Arboricultural Impact Assessment Report (AIA)

1 Kent Rd & 24 Durham Rd, Surrey Hills

27 May 2026

Tree Logic Ref. 014244

Prepared for VJ1KR Pty Ltd

Prepared by Harry Webb – Tree Logic Pty. Ltd.

Contents

Version	*Type*	*Design phase*	*Author*	*Date*
1	*Impact assessment AIA*	*TP submission*	*HW*	*17.02.2026*
2	*Impact assessment AIA*	*TP submission*	*HW*	*23.02.2026*
3	*Impact assessment AIA*	*TP submission*	*HW*	*27.05.2026*

1 Introduction

Tree Logic was engaged by Wulff Projects Pty Ltd on behalf of VJ1KR Pty Ltd to undertake an arboricultural impact assessment (AIA) for a proposed site redevelopment at 1 Kent Rd & 24 Durham Rd, Surrey Hills. The purpose of this report is to review supplied designs, determine likely tree impacts and provide advice to minimise impacts, where possible.

2 Method

Tree details have been taken from the preliminary arboricultural report (PAR) prepared by Tree logic, dated 29 September 2025.

The assessed trees have been allocated notional root zones (NRZ) and structural root zones (SRZ) as per The Australian Standard, AS 4970-2025. It is noted that the NRZ is a new acronym that replaces the 'TPZ', as defined in earlier versions of AS4970. Further guidance is provided in the Tree Protection Guidelines at Appendix 3.

The tree impact assessment reviewed the architectural and landscape set of drawings supplied by the client:

- Architectural set, prepared by Woods Bagot, Project 131135, Rev 1 – DTP Town Planning Submission, dated 20.05.2026

Refer to the Tree Impact Plan at Appendix 1 for trees colour coded by design outcome (retain, lost). Refer to the Tree Assessment Table at Appendix 2 for individual tree details.

3 Impact assessment

Refer to Tree Impact Plan at Appendix 1 for impact assessment results, however, to summarise:

- 32 trees can be retained
- 25 trees are considered lost due to major incursion and/or poor condition.

Table 1 presents the outcome results sorted by arboricultural ratings, while Figure 1 shows the proportions of each arboricultural rating category into the 2 outcome types.

Table 1. Tree outcomes sorted by arboricultural rating.

Outcome	Arb. rating	Tree IDs	Count	Total
Retain	Mod.A	5, 28, 33, 34	4	32
	Mod.B	4, 35, 36, 37, 38, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58	15	
	Mod.C	3, 6, 15, 39, 40, 42, 43, 44, 45, 46, 47, 57	12	
	Low	30	1	
Lost	Mod.B	14	1	25
	Mod.C	1, 7, 8, 9, 11, 16, 17, 21, 22, 23, 24, 25, 26, 31, 41	15	
	Low	12, 18, 19, 20, 32	5	
	Very low	2, 10, 13, 27	4	
Grand Total				**57**

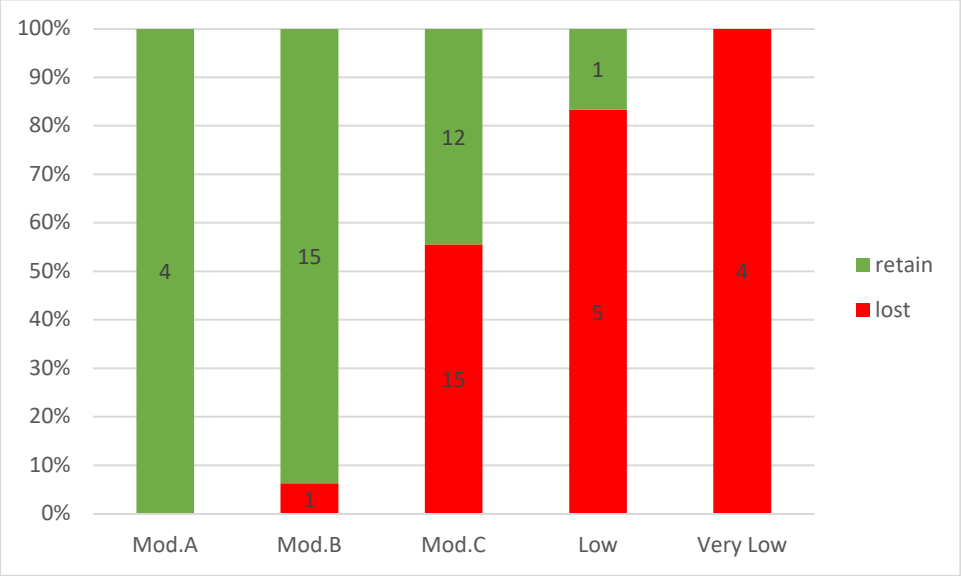

Figure 1. Proportion of trees being retained, review or lost, in each of the arb.rating categories.

4 Issues and recommendations

Removed trees

Of the 25 trees being removed, 1 is a council street tree. The tree (Tree 41) is a relatively small (15cm stem diameter) Camphor Laurel that will be lost due to the location of the proposed basement entry off Kent Road. Moving the crossover further to the west is likely to impact a London Plane of much greater significance to the streetscape (Tree 42) so loss of the smaller Camphor Laurel is a preferable outcome. The design team should work with council to determine a suitable site for a replacement tree. See Images 17-18.

Retained trees

Sixteen (16) trees being retained have minor to major NRZ encroachment from the building footprint and / or surface treatments. Of these, mitigation measures are recommended for eleven (11) trees, which are listed at Appendix 1. Four (4) of these (Trees 4, 28, 35 & 56) are discussed in greater detail below in order to justify the level of encroachment and to provide further details on the recommended mitigation measures.

- **Tree 4** (a Mod.B rated Liquidambar growing near the rear eastern boundary) is intended for retention in a designated open space area behind the Middlesex Residences. The built form has been reduced on this side to accommodate retention of the tree although rootzone encroachment will need to be investigated to further inform the viability of retaining the tree.

    1. The main risk to the tree is from the lower ground floor plan, which, as seen in Figures 3 & 4, requires a 1200mm retaining wall approximately 2.6m from the tree. This sits at the edge of the tree's SRZ, and, as seen in Figure 3, would amount to approximately 20.5% NRZ encroachment. While NRZ encroachments >20% are considered major under AS4970, this could be reasonably reduced to approximately 16.6% given part of the encroachment is currently occupied with major buildings (southwest and west).
    2. Although the species (Liquidambar styraciflua) is relatively sensitive to root loss and root zone disturbance in general, the specimen was in the early stages of maturity and had reasonable health indicators suggesting it would have higher than typical ability to adapt to root loss and site changes. Notwithstanding, the area of impact does warrant non-

destructive root investigation (NDRI) in order to better understand the size and number of roots that would be lost to the retaining wall excavation.

Existing conditions

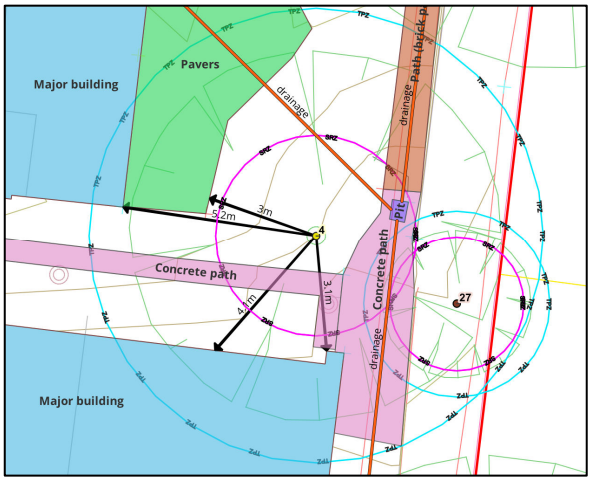

Figure 2. Showing existing features around tree. As seen major buildings are 5.2m west and 3.1-4.1m south of tree. Various paths south and east of tree. Drainage pit under path to tree's east with lines running north-south under path and to the northwest.

Photo 1. Looking east toward tree.

Photo 2. Looking northwest toward tree.

Photo 3. Looking north toward tree.

Lower ground floor

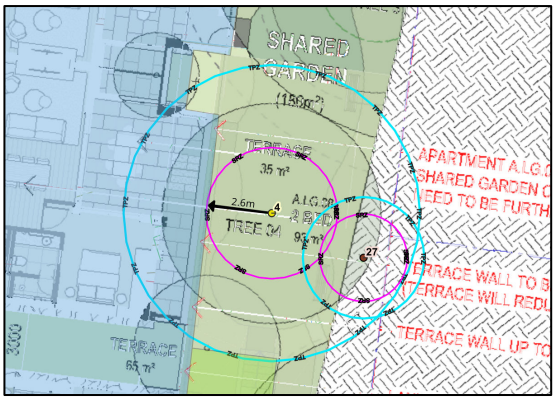

Figure 3. Lower ground floor plan relative to tree. Set back to retaining wall is 2.6m.

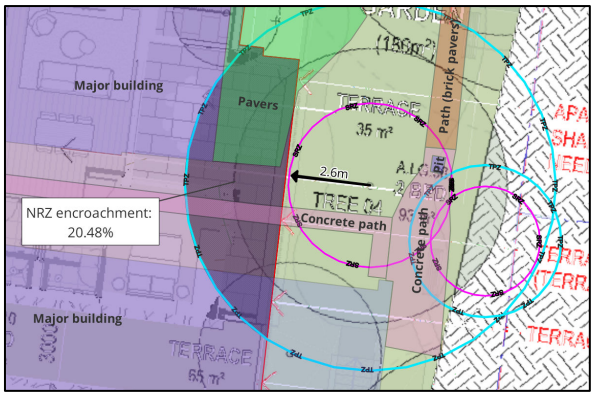

Figure 4. Lower ground floor overlaid with existing features. Total NRZ encroachment is 20.5%, although perceived impact is moderate given part of encroachment is currently occupied by building and pavement.

