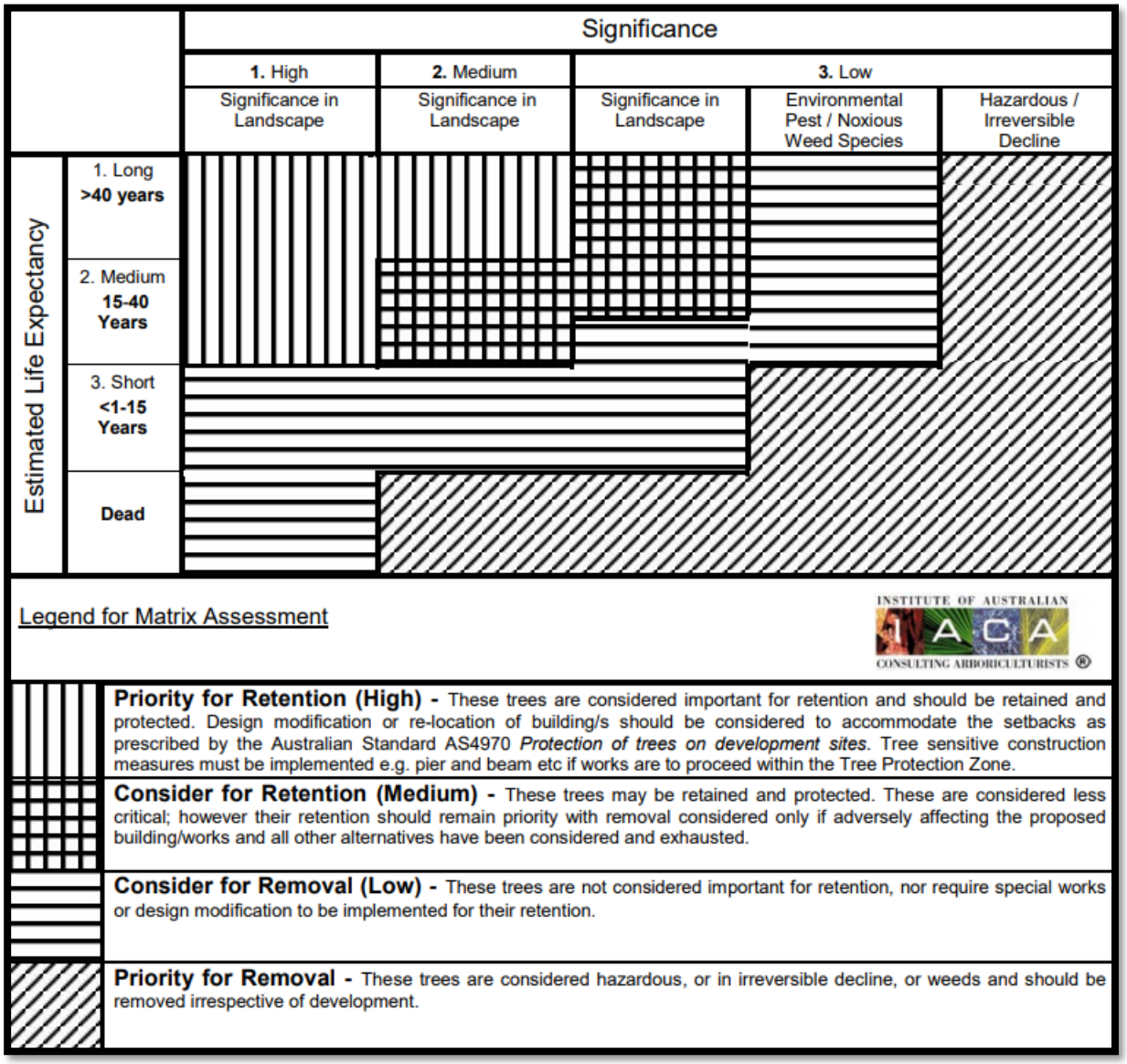
Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g., hedge.

