Arboricultural Impact Assessment

Prepared For
Jason & Kate Hollier
67 Woolgoolga Street
North Balgowlah NSW 2093

SITE ADDRESS
67 WOOLGOOLGA STREET
NORTH BALGOWLAH NSW 2093

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1 Introduction

1.1 Brief

1.1.1 This Arboricultural Impact Assessment (AIA) was prepared by Chantalle Hughes of Treeism Arboricultural Services. This report was commissioned by Jason Hollier, owner of the subject site. The Site is identified as Lot 29 of DP 23447 and is known as 67 Woolgoolga Street, North Balgowlah, New South Wales. Construction of a two-storey dwelling house, with deck area, double garage and swimming pool are proposed.

1.1.2 The purpose of this report is to identify the species of each assessed tree, assess their vigour, condition, landscape prominence and ascribe a Retention Value to each tree.

1.1.3 This report identifies the potential impacts the proposal will have on the retention or long-term viability of each tree and aims to provide guidelines for tree retention and protection during development.

1.2 Context

1.2.1 Acknowledgement of the original inhabitants of the Northern Sydney area is complex. The Aboriginal Heritage Office (AHO) states…' Clan names which can be found on most maps for the northern Sydney region of the AHO partner Councils are the following: Gayamaygal, Gamaragal, Garigal, Darramurragal and many more'…..exact clan name knowledge has been lost, or at the very least is hard to find, as traditional inhabitants of Australia were told to 'give up their language, stop practicing ceremony and hide their Aboriginality'.

1.2.2 The Department of Planning, Industry and Environment 'Espade' states the site geology as 'Hawkesbury Sandstone, which consists of medium to coarse-grained quartz sandstone with minor shale and laminite lenses.'

1.2.3 Details of vegetation as per Espade states 'Predominantly uncleared open-heathlands, closed-heathlands and scrublands, with patches of low eucalypt woodland. The heathlands and scrublands are often exposed to strong winds. Their shallow, poorly drained soils fluctuate between being saturated or dry. Bushfires are frequent. Isolated lines and patches of trees are occasionally associated with joint crevices. *Allocasuarina distyla* and/or *Banksia ericifolia* are usually dominant. Other shrubs such as *Hakea teretifolia* may be locally dominant in areas subject to seepage or prolonged saturation. Associated shrubs include various *Grevillea* spp., *Kunzea* spp., *Pultenaea* spp., *Leptospermum* spp. and *Epacris* spp. Isolated occurrences of low eucalypt open-woodland with dry sclerophyll shrub understorey are found at sites with deeper soils and unimpeded soil drainage. Trees often have a mallee habit. *Eucalyptus* (sic) *gummifera, E. luehmanniana, E. eximia, E. haemastoma* and *Angophora bakeri* are common mallee species. Growth of introduced species in urban areas is stunted. Native trees rarely attain a height of 10 m.

1.3 Methodology

1.3.1 In preparation for this report, ground level, visual tree assessments[1] or limited VTA (e.g. where access was limited), of nineteen (19) trees was completed by Chantalle Hughes of Treeism Arboricultural Services on 20th February 2025. Inspection details of these trees are provided in Appendix 3 — Schedule of Assessed Trees.

1.3.2 The tree heights were visually estimated or measured using a Nikon ForestryPro, unless otherwise noted in Appendix 3, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape unless indicated otherwise. Tree canopy spreads were stepped out with field observations written down, and photographs of the site and trees were taken using an iPhone 16 Pro Max.

1.3.3 The Structural Root Zone (SRZ) and the Tree Protection Zone (TPZ) of each tree is calculated using the formula provided within the Australian Standard 4970-2009 Protection of trees on development sites (AS4970).

1.3.4 Tree Retention Values (RV) were calculated utilising STARS – Significance of a Tree Assessment Rating System (IACA 2010) ©.

1.3.5 Tree data and field observations were entered into a data dictionary on a Trimble TDC600. Data was managed through Terraflex Trimble Connect.

1.4 Plans and Documents Referenced

1.4.1 Concept Design Plans, Job no. 23-1108, drawing no's. CD-10, CD-30, CD-40 & CD-100 Rev I, dated 25/11/2024, CD-20 Rev B, dated 9/10/2023, CD-50 & CD-60 Rev no. F, dated 13/3/2024. CD-70, Rev no. C dated 13/10/2023, & CD-110, Revision A, dated 27/9/2023 authored by Sixtoeight.

1.4.2 Survey Plan, plan no. 230022, Revision 3, dated 23/10/2024, authored by Total Surveying Solutions.

1.4.3 AS4970-2009 Protection of trees on development sites, Standards Australia.

1.4.4 AS4373-2007 Pruning of amenity trees, Standards Australia.

1.4.5 This AIA takes account Chapter 2 *Vegetation in Non-Rural Areas* of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 'The SEPP' Chapter E1 – Preservation of Trees or Bushland Vegetation, Warringah Development Control Plan, amended 2011 (WDCP).

[1]Visual Tree Assessment (VTA) is a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

1.5 Limitations

1.5.1 No Landscape or Hydraulic Service Plans were viewed as part of this assessment.

1.5.2 Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

1.5.3 This report is not intended to be a comprehensive tree risk assessment; however, the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.

1.5.4 No aerial inspections, root mapping or woody tissue testing were undertaken as part of this tree assessment.

1.5.5 Information contained in this report only reflects the condition of the trees at the time of inspection. Trees are dynamic, living things which can be subject to change without notice in certain circumstances.

1.5.6 This AIA is not intended as an assessment of any impacts on the trees by any proposed future development of the site.

2 Observations and Discussion

2.1 Threatened Species/Biodiversity Consideration

2.1.1 No species of assessed tree is subject to threatened conservation status under Australian and/or State Government legislation (i.e. NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

2.1.2 The site is not identified on the NSW Government Biodiversity Values Map and Threshold Tool

2.2 Assessed Trees

2.2.1 Nineteen (19) trees were assessed or identified and are included in this report. Details of these are included in the Schedule of Assessed Trees—Appendix 3.

2.2.2 **Tree numbers**—of the nineteen (19) assessed surveyed trees, the following is noted:

- Fifteen (15) trees are located within neighbouring property adjoining the subject site—Tree 1, 2, 4-7, 8A, 9, 9A, 11, 12 and 14-17.
- Four (4) trees are located within the subject site—Tree 3, 8, 10 and 13.
- One (1) tree on neighbouring property has been removed since the survey has been undertaken—Tree 6.

2.2.3 **Tree origin**—of the eighteen (18) assessed trees, the following is noted:

- Eleven (11) trees are locally native species—Tree 3-5, 8, 8A, 9, 9A and 10-13.
- Two (2) trees are introduced native species—Tree 1 and 2.
- Five (5) trees are introduced exotic species—Tree 7 and 14-17.

2.2.4 **Retention Value (RV) —** The eighteen (18) prescribed/neighbouring trees and their respective Retention Value (RV) are identified in Table 1, below. Note: Refer to Appendix 2 for the methodology used to assess the Retention Value of a tree.

Table 1—Tree Identification and Retention Value, where L = Low, M = Medium, H = High, R = Removal Proposed.

Tree No.	Common Name	RV	Tree No.	Common Name	RV
1	Brushbox	**H**	**9A**	Sweet Pittosporum	**M**
2	Bottlebrush	**L**	**10**	Smooth-barked Apple	**M**
3	Smooth-barked Apple	**H**	**11**	Smooth-barked Apple	**H**
4	Lemon-scented Tea Tree	**M**	**12**	Smooth-barked Apple	**H**
5	Smooth-barked Apple	**H**	**13**	Smooth-barked Apple	**H**
7	Hawthorn	**M**	**14**	South African Wild Plum	**M**
8	Smooth-barked Apple	**M**	**15**	Maidenhair Fern	**M**
8A	Cheese Tree	**H**	**16**	Apple	**M**
9	Smooth-barked Apple	**H**	**17**	Camellia	**M**

3 Impact of the Proposed Development

3.1 Prescribed Trees Proposed for Removal

3.1.1 One (1) tree would require removal to facilitate to proposal (see Appendix 7 – Tree Encroachment Calculations - visual) as discussed below;

- **Tree 8 – Smooth barked Apple** – The proposed pool and decking would encroach this specimen by 27.4% and this work falls within the Structural Root Zone (SRZ), specifically the excavation for the pool itself. This specimen could not be safely retained.

3.2 Potential Impacts on Trees Proposed for Retention

3.2.1 Under the Australian Standard 4970-2009 Protection of trees on development sites (AS4970), encroachments less than 10% of the Tree Protection Zone (TPZ) are considered to be minor. No specifications are provided in AS4970 for potential impacts of 10% or greater. This 10% is interpreted as the threshold figure, 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.

3.2.2 When determining the potential impacts of encroachment into the TPZ, the project arborist should consider the following items listed under Clause 3.3.4 of AS4970-2009:

(a) Location and distribution of the roots to be determined through non-destructive investigation methods (pneumatic, hydraulic, hand digging or ground penetrating radar). Photographs should be taken, and a root zone map prepared.

(b) The potential loss of root mass resulting from the encroachment: number and size of roots.