Basement

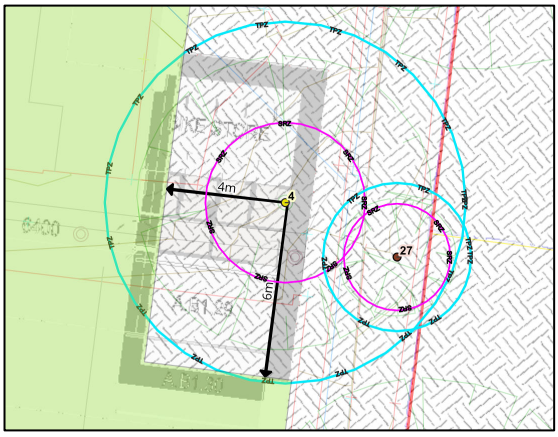

Figure 5. Basement plan relative to tree. Set back to basement is 4m west and 6m south.

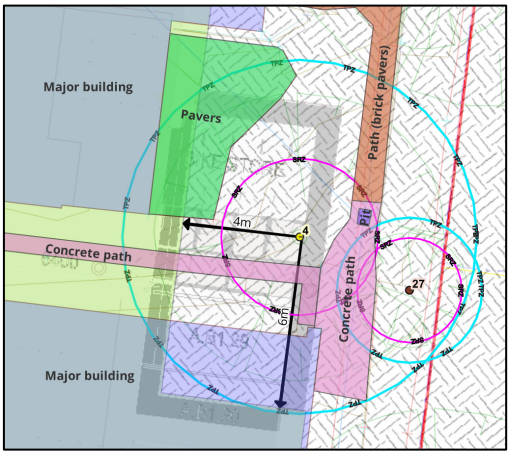

Figure 6. Basement plan overlaid with existing features.

Recommendations:

1. Undertake an NDRI (minimum depth 500mm) under arborist supervision prior to works. Arborist to determine likelihood of survival based size, location and density of roots in excavation area. If tree retention is plausible, the root investigation findings will help to inform the tree protection requirements which will be outlined within the tree protection specifications (TPS) and tree protection plan (TPP). See Figure 7 for NDRI locations.

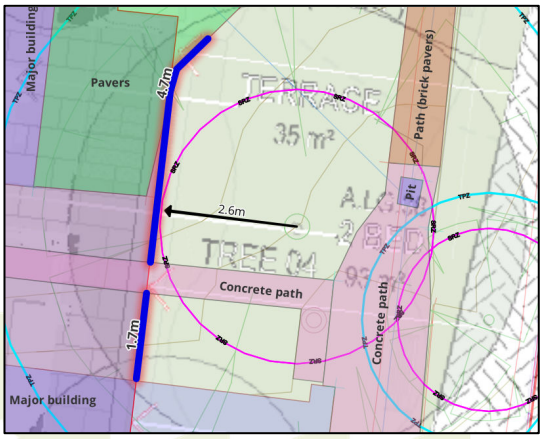

Figure 7. NDRI locations.

2. Landscaping

    - All landscape design in remaining parts of NRZ to adopt root sensitive design including:

        i. No continuous excavation for retaining walls, paths, regrading etc.

        ii. Any footings used in these areas must be minimum diameter e.g. micropiles or ground screws.

        iii. Maintain natural grade where possible.

        iv. Any fill requirement must be a porous topsoil <200mm depth.

        v. Fill must not be built up against tree trunk. Leave a gap at least 300mm wide around tree at natural grade.

3. Services

    - Any proposed services within non-impacted portion of NRZ are to be bored at least 600mm beneath natural grade.
    - Service pits should be sited outside the NRZ.

- **Tree 28** (a neighbouring Mod.A rated Lemon-scented Gum) has moderate (15.2%) NRZ incursion from the design, mostly from the Lower Ground and above floors. The tree is expected to tolerate the design proposal for the following reasons:

    1. The building footprint is site entirely outside the tree's SRZ. There is approximately 2m between the edge of SRZ and the nearest design component (building stairwell) and 2.8m from the basement plan (~6m between tree and basement). Any roots uncovered during excavations will thus not impact the tree structurally, and health impacts should be manageable with onsite arborist involvement.
    2. Trees 2 & 3 (to be removed) are growing in the area of proposed NRZ encroachment which are both likely to have suppressed major root growth from Tree 28 (see Image 7).
    3. The existing building footprint occupies approximately 15m^2 of the tree's NRZ so root growth in these areas is unlikely to contain major roots from Tree 28.
    4. Pruning: The outer western and northwestern canopy will need to be reduced to avoid conflicts with levels 1 & 2. Pruning can be undertaken with <10% total live canopy loss and with pruning wounds <100mmØ (see Image 6).

- **Tree 35** (a Mod.B rated London Plane street tree on Durham Rd) will experience major encroachment from the proposed design. The encroachment from the building is a relatively minor component of the total perceived impact, intercepting approximately13% of the tree's NRZ. In contrast, the proposed boundary wall presents a higher level of potential impact, noting there is no existing wall along this section of boundary. Site observations identified a concentration of surface roots contributing to heave of the existing asphalt driveway crossover to the southwest of the tree (refer to Image 2). It is considered likely that additional roots may be present below ground within the alignment of the proposed masonry wall. The following options are recommended to minimise impacts to the tree:

    1. Preferred option: Adopt an alternative boundary wall type to avoid tree roots. Roots can be avoided by suspending the bottom of the wall/fence above natural grade adjacent to

the tree (approx. 12m length). Alternately, a non-destructive root investigation (NDRI) could be undertaken to locate major roots and inform where smaller sections of wall would need to be suspended. Wall footings would also need to consider tree roots by adopting minimum ground disturbance footings (e.g. ground screws or micropiles) and/or using NDD (hand digging or hydro excavation) to move footings away from major roots.

2. Secondary option: If redesign is not feasible, the wall perimeter will need to be hydro-excavated under arborist supervision. The arborist is to prune roots and prescribe remedial measures depending on the scale of root losses (e.g. crown reduction, watering, mulching).

3. Other mitigation measures: As outlined in the Tree Impact Plan (Map ref 3), additional arborist supervision is recommended for the demolition of the existing crossover south of tree along with retaining wall excavation along the eastern edge of the building footprint.

4. Pruning: The outer western canopy will need to be reduced to avoid conflicts with levels 1 & 2. There are also low hanging branches in the area between the building and wall which will need to be uplifted. Pruning can be undertaken with <10% total live canopy loss and with pruning wounds <100mmØ (see Image 3).

- **Tree 56** (a Mod.B rated, Prickly-leaved Paperbark street tree on Middlesex Rd) has major (25.5%) NRZ encroachment from the design. Given that part of this encroachment consists of an existing driveway, total new design encroachment are approximately 17%. The design has recently been amended to move the new crossover 700mm to the south to avoid SRZ encroachment, and the new crossover is only 300mm north of the existing. While some root losses are anticipated, the tolerance of the species to rootzone disturbance is relatively high, in part due to their mostly fibrous root systems. Nevertheless, the following impact mitigation measures should be adopted to minimise damage to the root system:

    1. Crossover design to adopt a minimum depth profile.

    2. Crossover excavations to be performed under arborist supervision. Arborist to prune roots and prescribe remedial measures depending on the scale of root losses (e.g. crown reduction, watering, mulching).

  The tree root system and canopy are not expected to be majorly impacted by internal works given the existing brick wall along the property boundary is expected to have suppressed root growth within the subject site. Furthermore Trees 20, 21 & 22 (identified for removal) are growing in the area of the proposed NRZ encroachment which are likely to have suppressed any roots from Tree 56 that have extended underneath the boundary wall (see Images 11 & 14).

- Eight (8) other trees (Trees 5, 6, 15, 30, 33, 42, 51, 58) also have specific actions outlined, including design considerations, arborist supervision, NDD and/or pruning requirements, to help mitigate minor to moderate NRZ encroachment. Refer to Appendix 1 for recommendations.

A Tree Protection Management Plan (TPMP) is to be drafted once the designs are finalised and construction plans are available. Tree protection zones (works exclusion areas) will need to be established around all trees being retained within the subject site, along with any street trees and neighbouring trees growing adjacent to works activities.

As outlined in the preliminary report, City of Boroondara Local Law applies to several of the trees in and adjacent to the site. Furthermore, three trees (3) are considered Boundary Canopy Trees and trigger permit requirement under 52.37 – Canopy Trees. Refer to Appendix 1 & 2 for permit requirements for individual trees.

I am available to answer any questions arising from this report.

No part of this report is to be reproduced unless in full.

Signed

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Consultant Arborist

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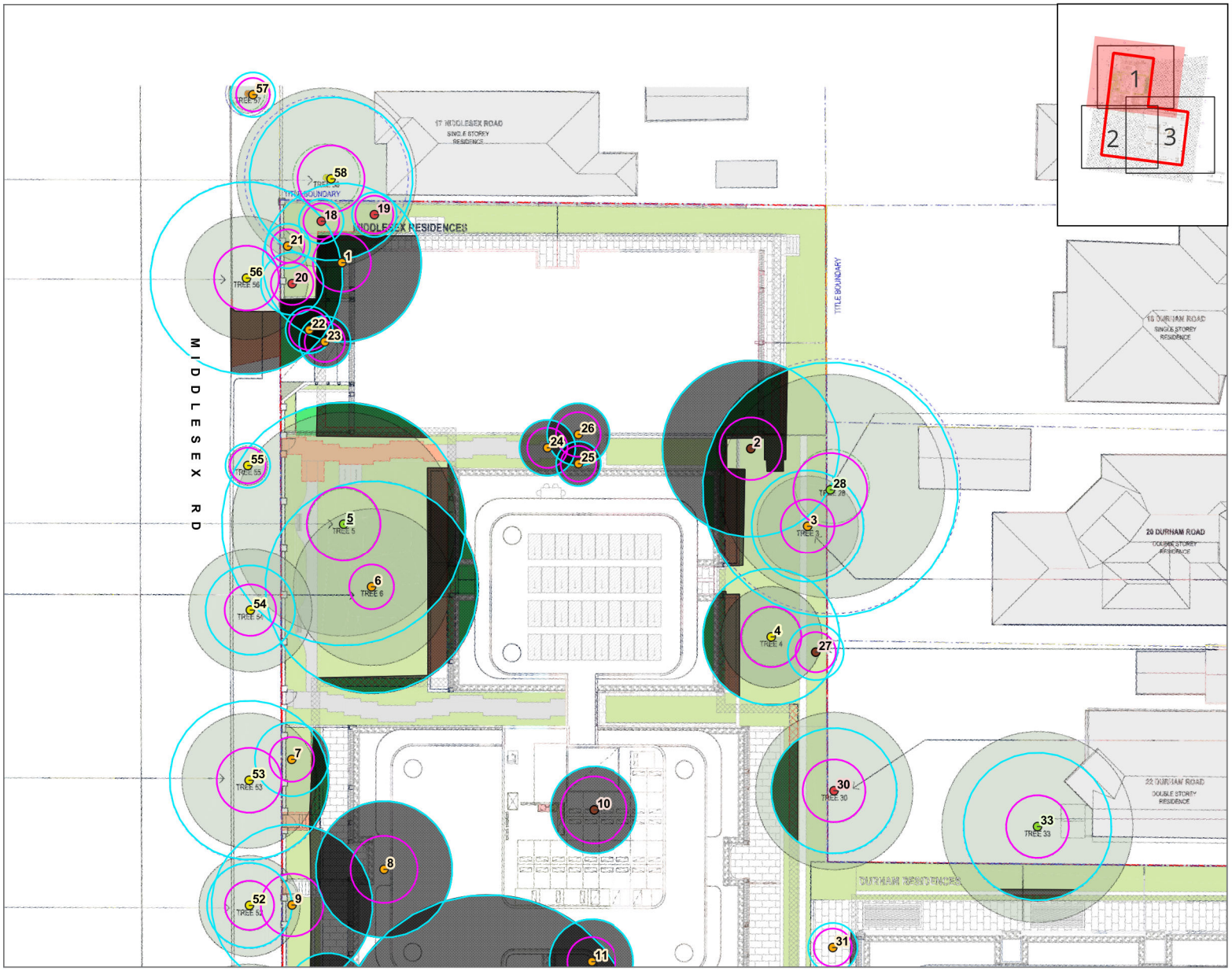

