



Arboriculture and Urban Forest Consultants
www.arbkey.com | info@arbkey.com | 0490 355 342

Arboricultural Impact Assessment

Location:

81 South Road, Brighton

Report Commissioned by:

Arki Design Studio

Author:

Lachlan Scott

Grad. Cert. Arb.

Arbkey ref: 24-06-24SouthBrightonV2.docx

Date submitted: August 26, 2024

Table of Contents

1	Introduction.....	2
2	Site Details.....	3
3	Methodology.....	4
4	Observations.....	5
5	Discussion.....	5
6	Conclusions and Recommendations	7
7	References.....	7
8	Appendix 1: Site Map.....	8
9	Appendix 2: Tree Details.....	9
10	Appendix 3: TPZ and SRZ details.....	11
11	Appendix 4: TPZ, SRZ and Encroachment Map.....	12
12	Appendix 5: Tree Photos	13
13	Appendix 6: Data Definitions	21
14	Appendix 7: Tree Protection Zones and Encroachment	23

1 Introduction

Arbkey has been engaged by Arki Design Studio to provide an Arboricultural Impact Assessment for trees likely to be affected by a proposed development at 81 South Road, Brighton. Arboricultural Impact Assessments are a procedure for determining the viability of trees at the design and review stage of a project. For the report arbkey has:

- Identified and assessed the trees, providing their location, species, dimensions, useful life expectancy and health and structural condition.
- Allocated each tree an arboricultural value, indicating its merit for retention throughout nearby disturbance.
- Calculated the size of the Tree Protection Zone (TPZ) in accordance with Australian Standard 4970, Protection of Trees on Development Sites.
- Calculated and provided comment regarding the impact of the proposed development to the trees TPZs and assessed the suitability for retention of all trees against the current development plans.
- Provided recommendations to protect any trees through the proposed developments.

2 Site Details

The subject site is a single occupancy residential property featuring a prominent heritage building and surrounding gardens (Figure 1). The vegetation of the site is typified by shrubs and smaller trees however larger canopy trees are present within the surrounding private properties and road reserves.



Figure 1: Subject site frontage

2.1 Development Proposal

Extension/alteration of the existing building and installation of an alfresco and pool area is proposed.

2.2 Planning and Policy Context

The subject site is located within Neighbourhood Residential Zone - Schedule 3 of the Bayside Planning Scheme (DEECA 2024). The vegetation protection related planning or policy controls for the site and how they affect the assessed trees has been provided in Table 1.

Table 1: Vegetation controls at site

Planning/Policy Control	Applied to site?	Overview of control	Trees affected
Heritage Overlay (HO)	Yes (H0344)	A permit is required to remove, destroy or lop a tree	All
Local Law	Yes	To remove a tree a Local Law permit will be required if: <ul style="list-style-type: none"> the tree has a single or combined trunk circumference greater than 155cm measured at 1m above ground level. If the tree has several trunks, the 4 largest trunks circumferences should be added together 	Trees 7, 12 and 29

Due to their ownership, any trees within adjacent third-party owned property must remain viable throughout works at the subject site unless under agreement with the tree’s respective owner. Modification of trees in adjacent property may also be subject to permit approval.

2.3 Site Map

A site map detailing existing conditions and tree locations has been provided in Appendix 1: Site Map

3 Methodology

On the 15 July 2024, Lachlan Scott undertook inspection of trees greater than 3m in height located at, or with tree protection zones (AS4970 2009) likely to intersect the property at, 81 South Road, Brighton. The following information was collected for the trees:

- Tree Species
- Tree Location
- Height (m)
- Crown Spread (m)
- Diameter at Breast Height (DBH) at 1.4m (cm)
- Diameter at Base (DAB) at just above the root flare (cm)
- Health
- Structure
- Significance
- Photographs of tree

Only a ground based visual inspection was undertaken of all trees according to the principles of Visual Tree Assessment and tree hazard assessment described in Harris, Clark and Matheny (1999) and Mattheck and Breloer (1994).

Tree location has been derived using a feature survey provided by the client or if not present aligned using an RTK corrected GNSS receiver.

Height was measured on site using an impulse laser accurate to +/- 30cm. Crown spread values or drawings are indicative of crown size only, not shape or form.

A diameter tape was used to measure DBH. To prevent trespass, DBH has been estimated on adjacent sites.

Health, Structure and Significance are qualitative values derived from visual indicators and the authors experience and qualifications.

Encroachment of TPZs by the development has been calculated using GIS software.

Full data collection definitions are available in Appendix 6: Data Definitions.

3.1 Documents Reviewed

Table 2: Documents reviewed to assist in the compilation of this report

Document Name	DWG/Document #	Author	Document Description	Date compiled/drawn
2402 WD Preliminary - 15.08.2024	2402	ARKI Design Studio	Site Plans	15 August 2024

4 Observations

4.1 Tree Details

34 trees were assessed, 19 on the site itself and 15 within adjacent third-party managed property (Table 3). Full details of the assessed trees have been provided in Appendix 2: Tree Details.