(c) Tree species and tolerance to root disturbance.

(d) Age, vigour and size of the tree.

(e) Lean and stability of the tree. NOTE: Roots on the tension side are likely to be most important for supporting the tree and are likely to extend for a greater distance.

(f) Soil characteristics and volume, topography and drainage.

(g) The presence of existing or past structures or obstacles affecting root growth.

(h) Design factors.

3.2.3 Disturbance within the Structural Root Zone (SRZ), and extent of encroachments into the TPZ's of prescribed trees to be retained are summarised in Table 1 below/next page.

Table 1: Estimated encroachments of permanent structures into the SRZ and TPZ of trees proposed for retention. Note 1: These figures are based on the SRZ and TPZ's offsets of the trees as calculated under AS4970 and do not necessarily reflect the actual root zones of the trees. Existing at or below ground structures, site topography and soil hydrology will influence the presence, spread and direction of tree root growth.

Tree No.	Tree	Tree located on site	SRZ affected	TPZ area (m^2)	TPZ encroachment (approx. m^2)	TPZ encroachment (approx. %)
1	Brushbox	**x**	✓	206	99.74	48.2
2	Bottlebrush	**x**	**x**	13	0.34	2.6
3	Smooth-barked Apple	✓	**x**	328	39.27 + 58.14	*30
4	Lemon-scented Tea Tree	**x**	**x**	13	0	0
5	Smooth-barked Apple	**x**	**x**	104	0	0
7	Hawthorn	**x**	**x**	33	0.37	1.1
8A	Cheese Tree	**x**	**x**	22	0	0
9	Smooth-barked Apple	**x**	**x**	163	7.88	4.8
9A	Sweet Pittosporum	**x**	*✓	14	0.07	0.5
10	Smooth-barked Apple	✓	**x**	44	*3.5	8.0
11	Smooth-barked Apple	**x**	**x**	104	0	0
12	Smooth-barked Apple	**x**	**x**	41	0	0
13	Smooth-barked Apple	✓	*✓	72	*12.37	*17.2
14	Wild Plum	**x**	✓	62	*13.34 + 0.18	*21.8
15	Maidenhair Tree	**x**	**x**	13	0.73	5.6
16	Apple	**x**	Just ✓	13	1.55	11.9
17	Camellia	**x**	**x**	13	0	0

* This symbol indicates that existing structures or the design methodology will amend the calculated encroachment shown as per detailed in discussion for individual trees below.

3.2.4 **Tree 1** Brushbox – located on Council managed land.

Structural Root Zone impacts:

- The proposed new concreted driveway cross over falls within the calculated SRZ of this tree. See further discussion below.

Tree Protection Zone impacts:

- An encroachment of 48.2% has been estimated for the proposed driveway and driveway cross over, placing it well within *major* encroachment under AS4970 (see Figure 1 next page). This triggers Clause 3.3.4 - *TPZ encroachment considerations under AS4970 – 2009*, the most relevant clauses are - (g) *The presence of existing or past structures or obstacles affecting root growth* and (h) *Design factors*.
- (g) Whilst no structures are within this area currently, it appears the previous dwelling inhabitants/vehicles utilised this area as the main driveway access, if abet informally as a gravel driveway only. The area is compacted heavily, potentially limiting root ingress into the area.
- (h) The proposed driveway cross over would need to ensure it is above the existing grade (i.e. the forming of the driveway and levelling would need to on or just above grade so a level surface can be achieved with no excavation) to ensure root damage does not occur.
- Provided these design methods are employed, minimal impact on tree health due to the proposal is expected.

Pruning impacts:

- No pruning will be required to accommodate works, the canopy is held high over the driveway and driveway cross-over.

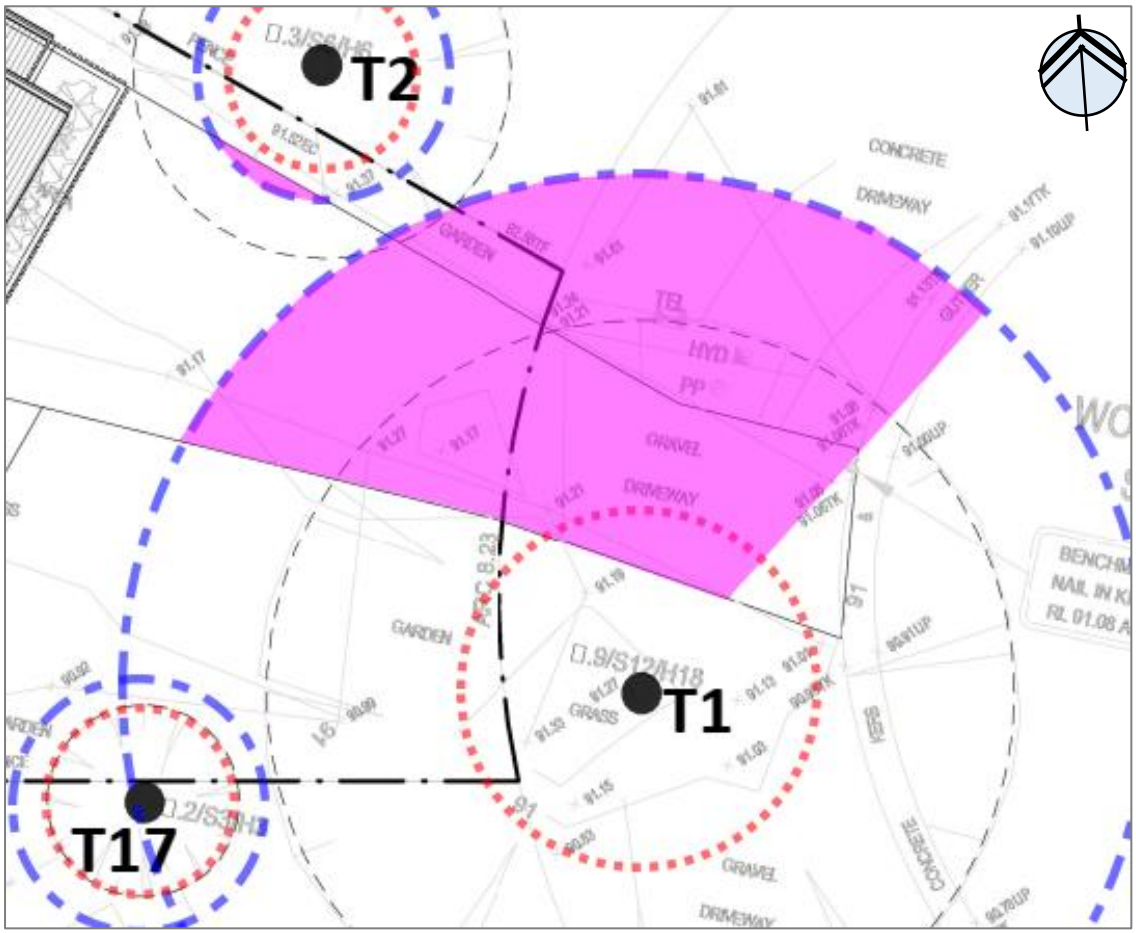

Figure 1 – Tree 1, 2 and 17 encroachment calculation – Excerpt of Veg Removal Plan, job no. 23-1108, Rev B, dated 25/10/24, authored by Sixtoeight. Red dotted circle notes SRZ, blue hashed TPZ. Pink shading estimated encroachment. Marked up by C Hughes. (NOT TO SCALE).

3.2.5 **Tree 2** Bottlebrush – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 2.6% has been estimated (see Figure 1 above) for the proposed driveway. This places it within *minor* encroachment under AS4970.
- The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- Minor pruning may be required to accommodate the dwelling build.

3.2.6 **Tree 3** Smooth-barked Apple – located on the subject site.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 30% has been estimated for the proposed dwelling, decking and pool, placing it well within *major* encroachment under AS4970 (see Figure 3 next page).
- This triggers Clause 3.3.4 - *TPZ encroachment considerations under AS4970 – 2009*, the most relevant clauses are - (b) *The potential loss of root mass resulting from the encroachment: number and size of roots*, and (h) *Design factors*.
- Whilst the pool itself and the garage/storage area will require excavation (see pink shaded areas in Figure 3 below), the living area and decking off both the pool, and living area, are proposed above grade, with pier and beam excavation (see orange shaded areas within Figure 3 next page and Figure 2 excerpt of Section Plan below).
- The excavated areas have been estimated to encroach 12% of the total TPZ area, whilst the remaining 18% is pier and beam construction.
- Provided non-destructive digging (NDD) such as an airspade or hand excavation under direct Project Arborist supervision is carried out, (ensuring isolated pier locations are not impacting woody roots in excess of 40mm in diameter), the long term viability of this tree is possible.
- Additional irrigation and consideration of deck board spacing to allow water infiltration below the built form would further increase the long-term viability of tree retention.

Pruning impacts:

- Pruning will be required to provided clearances for the proposed dwelling. This work can be carried out to comply with AS4373 and shall be a maximum 10% of total live canopy. The pruning required is as shown in Image 1 page 10.