REMOVE

treeid	species	Permit	nrz_incur	type	outcome
1	Koelreuteria paniculata	TP_LL	54.1	Within	lost
2	Fraxinus angustifolia	TP_LL	58.8	SRZ	lost
7	Lagerstroemia sp.	TP_LL	16.4	SRZ	lost
8	Ulmus glabra 'Lutescens'	TP_LL	100	Within	lost
9	Acmena smithii	TP_LL	35.5	SRZ	lost
10	Betula pendula	TP_LL	100	Within	lost
11	Lagerstroemia sp.	TP_LL	100	Within	lost
18	Callistemon 'Harkness'		7.4	SRZ	lost
19	Eriobotrya japonica		0.6	NRZ Minor (<10%)	lost
20	Pittosporum undulatum		21.6	SRZ	lost
21	Syzygium paniculatum				lost
22	Callistemon 'Harkness'		100	Within	lost
23	Callistemon viminalis		100	Within	lost
24	Betula pendula		100	Within	lost
25	Betula pendula		100	Within	lost
26	Betula pendula		100	Within	lost
27	Coprosma repens				lost
31	Schinus areira		8.4	SRZ	lost

RETAIN

ID	species	building incur%	surface incur%	type	Design comments	pruning
3	Lophostemon confertus					
4	Liquidambar styraciflua	20.3		NRZ Major (>20%)	Encroachment minus existing building footprint = 16.6%. 1. NDRI along retaining wall prior to works. 2. Arborist to incorporate findings into tree management plan including TPS/TPP specific to tree.	
5	Cedrus deodara	15.3	7	NRZ Moderate (10–20%)	1. Path surface - compacted lilydale toppings. 2. Hand dig footings for seating & decking.	Minor reduction and uplift of outer N / NE branches. <10% live canopy, branches <80mmØ
6	Arbutus unedo	21.6		NRZ Major (>20%)	1. Path surfaces closest to tree - compacted lilydale toppings. 2. Hand dig footings for seating & decking.	
28	Corymbia citriodora	15.2		NRZ Moderate (10–20%)	1. Arborist to manage roots exposed during excavation.	Minor reduction of outer W / NW branches. <10% live canopy, branches <100mm Ø
30	Ligustrum lucidum	15.4		NRZ Moderate (10–20%)	Self-sown weed. Hardy and tolerant of rootzone disturbance.	
33	Lophostemon confertus	3.4		NRZ Minor (<10%)	Approx 200mm fill adjacent to fenceline. Must be porous & uncompacted e.g. sandy loam.	
52	Platanus Xacerifolia					
53	Melaleuca styphelioides	5.9	2.5	NRZ Minor (<10%)		
54	Platanus Xacerifolia					
55	Platanus Xacerifolia					
56	Melaleuca styphelioides	25.1		NRZ Major (>20%)	Encroachment minus existing driveway footprint = 17%. Design has been shifted ~700mm south to avoid SRZ. New crossover ~300mm north of existing. 1. Arborist supervision req'd during crossover excavation.	
57	Platanus Xacerifolia					
58	Liquidambar styraciflua	6.3		NRZ Minor (<10%)	Approx 200mm fill adjacent to fenceline. Must be porous nursery sourced soil e.g. sandy loam.	

APPENDIX 1 — TREE IMPACT & OUTCOME PLAN

PROJECT
1 Kent Rd & 24 Durham Rd, Surrey Hills

TL REF. 14244
MAP NO. 1 / 3
DATE 2026-05-27
CLIENT VJ1KR Pty Ltd

LEGEND

Trees (arb.rating)
- High
- Mod-A
- Mod-B
- Mod-C
- Low
- Very Low

Protection zones
- NRZ
- SRZ
- NRZ encroachment

DATA SOURCES
- Overall Plan - Tree Protection Zone Encroachment Analysis, Prepared by Woods Bagot, Sheet no A-TP12021, Rev 1, dated 20.05.2026

COORDINATE REFERENCE SYSTEM
EPSG:28355 | GDA 94 MGA Zone 55

0 5 10m

ABN: 95 080 021 610
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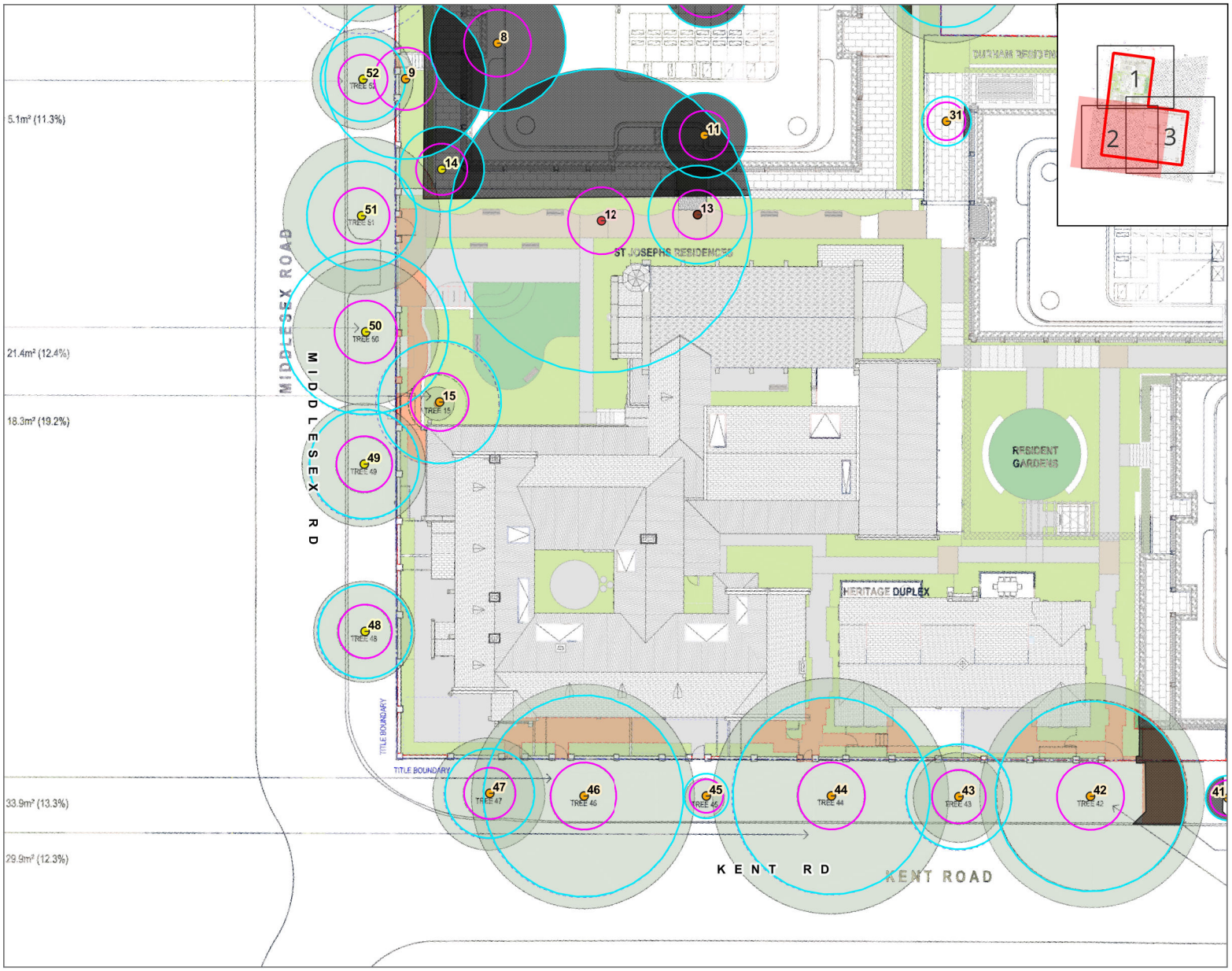

REMOVE

treeid	species	Permit	nrz_incur	type	outcome
8	Ulmus glabra 'Lutescens'	TP_LL	100	Within	lost
9	Acmena smithii	TP_LL	35.5	SRZ	lost
11	Lagerstroemia sp.	TP_LL	100	Within	lost
12	Melia azedarach	TP_LL	40.1	SRZ	lost
13	Pittosporum undulatum	TP_LL	26.5	SRZ	lost
14	Jacaranda mimosifolia	TP_LL	67.4	Within	lost
31	Schinus areira		8.4	SRZ	lost