Table 3: Count of assessed species and their respective species origin

Genus Species	Common Name	Species Origin	Count of Trees	Tree IDs
<i>Magnolia grandiflora</i>	Bull Bay	Exotic	6	8, 17, 18, 20, 22, 25
<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	5	19, 21, 26, 27, 28
<i>Camellia japonica</i>	Camellia	Exotic	4	6, 13, 16, 23
<i>Corymbia ficifolia</i>	Flowering Gum	Australian Native	3	1, 9, 15
<i>Ligustrum lucidum</i>	Privet	Exotic	2	24, 30
<i>Schinus areira</i>	Peppercorn Tree	Exotic	2	12, 14
<i>Viburnum tinus</i>	Viburnum	Exotic	2	2, 11
<i>Acca sellowiana</i>	Pineapple Guava	Exotic	1	31
<i>Citrus limon</i>	Lemon	Exotic	1	4
<i>Cornus sp.</i>	Crab Apple	Exotic	1	33
<i>Eucalyptus goniocalyx</i>	Long-leaved Box	Indigenous	1	32
<i>Ficus platypoda</i>	Rock Fig	Australian Native	1	7
<i>Gleditsia triacanthos</i>	Honey Locust	Exotic	1	3
<i>Ligustrum vulgare</i>	European Privet	Exotic	1	10
<i>Luma apiculata</i>	Luma	Exotic	1	29
<i>Murraya paniculata</i>	Orange Jessamine	Exotic	1	34
<i>Pittosporum eugenioides "Variegatum"</i>	Variegated Pittosporum	Exotic	1	5

5 Discussion

5.1 Arboricultural Value

All the assessed trees have been attributed an arboricultural value (Table 4). Arboricultural value is a calculated rating indicating the arboricultural merit of the tree for retention through any nearby disturbance. It is a qualitative combination of the trees ULE and significance values. Trees of higher arboricultural value should be prioritised for retention through works that may impact trees. Conversely, trees of low or no arboricultural value can often be removed to facilitate a development with little or no effect on wider landscape value.

Trees attributed an arboricultural value of ‘Third Party Ownership’ are located on adjacent land to the assessment. It is assumed that the owner of the tree attributes it a ‘High’ arboricultural value and requires its retention in the landscape.

Table 4: Overview of arboricultural value

Arboricultural Value	Count	Tree IDs
Medium	1	14
Low	18	2, 3, 5, 6, 8, 10, 11, 13, 16, 19, 21, 23, 26, 27, 28, 29, 30, 33
Third Party Ownership	15	1, 4, 7, 9, 12, 15, 17, 18, 20, 22, 24, 25, 31, 32, 34

5.2 Tree Protection Zone (TPZ) and Structural Root Zone (SRZ)

AS4970 (2009) specifies areas drawn radially from each tree’s stem which indicate the area required for its stability (SRZ) and viability (TPZ) throughout nearby disturbance such as development. Further information on TPZs and SRZs has provided in Appendix 7: Tree Protection Zones and Encroachment

5.2.1 TPZ and SRZ details

TPZ and SRZ details for all trees has been supplied in Appendix 3: TPZ and SRZ details.

5.3 Arboricultural Impact, TPZ Encroachment and Viability

5.3.1 Tree removal

Five (5) trees are proposed for removal under the current development plans (Table 5). Permit approval is required for the removal of all these trees.

Table 5: Trees proposed for removal, arboricultural value, and permit requirements.

Tree ID	Genus Species	Common Name	Arboricultural Value	Height (m)	Total DBH (cm)	DAB (cm)	Planning Permit Required?
14	<i>Schinus areira</i>	Peppercorn Tree	Medium	8	38	44	Yes
16	<i>Camellia japonica</i>	Camellia	Low	3	13	15	Yes
23	<i>Camellia japonica</i>	Camellia	Low	3	9	12	Yes
29	<i>Luma apiculata</i>	Luma	Low	3	28.14	30	Yes
33	<i>Cornus sp.</i>	Crab Apple	Low	4	7.81	10	Yes

5.3.2 Impact of design on trees to be retained

To assess the viability of the trees to be retained throughout the design’s implementation, their TPZ and SRZ has been calculated and mapped as per AS4970 (2009). Where a development’s footprint overlaps a TPZ it is termed ‘encroachment’ within AS4970 (2009).

Two (2) trees have TPZ encroached by the proposed development’s footprint (Table 6).

Trees 7, and 12, have TPZ encroached by less than 10% of their respective area by the proposed development footprint. Where encroachment of a respective TPZ is limited to less than 10% of its area it is termed ‘Minor Encroachment’. Minor encroachment and corresponding variations to a TPZ are considered acceptable while the lost area is compensated elsewhere while still being contiguous with the TPZ. These trees are expected to remain viable throughout the implementation of the design.

Table 6: Trees to be retained with TPZ encroached by development footprint (AS4970 2009)

Tree ID	Genus Species	Common Name	Arboricultural Value	TPZ Encroachment (%)	SRZ Encroachment?	Encroachment Classification
7	<i>Ficus platypoda</i>	Rock Fig	Third Party Ownership	8.5	No	Minor
12	<i>Schinus areira</i>	Peppercorn Tree	Third Party Ownership	9.9	No	Minor

The remaining trees to be retained are not encroached by the design footprint and will remain viable throughout its implementation.

5.3.3 TPZ, SRZ and Encroachment Map

Maps detailing the TPZ, SRZ and Encroachment have been provided in Appendix 4: TPZ, SRZ and Encroachment Map.

6 Conclusions and Recommendations

Extension/alteration of the existing building and installation of an alfresco and pool area is currently proposed at 81 South Road, Brighton. Arbkey has been engaged to assess the impact of the development on the trees at or adjacent to the site. 34 trees were assessed, 19 on the site and 15 within adjacent property. Five (5) of these trees are proposed for removal under the development plans. Permit approval is required for the removal of all these trees.

To assess the viability of the trees to be retained throughout the design's implementation, their tree protection zone (TPZ) and structural root zone (SRZ) has been calculated and mapped as per AS4970 (2009). Where a development's footprint overlaps a TPZ it is termed 'encroachment' within AS4970 (2009).

Two (2) of the trees to be retained have TPZ encroached by the proposed design footprint. Trees 7, and 12, have TPZ encroached by less than 10% of their respective TPZ area, a level considered generally permissible under AS4970 (2009). These trees will remain viable throughout the implementation of the proposal.

The remaining trees to be retained are not encroached by the design footprint and will remain viable throughout its implementation. It is recommended that:

- Trees that are unable to be retained through the development are removed prior to the commencement of construction but after the approval of final plans by the relevant authority.
- Prior to the commencement of any construction or demolition activities:
 - A Tree Protection Management Plan (TPMP) in accordance with AS4970 (2009) is prepared outlining the procedure for protecting any impacted trees throughout the implementation of the endorsed design.