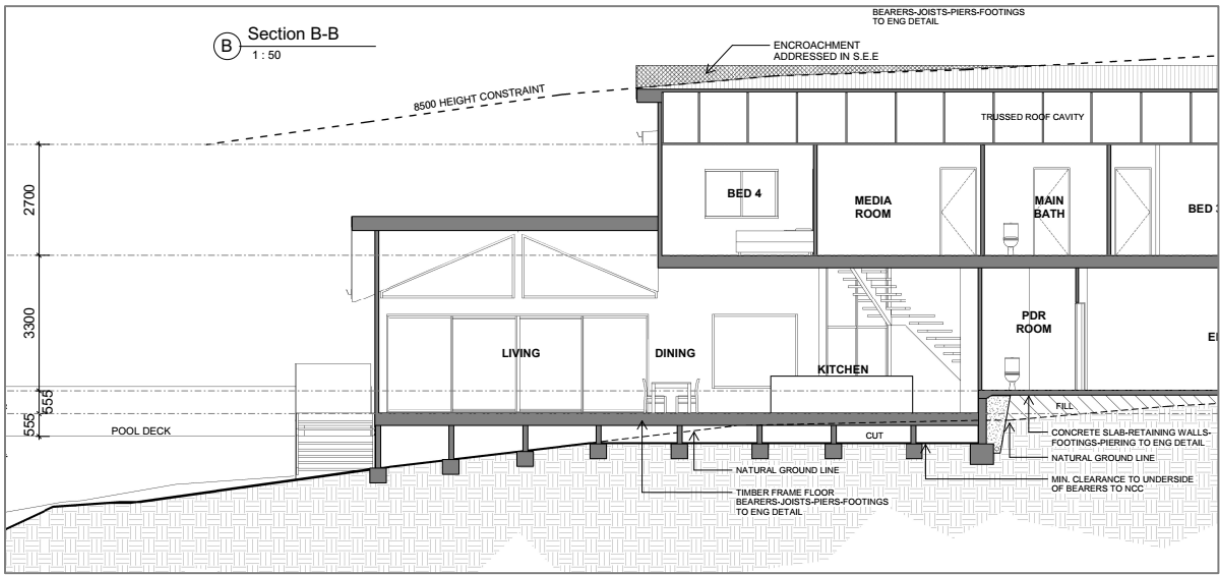

Figure 2 – Excerpt of Sections Plan – Excerpt of Sections Plan, Job no. 23-1108, Rev C, dated 25/11/24, authored by Sixtoeight.

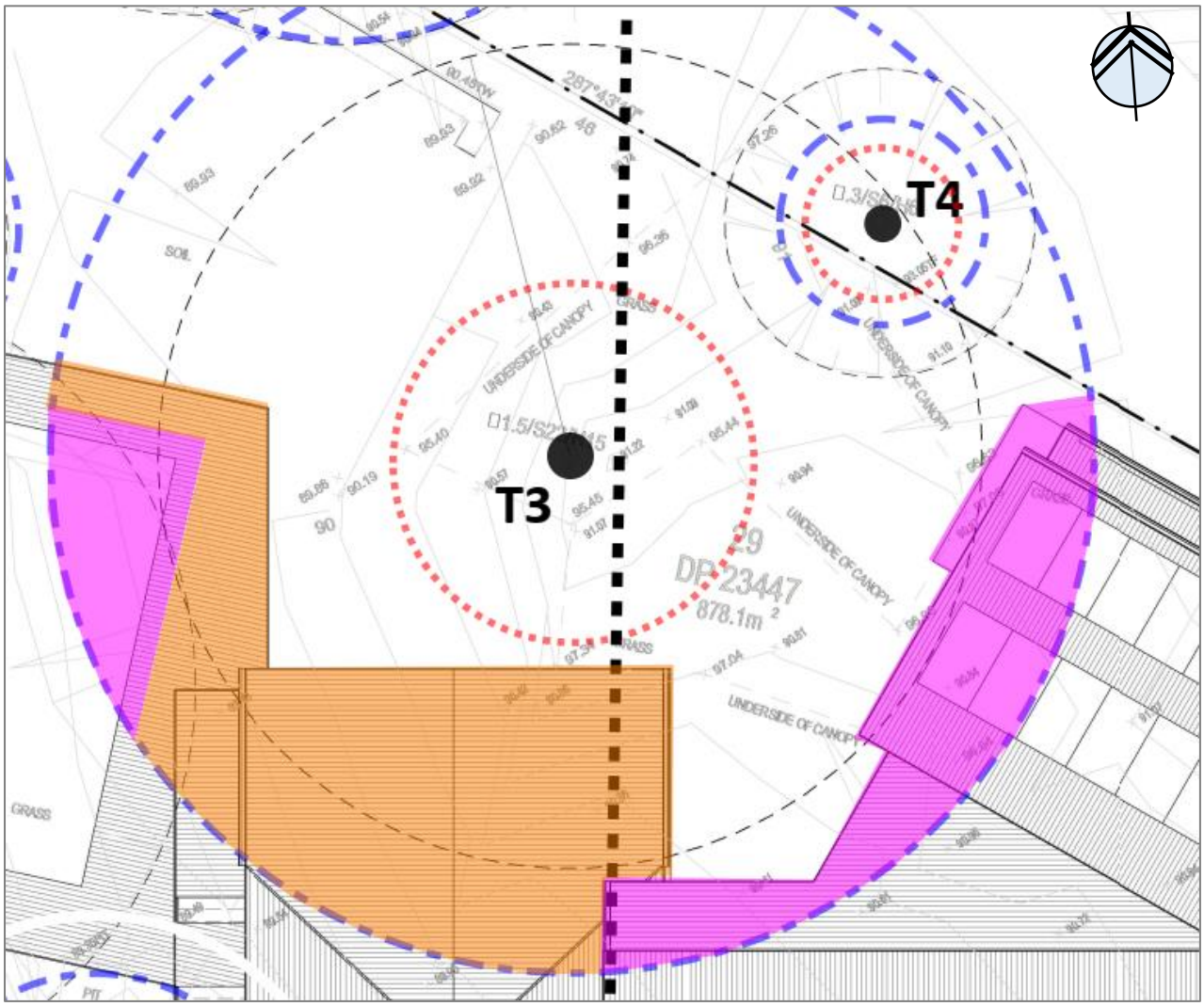

Figure 3 – Tree 3 encroachment calculation – Excerpt of Veg Removal Plan, job no. 23-1108, Rev B, dated 25/10/24, authored by Sixtoeight. Red dotted circle notes SRZ, blue hashed TPZ. Pink shading denotes encroachment impact ground levels, orange shading notes encroachment above grade – pier and beam. Black dotted line delineates approx. area of below ground encroachment (east of line) to above grade encroachment (west of line). Marked up by C Hughes. (NOT TO SCALE).

Image 1 – Required pruning of Tree 3 to accommodate built form under canopy.

3.2.7 **Tree 4** Lemon-scented Tea Tree – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen (see Appendix 7 - Tree Encroachment Calculations - visual). The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.8 **Tree 5** Smooth-barked Apple – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen (see Appendix 7 - Tree Encroachment Calculations - visual). The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.9 **Tree 7** Hawthorn – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 1.1% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed pool decking. This places it within *minor* encroachment under AS4970.
- The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.10 **Tree 8A** Cheese Tree – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen (see Appendix 7 - Tree Encroachment Calculations - visual). The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.11 **Tree 9** Smooth-barked Apple – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 4.8% has been estimated for the pool excavation and surrounding decking (see Appendix 7 - Tree Encroachment Calculations - visual). This places it within *minor* encroachment under AS4970.
- The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.12 **Tree 9A** Sweet Pittosporum – located on neighbouring property.

Structural Root Zone impacts:

- The pool decking just falls within the calculated SRZ of this specimen. See discussion below.

Tree Protection Zone impacts:

- An encroachment of 0.5% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed pool decking. Given works are just within the SRZ, this places it within *major* encroachment under AS4970 and Clause 3.3.4 - *TPZ encroachment considerations under AS4970 – 2009*, needs to be considered.
- The most relevant clauses are - (b) *The potential loss of root mass resulting from the encroachment: number and size of roots*, and (h) *Design factors*.
- The decking surrounding the pool will be isolated piers, provided woody root severance over 40mm in diameter is avoided, impact on tree condition is unlikely.

Pruning impacts:

- No pruning will be required to accommodate works.

3.2.13 **Tree 10** Smooth-barked Apple – located on the subject site.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 8.0% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed living area and stair access. This places it within *minor* encroachment under AS4970 and impact on tree health considered unlikely.

Pruning impacts:

- It is possible minor to moderate pruning would be required to accommodate the build however this tree has lost the codominant stem to the north some time ago, reducing canopy in this direction.

3.2.14 **Tree 11** Smooth-barked Apple – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen (see Appendix 7 - Tree Encroachment Calculations - visual). The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works, the canopy is held high over the subject site.

3.2.15 **Tree 12** Smooth-barked Apple – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen (see Appendix 7 – Tree Encroachment Calculations - visual). The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works, the canopy is held high over the subject site.

3.2.16 **Tree 13** Smooth-barked Apple – located on the subject site.