RETAIN

ID	species	building incur%	surface incur%	type	Design comments	pruning
15	Cupressus sempervirens		34.3		Pavement above existing grade within 5m of tree.	
42	Platanus Xacerifolia	12.9	8.6	NRZ Moderate (10–20%)	Driveway crossover ~3.2m further east from existing. Arborist supervision req'd during: 1. Existing driveway demolition. 2. Wall renewal works.	
43	Cinnamomum camphora					
44	Platanus Xacerifolia		21.1			
45	Cinnamomum camphora					
46	Platanus Xacerifolia		19.4			
47	Cinnamomum camphora		0.8			
48	Platanus Xacerifolia					
49	Platanus Xacerifolia		2.3			
50	Melaleuca styphelioides		12.8		Arborist supervision req'd during wall renewal works.	
51	Platanus Xacerifolia		6.5		Arborist supervision req'd during wall renewal works.	
52	Platanus Xacerifolia					

APPENDIX 1 — TREE IMPACT & OUTCOME PLAN

PROJECT
1 Kent Rd & 24 Durham Rd, Surrey Hills

TL REF. 14244
MAP NO. 2 / 3
DATE 2026-05-27
CLIENT VJ1KR Pty Ltd

LEGEND

Trees (arb.rating)
- High
- Mod-A
- Mod-B
- Mod-C
- Low
- Very Low

Protection zones
- NRZ
- SRZ
- NRZ encroachment

DATA SOURCES
- Overall Plan - Tree Protection Zone Encroachment Analysis, Prepared by Woods Bagot, Sheet no A-TP12021, Rev 1, dated 20.05.2026

COORDINATE REFERENCE SYSTEM
EPSG:28355 | GDA 94 MGA Zone 55

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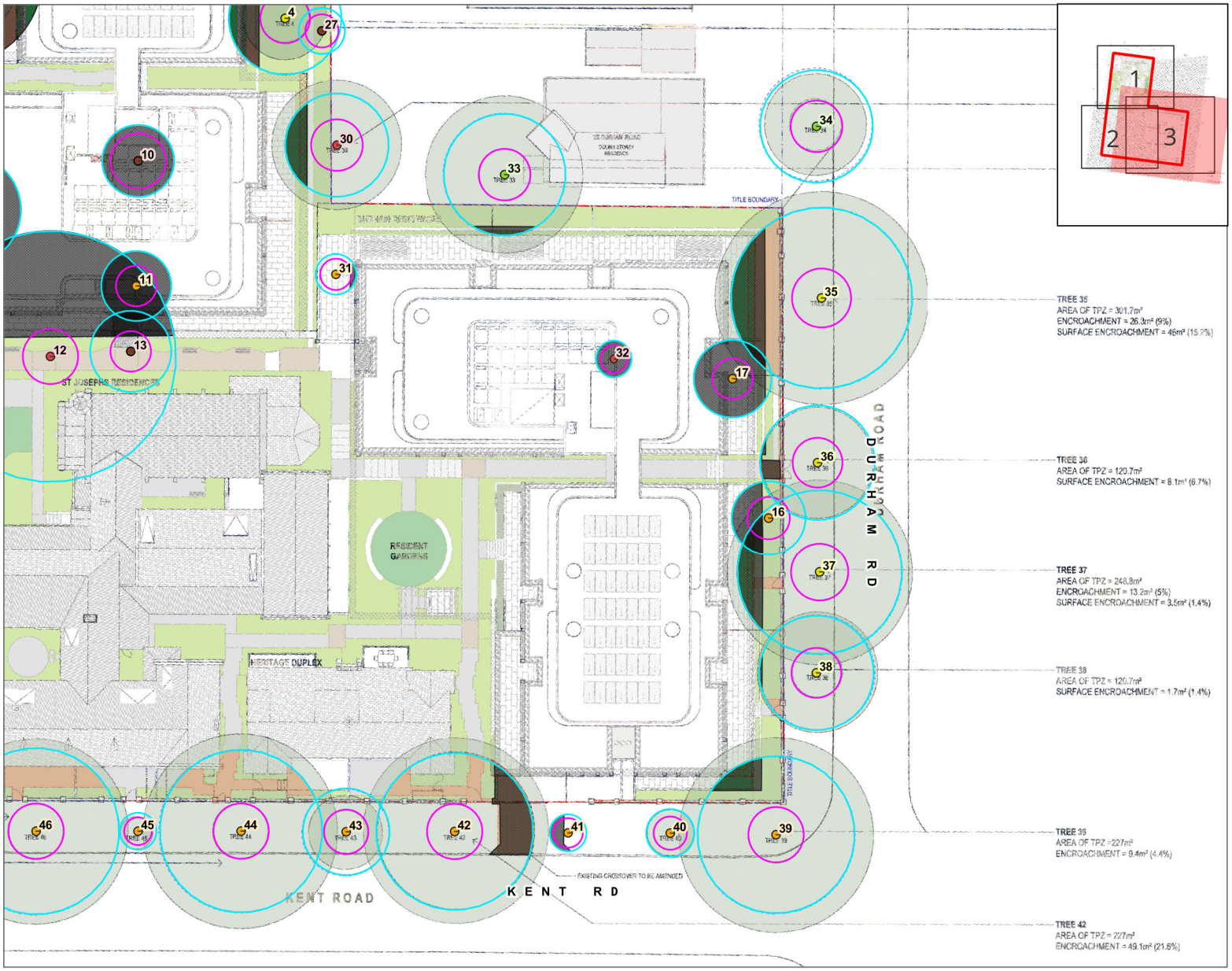

REMOVE

treeid	species	Permit	nrz_incur	type	outcome
10	Betula pendula	TP_LL	100	Within	lost
11	Lagerstroemia sp.	TP_LL	100	Within	lost
12	Melia azedarach	TP_LL	40.1	SRZ	lost
13	Pittosporum undulatum	TP_LL	26.5	SRZ	lost
16	Agonis flexuosa	52.37 & TP_LL	39.2	SRZ	lost
17	Gleditsia triacanthos	52.37 & TP_LL	96.3	Within	lost
27	Coprosma repens				lost
31	Schinus areira		8.4	SRZ	lost
32	Cotoneaster sp.		100	Within	lost
41	Cinnamomum camphora		37.6	SRZ	lost

RETAIN

ID	species	building incur%	surface incur%	type	Design comments	pruning
4	Liquidambar styraciflua	20.3		NRZ Major (>20%)	Encroachment minus existing building footprint = 16.6%. 1. NDRI along retaining wall prior to works. 2. Arborist to incorporate findings into tree management plan including TPS/TPP specific to tree.	
30	Ligustrum lucidum	15.4		NRZ Moderate (10–20%)	Self-sown weed. Hardy and tolerant of rootzone disturbance.	
33	Lophostemon confertus	3.4		NRZ Minor (<10%)	Approx 200mm fill adjacent to fenceline. Must be porous & uncompacted e.g. sandy loam.	
34	Acmena smithii					
35	Platanus Xacerifolia	13.1	22.4	NRZ Moderate (10–20%)	Boundary wall construction likely to result in major root loss. Recommend: 1. Wall redesign to avoid major roots (see report for details). 2. Arborist to supervise crossover demolition. 3. Arborist to supervise buidling/wall excavations.	Minor reduction and uplift of outer W branches. <10% live canopy, branches <100mm Ø
36	Acmena smithii	4		NRZ Minor (<10%)		
37	Platanus Xacerifolia	9.7	0.9	NRZ Minor (<10%)		
38	Syzygium paniculatum	0.7	1.3	NRZ Minor (<10%)		
39	Platanus Xacerifolia	5.5		NRZ Minor (<10%)		
40	Cinnamomum camphora					
42	Platanus Xacerifolia	12.9	8.6	NRZ Moderate (10–20%)	Driveway crossover ~3.2m further east from existing. Arborist supervision req'd during: 1. Existing driveway demolition. 2. Wall renewal works.	
43	Cinnamomum camphora					
44	Platanus Xacerifolia		21.1			
45	Cinnamomum camphora					
46	Platanus Xacerifolia		19.4			

APPENDIX 1 — TREE IMPACT & OUTCOME PLAN

PROJECT
1 Kent Rd & 24 Durham Rd, Surrey Hills

TL REF. 14244
MAP NO. 3 / 3
DATE 2026-05-27
CLIENT VJ1KR Pty Ltd

LEGEND

Trees (arb.rating)
- High
- Mod-A
- Mod-B
- Mod-C
- Low
- Very Low

Protection zones
- NRZ
- SRZ
- NRZ encroachment

COORDINATE REFERENCE SYSTEM
EPSG:28355 | GDA 94 MGA Zone 55

DATA SOURCES
- Overall Plan - Tree Protection Zone Encroachment Analysis, Prepared by Woods Bagot, Sheet no A-TP12021, Rev 1, dated 20.05.2026

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Appendix 2: Tree Assessment Table

Refer to the following 2 pages.

- DSH = Diameter at Standard Height (measured 1.4m above ground unless otherwise stated)
- ULE = Useful Life Expectancy
- Arb. rating = arboricultural rating
- NRZ = Notional Root Zone (TPZ in previous versions of AS4970)
- SRZ = Structural Root Zone
- NRZ & SRZ measurements are radius in metres from the centre of the trunk per AS 4970-2025.