7 References

AS 4373, 2007, Australian Standard, Pruning Amenity Trees, 2nd Edition Standards Australia

AS 4970, 2009, Australian Standard, Protection of Trees on Development Sites, Standards Australia

DEECA 2024, Vicplan, Department of Energy, Environment and Climate Action,
<https://mapshare.vic.gov.au/vicplan/>

Harris, R.W., Clark, J.R. & Matheny, N.P., 1999, Arboriculture; Integrated management of landscape trees, shrubs, and vines, Prentice Hall, Upper Saddle River, New Jersey

IACA 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia

Mattheck, C. and Breloer, H. 1994, The body language of trees: a handbook for failure analysis, London: HMSO

8 Appendix 1: Site Map



Figure 2: Site Map – Existing Condition

9 Appendix 2: Tree Details

Table 7: Details of assessed trees

Tree ID	Genus Species	Common Name	Species Origin	Height (m)	Crown Spread (m)	Total DBH (cm)	DAB (cm)	Health	Structure	Maturity	ULE (years)	Arboricultural Value	Notes
1	<i>Corymbia ficifolia</i>	Flowering Gum	Australian Native	8	7	67	75	Good	Fair	Mature	15 to 40	Third Party Ownership	
2	<i>Viburnum tinus</i>	Viburnum	Exotic	4	4	16.19	18	Good	Fair	Mature	5 to 15	Low	
3	<i>Gleditsia triacanthos</i>	Honey Locust	Exotic	6	5	12	15	Good	Good	Semi-mature	15 to 40	Low	
4	<i>Citrus limon</i>	Lemon	Exotic	5	3	9	12	Fair	Fair	Semi-mature	15 to 40	Third Party Ownership	
5	<i>Pittosporum eugenioides</i> "Variegatum"	Variegated Pittosporum	Exotic	7	5	27.8	28	Good	Fair	Mature	15 to 40	Low	
6	<i>Camellia japonica</i>	Camellia	Exotic	3	4	13.3	14	Good	Fair	Mature	15 to 40	Low	
7	<i>Ficus platypoda</i>	Rock Fig	Australian Native	11	12	84.85	95	Good	Fair	Mature	>40	Third Party Ownership	
8	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	5	2	10	15	Good	Good	Immature	>40	Low	
9	<i>Corymbia ficifolia</i>	Flowering Gum	Australian Native	8	11	59	67	Good	Fair	Mature	15 to 40	Third Party Ownership	
10	<i>Ligustrum vulgare</i>	European Privet	Exotic	4	2	11.53	14	Fair	Fair	Mature	5 to 15	Low	
11	<i>Viburnum tinus</i>	Viburnum	Exotic	4	3	12.53	13	Good	Fair	Mature	5 to 15	Low	
12	<i>Schinus areira</i>	Peppercorn Tree	Exotic	11	10	90	92	Good	Fair	Mature	15 to 40	Third Party Ownership	
13	<i>Camellia japonica</i>	Camellia	Exotic	3	3	13.89	16	Good	Fair	Mature	15 to 40	Low	
14	<i>Schinus areira</i>	Peppercorn Tree	Exotic	8	9	38	44	Good	Fair	Mature	15 to 40	Medium	
15	<i>Corymbia ficifolia</i>	Flowering Gum	Australian Native	4	2	13	15	Fair	Fair	Semi-mature	15 to 40	Third Party Ownership	
16	<i>Camellia japonica</i>	Camellia	Exotic	3	2	13	15	Good	Good	Semi-mature	15 to 40	Low	
17	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	3	1	6	7	Good	Good	Immature	15 to 40	Third Party Ownership	Group of 5 along fence
18	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	3	1	6	7	Good	Good	Immature	15 to 40	Third Party Ownership	Group of 5 along fence
19	<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	4	3	12	15	Good	Fair	Mature	15 to 40	Low	
20	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	3	1	6	7	Good	Good	Immature	15 to 40	Third Party Ownership	Group of 5 along fence
21	<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	4	3	13.6	15	Good	Fair	Mature	15 to 40	Low	
22	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	3	1	6	7	Good	Good	Immature	15 to 40	Third Party Ownership	Group of 5 along fence

Tree ID	Genus Species	Common Name	Species Origin	Height (m)	Crown Spread (m)	Total DBH (cm)	DAB (cm)	Health	Structure	Maturity	ULE (years)	Arboricultural Value	Notes
23	<i>Camellia japonica</i>	Camellia	Exotic	3	3	9	12	Good	Fair	Semi-mature	15 to 40	Low	
24	<i>Ligustrum lucidum</i>	Privet	Exotic	5	3	12	15	Fair	Fair	Semi-mature	5 to 15	Low	Third Party Ownership
25	<i>Magnolia grandiflora</i>	Bull Bay	Exotic	3	1	6	7	Good	Good	Immature	15 to 40	Low	Third Party Ownership Group of 5 along fence
26	<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	4	3	11	13	Good	Fair	Semi-mature	15 to 40	Low	
27	<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	3	2	8	9	Fair	Fair	Semi-mature	5 to 15	Low	
28	<i>Camellia sasanqua</i>	Sasanqua Camellia	Exotic	3	2	10	13	Good	Fair	Semi-mature	15 to 40	Low	
29	<i>Luma apiculata</i>	Luma	Exotic	3	4	28.14	30	Good	Fair	Mature	15 to 40	Low	
30	<i>Ligustrum lucidum</i>	Privet	Exotic	5	3	12	15	Good	Fair	Semi-mature	5 to 15	Low	
31	<i>Acca sellowiana</i>	Pineapple Guava	Exotic	5	4	19.75	20	Good	Fair	Mature	5 to 15	Low	Third Party Ownership
32	<i>Eucalyptus goniocalyx</i>	Long-leaved Box	Indigenous	14	15	80	90	Good	Fair	Mature	15 to 40	Low	Third Party Ownership
33	<i>Cornus sp.</i>	Crab Apple	Exotic	4	2	7.81	10	Fair	Fair	Semi-mature	5 to 15	Low	
34	<i>Murraya paniculata</i>	Orange Jessamine	Exotic	3	4	11.66	18	Good	Fair	Mature	5 to 15	Low	Third Party Ownership