USE OF THIS DOCUMENT AND REFERENCING

The IACA significance of a tree assessment rating system is free to use, but only in its entirety and must be cited as follows:

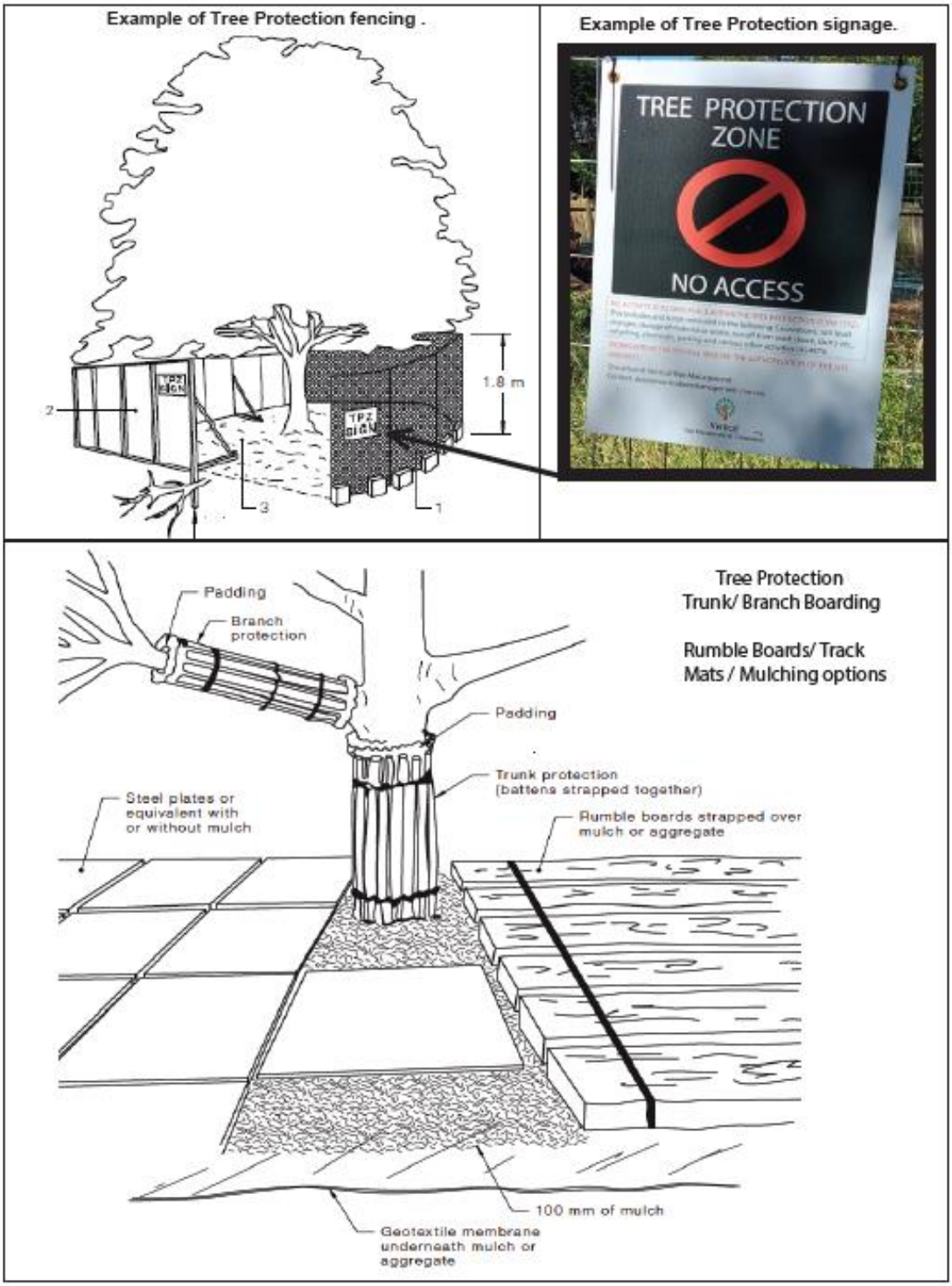
IACA, 2010 IACA significance of a tree assessment rating systems, institute of Australian consulting arborists, Australia www.iaca.org.au