Tree ID	Species	Common Name	Age	Origin	DSH (cm)	HxW (m)	Health	Structure	Arb. rating	ULE (years)	Permit	Comments	NRZ (m radius)	SRZ (m radius)	Outcome	Impact type	NRZ incursion (%)
1	*Koelreuteria paniculata*	Golden Rain Tree	Maturing	Exotic deciduous	45,39 @1.3	7x8	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Incipient decay. 2x hollows in limbs from branch tearout. Species unsure-deciduous-Not Liquidamber.	7.1	2.6	lost	Within	54.1
2	*Fraxinus angustifolia*	Narrow-leaved Ash	Over-mature	Exotic deciduous	66	6x7	Poor	Poor	Very Low	1 to 5	TP_LL	Incipient decay. Severely lopped with past limb failures, most lopped limbs dead	7.9	2.8	lost	SRZ	58.8
3	*Lophostemon confertus*	Brush Box	Early-mature	Australian native	42	10x9	Fair	Fair to Poor	Mod.C	11 to 20	52.37 & TP_LL	Crown bias, east, 2x stems at ~2m, partly suppressed under neighbouring Lemon-scented Gum. Past clearance prune of west branches.	5	2.4	retain		
4	*Liquidambar styraciflua*	Liquidamber	Early-mature	Exotic deciduous	51	18x13	Fair	Fair to Poor	Mod.B	11 to 20	TP_LL	Hangers, past branch failure, Good central leader, slight crown bias west. Canopy NESW-5, 3, 5.5, 7.5. Will be susceptible to Possum grazing if not already-deciduous. 4.8 from boundary to edge of trunk.	6.1	2.7	retain	NRZ Major (>20%)	20.5
5	*Cedrus deodara*	Deodar	Maturing	Exotic conifer	91	17x20	Fair	Fair	Mod.A	21 to 40	TP_LL	Minor dieback, subsiding limbs, over-extended limbs developing, . Paths, Crown pruned to east over old playground. Remove pruning stubs. Canopy- N-10,E-8.5,S-8.3,W-9.5.	10.9	3.3	retain	NRZ Moderate (10-20%)	15.3
6	*Arbutus unedo*	Irish Strawberry Tree	Over-mature	Exotic evergreen	56,38,34,22	6x14	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Over-extended limbs developing. West. Numerous trunk wounds, mostly old and moderately occluded, some decay apparent. Recent poor pruning cuts for carpark clearance.	9.5	2	retain	NRZ Major (>20%)	21.6
7	*Lagerstroemia sp.*	Crape Myrtle	Early-mature	Exotic deciduous	19,15,13	6x8	Fair to Poor	Fair	Mod.C	11 to 20	TP_LL	Foliage sparse - possums. Possums clawing & chewing bark. Possum exclusion req'd if retained.	3.3	2	lost	SRZ	16.4
8	*Ulmus glabra 'Lutescens'*	Golden Wych Elm	Early-mature	Exotic deciduous	40,31	12x10	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Co-dominant stems, incipient decay, trunk wounds. Large flush-cut pruning wounds at base; uncharacteristically narrow form due to pruning. Dead stub.	6.1	3	lost	Within	100
9	*Acmena smithii*	Lilly Pilly	Maturing	Victorian native	60	14x14	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Trunk wounds. Good form but extensive (~70cm) cambium loss on trunk, woundwood ribs & callus. Relatively healthy canopy but beginning to exhibit minor dieback at edges	7.2	2.8	lost	SRZ	35.5
10	*Betula pendula*	Silver Birch	Maturing	Exotic deciduous	23,20,11	8x8	Fair to Poor	Poor	Very Low	1 to 5	TP_LL	Decay at base and old stem pruning wounds, stems sound hollow, lopped. Eastern leader dead/decayed at top.	3.9	3	lost	Within	100
11	*Lagerstroemia sp.*	Crape Myrtle	Early-mature	Exotic deciduous	25,20	11x7	Fair	Fair to Poor	Mod.C	6 to 10	TP_LL	Incipient decay, included bark forks. Past tearouts near union, failures	3.8	2.2	lost	Within	100
12	*Melia azedarach*	White Cedar	Over-mature	Australian native	95,62	16x17	Fair to Poor	Poor	Low	1 to 5	TP_LL	See 2025 risk report. Old basal decay to northwest but does not appear to be progressing. Diminished foliage density as is typical with aged specimen. 1x branch faliure to west, split in branch to north; manageable. Regular inspection recommended	13.6	3	lost	SRZ	39
13	*Pittosporum undulatum*	Sweet Pittosporum	Semi-mature	Victorian native	26,23,12	6x4	Fair	Poor	Very Low	1 to 5	TP_LL	Multi-stemmed, weed infested, woody weed sp With Privet. Lopped	4.4	2.2	lost	SRZ	21.5
14	*Jacaranda mimosifolia*	Jacaranda	Semi-mature	Exotic deciduous	26,18	8x8	Fair	Fair	Mod.B	21 to 40	TP_LL	2x stems from base. Necrotic stubs at old pruning sites	3.8	2.3	lost	Within	67.1
15	*Cupressus sempervirens*	Italian Cypress	Semi-mature	Exotic conifer	40,20,10	10x3	Fair	Fair to Poor	Mod.C	21-40	TP_LL	1 stem removed. Against brick pillar	5.5	2.6	retain		
16	*Agonis flexuosa*	Willow Myrtle	Early-mature	Australian native	21,23,13	8x6	Fair	Fair to Poor	Mod.C	11 to 20	52.37 & TP_LL	Partly suppressed - crown bias, west. Partly suppressed - crown bias, west. Suppressed by street tree; in raised planter bed.	4	2.3	lost	SRZ	39.2
17	*Gleditsia triacanthos*	Honey Locust	Early-mature	Exotic deciduous	35	8x8	Fair	Fair to Poor	Mod.C	11 to 20	52.37 & TP_LL	Lopped to north and west, narrow planting space, cracking K&C, lifting road surface. Variegated Tarata 1.5m East.	4.2	2.2	lost	Within	96.3
18	*Callistemon 'Harkness'*	Harkness Bottlebrush	Semi-mature	Australian native	15,9	5x6	Poor	Fair to Poor	Low	1 to 5		Foliage sparse - possums.	2	1.6	lost	SRZ	7.4
19	*Eriobotrya japonica*	Loquat	Early-mature	Exotic evergreen	12,12,9	4x5	Poor	Poor	Low	1 to 5		Foliage sparse - possums, multi-stemmed.	2	1.7	lost	NRZ Minor (<10%)	0.6
20	*Pittosporum undulatum*	Sweet Pittosporum	Early-mature	Victorian native	23	9x7	Fair	Fair	Low	1 to 5		Woody weed sp <30cm from wall.	2.8	1.9	lost	SRZ	21.6
21	*Syzygium paniculatum*	Magenta Cherry	Semi-mature	Australian native	13	4x3	Fair	Fair to Poor	Mod.C	11 to 20		Partly suppressed - crown bias, nth, strip footings in srz. <30cm from wall.	2	1.5	lost		
22	*Callistemon 'Harkness'*	Harkness Bottlebrush	Early-mature	Australian native	14,10	6x5	Fair	Fair to Poor	Mod.C	11 to 20		Partly suppressed - crown bias, west.	2.1	1.8	lost	Within	100
23	*Callistemon viminalis*	Weeping Bottlebrush	Early-mature	Australian native	19	5x4	Fair	Fair	Mod.C	11 to 20			2.3	1.8	lost	Within	100
24	*Betula pendula*	Silver Birch	Semi-mature	Exotic deciduous	21	10x6	Fair	Fair	Mod.C	11 to 20			2.5	1.8	lost	Within	100
25	*Betula pendula*	Silver Birch	Semi-mature	Exotic deciduous	14	8x5	Fair to Poor	Fair to Poor	Mod.C	11 to 20		Minor dieback.	2	1.6	lost	Within	100
26	*Betula pendula*	Silver Birch	Early-mature	Exotic deciduous	23	10x6	Fair	Fair to Poor	Mod.C	11 to 20		Co-dominant stems w included bark.	2.8	2	lost	Within	100
27	*Coprosma repens*	Mirror Bush	Early-mature	Exotic evergreen	16,13	4x7	Fair	Fair to Poor	Very Low	1 to 5		Woody weed sp	2.5	1.8	lost		
28	*Corymbia citriodora*	Lemon-scented Gum	Maturing	Australian native	95	23x20	Good	Fair	Mod.A	11 to 20	TP_LL	Neighbour's tree, Canopy overhangs property by ~9m west.	11.4	3.3	retain	NRZ Moderate (10-20%)	15.2