10 Appendix 3: TPZ and SRZ details

Table 8: TPZ and SRZ details of assessed trees (AS4970 2009)

Tree ID	Genus Species	Common Name	SRZ radius (m) AS4970	TPZ radius (m) AS4970	TPZ Area AS 4970 (m ²)
1	<i>Corymbia ficifolia</i>	Flowering Gum	2.93	8.04	203.078
2	<i>Viburnum tinus</i>	Vibenum	1.61	2	12.566
3	<i>Gleditsia triacanthos</i>	Honey Locust	1.5	2	12.566
4	<i>Citrus limon</i>	Lemon	1.5	2	12.566
5	<i>Pittosporum eugenioides</i> "Variegatum"	Variegated Pittosporum	1.94	3.34	35.046
6	<i>Camellia japonica</i>	Camellia	1.5	2	12.566
7	<i>Ficus platypoda</i>	Rock Fig	3.24	10.18	325.571
8	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
9	<i>Corymbia ficifolia</i>	Flowering Gum	2.8	7.08	157.477
10	<i>Ligustrum vulgare</i>	European Privet	1.5	2	12.566
11	<i>Viburnum tinus</i>	Vibenum	1.5	2	12.566
12	<i>Schinus areira</i>	Peppercorn Tree	3.2	10.8	366.435
13	<i>Camellia japonica</i>	Camellia	1.53	2	12.566
14	<i>Schinus areira</i>	Peppercorn Tree	2.34	4.56	65.325
15	<i>Corymbia ficifolia</i>	Flowering Gum	1.5	2	12.566
16	<i>Camellia japonica</i>	Camellia	1.5	2	12.566
17	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
18	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
19	<i>Camellia sasanqua</i>	Sasanqua Camellia	1.5	2	12.566
20	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
21	<i>Camellia sasanqua</i>	Sasanqua Camellia	1.5	2	12.566
22	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
23	<i>Camellia japonica</i>	Camellia	1.5	2	12.566
24	<i>Ligustrum lucidum</i>	Privet	1.5	2	12.566
25	<i>Magnolia grandiflora</i>	Bull Bay	1.5	2	12.566
26	<i>Camellia sasanqua</i>	Sasanqua Camellia	1.5	2	12.566
27	<i>Camellia sasanqua</i>	Sasanqua Camellia	1.5	2	12.566
28	<i>Camellia sasanqua</i>	Sasanqua Camellia	1.5	2	12.566
29	<i>Luma apiculata</i>	Luma	2	3.38	35.891
30	<i>Ligustrum lucidum</i>	Privet	1.5	2	12.566
31	<i>Acca sellowiana</i>	Pineapple Guava	1.68	2.37	17.646
32	<i>Eucalyptus gonicalyx</i>	Long-leaved Box	3.17	9.6	289.529
33	<i>Cornus sp.</i>	Crab Apple	1.5	2	12.566
34	<i>Murraya paniculata</i>	Orange Jessamine	1.61	2	12.566