Structural Root Zone impacts:

- The proposed living area and 'basix' water tank fall within the SRZ of this tree. See discussion below.

Tree Protection Zone impacts:

- An encroachment of 17.2% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed living area and 'basix water tank, these also fall

within the SRZ. This places it within *major* encroachment under AS4970 and Clause 3.3.4 - *TPZ encroachment considerations under AS4970 – 2009* needs to be considered.

- The most relevant clauses are - (b) *The potential loss of root mass resulting from the encroachment: number and size of roots*, and (h) *Design factors*.
- The living area is proposed to be above existing grade on isolated pier and beam foundations (see Figure 2 page 9). Use of non-destructive digging (NDD) such as an airspade or hand excavation under direct Project Arborist supervision is required. Pier locations not impacting woody roots in excess of 40mm in diameter would be required.
- Additional irrigation below the built form would increase the chances of long-term tree retention.
- The 'basix' water tank is assumed to be on-grade. Given its location within the SRZ, this would best be placed on a deck (with piered footings) or, at minimum, ensuring any concrete foundation is above grade so excavation is not required.

Pruning impacts:

- No pruning will be required to accommodate works, the canopy is orientated over the neighbouring property and away from the build.

3.2.17 **Tree 14** South African Wild Plum – located on neighbouring property.

Structural Root Zone impacts:

- The proposed 'basix' water tank falls within the SRZ of this tree. See discussion below.

Tree Protection Zone impacts:

- An encroachment of 21.8% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed living area and 'basix water tank, these also fall within the SRZ. This places work within *major* encroachment under AS4970 and considerations to Clause 3.3.4 - *TPZ encroachment considerations* are required.
- Again, the 'basix' water tank is assumed to be on-grade. Given its location within the SRZ this would best be placed on decking or at minimum, ensuring the concrete foundation is above grade thus to ensure excavation is not required.
- The living area is proposed to be above existing grade on isolated pier and beam foundations. Provided non-destructive digging (NDD) such as an airspade or hand excavation under direct Project Arborist supervision is carried out, to find isolated pier locations not impacting woody roots in excess of 40mm in diameter, long term retention of this tree is possible.
- Additional irrigation below the built form would further increase the long-term tree retention.

Pruning impacts:

- No pruning will be required to accommodate works, at the time of assessment the canopy had been pruned previously reducing any overhang onto the subject site.

3.2.18 **Tree 15** Maidenhair Fern – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen.

Tree Protection Zone impacts:

- An encroachment of 5.6% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed living area. This places it within *minor* encroachment under AS4970 and impact on tree health considered unlikely.

Pruning impacts:

- No pruning will be required to accommodate works, the canopy does not overhang the subject site.

3.2.19 **Tree 16** Apple – located on neighbouring property.

Structural Root Zone impacts:

- The proposed dwelling falls just inside the calculated SRZ of this specimen. See discussion below.

Tree Protection Zone impacts:

- An encroachment of 11.9% has been estimated (see Appendix 7 - Tree Encroachment Calculations - visual) for the proposed living area and falls just within the SRZ. This places work just within *major* encroachment under AS4970 and considerations to Clause 3.3.4 - *TPZ encroachment considerations* are required.
- The most relevant clauses are - (c) *Tree species and tolerance to root disturbance* and (d) *Age, vigour and size of the tree*.
- This specimen is tolerant to root pruning, Apple are readily transplantable and this specimen, whilst mature, has many years of active growth to go, allowing it to establish itself within a new setting.
- The tree/shrub appeared vigorous at the time of assessment, some negative impact from overshadowing may be possible, however the majority of online resources state these trees tolerate partial shade.

Pruning impacts:

- This specimen's canopy extends over the subject site, moderate pruning will be required to allow the built form and dwelling clearance, Apple is very tolerant to pruning, long term impact of tree health is not expected.

3.2.20 **Tree 17** Camellia – located on neighbouring property.

Structural Root Zone impacts:

- All proposed works fall outside the calculated SRZ of this specimen (see Figure 1 page 7 above).

Tree Protection Zone impacts:

- All the proposed works fall outside the calculated TPZ of this specimen. The proposed works are not expected to impact tree health or condition.

Pruning impacts:

- No pruning will be required to accommodate works.

4 Conclusions

4.1.1 A total of nineteen (19) trees are included in this Arboricultural Impact Assessment.

4.1.2 No assessed tree has been identified as endangered or threatened under State or Federal Government legislation. The site is not identified on the Department of Planning and Environments Biodiversity Values Map (BV).

4.1.3 One (1) tree on neighbouring property has been removed since the site Survey was undertaken – Tree 6.

4.1.4 One (1) assessed tree is proposed for removal to accommodate the construction of the proposed pool – Tree 8.

4.1.5 Six (6) assessed trees (Trees 4, 5, 8A, 11, 12 and 17) will incur nil encroachment and impact on tree health is not expected.

4.1.1 Five (5) assessed trees (Trees 2, 7, 9, 10 and 15) will incur 'minor' encroachment (as per parameters under AS4970 -2009 Protection of trees on development sites) as the works fall under the 10% TPZ threshold. Impact on health or condition is not considered likely.

4.1.2 Six (6) assessed trees (Trees 1, 3, 9A, 13, 14 and 16) will incur 'major' encroachment as the works fall over the 10% TPZ threshold (with the exception of Tree 9A) and (with the exception of Tree 3) into the SRZ.

4.1.3 In relation to Tree 3, 9A, 13 and 14 design methods greatly reduce the calculated encroachment figure, however as with all these trees, careful and sympathetic management during works will be required under Project Arborist supervision to ensure these trees can be protection and retained.

4.1.4 In relation to Trees 3, 13 and 14, the installation of additional irrigation within the calculated TPZ of each tree following works would increase chances of ongoing viability and long-term tree retention.

5 Recommendations

5.1 Trees proposed for pruning/removal

5.1.1 Any tree pruning/removal is to be undertaken in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998) and Safe Work Guide to Managing Risks of Tree Trimming and Removal Work 2016. Tree pruning shall be in accordance with the Work Health and Safety Act 2011, the Work Health and Safety (WHS) Regulations 2017 and AS4373 Pruning of Amenity Trees.

5.1.2 Tree pruning/removal are subject to permit approval from the relevant consent authority.

5.2 Project Arboriculturist

5.2.1 A Project Arboriculturist (PA) shall be engaged prior to work commencing on the site.

5.2.2 A **tree specific Tree Protection Plan**, once Councils Conditions of Consent are issued, shall be established to ensure compliance with the relevant Notice of Determination and in line with Construction Plans/Drawings prior to the issue of the Construction Certificate.

5.2.3 The PA must have a minimum Australian Qualification Framework Level 5 (AQF5) or above in Arboriculture.

5.2.4 Duties of the PA shall include, but not be limited to:

- Liaising with the Project Manager/Head Contractor/Site Manager to confirm the tree protection and other specific tree protection requirements prior to site works commencing.
- Inspection of Tree Protection Devices and supervision of works as recommended in this report or as specified in any Conditions of Consent associated with an approved development application.
- Provision of Compliance/Occupation Certification if, and when required.

5.3 General Tree Protection Measures

5.3.1 Works within TPZs of trees to be retained shall be done under direct supervision of an AQF Level 5 Consulting Arborist and shall comply with the Tree Protection Plan.

5.3.2 Non-destructive excavation is to be used when working within the TPZ of trees to be retained and must be supervised by an AQF level 5 consulting arborist.

5.3.3 Encroachment within the TPZ must be offset with a range of mitigation measures to ensure that impacts to trees to be retained are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure trees to be retained remain viable. This can mean (but is not limited to) specific watering over warmer months, carbohydrate/mycorrhizal treatments and regular monitoring of tree condition.

5.3.4 Activities such as replacing or installing footpaths/driveways/retaining walls shall be done with minimal ground and root disturbance within the TPZs of trees that are proposed to be retained.

5.3.5 Any pruning required (including clearances for vehicle movements or other construction impacts) will need to be assessed and supervised by an AQF level 5 consulting arborist and is subject to consent authority approval. This shall be specified in the Tree Protection Plan.

5.3.6 If temporary access for machinery is required within the TPZ of trees to be retained, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Ground protection may include a permeable membrane such as geotextile fabric beneath a layer of mulch (minimum 75-100mm thickness), crushed rock or rumble boards. This is to be directed within the Tree Protection Plan.

5.3.7 Any additional construction activities within the TPZ of trees to be retained must be assessed and written in the Tree Protection Plan. All activities require approval by the Project Arborist and must comply with AS 4970-2009 - Protection of trees on development sites.

5.4 General Arboricultural advice

5.4.1 Tree and Root Pruning

- Any pruning required is to be assessed and approved by the Council/PA, prior to undertaking any of this type of work.
- Pruning shall not be undertaken by unqualified site personnel at any time.
- Pruning of branches must be undertaken by a minimum AQF Level 3 arborist in accordance with the Australian Standard AS4373-2007 *Pruning of amenity trees*,
- Unless otherwise approved by the Conditions of Development Consent, or by separate application and approval by the consent authority, pruning is to be limited to cutting of limbs less than 80mm diameters, and no more than 10% total live material removed.