Tree ID	Species	Common Name	Age	Origin	DSH (cm)	HxW (m)	Health	Structure	Arb. rating	ULE (years)	Permit	Comments	NRZ (m radius)	SRZ (m radius)	Outcome	Impact type	NRZ incursion (%)
30	*Ligustrum lucidum*	Shining Privet	Maturing	Exotic evergreen	28,28,25	12x14	Fair	Fair to Poor	Low	1 to 5	TP_LL	Included bark forks, multi-stemmed, neighbour's tree, woody weed sp.	5.6	2.8	retain	NRZ Moderate (10-20%)	15.4
31	*Schinus areira*	Peppercorn Tree	Semi-mature	Exotic evergreen	18	6x5	Fair	Fair to Poor	Mod.C	11 to 20		Woody weed sp., partly suppressed - crown bias, west	2.2	1.7	lost	SRZ	8.4
32	*Cotoneaster sp.*	Cotoneaster	Semi-mature	Exotic evergreen	12	3x2	Fair to Poor	Poor	Low	1 to 5		Woody weed sp., partly suppressed - crown bias, sw, .	2	1.5	lost	Within	100
33	*Lophostemon confertus*	Brush Box	Maturing	Australian native	55	14x17	Good	Fair	Mod.A	21 to 40	TP_LL	Neighbour's tree. ~4m Nth of fence, overhangs by ~3m.	6.6	2.8	retain	NRZ Minor (<10%)	3.4
34	*Acmena smithii*	Lilly Pilly	Maturing	Victorian native	51	14x11	Good	Fair	Mod.A	21 to 40	TP_LL	Street tree.	6.1	2.8	retain		
35	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	82	18x23	Fair	Fair to Poor	Mod.B	11 to 20	TP_LL	Street tree, . Lapsed pollard, On STR	9.8	3.2	retain	NRZ Moderate (10-20%)	13.1
36	*Acmena smithii*	Lilly Pilly	Early-mature	Victorian native	52	13x12	Fair	Fair	Mod.B	21 to 40	TP_LL	Chlorotic foliage, street tree. Reduced foliage colour,.	6.2	2.7	retain	NRZ Minor (<10%)	4
37	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	74	17x20	Fair	Fair to Poor	Mod.B	11 to 20	TP_LL	Street tree, . Lapsed pollard, On STR	8.9	3.1	retain	NRZ Minor (<10%)	9.7
38	*Syzygium paniculatum*	Magenta Cherry	Maturing	Australian native	52	13x13	Good	Fair	Mod.B	11 to 20	TP_LL	Street tree.	6.2	2.7	retain	NRZ Minor (<10%)	0.7
39	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	71	17x21	Fair	Fair to Poor	Mod.C	6 to 10	TP_LL	Past powerline clearance, street tree, . Lapsed pollard,.	8.5	3	retain	NRZ Minor (<10%)	5.5
40	*Cinnamomum camphora*	Camphor Laurel	Semi-mature	Exotic evergreen	22	5x5	Fair	Fair	Mod.C	21 to 40		Street tree. Under HV & LV.	2.6	1.8	retain		
41	*Cinnamomum camphora*	Camphor Laurel	Semi-mature	Exotic evergreen	15	5x4	Fair to Poor	Fair	Mod.C	21 to 40		Chlorotic foliage, street tree.	2	1.6	lost	SRZ	37.6
42	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	71	15x20	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Past powerline clearance, street tree, . Lapsed pollard, cut under HV & LV.	8.5	3	retain	NRZ Moderate (10-20%)	12.9
43	*Cinnamomum camphora*	Camphor Laurel	Early-mature	Exotic evergreen	39	5x8	Fair to Poor	Fair to Poor	Mod.C	11 to 20	TP_LL	Minor dieback, past powerline clearance, street tree. Cut under HV & LV.	4.7	2.4	retain		
44	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	73	16x21	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Past powerline clearance, street tree, . Lapsed pollard, cut under HV & LV.	8.8	3	retain		
45	*Cinnamomum camphora*	Camphor Laurel	Semi-mature	Exotic evergreen	5,4,4	3x4	Fair	Fair to Poor	Mod.C	11 to 20		Multi-stemmed, street tree, stump re-sprout.	2	1.5	retain		
46	*Platanus Xacerifolia*	London Plane	Maturing	Exotic deciduous	75	15x20	Fair	Fair to Poor	Mod.C	11 to 20	TP_LL	Past powerline clearance, street tree, . Lapsed pollard, cut under HV & LV.	9	3	retain		
47	*Cinnamomum camphora*	Camphor Laurel	Early-mature	Exotic evergreen	33	6x10	Fair	Fair to Poor	Mod.C	11 to 20		Past powerline clearance, street tree, . Lapsed pollard, cut under HV & LV.	4	2.3	retain		
48	*Platanus Xacerifolia*	London Plane	Early-mature	Exotic deciduous	35	13x9	Fair	Fair	Mod.B	21 to 40	TP_LL	Street tree, ug services in srz, .	4.2	2.4	retain		
49	*Platanus Xacerifolia*	London Plane	Early-mature	Exotic deciduous	41	17x11	Fair	Fair to Poor	Mod.B	21 to 40	TP_LL	Street tree, ug services in srz, . Trunk kinks.	4.9	2.5	retain		
50	*Melaleuca styphelioides*	Prickly-leaved Paperbark	Early-mature	Australian native	62	10x13	Fair	Fair	Mod.B	11 to 20	TP_LL	Street tree,	7.4	2.8	retain		
51	*Platanus Xacerifolia*	London Plane	Early-mature	Exotic deciduous	41	14x14	Fair	Fair	Mod.B	21 to 40	TP_LL	Street tree,	4.9	2.5	retain		
52	*Platanus Xacerifolia*	London Plane	Early-mature	Exotic deciduous	32	12x9	Fair	Fair	Mod.B	21 to 40		Street tree, partly suppressed - crown bias, west, .	3.8	2.2	retain		
53	*Melaleuca styphelioides*	Prickly-leaved Paperbark	Early-mature	Australian native	59	12x12	Fair	Fair	Mod.B	11 to 20	TP_LL	Street tree,	7.1	2.9	retain	NRZ Minor (<10%)	5.9
54	*Platanus Xacerifolia*	London Plane	Early-mature	Exotic deciduous	33	10x11	Fair	Fair	Mod.B	21 to 40		Street tree, ug services in srz, .	4	2.3	retain		
55	*Platanus Xacerifolia*	London Plane	Semi-mature	Exotic deciduous	15	6x5	Fair	Fair	Mod.B	21 to 40		Street tree, partly suppressed - crown bias, west.	2	1.6	retain		
56	*Melaleuca styphelioides*	Prickly-leaved Paperbark	Maturing	Australian native	72	11x11	Fair	Fair	Mod.B	21 to 40	TP_LL	Street tree,	8.6	2.9	retain	NRZ Major (>20%)	25.1
57	*Platanus Xacerifolia*	London Plane	Semi-mature	Exotic deciduous	10	4x4	Fair	Fair	Mod.C	21 to 40		Street tree.	2	1.5	retain		
58	*Liquidambar styraciflua*	Liquidamber	Maturing	Exotic deciduous	43,43	17x16	Fair	Fair	Mod.B	11 to 20	TP_LL	Co-dominant stems w included bark, neighbour's tree. Canopy extends ~6m over boundary.	7.3	3	retain	NRZ Minor (<10%)	6.3

Appendix 3 - Photos

Image 1. Existing conditions south of Tree 28.

Image 2. Significant heaving of asphalt indicating surface roots from Tree 28.

Image 3. Clearance pruning requirement for Tree 28.

Image 4. Existing conditions next to Tree 30.

Image 5. Tree 28

Image 6. Pruning requirements Tree 28.

Image 7. Site conditions property side of Tree 28.

Image 8. Tree 6.

Image 9. Pruning requirements Tree 5 (northern canopy)

Image 10. Pruning requirements Tree 5 (northwest canopy)

Image 11. Property interior adjacent to Tree 56.

Image 12. Tree 56.

Image 13. Existing crossover south of Tree 56.

Image 14. Nature strip and crossover south of Tree 56.

Image 15. Existing crossover east of Tree 42.

Image 16. Tree 42.

Image 17. Tree 41.

Image 18. Tree 41.

Appendix 3: Tree Protection Zones

1. Introduction

To sustain trees on a development site, consideration must be given to the establishment of tree protection zones.

The physical dimensions of tree protection zones can sometimes be difficult to define. The projection of a tree's crown can provide a guide but is by no means the definitive measure. The unpredictable nature of roots and their growth, differences between species and their tolerances, and observable and hidden changes to the trees growing environment, because of development, are variables that must be considered.

Most vigorous, broad canopied trees survive well if the area within the drip-line of the canopy is protected. Fine root density is usually greater beneath the canopy than beyond (Gilman, 1997). If few to no roots over 3cm in diameter are encountered and severed during excavation the tree will probably tolerate the impact and root loss. A healthy tree can sustain a loss of between 30% and 50% of absorbing roots (Harris, Clark, Matheny, 1999), however encroachment into the structural root system of a tree may be problematic.

The structural root system of a tree is responsible for ensuring the stability of the entire tree structure in the ground. A tree could not sustain loss of structural root system and be expected to survive let alone stand up to average annual wind loads upon the crown.

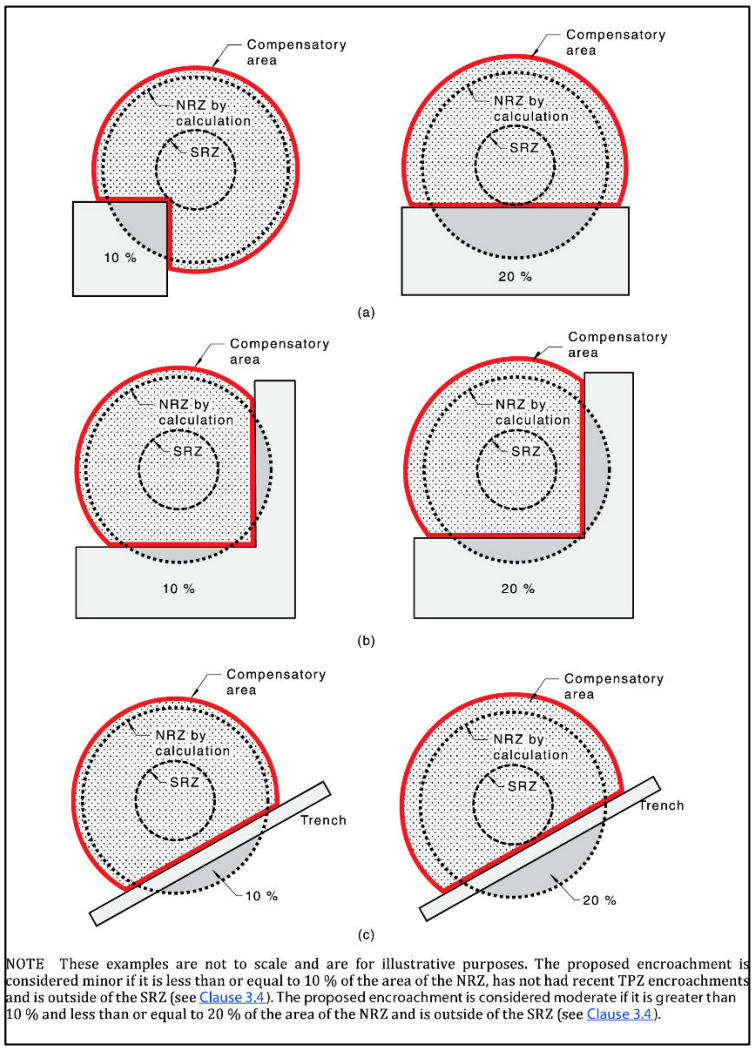
2. Notional Root Zone (NRZ)

Calculation of the NRZ (as defined in Australian Standard AS 4970-2025 *Protection of trees on development sites*) is a theoretical zone that surrounds each tree radially. The NRZ for individual trees is calculated based on trunk (stem) diameter (DSH), measured at 1.4 metres up from ground level. The radius of the NRZ is calculated by multiplying the trees DBH by 12. NRZ distances are measured as a radius from the centre of the trunk at (or near) ground level. The minimum NRZ should be no less than 2m and the maximum no more than 15m radius. The NRZ of palms should be not less than 1.0m outside the crown projection.

Encroachment into the NRZ is permissible under certain circumstances though is dependent on both site conditions and tree characteristics. Minor encroachment, up to 10% of the NRZ, is generally permissible provided encroachment is compensated for by recruitment of an equal area contiguous with the NRZ. Examples are provided in Diagram 1. Encroachment between 10-20% is considered moderate encroachment and is only permissible if it can be demonstrated that after such encroachment the tree would remain viable. Major Encroachment, greater than 20% of the NRZ and/or incursion into the SRZ, may have deleterious effects on tree condition/stability and requires engagement of a project arborist to assist with alternative design options and/or undertake advanced investigations to demonstrate that the tree would remain viable.

Existing infrastructure around some trees may be within the NRZ or root plate radius. The roots of some trees may have grown in response to the site conditions and therefore if existing hard surfaces and building alignments are utilised in new designs the impacts on the trees should be minimal.

The most reliable way to estimate root disturbance is to find out where the roots are in relation to the demolition, excavation or construction works that will take place (Matheny & Clark, 1998). Exploratory excavation prior to commencement of construction can help establish the extent of the root system and where it may be appropriate to excavate or build.