11 Appendix 4: TPZ, SRZ and Encroachment Map

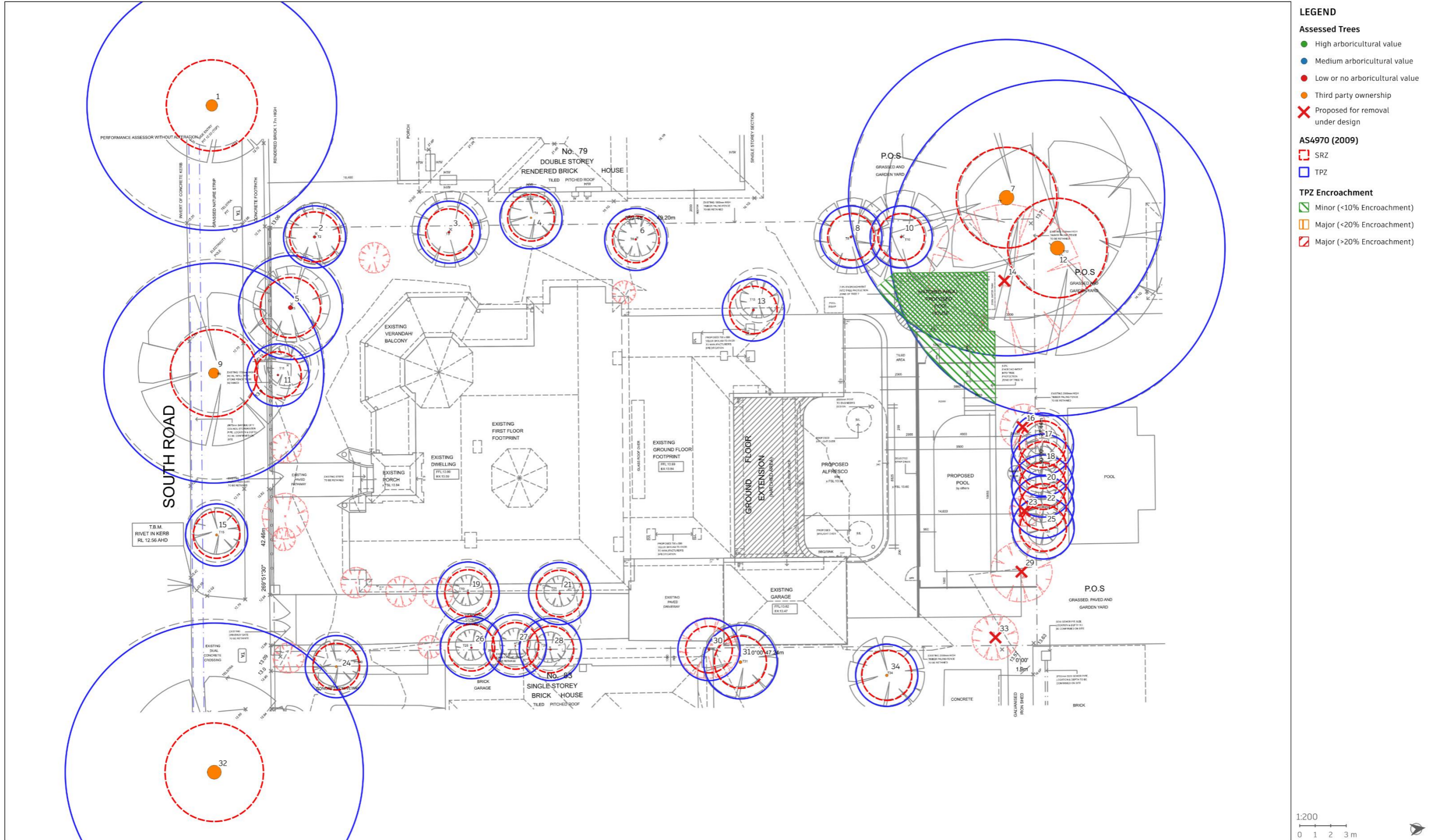


Figure 3: TPZ, SRZ and Encroachment Map

12 Appendix 5: Tree Photos

Tree ID: 1



Tree ID: 2



Tree ID: 3



Tree ID: 4



Tree ID: 5



Tree ID: 6



Tree ID: 7



Tree ID: 8



Tree ID: 9



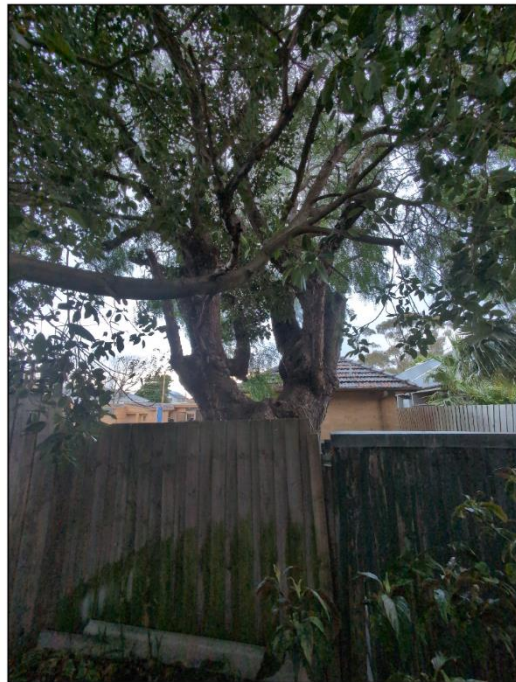
Tree ID: 10



Tree ID: 11



Tree ID: 12



Tree ID: 13



Tree ID: 14



Tree ID: 15



Tree ID: 16



Tree ID: 17, 18, 20, 22, 25



Tree ID: 19



Tree ID: 21



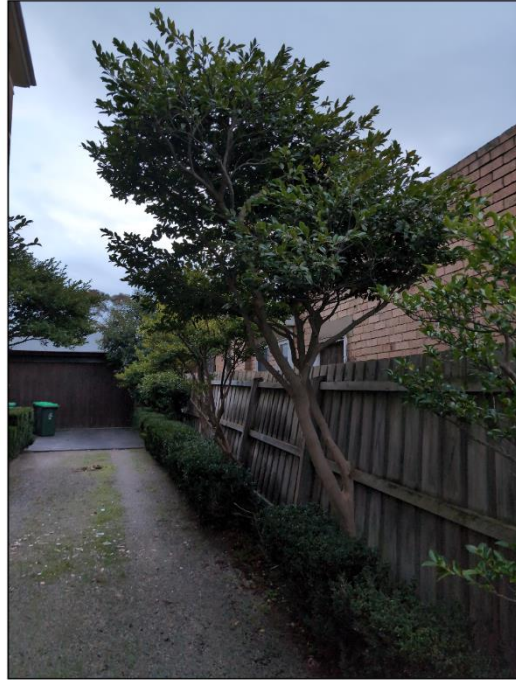
Tree ID: 23



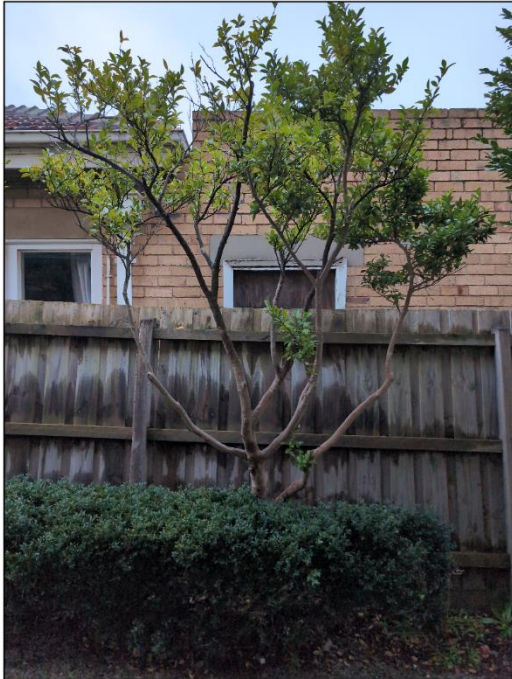
Tree ID: 24



Tree ID: 26



Tree ID: 27



Tree ID: 28



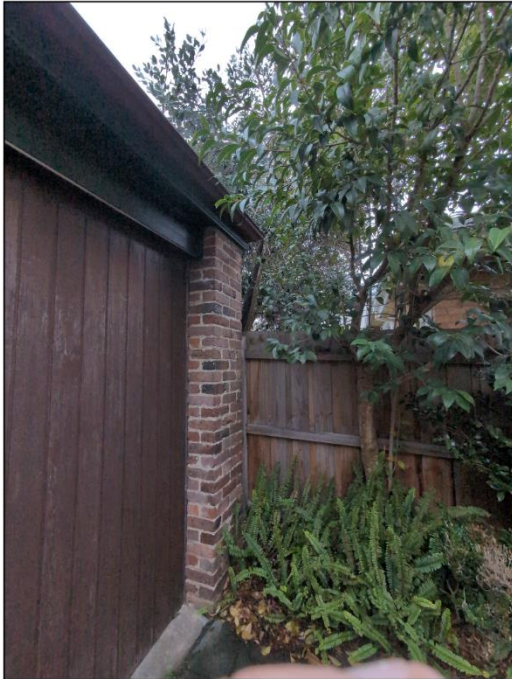
Tree ID: 29



Tree ID: 30



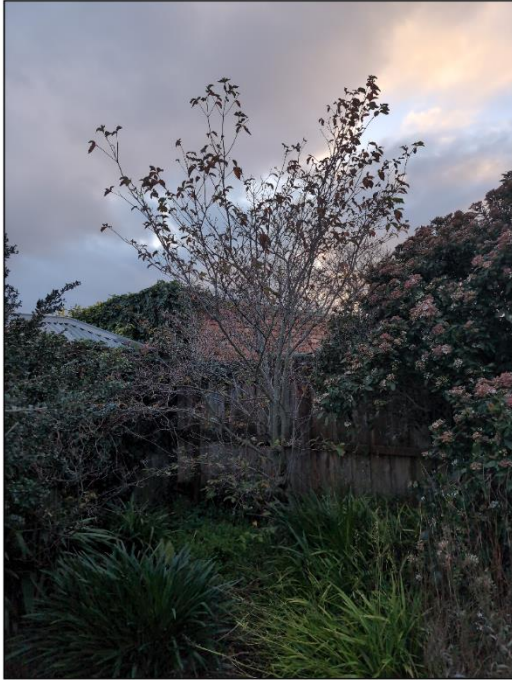
Tree ID: 31



Tree ID: 32



Tree ID: 33



Tree ID: 34



13 Appendix 6: Data Definitions

DBH (Diameter at Breast Height) is measured at 1.4 m above ground level or calculated from the total stem area if the tree was multi-stemmed at 1.4m above ground level in accordance with AS 4970 (2009).

DAB (Diameter at Base) is measured just above the root collar of a tree in accordance with AS 4970 (2009)

Health summarises qualitative observations of canopy density, overall vigour and vitality made in the field:

- Good - Canopy is visually dense with less than 10% dieback and shows no, or only very minor nutrient deficiencies, pest and disease presence or stress-induced epicormic growth.
- Fair - Canopy is of average density, consists of between 10-30% dieback and shows a minor, or occasionally moderate, level of nutrient deficiency, pest and disease presence or stress-induced epicormic growth.
- Poor - Canopy is visually sparse, consists of more than 30% dieback and typically has significant nutrient deficiency, pest and disease presence or stress induced epicormic growth.
- Dead – No indication the tree is alive

Structure summarises qualitative observations of tree structure and stability made in the field:

- Good - The tree's form is optimal for the species. Typically trees of 'Good' structure have no or only very minor trunk leans or canopy asymmetry. These trees have parts that are not structurally compromised by decay, cracks, or other structural faults. Structural failure of these trees is only likely only under strong and unusual weather events
- Fair - The tree's structure includes minor structural defects that do not typically fail in light or moderate weather events. Typically trees of 'Fair' structure have minor trunk leans or slightly asymmetric canopies. These trees are likely to have parts that are partly compromised by decay or structural defects such as included bark.