Table 3. Tree Retention Value – Priority Matrix



IACA2010, IACA Significance of a Tree Assessment Rating System (STARS), Institute of Australian Consulting Arborists. www.iaca.org.au

Appendix D - Tree protection



Vertical Tree – Vertical Tree Management & Consultancy

Appendix E – *TPZ & SRZ Incursion table*

	Requirements under AS 4970-2009	Impact	Mitigation measures
No encroachment (0%)	N/A	**No impact** (0%)	N/A
Minor encroachment (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Detailed root investigations should not be required.	**Low impact** (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Tree protection must be installed.
Major encroachment (>10%)	• The project arborist must demonstrate the tree(s) would remain viable. • Root investigation by non-destructive methods may be required. • Consideration of relevant factors including Root location and distribution, tree species, condition, site constraints and design factors. • The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.	**Medium impact** (<20%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • The project arborist will be required to supervise any works within the TPZ. • Tree protection must be installed.
		High impact (>20%)	• The project arborist must demonstrate the tree(s) would remain viable. • Non-destructive root investigation will be required for any trees proposed for retention. • The project arborist will be required to supervise any works within the TPZ. • Tree protection must be installed.

GLOSSARY:

Aerial inspection - a close inspection of the aerial part of a tree, either by elevated work platform (EWP) or by an AQF level 3 arborist (climbing inspection).

Air spade - equipment providing a jet of compressed air to a hand-held device which helps to excavate roots almost non-destructively.

Amenity tree – a tree grown for purposes other than for production**.**

***AS4373*-2007** – Current Australian Standard for the Pruning of Amenity Trees**.**

AQF – Australian Qualification Framework for all educational and training purposes.

Axiom of uniform stress - is a self-optimizing structure because the growth of new wood tends to eliminate any stress concentrations, maintaining a uniform stress distribution.

Bacteria - one of the five kingdoms of living things. Some cause disease, many are decomposers, and some are beneficial (such as nitrifying bacteria and those in the gut of animals).

Bark cambium (cork cambium, phellogen) - Layers of meristematic cells on the outer side of the phloem that give rise to the bark.

Branch order - The seedling axis, typically giving rise to the main stem, has a branch order of 0. Branches arising from axillary buds on the seedling axis are first-order branches, branches arising from them are second order and so on, the shoots at the periphery of the crown having the highest order.

Callus - cells that forms over an injury or scar, which develops from actively dividing plant tissue.

Canker - A discrete area of dead or malformed bark caused by a pathogen.

Canopy - Of a single tree, its crown, emphasizing its spreading and enclosing character. Of a forest, the crowns of the larger trees considered collectively.

Chlorophyll - The pigment in green plants and a kind of bacteria (cyanobacteria) that permits photosynthesis. Chlorophyll is green because it absorbs light most strongly in the blue and red regions of the visible spectrum, reflecting the green.

Compartmentalization - A form of defense in woody plants, in which barriers resistant to invasion by pathogens or wood decay fungi are laid down while the wood is living (sapwood), and which continue to act passively once the wood is incorporated into heartwood.

Deadwood - Dead and decomposing wood including dead trees (whether standing, snapped or fallen), branches of any size, stumps and roots.

Defect - Any feature of a tree that is likely to make it less safe (in the case of a structural defect) or otherwise to reduce its health, longevity, landscape prominence or conservation value for any other reason.

Diameter - Broadly, the width of a cylindrical object like the main stem of a tree.

dbh – the diameter of a stem measured at breast height i.e., 1000mm.

Dip. Arb. – Diploma in Arboriculture.

Drip zone – the area from one edge of the canopy to the other.

Expert witness - Someone capable of giving an expert opinion, to be relied upon in some official or legal process.