5.4.2 Stockpiling and location of site sheds

- The project arboriculturist must be consulted prior to placing any items within a tree's TPZ.
- Where stockpiling must be located within the TPZ offset of trees to be retained, the existing/undisturbed natural ground must be covered with thick, coarse mulch to a minimum 75-100mm thickness.
- Large, or bulky materials (non-contaminating) can be stacked on wooden pallets or boards placed over the mulch.
- Tarpaulins (or similar) placed on boards or pallets on top of mulch shall be used to prevent loose or potentially contaminating materials from moving into the soil profile within the TPZ of trees or within 10m upslope of trees.
- Where site sheds must be located within the TPZ offset of a tree/s, the shed must be fully elevated on all sides with a minimum 300m between existing ground and the floor/floor bearers. Isolated pad footings must be carefully dug by hand and not damage or sever any roots greater than 20mm diameters.
- Any conflict between footing locations and larger roots (i.e. 20mm Ø plus) must be brought to the attention of the project arboriculturist who is to provide practical alternatives that do not include unnecessary tree root removal.

5.4.3 Fill Material

- Placement of fill material within the TPZ of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be in accordance with specification set out within Appendix 6.
- The fill material should be consolidated by hand to minimise compaction of the underlying soil.
- Permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material shall be placed in direct contact with the trunk.

5.4.4 Pavements

- Pavements should be avoided within the TPZ of trees to be retained where possible.
- Proposed paved areas within the TPZ of trees to be retained is to be placed above grade to minimise excavations within the root zone, avoiding root severance and damage.

5.4.5 Fencing and walls within the SRZ and TPZ of retained trees.

- Where fencing and/or masonry walls are to be constructed along site boundaries, they must provide for the presence of any living woody tree roots greater than 50mm diameter.
- Hand digging must occur within the SRZ of trees to be retained.
- For masonry walls/fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (e.g. steel or timber pickets, lattice etc) fixed to pillars.

5.4.6 Landscaping within tree root zones.

- The level of introduced planting media into any proposed landscaped areas within the TPZ is not to be greater than 75mm depth, and be of a coarse, sandy material to avoid development of soil layers that may impede water infiltration.
- Appropriate container size of proposed plants within the SRZ of trees should be determined prior to purchase of plants. Otherwise, any proposed landscaping within the SRZ must consist of tubestock only. This is required to ensure that damage to tree roots is avoided.
- Mattocks and similar digging instruments must not be used within the TPZ of the trees. Planting holes should be dug carefully by hand with a garden trowel, or similar small tool.
- Where possible, do not plant canopy trees beneath, or within 6 - 8m of overhead lines.

5.4.7 Other

- No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within 8m upslope of any palms or trees to be retained.
- Regular monitoring of the trees during development works for unforeseen changes or decline will help maintain the trees in a healthy state.

6 References

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February & March 2025

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7 Appendices

Appendix 1 – Terms and Definitions

Age classes

Y Young refers to an established but juvenile tree.
SM Semi-mature refers to a tree at growth stages between immaturity and full size.
EM Early-mature refers to a tree close to full sized still actively growing.
M Mature refers to a full sized tree with some capacity for further growth.
LM Late-Mature refers to a full sized tree with little capacity for growth that is not yet about to enter decline.
OM Over-Mature refers to a full sized tree with little capacity for growth that is entering or has entered decline.

Co-dominant: refers to stems or branches equal in size and relative importance.

Condition/Structure: refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition/structure.

Deadwood: refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.

Diameter at Breast Height (DBH): Refers to the tree trunk diameter at breast height (1.4 metres above ground level).

Epicormic growth: adventitious branches that are considered to be a weak attachment in the short term due to minimal wood formation. There are generally formed following storm-related branch breakage or poor pruning practices. Should sufficient holding wood form in the long-term this growth is less of an issue.

Hazard: refers to anything with the potential to harm health, life or property.

Health: Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Secondary Stem: refers to stems or branches with one of unequal size and relative importance.

SRZ: refers to the Structural Root Zone of the tree, this is the area required for tree stability.

TPZ: refers to the Tree Protection Zone of the tree, this is the primary method of protecting trees, it is a combination of the root area and the canopy and the SRZ is located within it.

Visual Tree Assessment (VTA): a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

Appendix 2 – STARS – Significance of a Tree Assessment Rating System (IACA 2010)©

Estimated Life Expectancy

STARS refers to an estimated life expectancy of a tree, Treeism utilises the ULE categories to clarify how this was obtained/decided.

ULE categories (after Barrell 1996, Updated 01/04/01)

The five categories and their sub-groups are as follows:

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:
    a) Structurally sound trees located in positions that can accommodate future growth
    b) Trees which could be made suitable for long term retention by remedial care
    c) Trees of special significance which would warrant extraordinary efforts to secure their long term retention
2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:
    a) Trees which may only live from 15 to 40 years
    b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which could be made suitable for retention in the medium term by remedial care
3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:
    a) Trees which may only live from 5 to 15 years
    b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons
    c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    d) Trees which require substantial remediation and are only suitable for retention in the short term.
4. Removal - trees which should be removed within the next 5 years:
    a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions
    b) dangerous trees through instability or recent loss of adjacent trees
    c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form
    d) Damaged trees that are clearly not safe to retain
    e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
    f) Trees which are damaging or may cause damage to existing structures within the next 5 years
    g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
    h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review
5. Small, young or regularly pruned - Trees that can be reliably moved or replaced:
    a) small trees less than 5m in height
    b) young trees less than 15 years old but over 5m in height
    c) formal hedges and trees intended for regular pruning to artificially control growth

Landscape Significance

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.
This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and estimated life expectancy *(utilising Useful Life Expectancy)* 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 vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape.

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area;
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street;
- The tree provides a fair contribution to the visual character and amenity of the local area;
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape.

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings;
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area;
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen;
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions;
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms;
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species:

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties;
- The tree is a declared noxious weed by legislation.

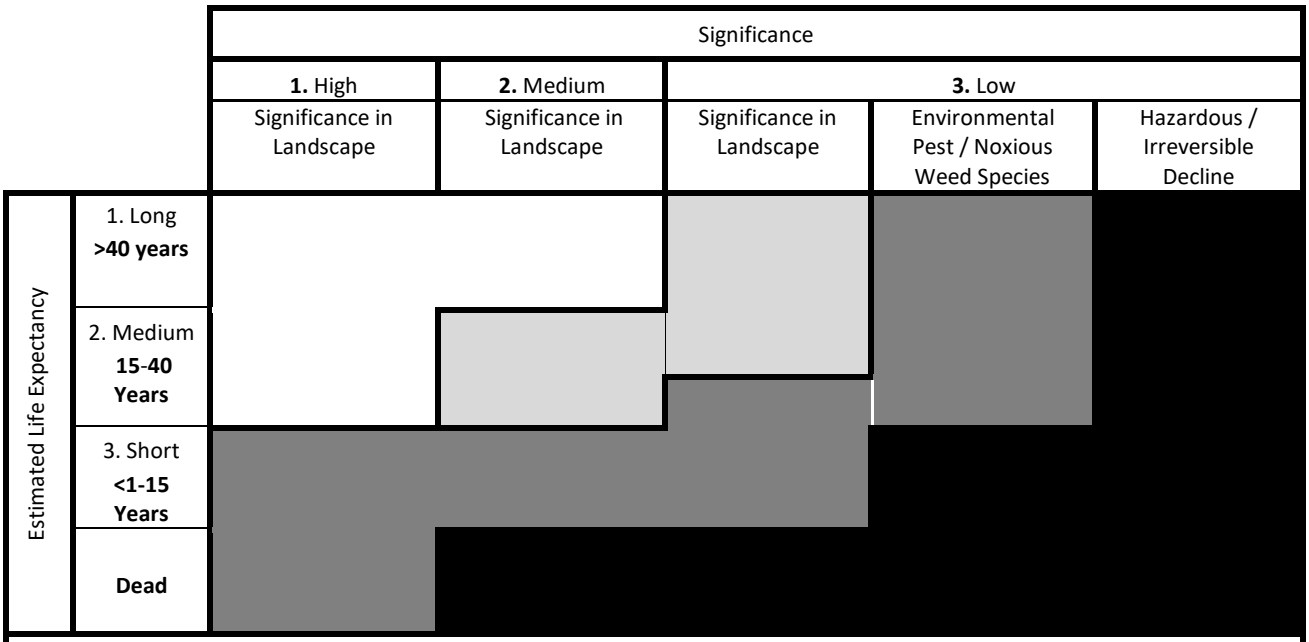
Hazardous/Irreversible Decline:

- The tree is structurally unsound and/or unstable and is considered potentially dangerous;
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

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

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd and Andrew Morton in June 2001.



Legend for Matrix Assessment

	Priority for Retention (High) -These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) -These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) -These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal -These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

Table 1 - Tree Retention Value - Priority Matrix.

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

Appendix 3 – Schedule of Assessed Trees – Site inspection 15/2/2025, 67 Woolgoolga Street, North Balgowlah.