NOTE These examples are not to scale and are for illustrative purposes. The proposed encroachment is considered minor if it is less than or equal to 10 % of the area of the NRZ, has not had recent TPZ encroachments and is outside of the SRZ (see Clause 3.4). The proposed encroachment is considered moderate if it is greater than 10 % and less than or equal to 20 % of the area of the NRZ and is outside of the SRZ (see Clause 3.4).

Diagram 1: Examples of minor, moderate and major encroachment into a NRZ. (Extract from: AS4970-2025, Figure 1, p23 of 46)

3. Allocation of tree protection zone (TPZ)

Once it has been established, through an arboricultural assessment, which trees and tree groups are to be retained, the next step will require careful management through the development process to minimise any impacts on the designated trees. The successful retention of trees on any particular site will require the commitment and understanding of all parties involved in the development process.
The most important activity, after determining the trees that will be retained, is the implementation of a TPZ.

The intention of tree protection zones is to:

- mitigate tree hazards;
- provide adequate root space to sustain the health and aesthetics of the tree into the future;
- minimise changes to the trees growing environment, which is particularly important for mature specimens;
- minimise physical damage to the root system, canopy and trunk; and

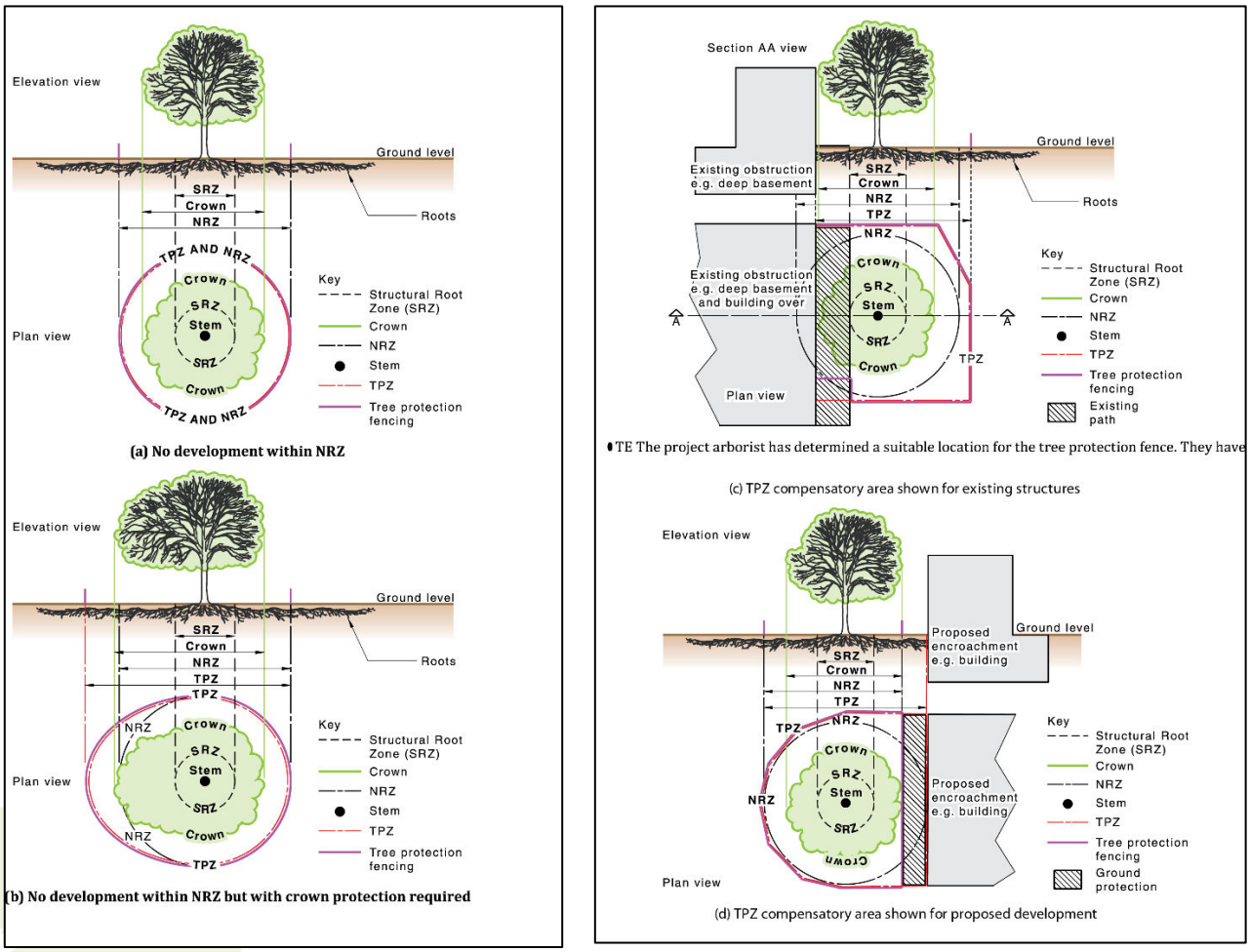
- define the physical alignment of the tree protection fencing

TPZs are to be allocated to trees being retained within a site redevelopment. The method of allocating a TPZ to a tree will be influenced by the NRZ along with site factors, the tree species, its age, and developed form.

Tree root growth is opportunistic and occurs where the essentials to life (primarily air and water) are present.
Heterogeneous soil conditions, existing barriers, hard surfaces and buildings may have inhibited the development of a symmetrically radiating root system. The TPZ should factor in site conditions along with any allowed encroachments, and allocate a zone that can realistically be protected and provide sufficient nourishment for the tree's ongoing vitality.

The TPZ should also consider the canopy and overall form of the tree which may require TPZ expanding beyond the NRZ in some areas (e.g. see Diagram 3). If the canopy requires severe pruning to accommodate a building or other works and in the process the form of the tree is diminished it may be worthwhile considering altering the design or removing the tree.

Importantly, the TPZ should account for any allowed encroachment within the NRZ, by allocating a compensatory area equal to the encroachment onto another area contiguous to the TPZ (see Diagrams 1 and 5).

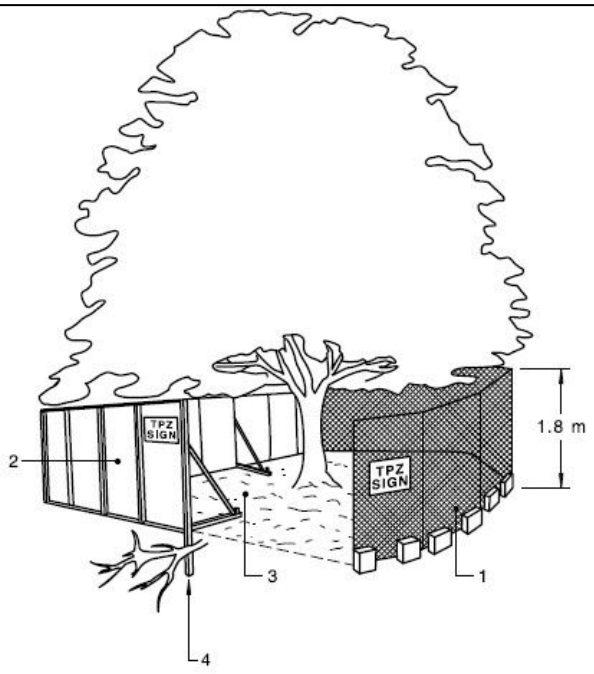


Diagrams 2, 3, 4 & 5. Examples of TPZ establishment in different scenarios (Extract from: AS4970-2025, Figure 3, pp25-26 of 46)

General tree protection guidelines

The most important factors are:

- Prior to construction works the trees nominated for tree works should be pruned to remove larger dead wood. Pruning works may also identify other tree hazards that require remedial works.
- Installation of tree protection fencing. Once the tree protection zones have been determined the next step is to mulch the zone with woodchip and erect tree protection fencing. This must be completed prior to any materials being brought on-site, erection of temporary site facilities or demolition/earth works. The protection fencing must be sturdy and withstand winds and construction impacts. The protection fence should only be moved with approval of the site supervisor. Other root zone protection methods can be incorporated if the TPZ area needs to be traversed.
- Appropriate signage is to be fixed to the fencing to alert people as to importance of the tree protection zone.
- The importance of tree preservation must be communicated to all relevant parties involved with the site.
- Inspection of trees during excavation works.



KEY:

1 Chain wire mesh panels that are held in place with concrete feet.

2 Alternatively, plywood or wooden paling fence panels may be used. This fencing material also prevents building materials or soil from entering the TPZ.

3 Mulch installation across the surface of the TPZ (as detailed in the TPS). No excavation, construction activity grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ other than those indicated in the TPS.

4 Bracing may be used within the TPZ. Installation of posts or supports should avoid damaging roots.

Diagram 6: Protective fencing (Extract from: AS4970-2025, Figure 4, p28 of 46)

Exploratory excavation

The most reliable way to estimate root disturbance is to find out where the roots are in relation to the

demolition, excavation or construction works that will take place (Matheny & Clark, 1998).

Exploratory excavation prior to commencement of construction can help establish the extent of the root system and where it may be appropriate to excavate or build. This also allows management decisions to be made and allows time for redesign works if required.

Any exploratory excavation within the allocated NRZ is to be undertaken with due care of the roots. Minor exploration is possible with hand tools. More extensive exploration may require the use of high pressure water or air excavation techniques. Either hydraulic or pneumatic excavation techniques will safely expose tree roots; both have specific benefits dependent on the situation and soil type. An arborist is to be consulted on which system is best suited for the site conditions.

Substantial roots are to be exposed and left intact.

Once roots are exposed decisions can be made regarding the management of the tree. Decisions will be dependent on the tree species, its condition, its age, its relative tolerance to root loss, and the amount of root system exposed and requiring pruning.

Other alternative measures to encroaching the NRZ may include boring or tunnelling.

How to determine the diameter of a substantial root

The size of a substantial root will vary according to the distance of the exposed root to the trunk of the tree. The further away from the trunk of a tree that a root is, the less significant the root is likely to be to the tree's health and stability.

The determination of what is a substantial root is often difficult because the form, depth and spread of roots will vary between species and sites. However, because smaller roots are connected to larger roots in a framework, there can be no doubt that if larger roots are severed, the smaller roots attached to them will die. Therefore, the larger the root, the more significant it may be.