Fastigiate - A growth habit with branches strongly ascending, like Lombardy poplar. A common ornamental form.

Fiber buckling A local transverse failure in compression of the outer wood of a stem as it sways in a strong wind. The resulting adaptive growth gives rise to a characteristic ring-like bulge around the stem.

First-order branch – a branch which emanates directly from the trunk, in contrast to a scaffold branch, sometimes referred to as a primary branch.

Flush cut - A pruning cut that removes the branch collar and/or part of the branch ridge, slowing the occlusion of the wound.

Footing - A relatively broad base to a foundation to help spread load and improve the stability of a structure.

Fungi (singular 'fungus') - One of the four main groups (kingdoms) of organisms. There are two groups of higher fungi, the Basidiomycetes and Ascomycetes, while other groups are molds. Many fungi are decomposers, including the relatively specialized wood decay fungi. Some are plant pathogens, some are symbiotic (see mycorrhiza, lichen) and some are cultivated by insects for food (see ambrosia beetle).

Included bark - Areas of bark on adjacent parts of a tree, typically on the inner faces of a narrow fork, which become grown over to occupy part of the internal joint.

Ganoderma spp. - A common wood decay fungus of the selective delignification type, causing root rot and butt rot mainly in broadleaf trees. The fruiting bodies of the fungus are woody brackets, commonly occurring in the flutes between the buttresses of big trees near ground level.

Heartwood - In a branch, main stem or root of sufficient diameter, the non-living inner wood, in contrast to the sapwood in which the xylem parenchyma cells are alive.

Lignin - A constituent of some plant cell walls making them stiff and woody. About 1/3 of the dry weight of wood is lignin.

Lion-tailing - A long branch with a tuft of secondary branches near the tip, a marked form of end loading, either arising naturally or from poor pruning practice.

Mistletoe - A semi-parasite, having green leaves for photosynthesis but growing into the host to obtain water and nutrients.

Mycelium - A network of hyphae making up the vegetative part of a fungus.

Mycelium - A network of hyphae making up the vegetative part of a fungus.

Osmosis - The flow of water across a semi-permeable membrane from a dilute solution to a more concentrated one, as from the soil water into a root cell or from the xylem into a leaf cell.

Quantified tree risk assessment (QTRA) - A refinement of visual tree assessment with emphasis on seeking to quantify the component probabilities of tree risk, particularly the occupancy of the target area, to arrive at an overall numerical or categorical risk.

Root Zone - Area encompassing the tree's roots

Scaffold branch – a branch which emanates from a first-order branch, also known as a second-order branch.

Structural defect - A defect in a structure that makes it less able to withstand the forces applied to it.

t/R ratio - In hollow tree stems, the ratio of the thickness of sound wood to the radius. A criterion helpful in evaluating tree risk developed by Mattheck & Breloer (1994)

Tension wood - The kind of reaction wood found in broadleaf trees which is strong in tension and is characterized by a low lignin content.

Tree risk - The risk that a tree causes damage or injury if it (or part of it) suffers structural failure. Tree risk is a composite of several variables: hazard, probability, target value and occupancy.

Urban forest - Trees and other woody vegetation in the built environment considered collectively over an extensive area (e.g., the jurisdiction of a local authority).

Vigour – the genetic capacity (potential) of a tree to resist strain. Vigour can be measured by applying a known stimulus [such as a wound] and then measuring the trees response. Vigour cannot be increased. Vigour is classified as either 'normal' or 'low' (Shigo, 1986, p.120).

Vitality – the ability (dynamic) of a tree to adapt to the conditions in which it finds itself. Vitality can be improved by; watering, mulching, fertilizing, aerating etc. (Shigo, 1986, p. 120). For the purpose of this report vitality shall be classified as either low or good.

VTA - Visual Tree Assessment

Windthrow- The fall of a tree in a high wind, with the breakage of the outer roots, so that the tree is uprooted. There are three main modes of windthrow.