- Poor - The tree's structure includes major structural defects. Failure of these trees is considered possible under light or moderate weather events. Typically trees of 'Poor' structure have major trunk leans or heavily asymmetric canopies. These trees are likely to have parts that are heavily compromised by decay or structural defects such as included bark.

Maturity summarises the life stage of the tree.

- Juvenile – The tree is in approximately the first 10% of its expected lifespan in its current environment
- Semi-mature – Tree is 10%-20% through its expected lifespan in its current environment and has not yet reached its mature dimensions.
- Mature – The tree is through 20%-90% of its expected lifespan in its current environment.
- Over-mature – The tree is through approximately 90% of its expected lifespan in its current environment

ULE (Useful Life Expectancy) indicates the anticipated remaining years of lifespan of the tree in its existing surroundings. The tree's lifespan is the time that it will continue to provide amenity value without undue risk or hazard and with a reasonable amount of maintenance.

Significance indicates the importance a tree may have on a respective site. The following descriptors are used to derive this value (adapted from IACA 2010):

High -

- Tree is good condition and good vigour
- The tree has a form typical for the species
- The tree is a remnant specimen or is rare or uncommon in the local area or of botanical interest or substantial age
- The tree is listed as a heritage item or threatened species or listed on a municipal significant tree register
- The tree is visually prominent and visible from a considerable distance when viewed from most directions due to its size and scale. The tree makes a positive contribution to the local amenity.
- The tree supports social or cultural sentiments or spiritual associations or has commemorative values
- The tree is appropriate to the site conditions

Medium -

- The tree is in fair condition and good or low vigour
- The tree has form typical or atypical of the species
- The tree is a planted locally indigenous taxa or a common species within the area.
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from a public space. The tree provides a moderate contribution to the amenity and character of the local area
- The tree is often partially restricted by above or below ground influences and/or resources.