Tree No.	*Genus & species* **Common Name**	Ht (m)	Sp (m)	DBH (mm)	AB (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)	TPZ encroachment (approx. %)
1	*Lophostemon confertus* | **Brushbox**	16	18	@ 0.7m AGL 675	680	M	G	G	Located on Council managed land. |Introduced native species. Secondary stem at 1m AGL, twiggy deadwood noted.	2A	H	**H**	2.8	8.1	206	48.2
2	*Callistemon* sp. | **Bottlebrush**	6	6	*100/110 (149)	*230	M	F	F-P	Located on neighbouring property. |Introduced native species. Sparse, some overhang onto subject site.	3A	M	**L**	1.8	2.0	13	2.6
3	*Angophora costata* | **Smooth-barked Apple**	16	18	505/685 @ 1m AGL (851)	1125	M	G	G	Located on subject site. |Locally native species. Sprawling specimen, some minor tip dieback.	2A	H	**H**	3.5	10.2	328	30
4	*Leptospermum petersonii* | **Lemon-scented Tea Tree**	5	6	*100	*110	M	G	G	Located on neighbouring property. |Locally native species. Canopy leans away from site.	2A	M	**M**	1.5	2.0	13	0
5	*Angophora costata* | **Smooth-barked Apple**	19	16	*480	*500	M	G-F	F	Located on neighbouring property. |Locally native species. Failure noted, deadwood to 40mm. Canopy held high over site.	2A	H	**H**	2.5	5.8	104	0
6	*Liquidamber styraciflua* | **Removed**	-	-	-	-	-	-	-	Located on neighbouring property. |Introduced exotic species. Removed prior to site assessment, client advised Treeism of species.	-	-	**-**	-	-	-	N/A
7	*Crataegus* sp. | **Hawthorn**	8	9	*200/180 (269)	*350	M	G	G	Located on neighbouring property. |Introduced exotic species. Minor overhang of branches onto subject site.	2A	M	**M**	2.1	3.2	33	1.1
8	*Angophora costata* | **Smooth-barked Apple**	15	14	190/250 (314)	300/420 (516)	M	G-F	G-F	Located on subject site. |Locally native species. Epicormic growth noted. Deadwood to 80mm dia.	2A	M	**M**	2.5	3.8	45	27.4
8A	*Glochidion ferdinandi* | **Cheese Tree**	12	10	*220	*240	M	G	G	Located on neighbouring property. |Locally native species. Not shown on survey plan.	2A	H	**H**	1.8	2.6	22	0
9	*Angophora costata* | **Smooth-barked Apple**	21	20	*600	*650	M	G	G-F	Located on neighbouring property. |Locally native species. Epicormic growth in upper canopy.	2A	H	**H**	2.8	7.2	163	4.8
9A	*Pittosporum undulatum* | **Sweet Pittosporum**	10	5	*90/150 (175)	*260	M	G-F	G-F	Located on neighbouring property. |Locally native species. Not shown on survey plan. Located hard against boundary fence.	2A	M	**M**	1.9	2.1	14	0.5
10	*Angophora costata* | **Smooth-barked Apple**	17	9	310	395	M	G-F	F-P	Located on subject site. |Locally native species. High percentage of deadwood. Deadwood to 50mm. Fauna scratches up stem. Board screwed into stem, lost codominant stem in past.	2A	M	**M**	2.2	3.7	44	8.0
11	*Angophora costata* | **Smooth-barked Apple**	19	20	*480	*500	M	G-F	G-F	Located on neighbouring property. |Locally native species. Canopy thin.	2A	H	**H**	2.5	5.8	104	0
12	*Angophora costata* | **Smooth-barked Apple**	16	14	*300	*390	M	G-F	G-F	Located on neighbouring property. |Locally native species.	2A	H	**H**	2.2	3.6	41	0
13	*Angophora costata* | **Smooth-barked Apple**	17	19	400	480	M	G	G-F	Located on subject site. |Locally native species. Canopy orientated over neighbouring property. Fauna scratches up stem.	2A	H	**H**	2.4	4.8	72	*17.2
14	*Harpephyllum caffrum* | **South African Wild Plum**	13	10	*370	*400	M	G	G-F	Located on neighbouring property. |Introduced exotic species.	2A	M	**M**	2.3	4.4	62	*21.8

Tree No.	*Genus* & *species* **Common Name**	Ht (m)	Sp (m)	DBH (mm)	AB (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)	TPZ encroachment (approx. %)
15	*Ginkgo biloba* | **Maidenhair Tree**	8	4	*80	*100	EM	F	F	Located on neighbouring property. |Introduced exotic species.	2A	M	**M**	1.5	2.0	13	5.6
16	*Malus* sp. | **Apple cv**	4	8	*60x 4, 100/20* (157)	*160	M	G	G	Located on neighbouring property. |Introduced exotic species. Branches extend low over subject site.	2A	M	**M**	1.5	2.0	13	11.9
17	*Camellia sasanqua* | **Camellia**	5	4	*60/40/20 (110)	*110	M	G	G	Located on neighbouring property. |Introduced exotic species. Murraya's located next to it.	2A	M	**M**	1.5	2.0	13	0

KEY

Trees to be retained.

Dead/non-prescribed tree or palm on site that may be removed or retained without Development Consent or Tree Management Permit.

Trees proposed for removal.

L Low Retention Value-These trees are not considered important for retention.

M Medium Retention Value-These trees may be retained & protected.

H High Retention Value -These trees are considered important for retention and should be retained and protected.

* DBH is visually estimated (those that are hard to access). AB – above *buttress roots*. AGL - above ground level. Figures in brackets indicates the determined DBH and TPZ for a multi-stemmed tree based on the formula shown in Appendix A of AS4970-2009.

NOTE: According to AS4970, the TPZ of palms, other monocots, cycads, and tree ferns should not be less than 1m outside the crown projection. The AS4970 formula for calculating the SRZ of a tree does not apply to palms, other monocots, cycads, and tree ferns.

H refers to the approximate height of a tree in metres, from base of stem to top of tree crown.

Sp refers to the approximate and average spread in metres of branches/canopy (the 'crown') of a tree.

DBH refers to the approx. diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted) in millimetres. Figures in brackets indicate the minimum TPZ allowable as per Section 3.2 Determining the TPZ with AS4970-2009.

Age refer to Appendix 1 -Terms and Definitions for more detail.

V refers to the tree's vigour (health) Refer to Appendix 1 -Terms and Definitions for more detail.

C refers to the tree's structural condition. Refer to Appendix 1 -Terms and Definitions for more detail.

ULE refers to the estimated *Useful Life Expectancy* of a tree. Refer to Appendix 2 for details.

TSR The *Tree Significance Rating* considers the importance of the tree because of its prominence in the landscape and its amenity value, from the point of view of public benefit. Refer to Appendix 2 – Significance of a Tree Assessment Rating for more detail.

RV Refers to the retention value of a tree, based on the tree's ULE *and* Tree Significance. Refer to Appendix 2 – Significance of a Tree Assessment Rating for more detail.

SRZ Structural Root Zone (SRZ) refers to the critical area required to maintain stability of the tree, noted in table as a radial measurement in meters. Refer to Appendix 1 -Terms and Definitions for more detail. This is not calculated/does not apply for palms, cycads, tree ferns or monocot species.

TPZ Tree Protection Zone (TPZ) refers to the *tree protection zones* for trees to be retained. noted in table as a radial measurement in meters. Refer to Appendix 1 -Terms and Definitions for more detail. For palms, cycads, tree ferns or monocot species it is calculated to be no less than 1m outside the crown projection.

Appendix 4 – Tree Protection Devices

Figure 1 – Tree Protection Zone Fencing
Key

1. 1.8m high chain wire mesh panels with appropriate feet such as concrete or water filled base blocks.
2. Inside TPZ fencing , 75-100mm deep layer of suitable, organic mulch is to be installed. No excavation, grade change, construction activity or material storage is permitted.
3. Alternate fencing option of 1.8m plywood/wooden panels can also be used, (with above ground bracing) to ensure prevention of soil build up/building materials entering TPZ.
4. Appropriate Tree Protection Zone signage must be displayed – see Figure 2.