Gilman (1997) suggests that trees may contain 4-11 major lateral roots and that the five largest lateral roots account (act as a conduit) for 75% of the total root system. These large lateral roots quickly taper within a distance to the tree, this distance is identified as the Structural Root Zone (SRZ). Within the SRZ distance, all roots and the soil surrounding the roots are deemed significant.

No root or soil disturbance is permitted within the SRZ

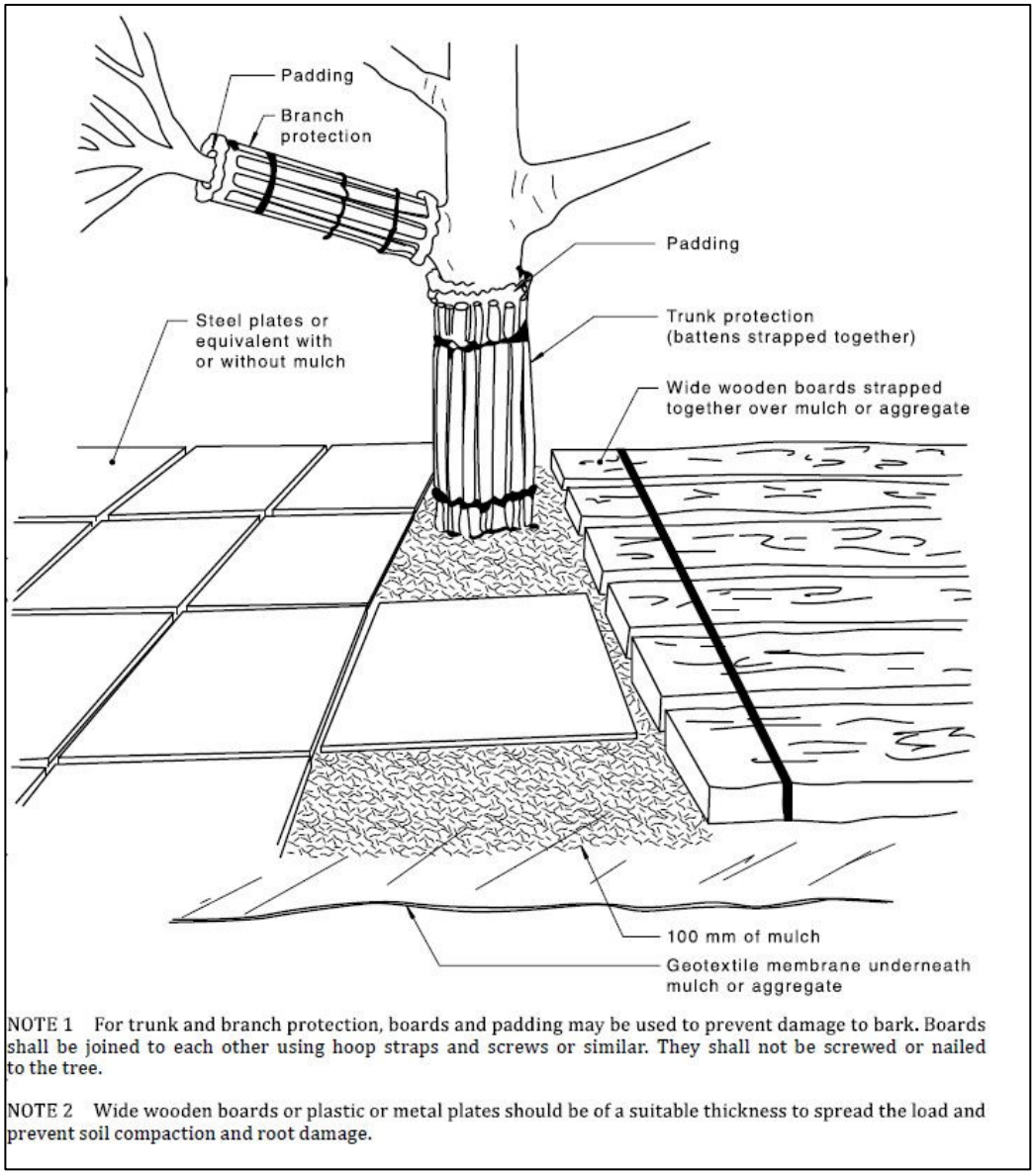
In the area outside the SRZ the tree may tolerate the loss of one or a number of roots. The table below indicates the size of tree roots, outside the SRZ that would be deemed substantial for various tree heights. The assessment of combined root loss within the NRZ would need to be undertaken by an arborist on an individual basis because the location of the tree, its condition and environment would need to be assess

Table 1: Estimated significant root sizes outside SRZ

Height of tree	Diameter of root	Height of tree	Diameter of root
Less than 5m	≥ 30mm	Less than 5m	≥ 30mm
Between 5m - 15m	≥ 50mm	Between 5m - 15m	≥ 50mm
More than 15m	≥ 70mm	More than 15m	≥ 70mm

Ground buffering

Where works are required to be undertaken within the tree root zone, surface, ground buffering and trunk and limb protection must be provided to minimise the potential for soil to become compacted and avoid potential for impact wounds to occur to surface roots, trunk or limbs. Refer below.



NOTE 1 For trunk and branch protection, boards and padding may be used to prevent damage to bark. Boards shall be joined to each other using hoop straps and screws or similar. They shall not be screwed or nailed to the tree.

NOTE 2 Wide wooden boards or plastic or metal plates should be of a suitable thickness to spread the load and prevent soil compaction and root damage.

Diagram 7: Examples of ground buffering and trunk and limb protection (Extract from: AS4970-2025, Figure 5, p30 of 46)

Construction Guidelines

The following are guidelines that must be implemented to minimise the impact of the proposed construction works on the retained trees.

- The Tree Protection Zone (TPZ) is fenced and clearly marked at all times. The actual fence specifications should be a minimum of 1.2 - 1.5 metres of chain mesh or like fence with 1.8 meter posts (e.g. treated pine or star pickets) or like support every 3-4 metres and a top line of high visibility plastic hazard tape. The posts should be strong enough to sustain knocks from on site excavation equipment. This fence will deter the placement of building materials, entry of heavy equipment and vehicles and also the entry of workers and/or the public into the TPZ. Note: There are many different variations on the construction type and material used for TPZ fences, suffice to say that the fence should satisfy the responsible authority.

- Contractors and site workers should receive written and verbal instruction as to the importance of tree protection and preservation within the site. Successful tree preservation occurs when there is a commitment from all relevant parties involved in designing, constructing and managing a development project. Members of the project team need to interact with each other to minimise the impacts to the trees, either through design decisions or construction practices. The importance of tree preservation must be communicated to all relevant parties involved with the site.

- The consultant arborist is on-site to supervise excavation works around the existing trees where the TPZ will be encroached.

- A layer of organic mulch (woodchips) to a depth of no more than 100mm should be placed over the root systems within the TPZ of trees, which are to be retained so as to assist with moisture retention and to reduce the impact of compaction.

- No persons, vehicles or machinery to enter the TPZ without the consent of the consulting arborist or site manager.

- Where machinery is required to operate inside the TPZ it must be a small skid drive machine (i.e Dingo or similar) operating only forwards and backwards in a radial direction facing the tree trunk and not altering direction whilst inside the TPZ to avoid damaging, compacting or scuffing the roots.

- Any underground service installations within the allocated TPZ should be bored and utility authorities should common trench where possible.

- No fuel, oil dumps or chemicals shall be allowed in or stored on the TPZ and the servicing and re-fuelling of equipment and vehicles should be carried out away from the root zones.

- No storage of material, equipment or temporary building should take place over the root zone of any tree.

- Nothing whatsoever should be attached to any tree including temporary services wires, nails, screws or any other fixing device.

- Supplementary watering should be provided to all trees through any dry periods during and after the construction process. Proper watering is the most important maintenance task in terms of successfully retaining the designated trees. The areas under the canopy drip lines should be mulched with woodchip to a depth of no more than 100mm. The mulch will help

maintain soil moisture levels. Testing with a soil probe in a number of locations around the tree will help ascertain soil moisture levels and requirements to irrigate. Water needs to be applied slowly to avoid runoff. A daily watering with 5 litres of water for every 30 mm of trunk calliper may provide the most even soil moisture level for roots (Watson & Himelick, 1997), however light frequent irrigations should be avoided. Irrigation should wet the entire root zone and be allowed to dry out prior to another application.

References

Bernatzky, A. 1978. *Tree Ecology and Preservation.* New York: Elsevier Publishing.
British Standard 5837. 1991. *Guide for Trees in relation to construction*. British Standards Institute. Gilman, E. F. 1997. *Trees for Urban and Suburban Landscapes.* Delmar.
Harris, R. W, Clark J.R. & Matheny N.P. 1999. *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines*, *Third Edition.* Prentice - Hall, New Jersey.
Helliwell, D. R. 1985. *Trees on Development Sites*. Arboricultural Association UK.
Matheny, N. & Clark, J. R. 1998. *Trees and development – A technical guide to preservation of trees during land development*. International Society of Arboriculture, Publishers.
Mattheck, C. & Breloer, H. 1994. *The Body Language of Trees*
HMSO Mattheck C. 2002. *Tree Mechanics*, Forschungszentrum
Karlsruhe GMBH
Tattar, T. A. 1989. *Diseases of Shade Trees*, 2nd ed. San Diego: Academic Press.
Watson, G. W. & Himelick, E. B. 1997. *Principals and Practices of Planting Trees and Shrubs.* International Society of Arboriculture.

agreed in writing to the terms upon which this Report may be relied on by that other person, entity or organisation.

The report and any values expressed therein represent the opinion of Tree Logic's consultant and Tree Logic's fee is in no way conditional upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

There is no warranty or guarantee, expressed or implied by Tree Logic Pty. Ltd., that problems or deficiencies of the plants or site in question may not arise in the future. Tree condition can change quickly in response to environmental conditions or altered growing conditions.

There can be no guarantees provided for on-going tree safety. It should be noted that not all of the potential structural concerns associated with trees can be eliminated and that there will always be a residual risk following any mitigation works. Also, not all tree defects are observable and extreme weather events are unpredictable. Since trees are complex, living organisms, it is difficult to quantify and precisely measure all variables when inspecting a standing tree for hazard.

Trees should be reassessed on a regular basis; the scheduled period of reassessment will be dependent on the characteristics of the tree, the landscape context and perceived targets, and resources available to maintain them.