Low -

- The tree is in fair condition and good or low vigour
- The tree has form atypical of the species.
- The tree is not visible or is partly visible from surrounding properties due to obstructions.
- The tree provides a minor contribution or has a negative impact on landscape amenity or character of the local area.
- The tree is a juvenile specimen that can easily be replaced.
- The tree's growth is severely restricted by above or below ground influences and/or resources.
- The tree has a feature that has potential to become structurally unsound.
- The tree is listed as a noxious or environmental weed under state, federal or municipal policy

Dead/Irreversible Decline -

- The tree is structurally unsound or unstable
- The tree is dead or in irreversible decline

Third Party Ownership

- The tree is located on adjoining land to the assessment.

A tree is to meet several or all the criteria in a category to be classified in that group

Arboricultural Value is a calculated value indicating the merit of the tree for retention through any nearby developments. It is a qualitative combination of the trees ULE and Significance Values (Table 9).

Table 9: Matrix for the calculation of Arboricultural Value

ULE	Significance Value				
	High	Medium	Low	Dead/Irreversible Decline	Third Party Ownership
>40 years	High	Medium	Low	Low	Third Party Ownership
15-40 years	High	Medium	Low	Low	Third Party Ownership
5-15 years	High	Medium	Low	None	Third Party Ownership
<5 years	Medium	Low	None	None	Third Party Ownership
0 years	Low	None	None	None	Third Party Ownership

- High – Trees attributed a 'High' arboricultural value are generally of strong visual amenity and significant in the landscape. The utmost level of consideration should be given for the retention of these trees throughout development activities and/or nearby disturbance
- Medium – Trees attributed a 'Medium' arboricultural value are of moderate amenity value and have been attributed some value in the landscape. Trees attributed a 'Medium' arboricultural value should be retained and designed around during developments or nearby disturbance. If retention is not possible for these trees, removal and replacement can be often considered as an acceptable compromise.
- Low – Trees attributed a Low arboricultural value are of poor arboricultural merit. Removal and replacement is an acceptable compromise if designing around these trees is not possible.
- None – Trees attributed an arboricultural value of none have no arboricultural merit. Removal is usually acceptable or required for these trees.
- Third Party Ownership – The tree is located on adjacent land to the assessment. It is assumed that the owner of the tree attributes it a High arboricultural value and requires its retention in the landscape.

14 Appendix 7: Tree Protection Zones and Encroachment

14.1 Structural Root Zones (SRZ)

SRZs are an indication of the area surrounding the base of a tree that is required for its stability. AS 4970 (2009) provides a method to calculate the SRZ of trees: The SRZ is calculated as

$$(DAB \times 50)^{0.42} \times 0.64$$

For grass like trees such as palms or tree ferns; SRZs are not calculated.

14.2 Tree Protection Zone (TPZ)

A Tree Protection Zone (TPZ) is considered one of the most effective ways to ensure the retention of trees throughout development. The aim of a TPZ is to secure the space around the tree so that no above or below ground activities or developments can affect the integrity of the tree's root system or above ground parts.

AS 4970 (2009) provides a method for calculating the standard area of TPZ's. For all broadleaf trees, the radius of the TPZ is calculated as:

$$12 * DBH$$

For grass like trees such as palms or tree ferns; TPZs are calculated as:

$$\text{Radius of extent of canopy} + 1\text{m,}$$

Dead trees are attributed a TPZ of the same size as their SRZ as only their stability can now be protected and not their vigour

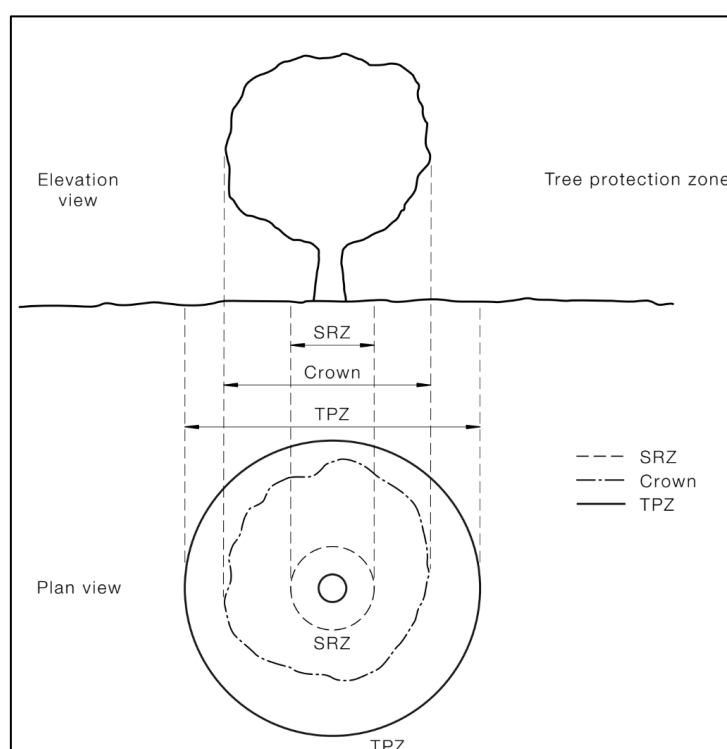


Figure 4: Diagram of TPZ and SRZ (AS 4970 2009)

14.2.1 TPZ Encroachment:

AS 4970 (2009) allows the extents of 'calculated' TPZs to be varied, under certain conditions, to allow varying levels encroachment into TPZs. Encroachment is the term given to the level of impact of the footprint of a disturbance (such as a development or construction activity) on the calculated TPZ of a tree. Two levels of encroachment are classified within AS 4970:

14.2.1.1 Minor Encroachment

Where encroachment of a respective TPZ is limited to less than 10% of a TPZs area it is termed 'Minor Encroachment'. Minor encroachment and corresponding variations to a TPZ is considered acceptable while the lost area is compensated elsewhere while still being contiguous with the TPZ.