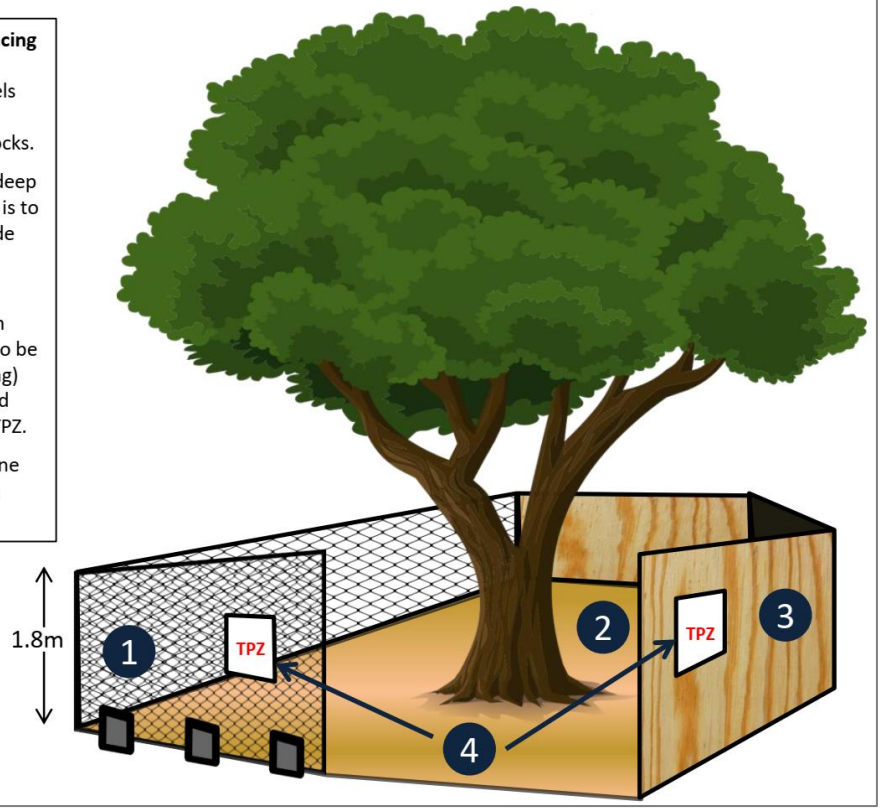


Figure 2
Suitable Tree Protection Zone Signage

Figures 1 & 2 – Tree Protection Fencing and appropriate signage.

Figure 3 - Stem, Branch & Ground protection measures

Key

1. Padding (such as geotextile membrane, natural hessian, rubber, or carpet to protect bark).
2. Battens/boards for branch/stem protection, strapped together NOT nailed into bark/tree. Minimum 2m in height on stem where feasible.
3. Ground protection base 75-100mm of fit for purpose mulch.
4. If machinery is required to move within the TPZ then steel rumble boards (4a) or wide, timber sheeting/boards thrashed together (4b) is to be placed over mulch layer (preferably with geotextile base layer), this to spread the weight and minimise soil compaction

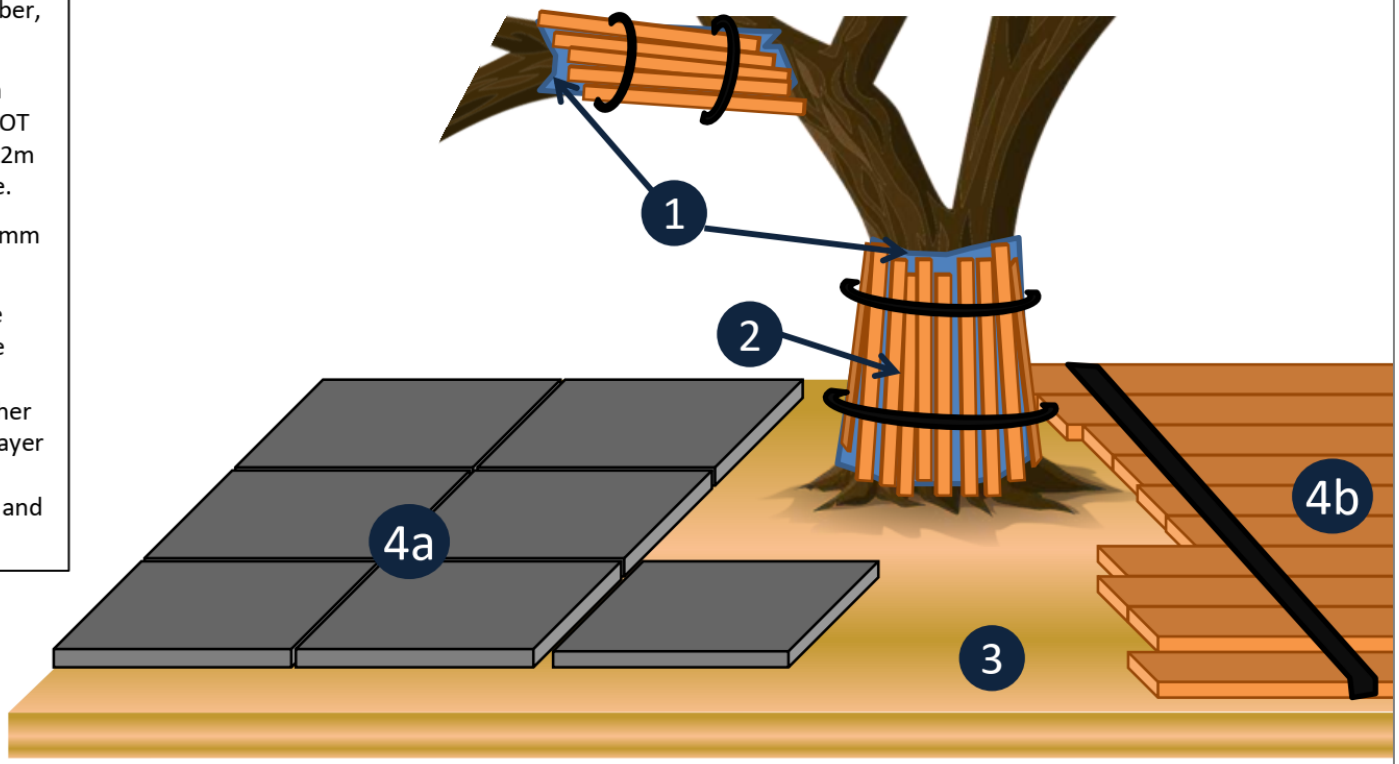


Figure 3 – Stem and ground protection measures.

Appendix 5 – Photographs

Plate 1 – Tree 1 – Arrow notes existing gravel driveway in close proximity to tree. Compaction evident, however proposed concrete driveway would need to ensure finished base level is above existing grade.

Plate 2 – Tree 2 – Arrow notes minor overhanging branches.

Plate 3 – Tree 3 – High RV and significant specimen that warrants special measures for retention.

Plate 4 – Tree 3 – High RV and significant specimen that warrants special measures for retention.

Plate 5 – Tree 8 – This tree requires removal to accommodate the proposed pool. Tree 5 noted in background, located on neighbouring property.

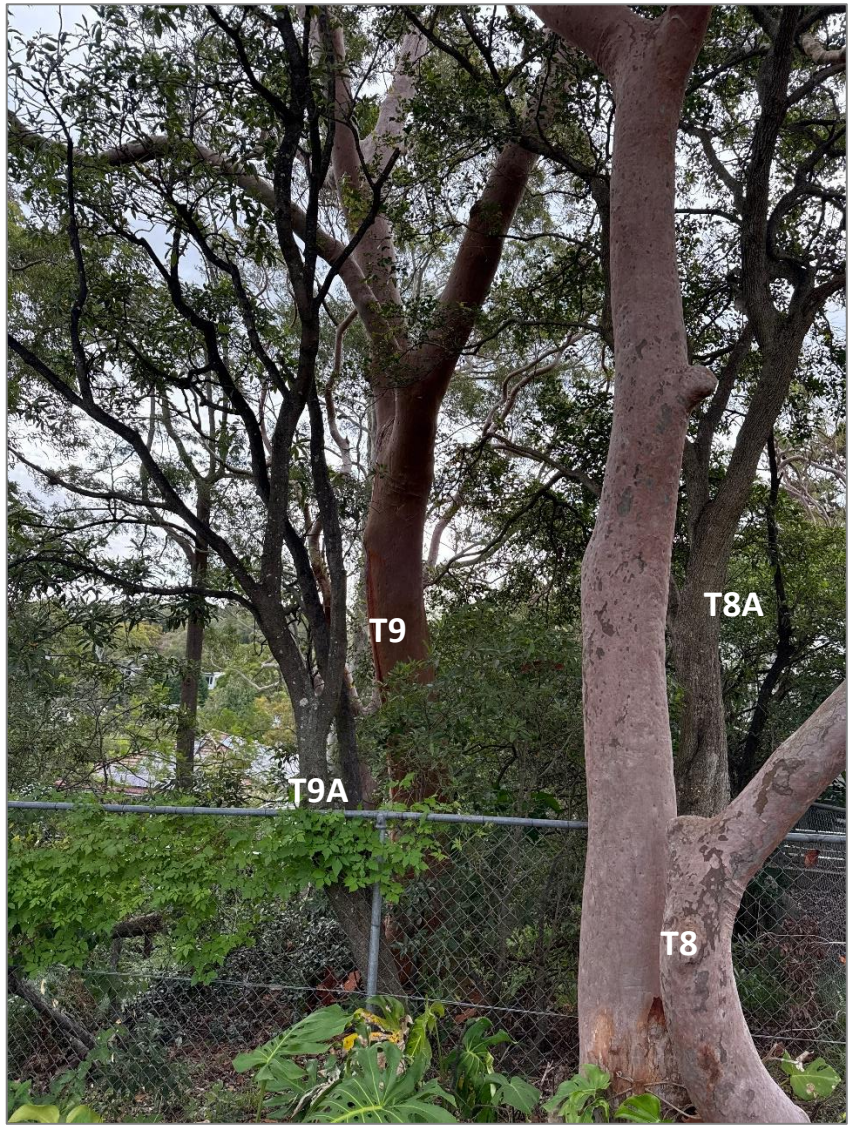


Plate 6 – Tree 2 – Frangipani can easily be relocated or lifted and replanted following works if required.