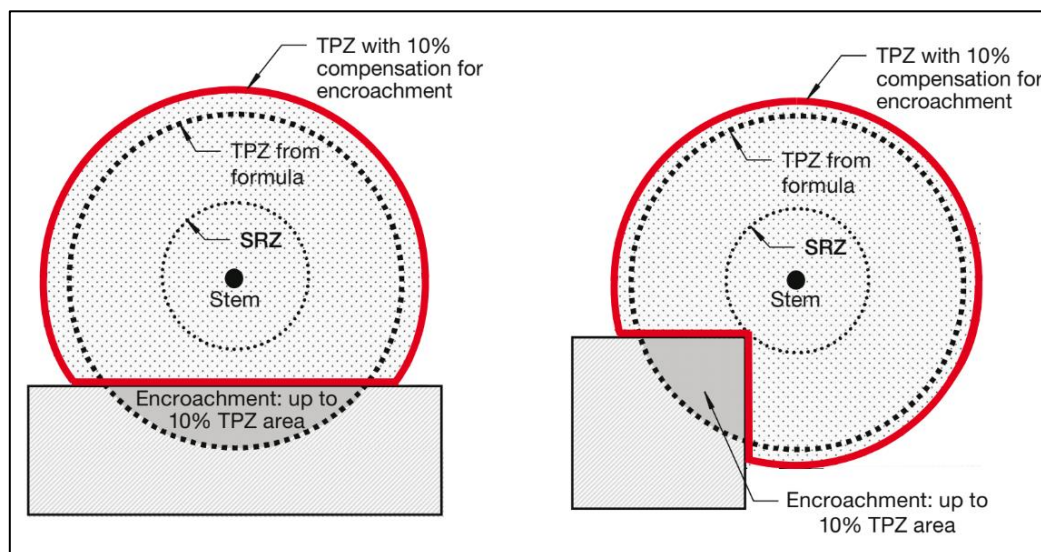


Figure 5: Examples of Minor TPZ encroachment and contiguous TPZ compensation (AS 4970 2009)

14.2.1.2 Major Encroachment

Where encroachment of the standard TPZ exceeds 10% of a TPZ it is termed 'Major Encroachment'. Major encroachment and corresponding variations to a TPZ can be considered acceptable providing the following conditions are met:

- The project arborist demonstrates the tree will remain viable through the encroachment.
- The lost area is compensated elsewhere while still being contiguous with the TPZ.

Regardless of encroachment, final TPZs and tree protection requirements should be clear to all parties during the entire construction process. Ideally all tree protection requirements should be outlined within a Tree Protection Management Plan (TPMP), prepared by a suitably qualified arborist, prior to the commencement of any construction activities

14.2.2 Tree Protection Fencing

Tree protection fencing should be installed around the final area of the TPZs of trees to be retained. Fencing should always be installed before the commencement of any construction activities and secured for the life of the construction. TPZ fencing should consist of chain mesh fencing of a minimum of 1.8m in height connected by temporary concrete footings. Where applicable, a finer mesh such as shade cloth should be applied to prevent airborne contaminants entering the TPZ. Warning signs should be erected at regular intervals along the entire length of any TPZ fencing.

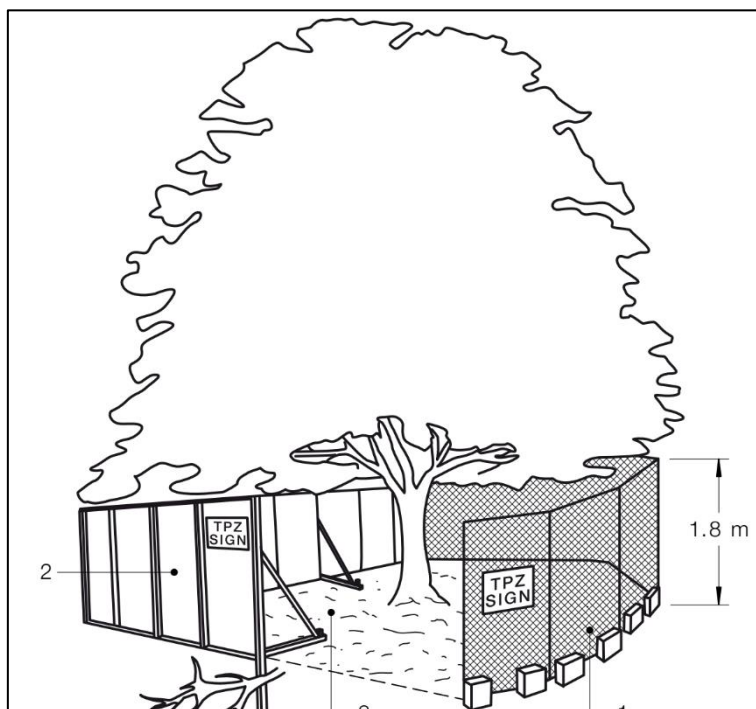


Figure 6: Examples of TPZ fencing (AS 4970 2009)

If the installation of tree protection fencing is not possible; alternative methods for protection of above and below grounds tree parts such a ground protection and physical barriers can be considered at the discretion of the project arborist.

14.2.2.1 General Tree Protection Guidelines

The following recommendations have been provided to as best practice guidelines to the establishment of a TPZ during the length of construction activities.

Exclude the following from taking place within any TPZ (adapted from AS 4970-2009):

- built structures or hard landscape features (i.e. paving, retaining walls)
- materials storage (i.e. equipment, fuel, building waste or rubble)
- soil disturbance (i.e. stripping or grade changes)
- excavation works including soil cultivation (specifically surface-dug trenches for underground utilities)
- placement of fill
- lighting of fires
- preparation of chemicals, including preparation of cement products
- pedestrian or vehicular access (i.e. pathways).