Plate 7 – Tree 10-13 – Tree 10 and Tree 13 within subject site, Tree T12 within neighbouring property.

Plate 8 – Tree 10-12 – Tree 10 within subject site, Tree 11 and T12 within neighbouring property.

Plate 9 – Tree 13 and Tree 14, note both canopies pruned/orientated to the south away from the proposed build.

Plate 10 – Tree 16 – Note overhanging branches that will require reducing back from subject site.

Appendix 6 – Tree Location Plan

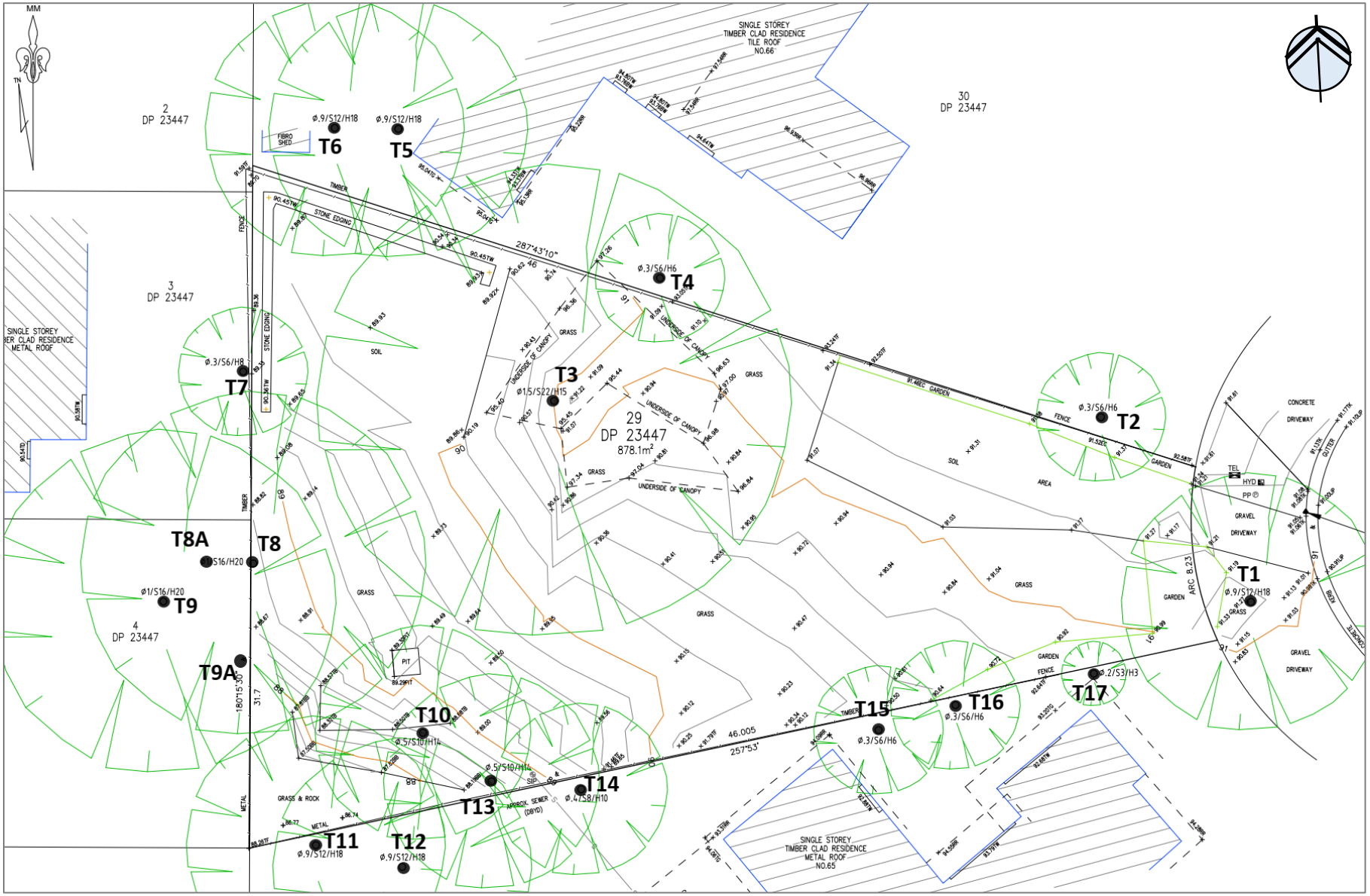


Figure 5 –Excerpt of Survey Plan, plan no. 230022, Revision 3, dated 23/10/2024, authored by Total Surveying Solutions. Marked up by C Hughes. (NOT TO SCALE).

Appendix 7 – Tree Encroachment Calculations – visual

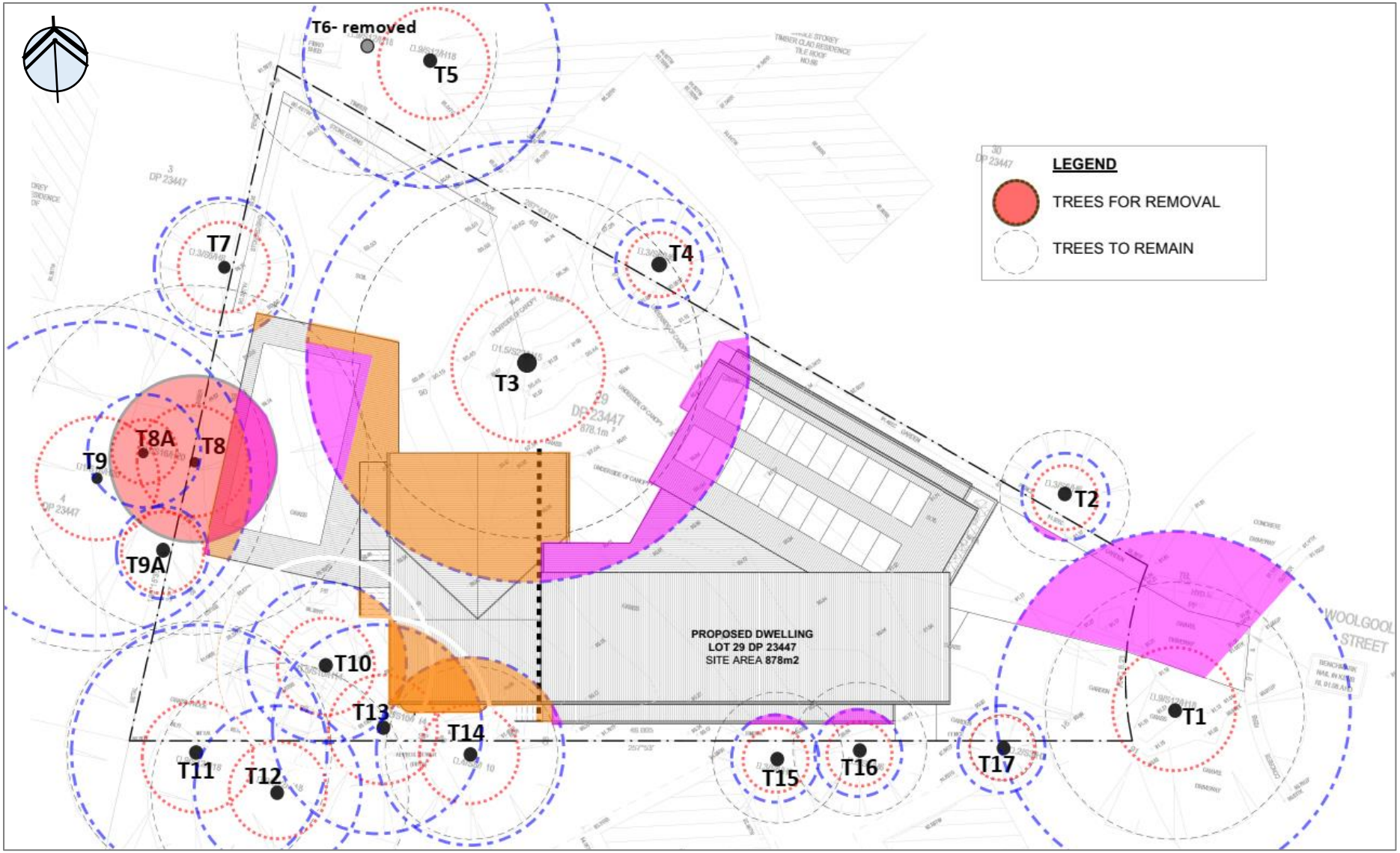


Figure 6 –Excerpt of Veg Removal Plan, job no. 23-1108, Revision B, dated 25/10/2024, authored by Sixtoeight. Marked up by C Hughes. Red dotted circles indicate SRZ, blue hashed circles TPZ, Pink shading denotes encroachment impact ground levels, orange shading notes encroachment above grade – pier and beam. Black dotted line delineates area of below ground encroachment (east of line) to above grade encroachment (west of line). NOT TO SCALE.